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

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INTRODUCTION

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EISA Host Bus
- 32-bit EISA bus master DMA data transfers up to 33 MBytes/sec burst mode
- Optional driver support for NetWare™ and UNIX™ operating systems
- Software configurable through standard EISA system configuration files
- Cost-effective EISA solution for file server or workstation applications

Ethernet Interface
- Unique 3-in-1 capabilities provide support for Thick, Thin, and 10BASE-T Ethernet networks
- Auto sensing polarity automatically corrects wiring errors
- 10 Mbit/sec Ethernet data transfer rate
- Diagnostic LEDs detect network activity and link integrity status

ASIC Technology
- Bus master ASIC co-designed by BusLogic
- Intelligent, high-performance Intel 82596 Ethernet controller
- High-speed, low-power CMOS technology
- Reduced component count that yields greater reliability
The **BT-763E ADVANTAGES**

**Features**
- Compatible with 32-bit EISA architectures
- Supports 33 MBytes/sec burst mode
- Diagnostic LEDs detect network activity and link integrity status
- Auto-sensing polarity switching
- 128-byte receive and 64-byte transmit FIFO
- Driver support for NetWare 2.2 and 3.11, SCO UNIX Release 3.2 V. 2.4, Open Desktop 2.0, ISC UNIX Release 3.2 V. 3, and packet drivers for PC/TCP and PC-NFS
- Intel 82596 LAN controller
- Boot ROM socket
- ASIC design and surface mount technology

**Benefits**
- Ideal for today's high-performance network servers and workstations
- Allows EISA machines to function at maximum speed
- Improves network management and troubleshooting
- Automatically corrects wiring errors
- Eliminates problems with long bus latencies
- Meets server and high-end workstation needs
- The industry's leading LAN controller solution
- Supports remote boot for diskless workstations
- Greater reliability and reduced power consumption

**Product Overview**

The BusLogic BT-763E Ethernet controller is designed for high-performance NetWare and UNIX file servers and workstations. The BT-763E can be used in NetWare 386 and 286 file servers, DOS workstations, UNIX workstations, and bridges (routers). The BT-763E is designed with unique 3-in-1 capabilities supporting Thick, Thin, and 10BASE-T Ethernet interfaces.

Within the UNIX environment, the BT-763E can be used in UNIX and NFS TCP/IP systems that are connected to the network via a thick-Ethernet cable. In a thin-Ethernet cable network, the BT-763E can be used in UNIX TCP/IP systems and DOS PC/NFS workstations. In a twisted-pair cable network, the BT-763E can be used in a UNIX TCP/IP system and DOS workstations that are running PC/NFS or PC-TCP/IP.

The BusLogic BT-763E EISA Ethernet controller provides the interface between the EISA bus and the Ethernet network. As Figure 1-2 indicates, a BusLogic-designed bus master controller ASIC (EISA9020BV) interfaces the system's memory with the network. An advanced Ethernet controller chip (Intel's 82596) performs the network protocol necessary to transfer data between the network and the system's memory. Because the BT-763E is bootable from the network, it is ideal for diskless workstation or file server applications.
**Host Interface**

The BT-763E uses a high-speed bus master interface chip (EISA9020BV) to connect the Ethernet controller to the EISA bus. Bus master DMA provides up to ten times the transfer rate of slave I/O and also reduces the number of interrupts generated per I/O command. Furthermore, a bus master frees the host processor from managing bus data transfer operations. This, in turn, improves system response in multitasking environments. The interface chip provides logic for EISA bus arbitration, signal translation, interrupt generation, and a slave interface.

**Ethernet Interface**

All Ethernet activity is controlled by Intel's 82596 controller. This intelligent, high-performance LAN controller executes data processing commands, command chaining and interprocessor communications via shared EISA bus system memory. This relieves the host's CPU of the multitude of tasks associated with network control. All time-critical functions are performed independently of the host's CPU which greatly improves system throughput.

**Multitasking Operation**

For operating systems such as NetWare and UNIX, the mailbox protocol of the BT-763E provides true multitasking operation. The host's CPU places commands in the mailbox, notifies the BT-763E of the delivery, and then returns to processing other chores. In response, the BT-763E checks its mailbox, retrieves and interprets the commands, and then executes them without any further interaction with the host's CPU. After the BT-763E completes its task, it places the results in the system's memory, updates the mailbox, and then interrupts the host's CPU.

