EtherSeries
User's Guide

EtherSeries
User's Guide

for use with DOS 2.0, 2.1 and 3.0

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Introduction

Overview

The EtherSeries is a family of integrated hardware and software networking products for IBM Personal Computers. Based on the industry standard Ethernet local network, EtherSeries gives you a fast and powerful system for communicating and sharing information with many other IBM Personal Computer users.

The EtherSeries family of products provides you with a network connection and access to a shared hard disk, as well as electronic mail services and a shared printer. In addition, you can use DOS commands, application programs and data files for other software in the normal way. There is nothing new or different when they are used across the network, except that your capabilities and resources are increased.

There are five EtherSeries products:

–EtherLink –EtherMail

–EtherShare –EtherMenu

–EtherPrint

In order to use EtherShare, EtherPrint and EtherMail, you must have a network server connected to the network. The server and server software are separate products and must be purchased separately. They are not included with the EtherSeries User Software. Contact your 3Com dealer or distributor to answer your questions.

EtherLink

This is the basic product which is the prerequisite to all other EtherSeries products. EtherLink is a printed circuit board that plugs into an expansion slot in your IBM Personal Computer (either the PC or XT version) and sends and receives information across the network. The EtherLink card conforms to the Ethernet specifications and is fully compatible with other Ethernet equipment. It is easily installed by you and requires no special tools.

Thin Ethernet cable is then used to connect together all computers to be included in the network. Once your computer is connected to the network, you can use the EtherShare, EtherPrint and EtherMail network services.

Introduction

EtherShare

EtherShare allows many IBM Personal Computers on an Ethernet network to share a single hard disk. The disk can be the fixed disk on an IBM PC (XT version or PC with compatible add-on disk) or the disk included with a 3Com Network Server.

Depending on the type of disk, you can share disk capacities of 10 or 30 megabytes, or more. Regardless of whether you are sharing an IBM PC fixed disk or a 3Com Network Server fixed disk, the EtherShare software offers the same capabilities to you at your IBM PC. The operation is identical with an IBM PC Network Server or a 3Com Network Server.

The disk is divided into volumes which are treated like the diskettes you use with your Personal Computer. EtherShare volumes can be made public, private or shared. Public volumes usually contain common program and information files for use by everyone on the network; private volumes can be used only by their owner; shared volumes can be accessed by more than one user at a time and are controlled by your own application programs.

EtherPrint

EtherPrint allows many users to print program, data and text files on a shared printer. In this way, the cost of a printer can be shared by all users on the network.

The EtherPrint software is installed on the Network Server, giving it the ability to function as a print server. EtherPrint can control two printers per server.

EtherMail

EtherMail is an electronic mail service for all network users. You can compose, forward and reply to messages and send them to anyone else on the network, as well as read, file and print messages sent to you. You can send messages to a single individual or to an entire group via a distribution list.

The screen-oriented message editor provides easy to use text entry and editing, including many word processing features such as word wrap, automatic insert, and block move, copy and delete operations.

The EtherMail software is installed on the Network Server which acts as EtherMail's post office, holding messages until the recipients request to read their new mail.

EtherMenu

EtherMenu allows you to use menus to select tasks you want to perform. You can use the menus and applications provided with your EtherSeries software or menus and applications designed by you. An application is a program or a sequence of commands that accomplish a task such as copying a file or creating a volume.

Using EtherMenu, you can quickly and simply perform tasks that normally require complicated or lengthy sequences of DOS or EtherSeries commands. Once the commands are set up as an application, you can perform the task using one or two keystrokes to select it from a menu.

For instructions on how to customize the menu system for your own applications, see the EtherMenu/PC Administrator's Guide.

Network Servers

The EtherShare, EtherPrint and EtherMail services are provided by installing these programs on a Network Server. There are two types of Network Servers that can be used with EtherSeries networks.

An IBM Personal Computer with a fixed disk can act as a Network Server when equipped with the EtherShare/PC, EtherPrint/PC and EtherMail/PC Server software. The IBM PC Network Server is a good server choice when you will have two to eight users per server.

A 3Com Network Server has the same capabilities as an IBM PC Network Server, but has greater storage capacity and can manage more users. This is a good server choice when you will have a greater number of users per server.

Both types of Network Server can be used on the same network. You can have multiple servers of either type operating together to provide disk sharing, printer spooling, and electronic mail on the same EtherSeries network.

Administration

In addition to the four EtherSeries products, an Administration program runs on each server and manages such functions as starting up and shutting down the server, checking network status, installing network applications, and modifying passwords. The Administration program for the 3Com Network Server also offers a versatile backup function, while the PC Network Server Administration program uses the DOS 2.0 backup facility.

Using this Manual

Section 2 of this manual gives step-by-step instructions on installing the EtherLink card and EtherSeries software, and cabling computers together. You must read and follow the procedures in this section before attempting to use your computer on the network.

Appendix A is a glossary of terminology.

Appendix B describes using EtherLink with an external transceiver in a "thick" Ethernet network.

Appendix C gives diagnostic and problem solving information.

Appendix D should be removed from this manual.

Appendix E tells you how to configure the EtherLink card and EtherSeries user software to use different DMA, interrupts, or base addresses.

EtherSeries Documentation

This binder contains User's Guides for all the EtherSeries products. Each manual is self contained with its own table of contents, error messages, and index. You will find a complete reference to each product in these individual guides. An overview of the product and information on using the manual can be found in the introduction to each User's Guide.

The EtherShare Administrator's Guide is provided as a separate manual. It is supplied when you purchase a 3Com Network Server or a Server software package for the IBM PC.

Installation

Overview

Before communication between computers can take place, the following operations must be performed.

1. Install an EtherLink card in each computer.

2. Connect each computer to Thin Ethernet cable.

3. Install the EtherSeries software.

This section gives step-by-step instructions on these operations.
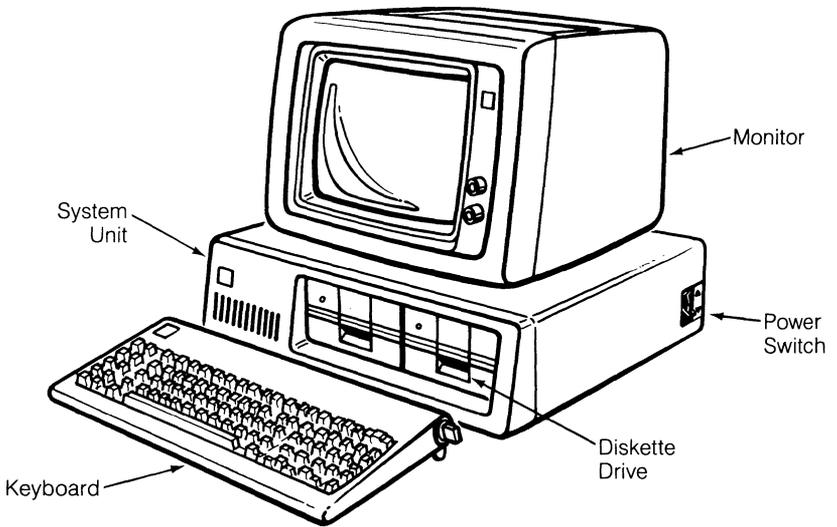
Figure 2-1. IBM Personal Computer

Installation

Requirements

The IBM Personal Computers to be connected to the network must have:

- at least one diskette drive
- at least 128K of memory (192K if you have EtherMail)
- an 80 character display
- at least one empty expansion slot in the system unit
- PC DOS version 2.0

You will also need the following:

1. EtherLink card
   - supplied with the EtherLink package

2. The following diskettes:
   - the EtherSeries User Software for the IBM PC, supplied with the EtherLink package
   - an unmodified DOS master diskette, version 2.0
   - a blank formatted diskette

3. EtherLink accessories package
   - supplied with the EtherLink package, containing:
     plastic card guide, BNC T-adapter, and transceiver cable adapter plate assembly

4. Thin Ethernet coaxial cable
   - supplied in various lengths; see the 3Com Ordering Guide for cable lengths and model numbers
   - at least 3 feet (1 meter) between computers, total length not to exceed 1000 feet (304.8 meters)

5. Terminators

   ■ purchased separately; see the 3Com Ordering Guide for information

   ■ one for each end of the network

6. Flat blade screwdriver

   ■ medium size

7. External transceiver installation parts, required only if an external transceiver is to be used; see the 3Com Ordering Guide for information

   ■ Ethernet transceiver

   ■ transceiver cable with "D" connectors

Installing the EtherLink Card

The first step is to install the EtherLink card in your IBM Personal Computer. One of these cards must be installed in each computer to be connected to the network.

The following installation procedure applies to both the IBM PC and XT versions. Slight differences are noted when applicable.

The EtherLink card must be installed *inside* the PC or XT's main system unit; it will not function properly if it is installed in an expansion unit.

Disconnect System Unit

Monitor Power Cable   Power Cable   Keyboard Cable   Monitor Cable
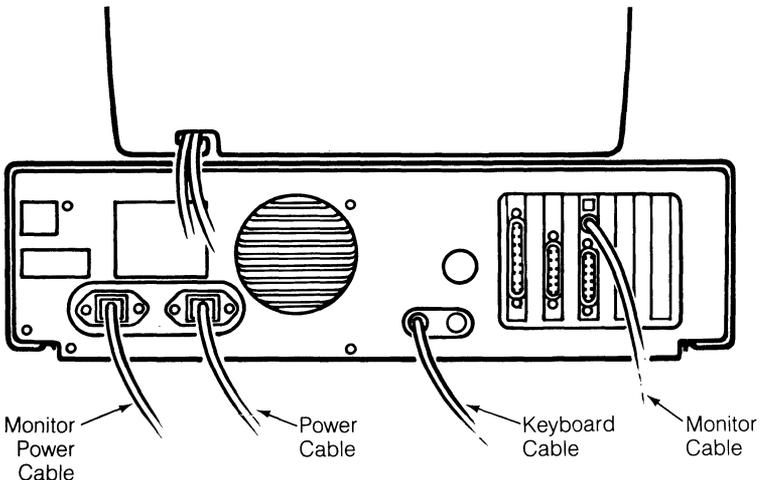
Figure 2-2. System Unit Cables

2-3

Installation

1. Turn off the power (the switch is on the right side of the system unit) and unplug the power cable from the wall and the system unit.

2. Disconnect the monitor cables from the back of the system unit. Remove the monitor from the top of the system unit and set it to one side.

3. Disconnect the keyboard cable from the back of the system unit and set the keyboard aside.

4. Disconnect any other cables that are attached to the system unit (for example, printer, communication lines).

5. Position the system unit so that you have access to the rear and enough room to work.

Remove System Unit Cover
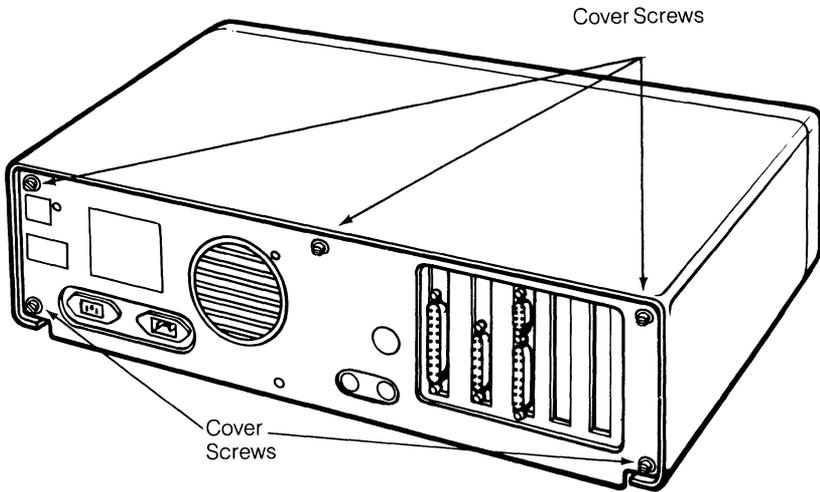
Figure 2-3. System Unit Cover Mounting Screws

1. Remove the cover mounting screws and set them aside for reassembly. The PC has two cover screws; the XT has five.

2. Gently slide the cover toward the front until it will go no farther. Tilt the cover up at the front and remove it from the base.

