CUBIX

Customer Service Support System

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BC Triton Series Manual

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Customer Service Support System

BC Triton Series
Chapter 1 - Introduction

Overview

The BC Triton includes several models of processors as described below:

- **SERVER (TS): BC 5166/5200TS** - the 166/200MHz Pentium processor-based ISA board with a 32-bit PCI SCSI interface and optional PCI bus extension, up to 512 MB of RAM, and a 10/100Mbps PCI Ethernet interface
- **ENGINE (TE): BC 5133/5166/5200TE** - the 133/166/200MHz Pentium processor-based ISA board with a 32-bit PCI SCSI interface, optional PCI bus extension, up to 128 MB of RAM, and a 10/100Mbps PCI Ethernet interface

Hardware

Each BC Triton board includes video support, two serial ports, one parallel port, keyboard and mouse support, on board memory, and floppy and IDE hard drive support. Also included is an integrated 10/100 Base-T Ethernet controller and a fast/wide SCSI interface.

The BC Triton processor is designed for installation in the following Cubix enclosures:

- BOS (Branch Office System). May contain up to three boards.
- ERS II (Enhanced Resource Subsystem).
- ERS/FT II (Enhanced Resource Subsystem/Fault Tolerant II) .

Feature Comparison

Tables 1-1 and 1-2 show the differences between models of BC Triton Series boards.

Table 1-1

BC Model	Bus	CPU Speed	L2 Cache	SCSI	Maximum DRAM*
5133TE	ISA/PCI	133	256K	Yes	128MB
5166TE	ISA/PCI	166	256K	Yes	128MB
5200TE	ISA/PCI	200	268K	Yes	128MB
5166TS	ISA/PCI	166	0-512K	Yes	512MB
5200TS	ISA/PCI	200	0-512K	Yes	512MB

Table 1-2

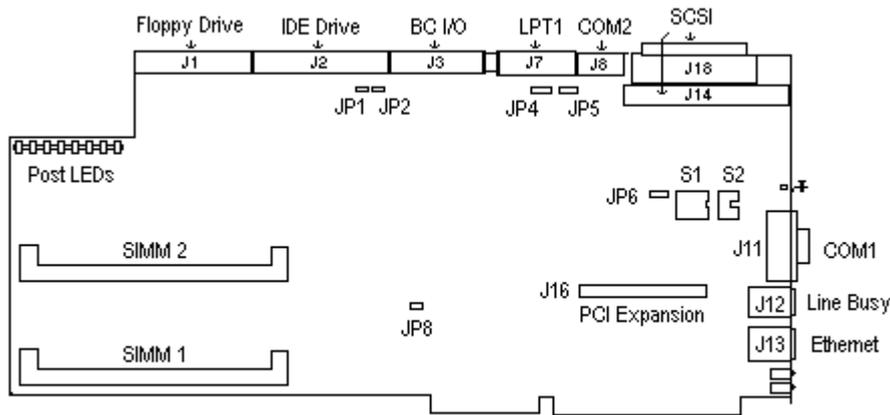# Board Identification

Figure 1-1
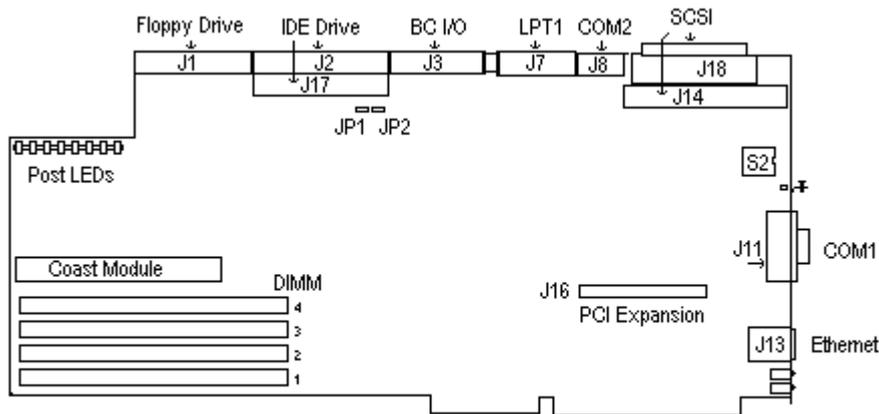**The BC5xxxTE has two right angle SIMM sockets.**

Figure 1-2
The BC5xxxTS has 4 vertical DIMM sockets.

Software

Integrated onto each BC Series processor is a BIOS developed by American Megatrends, Inc. (AMI). In addition, Cubix provides software to customers to support the following features.

- Mouse Multiplexing - software is required to allow a single mouse to be multiplexed between multiple BC processors
- Cubix Supervisory System - Cubix optionally provides a system which monitors and controls the BC processors and requires software support on each BC.
- DEC 21140 PCI Fast Ethernet Interface - use of the integrated Ethernet controller requires installation of 10/100 Base-T drivers
- Symbios 825A SCSI Interface - use of the integrated SCSI interface requires installation of SCSI drivers. Table 1-1 lists the boards supporting the SCSI interface.
- S3 Trio64V+ (765) Enhanced Video - installation of video drivers is required to increase the video resolution in certain environments

Function	BC 5xxxTE	BC 5xxxTS
Post LED's	YES	YES
Floppy Drive	YES	YES
IDE (primary)	YES	YES
IDE (secondary)	NO	YES
LPT1	YES	YES
COM2	YES	YES
SCSI (50 pin)	YES	YES
SCSI (68 pin)	YES	YES
PCI Expansion	YES	YES
COM 1	YES	YES
Memory Modules	SIMMs	DIMMs
Line Busy (COM1 only)	YES	NO
Ethernet	YES	YES
Video Disable Jumper	YES	NO
SCSI Disable Jumper	YES	NO
Ethernet Disable Jumper	YES	NO

BC Triton Series
Chapter 2 - Hardware

Configurable Hardware Options

Ethernet

A DEC 21140 PCI Fast Ethernet (10/100 Mbps) controller is integrated onto each BC Triton processor. The controller can be disabled in the system BIOS. On the BC 5xxxTE, the Ethernet controller can also be disabled in hardware with a jumper (JP5).

Reset on Loss of DCD / DSR

The BC 5xxxTE can be configured to perform a hardware reset when the Data Carrier Detect (DCD) or Data Set Ready (DSR) signal changes from true to false on the COM1 serial port. This feature is designed for use in remote communication applications where the BC 5xxxTE is used to host dial in sessions through the COM 1 Port on a network, as it forces the BC to reset after each session. The reset causes the BC hardware to return to its initial state and also prevents the next dial in user from accessing data left in memory by the previous user. ***This function is available on COM1 only.***

Video

A hardware jumper (JP4) can be set to disable the on board S3 Trio64V+(765) video controller on the (BC 5xxxTE) only. If this controller is disabled, an external video controller with a video BIOS at address C0000 hexadecimal must be installed.

Cubix Supervisory System

The Supervisory System requires installation of an IES (Intelligent Environmental Sensor) module in each Cubix subsystem being supervised except ERS/FT II. This IES module communicates with the BC processors in the subsystem via a hardware interrupt which is configurable as IRQ 10 or IRQ 15 on each BC. Note that if the secondary IDE controller is used on the Triton Server BC, IRQ 15 is not available. If no IES is installed, configure the BC for no Cubix Supervisory interrupt. **In older subsystems this interrupt should be configured for the PA 3030 supervisory processor (the PA 3030 was the predecessor to IES).**

Mouse

A PS/2 style mouse port is included on each BC processor. The mouse may be connected to the BC board via a Cubix multiplexer or by installing an separate adapter. If a mouse is installed, the

mouse interrupt (IRQ 12) must be enabled in the hardware configuration. The "Mouse Support Options" in the Advanced CMOS Setup section of the BIOS Setup Utilities must be "Disabled".

