User's Guide

Ethernet and Fast Ethernet Adapters

adaptec®

Ethernet and Fast Ethernet Adapters
Stock Number: 511277-00, Rev. B Page: Front Cover
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

Adaptec, Inc.
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WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

Canadian Compliance Statement

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matérial brouilleur du Canada.

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WARNING: This is a Class A product. In domestic environments this product may cause radio interference in which case the user may be required to take adequate measures.

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Federal Communications Commission Radio Frequency Interference Statement

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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tee that interference will not occur in a particular installation. However, if this equipment does cause interference to radio or television equipment 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 equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio / television technician for help.

Use a shielded and properly grounded I / O cable and power cable to ensure compliance of this unit to the specified limits of the rules.

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.

Adaptec, Inc.

ANA-6911A / TX
ANA-6911A / TXC
ANA-6901A
ANA-6901A / C

Tested To Comply With FCC Standards
FOR HOME OR OFFICE USE

Canadian Compliance Statement

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matérial brouilleur du Canada

European Compliance Statement

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Safety Standards

These products meet the following national and international regulations:

- UL 1950 Standard for Safety of Information Processing and Business Equipment
- IEC 950 Safety of Information Technology Equipment in Electrical Business Equipment
- CAN / CSA-C22.2 # 950 Safety of Information Technology Equipment including Electrical Business Equipment

To ensure safe operating conditions, it is recommended that these products be installed in UL Listed computers.

Contents

1 Getting Started

System Requirements 1-1
What You Need to Know 1-2
Conventions 1-2
Advisories 1-3
Fast Ethernet 1-3
- 10/100 Autosensing Models 1-4
- Quartet Adapters 1-4
- Ultimate Combo Adapter 1-4

2 Installing Your Adapter

Before You Begin 2-1
Installing the Adapter 2-2
Configuring the PCI Adapter 2-3
- PCI BIOS Settings 2-3
- PCI Interrupts 2-3

Configuring Quartet Adapters 2-4
- PCI-PCI Bridge Chip 2-4
- Testing the PCI Configuration 2-5
- Testing the Quartet Configuration 2-5

Configuring the EISA Adapter 2-6
- Running the EISA Configuration Utility 2-6
- EISA Configuration Options 2-6

Configuring the ISA Adapter 2-7
- Plug and Play Environments 2-7
- Non Plug and Play Environments 2-7

3 Connecting to Your Network Cable

Cable Requirements 3-1
- Connecting the Cable 3-2
  - Connecting the Quartet 3-2
- Crossover Cables 3-2

Diagnostic LEDs 3-4

Checking the Connection with EMDIAG 3-5

4 Installing Network Drivers

Installation Instructions and Optional Keywords 4-1
- Driver Naming Conventions 4-2
- Full Duplex Support 4-2

NetWare 4-3
- NetWare 3.x Server Driver 4-3
  - Sample AUTOEXEC.NCF for NetWare 3.x 4-4
  - Installing Duralink for NetWare 3.x 4-4
  - Configuring Duralink Failover 4-5
  - Configuring Duralink Protocols 4-5
  - Configuring Duralink Ports 4-6
  - Modifying Existing Duralink Configuration 4-7
- NetWare 4.x and 4.11 4-7
  - Sample AUTOEXEC.NCF for NetWare 4.x and 4.11 4-8
  - NetWare Server Driver Parameters 4-8
  - Installing Duralink for NetWare 4.x 4-9
  - Configuring Duralink for NetWare 4.x 4-10
  - Loading and Configuring SNMP and DMI Agents 4-12
  - Unbinding Duralink Protocols for Backup Host Adapters 4-13
  - Configuring the NetWare Client for Failover 4-13
  - Modifying Existing Duralink Configurations 4-13

Ethernet and Fast Ethernet Adapters
Stock Number: 511277-00, Rev. B Page: vi
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

DOS ODI 4-16
- Automated NetWare Client Installation 4-16
- Manual Installation 4-16
- DOS ODI Parameters 4-17

Windows NT 4-17
- Windows NT 3.51 Driver 4-17
  - Windows NT Driver Parameters 4-18
  - Quartet Binding Sequences 4-18
  - Installing Duralink for Windows NT 3.51 4-19
- Windows NT 4.0 4-20
  - Windows NT Driver Parameters 4-21
  - Quartet Bindings 4-21
  - Installing Duralink for Windows NT 4.0 4-22

Windows 95 4-24
- Windows 95 Installation for ISA 4-24
- Windows 95 Installation for EISA 4-25
- Windows 95 Installation for PCI 4-25
- Windows 95 Driver Parameters 4-26
- Windows for Workgroups 4-26
- Windows for Workgroups Driver Parameters 4-27

NDIS 2.0 4-27
- Installing With LAN Manager 4-28
- NDIS Driver Parameters 4-28

IBM O/S 2 SMP 4-29
- Installing with LAN Server 4-29
- Installing the Drivers for a Pre-existing OS/2 SMP 4-30
- Installing OS/2 SMP for the First Time 4-31
- Editing Driver Parameters 4-32

Unix Drivers 4-32
- SCO OpenServer 5.0 4-33
  - Installing the SCO OpenServer Driver 4-33
  - Configuring the SCO OpenServer Driver 4-34
- SCO Unixware SMP 4-34
  - Installing the Drivers 4-34
  - Configuring the IP Addresses 4-35

Ethernet and Fast Ethernet Adapters
Stock Number: 511277-00, Rev. B Page: vii
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

5 Using EMDIAG to Troubleshoot Problems

Running EMDIAG 5-2
Using EMDIAG for PCI Adapters 5-2
EMDIAG PCI Main Menu 5-2
Configuration Status 5-3
Diagnostics 5-4
PCI Device Information 5-6
Readme Viewer 5-8
Technical Support Information 5-8
Exit 5-8
EMDIAG for EISA Adapters 5-8
EMDIAG for ISA Adapters 5-9
Troubleshooting 5-10
Isolating Faulty Hardware 5-10
Frequently Asked Questions 5-11

A Adapter Specifications

ANA-6510/TX ISA A-1
ANA-6511/T4 and ANA-6511/T4 Combo ISA A-2
ANA-6511/TX and ANA-6511/TX Combo ISA A-3
ANA-6710/TX EISA A-4
ANA-6711/T4 and ANA-6711/T4 Combo EISA A-5
ANA-6711/TX and ANA-6711/TX Combo EISA A-6
ANA-6901A and ANA-6901A Combo A-7
ANA-6904 and ANA-6904BNC Quartet A-8
ANA-6910/FX ST and ANA-6910/FX SC A-9
ANA-6910/TX PCI A-10
ANA-6911/T4 and ANA-6911/T4 Combo PCI A-11
ANA-6911A/TX and ANA-6911A/TX Combo PCI A-12
ANA-6911/UC Ultimate Combo A-13
ANA-6940/Quartet TX A-14
ANA-6944A/Quartet TX A-15
ANA-6944/Quartet T4 A-16

Ethernet and Fast Ethernet Adapters
Stock Number: 511277-00, Rev. B Page: viii
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

B Cables

Twisted Pair Cable Types B-1
Straight-through Cable B-1
Crossover Cable B-2
Cable Type Parameters B-3

❒

1

Getting Started

This document contains information about installing and configuring the Adaptec® LAN adapters. These adapters are engineered for high-speed networking between ISA, EISA, and PCI local bus computers and IEEE 802.3 Ethernet and IEEE 802.3u Fast Ethernet networks.

Procedures in this document describe installing the adapter, installing and configuring the adapter drivers, and troubleshooting the Adaptec LAN adapters.

System Requirements

The minimum system requirements for using the Adaptec LAN adapters adapters and for running the *EMDIAG* Diagnostics Utility are as follows:

System Component	Requirements
PCI adapter	Available bus mastering PCI slot; most recent PCI system BIOS recommended
EISA adapter	Available EISA slot and free interrupt; most recent EISA Configuration Utility (ECU) recommended
ISA adapter	Available EISA or 16-bit ISA slot and free interrupt
Quartet adapter with Windows NT or Windows 95	System BIOS supporting PCI–PCI bridge chip
EMDIAG program	MS-DOS 3.3 or later

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 1-1
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

What You Need to Know

You should have basic knowledge of Ethernet networking. In addition, you need to do the following:

- Identify your adapter bus type: ISA, EISA, or PCI.
- Determine if your computer has a Plug-and-Play BIOS—a BIOS that configures adapters automatically. You need this type of a BIOS for ISA adapters, or if you are using an operating system that supports Plug-and-Play (such as Windows NT™ or Windows® 95).
- Determine the speed of your network: 10 Mbps or 100 Mbps.
- Determine if the device you are connecting the adapter to is a full-duplex device.
- Identify your adapter model. If you are not sure, look on the adapter.
- Identify the type of network operating system to which you want to connect.

Conventions

The following typographic conventions are used in this document:

Bold	Used for keystrokes (press the **Enter** key) and for options you are directed to select from a menu or list (select **Configuration Status** from the main menu).
Helvetica	Used for operator entry that you must type exactly as shown (a:\emdiag) and for messages that appear on the screen (Performing Automatic Media Detection).
Helvetica Italics	Used as a place holder for text you must determine and type (*drive* = boot drive letter) and for program and file names that appear in body text (the *readme.txt* file).

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 1-2
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

Advisories

Always use care when handling any electrical equipment. To avoid injury to people or damage to equipment and data, be sure to follow the cautions and warnings in this document.

Note: Notes are reminders, tips, or suggestions that might simplify the procedures included in this document.

Caution: Cautions alert you to actions that might cause damage to your system or your data.

WARNING: Warnings alert you to actions that might cause injury to you or someone else.

Adaptec does not claim to have included in this document every condition or situation that might require a caution or warning notice. Be sure to consult the documentation for your computer and any connected equipment when you are installing the equipment or changing its configuration.

WARNING: *Always* use caution when handling electrical equipment!

Fast Ethernet

Fast Ethernet is a networking standard defined by the Institute of Electrical and Electronic Engineers (IEEE) in their IEEE 802.3u Specification. Fast Ethernet runs at 100 Mbps or 200 Mbps in Full Duplex mode.

Fast Ethernet uses the same Carrier Sense Multiple Access with Collision Detection (CSMA / CD) architecture used on 10BASE-T 10 and 10BASE-2 10 Mbps network specifications, which allows for easy integration with existing networks.

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 1-3
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

IEEE 802.3u encompasses three different cable specifications: 100BASE-T4, 100BASE-TX, and 100BASE-FX.

	100BASE-T4	100BASE-TX	100BASE-FX
Cable supported	CAT 3,4,5 UTP, Type 1 STP	CAT 5 UTP, Type 1 STP	62.5/125m. multimode fiber
#of Cable pairs	4	2	1
Node-to-repeater cabling distance	100 meters	100 meters	137 meters

10/100 Autosensing Models

All 10/100 models support autosensing between 10 and 100 Mbps line speeds; no adapter configuration is necessary.

Quartet Adapters

The Adaptec Quartet adapters provide four separate Fast Ethernet segments on a single adapter. Each segment runs at full cable speed. Selected models support per port autosensing between 10 and 100 Mbps line speeds.

Ultimate Combo Adapter

The Adaptec Ultimate Combo adapter supports both the 100BASE-T4 and the 100BASE-TX Fast Ethernet standards, including autosensing, on the same adapter. The Ultimate Combo also supports standard 10 Mbps Ethernet via UTP, BNC, and AUI cable ports.

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Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 1-4
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

2

Installing Your Adapter

This chapter describes how to install and configure your Adaptec adapter in your computer.

Before You Begin

Determine the bus type of your Adaptec (ISA, EISA, or PCI) by looking at the model name on the adapter. After turning OFF your PC's power supply and removing the power cable, remove the cover from your PC. Find an empty expansion slot compatible with the bus type of your Adaptec adapter. The following figure illustrates the visual differences between slot types:

Note:

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 2-1
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

Installing the Adapter

WARNING: Before you unpack your adapter or install it in your computer, make sure you are grounded to avoid damaging any highly static-sensitive components on the adapter or your computer. To reduce your static electricity, touch your computer's metal chassis and then maintain grounding by wearing a wrist strap attached to the chassis or other ground.

1. Turn OFF your computer and unplug it from its power source.
2. Disconnect all cables connected to your computer.
3. Remove any jewelry from your hands and wrists.
4. Using insulated or nonconducting tools, unscrew your computer's cover from the chassis.
5. Carefully lift the adapter out of its antistatic container. Check the adapter for any visible signs of damage which may have occurred during shipment.

   If you find a problem, immediately notify your network supplier and the shipping service which delivered your adapter.
6. Be sure to use an expansion slot compatible with the bus type of your adapter.

Note: Adaptec PCI adapters require a bus mastering slot. Adaptec ISA adapters require a 16-bit ISA or 32-bit EISA slot.

7. Remove the metal guard from the back of the expansion slot.
8. Holding the adapter by its metal bracket, carefully insert the adapter into the expansion slot. Make sure the board is inserted all the way into the slot. Both rows of gold fingers must be fully seated in the PC connector.
9. Secure the adapter in the expansion slot with the screw used for the metal guard.

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 2-2
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

10 Screw the computer's cover back on the computer.

11 Reconnect all devices and cables except the network cable. See Chapter 3, *Connecting to Your Network Cable* for more information

12 Configure the adapter as described in *Configuring the PCI Adapter*, *Configuring Quartet Adapters*, *Configuring the EISA Adapter*, or *Configuring the ISA Adapter*.

Configuring the PCI Adapter

Your PCI computer's BIOS determines available adapter resources and configures the Adaptec PCI adapters automatically. However, depending on your system, you may need to configure your motherboard, PCI BIOS, or both.

PCI BIOS Settings

PCI BIOS configuration options vary widely by system. The following section discusses representative PCI configuration options, but may not exactly match your computer. (Some computer BIOSs provide no PCI configuration options, but instead automatically configure all PCI settings. Do not be alarmed if your BIOS does not provide the options described below). We recommend that you configure all PCI slots in your system, even those not currently in use, for later convenience. Enter your computer BIOS Setup, and select **Advanced Settings** from the Main Menu.

