CBI-1010

VAXBI SCSI Host Adapter
User's Manual

**CMD
TECHNOLOGY
INC.**

CBI-1010

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User's Manual

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This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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BASIC WARRANTY - In the absence of any optional warranty or continuing provisions by formal agreement, CMD warrants its products in accordance with the schedules listed below. Purchaser hereafter mentioned refers at all times to the customer who purchased CMD product(s).

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CABLE WARRANTY - All CMD provided cables are warranted for ninety (90) days from the time of shipment. Questionable cables should be returned to CMD, freight prepaid, where they will be repaired or replaced by CMD at its option and returned to the Purchaser, freight prepaid.

GENERAL TERMS - The above warranties shall not apply to expendable components such as fuses, bulbs, and the like, nor to connectors, adapters, and other items not a part of the basic product. CMD shall have no obligation to make repairs or to cause replacement required through normal wear and tear or necessitated in whole or in part by catastrophe, fault or negligence of the user, improper or unauthorized use of the product, or use of the product in such a manner for which it was not designed, or by causes external to the product, such as, but not limited to, power failure or air conditioning. CMD's sole obligation hereunder shall be to repair or replace any defective product, and, unless stated, pay return transportation costs within the United States of America for such replacement. Purchaser shall provide labor for removal of the defective product, shipping charges for return to CMD and installation of its replacement. On-site services are not a part of this warranty. Above warranties are subject to change without notice.

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Return and Repair Policy

WARRANTY PERIOD

The following warranty period is from the date of shipment:

CMD Host Adapter	one year
Cable	90 days
Drive	manufacturer's warranty

RETURN FOR CREDIT

The allowable period of return for credit from the date of shipment is as follows

CMD Host Adapter	less than 30 days
Cable	less than 30 days
Drive	not applicable

RETURN FOR REPAIR

CMD Host Adapter

In-Warranty (Less than 1 year)

- CMD offers a *15 working day turnaround repair service* at the cost of parts only. Defective boards will be repaired and returned to the customer within 15 working days from the date of return to CMD.
- CMD also offers two *in-warranty 24 hour expediting services:*

  24 Hour Turnaround Loaner Service:
  Under this policy, CMD will ship a loaner in 24 hours during regular working days to the customer for a charge of $100.00 per loaner. Upon receiving the loaner, customer must return the defective board to CMD within seven (7) days for repair. CMD will repair the defective board and return the board to the customer. Customer must then return the loaner in seven (7) days after the receipt of the repaired board. Approval for loaner service is based on credit verification.

  24 Hour Turnaround Swap Service:
  In the case that the defective board is within the first six (6) months of the warranty, CMD, at its own option, offers a 24 hour turnaround swap service. CMD will ship the same model of the board to customer within 24 hours during working days in exchange for the defective board. CMD will swap with a new board if board is not functional upon arrival. For all other cases, swap will occur with either a new or refurbished board for a charge of $200.00. CMD does not offer swap services for boards that are purchased more than six months from the date of shipment. Customer is responsible for returning the defective board to CMD within seven (7) days after receipt of the swapped board.
- The remaining warranty period shall apply to the repaired or swapped board.

Out-of-Warranty (more than 1 year)

- CMD offers a *15 working day turnaround repair service* at a rate of $300.00 plus parts and freight for all out-of-warranty host adapter boards. Defective boards will be repaired and returned to customer within 15 working days starting with date of return to CMD.
- CMD also offers an *Out-of-Warranty 24 Hour Turnaround Loaner Service:*
  Under this policy, CMD will ship the same model loaner in the 24 hour time frame of working days to customer for an additional charge of $100.00 plus freight per loaner. The loaner is for use by the customer during the period that the defective board is being repaired. Customer is responsible for returning the defective board to CMD within seven days after the receipt of loaner and returning the loaner in seven (7) days once the defective board is repaired and received. The approval of the loaner service is at CMD's option and based upon customer credit verification.
- CMD will extend warranty for a period of six (6) months on any out of- warranty repaired board.

Cable

In-Warranty (90 days) - free swap.
Out-of-Warranty (90 days) - not applicable.

Drive
In-Warranty (per manufacturer) - manufacturer charge only.
Out-of-Warranty (per manufacturer) - manufacturer charge plus $100 CMD handling.

RETURN FOR UPGRADE/ UPDATE
CMD Host Adapter
In-Warranty (less than 1 year)
- CMD offers a *15 working day turnaround different function upgrade service* for boards that can be upgraded to a higher function; and a *free 15 working day turnaround ECO Field Upgrade* for all its boards. CMD will *upgrade* the hardware of its board to a higher function for a charge of the difference of list prices of the original and upgraded functions. CMD will also update its board to its latest firmware release at no charge to the customer. Boards will be upgraded/updated and returned to the customer within 15 working days from the date of return to CMD.
- CMD also offers *24 hour turnaround loaner service* as stated in "RETURN FOR REPAIR."
- The remaining warranty period shall apply to the updated board. For upgraded boards, CMD will extend warranty for a period of six months.
Out-of-Warranty (More than 1 year)
- CMD offers a *15 working day turnaround different function upgrade service* for boards that can be upgraded to a higher function at a charge of the difference of list prices of two functions. CMD also offers a *free 15 working day turnaround ECO Field Upgrade* for all its boards. Boards will be upgraded/updated and returned to customer within 15 working days from the date of return to CMD.
- CMD also offers *24 hours turnaround Loaner Service* as stated in "RETURN FOR REPAIR."
- There will be no warranty extension for same function firmware update. For different function Hardware upgrade, CMD will extend warranty for a period of six (6) months.
Drive—same as in RETURN FOR REPAIR.

SHIPPING CHARGES
The following shipping charges apply to all REPAIR, SWAP, LOANER, and UPGRADE UNITS.
In-Warranty
- Domestic - freight from CMD to customer is to be paid by CMD; freight from customer to CMD is to be paid by customer.
- International - all fees are to be paid by customer (including custom duty and broker fees).
Out-of Warranty
- Domestic - all fees are to be paid by customer.
- International - all fees are to be paid by customer (including custom duty and broker fees).

GENERAL CONDITIONS
All goods returned to CMD including returns for credit, swap returns, loaner returns, and evaluation returns shall remain in good condition. Any damage or alteration done by the customer will result in a rejection or additional charge to the customer.

Customer must consult CMD Technical Support for authorization of CMD not functional upon arrival boards and swap requests. CMD Sales personnel must be consulted for authorization of returned goods for credit and/or evaluation.

Preface

Revision 1.3 of the CBI-1010 manual contains the following changes from the previous version:

- Instructions for switching between the CBI-1010/M and CBI-1010/MB have been added to Chapter 3.
- An error in the ULTRIX Configuration section has been corrected. The error was in steps 3 and 4 of the CBI-1010/TM instructions.

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Introduction

This User's Guide explains the basics of your CBI-1010™. It includes information on setting up and configuring the system and the CBI-1010 for use.

How to Use this Manual

This guide has five chapters and three appendices. Each chapter explains a different aspect of preparing your CBI-1010 for use. You may refer to the appendices for further configuration and troubleshooting information. The following descriptions summarize each section.

Chapter 1: Introduction explains the purpose of this guide and details the conventions used.

Chapter 2: Features and Specifications describes the CBI-1010 and details its features and specifications.

Chapter 3: Installation describes hardware configuration and installation procedures for the CBI-1010.

Chapter 4: Setup describes the On-Board Utility, set up of special features and software configuration.

Chapter 5: SCSI Library lists a glossary on SCSI terms and gives SCSI status and command codes for the CBI-1010.

Appendix A: Supported Devices and Host Computers lists the SCSI devices and Host computers compatible with the CBI-1010.

Appendix B: Troubleshooting gives some troubleshooting guidelines for the CBI-1010 under VMS®.

Appendix C: Jumper Settings list the jumper setting selections available on the CBI-1010.

Conventions

The following conventions are used in the CBI-1010 User's Guide.

Keycaps—Characters in square brackets represent keys on your keyboard. For example, "Press **[ENTER]**" means press the **[ENTER]** key. When two or more keys are joined by a plus sign (+), press those keys at the same time.

Commands—Italics text represents a command that can be used on a system, eg., *show dev du*.

Entering Text or Commands on Screen—Text or commands that must be entered on screen will be in italics and bold as ***show dev du;*** be sure to enter the text or command and press **[ENTER]**.

2

Features and Specifications

This section briefly describes the CBI-1010 VAXBI SCSI Host Adapter and details its specifications.

CBI-1010 Features

The CBI-1010 is an intelligent high performance VAXBI SCSI host adapter that is fully compatible with the DEC Mass Storage Control Protocol (MSCP) and Tape Mass Storage Control Protocol (TMSCP). Each CBI-1010 is fully licensed by Digital and is built around DEC's own BIIC interface chip.

The CBI-1010 can be used with the 5800, 6000, 8000, and 9000 series VAXBI systems. It supports VMS, ULTRIX, and selected UNIX operating systems which use *DU/TU* drivers.

The CBI-1010 supports either a single-ended or differential SCSI channel. A single-ended SCSI channel can be used for connecting up to 9.9 feet of cable (when the transfer rate is 10 MBytes/second) while a differential SCSI channel can be used to connect up to 80 feet of cable.

The CBI-1010 features Octaword DMA master transfers, virtual data buffer, command queuing, dynamic defect management, standard SCSI bus arbitration, disconnect and reconnect capabilities, and multiple host capability. Up to seven SCSI devices (either single-ended or differential) can be connected to the CBI-1010 SCSI port with SCSI bus data transfer rate up to 10-MB/sec in synchronous (sync) mode and 7-MB/sec in asynchronous (async) mode.

The CBI-1010 supports a variety of Sync/Async SCSI devices including magnetic disk, tape, and optical disk drives. Table 2-1 lists the devices supported by the different CBI-1010 models.

Table 2-1   CBI-1010 Models

CBI-1010/M	supports disk drives only
CBI-1010/T	supports tape drives only
CBI-1010/TM	supports disk and tape drives simultaneously
CBI-1010/MB	supports disk drives only

The CBI-1010 has an On-Board Utility for you to format and configure the SCSI drives, scan bad blocks and replace them automatically, and test SCSI disk and tape drives.

The CBI-1010 has an on-board non-volatile RAM (NOVRAM) to store the drive Logical Unit Number Offset and other important information to handle configuration of devices.

The CBI-1010 features six LEDs—three green, one red, and two yellow. These LEDs are visible from the front or top of the chassis when the system is running and are labeled as shown in Figure 2-1.
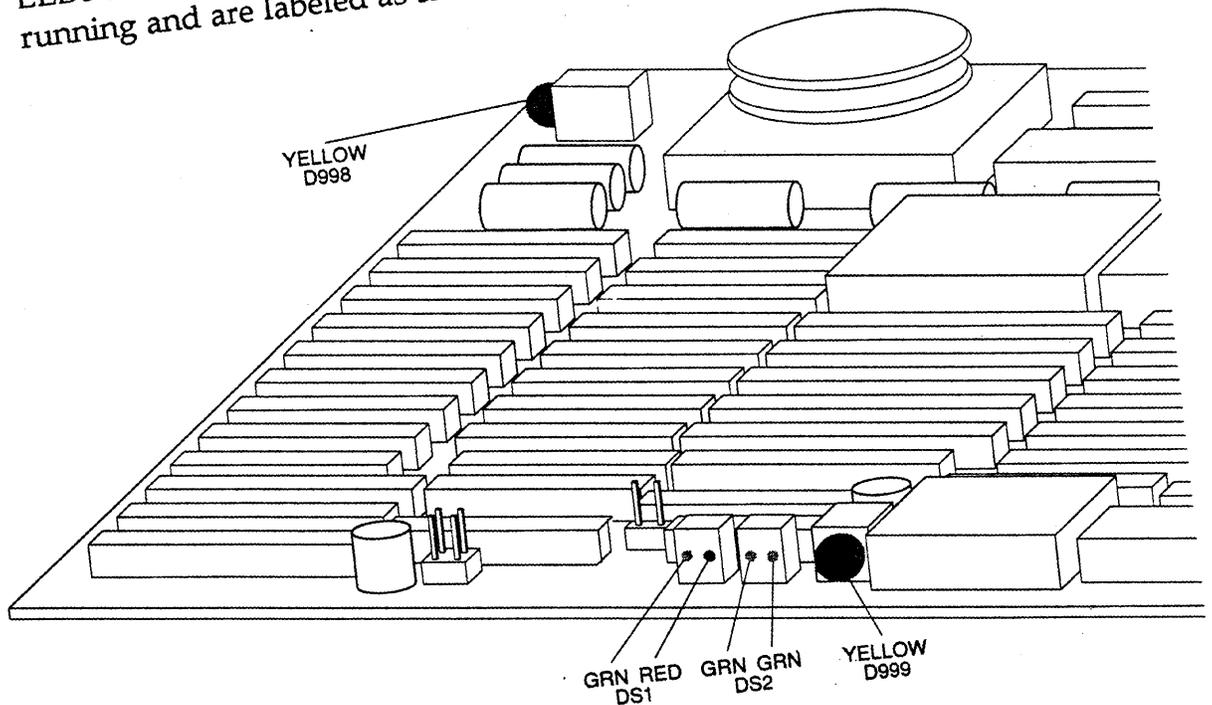
Figure 2-1: Front LED Assignment

Table 2-2 describes the conditions of CBI-1010 when LED's are lit.

Table 2-2   LED Indicators

LED	Color	Indication
DS1-Right	red	Error condition occurred.
DS1-Left	green	Power-up OK and activity indicator. Upon power up, this LED lights when the CQD-220 succeeds in the self-diagnostic testing. During normal operation, this LED will blink to show controller activity.
DS2-Left	green	SCSI controller chip Single-ended mode enabled when lit. Differential mode enabled with not lit.
DS2-Right	green	Terminator power pin is supplied with power. Refer to Figure 3-1.
D998/ D999	yellow	Self-test passed.

Special Features

The CBI-1010 supports special features that pertain to the different CBI-1010 models as listed Table 2-3.

Table 2-3   Special Feature Support List

Model	Multi-Hosting	TMU
CBI-1010/TM	Yes	Yes
CBI-1010/T	Yes	Yes
CBI-1010/M	Yes	No
CBI-1010/MB	Yes	No

Multi-Hosting

CBI-1010 gives you the ability to completely share an array of disks and tapes between multiple VAX systems running VAX cluster software. CMD's multi-host solution can support disk, tape, and optical devices including juke-boxes. Multi-hosting instructions are given in Chapter 4, under "Additional Utilities." Refer to Appendix A for supported disk and tape devices. Refer to Chapter 4 for configuration instructions.

Tape Monitor Utility

The Tape Monitor Utility™ (TMU) is an application software developed by CMD Technology and work exclusively with CMD SCSI host adapters as an optional feature for VAX/VMS systems.

This Tape Monitor Utility™ runs under VMS and displays the tape drive vendor identification, drive firmware revision, the remaining tape capacity, percentage of rewrites during writes or percentage of ECC retrys during reads, and current tape operations such as read, write, write file mark, space, rewind, etc. You can install multiple CBI-1010s and tape drives in one site and observe all tape activity from any VAX terminal locally or across the network without any additional add-in hardware. You also can open a file to log all the information during unattended backup.

To install the Tape Monitor Utility, use On-Board Utility (Chapter 4, subsection "Additional Utilities") to enable TMU since the factory setting for TMU OFF. Then follow the instructions given in the accompanying CMD Tape Monitor Utility User's Manual part number MAN-000TMU-001.