Prepare the Expansion Slot

Cover
Plate
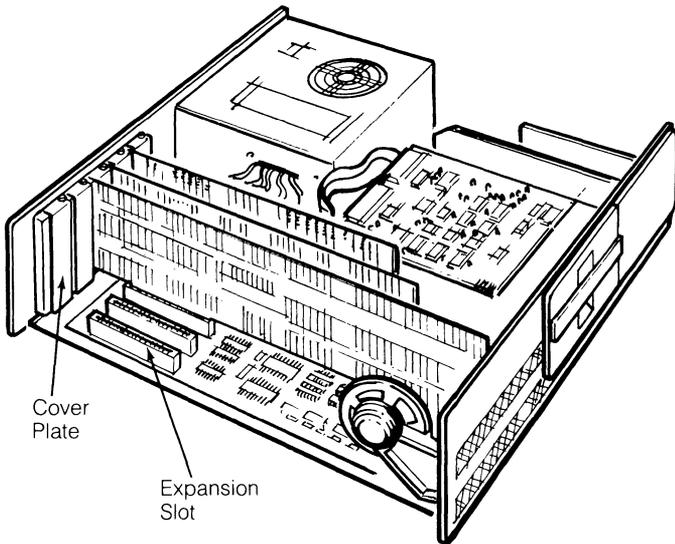
Expansion
Slot

Figure 2-4. Expansion Slot

1. You can install the EtherLink card in any one of the available system expansion slots in the IBM PC or XT. The PC has five expansion slots; the XT has eight. Slot 1 (on the left side when viewed from the front) is recommended since it has the easiest access for the cables.

   If you are using EtherLink card assembly number 0345 with an IBM PC AT, you can only install this card in slot one or slot seven.

   Remove the screw at the top of the expansion slot cover plate and set it aside.

2. Remove the cover plate. The EtherLink card comes with its own cover plate, but you should keep the original plate in case it is required for future use.

Set the Transceiver Select Switch

OMIT THIS STEP IF you have a new card and are using EtherLink with Thin Ethernet cable. Unless you are using an external transceiver, go on to the next step, Install the EtherLink Card Guide.

If you plan to use your EtherLink card with an external transceiver and transceiver cable, you must change the transceiver select switch as described below.

Two versions of the EtherLink exist. Each version has a different method for switching from on-board to external transceiver. The two verisons may be differentiated by their assembly numbers. These numbers are printed on the Etherlink cards. On one version this number is printed along the bottom edge of the card as ASSY 0345-. The other version has the number printed along the top edge of the card as ASSY 34-0780-. Version number ASSY 0345 can only be installed in slots 1 or 7 in an IBM PC AT.

The transceiver select switch is located on the EtherLink card, as shown in figure 2-5 for Assembly 0345 and figure 2-6 for Assembly 34-0780. This switch selects either the on-board transceiver for use with thin Ethernet ("BNC" position) or a connector on the rear panel for use with an external transceiver on thick Ethernet ("DIX" position).

If the on-board transceiver is selected, the BNC coaxial cable connector on the rear panel of the EtherLink card is enabled. If the external transceiver is selected, an Ethernet transceiver cable can be attached to the 15 pin connector, also on the rear panel of the EtherLink card.

Transceiver Select Switch (Assy 0345)

The transceiver select switch for the 0345 assembly consists of three pins and a plastic jumper. Two of the pins are covered by the jumper, as shown in figure 2-5.

Transceiver
Select Switch
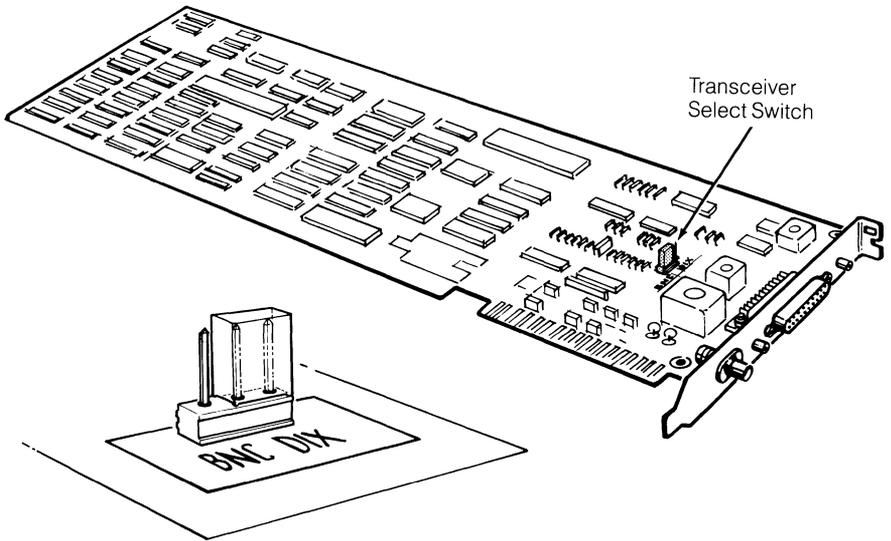
Figure 2-5 EtherLink Card and Transceiver Switch (Assy 0345)

The jumper is currently over the left and center pins toward the label "BNC". This selects the on-board transceiver which is connected to the round BNC coaxial cable connector on the rear panel.

To select the external transceiver, pull off the jumper and replace it firmly over the right and center pins, toward the label "DIX".

This bypasses the on-board transceiver and routes the signals to the Digital-Intel-Xerox (DIX) Ethernet transceiver cable connector, also on the back panel.

Installation

Transceiver Select Switch (Assy 34-0780)

The transceiver select switch for the 34-0780 assembly consists of two 16 pin sockets and one 16 pin plug. The transceiver select plug is installed by the factory in the socket labeled BNC. (This is the socket farthest from the edge of the PC board.) This selects the on-board transceiver which is used when the thin Ethernet cable is connected to the round BNC coaxial cable connector on the rear panel.

To select the external transceiver move the transceiver select plug, in the manner described below, to the socket labeled DIX (this is the socket closest to the top edge of the board). This bypasses the on-board transceiver and routes the signals to the Digital-Intel-Xerox (DIX) Ethernet transceiver cable connector on the rear panel.
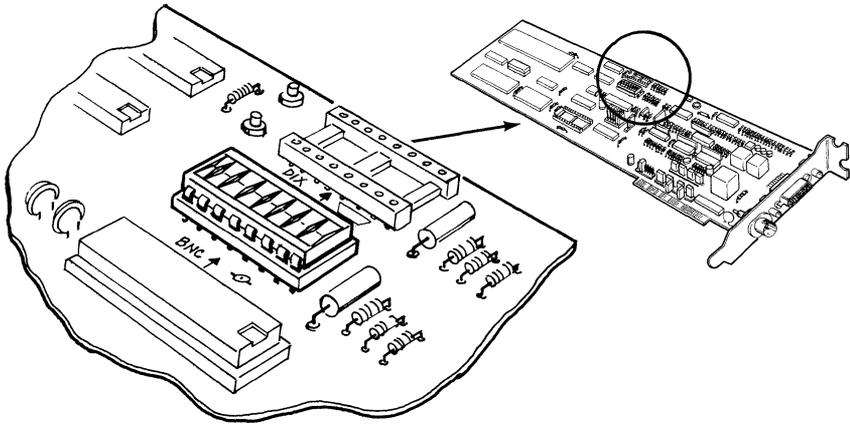
Figure 2-6. EtherLink Card and Transceiver Switch (Assy 34-0780)

The transceiver select plug can be removed from the socket using an integrated circuit extraction tool. However if this tool is not available a small screwdriver can be used.

If a screwdriver must be used, care must be taken not to bend any of the transceiver select plug pins. The screwdriver should be inserted between the plug and the socket and twisted (or lifted) slightly to raise each corner of the plug a small amount. This process should be repeated until the plug is free of the socket.

Once the plug is removed inspect it for any bent or damaged pins. Next carefully insert the plug into the correct socket being very careful to line up the plug pins with the holes in the socket. The plug can be inserted in either orientation but it is preferred that the notched end of the plug be placed toward the rear panel. Apply even pressure to the top of the plug in order to seat it correctly in the socket (care should be taken not to bend any pins by seating one end of the plug before the other). Inspect the plug pins thoroughly for bends or missed socket holes after insertion.

Install the EtherLink Card Guide
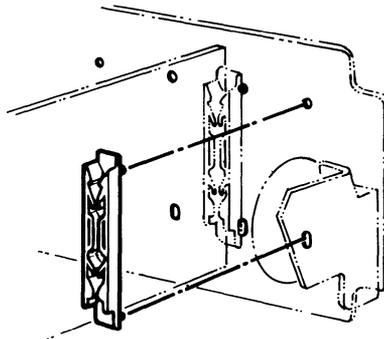
Figure 2-7. Installing the Card Guide

1. Install the plastic card guide by snapping it into the two holes in the system unit front panel. These holes align with expansion slot 1. The plastic leaves of the card guide should point down as shown in figure 2-7. The end of the card will slide into the groove in the guide which will hold the card in place.

Installation

Install the EtherLink Card
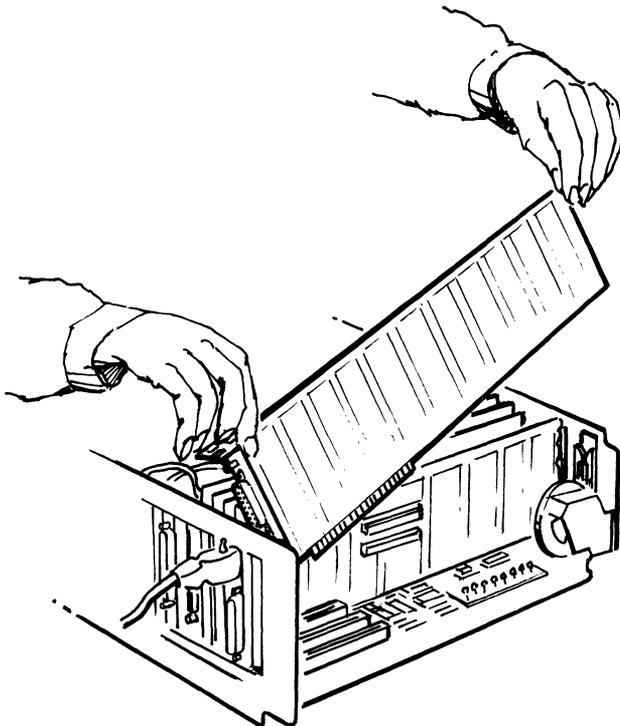
Figure 2-8. Inserting the EtherLink Card

1. Be sure the system power is off before inserting or removing a card.

2. As shown in figure 2-8, tilt the card so that the coaxial cable connector on the cover plate at the end of the card slips through the cut-out in the system unit rear panel.

3. Hold the card by the top corners and firmly press it into the expansion slot. The edge connector on the card aligns with the socket on the system board and the end of the card fits into the card guide on the front panel. The system board is the large board on the bottom of the system unit.

4. Check that the card is fully inserted and properly aligned. The top of the card should be level with the other option cards in the system.

5. Replace the screw that holds the rear panel cover plate in place.

Replace the System Unit Cover
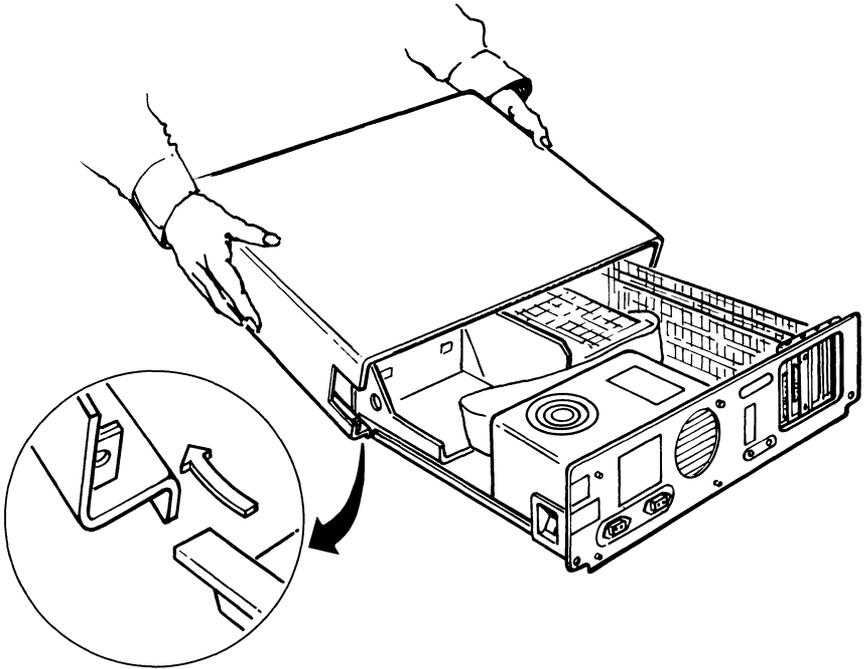
Figure 2-9. Replacing the Cover

1. Position the cover under the runners on the base with the front of the cover tilting upwards.

2. Slide the cover over the base toward the rear of the unit until it will go no farther.

3. Align the holes on the base cover plate with the threaded tabs on the lower corners of the cover. Insert and tighten all cover screws (two on the PC, five on the XT).