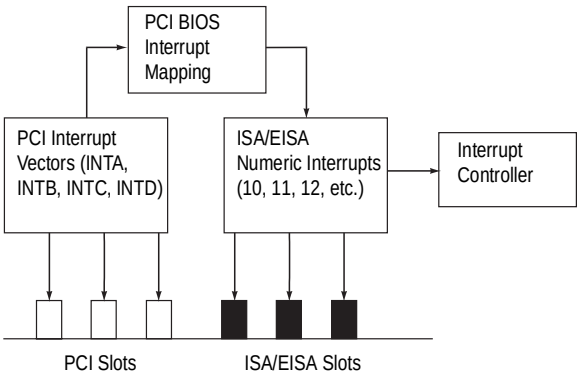
PCI Slot Enabled	Use this setting to enable all PCI slots in your system.
Bus Mastering	Use this setting to enable PCI bus mastering.
PCI INTA	Use this setting to assign an ISA interrupt (10, 11, 12, etc.) to PCI Interrupt Vector A.
PCI INT Vector	Use this setting to assign PCI Interrupt Vector A to the PCI slot(s).
PCI Bus Latency	Configure this setting to a value between 40 and 80.

PCI Interrupts

PCI uses an interrupt architecture that maps PCI interrupts to regular ISA interrupts. Some PCI BIOSs will refer directly to the numeric ISA interrupts (i.e., 10, 11, 12) for PCI slots. Other BIOSs will refer to

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 2-3
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

the PCI interrupt used by the slot (i.e., INTA, INTB, INTC, INTD). All Adaptec PCI adapters use the PCI interrupt INTA, and the ISA interrupt to which it is mapped.



Configuring Quartet Adapters

Quartet adapters use the resources of a single adapter to provide four separate Fast Ethernet segments. A Quartet adapter requires a PCI slot with enough room to accept a full length adapter. Follow the instructions above for configuring a single port PCI adapter to install and configure your Quartet.

If you are planning to use the Quartet adapter with Windows NT or Windows 95, please see the discussion of PCI-PCI Bridge chips below.

PCI-PCI Bridge Chip

Quartets use the DEC® PCI-PCI Bridge chip to increase the capacity of PCI computers by adding an additional PCI bus to the existing motherboard. Some older system BIOSs fail to configure a Quartet adapter properly, because the BIOS does not recognize the PCI-PCI Bridge chip. Such BIOSs need to be upgraded with a new BIOS from the computer manufacturer before the system can be used with Windows NT or Windows 95.

Testing the PCI Configuration

Use *EMDIAG* to make sure the PCI adapter is configured properly. For more information about *EMDIAG*, see Chapter 5, *Using EMDIAG to Troubleshoot Problems*.

1. Type A:\EMDIAG and press **Enter** to start the Adaptec setup program.
2. At the Main Menu, select **Configuration Status**.
3. The Configuration Status screen reports the resources in use by the adapter.If the adapter has encountered a resource conflict with another adapter, or is not yet fully configured, *EMDIAG* displays an error message.

   Try repeating the installation and configuration procedures again. If you still have difficulties, refer to Chapter 5, *Using EMDIAG to Troubleshoot Problems*.

Testing the Quartet Configuration

If you are planning to use your quartet with Windows NT you must first determine if your system's BIOS supports the PCI-PCI Bridge chip.

1. At *EMDIAG*'s Main Menu, select **PCI Device Information**.

   A screen similar to the following appears:

Note: If your system's BIOS does not support the PCI-PCI Bridge chip, an error message will appear. Contact your computer manufacturer to obtain a new BIOS version that supports the PCI-PCI Bridge chip.

Configuring the EISA Adapter

Use the EISA Configuration Utility (ECU) provided with your EISA system to configure your EISA adapter. Your driver diskette contains the *!COG1100.CFG* EISA configuration file.

Running the EISA Configuration Utility

1. Start your computer's ECU according to the instructions provided in your system documentation.
2. Follow the instructions provided by your ECU for adding a new board. Insert the Adaptec diskette when prompted.
3. Follow the instructions provided by the ECU and EISA configuration file for the adapter to customize the configuration parameters.
4. When you are finished specifying your configuration, save the results and quit the configuration utility.
5. Reboot your computer.

EISA Configuration Options

Your ECU provides the following configuration options. In most cases the ECU automatically selects the optimum settings.

EISA IRQ Number	This option determines the interrupt to be used by the adapter. The possible choices are 5, 9, 10, and 11. The Adaptec EISA adapter requires an unshared interrupt.
DMA Channel	This option determines the DMA channel to be used. The possible choices are 3, 5, 6, and 7.
Compressed EISA Cycle Support	This option enables or disables support for compressed EISA bus cycles. This option is disabled by default. Enable this option only if your system supports compressed EISA bus cycles.

Your system's configuration should be updated by again running the ECU if the adapter is removed from the system.

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 2-6
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

Configuring the ISA Adapter

The Adaptec ISA adapter uses one I/O address range and one interrupt, and supports both Plug and Play and non-Plug and Play environments. Go to the section below that matches your environment.

Plug and Play Environments

Plug and Play functionality in your system can be provided by either the system BIOS, or by the operating system, as in the case of Windows 95.

No adapter configuration is required when using the ISA adapter in a Plug and Play environment. The Plug and Play configuration sequence will automatically configure the ISA adapter using non-conflicting resources each time the computer boots.

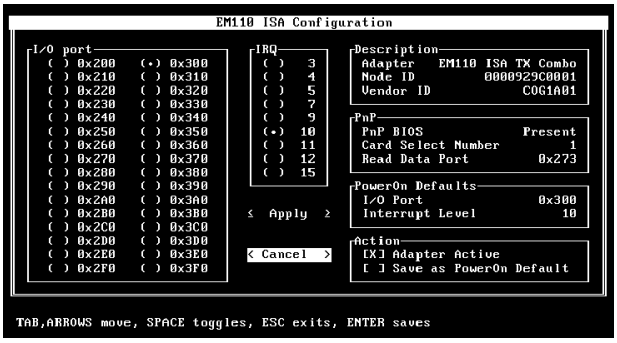
Non Plug and Play Environments

In non-Plug and Play environments, the ISA adapter defaults to the following settings:

- Interrupt 10 (hex A)
- I/O address 0x300

If these choices are already used in your system, change these settings as follows:

1. Insert the Adaptec Diskette in drive *a*.
2. Type A:\EMDIAG and press **Enter** to start the Adaptec setup program.



3. Use the Tab key to move to the IRQ box, and select the desired interrupt with the arrow and space keys.
4. Use the Tab key to move to the I/O Port box, and select the desired I/O port with the arrow and space keys.
5. Use the Tab key to move to the Action box, and select **Save as PowerOn Default**.
6. Use the tab key to select the **<Apply>** option, and press **Enter**.
7. Press **Esc** to exit.

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Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 2-8
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

3

Connecting to Your Network Cable

Cable Requirements

Cable requirements for Adaptec adapters vary according to network speed, cabling standard, and the connector to be used. The chart below identifies appropriate cabling, based on these variables. The chart is relevant to both Half Duplex (and also Full Duplex, for selected models) environments.

	Connector	10Mbps	100Mbps	Cable Pins Used
T4 Adapters (including Quartet)	RJ-45	CAT 3,4, 5 UTP	CAT 3,4,5 UTP	1 through 8[1]
	BNC[2]	RG-58 Coax	N/A	N/A
TX Adapters (including Quartet)	RJ-45	CAT 3,4, 5 UTP	CAT 5 UTP,	1,2,3 and 6
	BNC[2]	RG-58 Coax	N/A	N/A
FX Adapters	ST	N/A	62.5/125 micron multimode fiber	N/A
	SC	N/A	62.5/125 micron multimode fiber	N/A
Ultimate Combo	RJ-45 (with T4)	CAT 3,4, 5 UTP	CAT 3,4, 5 UTP	1 through 8[1]
	RJ-45 (with TX)	CAT 3,4, 5 UTP	CAT 5 UTP	1,2,3 and 6
	BNC	RG-58 Coax	N/A	N/A

[1] All 10 Mbps adapters using the RJ-45 connectors use pins 1,2,3 and 6
[2] Only available for the Combo versions.

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 3-1
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/14/97

Connecting the Cable

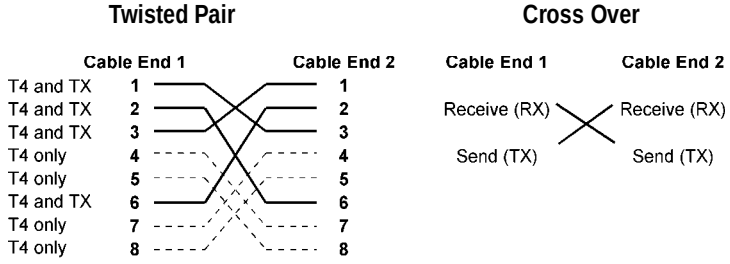
After making sure you have appropriate cabling, connect the cable to the adapter connector. (For Quartet adapters, connect up to four cables.)

Connecting the Quartet

Each Quartet adapter provides four separate connectors that can be used in any combination. If you load a Quartet network driver on a port that does not have a cable attached, you may receive a startup message on your server. This is normal and does not affect performance. To prevent this message, do not load the driver on a port unless a cable is attached.

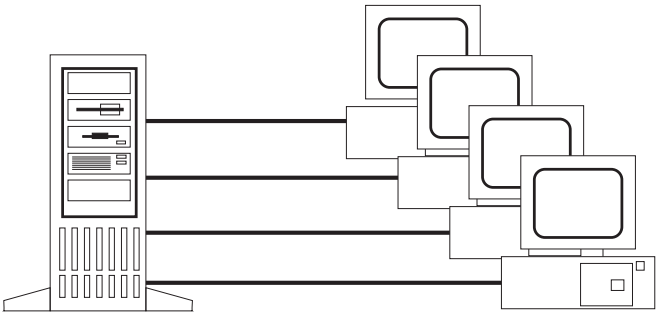
Crossover Cables

A twisted pair or fiber optic crossover cable allows you to connect servers and workstations directly, without the use of a hub. When using crossover cables, we recommend you override line speed autosensing by selecting either 10 Mbps or 100 Mbps in your driver configuration. See Chapter 4, *Installing Network Drivers* and Appendix B, *Cables* for more information.



Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 3-2
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/14/97

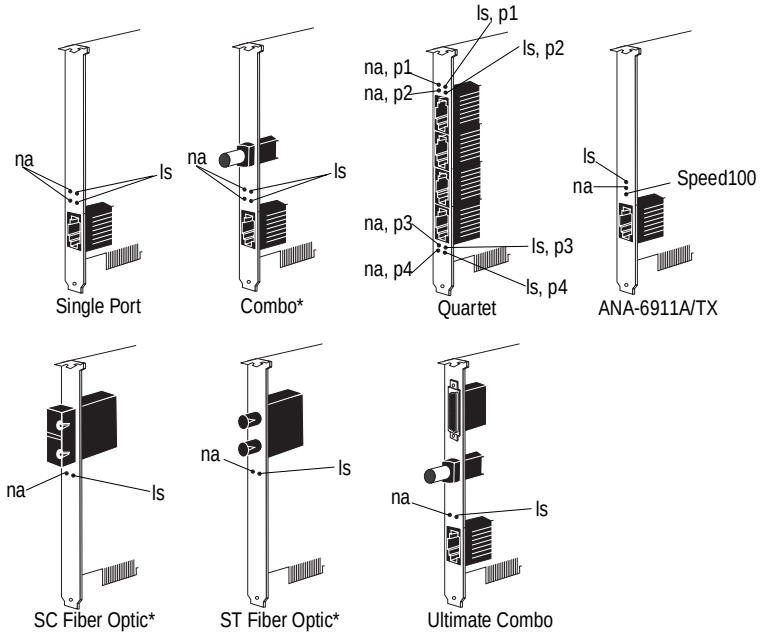
A simple network can be made by connecting a Quartet server directly to four workstations via crossover cables.



Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 3-3
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/14/97

Diagnostic LEDs

Diagnostic Light Emitting Diodes (LEDs) provide information about link status and network activity. See the table below for details on each LED function.



*10Mbps and 100Mbps single speed adapters provide only 1 link status and 1 network activity LED

Link Status (L.S.)		
LED lights when the adapter's driver is loaded, and indicates that an electronic link exists between the adapter device and repeater or switch.		
Speed	**Ports**	**Color**
10 Mbps	RJ-45	Green, with the exception of the Quartet and the Ultimate Combo—where it is yellow.
100 Mbps	RJ-45	Green. The LED blinks on T4 adapters.
Network Activity (N.A.)		
LED lights up to signal the presence of incoming or outgoing traffic.		
Speed	**Ports**	**Color**
10 Mbps	RJ-45, BNC, AUI	Yellow
100 Mbps	RJ-45, BNC, AUI	Yellow
Speed100 (ANA-6911A/TX)		
The Speed100 LED is green. When ON, it indicates 100Mbps, when OFF, it indicates 10Mbps.		

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 3-4
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/14/97

Checking the Connection with EMDIAG

After connecting the network cable to the adapter, use the *EMDIAG* diagnostics utility to test your connection. For more information about *EMDIAG*, see Chapter 5, *Using EMDIAG to Troubleshoot Problems*.

1. Type A:\EMDIAG and press **Enter** to start the Adaptec setup program
2. At the Main Menu, select **Diagnostics**.
3. At the Test Options Menu, select **Local Diagnostics**.
4. Use the Tab key to select **<Start>** and press **Enter**. *EMDIAG* runs a series of tests on the installed adapter, including sending a series of test packets.

If any of these tests fail, then a problem exists, possibly with the network cable or the connection.

In the event of a failure:

1. Exit from *EMDIAG*.
2. Remove the cable from the adapter.
3. Reattach the cable.
4. Reboot.
5. Run *EMDIAG*.

If a failure still occurs, see Chapter 5, *Using EMDIAG to Troubleshoot Problems*, for additional troubleshooting tips.