Sync/Async Mode

The CBI-1010 comes standard in synchronous mode. Most SCSI devices support synchronous mode. However, you can change the CBI-1010 to asynchronous mode using the On-Board Utility in Chapter 4.

In Sync mode, CBI-1010 will automatically negotiate with each SCSI device connected to find out whether the Sync mode is supported by the device.

In Async mode, CBI-1010 will communicate with the SCSI device asynchronously even if the SCSI device supports Sync mode. Most of the Sync SCSI devices also support Async mode.

CBI-1010 Specifications

Table 2-4 on the following page lists the Controller Specifications for the CBI-1010.

Table 2-4   Controller Specifications

Emulation	MSCP (*DU* driver) / TMSCP (*TU* driver)
Bus Interface	VAXBI
Adapter Size	Single VAXBI slot
Interrupt Vector	Software programmable
Transfer Mode	Octaword DMA master
Command Queuing	32 Commands with optimized seek
Data Buffer Capacity	Virtual data buffer
Defect Management:	Dynamic defect management
Software Supported	VMS, ULTRIX and selected UNIX versions
Multiple-Hosting	Support multiple-hosting for disks, optical drives and tapes.
Formatting	On board format and bad block replacement (ISO standard for optical erasable disk format)
Optional Software	Tape monitor utility (TMU)
LED Indicators	Self test, error conditions, single-ended SCSI enable, single-ended terminator power, differential SCSI enable, differential terminator power
Peripheral Interface	Small Computer System Interface (SCSI)
SCSI Transfer Rate	10.0-MB/sec in Synchronous mode 7.0-MB/sec in Asynchronous mode
SCSI Bus Parity	Odd parity
Devices Supported	Up to 7 SCSI devices
System Performance	Support disconnect/reconnect capability and multiple host configuration
SCSI Driver/Receiver	Single-ended or differential
SCSI Cable Length	Single-ended, up to 9.9 ft (3 meters) recommended at 10 MBytes/second transfer rate Differential, up to 80 ft (25 meters)
Operating Temperature	5° C to 50° C
Relative Humidity	10% to 90% , Non-condensing
Power Requirement	+5V DC 6.0A, +12V DC 14mA, -12V DC 6mA

Cabling

The CBI-1010 will operate in single-ended or differential mode; however, CMD Technology strongly recommends the use of differential mode when the data transfer rate exceeds five megabytes per second. If you have no choice but to use single-ended mode at a high transfer rate, the SCSI-3 proposal recommends that the total internal and external cable length should be no longer than three (3) meters or 9.9 feet when the transfer rate is 10 MBytes/second. Furthermore, the single-ended cable should meet or exceed the following specifications.

Table 2-5   Cable Specifications

Characteristic Impedance	No less than 90 ohms and no greater than 140 ohms
Signal Attenuation	.095 dB maximum per meter at 5 MHz
Pair-to-pair Propagation Delay Delta	.15 nanoseconds maximum per meter
DC Resistance	.23 ohms maximum per meter at 20 degrees C

Termination

The single-ended daughter card adapter for the CBI-1010 employs active termination. Some SCSI devices still use passive termination, which is inadequate at high transfer rates. If your system is running in single-ended mode at transfer rates in excess of five megabytes per second and the CBI-1010 is at one end of the SCSI bus, you must use active termination or some other type of high-performance termination at the other end of the bus.

3

Installation

This chapter details hardware configuration and installation for the CBI-1010. The CBI-1010 must be configured first, installed in the system second, and SCSI devices installed last. This chapter is organized in the order the CBI-1010 must be installed; after completing hardware installation, refer to "Setup" in Chapter 4. Features not selectable here can be selected through the On-Board Utility in Chapter 4.

Hardware Configuration

This section details setting up various features for the CBI-1010 before installing it inside a system. Be sure to follow the instructions listed in each subsection for proper configuration. Table 3-1 illustrates the default settings for each CBI-1010 model.

Table 3-1   Default Settings

Model	W1(1-3)	W1(2-4)	W5(1-2)	U9
CBI-1010/TM	OUT	OUT	OUT	PAL P1K08
CBI-1010/T	OUT	OUT	OUT	PAL P1K28
CBI-1010/M	OUT	OUT	OUT	PAL P1K29
CBI-1010/MB	OUT	OUT	IN	PAL P1K58A

Note that (F) means factory setting.

Figure 3-1 illustrates the components on the CBI-1010.
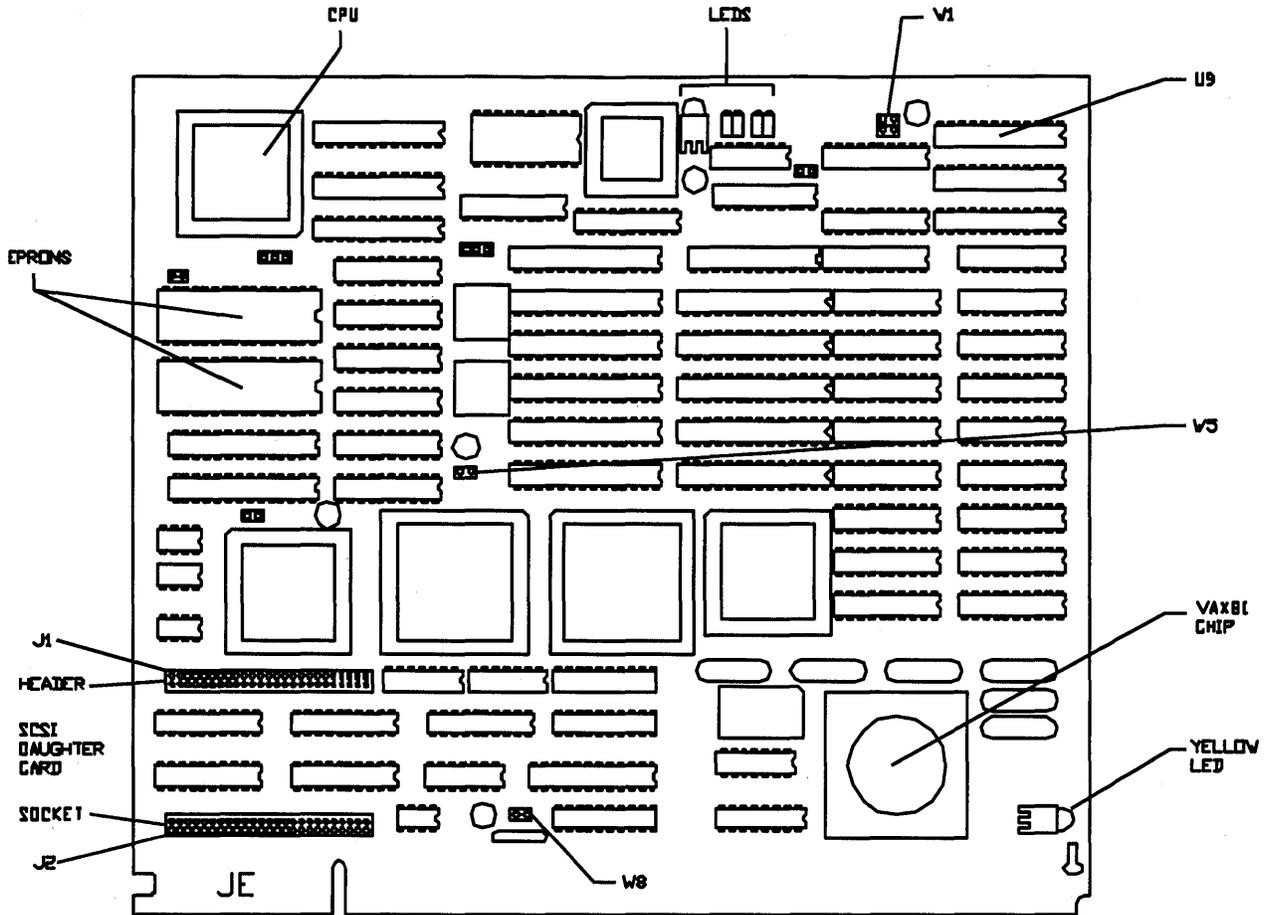
Figure 3-1: Components of the CBI-1010

Disk and Tape Emulation Selection for the CBI-1010/TM

The CBI-1010/TM is a multiple function controller. When you configure the
CBI-1010/TM as a single function controller (configured through RS-232 Util-
ity as 0 disk or 0 tape) the unused function *must* be disabled. You can disable
one of the functions shown below, see Table 3-2 for different configurations.

◆ To disable tape function, install a shunt on pins 1 and 3 of jumper W1.
  See Figure 3-2 for location of W1 and pin positions.

◆ To disable disk function, install a shunt on pins 2 and 4 of jumper W1.
  See Figure 3-2 for location of W1 and pin positions.

Table 3-2   W1 Jumper Settings

Pins 1 & 3	Pins 2 & 4	Description
OUT	OUT	CBI-1010/TM with PAL P1K08 in location U9 (F)
IN	OUT	CBI-1010/TM configured for disk only with PAL P1K08 in location U9
OUT	IN	CBI-1010/TM configured for tape only with PAL P1K08 in location U9

Note that (F) means factory setting.
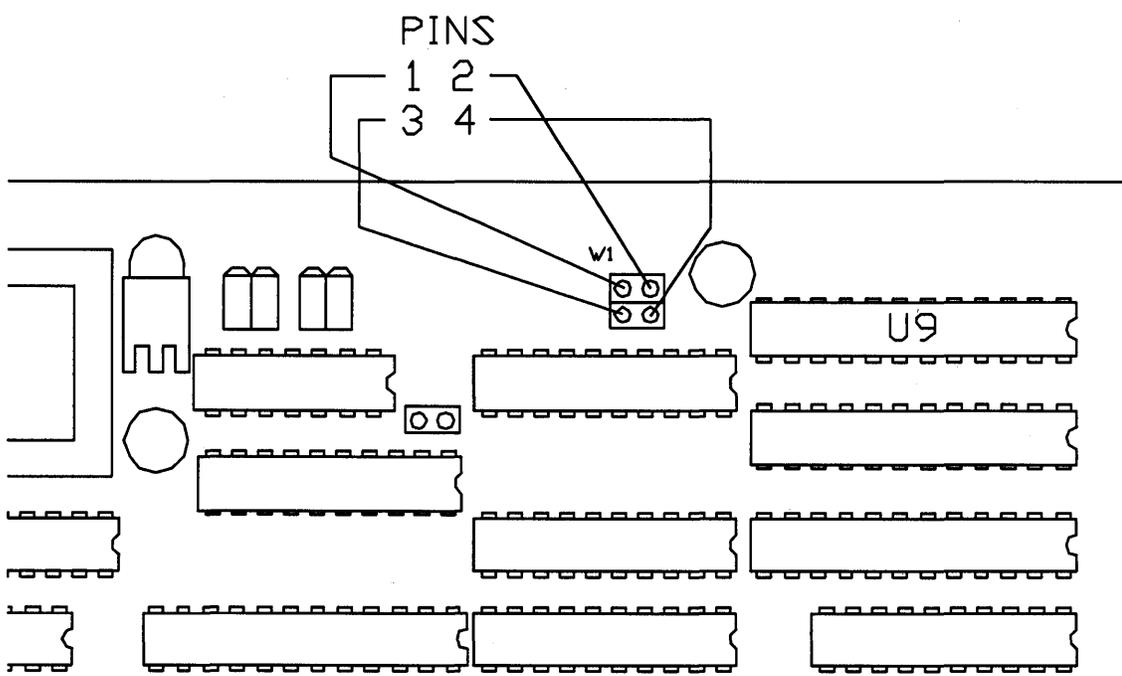
Figure 3-2: Jumper W1 Pin Positions

Switching Between CBI-1010/M and CBI-1010/MB

Both the CBI-1010/M and CBI-1010/MB support disk drives only, but the CBI-1010/M offers KLESI emulation, while the CBI-1010/MB offers KDB50 emulation, which is necessary for bootability on VAX 6000 systems. Switching between the CBI-1010/M and CBI-1010/MB models is a simple matter of changing the PAL at location U9 and either removing or installing the jumper at W5. All CBI-1010/M adapters come with PAL P1K29 installed at U9 and PAL P1K58A as an accessory. Likewise, all CBI-1010/MB adapters come with PAL P1K58A installed at U9 and PAL P1K29 as an accessory.

Be sure to turn off power to the adapter before you switch the PAL at U9. Use a screwdriver to pry the PAL loose and then remove it with your fingers. In-

sert the alternative PAL and press down until it is fully seated. Make sure that the alignment of the notch at one end of the PAL is identical to the surrounding chips. This will assure a proper pin-one match. Before restoring power, change the jumper at W5 to the appropriate setting for the model you desire. Table 3-3 shows the EPROM and jumper settings for each model.

Table 3-3   CBI-1010/M and CBI-1010/MB Settings

Model	Emulation	W5	U9
CBI-1010/M	KLESI	OUT	PAL P1K29 installed
CBI-1010/MB	KDB50	IN	PAL P1K58A installed

System Node ID

Care must be taken when installing a CBI-1010 to avoid having the operating system change the physical device names of the currently installed devices. During autoconfigure, each device found is given a unique device name. The device names are expressed as:

ddcu

where
dd = type of device (i.e. MU,DU,PT,PU)
c = Controller designator (A,B,C ...)
u = Unit number

The device name is determined by the physical address of the controllers port registers (IP/SA). Since these addresses are fixed within the CBI-1010, there are no concerns with configuring the device type. Refer to Chapter 4, Table 4-1 for unit numbers.

The controller designator is derived by the operating system as it scans I/O space. The first MSCP disk controller found is given the letter 'A', the second MSCP disk controller 'B' and so on. This will generate devices DUAx/PUAx, DUBx/PUBx, incrementing the controller letter until all disk controllers are found. The same is true for each TMSCP tape controller, yielding devices MUAx/PTAx, MUBx/PTBx and so on.

The scan will start at node 0 and will work its way up to the last node ID within the system. On native BI systems (i.e. 8200/8250/8350), the node ID of the BI is the system node ID. In these systems, the system ID's range from 0 to 15.

On systems where the BI is the system I/O bus (i.e. 58xx, 85xx, 8700, 8800 and all 6000's), the system node ID does not match the BI node ID. For example, a VAX 6000 machine has 240 system node ID's. The XMI bus has 15 nodes each logically capable of containing a bus adapter with 16 node ID of its own. Physically this arrangement is not permissible, however, this is how VMS looks at the system.

Table 3-4 shows a map of system node ID's for a VAX 6000 type machine.

Table 3-4   Map of System Node ID for VAX 6000

XMI node	System nodes
1	0 - 15
2	16 - 31
3	32 - 47
4	48 - 63
5	64 - 79
6	80 - 95
7	96 - 111
8	112 - 127
9	128 - 143
10	144 - 159
11	160 - 175
12	176 - 191
13	192 - 207
14	208 - 223
15	224 - 239

It is desirable to install the CBI-1010 at a system node ID that will not change the *physical* device names of the currently installed devices. **This is accomplished by installing the CBI-1010 at a higher system node ID than any other currently installed device of the same type.**

The CBI-1010/T is device type PT/MU and should be installed at a higher system node ID than other TMSCP tape controllers. The CBI-1010/M and CBI-1010/MB is a device type PU/DU and should be installed at a higher system node ID than other MSCP disk controllers. The CBI-1010/TM is a device type of PU/DU and PT/MU and should be installed at a higher system node ID than other MSCP disk and TMSCP tape controllers.

