



3Com Megahertz 16/4 Token Ring LAN PC Card User Guide

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ABOUT THIS GUIDE

This guide describes how to install and configure the 3Com 3C389 Token Ring LAN PC Card, and is intended for the token ring network administrator, operator, or hardware installer. A knowledge of token ring networks and microcomputer hardware configuration procedures is required.



If the information in the README.TXT file or the Release Notes differs from the information in this guide, follow the information in the README.TXT file first, the Release Notes second, and the user guide third. The README.TXT files are on the software diskettes; the printed Release Notes are placed in the product box or inserted in the user guide when the product is packed.

How to Use This Guide

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

If you are looking for...	Turn to...
Features of the 3C389 Token Ring LAN PC Card	Chapter 1
Installing the 3C389 Token Ring LAN PC Card	Chapter 2
Installing the network device drivers for a specific operating system	Chapter 3
Using LANAIID for network device driver configuration	Chapter 4
Troubleshooting and error codes	Chapter 5
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Conventions

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

Table 1 Notice Icons





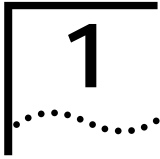
Icon	Notice Type	Alerts you to...
	Information note	Important features or instructions
	Caution	Risk of personal safety, system damage, or loss of data
	Warning	Risk of severe personal injury

Table 2 Text Conventions

Convention	Description
Commands	<p>The word “command” means you must enter the command exactly as shown in text and press the Return or Enter key. Example:</p> <p>To remove the IP address, enter the following command:</p> <pre>SETDefault !0 -IP NETaddr = 0.0.0.0</pre>
	<p><i>This guide always gives the full form of a command in uppercase and lowercase letters. However, you can abbreviate commands by entering only the uppercase letters and the appropriate value. Commands are not case-sensitive.</i></p>
Screen displays	This typeface represents information as it appears on the screen.
Words in <i>italicized</i> type	Italics emphasize a point or denote new terms at the place where they are defined in the text.



INTRODUCTION

The 3Com Token Ring LAN PC Card (formally known as the TokenLink Velocity PC Card and referred to as the 3C389 PC Card) is a network interface card (NIC) that provides an interface between PCs and token ring networks. The 3C389 PC Card is designed to operate in PCs with PC Card slots that comply with the standards of the Personal Computer Memory Card International Association (PCMCIA) Release 2.1, Type II slots.

Product Features

- Fully compatible and up to 90% faster than the 3Com TokenLink III PC Card.
- Remote Program Load (RPL) capability.
- Full-duplex ready.
- Supports the Desktop Management Interface (DMI).
- Easy to install—variable interrupt levels and I/O address choices.
- Choice of Plug and Play automated configuration or software configurable, with included graphical or command line tool, for fast and easy installation.
- RJ-45 cable and shielded twisted pair (STP) media access adapter for easy connection to either unshielded twisted pair (UTP) or STP cabling.
- Hot-Pluggability—conserves power and memory resources without removing the PC Card.

- Compliance with PCMCIA and IEEE 802.5 standards, Revision 2.
- Support for a variety of network operating systems and network applications.
- Auto Ring Speed option that automatically detects the data rate of the ring.



See the README.TXT files on the TokenDisk diskettes for information on 3C389 PC Card features not documented in the user guide.

Overview of Point Enablers, Socket Services, Card Services, and Super Client Drivers

Computers that support PC Cards have one or more PC Card slots, known as A, B, C... or 1, 2, 3....

Communication between the LAN device driver and the PC Card is enabled by a software layer which may include one or more of the following programs:

- Point Enablers
- Card Services
- Socket Services
- Super Client Drivers

Figure 1-1 shows how these programs operate relative to each other. A dotted line means that the program has fulfilled a temporary function and is no longer operating or resident in memory.

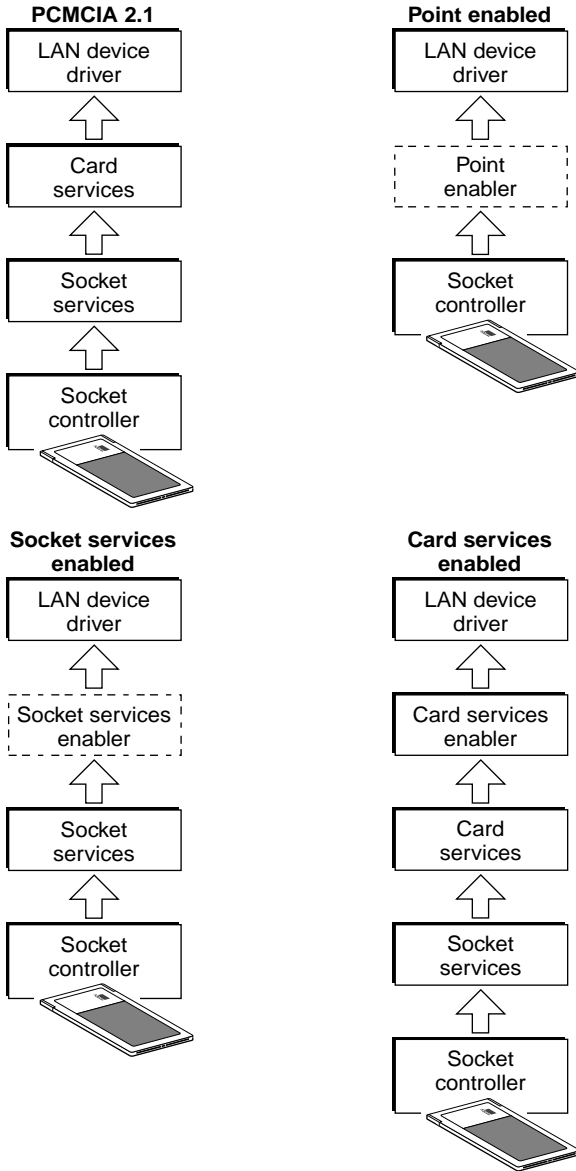


Figure 1-1 PC Card Software Interfaces

Point Enablers



Windows NT currently uses a point enabler called PCMCIA.SYS, which currently ships with Windows NT. OS/2 requires Card Services.

Point enablers are small programs that provide an interface directly to the PC Card controller; therefore, they must be written to support a particular type of controller. For the 3C389 PC Card, there are point enablers for the Intel chip (most PCs) and for the chip installed in the Toshiba 3300SL.

In the DOS environment only, you have the option of using these point enablers *instead* of Card and Socket Services.

Two point enablers are supplied for this PC Card:

- POINTTR.EXE—For PCs with Intel PCMCIA controllers, including the IBM ThinkPad, Toshiba 4500 and later, and many other makes.
- TOSHTR.EXE—For the Toshiba T3300SL.



When using the point enabler, it is vitally important that you make certain that the system resources used by the PC Card are different from and do not conflict with the system resources and any other PC Cards installed in your PC.

Advantages

Enablers consume no memory—they remove themselves after configuring the PC Card.

Disadvantages

You must specify the slot number; the point enabler will enable only that slot. Therefore, the PC Card must always be in a specific slot.

In some PCs, the slot may not be switched off when the PC is in suspend mode, so the PC Card will continue to consume power.

When configuring two or more PC Cards, you must allocate memory and interrupt resources manually.

Socket Services

This is a BIOS-type interface that provides a way to gain access to the PC Card sockets (slots) of a PC. It identifies how many sockets your PC has and detects the insertion or removal of a PC Card while the PC is switched on. It has an interface to Card Services. Socket Services is part of the PCMCIA Specification.

The Socket Services device driver is usually provided by the manufacturer of the PC, because the driver must understand the PC's BIOS and PCMCIA controller.

The Socket Services interface enabler shipped on *TokenDisk* diskette #2 is TOKENRNG.EXE. It will not work with Socket Services 2.0 or higher.

The file TOKENRNG.EXE is an MS-DOS Socket Services 1.01 interface enabler. It uses the Socket Services that is included in some PCs to configure the socket and PC Card. It is used on machines with DATABOOK PC Card controllers that support the Socket Services 1.01 interface and not Card Services.

Card Services

This is a software management interface that allows system resources (such as memory, interrupts, slots, and I/O ports) to be allocated automatically when Socket Services has detected that a PC Card has been inserted.

Client drivers call Card Services to allocate and de-allocate system resources. When Socket Services detects an insertion or removal of a PC Card, it sends notification to Card Services. Card Services then notifies its registered client drivers, such as IBMTOKCS.OS2, that they should allocate or de-allocate resources.

If the installation program detects Card and Socket Services in your PC, it will default to Autoset mode. Autoset mode allows your LAN driver to negotiate with Card Services for memory space and interrupts. This helps to prevent conflicts with other PC Cards that are installed in your PC; however, you will not know exactly what memory addresses and interrupts have been given to you.

Card Services requires Socket Services. The Card Services interface is usually provided with the operating system.

Advantages

- Ability to insert and remove PC Cards without PC reconfiguration and without damaging the electrical contacts.
- Automatic allocation of system resources.
- When used with your token ring software in Autoset mode, automatic configuration of your PC Card occurs.

Disadvantage

- Stay-resident program that uses system memory. The amount varies according to the type of PC Card support and the drivers used.

The file CS20TOK.EXE is a DOS Card Services 2.00 interface enabler shipped on *TokenDisk* diskette #2. It uses the Card Services interface to configure the socket and the PC Card. It is used when the token ring device driver is not a Card Services client driver and a Card Services environment is desired. It works with DOS Card Services 2.00 and higher.

Super Client Drivers

Many notebook PC vendors are providing customers with super client drivers that can enable many different PC Cards. PC-DOS 6.1 includes one called PCMSCD.EXE, for example.

They are best used for modems and other PC Cards that do not have a Card Services client driver of their own. If you use a super client driver, try to disable support for the PC Card and use the 3Com client driver. 3Com drivers have been written to take advantage of Card Services. Look at the documentation for your super client driver to find out whether you can disable token ring support.

Card Services Enabler

If you want to use a token ring device driver that does not have built-in Card Services support on a system that uses Card Services, CS20TOK.EXE is supplied. This program is a Card Services Enabler that uses Card and Socket Services to configure the 3C389 PC Card. As with other enablers, you must specify the resources desired for the PC Card, and they must agree with the settings of the token ring device driver for the system to work correctly.

Card and Socket Services Versus Point Enablers

In principle, Card and Socket Services is the better method of connection because it allows you to insert or remove PC Cards from any slot as you want, even while the PC is switched on (hot-swapping) and it automatically allocates resources like memory, I/O ports, interrupt levels, and slots.

Point Enablers, two of which are provided with the PC Card, are popular because they remove themselves from memory after having been loaded—as opposed to the 30-40 KB needed for Card and Socket Services.

For point enablers, you have to specify the slot in which a particular PC Card will be used and you have to specify memory locations, interrupt levels, and other parameters. This is not difficult unless you use several PC Cards at different times, in which case you need to make certain that what you specify does not conflict with any other PC Cards installed in your PC.

Autoset Mode

Card and Socket Services turns out to be most helpful when you have a number of PC Cards installed in your PC. If the installation program detects Card and Socket Services in your PC, it will default to Autoset mode. Autoset mode allows your LAN driver to negotiate with Card and Socket Services for memory space and interrupts every time you switch on your PC. This helps to prevent conflicts with other PC Cards that are installed in your PC; however, you will not know exactly what memory addresses and interrupts you are using.