These diagnostics are not currently available for ISA and EISA adapters.

Note: *EMDIAG* runs on only one adapter at a time. To learn how to specify individual Adaptec PCI adapters with *EMDIAG* when more than one exists in a system, see Chapter 5, *Using EMDIAG to Troubleshoot Problems*.

❒

4

Installing Network Drivers

The Adaptec setup diskette included with your adapter contains network drivers for most popular environments. Depending on your adapter, the Adaptec setup diskette provides drivers for Novell® NetWare, Windows NT, LAN Manager, Windows for Workgroups, Windows 95, IBM OS/2® Warp, and more. Additional drivers are available directly from Adaptec or your operating system vendor. See the *\README.TXT* file for details.

Always use the latest driver version available for your adapter. Drivers are updated regularly on Adaptec's BBS, CompuServe forum, World Wide Web, and FTP sites to provide enhanced performance and new features. See *Technical and Product Support* on page ii.

Installation Instructions and Optional Keywords

Installation, configuration, and optional parameters for the drivers are updated regularly. The *\readme* subdirectory contains supplemental installation instructions, as well as information about optional driver keywords.

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 4-1
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

Driver Naming Conventions

Adaptec adapters share common driver sets according to bus type. The naming conventions are as follows:

Bus Type	Driver
ISA, EISA	EMXSA
PCI, Quartet	EMPCI

This document uses the convention EMxxx to refer to both driver sets simultaneously.

Full Duplex Support

To implement Full Duplex on your network, you need both an adapter and a switch that support Full Duplex. Selected Adaptec models provide Full Duplex support. Full Duplex support allows an adapter to send and receive data at the same time, doubling available bandwidth. Servers particularly benefit from Full Duplex, because they must respond to requests from many workstations simultaneously.

Note: Full Duplex may also be enabled point to point with a cross-over cable instead of a switch.

Installation instructions in this chapter describe how to enable Full Duplex. Additional information can be found in the *\readme* subdirectory.

Adaptec PCI 10 Mbps adapters support Full Duplex on twisted pair cabling; Adaptec PCI TX adapters support Full Duplex at both 10 Mbps and 100 Mbps; Adaptec PCI T4 adapters support Full Duplex at 10 Mbps only.

Adaptec ISA and EISA models do not currently support Full Duplex.

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 4-2
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

NetWare

The Novell NetWare driver, *\nwserver\emxxx.lan* is used with both NetWare 3.1x and NetWare 4.x servers, and also with both NetWare 3 SFT III and NetWare 4 SFT III.

Note: The Adaptec LAN adapters may not be used as MSL adapters in an SFT-III environment.

NetWare 3.x Server Driver

1. Prepare the hard drives of your server according to the instructions in your NetWare 3.1x documentation.
2. While the server is down, insert the Adaptec Setup diskette into your server's *A* drive.
3. Copy the contents of *\nwserver* and *\nwserver\3x* to the disk from which you boot NetWare 3.1x.

   ```
   xcopy a:\nwserver\. c:\server.312 /s
   ```

   This copies *empci.lan* and *empci.ldi* to the *c:\server.312* directory and the *\31x* subdirectory.
4. Type SERVER at the DOS prompt and press **Enter** to boot the NetWare 3.1x Server.
5. Type LOAD INSTALL at the server console prompt and press **Enter**.
6. Select **System Options**.
7. Select **Edit AUTOEXEC.NCF File**.
8. Edit the *autoexec.ncf* file (see sample below).

Note: If you have a quartet adapter, or multiple single port adapters, you must load the driver once for each port in use.

Sample AUTOEXEC.NCF for NetWare 3.x

This sample shows an *autoexec.ncf* supporting either four single port adapters or one Quartet adapter (the statements are identical in both cases).

```
LOAD C:PATCHMAN.NLM ; NetWare 3.11 only
LOAD C:LSLENH.NLM ; NetWare 3.11 only
LOAD C:MSM31x.NLM ; (For NetWare 3.x)
LOAD C:MONITOR.NLM
LOAD C:ETHERTSM.NLM
LOAD C:EMxxx.LAN SLOT=16 NAME=SEGMENT_1 FRAME=ETHERNET_802.2
LOAD C:EMxxx.LAN SLOT=17 NAME=SEGMENT_2 FRAME=ETHERNET_802.2
LOAD C:EMxxx.LAN SLOT=18 NAME=SEGMENT_3 FRAME=ETHERNET_802.2
LOAD C:EMxxx.LAN SLOT=19 NAME=SEGMENT_4 FRAME=ETHERNET_802.2
BIND IPX SEGMENT_1 NET=001
BIND IPX SEGMENT_2 NET=002
BIND IPX SEGMENT_3 NET=003
BIND IPX SEGMENT_4 NET=004
```

Note: Replace EMxxx by EMPCI or EMXSA, depending on the type of adapter you have in your system.

Files ethertsm.nlm and msm31x.nlm from the Adaptec Setup diskette must be used in either one of the following directories: *c:\server.312*, or *f:\system*

Installing Duralink for NetWare 3.x

You can configure Adaptec PCI host adapters for failover. Each failover configuration must consist of two PCI host adapters: a primary and a backup.

1. Insert the Adaptec Duralink driver diskette in drive *A*.
2. Type load a:forsetup from the NetWare prompt. The system displays a list of available drivers.
3. Press the **Ins** key to add an adapter. The system displays a list of drivers.
4. Select the Duralink driver and press **Enter**.
5. Select the adapter you want to configure as the primary by pressing **Enter**. The system displays the Configuration menu.

Configuring Duralink Failover

1. Select **Failover Configuration** and press **Enter**. The system displays the primary and backup port status, and a list of available adapters.
2. Highlight the adapter you want used as the backup and press the **Ins** key.

Note: Press the **TAB** key to configure the polling time, if desired. Type in the polling time and press **Enter**. Press **Esc** to continue.

3. Select **Yes** to save the failover configuration information and press **Enter**. The system returns to the Configuration menu.

Configuring Duralink Protocols

At the Configuration menu, select **Protocols Configuration** and press **Enter**. The Protocol Configuration menu provides two configuration options: TCP / IP, and IPX

Configuring TCP/IP

1. Select **TCP/IP** on the Protocol Configuration menu and press **Enter**.
2. Select either Ethernet II or Ethernet SNAP on the Frame Configuration menu and press **Enter**. If you want to use both protocols, you must repeat the process.
3. The system displays the current TCP / IP values: IP address, IP Subnet Mask, and Frame Type (a read-only field). If you want to change a value, move the cursor to the field and press **Enter**. Type in the new value and press **Enter**.
4. Press **Esc** to exit.
5. Select **Save & Quit on the Save Configuration?** and press **Enter**. The system returns to the Frame Configuration menu. Repeat Steps 2 through 5 if to choose another frame configuration.
6. Press **Esc** twice to return to the Configuration menu and press **Enter**.

Configuring IPX

1. Select **IPX** from the Protocol Configuration menu and press **Enter**.
2. Select the **IPX frame type** from the IPX Frame Configuration Menu and press **Enter**.
3. Press **Esc** to return to the IPX Frame Configuration Menu.
4. Select **IPX Network #** and press **Enter**.
5. Type in the **IPX Network #** and press **Enter**.
6. Press **Esc** until you return to the Configuration menu.

Configuring Duralink Ports

1. At the Configuration menu, select **Port Configuration** and press **Enter**.
2. Select the port configuration type (Full Duplex / Half-Duplex) and press **Enter**.
3. Press **Esc**.
4. After you have completed the configuration, press **Esc** to return to the Configuration menu.
5. Press **Esc** to exit.
6. Select **Save and Exit** from the Save menu and press **Enter**.

   The system now saves the configuration and copies the files to the NetWare volume.
7. Type down at the NetWare prompt and press **Enter**
8. Restart the server. Your changes will now take effect.

Note: The system configures the backup adapter, you cannot.

Modifying Existing Duralink Configuration

To make changes to the current configuration:

- Type load forcnfg and press **Enter**. The Configuration menu appears.

You may now change the existing failover, protocol, and port configurations. See *Configuring Duralink Failover* on page 4-5, *Configuring Duralink Protocols* on page 4-5, and *Configuring Duralink Ports* on page 4-6 for complete configuration instructions.

NetWare 4.x and 4.11

The Novell NetWare driver, *\nwserver\empci.lan* is used with NetWare 4.11 servers.

1. Type LOAD INSTALL at the server console prompt and press **Enter**.
2. On the Installation Options menu, select **Driver options (load/unload disk and network drivers)**.
3. On the Driver Options menu, select **Configure Network Drivers.** The system displays the installed network drivers, and the Additional Driver Actions menu.
4. Select a driver and press **Enter**. If the desired Adaptec driver is not in the list, proceed to Step 5.
5. Insert the Adaptec Setup diskette into drive *A* and press **<INS>** to install the unlisted driver.
6. Press **Enter**. -1.22 TD1˝0.0011(p)15(ec)21((415 0 TD1˝0.0[(ism9(ll)-5(e)15(o)a7(s)-5(o) pa-5(h)7(e]TJ1˝/F1

Sample AUTOEXEC.NCF for NetWare 4.x and 4.11

This sample shows an *autoexec.ncf* supporting one ANA-6944A/TX adapter.

```
LOAD C:MSM.NLM
LOAD C:ETHERTSM.NLM
LOAD C:EMxxx.LAN SLOT=16 NAME=SEGMENT_1 FRAME=ETHERNET_802.2
LOAD C:EMxxx.LAN SLOT=17 NAME=SEGMENT_2 FRAME=ETHERNET_802.2
LOAD C:EMxxx.LAN SLOT=18 NAME=SEGMENT_3 FRAME=ETHERNET_802.2
LOAD C:EMxxx.LAN SLOT=19 NAME=SEGMENT_4 FRAME=ETHERNET_802.2
BIND IPX SEGMENT_1 NET=001
BIND IPX SEGMENT_2 NET=002
BIND IPX SEGMENT_3 NET=003
BIND IPX SEGMENT_4 NET=004
```

Note: Replace EMxxx by EMPCI or EMXSA, depending on the type of adapter you have in your system.

NetWare Server Driver Parameters

SLOT PCI. Use to specify a particular adapter or Quartet port. The first adapter or port is slot 16, the second is slot 17, and so on. For example:

LOAD EMPCI.LAN SLOT=16

INT Quartet only. Use to specify an available interrupt (in hex, i.e., A for 10, B for 11). Not required for motherboards that support the Quartet's PCI-PCI Bridge chip. For example:

LOAD EMPCI.LAN INT=B

FDE PCI adapters only. Enables Full Duplex support. Requires connection to a switch or other device supporting Full Duplex. For example:

LOAD EMPCI.LAN FDE

NAME Assigns a unique name to the board's configuration. You can use this optional parameter to identify network boards when you have more than one network board of the same type installed in the file server. The name can be 17 characters long.

FRAME Tells the Ethernet drivers which type of packet header to use with NetWare. The default for NetWare 3.11 is 802.3, the default for versions 3.12 and higher is 802.2. For example:

FRAME =ETHERNET 802.2

- Ethernet_802.3 assigns the standard Novell frame for versions of NetWare prior to NetWare 3.12.
- Ethernet_802.2 assigns the IEE and OSI standard frame type. This is the default frame type used by NetWare 3.12 and 4.x.
- Ethernet_II assigns a unique packet header (type code). Use on networks connected to DEC or to computers using the TCP / IP protocol.
- Ethernet_SNAP is used when the 802.02 SNAP extension is required.

Installing Duralink for NetWare 4.x

To configure failover adapters, you must have at least two PCI adapters installed in your system.

1. Insert the Adaptec Duralink Driver diskette in drive *A*.
2. Type load install at the NetWare prompt.
3. Select **Driver Options** from the Installation Options menu and press **Enter**.
4. Select **Configure Network Drivers** and press **Enter**.
5. Choose **Select a driver**. NetWare scans the system for available drivers, and displays a list of drivers.
6. Press **Ins** to install an unlisted driver, and press **Enter** to Continue.

Note: The system automatically reads drive A. If, however, you have the driver in a different drive, press F3 and enter the correct path.

7. Select the *EMPCI.LAN* driver and press **Enter**. The system asks if you want to copy the driver.

8 Select **Yes** and press **Enter**.

If any version of this driver has already been installed, the system asks if you want to save the existing file. If you say yes, the existing driver is saved in the *sys: system\drivers.old* directory. The system prompts you in the same way if any other files already exist on the system.

When the system has copied all the files, it displays the Configuration screen. See *Configuring Duralink for NetWare 4.x* for instructions on configuring your host adapters for Duralink failover.

Configuring Duralink for NetWare 4.x

You can configure Adaptec PCI host adapters for failover. Each failover configuration must consist of two PCI host adapters: a primary and a backup.

Note: You *must* first configure the primary host adapter before configuring the backup host adapter.

1 Choose **Select/Modify driver parameters and protocols** from the Board Actions menu. The Protocols Menu becomes highlighted.

2 Press **F3** to set IPX frame types. If you do not press F3 at this point, the driver binds with all frame types.

3 Use the arrow keys to move to a frame type. Press **Enter** to mark the frame type. You can select more than one. Press **Enter** again to deselect a frame type.

4 Press **Esc** or **F10** to save and return to the Protocols menu.

5 Select another protocol if desired. If you select TCP / IP, you can change the IP Address and IP Mask parameters. Press **Esc** or **F10** to save and return to the Protocols menu.

6 Move to the Parameters menu, using the arrow keys.

7 Select **Slot Number** and type in the slot number of the first host adapter and press **Enter**. The prompt moves to the Duplex Mode field.

8 Select **Duplex Mode**. Half-Duplex is the default. If this is the correct setting for the host adapter, go to the next step. If not,

Select Duplex Mode and press **Enter**. A menu appears with two options: Half-Duplex and Full Duplex.

9 Select the correct option and press **Enter**.

The prompt moves to the Failover Adapter Type field.

