> **Note**
>
> Before using this information and the product it supports, be sure to read the general information under "Notices" on page v.

Contents

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A safety notice is printed in this manual. The **DANGER** notice warns you of conditions or procedures that can result in death or severe personal injury.

Before you set up, install, or operate this IBM product, you first should become familiar with the related safety information. See Appendix E, "Safety Notice" on page 67 if you do not clearly understand the safety information in this manual.

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World Trade Safety Information

Some countries require that safety information contained in publications be presented in their national languages. See Appendix E, "Safety Notice" on page 67 for the translations of the **DANGER** notice.

Electronic Emissions Notice

The following statement applies to this IBM product. The statement for other IBM products intended for use with this product will appear in their accompanying manuals.

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Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

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.

Canadian Department of Communications Compliance Statement

This equipment does not exceed Class A limits per radio noise emissions for digital apparatus, set out in the Radio Interference Regulation of the Canadian Department of Communications. Operation in a residential area may cause unacceptable interference to radio and TV reception requiring the owner or operator to take whatever steps are necessary to correct the interference.

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Cet équipement ne dépasse pas les limites de Classe A d'émission de bruits radioélectriques pour les appareils numériques, telles que prescrites par le Règlement sur le brouillage radioélectrique établi par le ministère des Communications du Canada. L'exploitation faite en milieu résidentiel peut entraîner le brouillage des réceptions radio et télé, ce qui obligerait le propriétaire ou l'opérateur à prendre les dispositions nécessaires pour en éliminer les causes.

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与えることがあります。

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Related Publications

Refer to these publications for additional information:

- *Local Area Network Credit Card Adapters Technical Reference*, SC30-3585
- *Local Area Network Technical Reference*, SC30-3383
- *Supplement to LAN Technical Reference*, SD21-0049
- *NTS/2 LAN Adapter and Protocol Support Configuration Guide*, S96F-8489
- LAN Support Program NDIS Version 1.0 Program Diskette

Introducing the IBM Ethernet Credit Card Adapter II

The IBM Ethernet Credit Card Adapter II is a credit-card-sized adapter that provides an interface between computers and Ethernet networks. The Credit Card Adapter is designed to operate in computers having Personal Computer Memory Card International Association (PCMCIA) Release 2.0, Type II slots. The Credit Card Adapter complies with PCMCIA and the Institute of Electrical and Electronics Engineers (IEEE) 802.3 standards. This allows the Credit Card Adapter to be used with a variety of application programs.

The IBM Ethernet Credit Card Adapter II enables the use of remote program load (RPL) on computers that have RPL function in their basic input output system (BIOS). Refer to Appendix C, "Remote Program Load Function" on page 64 for additional information regarding RPL.

The Credit Card Adapter uses the following computer system software programs and PCMCIA services to operate:

Required system software

- IBM or Microsoft Disk Operating System (DOS) Version 5.0 (or higher)

    OR

    IBM* Operating System/2* (OS/2*) Version 2.1 (with Card Services 2.0 or higher)

    Note: The phrase *Card Services* is used throughout this document to refer to versions of Card Services 2.0 or higher.

- Ethernet network operating system software

1

Supported PCMCIA environments

- PCMCIA Card Services Version 2.0 or higher
- IBM-provided connectivity enablers for DOS (provided with this Credit Card Adapter)

  The IBM-provided connectivity enablers are used if either your computer or the network operating environment you have chosen does not support Card Services. The installation program determines whether or not you have the Card Services operating environment. If a connectivity enabler is required, the installation program prompts you to select the specific computer that you have, which causes the appropriate enabler software to be loaded.

Quick Reference Information

Following are references to parts of this publication, phone numbers, and tips to help you install the Credit Card Adapter.

1. Call 1-800-643-7409 from the United States and Canada to obtain information regarding your IBM Ethernet Credit Card Adapter II. If required, download the latest version of the adapter installation software from the IBM Personal Computer Company Bulletin Board System (BBS). See page 5.

2. Install OS/2 Version 2.1 or DOS Version 5.0 (or higher). For OS/2, at least 6 MB of memory is also required.

3. If you have Card and Socket Services software, Version 2.0 or higher, install it and reboot your computer. The software may be provided with your computer or operating system. See page 9.

4. Install your required LAN software before installing the credit card. Detailed installation instructions are provided in this publication.

5. If you're using DOS, take a moment to read the first few pages beginning on page 14.

6. If you're using OS/2, take a moment to read the first few pages beginning on page 38.

7. Make certain that the PCMCIA Release 2.0, Type II slot in your computer is powered on. Read your computer documentation for information about how to do this.

8. Always reboot your computer after installing software.

Credit Card Adapter Kit Contents

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

- IBM Ethernet Credit Card Adapter II (also described as *adapter*)
- Adapter sleeve (The sleeve is provided to store the adapter and keep it clean.)
- Product warranty and registration card (Keep the product warranty for your records.)
- One of two network connections:

  This Credit Card Adapter kit contains either an Ethernet 10BASE2 Media Access Module (MAM) or an Ethernet 10BASE-T adapter cable.

  - The 10BASE2 MAM (part number 92G9319) consists of a short cable with connectors at both ends. One end of the cable is used to connect to the adapter and the other is used to connect to the network cable.
  - The 10BASE-T adapter cable (part number 92G9320) is 3 meters (9.84 feet) long. One end of the cable has an RJ-45 connector that plugs into the network. The other end plugs into the adapter.

  See Appendix D, "Network Cabling Media Specifications" on page 66 for more information about the cabling.

  If you want additional cables, contact your IBM marketing representative, your place of purchase, or, in the United States and Canada, call 1-800-IBM-2468.

- LAN Support Program/NDIS Version 1.0 is included on the installation diskette and provides the same IEEE 802.2 and Netbios interface drivers for NDIS adapters that are provided in the latest LSP 1.3 stand-alone release.
- IBM Ethernet Credit Card Adapter II Installation Diskette, Version 2.0 (3-1/2 inch)

In the United States and Canada, call 1-800-643-7409 to obtain the latest information regarding your Credit Card Adapter. The latest version number of the installation diskette is given as well as a list of tested and supported computers and LAN operating systems.

If your Credit Card Adapter installation diskette is damaged, or you need to obtain an updated version, or if you need a new LSP instruction book, in the United States and Canada you can call the IBM Personal Computer Company BBS using the following phone numbers:

United States	(919) 517-0001
Vancouver	(604) 664-6464
Toronto	(416) 946-4244
Montreal	(514) 938-3022
Winnipeg	(204) 934-2798

You can download a copy of the installation diskette from the BBS by using a modem. In the United States, search directory 32 for "Ethernet Credit Card." If you do not have a modem or you are outside the United States or Canada, contact your IBM marketing representative. Download the latest file (ETENG2xx.EXE, the Ethernet Credit Card diskette, or LSPNDISxx.EXE, the LSP/NDIS User's Guide). Type ETENG2xx or LDPNDISxx to unpack the files onto your hard disk. One of the files is a READ.ME. Read the READ.ME file for further instructions about how to make a diskette.

The installation diskette contains all of the Credit Card Adapter files, which include the following key files:

File name	Description
READ.ME	The READ.ME file contains important, supplemental, technical information about how to configure your computer and Credit Card Adapter.
RPLREAD.ME	This file contains information about remote program load.
INSTALL.EXE	The installation program loads a device driver and a connectivity enabler if needed. It gives you the option of choosing the driver that is compatible with your network operating system.
xxxxx.**SYS**	A connectivity enabler for DOS without Card Services. The specific enablers are:

	POINTETH.SYS	Intel 82365 (or compatible) PCMCIA controller point enabler
	TOSHETH.SYS	Toshiba T3300SL PCMCIA controller point enabler

File name	Description
PCMNICCS.DOS	A Network Driver Interface Specification (NDIS) device driver for DOS.
PCMNICCS.OS2	An NDIS device driver for OS/2 (used on computers with Card Services).
PCMDMCS.COM	An Open Data-Link Interface (ODI) device driver for Novell** NetWare** network operating software for DOS.

PCMDMCS.SYS   An ODI device driver for Novell NetWare network operating software for OS/2.

ECCTEST.EXE   The Adapter Diagnostics program for DOS that is used to test the Credit Card Adapter and the network link.

DXMAID.EXE   The IBM LSP NDIS installation aid.

What You Should Know about Networks and Your Hardware

Computers that support PCMCIA have one or more card slots, known as A, B, C... or 1, 2, 3.... The slots are controlled by a processor chip; in most computers, this is an Intel 82365SL, but some older Toshiba and Sharp PCs use another type.

In order for communications programs to use a card, interface software of some sort is needed. At present, several interfaces are available and each has its advantages and disadvantages. The two most important interfaces are those provided by Point Enablers and Card Services; both are available under DOS, but OS/2 requires you to use Card Services.

Point Enablers: These are small programs that provide an interface directly to the PCMCIA controller; therefore, they must be written to support a particular type of controller. For the Ethernet Credit Card, for example, there are point enablers for the Intel chip and for the chip installed in the Toshiba 3300SL.

Advantages

- Consume no memory — remove themselves after configuring the card.
- Simple to configure.

Disadvantages

- You must specify the slot number; the point enabler will enable only that slot. Therefore, the card must always be in a specific slot.
- Hot-plugging is not possible (see Card Services).
- In some PCs, the slot may not be powered off when the PC is in suspend mode, so the card will continue to consume power.

Two Point Enablers are supplied for the Ethernet card:

POINTETH.SYS For computers with Intel PCMCIA controllers; these include the IBM ThinkPads, Toshiba 4500 and later and many other makes.

TOSHETH.SYS For the Toshiba T3300SL (and perhaps others).

