

**ISA Ethernet Adapters  
User's Guide**





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User's Guide**



**Note**

Before using this information and the product it supports, be sure to read the general information under "Product Warranties and Notices" on page 39.

### **Third Edition (February 1994)**

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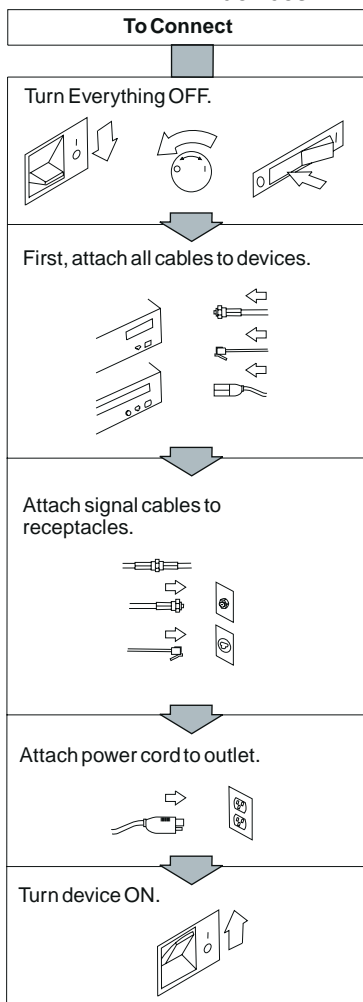
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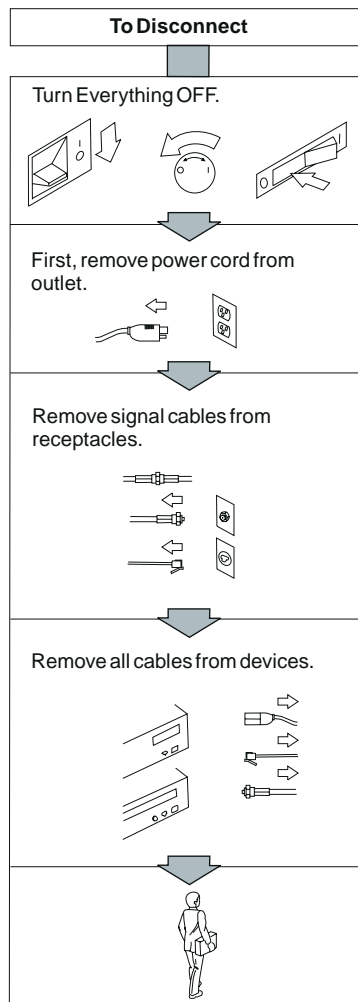
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## Electrical Safety

 **DANGER:** Electrical current from power, telephone, and communications cables is hazardous. To avoid shock hazard, connect and disconnect cables as shown below when installing, moving, or opening the covers of this product or attached devices.



Note: In the UK, by law, the telephone cable must be connected after the power cord.



Note: In the UK, by law, the power cord must be disconnected after the telephone line cable.





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## Related Publications

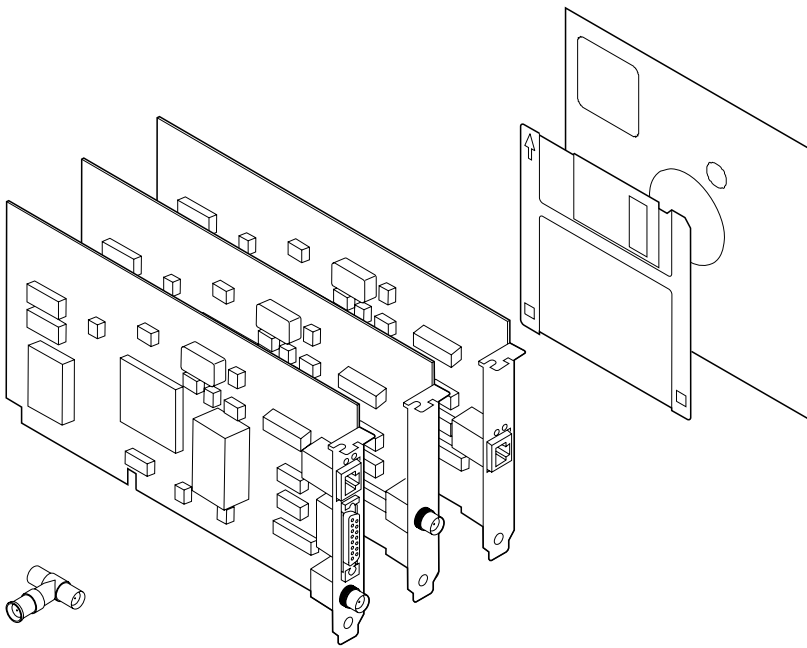
Other publications related to the use of this adapter are:

- 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 Administrator's Reference Volume 1: Planning and Installation (Version 2.0)*, S04G-1032

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

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## Contents of the Adapter Kit



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).

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## 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.

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## 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:

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

- 3** Follow the instructions under “Placing the Adapter in an Expansion Slot” on page 11.
- 4** Follow the instructions under “Connecting the Adapter to the Network” on page 11.
- 5** Follow the instructions under “Configuring the Adapter” on page 16 to make sure that the adapter is configured to work with your network.
- 6** Follow the instructions under “Running Adapter Diagnostics” on page 25 to make sure that you have installed the adapter correctly.
- 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 that 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 programs:

<b>File Name:</b>	<b>File Description:</b>
<b>Root directory</b>	
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
<b>NDIS\DOS directory</b>	
IBMENI.DOS	DOS NDIS device driver
IBMENI.NIF	DOS network information file
<b>NDIS\OS2 directory</b>	
IBMENI.OS2	OS/2* NDIS device driver
IBMENI.NIF	OS/2 network information file
<b>NOVELL\DOS directory</b>	
IBMENIO.COM	DOS ODI device driver
NET.CFG	Sample network configuration file
IBMENIO.INS	Installation information file
DRIVER.LST	Installation support file
<b>NOVELL\OS2 directory</b>	
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
<b>NOVELL\NETWARE\386SERV directory</b>	
IBMENIO.LAN	ODI NetWare** server driver
AUTOEXEC.NCF	Sample network configuration file

<b>File Name:</b>	<b>File Description:</b>
<b>NOVELL\NETWARE\286SERV directory</b>	
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

<b>NOVELL\NETWARE\NWLITE directory</b>	
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 page 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 100 meters (328 feet).
  - 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 185 meters (607 feet).

- 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 50 meters (164 feet).

- 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:

<b>File Name:</b>	<b>File Description:</b>
<b>Root directory</b>	
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
<b>NDIS\DOS directory</b>	
IBMENI.DOS	DOS NDIS device driver
IBMENI.NIF	DOS network information file
<b>NDIS\OS2 directory</b>	
IBMENI.OS2	OS/2 NDIS device driver
IBMENI.NIF	OS/2 network information file
<b>NOVELL\DOS directory</b>	
IBMENIO.COM	DOS ODI device driver
NET.CFG	Sample network configuration file
IBMENIO.INS	Installation information file
DRIVER.LST	Installation support file
<b>NOVELL\OS2 directory</b>	
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
<b>NOVELL\NETWARE\386SERV directory</b>	
IBMENIO.LAN	ODI NetWare server driver
AUTOEXEC.NCF	Sample network configuration file



<b>File Name:</b>	<b>File Description:</b>
<b>NOVELL\NETWARE\286SERV directory</b>	
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

<b>NOVELL\NETWARE\NWLITE directory</b>	
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 100 meters (328 feet).