10 Select **Failover Adapter type** and press **Enter**. The Failover Adapter type menu appears. Select the failover adapter type as follows:

– If you are configuring a primary host adapter, select **Primary** and press **Enter**. The system then prompts you for the Backup adapter slot number. Type the backup adapter slot number and press **Enter**.

  ■ The system now prompts you for the Polling Interval (in seconds). This is the interval after the start of a link when the active adapter is checked. The default is 5. For best results, do not enter a number greater than 10. Type in the polling interval and press **Enter**.

– If you are configuring a backup host adapter, select **Backup** and press **Enter**. The system then prompts you for the Primary adapter slot number. Type the primary adapter slot number and press **Enter**.

– If you are configuring a host adapter which will not be part of the Failover configuration, select **Standalone** and press **Enter**.

11 Press **Esc** or **F10** to return to the Board Actions menu.

12 Select **Save Parameters and Load Driver** and press **Enter.**

a If you just configured the primary adapter, the system asks if you want to configure another adapter. Select **Yes** to configure the backup adapter. Follow the same steps as for the primary, with the following exceptions:

  ■ Select No when prompted to copy the drivers. They have already been copied.

  ■ The backup host adapter's duplex mode must be the same as the primary's.

  ■ The system will prompt you for the primary slot number after you have selected the failover adapter type as *backup*.

- The system will not ask for polling interval.
- When prompted to configure another adapter, select No if you do not want to configure any more adapters. Otherwise continue configuring adapters as desired.

Note: You must enter a binding protocol for the backup host adapter. You must, however, then unbind the protocol as described in *Unbinding Duralink Protocols for Backup Host Adapters*.

13. Press **Esc** to return to the previous menu. Press **Esc** again to return to the Installation Options menu.
14. Select **Exit**, **Yes**, and press **Enter** to complete the configuration process.

If you configured all host adapters, continue to *Loading and Configuring SNMP and DMI Agents*.

Loading and Configuring SNMP and DMI Agents

Once you have configured your adapters, you must add two lines to the *autoexec.ncf,* as follows:

1. Type load edit sys:system\autoexec.ncf.
2. Press **Page Down** to go to the end of the file.
3. Add the following lines:

```
load CDTDMI
load FAILMIB
```

4. Press **Esc** to save the file, and select **Yes**. The system returns you to the NetWare prompt.

Continue to *Unbinding Duralink Protocols for Backup Host Adapters*.

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 4-12
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

Changing a Host Adapter's Configuration

1. Select **Boards** and press **Enter**. The system displays the currently configured host adapters.
2. Select a host adapter and press **Enter**. The Board Configuration screen appears, displaying the configuration information for the selected host adapter.
3. Make the desired changes and press **Esc**.
4. Select **Yes** on the Save menu to save the changes.
5. Press **Esc** to return to the Internetworking Configuration screen.
6. Press **Esc** to exit the menu.
7. Select **Yes** and press **Enter**. The system returns to the system prompt.
8. Type down at the NetWare prompt and press **Enter**.
9. Type restart server at the NetWare prompt and press **Enter.**

Insert a New Host Adapter

1. Select **Boards** and press **Enter**. The system displays the currently configured host adapters.
2. Press **Ins**. A pulldown list of the available drivers appears.
3. Select **EMPCI** and press **Enter**. The Board Configuration screen appears.
4. Configure the board as desired, then press **Esc**.
5. Select **Yes** on the Save menu to save the changes and press **Enter**.
6. Press **Esc** to return to the Internetworking Configuration screen.
7. Press **Esc** to exit the menu.
8. Select **Yes** and press **Enter**. The system returns to the system prompt.
9. Type down at the NetWare prompt and press **Enter**.
10. Type restart server at the NetWare prompt and press **Enter.**

Deleting a Host Adapter

1. Select **Boards** and press **Enter**. The system displays the currently configured host adapters.
2. Highlight the host adapter and press **Del**. The system tells that the BINDs to the interfaces on this board will also be deleted and asks if you want to proceed.
3. Select **Yes** and press **Enter**.
4. Press **Esc** to return to the Internetworking Configuration screen.
5. Press **Esc** to exit the menu.
6. Select **Yes** and press **Enter**. The system returns to the system prompt.
7. Type down at the NetWare prompt and press **Enter**.
8. Type restart server at the NetWare prompt and press **Enter.**

Changing Binding Protocols

1. Select **Bindings** and press **Enter**. The Configured Protocol to Network Interface Bindings screen appears.
2. Press **Ins** to insert a new binding type, **Del** to delete an existing binding type, or **Enter** to modify an existing binding type.
3. You can modify IPX network and Frame Type. You can also select Expert Binding Options. Press **Esc** to save, select **Yes** on the Save menu and press **Enter**.
4. Select a protocol from the list and press **Enter**. The system displays a list of host adapters bound to that protocol.
5. Select a host adapter from the list and press **Enter**. The system displays the fields you can modify: IPX network number, Frame Type.

   You may also select Expert Bind Options which allows you to change the following parameters: Delay Override, Throughput Override, RIP Bind Options, SAP Bind Options, and NLSP Options.
6. Make the desired changes and press **Esc**.
7. Select **Yes** and press **Enter** to save the new parameter settings and return to the list of host adapters.

3 Edit your *net.cfg* file using a text editor. Add the following lines:

```
LINK DRIVER EMxxx
 Frame Ethernet_802.2
 Protocol IPX E0 Ethernet_802.2
```

4 Your *autoexec.bat* should contain the following statements:

```
LSL.COM
EMxxx.COM
IPXODI.EXE
VLM.EXE
```

Note: Replace EMxxx by EMPCI or EMXSA, depending on the type of adapter you have in your system.

If you are using the VLM, you should add the following line to your *config.sys*:

```
LASTDRIVE=Z
```

DOS ODI Parameters

See *\readme\dosodi.txt* for supplemental installation instructions and descriptions of keyword parameters.

Windows NT

Windows NT 3.51 Driver

The Windows NT 3.51 driver for ISA and EISA adapters is in *\winnt*; for PCI adapters it is in *\winnt\i386*, or *\winnt\alpha*, depending on your adapter and computer type. See *\readme.txt* for details.

Note: To install the Windows NT 3.51 driver for quartet adapters, your computer must support PCI-PCI Bridge chips. For more information, see *PCI-PCI Bridge Chip* on page 2-4.

When you install the Windows NT 3.51 driver, support for all Adaptec PCI adapters or Quartet ports present in the system is installed simultaneously. If you do not plan to use all ports immediately, disable bindings for the unused ports.

See *\readme\winnt.txt* for supplemental installation instructions and descriptions of optional keyword parameters.

1. In the Control Panel, double-click the **Network** icon.
2. Select **Add Adapter**. The system may ask if you want it to autodetect adapters. Select **No**.
3. In the Add Network Adapter dialog box, select the **<Other>** option at the end of the list of displayed adapters.
4. Specify the path to your adapter diskette.
5. Select your adapter from the list provided.
6. When prompted, choose your cable type from the displayed list.
7. Select **OK**.
8. After Windows NT restarts, you will be able to use your new Adaptec adapter.

Windows NT Driver Parameters

Connection Type — To enable Full Duplex on PCI adapters only, select any one of InitSense / Full Duplex, ActiveSense / Full Duplex, 10 Mbps UTP / Full Duplex, or 100 Mbps UTP / Full Duplex (TX only). Requires connection to a switch or other device supporting Full Duplex.

See *\readme\winnt.txt* for supplemental installation instructions and descriptions of additional keyword parameters.

Quartet Binding Sequences

When installing a Quartet adapter under Windows NT, the binding sequence of each port is important. Protocols such as TCP / IP rely on specific protocol addresses to be mapped to specific ports. Windows NT may place port bindings in non-sequential order during initial driver installation. This can be corrected through the Control Panel.

Note: If your binding order is not in 1 2 3 4 sequence, see the *winnt.txt* readme file.

14 Click **OK** in the Network Settings window.

Note: If you are using TCP/IP you will be prompted to configure the IP addressing information.

15 Select **Don't Restart Now** when prompted to restart your system.

16 Open **Network** on the Control Panel.

17 Highlight the backup Duralink adapter on the Installed Adapter Cards list.

Note: This backup adapter has the symbol: -->[X] after it. If there is a number in square brackets, then the adapter is a primary duralink adapter.

18 Click **Configure** and then click **Enable Backup**.

19 Click **Continue**.

20 Click **OK** on the Network Settings window and then click **Restart Now**.

Windows NT 4.0

The Windows NT 4.0 driver is in *\winnt\i386*, or *\winnt\alpha*, depending on your adapter and computer type.

The ANA-6901A, ANA-6911A/TX and the ANA-6944A/TX all support Windows NT 4.0.

To install the Windows NT 4.0 driver for the ANA-6944A/TX, your computer must support PCI-PCI Bridge chips. See Chapter 2, *Installing Your Adapter*, for information on how to determine if your computer supports PCI-PCI Bridge chips.

Note: When the Windows NT 4.0 driver is installed, support for all ANA-6944A/TX ports present in the system is installed simultaneously. If you do not plan to use all ports immediately, disable bindings for the unused ports.

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 4-20
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

1. In the Control Panel, double-click the **Network** icon.
2. Select the **Adapters** tab and double-click **Add...**. The Select Network Adapter dialog box appears.
3. Select the **<Have Disk...>** option.
4. Specify the path to your adapter diskette, as follows:

   a:\winnt\i386
5. Select the **Adaptec PCI Adapter** from the displayed list and click **OK**. The Adaptec PCI Adapter Setup dialog box appears.
6. Select the cable type from the displayed list and click **OK**. The system prompts you for the cable type for each port on the ANA-6944A/TX.
7. Click the **Close** button.
8. After Windows NT restarts, you will be able to use the ANA-6944A/TX.

Windows NT Driver Parameters

Connection Type

To enable Full Duplex on the ANA-6944A/TX, select any one of the following:

- InitSense/Full Duplex
- ActiveSense/Full Duplex
- 10 Mbps UTP/Full Duplex
- 100 Mbps UTP/Full Duplex (TX only)

Requires connection to a switch or other device supporting Full Duplex.

Quartet Bindings

When installing a quartet adapter under Windows NT 4.0, the binding sequence of each port is important. Protocols such as TCP/IP rely on specific protocol addresses to be mapped to specific ports. Windows NT may place port bindings in non-sequential order during initial driver installation. This can be corrected through the Control Panel.

Note: If your binding order is not in 1 2 3 4 sequence, see the *winnt.txt* readme file.

Installing Duralink for Windows NT 4.0

You can configure Adaptec PCI host adapters for failover. Each failover configuration must consist of two PCI host adapters: a primary and a backup.

Note: Install NT SNMP before installing the Duralink drivers.

1. Insert the Adaptec Duralink Driver diskette in drive A.
2. Open **Network** on the Control Panel.
3. Select the **Add Adapter** tab. The Add Network Adapters dialog box appears.
4. Click the **Have Disk** button in the Select Network Adapter window.
5. Type the path (*a:*) to the Duralink drivers and then click the **OK** button. The Select OEM Option window appears.
6. Select **Adaptec PCI Adapter (Duralink (Failover))** and click **OK**. The system now copies the drivers to the appropriate directories, and then displays the Duralink Setup by Adaptec window.
7. Select the Connection Type. The default is *InitSense/Half Duplex*.

Note: The Failover configuration options will be grayed out at this time.

8. Click the Continue button to configure the second adapter's Connection Type. Click **Continue** for each adapter you are adding.
9. Highlight the adapter that you would like to be the primary Duralink adapter and click **Properties**.
10. In the Adapter Setup window click **Configuration** in the Failover section.
11. Highlight the adapter that you would like as the backup Duralink adapter from the list of adapters in the Available Backup Ports box. Click **Add**.

12 Click **OK** then **Continue.**

13 Click **Close**.

Note: If you are using TCP/IP you will be prompted to configure the IP addressing information.

14 Select **No** when prompted to reboot your system.

15 Open **Network** on the Control Panel.

16 Select the **Adapter** tab. The Add Network Adapters dialog box appears.

17 Highlight the backup Duralink adapter.

Note: This backup adapter has the symbol: -->[X] after it. If there is a number in square brackets, then the adapter is a primary duralink adapter.

18 Click **Properties** and then click **Enable Backup**.

19 Click **Continue.**

20 Click **OK** and then **Yes** to restart your computer.

Note: If any adapter is configured as backup then it will not be seen by the protocols during the binding process.

Removing the Duralink Configuration

If you need to change host adapter interfaces, or remove duralink host adapters from the system, keep the following in mind:

- You can return a primary or backup adapter to a normal multiple interfaces configuration by using the Configuration option in the Failover group.
- If you want to remove either the backup or the primary you must first disassociate the two adapters and then remove the desired adapter.

Modifying Link Check Timeout

The Link check Timeout may be changed from the default of 10 in the Failover Manager window. To get to the Failover Manager window:

1. Select **Network** in the Control panel.
2. Highlight the Primary adapter.
3. Click the **Properties** button.
4. Select the **Configuration** button in the Failover section.

Windows 95

The Windows 95 driver is in the *\win95* directory.

Windows 95 Installation for ISA

1. Power OFF your system and install your Adaptec ISA adapter in any 16-bit ISA or 32-bit EISA slot.
2. At boot-up, Windows 95 detects the newly installed adapter, and requests that the driver diskette be inserted.
3. Put the diskette in drive *A* and specify a:\win95 as the path to the driver.
4. During the driver installation process, Windows 95 also requests the WIN95 CD-ROM or diskette so that configuration files may be copied from it.
5. Be sure that at least one network client and one protocol are installed, in addition to the Adaptec adapter driver now listed under Control Panel / Network.
6. If you want to configure any of the parameters on the Adaptec adapter, highlight the adapter in the list of installed drivers and select **Properties**.
7. After you have made all desired changes, Windows 95 restarts your system.