SCSI Termination

Termination for the SCSI cable is enabled or disabled with a hardware switch on the board. SCSI termination should be enabled when the SCSI cable terminates at the BC processor or if the SCSI interface is not used. The Symbios 825A SCSI adapter can be enabled or disabled in the system BIOS. On the BC 5xxxTE, the SCSI can also be disabled with a hardware jumper (JP6).

PCI Extension

To accomplish PCI bus extension, an optional PCI Bus Extender card may be installed on any of the BC Triton boards. **Note: The only subsystem supporting PCI extension is the ERS/FT II.**

Switch and Jumper Settings

The following figures show the connector, switch and jumper locations on the BC5xxxTE and BC5xxxTS. Tables 2-1 and 2-2 define the settings for switch location S1 and S2. Table 2-3 defines jumper settings for the BC 5xxxTE.
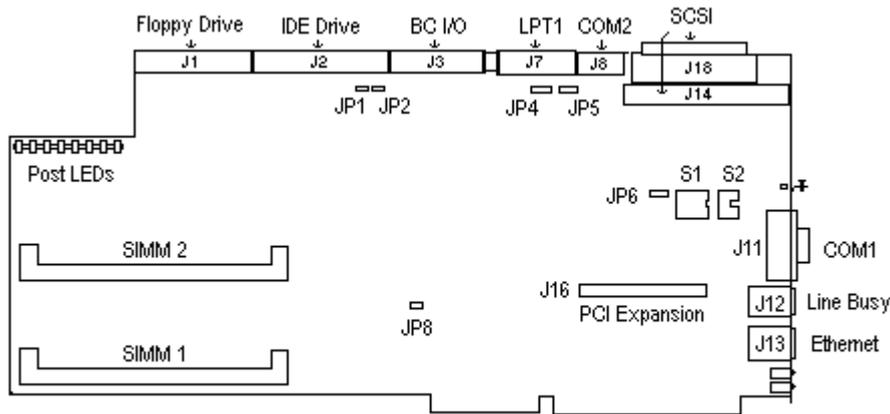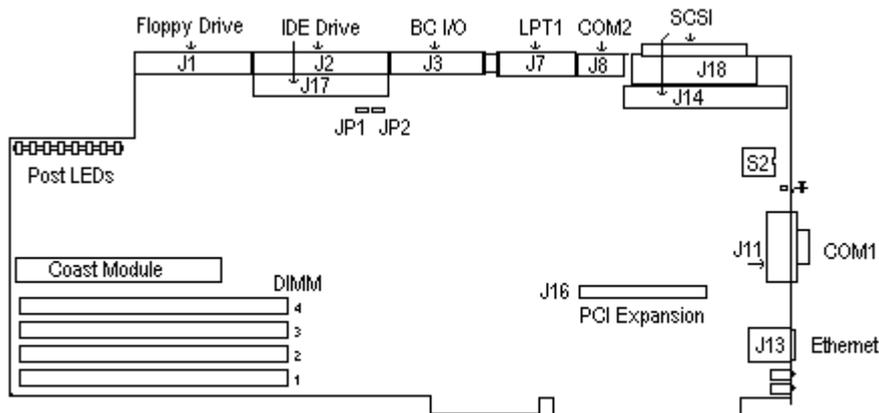

Figure 2-1, BC 5xxxTE

Figure 2-2, BC 5xxxTS

Table 2-1, S2 Switch Settings

Function	1	2	3	4	5
Supervisory Interrupt IRQ 10	on	off			

Supervisory Interrupt IRQ 15 *	off	on			
No Supervisory Interrupt	off	off			
PS/2 Mouse on IRQ 12 *			on		
PS/2 Mouse on IRQ 12 Disabled			off		
SCSI Upper 8 Bit Terminator Enabled *					off
SCSI Upper 8 Bit Terminator Disabled					on
SCSI Lower 8 Bit Terminator Enabled *				off	
SCSI Lower 8 Bit Terminator Disabled				on	
***Factory Settings**	off	on	on	off	off

Table 2-2, BC 5xxxTE S1 Switch Settings

Reset Condition (BC 5xxxTE only)	Position	
	1	**2**
Reset when DSR drops on COM1	on	off
Reset when DCD drops on COM1	off	on
Reset when DCD or DSR drops on COM1	on	on
Reset Disabled*	off	off
***Factory Setting**	off	off

Table 2-3, Jumper Settings

*Note: JP4, 5 & 6 are on BC 5xxx TE only.

JP1 and 2 are factory set and should not be changed.

I/O Connections

The headers and connectors on the BC Triton boards should be connected to the subsystem as indicated in Table 2 - 3.

When the BC Triton is installed in a Cubix ERS/FT Series II subsystem, all connections to the multiplexer are made via headers J1 and J3. When the BC is installed in an ERS/FT subsystem, Cubix supplies a special cable that connects J3 to the 3 separate connectors on the multiplexer.

Jumper	**Function**	**Jumper 1-2**	**Jumper 2-3**
JP4 *	Video	Enabled	Disabled
JP5 *	Ethernet	Enabled	Disabled
JP6 *	SCSI	Enabled	Disabled
JP8	Flash	Write Enable	Write Protect

Table 2-4, Cubix Enclosure I/O Connections - BC Triton

(Continued on next page)

Header/ Connector	Connector Description	Connect to:
J1 **34-pin header**	Floppy disk drive interface	Mux or floppy disk drive (see preceding note)
J2 **40-pin header**	IDE Primary hard disk drive interface	3.5" IDE hard disk drive with 0.1" pitch pins
J3 **26-pin header**	BC I/O	MUX or video/keyboard/mouse (see preceding note)
J7 **20-pin header**	Parallel printer interface (LPT1)	Optional LPT1 adapter board
J8 **10-pin header**	Serial port interface (COM2)	COM2 connector on optional adapter board
J11 **DB-9 connector**	Serial port connector (COM1)	Serial device
J12 ** ** **RJ-11 connector	Line busy connector	Telephone cable

Table 2-4, Cubix Enclosure I/O Connections - BC Triton

* J17 is only available on the Triton Server (BC 5xxx TS)

** J12 is only available on the Triton Engine (BC 5xxx TE)

Header/ Connector	Connector Description	Connect to:
J13 **RJ-45 connector**	10/100 Base-T connector	Ethernet cable

J14 **50-pin header**	SCSI interface	SCSI devices 0 - 6
J16 **80-pin header**	PCI extension connector	Optional PCI extension card
J17* **40-pin header**	IDE Secondary hard disk drive interface	3.5" IDE hard disk drive with 0.1" pitch pins
J18 **68-pin header**	SCSI interface	SCSI devices 0 - 15

BC Triton Series
Chapter 3 - Installation

Hardware Installation

Installation in a Cubix Enclosure

1. Configure the hardware options as described in Chapter 2.
2. Gain access to the backplane. Typically this requires removing the cover from the enclosure.
3. Power down the enclosure or group in which the BC will be installed (if the BC is being installed in a Fault Tolerant subsystem, only the group that will contain the BC needs to be powered down).
4. Seat the BC into the appropriate group in the backplane and secure the board with the screw on the end bracket.
5. Install any peripheral devices required in the enclosure.
6. Install any adapters required to provide connectors for peripheral devices as described later in this chapter.
7. Connect the cables to all peripherals and I/0 connectors (refer to **Chapter 2 - Hardware** for connection information.
8. Reassemble the system as necessary.
9. Apply power.
10. Use a monitor and keyboard to verify that the system is functioning properly. Monitor, keyboard and mouse support are provided through a multiplexer or via an adapter board as described in the *Optional Video, Keyboard & Mouse* section later in this chapter.
11. Run the BIOS setup utility to configure the CMOS install software as specified in the *Software Installation & Configuration* section of this chapter. Instructions to configure the 10/100 Base-T Ethernet drivers necessary to use the integrated Ethernet controller are included in the appendices.