Reconnect Cables and Power

1. Put the monitor back on top of the system unit and reconnect its cables.

2. Reconnect the keyboard cables and any cables going to other devices (for example, printer, communication line).

3. Plug the power cord into the back of the system unit and a wall outlet.

Installation

Install the Adapter Plate Assembly

OMIT THIS STEP IF you are using EtherLink with Thin Ethernet cable. Unless you are using an external transceiver, go on to the next step, Installing the Thin Ethernet Cables.

If you plan to use your EtherLink card with an external transceiver and transceiver cable, you must use the adapter plate assembly, as described below. The adapter plate assembly adapts the lock posts on the transceiver cable to the fastening method used on the IBM Personal Computer.
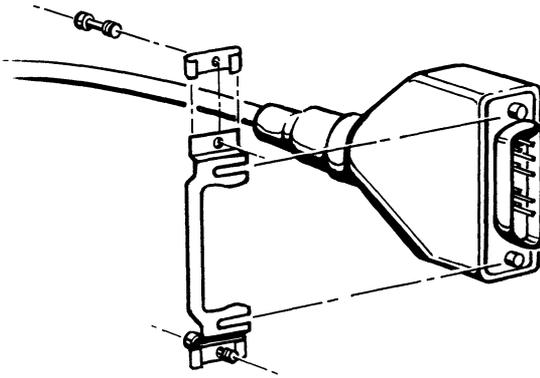
Figure 2-10. Assembling the Adapter Plate

1. Slide the threaded clips on to both ends of the adapter plate and insert the screws into the clips.

2. As shown in figure 2-10, align the slots in the adapter plate with the indents in the lock posts on the transceiver cable and press the plate on to the connector.
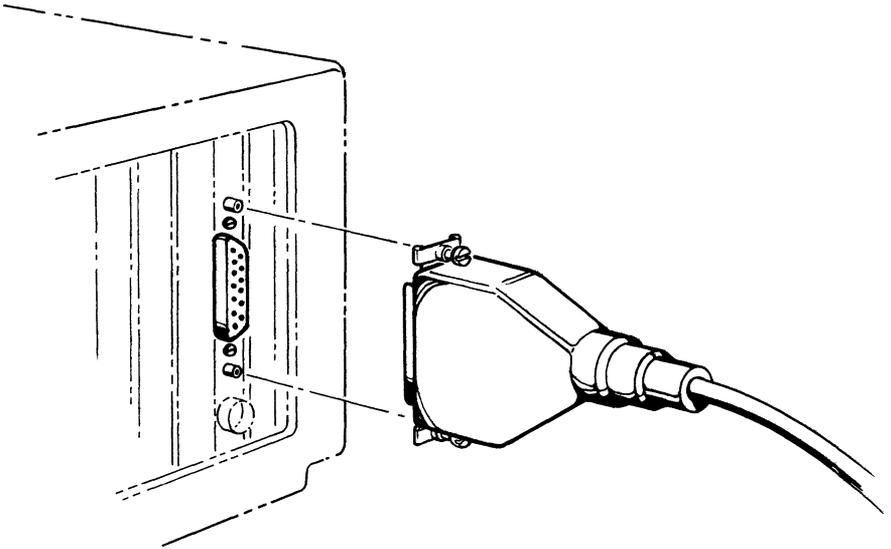
Figure 2-11. Attaching the Adapter Plate

3. Plug the adapter plate assembly into the 15 pin connector on the EtherLink card, as shown in figure 2-11. Tighten the screws on the adapter plate into the threaded jackposts on the EtherLink card.

You have now connected the transceiver cable to your IBM Personal Computer and can connect the other end to an Ethernet transceiver.

Installing the Thin Ethernet Cables

Computers connected with Thin Ethernet cables must adhere to the following rules. For more information on using thick Ethernet and an external transceiver, refer to Appendix B.

1. The total length of cable linking all the computers together cannot exceed 1000 feet (304.8 meters).

2. Each end of the network must have a terminator attached.

3. There can be no more than 100 computers connected to a single cable.

Figure 2-12 demonstrates some acceptable and unacceptable configurations.
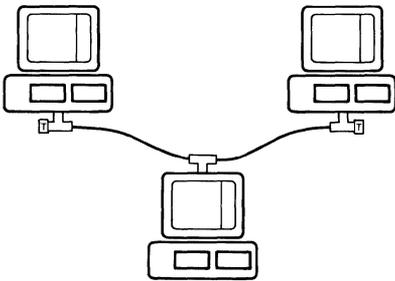
Correct configuration.
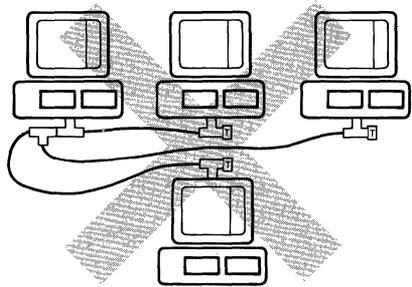
Branches off the main cable are not allowed.
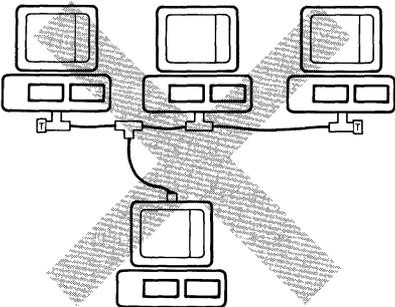
T-adapters must be attached directly to the back of each computer.
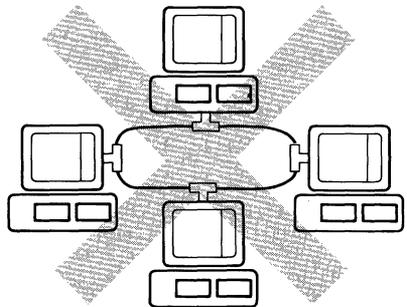
The cable must have two ends with a terminator at each end; a loop has no ends.

Figure 2-12. Planning the Configuration

Connecting Two Computers

Before you begin, be sure that you have installed the EtherLink card in the computers. You also need the following:

- Two terminators.

- A cable long enough to run between the two computers (at least three feet for Thin Ethernet cable).

- A T-adapter for each computer; one is supplied with each EtherLink package.

- A barrel connector if you need to join two pieces of cable to form a longer cable (see the 3Com Ordering Guide for information).

Attach the Cables and Terminators to the T-Adapters
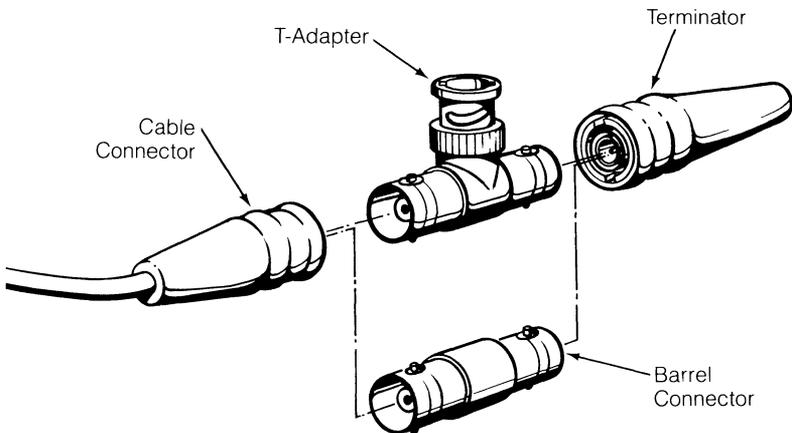
Figure 2-13. T-Adapter, Terminators and Barrel Connector

1. Attach a T-adapter to each end of the cable. Align the notches on the arm of the T-adapter with the slots in the cable connector and press the connector on to the adapter.

2. Twist the metal sleeve (located under the rubber insulator) on the cable connector clockwise one quarter turn to lock the connectors together.

3. In the same way, attach a terminator to the other arm of each T-adapter.

Installation

Ground One Terminator
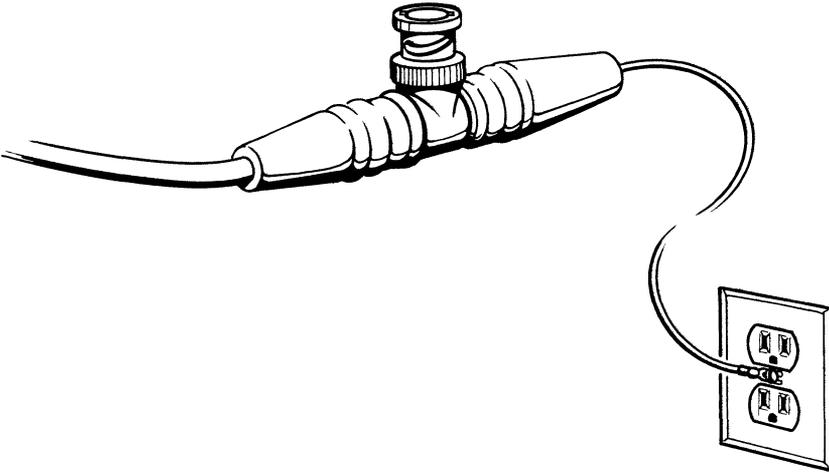
Figure 2-14. Grounding a Terminator

1. One of the terminators has a green wire with a lug at the end. Connect this lug under the screw of a grounded AC wall plate as shown in figure 2-14.

2. If the lug won't reach the wall plate with the terminator mounted on the back of your computer, add a short coaxial cable and barrel connector between the last T-adapter and the terminator.

3. Only *one* terminator should be grounded. The network may not be reliable if it is grounded in more than one place.

Attach the T-Adapter to the Computer
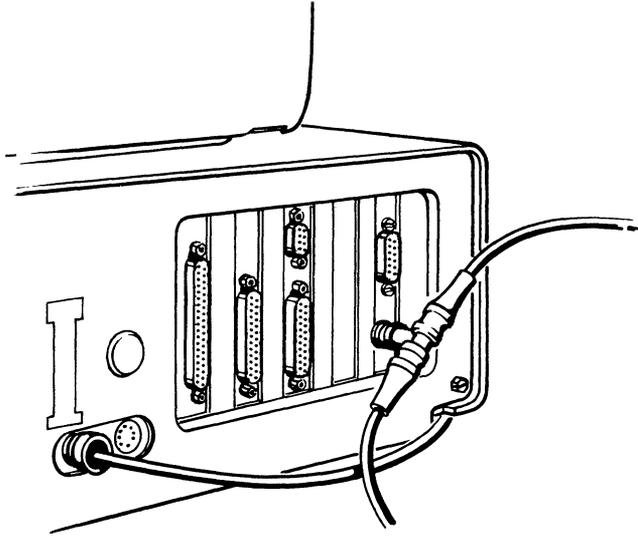
Figure 2-15. Attaching the T-adapter

1. The base of the T on the T-adapter connects with the bottom connector on the rear panel cover plate of the EtherLink card, as shown above. Push the T-adapter on to the round connector and twist the sleeve clockwise one quarter turn until it stops.

2. Check that all connections are secure. Loose or faulty connections will prevent the network from operating correctly.

You have now connected your first two computers. To connect more than two, use additional cables and attach the terminators to the T-adapters on the first and last computers only.

Adding More Computers

Ethernet does not depend on the physical location of the computers in the network. Computers can be connected at any location, or disconnected and reconnected at another location without having to change the EtherSeries software.

Be sure that no one is using the network when you want to expand or change it. **When you disconnect the cable from a T-adapter or remove a terminator, the network stops working.** However, you can remove the T-adapter from the rear panel of a computer without affecting communication between other computers.

Installation

You can add computers at either end of the network or anywhere in between.