In the DOS environment only, you have the option of using a point connectivity enabler *instead* of Card and Socket Services. When using the point connectivity enabler, it is vitally important that you make certain that the system resources used by the Ethernet PCMCIA adapter are different from and do not conflict with the system resources used by any other PCMCIA adapters installed in your computer.

Socket Services: This is a BIOS-level interface that provides a way to gain access to the PCMCIA sockets (slots) of a computer. It identifies how many sockets your computer has and detects the insertion or removal of a PC Adapter while the computer is powered on. It has an interface to Card Services. Socket Services is part of the PCMCIA Specification and its current level is Release 2.0.

The Socket Services device driver is normally provided by the manufacturer of the computer, since it must understand the computer's BIOS and PCMCIA controller.

Card Services: This is a software management interface that allows system resources (such as memory, interrupts, slots, and IO ports) to be allocated automatically when Socket Services has detected that a card has been inserted; it also releases these resources when the card is removed. This capability is often called *hot plugging*. The Ethernet software has the capability to negotiate with Card Services to acquire the system resources the card requires. This is called *autoset mode*. This prevents the Ethernet card from trying to use resources already allocated to another PC card that has been installed and configured in your computer. This

happens when a PC card driver was loaded and assigned system resources *before* the Ethernet card driver was loaded. Card Services provides an interface to higher level software. Its current level is Release 2.1.

Card Services requires Socket Services; at present, it also needs a Card Services device driver or some interface software. The goal is to have Card-Services-aware applications that allow for hot pluggability. These are sometimes called *clients*. Card Services is a server.

The Card Services interface will normally be provided with the operating system, as is the case with DOS 6.1 and OS/2 2.1. It has been provided with IBM ThinkPads up to the time when DOS 6.1 or OS/2 2.1 were available.

Advantages

- Ability to insert and remove cards without system reconfiguration and without damaging the electrical contacts.
- Automatic allocation of system resources.
- When used with your Ethernet software in autoset mode, automatic configuration of your Ethernet card occurs.

Disadvantage

Uses quite a lot of memory — 33 KB plus the Card Services interface enabler and LAN drivers in the case of IBM's Card and Socket Services and more for Phoenix (the amount varies according to the type of PCMCIA support and the drivers used).

Relationship between the Interfaces: Following is a diagram that shows how the interfaces relate to each other:

```
                    ┌──────────────────────┐
                    │  LSP/NetWare/LAPS...  │
                    └──────────────────────┘
              ┌──────────┴───────────┬──────────┐
              │                                  │
    ┌──────────────────┐              ┌──────────────────┐
    │ NDIS or ODI Driver│              │  Point Enabler   │
    └──────────────────┘              └──────────────────┘
              │                                  │
    ┌──────────────────┐                         │
    │  Card Services   │                         │
    └──────────────────┘                         │
              │                                  │
    ┌──────────────────┐                         │
    │  Socket Services │                         │
    └──────────────────┘                         │
              │                                  │
              └──────────────┬───────────────────┘
                    ┌──────────────────┐
                    │ PCMCIA Controller│
                    └──────────────────┘
                             │
                    ┌──────────────────┐
                    │     Adapter      │
                    └──────────────────┘
```
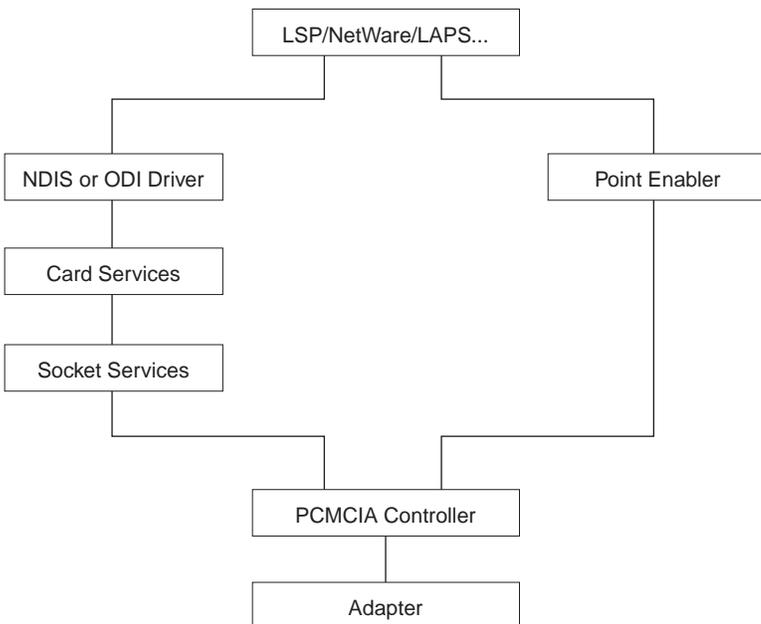
Card and Socket Services versus Point Enablers: There is much debate about which is better. In principle, Socket plus Card Services is the better method of connection because it allows you to insert or remove cards from any slot at will, even while the PC is switched on; and it automatically allocates resources like memory, IO ports, interrupt levels, and slots.

Card and socket services turns out to be most helpful when you have multiple PC cards installed in your computer. If the Credit Card Adapter installation program detects Card and Socket Services in your computer, it will default to autoset mode. Autoset mode allows your LAN card driver to negotiate with Card and Socket Services for memory space and interrupts every time you power on your computer. This helps to prevent conflicts with other cards that are installed in your computer; however, you will not know exactly what memory addresses and interrupts have been given to you.

With LAN cards, however, some of these benefits cannot be realized at present because the software that uses the cards is not designed to take advantage of the facilities that Card and Socket Services provide — for example, LAN Support Program, LAPS, or NetWare (DOS) time out if you remove the connection to the LAN and you must reboot the PC in order to reestablish the connection.

It must be emphasized that these difficulties are with the software, which was designed a long time ago; they are not because of a lack of function in the cards.

The goal is to have Card-Services-aware applications, which will take into account the removal of a card or disconnection from a network and will recover automatically when you reconnect.

Point Enablers, of which two are provided with the card, are intended to be stopgaps until such applications arrive; they are popular because they remove themselves from

memory after having been loaded — as opposed to the 30–40 KB needed for Card Services.

For Point Enablers, you have to specify the slot in which a particular card will be and you have to specify memory locations, interrupt levels, etc; but this is not difficult unless you use several cards at different times, in which case you need to make certain that what you specify does not conflict with any other cards installed in your computer. Some management may be required, in other words.

So the position is that, while Socket Services and Card Services have potential benefits, there is limited advantage in using them at the moment for LAN cards since the application software does not support hot pluggability. Point Enablers consume no memory and perform well, although you do have to be careful about slot allocation when using them.

OS/2 allows only Socket plus Card Services, so these arguments do not apply; the Card Services driver, PCMCIA.SYS, is supplied as part of OS/2 2.1. Earlier versions of OS/2, however, do not support PCMCIA.

Installation Instructions for DOS Operating Environment

The DOS-compatible installation environments are described in this section. Use the installation procedures in this section to perform the steps necessary for a successful installation.

DANGER

> **To avoid a shock hazard, do not connect or disconnect any cables or perform installation or maintenance of this product during an electrical storm.**

Before installing the Credit Card Adapter, be sure that the software listed in "Requirements for Installation with DOS" on page 15 has been installed and that you have a connection available to the Ethernet network.

The READ.ME file on the installation diskette contains information to help you configure and customize the adapter memory, I/O, interrupts, and other parameters for your computer. Most users can use the default parameters that are provided by the Credit Card Adapter installation program.

Requirements for Installation with DOS

Before you can install the Credit Card Adapter, you need the Credit Card Adapter installation diskette and the following items:

- A computer with a PCMCIA Release 2.0, Type II card slot

  Make certain the PCMCIA slot is powered on by following the instructions in the documentation provided with your computer. Make a note of which slot (A,B,C,D or 1,2,3,4) you plan to use.

- IBM PC-DOS or Microsoft** MS-DOS** Version 5.0 (or higher), installed

- PCMCIA Card Services Version 2.0 (or higher) and PCMCIA Socket Services Version 2.0 (installed) if you want to use the Card and Socket Services programming interfaces. See page 9 for details. These are usually included with your computer, your computer's reference diskettes, or your operating system. You must reboot your computer after installing these.

- One of the following Ethernet network operating system software programs:
  - IBM LSP/NDIS Version 1.0 (included on this diskette) or IBM LSP Version 1.33 (or higher)
  - Microsoft LANManager Version 2.2
  - Microsoft Windows for Workgroups Version 3.1
  - Banyan** VINES** Version 5.5
  - Novell NetWare Version 3.11 (or higher)

- An Ethernet network application program, such as one of the following:
    - PC 3270 Emulation Program Version 3.0 or higher
    - PC Support/400 Version 2.2
    - DOS LAN Requester Version 3.0

Where Do I Find the Installation Instructions for My Environment?

You can install the Credit Card Adapter on computers that have various combinations of operating systems and network operating programs. The procedures in this section contain the recommended sequence of installation steps that you should follow when installing the various network operating programs in combination with DOS. With DOS installed, you have the options to use:

Table 1. DOS-Compatible Installation Instructions

IBM LAN Support Program/NDIS	page 17
LANManager**/NDIS	page 21
Windows for Workgroups	page 26
Banyan VINES	page 29
Novell NetWare	page 34

IBM LAN Support Program/NDIS (for DOS) – Installation Overview

LSP NDIS 1.0 is included on the installation diskette and provides the same 802.2 and Netbios interface drivers for NDIS adapters that are provided in the latest LSP 1.3 stand-alone releases. Therefore, LSP NDIS can be used in place of LSP 1.3.

The only situation in which LSP stand-alone should be purchased is if the CID-enabled version of the LSP installation aid, DXMAID, is needed. The CID-enabled version of LSP is Version 1.35 or higher and should be purchased separately.