- 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:

<b>File Name:</b>	<b>File Description:</b>
<b>Root directory</b>	
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
<b>NDIS\DOS directory</b>	
IBMENI.DOS	DOS NDIS device driver
IBMENI.NIF	DOS network information file
<b>NDIS\OS2 directory</b>	
IBMENI.OS2	OS/2 NDIS device driver
IBMENI.NIF	OS/2 network information file
<b>NOVELL\DOS directory</b>	
IBMENIO.COM	DOS ODI device driver
NET.CFG	Sample network configuration file
IBMENIO.INS	Installation information file
DRIVER.LST	Installation support file
<b>NOVELL\OS2 directory</b>	
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
<b>NOVELL\NETWARE\386SERV directory</b>	
IBMENIO.LAN	ODI NetWare server driver
AUTOEXEC.NCF	Sample network configuration file

<b>File Name:</b>	<b>File Description:</b>
<b>NOVELL\NETWARE\286SERV directory</b>	
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

<b>NOVELL\NETWARE\NWLITE directory</b>	
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 185 meters (607 feet).
- 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

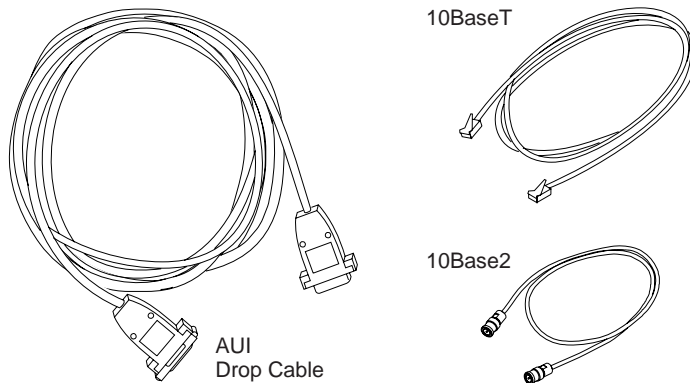
The option diskette (shipped with the adapter) provides the device drivers required to support the environments listed above.

## 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 under "Slot Numbers" on 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.)

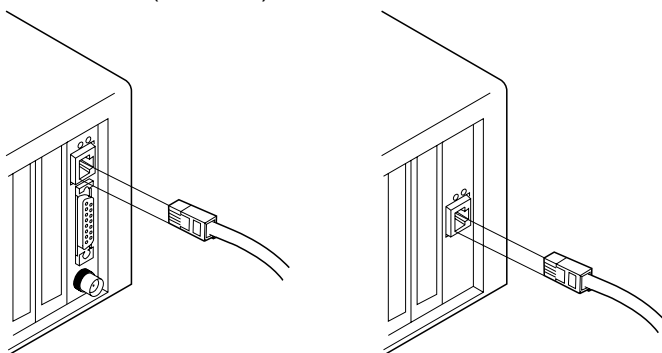


**Note:** Only one cable can be connected to the LAN Adapter for Ethernet at any time.

**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.)

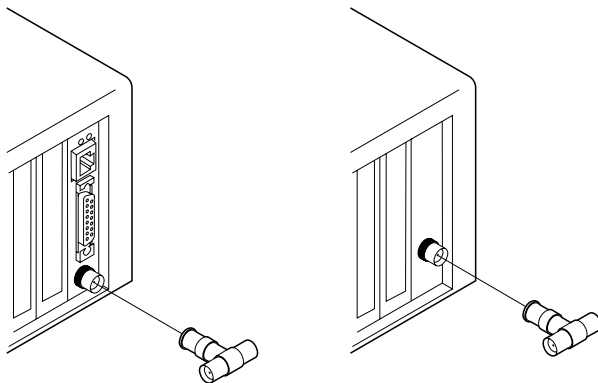
**Note:** The maximum length of twisted-pair cable between the concentrator and the workstation is 100 meters (328 feet).



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**

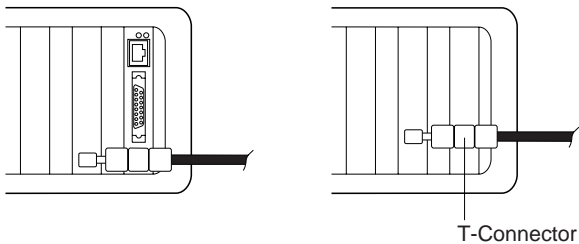
You need an RG-58 standard coaxial cable with BNC connectors. Connect the BNC T-type connector (shipped with the adapter) to the adapter. (See the following figures.)



