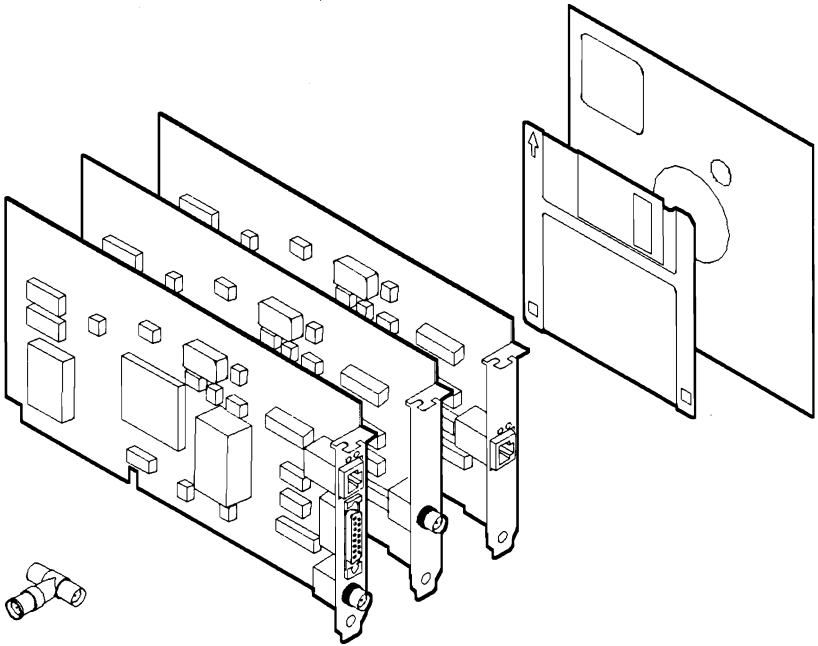# IBM ISA Ethernet Adapters—Installation and Testing Instructions

This adapter kit consists of:

- An IBM ISA Ethernet Adapter (Either the IBM LAN Adapter for Ethernet or the IBM LAN Adapter for Ethernet TP or the IBM LAN Adapter for Ethernet CX)

- The ISA Ethernet Adapter Option Diskette (5.25 or 3.5 inch)

- A BNC T-type connector (shipped only with the IBM LAN Adapter for Ethernet and the IBM LAN Adapter for Ethernet CX)

- The *Safety Information* manual

- This document.

If any item is missing or damaged, contact your place of purchase.

The IBM ISA Ethernet Adapters are for use with an IBM* Personal System/2* computer or an IBM compatible machine equipped with Industry Standard Architecture (ISA).

┌─── **Note** ────────────────────────────────────┐

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

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Contents

Product Warranty

International Business Machines Corporation   Armonk, New York 10504

STATEMENT OF LIMITED WARRANTY FOR THE IBM LAN Adapter for Ethernet and the IBM LAN Adapter for Ethernet TP and the IBM LAN Adapter for Ethernet CX (Product)

International Business Machines Corporation (IBM) gives you the following limited warranty for this Product only if it was originally purchased for use, not resale, from IBM, an IBM Authorized Dealer or any other IBM approved reseller for this Product (original purchase).

The Type of Warranty Service for this Product is **Customer Carry-In Exchange**. The Warranty Period is **Five Years** which starts on the date of original purchase (Date of Purchase) as shown on the receipt which establishes the proof of original purchase.

IBM warrants that on the Date of Purchase this Product will meet IBM's official published specifications which are available from IBM upon request. If, during the Warranty Period, this Product is found by IBM or an IBM Authorized Dealer to be 1) defective in material or workmanship or 2) otherwise not in good working order, IBM or such Dealer will remedy the problem by providing the Type of Warranty Service indicated above at no additional charge. Warranty service does not include repair or exchange when the problem results from accident, disaster, misuse, abuse, another machine, non-IBM modification, or service of the Product by other than IBM or an IBM Authorized Dealer for this Product.

To obtain warranty service, you must, during the Warranty Period, present this Product and the proof of original purchase to 1) an IBM Authorized Dealer for the Product or 2) IBM at an IBM Service/Exchange Center. Any transfer of the Product to another user during the Warranty Period should therefore include the proof of original purchase. You may ship the Product to an IBM Service/Exchange Center to obtain warranty service. If you do so, you must insure it or bear the risk of loss or damage in transit. In addition, you must prepay shipping charges and use the original shipping container or equivalent. Return shipping charges within the United States and Puerto Rico will be paid by IBM.

Note: If the Type of Warranty Service is **Customer Carry-In Repair**, it includes the return of the original Product to you. It may include the exchange of some parts or components.

If the Type of Warranty Service is **Customer Carry-In Exchange**, it includes the exchange of ownership of the Product between you and IBM or the IBM Authorized Dealer. Therefore, you must remove all non-IBM parts and all alterations and attachments, and you must also ensure that it is free from any outstanding liens.

Before presenting this Product for warranty service, you must remove all programs, data and removable storage media. Products and parts provided as a result of warranty service may be other than new but will be in good working order and

v

become your property at the time of exchange. At the same time, the exchanged Products or parts become the property of IBM or the IBM Authorized Dealer. If this Product is an optional feature, this limited warranty applies only when the feature is used in a machine for which it was designed, and, to obtain warranty service, you may be required to present the feature with an IBM machine for which it was designed.

If you have any question about your warranty, contact your IBM Authorized Dealer for this Product or call IBM at 1-800-428-2569.

If you purchased this Product directly from IBM under an Agreement for Purchase of IBM Machines, the Date of Installation is considered to be the Date of Purchase for warranty purposes, and, to obtain warranty service from IBM, you need not present proof of original purchase. To obtain warranty service from an IBM Authorized Dealer for the Product, contact IBM for proof of the original purchase from IBM.

This limited warranty will apply only to a Product purchased and located in the United States or Puerto Rico.

ALL EXPRESS AND IMPLIED WARRANTIES FOR THIS PRODUCT, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE WARRANTY PERIOD, AND NO WARRANTIES, WHETHER EXPRESS OR IMPLIED, WILL APPLY AFTER THIS PERIOD.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

LIMITATION OF REMEDIES: Your sole remedy under this Statement of Limited Warranty shall be IBM's or an IBM Authorized Dealer's performance of warranty service. For any claim concerning performance or nonperformance by IBM or an IBM Authorized Dealer under this Statement of Limited Warranty, or for any other claim directly related to this Product, you shall be entitled to recover actual damages up to the limits set forth in the following paragraph.

IBM's liability for damages to you for any cause whatsoever, arising out of this Statement of Limited Warranty, or for any other claim directly related to this Product, shall be limited to the greater of $5000 or the amount paid for this Product at the time of original purchase. This limitation of liability will not apply to claims for personal injury or damage to real property or tangible personal property caused by IBM's negligence. In no event will IBM be liable to you for any damages caused by your failure to perform your responsibilities under this statement, or for any lost profits, lost savings or other incidental or consequential damages, even if IBM, an IBM Authorized Dealer or an IBM approved reseller for this Product has been advised of the possibility of such damages, or for any claim by you based on any third party claim.

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Electronic Emission Notices

IBM LAN Adapter for Ethernet TP and IBM LAN Adapter for Ethernet CX are Class B products. IBM LAN Adapter for Ethernet is a Class A product. These adapters are collectively called IBM ISA Ethernet Adapters.

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

Electronic Emission Notice for Class A Devices

Federal Communications Commission (FCC) Statement

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.

Electronic Emission Notice for Class B Devices

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

Federal Communications Commission (FCC) Statement

Note: 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 that to which the receiver is connected.
- Consult an IBM authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM authorized dealers. 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.

Telecommunications Safety Requirements in the United Kingdom

This IBM product is made of high safety standards. It complies inherently with telecommunications safety standard BS6301. It is not designed to provide protection from excessive voltages appearing externally at its interfaces. Therefore, when this product is connected to a public telecommunications network via any other equipment, and you connect to this product items not supplied by IBM United Kingdom Ltd., you must comply with mandatory telecommunications safety requirements.

You may do this either by choosing products which also are approved as complying to BS6301 or British Telecom Technical Guide No. 26, or by the use of approved safety barriers. Consult the local office of your public telecommunications operator for advice and permission to make the connections.

Canadian Compliance Statement for Class A Equipment

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.

Avis de conformité aux normes du ministère des Communications du Canada

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.

Canadian Compliance Statement for Class B Equipment

Canadian Department of Communications Compliance Statement

This equipment does not exceed Class B limits per radio noise emissions for digital apparatus, set out in the Radio Interference Regulation of the Canadian Department of Communications.

Avis de conformité aux normes du ministère des Communications du Canada

Cet équipement ne dépasse pas les limites de Classe B 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.

Japanese VCCI Compliance Statement (Class 1 Equipment)

This equipment is Class 1 Equipment (information equipment to be used in commercial and industrial districts) which is in conformance with the standard set by Voluntary Control for Interference by Data Processing Equipment and Electronic Office Machines (VCCI) with an aim to prevent radio interference in commercial and industrial districts.