You will require:

- The T-adapter supplied with the EtherLink package (one for each computer to be added)
- Additional cable(s)

Adding a Computer to the End of the Network
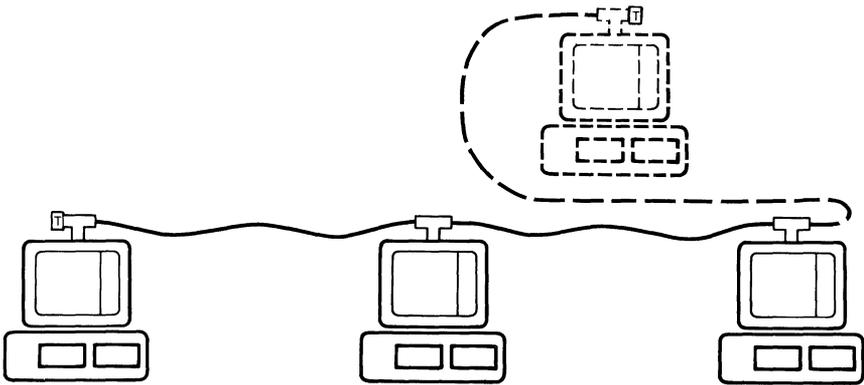
Figure 2-16. Computer Added to End of Network

1. Make sure no one is using the network.

2. Remove the terminator from the T-adapter on the computer that is currently at the end of the network.

3. Attach one end of the new cable to the T-adapter where the terminator used to be.

4. Attach the other end of the new cable to one side of the T-adapter which is to be connected to the new computer.

5. Attach the terminator to the other side of the T-adapter.

6. Attach the T-adapter to the new computer. The base of the T attaches to the bottom connector on the rear panel plate of the EtherLink card.

7. Check that all connections are secure.

Adding a Computer in the Middle of the Network
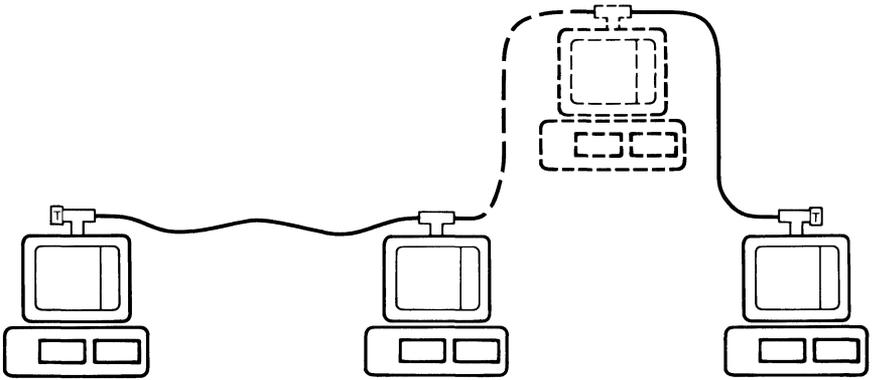
Figure 2-17. Computer Added in Middle of Network

1. Make sure no one is using the network.

2. Attach a T-adapter to the bottom connector on the rear panel plate of the EtherLink card in the computer to be added to the network.

3. Disconnect the cable from the T-adapter on the adjacent computer and connect it to one side of the T-adapter on the new computer.

4. Connect one end of a new cable to the other side of the T-adapter on the new computer.

5. Connect the other end of the new cable to the T-adapter on the old computer.

6. Check that all connections are secure.

When the EtherLink card has been installed and all computers in the network have been connected with Thin Ethernet cable, you should go on to the following steps to install the EtherSeries software.

Installing EtherSeries Software

This procedure installs the Ethernet software driver so that it will be loaded into memory whenever you boot your system. It also copies the EtherShare user program (ES.COM), the EtherPrint user program (EP.COM), and some useful batch files onto your diskette or fixed disk. Once you have completed the software installation, you should always boot your PC from this diskette or fixed disk.

To install the EtherSeries software, you need:

1. An unmodified DOS master diskette, version 2.0.

2. The EtherSeries User Software Diskette which is part of the EtherLink package.

3. An IBM Personal Computer with at least one diskette drive.

4. A blank diskette (single or double sided), or an IBM Personal Computer with a fixed disk.

Installing the Software on a Diskette

Using Two Diskette Drives

1. Insert the DOS diskette in drive A: (the left drive) and the blank diskette in drive B:.

2. At the DOS A > prompt, type:

   A > **DISKCOPY A: B:** ←┘

   This displays the message:

   > Insert source diskette in drive A:
   >
   > Insert target diskette in drive B:
   >
   > Strike any key when ready

3. Press any key to copy the DOS diskette in drive A: to the blank diskette in drive B:

   When the diskette has been copied, you are asked:

   Copy another (Y/N)?

4. Type N (for no) since you don't want to copy another diskette.

5. Remove the DOS diskette from drive A: and store it in a safe place. Remove the diskette from drive B: and insert it in drive A:. Insert the EtherSeries User Software Diskette in drive B:.

6. At the DOS A > prompt, type:

   A > B:SETUP ←┘

   This starts an automatic procedure which installs the EtherSeries software on the copy of the DOS diskette.

7. When the procedure is complete, you see the message:

   REM EtherSeries Software Installation Complete

   You can then remove the EtherSeries User Software Diskette from drive B: and store it in a safe place. Drive A: now contains the DOS diskette with EtherSeries software installed.

8. Put a label on your newly created diskette from drive A: that says ETHERSERIES/DOS.

   Before you can use the network, you must reboot your PC from the EtherSeries/DOS diskette you have just created. This is the diskette you should now use whenever you boot the system.

Installation

Using a Single Diskette Drive

1. Insert the DOS diskette in the diskette drive.

2. At the DOS A > prompt, type:

   A > **DISKCOPY A: B:** ←┘

   This displays the message:

   Insert source diskette in drive A:

   Strike any key when ready

3. Press any key to begin to copy the DOS diskette. When the diskette has been read, DOS displays:

   Insert target diskette in drive A:

   Strike any key when ready

4. Remove the DOS diskette and store it in a safe place. Insert the blank diskette in the drive and press any key to finish copying the diskette.

   Note that certain memory configurations require you to switch diskettes up to three times in order to complete the DISKCOPY procedure.

5. When the diskette has been copied, you are asked:

   Copy another (Y/N)?

   Type N (for no) since you don't want to copy another diskette.

6. At the DOS A > prompt, type:

   A > **COPY B:SETUP.BAT A:** ←┘

   This displays the message:

   Insert diskette for drive B: and strike
   any key when ready

7. Remove the new copy of DOS from the drive and insert the EtherSeries diskette. Press any key to begin copying. This displays the message:

   Insert diskette for drive A: and strike
   any key when ready

8. Remove the EtherSeries diskette, insert the new DOS diskette and press any key to complete the copy operation.

9. At the DOS A > prompt, type:

   A > **SETUP** ◄┘

   This starts an automatic procedure which installs the EtherSeries software on the copy of the DOS diskette.

10. Within this procedure, a total of six files must be copied from the EtherSeries diskette to the new DOS diskette. For each file, you are told:

    Insert diskette for drive B: and strike
    any key when ready

    Insert the EtherSeries diskette in the drive and press any key.

11. You are then told:

    Insert diskette for drive A: and strike
    any key when ready

    Insert the new DOS diskette in the drive and press any key.

    You will repeat steps 10 and 11 six times.

12. When the procedure is complete, you see the message:

    REM EtherSeries Software Installation Complete

    Store the EtherSeries Software Diskette in a safe place, but leave the new DOS diskette in the drive.

13. Delete the SETUP.BAT file by typing:

    A > **DEL SETUP.BAT** ◄┘

14. Remove the new diskette and put a label on it that says ETHERSERIES/DOS.

    Before you can use the network, you must reboot your PC from the EtherSeries/DOS diskette you have just created. This is the diskette you should now use whenever you boot the system.

Installing the Software on a Fixed Disk

Before you install the EtherSeries software, be sure you have already installed DOS on your fixed disk and booted your computer from this drive. If your IBM Personal Computer is new, refer to your DOS manual for instructions on installing the operating system.

1. Insert the EtherSeries Software Diskette in diskette drive A:. At the DOS C> prompt, type:

    C > **A:FDSETUP** ◄┘

This starts an automatic procedure which installs the EtherSeries software on the fixed disk.

2. When the procedure is complete, you see the message:

    REM EtherSeries Software Installation Complete

    Remove the EtherSeries Software Diskette and store it in a safe place.

Before you can use the network, you must reboot your PC from the fixed disk. This is the drive you should now use whenever you boot the system.

EtherSeries/DOS Files

Your diskette or fixed disk now contains the EtherSeries software, along with DOS and its most frequently used utilities. These files are:

EtherLink Files: **DOS Files:**

EtherLink Files	DOS Files	
ES.COM	ANSI.SYS	FIND.EXE
EP.COM	ASSIGN.COM	FORMAT.COM
CONFIG.SYS	BASIC.COM	GRAPHICS.COM
ENET.SYS	CHKDSK.COM	MODE.COM
LOGIN.BAT	COMMAND.COM	MORE.COM
PRINT.BAS	COMP.COM	PRINT.COM
	DISKCOMP.COM	SORT.EXE
	DISKCOPY.COM	SYS.COM
	EDLIN.COM	TREE.COM

Due to space constraints, BASICA.COM and some DOS utilities have not been included on your EtherSeries/DOS diskette (this does not apply if you are using a fixed disk). If you need to use either of these, delete a file from the EtherSeries/DOS diskette with the DOS DEL or ERASE command. You can then use the DOS COPY command to copy the file you need from the DOS master diskette to the EtherSeries/DOS diskette.

Note: The software installation procedure copies a system configuration file (called CONFIG.SYS) into the root directory of the diskette or fixed disk you use to boot the system. If you already had a CONFIG.SYS file, it has been saved as CONFIG.OLD. If you were using it to set the DOS configurable parameters or install other device drivers, you will have to merge the CONFIG.SYS and CONFIG.OLD files manually. The EtherSeries configuration file contains one entry:

DEVICE = ENET.SYS

Installation

You can add other entries to this file by putting them after this entry using EDLIN. Alternatively, you can add this entry at the beginning of your original CONFIG.SYS file. If you are using the CONFIG.SYS file to add a driver for another block device (such as a disk), the order of the entries will affect the letters assigned to the drives. When you log in to EtherShare, you will be told which drive letters are available. If you are using a non-IBM disk drive, you must modify the CONFIG.SYS file to include entries for both the disk driver and the network driver. Be sure the entry for the network device driver comes after the entry for all other installable device drivers. The line DEVICE = ENET.SYS should be at the end of the file.

When the EtherSeries software and EtherLink card have been installed, and all computers have been connected to the network, you can use the EtherSeries software products as described in the EtherShare, EtherPrint and EtherMail User's Guides.

Glossary

Glossary

Barrel Connector

An adapter that joins two cable segments together to form a longer cable. BNC barrels join Thin Ethernet cable and N-series barrels join thick Ethernet cable.

BNC Connector

A coaxial connector used in Thin Ethernet networks.

Boot

Reset your computer, loading new software from the diskette in drive A: or your fixed disk drive. Turning the power off and on is a hard boot; pressing **Ctrl-Alt-Del** is a soft boot.

DIX Connector

A 15 pin connector used to connect a standard Ethernet transceiver by means of a transceiver cable.

Drive Specifier

A single letter identifier followed by a colon to refer to your computer's diskette drive(s) or fixed disk drive. On a two-drive system, the left drive is A: and the right drive is B:. The fixed disk drive is C:.

EtherLink Card

A printed circuit board which plugs into your computer and manages sending and receiving information across the network.

Ethernet

The DEC-INTEL-XEROX (DIX) standard network communications system, Version 1.0, September 30, 1980.

EtherSeries/DOS Diskette

A special version of the DOS operating system that contains the software drivers for the EtherLink card.

N-Connector

A coaxial connector used in thick Ethernet networks.

Glossary

Network

A collection of computers connected by a common coaxial cable, allowing communication and shared resources.

T-adapter

A hardware connector which attaches Thin Ethernet coaxial cable to the EtherLink card in each computer in the network.

Terminator

A hardware connector containing a 50 ohm resistor which attaches to the T-adapters or coaxial connectors at both ends of the network. Both terminators must be in place for the network to operate correctly.

Thick Ethernet

A version of Ethernet which uses standard Ethernet cable (0.4 inch diameter) and N-series connectors. To use EtherLink with thick Ethernet, you need an external transceiver and transceiver cable, or the N-series to BNC-series adapters.

Thin Ethernet

A version of Ethernet which uses RG-58 A/U cable (0.2 inch diameter) and BNC connectors. A T-adapter connects the Thin Ethernet cable to your EtherLink card.

Transceiver Select Switch

A three-pin jumper connection on the EtherLink card which enables the EtherLink card for use with thick Ethernet (using an external transceiver) or Thin Ethernet (using the internal transceiver).

Using Thick Ethernet

Using Thick Ethernet

The EtherLink card for the IBM Personal Computer is compatible with Ethernet local computer networks (Digital-Intel-Xerox (DIX) Version 1.0 and 2.0).

The EtherLink card can be used to build a low-cost Thin Ethernet network, as described in Section 2 of this manual. It can also be used to connect with a DIX "thick" Ethernet network.

