TECH CONFIG & OPTION INST GUIDE

applicationDEC 433MP EISA

Technical Configuration and Option Installation Guide

This document describes the configuration and installation information for the applicationDEC 433MP EISA system and all option modules and media storage devices available with it.

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Preface

Intended Audience

This manual is intended for technical users of the applicationDEC 433MP system. Personnel responsible for installation and upgrade of the applicationDEC 433MP system will benefit from this book. Configuration and installation of all supported applicationDEC 433MP option modules and media devices are described in this book.

Purpose

This manual, the *Technical Configuration and Option Installation Guide*, is designed as a reference manual for all hardware configurable features of the applicationDEC 433MP system. It is not intended to be read sequentially. Instead, the manual is organized for easy reference when, at some later date, you need to install an option module or device.

It is helpful to read the entire *applicationDEC 433MP EISA System Overview* before you read this manual. The *System Overview* describes the system hardware components and describes how the system can be expanded for additional users, processing power, memory, storage space, or higher performance.

Each piece of the system is described in a single chapter. Both the installation and configurable features of each item are identified and the selection options shown.

Some chapters contain conceptual and general information, such as Chapter 3, SCSI Bus Schemes and Chapter 4, I/O Addresses and Interrupts. It may be useful to read these chapters prior to installing additional option modules or devices. In addition, you should read the other manuals in the applicationDEC 433MP documentation set.

applicationDEC 433MP EISA Documentation Set

This manual is part of a four-manual documentation set shipped with each applicationDEC 433MP system. The manuals in this set are listed in Table 1.

Table 1   applicationDEC 433MP EISA Documentation Set

Manual	Part Number	Purpose
System Installation Guide	EK-PS110-IG	Installation of hardware components; meant to be used once at initial installation.
Using the System	EK-PS110-RC	User information; this manual shows, in easily referenced format, how to operate the system hardware.
System Overview	EK-PS110-OV	User information; this manual provides a short overview description of the system. Methods of adding users, storage space, processing power, and memory are all briefly described. Technical details such as switch settings and installation instructions are omitted.
Technical Configuration and Option Installation Guide	EK-PS110-CG	System administrator information; describes how to configure all hardware items in the system; provides installation and configuration information for all option modules and optional media devices that can be installed in an applicationDEC 433MP system.

Table 2 lists related documentation.

Table 2 Related Digital Equipment Corporation Documentation

Manual	Part Number	Purpose
Upgrade Installation Instructions	EK-PS1XX-IG	Provided with the PS11K-DA Upgrade Kit; describes how to upgrade a PS10x-xx applicationDEC 433MP system to the PS11x-xx applicationDEC 433MP system level.
Terminal Multiplexer Intelligent I/O Subsystem Installation Guide	ER-PCTMC-IG	Installation of the terminal multiplexer host adapter, installation of the multiplexer software driver, installation of terminal concentrators, configuration of terminal and printer devices, description of using intelligent transparent printing, explanation of the terminal multiplexer extension power kit.
VRC16 Color Multisync Monitor Installation and User Manual	ER-VRC16-IG	Installation and use of the VRC16 monitor.
PS1XG-AA High Resolution Graphics Adapter Installation and User's Manual	ER-PS1XG-IG	Installation of the VGA module, use of the bootable diskette utility for configuration of adapter and bus mouse, description of DOS driver diskettes, description of all monitor modes supported.
ISA 16-Bit SCSI Host Adapter Installation and User's Manual	ER-PS1XR-IG	Installation of the ISA SCSI adapter, configuration of jumpers and terminator resistor packs.

Conventions

The following conventions are used in this manual:

`Enter`	A key name, such as Enter, is shown enclosed to indicate that you press a key on the keyboard.
`Ctrl/X`	A two key sequence, such as Ctrl/X, is shown enclosed to indicate that you must hold down the key labeled Ctrl while you simultaneously press another key.
`Ctrl/Alt/S`	A multiple key sequence, such as Ctrl/Alt/S, is shown enclosed to indicate that you must hold down the keys labeled Ctrl and Alt while you simultaneously press another key.
boldface text	Boldface text is used to represent the name of a command.
italic text	Italic text is used to indicate SCO UNIX file names.

1

Hardware Overview

This chapter describes the following hardware components of the applicationDEC 433MP system:

- Processors
- System memory
- Storage devices
- Media devices
- Dual bus design
- ISA modules

Figures 1–1 and 1–2 show where the storage and media devices are located in the system. Figure 1–3 shows the system back panel for a typical configuration.

1.1 Processors

The applicationDEC 433MP system is a symmetric multiprocessing computer. Symmetric multiprocessing is an architecture that shares system resources across all of the CPUs in the system.

All systems include one base processor module and a bridge module for communication with the EISA bus. Optional processor modules can be added.

The applicationDEC 433MP system allows up to four Intel 80486 processor modules to be installed in the system. The base processor module is standard in every system. Optional processor modules are the CPU/SIO module and the CPU/SCSI module.