Perform the following installation steps for the Credit Card Adapter when using DOS and the IBM LAN Support Program (LSP) NDIS environment:

Note: The LSP NDIS Version 1.0 User's Guide is available on the BBS for users who need more information. See page 5.

1. Run the installation aid, DXMAID, that is included on the installation diskette.

   - Type **a:DXMAID** and follow the instructions on the screens to run the installation aid.

   - During the LSP installation process, indicate that you have an adapter option diskette. This is the default.

   - Make a note of the name of the directory where LSP is installed. You will have to specify this name when the Credit Card Adapter Installation Program asks for the directory containing your PROTOCOL.INI file. This is done during step 2 on page 18 of these instructions.

- While running the LSP NDIS installation aid, when you are prompted for the driver diskette, leave the installation diskette in the drive and press **Enter** to load the NDIS driver.

- If installing DXME0MOD.SYS we recommend changing the DXME0MOD.SYS Work Space parameter to 8 KB, the lowest value, to save memory. Do this by selecting F5=Change Parameters on the driver selection panel. Tab down to the Work Space parameter and change the 16 to an 8.

  Note: When installation is complete, you do not need to reboot your computer before step 2.

2. Install the Credit Card Adapter software:

- The Credit Card Adapter installation program will allow you to select values for resources to be used by your Credit Card Adapter such as IO Base, Memory Base, and Interrupt. In most cases you can use the default values provided by the program. In addition, if you are using Card and Socket Services, the program will default to autoset mode, which allows the driver to negotiate with Card and Socket Services for whichever resources are available.

  If you are using Card and Socket Services and do not wish to use autoset mode, here are a few things that you should know before selecting values for IO Base, Memory Base, and Interrupt. If you fail to do the following, the Ethernet card will fail to initialize. The memory requirement is 16 KB.

  a. The IO Base, Memory Base, and Interrupt Level must not conflict with other adapters installed in your computer.

b. IBM Card Services allows the use of the /MA parameter to adjust the range of memory that it can give to PC Cards. You must select a value for Memory Base within the range being used if you have IBM Card Services. To do this, look in your CONFIG.SYS for:

   –   On the IBM ThinkPad 720, the /MA option is on the "DEVICE= C:\DICRMU02.SYS" line.

   –   On the IBM ThinkPad 750, the /MA option is on the "DEVICE= C:\DICRMU01.SYS" line.

   For example, if the /MA option is set to C800-CFFF, that is the same as C8000-CFFFF, and the value specified for Shared RAM Base *must* be within this range.

c. If you are using Phoenix Card Services, the value for Memory Base must *not* be equal to (or within a 2-KB range above) the value set by the /ADDR option.

   Note: For the IBM ThinkPad 350, the /ADDR option is on the "DEVICE=C:\DOS\PCMCS.EXE" line in your CONFIG.SYS. For example, if the /ADDR option is set to C8, which is the same as C8000, the Shared RAM Base should *not* be set to C8000.

d. If you are not using Card and Socket Services, you must ensure that the values that you select for IO Base, Memory Base, and Interrupt do not conflict with other PCMCIA cards or adapters in your computer. Also, if you are using a memory manager, you must exclude the memory ranges being used by your card for Memory (16 KB). For example, if you are using EMM386 and the Memory default base address, the memory manager in the CONFIG.SYS might be as follows: "DEVICE=C:\DOS\EMM386.EXE 640 X=D400-D7FF". If you

do not use the default base address, you must exclude the memory range starting from the base address.

- Leave the Credit Card Adapter installation diskette in drive A, and enter **a:install**.
- When you get to the panel that asks for the network environment, specify **Other NDIS**.
- If you have more than one adapter slot in your computer, note which adapter slot you are configuring.

Refer to Appendix A, "Running the Credit Card Adapter Installation Program" on page 56 if you want more details about the Credit Card Adapter installation diskette.

3. Install the adapter using the instructions in "Installing the Credit Card Adapter" on page 50.

4. Install the network computer operating system software (for example, DOS LAN Requester or PC LAN Program) using the installation procedures that are supplied with the programs.

5. If any error messages are displayed after you have installed the Credit Card Adapter in the previous step, see Appendix B, "Running the Credit Card Adapter Diagnostics Program" on page 59 to help resolve the errors.

LANManager/NDIS (for DOS) – Installation Overview

Perform the following installation steps for the Credit Card Adapter when using DOS and the Microsoft LANManager environment:

1. If Microsoft LANManager is not already installed, refer to the *Microsoft LANManager Installation and Configuration Guide* for instructions on how to install the program.

    a. Install the program beginning with the SETUP diskette.

    b. Insert the DOS Driver 1 Diskette when prompted.

    c. On the Network Adapter Drivers window, select the **Other Driver** option.

    d. When prompted, insert the IBM Ethernet Credit Card Adapter II installation diskette into the diskette drive. Do not enter a path name on the prompt window.

    A message will be displayed to indicate when the NDIS driver (PCMNICCS.DOS) has been copied.

    e. On the Network Protocols window, select a protocol. Microsoft LAN Manager requires the NetBEUI driver for NetBIOS support.

    f. Follow the instructions on the panels to complete the configuration. However, do not reboot your computer at this time.

    Note: On the Memory Management screen, you will be asked if you want to maximize application memory. If you answer yes, LANManager will install a memory manager (EMM386) on your computer by adding it to your CONFIG.SYS.

    To make that sure there are no memory conflicts between EMM386 and the memory used by Card and Socket Services, as well as the adapter, please

read the Memory Manager screen in the adapter installation program by pressing HELP (F1).

   g. Go to step 3 on page 23.

2. If Microsoft LANManager is already installed:

   a. Start the Microsoft LANManager Setup program.

   b. If Microsoft LANManager has been configured to support other LAN adapters in the computer, the Workstation Configuration window will be displayed. Select the **Add New Configuration** option on that window.

   c. On the Network Adapter Drivers window, select the **Other Driver** option.

   d. When prompted, insert the IBM Credit Card Adapter for Ethernet installation diskette into the diskette drive. Do not enter a path name on the prompt window.

     A message will be displayed to indicate when the NDIS driver (PCMNICCS.DOS) has been copied.

   e. On the Network Protocols window, select a protocol. Microsoft LANManager requires the NetBEUI driver for NetBIOS support.

   f. Follow the instructions on the panels to complete the configuration. NOTE: On the Memory Management screen, you will be asked if you want to maximize application memory. If you answer yes, LANManager will install a memory manager (EMM386) on your computer by adding it to your CONFIG.SYS.

     To make sure there are no memory conflicts between EMM386 and the memory used by Card and Socket Services, as well as the adapter, please read the Memory Manager screen in the adapter installation program by pressing HELP (F1).

g. After the configuration is completed, return to step 2b if you need to configure LANManager for a second IBM Ethernet Credit Card Adapter II.

3. Install the Credit Card Adapter software:

- The Credit Card Adapter installation program will allow you to select values for resources to be used by your Credit Card Adapter such as IO Base, Memory Base, and Interrupt. In most cases you can use the default values provided by the program. In addition, if you are using Card and Socket Services, the program will default to autoset mode which allows the driver to negotiate with Card and Socket Services for whichever resources are available.

  If you are using Card and Socket Services and do not wish to use autoset mode, here are a few things that you should know before selecting values for IO Base, Memory Base, and Interrupt. If you fail to do the following, the Ethernet card will fail to initialize. The memory requirement is 16 KB.

  a. The IO Base, Memory Base, and Interrupt Level must not conflict with other adapters installed in your computer.

  b. IBM Card Services allows the use of the /MA parameter to adjust the range of memory that it can give to PC Cards. You must select a value for Memory Base within the range being used if you have IBM Card Services. To do this, look in your CONFIG.SYS for:

     – On the IBM ThinkPad 720, the /MA option is on the "DEVICE= C:\DICRMU02.SYS" line.

     – On the IBM ThinkPad 750, the /MA option is on the "DEVICE= C:\DICRMU01.SYS" line.

For example, if the /MA option is set to C800-CFFF, that is the same
as C8000-CFFFF, and the value specified for Shared RAM Base *must*
be within this range.

c. If you are using Phoenix Card Services, the value for Memory Base
must *not* be equal to (or within a 2-KB range above) the value set by
the /ADDR option.

Note: For the IBM ThinkPad 350, the /ADDR option is on the
"DEVICE=C:\DOS\PCMCS.EXE" line in your CONFIG.SYS. For
example, if the /ADDR option is set to C8, which is the same as
C8000, the Shared RAM Base should *not* be set to C8000.

d. If you are not using Card and Socket Services, you must ensure that
the values that you select for IO Base, Memory Base, and Interrupt do
not conflict with other PCMCIA cards or adapters in your computer.
Also, if you are using a memory manager, you must exclude the
memory ranges being used by your card for Memory (16 KB). For
example, if you are using EMM386 and the Memory default base
address, the memory manager in the CONFIG.SYS might be as
follows: "DEVICE=C:\DOS\EMM386.EXE 640 X=D400-D7FF". If you
do not use the default base address, you must exclude the memory
range starting from the base address.

- Insert the Credit Card Adapter installation diskette in drive A, and enter
a:install.
- When you get to the panel that asks for the network environment, specify
Other NDIS.
- If you have more than one adapter slot in your computer, note which
adapter slot you are configuring.

See Appendix A, "Running the Credit Card Adapter Installation Program" on page 56 if you want more details about the Credit Card Adapter installation diskette.

4. Install the adapter using the instructions in "Installing the Credit Card Adapter" on page 50.

5. If any error messages are displayed after you have installed the Credit Card Adapter in the previous step, see Appendix B, "Running the Credit Card Adapter Diagnostics Program" on page 59 to help resolve the errors.