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 4-24
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

Windows 95 Installation for EISA

1. Power OFF your system and install your Adaptec EISA adapter in any 32-bit EISA slot, using your EISA Configuration Utility (ECU) to assign valid resources. (See *Running the EISA Configuration Utility* on page 2-6.) Boot up when finished.
2. In the Control Panel, double-click the **Network** icon.
3. Select **Add**, and then select **Adapter** as the network component type.
4. Click **Have Disk** and enter a:\win95 as the path to your Windows 95 network driver.
5. Select the adapter model and click **OK**. The system returns you to the Control Panel's Network dialog box.
6. Be sure that at least one network client and one protocol are installed, in addition to the Adaptec adapter driver that will now be listed.
7. If you want to configure any of the parameters on the Adaptec adapter, highlight the adapter in the list of installed drivers and select **Properties**.
8. After you have made all desired changes, select **OK**. Windows 95 will restart your system.

Windows 95 Installation for PCI

1. Power OFF your system and install your Adaptec PCI adapter in any bus mastering PCI slot.
2. After booting up Windows 95, the operating system detects any newly installed adapter, and requests that the driver diskette be inserted.
3. Put the diskette in drive *A* and specify a:\win95 as the path to the driver.
4. During the driver installation process, Windows 95 also requests the WIN95 CD-ROM or diskette so that configuration files may be copied from it.
5. Make sure that at least one network client and one protocol are installed, in addition to the Adaptec adapter driver now listed under Control Panel / Network.

6. If you want to configure any of the parameters on the Adaptec adapter, highlight the adapter in the list of installed drivers and select **Properties**.
7. After you have made all desired changes, Windows 95 will restart your system.

Windows 95 Driver Parameters

Connection Type To enable Full Duplex on PCI adapters only, select any one of InitSense / Full Duplex, ActiveSense / Full Duplex, 10 Mbps UTP / Full Duplex, or 100 Mbps UTP / Full Duplex (TX only). Requires connection to a switch or other device supporting Full Duplex.

See *\readme\win95.txt* for supplemental installation instructions and descriptions of additional keyword parameters.

Windows for Workgroups

The Windows for Workgroups **.386* file supports all Adaptec PCI single port adapters.

You may use any of the following drivers for Windows for Workgroups:

- DOS ODI (*emxxx.com*)
- DOS NDIS 2.0 (*emxxx.dos*)
- Windows 32-bit NDIS 3.0 (*emxxx.386*)

The *oemsetup* file located in the *\windows* subdirectory supports installation and configuration of any of these three drivers.

1. In the Main program group, double-click the **Windows Setup** icon.
2. From the Options menu, select **Change Network Settings**.
3. From the Network Setup dialog box, click the **Drivers** button.
4. Click the **Add Adapter** button.
5. From the list of adapters provided, select **Unlisted** or **Updated Network Adapter**.
6. Select the drive where your Adaptec driver diskette is located and select the *\WINDOWS* subdirectory as the install path. Click **OK**.

7 Select your Adaptec PCI adapter from the list of adapters provided, then click **OK**. You can use the NDIS 3.0 (32-bit), the DOS ODI, or the DOS NDIS driver.

8 After selecting OK, you can highlight your Adaptec adapter in the list of network drivers, and then select setup, to edit the network adapter settings.

For the non-NDIS 3.0 drivers, use this setup option to select between DOS ODI and DOS NDIS. The Driver Type option at the bottom of the Setup window allows you to choose between NDIS and ODI.

9 After making any driver setup changes, select **Close** to go back to the previous window. Click **OK** again to exit from the Network Driver Install window. At this point, any necessary drivers will be copied to your system from the Windows for Workgroups and Adaptec diskettes.

10 You must reboot before your new driver takes effect.

Windows for Workgroups Driver Parameters

See *\readme\wfw.txt* for supplemental installation instructions and descriptions of additional NDIS 3.0 keyword parameters.

See *\readme\ndis.txt* for supplemental installation instructions and descriptions of additional NDIS 2.0 keyword parameters.

See *\readme\dosodi.txt* for supplemental installation instructions and descriptions of additional DOS ODI keyword parameters.

NDIS 2.0

The NDIS 2.0 driver for DOS is in the *\ndis.dos* directory. The NDIS 2.0 driver for OS/2 is in the *\ndis.os2* directory. The Microsoft LAN Manager installation file is in the *\mslanman.dos* directory tree.

Here is a partial list of products that use the NDIS driver:

- Microsoft LAN Manager
- Artisoft Lantastic
- IBM DOS LAN Requester
- IBM OS/2 Warp Connect
- DEC® PATHWORKS for DOS
- SunSoft PC-NFS

- Banyan® VINES Client
- Various brands of TCP/IP

The DOS NDIS driver is compatible with DOS memory managers such as *emm386* and can be loaded into high memory. In addition, the driver is compatible with Windows 3.0 and later.

Installing With LAN Manager

Follow the instructions below to install the NDIS driver for LAN Manager, OS/2 Warp, and others.

1. Boot your system.
2. Run your network operating system's Setup program according to the documentation provided with your network operating system software.
3. When prompted, insert the driver diskette in drive *A*.
4. Enter information as required.
5. Exit your network operating system's Setup program.
6. Reboot your computer.

For information about configuring multiple adapters, see *\readme\ndis.txt.*

Note: Your *protocol.ini* should include a section similar to the following:

```
[EMPCI_NIF]
DRIVERNAME=EMPCI$
```

NDIS Driver Parameters

FullDuplex=Yes PCI adapters only. Use in the protocol.ini to specify a value of yes for the FullDuplex keyword to enable Full Duplex. Requires connection to a switch or other device supporting Full Duplex.

See *\readme\ndis.txt* and *\readme\os2.txt* for supplemental installation instructions and descriptions of additional *protocol.ini* keyword parameters.

IBM O/S 2 SMP

The ANA-6944A/TX, ANA-6901A, and the ANA-6911A/TX OS/2 drivers support OS/2 SMP. If you choose to run an older or different version of OS/2, you may need to obtain your protocol or client files from third-party sources.

The ANA-6944A/TX, ANA-6901A, and the ANA-6911A/TX OS/2 drivers support connections to all of the following network operating systems:

- Novell NetWare
- OS/2 Peer Client
- IBM LAN Server
- IBM LAN Requestor
- Windows NT

Follow the instructions below to install the ANA-6944A/TX, ANA-6901A, and the ANA-6911A/TX OS/2 drivers using OS/2 SMP. If you are using an older version of OS/2, refer to the installation documentation that came with your OS/2 software.

Installing with LAN Server

Use this installation procedure when installing for the IBM LAN Server and IBM LAN Requestor environments.

1. In the IBM LAN Services window, double-click the **OS/2 LAN Services Installation/Configuration** icon.
2. Select **Other Adapter** to add a single port adapter. Repeat this three times for the ANA-6944A/TX to add the other three ports as separate devices.
3. Enter the full path name for the drivers as follows:

   a:\ndis.os2

   The drivers are now displayed on the list of drivers.
4. Click **Add** to add the drivers.

Note: If you added all four ports for the ANA-6944A/TX, OS/2 automatically loads as many drivers as you need when you reboot.

5 Select the appropriate protocols and click **Add**.

Note: If you need to configure each port with different protocols, pay attention to the order of binding. The first device on your list installs the driver for port 1 (the top connector on the card and the furthest from the PCI bus connector). The second device loads port 2 (next to port 1), and so on.

6 Shutdown OS/2 and reboot for your network driver and protocol(s) to take effect.

Installing the Drivers for a Pre-existing OS/2 SMP

Use the following instructions if you already have OS/2 SMP or OS/2 Peer Client installed on your machine. If you are installing OS/2 SMP for the first time, see *Installing OS/2 SMP for the First Time* on page 4-31.

1 On your desktop, double-click the **MPTS** (Multi-Protocol Transport Services) icon.

2 Select **Install**.

3 Select **Install Additional Network Drivers**, and specify a:\ndis.os2 as the source. Select **OK**.

4 After the OS/2 driver is copied from the diskette, select **OK**.

5 Select **Configure**.

6 Select **LAN Adapters and Protocols** and then click **Configure**.

7 In the LAPS dialog box, under Network Adapters, highlight the **ANA-6944A/TX** and click **Add**. Repeat this three times to add the other three ports as separate devices.

8 Under Protocols, highlight the desired network protocol(s) and click **Add**.

9 Click **Edit** to change the ANA-6944A/TX configuration settings, if desired.

If you selected IBM NetWare Requester Support from the Protocols box, you need to make the following configuration changes:

- In the Current Configuration box, highlight **IBM NetWare Requester** and select **Edit**.
- Change the Token-Ring Support Option to **NO**.
- Enable one more of the listed Ethernet frame types by specifying **YES** in the appropriate boxes. (If you are not sure which frame type(s) are used on your NetWare network, enable all of them).
- Change the Network Adapter Address to the Ethernet address of your Adaptec adapter.

You can run *emdiag.exe* from your Adaptec driver diskette at an OS/2 command line prompt, and choose **Configuration Status**, to display your adapter's Ethernet address.

10 Make the changes and click **OK**.

11 In the Configure dialog box, select **Close**.

12 In the Multi-Protocol Transport Services dialog box, select **Exit**.

13 Select **Update CONFIG.SYS** and then select **Exit**.

14 Shutdown OS/2 and reboot for your network driver and protocol(s) to take effect.

Installing OS/2 SMP for the Fi9i˝/F(f)8(e)7(ct)25(.)]TJi˝/Flfect.1 1 2 5

7. Specify **Ethernet** as the type of LAN and select **OK**.
8. Select **OK** twice more to confirm your choice.
9. Continue through the rest of the OS/2 installation, following the on-screen instructions.

Editing Driver Parameters

You may wish to edit one of the following driver parameters through the MPTS program.

Full Duplex Ethernet	Default value equals FALSE. To enable Full Duplex Ethernet, change value to **TRUE**. You will need a Full Duplex Ethernet switch, in addition to your ANA-6944A/TX adapter, to use Full Duplex Ethernet.
Intel 430FX PCI Optimization	Default value equals FALSE. If your system uses the Intel 430FX PCI chipset (which includes Intel chips with the following part numbers: 82437FX, 82438FX, 82371FB, 82438FX), set this parameter to **TRUE**.
Other Custom Parameters	Several other parameters can be used in the *\ibmcom\protocol.ini* configuration file to customize your Adaptec ANA-6944A/TX driver. See *\readme\ndis.txt* on your Adaptec ANA-6944A/TX diskette for complete information about all of these parameters.

Unix Drivers

The Adaptec adapters support the following UNIX products (support for some UNIX versions not available on every adapter):

- SCO UNIX System 3.2 v4.2
- SCO Unix drivers: SCO Open Desktop 2.0
- SCO Open Desktop 3.0/5.0
- SCO OpenServer 5.0 (ANA-6911A/TX, ANA-6901A, and ANA-6944A/TX only)
- SCO Unixware SMP (ANA-6911A/TX, ANA-6901A, and ANA-6944A/TX only)
- Sun Solaris 2.4/2.5
- NextStep 3.2/3.3

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 4-32
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

The list of supported UNIX systems is updated periodically; contact Adaptec if your type of UNIX is not listed here. The UNIX drivers and installation instructions are available from Adaptec's BBS, CompuServe Forum, World Wide Web, and FTP sites.

The Sun Solaris and NextStep drivers are available at the World Wide Web sites of the respective operating system vendors. See *\readme.txt* for more information.

SCO OpenServer 5.0

The ANA-6944A/TX, ANA-6901A, and the ANA-6911A/TX UNIX drivers support SCO OpenServer 5.0.

Installing the SCO OpenServer Driver

1. Insert the Unix Drivers diskette into the first floppy drive (usually *A*).
2. Make a directory for the driver, as follows:

   ```
   mkdir adaptec
   ```

3. Change to the directory you just created, as follows:

   ```
   chdir adaptec
   ```

4. Copy the files from the floppy diskette to the hard disk, as follows:

   ```
   doscp a:\sco5_0\*.* .
   ```

5. Extract the driver files, as follows:

   ```
   tar -xvf -d adaptec\empci.tar
   ```

6. Enter the Software Manager window, as follows:

   ```
   custom
   ```

7. On the Software menu, select **Install new**.
8. Select the host (computer) you want to install from, and click **Continue**. The default host is the computer on which you are working.
9. In the Select Media dialog box select **media images** and click **Continue**.
10. Enter the directory path for the directory containing the media images (*/adaptec*), and click **OK**.
11. Select **Full installation**, and click **OK**.

The program displays the progress of the installation, and displays a message box telling you when you are finished. If the installation was successful, the driver name will be listed in the Software Manager window.

Configuring the SCO OpenServer Driver

Once the driver is installed, you can configure the driver for the ANA-6911A/TX, ANA-6901A, or the ANA-6944A/TX.

1. In the System Administration window, double-click the **Networks** icon.
2. Open the Network Configuration Manager.
3. On the Hardware menu, select **Modify Hardware Configuration**.
4. Make the necessary changes in the Network Driver Configuration window, and select **OK**.
5. On the Hardware menu, select **Exit**.
6. Relink, and reboot the system.

SCO Unixware SMP

The ANA-6944A/TX, ANA-6901A, and the ANA-6911A/TX UNIX drivers support SCO

Installing the Drivers

1. Insert the Unix Drivers diskette into the first floppy drive (usually *A*).
2. Make a directory for the driver, as follows:

   ```
   mkdir adaptec
   ```

3. Change to the directory you just created, as follows:

   ```
   chdir adaptec
   ```

4. Copy the files from the floppy diskette to the hard disk, as follows:

   ```
   doscp a:\unixware\*.* .
   ```

5. Extract the files, as follows:

   ```
   tar -xvf -d adaptec\empci.tar
   ```

6 To install the drivers, type:

./Install

The system loads the *EMPCI* modules and displays the following messages:

```
ADAPTEC: Adaptec (10/100) PCI Fast Ethernet
Installation
ADAPTEC:  Please Enter the Card you are Installing (1/2)
        1. Adaptec ANA-6911 PCI EM110
        2. Adaptec ANA-6944 PCI EM4400
```

7 Enter the number (1 or 2, as shown above) of the adapter you are installing. The system displays the following messages:

```
ADAPTEC: Netinfo
EMPCI_0
EMPCI_1
EMPCI_2
EMPCI_3
ADAPTEC: Please use /etc/confnet.d/configure -i to config-
ure the IP address
ADAPTEC: Installation Complete
ADAPTEC: Please Reboot the system for the changes to take
effect.
```

Note: The system lists an EMPCI address for each of the ANA-6944A / TX ports.