Figure 1–1 applicationDEC 433MP Internal Components, Right Side

3.5" 1.44MB
Diskette
Drive

QIC Tape
Drive

CD-ROM Drive

5.25" 1.2MB
Diskette Drive

Power
Switch

Pull Out
Brake

209 MB
Hard Disk
(5 shown)

Power
Supply
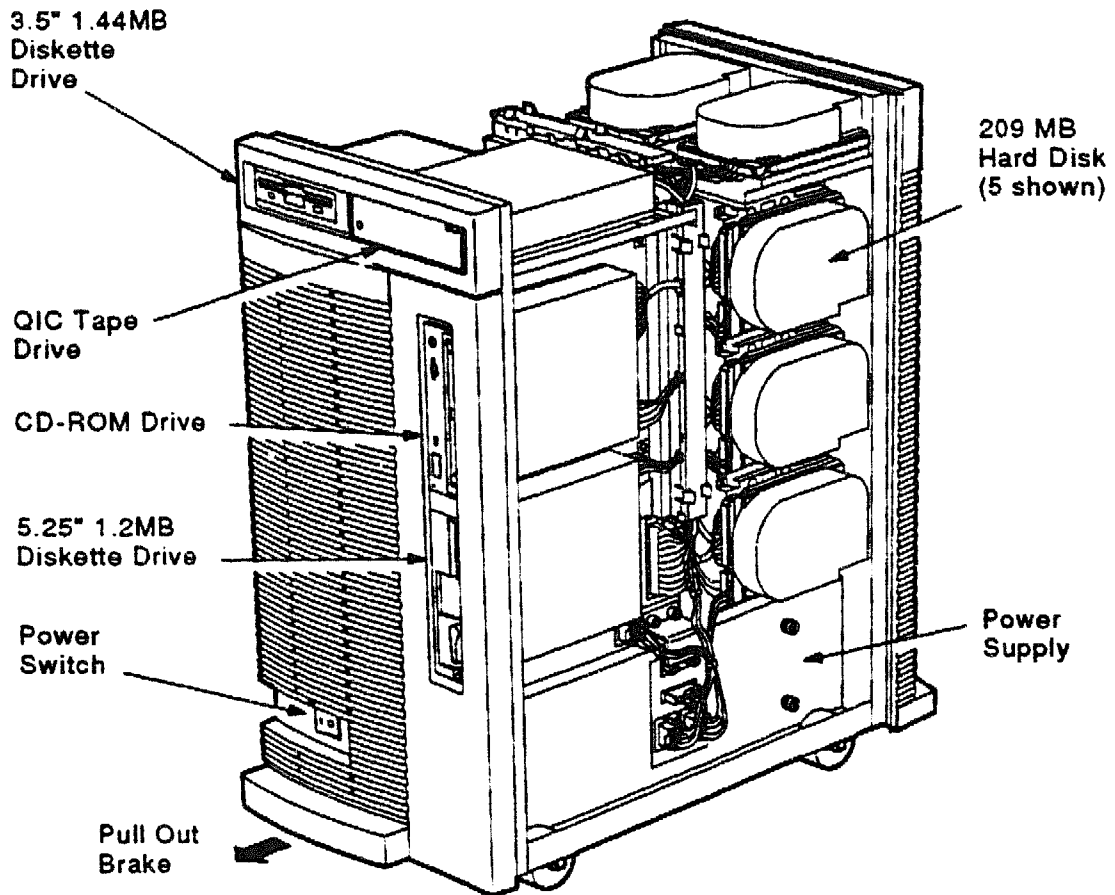
TA-0752-TI

Figure 1–2 applicationDEC 433MP Internal Components, Left Side

Q/C Tape Drive

3.5" 1.44 MB Diskette Drive

209 MB Hard Disk

Key to Unlock Top Panel

I/O Panel

AC Power Receptacle

Card Cage with 9 System Bus Slots and 7 EISA Slots
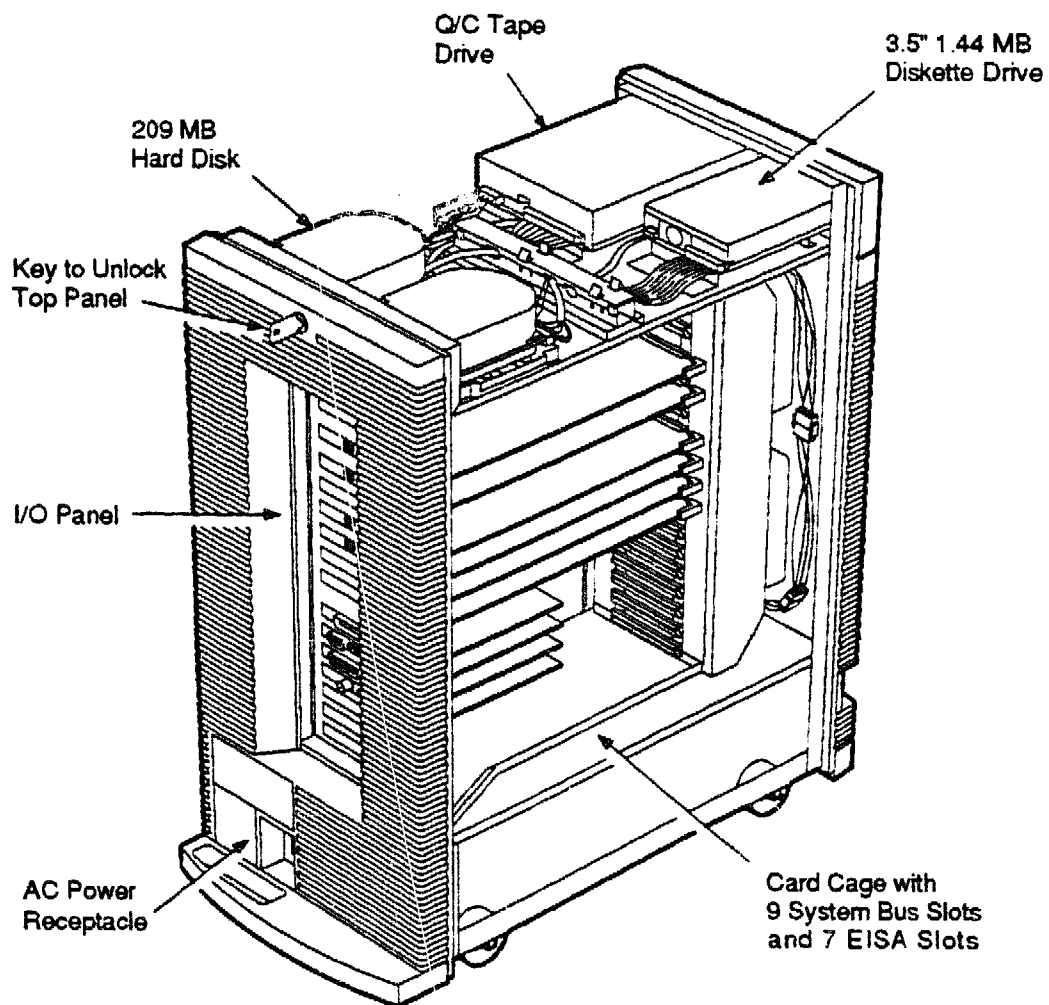
MR-0122-91DG

Figure 1-3 applicationDEC 433MP Back Panel, Typical Configuration

Panel Lock

Keyboard

Memory

CPU/SCSI

CPU/SIO

Reset Switch

ISA SCSI

Bridge

Serial/Parallel

Base CPU

VGA

Ethernet

AC Power
Socket
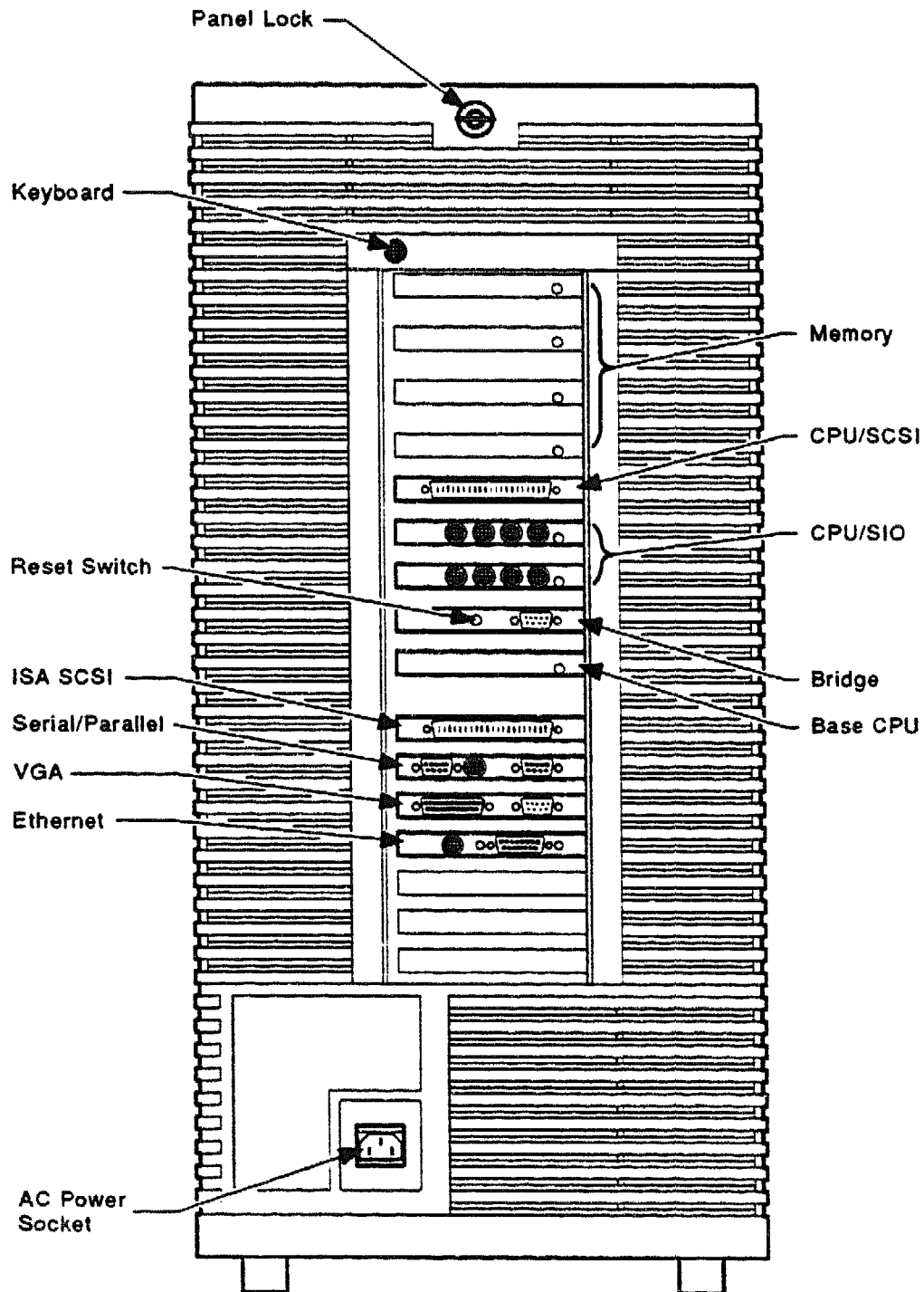
MR-0118-91DG

1.2 System Memory

The applicationDEC 433MP system comes with 8 MB of memory. Single inline memory modules (SIMMs) are used for easy upgrading of system memory. SIMMs can be added to a memory module in units of 4 MB. Each memory module can contain up to 16 MB of memory, and up to four memory modules can be installed. This provides a total system memory of 64 MB.

1.3 Storage Devices

The applicationDEC 433MP system comes with a single 209 MB hard disk drive. Mounting spaces within the system box allow up to five additional hard disk drives to be installed. If the five additional hard disk drives are 426 MB Digital Equipment Corporation drives, this provides a total of 2.3 GB within the system. Replacing the 209 MB hard disk drive with a 426 MB hard disk drive increases the total storage to 2.6 GB. For more storage, external storage expansion boxes are available. These storage expansion boxes can provide up to 19.2 GB of storage.

All hard disk storage devices are SCSI compliant.

1.4 Media Devices

The applicationDEC 433MP system supports the following media devices:

- 3.5-inch diskettes
- 5.25-inch diskettes
- CD-ROM
- QIC tape
- EXABYTE 8200 8-mm cartridge tape subsystem

The 3.5-inch 1.44 MB diskette drive reads and writes high-density and double-density diskettes. The 5.25-inch 1.2 MB diskette drive reads and writes high-density, and reads double-density diskettes. The CD-ROM is a High Sierra compatible compact disk, ROM drive. The QIC 320/525 MB tape is compatible with the QIC-320 format. For convenient backup of a large amount of data, the EXABYTE 8200 8-mm 2.5 GB tape drive is recommended.

The applicationDEC 433MP system comes with a single 3.5-inch diskette drive. The other media devices are all optional equipment.

1.5 Dual Bus Design

For increased system performance, the applicationDEC 433MP system uses a dual bus design. This design provides a system bus for processor and memory interaction and a separate I/O bus for communications and option modules.

The system bus in an applicationDEC 433MP system operates at 64 MB per second. This high speed means that processor requests for system memory data are filled quickly. The processors spend as little time idle as possible. CPUs and memory are installed in the system bus slots.

The applicationDEC 433MP system uses an EISA I/O bus for complete system openness. Up to seven ISA or EISA modules can be installed in an applicationDEC system.

1.6 ISA Modules

The applicationDEC 433MP system comes with the following ISA modules:

* ISA SCSI adapter (installed in backplane slot 10)

* Serial/parallel module (installed in backplane slot 11)

* Video graphics adapter (installed in backplane slot 12)

These ISA modules are all supported under SCO UNIX.

Your applicationDEC 433MP system may be configured with additional factory-installed ISA modules, including:

* PC4XD-DA terminal multiplexer host adapter

* EtherWORKS Turbo Ethernet controller

2

Booting the System

This chapter describes the applicationDEC 433MP system boot sequence and how to boot the system.

2.1 The Boot Sequence

The boot sequence is the procedure used by applicationDEC 433MP firmware to begin operation. When power is first applied to the system, the firmware is activated and begins operation. This firmware prepares the system for operation, and then begins the boot sequence.