Windows for Workgroups (for DOS) – Installation Overview

Perform the following installation steps for the Ethernet Credit Card when using Microsoft Windows for Workgroups:

1. Follow the setup instructions included with Windows for Workgroups.

   If Windows for Workgroups is not already installed, you will be prompted to install a network adapter during the Windows for Workgroups installation process.

   If you are installing the credit card in a computer that already has Windows for Workgroups installed, see the Windows For Workgroups User's Guide for instructions on how to install and configure a third party device driver.

   a. When prompted to install a new network adapter, select **Unlisted or Updated Network Adapter**. You will be asked to insert the Credit Card Adapter installation diskette. Follow the instructions as they appear on the screen to install the PCMNICCS.DOS device driver.

   b. Accept the defaults for Interrupt, Memory and IO base. You will be given a chance to update these later, if necessary.

   c. Exit the Windows for Workgroups setup. *Do not* reboot your computer at this time. Exit to the DOS prompt.

2. Install the Credit Card Adapter software:

   - The Credit Card Adapter installation program will allow you to select values for resources to be used by your Credit Card Adapter such as IO Base, Memory Base, and Interrupt. In most cases you can use the default values provided by the program. In addition, if you are using Card and Socket Services, the program will default to autoset mode which allows the driver to

negotiate with Card and Socket Services for whichever resources are available.

If you are using Card and Socket Services and do not wish to use autoset mode, here are a few things that you should know before selecting values for IO Base, Memory Base, and Interrupt. If you fail to do the following, the Ethernet card will fail to initialize. The memory requirement is 16 KB.

a. The IO Base, Memory Base, and Interrupt Level must not conflict with other adapters installed in your computer.

b. IBM Card Services allows the use of the /MA parameter to adjust the range of memory that it can give to PC Cards. You must select a value for Memory Base within the range being used if you have IBM Card Services. To do this, look in your CONFIG.SYS for:

   – On the IBM ThinkPad 720, the /MA option is on the "DEVICE= C:\DICRMU02.SYS" line.

   – On the IBM ThinkPad 750, the /MA option is on the "DEVICE= C:\DICRMU01.SYS" line.

   For example, if the /MA option is set to C800-CFFF, that is the same as C8000-CFFFF, and the value specified for Shared RAM Base *must* be within this range.

c. If you are using Phoenix Card Services, the value for Memory Base must *not* be equal to (or within a 2-KB range above) the value set by the /ADDR option.

   Note: For the IBM ThinkPad 350, the /ADDR option is on the "DEVICE=C:\DOS\PCMCS.EXE" line in your CONFIG.SYS. For example, if the /ADDR option is set to C8, which is the same as C8000, the Shared RAM Base should *not* be set to C8000.

d. If you are not using Card and Socket Services, you must ensure that the values that you select for IO Base, Memory Base, and Interrupt do not conflict with other PCMCIA cards or adapters in your computer. Also, if you are using a memory manager, you must exclude the memory ranges being used by your card for Memory (16 KB). For example, if you are using EMM386 and the Memory default base address, the memory manager in the CONFIG.SYS might be as follows: "DEVICE=C:\DOS\EMM386.EXE 640 X=D400-D7FF". If you do not use the default base address, you must exclude the memory range starting from the base address.

- Insert the Credit Card Adapter installation diskette in drive A, and enter **a:install**.
- When you get to the panel that asks for the network environment, specify **Other NDIS**.
- If you have more than one adapter slot in your computer, note which adapter slot you are configuring.

Refer to Appendix A, "Running the Credit Card Adapter Installation Program" on page 56 if you want more details about other options that may be selected when using the Credit Card Adapter installation program.

3. Install the adapter using the instructions in "Installing the Credit Card Adapter" on page 50.

4. Use the *Microsoft Windows for Workgroups User's Guide* to configure your network resources.

5. If any error messages are displayed after you have installed the Credit Card Adapter in the previous step, see Appendix B, "Running the Credit Card Adapter Diagnostics Program" on page 59 to help resolve the errors.

Banyan VINES (for DOS) – Installation Overview

Perform the following installation steps for the Credit Card Adapter when using DOS
and a Banyan VINES environment with NDIS drivers:

1. Install the Banyan VINES software using the installation instructions that are
   included with it:

   a. Copy the contents of the Master diskette onto the hard disk of your
      computer. If you select a directory name other than \VINES, make a note of
      the Banyan installation directory name. You will need the directory name
      when you perform the installation procedures in step 2 on page 30.

   b. Locate the subdirectory \NDIS on one of the two Banyan VINES LAN
      software diskettes and copy the contents of this subdirectory to the
      subdirectory on your hard disk containing the other Banyan software.

   c. If there is already one computer attached to your Banyan server, the easiest
      way to install Banyan on your computer may be the following:

      • From the computer already logged in to the server, invoke PCCOPY
        according to the Banyan instructions.

      • On successive screens, select:
        – **Copy PC Configuration Software and/or LAN Driver**
        – **NDIS Ethernet and PCCONFIG**
        – **REDIRALL**
        – **A:**

      • Insert a diskette into your A drive.

- This will make one installation diskette with all the required Banyan files on it.
- Copy the contents of this diskette into your \VINES directory on your hard disk.

2. Install the Credit Card Adapter software:

   - The Credit Card Adapter installation program will allow you to select values for resources to be used by your Credit Card Adapter such as IO Base, Memory Base, and Interrupt. In most cases you can use the default values provided by the program. In addition, if you are using Card and Socket Services, the program will default to autoset mode which allows the driver to negotiate with Card and Socket Services for whichever resources are available.

     If you are using Card and Socket Services and do not wish to use autoset mode, here are a few things that you should know before selecting values for IO Base, Memory Base, and Interrupt. If you fail to do the following, the Ethernet card will fail to initialize. The memory requirement is 16 KB.

     a. The IO Base, Memory Base, and Interrupt Level must not conflict with other adapters installed in your computer.

     b. IBM Card Services allows the use of the /MA parameter to adjust the range of memory that it can give to PC Cards. You must select a value for Memory Base within the range being used if you have IBM Card Services. To do this, look in your CONFIG.SYS for:

        – On the IBM ThinkPad 720, the /MA option is on the "DEVICE= C:\DICRMU02.SYS" line.

        – On the IBM ThinkPad 750, the /MA option is on the "DEVICE= C:\DICRMU01.SYS" line.

For example, if the /MA option is set to C800-CFFF, that is the same as C8000-CFFFF, and the value specified for Shared RAM Base *must* be within this range.

c. If you are using Phoenix Card Services, the value for Memory Base must *not* be equal to (or within a 2-KB range above) the value set by the /ADDR option.

Note: For the IBM ThinkPad 350, the /ADDR option is on the "DEVICE=C:\DOS\PCMCS.EXE" line in your CONFIG.SYS. For example, if the /ADDR option is set to C8, which is the same as C8000, the Shared RAM Base should *not* be set to C8000.

d. If you are not using Card and Socket Services, you must ensure that the values that you select for IO Base, Memory Base, and Interrupt do not conflict with other PCMCIA cards or adapters in your computer. Also, if you are using a memory manager, you must exclude the memory ranges being used by your card for Memory (16 KB). For example, if you are using EMM386 and the Memory default base address, the memory manager in the CONFIG.SYS might be as follows: "DEVICE=C:\DOS\EMM386.EXE 640 X=D400-D7FF". If you do not use the default base address, you must exclude the memory range starting from the base address.

- Insert the Credit Card Adapter installation diskette in drive A, and enter **a:install**.

- When you get to the panel that asks for the network environment, specify **Banyan**. Although the Banyan environment is in fact an NDIS environment, the Installation Program must know specifically that you are installing Banyan software to perform the correct operation.

- If you have more than one adapter slot in your computer, note which adapter slot you are configuring.

See Appendix A, "Running the Credit Card Adapter Installation Program" on page 56 if you want more details about other options that may be selected when using the Credit Card Adapter installation program.

3. Run the PCCONFIG program that was supplied with the Banyan Software.

   - Select **Login Environment Settings/Select Default Communications Driver** and choose **NDIS Ethernet** as the default driver.
   - Go back to the main menu. Select **Network Card Settings** and **NDIS Ethernet**. Specify **PCMCIA_ETH** as the PROTOCOL.INI bindings entry.
   - Make sure that the other settings are the same as those selected when you ran the Credit Card Adapter Installation Program (those specified in your PROTOCOL.INI).
   - Press **F10** to save your changes.
   - Edit the PROTOCOL.INI to add the VINES NDIS driver section according to the Banyan documentation. This section should be placed after the Protocol Manager section and before the LAN card section.
   - For ease of login, make sure that you define a search list in PCCONFIG, LOGIN ENVIRONMENT SETTINGS, EDIT/VIEW LOGIN GROUP SEARCH LIST tailored to your network, according to the Banyan documentation.
   - To enable the Banyan software and the IBM NDIS drivers, reboot your computer.

4. Install the adapter using the instructions in "Installing the Credit Card Adapter" on page 50.

5. If any error messages are displayed after you have installed the Credit Card
   Adapter in the previous step, see Appendix B, "Running the Credit Card Adapter
   Diagnostics Program" on page 59 to help resolve the errors.

Novell NetWare (for DOS) – Installation Overview

Perform the following installation steps for the Credit Card Adapter when using DOS and the Novell NetWare environment.

1. Install the Novell NetWare computer files onto your computer's hard disk by doing the following:

   - Create a directory that will hold the NetWare files and add the directory to the PATH= command in your AUTOEXEC.BAT.