This equipment could cause interference to radio and television receivers when used in and around residential districts.

Please handle the equipment properly according to the instruction manual.

Japanese VCCI Compliance Statement (Class 2 Equipment)

Japanese Voluntary Control Council for Interference (VCCI) Statement

This equipment is Class 2 Equipment (information equipment to be used in a residential area or an adjacent area thereto) which is in conformance with the standard set by Voluntary Control for Interference by Data Processing Equipment and Electronic Office Machines (VCCI) with an aim to prevent radio interference in residential areas.

This equipment could cause interference to radio and television receivers.

Please handle the equipment properly according to the instruction manual.

情報処理装置等電波障害自主規制協議会(VCCI) 表示

この装置は、第二種情報装置（住宅地域又はその隣接した地域において使用されるべき情報装置）で住宅地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会(VCCI)基準に適合しております。

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取扱説明書に従って正しい取り扱いをして下さい。

System Security

This product is intended for use within a single establishment and within a single homogeneous user population. For sensitive applications requiring isolation from each other, management may wish to provide isolated cabling or to encrypt the sensitive data before putting it on the network.

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IBM	Personal System/2
Operating System/2	PS/2
OS/2	

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NetWare	Novell, Inc.
Novell	Novell, Inc.

Related Publications

Other publications related to the use of this adapter are:

- Publications shipped with your computer

    - The computer's instruction manual
    - The computer's *Hardware Maintenance Reference*
    - The computer's *Hardware Maintenance Service* manual

- IBM Local Area Network publications

    - *IBM Local Area Network Technical Reference*, SC30-3383
    - *IBM Local Area Network Administrator's Guide*, GA27-3748

- Software publications

    - *IBM Local Area Network Support Program User's Guide* (supplied with the IBM Local Area Network Support Program)

    - *IBM Operating System/2 Local Area Network Server Network Administrators Reference Volume 1: Planning and Installation (Version 2.0)*, S04G-1032

For assistance in obtaining IBM publications, contact your IBM representative, the IBM branch office, or the authorized dealer serving your locality.

The IBM ISA Ethernet Adapters

The IBM ISA Ethernet Adapters allow you to attach IBM* Personal System/2* (PS/2*) computers or IBM compatible computers equipped with Industry Standard Architecture (ISA) to an Ethernet Network.

The IBM LAN Adapter for Ethernet transmits and receives data at a rate of 10 Mbps over IEEE 802.3 Standard 10BASE-T (unshielded twisted-pair [UTP]), IEEE 802.3 Standard 10BASE2 (thin coaxial), or AUI (shielded-twisted-pair) media.

The IBM LAN Adapter for Ethernet TP transmits and receives data at a rate of 10 Mbps over IEEE 802.3 Standard 10BASE-T (unshielded twisted-pair [UTP]) media.

The IBM LAN Adapter for Ethernet CX transmits and receives data at a rate of 10 Mbps over IEEE 802.3 Standard 10BASE2 (thin coaxial) media.

Installing the Adapter

There are some exceptions to the following instructions for installing and testing the ISA Ethernet Adapters. Please review the topics discussed in Appendix A and Appendix B before continuing with the installation. Situations may be referenced in the appendixes that apply to the installation and testing procedures you will need to follow.

To install the ISA Ethernet Adapters, you must:

Step   1. Read the information under "Items Needed to Install the Adapter" on page 3 to make sure that you have everything you need to install the adapter.

Step   2. Read the information under "Software Prerequisites" on page 10 to make sure that you have the programs necessary to use the adapter.

Step   3. Follow the instructions under "Placing the Adapter in an Expansion Slot" on page 11.

1

Step 4. Follow the instructions under "Connecting the Adapter to the Network" on page 11.

Step 5. Follow the instructions under "Configuring the Adapter" on page 16 to make sure that the adapter is configured to work with your network.

Step 6. Follow the instructions under "Running Adapter Diagnostics" on page 25 to make sure that you have installed the adapter correctly.

Step 7. Follow the instructions under "Installing Network Program Device Drivers" on page 28 to install the device driver for your network.

Note: If you are installing more than one ISA Ethernet Adapter, install the first and be sure it is working before you begin installing the next adapter.

Items Needed to Install the Adapter
To install the LAN Adapter for Ethernet, you need:

- The LAN Adapter for Ethernet
- The IBM ISA Ethernet Adapters Option Diskette (3.5 inch or 5.25 inch) which contains the following:

Filename:	File Description:
Root directory	
CONFIG.EXE	configuration/diagnostics program
MESSAGE.MSG	messages for CONFIG.EXE
RPLBOOT.COM	RPL utility program
READ.ME	Additional information about the product; exceptions and hints
NDIS\DOS directory	
IBMENI.DOS	DOS NDIS device driver
IBMENI.NIF	DOS network information file
NDIS\OS2 directory	
IBMENI.OS2	OS/2 NDIS device driver
IBMENI.NIF	OS/2 network information file
NOVELL\DOS directory	
IBMENIO.COM	DOS ODI device driver
NET.CFG	sample network configuration file
IBMENIO.INS	installation information file
DRIVER.LST	installation support file
NOVELL\OS2 directory	
IBMENIOP.SYS	OS/2 ODI device driver for programmed I/O
IBMENIOS.SYS	OS/2 ODI device driver for shared memory
NET.CFG	sample network configuration file
README.OS2	information text file for this directory
NOVELL\NETWARE\386SERV directory	
IBMENIO.LAN	ODI NetWare** server driver
AUTOEXEC.NCF	sample network configuration file

Filename:	File Description:
NOVELL\NETWARE\286SERV directory	
ANE200A1.OBJ	NetWare 386 Version 2.2 server driver
ANE200A2.OBJ	NetWare 386 Version 2.2 server driver
BNE200A1.OBJ	NetWare 386 Version 2.2 server driver
BNE200A2.OBJ	NetWare 386 Version 2.2 server driver
CNE200A1.OBJ	NetWare 386 Version 2.2 server driver
CNE200A2.OBJ	NetWare 386 Version 2.2 server driver
DNE200A1.OBJ	NetWare 386 Version 2.2 server driver
DNE200A2.OBJ	NetWare 386 Version 2.2 server driver
NE2000A1.LAN	sample network configuration file
NE2000A2.LAN	sample network configuration file
README.NE2	informational text file for this directory
NOVELL\NETWARE\NWLITE directory	
IBMENIO.COM	DOS ODI device driver
NET.CFG	sample network configuration file
IBMENIO.INS	installation information file for NetWare Lite

- One of the following cables (not furnished with this adapter; see the figure on 11):

  - A Category 3, 4, or 5 cable with RJ-45 connectors, for use with the telephone twisted-pair (10BASE-T) media in your Ethernet network.

    The maximum length of twisted-pair cable between the concentrator and the workstation is 328 feet (100 meters).

  - An RG-58 standard coaxial cable (IEEE standard 802.3 10BASE2) with bayonet connectors (BNCs), if your Ethernet network uses thin coaxial media (the BNC T-type connector that was shipped with this package is also required.

The maximum length of thin coaxial cable between each repeater is 606.8 feet (185 meters).

  — A shielded-twisted-pair drop cable with AUI connectors, if your Ethernet network uses external transceivers.

    The maximum length of drop cable between each transceiver is 164 feet (50 meters).

- An IBM PS/2 computer or an IBM compatible computer equipped with ISA.

- The instruction manual supplied with the computer.

To install the LAN Adapter for Ethernet TP, you need:

- The LAN Adapter for Ethernet TP

- The IBM ISA Ethernet Adapters Option Diskette (3.5 inch or 5.25 inch) which contains the following programs:

Filename:	File Description:
Root directory	
CONFIG.EXE	configuration/diagnostics program
MESSAGE.MSG	messages for CONFIG.EXE
RPLBOOT.COM	RPL utility program
READ.ME	Additional information about the product; exceptions and hints
NDIS\DOS directory	
IBMENI.DOS	DOS NDIS device driver
IBMENI.NIF	DOS network information file
NDIS\OS2 directory	
IBMENI.OS2	OS/2 NDIS device driver
IBMENI.NIF	OS/2 network information file
NOVELL\DOS directory	
IBMENIO.COM	DOS ODI device driver
NET.CFG	sample network configuration file
IBMENIO.INS	installation information file
DRIVER.LST	installation support file
NOVELL\OS2 directory	
IBMENIOP.SYS	OS/2 ODI device driver for programmed I/O
IBMENIOS.SYS	OS/2 ODI device driver for shared memory
NET.CFG	sample network configuration file
README.OS2	information text file for this directory
NOVELL\NETWARE\386SERV directory	
IBMENIO.LAN	ODI NetWare** server driver
AUTOEXEC.NCF	sample network configuration file

Filename:	File Description:
NOVELL\NETWARE\286SERV directory	
ANE200A1.OBJ	NetWare 386 Version 2.2 server driver
ANE200A2.OBJ	NetWare 386 Version 2.2 server driver
BNE200A1.OBJ	NetWare 386 Version 2.2 server driver
BNE200A2.OBJ	NetWare 386 Version 2.2 server driver
CNE200A1.OBJ	NetWare 386 Version 2.2 server driver
CNE200A2.OBJ	NetWare 386 Version 2.2 server driver
DNE200A1.OBJ	NetWare 386 Version 2.2 server driver
DNE200A2.OBJ	NetWare 386 Version 2.2 server driver
NE2000A1.LAN	sample network configuration file
NE2000A2.LAN	sample network configuration file
README.NE2	informational text file for this directory
NOVELL\NETWARE\NWLITE directory	
IBMENIO.COM	DOS ODI device driver
NET.CFG	sample network configuration file
IBMENIO.INS	installation information file for NetWare Lite

• A Category 3, 4, or 5 cable with RJ-45 connectors, for use with the telephone twisted-pair (10BASE-T) media in your Ethernet network.