The boot sequence has four basic steps:

* Power-on self-test (POST)

* ROM resident diagnostics (RRD) prompt (if enabled)

* Boot from diskette (if present)

* Boot from hard disk SCSI ID 0 (if there was no boot from a diskette)

The power-on self-tests provide a brief test of memory and CPU presence. If the power-on self-tests pass, the system proceeds with the RRD prompt, if enabled. If the RRD prompt is not enabled, the system proceeds directly to booting from diskette drive A.

The ROM resident diagnostics prompt is displayed only if the RRD is enabled in the setup menu. See Chapter 5, Setup Program, for details on how to enable the RRD. When the RRD diagnostics are enabled, the system pauses at the RRD prompt and waits for your input. You can either type **runall** to run the diagnostics, or you can type **b** to skip the RRD and continue the boot procedure. See Chapter 6, ROM Resident Diagnostics, for details on running the diagnostics.

The system always attempts to boot from the diskette drive first. The boot diskette drive is drive A. Drive A is factory configured to be the 3.5-inch diskette drive. The optional 5.25-inch diskette drive can be configured to be

drive A, the boot drive, if desired. See Figure 14–2, Bridge Module J11 Factory Configuration, for details on how to change the boot drive jumpers.

_____ **Note** _____

Do not leave nonbootable diskettes in drive A during the boot sequence.

_____

If nonbootable diskettes are in drive A during the boot sequence, the system attempts to boot from the diskette and will hang. A nonbootable diskette is a diskette such as a data file diskette, an application diskette, or a UNIX file system diskette.

If there is no diskette in drive A, the system attempts to boot from the hard disk SCSI ID 0 on the SCSI bus controlled by the ISA SCSI adapter. If the operating system is present on this disk, the system boots the operating system and begins operation.

If there is no operating system present, the system issues a message as shown below.

NO OS

The operating system should be installed after you see this message.

2.2 Booting the System

To boot the system from a diskette, use the following procedure:
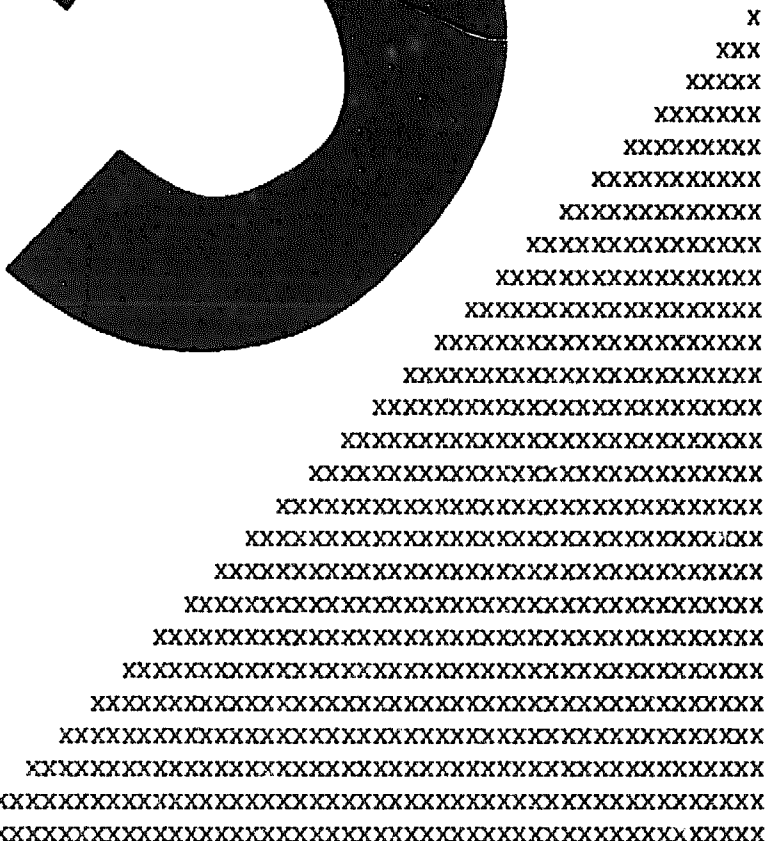
1. Insert the diskette into drive A. The 3.5-inch diskette drive is factory configured as drive A.

2. Power up the system or press the reset switch on the bridge module if the system is already powered up.

3. If the RRD is enabled, the RRD prompt appears. Type **b** at the RRD prompt.

    The system begins the boot sequence as described above and then loads and begins execution of the program on the diskette.

If the operating system is installed on the hard disk, booting the system can be done as described below:

1. Power-on the system or press the reset switch on the bridge module if the system is already powered up.

2. If RRD is enabled, the RRD prompt appears. Type **b** at the RRD prompt.

    The system loads the operating system from the hard disk and begins execution.

3

SCSI Bus Schemes

This chapter describes how the applicationDEC 433MP system uses the SCSI bus architecture for storage devices.

3.1 Description

The applicationDEC 433MP system uses the small computer storage interface (SCSI) bus to connect all hard disk drives, tape drives, and CD-ROM drives. The SCSI bus is an industry standard bus that allows for easy expansion and connection of drives.

3.2 SCSI Bus Schemes Available

The applicationDEC 433MP system provides a versatile approach to connecting SCSI storage devices. Up to four separate SCSI buses can be installed in the applicationDEC 433MP system, as shown in Table 3–1. Each SCSI bus has its own adapter.

Table 3–1 SCSI Bus Possibilities

Adapter	Devices Controlled
An ISA SCSI adapter	Can control internal devices and some external devices
A second ISA or EISA SCSI adapter	Can control external devices only, and affects capacity of first ISA SCSI adapter[1]
A CPU/SCSI in slot 5	Can control internal devices (those not controlled by ISA adapter) and external devices[2]
A CPU/SCSI in slot 6	Can control externally connected SCSI devices[2]

[1]SCO UNIX System V Release 3.2 Version 2.0 supports a maximum of four hard disk drives connected to the ISA SCSI adapter. This limit is a per-system limit, not a per-adapter limit. SCO MPX replaces the driver for the ISA SCSI adapter and allows up to seven devices per ISA SCSI adapter.

[2]Seven SCSI devices per SCSI bus is the maximum.

3.3 Software Hard Disk Drive Limitations

SCO UNIX System V Release 3.2 Version 2.0 contains a driver for the Adaptec 1540B ISA SCSI adapter. This is the driver used for the ISA SCSI adapter installed in the applicationDEC 433MP system. This driver supports up to seven SCSI devices per adapter, however there is a limit of four hard disks per system, regardless of the number of adapters installed. Thus, in a uniprocessor applicationDEC 433MP system a maximum of four hard disks can be installed.

SCO MPX replaces this standard driver with a new driver for the ISA SCSI adapter. This driver supports up to seven SCSI devices per ISA SCSI adapter, any number of which may be hard disks. Thus, in a multiprocessor applicationDEC 433MP system up to seven hard disks may be installed on each ISA SCSI adapter and on each CPU/SCSI adapter.

3.4 SCSI Bus Configuration Guidelines

Each SCSI bus in the system should be configured with the following guidelines in mind:

- All SCSI buses must be terminated at each end. If external devices are not attached to the external connector in the I/O distribution panel, a terminator must be installed on the connector.

- Each SCSI bus can have up to seven SCSI devices.

- Each device on the SCSI bus must have a unique SCSI ID between 0 and 6. (SCSI IDs are set with jumpers on the device. See the chapter on each device for the location of the jumpers, or refer to your vendor's documentation for non-Digital SCSI devices.)

- The adapter's SCSI ID is always 7.

- The total length of all SCSI cables on each SCSI bus must be less than 6 meters (18 feet).

3.4.1 Single SCSI Bus

The factory-configured applicationDEC 433MP system uses an ISA SCSI adapter to connect internal disk drives. In this configuration, shown in Figure 3–1, a maximum of seven devices can be attached to the internal SCSI cable. Eight connections are provided on the SCSI bus cable, but these connections are for use when a dual SCSI bus cable is added.

Figure 3–1 Single SCSI Bus Cabling Diagram

ID 0

ID 1

ID 2

ID 3

ID 4

ID 6

Terminator

No Connection

No Connection

Grey

ISA SCSI

System SCSI

Grey Cable

Maximum configuration for ISA/SCSI shown.