If you do not adhere to these guidelines, currently installed devices that have a higher system node ID than the CBI-1010 will have their controller designator changed (incremented by the number of CBI-1010's installed).

As an example, if the current system has a KDB-50 disk controller installed at XMI node 15, BI node 4, (system node ID 228) and a CBI-1010/M, CBI-1010/TM or CBI-1010/MB installed at XMI node 14, BI node 4, (system node ID 212), the controller designator for the KDB-50 will be incremented from 'A' to 'B' and the CBI-1010 will have the controller designator of 'A'.

Differential Mode

The CBI-1010 supports either single-ended or differential SCSI modes. The CBI-1010 SCSI port is factory configured to your specifications. If for any reason you need to convert the CBI-1010 from single-ended SCSI mode to differential, follow these instructions.

NOTE   Use only the components supplied by CMD.

1   Remove the single-ended SCSI daughter card (CBI-1011) from the lower left corner of the CBI-1010 board.

2   Install the differential SCSI daughter card (CBI-1012) at the same location of the CBI-1010 board. Make sure to align J1 of the daughter card with J1 of the CBI-1010 board. See figure 3-3.
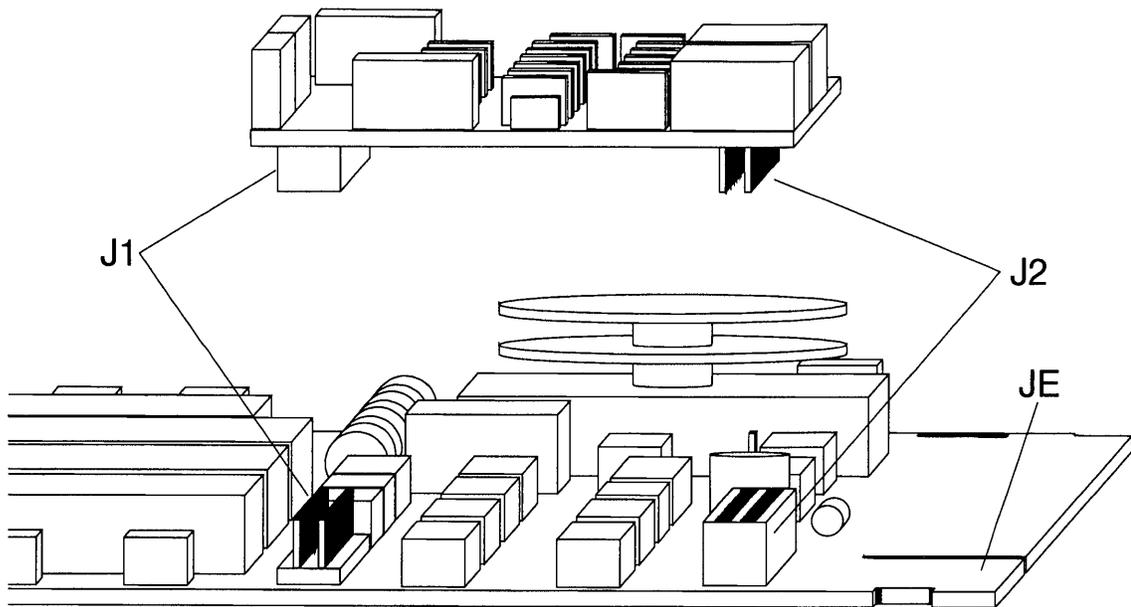
Figure 3-3: Differential Card (CBI-1012) Installation

Figure 3-4 illustrates the components of the CBI-1012 differential daughter card. The terminator resistors are located at U22 and U23.
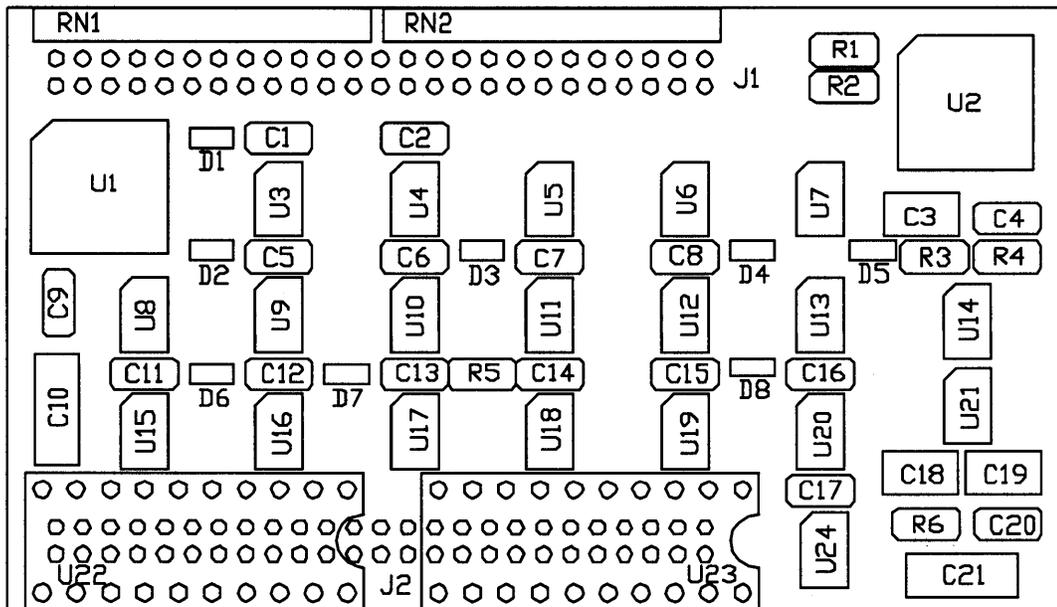
Figure 3-4: CBI-1012 Components

Single-Ended Mode

The CBI-1010 is factory configured to user specifications. However, if you need to convert the CBI-1010 from differential to single-ended, follow these instructions.

1   Remove the differential SCSI daughter card (CBI-1012) from the lower left corner of the CBI-1010 board.

2   Install the single-ended SCSI daughter card (CBI-1011) at the same location of the CBI-1010 board. Make sure to align J1 of the daughter card with J1 of the CBI-1010 board. See figure 3-5.
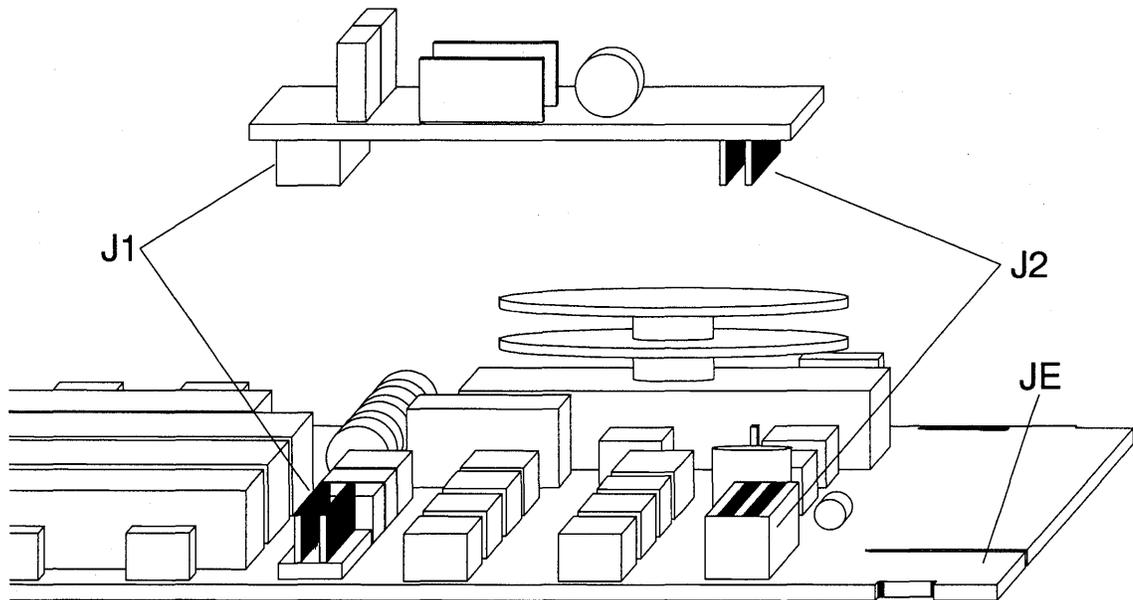
Figure 3-5: Single-Ended Card (CBI-1011) Installation

Figure 3-6 illustrates the components of the CBI-1011 single-ended daughter card. The terminator resistors are located at RN1 and RN2.
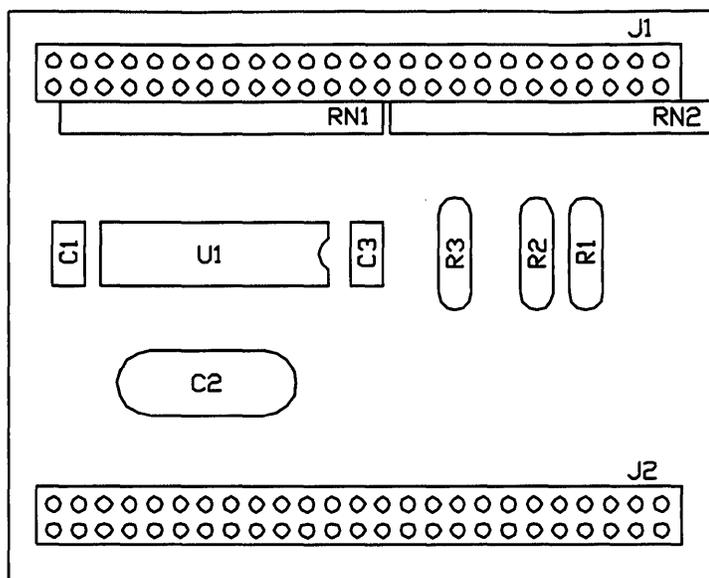
Figure 3-6: CBI-1011 Components

Installing the CBI-1010

Installing the CBI-1010 involves installing the board, cables, terminating the SCSI bus, identifying and testing SCSI devices with the On-Board Utility. This section explains these topics prior to listing installation procedures; carefully read the explanations first.

SCSI Cabling

The VAXBI systems provide two 30-pin connectors in the backplane for every one of the VAXBI Zero Insertion Force (ZIF) connectors JC, JD, and JE. The 30-pin connector on the component side of the CBI-1010 is defined as connector CON1. The 30-pin connector on the solder side of the CBI-1010 is defined as connector CON2 (see Figure 3-4 for details). Table 3-5 lists the connectors and cables for the CBI-1010.

Table 3-5   Connectors and Cables

Connector	Connector – CON1	Connector – CON2
JE	Single-Ended/Differential signals	On-Board RS-232 Utility & Single-Ended/Differential signals

The CBI-1010 comes with one three-foot SCSI I/O cable (including RS-232 utility interface) and system back panel adapter kit. The I/O cable is a 60-conductor cable. One end has two 30-pin connectors and the other end has 50-pin SCSI connector and a 10-pin connector.

NOTE CMD strongly recommends the use of differential mode in systems employing transfer rates in excess of five megabytes per second. If you have no alternative but to use single-ended mode, the SCSI-3 proposal recommends that the total length of the SCSI cable be no longer than three meters (about 9.9 feet) at 10 megabytes per second. See page 2-6 for more details.

SCSI Terminator Power

Typically the initiator (SCSI host adapter) supplies terminator power, +5-volts, to the SCSI bus. Because the CBI-1010 is considered an initiator to the SCSI devices, the terminator power option of the CBI-1010 needs to be enabled.

The CBI-1010 supplies terminator power to the TERMPWR pins of single-ended/differential SCSI connector (JE) through a polyswitch and jumper block, W8. (Check Tables 5-5 and 5-6 for pin assignments.)

SCSI ID for Host Adapter (Initiator)

Each device on the SCSI bus requires a unique SCSI Identification address (0 to 7). SCSI ID 7 has the highest priority on the bus and SCSI ID 0 has the lowest priority.

The CBI-1010 plays the role of initiator and is factory configured to SCSI ID 7. To alter the Host Adapter SCSI ID, change NOVRAM settings through the On-Board RS-232 Utility given in Chapter 4.

CBI-1010 Installation Procedures

1   Make sure the system is powered OFF. Make sure the CBI-1010 is configured as given in the section, "Hardware Configuration."

WARNING   Make sure you are wearing anti-static wrist straps.

2   Choose a correct slot for installing the CBI-1010 by reading the section "System Node ID."

3   Install the CBI-1010 in the correct slot with the ZIF connectors set into the system's backplane; push the ZIF handle down to clamp the CBI-1010 into place.

4a   **Differential Configuration:** Install the back panel into the back of the system with the ribbon cable inside the system. If necessary, move the external connector to the "SCSI Differential" slot on the back panel by unscrewing the connector from the "SCSI Single Ended" slot and the plate from the "SCSI Differential" slot. Swap the plate and the connector and screw them both back into place. (See Figure 3-7.)
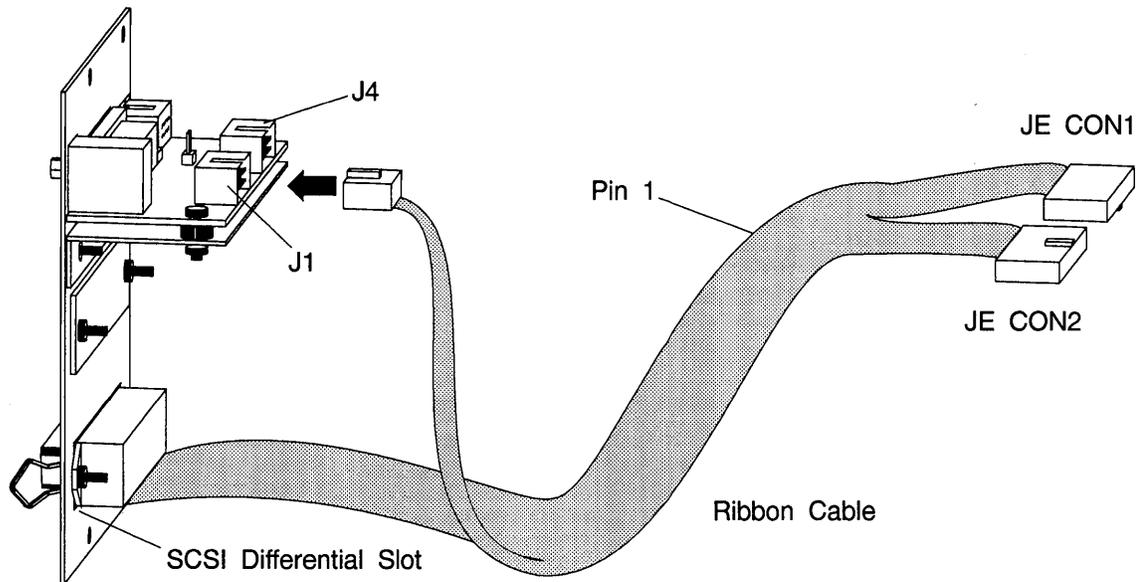
Figure 3-7: Back Panel Cabling (Differential)

4b   **Single Ended Configuration:** Install the back panel into the back of the system with the ribbon cable inside the system. If necessary, move the external connector to the "SCSI Single Ended" slot on the back panel by unscrewing the connector from the "SCSI Differential" slot and the plate from the "SCSI Single Ended" slot. Swap the plate and the connector and screw them both back into place. (See Figure 3-8.)
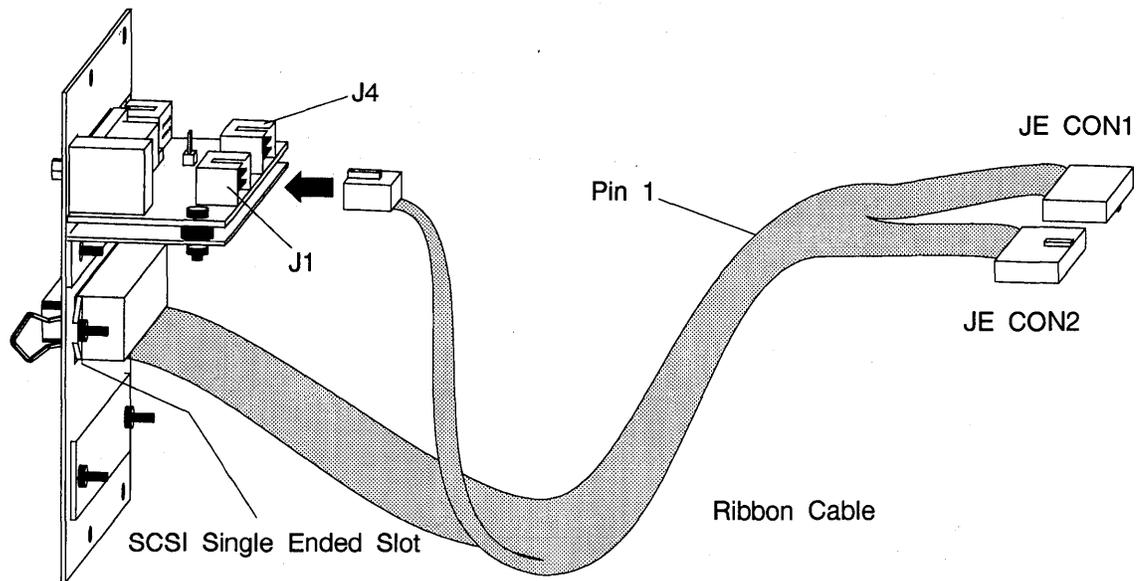
Figure 3-8: Back Panel Cabling (Single Ended)

5   Locate the 60-pin ribbon cable and connect cable labeled JE CON1 to JE CON1 of the backplane. (See Figure 3-9 for connectors on the system backplane.)