**Specifications**

Refer to Table 1-1 for a summary of the physical and electrical specifications.

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REFERENCE DOCUMENTS

To install the BT-763E in your computer, you may need the following documentation:

- BT-560 and BT-763E Network Driver Installation Guide
- EISA installation and set-up guide
- Operating system installation and user’s guide
- Novell’s NetWare 286 and/or 386 installation manuals
- UNIX documentation and
- TCP/IP documentation.

HARDWARE AND SOFTWARE REQUIREMENTS

The BT-763E can be installed in any EISA compatible computer. To install the BT-763E successfully you will need the enclosed BusLogic BT-763E network drivers, or third-party device drivers for any of the following operating systems:

- PC-DOS or MS-DOS
- Interactive UNIX or SCOUNIX/XENIX “GT” version, or
- Novell NetWare 286/386.

UNPACKING AND INSTALLATION

UNPACKING AND INSPECTION

This section describes how to unpack, to inspect, to configure, and to install the BT-763E controller. For instructions on how to cable the network, refer to Section 3 in this manual. For instructions on installing the BT-763E network driver, refer to the BT-560 and BT-763E Network Driver Installation Guide.

Before handling the BT-763E, please take the necessary electro-static discharge precautions. Touch your computer on a metal part to discharge static electricity before handling the board. The board should always be held by the edges even after static electricity is discharged.

While practicing appropriate anti-static precautions remove the BT-763E from its protective envelope. Verify that no physical damage occurred during shipping by inspecting the board for bent pins, loose parts, broken traces, and chipped or broken connectors.

INSTALLATION TOOLS

The following items, available from any authorized dealer, may be needed to assist with the installation of the BT-763E for your EISA host system:

- DOS diskette(s)
- EISA CF (Configuration) program for the target system
- Small screwdriver
- Small needle-nosed pliers.

You will also need the following two BusLogic installation diskettes that came with the BT-763E: (1) the option diskette that contains the configu-
ration file (BUS6301.CFG), and (2) the LAN driver diskette that contains the BT-763E network driver (the BT763E.LAN file).

**INSTALLATION and CONFIGURATION OVERVIEW**

The following tasks must be performed to install and configure the BT-763E:

- Placing the BT-763E board into the EISA host system
- Running the EISA system configuration utility to configure the BT-763E board
- Cabling the EISA host system into the Ethernet network and
- Loading the BT-763E network driver into the EISA host system.

**INSTALLING THE BT-763E BOARD**

This section describes how to install the BT-763E controller board in a 32-bit EISA slot inside the EISA host system. Install the BT-763E in your EISA host system by performing the following steps:

1. Remove power from the EISA host system.
2. Refer to the host system user's manual. Open the case to gain access to the motherboard and expansion slots. If the computer has been on, wait a few minutes until the power supply case has cooled down inside the computer. If the power supply case is cold, touch it to discharge any static electricity that may be on your clothes or body.
3. Loosen the mounting screw and the existing bracket from the rear panel behind the 32-bit EISA slot that has been selected for insertion of the BT-763E.
4. Press the BT-763E downward into the selected 32-bit slot, align the mounting bracket, and reinstall the mounting screw.

**Caution:** Make sure that the board is properly seated in the slot.

After you have installed the BT-763E board in your EISA host system, the next step is to configure the BT-763E board.

**CONFIGURING THE BT-763E BOARD**

After you have installed the BT-763E in the EISA host system, the next step is to configure the BT-763E. The BT-763E is configured using the EISA configuration utility that is included with your EISA host system, and with BusLogic's option diskette that is included with the BT-763E.

**EISA Configuration Settings**

The BT-763E fully supports the EISA automatic configuration facility and is operational with most computers using the default settings in the BT-763E option diskette supplied with the BT-763E. The controller configuration options will need to be changed if conflicting port assignments or memory allocation is encountered. Every BusLogic EISA controller comes with a floppy diskette that contains the BusLogic configuration file (BUS6301.CFG).
Before starting, perform the following steps:

1. Prepare a back-up copy of the EISA configuration diskette that was provided with your EISA host computer. You will also need your option diskette that came with the BT-763E.

2. Copy the BusLogic!BUS6301.CFG file from the option diskette onto your working copy of the EISA configuration diskette.

3. Place the back-up EISA configuration diskette in the floppy drive and then type CF (or the name of your EISA configuration program).