8 Reboot the system.

Configuring the IP Addresses

1 To begin configuring the IP Addresses for the ANA-6944A / TX, enter:

/etc/confnet.d/configure -i

The system lists the devices and displays the following message:

```
These are the devices available on your system:
1 EMPCI_0
2 EMPCI_1
3 EMPCI_2
4 EMPCI_3
Type the number of the device(s) to be configured with inet
[?,??,quit]:
```

2 For the ANA-6944A / TX, enter the four addresses, using spaces in between the numbers (no commas):

```
1 2 3 4
```

The system displays the following message:

```
Please enter the IP host name for device EMPCI_0 (default:
xxx):
```

3 Enter the name of the host (string). The system displays the following message:

```
Please initialize the IP address for the host xxx (default:
xxx.xx.xx.xx):
```

4 Enter the IP address, or press **Enter** to use the default IP address. The system displays the following message:

```
Configure host xxx with the default Ethernet (TM) if config
options?: (yes no ClassC BerkeleyC info; default:info):
```

5 Enter *Class C* for ClassC type addressing. The system displays the following message:

```
Do you want to set this machine as a gateway?[y/no/
unchanged]
```

6 Enter *y, n* or *u* (if unsure). Please refer to your system administrator about gateways.

❒

5

Using EMDIAG to Troubleshoot Problems

This chapter explains how to use the Adaptec *EMDIAG* program, and how to troubleshoot problems that you may be having with your adapter.

If your adapter is not functioning properly, first make sure that it was set up according to instructions in this document.

1. Verify that your adapter is installed properly and configured correctly (Chapter 2, *Installing Your Adapter*).
2. Verify that your network is properly cabled and the adapter is properly connected (Chapter 3, *Connecting to Your Network Cable*).
3. Verify that the adapter's network driver is installed correctly (Chapter 4, *Installing Network Drivers*).
4. Verify that you are using the latest BIOS for your computer, and the latest driver for your adapter.

If the adapter still does not work, run the adapter's diagnostic tests.

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 5-1
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

Running EMDIAG

Your Adaptec adapter is supplied with a comprehensive diagnostics program called *emdiag.exe*. *EMDIAG* resides in the root directory of the Adaptec diskette. To run *EMDIAG*

1. Boot up to MS-DOS version 3.3 or later. You should run *EMDIAG* with no network drivers loaded.
2. Type A:\EMDIAG and press **Enter** to start *EMDIAG.*

Using EMDIAG for PCI Adapters

EMDIAG for PCI adapters includes a number of startup options. These startup options allow you to specify a particular Adaptec adapter if you have more than one Adaptec adapter installed in your computer, and to override *EMDIAG's* default configuration settings.

The optional startup parameters for *EMDIAG* are:

/t: [value]	Determines the number of times (in thousands) the transmitter test is run, when local or remote diagnostics is initiated.
/v: [10 or 100]	Overrides cable speed AutoSensing and sets the signalling speed to be used by *EMDIAG* to either 10 Mbps or 100 Mbps.
/x: [thin or utp]	Overrides connector AutoSensing and sets the connector to be tested by *EMDIAG*

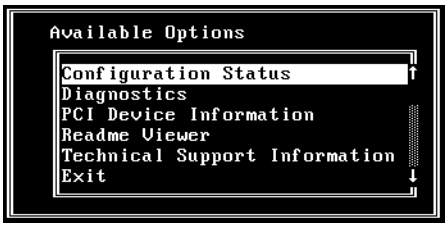
EMDIAG PCI Main Menu

There are six menu options on the EMDIAG PCI Main Menu:

- Configuration Status
- Diagnostics
- PCI Device Information
- Readme Viewer
- Technical Support Information
- Exit

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 5-2
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

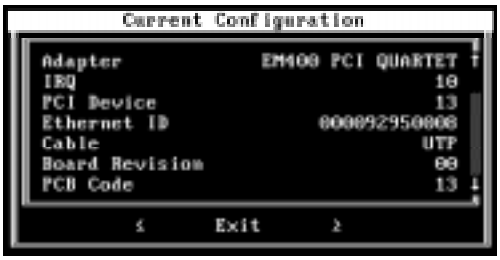
The menu options permit you to view the configuration and device information, run diagnostics, access technical support and Readme files, and leave the *EMDIAG* program.



When you quit *EMDIAG*, you can access the *cogent.log* or *adaptec.log* in your directory. This is an ASCII text file contains BIOS configuration information generated by *EMDIAG*. This information can be used by Technical Support to help diagnose problems.

Configuration Status

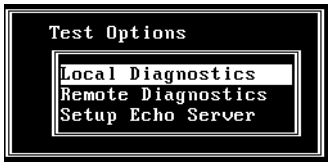
When you select the Configuration Status option on the Main Menu, the Current Configuration screen appears. The Current Configuration screen shows the resources in use by the adapter. Use this option to determine if your adapter is recognized by the system.



Note: If Configuration Status reports that no Adaptec adapter is found, your adapter is not yet ready for use. Make sure that your PCI BIOS is assigning resources to the PCI slot of the adapter.

Diagnostics

When you select **Diagnostics** on the Main Menu, The Test Options menu appears. You may select to run **Local Diagnostics**, **Remote Diagnostics**, or **Setup Echo Server**. These test options are described below:



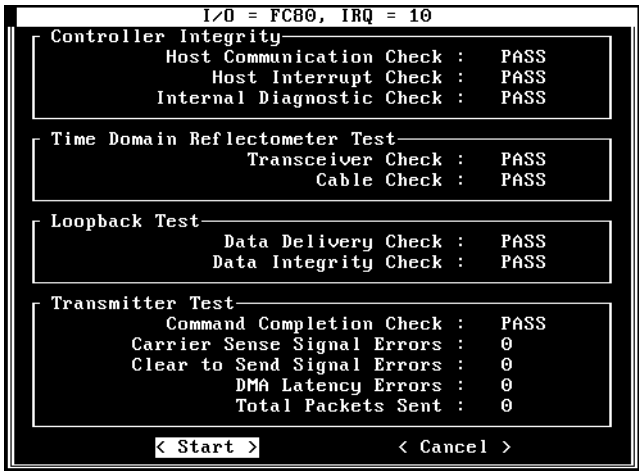
- **Local Diagnostics** tests whether your adapter's components, including the transceiver and Ethernet controller, are working properly. To test your adapter locally, run the diagnostics on an Adaptec adapter installed in a computer connected to a network or terminated cable.
- **Remote Diagnostics** tests how accurately your Adaptec adapter sends packets to and receives packets from an echo server. To test your adapter with a test workstation and an echo server, make sure that both the workstation and echo server are on a private network and each contain an Adaptec adapter. To achieve valid results, use an adapter in the echo server which is known to function correctly.
- **Setup Echo Server** sets up the workstation to act as an echo station for another Adaptec workstation running the **Remote Diagnostics** option. Make sure that the workstation in use as the echo server is known to work properly.

Running Local Diagnostics

If you select Local Diagnostics from the Test Options menu, the screen displays a list of tests to be run. The tests are: Controller Integrity, Time Domain Reflectometer, Loopback, and Transmitter.

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 5-4
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

Use the Tab key to select the <Start> button and then press **Enter** to begin the local diagnostics tests. As each test finishes, the completion status is displayed.



Running Remote Diagnostics

Before running Remote Diagnostics, you must first set up an echo server on another Adaptec adapter.

After selecting Remote Diagnostics from the Test Options menu, the screen displays a list of tests it will run. The tests are: Remote Loopback, Transmitter Section Statistics, and Receiver Section Statistics.

Use the Tab key to select the <Start> button to begin the remote diagnostic tests. As each test finishes, the completion status is displayed.

Setting up the Echo Server

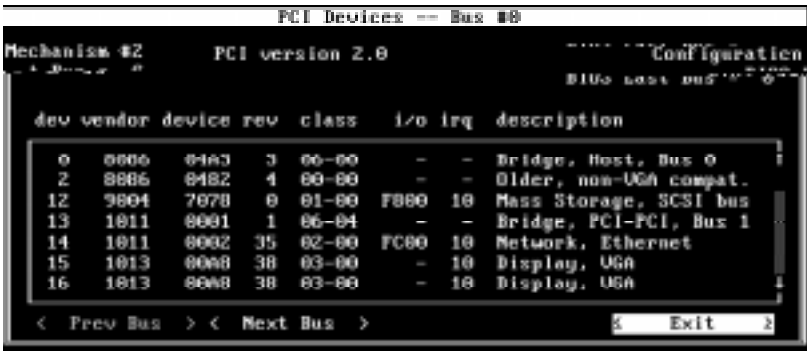
A workstation using the Setup Echo Server option from the Test Options menu works in conjunction with another workstation running the Remote Diagnostics option. The workstation waits to receive any echo packets being sent by a remote workstation running the Remote Diagnostics option and using any Adaptec LAN adapter.

The echo server workstation waits to receive echo packets from the remote workstation. The Echo Server screen reports the number of packets reflected.

PCI Device Information

The PCI Device Information option on the Main Menu provides information about all PCI devices installed in the computer, including Adaptec LAN adapters. The information displayed

includes slot (or device) number, vendor ID, interrupt (IRQ), I/O address, and description:



Quartet Device Information

If a Quartet adapter is installed, the PCI Device Information option helps you determine if your system's BIOS supports the PCI-PCI Bridge chip, and allows you to view devices on a PCI bus that resides on the other side of a PCI-PCI bridge chip (including all four Fast Ethernet ports on a Quartet adapter).

- PCI-PCI Bridge Chip Support—If your system does not support the PCI-PCI Bridge chip, and you are using a Quartet adapter with Windows 95 or Windows NT, the system displays a warning message when you select the PCI Device Information option.

  For more information about PCI-PCI Bridge chip support, see Chapter 2, *Installing Your Adapter*.

- Viewing PCI Bus Devices—To view devices on a PCI bus that resides on the other side of a PCI-PCI Bridge chip, select the **<NEXT BUS>** option on the **PCI Device Information** screen. You can also view all four Fast Ethernet ports on a Quartet adapter.

Note: PCI Buses are numbered sequentially, starting with '0' for the first logical PCI Bus. Some motherboards have more than one PCI bus; the adapters and ports will be numbered depending on the bus they are on, and their position in the bus. The current bus number is displayed in the PCI Device Information windows title bar.

Readme Viewer

This *EMDIAG* PCI Main Menu option allows you to view the *\readme.txt* file on-line. The file is located on the Adaptec diskette.

Technical Support Information

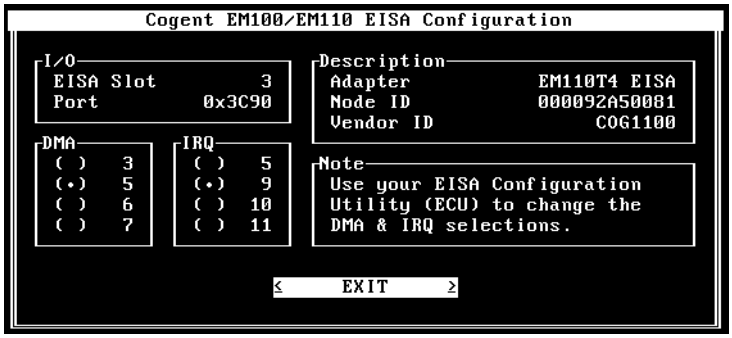
This *EMDIAG* PCI Main Menu option displays contact information for Adaptec Technical Support.

Exit

Choose this *EMDIAG* PCI Main Menu option to quit *EMDIAG*.

EMDIAG for EISA Adapters

The *emdiag.exe* for EISA adapters displays adapter configuration information as described below:



EISA Slot Reports the EISA slot number used by the adapter.

Port Reports the I/O port used by the adapter.

IRQ Reports the IRQ used by the adapter.

DMA Reports the DMA used by the adapters.

Adapter Reports the adapter model.

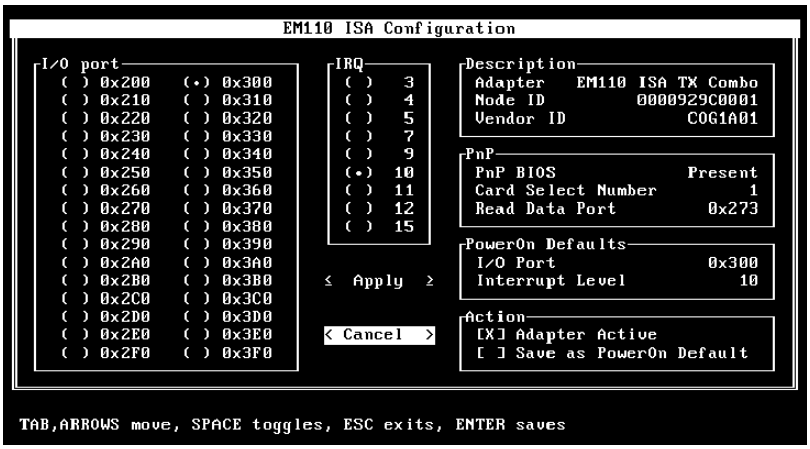
Node ID Reports the adapter node ID.

Vendor ID Reports the Adaptec EISA Vendor ID for the adapter model.

EXIT Quits the *EMDIAG* program.

EMDIAG for ISA Adapters

The *emdiag.exe* for ISA adapters provides adapter configuration information as described below:



I/O Port Allows you to select the preferred I/O port setting for your adapter. (Adapter default is 0x300 as shipped.)

IRQ Allows you to select the preferred IRQ setting for your adapter. (Adapter default is 10 as shipped.)

Description Provides information about your adapter, its node ID, and its vendor ID. No user input allowed.

PnP Determines if your BIOS is a Plug and Play BIOS. No user input allowed.

PowerOn Defaults Displays the current adapter default settings at system PowerOn time.