PCI Extension Overview

The BC Triton boards support PCI bus extension via the connection of an optional PCI bus extender card. The extender card, which connects to the 80-pin connector at location J16 on the BC board, extends the PCI bus to an ERS/FT II PCI Master Interconnect Board (MIB). When installed in the ERS/FT II subsystem, the ISA connectors on the BC board and the PCI connectors on the PCI bus extender card simultaneously engage the ISA and PCI connectors on the MIB. The only subsystem that supports PCI extensions is the ERS/FT II.

Two PCI extender cards are available, passive and active.

The **passive** extender card (figure 3-1) is used on PCI MIBs with one or two PCI expansion slots.
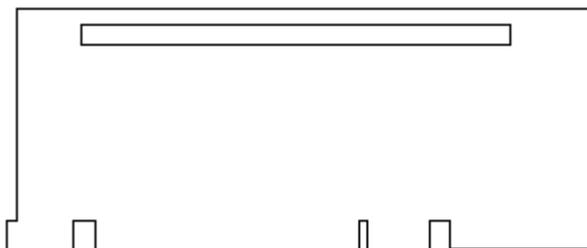
Figure 3-1, Passive PCI Extender Card

The **active** PCI extender card (figure 3-2) is equipped with a PCI-to-PCI bridge controller that extends the PCI bus to a maximum of four external controllers. The active PCI extender card is designed for use with MIBs having three to four PCI adapter slots for each BC Triton board installed. MIBs having fewer than three PCI adapter slots per BC installed will not support the active PCI extender card. The only MIB supporting the active card is the 2x5 PCI + 2x2 ISA.
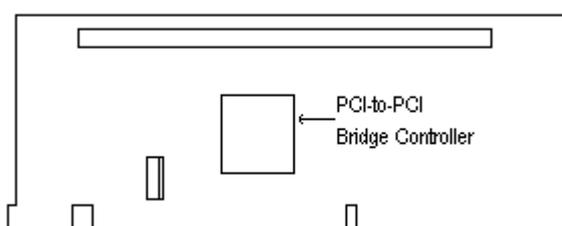

Figure 3-2, Active PCI Extender Card

PCI Bus Extender Card Installation

The PCI bus extender card is shipped with four #6 screws and two spacers. These parts are used to secure the extender card to the BC processor.

1. On the BC processor, insert two #6 screws through the two round cutouts on either side of the male 80-pin connector at location J16. Insert them up from the back side of the BC processor.
2. Attach the spacers to the #6 screws and tighten.
3. Connect the extender card's female 80-pin connector to the BC processor's male 80-pin connector.
4. Insert the other #6 screws through the extender card's round cutouts. The screws extend into the spacers and should be tightened to secure the extender card to the BC processor.
5. Install the BC processor with the PCI bus extender card into the supporting ERS/FT II MIB slots.

Note: The ERS/FT II PCI MIB's have dedicated bus master positions that accept BC boards equipped with the PCI bus extender card. Care should be taken to see that edge connectors on both the BC board and the extension card are properly aligned before inserting them into the MIB slots.

SCSI Device Installation

The Symbios SCSI adapter on the BC Triton series supports:

- SCSI 8 bit (narrow) - Devices 0-6 on J14 with a 50 pin standard ribbon connector.
- SCSI 16 bit (wide) - Devices 0-15 on J18 with a 68 pin high density ribbon connector.

SCSI BIOS Configuration

A SCSI configuration utility is available on boot-up of the BC processor. Shortly after the SCSI BIOS information displays, the configuration program can be accessed by pressing **Control C**. The configuration utility will allow you to scan the SCSI bus, change configuration options, and view a list of SCSI devices connected to the board.

SCSI Drivers and Utilities

The Symbios Driver diskettes contain various drivers, utilities and installation instructions. The utilities include a SCSI format program, a MSDOS configuration program, and a diagnostics program.

SCSI Termination

On-board SCSI termination is controlled by dip switches 4 and 5 of switch S2. Normally, both switches are off, which terminates the high and low order bits of the SCSI bus.

The following four diagrams show the switch settings for proper SCSI termination with SCSI devices connected to connectors J14 (50 pin) or J18 (68 pin).
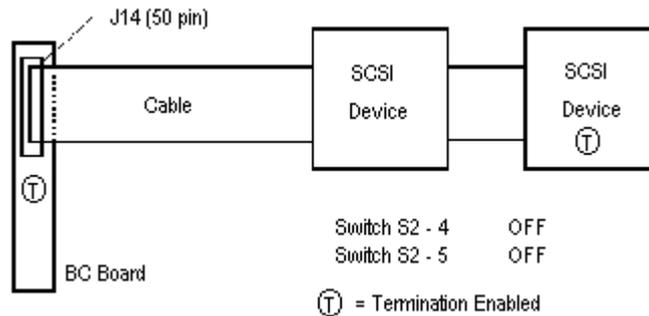
Figure 3-3, 8 Bit External OR Internal SCSI devices

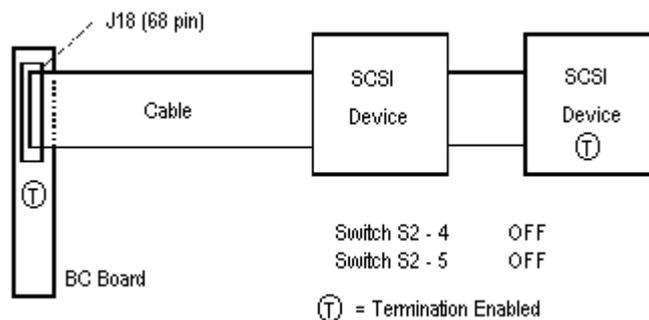**Figure 3-4, 8 Bit Internal AND External SCSI devices**

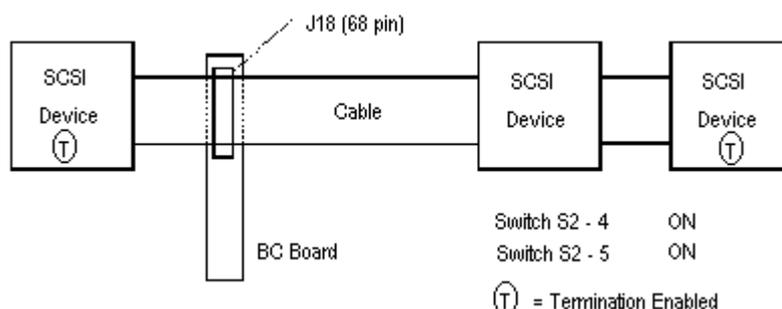**Figure 3-5, 16 Bit Internal OR External SCSI devices**

Figure 3-6, 16 Bit Internal AND External SCSI devices

Note: Termination should also be configured as "enabled" if the SCSI interface is not used. The last device on the SCSI cable must also supply a termination load to the cable. SCSI devices not at the end of the cable must have their termination loads disconnected. Enabling and disabling a SCSI device's termination may involve a switch or shunt setting or the installation or removal of resistive SIP or DIP packages on their circuit board. Consult the installation manual for the SCSI device to determine its termination options.

Optional Video, Keyboard & Mouse

The video, keyboard, and PS/2 style mouse signals are normally cabled from headers on the top of the BC board to a Cubix multiplexer where they are ultimately brought out to standard connectors and attached to a monitor, keyboard, and mouse. If a multiplexer is not used, Cubix can provide an optional adapter. This adapter is a printed circuit board and bracket that provide an interface between the BC headers and the Mini-DIN 6 and HD DSUB-15 connectors needed to connect a VGA monitor and PS/2 style keyboard and mouse. These optional connectors may be installed in an empty slot (where the end bracket of a board would normally be), or in the additional connector space of an auxiliary junction panel.