  The maximum length of twisted-pair cable between the concentrator and the workstation is 328 feet (100 meters).

• An IBM PS/2 computer or an IBM compatible computer equipped with ISA.

• The instruction manual supplied with the computer.

To install the LAN Adapter for Ethernet CX, you need:

- The LAN Adapter for Ethernet CX

- The IBM ISA Ethernet Adapters Option Diskette (3.5 inch or 5.25 inch) which contains the following programs:

Filename:	File Description:
Root directory	
CONFIG.EXE	configuration/diagnostics program
MESSAGE.MSG	messages for CONFIG.EXE
RPLBOOT.COM	RPL utility program
READ.ME	Additional information about the product; exceptions and hints
NDIS\DOS directory	
IBMENI.DOS	DOS NDIS device driver
IBMENI.NIF	DOS network information file
NDIS\OS2 directory	
IBMENI.OS2	OS/2 NDIS device driver
IBMENI.NIF	OS/2 network information file
NOVELL\DOS directory	
IBMENIO.COM	DOS ODI device driver
NET.CFG	sample network configuration file
IBMENIO.INS	installation information file
DRIVER.LST	installation support file
NOVELL\OS2 directory	
IBMENIOP.SYS	OS/2 ODI device driver for programmed I/O
IBMENIOS.SYS	OS/2 ODI device driver for shared memory
NET.CFG	sample network configuration file
README.OS2	information text file for this directory
NOVELL\NETWARE\386SERV directory	
IBMENIO.LAN	ODI NetWare** server driver
AUTOEXEC.NCF	sample network configuration file

Filename:	File Description:
NOVELL\NETWARE\286SERV directory	
ANE200A1.OBJ	NetWare 386 Version 2.2 server driver
ANE200A2.OBJ	NetWare 386 Version 2.2 server driver
BNE200A1.OBJ	NetWare 386 Version 2.2 server driver
BNE200A2.OBJ	NetWare 386 Version 2.2 server driver
CNE200A1.OBJ	NetWare 386 Version 2.2 server driver
CNE200A2.OBJ	NetWare 386 Version 2.2 server driver
DNE200A1.OBJ	NetWare 386 Version 2.2 server driver
DNE200A2.OBJ	NetWare 386 Version 2.2 server driver
NE2000A1.LAN	sample network configuration file
NE2000A2.LAN	sample network configuration file
README.NE2	informational text file for this directory
NOVELL\NETWARE\NWLITE directory	
IBMENIO.COM	DOS ODI device driver
NET.CFG	sample network configuration file
IBMENIO.INS	installation information file for NetWare Lite

- An RG-58 standard coaxial cable (IEEE Standard 802.3 10BASE2) with bayonet connectors (BNCs), if your Ethernet network uses thin coaxial media (the BNC T-type connector that was shipped with this package is also required).

  The maximum length of thin coaxial cable between each repeater is 606.8 feet (185 meters).

- An IBM PS/2 computer or an IBM compatible computer equipped with ISA.

- The instruction manual supplied with the computer.

Software Prerequisites

The software needed to operate the ISA Ethernet Adapters on the Ethernet network differs according to the operating system environment you are using.

The different environments and the software needed to operate the ISA Ethernet Adapters in each are:

- IBM DOS workstation environment
  - IBM DOS 3.3, 4.0, or 5.0
  - IBM LAN Support Program Version 1.3 or later
- IBM DOS server environment
  - IBM DOS 3.3, 4.0, or 5.0
  - IBM LAN Support Program Version 1.3 or later
  - IBM PC LAN Program (PCLP) Version 1.34
- OS/2 Extended Edition environment
  - IBM OS/2 Extended Edition Version 1.30.2
- OS/2 LAN Server environment
  - IBM OS/2 LAN Server Version 2.0 or later
- OS/2 Extended Services environment
  - IBM Extended Services for OS/2 Version 1.0
- Netware from IBM environment
  - Netware from IBM Version 2.2 or Version 3.11
- Novell** NetWare environment
  - Novell Netware Version 2.2 or Version 3.11

The option diskette (shipped with the adapter) provides the device drivers required to support the environments listed above.

Placing the Adapter in an Expansion Slot

1 Ensure that the computer is turned off, and go to the computer's instruction manual for instructions to install the adapter. Install the adapter in any available 8- or 16-bit expansion slot, and then go to step 2.

2 In the space provided across the top of the chart on page 25, record the slot number of the adapter installed.

3 Continue with "Connecting the Adapter to the Network."

Connecting the Adapter to the Network

1 Determine the type of cable to be connected to the adapter. (See the following figure.)
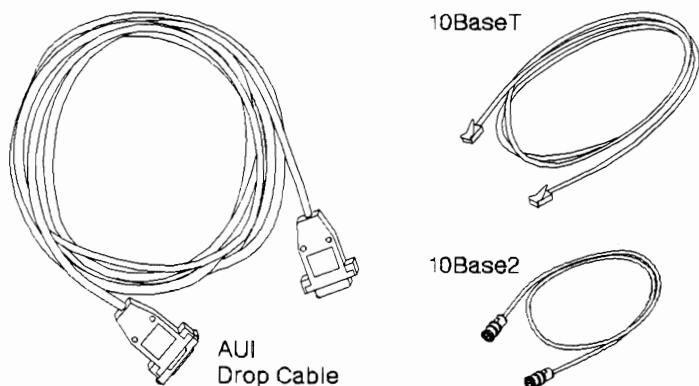
Note: Only one cable can be connected to the LAN Adapter for Ethernet at any time.

a Cabling the LAN Adapter for Ethernet or the LAN Adapter for Ethernet TP to a 10BASE-T Network

You need a Category 3, 4, or 5 cable with RJ-45 connectors. Connect the modular plug at one end of the cable to the adapter. (See the following figures.)

Note: The maximum length of twisted-pair cable between the concentrator and the workstation is 328 feet (100 meters).
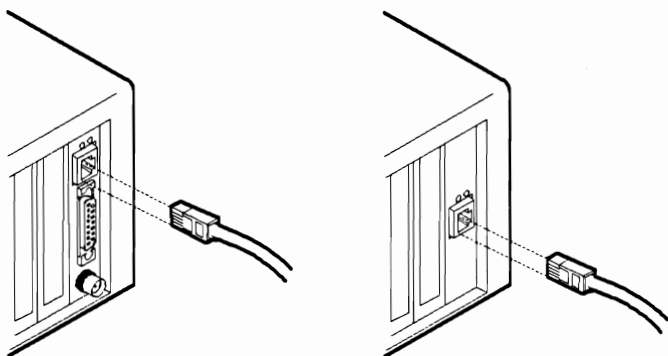
Connect the other end of the cable to the network.

b Cabling the LAN Adapter for Ethernet or the LAN Adapter for Ethernet CX to a 10BASE2 Network

You need an RG-58 standard coaxial cable with BNC connectors. Connect the BNC T-type connector (shipped with the adapter) to the adapter. (See the following figures.)
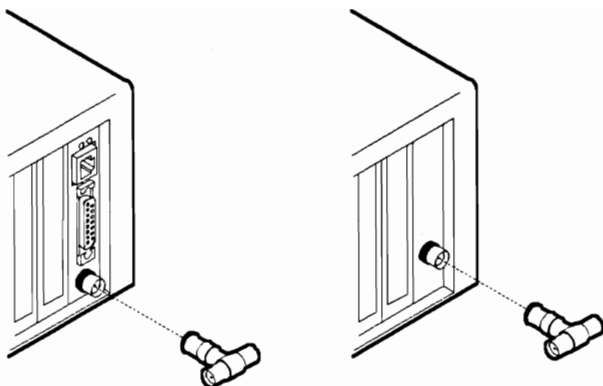
Notes:

1) There may be a clearance problem in some PCs when putting on the T-connector and attaching to the 10BASE2 network. If you encounter this problem, rotate the T-connector 90 degrees to allow more clearance.

2) The maximum length of thin coaxial cable between each repeater is 606.8 feet (185 meters).

