EtherWORKS *Turbo EISA*

User Information

Order Number: EK-DE425-OM. A01

Revision/Update Information: This is a new manual.

Digital Equipment Corporation
Maynard, Massachusetts

FCC ID: AO9-DE425

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

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

Any changes or modifications made to this equipment may void the user's authority to operate this equipment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

– Re-orient or relocate the receiving antenna

– Increase the separation between the equipment and receiver

– Connect the equipment into an outlet on a circuit different from that to which the receiver is connected

– Consult the dealer or an experienced radio/TV technician for help

The use of unshielded Ethernet cables on ThinWire and thickwire ports with this equipment is prohibited due to non-compliance with FCC regulations for a Class B computing device pursuant to Part 15 of FCC Rules.

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First Edition, November 1994

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About This Manual

The EtherWORKS *Turbo EISA* adapter is a computer option adapter that enables you to integrate various EISA-compatible computers into local area network (LAN) environments that use IEEE 802.3 and Ethernet protocols. The EtherWORKS *Turbo EISA* adapter is also referred to as *Turbo EISA* adapter or adapter in this manual.

This manual explains how to:

- Configure the *Turbo EISA* adapter before installation
- Prepare an EISA-compatible computer for installation
- Install the adapter
- Run the diagnostic utility

Manual Conventions

This manual uses the following conventions:

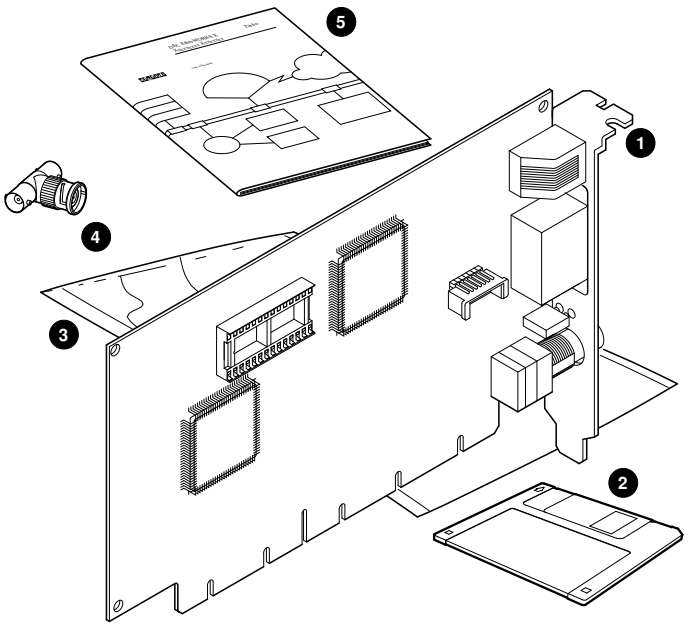
Convention	Description
Note	A note contains information of special importance to the reader.
Caution	A caution contains information to prevent damage to the equipment.
PN	Part number.
❶	A number in a black circle in text refers to the corresponding number in an accompanying illustration.
Enter	A word in a box indicates a particular keyboard key. For example, Enter indicates the Enter key.
`This type`	Text in monospace type indicates text you enter or text that the system displays.

Product Kit Contents

The product kit includes the items shown in Figure 1. Verify that you have the following components before proceeding:

- EtherWORKS *Turbo EISA* adapter ❶
- 3½ inch distribution diskette ❷
- Anti-static packaging bag ❸
- T-connector ❹
- Owner's manual ❺

Figure 1 EtherWORKS *Turbo EISA* Product Kit



1
Introduction

This chapter describes the EtherWORKS *Turbo EISA* adapter and briefly summarizes its features.

The *Turbo EISA* adapter enables you to integrate EISA-compatible computers into a network using ThinWire, AUI, or twisted-pair Ethernet cables. After you install the adapter in your computer, you can use various network software products to integrate the computer into a local area network (LAN) environment.

Features

The main features of the *Turbo EISA* adapter are as follows:

- Capable of full duplex (20 Mb/s) operation in 10Base-T mode
- High performance 32-bit Direct Memory Access (DMA) architecture
- Auto media selection with software media configuration for 10Base2 ThinWire and 10Base-T twisted-pair Ethernet connections
- Low CPU utilization on the host computer

- Supports ThinWire, AUI, and twisted-pair Ethernet connections
- Provides a comprehensive set of device drivers for the most popular network operating environments.
  - Novell NetWare
  - Microsoft Windows NT (Intel and Alpha)
  - Microsoft Windows
  - Microsoft Windows for Workgroups
  - Digital PATHWORKS
  - IBM LAN Manager
  - SCO Unix
  - DOS
  - OS/2

2
Configuration

This chapter describes how to prepare your system's configuration to accept the EtherWORKS *Turbo EISA* adapter prior to installing the adapter in your system.

The configuration file (!DEC4250.CFG), contained on the distribution diskette included in the *Turbo EISA* kit, must be used with your system EISA Configuration Utility (ECU).

The *Turbo EISA* adapter's system parameters are automatically configured by the ECU. The parameters are set to the default values that correspond to the needs of most users. Use the ECU to view or change these settings.

Once you have run the ECU and prepared your system configuration to accept the *Turbo EISA* adapter, proceed to Chapter 3.

Note

If you are using an OpenVMS or DEC OSF/1 operating system, you must use the ECU and configuration file (ADEC4250.CFG) located on the ECU DEC AXP diskette, Version 1.6 or later. This diskette comes with your AXP system. Earlier versions of the ECU should not be used.