Figure 3-7, BC 5xxx with Video/Keyboard/Mouse Adapter

WARNING!

WHEN HEADER J3 IS NOT CONNECTED TO THE MULTIPLEXER, THE PROCESSOR WILL NOT SUPPORT THE MULTIPLEXED FLOPPY INTERFACE.

Optional LPT1

An optional parallel port may be added to function as LPT1 on the BC. This requires a Cubix LPT1 printed circuit board adapter and bracket which provide an interface between the BC header (J7) and the DB-25 connector. The optional connector may be installed in an empty slot (where the end bracket of a board would normally be), or in the additional connector space of an auxiliary junction panel.
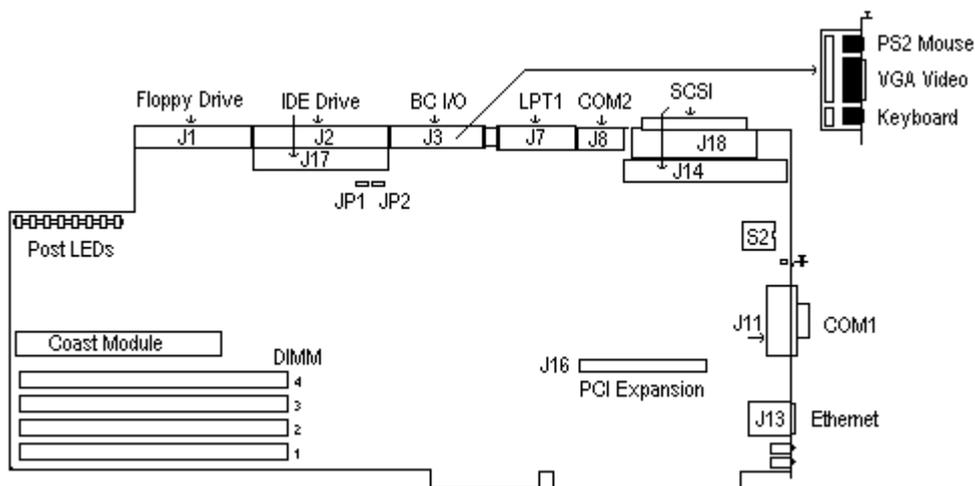
Figure 3-8, BC 5xxx with Optional LPT1 Adapter

Optional COM2

An optional second serial port may be added to function as COM2 of the BC. Connecting COM2 requires a Cubix printed circuit board adapter and bracket, which provide an interface between the BC header (J8) and the DB-9 connector. The connector may be installed in an empty slot (where the end bracket of a board would normally be), or in the additional connector space of an auxiliary junction panel.
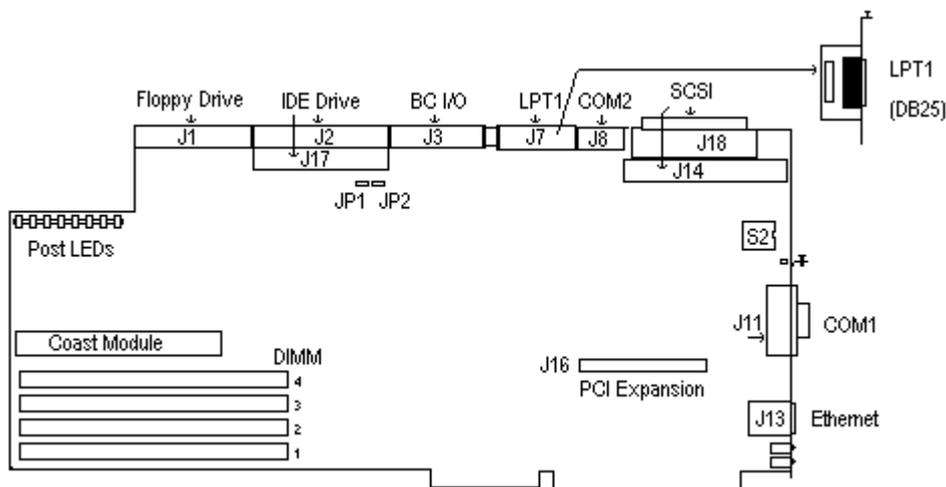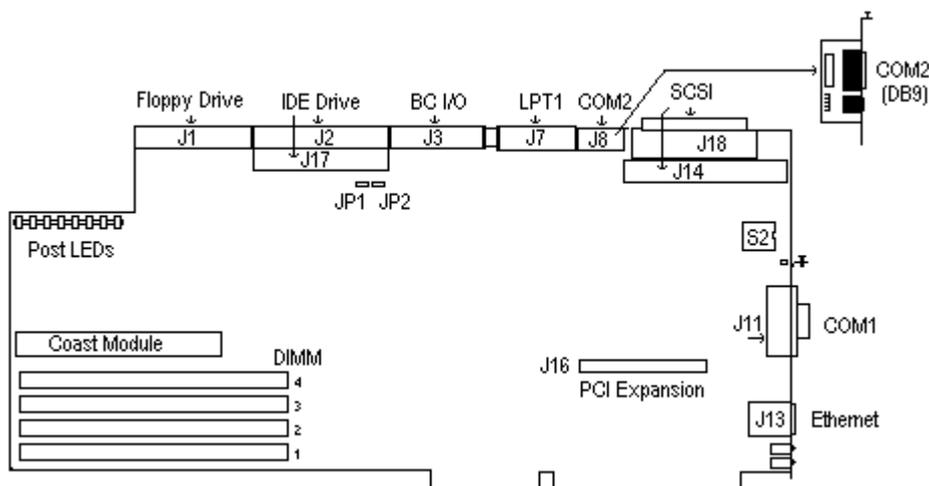

Figure 3-9, BC 5xxx with Optional COM2 Adapter

Peripheral Adapter Installation

Follow the steps below to install optional Cubix adapter boards for peripheral devices such as video, keyboard, mouse, and LPT1.

WARNING!

MAKE SURE THE SYSTEM IS POWERED OFF AND UNPLUGGED BEFORE BEGINNING THIS PROCEDURE.

1. Install the Cubix adapter in a panel opening on the system. Typically, an opening provided for an empty board space is dedicated to the adapter. In this case, install the bracket next to the BC board that requires the adapter port and tighten the screw firmly.
Alternately, if the adapter is being installed into a Cubix auxiliary junction panel, the bracket provided with the adapter should be removed. Unscrew the connector from the bracket and install the adapter into the desired panel opening.

2. Connect one end of the provided cable to the appropriate header on the BC board. The pin-one side of the ribbon cable is marked with a colored (blue or red) stripe. Pin one on the BC box header is labeled with a triangular arrowhead (**Ú**). Align the pin-one side of the ribbon cable with pin one on the header.
3. Connect the other end of the ribbon cable to the adapter. Pin one on the adapter's box header is labeled with a triangular arrowhead. Align the pin-one side of the ribbon cable with pin one on the adapter.
4. Plug the peripheral device's cable into the connector.

Software Installation

Overview

To fully utilize all of the features integrated into the BC Series processors, the following software drivers and utilities are available:

- BC Series Software - support for mouse and Cubix Supervisory System
- DEC Ethernet Drivers - support for the on-board 10/100 Base-T Ethernet interface
- S3 Video Drivers - support for enhanced video resolutions
- Symbios SCSI Drivers - support for the on-board SCSI interface

BC Series Software

The functions provided by the BC Series Software are:

- Remote mouse and keyboard support - required when the BC processor is functioning as a remote control host for a remote system using a mouse and/or keyboard, and no mouse or keyboard is physically attached to the BC host processor.
- Mouse multiplexer support - required if a single mouse is shared via a Cubix multiplexer between multiple BC processors.
- Cubix Supervisory System support - required for BC processors installed with a Cubix Supervisory System.