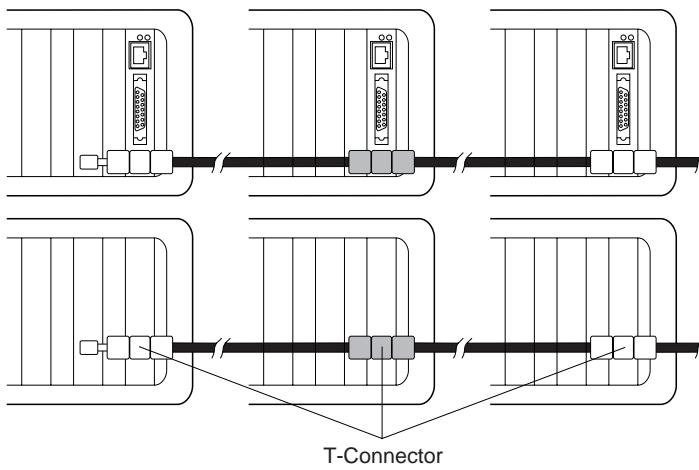
**Notes:**

- 1) There may be a clearance problem in some computers 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 185 meters (607 feet).

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.)



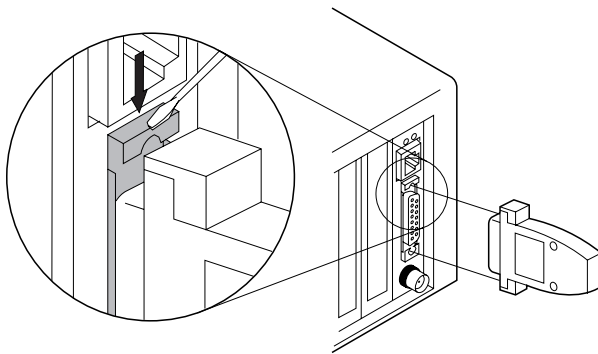
If the computer you are installing is not the last in the Ethernet network, attach cables from the Ethernet network to both ends of the T-connector. (See the following figures.)





### **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

### Notes:

1. 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.
2. If you are planning to use RiPL and are installing more than one adapter, see "POST and RiPL" on page 58 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 54.

**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 step **c**.

## **a Configuring a 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) that 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, and 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 Configuring a New Adapter Manually**

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

Refer to the list of parameters shown in the chart in 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 configuration 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 option 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 set the I/O Base Address values and Interrupt assignment manually, 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

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**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*

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**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

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**Physical Media**

**Description:** This parameter allows you to select the media type that 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(10BASE-T)
  - ISA Ethernet Adapter CX ==>Thin Ethernet
  - LAN Adapter for Ethernet, select from:
    - TPI(10BASE-T)
    - 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 16 KB 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, use the Tab key to toggle and view the available addresses, and 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, and 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 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 parameters from those listed in 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, and 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
<b>Parameters:</b>	
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 **Esc** 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 drive A.  
**Note:** If you do not have a DOS session available with your operating system, refer to “Configuring in a Non-DOS Environment” on page 54.
- 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, and then turning the power back on.).

**Notes:**

- a. 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 has been write protected, all configuration parameters will still be saved to the adapter's memory.

- b. 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 information about installing the device driver you need.

If your operating system environment is:	Go to:
<b>NetWare environment</b>	
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
<b>Other environments</b>	
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" of 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 about 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\IBMNIOP.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 depends on the architecture you selected during configuration.)