WARNING   Pin 1 of the cable *must* match CON1 pin 1 of the backplane.

Component side of CBI-1010 | Solder side of CBI-1010

Blue Node ID plug

JA Connector
JB Connector

CON1 pin 1

JC Connector

CON2 pin 1

CON1 pin 1

JD Connector

CON2 pin 1

CON1 pin 1

JE Connector

CON2 pin 1
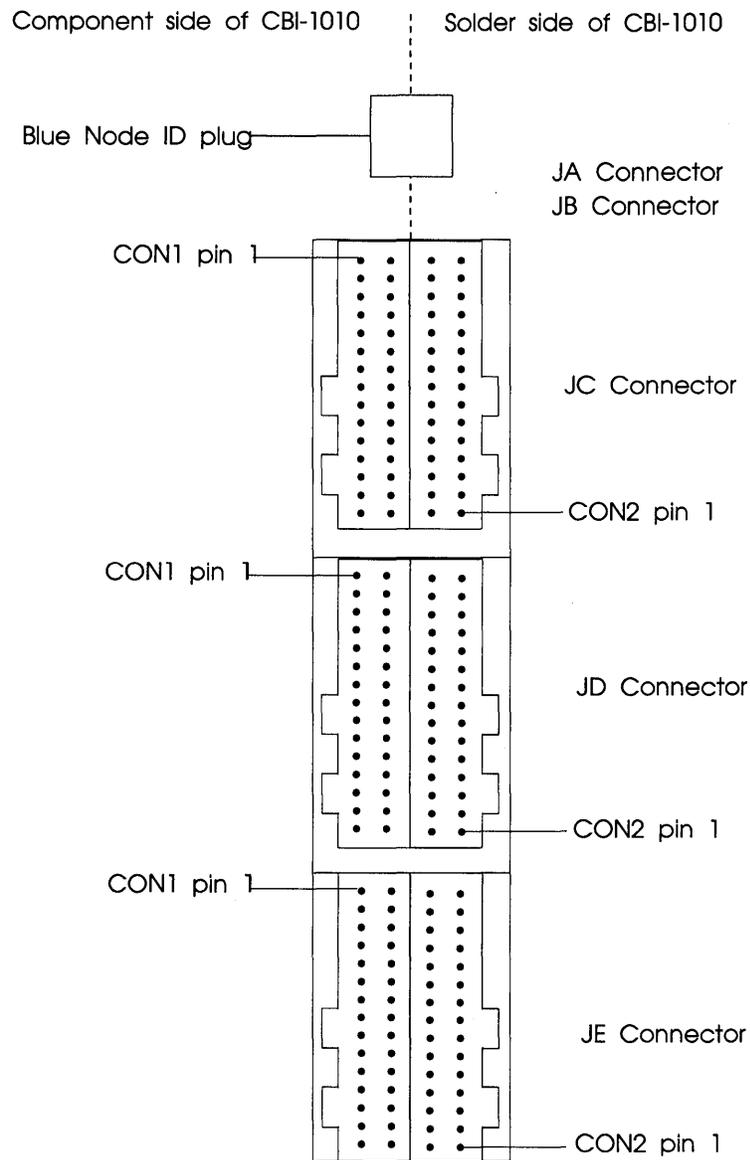
Figure 3-9: Connectors on the system backplane

6 Connect JE CON2 of the ribbon cable to JE CON2 of the backplane.

7 Connect the 10-pin RS-232 cable to the back panel at J1 (see Figure 3-7 for differential configurations and Figure 3-8 for single ended configurations.)

Installing SCSI Devices

This section details installing devices from the connectors of the back panel adapter kit to the SCSI devices. Read carefully the subsections, "Cable Specifications" and "SCSI ID for Target Devices" before installing the devices.

Cable Specifications

Single-ended and differential cable specifications vary; see the appropriate paragraph below for cable specifications before attempting to install devices. See page 2-6 for a discussion of cabling issues in systems running at high transfer rates.

Single-ended:
◆ When the CBI-1010 and the SCSI devices are installed in the same cabinet that meets EMI/RFI shielding requirements, a 25-conductor twisted pair cable must be used for connecting the CBI-1010 (JE) and the SCSI devices.
◆ When the CBI-1010 and the SCSI devices are installed in separate cabinets, a shielded twisted pair cable must be used to meet FCC requirements.
◆ A minimum conductor size of 28-AWG must be used to minimize noise effects and ensure proper distribution of optional terminator power.
◆ The maximum cable length is 3.0 meters or 9.9 feet in single-ended mode at 10 megabytes per second.

Differential:
◆ When the CBI-1010 and the SCSI devices are installed in the same cabinet that meets EMI/RFI shielding requirements, a 25-conductor twisted pair cable must be used for connecting the CBI-1010 (JE) and the SCSI devices.
◆ When the CBI-1010 and the SCSI devices are installed in separated cabinets, a shielded twisted pair cable must be used to connect the SCSI devices from the back panel adapter kit meeting FCC requirements. Otherwise, crosstalk between adjacent signals causing spurious pulses on differential signals will occurs even at slow data transfer rates and short cable distances. Each pair should be connected to the same signal, one wire to the positive signal, and the other wire to the negative.
◆ Cables should consist of conductors of 26-AWG or 28-AWG.
◆ The maximum cable length is 25 meters or 80 feet in differential mode.

SCSI ID for Target Devices

Each SCSI device (initiator or target) on the SCSI bus requires a unique SCSI ID number. Since the CBI-1010 has been set to SCSI ID 7 (initiator), target

devices must be set from SCSI ID 0 to 6. Normally, the assignment of SCSI Target ID starts with SCSI ID 0 on single function boards.

The factory setting of the CBI-1010/TM is four disk devices (SCSI ID=0 to 3) and three tape devices (SCSI ID=4 to 6). If you have more than four disks drives or three tapes drives you *must* use the On-Board Utility to change the configuration; if you do not, you do not need to change the configuration.

SCSI Device Installation Procedures

To install SCSI devices follow the procedures below:

1   Connect SCSI cables as listed below for the specified mode:

For single-ended mode: Connect a SCSI cable from the back panel at the label "Single-Ended" to the SCSI devices (see "Cable Specifications"). The total of the internal and external cable lengths must not exceed 9.9 feet at 10 MBytes/second. See Figure 3-10.

For differential mode: Connect a SCSI cable from the back panel at the label "Singled-Ended" to the SCSI devices (see "Cable Specifications"). The total of the internal and external cable lengths must not exceed 80 feet. See Figure 3-10.
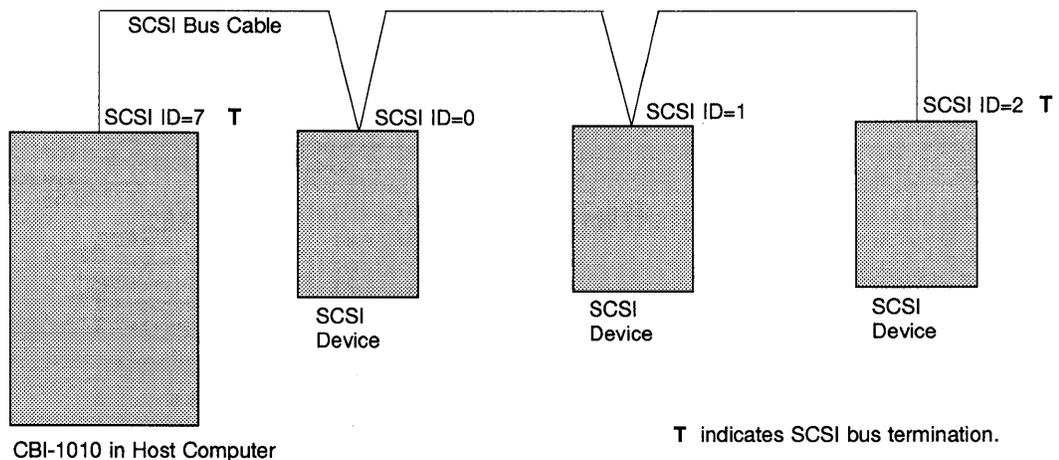
Figure 3-10: SCSI cabling

2   Terminate the *physical* ends of the SCSI bus by terminating the last SCSI device with on-board termination (see manufacturer's documentation) or by using an external terminator. Be sure devices in the middle of the SCSI bus are not terminated (see Figure 3-10).

The CBI-1010 is factory configured with on-board termination.

3   Set the devices SCSI ID numbers to the specifications set forth in "SCSI ID for Target Devices" (see manufacturer's documentation for setting devices SCSI ID).

NOTE   For multi-hosting refer to section, "Multi-Hosting Configuration."

4

Setup

This chapter will assist you in setting up the CBI-1010 and your system for use.

On-Board Utility

The CBI-1010 SCSI host adapter comes with the general purpose RS-232 utility for all DEC VAXBI systems. The On-Board utility can test the VAXBI slot, SCSI cable, and SCSI devices connected to the CBI-1010. Be sure to complete utility functions, explained at the end of this chapter.

Accessing the Utility

To access the RS-232 utility, follow the instructions below.

1   Connect a terminal to the CBI-1010's RS-232 port (DB-25 connector or DEC compatible RJ-11/Modified Module 423 Jack connector of the back panel adapter kit).

2   Set the terminal baud rate to 9600 (8-bit data, 1-stop bit, no parity).

3   Halt the system's CPU, reset the system, and hit carriage return on the terminal. The main menu will display as shown in Figure 4-1 on the following page.

```
┌─────────────────────────────────────────────────────────────────────────┐
│ SCSI HOST ADAPTER UTILITY (REV. YYYxZZ)                                   │
│                                                                           │
│ X = EXIT                                                                  │
│                                                                           │
│ [DISK]                                 [TAPE]                             │
│ 1 = LOGICAL UNIT NUMBER OFFSET         6 = LOGICAL UNIT NUMBER OFFSET     │
│ 2 = FORMAT DRIVE                       7 = ADDITIONAL UTILITIES           │
│ 3 = QUALIFY DRIVE                                                         │
│ 4 = MANUALLY REPLACE BAD BLOCKS                                           │
│ 5 = ADDITONAL UTILITIES                                                   │
│                                                                           │
│ SELECT OPTION ?                                                           │
└─────────────────────────────────────────────────────────────────────────┘
```

Figure 4-1: Utility Main Menu

Once the main utility menu shows up, you can key in the number to select the desired option. Press **[CTRL] + C** at any time to return to the main menu.

4   Refer the the next subsections for configurations. When completed, unplug the terminal, reset the system, and boot. DO NOT use the On-Board Utility while the system is running.

Changing LUN Offset

When a system has a HSC or in a VAX cluster it will be necessary to change the LUN (Logical Unit Number) offset. Each MSCP drive requires a different Unit Number so that the unit numbers are not duplicated. If there are no other MSCP controllers in the system, the LUN offset can be 0.

If there exists another MSCP controller with four drives (0 to 3), then the LUN offset should be four or above. In the case that LUN offset is equal to 10, SCSI ID 0 will be DUB10 and SCSI ID 1 will be DUB11. The drives will show up as such DUA0, DUA1, DUA2, DUA3, DUB10, DUB11 (see section, "SCSI ID for Target Drives" in Chapter 3 for explanation).

1   Select option *1* from the main menu for disk drives; *6* for tape drives.

2   Enter the new value for LUN offset at the statement: PRESENT LUN OFFSET = 0, ENTER NEW VALUE:

3   At the statement: SAVE NEW CONFIGURATION (Y or N)? enter Y.

4   The monitor will display COMPLETE when finished executing.

Formatting the Drive

This section details formatting a drive. The CBI-1010 issues Format Unit Command to the selected SCSI disk drive and requests it to map out the defects on the Manufacture Defect List (MDL). Remember formatting a drive will rewrite all the sectors of that drive.

CMD recommends that you format all new drives. To format a drive, follow the steps below:

1   Select option 2 from the main menu.

2   Enter the device number from 0 to 6 in the statement: ENTER DEVICE NUMBER 0 TO 6 :

3   At the statement: *** WILL DESTROY DATA ON DEVICE X, ARE YOU SURE? enter Y if you want to continue.

4   The monitor displays WAIT while the drive is executing the format process.

5   The monitor will display COMPLETE when finished executing.

Qualifying the Drive

After formatting the device, CMD recommends you qualify devices by running this procedure at lease once without errors detected. The qualify program writes different patterns to the drive and then verifies the data. If there are any bad sectors, the sectors will automatically be replaced and the statement XX XXXXXXX BAD BLOCK REPLACED will appear. Follow the instructions below for qualifying a drive.