If the computer you are installing is the last in the Ethernet network, attach the cable from the Ethernet network to one end of the T-connector. Attach a 50-ohm terminator to the other end of the T-connector. (See the following figures.)
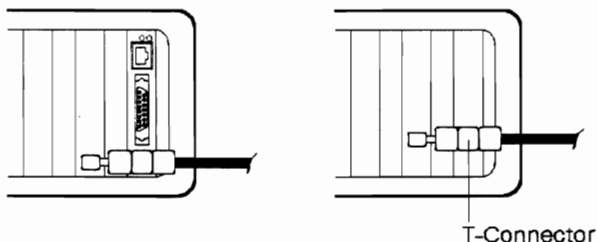
T-Connector

If the computer you are installing is not the last in the Ethernet network, attach cables from the Ethernet network to both ends of the T-connector. (See the following figures.)
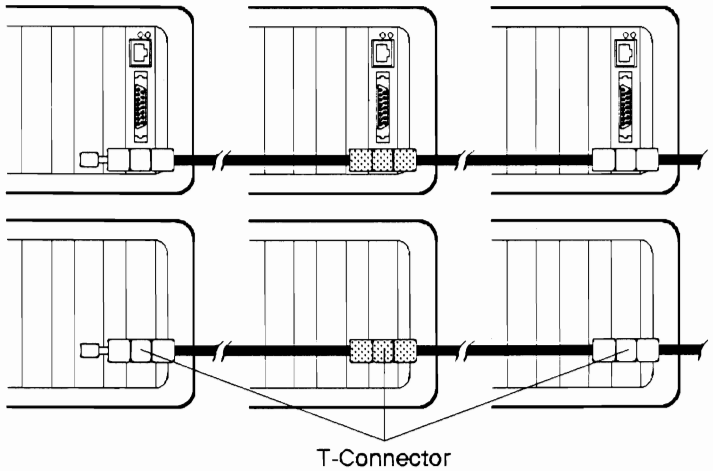
T-Connector

C Cabling the LAN Adapter for Ethernet to a network using drop cable

You need a shielded-twisted-pair drop cable with AUI connectors. Connect one end of the cable to the adapter. Push down the sliding latch on the AUI connector port to lock the cable in place. (See the following figure.)
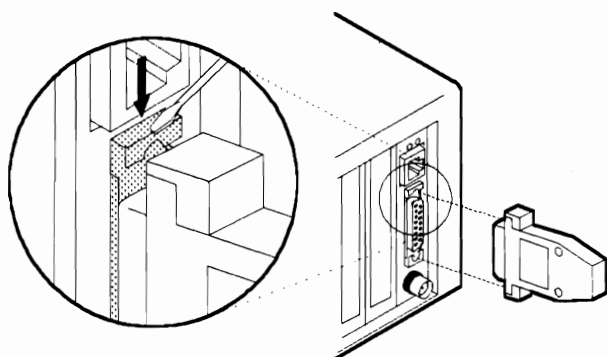
Any Media Access Units (MAUs) or transceivers used on your AUI network can be connected to the adapter without the use of the AUI drop cable.

2 Continue with "Configuring the Adapter" on page 16.

Configuring the Adapter

Note: The configuration of your adapter must be set on a computer that has a diskette drive, so you can run the configuration program found on the option diskette. Hence, if you want to have the IBM ISA Ethernet Adapters operate in a computer without a diskette drive, you will have to temporarily install and configure it in a computer that has a diskette drive, ensuring that you set the configuration parameters to be compatible with the computer in which the adapter will be installed.

Note: If you are planning to use RiPL and are installing more than one adapter, see "POST and RiPL" on page 46 before configuring the adapters.

1 Turn on your computer.

2 After the DOS prompt appears, insert the option diskette in the A: drive.

> **Note:** If you do not have a DOS session available with your operating system, refer to "Configuring in a Non-DOS environment" on page 41.

3 From the DOS prompt, type **A:** and press **Enter**.

4 From **A:>** prompt, type **CONFIG** and press **Enter**.

The **MAIN MENU** of the configuration/diagnostics program appears on your computer's display.

5 This program allows you to choose to configure the new adapter automatically or manually. Review step **a** and step **b** and select the appropriate option. Step **a** (automatic configuration) is generally preferable. This program also allows you to select advanced configuration options; these are described in section **c**.

a Configure New Adapter Automatically

1 From the **MAIN MENU**, select **Configure New Adapter** and press Enter.

2 From the **CONFIGURE NEW ADAPTER** window select **Configure New Adapter Automatically** and press Enter.

This message is displayed briefly: *Adapter Enabled Correctly.*

3 From the **ARCHITECTURE MODE** window, choose the desired adapter architecture. Accept the default, **I/O Port**, unless your computer's instruction manual has specified that **Shared Memory** should be chosen. See "Adapter Architecture" in Figure 1 on page 20 for more details.

This message is displayed briefly: *Searching for cable type, please wait.*

If you have attached a cable to your LAN adapter for Ethernet, the physical media (cable) will be automatically selected.

If you have not attached a cable to your LAN Adapter for Ethernet, you can select the physical media (cable) which will be used by your adapter from the **SELECT CABLE INTERFACE** window, then press Enter.

4 When you reach the **AUTO-SELECTED PARAMETERS** window, copy the information shown onto the chart on page 25 for later use. The program has automatically set the following configuration parameters:

I/O Base Address
IRQ Interrupt Level
Media type
Enable Boot ROM address

5 Select **Return to previous menu** from this window
and **Return to previous menu** from the next
window to get back to the **MAIN MENU**.

Note: The POST/RiPL function will not be enabled
until after you perform a "cold boot" (A cold boot
is done by turning the power off to your computer,
waiting 3 to 5 seconds, then turning the power
back on.) The POST/RiPL function does not need
to be enabled to perform the following steps.

6 Continue with "Running Adapter Diagnostics" on
page 25.

Note: When you select the option to save the
configuration, all configuration parameters are
automatically saved to the adapter's memory and
copied into a text file, CONFIG.TXT, on the option
diskette. In cases where the Option Diskette is
write protected, all configuration parameters will
still be saved to the adapter's memory.

b **Configure New Adapter Manually**

Select this option if you wish to manually set any
parameter instead of having the parameters set
automatically.

Refer to the list of parameters shown in the chart on
page Figure 1 on page 20 for a description of each
parameter.

1 From the **MAIN MENU**, select **Configure New
Adapter** and press Enter.

2 From the **CONFIGURE NEW ADAPTER** window,
select **Configure New Adapter Manually** and press
Enter.

3 From the **CONFIGURE NEW ADAPTER MANUALLY**
window, select the desired parameter value for
each of the options shown in this window.

4 Once all of the configurtion parameters have been set to the desired values, copy the information in the window onto the chart on page 25.

Select the **Save Configuration** option and press Enter.

5 From the **CONFIGURE NEW ADAPTER** window, select **Return to previous menu.** and press Enter.

6 Continue with "Running Adapter Diagnostics" on page 25.

Note: When you select the option to save the configuration, all configuration parameters are automatically saved to the adapter's memory and copied into a text file, CONFIG.TXT, on the option diskette. In cases where the Option Diskette is write protected, all configuration parameters will still be saved to the adapter's memory.

Novell Configuration

Description: This option allows you to select one of the Novell standard configurations for the NE2000 architecture. Each Novell configuration options corresponds to specific combinations of I/O Base Address values and Interrupt assignments.

Use the Tab key to toggle and select the required Novell configuration option; the I/O Base Address values and Interrupt assignments will be updated.

If you wish to manually set the I/O Base Address values and Interrupt assignment, select "None" for this option.

Available Options: None, Option 1, Option 2, Option 3, Option 4, Option 5, Option 6, Option 7, Option 8, Option 9, Option 10, Option 11

I/O Base Address

Description: This is the address used by the computer to identify and communicate with each individual adapter.

Available Options: 0x240, 0x280, 0x2C0, 0x300, 0x320, 0x340, 0x360, DISABLED

Figure 1 (Part 1 of 3). Manual Configuration Parameters

IRQ Interrupt Address

Description: This parameter establishes the priority by which the adapter can interrupt the computer. The lowest value is given the highest priority.

Available Options: 3, 4, 5, 7, 9, 10, 11, DISABLED

Physical Media

Description: This parameter allows you to select the media type which is used to attach the Ethernet adapter to the network. For each of the IBM Ethernet adapters, your choices are:

- ISA Ethernet Adapter TP = = > TPI(10BaseT)
- ISA Ethernet Adapter CX = = > Thin Ethernet
- LAN Adapter for Ethernet, select from:
  - TPI(10BaseT)
  - Thin Ethernet
  - Thick Ethernet

Adapter Architecture

Description: This adapter can be configured in two architecture modes; I/O Port or Shared Memory. Both modes have their advantages.

I/O port mode provides the maximum compatibility by using the least amount of memory and being NE2000 compatible.

Shared memory provides a performance improvement but requires 16K of system memory.

When in doubt about which architecture, choose I/O port.

Available Options: Shared Memory, I/O Port

Figure 1 (Part 2 of 3). Manual Configuration Parameters

Boot PROM

Description: This parameter allows you to select the address for the POST/RiPL PROM. On the BOOT PROM menu, press the tab key to toggle and view the available addresses, then press Enter to select the appropriate address.

Note: After you have selected the address, it will not be defined until you have performed a "cold boot" (A cold boot is done by turning the power off to your computer, waiting 3 to 5 seconds, then turning the power back on.)

