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Black Box Corporation
The World's Source for Cabling and Network Connectivity™

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Economy 10BASE-T Hub

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Chapter 1 Introduction

The Economy 10BASE-T Hub

The LE1062A and LE1063A are multi-port repeaters used in IEEE802.3 Ethernet networks. They provide 16 or 32 RJ-45 STP ports for 10Base-T connection, one AUI port for 10Base-5 connection and one BNC port for 10Base-2 connection. The 19" standard rack-mount design is suitable for either an equipment rack or a desktop.

The hub features a Link LED to show the connection status of each port. Power, Collision, and Activity indicators show the status of the hub as whole.

Packing List

The Economy 10BASE-T Hub package should contain the following items:

➤ One LE1062A or LE1063A 10BASE-T Hub

➤ An accessory bag containing mounting brackets and screws

➤ T-connector and 50-ohm terminator

➤ One AC power cord

➤ User's manual

Hub Features

➤ Complies with the IEEE 802.3 10Base-T Ethernet standard

➤ Provides collision detection, like test, re-locking, re-timing, and preamble generation

➤ Auto-isolation for faulty port and auto-reconnection after fault cleared

➤ Supports 16 or 32 standard RJ-45 twisted pair ports with modular jacks for twisted-pair wiring

➤ AUI port for thick cabling

➤ BNC port for thin cabling

➤ LED indicator for each twisted pair, BNC and AUI ports link & activity status

➤ LED indicators for Power and Collision

Important Terms

Twisted-Pair Cable

Twisted-Pair Cable is the transmission media for 10Base-T Ethernet. Its specifications are listed below.

➤ 0.4 to 0.6 mm diameter (26 to 22 AWG) unshielded wire in a multi-pair cable.

➤ Characteristic impedance:
   85 to 111 at all frequencies between 5 and 10 MHz

➤ Insertion Loss:
   11.5 dB at all frequencies between 5 and 10 MHz

RJ-45 Modular Jack

The RJ-45 Modular Jack is an 8-pin connector used to connect the Twisted-Pair link segment.
Here is a table showing the function of each pin on the RJ-45 Modular Jack.

| Pin No.	Function
1	Output Data +
2	Output Data -
3	Input Data +
4	Not Used
5	Not Used
6	Input Data -
7	Not used
8	Not used

RJ-45 Modular Plug

The RJ-45 type, 8-pin modular plugs are installed at both ends of the Twisted-Pair Cable.
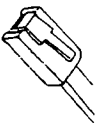
Twisted-Pair Link Segment

The path of full-duplex twisted-pair wire between the Ethernet Hub and the station's twisted-pair connector may consist of one or more twisted-pair joined devices such as wall phone plates. Example of LE1062A:
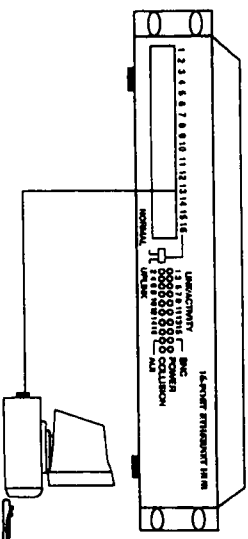

Chapter 2   Installation

This chapter introduces the various components on the front panel and rear panel of the Hub and illustrates how to install it.

The Front Panel

The front panel contains 16 or 32 RJ-45 modular jacks, 1 switch for Normal or Uplink, LED indicators for Power and Collision, and one LED for each twisted-pair, BNC or AUI port indicating link & activity status.
Example of LE1062A:
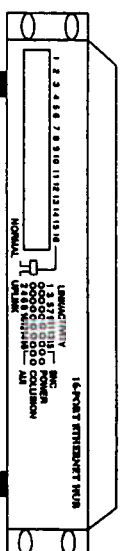
➢ RJ-45 Modular Jack 1 through 16 are for the twisted-pair cables that connect the stations to the Economy 10BASE-T Hub.