1   Select option 3 from the main menu.

2   Enter the device number at the statement: QUALIFY DEVICE NUMBER <0 TO 6>:

3   At the statement: *** WILL DESTROY DATA ON THIS DEVICE, ARE YOU SURE? enter Y if you want to continue.

4   The monitor will display QUALIFY STARTED <SEQUENTIAL WRITE AND READ>! <HIT <BREAK> TO ABORT>.

5   The monitor will display TESTING LOOP COUNT AND BLOCK NUMBER:

6   Press **[BREAK]** to exit back to the main menu after you are satisfied with the qualifying process.

Manually Replacing Bad Sectors

This option allows you to replace bad sectors manually. The controller supports dynamic defect management which replaces defective sectors on-line so there is no need to manually replace bad sectors. However, if you wish to replace bad sectors manually follow these instructions; remember that any data in the sector will be lost:

1   Select option **4** from the main menu.

2   Enter the device number at the statement: DEVICE NUMBER ? DEV <0 TO 6>:

3   Enter the logical block number in HEX at the statement: ENTER THE BAD BLOCK NUMBER <HEX>:

4   The monitor will display —BAD BLOCK REPLACED— when finished executing.

Additional Utilities

To access additional utilities for disk drives, select option 5 from the main menu. To access additional utilities for tape drives, select option 7 from the main menu. The additional utilities menu will display as shown in Figure 4-2.

```
ADDITIONAL UTILITIES   (REV. YYYxZZ)   SN = 1278X

D = DISPLAY SCSI DEVICE AND SET UP CONFIGURATION
S = SEND SCSI COMMAND TO THE DEVICE
T = TEST SCSI DEVICE
R = FORMAT RCT BLOCK

SELECT OPTION ?
```

Figure 4-2: Utility Sub-menu

Displaying SCSI Device and Setting Up Configuration

Selection 'D' can be used to change the controller default configurations such as those listed below:

- ◆ reset to default
- ◆ number of disk and tape devices supported
- ◆ SCSI ID of the CBI-1010
- ◆ SCSI reset enable/disable
- ◆ SCSI disconnect enable/disable
- ◆ sync/async mode selection
- ◆ tape buffer mode enable/disable
- ◆ prevent medium removal enable/disable
- ◆ disk write with verify enable/disable
- ◆ Tape Monitor Utility (TMU) enable/disable
- ◆ Tape Fast Search enable/disable
- ◆ SCSI transfer rate selection
- ◆ remote density mode enable/disable
- ◆ default tape enable/disable
- ◆ reconfigure device
- ◆ autoboot start from floppy enable/disable
- ◆ write protect from controller jumper setting
- ◆ truncate disk size for volume shadowing
- ◆ eject removable disk cartridge after dismount

This utility can also scan/display the SCSI devices attached to the CBI-1010. The CBI-1010/TM will be shown as an example in the following display.

To display SCSI devices and set up configuration follow the procedures below.

1   Select option *D* at the sub-menu (Figure 4-2), the following current configuration is displayed as shown in Figure 4-3.

```
DEV0    DU0, SCSI ID 0, LUN 0
        Disconnect ON, Sync Mode ON, Prevent Medium Removal ON, Write W/Verify OFF

DEV1    DU1, SCSI ID 1, LUN 0
        Disconnect ON, Sync Mode ON, Prevent Medium Removal ON, Write W/Verify OFF

DEV2    DU2, SCSI ID 2, LUN 0
        Disconnect ON, Sync Mode ON, Prevent Medium Removal ON, Write W/Verify OFF

DEV3    DU3, SCSI ID 3, LUN 0
        Disconnect ON, Sync Mode ON, Prevent Medium Removal ON, Write W/Verify OFF

DEV4    MU0, SCSI ID 4, LUN 0
        Disconnect ON, Sync Mode ON, Prevent Medium Removal ON, Buffer Mode ON

DEV5    MU1, SCSI ID 5, LUN 0
        Disconnect ON, Sync Mode ON, Prevent Medium Removal ON, Buffer Mode ON

DEV6    MU2, SCSI ID 6, LUN 0
        Disconnect ON, Sync Mode ON, Prevent Medium Removal ON, Buffer Mode ON

DEV7    SCSI ID 7, HOST ADAPTER SCSI Reset ON, Tmu OFF, Fast Search OFF, sync rate=4-
        mb, Density Mode ON, Default Tape OFF Boot Floppy OFF, Jumper Write Protect OFF,
        Eject Disk ON, Truncate Size OFF, Rsv/Rls Option ON, Sel Timeout=250 msec
```

Figure 4-3: Current configuration, default

NOTE   If Truncate Size is toggled, "Truncate Mode ON" will display under each disk device options and at the bottom when configuration is displayed.

2   To change the configuration, enter *Y* at the statement: CHANGE CONFIGURATION ? (Y/N). The menu shown in Figure 4-4 will display.

NOTE   See subsection, "Unit Numbering" before trying to re-configure devices.

```
R = Toggle SCSI Reset               M = Toggle Density Mode
D = Toggle Disconnect               B = Toggle Buffer/Truncate Mode (Tape/Disk)
S = Toggle Sync/Async               W = Toggle Density/Write Verify Mode (Tape/Disk)
C = Reconfigure Device              P = Toggle Prevent Medium Removal (Disk only)
Q = ToggleTMU                       F = Toggle Fast File Search(Tape only)
G = Toggle FMT                      U = Toggle Default Tape (Tape Only)
A = Autoboot Start From Floppy Drive
N = Write Protect from Controller Jumper Setting
V = Truncate Disk Size for Volume Shadowing
E = Eject Disk after Dismount
L = Reserve/Release Disk Option
J = Change Selection Timeout Period
T = Reset All Device Modes to Default
Z = Reset Controller to Default Configurtation
(Hit <return> key to exit)
```

Figure 4-4: Configuration change

The following list is an explanation of the selections in Figure 4-4.

R = Toggle SCSI reset—Choosing this option will toggle the controller's ability to issue SCSI resets. This should be turned off when multi-hosting is desired.

D = Toggle Disconnect—This option allows you to enable or disable disconnect for each device. If disconnect is enabled, the controller will indicate its ability to disconnect during the SCSI identify message.

S = Toggle Sync/Async—This option allows you to configure each device for synchronous or asynchronous operations. If synchronous is selected, the controller will attempt a synchronous message exchange with the device. If the device accepts the message exchange, they will transfer data synchronously, otherwise they will transfer asynchronously.

C = Reconfigure Device—This option allows you to reconfigure each device.

Q = Toggle TMU—This option allows you to configure the controller for tape monitoring. It is used in conjunction with licensed software that will display tape statistics. If enabled, a pseudo unit of 255 will appear during a VMS *show dev* command.

G = Toggle FMT—This options enables DU254 to show up for SCSIformat ON-LINE. This feature must be enabled when using SCSIformat ON-LINE.

U = Toggle Default Tape—This option allows you to force the presence of a tape unit to the operating system even if one does not exist. This is needed for some operating systems when the controller is connected to devices with a long self test procedure after power-up. If it is disabled, only units connected to the controller are seen by the operating system.

A = Autoboot Start From Floppy Drive—This option allows you to set the system to boot directly from the first floppy drive; if no floppy drive is present, the system will begin to boot from the first device.

N = Write Protect from Controller Jumper Setting—This option may be used when jumper setting for front panel is IN to allow you to select write protection to disk 0 and disk 1. Default is OFF.

V = Truncate Disk Size for Volume Shadowing—This option allows the size of the disk to be truncated to multiples of 126 blocks to allow VMS volume shadowing copy process to reach higher performance. The message "** WARNING ** Truncate Size ON/OFF will be toggled, Are you sure?" will display before truncate switch can be toggled. If this feature is used on a disk that contains valid data, the data must be removed and later restored after turning this feature ON.

E = Eject Disk after Dismount—This option allows you to specify whether the removable disk cartridges will eject from the drive after dismount.

L = Reserve/Release Disk Option—This option is to let the MSCP ON-LINE exclusive use modifier to be operable.

T = Reset all Devices Mode to Default—These modes are—disconnect, synchronous, Prevent Medium Removal, Write with Verify, and Buffer modes, etc.

Z = Reset Controller to Default Configuration—This option allows the user to set the controller to its factory default configuration. This will set the controller to support four disk drives, three tape drives; disconnect, SCSI reset, synchronous communication, buffer mode, prevent medium removal and density selection enabled; and fast file search, write with

verify, write protect disabled, reserve/release disabled, and default tape disabled. **ALWAYS** use this feature before reconfiguring the board.

M = Toggle Density Mode—This option allows you to configure the controller for remote density selection. If enabled, remote density selection may take place. If enabled, the controller reports itself as a 'TU81'. If disabled, it reports itself as a 'TK50'.

B = Toggle Buffer/Truncate Mode (Tape/Disk)—For tape devices, this option allows the controller to configure each individual tape device for write caching. If enabled, the tape device will send command complete message and good status to the controller once the data as been transferred to the tape device's internal buffers. If disabled, such message and status will be sent when the data is actually written to the tape. For disk devices, you may toggle truncate disk size, see "V = Truncate Disk Size for Volume Shadowing" for explanation.

W = Toggle Write W/Verify—This option will allow the SCSI command Write with Verify to be issued for MSCP write with verify modifier. When set to OFF (which is the default), the normal write command will be issued.

P = Prevent Medium Removal—This option is for removable disk drives only. When set to ON, a "Prevent Medium Removal" will be issued to a drive when it is mounted by VMS. This will disable the eject media push-button in front of the drive. An "Allow Medium Removal" will be issued when the drive is dismounted by VMS and the push-button will be enabled. This features can be disabled and the media can be ejected at anytime.

F = Toggle Fast File Search—This option allows you to configure the controller for normal or fast file searching. The difference between normal and fast file search is the type of SCSI commands used to find file marks. A normal file search will issue iterative 'Space Record' commands until a filemark is encountered, while the fast mode will issue a single 'Space filemark' command. VMS may use Fast File Search mode if you do not attempt a stand-alone boot or run other programs that require the controller to keep track of the number of objects. In VMS stand-alone boot applications, this option needs to be disabled. When fast file mark is enable, the controller's ability to keep correct position information for the host is not possible.

3   To reconfigure the device select option *C* and the screen will prompt you with the following question as shown in Figure 4-5.

WARNING   Use homogeneous high quality twisted pair cables within SCSI specifications for 5-MB/sec transfer rate.

```
Enter Synchronous transfer rate (MB/sec)
Enter (4-10)
```

Figure 4-5: Synchronous transfer rate change

4   Enter synchronous rate from 4 to 10 MB/sec. The screen will prompt you to answer the next series of questions as shown in Figure 4-6.

```
Enter Initiator ID 7
Number of Disks? (0-7)     4
    DU0 to be Reconfigured ? (Y/N)   N
    DU1 to be Reconfigured ? (Y/N)   N
    DU2 to be Reconfigured ? (Y/N)   N
    DU3 to be Reconfigured ? (Y/N)   N

Number of Tapes? (0-3)     3
    MU0 to be Reconfigured ? (Y/N)   N
    MU1 to be Reconfigured ? (Y/N)   N
    MU2 to be Reconfigured ? (Y/N)   N
```

Figure 4-6: SCSI host adapter ID change

5   Enter Initiator SCSI ID **7** or the required Host Adapter SCSI ID (default is 7). Enter the number of disk and/or tapes. Default configuration is four disks, and three tapes; it is not necessary to configure if running fewer than four disks and three tapes.

NOTE   If zero is selected for the number of disk or tapes, place a shunt over the appropriate pins on jumper W1. See Table 3-2 on page 3-3.

Answer *Y* or *N* to reconfigure each of the disks or tapes. If you answer *Y*, the screen will prompt you with these questions:

```
DUX SCSI ID? <0-7>
DUX LUN? <0-3>
```

Figure 4-7: Disk and Tape Configuration Change

NOTE   This LUN is SCSI LUN; it is normally 0. This is used only for devices that support multiple LUN's.

6   When you have completed these instructions the display will show your current configuration and prompt you again with the question CHANGE CONFIGURATION ? (Y/N). Enter *N*; this will cause the CBI-1010 to scan the SCSI bus.

The utility will display your current configuration with manufacturer's name, model number, and firmware revisions for each device.

Sending SCSI Commands To The Device

Selection 'S' can be used to send SCSI commands to the selected disk/tape drives directly.

This option is used to send a 6-, 10-, or 12-byte command to a SCSI device. Follow these procedures to send SCSI commands to the device:

1   Enter *S* from the "Additional Utilities" Menu. (Be sure you have correctly selected either 5 from the Main Menu for disk drives, or 7 for tape drives.)

2   At the question DEVICE NUMBER ? DEV <0-6> enter the device number.

3   Enter the command sequence at the statement:

```
READY TO TEST DEVICE X
      EDIT CDB <HEX>  ***<ESC> TO TERMINATE EDITING***
      BYTE  0000= 00
```

If a 6- or 10-byte command is used, press **[ESC]** to terminate command editing. If a 12-byte command is used, command editing is terminated automatically.

4   At the statement WRITE DATA TO THE DEVICE ? <Y OR N> enter *N* to immediately send the command if SCSI command does not require a data out phase.

Or enter *Y* to send data to the device after the command phase if SCSI command requires a data out phase. Enter the data and enter **[ESC]** to terminate editing. The statement SAVE EDITED DATA IN BUFFER ? <Y OR N> will appear. Enter *Y* to save data in the buffer; or enter *N* to erase edited data after the command is sent.

Testing SCSI Device

Selection 'T' can be used to read only, write and read selected disk drive, and/or write and read selected tape drive continuously. This is a diagnostic tool to help with installation and testing. Follow the procedures below to test the SCSI device.

1   Enter *T* from the "Additional Utilities" menu. (Be sure you have correctly selected either 5 from the main menu for disk drives, or 7 for tape drives.)

2   At the question DEVICE NUMBER ? DEV <0-6> enter the device number.

3   When testing for *disk devices*, at the statement READY TO TEST THE DEVICE DO YOU WANT TO READ ONLY ? <Y OR N> enter *Y* to read only or *N* to read and write. If you selected *N*, the question ARE YOU SURE? will display. Enter *Y* to read and write to the device.

WARNING   *N* will destroy all data on the device.

When testing for *tape devices*, the statement ARE YOU SURE? will display. Enter *Y* to test the device.

4   The test will continue until you abort. Allow the test to continue for a few minutes for new devices and ten minutes for suspected bad devices. Press **[BREAK]** or **[CTRL] + C** to abort and exit back to the main menu.

Formatting RCT Block

Selection 'R' can be used to format the RCT blocks of the disk drive selected. This command writes zeros in the last logical block of the device. If you try to skip the formatting process and directly use the drive, you *must* use this option to eliminate "unrecoverable bad RCT block." However, CMD recommends you format the drive. To format the RCT block follow these instructions:

1   Select *R* from the "Additional Utilities" menu. (Be sure you have correctly selected either *5* from the main menu for disk drives, or *7* for tape drives.)

2   Select the device number at the statement: DEVICE NUMBER DEV <0-6>.

3   FORMAT COMPLETE will display when RCT block has been formatted.

Completing Utility Functions

The following procedures should be done when using the On-Board Utility.

1   Use the On-Board Utility to verify the VAXBI slot seating, SCSI cable, and SCSI devices connected to the CBI-1010 after installing the CBI-1010 in the VAXBI slot.

2   After verifying the SCSI connections, disconnect RS-232 cable from the back panel, and reset the system; make sure that the system scans this VAXBI node (where the CBI-1010 is installed) successfully. The following indicators will display when the system completes the scan:

   ◆ *A negative sign (-)* of the VAXBI node ID displayed in the system terminal indicates that the scanning of that VAXBI slot is unsuccessful. When this condition occurs, reseat the CBI-1010 in the VAXBI slot or use a different VAXBI slot and repeat the installation procedures.
   ◆ *A period (.)* signifies nothing is found in that slot. Follow the procedures given for the negative sign if an adapter is in that slot.
   ◆ *A positive sign (+) or the node ID number* signifies the system found the CBI-1010 and the node passed the self test.