2

INSTALLING THE TOKEN RING LAN PC CARD

Kit Contents

In addition to this manual, your kit contains the following items:

- 3Com 3C389 Token Ring LAN PC Card
- Token Ring LAN PC Card RJ-45 cable
- Six *TokenDisk* diskettes
- An shielded twisted pair (STP) connector for connection to STP network wiring



The 3C389 PC Card cable can be purchased separately. If you want additional cables, contact your 3Com marketing representative or your place of purchase.

Installation Tips

If you plan to use Card and Socket Services software, Version 2.0 or higher, install it and reboot your PC. The software may be provided with your PC or operating system. See Chapter 1 for a description of these services.

The README.TXT file on *TokenDisk* diskette #2 contains more information to help you configure and customize the 3C389 PC Card.

Installing the 3C389 PC Card

The procedures in this section explain how to physically install the 3C389 PC Card. The installation procedure is summarized by the following sequence:

- Attach the RJ-45 cable to the 3C389 PC Card.
- Insert the 3C389 PC Card into the PC.
- Plug the cable into the appropriate network port.



If you are using Card and Socket Services, you may be able to use hot-pluggability features with your 3C389 PC Card. See Appendix C, “Hot-Pluggability and Suspend/Resume” for more information

- 1 Turn off the power to the PC.**
- 2 Attach the cable to the 3C389 PC Card (Figure 2-1).**

Retract the latch by sliding the half-circle latching button on the connector backwards toward the cable. The cable cannot be connected or disconnected unless the latch is retracted.

With the part number facing down, attach the cable connector to the 3C389 PC Card.

The connector can attach to the 3C389 PC Card in only one way. If the connector does not seem to fit, turn it over and gently try again.



The cable for the 3Com 3C689 TokenLink III PC Card is not compatible with the 3C389 PC Card.

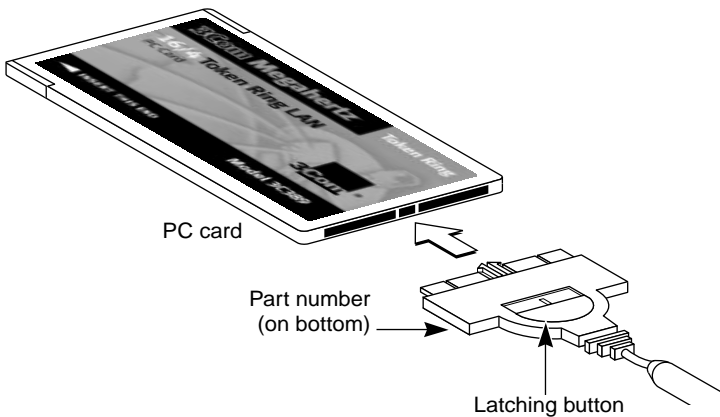


Figure 2-1 Attaching the Cable to the 3C389 PC Card

3 Lock the cable connector to the 3C389 PC Card.

Slide the latching button toward the 3C389 PC Card.

You can leave the latching button retracted, so that if the cable is yanked, the connector will disconnect from the PC Card, possibly saving your PC from being pulled off a table.

**4 Insert the 3C389 PC Card in the slot (Figure 2-2).
If you are using a point enabler, note which slot you use.**

The 3C389 PC Card can go in only one way. If you feel resistance before the 3C389 PC Card is fully inserted, remove the 3C389 PC Card, turn it over, and reinsert it.

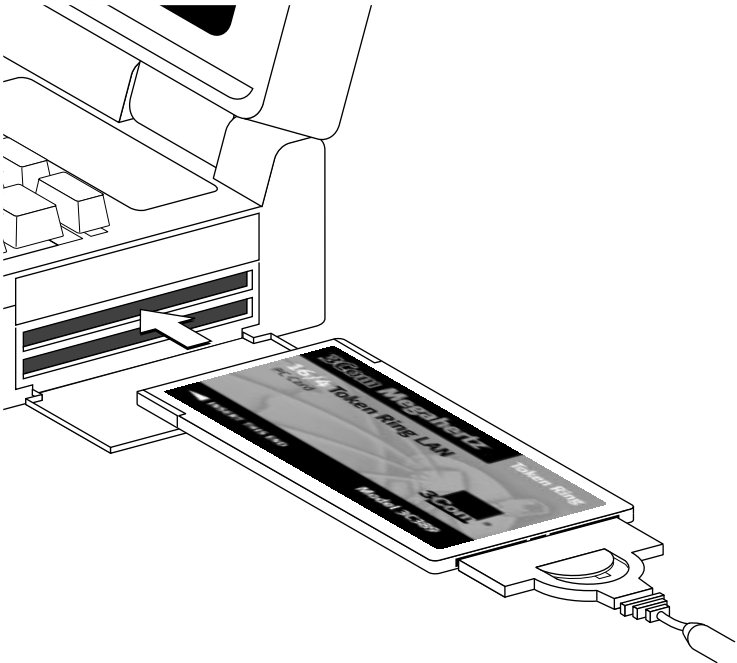


Figure 2-2 Inserting the 3C389 PC Card

5 Connect the PC Card cable to the network port.

- If your network uses unshielded twisted pair (UTP) cabling, attach the RJ-45 (8-pin modular) connector on the 3C389 PC Card cable (P/N 38H7044) to the RJ-45 network port (Figure 2-3).

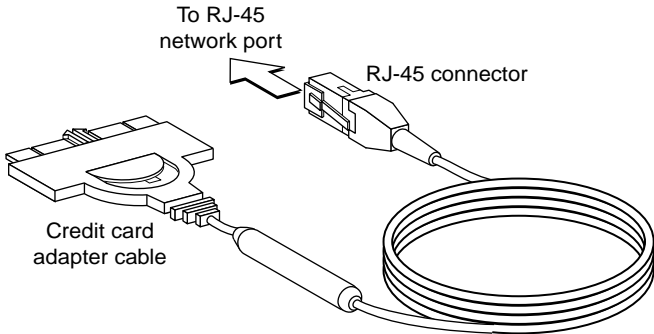


Figure 2-3 Modular UTP Cable for the 3C389 PC Card

- If your network uses shielded twisted pair (STP) cabling, attach the RJ-45 connector on the 3C389 PC Card cable (P/N 38H7044) to the RJ-45 end of the STP connector (P/N 73G8315). Attach the STP connector to the STP network port (Figure 2-4).

The STP connector has been specifically designed to work with the 3C389 PC Card.

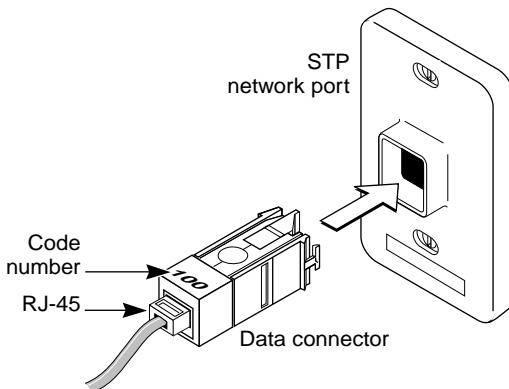


Figure 2-4 RJ-45 to STP Connector



Verify that you are using the correct STP connector. The correct STP connector is labeled with the number 100.

6 Turn on the power to the PC.

Proceed to Chapter 3 for instructions on how to install the network drivers.

Removing the 3C389 PC Card



Removing the cable from the 3C389 PC Card makes the operating system behave as if the PC Card has been physically removed from the slot. See Appendix C for more information.

Follow these steps to remove the 3C389 PC Card:

- 1 Switch off the power to the PC.**
- 2 With the cable still attached to the 3C389 PC Card, remove the 3C389 PC Card from the PC.**
- 3 To detach the cable from the 3C389 PC Card, retract the latching button (the half-circle in the center of the connector) by sliding it backwards away from the 3C389 PC Card.**
- 4 Disconnect the cable connector from the 3C389 PC Card.**

3

INSTALLING THE NETWORK DRIVERS

This chapter describes how to install network LAN drivers other than IBM LAN Client. After installation, some network drivers must be configured using LANAID, an installation and diagnostic utility described in Chapter 5.



If you are installing the IBM LAN Client go directly to Chapter 5.

Consult the following lists to determine if LANAID is required to configure your network driver:

LANAID is not required to configure the following drivers:

- Windows 98
- Windows 95
- Windows NT 3.51
- Windows NT 4.0
- OS/2 NDIS 2 device driver using LAPS
- OS/2 NDIS 2 device driver using MPTS
- OS/2 NDIS 2 device driver using other installation programs
- Warp Connect
- Warp Server
- Novell NetWare Client 32 for Windows 95

LANAID is required to configure the following drivers:

- IBM LAN Support Program/Native
- IBM LAN Client
- DOS Client 16 for Novell NetWare lower than 3.12
- DOS Client 16 for Novell NetWare 3.12 and 4.0
- DOS Client 16 for Novell NetWare 4.01 and higher
- OS/2 NetWare Client
- Artisoft LANtastic 6.0, 7.0
- Banyan VINES 6.X
- Microsoft LAN Manager/NDIS
- Windows for Workgroups\NDIS 2
- Other DOS NDIS environments

The installation procedures for the following drivers are found in the README.TXT file shipped on *TokenDisk* diskette #1:

- Microsoft LAN Manager, NDIS
- ARTISOFT LANtastic Versions 6.0 and 7.0
- Banyan VINES, NDIS
- DOS Client-16 for Novell NetWare lower than 3.12
- DOS Client-16 for Novell NetWare 3.12 and 4.0
- OS/2 NetWare Client
- OS/2 NDIS 2 Device Driver Using Other Installation Programs



The most recent 3Com drivers are available from the 3Com World Wide Web site (www.3com.com) or the 3Com Bulletin Board Service. See Appendix D for information on how to connect with 3Com online services.

Windows 98 Installation

You will need your Windows 98 CD during installation, unless you have copied the .CAB files to your hard disk.

TokenDisk diskette #6 contains the device driver for Windows 98.

- 1 Insert the PC Card and connect the cable to the card as described in Chapter 2.**
- 2 Turn on the computer and start Windows 98.**

Windows 98 automatically detects the card and displays the New Hardware Found dialog box and the Start building a driver information database.
- 3 Click *Next* when the Add New Hardware Wizard appears.**
- 4 Insert *TokenDisk* diskette #6.**
- 5 Select *Search for the best driver for your device (recommended)* then click *Next*.**
- 6 Select *Specify a location* and make sure that no other boxes are checked.**
- 7 Below Specify a location, type a:\win98 and click *Next*.**
- 8 Click *Next* and the Start building a driver information database displays.**
- 9 When prompted, insert the Windows 98 CD.**
- 10 Click *Finish*.**
- 11 When Windows 98 prompts whether to reboot the computer, remove *TokenDisk* diskette #6 from the floppy drive and click *YES* to restart the computer.**

Windows 95 Installation

You will need your Windows 95 diskettes or CD during installation, unless you have copied the .CAB files to your hard disk.

TokenDisk diskette #2 contains the device driver for Windows 95. It is recommended that you use the Windows 95 3C389 PC Card support software.