DEC 21140 PCI Fast Ethernet Drivers

The DEC Ethernet Drivers are required if using the on-board Ethernet controller. The driver diskettes provided by Cubix contain the following drivers and installation instructions.

- NDIS2, NDIS3 and NDIS4 Drivers
- Novell Client and Server Drivers
- SCO Unix Drivers

S3 Trio64V+ (765) Video Drivers

The S3 Drivers may be required by some operating systems or application programs. The driver diskettes provided by Cubix contain the following drivers and installation instructions.

- Windows 95
- Windows 3.1 (English)
- OS/2
- Windows NT 4.0
- Windows NT 3.51

Symbios 825A SCSI Drivers

The Symbios (NCR) Drivers may be required when installing SCSI devices on the BC Series board. The driver diskettes provided by Cubix contain the following drivers and installation instructions .

- DOS, Windows 3.1 and Utilities
- NetWare
- Windows NT
- OS/2
- Windows 95
- SCO Unix

BC Series Software Installation

DOS Environment

BCSETUP

The Cubix DOS device driver BCSETUP.SYS supports the Cubix Supervisory System by providing an interface between the IES module and a BC processor running DOS. BCSETUP.SYS also provides remote mouse and keyboard support as well as mouse multiplexer support.

A mouse driver (e.g. Logitech's MOUSE.COM or Microsoft's MOUSE.EXE) must be loaded for BCSETUP.SYS to provide mouse support.

To install this driver on disk drives formatted with the DOS operating system, copy the BCSETUP.SYS file from the \DOS directory of the *BC Series Installation Diskette* to the root directory of the boot drive. Next, add the following line to CONFIG.SYS file in the root directory of the drive:

device = bcsetup.sys

This sets the following defaults:

- Remote Mouse Support Enabled
- Mouse Multiplexer Support Enabled
- Interrupt Selection 15
- Keyboard Type 101/102 Keys

The following is a list of options that may be used with this command. Place them on same line in the CONFIG.SYS file.

Command line options are not case sensitive.

Table 3-1, BCSETUP Command Line Options

Command Line Examples

For example, to load BCSETUP for an 83/84 key keyboard, without mouse emulation, and hooking interrupt 10 for the supervisor interface support, the command line in the CONFIG.SYS file would appear as follows:

device = bcsetup.sys -n -m -i = 10

All BC mouse software is designed to be used explicitly with Logitech PS/2 style mice. If non-Logitech mice are to be used, the command line option -nl should be entered in the config.sys file following the mouse emulation software filename:

device= bcsetup.sys -nl

The -nl option disables the synchronizing algorithms specific to Logitech mice. As a result, mouse multiplexing is not supported.

Finally, reboot the BC processor to allow the modifications in the CONFIG.SYS file to take effect.

How to Differentiate an IES I Module from an IES II Module

To determine if an IES I module is installed in the ERS II subsystem, remove the subsystem's cover and locate the IES module. Either a 26-pin ribbon connector or a 3-pin molex connector will be located at the top of the board next to the "L" bracket. If the connector is a 26-pin ribbon connector, the module is an IES I. If a 3-pin molex connector is at this location, the module is an IES II.

Windows 3.1x Environment Installation

VHOTFIX

The Cubix virtual device driver VHOTFIX.386 will "hot fix" a mouse in the Windows environment, allowing a mouse to function properly if it is attached locally to the BC processor after Windows is invoked, or if it is attached through a Cubix multiplexer and multiplexed to the BC processor after Windows is invoked.

To install this virtual device driver with Windows, first install BCSETUP as described in the **DOS Environment Installation** section. Locate the directory containing Windows virtual device driver files. They may be identified by their .386 extensions and are usually located in the \WINDOWS\SYSTEM directory. Copy the file VHOTFIX.386 from the \DOS directory of the *BC Series Installation Diskette* to the directory containing the other virtual device drivers. Modify the [386enh] section of the Windows SYSTEM.INI file (usually in the \WINDOWS directory) to include the line:

device = vhotfix.386

This program will function only if the device driver BCSETUP.SYS v1.10 or above is loaded in the CONFIG.SYS. Finally, reboot the BC processor to allow the modifications to take effect.

Windows NT Drivers

Beginning with version 2.17, the *BC Series Installation Diskette* includes an InstallShield setup program to install these NT files:

- WINNT\BCACTVNT.SYS - provides Cubix Supervisory System support for BC processors installed with the Windows NT operating system.
- WINNT\CBXI8042.SYS - a mouse driver required to support mouse multiplexing in Windows/NT environments.

Installation

BCACTVNT

The Cubix device driver BCACTVNT.SYS supports the Cubix Supervisory System by providing an interface between the IES module and a BC processor running Windows NT.

CBXI8042

CBXI8042.SYS is a complete multiplexed mouse and keyboard device driver for BC Series processors running Windows NT. CBXI8042.SYS replaces the I8042PRT.SYS device driver file provided with Windows NT.

To install either BCACTVNT.SYS or CBXI8042.SYS, run the InstallShield setup program found in the \WINNT subdirectory of the *BC Series Installation Diskette.*

To run Setup from the DOS command prompt, type

a:\winnt\setup

Setup provides the option of installing either BCACTVNT.SYS or CBXI8042.SYS. Follow the prompts provided by the Setup program to install either of these drivers.

OS/2 Environment Installation

BCSETOS2

The Cubix device driver BCSETOS2.SYS supports the Cubix Supervisory System by providing an interface between the IES module and a BC processor running OS/2.

To install this driver, copy the file BCSETOS2.SYS from the \OS2 directory of the *BC Series Installation Diskette* to the root directory of the boot drive. Next, add the following line to CONFIG.SYS file in the root directory of the boot drive:

device = bcsetos2.sys

This will give the default option of interrupt 15 (decimal) for the Supervisor interface. If interrupt 10 is preferred, it must be specified on the same line in the CONFIG.SYS file. To load BCSETOS2 to use interrupt 10, the line in the CONFIG.SYS should appear as follows:

device= bcsetos2.sys -i = 10

If BCSETOS2.SYS is not specified in the CONFIG.SYS file, the BC will not support the Cubix Supervisory System and interrupts 10 and 15 are available for other uses. Finally, reboot the BC processor to allow the modifications to take effect.

CBXMOUSE

The Cubix device driver CBXMOUSE.SYS provides mouse emulation and mouse multiplexer support for BC Series processors running OS/2 operating system.

To install this driver, copy the file CBXMOUSE.SYS from the \OS2 directory of the *BC Series Installation Diskette* to the \OS2 directory of the boot drive. Next, modify the CONFIG.SYS file in the root directory of the boot drive as follows:

remark out the line:

device = os2\mouse.sys

by placing "REM" in front of it, so that it reads:

rem device= os2\mouse.sys

add the line:

device = os2\cbxmouse.sys

CBXMOUSE.SYS is a fully functional mouse driver that replaces the MOUSE.SYS driver. CBXMOUSE.SYS loads PS/2 mouse support whether or not a mouse is physically present.

All BC mouse software is designed to be used explicitly with Logitech PS/2 style mice. If non-Logitech mice are to be used then the command line option -nl should be entered in the config.sys file following the mouse emulation software filename:

device= cbxmouse -nl

The -nl option disables the synchronizing algorithms specific to Logitech mice. As a result, mouse multiplexing is not supported.

Finally, reboot the BC processor to allow the modification in the CONFIG.SYS to take effect.