EISA Configuration Utility

The ECU is used to select system- and adapter-specific parameters to help ensure proper system operation when adding a new adapter to your system. Refer to your computer documentation for information on how to install an adapter using your system ECU.

Note

If there is an adapter installed in your system that has not been configured by the ECU, an IRQ or memory conflict could occur with the *Turbo EISA* adapter. To resolve the conflict, change the *Turbo EISA* adapter settings. Check with your system manager for a list of the other installed adapter settings.

Table 2–1 shows the *Turbo EISA* adapter's default parameters. Refer to the Changing the Adapter Settings section of this chapter for further parameter information.

Table 2–1 *Turbo EISA* Adapter Parameters

Parameter	Default
Interrupt Mode	Edge-Triggered
IRQ	Selected by ECU
DMA Mode—Burst Length	16 longwords
DMA Mode—Burst Address Alignment	32 longwords
DMA Mode—Arbitration	Rcv/Txm
Network mode/Cable type	Twisted-pair
AUI Thickwire/ThinWire (AUI jumper)	ThinWire

Accessing the Configuration Utility

To configure the *Turbo EISA* adapter, you need the system ECU diskette that comes with your system and the software distribution diskette contained in the *Turbo EISA* kit.

The following is an example of how to configure the *Turbo EISA* adapter in a computer. This procedure could differ somewhat according to the system you are using.

1. Power down the system before you begin.
2. Insert the ECU system diskette, then power on the system.
3. Run your system ECU, following the screen directions to add an adapter to your system.
4. When prompted for the option diskette, remove the ECU system diskette and insert the *Turbo EISA* distribution diskette containing the configuration file (!DEC4250.CFG) into drive A.
5. Select the *Digital EtherWORKS Turbo EISA (DE425-xx)* option.
6. When prompted for the ECU diskette, remove the *Turbo EISA* diskette and insert the system ECU diskette again.
7. Select an available bus master slot into which the *Turbo EISA* adapter will be placed.
8. Once the adapter is added to the configuration, review the adapter's settings to ensure they meet your needs. You can choose to either keep the default settings or change them (see the Changing the Adapter Settings section of this chapter).
9. Review and note the *Turbo EISA* adapter's jumper setting. When installing the adapter, manually set the AUI jumper setting on the adapter to match the ECU setting and the network cable type.
10. Select the *Save Configuration* option, then exit the ECU.
11. When prompted to reboot or power down the system, remove the ECU system diskette first. Proceed with the *Turbo EISA* adapter installation (see Chapter 3).

Changing the Adapter Settings

This section describes how to change the *Turbo EISA* adapter settings using the following ECU menu options.

Note

An asterisk in the following examples indicates the default settings.

Interrupt Mode

The *Turbo EISA* adapter can use IRQ5, IRQ9, IRQ10, or IRQ11. The ECU will select the first available IRQ. You can view or edit the selected IRQ.

The available IRQ modes are as follows:

```
(*) Edge-Triggered
( ) Level-Triggered (no sharing)
( ) Level-Triggered (sharing)
```

Edge-Triggered mode is the default interrupt mode. It is supported in all EISA systems.

Level-Triggered (no sharing) mode is supported in all EISA systems.

Level-Triggered (sharing) mode is supported in most systems. This mode allows the sharing of a single IRQ level by one or more devices that support shared Level-Triggered interrupts.

Note

Before selecting level-triggered sharing mode, check with your driver README files to ensure that interrupt sharing is supported.

DMA Mode—Burst Length

This menu option indicates the maximum number of longwords to be transferred in a single DMA transaction. The more longwords transferred, the higher the *Turbo EISA* adapter's performance; therefore, select the default (16 Longwords) whenever possible.

The available number of longwords that can be transferred during a single DMA transaction are as follows:

```
(*) 16 Longwords
( )  8 Longwords
( )  4 Longwords
( )  2 Longwords
( )  1 Longword
```

DMA Mode—Burst Address Alignment

This menu option selects the address alignment for DMA burst transfers. To maximize performance, this selection must be equal to or larger than the selected DMA Burst Length. The default is 32 longwords.

The available address alignments are as follows:

```
(*) 32 Longwords
( ) 16 Longwords
( )  8 Longwords
```

DMA Mode—Arbitration

This menu option is used to set the internal bus arbitration between the receive and transmit data transfer process. The default is Rec/Txm.

When Rcv/Txm DMA arbitration is selected, the receive process has priority over the transmit process. When Round Robin arbitration is selected, there is an equal sharing of the DMA request between the receive and transmit processes.

The available bus arbitration selections are as follows:

```
(*) Rcv/Txm
( ) Round Robin
```

Network Mode/Cable Type

The Network Mode option determines the network function and whether the twisted-pair cable connector or one of the AUI ports (thickwire/ThinWire) will be active. When AUI thickwire or AUI ThinWire is selected, cable selection is performed manually by setting the AUI jumper (see Figure 3–2).

The available network modes are as follows:

```
(*) Twisted-Pair
( ) Twisted-Pair - Full Duplex
( ) Twisted-Pair - Link Disabled
( ) AUI ThinWire
( ) AUI Thickwire
( ) AutoSense
```

Twisted-pair (TP) mode enables the twisted-pair cable connector and disables the AUI mode (AUI thickwire or ThinWire connectors).

Twisted-pair full duplex mode selects the twisted-pair mode and enables full duplex (20 Mb/s) operation. Select this mode only when connecting to another full duplex device.