There are two versions of Windows 95: the original version shipped in August 1995 and the OEM Sales Release 2 (OSR 2). The driver installation instructions are slightly different in the two versions.

1 Determine if you have OSR 2.

Click Start, Settings, Control Panel, and System.

If the system version number is 4.00.950 B, you are using OSR 2. If it is 4.00.950 A or just 4.00.950, you are using the original version of Windows 95.

If you are running OSR 2, use the instructions in “Windows 95 OSR 2 Installation” later in this chapter. Otherwise, perform the following instructions.

2 If you have not already inserted the 3C389 PC Card, insert it now with the cable attached.

The PC does not detect the 3C389 PC Card if the cable is detached.

If PCMCIA support has been started on your machine, the system will prompt you for a diskette.

If PCMCIA support has not been started on your machine, do the following sub steps.

- a Click *Start, Settings, and Control Panel*.
- b Click *PC Card (PCMCIA)* to start PCMCIA support, and follow the instructions given.

3 Insert *TokenDisk* diskette #2 into the appropriate floppy drive and press [Enter].

4 Type `a:\win95` [Enter]

5 Set the displayed parameters.

The system will list acceptable default values.

6 Follow the instructions to copy the files.

Windows 95 PC Card software installation is now complete.

Windows 95 OSR 2 Installation

1 If you have not already inserted the 3C389 PC Card, insert it now with cable attached.

The PC does not detect the 3C389 PC Card if the cable is detached.

If PCMCIA support has been started on your machine, the system will prompt you for a diskette.

If PCMCIA support has not been started on your machine, complete the following sub steps.

a Click *Start, Settings, and Control Panel*.

b Click *PC Card* (PCMCIA) to start PCMCIA support, and follow the instructions given.

2 When the Update Device Driver Wizard appears, insert *TokenDisk* diskette #2 to install the NDIS 3 driver or *TokenDisk* diskette #6 to install the NDIS 4 driver. Click *Next* to search the diskette for the drivers.

3 If the driver is not found on the diskette, click *Other Locations* and type:

a: \win95

4 When the driver is found, click *Finish*.

5 Set the parameters.

The system will list acceptable default values.

6 Follow the displayed instructions to copy the files.

Windows OSR 2 PC Card software installation is now complete.

Windows for Workgroups/NDIS 2 Installation

If you are installing the 3C389 PC Card in a PC that already has Windows for Workgroups installed, refer to the *Microsoft Windows for Workgroups User's Guide* for instructions on how to install and configure a third-party device driver.

If you are running Windows for Workgroups Version 3.11, perform the following procedure:

- 1 **At the Network Setup window, select *Networks*, then *Install Microsoft Windows Network*.**
- 2 **Change any other items for your environment, and click *OK* and *Continue*.**
- 3 **When prompted to install a new PC Card, select *Unlisted or Updated Network Adapter*.**
- 4 **When prompted to insert a diskette that contains the network driver, insert *TokenDisk* diskette #2 and click *OK*.**
- 5 **Follow the instructions as they appear on the window to install the device driver.**
- 6 **Accept the defaults for Interrupt, MMIO, and SRAM.**
You will be given a chance to update these later, if necessary.
- 7 **Exit the Windows for Workgroups setup.**
- 8 **Exit to the DOS prompt. *Do not* reboot your PC at this time.**
- 9 **Configure the 3C389 PC Card using LANAIID.**
See Chapter 5 for information on how to use LANAIID.
- 10 **If LANAIID is not already installed, install it as described in Chapter 4 in the section "Installing LANAIID."**
- 11 **After LANAIID is installed, continue with Chapter 4 "Using LANAIID to Configure the 3C389 PC Card."**

When you get to the panel that asks for the existing network operating system, select Microsoft windows for workgroups.

Using Memory Management

- If you are using Card and Socket Services, the program will default to Autoset mode, which allows the LAN driver to negotiate with Card and Socket Services for available resources. LANAID will allow you to select values for resources to be used by your 3C389 PC Card such as Interrupt, memory, and I/O Base Address.
- If you are not using Card and Socket Services in Autoset mode, you must ensure that the values that you select for Interrupt, MMIO, and SRAM do not conflict with those for other PC Cards and resources installed in your PC (such as video, sound, COM port).
- If you are using EMM386, in most cases the memory exclusions will be automatically handled by LANAID. If you are using a memory manager, you must exclude the memory ranges being used by your 3C389 PC Card (8-KB default).

The Microsoft Windows for Workgroups PC Card software installation is now complete.

Windows NT 3.51 Installation

The NDIS 3.0 device driver for Windows NT 3.51 or higher requires that Service Pack 2 or higher be installed with your Windows NT system. It will function only in a PC with an Intel 82365SL or compatible socket controller. Windows NT does not support the Databook socket controllers at this time. Check your PC user guide to determine which controller is in your PC.



Make sure that the 3C389 PC Card with cable attached is inserted before installing Windows NT.

- 1 On the Windows NT desktop, open the program group Main.**
- 2 In the Main Window, double-click the Control Panel icon.**
- 3 In the Control Panel Window, double-click the Network icon.**

- 4 Click **Add Adapter**.
- 5 Select **<Other>** – *Requires disk from manufacturer from the bottom of the Network Adapter Card drop down list and click Continue.*

The Insert Disk dialog box appears.

- 6 Insert **TokenDisk** diskette #2 into the floppy drive.
- 7 Type **a:\nt** and click **OK**.

The Select OEM Option dialog box appears.

- 8 Select **3C389 TokenLink Velocity PC Card** and click **OK**.

The 3C389 PC Card driver and its associated files will be copied from the diskette to the hard drive.

- 9 In the **3Com TokenLink Velocity PC Card** dialog box, click **Configure**.

- 10 Choose either **Enhanced Mode** or **Compatibility Mode** and click **OK**.

Enhanced Mode uses less memory for the hardware operation of the 3C389 PC Card. Compatibility Mode allows the configuration to be used by earlier token ring PC Cards such as the 3C689 PC Card.

The system lists acceptable defaults.

- 11 Set the displayed parameters and click **OK**.

Make sure the Ring Speed parameter is set to the correct value.

- 12 Click **Save** to accept the configuration.

- 13 Click **OK**.

- 14 Restart the PC.



If this is a first time installation, Windows NT prompts you to enter additional NOS configuration information, such as client addresses and server names.

- 15 Restart the PC.

Windows NT 3.51 PC Card software installation is now complete.

Windows NT 4.0 Installation

- 1 Insert *TokenDisk* diskette #6 into the floppy drive.
- 2 Right-click the Network Neighborhood icon.
- 3 Select *Properties*.
- 4 Click the *Adapters* tab.
- 5 Click *Add*.

The PC will generate a list of available NICs.

- 6 Click *Have Disk*.

The Insert Disk window appears.

- 7 Type `a:\nt` and click *OK*.

The Select OEM Option dialog box appears.

- 8 Select *3C389 TokenLink Velocity PC Card* and click *OK*.

The 3C389 PC Card driver and its associated files will be copied from the diskette to the system.

- 9 In the 3Com TokenLink Velocity PC Card dialog box, click *Configure*.

- 10 Choose either **Enhanced Mode** or **Compatibility Mode** and click *OK*.

Enhanced Mode uses less memory for the hardware operation of the 3C389 PC Card. Compatibility Mode allows the configuration to be used by earlier token ring PC Cards such as the 3C689 PC Card.

- 11 Set the displayed parameters and click *OK*.

Make sure the Ring Speed parameter is set to the correct value.

- 12 Click *Save* to accept the configuration.

- 13 Click *OK*.

- 14 Restart the PC.

Windows NT 4.0 PC Card software installation is now complete.

Novell NetWare Client 32 for Windows 95 Installation

- 1 Click *Remove PC Cards* from the Network Control Panel for any PC Cards that are no longer in the system or that you are removing.
- 2 In a DOS window, change to the `\windows\inf` subdirectory.
- 3 Delete the `TOKENCS.INF` file.
- 4 Copy the new `.INF` file for your driver from the *TokenDisk* diskette #2 `\novell\netware` directory into the `\windows\inf` directory.
- 5 Complete the Client 32 installation.
- 6 Reboot the machine to effect the changes and load the new driver.

Novell NetWare Client 32 for Windows 95 installation is now complete.

OS/2 NDIS 2 Device Driver Using LAN Adapter Protocol Support (LAPS)

If your OS/2 network operating system has not yet been installed on your PC, install it now and follow its instructions for installing device drivers. If an OS/2 network operating system has previously been installed, follow the instructions here for using LAPS to install device drivers.

- 1 Insert *TokenDisk* diskette #2 into the floppy drive.
- 2 Enter `laps` at the OS/2 prompt.

LAPS is usually located in the `\ibmcom` subdirectory on the boot drive.

- 3 Click *Install*.

You will be prompted for the source of the `.NIF` file.

- 4 Type:

`a: [Enter]`

- 5 Click *OK* when the Installation Complete message appears.

You will return to the main menu.

6 Click *Configure* in the main menu.

The Select a Configuration Option menu appears.

7 Make sure that *Configure LAN Transport* is highlighted then click *Continue*.

The Configuration Workstation panel appears.

8 From the Network Adapters group box, select *3Com TokenLink Velocity PC Card*, then click *Add*.



You can edit parameter settings for this NIC. Select this NIC in the Current Configuration box and select Edit.

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

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

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



You can edit parameter settings for the protocols. Highlight a protocol and select Edit.

10 Click *OK* when you have completed your selections for the NIC.

You will now return to the main menu.

11 Click *Exit* for the changes to take effect.

12 Click *Exit* on the IBM logo panel.

You will see messages regarding updates to the CONFIG.SYS file.

13 Make sure that the correct drive and directory for the CONFIG.SYS file are specified, and click *Continue*.

14 Exit the program.

15 Select *OK* when asked if you want CONFIG.SYS, STARTUP.CMD, and PROTOCOL.INI updated.

16 Select *Exit* on the Exiting LAPS window.

17 Shut down and restart your PC for all changes to take effect.

OS/2 NDIS 2 device driver using LAPS installation is complete when the following conditions exist:

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

If you experience problems, go to Chapter 5, "Troubleshooting."

DOS Client 16 for Novell NetWare 4.01 and Above Installation

- 1 **Insert the Novell 4.01 Diskette into the floppy disk drive.**
- 2 **Type:**
`install [Enter]`
Follow the steps on the panels as they appear.
- 3 **Record the client directory name in order to do a client installation.**
The default directory name is C:\NWCLIENT.
- 4 **At the Insert the driver disk window, insert *TokenDisk* diskette #2 and type:**
`a:\novell\dos [Enter]`
- 5 **Select *Other drivers*.**
- 6 **Choose *3Com TokenLink Velocity PC Card*.**
- 7 **At the Settings for 3Com TokenLink Velocity PC Card window, press [Esc].**
- 8 **At step 5, press [Enter] to finish installing NetWare.**
- 9 **Press Enter to exit the installation tool.**
- 10 **Configure the 3C389 PC Card.**
- 11 **If LANAIID is not already installed, install it as described in Chapter 4 in the section "Installing LANAIID."**

12 After LANAIID is installed, continue with Chapter 4 "Using LANAIID to Configure the 3C389 PC Card."

When you get to the panel that asks for the existing network operating system, select *Novell NetWare 16-Bit Client*.