4. Follow the directions on your screen to select the configure computer option. An Auto Added prompt will advise you that the BT-763E has been installed into a previously empty EISA slot.

5. Follow the directions on your screen to select the BT-763E board.

The following sections describe the four individual configuration options that are available with the !BUS6301.CFG File.

**Host Interrupt Request Menu** As Figure 2-2 illustrates, this option allows you to select the Host Interrupt Channel. The default is Channel 10.

![Figure 2-2. Host interrupt Request Menu](image)

**Twisted-Pair/Thick/Thin Ethernet Cabling Option** If you have used twisted-pair Ethernet, the BT-763E will automatically configure itself to support twisted pair. To select from either Thick Net or Thin Net, you must use the BT-763E EISA configuration file. If you have used Thick Ethernet, then you must select the Thick Net option as described in Figure 2-3. If you have used Thin Ethernet, then you must select the Thin Net option.

![Figure 2-3. Ethernet Cabling Options](image)

**Note:** The BT-763E will support only one cable at a time.

**BT-763E Ethernet EPROM** To install a Boot PROM in the BT-763E, allowing it to boot remotely, you must configure the PROM as illustrated in Figure 2-4.

![Figure 2-4. BT-763E Boot PROM](image)

**BT-763E Burst Mode Function** The 33 MBytes per second DMA Burst Mode function of the BT-763E can be enabled as illustrated in Figure 2-5.

![Figure 2-5. Burst Mode Option](image)
After you have installed the BT-763E board in the EISA host system, and configured the BT-763E board, your next step is to cable all the network stations together. *Network stations* can be any of the following: file servers, bridges, or workstations. One main cable, a trunk segment *cable*, is used to connect all of the network stations. The stations in the network and the trunk segment cable form a trunk segment.

Use the following guidelines when you are installing the network cabling:

- Check that each network station is turned off.
- Install only one trunk segment at a time if you are installing multiple trunk segments.
- Avoid crimping the cable, damaging its insulation, or installing it near heat sources, fluorescent lights, or heavily trafficked areas.

Instructions on how to cable a thin-Ethernet cable network, a thick-Ethernet cable network, and a 10BASE-T Ethernet network are provided in this section.
THIN-ETHERNET CABLE NETWORKS

The order in which you assemble each trunk segment can vary. For example, you could use the following sequence to assemble your trunk segment: (1) place your network stations and peripherals, (2) place your trunk segment cable(s), and (3) connect the T-connectors directly to the BNC connector jacks on the BT-763E or other network board installed in each network station. Refer to Figure 3-1 for an example of a thin-Ethernet cable network.

To block electrical interference on the network attach a BNC 50-ohm terminator to each end of the trunk segment. One of these BNC terminators should have a grounding wire attached. As Figure 3-1 illustrates, attach the grounding wire's end to an earth ground (e.g., an AC outlet's middle screw). If you need to extend the grounding wire because it is too short to reach the outlet, then use 16- or 18-gauge insulated wire.

If you want to connect trunk segments, use a repeater. To connect two trunk segments to a repeater you must attach one of each trunk segment's end directly to the repeater.

THICK-ETHERNET CABLE NETWORKS

As Figure 3-2 illustrates, stations in a thick-Ethernet cable network use external transceivers to communicate with the network. These transceivers are attached to the trunk segment cable. Any standard Ethernet-style (IEEE 802.3) external transceiver can be used.

Install each trunk segment in your thick-Ethernet cable network by performing the following steps:

1. Place your network stations and peripherals in their desired location.
2. Install the external transceivers.
3. Connect the transceivers to the thick cable that you are using as the trunk segment cable.
4. Note that the female DIX connector has a slide lock. To attach the connector on the transceiver cable to the transceiver: (1) slide the lock on the female DIX connector to open, (2) attach the female DIX connector to the transceiver, and (3) slide the lock on the female DIX connector back to lock. The slide lock helps to prevent accidental disconnection.

5. Connect the male DIX connector to the BT-763E as shown in Figure 3-2.

6. Attach an N-series terminator to the both ends of the trunk segment.

7. Check that a grounding wire is attached to one of the terminators. Attach the grounding wire's end to an earth ground (e.g., an AC outlet's middle screw). If you need to extend the grounding wire because it is too short to reach the outlet, then use 16- or 18-gauge insulated wire.

8. To connect trunk segments, use a repeater. To connect two trunk segments to a repeater you must attach one end of each trunk segment directly to the repeater.