NOTE   If the terminal is connected, this may cause the On-Board Utility to be invoked during system operation and will take control of the Host Adapter from VMS.

Unit Numbering

This section explains configuring unit numbers. Unit numbers may be changed by using the "Configure LUN Offset" from the main menu. If you used the 'D' option from the "Additional Utilities" menu, the terminal will display the *MU* and/or *DU* numbers as shown in Table 4-1, factory default settings for unit numbers.

Table 4-1   Default for Unit Numbers

CBI-1010/T	SCSI ID	On-Board Utility	OS Unit Number
	0	MU0	0
	1	MU1	1
	2	MU2	2
	3	MU3	3
	4	MU4	4
	5	MU5	5
	6	MU6	6
CBI-1010/M or	**SCSI ID**	**On-Board Utility**	**OS Unit Number**
CBI-1010/MB	0	DU0	0
	1	DU1	1
	2	DU2	2
	3	DU3	3
	4	DU4	4
	5	DU5	5
	6	DU6	6
CBI-1010/TM	**SCSI ID**	**On-Board Utility**	**OS Unit Number**
	0	DU0	0
	1	DU1	1
	2	DU2	2
	3	DU3	3
	4	MU0	0
	5	MU1	1
	6	MU2	2

An example below is given for each type of controller to show how the unit numbers can be determined. Refer to Figure 4-3 if necessary.

CBI-1010/T—Tape drives must be configured starting from SCSI ID 0 to properly use the information from Table 4-1. *MU0* will be unit number 0; this is with LUN offset set to 0. Setting the LUN offset to 10 will change the *MU* number to 10 (ie., *MU10*), making the unit number 10.

CBI-1010/M and CBI-1010/MB—Disk drives must be configured starting from SCSI ID 0 to properly use the information from Table 4-1. *DU0* will be unit number 0. This is with LUN offset set to 0. Setting the LUN offset to 10 will change the *DU* number to 10 (ie., *DU10*), making the unit number 10.

CBI-1010/TM—Default is four disk drives and three tape as shown in Table 4-1. If you have more than four disk drives or three tape drives, follow these guidelines—disk drives must start at SCSI ID 0 and tape drives must start after the last disk drive's SCSI ID number and reconfigure the CBI-1010/TM (see subsection, "Displaying SCSI Devices and Setting Up Configuration"). Note the example below:

    SCSI ID 0 disk
    SCSI ID 1 disk
    SCSI ID 2 disk
    SCSI ID 3 disk
    SCSI ID 4 disk

    SCSI ID 5 tape
    SCSI ID 6 tape

    SCSI ID 7 is inititaor (CBI-1010/TM)

The *MU* and *DU* numbers are the unit numbers mapped back to the operating system. If the CBI-1010/TM is configured following these guidelines, you can apply this formula to determine the unit number mapped back to the operating system:

				SCSI ID of tape drive
	SCSI ID of the disk drive		–	number of disk drives
+	the LUN offset for disk		+	LUN offset for tapes
=	unit number for disk		=	unit number for tape

Multi-Hosting Configuration

The following is a list of software requirements for multi-hosting:

♦ VMS version 5.3 or above
♦ VAX cluster software must be running on both systems with at least one of the DEC's interconnects operational
♦ Tape drives can only be mounted to one system at a time
♦ Allocation classes must be the same for all systems when installing disk drives (value must not equal 0).

Refer to Appendix A for supported multi-hosting devices and follow the instructions below for multi-hosting:

1   From the Additional Utilities Menu in the On-Board Utility, follow these instructions:

a   Select option *D* to display current configuration.
b   Answer *Y* to the statement: CHANGE CONFIGURATION ? (Y/N) The menu shown in Figure 4-4 will display.
c   Select *R* to toggle SCSI reset.
d   Set the host adapter SCSI reset to OFF. Do this for all SCSI host adapters to be multi-hosted.
e   Answer *Y* to reconfigure the adapter.
f   Select *C* to reconfigure the device.
g   Configure the CBI-1010 to SCSI ID 7 for the first computer, and SCSI ID 6 for the second computer.
h   Configure the CBI-1010 for exact number of disks and tapes. This will inhibit scanning of other host adapters (see Figure 4-6).
i   If other MSCP disks are in the cluster, follow the rules in the subsection "Changing LUN Offset" in "On-Board Utility" so that each device has a unique unit number.

NOTE   In a multi-hosting system the *physical* disk device name must be identical on both systems.

2   Terminate both *physical* ends of the SCSI bus.

If the CBI-1010 is at either end of the SCSI bus, do not change the configuration. The CBI-1010 is factory configured with on-board termination.

If the CBI-1010 is in the middle of the SCSI bus, terminators *must* be removed from the default setting as listed below:

For single-ended mode: remove RN1 and RN2 from daughter card (CBI-1011). See Figure 3-6 on page 3-8.

For differential mode: remove U22 and U23 from daughter card (CBI-1012). See Figure 3-4 on page 3-7.

In the event that one system becomes inoperable with only two nodes in the VAX cluster, a quorum disk must be used to count as a vote; this keeps the other system running. Refer to VMS VAXcluster manual order number AA-LA27A-TE to set up a quorum disk and a VAX cluster.

NOTE   When running *cluster_config.com* on a system with only Ethernet as a computer interconnect, answer *Yes* for the question, "WILL THIS BE A SATELLITE NODE?"

VMS Configuration

VAX systems using VMS software will automatically configure new devices added. *NO* other configuration is required if guidelines are followed from Chapter 3, "System Node ID."

ULTRIX Configuration

VAX and DEC systems using ULTRIX software must be manually configured to access the CBI-1010 boards. First, examine current configuration file to determine which controllers and devices are already connected to the system. Then refer to the respective sections for configuration procedures for the CBI-1010/T, CBI-1010/M, CBI-1010/MB, CBI-1010/TM.

CBI-1010/T

Edit the configuration file by performing the following instructions for the CBI-1010/T. Note, the CBI-1010/T must be configured with a higher *klesib number*, higher *uq number*, and higher *tms number* than any other *klesib* controller in the configuration file.

1   Make sure the following two lines are in the configuration file:

adapter xmi0 at nexus?   (this line only for VAX 6000's and 5810's)
adapter vaxbi& at nexus?

Where
? = the system will fill in this variable (simply enter this *?*).
& = the XMI node ID of the XMI to BI adapter for 6000's and 5810's (on 8200's use 0, zero, for the variable).

2   Connect the controller to the node on the BI bus by entering the following line:

controller klesibϑ at vaxbi& node XX

Where
ϑ = the variable number that represents the CBI-1010/T.
& = same number used in step 1.
XX = the node ID of the VAXBI slot that contains the CBI-1010/T.

3   Tell ULTRIX what the name of the controller will be:

controller uq# at klesibϑ vector uqintr

Where
ϑ = the same number used in step 2.
= the variable used to represent the controller.

4   Name the tape drives and list drive unit by entering the following line:

*tape tms0 at uq# drive*α
*tape tms1 at uq# drive*α

Where
= the same number used to represent the controller in step **3**.
α = the *MU* number in the On-Board Utility displays this configuration.

CBI-1010/M

Edit the configuration file by performing the following instructions for the CBI-1010/M. Note the CBI-1010/M must be installed with a higher *node ID number*, higher *klesib number*, higher *ra number*, and higher *uq number* than any other *kdb* and *klesib* controller in the configuration file.

1   Make sure the following two lines are in the configuration file:

adapter xmi0 at nexus?   (this line only for VAX 6000's and 5810's)
adapter vaxbi& at nexus?

Where
? = the system will fill in this variable (simply enter this ?).
& = the XMI node ID of the XMI to BI adapter for 6000's and 5810's (on 8200's use 0, for the variable).

2   Connect the controller to the node on the BI bus by entering the following line:

*controller klesib*ϑ *at vaxbi& node XX*

Where
ϑ = the variable number that represents the CBI-1010/M.
& = the same number used in step 1.
XX = the node ID of the VAXBI slot that contains the CBI-1010/M.

3   Tell ULTRIX what the name of the controller will be:

*controller uq# at klesib*ϑ *vector uqintr*

Where
ϑ = the same number used in step 2.
= the variable used to represent the controller.

4   Name the tape drives and list drive unit by entering the following line:

*disk   ra0   at   uq#   drive*β
*disk   ra1   at   uq#   drive*β

Where
= the same number used to represent the controller in step **3**.
β = the DU number in the On-Board Utility displays this configuration.

CBI-1010/MB

Edit the configuration file by performing the following instructions for the CBI-1010/MB. Note the CBI-1010/MB must be installed with a higher *node ID number,* higher *kdb number,* and higher *ra number* than any other *kdb* controller in the configuration file.

1   Make sure the following two lines are in the configuration file:

adapter   xmi0   at   nexus?   (this line only for VAX 6000's and 5810's)
adapter   vaxbi&   at   nexus?

Where
? = the system will fill in this variable (simply enter this *?*).
& = the XMI node ID of the XMI to BI adapter for 6000's and 5810's (on 8200's use 0 for the variable).

2   Connect the controller to the node on the BI bus by entering the following line:

*controller   kdb*ϑ   *at   vaxbi&   node   XX*

Where
ϑ = the variable number that represents the CBI-1010/MB.
& = the same number used in step **1**.
XX = the node ID of the VAXBI slot that contains the CBI-1010/MB.

3   Tell ULTRIX what the name of the controller will be:

*controller   uq#   at   kdb*ϑ   *vector   uqintr*

Where
ϑ = the same number used in step **2**.
= the variable used to represent the controller.

4   Name the tape drives and list drive unit by entering the following line:

*disk ra0 at uq# drive*β
*disk ra1 at uq# drive*β

Where
= the same number used to represent the controller in step **3**.
β = the DU number in the On-Board Utility displays this configuration.

CBI-1010/TM

Edit the configuration file by performing the following instructions for the CBI-1010/TM. Note the CBI-1010/TM must be configured with a higher *klesiu number*, higher *uq number*, and higher *tms numbers* than any other *klesiu* controller; and a higher *uda number*, higher *uq number*, and higher *ra number* than any other *uba* controller in the configuration file.

1   Make sure the following two lines are in the configuration file:

adapter xmi0 at nexus? (this line only for VAX 6000's and 5810's)
adapter vaxbi& at nexus?

Where
? = the system will fill in this variable (simply enter this *?*).
& = the XMI node ID of the XMI to BI adapter for 6000's and 5810's (on 8200's use 0, zero, for the variable).

2   Connect the controller to the node on the BI bus by entering the following line:

*controller uba*ϑ *at vaxbi& node XX*

Where
ϑ = the variable number that represents the CBI-1010/TM.
& = the same number used in step **1**.
XX = the node ID of the VAXBI slot that contains the CBI-1010/TM.

3   Connect disk and tape controller by entering the following lines in the
     configuration file:

     controller klesiu# at uba϶
     controller uda$ at uba϶

     Where
     ϶ = the same number used in step **2**.
     # = a number that makes the CBI-1010/T unique from other *klesiu*
     controllers.
     $ = a number that makes the CBI-1010/T unique from other *uda*
     controllers.

4   Tell ULTRIX what the name of the controller for the different functions
     will be:

     controller uq∇ at klesiu# csr 0174500 vector uqintr
     controller uqΔ at uda$ csr 0172150 vector uqintr

     Where
     ∇ = variable used to represent the controller.
     Δ = variable used to represent the controller (unique from∇ above).
     # = the same number used in step **3** representing the controller.
     $ = the same number used in step **3** representing the controller.

5   Name the tape drives and list drive unit by entering the following line:

     tape tms0 at uq∇ driveα
     tape tms1 at uq∇ driveα
     disk ra0 at uqΔ driveβ
     disk ra1 at uqΔ driveβ

     Where
     ∇ = the same number used to represent the controller in step **4**.
     Δ = variable used to represent the controller (unique from ∇ above).
     α = the MU number in the On-Board Utility displays this configuration.
     β = the DU number in the On-Board Utility displays this configuration.

5

SCSI Basics

This chapter consists of a SCSI glossary, SCSI commands used by the CBI-1010 for MSCP emulation, SCSI status codes, SCSI messages, SCSI single-ended and differential signals.

SCSI Glossary

The following is a glossary of frequently used SCSI terms.

Connect—The function that occurs when an initiator selects a target to start an operation.

Disconnect—The function that occurs when a target release control of the SCSI bus, allowing it to go to the BUS FREE phase.

Initiator—A SCSI device (usually a host system) that requests an operation to be performed by another SCSI device.

LUN—Logic Unit Number.

Peripheral device—A peripheral that can be attached to a SCSI device (e.g., magnetic disk, magnetic tape, or optical disk).

Reconnect —The function that occurs when a target selects an initiator to continue an operation after a disconnect.

SCSI address—The octal representation of the unique address (0-7) assigned to an SCSI device. This address would normally be assigned and set in the SCSI device during system installation.

SCSI ID—The bit-significant representation of the SCSI address referring to one of the signal lines DB (7-0).

SCSI device—A host computer adapter or a peripheral controller or an intelligent peripheral that can be attached to the SCSI bus.

Target—A SCSI device that performs an operation requested by an initiator.

SCSI Commands

SCSI commands used by CBI-1010 for MSCP emulation are listed in Table 5-1. The Format Unit command is used by the On-Board Utility only. These commands are used if the drives support them.

Table 5-1   SCSI Commands (MSCP)

Code	Command Name
00h	Test Unit Ready
01h	Rezero Unit
03h	Request Sense
04h	Format Unit (1)
07h	Reassign Block
08h	Read
0Ah	Write
0Bh	Seek
12h	Inquiry
15h	Mode Select
16h	Reserve Unit
17h	Release Unit
1Ah	Mode Sense
1Bh	Start/Stop Unit
1Eh	Prevent/Allow Medium Removal
25h	Read Capacity
28h	Extended Read
2Ah	Extended Write
2Bh	Extended Seek
3Eh	Read Long (2)
3Fh	Write Long(2)

SCSI commands used by CBI-1010 for TMSCP emulation are listed in Table 5-2.

Table 5-2   SCSI Commands (TMSCP)

Code	Command Name
00h	Test Unit Ready
01h	Rewind
03h	Request Sense
08h	Read
0Ah	Write
10h	Write Filemarks
11h	Space
12h	Inquiry
15h	Mode Select
16h	Reserve Unit
17h	Release Unit
19h	Erase
1Ah	Mode Sense
1Bh	Load/Unload
1Eh	Prevent/Allow Medium Removal

SCSI Status

The SCSI status codes used by CBI-1010 are listed in Table 5-3.

Table 5-3   SCSI Status

Code	Status Name
00h	Good
02h	Check Condition
08h	Busy
10h	Intermediate/Good
18h	Reservation Conflict

SCSI Messages

The SCSI Messages used by CBI-1010 are listed in Table 5-4.

Table 5-4   SCSI Messages

Code	Message Name
00h	Command Complete
01h	Extended Message
02h	Save Data Pointer
03h	Restore Pointer
04h	Disconnect
05h	Initiator Detected Error
06h	Abort
07h	Message Reject
08h	No Operation
09h	Message Parity Error
80-FFh	Identify

SCSI Single-Ended Signals

Figure 5-1 illustrates the pin locations of the CBI-1010 shielded SCSI device connector.
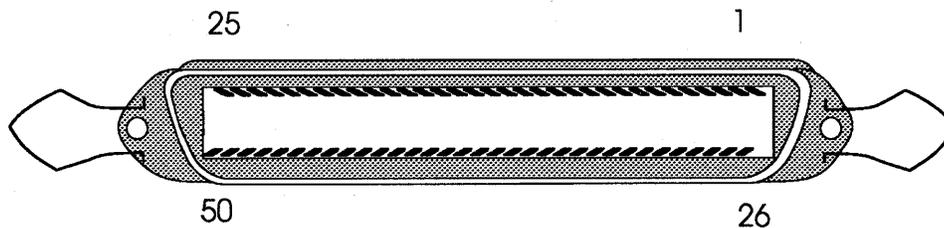
Figure 5-1: Single-Ended SCSI device connector

Table 5-5 shows the CBI-1010 shielded single-ended SCSI connector pin assignments.