Action Adapter Active - When *EMDIAG* first starts, this option reports if the adapter is currently active on the bus. Upon exit from *EMDIAG*, this option determines if the adapter is active on the bus. (Unless directed by Adaptec Technical Support, you should normally leave this option alone.)

	Save as PowerOn Default - When this option is selected, and Apply is chosen, the currently selected I/O port and IRQ become the new PowerOn default settings. In most cases, you should keep this option selected.
Apply	Selecting this option saves the current selections and closes the *EMDIAG* program.
Cancel	Selecting this option closes *EMDIAG* without first saving your selections.

Troubleshooting

If your adapter fails the diagnostic tests, verify again that you have properly installed, configured, and cabled your adapter. Make sure that your cable, terminators, and connectors are functioning properly, or install the adapter in a different slot and run the diagnostic program again. See *Copyright* on page ii if the solutions in this chapter do not help.

Isolating Faulty Hardware

If the problem persists, try the following:

- Replace the adapter with the same type of Adaptec adapter which is known to work. If the new adapter functions properly, the problem is related to the original adapter.
- Install the adapter in another functioning computer and run the tests again. If the adapter works in this machine, the problem is related to one of three areas:
  - the computer is faulty
  - there is a hardware conflict
  - there are problems with the cables or connectors

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: 5-10
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/27/97

Frequently Asked Questions

Use the following table to help answer common questions.

Symptom	Solution
EMDIAG reports that the PCI adapter is not found.	Make sure an interrupt is being allocated in the BIOS configuration. Make sure that you are using the latest BIOS available for your computer.
NetWare workstation cannot connect to server.	Make sure workstation and server are using the same frame type.
The Adaptec network adapter does not work with a PCI SCSI adapter installed.	Try moving the Adaptec network adapter to the lowest numbered PCI slot.
Network performance is extremely slow.	If you are using a TX adapter for 100 Mbps, be sure to use CAT 5 UTP. Is your adapter configured for Full Duplex? If so, make sure the switch is configured for Full Duplex.
Link status light does not light when connected to the cable.	Make sure the adapter's network driver is loaded.
Network driver cannot find the ISA adapter.	Your computer may not support Plug and Play. Configure the adapter for non-Plug and Play systems, or run *EMDIAG* and change the interrupt and I/O address in use.
System hangs upon boot up.	Determine if the problem is a memory conflict by booting again with no memory manager present. If the system now boots up, you may need to upgrade EMM386 (PCI systems) or provide a memory exclusion for the boot PROM (ISA).
EMDIAG reports that not all test packets are transmitted properly.	You are probably connected to an active network cable and are simply encountering collisions on the cable. If so, losing some packets is normal.
Quartet *EMDIAG* reports that the PCI BIOS does not support PCI-PCI Bridge chip.	Make sure you are using the latest BIOS for your PCI computer. You may use the NetWare and NDIS 2.0 drivers even without PCI-PCI Bridge chip support.

A

Adapter Specifications

ANA-6510/TX ISA

Bus Interface	ISA, 16-bit I/O Mapped
	EISA, DMA burst mode transfer
	PCI, 32-bit bus master
Hardware Interrupts	PCI INTA, supports shared interrupts
	5, 9, 11, and 15 supports shared interrupts (EISA)
	11 different Plug and Play interrupts (ISA)
Base I/O Addresses	Assigned by BIOS (PCI)
	8 different possible choices, default 300h (EISA)
	8 different Plug and Play choices (ISA)
Ethernet Node ID Number	000092xxxxxx
Power Requirements	+ 5 volts @ 0.5 Amp. max.
Environmental	
Operating Temperature	0° C to 50° C
Humidity	5% to 85% non-condensing
Altitude	3000m maximum
Network Interface Standards	Ethernet IEEE 802.3u 100BASE-TX
Network Speeds Supported	100 Mbps
	200 Mbps Full Duplex (PCI only)
Certifications	FCC Class A
	CE A
Network Connectors	RJ-45 female
Physical Dimensions	5.075" x 3.9" (conforms to PCI Short Card specification)
	7.6" x 4.2" (EISA)
	7.3" x 4.2" (ISA)
Diagnostic LEDs	Link status (green) normally on
	Yellow network activity LED on when activity detected

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: A-1
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/14/97

ANA-6511/T4 and ANA-6511/T4 Combo ISA

Bus Interface	PCI, 32-bit bus master
	EISA, DMA burst mode transfer
	ISA, 16-bit I/O Mapped
Hardware Interrupts	PCI interrupt A, supports shared interrupts (PCI)
	5, 9, 11 and 15, supports shared interrupts (EISA)
	11 different Plug and Play interrupts (ISA)
BASE I/O or Memory Address	Assigned by BIOS (PCI)
	8 different possible choices, default 300h (EISA)
	8 different Plug and Play choices (ISA)
Power Requirements	+5 volts @ 1.5 Amp. max
Environmental	
Temperature	0° C to 50° C
Relative Humidity	5% to 85% non-condensing
Altitude	3000m maximum
Network Interface Standards	IEEE 802.3 10BASE-2
	IEEE 802.3 10BASE-T
	IEEE 802.3u 100BASE-T4
Certifications	FCC Class A
	CE A
Network Speeds Supported	10 Mbps
	20 Mbps Full Duplex (PCI only)
	100 Mbps
Network Connectors	RJ-45 female, BNC
Physical Dimensions	5.075" x 3.9" (conforms to PCI Short Card specification)
	7.6" x 4.2" (EISA)
	7.3" x 4.2" (ISA)
Diagnostic LEDs	Link status (green) normally on, or blinking for 100 Mbps
	Network activity (yellow) on when activity detected

ANA-6511/TX and ANA-6511/TX Combo ISA

Bus Interface	PCI, 32-bit bus master
	EISA, DMA burst mode transfer
	ISA, 16-bit I/O Mapped
Hardware Interrupts	PCI interrupt A, supports shared interrupts (PCI)
	5, 9, 11 and 15, supports shared interrupts (EISA)
	11 different Plug and Play interrupts (ISA)
BASE I/O or Memory Address	Assigned by BIOS (PCI)
	8 different possible choices, default 300h (EISA)
	8 different Plug and Play choices (ISA)
Power Requirements	+5 volts @ 1.5 Amp. max
Environmental	
Temperature	0° C to 50° C
Relative Humidity	5% to 85% non-condensing
Altitude	3000m maximum
Network Interface Standards	IEEE 802.3 10BASE-2
	IEEE 802.3 10BASE-T
	IEEE 802.3u 100BASE-TX
Certifications	FCC Class A
	CE A
Network Speeds Supported	10 Mbps
	20 Mbps Full Duplex (PCI only)
	100 Mbps
	200 Mbps Full Duplex (PCI only)
Network Connectors	RJ-45 female, BNC
Physical Dimensions	5.075" x 3.9" (conforms to PCI Short Card specification)
	7.6" x 4.2" (EISA)
	7.3" x 4.2" (ISA)
Diagnostic LEDs	Link status (green) normally on
	Network activity (yellow) on when activity detected

ANA-6710/TX EISA

Bus Interface	ISA, 16-bit I/O Mapped

Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: A-4
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/14/97

ANA-6711/T4 and ANA-6711/T4 Combo EISA

Bus Interface	PCI, 32-bit bus master
	EISA, DMA burst mode transfer
	ISA, 16-bit I/O Mapped
Hardware Interrupts	PCI interrupt A, supports shared interrupts (PCI)
	5, 9, 11 and 15, supports shared interrupts (EISA)
	11 different Plug and Play interrupts (ISA)
BASE I/O or Memory Address	Assigned by BIOS (PCI)
	8 different possible choices, default 300h (EISA)
	8 different Plug and Play choices (ISA)
Power Requirements	+5 volts @ 1.5 Amp. max
Environmental	
Temperature	0° C to 50° C
Relative Humidity	5% to 85% non-condensing
Altitude	3000m maximum
Network Interface Standards	IEEE 802.3 10BASE-2
	IEEE 802.3 10BASE-T
	IEEE 802.3u 100BASE-T4
Certifications	FCC Class A
	CE A
Network Speeds Supported	10 Mbps
	20 Mbps Full Duplex (PCI only)
	100 Mbps
Network Connectors	RJ-45 female, BNC
Physical Dimensions	5.075" x 3.9" (conforms to PCI Short Card specification)
	7.6" x 4.2" (EISA)
	7.3" x 4.2" (ISA)
Diagnostic LEDs	Link status (green) normally on, or blinking for 100 Mbps
	Network activity (yellow) on when activity detected

ANA-6711/TX and ANA-6711/TX Combo EISA

Bus Interface	PCI, 32-bit bus master
	EISA, DMA burst mode transfer
	ISA, 16-bit I/O Mapped
Hardware Interrupts	PCI interrupt A, supports shared interrupts (PCI)
	5, 9, 11 and 15, supports shared interrupts (EISA)
	11 different Plug and Play interrupts (ISA)
BASE I/O or Memory Address	Assigned by BIOS (PCI)
	8 different possible choices, default 300h (EISA)
	8 different Plug and Play choices (ISA)
Power Requirements	+5 volts @ 1.5 Amp. max
Environmental	
Temperature	0° C to 50° C
Relative Humidity	5% to 85% non-condensing
Altitude	3000m maximum
Network Interface Standards	IEEE 802.3 10BASE-2
	IEEE 802.3 10BASE-T
	IEEE 802.3u 100BASE-TX
Certifications	FCC Class A
	CE A
Network Speeds Supported	10 Mbps
	20 Mbps Full Duplex (PCI only)
	100 Mbps
	200 Mbps Full Duplex (PCI only)
Network Connectors	RJ-45 female, BNC
Physical Dimensions	5.075" x 3.9" (conforms to PCI Short Card specification)
	7.6" x 4.2" (EISA)
	7.3" x 4.2" (ISA)
Diagnostic LEDs	Link status (green) normally on
	Network activity (yellow) on when activity detected

ANA-6901A and ANA-6901A Combo

Bus Interface	PCI, 32-bit bus master
Hardware Interrupts	PCI INTA, supports shared interrupts
Base I/O Addresses	Assigned by BIOS
Ethernet Node ID Number	0000D1xxxxxx
Power Requirements	+ 5 volts @ 0.5 Amp. max. (TP)
	+ 5 volts @ 1 Amp. max. (Combo)
Environmental	
Operating Temperature	0° C to 50° C
Humidity	5% to 85% non-condensing
Altitude	3000m maximum
Network Interface Standards	Ethernet IEEE 802.3 10BASE-T
	Ethernet IEEE 802.3 10BASE-2 (Combo only)
Certifications	FCC Class B
	CE Class B
Network Speeds Supported	10 Mbps
	20 Mbps Full Duplex (RJ-45 only)
Network Connectors	RJ-45 female, BNC
Physical Dimensions	4.875" x 2.875" (conforms to PCI Short Card specification)
Diagnostic LEDs	Link status (green) normally on for RJ-45 connector
	Network activity (yellow) on when activity detected

ANA-6904 and ANA-6904BNC Quartet

Bus Interface	PCI, 32-bit bus master
Hardware Interrupts	PCI INTA, supports shared interrupts
Base I/O Addresses	Assigned by BIOS
Ethernet Node ID Number	000092xxxxxx
Power Requirements	+ 5 volts @ 2 Amp. max. (TP)
	+ 5 volts @ 3.5 Amp. max. (BNC)
Environmental	
Operating Temperature	0° C to 50° C
Humidity	5% to 85% non-condensing
Altitude	3000m maximum
Network Interface Standards	Ethernet IEEE 802.3 10BASE-T
	Ethernet IEEE 802.3 10BASE-2
Certifications	FCC Class A
	CE A
Network Speeds Supported	10 Mbps
	20 Mbps Full Duplex (RJ-45 only)
Network Connectors	RJ-45 female (4), or BNC (4)
Physical Dimensions	9.75" x 4" (conforms to PCI Long Card specification)
Diagnostic LEDs	Link status (green) normally on for RJ-45 connector
	Network activity (yellow) on when activity detected

ANA-6910/FX ST and ANA-6910/FX SC

Bus Interface	PCI 32-bit bus master
Hardware Interrupts	PCI INTA, supports shared interrupts
Base I/O Addresses	Assigned by BIOS
Ethernet Node ID Number	000092xxxxxx
Power Requirements	+ 5 volts @ 0.5 Amp. max.
Environmental	
Operating Temperature	0° C to 50° C
Humidity	5% to 85% non-condensing
Altitude	3000m maximum
Network Interface Standards	Ethernet IEEE 802.3u 100BASE-FX
Certifications	FCC Class B
	CE Class B
Line Speeds Supported	100 Mbps
	200 Mbps Full Duplex
Network Connectors	ST, SC
Physical Dimensions	5.075" x 3.9" (conforms to PCI Short Card specification)
Diagnostic LEDs	Link status (green) normally on
	Network activity (yellow) on when activity detected

ANA-6910/TX PCI

Bus Interface	ISA, 16-bit I/O Mapped
	EISA, DMA burst mode transfer
	PCI, 32-bit bus master
Hardware Interrupts	PCI INTA, supports shared interrupts
	5, 9, 11, and 15 supports shared interrupts (EISA)
	11 different Plug and Play interrupts (ISA)
Base I/O Addresses	Assigned by BIOS (PCI)
	8 different possible choices, default 300h (EISA)
	8 different Plug and Play choices (ISA)
Ethernet Node ID Number	000092xxxxxx
Power Requirements	+ 5 volts @ 0.5 Amp. max.
Environmental	
Operating Temperature	0° C to 50° C
Humidity	5% to 85% non-condensing
Altitude	3000m maximum
Network Interface Standards	Ethernet IEEE 802.3u 100BASE-TX
Certifications	FCC Class B
	CE Class B
Network Speeds Supported	100 Mbps
	200 Mbps Full Duplex (PCI only)
Network Connectors	RJ-45 female
Physical Dimensions	5.075" x 3.9" (conforms to PCI Short Card specification)
	7.6" x 4.2" (EISA)
	7.3" x 4.2" (ISA)
Diagnostic LEDs	Link status (green) normally on
	Network activity (yellow) on when activity detected