CBXMOUSE is intended for use in systems equipped with the Cubix multiplexer. If a mouse is to be shared by multiple OS/2-based processors via the multiplexer, the mouse must be booted on an OS/2 system (i.e. an OS/2-based processor must be selected by the multiplexer when the system is booted)

Windows 95 PS/2 Mouse Driver

This driver provides PS/2 mouse support on processors running Windows 95. If a Cubix mouse driver for Windows 95 was previously installed on a BC processor, the old files must be deleted before installing the new PS/2 mouse driver.

To Remove Old Cubix Windows 95 Mouse Driver Files:

1. Start the processor in "Command Prompt" mode by pressing **F8** during boot up (before the "Windows" logo appears).
2. On the hard drive, delete the following file: VHOTFIX.386
   This file is generally in the *root* and *\WINDOWS* directories.
3. Edit the *CONFIG.SYS* files in the root directory by modifying the line containing *BCSETUP.SYS.* to read:

device=bcsetup.sys -M

1. Edit the *SYSTEM.INI* file by changing *MOUSE=*VMD* to *MOUSE=*VMOUSE.* Remove the line *DEVICE=*VHOTFIX.386*.
   Note: *The original MOUSE.DRV file for Windows 95 must be in the WINDOWS\SYSTEM directory. This file is dated "1995" as opposed to the Windows 3.1 MOUSE.DRV file dated "1992 at 3:10."*
2. Reboot the processor and continue with the next set of instructions, "*To Install the Cubix PS/2 Mouse Driver for Windows 95*".

To Install the Cubix PS/2 Mouse Driver for Windows 95:

1. From the Cubix Subsystem's front panel, select the group number of the processor on which the PS/2 Mouse Driver is to be installed. Then access Windows 95.
   Note: if using a keyboard instead of a mouse, use the **Alt**, **Tab**, **Arrow**, and **Enter** keys to move and to select the buttons and options referenced in the following steps.
2. Select the **Start** button by clicking on it or by pressing the **Ctrl and Esc** keys. The first set (list) of options appears.
3. Select the **Settings** option. The "Settings" list appears.
4. Select the **Control Panel** option. This opens the "Control Panel" window.
5. From the "Control Panel" window, select the **Add New Hardware** icon.
6. From the "Add New Hardware Wizard" window, click on the **Next** button.
7. When prompted about whether or not Windows should search for the new hardware, select **NO** and click on the **Next** button. A list of hardware type options appears.
8. From the **Hardware Types** list, select **Mouse** and click on the **Next** button. The **Manufacturers and Models** list appears.
9. From the "Manufacturers and Models" list, click on the **Have Disk** button.
10. Make sure the *BC Series Installation* diskette is in the floppy drive, and **A:\ WIN95** is the file path. Click on the **OK** button.
11. When the **Cubix Mouse Driver** option appears, select it and click on the **Next** button.
12. In response to the message **"To continue installing the software needed by your hardware, click Finish,"** click on the **Finish** button. When the current window closes (in

approximately 60 seconds), the installation is complete and the driver is available for immediate use. Note that rebooting the system is not required.

Operating the Mouse after Installation

To ensure the mouse functions properly during normal operations, be sure to "power on" the system and initiate resets as described below:

Note: Avoid moving the mouse when selecting channels and do not switch channels while the processor reboots.

Resetting a Processor

Before initiating a "reset," make sure the mouse is attached and its channel selected on the subsystem's front panel. Also, make sure the processor loads into Windows 95. When the Windows 95 screen appears, the mouse should be functional. If the mouse does not work, disconnect then reconnect the mouse connector.

When Powering Up the Subsystem:

When the subsystem is powered up, make sure at least one processor completes the boot process with the mouse attached and its channel selected. If the mouse does not work, disconnect then reconnect the mouse.

NetWare Environment Installation

BCACTIVE

BCACTIVE.NLM is a NetWare Loadable Module (NLM) that supports the Cubix Supervisory System by providing an interface between the IES module and a BC processor running NetWare 3.x/4.x. To install Cubix Supervisory support on a BC processor running NetWare, first install the BCSETUP.SYS device driver on the DOS partition as previously explained in the ***DOS Environment Installation*** section. Then install the BCACTIVE.NLM on the NetWare partition. Both BCSETUP.SYS and BCACTIVE.NLM **must** be installed with the same interrupt configuration.

To install the NLM on a BC processor functioning as a NetWare 3.X/4.x server, copy the file BCACTIVE.NLM from the NetWare subdirectory of the *BC Series Installation Diskette* to the SYSTEM subdirectory of the SYS volume of the NetWare server. Next, add the following line to the AUTOEXEC.NCF file on the NetWare partition:

load bcactive 15

This will load BCACTIVE.NLM with the default IRQ 15 configuration. Two interrupt levels are supported by the BC hardware: IRQ 10 and IRQ 15. If the IRQ 10 configuration is preferred, modify the load command as follows:

load bcactive 10

BCACTIVE must have a command line parameter specifying the IRQ and this must match the IRQ configuration of BCSETUP. BCACTIVE should not be loaded if BCSETUP is loaded without BC Supervisory System support (bcsetup.sys -INT= NO)

Acquiring Additional or Updated Drivers

BC Series Software, DEC Ethernet, Symbios, and S3 Drivers are available on the Cubix Customer Support BBS at (702) 888-1003 (No parity, 8 data bits, 1 stop bit)

Command Line Option	Explanation
-n	83/84 key keyboard
-m	disable mouse support
-i=x or -int=x	hook interrupt x (decimal) for the Cubix supervisor interface, where x= 10, 15 or "no". The "i=no" option disables the supervisor interface support in BCSETUP and frees interrupts 10 and 15.
-ep	enables BC processors equipped with a BC NET UART (e.g., BC Triton), to be monitored by an IES I (original) module when installed in an ERS II subsystem. To determine if an IES I module is installed in the ERS II subsystem, refer to the following section "How to Differentiate an IES I from and IES II Module." Do not use the -ep command if an IES II (enhanced) module is installed in the ERS II subsystem.

Customer Service Support System

BC Triton Series
Chapter 4 - Technical Reference

BIOS

An American Megatrends, Inc. (AMI) system BIOS with embedded setup and hard disk setup utilities resides in Flash ROM on the board.

POST Display

The BC has eight LEDs arranged in two groups of four. As the system proceeds through its Power On System Test (POST) these LEDs display binary codes which can be used to diagnose board failures. The post codes are listed in Appendix A.

Memory Configuration

- **BC 5133/5166/5200TE** - All BC Triton Engine (TE) system memory is provided in 72-pin, 36-bit standard 60ns SIMMs. Two SIMMs must be installed, and both SIMMs must be of an identical size.
- **BC 5166/5200TS** - All BC Triton Server (TS) system memory is provided in 168 pin, 72 bit standard 60ns DIMMs. DIMMs do not need to be installed in pairs, and different sizes may be mixed in a BC.