   - For Novell NetWare version 4.0x:

     – Insert your NetWare disk in drive A

     – Copy LSL.COM, IPXODI.COM, and ROUTE.COM to your NetWare directory

     – Copy all files with .VLM extension to your NetWare directory

     – Copy VLM.EXE to your NetWare directory

     – Add LASTDRIVE=Z to your CONFIG.SYS

     – Add the following commands to the end of your AUTOEXEC.BAT:

       ```
       LSL (NetWare Link Support Layer program)
       PCMDMCS (IBM Ethernet driver)
       IPXODI (NetWare ODI Network driver)
       VLM (NetWare workstation shell for NetWare 4.0x)
       ```

     – Now follow step 2 on page 35 without rebooting your computer.

- For Novell NetWare version below 4.0x:
  - Insert your NetWare disk in drive A.
  - Copy LSL.COM, IPXODI.COM, ROUTE.COM, and NETX.EXE to your NetWare directory
  - Add the following commands to the end of your AUTOEXEC.BAT:

        LSL (NetWare Link Support Layer program)
        PCMDMCS (IBM Ethernet driver)
        IPXODI (NetWare ODI Network driver)
        NETX (NetWare workstation shell for NetWare 3.11)

  - Now follow step 2 without rebooting your computer.

  Note: Make a note of the directory name to which the NetWare files are copied. You will need the directory name when you perform the installation procedures in step 2.

2. Install the Credit Card Adapter software:
   - The Credit Card Adapter installation program will allow you to select values for resources to be used by your Credit Card Adapter such as IO Base, Memory Base, and Interrupt. In most cases you can use the default values provided by the program. In addition, if you are using Card and Socket Services, the program will default to autoset mode which allows the driver to negotiate with Card and Socket Services for whichever resources are available.

     If you are using Card and Socket Services and do not wish to use autoset mode, here are a few things that you should know before selecting values for IO Base, Memory Base, and Interrupt. If you fail to do the following, the Ethernet card will fail to initialize. The memory requirement is 16 KB.

a. The IO Base, Memory Base, and Interrupt Level must not conflict with other adapters installed in your computer.

b. IBM Card Services allows the use of the /MA parameter to adjust the range of memory that it can give to PC Cards. You must select a value for Memory Base within the range being used if you have IBM Card Services. To do this, look in your CONFIG.SYS for:

   – On the IBM ThinkPad 720, the /MA option is on the "DEVICE= C:\DICRMU02.SYS" line.

   – On the IBM ThinkPad 750, the /MA option is on the "DEVICE= C:\DICRMU01.SYS" line.

   For example, if the /MA option is set to C800-CFFF, that is the same as C8000-CFFFF, and the value specified for Shared RAM Base *must* be within this range.

c. If you are using Phoenix Card Services, the value for Memory Base must *not* be equal to (or within a 2-KB range above) the value set by the /ADDR option.

   Note: For the IBM ThinkPad 350, the /ADDR option is on the "DEVICE=C:\DOS\PCMCS.EXE" line in your CONFIG.SYS. For example, if the /ADDR option is set to C8, which is the same as C8000, the Shared RAM Base should *not* be set to C8000.

d. If you are not using Card and Socket Services, you must ensure that the values that you select for IO Base, Memory Base, and Interrupt do not conflict with other PCMCIA cards or adapters in your computer. Also, if you are using a memory manager, you must exclude the memory ranges being used by your card for Memory (16 KB). For example, if you are using EMM386 and the Memory default base

address, the memory manager in the CONFIG.SYS might be as follows: "DEVICE=C:\DOS\EMM386.EXE 640 X=D400-D7FF". If you do not use the default base address, you must exclude the memory range starting from the base address.

- Insert the Credit Card Adapter installation diskette in drive A, and enter **a:install**.
- When you get to the panel that asks for the network environment, specify **Novell NetWare** environment for DOS.

Refer to Appendix A, "Running the Credit Card Adapter Installation Program" on page 56 if you want more details about other options that may be selected when using the Credit Card Adapter installation program.

3. Install the adapter using the instructions in "Installing the Credit Card Adapter" on page 50.

4. If any error messages are displayed after you have installed the Credit Card Adapter in the previous step, see Appendix B, "Running the Credit Card Adapter Diagnostics Program" on page 59 to help resolve the errors.

Installation Instructions for OS/2 Operating Environment

The OS/2-compatible installation environments are described in this section. Use the installation procedures in this section to perform the steps necessary for a successful installation.

When installing the Credit Card Adapter in an OS/2 environment, run the Credit Card Adapter installation program in a DOS full-screen window.

DANGER

> **To avoid a shock hazard, do not connect or disconnect any cables or perform installation or maintenance of this product during an electrical storm.**

Before installing the Credit Card Adapter, be sure that the software listed in "Requirements for Installation with OS/2" on page 39 has been installed and that you have a connection available to the Ethernet network.

The READ.ME file on the installation diskette contains information to help you configure and customize the adapter memory, I/O, interrupts, and other parameters for your computer. Most users can use the default parameters that are provided by the Credit Card Adapter installation program.

Requirements for Installation with OS/2

Before you install the Credit Card Adapter, you need the Credit Card Adapter installation diskette and the following items:

- A computer with a PCMCIA Release 2.0, Type II card slot and at least 6 MB of memory
- IBM OS/2 Version 2.1, installed with PCMCIA Card Services Version 2.0 (or higher). Card Services Version 2.0 is included with OS/2 Version 2.1.
- PCMCIA Socket Services Version 2.0 (for OS/2) and Resource Map Utility (for OS/2, which is usually included with your computer), installed

  Warning: During OS/2 installation, the PCMCIA drivers are often commented out in the CONFIG.SYS. Also make sure you have installed Socket Services. See your OS/2 and computer documentation for more information.

  Note: These programs are sometimes referred to as *PCMCIA device drivers*.

- One of the following Ethernet network software programs:
  - Network Transport Services/2 (NTS/2), which includes the LAN adapter and protocol support (LAPS)
  - Any of the following programs, which contain the LAN adapter and protocol support (LAPS): OS/2 Extended Services* 1.0, LAN Server 2.0, LAN Server 3.0, or TCP/IP for OS/2 Version 1.2.1
  - Novell NetWare Requester for OS/2, Version 3.11 or higher
- One of the following connections to the LAN:
  - A coaxial T-connector for use with the 10BASE2 MAM

You need a 50-ohm terminator for the 10BASE2 MAM if the connection is at the end of a segment.

– An RJ-45 modular jack for use with the 10BASE-T adapter cable

See Appendix D, "Network Cabling Media Specifications" on page 66 for the specifications on each type of network connection.

Where Do I Find the Installation Instructions for My Environment?

You can install the Credit Card Adapter on computers that have various combinations of operating systems and network operating programs. The procedures in this section contain the recommended sequence of installation steps that you should follow when installing the various network operating programs in combination with OS/2.

You must run the Credit Card Adapter installation program in a DOS (or OS/2) full-screen window.

When installing the Credit Card Adapter on a computer with OS/2 installed, you have the options to use:

Table 2. OS/2-Compatible Installation Instructions

IBM Communications Programs and NDIS	page 41
Novell NetWare	page 47

IBM Communications Programs and NDIS (for OS/2) – Installation Overview

Use the installation steps in this section when you have OS/2 and any of the following LAN communications programs:

- OS/2 Extended Services Version 1.0
- OS/2 LAN Server Version 2.0 or 3.0
- TCP/IP for OS/2 Version 1.2.1
- OS/2 Communications Manager/2 Version 1.0

Each of the communications programs uses a form of the LAN adapter and protocol support (LAPS) configuration tool. For some communications programs, you must have installed Network Transport Services/2 (NTS/2) before installing the communications program.

Refer to the LSP documentation for specific information regarding LSP installation.

Notes:

1. LAPS is the configuration tool that you will use during the installation of any of the communications programs listed here.

   LAPS will request that you select a network protocol. Refer to the documentation for your LAN communications program to determine which protocols you need. In most cases, you may be able to install both IEEE 802.2 and NetBIOS support.

2. When you configured your computer for PCMCIA Socket Services 2.0 and the resource map utility, device driver statements for socket services and the resource map utility were added to your CONFIG.SYS file. The device driver statements (for example, the device driver statements on an IBM

Micro Channel* computer are: `IBM2SS02.SYS` and `ICRMU02.SYS`) must be moved to the bottom of the CONFIG.SYS file before you install the Credit Card Adapter. The Credit Card Adapter installation program will move the IBM Socket Services statement and the IBM resource map utility statement for you. Determine the file names for the Socket Services and resource map utility (if it exists), and move the statements if you are using a communication program other than one that is listed in this section.

See either of the following installation procedures for the Credit Card Adapter to perform the installation procedures:

- "When Using NTS/2 with OS/2 LAN Server 3.0 or OS/2 Communications Manager/2 1.0" on page 43
- "When Using OS/2 Extended Services 1.0, OS/2 LAN Server 2.0, or TCP/IP for OS/2" on page 45

When Using NTS/2 with OS/2 LAN Server 3.0 or OS/2 Communications Manager/2 1.0

1. Run the installation aid for LAPS, and specify that you will use an additional network driver.

   The typical combinations of communications programs and network protocols are:

Communications Program	Protocol
OS/2 LAN Server 3.0	NetBIOS
OS/2 Communications Manager/2 1.0	IEEE 802.2

2. Refer to the *LAN Adapter and Protocol Support Configuration Guide* for the section titled "Installing Additional Network Adapter Drivers."

   Notes:

   a. LAPS considerations:

   LAPS installation must be run in an OS/2 window.

   Do not use the LAPS installation diskette as the source diskette for installing additional network drivers. First install LAPS using the LAPS installation aid and exit without specifying any configuration.

   After installing LAPS, reboot your computer. Run LAPS configuration and specify the IBMCOM subdirectory for the disk drive on which you installed LAPS. Select the install option again. LAPS installs the additional network driver from the Credit Card Adapter installation diskette.