Figure 1 (Part 3 of 3). Manual Configuration Parameters

C Advanced Configuration Options

If you want to include any of the advanced configuration options in your configuration, refer to the list of parameters shown in the chart on page Figure 2 on page 24 for a description of each parameter. Perform the following steps; otherwise, go to "Running Adapter Diagnostics" on page 25.

1 On the **MAIN MENU**, select **Display/Change Configuration** and press Enter.

2 On the **SELECT ADAPTER I/O PORT ADDRESS** menu, press Enter.

3 On the **DISPLAY/CHANGE ADAPTER CONFIGURATION** menu, select **Advanced Configuration Options.**, and press Enter.

4 On the **ADVANCED CONFIGURATION OPTIONS** menu, select the parameter(s) from those listed in the chart on page Figure 2 on page 24.

Channel Ready (CHRDY)

Description: This parameter defines when the ISA bus I/O channel ready (CHRDY) signal will be generated. This parameter allows the ISA Ethernet Adapter to be compatible with different implementations of the ISA architecture. This typically affects 286-based and older computers. When installing the ISA Ethernet Adapter in a PS/2 Model 30 286 PC, this option must be set to "FAST" at configuration.

Available Options: FAST, NORMAL

TPI Link Integrity Check

Description: This parameter allows you to enable or disable the TPI Link Integrity Check. This check is part of the 10BASE-T standard. If the ISA Ethernet Adapter is connected to a hub that is not compliant with the 10BASE-T standard, you must disable the TPI Link Integrity Check.

Available Options: Enabled, Disabled

Boot PROM

Description: This parameter allows you to disable the POST/RiPL PROM. From the BOOT PROM menu, press the Tab key to toggle between the available options.

Note: If you have disabled the Boot PROM, the change will not take effect until you have performed a "cold boot" (A cold boot is done by turning the power off to your computer, waiting 3 to 5 seconds, then turning the power back on.).

Available Options: No Boot ROM, Boot ROM enabled at 0xxxxx

Figure 2. Advanced Configuration Parameters

ISA Ethernet Adapters Parameter Record	
	Slot Numbers
Parameters:	
Base I/O Address	
IRQ Interrupt Assignment	
Adapter Architecture	
Shared Memory Address	

Running Adapter Diagnostics

1 Select the **Diagnostics** option from the **MAIN MENU**.

2 From the **INITIALIZATION AND DIAGNOSTICS** window, select the **Adapter Initialization and Diagnostics** option.

3 From the **SELECT ADAPTER I/O BASE ADDRESS** window, press Enter.

Note: If you have more than one LAN Adapter for Ethernet installed, select the I/O Base Address of the adapter on which you want to run diagnostics and press Enter.

If you have configured the adapter to use the "Shared Memory architecture", the **SHARED MEMORY ADDRESS** window will be displayed. Copy the Shared Memory Address into the chart on page 25 for later use. Press Enter.

4 The **INITIALIZATION AND DIAGNOSTICS** window is displayed and the diagnostics are run automatically.

Record the 12-digit Ethernet adapter address that is shown in parentheses beside the term Network Interface Controller.

Ethernet adapter address: _____

Report the Ethernet adapter address to the network administrator.

5 If all of the tests listed returned the message OK, the ISA Ethernet Adapter has completed the diagnostic tests.

Press the Escape key from this window and select **Return to previous menu** from the next window to get back to the **MAIN MENU**.

Select **Quit and return to DOS** from the **MAIN MENU**.

Continue with step 7.

6 If any test fails, record the test and go to "Problem Identification" on page 33 for more information.

7 Continue with "Installing Network Program Device Drivers" on page 28.

Changing a Configuration

If you have configured an adapter and sometime later you want to change its configuration, follow this procedure:

1 Turn on your computer.

2 After the DOS prompt appears, insert the option diskette in the A: drive.

Note: If you do not have a DOS session available with your operating system, refer to "Configuring in a Non-DOS environment" on page 41.

3 From the DOS prompt, type **A:** and press **Enter**.

4 From **A:>** prompt, type **CONFIG** and press **Enter**.

The **MAIN MENU** of the configuration/diagnostics program appears on your computer's display.

5 From the **MAIN MENU**, select **Display/Change Adapter Configuration** and press Enter.

6 From the **DISPLAY/CHANGE ADAPTER CONFIGURATION** menu, select whatever parameters you want to change.

When completed, select **Save Configuration** and perform a "cold boot" of your computer (a cold boot is done by turning the power off to your computer, waiting 3 to 5 seconds, then turning the power back on.).

Note: When you select the **Save Configuration** option, all configuration parameters are automatically saved to the adapter's memory and copied into a text file, CONFIG.TXT, on the option diskette. In cases where the Option Diskette is write protected, all configuration parameters will still be saved to the adapter's memory.

Note: The **Temporarily Change Configuration** option allows you to temporarily save a configuration, except the address location of the Boot PROM. Changes saved using this option

are in effect only until you perform a "cold boot" of your
computer.

Installing Network Program Device Drivers

The network operating system software **must** be installed before
you install the device driver.

A device driver for an adapter provides a software interface to
enable an application program to communicate with the adapter.
The Option Diskette contains device drivers needed for the ISA
Ethernet Adapters to support network programs.

Refer to the following chart and find the network operating system
environment you are running on your computer. Go to the section
indicated in the column beside the operating system environment
for instructions on installing the device driver you need.

If your operating system environment is:	Go to:
NetWare environment	
IBM NetWare Version 2.2 or Novell NetWare Version 2.2 Server	"Installing NetWare Version 2.2 Server Device Drivers" on page 29.
IBM Netware Version 3.11 ODI Server or Novell NetWare Version 3.11 ODI Server	"Installing NetWare Version 3.11 ODI Server Drivers" on page 29.
IBM Netware DOS ODI or Novell NetWare DOS ODI	"Installing NetWare DOS ODI Device Drivers" on page 30.
Novell NetWare Lite	"Installing NetWare Lite DOS ODI Device Drivers" on page 30.
IBM Netware with OS/2 or Novell NetWare with OS/2	"Installing NetWare Requester Device Drivers for OS/2" on page 30.
Other environments	
IBM DOS workstation or IBM DOS server	"Installing DOS NDIS Device Drivers" on page 31.
OS/2 Extended Edition, OS/2 LAN Server, or OS/2 Extended Services	"Installing OS/2 NDIS Device Drivers" on page 32.

Installing NetWare Version 2.2 Server Device Drivers

The NetWare Version 2.2 Server Device Driver is needed to run in a NetWare Version 2.2 Server environment. The option diskette contains the NetWare Version 2.2 Server Device Driver you will need in the \NOVELL\NETWARE\286SERV directory.

The following list contains the device drivers needed to run the ISA Ethernet Adapters in a NetWare Version 2.2 Server environment. Refer to the *NetWare Version 2.2 Installing and Maintaining the NetWork* manual to determine which device driver you will need for your environment.

- ANE200A1.OBJ
- ANE200A2.OBJ
- BNE200A1.OBJ
- BNE200A2.OBJ
- CNE200A1.OBJ
- CNE200A2.OBJ
- DNE200A1.OBJ
- DNE200A2.OBJ

To install the NetWare Version 2.2 Server Device Driver, follow the instructions in Chapter 1, "Installation" of the *NetWare Version 2.2 Installing and Maintaining the NetWork* manual. For step 7 (7a - 7c), follow the instructions for inserting the diskette and selecting the correct driver.

Installing NetWare Version 3.11 ODI Server Drivers

The NetWare Version 3.11 ODI Server Driver is needed to run in a NetWare Version 3.11 ODI Server environment. The option diskette contains the NetWare Version 3.11 ODI Server Driver under the name IBMENIO.LAN in the \NOVELL\NETWARE\386SERV directory.

To install the NetWare Version 3.11 ODI Server Driver, follow the instructions in Chapter 3, "File Server Installation" from the *NetWare Version 3.11 Installation* manual. To complete step 2 of the "Load LAN drivers and other loadable modules" section, insert the option diskette and enter the following command:

LOAD A:\NOVELL\NETWARE\386SERV\IBMENIO.LAN

Installing NetWare DOS ODI Device Drivers

The NetWare DOS ODI Device Driver is needed to run in a DOS ODI workstation environment. The option diskette contains the NetWare DOS ODI Device Driver under the name IBMENIO.COM in the \NOVELL\DOS directory.

Use a DOS copy command to copy the driver into the directory on your workstation that contains the network operating system software. (See the following example).

```
COPY A:\NOVELL\DOS\IBMENIO.COM C:\NETWARE
```

Edit the AUTOEXEC.BAT file for your workstation to include the following lines:

```
LSL
IBMENIO.COM
IPXODI
NETX
F:
```

For additional information, refer to the *NetWare ODI Shell for DOS* manual.

Installing NetWare Lite DOS ODI Device Drivers

The NetWare Lite DOS ODI Device Driver is needed to run in a DOS ODI workstation environment with NetWare Lite. The option diskette contains the NetWare Lite DOS ODI Device Driver under the name IBMENIO.COM in the \NOVELL\NETWARE\NWLITE directory.