Using Memory Management

- If you are using Card and Socket Services, the program will default to Autoset mode, which allows the LAN driver to negotiate with Card and Socket Services for available resources. LANAIID will allow you to select values for resources to be used by your 3C389 PC Card such as Interrupt, memory, and I/O Base Address.
- If you are not using Card and Socket Services in Autoset mode, you must ensure that the values that you select for Interrupt, MMIO, and SRAM do not conflict with those for other PC Cards and resources installed in your PC (such as video, sound, COM port).
- If you are using EMM386, in most cases the memory exclusions will be automatically handled by LANAIID. If you are using a memory manager, you must exclude the memory ranges being used by your 3C389 PC Card (8 KB default).

The DOS Client-16 for Novell NetWare 4.01 and Higher installation is now complete.

OS/2 NDIS 2 Device Driver Using Multiprotocol Transport Service (MPTS)

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

1 Start MPTS by performing either of the following actions:

- From the OS/2 desktop, double-click the MPTS icon.
- From an OS/2 window, go into the IBMCOM subdirectory and enter mpts at the OS/2 prompt.

2 Click *OK* on the MPTS logo panel.

3 Click *Install*.

You will be prompted for the source of the .NIF file.

4 Insert *TokenDisk* diskette #2 in the floppy drive.

5 Click *OK* when the Installation Complete message appears.

You will return to the main menu.

6 Click *Configure* in the MPTS dialog box.

7 On the Configure panel, make sure that LAN adapters and protocols is preselected and then click *Configure* at the bottom of the panel.

8 In the Configuration panel, in the Network Adapters group box, select *3Com TokenLink Velocity PC Card* and click *ADD*.



You can edit parameter settings for the 3C389 PC Card. Highlight this NIC in the Current Configuration list box and click Edit. When you have finished with the parameter settings, click OK.

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

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

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



You can edit parameter settings for the protocols. Highlight a protocol and select Edit.

- 10 Click *OK* when you have finished selecting and editing protocols in the Configuration panel.
- 11 Click *Close* on the Configure panel.
- 12 Click *Exit* in the MPTS dialog box.
- 13 Click *Exit* on the Update CONFIG.SYS panel to update the CONFIG.SYS file.
- 14 Click *OK* when you get the message that the CONFIG.SYS has been successfully updated.
- 15 Click *Exit* on the Exiting MPTS panel.
- 16 Shut down OS/2 and restart your PC to let the changes take effect.

OS/2 NDIS 2 device driver using MPTS installation is complete when the following conditions exist:

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

If you experience problems, go to Chapter 5, "Troubleshooting."

IBM LAN Support Program/Native Installation

The LAN Support Program/Native (LSP Native) installs the LAN support driver DXMCSMOD.EXE. It does not support the NDIS environment and should not be used for the installation of NDIS drivers.

Perform the following installation steps for the 3C389 PC Card when using DOS and LSP Native:

- 1 Insert *TokenDisk* diskette #2 into the floppy drive and type:

```
a:\lspnativ\dxmaid [Enter]
```



The default configuration will install both the 3C389 PC Card driver for Native mode (DXMCSMOD.SYS) and the NetBIOS interface (DXMTOMOD.SYS). DXMCSMOD is a card-services-aware version of DXMCOMOD, the native token ring driver that comes with the LAN Support Program (LSP). A Card Services enabler is no longer necessary to use LSP. DXMCSMOD.SYS supports Card Services 2.1 and utilizes a parameter initialization file called LSP.INI to read in configuration options. The LSP.INI file is similar to the PROTOCOL.INI file that is used in the NDIS environment.

- 2 Make a note of the name of the directory (default is LSP) where the LSP is installed. You will have to specify this name when LANAIID asks for the directory containing your LSP.INI file during step 2. Also, if you are using a locally administered address, edit the LSP.INI file and add:**

```
netaddress=yyyyyyyyyyyyyy
```

where `yyyyyyyyyyyyyy` is the 12-digit hexadecimal address.

- 3 Configure the 3C389 PC Card using the LANAIID program (See Chapter 4).**
- 4 If LANAIID is not already installed, go to the section "Installing LANAIID" in Chapter 4.**
- 5 After LANAIID is installed, continue with Chapter 4 "Using LANAIID to Configure the 3C389 PC Card."**

When you get to the panel that asks for the existing network operating system, select IBM LSP/Native.

Using Memory Management

- If you are using Card and Socket Services, the program will default to Autosect mode, which allows the LAN driver to negotiate with Card and Socket Services for available resources. LANAID will allow you to select values for resources to be used by your 3C389 PC Card such as Interrupt, memory, and I/O Base Address.
- If you are not using Card and Socket Services in Autosect mode, you must ensure that the values that you select for Interrupt, MMIO, and SRAM do not conflict with those for other PC Cards and resources installed in your PC (such as video, sound, COM port).
- If you are using EMM386, in most cases the memory exclusions will be automatically handled by LANAID. If you are using a memory manager, you must exclude the memory ranges being used by your 3C389 PC Card (8 KB default).

IBM LAN Support Program/Native Installation is complete.

4

LANAID AND IBM LAN CLIENT

After you have installed the 3C389 PC Card and the network drivers, you must configure the 3C389 PC Card software to operate with your PC and network operating system. You will need the manuals that were shipped with your network operating system.

LANAID

LANAID is a software tool shipped on the 3C389 PC Card *TokenDisk* diskettes. Use LANAID to configure the 3C389 PC Card to work with any of the following network device drivers:



LANAID requires that Card Services or an Intel socket controller that is compatible with the point enabler be installed.

- IBM LAN Support Program/Native
- IBM LAN Client
- DOS Client 16 for Novell NetWare lower than 3.12
- DOS Client 16 for Novell NetWare 3.12 and 4.0
- DOS Client 16 for Novell NetWare 4.01 and higher
- OS/2 Novell NetWare Client
- Artisoft LANtastic 6.0, 7.0
- Banyan VINES 6.X
- Microsoft LAN Manager/NDIS
- Windows for Workgroups\NDIS 2
- Other DOS NDIS environments

LANAID can also install the IBM LAN Client. For all other environments, you will use your network operating system to change parameters in the 3C389 PC Card configuration.

Net Address

LANAID identifies the 3C389 PC Card to be configured by its universally administered address, which was assigned at the factory. The universally administered address (also known as the net address or MAC address) of the 3C389 PC Card is shown on the back of the card. Ensure that the address shown by LANAID is the same as the address on the 3C389 PC Card. It may be necessary to remove one or more PC Cards to allow LANAID to find the 3C389 PC Card to be configured.

IBM LAN Client

IBM LAN Client has the following features:

- As little as 2 KB conventional memory required.
- Protocol NetWare Loadable Modules (NLMs): these are dynamically loadable and unloadable modules that operate in 32-bit protect mode and implement the various protocol functions. Supported protocols include 802.2, IPX/SPX, TCP/IP, and NetBIOS.
- New Novell NetWare Client-32 for DOS/Windows
 - 32-bit, protect-mode client
 - Automatically reconnects an entire network environment, including open files
 - Enhanced cache (large, configurable network cache)
 - Enhanced native installation and configuration utilities.
- Provides backwards compatibility for existing DOS 802.2 and NetBIOS applications.
- Uses NET.CFG file, consistent with other products.
- Concurrent multiple frame types and protocols.
- Winsock 1.1 support for TCP/IP.



DOS conventional memory consumption does not increase when you combine multiple protocols. The DOS LAN Services (DLS) Client can require significant amounts of DOS memory.

IBM LAN Client provides support using one PC Card specific LAN device driver instead of two different kinds of drivers for your clients and servers. You select the appropriate device drivers and protocol stacks for your PC. The correct modules are automatically loaded based on the options you select.

IBM LAN Client provides support for the following protocols and clients:

- For DOS 5.0 or higher:
 - NetWare Client-32 (IPX**/SPX)
 - IEEE 802.2
 - NetBIOS
 - DOS LAN Services
- For Windows 3.1:
 - NetWare Client-32 (IPX/SPX)
 - IEEE 802.2
 - NetBIOS
 - TCP/IP
 - DOS LAN Services
- For Windows for Workgroups 3.11:
 - NetWare Client-32 (IPX/SPX)
 - IEEE 802.2
 - NetBIOS
 - TCP/IP
 - DOS LAN Services

Installing LANAIID

The LANAIID graphical user interface operates under DOS or in a *full-screen* DOS session of OS/2. (A DOS window of OS/2 will not work correctly.) You need at least 1.5 MB of free, extended memory and 300 KB of conventional memory to run the program.

You can get help on each LANAIID panel by selecting the Help button at the bottom of the panel. You can get context-sensitive help by placing your mouse pointer on any part of the panel and pressing [F1].

Complete the following procedure to install LANAID on your hard disk:

- 1 **At the DOS prompt, insert *TokenDisk* diskette #1 in the drive and type:**
a:install [Enter]
- 2 **Change the drive, path, and directory for the LANAID files, or press [Enter] to accept the default values.**

The LANAID program may display a prompt requesting permission to modify the CONFIG.SYS and AUTOEXEC.BAT files. The LANAID program launches automatically after the files are and copied to the target directory.

Using LANAID to Install IBM LAN Client



LANAID must be run from DOS or full screen DOS in an OS/2 session.

- 1 **Launch LANAID.**
- 2 **Click *Network Software*.**

The Select Disk Drive window appears.
- 3 **Enter the letter of the hard disk on which you want to install IBM LAN Client and click *Continue*.**

The Network Operating System Choices window appears.
- 4 **Select *Install IBM LAN Client* and click *Continue*.**

The IBM LAN Client Installation window appears.
- 5 **Select the appropriate operating system from the drop down list box.**
- 6 **Select *Express Install* or *Custom Install*.**

If you chose *Custom Install* go to step 7.

If you chose *Express Install* go to step 9.

When you choose *Express Install*, NetWare Client-32 and frame type 802.2 are loaded as well as IBM LAN Client using the default protocols provided for your 3C389 PC Card type and operating system.

7 Select one or more of the clients and protocols and click *Continue*.

The IBM LAN Client Configuration window appears.

Table 4-1 Clients and Protocol Descriptions

Client or Protocol	Description
NETWARE CLIENT 32 (IPX/SPX)	NetWare Client 32 is Novell's version of client software. You cannot select both NetWare Client and DOS LAN Services
DOS LAN SERVICES (DLS)	DLS is the DOS client software for IBM LAN and Warp servers. When you select DLS, you must provide the following information: User Name Machine ID Domain Name When you select DLS, NetBIOS is automatically selected as well. You cannot select both DLS and NetWare Client
NetBIOS	When you select NetBIOS, device driver parameters cannot be set in LANAIID. You can find up-to-date information about the NetBIOS device driver parameters in LNCLIENT.TXT in the \LNCLIENT subdirectory.
IEEE 802.2	Choose 802.2 when you are using the IEEE 802.2 protocol on your LAN. When you select 802.2, driver parameters cannot be set in LANAIID.
TCP/IP	This option is available under Windows or Windows for Workgroups only. Choose TCP/IP when you are using the TCP/IP protocol on your network. When you select TCP/IP, you are required to select a local IP address and default gateway. The local subnet mask is set to 255.255.240.0 by default.