ANA-6911/T4 and ANA-6911/T4 Combo PCI

Bus Interface	PCI, 32-bit bus master
	EISA, DMA burst mode transfer
	ISA, 16-bit I/O Mapped
Hardware Interrupts	PCI interrupt A, supports shared interrupts (PCI)
	5, 9, 11 and 15, supports shared interrupts (EISA)
	11 different Plug and Play interrupts (ISA)
BASE I/O or Memory Address	Assigned by BIOS (PCI)
	8 different possible choices, default 300h (EISA)
	8 different Plug and Play choices (ISA)
Power Requirements	+5 volts @ 1.5 Amp. max
Environmental	
Temperature	0° C to 50° C
Relative Humidity	5% to 85% non-condensing
Altitude	3000m maximum
Network Interface Standards	IEEE 802.3 10BASE-2
	IEEE 802.3 10BASE-T
	IEEE 802.3u 100BASE-T4
Certifications	FCC Class B
	CE Class B
Network Speeds Supported	10 Mbps
	20 Mbps Full Duplex (PCI only)
	100 Mbps
Network Connectors	RJ-45 female, BNC
Physical Dimensions	5.075" x 3.9" (conforms to PCI Short Card specification)
	7.6" x 4.2" (EISA)
	7.3" x 4.2" (ISA)
Diagnostic LEDs	Link status (green) normally on, or blinking for 100 Mbps
	Network activity (yellow) on when activity detected

ANA-6911A/TX and ANA-6911A/TX Combo PCI

Bus Interface	PCI, 32-bit bus master
	EISA, DMA burst mode transfer
	ISA, 16-bit I/O Mapped
Hardware Interrupts	PCI interrupt A, supports shared interrupts (PCI)
	5, 9, 11 and 15, supports shared interrupts (EISA)
	11 different Plug and Play interrupts (ISA)
BASE I/O or Memory Address	Assigned by BIOS (PCI)
	8 different possible choices, default 300h (EISA)
	8 different Plug and Play choices (ISA)
Power Requirements	+5 volts @ 1.5 Amp. max
Environmental	
Temperature	0° C to 50° C
Relative Humidity	5% to 85% non-condensing
Altitude	3000m maximum
Network Interface Standards	IEEE 802.3 10BASE-2
	IEEE 802.3 10BASE-T
	IEEE 802.3u 100BASE-TX
Certifications	FCC Class B
	CE Class B
Network Speeds Supported	10 Mbps
	20 Mbps Full Duplex (PCI only)
	100 Mbps
	200 Mbps Full Duplex (PCI only)
Network Connectors	RJ-45 female, BNC
Physical Dimensions	5.075" x 3.9" (conforms to PCI Short Card specification)
	7.6" x 4.2" (EISA)
	7.3" x 4.2" (ISA)
Diagnostic LEDs	Link status (green) normally on
	Network activity (yellow) on when activity detected

ANA-6911/UC Ultimate Combo

Bus Interface	PCI 32-bit bus master
Hardware Interrupts	PCI INTA, supports shared interrupts
Base I/O Addresses	Assigned by BIOS
Ethernet Node ID Number	000092xxxxxx
Power Requirements	+ 5 volts @ 3 Amp. max, or
	+3.3 volts @ 5 Amp. max
Environmental	
Operating Temperature	0° C to 50° C
Humidity	5% to 85% non-condensing
Altitude	3000m maximum
Network Interface Standards	Ethernet IEEE 802.3 10BASE-T
	Ethernet IEEE 802.3 10BASE-2
	Ethernet IEEE 802.3 10BASE-5
	Ethernet IEEE 802.3u 100BASE-T4
	Ethernet IEEE 802.3u 100BASE-TX
Certifications	FCC Class A
	CE Class A
Network Speeds Supported	10 Mbps
	20 Mbps Full Duplex
	100 Mbps
	200 Mbps Full Duplex (TX only)
Network Connectors	RJ-45 female, BNC, AUI
Physical Dimensions	6" x 3.9" (conforms to PCI Short Card specification)
Diagnostic LEDs	Link status 10/100 (yellow/green) normally on
	Network activity (yellow) on when activity detected

ANA-6940/Quartet TX

Bus Interface	PCI 32-bit bus master
Hardware Interrupts	PCI INTA, supports shared interrupts
Base I/O Addresses	Assigned by BIOS
Ethernet Node ID Number	000092xxxxxx
Power Requirements	+ 5 volts @ 2 Amp. max
Environmental	
Operating Temperature	0° C to 50° C
Humidity	5% to 85% non-condensing
Altitude	3000m maximum
Network Interface Standards	Ethernet IEEE 802.3u 100BASE-TX
Certifications	FCC Class A
	CE Class A
Network Speeds Supported	100 Mbps
	200 Mbps Full Duplex
Network Connectors	RJ-45 female (4)
Physical Dimensions	9.75" x 4.2" (conforms to PCI Long Card specification)
Diagnostic LEDs	Link status (green) normally on
	Network activity (yellow) on when activity detected

ANA-6944A/Quartet TX

Bus Interface	PCI 32-bit bus master
Hardware Interrupts	PCI INTA, supports shared interrupts
Base I/O Addresses	Assigned by BIOS
Ethernet Node ID Number	000092xxxxxx
Power Requirements	+ 5 volts @ 2 Amp. max + 5 volts @ 3.5 Amp. max
Environmental	
Operating Temperature	0° C to 50° C
Humidity	5% to 85% non-condensing
Altitude	3000m maximum
Network Interface Standards	Ethernet IEEE 802.3 10BASE-T
	Ethernet IEEE 802.3u 100BASE-TX
Certifications	FCC Class A
	CE Class A
Network Speeds Supported	10 Mbps
	20 Mbps Full Duplex
	100 Mbps
	200 Mbps Full Duplex
Network Connectors	RJ-45 female (4)
Physical Dimensions	9.75" x 4.2" (conforms to PCI Long Card specification)
Diagnostic LEDs	Green link status light, normally on, indicates 100TX link. Yellow link status light indicates 10T link.
	Yellow network activity light on when activity detected

ANA-6944/Quartet T4

Bus Interface	PCI 32-bit bus master
Hardware Interrupts	PCI INTA, supports shared interrupts
Base I/O Addresses	Assigned by BIOS
Ethernet Node ID Number	000092xxxxxx
Power Requirements	+ 5 volts @ 2 Amp. max
	+ 5 volts @ 3.5 Amp. max
Environmental	
Operating Temperature	0° C to 50° C
Humidity	5% to 85% non-condensing
Altitude	3000m maximum
Network Interface Standards	Ethernet IEEE 802.3 10BASE-T
	Ethernet IEEE 802.3u 100BASE-T4
Certifications	FCC Class A
	CE Class A
Network Speeds Supported	10 Mbps
	20 Mbps Full Duplex
	100 Mbps
Network Connectors	RJ-45 female (4)
Physical Dimensions	9.75" x 4.2" (conforms to PCI Long Card specification)
Diagnostic LEDs	Link status (green) normally on, or blinking for 100 Mbps
	Network activity (yellow) on when activity detected

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Ethernet and Fast Ethernet Adapters User's Guide
Stock Number: 511277-00, Rev. B Page: B-2
Print Spec Number: 495440-00
Current Date: 1/24/97 ECN Date: 1/14/97

Cable Type Parameters

The following parameters can be used in the *NET.CFG* to override cable type and line speed autosensing.

THICK	(ANA-6901/C only) Sets cable type to AUI Thicknet.
THIN	(Selected models only) Sets cable type to BNC Thinnet.
UTP	Sets cable type to RJ-45 twisted pair.
UTP_LINK_OFF	Deactivates link integrity on RJ-45 port.
UTP_FDE	(10BASE-T and 100BASE-Enables Full Duplex mode on RJ-45 X only) port.
SPEED	"value" (10/100 models only) Sets cable speed to be used by the adapter. Example: Speed 10
ACTIVESENSE	Configures the driver for autosensing at regular intervals during runtime. The driver will automatically adjust to a change in cable type or line speed without requiring a driver reload when configured for "ACTIVESENSE." The driver will also display a message if a cable break occurs. Use the ACTIVESENSE keyword only when a cable is connected to the adapter.
DEFAULT	Driver will perform an autosense cycle at initialization time to determine cable type and line speed.

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Index

100BASE-FX 1-4

100BASE-T4 1-4

100BASE-TX 1-4

A

Adapter

- EISA 2-6
- Installation 2-1
- ISA 2-3
- PCI 2-3
  - Quartets 2-4
- Specifications A-1

C

Cables

- Checking Connections with EMDIAG 3-5
- Connecting
  - Connecting the Quartet 3-1
- Crossover Cables 3-1
- Parameters B-3
- Requirements 3-1
- Twisted Pair
  - Crossover B-2
  - Straight-through B-1

Canadian iii, iv

conventions 1-2

Customer Support

- See Technical Support

D

Diagnostic LEDs 3-4

DOS ODI

- Automated NetWare Client Installation 4-16
- Manual Installation 4-16
- Parameters 4-17

Duralink

- Backup Adapters
  - Unbinding Protocols 4-13
- NetWare 3.x
  - Configuring Failover 4-5
  - Configuring Protocols 4-5
  - Installing 4-4
- NetWare 4.x and 4.11
  - Changing Binding Protocols 4-15
  - Configuring 4-10
  - Deleting Host Adapters 4-15
  - Inserting New Host Adapters 4-14
  - Installing 4-9
  - Loading SNMP and DMI Agents 4-12
  - Modifying Configurations 4-13
- Windows NT 3.51
  - Configuring 4-19
  - Installing 4-19
- Windows NT 4.0
  - Configuring 4-22
  - Installing 4-22
  - Modifying Link Check Timeout 4-24
  - Removing Duralink 4-23

E

EISA Adapters
- Configuration Options 2-6
- Configuring
  - Running the ECU 2-6

EISA Configuration Utility (ECU) 2-6

EMDIAG
- EISA 5-8
- EXIT 5-8
- ISA 5-9
- PCI 5-2
- PCI Main Menu 5-2
  - Configuration Status 5-3
  - Diagnostics 5-4
  - Exit 5-8
  - PCI Device Information 5-6
  - Readme Viewer 5-8
  - Technical Support Information 5-8
- Running 5-2

F

Failover. See Duralink

Fast Ethernet
- 100BASE-FX 1-3
- 100BASE-T4 1-3
- 100BASE-TX 1-3

Frequently Asked Questions 5-11

I

ISA Adapters
- Configuring 2-3
  - Non Plug and Play 2-7
  - Plug and Play 2-7
- Default Settings 2-7

L

LEDs
- Diagnostic 3-4

N

NDIS 2.0 4-27
- Installing with LAN Manager 4-28
- Parameters 4-28

NetWare 4-3

NetWare 3.x 4-3
- Duralink
  - Configuring Failover 4-5
  - Configuring Protocols 4-5
  - Installing 4-4
- Sample AUTOEXEC.NCF 4-4

NetWare 4.x and 4.11
- Duralink
  - Configuring 4-10
  - Installing 4-9
  - Modifying Configurations 4-13
- Duralink Backup Adapters
  - Unbinding Protocols 4-13
- Loading SNMP and DMI Agents 4-12
- Parameters 4-8
- Sample AUTOEXEC.NCF 4-8

NetWare Drivers
- NetWare 3.x 4-3

Network Drivers
- Full Duplex Support 4-2
- Installation 4-8
- Installation Instruction and Keywords 4-1
- Naming Conventions 4-2
- NDIS 2.0 4-27
- NetWare 4-3
- OS/2 SMP 4-29
- SCO OpenServer 5.0 4-33
- SCO Unixware SMP 4-34

Ethernet and Fast Ethernet Adapters
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UNIX 4-32
Windows 95 4-24
Windows for Workgroups 4-26
Windows NT 4-17
Windows NT 4.0 4-20

O

OS/2 SMP 4-29
Installing for the First Time 4-31
Installing with LAN Server 4-29
Installing with Pre-existing OS/2 SMP 4-30
Parameters 4-32

P

PCI
Diagnostics
Setup Echo Server 5-6
PCI Adapter
Configuring
BIOS 2-3
Interrupts 2-3
PCI Main Menu (EMDIAG)
Configuration Status 5-3
Diagnostics 5-4
Local 5-4
Remote 5-5
Exit 5-8
PCI Device Information 5-6
Quartet Information 5-7
Readme Viewer 5-8
Technical Support Information 5-8
PCI-PCI Bridge Chip 2-4

Q

Quartet Adapters
Binding Sequences
Windows NT 4-18
Configuring
PCI-PCI Bridge Chip 2-4
Testing Configuration 2-5

R

Readme Files 5-8
Readme Viewer 5-8

S

SCO OpenServer 5.0 4-33
Configuration 4-34
Installation 4-33
SCO Unixware SMP 4-34
Configuring the IP Addresses 4-35
Installation 4-34
System Requirements 1-1

T

Technical Support Information
EMDIAG PCI Main Menu 5-8
Troubleshooting 5-10
Frequently Asked Questions 5-11
Isolating Faulty Hardware 5-10
typographic conventions 1-2

U

Unbinding Protocols
Duralink Backup Adapters 4-13
UNIX
NEXTSTEP 4-32
SCO Open Desktop 4-32
SCO OpenServer 5.0 4-32
SCO UNIX System 4-32
SCO Unixware SMP 4-32
Sun Solaris 4-32

W

Windows 95 4-24
  Installation
    EISA 4-25
    ISA 4-24
    PCI 4-25
  Parameters 4-26
Windows for Workgroups 4-26
  Parameters 4-27
Windows NT 4-17
  Parameters 4-18
  Quartet Binding Sequences 4-18
  Windows NT 3.51 4-17
Windows NT 3.51
  Duralink
    Installing 4-19
Windows NT 4.0 4-20
  Duralink
    Installing 4-22
    Modifying Link Check Timeout 4-24
    Removing 4-23
  Parameters 4-21
Windows NT driver
  driver parameters 4-21

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