Refer to the documentation for your network operating system for information on installing and using the device driver in your environment.

Installing NetWare Requester Device Drivers for OS/2

The NetWare Requester Device Driver for OS/2 is needed to run in a NetWare with OS/2 environment. The option diskette contains the NetWare Requester Device Drivers for OS/2 under the names IBMENIOP.OS2 and IBMENIOS.OS2 in the \NOVELL\OS2 directory.

In addition to NetWare Requester for OS/2 software, OS/2 Version 1.3 or later must be installed on the workstation.

Use an OS/2 copy command to copy the driver into the directory on your workstation that contains the network operating system software. (See the following examples).

1 For shared memory:

```
COPY A:\NOVELL\OS2\IBMENIOS.OS2 C:\NETWARE
```

2 For programmed I/O:

```
COPY A:\NOVELL\OS2\IBMENIOP.OS2 C:\NETWARE
```

Edit the CONFIG.SYS file on your workstation to add one of the following statements. (The statement you will choose to add is dependent on the architecture you selected during configuration):

1 For shared memory:

```
DEVICE=IBMENIOS.OS2
```

2 For Programmed I/O or I/O Port:

```
DEVICE=IBMNEIOP.OS2
```

Refer to the sample NET.CFG file shipped on the option diskette for information regarding Custom Keywords.

For additional information, refer to the *NetWare Requester for OS/2* manual or the *NetWare Requester for OS/2 Version 2.0* manual.

Installing DOS NDIS Device Drivers

The DOS NDIS Device Driver is needed to run in an IBM DOS workstation environment or an IBM DOS Server environment. The option diskette contains the DOS NDIS Device Driver under the name IBMENI.DOS.

If you are using the LAN Support Program, you can use the LAN Support Program's device driver installation tool, DXMAID, to install the DOS NDIS Device Driver. Refer to the *Local Area Network Support Program User's Guide* for instructions on using DXMAID.

When DXMAID presents a default directory of A:\DOS, change the directory to A:\NDIS\DOS so DXMAID can locate the DOS NDIS Device Driver from the Option Diskette.

If you need to use the manual procedure for installing the DOS NDIS Device Driver, see "Manual Installation for the NDIS Device Driver" on page 37.

Installing OS/2 NDIS Device Drivers

The OS/2 NDIS Device Driver is needed to run in an OS/2 Extended Edition environment, an OS/2 LAN Server environment or an OS/2 Extended Services environment. The option diskette contains the OS/2 NDIS Device Driver under the name IBMENI.OS2.

You can use the OS/2 device driver installation tool, the LAN Services installation/configuration program, to install the OS/2 NDIS Device Driver. Refer to the *IBM Extended Services for OS/2 2.0 LAN Adapter and Protocol Support Configuration* guide or the *IBM Operating System/2 Local Area Network Server Version 2.0 Network Administrator Reference Volume 1: Planning and Installation* guide for instructions on using the LAN Services installation/configuration program.

When the LAN Services installation/configuration program presents a default directory of A:\, change the directory to A:\NDIS\OS2 so the LAN Services installation/configuration program can locate the OS/2 NDIS Device Driver from the option diskette.

If you need to use the manual procedure for installing the OS/2 NDIS Device Driver, see "Manual Installation for the NDIS Device Driver" on page 37.

Problem Identification

The following chart lists all of the diagnostic tests that are performed while running adapter diagnostics as shown on 25 for the ISA Ethernet Adapters. Listed also are the reasons for test failure and the actions to be taken to resolve the problem.

Read the chart and go to "Problem Solving" on page 34.

Test	Cause	Action
Network Interface Controller	I/O conflict in the configuration	Change the Base I/O address so that no conflicts exist.
Buffer Memory Check	Shared memory conflict	Change the Shared Memory address so that no conflicts exist.
Check Cable Connection	Link status is bad	Verify that all cables are firmly attached and properly terminated. Check all cables to verify that they are working properly. Verify that the correct media type is configured.
Interrupt Assignment	Possible interrupt conflict	Change the Interrupt Assignment so that no conflicts exist.
Boot PROM Check	Two devices mapping to same address	Change the Base Memory Address so that no conflicts exist.

Descriptions of LEDs

There are two LED lights found on the end of each adapter under the cable connection. These LEDs can be useful when trying to isolate problems with the adapter or the network.

LEDs on the LAN Adapter for Ethernet:

green LED   When this light is on, the Twisted Pair Segment is enabled, Link Test is enabled, and Link Integrity is GOOD; **or** the Twisted Pair Segment is enabled and the Link Test is disabled. When this light is off, the AUI Segment is enabled **or** the Twisted Pair Segment is enabled, Link Test enabled, and the Link Integrity is BAD.

yellow LED   When this light is on, there is traffic moving over the network.

LEDs on the LAN Adapter for Ethernet TP:

green LED   When this light is on, the link to the network is good.

yellow LED   When this light is on, there is traffic moving over the network.

LEDs on the LAN Adapter for Ethernet CX:

green LED   When this LED light is on, there is traffic moving over the network.

yellow LED   When this LED light is on, there are packet collisions on the network.

Under normal conditions, this light will be blinking. If the light is steadily shining, check the adapter or the network for problems.

Problem Solving

1 Go to the **Main Menu** of the configuration/diagnostics program.

If the action you perform calls for a change to any of the configuration parameters, continue with the next step.

If no change to the configuration is necessary, go to step 6 on page 35.

2 Select the option that allows you to Display/Change the configuration.

3 Use the arrow keys to select the parameter you want to change and use the TAB key to select the different choices for that parameter.

4 Once you have changed the necessary parameters, select the option that allows you to save the configuration.

5 Turn off your computer, wait several seconds, and turn it back on.

6 Run the Diagnostics as instructed in "Running Adapter Diagnostics" on page 25 once more.

Note: The only time that the Shared Memory Address can be changed is while Running Adapter Diagnostics.

7 If all tests return OK, the adapter is ready for use.

If the same tests fail again, call your customer service center.

Appendix A. Advanced Functions

Disabling the Boot PROM

Follow the steps listed below to disable the Boot PROM for the ISA
Ethernet Adapters.

1 Follow the instructions under "Changing a Configuration" on
page 27.

2 From the **DISPLAY/CHANGE ADAPTER CONFIGURATION**
window, select the **Advanced Configuration Options**.

The **ADVANCED CONFIGURATION OPTIONS** window will be
displayed.

3 Select **Boot PROM enabled at XXXX**. Upon selection, this
option will change to **No Boot PROM**.

Note: If you have disabled the Boot PROM, the change will
not take effect until you have performed a "cold boot" (A
cold boot is done by turning the power off to your computer,
waiting 3 to 5 seconds, then turning the power back on.).

4 Return to the previous menu and save the configuration.

The Boot PROM is now disabled.

Manual Installation for the NDIS Device Driver

When manually installing the NDIS Device Drivers, the DEVICE =
statement must be manually inserted into the CONFIG.SYS file on
your workstation.

The DEVICE = statement for the NDIS Device Driver must follow
the DEVICE = statement for the Protocol Manager.

37

Copy the DOS or OS/2 NDIS device driver from the Option diskette to the directory on your workstation that contains the network operating system software.

Add the DEVICE= statement in the CONFIG.SYS file to start the NDIS device driver during system initialization. Examples of DEVICE= statements for the CONFIG.SYS file are:

1 DOS:

```
DEVICE=C:\..path..\IBMENI.DOS
```

2 OS/2:

```
DEVICE=C:\..path..\IBMENI.OS2
```

Manual NDIS Device Driver Configuration

The I/O base address, interrupt assignment, shared RAM address, and mode can be configured on the ISA Ethernet Adapters using the CONFIG.EXE program supplied on the option diskette. The NDIS device driver must be configured to match the adapter's configuration. The NDIS Device Driver can be configured using DXMAID for LAN Support Program, the LAN Services installation/configuration program for OS/2, or by manually editing the PROTOCOL.INI file. A detailed description of the configurable parameters follows:

IOBASE
This parameter specifies the adapter I/O Base address that will be used by the device driver to access the adapter registers.

The value entered must be one of 240, 280, 2C0, 300, 320, 340 or 360. The default is 300.

EXAMPLE: IOBASE = 300

If the IOBASE value in PROTOCOL.INI conflicts with the adapter setting, the following message is displayed:

```
LTA0006E  IBM LAN Adapter card not
present at I/O address.
```

INTERRUPT   This parameter specifies the interrupt
             assignment used for notifications between the
             workstation and the network adapter card.
             Ensure that no conflicts exist between the various
             system components in their use of interrupts.

             The value entered must be one of 3, 4, 5, 6, 7, 10
             or 11. The default value is 3.

             EXAMPLE: INTERRUPT = 3

             If the INTERRUPT value in PROTOCOL.INI
             conflicts with the adapter setting, the following
             message is displayed:

             LTA0008E Interrupt vector does
             not match configured value.