Memory Management

Figure 4-1 shows the Memory map for the BC Triton processor. Table 4-1 defines the boards I/O configuration.
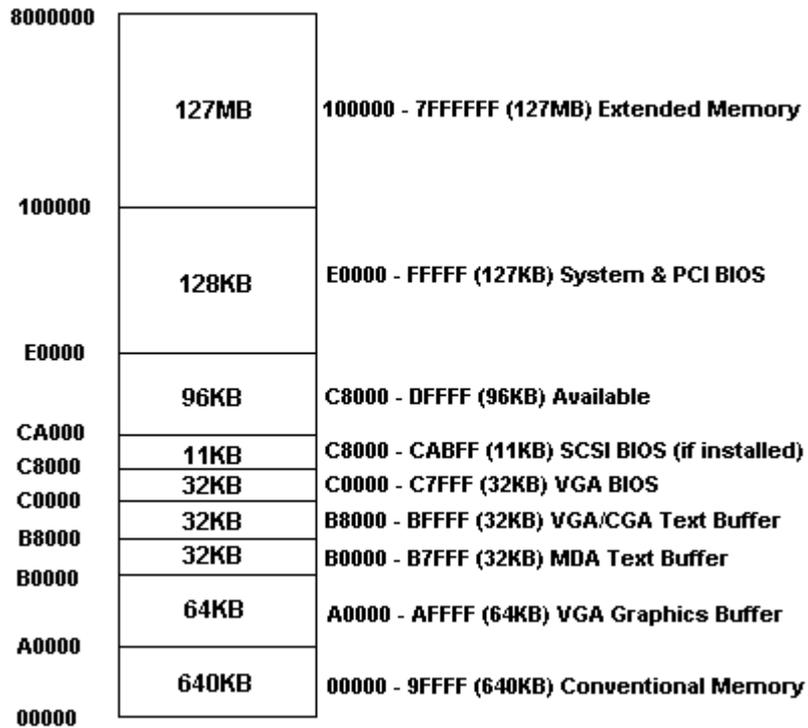
8000000		
	127MB	100000 - 7FFFFFF (127MB) Extended Memory
100000		
	128KB	E0000 - FFFFF (127KB) System & PCI BIOS
E0000		
	96KB	C8000 - DFFFF (96KB) Available
CA000		
C8000	11KB	C8000 - CABFF (11KB) SCSI BIOS (if installed)
C0000	32KB	C0000 - C7FFF (32KB) VGA BIOS
	32KB	B8000 - BFFFF (32KB) VGA/CGA Text Buffer
B8000	32KB	B0000 - B7FFF (32KB) MDA Text Buffer
B0000		
	64KB	A0000 - AFFFF (64KB) VGA Graphics Buffer
A0000		
	640KB	00000 - 9FFFF (640KB) Conventional Memory
00000		

Figure 4-1, BC Triton Series Memory Map

Table 4-1, BC Triton Series I/O Map

Keyboard/Mouse Controller

The BC has a PS/2 compatible keyboard controller with the AMI keyboard BIOS. The keyboard controller uses IRQ 1 for its interrupts, and requires no DMA channel. The keyboard controller also supports a PS/2 compatible mouse which uses IRQ 12. Switch S2 is used to enable the PS/2 mouse interrupt on IRQ 12 (refer to Chapter 2 for switch settings).

IDE Hard Drive Interface

An IDE hard drive interface is included on the BC for applications that require a hard disk drive. IDE drives include an AT compatible disk controller. The IDE interface circuit on the Triton Engine will support one or two IDE drives, while the Triton Server will support 4 IDE devices. The primary hard disk controller uses IRQ 14 for its interrupt. The secondary hard disk controller, which is only used on the Triton Server, will use IRQ 15 when it is enabled. When adding an IDE drive to the board, the BIOS will auto-detect the new drive on boot. If the correct drive is not detected, use the BIOS to specify the hard drive parameters.

Note 1: To recover IRQ 14, all IDE drives must be removed from the 40-pin header cable.

Note 2: The Triton Server (BC5xxxTS) includes a secondary IDE controller. If this is enabled, it will use IRQ 15. The Cubix Supervisory System Interrupt must be set to IRQ 10 if it is to be used.

Floppy Disk Controller

The BC contains a PC/AT compatible floppy disk controller that supports all PC/AT floppy disk configurations. It is configured for industry standard single-speed floppy disk drives, and supports up to two of any combination of 5.25 or 3.5 inch drives. The BIOS setup program must be

configured for the proper drives. The floppy controller uses IRQ 6 for its interrupt and DRQ 2 for its DMA channel. ISA processors allow the floppy disk controller to be disabled in the **Peripheral Management Setup** section of the System BIOS CMOS setup program.

SCSI Adapter

The BC Triton Series is equipped with an integrated fast/wide SCSI adapter. This adapter is enabled or disabled via the Chipset option of the BIOS Setup utility. Refer to Chapter 3 for drive installation instructions.

The BC Triton Series SCSI adapter is a bus master device which gains control of the PCI bus to transfer data between the CPU memory and the SCSI devices. The I/0 base address is set by the PCI plug and play BIOS at boot time. The SCSI adapter uses interrupt 11. The adapter does not use a shared memory window with the CPU.

The BC Triton Series SCSI adapter has SCSI cable termination which is enabled or disabled by setting switch S2 as described in Chapter 2. Refer to the *SCSI Device Installation* section of Chapter 3 for further details on SCSI termination.

Serial and Parallel Ports

Two serial ports and a parallel port are available on the BC processor board. One serial port is accessible through a standard DB-9 connector on the rear bracket (J11). The other serial port (COM2) and the parallel port (LPT1) are accessible internally through header connectors (J8 and J7). All ports comply fully with PC/AT interrupt and I/0 port standards. External access to the internal I/0 connectors (COM2 and LPT1) is accomplished through Cubix-supplied adapter boards. Refer to the sections Optional LPT1 *and* Optional COM2 and Mouse in Chapter 3 for more information.

Ethernet Controller

The BC is equipped with an integral DEC 21140 PCI fast Ethernet controller with a 10/100 BASE-T RJ-11 connector (J13) on the mounting bracket at the rear of the card. Software drivers are provided for this controller to support PC local area networks.

Near the RJ-45 connector and visible in the mounting bracket are two sets of light emitting diodes (LED). On the lower set, the green LED will light when the interface has a valid connection to an Ethernet hub. The amber LED will light when the interface is set to 100 mbit/s. On the upper set, the green LED indicates network activity, and the amber LED indicates a data collision on the network. These LEDs can be useful indicators of network activity.

Ethernet Configuration

The BC Triton Series Ethernet adapter is a bus master device which gains control of the PCI bus to transfer data between the CPU and the network. This adapter is enabled or disabled via the "Chipset" option of the BIOS Setup utility. The I/O addresses are set by the PCI plug and play BIOS at boot time. The interrupt used by the Ethernet adapter is 5. Note that the BC Ethernet controller does not use a shared memory window on the CPU nor does it support diskless boot configurations.

Line Busy

Installed only on the BC Triton Engine (BC5xxxTE)

The Cubix Line Busy RJ-11 jack is designed to be connected to the phone line that attaches to a modem. Its purpose is the make the telephone line appear busy when the processor or modem is

not ready to answer an incoming telephone call.

The Line Busy circuit is inserted in parallel with the telephone line from the PBX to the modem. The Federal Communications Commission (FCC) has registered this circuit for use on PBX systems only and not for direct connection to the Public Telephone Network.

The Line Busy circuit is designed to be used on rotary PBX systems to keep incoming calls from ringing on lines that will not answer. The circuit uses Data Terminal Ready (DTR) from the Cubix processor's communication port to determine whether the processor is ready for a call. If DTR is false, the circuit creates an off-hook condition on the telephone line to force the rotary PBX to bypass this extension for an incoming call. When DTR is true, the Line Busy Circuit will terminate the off-hook condition, and the processor will respond to an incoming call. The Line Busy circuit on the BC is controlled by the COM1 DTR signal. The COM2 port has no effect on Line Busy.

Cubix processors assert DTR false on the reset operation. It is the responsibility of the communications application running in the processor to assert the DTR signal true.

WARNING!

The line busy circuit integrated onto the BC (J12) has been registered with the Federal Communications Commission for use on PBX's in the United States only. Use of this function outside the United States may violate local regulations and is not recommended by Cubix Corporation.

The line busy circuit complies with Part 68, FCC Rules.

FCC REGISTRATION NUMBER
2HEUSA-73508-KX-N
RINGER EQUIVALENCE O.O.B.