Twisted-pair link disabled mode selects the twisted-pair mode with twisted-pair link integrity disabled. Select this mode only if the network device to which you are connecting does not support twisted-pair link integrity.

AUI ThinWire or AUI thickwire mode will enable either the ThinWire BNC connector or the thickwire 15-pin connector depending on the AUI jumper setting.

Note

Selecting AUI ThinWire or AUI thickwire will enable the AUI port and prompt the ECU to display the proper AUI jumper position. After making your selection, use the ECU to view the AUI jumper position and record this information. Before installing the *Turbo EISA* adapter in your system, manually set the AUI jumper setting on the adapter to match the ECU setting (see Figure 3–2).

AutoSense will check the connectors in the following order to find the first active connection: twisted-pair, AUI ThinWire, and AUI thickwire. When an active connection is found, AutoSense will select that port/connection. However, if you are using AUI ThinWire or AUI thickwire, you must ensure the AUI jumper is in the correct position to detect activity on the port being used.

3

Adapter Installation and Diagnostics

The steps to install the EtherWORKS *Turbo EISA* adapter are as follows:

1. Prepare the *Turbo EISA* adapter for installation.
2. Prepare your computer's configuration using the the !DE4250.CFG configuration file and your system EISA Configuration Utility (ECU).
3. Install the *Turbo EISA* adapter into an EISA-compatible computer.
4. Run the NICDIAG Diagnostic utility.
5. Connect your system to the network.
6. Install the software (see Chapter 4).

The only tool you should need is a screwdriver.

Caution

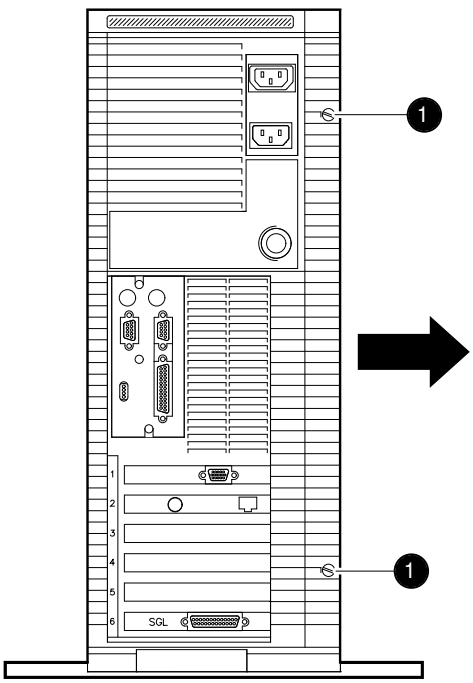
Static electricity can damage electronic components. Use an antistatic wrist strap while handling the components.

Preparing the Computer

Use the following procedure to prepare your computer for a typical installation of the *Turbo EISA* adapter. Refer to your computer documentation for specific installation information.

1. Set all power switches (system and peripherals) to the off position.
2. Unplug the power cord from the wall socket, then disconnect the cord from the system unit. Unplug any external devices.
3. Remove the captive screws from the system cover (see ❶ in Figure 3–1) and remove the cover.

Figure 3–1 Removing the System Unit Outside Cover



Preparing the Adapter

Your *Turbo EISA* adapter provides auto media selection with software media configuration features for 10Base-T twisted-pair networks and 10Base2 ThinWire networks.

If you intend to use a 10Base-T twisted-pair network, no adapter preparation is needed–the AUI jumper has no effect. Proceed to the Installing the Adapter section of this chapter.

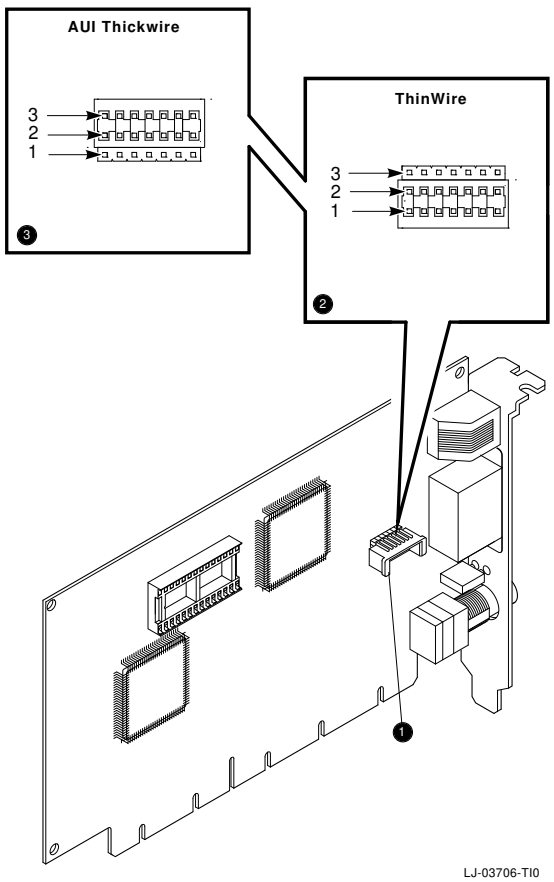
When not using a 10Base-T twisted-pair interface, the AUI jumper (❶, Figure 3–2) on the EtherWORKS *Turbo EISA* adapter determines which media interface, 10Base2 ThinWire or AUI, will be used. The default AUI setting is for a ThinWire network.

If you intend to use an AUI network, change the AUI jumper setting before you install the adapter in your computer. Table 3–1 provides instructions for setting the AUI jumper; Figure 3–2 shows the AUI jumper settings.