NOTE: A single SCSI bus uses a PS1XR-AA adapter in backplane slot 10. A single SCSI bus supports 7 devices. Actual devices installed may differ from those illustrated.
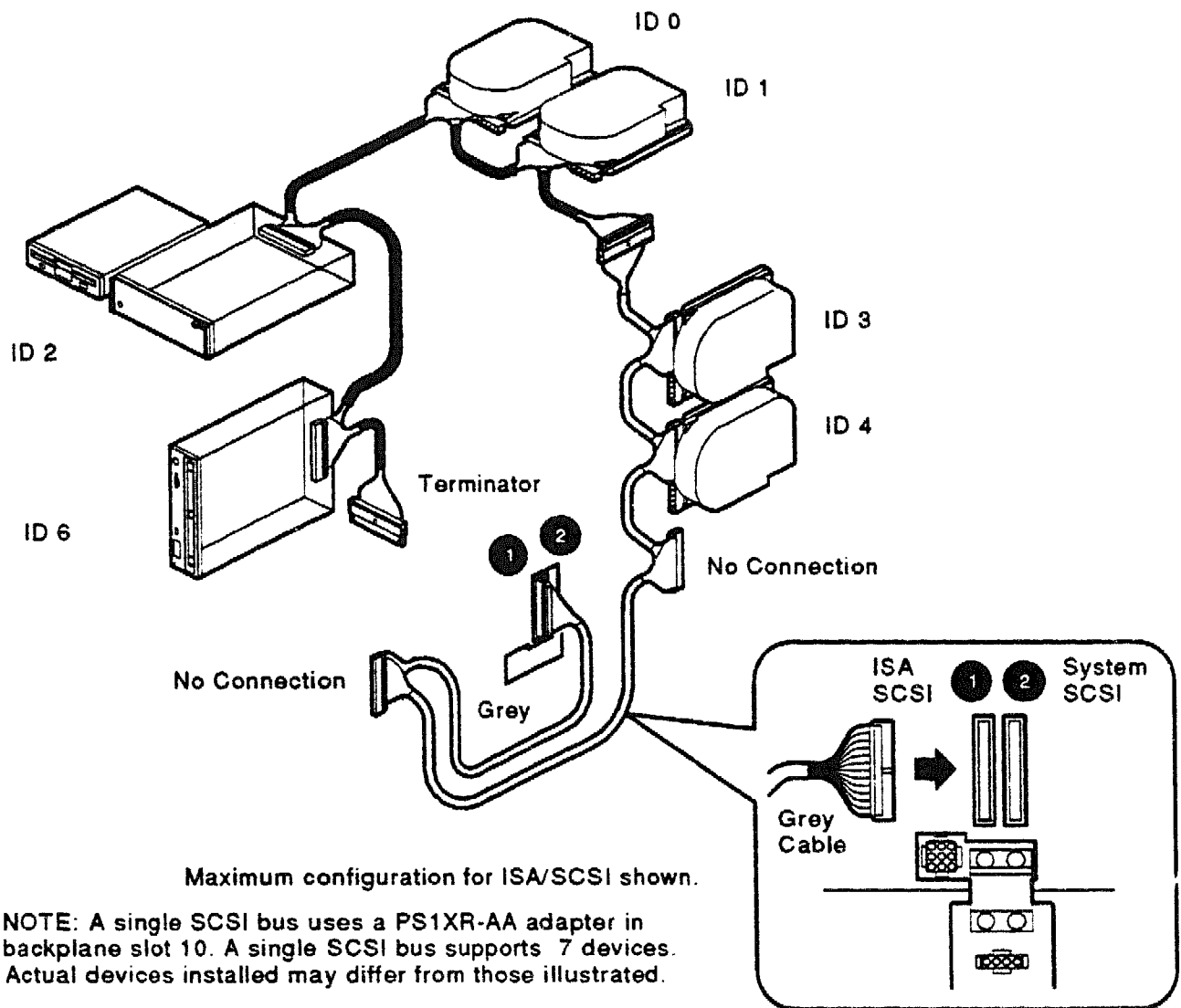
MR_0546-91DG

The ISA-based SCSI adapter has an external connector at the rear distribution panel. This connector can be used to add external SCSI devices to the SCSI bus. These external SCSI devices are part of the same internal SCSI bus. If external devices are added to the ISA SCSI adapter, the total of all devices on the bus must not exceed seven.

Use the **mkdev** command to configure devices on the ISA SCSI bus if this is a uniprocessor system. Use the **mkdev corollary** command to define devices on the ISA SCSI adapter if this is a multiprocessor system. See the *SCO MPX Release Notes and Installation Guide* for full information.

Use the PS1XR-*xx* Storage Expansion Box or the PS2XR-*xx* Storage Expander for external SCSI storage expansion. See Section 3.9 or Section 3.10.

3.4.2 Adding a Second ISA SCSI Adapter

The applicationDEC 433MP system is factory-configured for one ISA SCSI adapter. A second ISA SCSI adapter can be added. (In a uniprocessor system, however, a limit of four hard disks applies to the entire system. This is a restriction of SCO UNIX System V Release 3.2 Version 2.0.) The second ISA SCSI adapter can be used for external expansion only. Use the PS1XR-*xx* Storage Expansion Box or PS2XR-*xx* Storage Expander for external SCSI storage expansion. See Section 3.9 or Section 3.10 for more information on external storage expansion.

See Section 18.7 for details on how to install a second ISA controller.

3.4.3 Dual Internal SCSI Buses

For increased performance, the applicationDEC 433MP system supports a dual internal SCSI bus scheme. By using a CPU/SCSI option in the system bus, a second SCSI bus can be added.

The CPU/SCSI option provides additional CPU processing power for symmetrical multiprocessing. The Intel 80486 chip executes user and system code, and additionally processes SCSI requests and data transfers on the high performance SCSI bus. Because the CPU/SCSI is installed in the system bus, SCSI requests from other CPUs can be satisfied more quickly since data does not have to be exchanged over the slower ISA bus.

Use the **mkdev corollary** command to define devices on the CPU/SCSI adapter. See the *SCO MPX Release Notes and Installation Guide* for full information.

The dual bus cabling scheme is designed so that most of your internal disk drives are attached to the high performance SCSI bus. Figure 3–2 shows how the two separate SCSI cables are routed when the dual SCSI bus capability is used.

Figure 3–2 Dual SCSI Bus Cabling Diagram
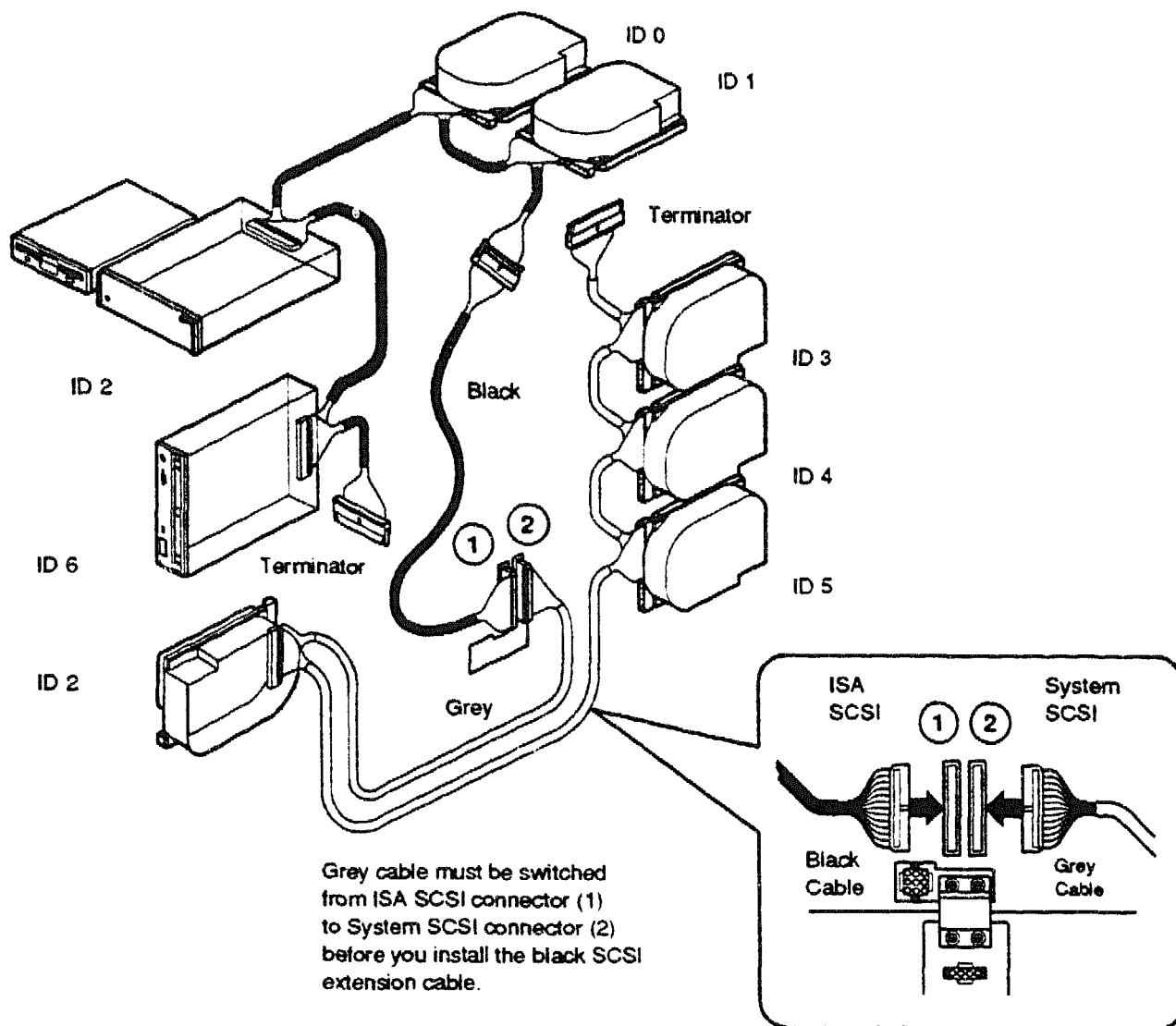
Grey cable must be switched
from ISA SCSI connector (1)
to System SCSI connector (2)
before you install the black SCSI
extension cable.

NOTE: Dual SCSI buses use a PS1XR-AA adapter in backplane slot 10
and a CPU SCSI adapter in backplane slot 5. Refer to this manual for
complete installation details.

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The CPU/SCSI adapter, when installed in backplane slot 5, can be used for
both internal SCSI devices and external SCSI devices. If external devices are
attached, the total number of internal and external devices must not exceed
seven. See Chapter 17 for further information on the CPU/SCSI adapter.

Use the PS1XR-*xx* Storage Expansion Box or PS2XR-*xx* Storage Expander for external SCSI storage expansion. See Section 3.9 or Section 3.10 for more information on external storage expansion.

3.4.4 Dual SCSI Buses with External SCSI Expansion

For additional expansion beyond the dual internal SCSI bus configuration, an additional CPU/SCSI adapter can be be installed for external connections only. This CPU/SCSI adapter provides additional processing power and serves as an adapter for the external SCSI bus.