**Twisted-pair Cable Networks**

As Figure 3-3 illustrates, the concentrator functions as the network hub for a twisted-pair Ethernet network. Twisted-pair Ethernet shielded or unshielded cable can be used. Note that the BT-763E's mounting bracket allows for twisted-pair or thick-Ethernet cabling.

When laying out your twisted-pair network, use the following guidelines: (1) limit the segment length (unshielded) to a maximum length of 328 feet (100 meters), (2) limit the number of trunk segments to a maximum of 1024, and (3) limit the number of repeaters to four (five segments with three tapped).

**Warranty Information**

If damage to the board has occurred, return it in the protective envelope with this manual to your BusLogic board supplier. The shipping agent should also be notified if the unit has been damaged during shipment. The BusLogic warranty conditions are given in the back of this manual.
CLASS A EQUIPMENT

Computing devices and peripherals manufactured by BusLogic generate, use, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions in this manual, may cause interference to radio communications. Such equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against radio interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user—at his own expense—will be required to take whatever measures are necessary to correct the interference.

MODIFICATIONS TO PRODUCT DESIGN

The material in this manual is for information only and is subject to change without prior notice to its users. BusLogic Inc. reserves the right to make changes in the product design without notice to its users.
PRODUCT SUPPORT RECORD

The information on this page should be compiled and provided to your supplier in writing to obtain technical support assistance. This will enable your supplier to respond more rapidly and more appropriately to your problem.

About BusLogic Product:
BusLogic Product No: ___________________________
Serial Number: ___________________________
Date of Purchase: ___________________________
Firmware Version Number: ___________________________
BIOS Version Number: ___________________________

Purchased From:
Company: ___________________________
Address: ___________________________

Purchased By:
Name/Title: ___________________________
Company: ___________________________
Address: ___________________________
Telephone #: ___________________________

About System Hardware Configuration:
System Manufacturer: ___________________________
System Model and Speed: ___________________________
System BIOS Manufacturer: ___________________________
Memory in System: ___________________________
Hard Drives on System: ___________________________

About System Software Configuration:
Operating System/Version: ___________________________
Application Program/Version: ___________________________

Detailed Description of Problem: ___________________________

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**STANDARD WARRANTY**

BusLogic warrants that subject to the terms of this policy the Products shall be free from defects due to faulty material or workmanship on the part of BusLogic for a period of one year from the date of delivery.

This warranty shall not apply if the Products have been subject to misuse by Customer or any other party; if any material alteration, addition, amendment, or modification shall have been carried out without the prior written consent of BusLogic; failure to install or operate the Products in accordance to BusLogic’s Product reference manual; or failure caused by improper or inadequate maintenance of users.

BusLogic will make good by repair or at its option by replacement any Products which become defective within the warranty period. Repairs will be warranted for 90 days. Products or parts replaced under this provision shall become the property of BusLogic.

**BEFORE RETURNING A PRODUCT FOR REPAIR, BUYER MUST REQUEST A RETURN MATERIAL AUTHORIZATION (RMA) NUMBER FROM BUSLOGIC.**

All Products under warranty returned to BusLogic for repair shall be returned to Customer at BusLogic’s expense. Shipping costs for all Products returned to BusLogic for repair which are out of the warranty period shall be at Customer’s expense both to and from BusLogic.

Customer is expressly prohibited from issuing Debit Memos for material returned under the provisions of this warranty.

BusLogic shall notify Customer in the event that the Products returned for repair are not, in BusLogic’s sole opinion, within this Warranty condition and, unless disposition instructions are given for such Products within thirty (30) days of such notification, the Products will be returned to Customer freight collect.

**EXCEPT FOR THE ABOVE EXPRESS LIMITED WARRANTY, BUSLOGIC MAKES NO WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, AND BUSLOGIC SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

The total liability of BusLogic for any claim or damage arising out of this Agreement, and whether in contract or in tort, shall not exceed the price of the individual Product(s) whose defect or damage is the basis of the claim.

**IN NO EVENT SHALL BUSLOGIC BE LIABLE FOR ANY LOSS OF PROFITS OF FOR ANY OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

No action against BusLogic for breach of the warranty shall be commenced more than one (1) year after the accrual of the cause of action.

Customer also agrees to perform its duties and responsibilities under BusLogic’s Warranty Policy, which shall be updated from time to time.