Table 3–1 AUI Jumper Settings

If you want to ...	Then ...
Connect to a 10Base2 ThinWire Ethernet network ❷	Leave the AUI jumper in the position connecting pin rows 1 and 2 (default setting).
Connect to Ethernet network using AUI cable ❸	Remove the AUI jumper assembly from the adapter. Rotate the assembly 180°, then position it over pin rows 2 and 3. Press the AUI jumper assembly firmly into place.
Connect to a 10Base-T twisted-pair Ethernet network	AUI jumper has no effect.

Figure 3–2 Configuring Media Interface



Installing the Adapter

To install the *Turbo EISA* adapter in your computer, use the following procedure:

1. Set all power switches (system and peripherals) to the off position.
2. Unplug the power cord from the wall socket, then disconnect the cord from the system unit. Unplug any external devices.
3. Remove the computer cover(s) to access the slots.
4. Unscrew and remove the system's option slot cover from the slot you plan to use (Figure 3–3). Be sure to use the slot that you specified while running the Configuration utility.

Caution

For safe operation, be sure there are no missing slot covers when you complete the installation.

5. Carefully install the *Turbo EISA* adapter into the appropriate EISA bus slot connector on the system module, then push firmly into place (Figure 3–4).
6. Replace the screw to secure the adapter.
7. Replace the computer cover(s).
8. Connect the power cord to the system unit, then plug the power cord into the wall outlet. Reconnect any external devices.
9. Power on the system and peripherals.

Figure 3–3 Removing the Slot Cover

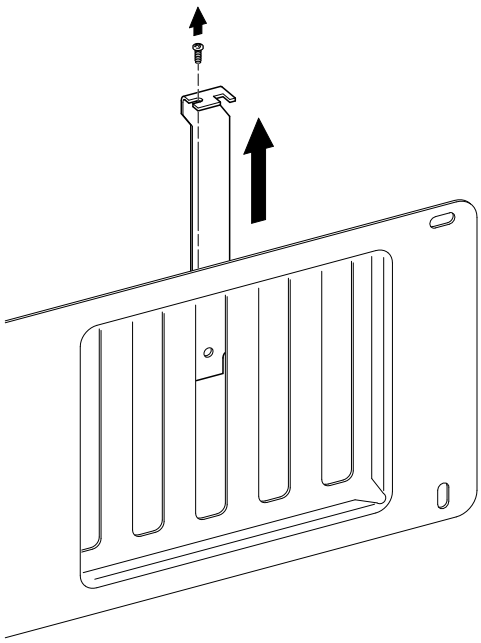


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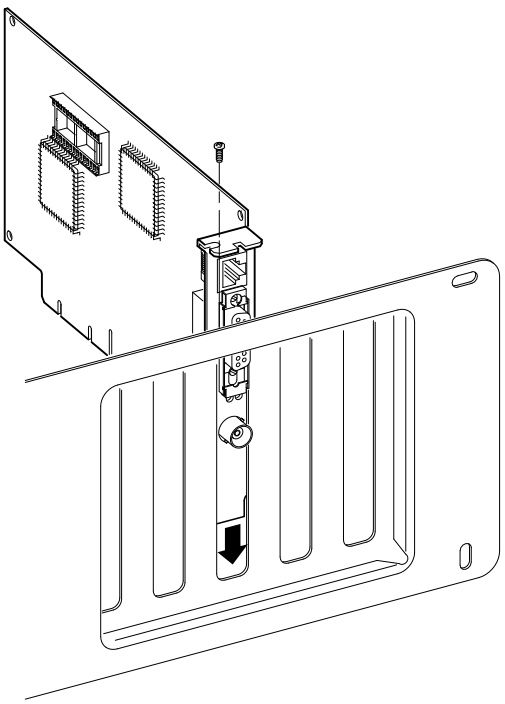
Figure 3–4 Installing the EtherWORKS *Turbo EISA* Adapter



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Diagnostics

The EtherWORKS *Turbo EISA* distribution diskette contains the NICDIAG Diagnostic utility for DOS-based computers. For other systems, refer to your computer documentation. It is recommended that you run this utility after initial installation to ensure the adapter is set up to meet your system requirements and to verify the adapter's functionality. When you run the NICDIAG diagnostics, make sure both the NICDIAG.EXE and the DIAG.EXE files are in the same directory.

The NICDIAG Diagnostic utility prevents diagnostics from running if it detects an active EtherWORKS *Turbo EISA* adapter. The adapter is considered active if a network device driver is loaded. If necessary, remove the statement that loads the device driver in the CONFIG.SYS or other files and cold boot the computer to deactivate the adapter, or press F5 to bypass all startup files.

Accessing the Diagnostic Utility

To access the Diagnostic utility, use the following procedure.

1. Insert the EtherWORKS *Turbo EISA* distribution diskette into the disk drive.
2. Set the system to the drive being used.
3. Type `NICDIAG` at the DOS prompt.

   An introductory window appears. Follow the screen instructions to display the Main Menu.

4. Select the *Configuration* option, then press Enter to display the current *Turbo EISA* adapter configuration. These parameters are for viewing only, and cannot be changed.
5. Select the *Diagnostics* option, then press Enter to run the diagnostics.

   When the diagnostics are complete, the screen displays the diagnostic result code and lets you know whether the adapter diagnostics passed or failed.
6. Press Esc to return to the NICDIAG Main Menu.
7. Select the *Exit* option from the Main Menu.

   The following warning message appears:

   ```
   Do you really want to quit? (Y/N)
   ```
8. Press `Y` to exit NICDIAG.
9. Restore the CONFIG.SYS file if modified.
10. Reboot your system.