➢ Normal/Uplink switch; Port 16 can be set as either Normal or Uplink. Normal is Link/Rx function. Uplink swaps the 16th port transmit and receive pin assignments, allowing you to cascade another hub via 10Base-T cable without using a special crossover cable.

➤ **LED Indicators 1-16** are normally on when the Hub receives signals from the stations, indicating the link is successful. However, if the link fails, the indicator will turn off. Each LED indicator corresponds to an RJ-45 twisted-pair port.

➤ **BNC LED** indicates BNC port connection with 10Base-2 thin network.

➤ **AUI LED** indicates AUI port connection with 10Base-5 thick network.

➤ **COLLISION LED** flashes when a collision is detected.

➤ **POWER LED** is on when power is available.

The Rear Panel

The rear panel of the Hub contains the power switch, power cord socket, BNC and AUI port.
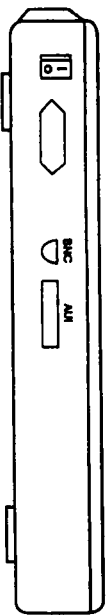
➤ **AUI Port** is a D-type connector that allows connecting a thick-cable network to the Hub.

➤ **BNC Port** is a BNC connector that allows connecting an RG-58 thin-cable network to the Hub.

Ethernet Hub Installation

Step 1: Place the Hub where you can see the front panel.

Step 2: Plug the power cable into the power socket on the rear panel of the hub. It should be easy to insert if it is properly aligned.

Step 3: Plug the power cable into a wall outlet or other end of the source of power.

Step 4: For each station, plug one end of the twisted-pair cable into an RJ-45 modular jack marked 1 through 16 on the front panel.

Step 5: If you want to connect to an existing thick-cable Ethernet, attach an external transceiver cable to the AUI connector on the Hub and lock the slide lock to hold the connector in place.

Step 6: If you want to connect to an existing thin-cable Ethernet, attach a BNC T-connector to the BNC connector on the rear panel.

Warning: *If the other side of the T-connector is not used, a 50-Ohm terminator MUST be attached to.*

Chapter 3   Network Interconnection

The Economy 10BASE-T Hubs provide various types of Ethernet connections. Using the Hub, you can efficiently build a flexible twisted-pair Ethernet network. Furthermore, the built in AUI and BNC connections provide ability to connect to existing coaxial systems (Thick, Thin, and 10Base-T) with a wide range of configurations.

Guidelines for Interconnection

No matter what kind of medium and configuration you choose to build up your network, certain guidelines must be observed.

1. **Twisted-pair Wire, Coaxial Cable and Transceiver Cable Distance Guidelines**

Medium	Connection	Maximum Distance
Twisted pair	Hub-to-station	100 Meters
Twisted pair	Hub-to-Hub	100 Meters
Twisted pair	Hub-to-AUI Adapter	100 Meters
Transceiver (AUI) Cable	Hub-to-Ethernet Transceiver	50 Meters
Thin Cable	Hub-to-Hub	200 Meters
Thick Cable	Hub-to-Hub	500 Meters

2. **Guideline for the maximum Ethernet Network Length**

   ➤ A maximum of three to four Ethernet Hubs or Repeaters may be attached within the path between any two stations, depending on your network environment.

   ➤ Only three coaxial segments may be used. Any other segments must be 10BASE-T.

Twisted-Pair Network; Creating a Basic

With an Economy 10BASE-T Hub, you can directly connect computers in a star configuration to form a basic twisted-pair network. Here is an example using the LE1062A:
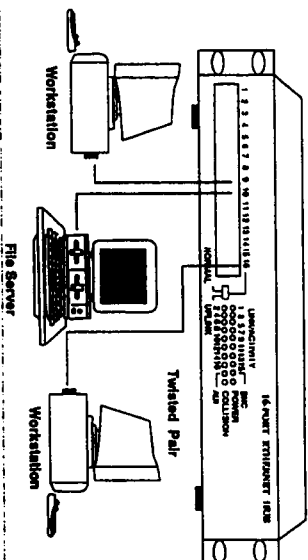

Linking Multiple Twisted-Pair Networks

With the Economy 10BASE-T Hub, you can easily link multiple twisted-pair networks together in the following ways.