NOTE   Pin 1 to pin 25 (except pin 13) are connected to ground. Pin 13 is left open. The minus sign next to the signal indicates active low.

Table 5-5   SCSI Single-Ended Connector Pin Assignments

Signal	Pin Number
-DB(0)	26
-DB(1)	27
-DB(2)	28
-DB(3)	29
-DB(4)	30
-DB(5)	31
-DB(6)	32
-DB(7)	33
-DB(P)	34
GROUND	35
GROUND	36
GROUND	37
TERMPWR	38
GROUND	39
GROUND	40
-ATN	41
GROUND	42
-BSY	43
-ACK	44
-RST	45
-MSG	46
-SEL	47
-C/D	48
-REQ	49
-I/O	50

SCSI Differential Signals

Figure 5-2 illustrates pin locations for the differential SCSI device connector.

25   1

50   26
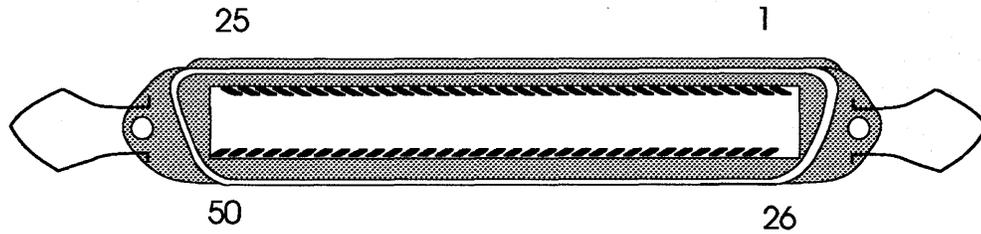
Figure 5-2: Differential SCSI device connector

Table 5-6 illustrates the CBI-1010 shielded differential SCSI connector pin assignments.

Table 5-6   SCSI Differential Connector Pin Assignments

Signal	Pin Number	Signal	Pin Number
GROUND	1	GROUND	26
+DB(0)	2	-DB(0)	27
+DB(1)	3	-DB(1)	28
+DB(2)	4	-DB(2)	29
+DB(3)	5	-DB(3)	30
+DB(4)	6	-DB(4)	31
+DB(5)	7	-DB(5)	32
+DB(6)	8	-DB(6)	33
+DB(7)	9	-DB(7)	34
+DB(P)	10	-DB(P)	35
DIFFSENS	11	GROUND	36
GROUND	12	GROUND	37
TERMPWR	13	TERMPWR	38
GROUND	14	GROUND	39
+ATN	15	-ATN	40
GROUND	16	GROUND	41
+BSY	17	-BSY	42
+ACK	18	-ACK	43
+RST	19	-RST	44
+MSG	20	-MSG	45
+SEL	21	-SEL	46
+C/D	22	-C/D	47
+REQ	23	-REQ	48
+I/O	24	-I/O	49
GROUND	25	GROUND	50

Appendix A

Supported Devices and Operating Systems

SCSI Devices

The following subsections list devices that are supported by the CBI-1010. Contact CMD Technical Support for correct firmware revision for the drives listed.

NOTE Devices marked by *italics* represent new qualified devices; devices marked **bold** support multi-hosting; devices marked by ***bold italics*** represent both new qualified devices supporting multi-hosting.

Magnetic disk drives supported by CBI-1010/TM, CBI-1010/M, and CBI-1010/MB

SEAGATE	**WREN VI**, SWIFT (3-1/2-inch), SABRE 8-inch, **WREN VII**, ***ELITE I & II (5400 RPM)***, ***WREN VIII***
CONNER	CP-3100, *CP3200*
CITOH	YD-3042, YD3082
DEC	*RZ23, RZ24, RZ56, RZ57*
FUJITSU	M2246SA Series, M2249SA, **M2263SA**, **M2266SA**
HITACHI	**DK515C Series**, *DK516C*
HP	97548S/D series, C2233, C2234, C2235, C3010, C3009, C3007
IBM	320-MB, 3-1/2-inch
MAXTOR	XT-4000S Series, XT-8000S Series
MICROPOLIS	*1588-15* , 1598
QUANTUM	ProDrive 40S/80S
TEAC	*FD235HS* (3-1/2-inch FLOPPY, DEC RX23 compatible)

More disk drives will be qualified soon.

Erasable Optical disk drives supported by CBI-1010/TM, CBI-1010/M, and CBI-1010/MB

MAXTOR	Tahiti 1, Tahiti 2
SONY	**SMO-D501, SMO-D502**
RICOH	*RO-5030E, RO-5030E2*

Erasable Optical disk cartridge manufacturers

SONY, RICOH, MAXOPTICS, PDO, 3M.

CD ROM disk drives supported by CBI-1010/TM, CBI-1010/M, and CBI-1010/MB

DEC	RRD40 , RRD42
LMS	CM210, CM212
TOSHIBA	XM3200 series

WORM drives supported by CBI-1010/TM, CBI-1010/M, and CBI-1010/MB

1 With Ten X Technology Optical Conversion Unit
All WORM drives supported by the optical conversion unit.
2 With LASERDRIVE interface
LASERDRIVE   Model 800 series

Tape drives supported by CBI-1010/TM, CBI-1010/T

1 8-mm helical scan tape drives
EXABYTE   **EXB-8200, EXB-8500**
2 4-mm DAT drives (Digital Audio Tape)

Archive	**Python 4520 DAT**
GIGATREND	**1200 series DAT**
HP	**35450A DAT** , 35470A, 35480A
SONY	**SDT-1000 DAT**
WangDat	**1300 DAT** , **2600 DAT**, 3200 DAT
Wangtek	**6130 series DAT**

3 VHS helical scan tape drives
Digidata
Metrum

4 IBM-3480 compatible 18-track cartridge tape drives

ASPEN	System 480
CIPHER	T480
FUJITSU	M2480 series, 2680
LMS	Independence
DEC	*TKZ60*
STORAGE TECH	4280 series (model Summit)

5 9 track reel to reel tape drives

CIPHER	**F880-II, M990, M995**
HP	**Model 88780B**
KENNEDY	**Model 9612**
STORAGE TECH	Model 2925, 9914
QUALSTAR	Model 340
TELEX	Model 9294
DEC	TSZ07
M4 data	**Model 9914**

6 TK50 compatible tape drives

DEC	TZ30

Jukeboxes supported by CBI-1010/TMJ

1 Disk Jukebox

Hewlett-Packard	*C1710A*
IDE	*6500, 7000*

2 Tape Jukebox

EXABYTE	EXB120

Operating Systems

All DEC-compatible products designed by CMD Technology, Inc. implement MSCP (Mass Storage Control Protocol) / TMSCP (Tape Mass Storage Control Protocol). CMD supports its implementation of MSCP/TMSCP beginning with the indicated version of the DEC operating systems listed in Table A-1.

Table A-1 Operating Systems Supported by CBI-1010

VMS®	4.0 to 5.5
ULTRIX™	1.2 to 4.2
Unix/Berkeley™	4.2 to 4.3
AT&T UNIX®	System V

Appendix B

Troubleshooting

VMS Analyze/Error Utility

The CBI-1010 logs controller dependent information in ERRLOG.SYS file. User can use the VMS ANALYZE/ERROR utility to open the file ERRLOG.SYS and display the error messages for troubleshooting. By including option switches such as /SINCE=DATE and /INCLUDE=MUB0, user may define the time reference and device. To enter the ANALYZE/ERROR utility, log onto the system and enter the following command:

ana/err/since=[time]/include=[device]

Some examples are shown by the following:
To view all errors that VMS has logged, enter:

ana/err

To view the errors only on tape devices, enter:

ana/err/inc=tapes

To view the errors that have occurred only on one tape unit (MUB0), enter;

ana/err/inc=mubo
ana/err/inc=(ptb,mubo)

To view the MUB0 errors that occurred on April 20, 1990 since 14:22 (02:22 PM), enter:

ana/err/since=20-Apr-1989:14:22/inc=mubo

One example of the error log message is shown in below:

BEGINNING OF INTERVENING ENTRIES

*************************ENTRY   1163*************************

ERROR SEQUENCE 8.   LOGGED ON SID 0A000005

DATE/TIME 0 DAYS : 090991   15:15:15   SYS TYPE 0241020

SYSTEM UPDATE TIME 00:08:56

SCS NODE: XMIVAX   VAX/VMS V5.4

ERL$LOGMESSAGE ENTRY   KA62B   CPU FW REV # 6.

                           CONSOLE FW REV #4.1

                           XMI NODE #1

I/O SUB-SYSTEM, UNIT _MUA0:

MESSAGE TYPE   0002

                                   TAPE MSCP MESSAGE

MSLG$L_CMD_REF   99730004

MSLG$W_SEQ_NUM   0001

                                   SEQUENCE #1.

MSLG$B_FORMAT   00

                                   CONTROLLER ERROR

MSLG$B_FLAGS   00

MSLG$W_EVENT   00E8   DATA ERROR

                                   UNRECOVERABLE ECC ERROR

MSLG$Q_CNT_ID   00340000

                   03090000

                                   UNIQUE IENTIFIER, 000000340000

                                   TAPE CLASS DEVICE

                                   TK50P

MSLG$B_CNT_SVR   01

                                   CONTROLLER SOFTWARE VERSION #1.

MSLG$B_CNT_HVR   01

                                   CONTROLLER HARDWARE VERSION #1.

Controller Dependent Information: Listed below is the controller dependent information for the CBI-1010.

		;COMMENTS:
		;SCSI COMMAND, 6 BYTES
LONGWORD 1.	00000008	;COMMAND BYTE 3 TO 0
	/..../	;(LEFT TO RIGHT, BYTE 3,2,1,0)
LONGWORD 2.	00000050	;BYTE 7 TO 6 DONT CARE
		;COMMAND BYTE 5 TO 4
	/P.../	;EXTENDED SENSE, 26 BYTES
LONGWORD 3.	00030070	;SENSE DATA BYTE 3 TO 0
	/P.../	;(LEFT TO RIGHT, BYTE 3,2,1,0)
LONGWORD 4.	12000000	;SENSE DATA BYTE 7 TO 4
	/..../;	
LONGWORD 5.	00000000	;SENSE DATA BYTE 11 TO 8
	/..../;	
LONGWORD 6.	00000000	;SENSE DATA BYTE 15 TO 12
	/..../;	
LONGWORD 7.	10000000	;SENSE DATA BYTE 19 TO 16
	/..../;	
LONGWORD 8.	04000000	;SENSE DATA BYTE 23 TO 20
	/..../;	
LONGWORD 9.	0000E202	;SENSE DATA BYTE 26 TO 24
	/.b../;	
LONGWORD 10	00000000	;(RESERVED)
	/..../;	

Refer to the SCSI tape drive manual for a description of the error reported by the tape drive or call CMD for more detailed information.

Cables

If the system does not recognize the CBI-1010 or devices connected, check the cable connections. Make sure pin 1 on the cable is aligned with pin 1 on the SCSI device or CBI-1010. Make sure pins are *NOT* bent.

LED Indicators

When the Red LED is lit, turn system "OFF" and reboot. If the Red LED is still lit, call CMD technical support at (800) 426-3832 or (714) 454-0800.

CMD Technical Support

Having a CMD board entitles you to responsive technical support. Before you call CMD Technical Support, please gather the information listed below that pertains to you. Make a note of any on-screen messages when the problem occurs and have your manual close by.

CMD CMD product model number and serial number.
Firmware Revision of CMD board as shown on Eproms.
Listing of jumper settings on the board.
Distributer company and contact.

SCSI SCSI devices model numbers and firmware Rev.
Settings of SCSI ID numbers of all devices.

Computer Computer model.
Operating System version.
Complete listing of other controllers in computer backplane.
Specify multi-hosting or clustering.

Problem Describe exact nature of problem.
Specify detailed error messages.
Specify any recent modification to the system.
Is this a new install?
Does the problem occur consistently?
Does the problem occur when you do not use the board?
Does the problem occur with another system (if available)?

You may contact CMD Technical Support from 8:30 AM to 5:30 PM, Pacific Standard Time, Monday through Friday, excluding major holidays, at:

(714) 454-0800 or
(800) 426-3832 or
(714) 455-1656 FAX

Appendix C

Miscellaneous

Jumper Settings

Table C-1 lists the jumper settings for the CBI-1010.

Table C-1   Jumper Settings for the CBI-1010

W2	OUT	Reserved (F)
W3	2-3 IN	32Kx8 EPROMS Configuration (F)
W3	1-2 IN	1 Megabit EPROMS Configuration
W4	1-2 IN	10 MB/sec SCSI Configuration (F)
W4	2-3 IN	Reserved
W5	IN	MB mode enabled
W5	OUT	TM mode enabled
W6	IN	Timer disabled (F)
W6	OUT	Timer enabled
W8	IN	Single-ended/differential SCSI channel terminator power enabled (F)
W8	OUT	Single-ended/differential SCSI channel terminator power disabled
W9	OUT	Reserved (F)

Note that (F) means factory setting.

Table C-2 lists the W1 jumper settings for the CBI-1010.

Table C-2   W1 Jumper Settings

Pins 1 & 3	Pins 2 & 4	Description
OUT	OUT	CBI-1010/TM with PAL P1K08 in location U9 (F)
OUT	OUT	CBI-1010/T with PAL P1K28 in location U9 (F)
OUT	OUT	CBI-1010/M with PAL P1K29 in location U9 (F)
OUT	OUT	CBI-1010/MB with PAL P1K58A in location U9 (F)

Note that (F) means factory setting.