Connecting to a Network

Use one of the following procedures to connect your system to the network.

Connecting to a ThinWire Ethernet Network

To connect the *Turbo EISA* adapter to a ThinWire network:

1. Attach the ThinWire cable(s) to a T-connector (included in your *Turbo EISA* kit).
2. If the system is at the end of an Ethernet segment, attach a terminator (not supplied) to the unused side of the T-connector. If the system is between two consecutive networked systems, attach a ThinWire cable to each end of the T-connector. Termination is usually required at each end of a ThinWire cable segment.
3. Push the T-connector onto the BNC connector, then twist the T-connector to lock it in place (see ❶ in Figure 3–5).

Connecting to a Twisted-Pair Ethernet Network

To connect the *Turbo EISA* adapter to a twisted-pair network:

Plug the twisted-pair Ethernet cable connector into the 8-pin (RJ-45) connector until it clicks and locks in place (see ❷ in Figure 3–5).

To configure a full duplex connection, make sure that you are connecting to another device that supports full duplex mode to avoid serious network problems. Full duplex mode is enabled by the software. See the README.TXT file referenced in Chapter 4 for further information.

Connecting to an AUI Ethernet Network

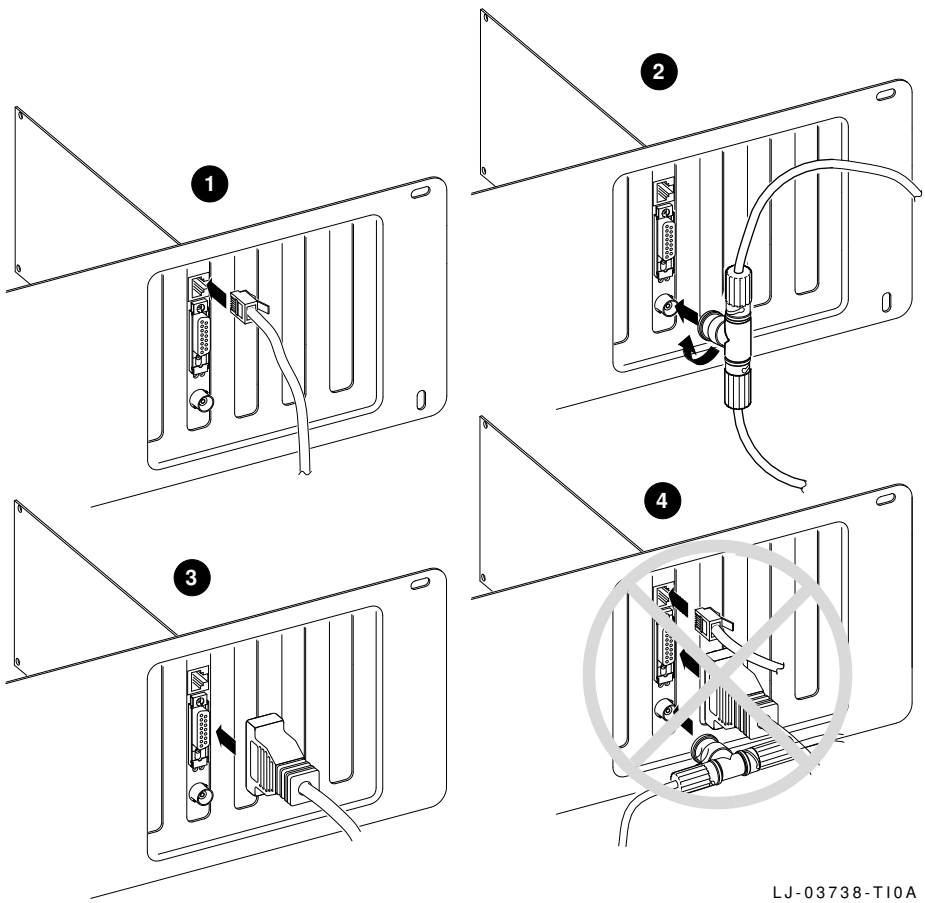
To connect the *Turbo EISA* adapter to an AUI network:

1. Slide the latch assembly on the adapter's AUI connector upward.
2. Plug the AUI cable connector into the 15-pin AUI connector on the adapter.
3. Slide the latch assembly downward to lock the connector in place (see ❸ in Figure 3–5).

Note

Do not connect more than one Ethernet cable to the EtherWORKS *Turbo EISA* adapter at the same time (see ❹ in Figure 3–5).

Figure 3–5 Connecting to the Ethernet Network



4

Device Driver Information

The EtherWORKS *Turbo EISA* distribution diskette files, README.TXT and RELEASE.NOT, contain device driver software and installation information. The diskette also contains configuration information for PATHWORKS, LAN Manager-based, Windows NT, and NetWare network operating systems (NOS).

- Refer to the README.TXT file located in the diskette's root directory for a complete list of the supported device drivers and the directory structure for each of the supported operating environments.
- Refer to the RELEASE.NOT file for information about known installation or configuration problems.

The diskette contains additional README.TXT files within the directory structures for each supported operating environment. These files contain information that pertains to the specific device driver or operating environment corresponding to the subdirectory where they are found.

Obtaining the Latest EtherWORKS *Turbo EISA* Driver Files

The device driver software diskette included in your EtherWORKS *Turbo EISA* kit could become outdated as operating system software evolves. To obtain the latest versions of the driver files from the Internet, CompuServe, and the DECpc Bulletin Board Service, use the following procedures.