8 Enter the parameters for *Install Options*, *Network Options* and if appropriate, for *TCP/IP* or *NetWare Client 32*.

On the IBM LAN Client Configuration window, there are two or more folder tabs. The Install Options and NetWork Options folders always appear. The TCP/IP and NetWare Client 32 folders appear only when they are selected for in the IBM LAN Client IBM Installation window. Make sure that you enter all requested information.

9 Click *Install*.

You will be prompted to insert diskettes. The options that you have selected will be installed automatically.

The Installation Log and IBM LAN Client Installation Complete windows appear.

10 Click *OK* and click *Close*.

The View Adapter Configuration window appears.

On the View Adapter Configuration panel, there are two folder tabs: Configurable and Hardware. The Configurable folder shows all the parameters that you can set along with their current values. Parameters that are in conflict with other settings are noted. The Hardware folder shows parameters of the PC that you cannot set, but that might be useful to know.

11 Click *Suggest* to have LANAID suggest non-conflicting values.**12 Click *Change* to select from the allowable values yourself.****13 Click *Store* to save the settings.**

You will be prompted to insert diskettes, and the values that you have chosen are configured automatically.

14 Click *Done* to complete the installation.

The LANAID main menu reappears.

15 Click *Exit* to return to DOS.**16 Reboot your PC.**

This completes the LANAID IBM LAN Client installation procedure.

Using LANAID to Configure the 3C389 PC Card

This section explains how to run LANAID to configure the 3C389 PC Card for operation with a device driver. See Chapter 3, "Installing the Network Drivers," for information on installing device drivers.

If you are using Card and Socket Services, LANAID will default to Autoset mode, which allows the LAN driver to negotiate with Card and Socket Services for available resources. If you do not use Autoset mode, LANAID will allow you to select values for resources to be used by your 3C389 PC Card such as Interrupt and I/O Address.

- 1 From the LANAID main panel, select *Network Software*.**
- 2 In the Network Operating System Choices window, select *Identify Existing Network Operating System* and click *Continue*.**

The Network Operating System Selection window appears.

LANAID identifies a network operating system and the directory in which the network operating system is installed. Either confirm the displayed choice or select another operating system and type in the path to the network configuration file.

- 3 Click *Continue*.**

The View Adapter Configuration window appears.

There are two folder tabs: Configurable and Hardware. The Configurable folder shows all the parameters you can set along with their current values. Parameters that are in conflict with other settings are noted. The Hardware folder shows parameters of the PC system that you cannot set, but that might be useful.

- 4 Click *Suggest to have LANAID suggest non-conflicting values*.**

If you are not using Card and Socket Services in Autoset mode, you must ensure that the values that you select for Interrupt and I/O address do not conflict with those for other PC Cards installed in your PC.

5 Click ***Change*** to select from the allowable values yourself.

6 Click ***Store***.

You are prompted to insert diskettes at the correct time, and the values that you have chosen are configured automatically.

7 Click ***Done***.

The LANAID main window reappears.

8 Click ***Exit*** to return to DOS.

9 **Reboot your PC.**

See the section “Running the Diagnostics Program” in Chapter 5 to use the diagnostics utility.

Running LANAID From the Command Line

If you want to do automated installations of LAN Client, run the LANAIDC.EXE program from the DOS command line. Enter `lanaidc /h` for help. See the README.TXT file on *TokenDisk* diskette #1 for more information on running LANAID from the command line.

5

TROUBLESHOOTING

Check this list of possible error conditions if problems occur:

- Make sure that the 3C389 PC Card is correctly installed. See Chapter 3 for details.
- When you are using EMM386.EXE or another memory manager.

When EMM386.EXE and the LAN device driver are using the same memory, contention occurs and the 3C389 PC Card will not function correctly. If you are using Card Services, check to be sure that the memory that Card Services controls is excluded by the memory manager. If you are using a point enabler, be sure that the memory that you use is excluded by the memory manager. As a quick test, you may want to comment out EMM386.EXE in your CONFIG.SYS, reboot, and try the 3C389 PC Card again.

If the 3C389 PC Card functions, you will have to edit the EMM386.EXE command to exclude some memory. The 3C389 PC Card uses 8 KB of memory in two separate areas. These memory areas may be consecutive. See Appendix A, "Using a Memory Manager" for more information.

- If are using Card Services.

During reboot, you hear four alternating tones which indicates that Card Services was unable to give you one or more resources (I/O ports, interrupt level, and memory locations) that your program requested.



The items in the following paragraph are performed by the installation program.

If you are using the NDIS driver (IBMTOKCS.DOS), edit the PROTOCOL.INI file and see whether you have specified a particular value for the interrupt level or memory locations. This would be indicated by the keywords INTERRUPT=X, MMIO=0XXXXX, or RAM=0XXXXX. If you are using the ODI driver (TOKENCS.COM), edit the NET.CFG file and see whether you have specified a particular value for the interrupt level or memory locations. This would be indicated by the keywords INT X, MEM #1 XXXXX, or MEM #2 XXXXX.

These keywords specify a particular value for these parameters. If you find one or more of these keywords, comment them out by placing a semicolon in front of the keyword. Save the file and reboot your PC. If all three are commented out or are not in PROTOCOL.INI or NET.CFG, the driver is in Autoset mode and lets Card Services determine what values are used by the driver. If you reboot and still receive the alternating beep alarm, there is a problem with Card Services. Check your level of Card Services and ensure that it is the latest available.

- If you are using a point enabler

When you use a point enabler, it is essential that the I/O ports, interrupt, memory areas, and slot number that are chosen by the enabler agree with what the LAN device driver is expecting. Problems occur when the enabler has set up certain resources and the LAN device driver is expecting others. Typically, the LAN driver will not initialize. Look at the default values for the interrupt, whether the 3C389 PC Card is a primary or secondary 3C389 PC Card (this affects the I/O ports), and where the MMIO memory and the SRAM memory are located. Be sure that the enabler settings and the settings of the LAN driver coincide. By the use of parameters on the command line of the enabler and the parameters for the LAN device driver (in PROTOCOL.INI, NET.CFG, or LSP.INI), you should be able to configure your 3C389 PC Card to function.

- If you believe that you have a hardware problem with the 3C389 PC Card, run the 3C389 PC Card diagnostics.

See "Running the Diagnostics Program" later in this chapter.

- Check "Error Codes" if your PC displays an error code.

Error Codes

The following sections provide messages that can be received from the NDIS driver function. The messages are logged to a file. The NDIS driver signals you with an alternating beep when a Card Services call fails.

OS/2 NDIS Error Codes

If a Card Services call fails, and you are running OS/2, a problem is occurring during configuration of the 3C389 PC Card and you must review the LANTRAN.LOG file in your \IBMCOM subdirectory to determine what is wrong. Depending on the error, you may see one or more of the error codes listed in Table 5-1 and Table 5-2.

OS/2 message information can be displayed with the OS/2 help facility. Enter **help <error code>** where <error code> is the error code from the LANTRAN.LOG
DOS ODI Error Codes

Table 5-1 DOS ODI Error Codes

Error Code	Explanation and Action
TOKENCS-DOS-50	<p>PC Card cannot be found or the cable is not attached.</p> <p>3C389 PC Card has not been inserted in the PCMCIA socket.</p> <p>Insert your 3C389 PC Card in the socket and try again.</p>
TOKENCS-DOS-204	<p>The shared RAM is on incorrect boundary.</p> <p>Change the Shared RAM base address and place it on a 16-KB boundary (C0000, C4000, C8000, CC000, D0000, D4000, D8000, DC000).</p>
TOKENCS-DOS-205	<p>The 3C389 PC Card did not reset during initialization.</p> <p>During initialization, no interrupt occurred.</p> <p>This can happen if you are using an enabler and it is setting an interrupt level that is different from the interrupt level TOKENCS.COM is using. Check to make sure that both interrupts are the same.</p>
TOKENCS-DOS-206	<p>An interrupt failed to occur during initialization.</p> <p>During initialization, no interrupt occurred.</p> <p>This can happen if you are using an enabler and it is setting an interrupt level that is different from the interrupt level TOKENCS.COM is using. Check to make sure that both interrupts are the same.</p>
TOKENCS-DOS-226	<p>The ROM and shared RAM address ranges overlap.</p> <p>The ROM and RAM memory areas are overlapping.</p> <p>Check the settings in NET.CFG for MEM #1 and MEM #2. MEM #1 determines the ROM (MMIO) base address. MEM #2 determines the Shared RAM base address. If you are using an enabler, check where it is placing the ROM (MMIO) and the RAM address. ROM is 8 KB in size. RAM is usually 16 KB in size.</p>
TOKENCS-DOS-228	<p>The MAX FRAME SIZE in NET.CFG file is too large (Max=17960).</p> <p>The maximum frame size has been exceeded.</p> <p>Change the maximum frame size to a valid value.</p>
TOKENCS-DOS-229	<p>The MAX FRAME SIZE in NET.CFG file is too small (Min=632).</p> <p>The maximum frame size is too small.</p> <p>Increase the maximum frame size to a valid value.</p>

(continued)

Table 5-1 DOS ODI Error Codes (continued)

Error Code	Explanation and Action
TOKENCS-DOS-230	<p>The MAX FRAME SIZE in NET.CFG file is not a multiple of 8.</p> <p>The maximum frame size has been set to a value that is not valid.</p> <p>Change the MAX FRAME SIZE to a multiple of 8.</p>
TOKENCS-DOS-231	<p>The MAX FRAME SIZE in NET.CFG is too big for this 3C389 PC Card.</p> <p>The maximum value at this speed for this 3C389 PC Card is xx.</p> <p>Change the MAX FRAME SIZE to a valid value.</p>
TOKENCS-DOS-233	<p>Card Services could not be found.</p> <p>TOKENCS.COM could not find Card Services.</p> <p>Check your CONFIG.SYS and ensure that Card Services is loading. If Card Services support is not wanted, take the PCMCIA keyword out of NET.CFG.</p>
TOKENCS-DOS-235	<p>A Card Services error has occurred.</p> <p>You have heard an alternating tone and this message is posted to the panel. This indicates that Card Services was unable to provide the resources requested.</p> <p>Check your NET.CFG parameters INT, MEM #1, MEM #2. If they are not in NET.CFG, Card Services has a problem. If they are specified in NET.CFG, comment (REM) them out and try again.</p>
TOKENCS-DOS-246	<p>The DATA RATE specified in NET.CFG must be either 4 or 16 Mbps.</p> <p>You have specified an incorrect ring speed. It must be either 4 or 16 Mbps. The DATA RATE keyword is used to set the speed.</p>
(no message)	<p>Please insert a 3C389 PC Card or press [ESC] to avoid loading the driver.</p> <p>This message occurs when you have not inserted a 3C389 PC Card in the machine and have started TOKENCS.COM.</p> <p>Insert a 3C389 PC Card at this time or press [ESC] to leave.</p>