The second CPU/SCSI module is installed in slot 6 of the backplane.

Use the PS1XR-*xx* Storage Expansion Box or PS2XR-*xx* Storage Expander to attach external storage devices. Up to three PS1XR-*xx* Storage Expansion Boxes or two PS2XR-*xx* Storage Expanders can be connected. See Section 3.9 or Section 3.10.

Devices on this external SCSI bus (whether internal or external) are defined by using the **mkdev corollary** command. See the *SCO MPX Release Notes and Installation Guide* for full information.

3.5 Recommended Slot for Systems with One CPU/SCSI

For systems with only one CPU/SCSI, Digital Equipment Corporation recommends that you install this CPU/SCSI in slot 5. This ensures an easy upgrade path should you ever install a second CPU/SCSI.

SCO MPX recognizes as device *ciha0* the first CPU/SCSI seen in the backplane (by searching the backplane slots is ascending numerical order: slot 1 through 9). When you have two CPU/SCSIs installed, the CPU/SCSI in slot 5 is *ciha0* and the CPU/SCSI in slot 6 is *ciha1*. When you have one CPU/SCSI installed, it is *always* recognized as *ciha0*, regardless of slot.

_____ **Note** _____

If you have only one CPU/SCSI installed, future upgrades will be easier if you install the single CPU/SCSI in slot 5. It will be configured now as *ciha0* and will remain *ciha0* when the second CPU/SCSI is installed.

_____

If you install the first CPU/SCSI in slot 6, it will be configured as *ciha0*. At the later addition of a CPU/SCSI in slot 5, the slot 5 CPU/SCSI becomes *ciha0*, and an entire reconfiguration of your filesystem is necessary. This is avoided if you place your first CPU/SCSI in slot 5.

3.6 SCSI ID Addresses

The SCSI architecture allows for eight addressable devices to be connected to the SCSI bus. This includes the adapter, which controls SCSI bus requests and data transfers. In an applicationDEC 433MP system, the adapters use SCSI address 7. Each storage device connected to a SCSI bus must have a unique ID address between 0 and 6.

A SCSI storage device ID address is typically set on the device with jumpers. All applicationDEC 433MP system SCSI storage devices use jumpers to set the SCSI address. There are three ID jumpers, used to represent binary numbers between 0 and 7. When a jumper is installed, it represents a 1 in that address position. Thus, if no jumpers are installed on the three jumper pins, the ID address is set to 0. If a jumper is installed on the middle jumper pins, the ID address is set to 2. Figure 3–3 shows how jumpers are installed to set SCSI IDs.

Figure 3–3 SCSI ID Jumpers

MR–5122–RA
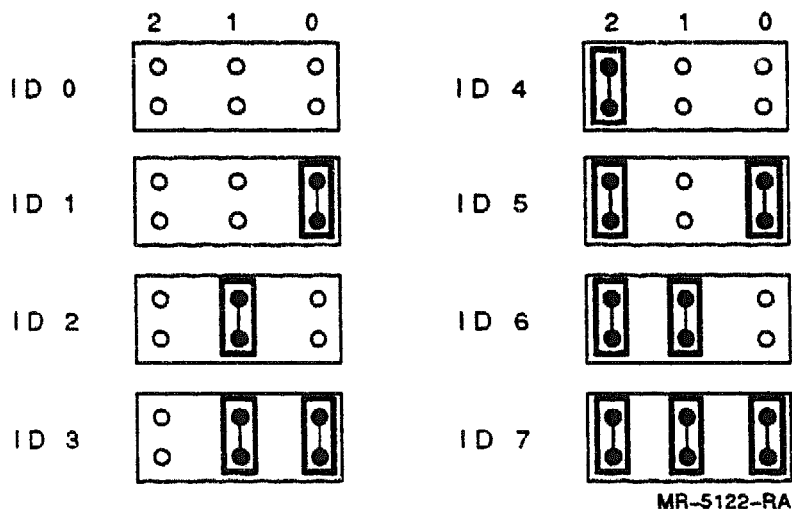
3.7 Recommended SCSI Device ID Addresses

In the applicationDEC 433MP system, all factory-installed devices are factory-configured with proper SCSI ID addresses. The ID address scheme is designed to avoid changing SCSI ID addresses when you upgrade a system to include the second CPU/SCSI bus. Figure 3–4 shows the default SCSI ID addresses for each device installed in the system.

Figure 3–4 Recommended SCSI ID Addresses
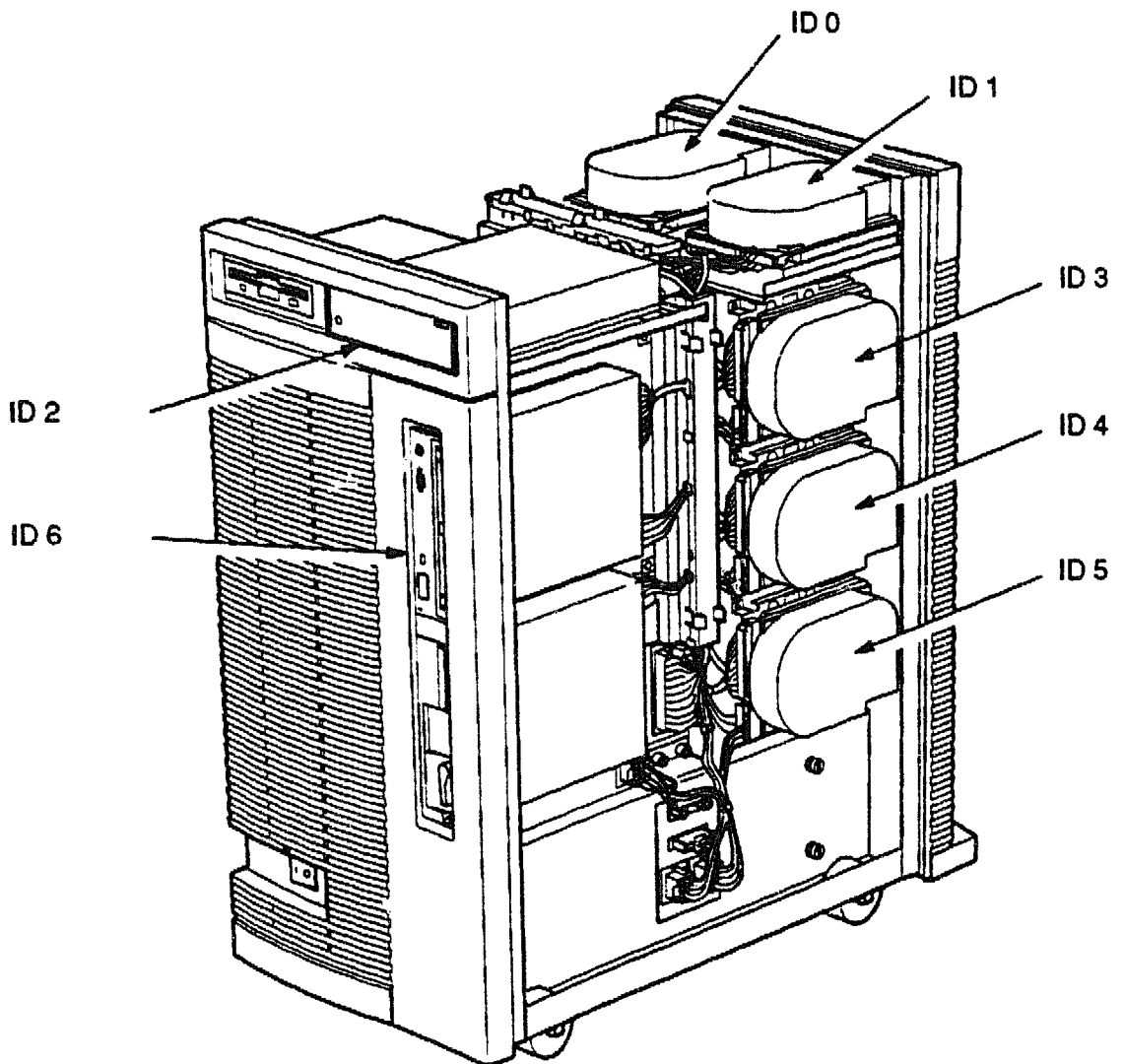
TA-0713-AC

When you upgrade the system to include a system bus-based SCSI bus, you do not need to change the SCSI ID of any existing devices, if you use these ID addresses.

3.8 SCSI Terminators

All SCSI buses must be terminated at both ends of the SCSI bus. The SCSI buses are terminated internally with connectors on the end of the cables. The external connectors of both the CPU/SCSI and the ISA SCSI adapter must be terminated by installing an H8574-A 50-pin terminator. If the SCSI is extended externally, the terminator must be installed on the open port of the last storage expansion box.

Figure 3–5 shows the terminator used.

Figure 3–5 SCSI Terminator
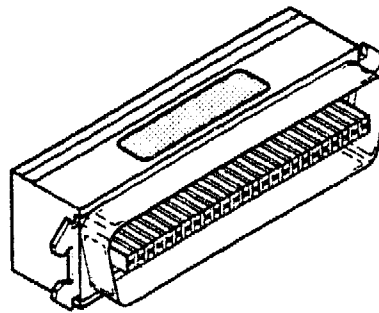
MLO-002346

3.9 External SCSI Storage Devices in the PS1XR-*xx* Storage Expansion Box

The Storage Expansion Box provides additional storage capacity. The Storage Expansion Box is available in a variety of configurations. Each Storage Expansion Box can contain up to two SCSI devices. Up to three Storage Expansion Boxes can be chained together if attached to an adapter without internal drives (a CPU/SCSI in slot 6 or a second ISA SCSI adapter with SCO MPX). When attached to a CPU/SCSI in slot 5 or the standard ISA SCSI adapter, one Storage Expansion Box can be attached.