   From the configuration option of the LAPS installation aid, select "IBM PCMCIA Ethernet Network Adapters."

   To enable the LAPS changes that you make, reboot your computer.

     b. While running the LAPS installation aid, when you are prompted for the additional network drivers diskette, insert the IBM Ethernet Credit Card Adapter II installation diskette to load the IBM-supplied NDIS driver.

3. Install the LAN communications program that you will be using.

4. Run the Credit Card Adapter installation program:

   - Insert the Credit Card Adapter installation diskette in drive A, and enter **a:install**.

   - When you get to the panel that asks for the network environment, specify **NDIS/IBM LAPS for OS/2**.

   Refer to Appendix A, "Running the Credit Card Adapter Installation Program" on page 56 if you want more details about the Credit Card Adapter installation diskette.

   The installation program checks your version of OS/2 and verifies that the correct version of Card Services is installed.

   It also verifies that the device driver statements for socket services and resource map utility are placed in the correct sequence in the CONFIG.SYS file.

5. Install the adapter using the instructions in "Installing the Credit Card Adapter" on page 50.

6. If any error messages are displayed after you have installed the Credit Card Adapter in the previous step, see Appendix B, "Running the Credit Card Adapter Diagnostics Program" on page 59 to help resolve the errors.

When Using OS/2 Extended Services 1.0, OS/2 LAN Server 2.0, or TCP/IP for OS/2

1. Install the LAN communications program that you will be using.

2. Run the installation aid for LAPS, and specify that you will use an additional network driver.

   The typical combinations of communications programs and network protocols are:

Communications Program	Protocol
OS/2 Extended Services 1.0	IEEE 802.2
OS/2 LAN Server 2.0	NetBIOS
TCP/IP for OS/2	TCP/IP

   Notes:

   a. Refer to your LAN adapter and protocol support documentation for information about installing additional network adapter drivers.

   b. LAPS considerations:

      LAPS installation must be run in an OS/2 window.

      Do not use the LAPS installation diskette as the source diskette for installing additional network drivers. First install LAPS using the LAPS installation aid and exit without specifying any configuration.

      After installing LAPS, reboot your computer. Run LAPS configuration and specify the IBMCOM subdirectory for the same disk drive on which you installed LAPS. Select the install option again. LAPS installs the additional network driver from the Credit Card Adapter installation diskette.

      From the configuration option of the LAPS installation aid, select "IBM PCMCIA Ethernet Network Adapters."

To enable the LAPS changes that you make, reboot your computer.

   c. While running the LAPS installation aid, when you are prompted for the additional network drivers diskette, insert the IBM Ethernet Credit Card Adapter II installation diskette to load the IBM-supplied NDIS driver.

3. Run the Credit Card Adapter installation program:

- Insert Credit Card Adapter installation diskette in drive A, and enter **a:install**.

- When you get to the panel that asks for the network environment, specify **NDIS/IBM LAPS for OS/2**.

Refer to Appendix A, "Running the Credit Card Adapter Installation Program" on page 56 if you want more details about the Credit Card Adapter installation diskette.

The installation program checks your version of OS/2 and verifies that the correct version of Card Services is installed.

It also verifies that the device driver statements for socket services and resource map utility are placed in the correct sequence in the CONFIG.SYS file.

4. Install the adapter using the instructions in "Installing the Credit Card Adapter" on page 50.

5. If any error messages are displayed after you have installed the Credit Card Adapter in the previous step, refer to Appendix B, "Running the Credit Card Adapter Diagnostics Program" on page 59 to help resolve the errors.

Novell NetWare (for OS/2) – Installation Overview

Perform the following installation steps for the Credit Card Adapter when using OS/2 and the Novell NetWare environment.

Before performing the installation procedures, determine which adapter address (local or universal) you will be using.

- If you are using the locally administered adapter address (an adapter address that you can assign that overrides the universally administered address), continue with the procedures in step 1.

- If you are using the universally administered adapter address (an adapter address that is permanently encoded in the adapter at the time of manufacture, which is unique to the adapter), you must run the Credit Card Adapter diagnostics to determine the universal address. Use the following procedures to determine the universal address:

  a. Insert the Credit Card Adapter using the procedures beginning with step 1 on page 50.

  b. To see the adapter address, reboot your computer with the Credit Card installation diskette in drive A and follow the instructions on the screen. For more information, see Appendix B, "Running the Credit Card Adapter Diagnostics Program" on page 59.

     Record the universal address here. _____

  c. Continue with the procedures in step 1.

1. Use the Novell NetWare instructions to install the NetWare files on your computer's disk drive.

Warning: *Do not reboot* your computer during the NetWare installation. Your specific environment variables will not be set until you perform the Credit Card Adapter installation procedures (in step 2 on page 48).

Notes:

   a. Verify that you are installing the NetWare Requester for OS/2.

   b. When requested to select the network interface card driver, enter PCMDMCS.SYS to select the ODI LAN driver from the Credit Card Adapter installation diskette.

   c. When the system requests the WSDRV_1 driver disk, insert the Credit Card Adapter installation diskette.

2. Install the Credit Card Adapter software:

   • Insert the Credit Card Adapter installation diskette in drive A, and enter **a:install**.

   • When you get to the panel that asks for the network environment, specify **Novell NetWare for OS/2**.

   Refer to Appendix A, "Running the Credit Card Adapter Installation Program" on page 56 if you want more details about other options that may be selected when using the Credit Card Adapter installation program.

   Note: You need to change the default adapter address that is supplied by the Credit Card Adapter installation program to a locally administered address or to the universally administered address. Contact your network system administrator if you do not know the correct address to enter.

3. Install the adapter using the instructions in "Installing the Credit Card Adapter" on page 50.

4. If any error messages are displayed after you have installed the Credit Card Adapter in the previous step, see Appendix B, "Running the Credit Card Adapter Diagnostics Program" on page 59 to help resolve the errors.

Installing/Inserting and Removing the Credit Card Adapter

During your initial installation of the Credit Card Adapter and during normal use, you will insert and remove the Credit Card Adapter from your computer.

Follow the steps in:

- "Installing the Credit Card Adapter" to install or insert the adapter

  Use the installation steps when you are doing the initial installation of your IBM Ethernet Credit Card Adapter II or any time when you are inserting the adapter for normal use.

- "Removing the Credit Card Adapter" on page 55 to remove the adapter

Installing the Credit Card Adapter

After the adapter software has been installed, complete the following steps to install the Credit Card Adapter:

Step   1. Turn OFF the power to the computer.

Step 2. Insert the adapter in the slot that you have configured for the Credit Card Adapter.

Adapter Slot
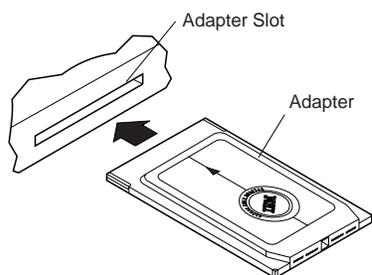
Adapter

The adapter is keyed to go in one way only. If you feel resistance before the adapter is fully inserted, remove the adapter, turn it over, and reinsert it.

Step   3. Determine which type of network cabling you will be using as shown in the following figures, and connect the Credit Card Adapter cable to the network as described.

- If your network is 10BASE-T, attach the RJ-45 connector on the Credit Card Adapter cable to the modular phone jack.

Data Traffic LED

Link Status LED

RJ-45 Connector

10BASE-T Adapter Cable
3 meters (9.84 feet) long
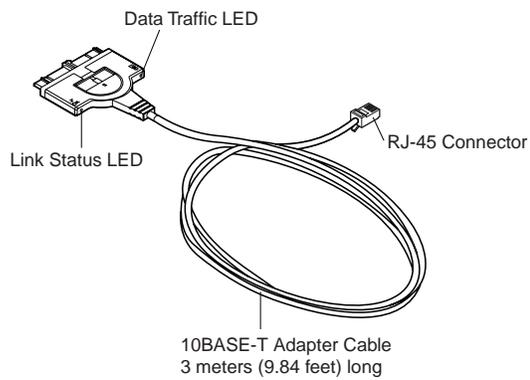
- If your network is 10BASE2 Ethernet, attach the coaxial connector on the Credit Card Adapter MAM to the coaxial cable. Attach the other end of the coaxial cable to the coaxial T-connector.

  If you are at the end of a network segment, attach a 50-ohm terminator to one end of the T-connector.

Data Traffic LED   Coaxial
                        Connector

10BASE2 MAM
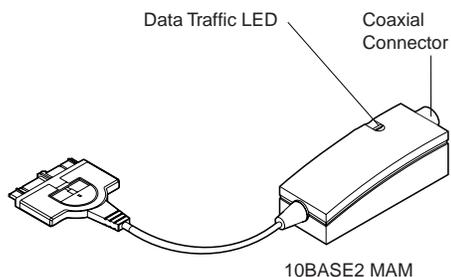
Step   4. To attach the adapter cable or the MAM to the adapter, move the latching button (the half-circle in the center of the adapter connector) toward the cable. The adapter cable cannot be connected or disconnected unless the latch is retracted.

Attach the adapter cable to the adapter.

The adapter connector is keyed to attach to the adapter one way only. If you feel any resistance, remove the adapter connector, turn it over, and reattach it.