RAMADDRESS   This parameter specifies the physical location of
             the adapter in the memory of the computer. The
             specified location must not conflict with that of
             any other adapter installed in the workstation or
             with an address that is used by an
             expanded-memory manager.

             The value entered must be a hexadecimal
             number between 0XC8000 and 0XDC000, and
             must be a multiple of 4000. The default address
             is 0XD0000.

             EXAMPLE: RAMADDRESS = 0XD0000

NETADDRESS   This parameter overrides the network address of
             the network adapter card. The value of this
             parameter is a hexadecimal string of 12 digits in
             canonical format, as in 02008040C020. This
             address in non-canonical (or token-ring) format is
             400001020304.

             The address must be unique among all other
             network adapter addresses on the network.

             EXAMPLE: NETADDRESS = "02008040C020"

The NDIS device driver anticipates the mode of the adapter, either programmed I/O or shared memory, by the presence of the RAMADDRESS= statement in PROTOCOL.INI. If the RAMADDRESS= statement is specified, it is assumed that the adapter is in shared memory mode. If the RAMADDRESS= statement is not specified, it is assumed that the adapter is in programmed I/O mode.

If the adapter's mode specified in PROTOCOL.INI conflicts with the actual adapter mode, the message LTA0005E Driver initialized for wrong mode will be displayed.

To configure the NDIS Device Driver manually, edit the PROTOCOL.INI file on your workstation and add the following:

```
[IBMENI_MOD]
Drivername = IBMENI$
IOBase = 0X240
Interrupt = 3
RAMAddress = 0Xc0000
```

Note: The parameter values in the PROTOCOL.INI file must match the parameter values chosen during configuration and recorded in the chart on page 25.

The desired protocol drivers must then be *bound* to the NDIS device driver by manually editing the BINDINGS= statement of those protocol drivers. (See the following example).

```
[PROTOCOL_DRIVER_ABC]
Bindings = IBMENI_MOD
```

NDIS Device Driver Support for Two Adapters

When two ISA Ethernet Adapters are installed in the same system, there must be two DEVICE= statements in the CONFIG.SYS file on the workstation and two NDIS Device Driver sections in PROTOCOL.INI. (See the following examples).

1 **CONFIG.SYS**:

```
DEVICE=C:\..path..\IBMENI.OS2
DEVICE=C:\..path..\IBMENI.OS2
```

2 **PROTOCOL.INI**:

```
[IBMENI_MOD]
Drivername = IBMENI$
IOBase = 0X240
Interrupt = 10
RAMAddress = 0XC0000

[IBMENI2_MOD]
Drivername = IBMENI2$
IOBase = 0X320
Interrupt = 4

[PROTOCOL_DRIVER_ABC]
Bindings = IBMENI_MOD, . . . , IBMENI2_MOD
```

Note: The parameter values in the PROTOCOL.INI file must match the parameter values chosen during configuration and recorded in the chart on page 25.

In the second NDIS device driver section of PROTOCOL.INI above, the LAN Adapter for Ethernet is in programmed I/O mode since the RAMADDRESS = statement is absent.

Configuring in a Non-DOS environment

If you do not have a DOS session available on your computer, work through the following steps to configure your ISA Ethernet Adapter.

1 Note the I/O Base Address and the IRQ Interrupt Levels of any adapters already installed in your computer.

2 Insert the option diskette in the A: drive and turn on your computer.

3 Press Enter after a caution message is displayed.

Note: You may ignore the this caution message if you have completed step 1 above.

4 The **Main Menu** of the configuration program appears on your computer's display.

    a If there are no other adapters already installed in your computer, return to "Configuring the Adapter" on page 16 and continue with step 5 on page 16.

    b If there are other adapters already installed in your computer, select the option to **Configure New Adapter**.

    c Select the option to **Configure New Adapter Manually**

       Do NOT configure the adapter automatically.

5 Select an I/O Base Address and an IRQ Interrupt Level that is not being used by another adapter.

6 Return to 5b on page 18 and continue with step 4.

Moving a Configured ISA Ethernet Adapter to Another PC

When a ISA Ethernet Adapter is configured, the values for the Base I/O Address and the IRQ Interrupt Assignment are assigned based on the personal computer in which the ISA Ethernet Adapter is installed. The values of these parameters are different for each PC.

For that reason, the ISA Ethernet Adapter must be disabled before it can be moved into another computer.

Once the ISA Ethernet Adapter is installed in another computer, it must then be re-configured following the steps in "Configuring the Adapter" on page 16.

To disable the ISA Ethernet Adapter, follow the steps found under "Disabling the ISA Ethernet Adapter" on page 43.

Disabling the ISA Ethernet Adapter

The ISA Ethernet Adapter must be disabled before it can be moved from one configuration to another.

To disable the ISA Ethernet Adapter, work through the following steps.

1 Disconnect the ISA Ethernet Adapter from the Ethernet network.

2 Turn off your computer.

3 Follow the instructions found in "Changing a Configuration" on page 27, selecting the **Display/Change Adapter Configuration** option.

4 Using the arrow keys to select the parameter and the TAB key to select the value for that parameter, change the **I/O Base Address** and the **Interrupt Assignment** to have a value of DISABLED.

5 Save the changes and exit the configuration program.

The ISA Ethernet Adapter is now in disabled mode.

Once the ISA Ethernet Adapter is disabled, you must turn off your computer to remove the card. The disable procedure will not work again until you turn off your computer.

Advanced Diagnostics

The Advanced Diagnostics feature allows you to execute a data transfer test between two ISA Ethernet Adapters in different computers.

In addition, you can use the computer with an IBM LAN Adapter for Ethernet which is connected to a network to monitor packets on the network.

Note: It is not necessary to use this feature for installation or testing of the ISA Ethernet Adapter.

To use the Advanced Diagnostics, data transfer test,:

1 Disconnect both ISA Ethernet Adapters from the main Ethernet network and connect the adapters to each other to create an isolated, point-to-point connection between the adapters.

Note: There must be one ISA Ethernet Adapter installed in one computer and one ISA Ethernet Adapter installed in another computer.

2 Place the option diskette in the A: drive of one of the computers being used for the test.

3 If the computer is off, turn it on.

If the computer is on, type **CONFIG** from the A:> DOS prompt.

4 Select the **Diagnostics** option from the **Main Menu** of the configuration program.

5 Run the **Initialization and Diagnostics** test as described in "Running Adapter Diagnostics" on page 25. Make sure that all tests return the message OK.

If all tests return OK, press the Escape key and continue with step 6.

If one or more of the tests fail, go to "Problem Solving" on page 34.

6 From the **INITIALIZATION AND DIAGNOSTICS** window, select the **Advanced Network Diagnostics** option and press Enter.

7 From the **ADVANCED NETWORK DIAGNOSTICS** window, select the **Set up as slave station** option and press Enter.

The **Slave Station** window will display a rotating | character, signifying that the computer is ready for the test.

8 Repeat steps 3 through 6 above for the other computer being used in the Advanced Diagnostics test and return here.

9 Select the **Set up as master station** option.

10 Type the number of times you want the data packet sent. Press **Enter** to begin the test.

11 Upon completion of the test, the master station will display **Network Test Passed**.

12 Press the Escape key to continue.

The Advanced Diagnostics data transfer test is now complete.

You may repeat the test by repeating steps 9 through 10.

To use the network monitor utility,

1 Ensure your IBM LAN Adapter for Ethernet is properly installed, configured, and connected to your network.

2 Place the option diskette in the A: drive of one of the computers being used for the test.

3 If the computer is off, turn it on.

If the computer is on, type **CONFIG** from the A:> DOS prompt.

4 Select the **Diagnostics** option from the **Main Menu** of the configuration program.

5 Run the **Initialization and Diagnostics** test as described in "Running Adapter Diagnostics" on page 25. Make sure that all tests return the message OK.

If all tests return OK, press the Escape key and continue with step 6 on page 44.

If one or more of the tests fail, go to "Problem Solving" on page 34.

6 From the **INITIALIZATION AND DIAGNOSTICS** window, select the **Advanced Network Diagnostics** option and press Enter.

7 From the **ADVANCED NETWORK DIAGNOSTICS** window, select the **Show packets on networks** option and press Enter.

As packets from the network are passed through the adapter, they will appear on your display continuously.

8 Press the Escape key to continue.

The Network Monitor utility is now complete.

POST and RiPL

Two other functions that the ISA Ethernet Adapters can perform are the Power-on Self Test (POST) and the Remote (initial) Program Load (RiPL) functions.

Note: The Boot PROM must be enabled on one of the ISA Ethernet Adapters in order for POST and RiPL to run properly. The Boot PROM is enabled upon automatic configuration. If you have not configured your ISA Ethernet Adapter, see "Configuring the Adapter" on page 16 and follow the instructions for configuring the ISA Ethernet Adapters.

The POST Function

The Power-on Self Test (POST) is a test program that will execute each time the computer is booted. The results of the test will be displayed on the terminal.

The following example shows what would be seen on the display after POST runs on an adapter that is functioning properly.

```
IBM LAN Adapter for Ethernet    POST/RPL v1.01
(C)  IBM, NSC, 1993         All rights reserved

Testing Adapter in slot  x...    OK'
```

The x shown in the preceding example is the number of the slot in which the adapter is installed.