- **Internet:**
  1. Perform an ftp connect to ftp.digital.com. Your login name is `anonymous`.
  2. Enter your password. (Use your Internet address as your password.)
  3. Using lowercase letters, change your directory as follows:

     ```
     cd /pub/micro/msdos/network
     ```

  4. Select image mode:

     ```
     ftp> i
     ```

  5. Perform a get command on the DE425.ZIP file:

     ```
     ftp> get DE425.ZIP
     ```

  6. Type `quit` to exit ftp.
- **CompuServe:**
  1. Type `Go decpci` to select the *decpci forum* and enter the LAN Controllers library.
  2. Select the *Browse* option to scroll through the library titles.
  3. Click on the DE425 title, then press Return to display the description of the DE425 PC Card file.
  4. Select the *Retrieve* option to copy the file to your system.

  For information on how to obtain a CompuServe account in the U.S., call 1-800-848-8990.

- **DECpc Bulletin Board Service:**

  1. Using a modem (parameters 2400, 8, n, 1), connect to the DECpc Bulletin Board Service in the U.S. by dialing 508-496-8800.
  2. Follow the menu-driven instructions on your screen to download the driver files.

A

Problem Solving

This appendix describes problems you could encounter when installing the EtherWORKS *Turbo EISA* adapter and suggests possible causes and solutions.

Fault Isolation By Symptom

Table A–1 describes how to isolate faults by the symptoms that are occurring.

Table A–1 Fault Isolation By Symptom

Symptom	Possible Cause	Recommended Action
The system is on, but there is no display.	The monitor is not on or it is not connected to the video board.	Be sure the monitor cable is firmly connected to the video board. Set the monitor power switch to ON.
	The adapter is not seated firmly.	Turn your computer off, reseat the adapter, then turn your computer on again (see Chapter 3).

(continued on next page)

Table A–1 (Cont.) Fault Isolation By Symptom

Symptom	Possible Cause	Recommended Action
The system is on, but nothing happens. The keyboard does not respond.	The adapter is preventing the CPU from operating correctly.	Disconnect the ThinWire or twisted-pair cable from the adapter. Turn the computer off, reseat the adapter, then turn the computer on again.
The system does not boot from the diskette.	The system diskette could be corrupted.	Remove the *Turbo EISA* adapter from your system. Check the ECU setup for conflicts. See your system administrator for a bootable system diskette.
	The Ethernet address is not registered for this address node.	Register the adapter at the server node. If the problem persists, contact your system administrator.
The system is on and displays a DE425 configuration error during system startup.	A problem could exist with the adapter or configuration.	See Table A–2. Press the F1 key to continue. Reinsert or replace the adapter and start the system again.
	The error code could be a system error code.	Refer to your system's documentation for additional information. If the problem persists, contact your system administrator.

(continued on next page)

Table A–1 (Cont.) Fault Isolation By Symptom

Symptom	Possible Cause	Recommended Action
The system is on, but the network does not start.	The network cables are loose.	Check and secure all cables.
	A conflict exists with another adapter in the system:	
	The IRQ settings are incorrect.	Check the ECU setup and change the settings if necessary.
	No network software or driver is loaded.	Ensure the network software and driver are properly installed.
The system is on, network software is loaded, but the network activity LED does not blink or turn on.	Network software or driver is not properly configured.	Check the ECU setup and reconfigure if necessary.
	A conflict exists with another adapter.	Run the *Turbo EISA* adapter diagnostics. If diagnostics pass, then check that the network software and driver are properly installed and configured. If diagnostics fail, check system configuration for conflicts. If the problem persists, replace the adapter.
Network software is loaded, twisted-pair mode is selected, but the twisted-pair link LED is off.	Twisted-pair cable is not properly connected.	Reconnect the twisted-pair cable.

(continued on next page)

Table A–1 (Cont.) Fault Isolation By Symptom

Symptom	Possible Cause	Recommended Action
	Network device has twisted-pair link integrity disabled or does not support link integrity.	Enable twisted-pair link on the network device, if supported.
	Twisted-pair cable is defective.	Replace twisted-pair cable.

Diagnostic Test Errors

Table A–2 describes the *Turbo EISA* adapter diagnostic test error messages and the recommended corrective actions for each group of messages.

Note

If the adapter detects an error and is not operating, you can still use your PC.

Table A–2 Diagnostic Test Error Codes

Error Message	Recommended Actions
Err 1, Memory allocation error	Insufficient memory for diagnostics; release some memory. If the problem persists, contact your system administrator.
Err 2, Registers W/R error	Ensure adapter is seated firmly in the bus slot, or try another available bus slot. If the problem persists, the adapter could be defective. Contact Digital Technical Support.
Err 4, Adapter not enabled or found	Ensure the adapter is seated firmly in the bus slot, or try another available bus slot. If the problem persists, the adapter could be defective. Contact Digital Technical Support.
Err 5, Undefined error code	This error code is reserved for future use.
Err 7, Bus error: parity error Err 8, Bus error: master abort Err 9, Bus error: target abort	The adapter could be defective. Contact Digital Technical Support.