Thin Ethernet takes advantage of EtherLink's on-card transceiver. Thin Ethernet cables are connected directly to the BNC connector on the EtherLink card. This cable is lighter, smaller, less expensive and easier to install than thick Ethernet cable, but it limits the length of the network to 1000 feet (304.8 meters).
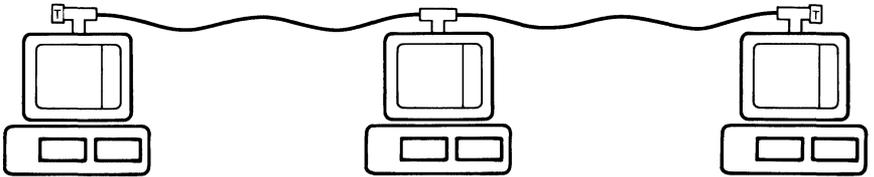
Figure B-1. Thin Ethernet Configuration

Thick Ethernet requires an external transceiver and a cable to connect the transceiver with the EtherLink card, but affords a greater distance and allows the IBM Personal Computers to be located up to 164 feet (50 meters) from the network cable. Thick Ethernet allows a maximum cable length of 3280 feet (1000 meters) when using 3Com transceivers.

You connect an external Ethernet transceiver to the Ethernet transceiver outlet on the rear panel of the EtherLink card. This 15 pin connector conforms to the Ethernet Specification established by Digital Equipment Corporation, Intel and Xerox. The transceiver select switch on the EtherLink card must be set for an external transceiver, as described in Section 2 on Installation.

The EtherLink card can be connected to an Ethernet 2.0 network and will be fully interoperable. This means that it can send and receive data to and from other computers in the network which are built to Ethernet 2.0 Specifications (published November, 1982).

An EtherLink card connected to an Ethernet 2.0 network through a 3Com Ethernet Transceiver (model number 3C100) is also fully interoperable. The EtherLink card can be used with an Ethernet 2.0 transceiver, but it will ignore the transceiver heartbeat.

Using Thick Ethernet
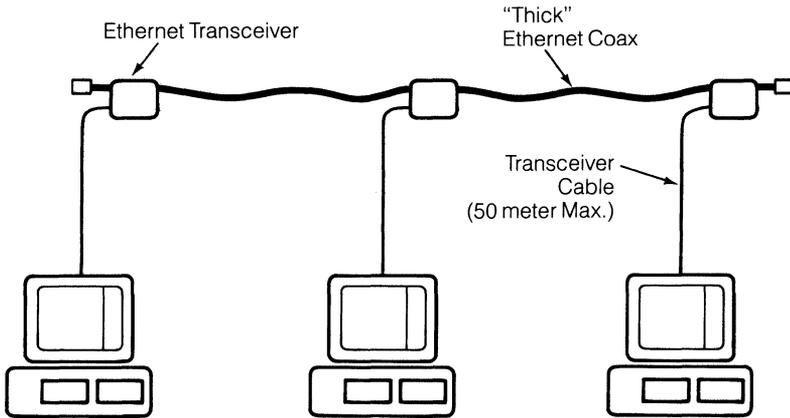
Figure B-2. Thick Ethernet Configuration

Combining Thin Ethernet with Thick Ethernet

Thin Ethernet and standard Ethernet coaxial cables are electronically identical and both conform to the signal and protocol definitions of the Ethernet specification. Because of its reduced size, Thin Ethernet has a slightly higher signal loss and so cannot transmit information over as great a distance. If you combine both types of cable into a single network, do not exceed the combination of lengths shown in Table B-1.

Length of Thin Ethernet Cable		Length of thick Ethernet Cable with 3Com Transceivers only	
Meters	Feet	Meters	Feet
304.8	1000	0	0
300	984	16	52
250	820	180	590
200	656	344	1128
150	492	508	1666
100	328	672	2204
50	164	836	2742
0	0	1000	3280

Table B-1. Combining Thin and Thick Ethernet Cables

For example, if you use 200 meters of Thin Ethernet cable in your network, you cannot use more than 344 meters of thick Ethernet cable in the same network.

When you combine Thin Ethernet with thick Ethernet, you must adhere to the following specifications:

1. The total length of the combined network should not exceed 1000 meters or the length as defined by the expression:

    $(3.28 \times T) + E \leqslant 1000$ meters

    where T = length of Thin Ethernet cable in meters
    E = length of thick Ethernet cable in meters

    This assumes only 3Com transceivers and EtherLinks on the network. If you use transceivers supplied by other manufacturers, total length is reduced to:

    $(3.28 \times T) + E \leqslant 500$ meters

2. There should be a minimum of 7.5 feet (2.5 meters) between any two computers on thick Ethernet, and 3 feet (1 meter) on Thin Ethernet.

Using Thick Ethernet

Table B-2 compares the specifications for Thin Ethernet and thick Ethernet networks.

	Thin Ethernet	Ethernet Specification
Cable type	RG-58 A/U, 50 ohm RG-58 C/U, 50 ohm	Ethernet, 50 ohm
Connectors	BNC Series	N Series*
Maximum length of segment	1000 feet (304.8 meters)	1640 feet (500 meters)**
Minimum distance between computers or transceivers	3 feet (1 meter)	7.5 feet (2.5 meters)***

Table B-2. Comparison of Thin Ethernet to Thick Ethernet Network

* Assumes 3Com 3C100 transceivers. Other transceivers may use tap type connectors.

** Using only 3Com 3C100 transceivers increases the maximum network length to 3280 feet (1000 meters).

*** If you use 3Com 3C100 transceivers, there is no minimum distance between transceivers.

A complete list of Ethernet and Thin Ethernet components is given in table B-4.

Interseries Adapters

The components listed in table B-3 are used to interconnect thick Ethernet and Thin Ethernet cables. They can be ordered from 3Com by the model numbers shown.

Adapter	Description	3Com Model Number
BNC Female to N Series Female	Connects Thin Ethernet cable to thick Ethernet cable	3C540
BNC Female to N Series Male	Adapts Ethernet transceiver for BNC connectors and Thin Ethernet cable	3C541
BNC Barrel Connector	Connects two lengths of Thin Ethernet cable	3C536
N Series Barrel Connector	Connects two lengths of thick Ethernet cable	3C160

Table B-3. Ethernet to Thin Ethernet Connectors

Using Thick Ethernet

Repeaters

Repeaters allow you to combine multiple thick Ethernet or Thin Ethernet segments into a larger network. Repeaters link separate segments together, forming a larger multi-branch network with operational characteristics similar to a single Ethernet coaxial cable segment. Repeaters extend the length of a single cable segment and enable branching from a centrally located segment. Each repeater has the electrical characteristics of a single transceiver, so the combined number of repeaters and computers cannot exceed 100 on any cable segment. No more than two repeaters can be in the path between any two computers.
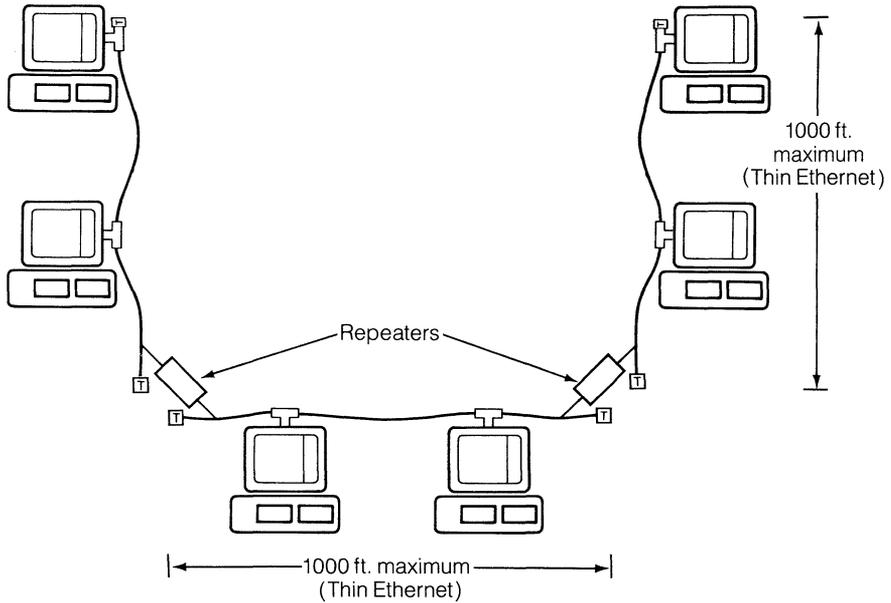
Figure B-3. Ethernet Network with Repeaters

Appendix C
Problem Solving on the Network

The EtherSeries User Software Diskette supplied with your EtherLink card includes a diagnostic program called DIAGNOSE.COM which can be used to help you solve problems with your network.

The program indicates three possible sources of Ethernet problems:

- The EtherLink card

- The network (coaxial cable and connectors)

- The server

This appendix describes the DIAGNOSE program, the equipment and tools required to run the program, a step-by-step procedure on how to use the DIAGNOSE program, and potential solutions to problems which may be found on the network.

Problem Solving

The Diagnose Program

DIAGNOSE takes about two minutes to run from start to finish. As it runs, it reports its progress by displaying the name of each internal test routine and counts each pass of the tests. There are seven internal test routines:

    1 - Preliminary test   5 - Message exchange test

    2 - DMA test   6 - Passive receive test

    3 - Packet test   7 - EtherSeries echo server

    4 - Recognizer test

Tests 1 and 2 do not attempt to transmit or receive packets of data on the network. Any error during these tests indicates a failure of the Ethernet controller or the DMA channel in your IBM Personal Computer.

Tests 3 and 4 (the packet and recognizer tests) use both the receive and transmit circuitry of the controller. Running these while connected to an active network can occasionally cause false errors due to interaction with extraneous network traffic.

Normally, these interactions and the resultant errors are not reported unless they exceed a certain level. If the "A" option is used, all errors are reported, including those caused by the extraneous network traffic. Using the "A" option when connected to an active network may result in errors being reported even though the EtherLink card is functioning properly.

Test 5 (the message exchange test) depends on the availability of another PC or network server to exchange EtherSeries or NS echo protocol packets. This test does not run when the loopback ("L") parameter is used in the command string.

Test 6 (the passive receive test) counts any legal packet that is transmitted on the network. It does not run as a part of the regular test sequence, but can be used to indicate network activity. Test 6 continues to run until interrupted by **Cntl-Break.**

Test 7 (EtherSeries echo server) designates this computer as an echo server which is used to exchange packets with a computer under test. This test does not run as a part of the regular test sequence. It echoes messages back to computers which are running test 5 (message exchange test). Test 7 continues to run until interrupted by **Cntl-Break.**

Format

DIAGNOSE [*I*] [*D*] [− *D*] [*Bxxx*] [*L*] [*#*] [*A*] [*M*] [*E*]

Parameters

I   Tests for interrupts on INT 5. This should only be used if the INT jumpers have been changed from the factory setting. Otherwise, Interrupts on INT 3, the factory setting, will be tested.

D   Uses DMA channel three. This option should only be used if the DMA jumpers have been altered from the factory settings. Otherwise DMA channel one, the channel selected by the factory, is used.

-D   Does not use the DMA channel at all.

Bxxx   Sets the base address of the EtherLink card to xxx (three hexadecimal digits). This option should only be used if the I/O address jumpers on the EtherLink card have been changed.

L   Use this option when testing with a loopback connector. Testing stops at the first error. The extraneous traffic filter is turned off.

Enter 1, 2, 3, 4, 5, 6 or 7 to select one of the following test routines:

1 - Preliminary test

2 - DMA test

3 - Packet test

4 - Recognizer test

5 - Message exchange test

6 - Passive receive test

7 - EtherSeries echo server

If you use this parameter, the test you select is the only test that will be run.

A   Reports all errors. The extraneous traffic filter is turned off.

M   Prints an extended diagnostic message after a fatal error.

E   Uses NS echo protocol to access remote nodes during the message exchange test. This option should be used on Xerox NS 8000 networks that have echo servers.

Problem Solving

Requirements for Testing

For testing, you need:

■ Another IBM Personal Computer with an EtherLink card installed, connected to the network;

OR

■ An IBM PC or AP Network Server that is operating and connected to the network.

One of these will be used as an echo server, which will exchange packets over the network with the computer during the final stages of testing.

If neither of these are available, you can still test 98% of the EtherLink card. You must disconnect the malfunctioning computer from the network, attach a loopback plug to the EtherLink card, and run the DIAGNOSE program using the "L" (loopback) parameter.

If you do a loopback test, you must use the loopback plug that corresponds to the way you are connected to your network. You cannot use the other type of loopback connector without reconfiguring the transceiver select switch on the EtherLink card.