Line Busy Installation

1.   Connect the PBX modular telephone cable to the "Line" input of the modem.
2. Connect the modular telephone cable from the modem's "Phone" jack to the RJ-11 jack on the BC (J12).
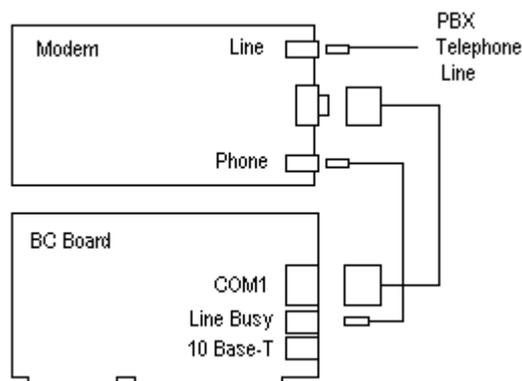

Figure 4-2

1.   If the modem phone jack is unavailable, a "T" modular jack can be used.
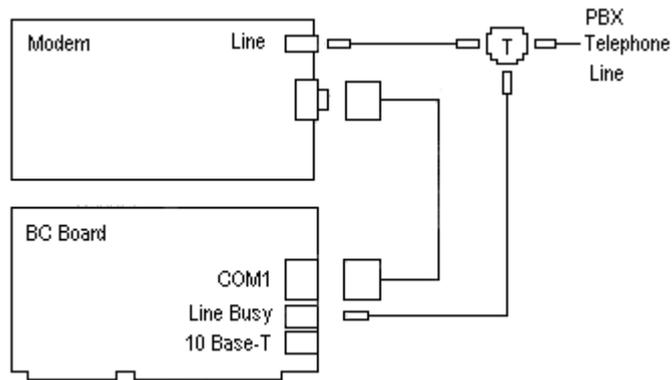
Figure 4-3

CMOS Battery

The BC has an internal battery that backs up the real time clock and CMOS memory. No external battery is required to retain date, time of day or setup information.

System Interrupts

The 16 system hardware interrupts on the BC are represented in Table 4 - 4. Interrupts are managed by two standard 8259A Programmable Interrupt Controllers (PICs). Interrupts at IRQ 0 through 7 are located on the main PIC; IRQ 8 through 15 are on the SLAVE PIC.

ISA Ports	Description
0000-00FF	Various "AT" functions in ISP chip and keyboard controller
01F0-01F7	IDE hard drive interface
02F8-02FF	COM2
03A0	Cubix supervisory interface
03A8-03AF	IES serial port
03B4-03B5	VGA
03BC-03BF	LPT1
03C0-03CF	VGA
03D4-03D5	VGA
03F0-03F7	Floppy / IDE
03F8-03FF	COM1
PCI Ports	**Description**
0CF8-0CFF	Used by PCI chip set
E880-E8FF	Used by Ethernet controller
EC00-ECFF	Used by SCSI adapter

Table 4-2, System Interrupts

IRQ	Description
0	Timer clock
1	Keyboard
2	Second PIC controller
3	COM2
4	COM1
5	Available OR Ethernet
6	Floppy Disk Controller
7	LPT1
8	Real time clock
9	Redirected IRQ 2
10	Available OR IES (S2)
11	Available OR SCSI
12	Available OR Mouse
13	Math Coprocessor
14	Primary Hard Disk controller
15	Available OR IES (S2) OR Secondary hard disk controller (TS only)

BC Triton Series
Chapter 5 - Troubleshooting

Continual Resets

The Cubix Supervisory System supports a CPR (Cubix Processor Recovery) function designed to automatically reset an inactive BC Triton Series processor. If a Supervisory System is installed with the CPR function enabled and a BC Triton Series processor continuously resets, follow the steps below.

1. Disable CPR on the resetting BC Triton Series. Verify that the erroneous resets cease.
2. Verify that the appropriate software is installed on the BC Triton Series:

DOS Environments - BCSETUP.SYS must be loaded

Windows Environments - BCSETUP.SYS must be loaded

OS/2 Environments - BCSETOS2.SYS must be loaded

NetWare Environments - BCACTIVE.NLM must be loaded

1. Verify the S2 switch setting on the BC Triton Series processor. It must be set to configure the Supervisory Interrupt on IRQ 15 or IRQ 10. Refer to **Chapter 2 - Hardware** for switch configurations.
2. Verify that the interrupt selection (IRQ 15 or IRQ 10) of the hardware (via S2) and the software (via command line parameters) match.

Note: Refer to the **Software Installation & Configuration** section in chapter 3 for more information on installation and command line parameters of the software components.

NIC Driver Installation

To use the integrated Ethernet controller on the BC Triton Series processor, a NIC driver must be installed. The onboard Ethernet is based on a DEC 21140 chip. In Novell environments, the name of the driver is DC21X4.LAN (for BC Triton Series processors installed as NetWare servers or routers) or DC21X4.COM (for BC Triton Series processors installed as NetWare workstations).

Resets on Modem Initialization

If a BC Triton Series processor is configured as a host for remote communication sessions, and the BC Triton Series resets when the remote communication software is loaded, examine switch S1. If reset on loss of DCD is enabled, the modem is probably toggling DCD during initialization. Contact the modem vendor to determine how to correct this condition.

Mouse Problems

Sometimes problems occur if a mouse is connected to a BC Triton Series processor via a multiplexer (mux). For proper muxed mouse operation under DOS (or Windows) the following steps must be taken.

1. The CONFIG.SYS file must contain the line:

device = bcsetup.sys

2. A mouse driver must be loaded (e.g., Logitech's MOUSE.COM or Microsoft's MOUSE.EXE).

3. The mouse device must be a Logitech PS/2 style bus mouse.

4. The processor must boot with the segment selected so that the mouse is detected when the driver loads.

If MUXed operation is required with Windows V3.1, these additional steps must be followed:

1. The file VHOTFIX.386 must be copied to the \WINDOWS\SYSTEM subdirectory.

2. Add the following line to the [386enh] section of the SYSTEM.INI file in the \WINDOWS subdirectory:

device = vhotfix.386

Line Busy

If the Line Busy Circuit does not cause the line to appear busy, check the cable connections.
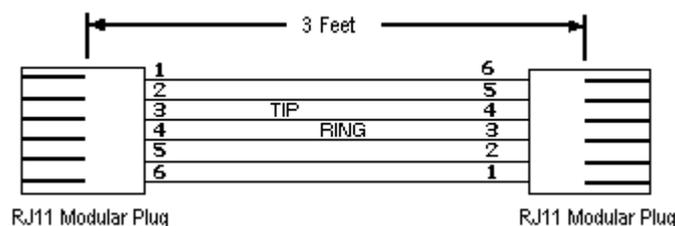

Figure 5 - 1. RJ-11 Tip and Ring Lines

The center two pins of the RJ-11, tip and ring, should measure approximately 48 volts DC under on-hook conditions. When the Line Busy Module has asserted an off-hook condition, the tip-ring voltage should be approximately 8 volts DC

If the Line Busy Circuit is not asserting off-hook, check the state of the DTR signal (pin 4 of the DB-9 RS-232 connector). DTR is false when it is -6 volts with respect to pin 7 of this connector. DTR is true when it is +6 volts with respect to pin 7. The voltage on pin 20 can be measured on the modem DB-25 connector while the computer DB-9 connector is cabled to the Cubix processor.
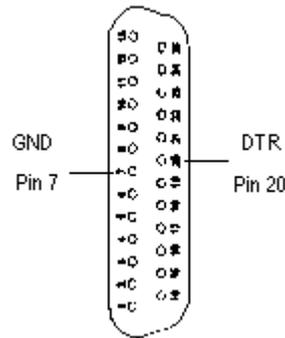

Figure 5 - 2. DB-25 Connector

If DTR is not changing as expected, check the Cubix processor's COM1 port hardware. Verify the COM1 port configuration in the communication application software.

If DTR is changing properly and the telephone line is not changing from 48 volts to 8 volts, the Line Busy Circuit is probably defective. Contact Cubix Customer Service for assistance.