Figure C-1 illustrates the jumper locations for the CBI-1010.
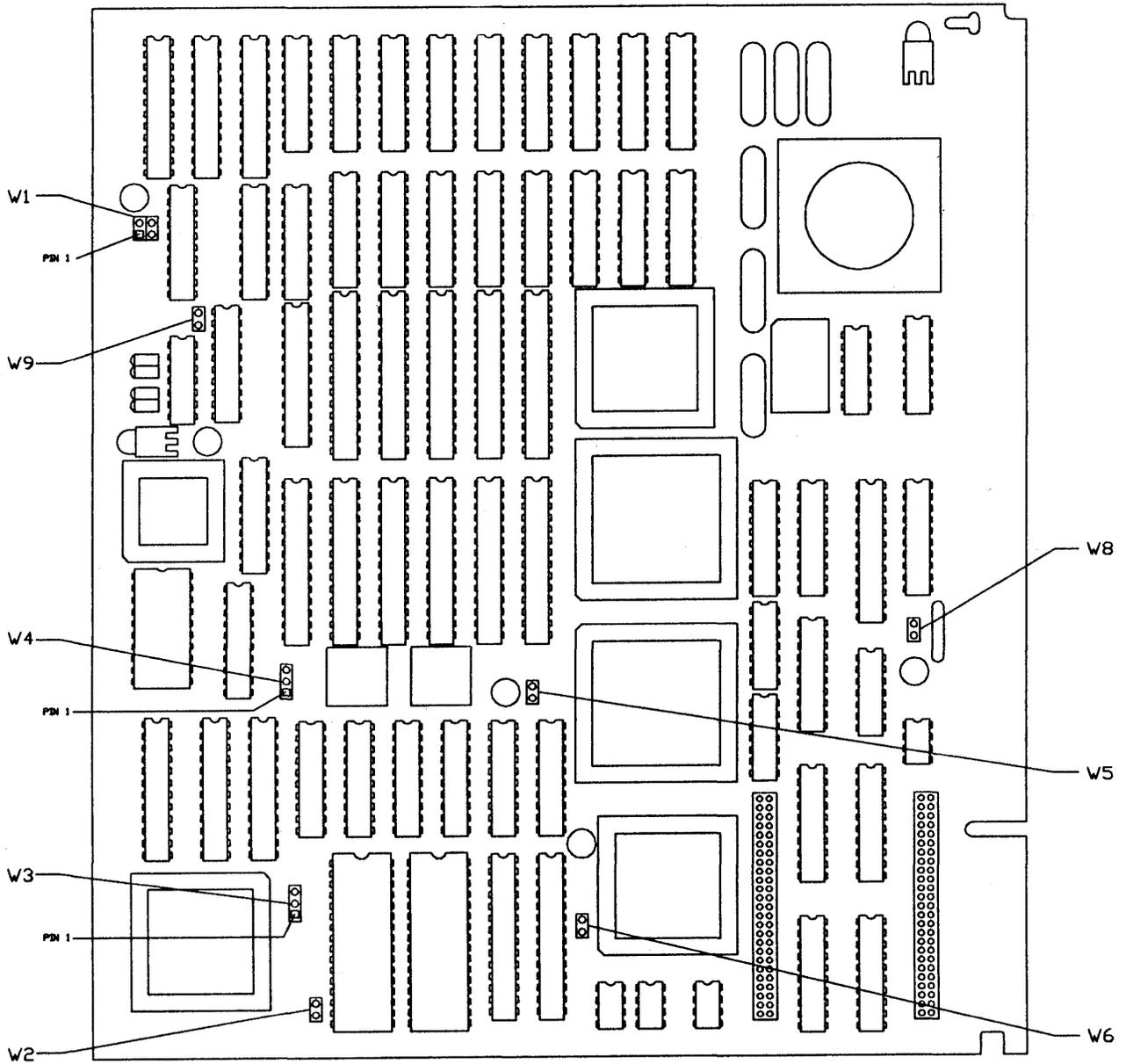
Figure C-1: CBI-1010 jumper locations
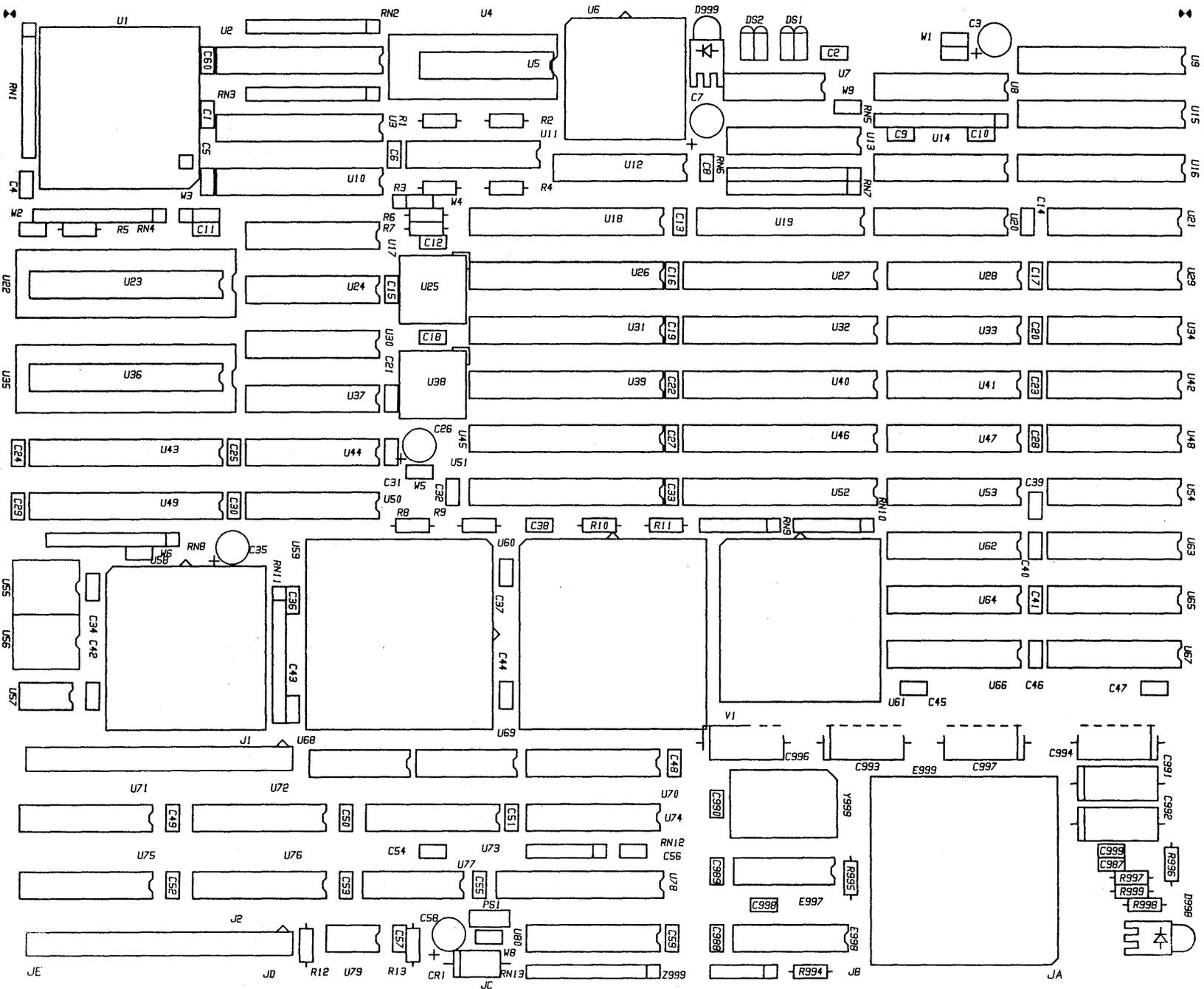
Figure C-2: CBI-1010 Silk Screen Rev. C

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CBI-1010 Quick Reference Guide

Installing the CBI-1010

1   Turn off the system. If you need to change the configuration for the CBI-1010 see section, "Hardware Configuration," Chapter 3 of the CBI-1010 User's Manual.

    Make sure you are wearing anti-static wrist straps.

2   Choose a correct slot for installing the CBI-1010 by reading the section "System Node ID."

3   Install the CBI-1010 in the correct slot with the ZIF connectors set into the system's backplane; push the ZIF handle down to clamp the CBI-1010 into place.

4a **Differential:** Install the back panel into the back of the system with the ribbon cable inside the system. If necessary, move external connector to "SCSI Differential" slot on back panel. (See Figure 2.)

4b **Single Ended:** Install the back panel into the back of the system with the ribbon cable inside the system. If necessary, move external connector to "SCSI Single Ended" slot on back panel. (See Figure 3.)

5   Locate the 60-pin ribbon cable and connect cable labeled JE CON1 to JE CON1 of the back panel (see Figure 1).

Component side of CBI-1010   Solder side of CBI-1010

Blue Node ID plug

JA Connector
JB Connector

CON1 pin 1

JC Connector

CON2 pin 1

CON1 pin 1

JD Connector

CON2 pin 1

CON1 pin 1

JE Connector

CON2 pin 1
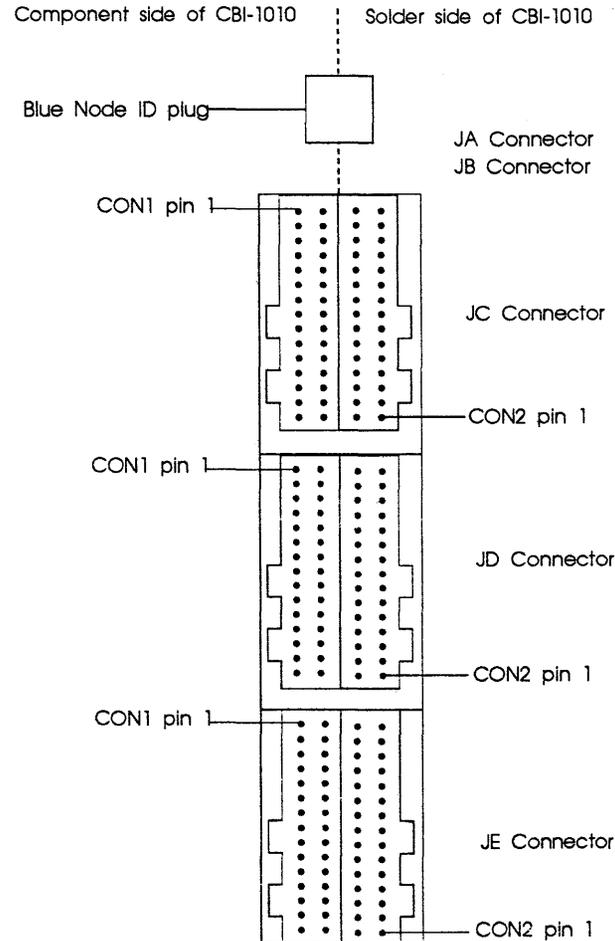
Figure 1: VAXBI backplane connectors

Pin 1 of the cable *must* match CON1 pin 1 of the backplane.

6   Connect JE CON2 of the ribbon cable to JE CON2 of the back panel.

7   Connect the 10-pin RS-232 cable to the back panel at J1 (see Figures 2 and 3).

Installing SCSI Devices

Be sure you have successfully installed the CBI-1010 into your system. Then follow these instructions to install SCSI devices:

1   Connect SCSI cables as listed below for the specified mode (see examples in Figures 2 and 3):

    For single-ended mode: Connect a SCSI cable from the back panel at the label "Single-Ended" to the SCSI devices (see "Cable Specifications"). The sum total of the internal and external cable lengths must not exceed 3 meters (9.9 ft.) at 10 MBytes/sec.

    For differential mode: Connect a SCSI cable from the back panel at the label "Single-Ended" to the SCSI devices (see "Cable Specifications"). The sum total of the internal and external cable lengths must not exceed 80-feet .

2   Terminate the *physical* ends of the SCSI bus by terminating the last SCSI device

with on-board termination (see manufacturer's documentation) or by using an external terminator.

Be sure devices in the middle of the SCSI bus are not terminated (see Figure 4).

The CBI-1010 is factory configured with on-board termination.

3 Set the devices SCSI ID numbers to the specifications set forth in "SCSI ID for Target Devices" (see manufacturer's documentation for setting devices SCSI ID).

On-Board Utility

The On-Board Utility can be used to change the system configuration for use with the CBI-1010 and other special features. To access the RS-232 utility, follow the instructions below.

1 Connect a terminal to the CBI-1010's RS-232 port (DB-25 connector or DEC compatible RJ-11/Modified Module 423 Jack connector of the back panel adapter kit).

2 Set the terminal baud rate to 9600 (8-bit data, 1-stop bit, no parity).

3 Halt the system's CPU, reset the system, and hit carriage return on the terminal.

Once the main utility menu shows up, you can key in the number to select the desired option. Press [CTRL] + C at any time to return to the main menu.

4 Refer the the next subsections for configurations. When completed, unplug the terminal, reset the system, and boot. DO NOT use the On-Board Utility while the system is running. Refer to CBI-1010 User's Manual, Chapter 4 for further details.
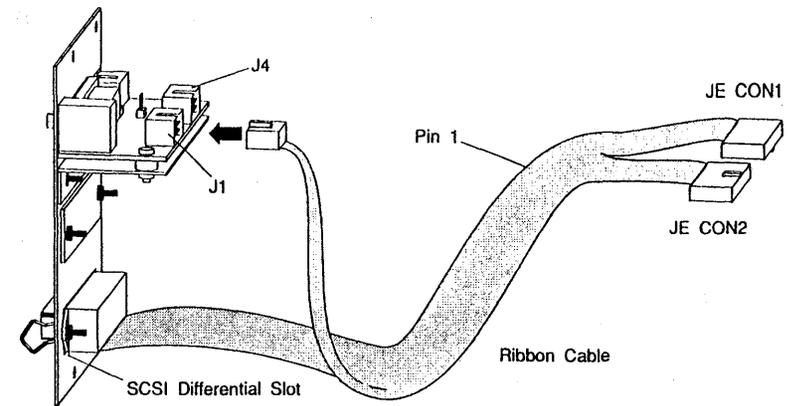
Figure 2: Back Panel (Differential)
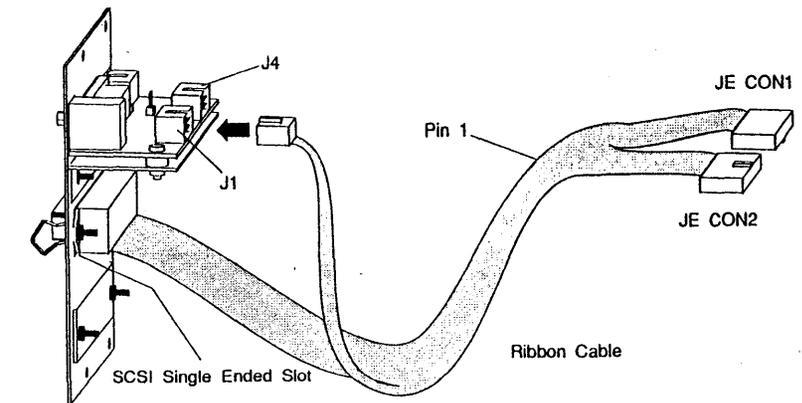
Figure 3: Back Panel (Single Ended)

Figure 4: SCSI cabling

T indicates SCSI bus termination.

CMD TECHNOLOGY, INC.
1 Vanderbilt Irvine, CA 92718
(800) 426-3832
(714) 454-0800

If you wish to contact CMD Technology for any reason concerning CMD Warranty Service, please call at (714) 454-0800 or send a letter to:

CMD Technology, Inc.
Customer Service Department
1 Vanderbilt
Irvine, CA 92718

Product_____

Model Number_____

Serial Number_____**Rev.**_____

Purchase Date_____

Purchased From (Dealer)_____

Please retain proof of purchase/sales receipt to verify CMD Warranty.
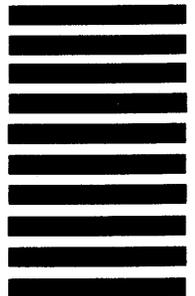
WARRANTY REGISTRATION CARD

The warranty on your CMD computer products and/or software is activated when the questions on this card have been filled out completely and this card has been received by CMD.

Product_____Model Number_____ Serial Number_____Rev._____

Identification (please provide company information if the system was purchased for your work place.)

Your name_____ Title _____

Company_____ Dept._____

Address_____

City_____ State/Province_____

Country_____ Day time phone_____

Authorized Reseller_____ Purchase date_____

What prompted you to buy CMD products?

❐ Advertisement   Magazine _____   ❐ Dealer Recommendation

❐ Article   Magazine _____   ❐ Referral

❐ CMD Competitive Price   ❐ CMD Quality Name Recognition

What computer did you purchase the product for?_____