1. Using twisted-pair wire through the RJ-45 modular jack, the Economy 10BASE-T Hub can be up-linked with an adjacent Ethernet Hub to extend the network.
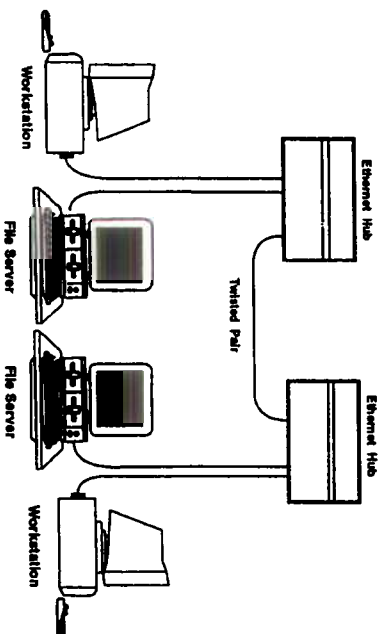
2. You can also link twisted-pair networks together by using the AUI port.
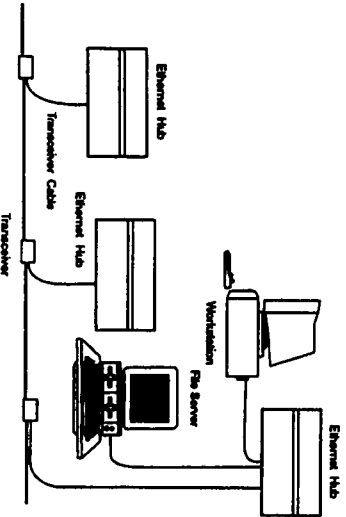
3. By using the BNC port, you can use an RG-58 thin coaxial cable as the backbone network trunk to link twisted-pair networks together. However, the maximum length of the twisted-pair wire is 100 meters.
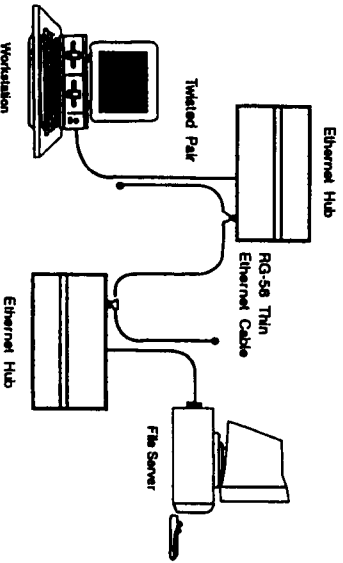
NOTE: If not used, the other side of the T-connector is 50-Ohm BNC terminator must be attached to it.

Connecting Your Existing RG-58 Thin Ethernet Cable to the Twisted-Pair Ethernet Network

The Economy 10BASE-T Hub can provide a flexible and friendly solution for expansion. It even can link your existing RG-58 thin cable Ethernet to the twisted-pair Ethernet network by using the BNC port via a "T" Connector.
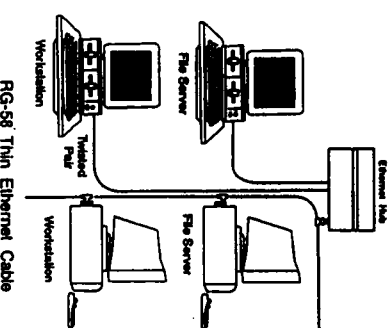
Linking Your Existing Thick Ethernet Cable to the Twisted-Pair Ethernet Network

The Economy 10BASE-T Hub can link your existing thick Ethernet cable to the twisted-pair Ethernet network through the AUI port.