The Storage Expansion Box connects to the external connector of the CPU/SCSI or an ISA SCSI adapter. The terminator on these connectors is removed, but is reinstalled on the connector of the last Storage Expansion Box attached.

The -xx in the PS1XR-xx order number indicates how much storage is contained in the Storage Expansion Box. For variations that have only one hard disk factory-installed, an upgrade variation is available that allows you to install an additional hard disk.

Up to three Storage Expansion Boxes can be connected together. By connecting three PS1XR-EA, (or -E3) boxes to a CPU/SCSI in slot 6, 6.0 GB of external storage is available. This is in addition to a possible 2.6 GB of storage inside the system box.

Table 3-2 lists the external storage options available for the PS1XR-xx Storage Expansion Box.

Table 3-2 PS1XR-xx External Storage Options

Option	Disk Drives Installed	Total External Storage
PS1XR-CA, C3	One 665 MB RZ56	665 MB
PS1XR-BA, B3	Two 665 MB RZ56	1.3 GB
PS1XR-FA, F3	One 1.0 GB RZ57	1.0 GB
PS1XR-EA, E3	Two 1.0 GB RZ57	2.0 GB

The second letter in the -xx extension of the PS1XR-xx order number designates power supply requirements. An -xA variation designates a 120 V power supply. An -x3 variation (such as -C3) designates a 240 V power supply.

Expansion kits are also available for adding 665 MB or 1.0 GB hard disk drives to the single-disk storage expansion boxes (PS1XR-C and PS1XR-F). These are listed in Table 3-3.

Table 3-3 Single-Disk Storage Expansion Box Options

Option	Disk Drives Installed
PS1XR-DA	One 665 MB RZ56
PS1XR-GA	One 1.0 GB RZ57

3.10 External SCSI Storage Devices in the PS2XR-*xx* Storage Expander

The Storage Expander allows for a variety of configuration options in one tower cabinet. The Storage Expander can contain up to 14 half-height disk drives for a total capacity of 5.8 GB, or up to 7 full-height disk drives for a total capacity of 7.0 GB.

The Storage Expander has the following features:

- A total of 14 half-height (7 full-height) storage bays

- Four half-height (2 full-height) externally accessible bays, for tape drives or SCSI diskette drives (available from many vendors)

- Connections for one or two SCSI buses

- A 350 W international power supply, which automatically senses 110/120 V or 220/240 V

For maximum storage, a Storage Expander with seven 1.0 GB disks can be attached to each CPU/SCSI. This provides a total external storage capacity of 14 GB.

_____ **Note** _____

If the Storage Expander is attached to an adapter which is also controlling internal drives, the total number of internal drives and external drives must not exceed seven.

_____

The Storage Expander is available in two versions. The first letter in the -*xx* extension of the order number indicates who will install the drive. If you want Digital to install the drives, order PS2XR-AA or PS2XR-A3. If you want to install the drives or if you want your dealer to install the drives, order PS2XR-BA or PS2XR-B3. You must order each drive separately.

The second letter in the -*xx* extension of the order number indicates the power cord requirements. An -*x*A order number includes a US power cord. An -*x*3 order number (such as -A3) includes your choice of a country-specific power cord.

Table 3–4 lists Digital-supplied drives that can be installed in the Storage Expander.

Table 3–4 Hard Disk and Tape Drives

Formatted Capacity	Model Number	Order Number	Size
209 MB	RZ24-S	RZ24-S	Half-height (3.5-inch)
426 MB	RZ25-S	RZ25-S	Half-height
665 MB	RZ56	PS1XR-DA	Full-height (5.25-inch)
1.0 GB	RZ57	PS1XR-GA	Full-height
525 MB QIC tape	TZK10-E	TZK10-E	Half-height

If you want Digital to install the drives, order RS24-SJ, RZ25-SJ, TZK10-EF, PS1XR-DA, or PS1XR-GA. If you want to install the drives, order RS24-SH, RZ25-SH, TZK10-EG, PS1XR-DA, or PS1XR-GA.

Table 3–5 shows the configurations that provide the maximum storage and maximum number of drives. With many applications, when you install the maximum number of drives, the performance improves because multiple processes can access the drives simultaneously rather than sequentially.

Table 3–5 Maximum Configurations

Configuration	Drives Installed	Model Number	Size	Capacity
Maximum storage	7	RZ57	Full-height (5.25-inch)	7.0 GB
Maximum number of drives	14	RZ25	Half-height (3.25-inch)	5.96 GB

Externally accessible drives can be added to any configuration. They must be installed in the upper front storage bays. Generally, they occupy a single, half-height storage bay.

The cabling scheme allows two SCSI buses within a single Storage Expander enclosure. If more than seven drives are installed, two SCSI buses are required. If less than seven drives are installed, two SCSI buses may improve the performance. (Each SCSI bus requires a SCSI adapter in the host system.)

3.11 Maximum External Storage

To achieve the maximum amount of storage, Digital recommends that you use two fully loaded PS2XR-xx Storage Expanders, each connected to a CPU/SCSI module. (The CPU/SCSI module in backplane slot 5 is not connected to any internal disks.) This configuration provides up to 14 GB of external storage capacity and has been fully tested and qualified by Digital Equipment Corporation.

Further expansion is possible by attaching another PS1XR-xx Storage Expansion Box or a PS2XR-xx Storage Expander to the standard ISA SCSI adapter or a second ISA SCSI adapter. However, Digital Equipment Corporation has not tested and qualified these combinations.

The maximum theoretical storage is 28 GB. In this configuration, four PS2XR-xx Storage Expanders, each with seven 1.0 GB drives installed, are connected on each of the four possible SCSI buses. This configuration has no internal drives.

Greater storage expansion might be possible with full-height drives from other vendors (that have capacities greater than 1.0 GB) installed in the Storage Expander. At this time, Digital has not tested vendor drives in a Storage Expander connected to an applicationDEC 433MP system.

4

I/O Addresses and Interrupts

This chapter provides configuration information for ISA options that are installed in the EISA bus.

4.1 Description

The extended industry standard architecture (EISA) bus provides you with an open architecture for installation of any ISA or EISA option module. Seven EISA option slots are available for installation of an option module. Three ISA modules are standard with the applicationDEC 433MP system, leaving four slots available for option modules.

4.2 IRQ Interrupt Lines

Prior to installation in the EISA bus slots, an option module must be assigned a unique interrupt priority level, or IRQ. (IRQ stands for interrupt request, a signal line in the ISA and EISA bus.) The EISA bus supports 16 IRQ lines, numbered from 0 to 15. However, not all of these assignments are available on each ISA or EISA option. Many options allow you to select from only three or four IRQ lines.

IRQ lines have differing levels of priority. The highest priority is given to IRQ9 and the lowest priority to IRQ7. If two devices request service at the same time, the device with the higher priority IRQ line is serviced first. Table 4–1 shows the ranking scheme for IRQ priority.

Table 4–2 summarizes the available IRQ settings for all standard applicationDEC 433MP system ISA option modules.

Table 4-1 IRQ Priority Levels

IRQ Line	Priority
IRQ0	Highest
IRQ1	
IRQ2	
IRQ8	
IRQ9	
IRQ10	
IRQ11	
IRQ12	
IRQ13	
IRQ14	
IRQ15	
IRQ3	
IRQ4	
IRQ5	
IRQ6	
IRQ7	Lowest

Table 4-2 ISA Bus Interrupt Lines

Option	Available IRQs	Set By SW/HW
PS1XG-AA VGA	2, 3, 4, 5	Set by SW utility.
Serial/parallel adapter		
COM port	2, 3, 4, 5	Set by jumpers.
Parallel port	5, 7	Set by jumpers.
Terminal multiplexer	10, 11, 12, 15	Set during SW installation.
ISA SCSI adapter	9–12, 14, 15	Set by jumpers.

Each ISA or EISA option must have a unique IRQ assigned to it. Some options, such as the applicationDEC 433MP serial/parallel port, make use of more than one IRQ assignment because of additional functionality on the module.

When you install an ISA or EISA option other than those listed in Table 4–2, you must ensure that it has a unique IRQ assigned to it. Refer to the documentation supplied with the option to determine how to select an IRQ line.

4.3 EISA Option I/O Addresses

EISA options are also assigned an I/O address. Because the CPU uses the address to identify the option, the address must be unique (see Table 4–3).

Many EISA options have selectable addresses. Generally, this design allows you to install more than one module of the same kind. Additionally, however, it allows you to select a new address for an option whose default address conflicts with an already installed option.

Table 4–3 ISA I/O Address Assignments

Option	I/O Address	Selectable or Fixed
PS1XG-AA VGA		
Video port	3B0–3DF	Fixed.
Mouse port (primary)	23C–23F	Factory default.
Mouse port (secondary)	238–23B	Set by SW utility.
Serial/parallel adapter		Set by jumpers.
Port as COM1:	3F8–3FF	
Port as COM2:	2F8–2FF	Factory default. COM1: is the serial connector on the bridge module.
Parallel port	3BC, 378, 278	Set by jumpers.
ISA SCSI adapter	330	Set by jumpers.

4.4 I/O Use of System Memory

In the PC system architecture, I/O options generally use memory locations betwen 640K and 1 MB. Some ISA and EISA options, however, use memory locations in higher ranges. Memory locations higher than 1 MB are usually reserved for system use. The applicationDEC 433MP system can accommodate options that use high memory locations.

When system memory is used for ISA or EISA options, the system designates those memory locations as noncacheable since the ISA or EISA options have no mechanism for updating the cache coherency status bits. The system identifies noncacheable memory locations by reading the system configuration file created by the ECU. Therefore, memory locations used by options in any space above 1 MB must be correctly identified in the CFG file for that option.