■ If you are using your EtherLink with Thin Ethernet, use a Thin Ethernet loopback plug.

■ If you are using an external transceiver and thick Ethernet, use a standard Ethernet loopback plug.

Running the DIAGNOSE Program

The DIAGNOSE program is supplied on the EtherSeries User Software Diskette.

1. Run the DIAGNOSE program on another IBM Personal Computer that is connected to the network and known to be working correctly. (Omit this step if you have an operating Network Server on your network.)

    Insert the EtherSeries User Software Diskette in drive A: and type:

    A> **DIAGNOSE** 7 ←┘

2. Run the DIAGNOSE program on the IBM Personal Computer that appears to be malfunctioning.

    Insert the EtherSeries User Software Diskette in drive A: and type:

    A> **DIAGNOSE** ←┘

3. As the program runs, it prints messages indicating its progress through various tests. When it finds a failure, it prints the message:

    TEST FAILS, ——————————— failure: ———————————

    Messages you might receive as causes of failure include:

    - hard controller failure
    - probable controller failure

    (A controller failure indicates failure of the EtherLink card)

    - probable network failure
    - probable server failure

Examples of these failures and potential solutions are described on the following pages.

Problem Solving

Controller Failure

Isolate a failing controller as follows:

1. Disconnect the IBM Personal Computer from the network.

2. Substitute the appropriate loopback connector. If you are using your EtherLink with Thin Ethernet, use a Thin Ethernet loopback plug. If you are using an external transceiver and thick Ethernet, use a standard Ethernet loopback plug. You must use the loopback plug that corresponds to your network. You cannot use the other type of loopback connector without reconfiguring the transceiver select switch on the EtherLink card.

3. When you have installed the loopback connector, run DIAGNOSE with the "L" option.

4. If DIAGNOSE ends with a fatal error while using the loopback connector, either the EtherLink card or the DMA controller in the computer under test has failed.

   To isolate an EtherLink card failure from a failure of the IBM Personal Computer, move the EtherLink card to another computer and repeat steps 1-4.

DIAGNOSE can run while attached to an active network, but under these circumstances a fatal error does not necessarily mean that this EtherLink card is malfunctioning. For example, an unterminated network would cause DIAGNOSE to fail due to excessive collisions.

Unless you explicitly indicate the presence of a loopback connector by using the "L" option, DIAGNOSE attempts to exchange messages with another PC, a network server, or a Xerox NS 8000 echo server (Xerox NS 8000 echo server requires the "E" option to be set). If DIAGNOSE cannot find a server on the network, there are malfunctions in either the cable, the PC being used as the echo server, the network server, or the Xerox NS 8000 echo server.

Network Failure

When all nodes on the network cannot communicate, the likely cause is a network cable failure. Possible causes of cable failure are:

- The cable has been disconnected by unscrewing a connector or terminator

- The network is not terminated at one or both ends; excessive collisions will be reported

- The network is improperly installed; for example:
  —the cable length exceeds 1000 feet
  —there are more than 100 computers connected to the cable
  —the minimum distance between computers has not been observed (refer to table B-1 in Appendix B)
  —there are "branches" off the main network cable "trunk"

- The terminators are faulty; causes excessive collisions or transmissions without corresponding receptions

- There are breaks in the center conductor or shield; causes excessive collisions

- A short in the cable between the shield and center conductor can cause excessive data and fcs (frame check sequence) errors

- There are multiple grounds on the cable shield; can cause data and fcs errors

Problem Solving

If you suspect a **network failure:**

1. Make sure the network is properly terminated. A terminator should be attached to each end of the cable.

2. Check all connectors on the network to make sure none have been disconnected or are loose.

3. Check that the terminators are of the proper resistance, 50 ohms, and are not shorted.

4. Check that the network is grounded at only one point.

If you suspect a network failure, but cannot identify the failing component by inspection, isolate the failure as follows:

1. Partition the network into two halves and terminate each half.

2. One half of the network should now function and one should not, helping to isolate the problem.

3. Continue the procedure of halving the failing part of the network until you isolate the faulty station, T-adapter or cable segment.

Server Failure

If the message indicates a **probable server** failure, try the following:

1. Check that you have an operating Network Server or IBM Personal Computer running the DIAGNOSE 7 command on the network

2. Try running the DIAGNOSE 7 command on another computer

3. Try running the DIAGNOSE program on another computer

Examples

The following example shows a test that was run on a fully functioning network. Highlighted information will vary depending on your installation.

A> **DIAGNOSE** ◄┘

3Com Ethernet Diagnostic for the IBM Personal Computer
Version n.n © Copyright 3Com Corporation 1982, 1983

My station address is 02 60 8C 00 00 10

Preliminary test	1 2 3 4 5 6 7 8 9 10 complete
DMA test	1 2 3 4 5 6 7 8 9 10 complete
Packet test	1 2 3 4 5 6 7 8 9 10 complete
Recognizer test	1 complete

EtherShare service by 02 60 8c 00 09 47

2166 (0)/700 packets transmitted (collision)/received

Your controller passes diagnose with flying colors.

The following example shows a test that was run on a failing network.

A> **DIAGNOSE** ◄┘

3Com Ethernet Diagnostic for the IBM Personal Computer
Version n.n © Copyright 3Com Corporation 1982, 1983

My station address is 02 60 8C 00 00 10

Preliminary test	1 2 3 4 5 6 7 8 9 10 complete
DMA test	1 2 3 4 5 6 7 8 9 10 complete
Packet test ·	╱─Cause of Failure ╱─Diagnostic Aid

TEST FAILS, probable network failure; excessive collisions
1 (15)/0 packets transmitted(collision)/received
excessive collisions
total errors 16
15 collision
1 excessive collisions

In this example, the network is given as the probable cause of failure, and excessive collisions are reported as a diagnostic aid. Other messages you might receive as causes of failure are:

- hard controller failure
- probable network failure
- probable network failure
- probable server failure

Problem Solving

For Information or Repair

For further information on diagnosing or repairing your network components, contact your dealer or call 3Com's Customer Support Department (between 8:00 and 5:00 Pacific Time) at (415) 961-9602.

Appendix E

Configuring the EtherLink and EtherSeries User Software to Use Different DMA, Interrupts, or Base Addresses

If you want to add peripheral equipment to your IBM PC that conflicts with any of the factory settings, you must:

- change the appropriate jumpers on the EtherLink card, and

- patch the software to use the corresponding values

The EtherSeries User Software is configured to run with the factory-set jumpers on the EtherLink card, as follows:

DMA Channel	1
Interrupt Level	3 (after May, 1983)
	5 (before May, 1983)
I/O Base Address	300H (uses addresses 300-30FH)

The EtherSeries User Software is configured to use DMA Channel 1, so as not to conflict with the IBM PC fixed disk which uses DMA channel 3. The EtherSeries User Software may not work properly with a non-IBM fixed disk that uses DMA channel 1.

The EtherSeries User Software does not use interrupts.

The EtherLink card uses 16 sequential I/O addresses, starting at the base address.

Configuration

The EtherLink Card

There are two versions of the EtherLink card. Before using the information in this appendix to reconfigure your card, be sure you know which version of the card you have. The EtherLink card is identified by an assembly number printed on the top left corner or along the lower edge of the card, as shown in figure E-1.
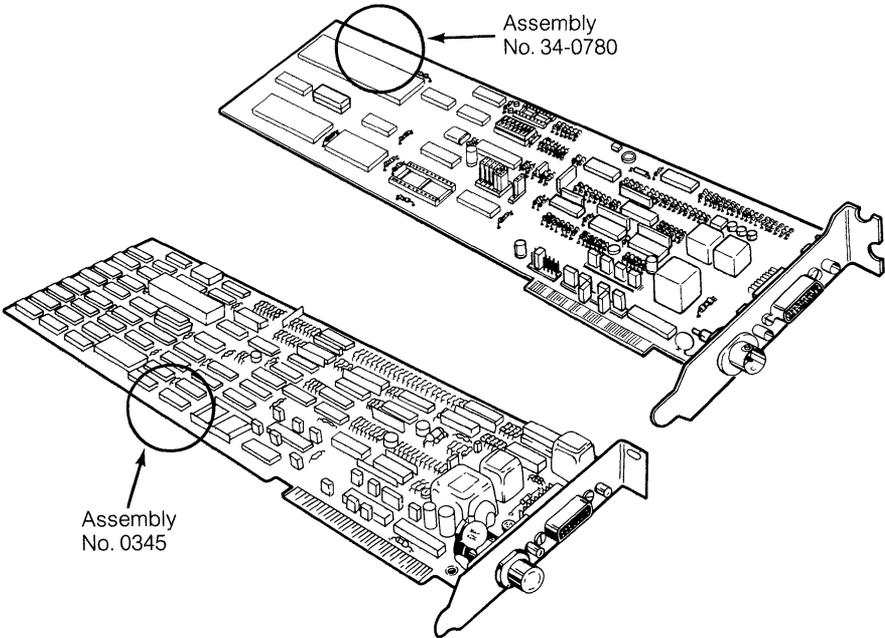
Figure E-1. EtherLink Card Assembly Numbers

Your card will be either assembly number 0345 or 34-0780.

This appendix gives instructions for reconfiguring both versions of the EtherLink card. Be sure you follow the instructions for your particular version.

Both versions of the card operate in the same way, but offer different choices for reconfiguring DMA, interrupts, and base addresses. These choices are described in Table E-1.

	Assembly No. 0345	Assembly No. 34-0780
DMA Channel	1 or 3	1, 2, or 3
Interrupt	3 or 5	2, 3, 4, 5, 6, or 7
I/O Base Address	200-3F0	0-3F0

Table E-1. Possible Configurations for the EtherLink Cards

The IBM PC components and peripherals use the DMA, interrupts, and base addresses shown in Table E-2. Before you reconfigure the EtherLink card, check this table and documentation provided with your other accessory boards to be sure you do not conflict with any of the other settings.

IBM Add On Feature	Interrupt Channel	DMA Channel	I/O Address
SDLC	4 and 3	1	380-38C
Fixed Disk	5	3	321-323
Diskette Drive	6	2	3F2, 3F4, and 3F5
Parallel Printer	7	—	3BC-3BD 378-37A
ASYNC Adaptor	4 and 3	—	3F0-3FF 2F0-2FF
Prototype Card	—	—	300-31F

Table E-2. IBM PC DMA, Interrupts, and Base Addresses

Changing Jumpers on the EtherLink Card (Assembly No. 0345)

The jumpers to configure the DMA channel, interrupt channel, and base I/O address of the EtherLink card are located near the connector at the bottom of the card, as shown below:
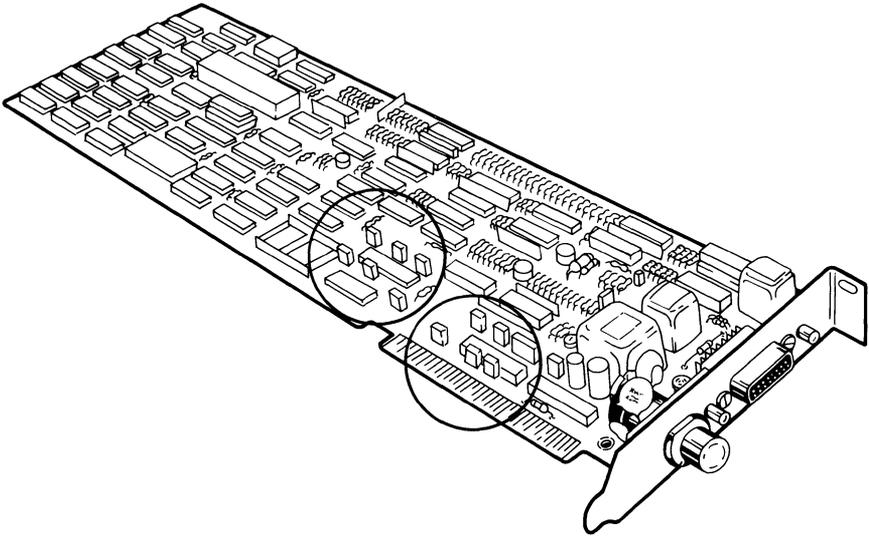
Figure E-2. Location of Jumpers (Assembly No. 0345)

Jumper Description (0345)

Each jumper consists of a plastic block holding three pins. A plastic cover fits over the middle and one of the end pins, shorting them together. Changing the position of the jumper to fit over the middle and the other end pin will change its state.

CAUTION

Certain jumper blocks are placed close together on the board. Connecting two adjacent pins that are not on the same jumper block could cause electrical damage to the board. USE CAUTION TO BE SURE THAT THE JUMPERS ARE PROPERLY INSTALLED.