**1** For shared memory:

```
DEVICE=IBMENIOS.OS2
```

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

```
DEVICE=IBMNIOP.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 IBM LAN Support Program's device driver installation tool, DXMAID, to install the DOS NDIS Device Driver. Refer to the *IBM Local Area*

*Network Support Program User's Guide* for information about 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 49.

### **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 and 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 Network Administrator Reference Volume 1: Planning and Installation* (Version 2.0) guide for information about using the LAN Services installation and configuration program.

When the LAN Services installation and configuration program presents a default directory of A:\, change the directory to A:\NDIS\OS2 so the LAN Services installation and 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 49.

---

## Problem Identification

The following chart lists all of the diagnostic tests that are performed while running adapter diagnostics as shown on page 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.

<b>Test</b>	<b>Cause</b>	<b>Action</b>
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 correctly terminated. Check all cables to verify that they are working correctly. 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 the same address	Change the Base Memory Address so that no conflicts exist.

## Descriptions of LEDs

There are two LEDs 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 LED is lit, 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 LED 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 LED is lit, traffic is moving over the network.

### LEDs on the LAN Adapter for Ethernet TP:

**green LED** When this LED is lit, the link to the network is good.

**yellow LED** When this LED is lit, traffic is moving over the network.

### LEDs on the LAN Adapter for Ethernet CX:

**green LED** When this LED is lit, traffic is moving over the network.

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

Under normal conditions, this LED blinks. If the LED is shining steadily, 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.

- 2** Select the option that allows you to display and 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, contact your provider of service.



---

## Help and Service Information

During the warranty period, you can get toll-free technical support 24 hours a day, 7 days a week, to answer any questions about your new IBM option. If you need warranty service, return or exchange is available. In addition, if your IBM option is installed in an IBM computer, you might be entitled to service at your location. Your technical support representative can help you determine the best alternative.

Before calling, please prepare for your call by following these steps.

**CAUTION:** To avoid electrical shock, unplug your computer and all attached devices from electrical outlets before performing any troubleshooting procedure.

---

### Step 1: Troubleshooting

You might be able to solve the problem yourself. Before calling IBM, you might want to try some or all of the following troubleshooting procedures.

1. Remove and reattach all option cables.
2. Remove and reseal the option.
3. Place the option in a different slot, if one is available.
4. If your option contains jumpers or switches, check that they are set as specified.
5. Reread any software instructions; be sure software settings are correct.
6. Inspect the option for damage, such as bent pins.
7. Check the computer manual for instructions about the installation of upgrades. Look for a section about system setup or system configuration. Follow all procedures.

8. After completing these steps, reassemble the computer and connect the power cord.

---

## Step 2: Preparing for the Call

To assist the technical support representative, have available as much of the following information as possible:

1. Option name, description, and serial number (if any)
2. Proof of purchase
3. Computer manufacturer, model, serial number (if IBM), and manual
4. Exact wording of the error message (if any)
5. Description of the problem
6. Hardware and software configuration information for your system

If possible, be at your computer. Your technical support representative might want to walk you through the problem during the call.

---

## Step 3: Placing the Call to IBM

Use one of the following numbers:

- Within the United States, call the Options by IBM HelpCenter\* at 1-800-426-7299.
- Within Canada
  - For support, call HelpPC at 1-800-565-3344.
  - For more information or to place an order, call 1-800-465-7999.
- Outside the United States and Canada, contact your IBM HelpWare\* number, your place of purchase, or your local branch office.

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\* Trademark of the IBM Corporation.



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## Product Warranties and Notices

International Business Machines Corporation

Armonk, New York, 10504

### Statement of Limited Warranty

*The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you originally purchase for your use, and not for resale, from IBM or an IBM authorized reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. Machines are subject to these terms only if purchased in the United States or Puerto Rico, or Canada, and located in the country of purchase. If you have any questions, contact IBM or your reseller.*