(continued on next page)

Table A–2 (Cont.) Diagnostic Test Error Codes

Error Message	Recommended Actions
Err 10, EthWRKS babbler, can't transmit Err 11, Transmit time-out error Err 12, Receive time-out error Err 13, Receive data failure Err 14, RDES0: receive error detected Err 15, RDES0: framing error Err 16, RDES0: overflow error Err 17, RDES0: CRC error Err 18, RDES0: runt frame Err 19, RDES0: length error Err 20, RDES0: collision seen Err 21, EthWRKS failed to detect CRC error Err 22, TDES0: transmit error detected Err 23, TDES0: deferred Err 24, TDES0: underflow error Err 25, TDES0: link fail	These messages indicate network-related test failures. If the driver was installed before running diagnostics, disable the driver and network software, power down your computer, and rerun diagnostics. If the problem persists, the adapter could be defective. Contact Digital Technical Support.
Err 26, TDES0: heartbeat fail	Ensure AUI device supports heartbeat test and is enabled. If not supported, ignore the error. If supported, check or replace cable or AUI device. If the problem persists, the adapter could be defective. Contact Digital Technical Support.
Err 27, TDES0: excessive collisions Err 28, TDES0: late collision Err 29, TDES0: no carrier Err 30, TDES0: loss of carrier Err 31, TDES0: jabber time-out Err 32, TDES0: chained xmt/rcv test error	These messages indicate network-related test failures. If the driver was installed before running diagnostics, disable the driver and network software, power down your computer, and rerun diagnostics. If the problem persists, the adapter could be defective. Contact Digital Technical Support.

(continued on next page)

Table A–2 (Cont.) Diagnostic Test Error Codes

Error Message	Recommended Actions
Err 33, Internal loopback test error Err 34, 10Base-T internal loopback test error	These messages indicate an IRQ conflict (when two adapters want to use same interrupt line). Run ECU to reconfigure adapter to another IRQ line. If the problem persists, the adapter could be defective. Contact Digital Technical Support.
Err 35, 10Base-T external loopback test error Err 36, AUI external loopback test error	These messages indicate improper termination causing Loopback test to fail. Supplemental network tests require loopback connectors for ThinWire or twisted-pair repeater link for twisted-pair testing (available when diagnostics are run from NICDIAG diagnostic menu). To test the ThinWire coaxial port, remove the adapter from a live network and terminate T-connector. To test the twisted-pair port, the adapter must have valid link to a twisted-pair repeater (green LED lights when good link). If the LED does not light, check the twisted-pair cabling and twisted-pair repeater port. To test the AUI thickwire port, select the AUI port using adapter AUI jumper and connect to AUI Hub or repeater. If the problem persists, the adapter could be defective. Contact Digital Technical Support.

(continued on next page)

Table A–2 (Cont.) Diagnostic Test Error Codes

Error Message	Recommended Actions
Err 37, Interrupt mask test error	This message indicates an IRQ conflict (when two adapters want to use the same interrupt line). Run the ECU to reconfigure the adapter to another IRQ line. If the problem persists, the adapter could be defective. Contact Digital Technical Support.
Err 38, Force collision test error Err 39, Two buffered xmt/rcv test error Err 40, CSR5: transmit process stopped Err 41, CSR5: transmit jabber time-out Err 42, CSR5: transmit underflow Err 43, CSR5: receive buffer unavailable Err 44, CSR5: receive process stopped Err 45, CSR5: receive watchdog time-out Err 46, CSR5: AUI/twisted-pair switch Err 47, CSR5: full duplex short frame rcv Err 48, CSR5: link fail Err 49, Multiple xmt/rcv test error Err 50, RDESO: dribbling bit error	These messages indicate network-related test failures. If the driver was installed before running diagnostics, power down your computer, then start again. If the problem persists, the adapter could be defective. Contact Digital Technical Support.
Err 51 to 59, Unidentified error code	None.

B

General Information

This appendix provides general system specifications and cabling requirements for the EtherWORKS *Turbo EISA* adapter.

Physical Description

The *Turbo EISA* adapter is an EISA form-factor printed circuit board that uses the full 32-bit bus data path interface. The adapter measures 7.325 inches (184.785 mm) x 4.420 inches (112.268 mm), and is constructed using six-layer circuit board technology with four signal layers and two power/ground layers.

Functional Components

The major functional components of the *Turbo EISA* adapter are as follows:

- EISA bus interface and support registers
- Ethernet network protocol controller (MAC)
- 10Base-T twisted-pair Ethernet (RJ-45 connector) network interface
- 10Base2 ThinWire Ethernet (coaxial) network interface
- AUI Ethernet network interface

LEDs

During normal system power-up, both the amber and green LEDs will light and remain on. Once the network software and driver is loaded, or the *Turbo EISA* adapter's diagnostics are executing, the LEDs reflect status described in Table B–1.

Table B–1 describes the *Turbo EISA* adapter LEDs.

Table B–1 LEDs

This LED . . .	Indicates . . .	The status is . . .
Amber	Network activity	**On** or **blinking**—Network is active.
		Off—Network is inactive.
Green[1]	Twisted-pair link	**On**—Link is OK.
		Off—Link has failed.
		Blinking—Link is failing.

[1]This LED is used when twisted-pair or twisted-pair full duplex mode is selected and a twisted-pair cable is attached to the network. Refer to the twisted-pair link LED description for more information.

Network Activity

When the network diagnostic software is running, the network activity LED turns on whenever transmit and receive data are detected on the network. With low levels of network activity, the LED blinks. As network activity increases, the LED blinks faster and, at times, appears to remain on.

Twisted-Pair Link

When the network or diagnostic software is running, and Twisted-pair or Twisted-pair Full Duplex mode is selected, the twisted-pair link LED turns on if receive data or twisted-pair link pulses are detected. If no receive data or twisted-pair link pulses are detected within 150 milliseconds, the twisted-pair link LED turns off, indicating twisted-pair link fail status. When Twisted-pair Link Disabled or AUI Thickwire or ThinWire mode is selected, this LED remains on.