Adapter in Slot

Latching Button

Adapter Connector — Part Number
(on bottom)
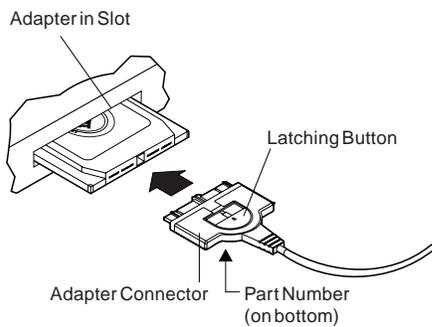
Step   5.   To lock the adapter cable securely, move the latching button in toward the
            adapter. In some cases, you may want to leave the adapter cable latch
            retracted. If the adapter cable is pulled, it will disconnect from the adapter,
            possibly saving your computer from being pulled off a table.

Step   6.   Turn ON the power to the computer.

The 10BASE2 MAM has a *data traffic* light-emitting diode (LED). After the Credit Card
Adapter has been installed, the LED blinks as data activity on the network is detected.
When there is no data activity, the data traffic LED is off.

The 10BASE-T adapter cable has two LEDs built into the adapter connector that attaches to the adapter. One is a *data traffic* LED that blinks when data is received by the adapter. The other LED is a *link status* LED that indicates link status. If the link status LED is lit, the link is active. There is a symbol next to each LED:

Symbol for Data Traffic LED

Symbol for Link Status LED

Note: If the link status LED on the 10BASE-T adapter cable does not come on when your computer is turned ON, see "Problem Determination" on page 62 to help solve the problem.

Removing the Credit Card Adapter

Note: Before removing the Credit Card Adapter, first disconnect the MAM from the adapter.

Follow these steps to remove the Credit Card Adapter:

Step 1. Turn OFF the power to the computer.

Step 2. To detach the adapter cable from the adapter, retract the latching button (the half-circle in the center of the adapter connector) by moving the latching button toward the cable.

Step 3. Grasp the adapter connecter and unplug it from the adapter. The adapter cable is still connected to the network cable.

Step 4. Remove the adapter from the slot and store it in the adapter sleeve.

Appendix A. Running the Credit Card Adapter Installation Program

You will run the Credit Card Adapter installation program to install the adapter software. Installing the adapter software consists of installing a device driver and, if needed, a connectivity enabler.

To load the adapter software, use the Credit Card Adapter installation program on the installation diskette that is packaged with these instructions.

Note: If you just installed Card Services (2.0 or higher), reboot your computer before running the Credit Card Adapter installation program.

To install this software, complete the following steps:

Step 1. Turn ON the power to the computer. Wait for the ready prompt.

Step 2. Insert the installation diskette into the diskette drive.

Step 3. At the DOS or OS/2 ready prompt, type:

```
A:install
```

where A is the diskette drive.

Step 4. Press **Enter**.

Step 5. Follow the instructions on the installation panels as they appear.

In most cases, you can use the default parameters that the Credit Card Adapter installation program provides.

The network environments that are supported by the installation program are NDIS and Novell NetWare. Select the appropriate options for your installation.

Note: Use the appropriate target directory name. The target directory names are dependent on whether you are using OS/2 or DOS, and which network software you are using. If you are using:

- DOS with Novell NetWare — the target directory is the directory that contains your Novell NetWare software.

- DOS with NDIS — the target directory is the directory that contains your PROTOCOL.INI file. This includes the following environments:

    IBM LSP NDIS
    LANManager
    Windows for Workgroups
    Banyan VINES

- OS/2 with NDIS — you do not need to select a target directory. However, you must specify the correct target drive letter of your OS/2 system drive. (For example, use C or D to specify the drive that contains the OS/2 system files.)

- OS/2 with Novell NetWare — you must specify the complete path (the drive letter and the directory name).

For OS/2:

Select the appropriate OS/2 option.

For DOS:

The installation program checks your computer for PCMCIA Card Services.

- If PCMCIA Card Services (2.0 or higher) is installed, only the device driver is installed.
- If Card Services is not installed on your computer, the installation program will allow you to install a connectivity enabler, a device driver, or both.

When you have finished the installation, store the installation diskette and this document in a safe place. The installation diskette also contains the Adapter Diagnostics program.

Appendix B. Running the Credit Card Adapter Diagnostics Program

The program checks your computer and then performs a series of tests on the adapter and checks the network connection. As each test is completed, the program displays the result. During the diagnostic testing, you will be instructed to disconnect and connect to the network to prevent network traffic from disrupting the diagnostic tests.

If a diagnostic test fails, the diagnostics will end. The error indication is displayed on the screen.

Verify that the network system software has been installed before you run the Adapter Diagnostics program. To test the adapter and the network link, complete the following steps:

- If your computer has OS/2 installed:

    Step   1.   Insert the Credit Card Adapter installation diskette.

    Step   2.   Turn ON the power to the computer.

              Follow the instructions as they appear.

- If your computer has DOS installed:

    Step   1.   Turn ON the power to the computer.

    Step   2.   Insert the installation diskette.

    Step   3.   At the DOS ready prompt, type **a:ecctest**

    Step   4.   Press **Enter**. Follow the instructions as they appear.

Table 3 shows the tests, possible test results, and the actions you can take. When the action indicates to **replace**, install the new part that is indicated.

Table 3 (Page 1 of 2). Diagnostics Program Testing

Test	Test Result	Action
Card Test	OK	The card is working correctly. If network problems continue, contact your system administrator.
	Failed	The computer is not configured correctly or the computer cannot access the Credit Card Adapter to perform diagnostics. Check for I/O register, interrupt, or memory address conflicts. See the READ.ME file on the IBM Ethernet Credit Card Adapter II installation diskette for computer configuration information. Replace the Credit Card Adapter if the computer is configured correctly.
10BASE-T Adapter Cable or 10BASE2 MAM Connection to Adapter	Yes	10BASE-T adapter cable or 10BASE2 MAM is attached.
	No	If adapter cable or MAM is connected, unplug and replug the adapter connector and repeat the diagnostics. If the test fails again, the connection between the adapter and adapter cable or MAM may be defective. Replace the Credit Card Adapter.
Loopback Test	OK	The adapter is working correctly.
	Failed	Replace the Credit Card Adapter.

Table 3 (Page 2 of 2). Diagnostics Program Testing

| Test	Test Result	Action
10BASE2 Network Cable Connection Test	OK	The network connection is good. If network problems continue, check the network or consult your system administrator.
	Failed	There is a problem with your network cabling, the network is not terminated, or the MAM is defective. Attach the terminator and T-connector to the MAM and run the Adapter Diagnostics program again. If the network cable connection test passes with the terminator and T-connector attached, the problem is in the network cabling. Consult your network administrator.
10BASE-T Network Cable Connection Test	OK	The network connection is good. If network problems continue, check the network or consult your system administrator. The Link Status LED (OK) should be lit. If the LED is not lit and this test is successful, replace the cable.
	Failed	This test checks to see whether or not the network cable is connected to the hub and whether the port is active.
		If the network cable is securely connected, use a different cable.

Problem Determination

If you are experiencing problems with your Ethernet communications on a network that is known to be operating, perform the following actions:

Configuration: The configuration settings in your computer may not be correct. The IBM Ethernet Credit Card Adapter II diagnostics check the system interrupt, I/O, and memory configuration for conflicts with the adapter settings. Refer to your operating system (DOS or OS/2) documentation or LAN documentation, and to the READ.ME file on your IBM Ethernet Credit Card Adapter II installation diskette, for more information.

Connections: Unplug and replug all cables, and verify that the cable connection between the adapter and the computer is secure. See "Installing the Credit Card Adapter" on page 50 for instructions.

- **10BASE-T Network**: Make sure that the hub port you are using is enabled. The Link Status LED (OK) on the 10BASE-T MAM indicates that the connection is active and that the hub is sending link pulses to the Credit Card Adapter. Most hubs and repeaters also have status LEDs that indicate whether they are receiving link pulses from computer nodes.

- **10BASE2 Network**: You need a T-connector with two 50-ohm (Ω) terminators to run 10BASE2 diagnostic testing. If the connector and terminators are not used, part of the 10BASE2 diagnostics will be bypassed.

T-Connector

50-Ω Terminators
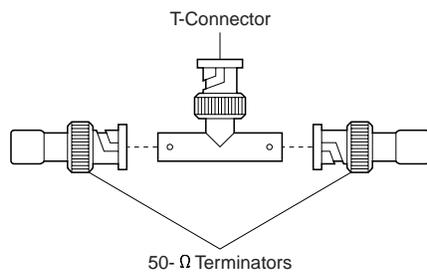
Adapter: Run the Adapter Diagnostics program to help determine whether or not the adapter is working correctly or whether the problem is in the network. See Appendix B, "Running the Credit Card Adapter Diagnostics Program" on page 59 for instructions.

If a problem with the Credit Card Adapter persists and you have consulted your system administrator, contact the place where the adapter was purchased.

Appendix C. Remote Program Load Function

The IBM Ethernet Credit Card Adapter II supports initialization of your computer by loading an operating system from the network server. This feature, referred to as *remote program load* (RPL) is useful for computers that do not contain a hard disk or diskette drive.

The RPL function loads the operating system files that the client computer receives from a LAN server.

The RPL function also enables the computer to receive and use executable files (sometimes referred to as *image files* or *remote boot image files*) sent from the file server to the computer on the network.

See the RPLREAD.ME file on your Ethernet Credit Card installation diskette for detailed information on RPL.

The IBM Ethernet Credit Card Adapter II supports RPL using several network operating systems. Please see the READ.ME on the installation diskette for a list of those currently supported.

Once a Credit Card Adapter is installed in a computer that does not have a diskette drive, the RPL function will be enabled automatically each time the computer is turned on. The adapter detects that there is no diskette drive and starts the RPL program.

If your computer has a disk drive and you want to use the RPL function of the Credit Card Adapter you can do one of the following:

 1. Change the Drive-Startup Sequence (or Boot Sequence) on your computer. See the user's guide for your computer to determine if your computer supports this

function. Some computers allow this operation through the "set features" function on the reference diskette. On some computers this feature can be accessed through the built-in "Easy-Setup" function.