DMA Channel Jumpers (0345)

There are two jumpers required to select the DMA channel:

- To select DMA channel 1, both jumpers should be set to connect the left and center pins on JP1 and JP2. This is the default factory setting.

- To select DMA channel 3, move the jumper cover to fit over the center and right pins on both jumper blocks.

In the figure below, the jumpers are shown set for DMA channel 1.
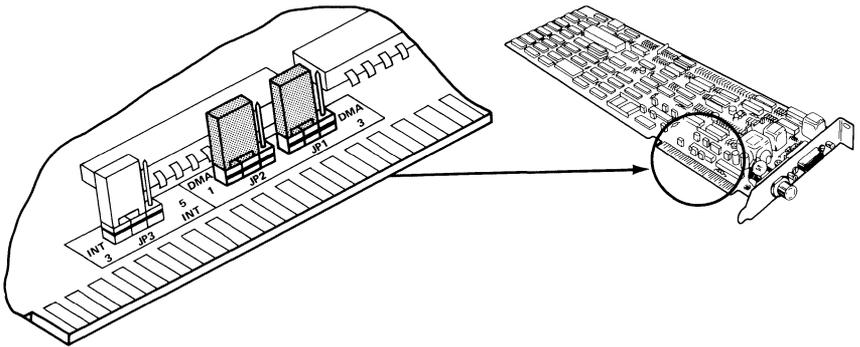
Figure E-3. DMA Channel Jumpers (Assembly No. 0345)

Interrupt Channel Jumpers (0345)

There is only one jumper block required to select the interrupt channel. In the figure which follows, the interrupt jumper is set for interrupt level 3.

- To select Interrupt channel 3, place the jumper over the left and center pins on JP3.

- To select Interrupt channel 5, place the jumper over the center and right pins.

Configuration
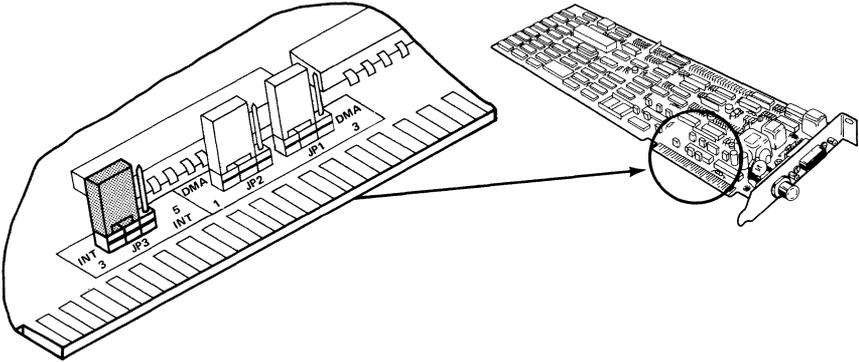
Figure E-4. Interrupt Channel Jumpers (Assembly No. 0345)

I/O Base Address Jumpers (0345)

The EtherLink card uses 16 I/O addresses, starting at the I/O base address selected by jumpers JP4, JP5, JP6, JP7 and JP8. The I/O address bit and factory setting for each jumper is shown below:

Jumper Number	JP4		JP5	JP6	JP7	JP8			
I/O Address Bit	9	8	7	6	5	4	3	2	1	0
Possible Values	1	1/0	1/0	1/0	1/0	1/0	0	0	0	0
Factory Settings	1	1	0	0	0	0	0	0	0	0
Hex Value	3		0				0			

To change the base address, locate the jumper corresponding to the address bit you want to select.

■ To set the address decoding logic to recognize a "1", place the jumper cover so that it fits over the center and right pins on the jumper block.

■ To set the logic to recognize a "0", place the jumper cover to fit over the left and center pins.

The EtherLink card can be set to select any I/O address block starting between 200H and 3F0H, inclusive. In the figure, the I/O Base Address is set for 300H.
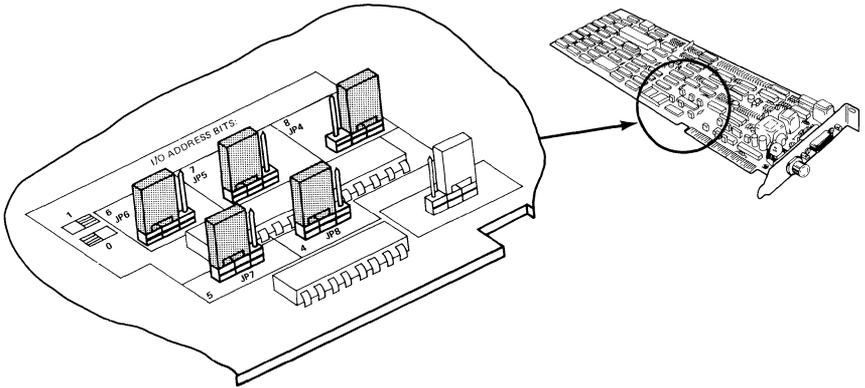
Figure E-5. I/O Base Address Jumpers (Assembly No. 0345)

Changing Jumpers on The EtherLink Card (Assembly No. 34-0780)

The jumpers to configure the DMA channel, interrupt channel, and base I/O address of the EtherLink card are located near the connector at the bottom of the card, as shown below:
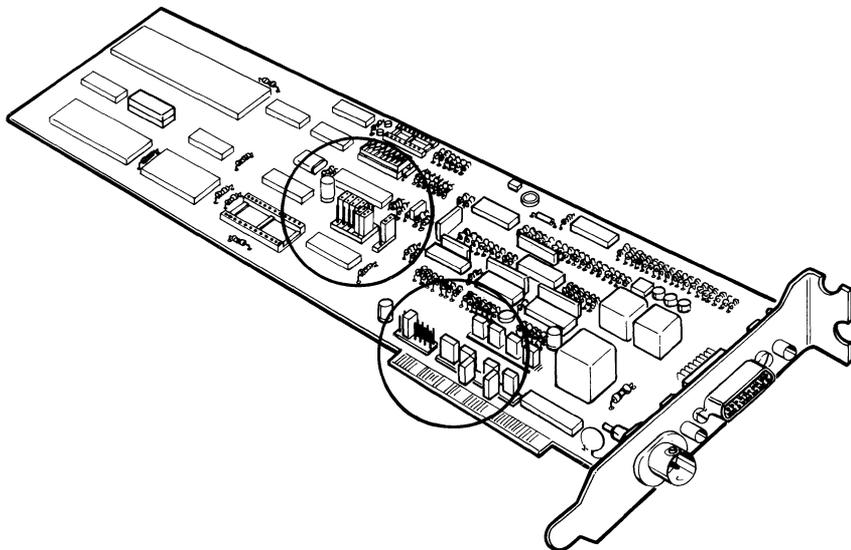
Figure E-6. Location of Jumpers (Assembly No. 34-0780)

Jumper Description (34-0780)

The I/O base address jumpers consist of a plastic block holding three pins. A plastic cover fits over the middle and one of the end pins, shorting them together. Changing the position of the jumper to fit over the middle and the other end pin will change its state.

The DMA channel and interrupt jumpers consist of several rows, each containing two pins. A plastic block fits over one row of two pins. Changing the position of the jumper to fit over another row of pins will change its state.

CAUTION

Certain jumper blocks are placed close together on the board. Connecting two adjacent pins that are not on the same jumper block could cause the board to malfunction. USE CAUTION TO BE SURE THAT THE JUMPERS ARE PROPERLY INSTALLED.

DMA Channel Jumpers (34-0780)

There are two jumpers required to select the DMA channel:

- To select the DMA request channel, move the jumper cover to fit over two of the pins in the leftmost group (toward the label DMA REQ). You can select channel 1, 2, or 3.

- To select the DMA acknowledge channel, move the jumper cover to fit over two of the pins in the rightmost group (toward the label DMA ACK). You can select channel 1, 2, or 3.

- Both jumpers must select the same DMA channel.

In the figure below, the jumpers are shown set for DMA channel 1.
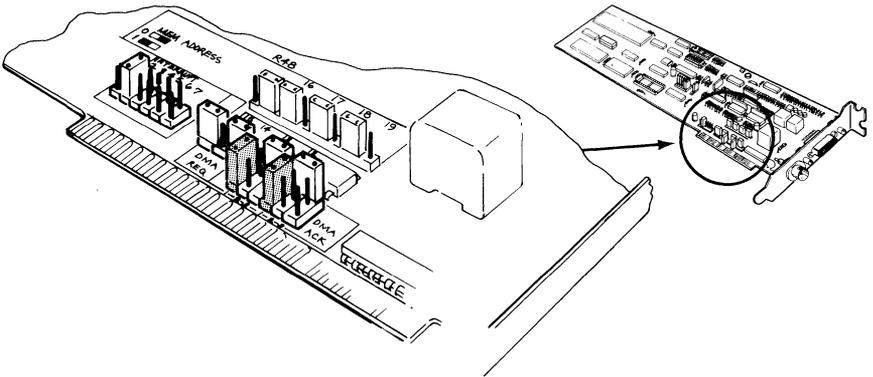
Figure E-7. DMA Channel Jumpers (Assembly No. 34-0780)

Configuration

Interrupt Channel Jumpers (34-0780)

There is only one jumper block required to select the interrupt channel. In the figure below, the interrupt jumper is set for interrupt level 3.

You can use interrupt channels 2 through 7. Place the jumper over the row of two pins that corresponds to the channel you want to select.
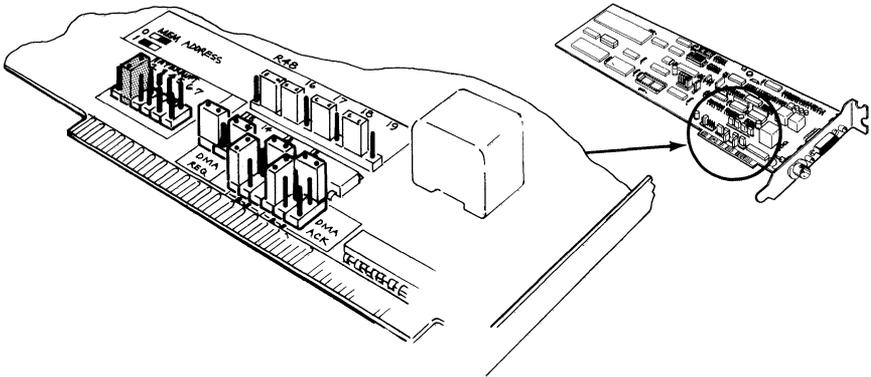
Figure E-8. Interrupt Channel Jumpers (Assembly No. 34-0780)

I/O Base Address Jumpers (34-0780)

The EtherLink card uses 16 I/O addresses, starting at the I/O base address selected. The I/O address bit and factory setting for each jumper is shown below:

I/O Address Bit	9	8	7	6	5	4	3	2	1	0
Possible Values	1/0	1/0	1/0	1/0	1/0	1/0	0	0	0	0
Factory Settings	1	1	0	0	0	0	0	0	0	0
Hex Value	3		0				0			

To change the base address, locate the jumper corresponding to the
address bit you want to select.

■ To set the address decoding logic to recognize a "1", place the jumper
cover so that it fits over the center and lower pins on the jumper block.

■ To set the logic to recognize a "0", place the jumper cover to fit over the
center and top pins.

The EtherLink card can be set to select any I/O address block starting
between 0 and 3F0H, inclusive. In the figure, the I/O Base Address is set
for 300H.
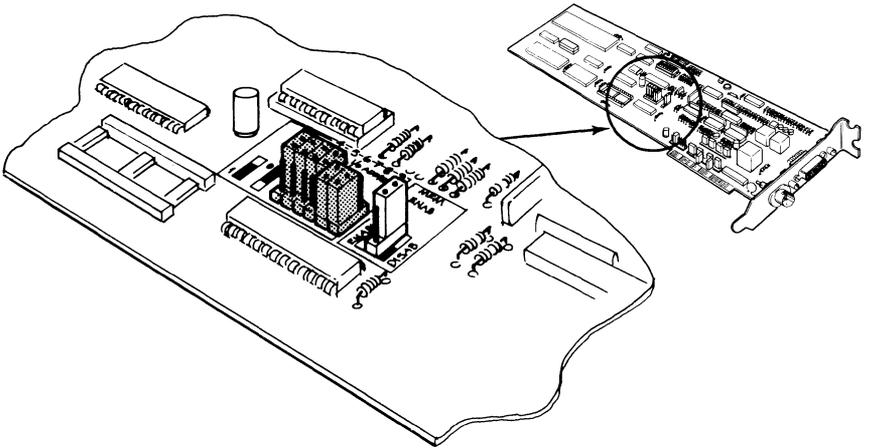
Figure E-9. I/O Base Address Jumpers (Assembly No. 34-0780)

Modifying the EtherSeries User Software

If you change the DMA channel or I/O Base Address, you must modify
the EtherSeries network driver program which is contained in the file
ENET.SYS. This is stored on your EtherSeries/DOS boot diskette, or on
your fixed disk drive if you have an XT and boot from the fixed disk.