DXMCSMOD Error Codes

Table 5-2 DXMCSMOD Error Codes, Explanation, and Action

Error Code	Explanation and Action
DXMCS 18I	<p>The 3C389 PC Card is ready to attach to the ring. It is configured for the displayed ring speed in Mbps. Enter Y if this is correct. If you would like to change the configured ring speed, enter C to change.</p> <p>The PC Card permits you to select the ring speed it will use. You can respond to the question or prevent the question from being asked by removing the PROMPT keyword in LSP.INI.</p>
DXMCS 19I	<p>Changing the ring speed configuration to xx Mbps.</p> <p>This message is displayed in response to the user input from message DXMCS 18I.</p> <p>No action indicated.</p>
DXMCS 20I	<p>Ring speed will REMAIN at xx Mbps.</p> <p>This message is displayed in response to the user input from message DXMCS 18I.</p> <p>No action indicated.</p>
DXMCS 21E	<p>An error occurred during configuration.</p> <p>An error prevented DXMCSMOD from configuring the PC Card using the parameters entered in LSP.INI.</p> <p>Verify that the parameters entered in LSP.INI do not conflict with other settings in the computer. The possible conflicts are memory and interrupt settings.</p>
DXMCS 22I	<p>No Card Services present.</p> <p>DXMCSMOD cannot locate Card Services.</p> <p>Ensure that the Card Services drivers have been loaded before DXMCSMOD loads.</p>
DXMCS 23I	<p>An error occurred when accessing the LSP.INI file.</p> <p>The LSP.INI file could not be read. The file may either be corrupted or not be present in the same directory as DXMCSMOD.</p> <p>Verify that the LSP.INI file exists. Reinstall DXMCSMOD using the installation aid.</p>
DXMCS 24E	<p>An error occurred when the program was accessing PARSEINI.COM.</p> <p>The PARSEINI.COM file could not be read. The file may either be corrupted or not be present in the same directory as DXMCSMOD.</p> <p>Check that the PARSEINI.COM file exists in the same directory as DXMCSMOD.</p>

Troubleshooting Windows 95 (NDIS 3)

Windows 95 sometimes has trouble selecting available resources for the 3C389 PC Card, causing the 3C389 PC Card not to function. If you find that your 3C389 PC Card is not functioning, follow this procedure.

- 1 **Click *Start*.**
- 2 **Go to the Settings menu selection and click *Control Panel*.**
- 3 **Click *System*.**
- 4 **Click the *Device Manager* tab.**
- 5 **Check the 3C389 PC Card network adapters icon for indications of a resource conflict.**

The resource conflict indicator is an exclamation point inside a yellow or red circle that appears on top of the network adapter icon.

- 6 **If you see a conflict indicator, double click the 3C389 PC Card networks adapters icon.**

The properties dialog for the 3C389 PC Card appears.

- 7 **Click the Resources tab of the dialog box.**

There are three resources that must be correct before the 3Com Token Ring LAN PC Card will function correctly: the Interrupt Request (IRQ), Memory Range, and Input/Output (I/O) range. The interrupt request value should be a value between 3 and 15 that does not conflict with any other devices. The memory range is often set incorrectly by Windows 95. It is recommended that the memory range be set in the 000D0000 to 000DC000 in a non-conflicting memory region. The memory range 000C0000 to 000CFFFF is often used for video caches and Windows 95 does not always exclude memory regions that are already in use. Acceptable values for the input/output range include any four consecutive values beginning at 0300.

- 8 **If EMM386.EXE is in your CONFIG.SYS, comment it out.**

Troubleshooting Windows NT (NDIS 3)

Windows NT 3.51 and 4.0 use a point enabler called PCMCIA.SYS that is supplied with Windows NT. PCMCIA.SYS configures the Intel compatible socket controller with settings gleaned from the registry entry for the PC Card. Windows NT will indicate resource conflicts only after an attempt is made to configure a device. As when using a DOS enabler, you must manually choose your PC Card resources. By looking at the event viewer in the administrative tools, you might find that there is an I/O, IRQ, or memory conflict. A program called WINMSD is included with Windows NT which allows you to see the resources of your machine and determine if there are any conflicts. Make a note of your configured resources and compare them to the settings indicated by WINMSD. Make corrections to your configuration as needed. This is done by the following procedure:

- 1 **Right-click *Network Neighborhood*.**
- 2 **Select *Properties*.**
- 3 **Select the *Adapter* tab.**
- 4 **Select *3Com TokenLink Velocity PC Card* and click *Properties*.**

You can now change your configuration as needed.

Running the Diagnostics Program

Use the diagnostics program on *TokenDisk* diskette #1 to test the hardware components of the 3C389 PC Card.

The diagnostics program performs a series of tests and displays the results of each one by showing success or failure. An error during any test will end the test in progress and display an error message and error code. See the following tables for a description of error codes and recommended actions.



The testing process might run as long as three minutes and can be exited at any time by pressing [Enter] or by removing the diskette and pressing [Esc]. Pressing [Esc] will cause the computer to reboot. Pressing [Enter] will end the test in progress and allow the user to select another test option.

1 Boot the PC with *TokenDisk* diskette #1.

TokenDisk diskette #1 is a PC DOS system diskette.

2 At the DOS Menu, select 2, *3Com TokenLink Velocity PC Card Extended Diagnostics*.

3 Follow the instructions as they appear.

You will be prompted to select a test option. See “Test Options” for descriptions.

Test Options

There are two test options: the wrap test and the on-ring test.

The wrap test ensures that the PC Card and cable hardware are functioning properly. For this test, connect the NIC and cable to the network to perform a wrap test through the hub or concentrator, or insert a wrap plug (no wrap plug is required if you have a shielded twisted pair cable connection) to help isolate a failure to the NIC, the cable, or the wiring to the hub or concentrator.

The on-ring test verifies communication between the NIC and the LAN. This test requires that the NIC is connected to a network with other NICs, so the ring speed of the network can be automatically sensed. If the NIC under test is the only one on the network, the on-ring test will fail. Continue testing the NIC using the wrap test, or connect the NIC to a network that has at least one other station connected and open.

Diagnostics Error Codes and Suggested Actions

Initialization Error Codes

Failure during PC Card initialization usually indicates a hardware error on the PC Card. Reboot your PC using the diagnostic diskette (*TokenDisk* diskette #1 is a bootable diskette), and run the diagnostic program again. If the 3C389 PC Card continues to fail, replace the card and cable.

One of the following codes will be shown to indicate the results of the initialization test. The error codes are displayed in hexadecimal format and represent the BRING_UP_CODE set by the 3C389 PC Card.

- 0000 Initialization success
- 0020 Diagnostics could not be executed
- 0022 ROM diagnostics failed
- 0024 Shared RAM diagnostics failed
- 0026 Processor instruction test failed
- 0028 Processor interrupt test failed
- 002A Shared RAM interface register diagnostics failed
- 002C Protocol-handler diagnostics failed
- 0040 PC Card's programmable timer for the computer failed (set by the microcode)
- 0042 Cannot write to shared RAM (set by microcode)
- 0044 Reading from shared RAM read-only area caused an incorrect error indication (interrupt)
- 0046 Writing into shared RAM read-only area did not cause an error indication (interrupt)
- 0048 Initialization timed out

Open Errors

Failure during the adapter open test might indicate that the PC Card is not properly configured to run on the network it is trying to open onto or that the PC Card is not properly configured for the system. The open test provides a return code and an open error code. If the return code is 07, then see "Open Error Codes" in this chapter for a more accurate description of the failure and suggested actions. If the return code is a value other than 00 or 07, record the error and contact your network administrator.

00	Open completed successfully
01	Incorrect command code
03	PC Card open, should be closed
05	Required parameters not provided
07	Command cancelled, unrecoverable failure (see open error codes to isolate problem)
30	Inadequate receive buffers
32	Incorrect MAC address
33	Incorrect PC Card receive buffer length
34	Incorrect PC Card transmit buffer length

Open Error Codes

If the open test provides a return code of 07, there will be a corresponding error code. The open errors are returned in 2 bytes. The high-order byte is always 0 and the low-order byte contains the following information:

- The phase of testing in which the error was encountered is in the high-order nibble (half-byte) of the low-order byte.
- The error condition is in the low order nibble of the low-order byte.

Phases

Table 5-3 Phase Nibble Explanations

Value	Meaning
1n	Lobe media test
2n	Physical insertion
3n	Address verification
4n	Roll call poll (neighbor notification)
5n	Request parameters

Errors

Table 5-4 Error Condition Nibble Explanations

Value	Meaning
n1	Function failure
n2	Signal loss
n3	Reserved
n4	Frequency error (see note)
n5	Time-out
n6	Ring failure
n7	Ring beaconing
n8	Duplicate node address
n9	Parameter request--retry count exceeded
nA	Remove received
nB	IMPL force received
nC	Duplicate modifier
nD	No monitor detected
nE	Monitor contention failed for RPL

Suggested Actions in Response to Open Errors

When the following phase-error combination values are presented, they are the result of certain specific occurrences. Explanation of the occurrences follows with recommended actions listed. Table 5-6 lists the recommended actions for both the application program and the computer operator.

Table 5-5 Actions for Open Errors

Error Code	Explanation	Action
11	Lobe Media, Function Failure: The testing of the lobe between the PC Card and the access unit has been unsuccessful because the lobe has a bit-error rate that is too high, or the PC Card cannot receive successfully.	1, 3, and 5
24	Physical Insertion, Frequency Error: The PC Card has detected that the ring is operating at a speed other than the speed at which it was inserting.	2
26	Physical Insertion, Ring Failure: The PC Card, acting as an active monitor, was unable to complete the ring purge function successfully. This indicates that an error condition has occurred since the successful completion of monitor contention (claim token), when this PC Card became the active monitor.	1 and 2a
27	Physical Insertion, Ring Beaconing: The PC Card has detected one of the following conditions: <ul style="list-style-type: none"> ■ The PC Card tried to insert on a ring that was operating at a different data rate. ■ A monitor contention (claim token) failure occurred. ■ The PC Card received a beacon MAC frame from the ring. 	1, 2, and 2b
2A	Physical Insertion, Remove Received: The PC Card has received a remove ring station MAC frame, indicating that a network management function has directed this PC Card to get off the ring.	2a and 4
2D	Physical Insertion, No Monitor Detected: RPL station is the first station attempting to insert onto the ring.	1 and 2a
2E	Physical Insertion, Monitor Contention Failed for RPL: Physical insertion failure of RPL station.	2
32	Address Verification, Signal Loss: The PC Card has detected a 250-ms signal loss (receiver cannot recognize signal), indicating that an error condition has occurred since the PC Card successfully completed the ring signal recognition phase of the open operation.	1 and 2a
35	Address Verification, Time Out: The insertion timer expired before this function was completed, indicating that the ring may be congested, experiencing a high bit error rate, or losing an abnormally high number of tokens or frames, thus preventing successful Address Verification MAC frame transmissions.	1 and 2a

(continued)

Table 5-5 Actions for Open Errors (continued)