2. Use the RPLENABL.EXE program shipped on the Credit Card Adapter installation diskette to disable your disk drive. See the RPLREAD.ME file on the adapter installation diskette for information on how to run this program. Do not run this program on a hard drive that has been partitioned or loss of data may occur. If your computer allows you to alter the drive start-up sequence do not use the RPLENABL.EXE program.

Although the RPL function exists on the IBM Ethernet Credit Card Adapter II, there are some important system dependencies that are required for RPL to operate. They are:

- The computers that will use the RPL function cannot use Card Services support. The function of Card Services is incompatible with RPL. As a result, it is not possible to RPL and boot OS/2 since OS/2 always uses Card Services.

- The computer must include basic input output system (BIOS) code, which performs the following functions:

    - During power-on self-test (POST), the BIOS must scan for the PCMCIA Function ID tuple (21H) and activate the PCMCIA slot if read-only memory (ROM) and POST code reside on the adapter.

    - Based on the contents of the card information structure (CIS), the BIOS must set the interrupt level and provide memory and I/O addresses.

    - The BIOS must follow these with the ROM SCAN command.

Please consult your computer manufacturer to determine whether this function exists on your computer.

Appendix D. Network Cabling Media Specifications

The 10BASE2 MAM uses coaxial cable. The coaxial cable is connected to the 10BASE2 MAM with a T-connector.

The 10BASE-T adapter cable uses unshielded twisted-pair telephone wiring. The network must have an RJ-45 phone jack to plug into.

The following table provides the physical specifications for each type of network cabling. These specifications conform to the IEEE 802.3 standards.

Table 4. MAM Specifications

	Cable Type	Segment Length (maximum)	Total Nodes/ Segment	Tap Spacing
Ethernet 10BASE2	Coax (50 ohm)	185 m (607 ft)	30	0.5 m (1.6 ft)
Ethernet 10BASE-T	Unshielded twisted-pair (EIA/TIA Category 3)	100 m (328 ft)	256	N/A

Appendix E. Safety Notice

Danger: To avoid a shock hazard, do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.

VORSICHT: Aus Sicherheitsgründen bei Gewitter an diesem Gerät keine Kabel angeschließen oder lösen. Ferner keine Installations-, Wartungs oder Rekonfigurationsarbeiten durchführen.

DANGER: Pour éviter tout risque de choc électrique, ne manipulez aucun câble et n'effectuez aucune opération d'installation, d'entertien ou de reconfiguration de ce produit au cours d'un orage.

FARE: For å unngå elektrisk støt må ikke kabler kobles til eller fra. Du må heller ikke foreta installering, vedlikehold eller rekonfigurering av dette produktet under tordenvær.

Varning — livsfara: Vid åskväder ska du aldrig ansluta eller koppla ur kablar eller arbeta med installation, underhåll eller omkonfigurering av utrustningen.

VAARA: Älä kytke tai irrota kaapeleita äläkä asenna tai huolla tätä laitetta tai muuta sen kokoonpanoa ukonilman aikana. Muutoin voit saada sähköiskun.

PERICOLO: Per evitare scosse elettriche, non collegare o scollegare cavi o effettuare installazioni, riconfigurazioni o manutenzione di questo prodotto durante un temporale.

67

Peligro: Para evitar la posibilidad de descargas, no conecte o desconecte ningún cable, ni realice ninguna instalación, mantenimiento o reconfiguración de este producto durante una tormenta eléctrica.

Perigo: Para evitar possíveis choques eléctricos, não ligue nem desligue cabos, nem instale, repare ou reconfigure a máquina, durante uma trovoada.

GEVAAR !: Om het gevaar voor elektrische schokken te vermijden, mag u geen kabels aansluiten of loskoppelen en dit product niet installeren, onderhouden of opnieuw instellen tijdens een onweer.

Perigo: Para evitar perigo de choque, não conecte ou desconecte quaisquer cabos ou faça instalação, manutenção ou reconfiguração deste produto durante uma tempestade magnética.

Fare!: Undgå elektrisk stød:
Produktet må hverken installeres, vedligeholdes eller omkonfigureres i tordenvejr. Det samme gælder for tilslutning eller afmontering af kabler.

注意:

安全のために、機器は正しく配線された接地（アース）極付きの電源コンセントに接続
してください。電源コンセントの誤配線により、機器の金属部分に危険な電圧が生ずる
ことがあります。コンセントの配線はお客さまの責任で行ってください。

주의 :

안전을 위해서, 장비를 올바르게 배선된 전원 공급구에 접지시키시오.
전원 공급구의 배선은 장비의 금속부분에 위험한 전압을 발생시킬
수 있습니다. 위의 사항은 고객의 책임입니다.

Glossary of Terms and Abbreviations

This glossary defines terms and abbreviations used in this book. If you do not find the term you are looking for, refer to the index or to the *IBM Dictionary of Computing*, SC20-1699.

C

CID. See *Configuration Installation Distribution*.

Configuration Installation Distribution. Installation aid for LSP which can be used by a CID administrator who should be familiar with NetView* DM/2 (NV DM/2) or an equivalent CID software distribution agent.

Card Services. Card Services is a software management interface that allows for the automatic allocation of system resources (such as memory and interrupts) once Socket Services detects that the Credit Card adapter has been inserted. Card Services releases these resources when the adapter has been removed. Card Services also provides an interface to higher level software to load any needed drivers.

Connectivity Enabler. The Connectivity Enabler (sometimes referred to as simply the *enabler*) is software used to configure the PCMCIA socket hardware and the Credit Card Adapter. It is loaded as a driver in the CONFIG.SYS file after Card and Socket Services, and before the LAN software is loaded. The Connectivity Enabler enables the PCMCIA socket and opens a *window* in system memory that can be allocated to the Credit Card Adapter.

Connectors. The Credit Card adapters use industry-standard connectors at the PCMCIA end of the card. This connector is a 68-pin edge connector for attachment to the computer's PCMCIA slot. The network connection end of the card uses a 15-pin connector that interfaces to industry-standard LAN/communications media via a short interface cable.

Credit Card. The Credit Card adapters were so named because they are approximately the size and shape of a credit card. They are full-function adapters for personal computers, like notebooks, tablets and even some desktops, that have adapter slots conforming to the PCMCIA 2.0 standards for Type II cards.

E

Enabler. See *Connectivity Enabler*.

J

Japanese Electronics Industry Development Association. The Japanese Electronics Industry Development Association (JEIDA) is an organization of companies in the Asia-Pacific area developing the personal computer card standard. PC cards are a key technology for adding memory, storage, and I/O capability to portable systems like notebooks and laptops. The standard describes the physical requirements, electrical specifications, and software architecture for PC cards. JEIDA works closely with PCMCIA to promote a worldwide standard.

JEIDA. See *Japanese Electronics Industry Development Association*.

M

MAM.   See *Media Access Module*.

Media Access Module.   A Media Access Module (MAM) is a cable attached to a plastic enclosure containing circuitry that allows the Credit Card Adapter for Ethernet to connect to Ethernet 10BASE2 cabling (thin coaxial).

N

NDIS.   Sometimes pronounced "en'-dis".   See *Network Driver Interface Specification*.

Network Driver Interface Specification.   The Network Driver Interface Specification (NDIS) was developed by Microsoft and 3Com as a LAN adapter driver architecture that lets a DOS or OS/2 system support one or more network adapters and protocol drivers.   An NDIS driver is included on the diskette that is shipped with the Token-Ring and Ethernet Credit Card adapters.

O

ODI.   See *Open Data Link Interface*.

Open Data Link Interface.   The Open Data Link Interface (ODI) was developed by Novell as a LAN adapter driver architecture that lets a computer operating system support one or more network adapters and protocol drivers.   An ODI driver is included on the diskette that is shipped with the Token-Ring and Ethernet Credit Card adapters.

P

PCMCIA. See *Personal Computer Memory Card International Association*.

Personal Computer Memory Card International Association. The Personal Computer Memory Card International Association (PCMCIA) is an organization of companies developing the personal computer card standard. PC cards are a key technology for adding memory, storage, and I/O capability to portable systems like notebooks and laptops. The standard describes the physical requirements, electrical specifications, and software architecture for PC cards. PCMCIA works closely with JEIDA to promote a worldwide standard.

Point Connectivity Enabler. The Point Connectivity Enabler (sometimes referred to as simply the enabler) is software used to configure the PCMCIA socket hardware and the Credit Card Adapter. The Point Connectivity Enabler enables the PCMCIA socket and opens a *window* in system memory that can be allocated to the Credit Card Adapter.

R

Remote Program Load. Remote Program Load (RPL) is the ability of one computer to load programs and operating systems into the memory of another computer that does not have its own fixed disk or diskette capability.

RPL. See *Remote Program Load.*

S

Slot.   A PCMCIA slot is the physical access point for a Credit Card Adapter to be installed into or removed from on a computer. This term is sometimes used interchangeably with socket.

Socket.   A PCMCIA socket is the electrical and software access point for a Credit Card to connect to a computer's PCMCIA interface. This term is often used interchangeably with slot.

Socket Services.   Socket Services is a BIOS-level software interface that provides a way to access the PCMCIA sockets of a computer that is independent of the PCMCIA hardware controller. It identifies all sockets and detects the insertion or removal of a credit card adapter while the system is powered on.

U

Unshielded Twisted Pair.   Unshielded twisted-pair (UTP) is a thin, relatively inexpensive media used for Token-Ring and Ethernet connectivity. UTP cabling is also typically easier to install than other media types, although some restrictions with regard to distance or number of devices on the LAN may apply.

UTP.   See *Unshielded Twisted Pair*.

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