The EtherSeries User Software does not use interrupts.

Making Changes to Driver Programs

You use the program CONFIG.EXE to change the I/O base addresses and
the DMA channel values in the EtherSeries software to correspond to the
changes you have made to your EtherLink card.

The CONFIG program is part of the EtherSeries User Software.

Running the CONFIG Program

You can use the CONFIG program to change your EtherSeries/DOS
diskette or to change the network driver on your fixed disk.

Changing Your EtherSeries/DOS Diskette

1. Insert theEtherSeries User Software Diskette in drive A:.

2. Set the default drive to A:.

    D> **A:** ◄┘

3. At the prompt, type:

    A> **CONFIG** ◄┘

    This displays the EtherSeries Configuration Menu.

```
        3Com Corporation

                    ================================
                    || EtherSeries Configuration ||
                    ================================

               The following items may be configured:

                       1 - I/O Base Address
                       2 - DMA Channel
                       3 - Interrupt Level
                       4 - Input(s) complete

               Please enter options:
```

Figure E-10.   The EtherSeries Configuration Menu

4. When the menu is displayed, remove the EtherSeries User Software Diskette and insert your EtherSeries/DOS diskette in drive A:. You can begin selecting items from the menu to make changes.

Changing the Network Driver on Your Fixed Disk

1. Insert the EtherSeries User Software diskette in drive A:.

2. Set the default drive to C:.

   A> C: ←

3. Set the default directory to the root directory. Type:

   C> CD \ ←

4. Run the CONFIG program.

   C> A:CONFIG ←

   This displays the EtherSeries Configuration Menu.

5. When the EtherSeries Configuration Menu is displayed, remove the EtherSeries User Software Diskette from A: and begin selecting items from the menu to make the necessary changes.

Changing the I/O Base Address

1. Select item 1 (I/O BASE ADDRESS) on the EtherSeries Configuration menu.

2. Type the new base address at the prompt.

   I/O Base Address can be from 0H through 3F0H
   Please enter new I/O Base Address: **300** ←

   This example changes the I/O base address to the hexadecimal value 300.

   If you are using the EtherLink Card with Assembly Number 0345 you can use an address between 200 and 3F0. The EtherLink Card with Assembly Number 34-0780 uses addresses between 0 and 3F0. See Installing the EtherLink Card in this manual to identify the EtherLink card you are using.

Configuration

Changing the DMA Channel

1. Select item 2 (DMA CHANNEL) on the EtherSeries Configuration
    menu.

2. Type the new DMA channel number at the prompt.

    DMA Channel can be 1, 2 or 3
    Please enter new DMA Channel: **1** ⏎

    This example changes the DMA channel to channel 1.

    If you are using the EtherLink Card with Assembly Number 0345, you
    can use DMA Channels 1 or 3. Assembly Number 34-0780 uses 1, 2,
    or 3.

Changing the Interrupt Level

The EtherSeries Configuration Menu provides Interrupt Level as a choice.
However, EtherSeries User Software does not use interrupts, so you will
not need to use this option.

1. Select item 3 (INTERRUPT LEVEL) on the EtherSeries Configuration
    menu.

2. Type the new interrupt level at the prompt. (EtherSeries software does
    not use interrupt levels.)

    Interrupt Level can be 2 through 7
    Please enter new interrupt level: **3** ⏎

    This example changes the interrupt level to 3.

    The EtherLink card with Assembly Number 0345 uses interrupts 3 or 5;
    Assembly Number 34-0780 uses 2 through 7.

Saving the Configuration Changes

1. Select item 4 (INPUT(S) COMPLETE) on the EtherSeries Configuration menu.

2. Check the new values that are displayed.

   The changes are:

   I/O 300
   DMA 1
   INT 3

   Are these correct (y or n)?

3. Type **Y** if the correct values are displayed. At this point the appropriate changes are made to the driver file. When the changes have been successfully made, a message is displayed.

   ENET.SYS has been changed.

   If you respond **N** to the prompt, you see the message "Cancelled by user" and the DOS prompt is redisplayed. Run the CONFIG program again to enter the changes you want to make.

Configuration

Error Messages

Configuration error messages are displayed in the form of
***ERROR message.

All error messages related to changing the configuration are listed here alphabetically. In addition to the message, the list includes an explanation and a recommended recovery.

The word FILENAME represents the name of the driver file. The actual filename is substituted when the message is displayed.

Error Message	Meaning/Action
Cannot close file FILENAME	An error occurred while the changed file is being closed. Try running the CONFIG program and making the change again. If it does not work on the second try, reload FILENAME from your backup diskette.
Cannot find file 3C*.VER	Cannot find at least one file of the type 3C*.VER. Check that 3C*.VER file is located and the files to be changed are on the default drive.
Cannot open file FILENAME	File could not be opened to make the change. Try running the CONFIG program and making the change again. If it does not work after the second try, reload FILENAME from your backup diskette.
Cannot read file FILENAME	An error occurred while the file was being read to make the change. Try running the CONFIG program and making the change again. If it does not work after the second try, reload FILENAME from your backup diskette.
Cannot seek to beginning of file FILENAME	An error occurred while moving to the beginning of the file you want to change. Try running the CONFIG program and making the change again. If it does not work after the second try, reload FILENAME from your backup diskette.

Error Message	**Meaning/Action**
Cannot write to file FILENAME	An error occurred while trying to write the file back to 3CSHARE.VER. Check to make sure there is enough space on the diskette (6000) bytes. Use the DOS CHKDSK command to be sure the diskette is not defective. Try running the CONFIG program and making the change again. If it doesn't work after the second try, reload FILENAME from your backup diskette.
Input error	Any key other than a menu item was pressed while the Configuration menu was displayed. Run CONFIG again and type an appropriate menu item number.
Invalid DMA channel	You entered a number other than 1 or 3 for the new DMA channel. Type 1 or 3. Run CONFIG again and type 1 or 3.
Invalid I/O base address	The number you entered for the I/O base address was not in the range of 0H to 3F0H. Run CONFIG again and type a number in the correct range.
Invalid interrupt level	The number you entered for the interrupt level was not between 2 and 7. Run the CONFIG program and type a number between 2 and 7.

Appendix F

Error Messages

Error Messages

EtherShare error messages are displayed in the form of ***Error message.** This appendix lists these messages alphabetically, explains the message and recommends recovery action.

The words VOLUME, USER and SERVER represent any volume name, user name or server name. The actual volume name, user name or server name is substituted when the message is displayed.

Error Message	Meaning/Action
A value must be supplied.	A parameter value is required. No default is assigned.
Bad character.	An illegal character has been typed for this parameter.
Bad server.user name format.	A user name can be an optional server name and a period followed by a user name.
Bad user.volume name format.	A volume name can be an optional user name and period followed by a volume name.
Can't find user USER.	The specified user could not be found on any server on the network.
Can't link to an assigned drive.	You cannot link to any drive id which has been redefined using the DOS ASSIGN command.
Caution: Overlaying default drive X:	You are requesting to link a volume to your default drive. This can get you into trouble.
Caution: At least one server did not respond, so a duplicate user name may result. Add user anyway (Y/N)?	When adding a new user, all EtherShares are checked for that user name. If one of the EtherShares does not respond, it is possible the user already exists on that server. If you are sure the user is unique, go ahead. Otherwise, cancel the operation, and try again later.

Error Messages

Error Message	Meaning/Action
Cross server access failed.	There was a failure in a request to access a server other than the one to which you are logged in.
#CROSS is a reserved user name.	#CROSS is used by EtherShare internally and is not available for general use.
Drive not ready— Abort, Retry, Ignore?	You are linked or cross-linked to a volume and your default drive does not have a volume currently linked to it, or the server storing the linked volume is busy, or the server you are linked to has failed. Retry several times. If this does not work, log out then log in to your server and re-establish the link or cross-link when the other server on which the linked volume is stored is operating.
Drive X: in use... OK to unlink (Y/N)?	The requested drive has a volume linked to it. You are asked if the volume can be unlinked.
Enter only one value.	More than one value has been entered for a command parameter. Remember, use a space to separate parameter values.
Enter /P for pause.	In a directory listing, /P is used to request a pause.
Enter /PUB, /PRIV, or /SHAR.	These are the acceptable values for the access parameter.
Enter /W for a wide listing.	In a directory listing, /W is used to display several entries on one line.
Enter /1 or /2, /64KB - /32000KB, or /1MB - /32MB.	Volume size options. /1 is single sided; /2 is double sided. You can also indicate the size in kilobytes (KB) or megabytes (MB).
Ethernet driver not loaded.	You must boot using the EtherSeries/DOS diskette.

Error Message	Meaning/Action
Failure formatting volume.	There was a write error while automatically formatting the volume being created. Delete and recreate the volume. If failure continues, you are possibly out of disk space on your server. Use the server ADMIN functions to remove unnecessary undelivered mail and files waiting to be printed, and restart the EtherSeries software.
Maximum users logged in.	No more users can log in to EtherShare. Someone needs to log out before you can log in.
Max of 2 characters.	More than two characters have been given for a drive id value such as C: or D:.
Max of 8 characters.	A server, user or volume name can contain a maximum of eight characters.
No match.	No name matches the request.
Not enough disk space, numKB remain.	Not enough disk space to create the volume requested.
Nothing to modify.	You must include at least one of the parameters in the ES MODIFY command.
No user logged in.	You are linked or cross-linked to a volume and the server you are cross-linked to goes down. You must log out, log in to your own server and link or cross-link to the volume when the server on which the linked volume is stored is operating.
No volumes linked.	You are requesting to list currently linked volumes with the ES DIR /L command. There are none, or you are attempting to "unlink*" and there are no volumes linked.
No volume linked.	No volume is currently linked to the drive specifier given.
Password incorrect.	The password given is not correct. Try again. Be sure you have typed the correct password.

Error Messages

Error Message	Meaning/Action
Passwords must be enclosed in parens.	Enter the password enclosed in parentheses ( ). The right parenthesis is not required.
Please log in first.	You must log in to use any EtherShare commands.
Selection must be 1-14.	Select a command by typing the number next to the command option. Only 1-14 can be used.
Semicolon (;) must be followed by a space.	There must be at least one space after each semicolon (;) to separate multiple EtherShare commands entered on one line.
Server not ready.	The EtherShare server is not responding. It may be too busy or not operating. Try a few more times, then check the EtherShare.
Server not ready ... Correct login name?	No server is responding to your log in request. It may be an unknown user name, or the server may be too busy or not operating. If you are sure the log in name is correct, try again.
Server SERVER not ready.	The server named SERVER is either not operating or too busy.
Unknown command.	EtherShare commands are used in the form ES COMMAND. It must be one of the 15 defined commands.
Use /L or a volume name, not both.	You can list volumes or linked volumes, not both. Use either ES DIR /L or ES DIR volname.
USER already exists on server SERVER.	The user name you want to add to EtherShare already exists on the server named SERVER. User names must be unique on the entire network.
USER unknown.	The user name you want to delete does not exist on the EtherShare to which you are logged in.

Error Message	Meaning/Action
Value must be X: through X:.	You can link EtherShare volumes to the drive specifiers shown only.
Values ignored from XXX.	Too many parameters have been given. The command has been executed, but all values including XXX have been ignored.
VOLUME already exists.	Each volume you create must have its own unique name.
VOLUME has no assigned password.	You cannot access another user's volume unless a password has been assigned and you give that password.
VOLUME is a private volume and already in use	Private volumes have exclusive access. Once a private volume has been linked, no other user can link it.
VOLUME is linked.	You cannot modify or erase a linked volume. You must first unlink the volume using ES UNLINK and make sure no one else has it linked.
VOLUME is linked to X: … OK to unlink (Y/N)?	The requested drive is currently linked to VOLUME. Confirm if it is all right to unlink VOLUME.
VOLUME not linked.	When requesting an ES UNLINK for VOLUME, it is not currently linked.
VOLUME space is full.	All EtherShare disk space has been used. An EtherShare volume must be deleted before space will be available.
VOLUME unknown.	There is no EtherShare volume with this name. Check the spelling. Make sure you include the owner's name if it is not your volume.
Write to network failed.	Your IBM Personal Computer cannot access the network probably because the network itself has a problem. Consult the EtherLink User's Guide for help in finding the problem.

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