_____ **Note** _____

You must have a CFG file for your ISA or EISA option which uses space above 1 MB. This CFG file must be set to match the configuration of your ISA or EISA module which uses memory locations above 1 MB.

_____

4.5 Recommended Configuration for ISA Modules

Table 4–4 lists the recommended configurations for applicationDEC 433MP ISA option modules. This table is useful when you install one of the Digital Equipment Corporation options listed.

When you install other option modules in the system, it may be useful to consult Tables 4–5 through 4–8 to determine what I/O addresses and IRQ lines are available. Table 4–5 lists the IRQ lines and the assignments for each IRQ. Table 4–6 lists the I/O addresses used in the system. Table 4–7 lists the memory addresses used. Table 4–8 shows how DMA channels are assigned.

_____ **Note** _____

When you install an ISA or EISA option in an existing system, it is necessary to run the ECU to reconfigure that system for the new option and to set or change the memory allocation settings.

_____

These tables assume that you have a fully loaded system. The settings below are recommended even for a partially loaded system, because they allow for expansion without reconfiguring an existing ISA module.

Table 4–4 Recommended ISA I/O Address and IRQ Settings

Option	IRQ	Address	Memory
Serial/parallel module			
Serial port	3	COM2:	
Parallel port	7	LPT1:	
ISA SCSI adapter	11	330	
Adapter BIOS address			C8000
Second ISA SCSI	14	230	
Second adapter BIOS			Disabled
Terminal multiplexer	12		E10000–E1FFFF (Switches: H:E, L:1)
Second terminal multiplexer	12		E20000–E2FFFF (Switches: H:E, L: 2)
Bus mouse	5		
3Com 3c503 network	2	310	Memory disabled (if TCP/IP only)
			CC000 (if DECnet for SCO is installed)
Western Digital 8003 network	9	240	CC000

Table 4-5 ISA Module IRQ Assignments

IRQ Line	Device Allocation
0	Timer/counter
1	Keyboard
2	Cascade input from 8–15 (3Com 3c503 = alias 9)
3	COM2:
4	COM1:
5	Bus mouse
6	Diskette
7	LPT1:
8	Real-time clock
9	WD8003
10	MPX software interrupt
11	ISA SCSI adapter
12	Terminal multiplexer host adapter
13	FPU error
14	Unused (available for second ISA SCSI adapter)
15	Digital EtherWORKS Turbo

Table 4-6 I/O Address Allocation

I/O Address	Device Allocation
23C–23F	Bus mouse
240–25F	WD8003
2F8–2FF	COM2:
300–30F	Digital EtherWORKS Turbo
310–31F	3Com 3c503
330–332	ISA SCSI adapter
378–37F	LPT1:
3F0–3F7	Diskette
3F8–3FF	COM1:

Table 4–7 Memory Address Allocation

Memory Address	Device Allocation
0A0000–0BFFFF	VGA
0C0000–0C7FFF	Video BIOS
0C8000–0CBFFF	ISA SCSI adapter BIOS
0CC000–0CFFFF	WD8003 shared RAM (or 3Com 3c503 in DECnet environment)
0D0000–0DFFFF	Digital EtherWORKS Turbo
0E0000–0E7FFF	Diagnostic RAM
E10000–E1FFFF	Terminal multiplexer host adapter (first)
E20000–E2FFFF	Terminal multiplexer host adapter (second)

Table 4–8 DMA Channel Allocation

DMA Channel	Device Allocation
0	Spare
1	Spare
2	Diskette
3	Spare
5	ISA SCSI adapter
6	Spare (second ISA SCSI adapter)
7	Spare

5

Setup Program

This chapter describes the ROM resident setup program.

5.1 Description

The ROM resident setup program is used to specify the following characteristics of the system:

- Des' ,nation of disk drive A

- Designation of disk drive B

- Turn on or off the ROM resident diagnostics (RRD)

- Designation of the boot drive location

5.2 Accessing the Setup Program

To get to the setup menu, press [Ctrl/Alt/S] during the boot sequence, anytime after the "Extended RAM Passed" BIOS message.

_____ **Note** _____

The setup menu cannot be accessed when the ECU is executing. Do not press [Ctrl/Alt/S] while the ECU is running.

_____

5.3 Changing Setup Parameters

The system stores many system parameters in battery backed-up RAM. These parameters are available to the system each time it starts up.

After you have used the Ctrl/Alt/S key sequence, the default setup menu and current options are displayed. An applicationDEC 433MP system with one diskette drive has the following default setup options:

```
BIOS Setup Version 3.05
Copyright 1990 Quadtel Corporation.  All rights reserved.
 1> Diskette Drive A.............: 3.50-inch (1.44 MB)
 2> Diskette Drive B.............: Not Installed
 3> RRD Menu Status..............: Off
 4> Boot Device..................: EISA Bus
 5> Save Current Options
Select option to change [0 to Exit]:
```

To change the value of an option, type the number (1 to 4) of the option you want to change. Then type either the new value or a number specifying the new value.

For example, to enable RRD, type 3. To exit the setup program, type 0.

Each time you change the value of an option, the setup utility menu is redisplayed with the current values.

You can change the following parameters:

1> Diskette Drive A

This option prompts you for the size of drive A, the boot drive. Specify the size of the drive so that UNIX can read from and write to the diskettes.

```
Select option to change [0 to Exit]:
The floppy diskette options are:
 0> Not Installed
 1> 5.25-inch (360 KB)
 2> 5.25-inch (1.2 MB)
 3> 3.50-inch (720 KB)
 4> 3.50-inch (1.44 MB)
Enter Diskette Drive A type [0..4]:
```

The default size for diskettes in drive A is 3.5-inch, 1.44 MB. The RX23 3.5-inch, 1.44 MB diskette drive is standard on all applicationDEC 433MP systems.

─────────────────────────────── **Note** ───────────────────────────────

Setting the diskette drive sizes from the setup menu does not designate which drive is drive A. Jumpers on the bridge module specify which drive is drive A. See Chapter 14, Bridge Module.

───

2> Diskette Drive B

This option prompts you for the size of diskettes in drive B. Specify the size of diskettes in the drive so that UNIX can read from and write to the diskettes.

```
Select option to change [0 to Exit]:
The floppy diskette options are:
 0> Not Installed
 1> 5.25-inch (360 KB)
 2> 5.25-inch (1.2 MB)
 3> 3.50-inch (720 KB)
 4> 3.50-inch (1.44 MB)
Enter Diskette Drive B type [0..4]:
```

The default size for diskettes in drive B is 5.25-inch, 1.2 MB. The RX33 5.25-inch, 1.2 MB diskette drive is optional on all applicationDEC 433MP systems. Therefore, type 0 to indicate that drive B is not installed, or type 1, 2, 3, or 4 to specify the size of your diskette drive.

3> RRD Menu Status

This option prompts you to turn on or off the ROM resident diagnostics (RRD) menu.

```
Select option to change [0 to Exit]:
The RRD menu status options are:
 0> Off
 1> On
RRD Menu Status.........:
```

If you set the RRD Menu Status to On, and you power up or reboot the system, the boot path goes to RRD and you get the RRD prompt (*). From the RRD prompt, you can type commands to run diagnostic tests. See Chapter 6.

If the RRD Menu Status is set to Off, the boot path does not take you to the RRD prompt.

4> Boot Device

This option specifies the bus location of the hard disk drive from which the operating system is booted. The boot drive can be located on the SCSI bus whose adapter is on the EISA bus (PS1XR–AA), or on the SCSI bus whose adapter is the CPU/SCSI on the system bus. The location of the boot drive is set by specifying the adapter's bus.

_____ **Note** _____

Booting from the CPU/SCSI adapter on the system bus is not currently supported.

_____

```
Select option to change [0 to Exit]:

The boot device options are:

 0> EISA Bus
 1> System Bus

Boot Device ............:
```

If the boot drive is a device on the EISA SCSI bus, enter 0. If the boot drive is a CPU/SCSI adapter on the system bus, enter 1. When 1 is entered, setup displays additional prompts:

```
Boot Device ............: 1 Enter
```

Setup next prompts you for the system bus slot ID number of the CPU/SCSI adapter from which you want to boot.

```
Enter System Boot Slot ID [5 or 6]: 6 Enter
```

After you select the system bus slot, setup displays the options menu showing your boot device selection.

```
BIOS Setup Version 3.05
Copyright 1990 Quadtel Corporation.  All rights reserved.
 1> Diskette Drive A.............: 3.50-inch (1.44 MB)
 2> Diskette Drive B.............: Not Installed
 3> RRD Menu Status..............: Off
 4> Boot Device..................: System Bus, Boot Slot ID 6
 5> Save Current Options
Select option to change [0 to Exit]:
```

5> Save Current Options

If you want to make the new parameters available to the system, you must save the current options.

```
Select option to change [0 to Exit]: 5 Enter
```

The options that you have specified are now saved.

If you change any option and then type 0 to exit, you are prompted to save current options before you exit.

```
Select option to change [0 to Exit]: 0 Enter
Configuration has been modified. Save options before you exit. [Y/N]?
```

Press Y to save your options before you exit.

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ROM Resident Diagnostics 6

6.1 Description

This chapter describes how to use the ROM resident diagnostics (RRD).

The ROM resident diagnostics (RRD) are firmware diagnostics that provide testing of all modules installed in the system bus. The diagnostics can detect and identify all modules installed in the system bus. Memory tests and processor tests are run to verify that all system bus modules are functional.