Interrupt Request (IRQ) Lines

The IRQ lines can be set to IRQ5, IRQ9, IRQ10, or IRQ11.

Input/Output (I/O) Address

The *Turbo EISA* adapter supports EISA bus slot addressing with an I/O address range of 0z000 to 0z0FF and 0zC80 to 0zCAF. The letter "z" denotes the bus slot into which the adapter is installed. If the adapter is installed in slot 2, the EISA slot address is 02000.

Electrical Parameters

Table B–2 shows the electrical parameters for the *Turbo EISA* adapter.

Note

When using AUI cable, the amount of +12.0 V dc power used is dependent on the transceiver or medium attachment unit (MAU) to which the adapter is connected.

Table B–2 Electrical Parameters

Cable Type	AUI Jumper	Power Maximum	DC Amps (+5.0 V) Maximum	DC Amps (+12.0 V) Maximum
Twisted-pair[1]	ThinWire	12.4 W	2.0 A	0.2 A
	AUI	10.0 W	2.0 A	0 A
ThinWire	ThinWire	12.4 W	2.0 A	0.2 A
AUI	AUI	16.0 W	2.0 A	0.5 A

[1]When using twisted-pair cable, the AUI jumper position affects the amount of power consumed by the *Turbo EISA* adapter.

Caution

When adding adapters to your computer, verify that the combined power (wattage) required for the adapters in your computer does not exceed the power supply rating. Check your computer documentation for this information.

Operating Environment

Table B–3 shows the recommended operating environment specifications for the *Turbo EISA* adapter.

Table B–3 Operating Environment

Condition	Value
Temperature (at sea level)	15°C—32°C (59°F—90°F)
Relative humidity	8% to 80% (non-condensing)
Radiated emissions	FCC Class B, VDE Class B

Cabling Requirements

You are required to use one of the following cable types or the equivalent to connect your *Turbo EISA* adapter to the network. When referring to the following Digital part numbers, the xx stands for cable length in meters.

- 10Base-T twisted-pair cable:
  - BN25G-xx or BN26K-xx—Point-to-point unshielded twisted-pair patch cable to connect a *Turbo EISA* adapter to an office wall plate from a repeater.
  - BN26M-xx—Point-to-point shielded twisted-pair office cable to connect a *Turbo EISA* adapter to a shielded office wall plate.
  - BN24F-xx—Unshielded twisted-pair office cable with crossover 4-conductor, 2-twisted-pair to connect a *Turbo EISA* adapter to another *Turbo EISA* adapter, or a *Turbo EISA* adapter to an office wall plate from a 900-series DECrepeater.
  - BN26N-xx—Shielded twisted-pair office cable with crossover 4-conductor, 2-twisted-pair to connect a *Turbo EISA* adapter to another *Turbo EISA* adapter, or a *Turbo EISA* adapter to a shielded office wall plate from a 900-series DECrepeater.
- 10Base2 ThinWire cable:
  - BC16M-xx ThinWire cable used with an H8223-00 T-connector and an H8225-00 ThinWire terminator when connecting to an office wall plate.
- AUI cable:
  - BNE4C-xx IEEE 802.3 office transceiver cable
  - BNE3H-xx (PC) IEEE 802.3/standard transceiver cable
  - BNE3L-xx (Plenum) IEEE 802.3/standard transceiver cable

For further information about network configuration, planning, and cabling, refer to the following:

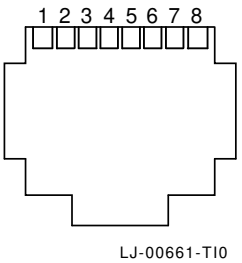
- *DECconnect System Planning and Configuration Guide* (PN EK-DECSY-CG)
- *OPEN DECconnect Applications Guide* (PN EC-G2570-42)

Card Connector Pinning (RJ-45)

If you are using your *Turbo EISA* adapter to connect 10Base-T twisted-pair networks, the connector has the following pin signals (see Figure B–1).

Pin Number	Signal Name
1	Transmit +
2	Transmit -
3	Receive +
4	NC (no connection)
5	NC (no connection)
6	Receive -
7	NC (no connection)
8	NC (no connection)

Figure B–1 RJ-45 Connector (Front View)



C

International Technical Support

Table C–1 lists the international telephone numbers to call for technical support for the EtherWORKS *Turbo EISA* adapter.

Table C–1 International Support Telephone Numbers

Country	Telephone Number
United States	1-800-354-9000
Australia	31-2-5615252
Austria	0222-86630-555
Belgium	02-7297744
Canada (English)	1-800-267-5251
Canada (French)	1-800-267-2603
Denmark	80301005
Finland	90 9800 2878
France	1-69874123
Germany	01307702
Hong Kong	852-4149779
Israel	052-592-300
Italy	2-1678 20062
Korea	82-2-7991114
Malaysia	60-3-2300111

(continued on next page)

Table C–1 (Cont.) International Support Telephone Numbers

Country	Telephone Number
Mexico	520140810017
Netherlands	030-832888
Northern Ireland	0232 381381
Norway	02-256300
Philippines	623-810-5156
Portugal (Lisbon)	01-3877051
Portugal (Oporto)	02-6068805
Republic of Ireland	01-381216
Singapore	330-6225
Spain (Madrid)	34-(9)1-5834257
Spain (Barcelona)	34-(9)3-4012222
Sweden	08-988835
Thailand	66-254-8191
United Kingdom	025 6-59200