Note: Additional messages may be displayed before and/or after this one.

Note: Only one adapter should have the Boot PROM enabled. That adapter will report the status of all other installed ISA Ethernet Adapters. Please disable the Boot PROM (see "Disabling the Boot PROM" on page 37 for instructions) on all other ISA Ethernet Adapters installed.

If the POST program fails, an error message will appear on the screen. The following list indicates the errors that can be returned from the POST program. Listed beside each error is the description of the error, possible causes for the error, and suggested actions to correct the error.

PR001

> **Description**: POST/RPL ROM integrity error.
>
> **Possible Cause**: ROM not correctly inserted in socket or ROM defective.
>
> **User Action**: Verify that the ROM is correctly inserted in socket. If not, have the adapter serviced.

PR002

> **Description**: Shared memory interface error.
>
> **Possible Cause**: Adapter not configured correctly for the system. Possible memory conflict.
>
> **User Action**: Verify that the adapter configuration and the system configuration are correct. Otherwise, have adapter serviced.

PR003

Description: IRQ set up error.

Possible Cause: Adapter not configured correctly for the system. Possible interrupt conflict.

User Action: Verify that the adapter configuration and the system configuration are correct. Otherwise, have the adapter serviced.

PR004

Description: No interrupt received.

Possible Cause: Adapter defective. System unit on computer defective.

User Action: Verify that the adapter installation was performed correctly. Verify that the system unit on the computer is working properly. Otherwise, have the adapter serviced.

PR005

Description: EEPROM integrity error.

Possible Cause: Defective EEPROM.

User Action: Have the adapter serviced.

PR006

Description: Buffer memory integrity error.

Possible Cause: On-card buffer memory is not working properly.

User Action: Have the Adapter serviced.

PR007

Description: Cable connection error.

Possible Cause:

1. Cable not connected properly
2. Wrong cable type configured.

User Action:

1. Check all cable connections.
2. Verify cable type is configured correctly.
3. Verify cable is connected properly.

PR008

Description: Transmission loopback error.

Possible Cause:

1. Defective cable.

2. Defective adapter.

User Action: Verify cable is connected properly. Otherwise, have the adapter serviced.

PR009

Description: Host bus interface error.

Possible Cause:

1. The computer's system unit is not working properly.

2. Adapter's interface to the system bus is not working properly.

User Action: Verify system unit on the computer is not defective. Otherwise, have the adapter serviced.

PR010

Description: Insufficient memory for RPL.

Possible Cause: Not enough RAM available on computer's system unit.

User Action: Re-allocate system RAM.

PR100

Description: Adapter(s) not responding or failures detected.

Possible Cause: Unknown (error other than those listed above).

User Action: Verify installation performed correctly. Otherwise, have the adapter serviced.

When POST errors occur, they can sometimes be resolved by performing the adapter installation again, verifying that the computer's system unit is working properly, or installing the adapter in another computer. If the failure or error condition persists, call your customer service center.

The POST program will check for cable connection in the LAN Adapter for Ethernet and the LAN Adapter for Ethernet CX, but not in the LAN Adapter for Ethernet TP. If a cable connection problem is determined in the LAN Adapter for Ethernet or the LAN Adapter for Ethernet CX, it will be referred to as a *packet output error*.

The RiPL Function

The Remote (initial) Program Load (RiPL) function gives the ISA Ethernet Adapters the capability to bring up a computer without a diskette drive using files the computer receives from a LAN server.

One of the following network operating systems is required for the ISA Ethernet Adapters to complete an RiPL.

- IBM OS/2 LAN Server 2.0
- IBM OS/2 LAN Server 3.0
- Novell NetWare 3.11
- Microsoft LAN Manager 2.2

To enable the ISA Ethernet Adapters to use RiPL feature, the adapter must be configured so the Boot PROM will be enabled.

To configure the adapter, you must use a computer that has a diskette drive. (See "Configuring the Adapter" on page 16.) Once configuration has been completed, the adapter may be installed in a computer or workstation which does not have a diskette drive.

If you install more than one ISA Ethernet Adapter in a computer which does not have a diskette drive, only one of the adapters should have the Boot PROM enabled. (See "Disabling the Boot PROM" on page 37 for instructions on disabling the Boot PROM.) You will also need to ensure that the IRQ Interrupt Levels, I/O Base Addresses, and memory configurations of the ISA Ethernet Adapters do not conflict. If conflicts exist, the computer may fail to boot properly.

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

If you wish to use the RiPL function of the ISA Ethernet Adapters in a computer that has a diskette drive, you may run the RPLBOOT.COM utility program (shipped on the IBM ISA Ethernet Adapters Option Diskette) to disable the diskette drive. The computer will then RiPL directly from the LAN instead of from the diskette drive.

Note: To reactivate your computer's fixed disk (if you are using DOS), use the FDISK command (a DOS utility) and set an active partition. This can be done by booting your computer from a diskette that has been formatted as a system diskette. Once you boot up in this manner, you will be able to access your fixed disk.

To reactivate your computer's fixed disk (if you are using OS/2), use the DOS Install diskette and follow the instructions in the preceding note.

Note: If you are installing an ISA Ethernet Adapter in a computer that is set up as a server, **do not** run RPLBOOT.COM on that computer. (See "Installing RiPL in a Server" on page 52 for more information.)

In the event of an RiPL failure, the following information will appear on your computer's display.

```
RPL-ROM-ADR:  0800 5A7F 8170[1]
RPL-ROM-IRQ:  5[1]
RPL-ROM-PIO:  1000[1]

RPL-ROM-FFC:  25[1]
```

Where:

RPL-ROM-ADR = The burned-in address of the adapter

RPL-ROM-IRQ = The IRQ interrupt level that was configured for the adapter.

RPL-ROM-PIO = The programmed I/O address that was configured for the adapter.

RPL-ROM-FFC = The find frame count.

The value for RPL-ROM-FFC will increment until the problem is resolved.

If you should experience any problems with RiPL, check all cables carefully to verify that they are connected properly. If all cables are connected properly and there is still an RiPL failure, contact

---

[1] This value will differ for each individual adapter, depending on how the adapter was configured.

your LAN administrator. Copy the information shown on your computer's display to relay to the LAN administrator.

Installing RiPL in a Server

The RiPL function of the ISA Ethernet Adapters can be used in a computer that is set up as a server.

For instructions on installing the RiPL program on a server, please consult your network operating system documentation.

Some network operating systems require that you create a boot image to be downloaded to a computer which does not have a diskette drive but has a ISA Ethernet Adapter installed. Refer to your network operating system documentation for information on creating boot images.

RiPL with Novell NetWare

If your network operating system is Novell NetWare, you will need an RiPL upgrade kit for IBM compatible NetWare RiPL to use the RiPL function of the ISA Ethernet Adapters.

Contact your Novell representative to obtain the upgrade kit.

To install the upgrade kit on your server, follow the instructions you receive with the kit.

Appendix B. Exceptions to the Installation Procedure

The ISA Ethernet Adapters in 8086/8088 Computers

IBM does not support the use of the ISA Ethernet Adapter's Device Drivers in 8086- and 8088-based computers.

However, the DOS ODI device driver shipped with the ISA Ethernet Adapters can be used in 8086- and 8088-based computers.

In addition, the ISA Ethernet Adapters are NE2000-compatible Ethernet adapters. Therefore, if the network operating system you are using is compatible with and offers NE2000 device drivers, the ISA Ethernet Adapters can be used in 8086- and 8088-based computers with the NE2000 device drivers provided.

Refer to the documentation provided with your network operating system for information on the drivers that are available to you.

If you are able to use the ISA Ethernet Adapters in an 8086- or 8088-based computer, work through the following steps to configure the ISA Ethernet Adapters for use.

1 Follow the instructions under "Configuring the Adapter" on page 16, selecting the option to **Display/Change Adapter Configuration**.

2 Change the **Novell Configuration** parameter to **Option 0**.

3 Save the change and exit the configuration program.

The ISA Ethernet Adapters should now be ready for use with NE2000 compatible device drivers in an 8086- or 8088-based environment.

Consult the documentation for your network operating system for further information.

Installing the Adapter in a PS/2 Model 25

Some versions of the PS/2 Model 25 are designed for use with an 8-bit adapter. These PS/2s are distinguished by a clear, molded plastic piece covering the system bus slot area. This clear plastic piece is the option card holder.

The option card holder must be removed from the PS/2 for either of the ISA Ethernet Adapters to fit in the computer.

Note: Removal of the option card holder does not affect the operation of the PS/2 Model 25 in any way.

To install the ISA Ethernet Adapter in a PS/2 Model 25, work through the following steps.

1 The option card holder is held onto the PS/2's system board by one screw. Remove the screw using a standard flathead screwdriver.

2 Carefully remove the option card holder from the system board.

3 Install the ISA Ethernet Adapter using the procedure described in "Installing the Adapter" on page 1.

Continue with "Configuring the Adapter" on page 16.

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