Error Code	Explanation	Action
36	Address Verification, Ring Failure: The PC Card, acting as an active monitor, was unable to complete the ring purge function successfully. This indicates that an error condition has occurred since the successful completion of monitor contention (claim token), when this PC Card became the active monitor.	1 and 2a
37	Address Verification, Ring Beaconing: The PC Card has either detected a monitor greater than or equal to contention (claim token) failure or received a beacon greater than or equal to MAC frame from the ring.	1 and 2b
38	Address Verification, Duplicate Node Address: The PC Card has detected that another station on the ring has a PC Card address that is the same as the PC card address being tested.	4
3A	Address Verification, Remove Received: The PC Card has received a remove ring station MAC frame, indicating that a network management function has directed this specific address to get off the ring.	2a and 4
42	Ring Poll, Signal Loss: The PC Card has detected a 250-ms signal loss (receiver cannot recognize signal) indicating that an error condition has occurred since the PC Card successfully completed the ring signal recognition phase of the open operation.	1 and 2a
45	Ring Poll, Time Out: The insertion timer expired before this function was completed, indicating that the ring can be congested, experiencing a high bit-error rate, or losing an abnormally high number of tokens or frames. This prevents the PC Card's successful reception of either the ring poll request or response MAC frame, or transmission of the required ring poll response MAC frame.	1 and 2a
46	Ring Poll, Ring Failure: The PC Card, acting as an active monitor, was unable to complete the ring purge function successfully. This indicates that an error condition has occurred since the successful completion of monitor contention (claim token), when this PC Card became the active monitor.	1 and 2a

(continued)

Table 5-5 Actions for Open Errors (continued)

Error Code	Explanation	Action
47	Ring Poll, Ring Beaconsing: The PC Card has either detected a monitor contention (claim token) failure or received a beacon MAC frame from the ring.	1 and 2b
4A	Ring Poll, Remove Received: The PC Card has received a remove ring station MAC frame, indicating that a network management function has directed this PC Card to get off the ring.	2a and 4
55	Request Parameters, Time Out: The insertion timer expired before this function was completed, indicating that the ring can be congested, experiencing a high bit-error rate, or losing an abnormally high number of tokens or frames. This prevents successful transmission of the request parameter MAC frame or reception of either the set parameter 1 or set parameter 2 MAC frame (required response to the PC Card's request).	1 and 2a
56	Request Parameters, Ring Failure: The PC Card, acting as an active monitor, was unable to complete the ring purge function successfully. This indicates that an error condition has occurred since the successful completion of monitor contention (when this PC Card became the active monitor).	1 and 2a
57	Request Parameters, Ring Beaconsing: The PC Card has received a beacon MAC frame from the ring.	1 and 2b
59	Request Parameters, Parameter Request - Retry Count Exceeded: The PC Card has detected that the ring parameter server is present on the ring but that the required response (set parameter 1 or set parameter 2 MAC frame) was not received in the allotted time. This indicates that the ring can be congested, experiencing a high bit-error rate, or losing an abnormally high number of tokens or frames.	1 and 2a
5A	Request Parameters, Remove Received: The PC Card has received a remove ring station MAC frame, indicating that a network management function has directed this PC Card to get off the ring.	2a and 4

Table 5-6 Recommended Actions Key

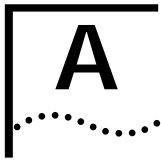
Number	Description
1	After delaying at least 30 seconds, retry the open two times, inserting the same delay between each try.
2	After delaying at least 30 seconds, check the PC Card configuration (especially the PC Card data rate) and retry the open.
2a	If this error persists, direct the computer operator to contact the network administrator for assistance and provide Open Error information.
2b	If this error persists, direct the computer operator to contact the network administrator for assistance.
3	Direct the computer operator to contact the network administrator for assistance and provide Open Error information.
4	Direct the computer operator to contact the network administrator for assistance and provide Node Address information, and try attaching to the ring after 6 minutes.
5	If this error persists, problem determination of the PC Card or lobe is necessary. Contact your network administrator for problem determination assistance.

Transmit Error Codes

If you experience time-out errors during the on-ring test, try running the wrap test in the diagnostics. If the wrap test is completed successfully, but the on-ring test fails, it might indicate problems on the Token-Ring network that the NIC is opening onto during the on-ring test.

For any other errors, ensure that the NIC and cabling are properly connected, and retry the test. If the NIC continues to fail, record the error and contact your network administrator.

- 01 Unrecognized command code
- 08 Unauthorized access priority
- 22 Error on frame transmission, examine STRIPPED_FS
- 23 Error on frame transmit or strip process
- 24 Unauthorized MAC frame
- 25 Maximum commands exceeded
- 26 Correlator not acceptable
- 27 Link not transmitting I frames, status changed from link open
- 28 Transmit frame length not acceptable
- 29 Link retransmission in process, buffers free
- 40 Station ID not acceptable
- 41 Protocol error, link not in acceptable state for command



USING A MEMORY MANAGER

If your PC comes with a memory manager preinstalled, or if you would like to use one, you must configure your PC so that the memory manager does not use the same memory as your 3C389 PC Card. If you have more than one 3C389 PC Card, you must reserve the memory needed for all of them. One 3C389 PC Card cannot use the same memory ranges as another.

To determine whether or not your PC has a memory manager, edit your CONFIG.SYS file and look for the memory manager driver name. For example, when using EMM386, look for:

```
DEVICE=C:\DOS\EMM386.EXE . . . . .
```

You must also consider your PC Card environment (Point Enabler or Card and Socket Services) as described in the sections that follow. For more information on your memory manager and your configuration files, refer to your PC's operating system manual.

Memory Managers with Point Enabler

To prevent duplicate use of a memory location, the memory range used by your 3C389 PC Card must be excluded from the memory manager. To do this, you must edit your CONFIG.SYS file. In certain environments, LANAIID will add the exclude statement automatically.

If you are using enhanced mode, 8 KB of memory must be excluded. If you are using compatibility mode, 24 KB of memory must be excluded.

For the point enabler, the required exclusions are shown in the following example (using EMM386, this is done using the X= parameter):

For enhanced mode:

```
DEVICE=C:\POINTTR.EXE SA RS=4 MMIO=D000 IRQ=9
SRAM=D000,4 WS=0
```

.

.

```
DEVICE=C:\DOS\HIMEM.SYS
```

.

.

```
DEVICE=C:\DOS\EMM386.EXE 1024 RAM
X=D000-D1FF
```

For compatibility mode:

```
DEVICE=C:\POINTTR.EXE SA RS=4 MMIO=D000 IRQ=9
SRAM=D800,16 WS=0
```

.

.

```
DEVICE=C:\DOS\HIMEM.SYS
```

.

.

```
DEVICE=C:\DOS\EMM386.EXE 1024 RAM
X=D000-D1FF X=D800-DBFF
```

Notice that the EMM386 line excludes the ranges that the POINTTR.EXE enabler uses.

Memory Managers with Card and Socket Services

To prevent duplicate use of a memory location, the memory range used by your 3C389 PC Card must be excluded from the memory manager. To do this, you must edit your CONFIG.SYS file. In certain environments, the installation program will add the exclude statement automatically.

If you are in enhanced mode, 8 KB of the MMIO range must be excluded.

If you are in compatibility mode, 8 KB of the MMIO range (MMIO base address default of D000) and 16 KB of the shared RAM (SRAM) range (SRAM base address default of D800) must be excluded.

In addition, Card Services needs at least 4 KB excluded for its use. Remember, if you are using more than one 3C389 PC Card, the memory locations for the other 3C389 PC Cards must also be excluded.

Card Services and memory managers typically do not talk to each other. You must tell them what areas can be used. For example, with IBM Card Services the /MA option is used to tell Card Services what memory range it can use for 3C389 PC Cards. It also uses some of this area for itself. That same /MA range must be excluded from the memory manager line. This will prohibit the memory manager from also using that same space.

For IBM card services, the /MA is used to specify the range of memory the 3C389 PC Cards and Card Services use. The parameter is added to the Resource Map Utility line in your CONFIG.SYS. For example:

- Using IBM Card Services:

On a PC using memory range C0000-CFFFF

```
DEVICE=C:\DOS\EMM386.EXE NOEMS X=C000-CFFF
```

```
·  
·
```

```
DEVICE=C:\DOS\DICRMU02.SYS /MA=C000-CFFF
```

The Resource Map Utility driver name may be slightly different for the various PCs. Consult your notebook user guide.

- Using Phoenix Card Services with the /ADDR option:

For some versions of Phoenix Card Services, the /ADDR parameter is used to specify the 4-KB memory range used by Card Services. The memory range chosen for the 3C389 PC Cards must not conflict with this range. The /ADDR parameter is placed on the Phoenix device driver line in the CONFIG.SYS file. Consult your notebook user guide for the version you have and whether the /ADDR option is needed.



The /ADDR parameter needs only the starting address of the Card Services memory area.

On a PC using memory range D0000-DFFFF

```
DEVICE=C:\DOS\EMM386.EXE NOEMS X=D000-DFFF
.
.
DEVICE=C:\PCPLUS\PCMCS.EXE /WAIT=12
/ADDR=D0 /IRQ=9
```

IBM Card Services

- The memory range used by 3C389 PC Cards must fall within the range specified by /MA.
- The memory range used by Card Services itself (4 KB) must be included in the /MA range.
- All of the /MA range must be excluded from your memory manager line.

Phoenix Card Services

- The memory used by Card Services starting at the /ADDR address and the memory used by the 3C389 PC Card should be excluded from the memory manager line.
- If the /ADDR line is not used, the driver will use the first available address on a 4-KB boundary for Card Services. The memory manager line must exclude this area and the 3C389 PC Card memory area.

Expanded Memory Specification

Expanded memory specification (EMS) requires 64 KB (one page frame) of contiguous memory which may cause you to move your 3C389 PC Card memory range. With EMM386 you set the page frame base address using the FRAME= option on the memory manager line in the CONFIG.SYS. If the FRAME= option is not used, EMM386 will find the first 64-KB block of contiguous memory. For example:

Using a point enabler with the 3C389 PC Card at D0000-DBFFF, the C0000-CFFFF range is free for the EMS

page. A sample enhanced mode memory manager line in your CONFIG.SYS is:

```
DEVICE=C:\DOS\EMM386.EXE RAM 1024 X=D000-D1FF  
FRAME=C000
```



The token ring 3C389 PC Card uses D0000-D1FFF for 8-KB MMIO. The FRAME= parameter sets the base address of the EMS page frame (the page frame uses C0000-CFFFF). So, no 3C389 PC Cards should be set to use memory in the range C0000-CFFFF.

Using a point enabler with the 3C389 PC Card at D0000-DBFFF, the C0000-CFFFF range is free for the EMS page. A sample compatibility mode memory manager line in your CONFIG.SYS is:

```
DEVICE=C:\DOS\EMM386.EXE RAM 1024 X=D000-D1FF  
X=D800-DBFF FRAME=C000
```



The token ring 3C389 PC Card uses D0000-D1FFF for 8-KB MMIO and D8000-DBFFF for 16-KB SRAM. The FRAME= parameter sets the base address of the EMS page frame (the page frame uses C0000-CFFFF). So, no 3C389 PC Cards should be set to use memory in the range C0000-CFFFF.

Using IBM Card Services, you can set the /MA option such that a 64 KB block is free for the EMS page frame. A sample memory manager line in your CONFIG.SYS is:

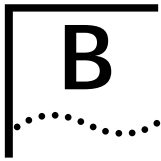
```
DEVICE=C:\DOS\EMM386.EXE RAM 1024 X=D000-DBFF  
FRAME=C000
```

```
.  
.
```

```
DEVICE=C:\DICRMU01.SYS /MA=D000-DBFF
```



Because of the /MA option, IBM Card Services will use memory in the range D0000-DBFFF only. The FRAME= parameter sets the base address of the EMS page frame (the page frame uses C0000-CFFFF). So, no 3C389 PC Cards should be set to use memory in the range C0000-CFFFF.