**Machine:** IBM LAN Adapter for Ethernet and the IBM LAN Adapter for Ethernet TP and the IBM LAN Adapter for Ethernet CX

**Warranty Period\*:** Five Years

*\*Elements and accessories are warranted for three months. Contact your place of purchase for warranty service information.*

### Production Status

Each Machine is manufactured from new parts, or new and serviceable used parts (which perform like new parts). In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's warranty terms apply.

### The IBM Warranty

IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications. IBM calculates the expiration of the warranty period from the Machine's Date of Installation. The date on your receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

During the warranty period, IBM or your reseller will provide warranty service under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine. IBM or your reseller will specify the type of service.

For a feature, conversion, or upgrade, IBM or your reseller may require that the Machine on which it is installed be 1) the designated, serial-numbered Machine and 2) at an engineering-change level compatible with the feature, conversion, or upgrade. Some of these transactions (called "Net-Priced" transactions) may include additional parts and associated replacement parts that are provided on an exchange basis. All removed parts become the property of IBM and must be returned to IBM.

Replacement parts assume the remaining warranty of the parts they replace.

If a Machine does not function as warranted during the warranty period, IBM or your reseller will repair or replace it (with a Machine that is at least functionally equivalent) without charge. If IBM or your reseller is unable to do so, you may return it to your place of purchase and your money will be refunded.

If you transfer a Machine to another user, warranty service is available to that user for the remainder of the warranty period. You should give your proof of purchase and this Statement to that user.

### **Warranty Service**

To obtain warranty service for the Machine, you should contact your reseller or call IBM. In the United States, call IBM at **1-800-426-7299**. In Canada, call IBM at **1-800-565-3344**. You may be required to present proof of purchase.

Depending on the Machine, the service may be 1) a "Repair" service at your location (called "On-site") or at one of IBM's or a reseller's service locations (called "Carry-in") or 2) an "Exchange" service, either On-site or Carry-in.

When a type of service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced.

It is your responsibility to:

1. obtain authorization from the owner (for example, your lessor) to have IBM or your reseller service a Machine that you do not own;
2. where applicable, before service is provided —
  - a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provide,
  - b. secure all programs, data, and funds contained in a Machine,
  - c. inform IBM or your reseller of changes in a Machine's location, and
  - d. for a Machine with exchange service, remove all features, parts, options, alterations, and attachments not under warranty service. Also, the Machine must be free of any legal obligations or restrictions that prevent its exchange; and
3. be responsible for loss of, or damage to, a Machine in transit when you are responsible for the transportation charges.

### **Extent of Warranty**

IBM does not warrant uninterrupted or error-free operation of a Machine.

Misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible may void the warranties.

THESE WARRANTIES REPLACE ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. HOWEVER, SOME LAWS DO NOT ALLOW

THE EXCLUSION OF IMPLIED WARRANTIES. IF THESE LAWS APPLY, THEN ALL EXPRESS AND IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD.

In Canada, warranties include both warranties and conditions.

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

#### **Limitation of Liability**

Circumstances may arise where, because of a default on IBM's part (including fundamental breach) or other liability (including negligence and misrepresentation), you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages, IBM is liable only for:

1. bodily injury (including death), and damage to real property and tangible personal property; and
2. the amount of any other actual loss or damage, up to the greater of \$100,000 or the charge for the Machine that is the subject of the claim.

Under no circumstances is IBM liable for any of the following:

1. third-party claims against you for losses or damages (other than those under the first item listed above);
2. loss of, or damage to, your records or data; or
3. economic consequential damages (including lost profits or savings) or incidental damages, even if IBM is informed of their possibility.

Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

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

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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.

### **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

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## 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, and then turning the power back on.)
- 4** Return to the previous menu and save the configuration.

The Boot PROM is now disabled.

Continue with “Running Adapter Diagnostics” on page 25.

---

### 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.

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 and 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 obtain access to 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 following message is displayed:

```
LTA0005E Driver initialized for
wrong mode.
```

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

```
[IBMENI_MOD]
Drivename = 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 on 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 on 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 drive A drive and turn on your computer.
- 3** Press Enter after a caution message is displayed.  
**Note:** You may ignore 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 **Configure New Adapter**.
  - c** Select **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.

---

## Moving a Configured ISA Ethernet Adapter to Another Computer

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



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 reconfigured 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.”

---

## 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 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 has been 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 perform 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 that 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 drive A 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 **Esc** and continue with step 6 on page 57.

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 **Set up as master station**.
- 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 **Esc** to continue.

The Advanced Diagnostics data transfer test is now complete.

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

#### **To use the network monitor utility**

- 1** Ensure your IBM LAN Adapter for Ethernet is correctly installed, configured, and connected to your network.
- 2** Place the option diskette in drive A 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 **Diagnostics** 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 **Esc** 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 **Advanced Network Diagnostics** and press **Enter**.
- 7** From the Advanced Network Diagnostics window, select **Show packets on networks** and press **Enter**.  
  
As packets from the network are passed through the adapter, they will appear on your display continuously.
- 8** Press **Esc** 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 correctly. 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 runs each time the computer is booted. The results of the test are displayed on the terminal.

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

```
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.

### Notes:

1. Additional messages may be displayed before and/or after this one.
2. Only one adapter should have the Boot PROM enabled. That adapter will report the status of all other installed ISA Ethernet Adapters. Disable the Boot PROM (see “Disabling the Boot PROM” on page 49 for instructions) on all other ISA Ethernet Adapters installed.

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

---

### PR001

**Description:** POST/RPL ROM integrity error.

**Possible Cause:** ROM not correctly inserted in the socket or ROM defective.

**User Action:** Verify that the ROM is correctly inserted in the socket. If not, have the adapter serviced.

## PR002 • PR007

---

### 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 the 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 correctly. 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 correctly.

**User Action:** Have the adapter serviced.

---

### PR007

**Description:** Cable connection error.

**Possible Cause:**

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

**User Action:**

1. Check all cable connections.

## PR008 • PR100

2. Verify that the cable type is configured correctly.
3. Verify that the cable is connected correctly.

---

### PR008

**Description:** Transmission loopback error.

**Possible Cause:**

1. Defective cable.
2. Defective adapter.

**User Action:** Verify that the cable is connected correctly. Otherwise, have the adapter serviced.

---

### PR009

**Description:** Host bus interface error.

**Possible Cause:**

1. The computer's system unit is not working correctly.
2. Adapter's interface to the system bus is not working correctly.

**User Action:** Verify that the 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 the computer's system unit.

**User Action:** Reallocate system RAM.

---

### PR100

**Description:** Adapters not responding or failures detected.

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

**User Action:** Verify that installation was 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 correctly, or installing the adapter in another computer. If the failure or error condition persists, contact your provider of service.

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\*\* LANManager\*\* 2.2

To enable the ISA Ethernet Adapters to use the 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 that does not have a diskette drive.

If you install more than one ISA Ethernet Adapter in a computer that does not have a diskette drive, only one of the adapters should have the Boot PROM enabled. (See “Disabling the Boot PROM” on page 49 for information about 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 correctly.

Once an ISA Ethernet Adapter is installed in a computer that 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 want 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 hard 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 obtain access to your hard disk.

To reactivate your computer's hard 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 64 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<sup>1</sup>

RPL-ROM-IRQ: 5<sup>1</sup>

RPL-ROM-PIO: 1000<sup>1</sup>

RPL-ROM-FFC: 25<sup>1</sup>

Where:

**RPL-ROM-ADR=** The universally administered address of the adapter.

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

---

<sup>1</sup> This value will differ for each individual adapter, depending on how the adapter was configured.

**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 correctly. If all cables are connected correctly and there is still an RiPL failure, contact 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 information about installing the RiPL program on a server, refer to your network operating system documentation.

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

### **RiPL with Novell NetWare**

If your network operating system is Novell NetWare, you will need an RiPL upgrade kit for an 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

The use of the ISA Ethernet Adapter's Device Drivers in 8086- and 8088-based computers is not supported.

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 about 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 an IBM PS/2 Model 25

Some versions of the IBM PS/2 Model 25 are designed for use with an 8-bit adapter. These computers 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 computer 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 IBM PS/2 Model 25 in any way.

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

- 1** The option card holder is held onto the computer's system board by one screw. Remove the screw with 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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