SYSTEMSOFT CARD AND SOCKET SERVICES SPECIFICS

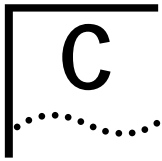
Complete the following procedure to install the 3C389 PC Card on Compaq PCs using SystemSoft Card and Socket Services with DOS or Windows 3.1:

- 1 After installing and configuring the card using LANAIID, go to the CPQDOS directory, or the directory containing SystemSoft C&SS and the file PC-CARD.EXE.
- 2 Run PCCARD.BAT, click *Utility* and then *Resource Allocation*.
- 3 Click *Open* and the appropriate memory range for the card.
- 4 Click *Edit* and then *Change*.
- 5 Change the memory range to comply with the range of the card and then click *Include*.



When performing step 5, it may be necessary to change the exclude range specified in the EMM386 driver setting in the CONFIG.SYS file.

- 6 Click *OK*.
- 7 Click the appropriate I/O and IRQ ranges for the card and include their ranges as well by repeating the previous three steps.
- 8 Click *Save* and remove any cards from their slots when prompted to do so.
- 9 Click *OK*, *Done*, *File*, and then *Exit*.
- 10 This procedure will modify the CSALLOC.INI file.
- 11 The CARDID.INI file may also need to be edited manually to comply with the card's settings.



HOT-PLUGGABILITY AND SUSPEND/RESUME

The Windows 95 (NDIS 3), DOS NDIS, DOS ODI, and OS/2 NDIS drivers support *hot-pluggability* and the suspend/resume capability. Hot-pluggability allows you to attach or detach the 3C389 PC Card cable from the PC Card while the PC is running. This has the same effect on the operating system as physically removing the PC Card from the slot; it conserves system resources such as battery power and memory. When the cable is reattached, the operating system behaves as if the PC Card was reinserted into the slot.



Hot-swapping allows you to physically remove or insert the 3C389 PC Card from an operating PC. The environments that support hot-plugging also support hot-swapping.

If you follow these guidelines, no damage will occur to either your 3C389 PC Card, PC, or software when hot-plugging.

To use the hot-plugging features of this card, you must:

- Use Card and Socket Services.



CAUTION: *If you are using a point enabler, do not attempt to unplug your card while the machine is powered on. You might damage both your card and the machine in this case.*

- Use the Windows 95, DOS ODI environment, DOS NDIS environment, OS/2 ODI environment, or OS/2 NDIS environment.



CAUTION: *At the present time the DOS Native environment and Microsoft Windows NT do not support hot-pluggability and hot-swapping. Removing your card while in these environments might result in a system failure or the inability to access your LAN applications.*

- Avoid hot-plugging a card when in a Windows for Workgroups environment.

Your card does not have to be present when NET START is run. If you plan to access your network in your Windows session, insert your card before starting Windows. If you plan to pull out your card, shut down Windows before doing so. It is suggested that you include your Network Address in the protocol.ini file if you execute NET START without a card present. This ensures that the system has your card's address even if the card is not present.

The following sections describe, in more detail, the exact procedure to follow for each of the supported hot-plugging environments.

Windows 95 (NDIS 3)

Windows 95 has built-in support for hot-swapping and suspend/resume. Windows 95 recognizes the 3C389 PC Card when it is inserted into a PCMCIA slot (or the cable is attached to an already inserted 3C389 PC Card) and loads the correct driver and configured protocol stack for the 3C389 PC Card.

If you plan to disconnect from your network, complete the following procedure:

- 1 Click the 3C389 PC Card icon on the status bar.**

A message box appears with a message to stop the 3C389 PC Card.

- 2 Click Stop.**

When the "Safe to remove message" appears, you can either detach the cable or physically remove your 3C389 PC Card.

DOS ODI Hot-Pluggability and Suspend/Resume

It is recommended that you use the NetWare Event Service Layer program (NESL.COM) for hot-plugging to work in this environment. Without this support, you should use the following procedure.

Complete the following procedure to remove the 3C389 PC Card or to go into a suspend mode:

1 Unload all the drivers.

Remove them in the reverse order they were installed. by typing the following commands at the DOS prompt:

```
netx u ("or" vlm u)
ipxodi u
tokensc u
lsl u
```

2 Remove the card from your machine.

Once the card is removed, you can enter and exit suspend mode as often as you like before reinstalling the card. It is best to reinstall the card while the machine is not in suspend mode.

After reinserting the card or resuming, you can restart your network software by typing the following commands at the DOS prompt:

```
lsl
tokensc
ipxodi
netx
```

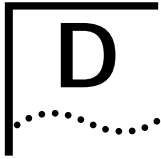
DOS NDIS Hot-Pluggability

You can insert and remove your card before and after using Windows for Workgroups. You cannot hot-plug the card while using Windows for Workgroups. Insert the card before starting the software. Remove the card only after exiting the Windows for Workgroups environment.

OS/2 NDIS Hot-Pluggability and Suspend/Resume

You can remove the card or go into suspend mode at any time as long as you are not running any applications that use shared resources. After you reinsert the card or resume, you should have all of your LAN shared resources connected. If you use CM/2 to connect to the host, you will have to log on again.

One scenario that does not work is suspending and then removing the card. The card will not be recognized when it is reinserted. If you want to do something like this, you must first remove the card and then suspend. You can then resume later and reinsert the card later.



TECHNICAL SUPPORT

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

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

Online Technical Services

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

- World Wide Web site
- 3Com FTP site
- 3Com Bulletin Board Service (3Com BBS)
- 3ComFactsSM automated fax service

World Wide Web Site

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

<http://www.3com.com/>

This service provides access to online support information such as technical documentation and software library, as well as support options ranging from technical education to maintenance and professional services.

3Com FTP Site

Download drivers, patches, and software across the Internet from the 3Com public FTP site. This service is available 24 hours a day, 7 days a week.

To connect to the 3Com FTP site, enter the following information into your FTP client:

- Hostname: **ftp.3com.com** (or **192.156.136.12**)
- Username: **anonymous**
- Password: **<your Internet e-mail address>**



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

3Com Bulletin Board Service

The 3Com BBS contains patches, software, and drivers for 3Com products. This service is available through analog modem or digital modem (ISDN) 24 hours a day, 7 days a week.

Access by Analog Modem

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

Country	Data Rate	Telephone Number
Australia	Up to 14,400 bps	61 2 9955 2073
Brazil	Up to 14,400 bps	55 11 5181 9666
France	Up to 14,400 bps	33 1 6986 6954
Germany	Up to 28,800 bps	4989 62732 188
Hong Kong	Up to 14,400 bps	852 2537 5601
Italy	Up to 14,400 bps	39 2 27300680
Japan	Up to 14,400 bps	81 3 3345 7266
Mexico	Up to 28,800 bps	52 5 520 7835
P.R. of China	Up to 14,400 bps	86 10 684 92351
Taiwan, R.O.C.	Up to 14,400 bps	886 2 377 5840
U.K.	Up to 28,800 bps	44 1442 438278
U.S.A.	Up to 28,800 bps	1 408 980 8204

Access by Digital Modem

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

1 408 654 2703

3ComFacts Automated Fax Service

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

Call 3ComFacts using your Touch-Tone telephone:

1 408 727 7021

Support from Your Network Supplier

If additional assistance is required, contact your network supplier. Many suppliers are authorized 3Com service partners who are qualified to provide a variety of services, including network planning, installation, hardware maintenance, application training, and support services.

When you contact your network supplier for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

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

Support from 3Com

If you are unable to obtain assistance from the 3Com online technical resources or from your network supplier, 3Com offers technical telephone support services. To find out more about your support options, please call the 3Com technical telephone support phone number at the location nearest you.

When you contact 3Com for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

Below is a list of worldwide technical telephone support numbers:

Country	Telephone Number
Asia Pacific Rim	
Australia	1 800 678 515
Hong Kong	800 933 486
India	61 2 9937 5085
Indonesia	001 800 61 009
Japan	0031 61 6439
Malaysia	1800 801 777
New Zealand	0800 446 398
Pakistan	61 2 9937 5085
Philippines	1235 61 266 2602
P.R. of China	10800 61 00137 or 021 6350 1590
Singapore	800 6161 463
S. Korea	
From anywhere in S. Korea:	82 2 3455 6455
From Seoul:	00798 611 2230
Taiwan, R.O.C.	0080 611 261
Thailand	001 800 611 2000
Europe	
From anywhere in Europe, call:	+31 (0)30 6029900 phone +31 (0)30 6029999 fax
From the following European countries, you may use the toll-free numbers:	
Austria	06 607468
Belgium	0800 71429
Denmark	800 17309
Finland	0800 113153
France	0800 917959
Germany	0130 821502
Hungary	00800 12813
Ireland	1 800 553117
Israel	177 3103794
Italy	1678 79489
Netherlands	0800 0227788
Norway	800 11376
Poland	0800 3111206
Portugal	05 05313416
South Africa	0800 995014
Spain	900 983125
Sweden	020 795482
Switzerland	0800 55 3072
U.K.	0800 966197

(continued)

Country	Telephone Number
Latin America	
Argentina	541 312 3266
Brazil	55 11 523 2725, ext. 422
Colombia	571 629 4847
Mexico	01 800 849 2273
North America	1 800 NET 3Com (1 800 638 3266)

Returning Products for Repair

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

To obtain an RMA number, call or fax:

Country	Telephone Number	Fax Number
Asia, Pacific Rim	65 543 6342	65 543 6348
Europe, South Africa, and Middle East	011 44 1442 435860	011 44 1442 435718

From the following European countries, you may call the toll-free numbers; select option 2 and then option 2:

Austria	06 607468	
Belgium	0800 71429	
Denmark	800 17309	
Finland	0800 113153	
France	0800 917959	
Germany	0130 821502	
Hungary	00800 12813	
Ireland	1800553117	
Israel	177 3103794	
Italy	1678 79489	
Netherlands	0800 0227788	
Norway	800 11376	
Poland	00800 3111206	
Portugal	05 05313416	
South Africa	0800 995014	
Spain	900 983125	
Sweden	020 795482	
Switzerland	0800 55 3072	
U.K.	0800 966197	
Latin America	1 408 326 2927	1 408 764 6883
U.S.A. and Canada	1 800 876 3266, option 2	1 408 764 7120

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

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

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This Limited Warranty shall be governed by the laws of the state of California.

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

- 1 This device may not cause harmful interference, and
- 2 This device must accept any interference received, including interference that may cause undesired operation.

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

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

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

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

Tested to comply with the FCC Standards for home and office use.

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

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We declare under our sole responsibility that the

Model:	Description:
3C389	16/4 Token Ring LAN PC Card

to which this declaration relates, is in conformity with the following standards or other normative documents:

- ANSI C63.4-1992 Methods of Measurement
- Federal Communications Commission 47 CFR Part 15, subpart B
15.107 (e) Class B Conducted Limits
15.109 (g) Class B Radiated Emissions Limits

Responsible Party:

3Com Corporation, 5400 Bayfront Plaza, P.O. Box 58145, Santa Clara, CA 95052-8145
(408) 326-5000

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AVIS DE CONFORMITÉ À LA RÉGLEMENTATION D'INDUSTRIE CANADA

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