6.2 Running the RRD

The ROM resident diagnostics are available as part of the boot sequence of the system. If the RRD is enabled in the setup menu, then the RRD prompt (*) appears during the boot sequence. When the power-on self-tests complete, the system displays the RRD prompt.

To run the ROM resident diagnostics, type the **runall** command at the RRD (*) prompt and press Enter, as follows:

* runall Enter

As each test executes successfully, the number and name of the test is displayed on the console monitor.

The entire RRD diagnostic can take from 10 to 30 minutes, depending upon the configuration of your system.

If the diagnostics locate a problem with a CPU or memory module, one or more error messages are displayed. The error message includes the test name and number, the slot number of the faulty module, if applicable, and an error description.

By default the diagnostics continue running when an error occurs. To have the RRD stop execution when an error occurs, use the **abort on** command before executing the **runall** command:

* abort on [Enter]
* runall [Enter]

When the abort flag is set, RRD stops execution when an error is detected.

If a module is identified by the RRD as failed, further investigation is usually required before replacing the module. You should reseat the module in the backplane and rerun the test.

Contact your service provider in the event of an error message.

_____ **Note** _____

If you do not type a command at the RRD prompt, the RRD diagnostics time out and the system continues with the boot sequence.

_____

6.3 Enabling RRD with Setup

The RRD diagnostics must be enabled in the setup menu in order to be invoked during the boot sequence. When enabled, the RRD prompt is displayed for a short period of time during the boot sequence. If no characters are typed on the keyboard during this time, the system bypasses RRD and continues with the boot sequence.

If the RRD is not enabled, the RRD firmware is bypassed during the boot sequence and the system boots from the diskette drive or directly from the hard disk after the power-on self-tests conclude.

To get to the setup menu, press [Ctrl/Alt/S] during the boot sequence anytime after the "Extended RAM Passed" message is displayed.

Select item 3 from the setup menu, and then type 1 to enable the RRD diagnostics. See Chapter 5, Setup Program, for complete information on the RRD diagnostics.

6.4 Booting from the RRD Prompt

When the RRD diagnostics are enabled, the RRD prompt always appears during the boot sequence. If, at the RRD prompt, you do not want to run the RRD diagnostics, but instead, want to boot the system, use the **boot** command. Type **b** at the RRD prompt, as shown below:

* b [Enter]

The system then boots from either the diskette or the hard disk.

```
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7

EISA Configuration Utility

This chapter describes the diskette-based EISA configuration utility (ECU) software you use to configure your applicationDEC 433MP system.

7.1 Description

The EISA architecture includes a means of configuring a system by software. EISA option modules also have no jumpers or switches and their addresses and interrupt selections are all made with software.

The EISA configuration utility (ECU) is used to configure the system. The ECU performs many of the same functions that a firmware-based setup utility does in ISA systems. However, the ECU provides additional functionality beyond traditional setup utilities.

When the ECU executes, it is able to automatically detect your system module configuration (CPUs and memory) and any EISA modules that are installed. System modules are detected by reading data created by the RRD firmware diagnostics which execute on power-up. EISA modules are detected by polling modules on the EISA bus. ISA modules are detected by use of ISA CFG files; you define the ISA modules installed in your system.

The ECU then creates a system configuration file which represents the configuration of your system. The ECU saves system configuration files in two ways:

* By writing system configuration data to nonvolatile RAM on your base processor module

* By writing a system configuration file to your system configuration diskette

The NVRAM data is accessed by the system firmware. The NVRAM data must be accurate. Therefore the ECU must be run whenever your system configuration changes.

The system configuration file is also written to your ECU diskette as a backup. The file is included on your system as an SCI file.

_____ **Note** _____

The ECU diskette must be write-enabled to write a system configuration file to your diskette. No error message is produced if the ECU is able to write to NVRAM but not to your diskette. You must ensure that the ECU diskette is write-enabled.

_____

7.2 Diskettes Provided

Two diskettes are provided for use with the applicationDEC 433MP system. The ECU and system configuration diskette, labeled "appDEC 433MP ECU SYS CFG," contains both the ECU program and the system configuration files. When the ECU prompts you for the "System Configuration Diskette," this is the diskette that is needed. Also provided is a library diskette, labeled "Library Diskette," which contains vendor-supplied ISA CFG files for many ISA modules.

7.3 When to Use the ECU

You must run the ECU whenever any of the following occurs:

- When the system is first installed.
- When you add a system module such as memory or a CPU
- When you add or remove an ISA or EISA option module
- When you change a jumper or switch setting on an ISA option module
- When you need to set the date or time
- Whenever the base processor module or bridge module is replaced

It is important to remember that the ECU writes system configuration information to nonvolatile RAM (NVRAM) on the base processor module. The system relies on the information in this NVRAM for configuration information. Therefore, whenever the configuration of your system changes, you must run the ECU and save the system configuration file to your system NVRAM.

7.4 Booting the ECU

Boot the ECU from the 3.5-inch diskette drive. Insert the diskette labeled "appDEC 433MP ECU SYS CFG" into the drive and press the reset switch on the bridge module I/O panel.

——————————— **Note** ———————————

The setup menu cannot be accessed when the ECU is executing. Do not press [Ctrl/Alt/S] while the ECU is running.

_____

7.5 Main Menu Selections

When the ECU boots, five selections are presented on the main menu. These are:

- Learn about configuring your computer
- Set time
- Set date
- Configure computer
- Maintain configuration files

7.5.1 Learn About Configuring Your Computer

This brief series of screens provides a good overview of the EISA architecture including the difference between ISA and EISA modules and how the ECU controls system configuration.

7.5.2 Set Time

This selection allows you to set the time used by your system clock.

7.5.3 Set Date

This selection allows you to set the date used by your system clock.

7.5.4 Configure Computer

This selection is used to configure your system.

You must select this option to create a system configuration file. When the "Configure computer" menu appears, five steps are shown:

1. Important EISA information

2. Add or remove boards

3. View or edit details

4. Examine required switches

5. Save and exit

Step 2, "Add or remove boards," shows the entire configuration of your system. System modules and EISA option modules are automatically detected and are shown in this step. ISA modules must be "installed" in the system configuration file through the use of ISA CFG files. See Section 7.6 below.

Step 3, "View or edit details," is used to select the configurable features of the system and option modules. When you make a selection for system or EISA options, the feature will be set when you save the system configuration file in step 5. When you make a selection for an ISA module, you must ensure that the physical jumper or switch on the ISA module is set to reflect the change you select in the ECU.

_____ **Note** _____

It is your responsibility to ensure that the ISA module features set in the ECU accurately reflect the true settings of the ISA module. The ECU cannot detect or change features on ISA modules; the ECU only records those settings.

_____

For example, the ISA CFG file for the VGA module contains a selection indicating whether the mouse is enabled or not. This selection does not enable the mouse; enabling the mouse is done with the VSETUP program provided with the VGA module. Enabling the mouse in the ECU tells the ECU that IRQ5 is being used and that the mouse port address is being used. If you enable the mouse with the VSETUP program, but do not enable the mouse in the ECU, the ECU may believe that IRQ 5 is available and either assign it to an EISA module or list it as an available resource for other ISA modules.

Step 4, "Examine required switches," helps ensure that ISA modules are set on the module as defined in the ECU. This step is required if you have set any ISA module's configurable features. The jumpers shown in this step reflect the settings you selected in step 3. (If you change a feature in step 3, the jumper settings shown here change.)

Step 5, "Save and exit," creates the system configuration file that is written to NVRAM. A backup copy is also made on your system configuration diskette. You must save the system configuration file to complete the configuration process.

_____ **Note** _____

The ECU system configuration diskette must be write-enabled to create a system configuration file backup on your diskette.

_____

_____ **Note** _____

In the "Save and exit" menu, an option is available for returning to the operating system. This option is for DOS environments only and is not supported on a applicationDEC 433MP system.

_____

7.6 Maintain Configuration

This selection allows you to:

• Add ISA CFG files to your system configuration diskette library

• Copy or delete system configuration files (SCI files)

7.7 System Configuration Features in the ECU

In step 3, "View or edit details," of the "Configure computer" menu, several system level configuration choices are possible. Table 7-1 lists the system options that can be set in the ECU, along with the recommended default settings.

Table 7-1 System Configurable Options in the ECU

Feature	Default Setting	Description
Diskette drive A size	3.5-inch, 1.44 MB	This setting specifies the size of drive A. It does not specify which drive is drive A; jumpers on the bridge module specify which drive is drive A. The 3.5-inch drive is drive A by factory default.
Diskette drive B size	Not installed	If you ordered a 5.25-inch drive and it was factory integrated, this option will show 5.25-inch, 1.2 MB.
Video adapter	EGA/VGA	This should be changed only if you are using a monitor other than VGA.
Fixed disk drive 0	Drive not installed	This feature is for use with ST506 drives where the number of cylinders must be specified. Digital recommends that you use the SCSI bus for hard disk drives, not ST506 drives.
Fixed disk drive 1	Drive not installed	This feature is for use with ST506 drives where the number of cylinders must be specified.
Base processor cache	Disabled	The Intel 80486 chip has 8K of cache on board. This selection controls whether this cache is used or is disabled. Because of the large 256K cache on the processor modules, use of the chip cache does not significantly affect performance.
Boot device	ISA SCSI	The hard disk drive with SCSI ID of 0 attached to the ISA SCSI adapter is the boot device. Placing the boot drive on a disk attached to the CPU/SCSI is not currently supported by the CPU/SCSI software drivers. Therefore, this selection must indicate ISA SCSI.

(continued on next page)

Table 7–1 (Cont.) System Configurable Options in the ECU

Feature	Default Setting	Description
Shadow memory	Disabled	For each memory range, select disabled when running SCO UNIX or SCO ODT.

All of the other features listed as system features are informational only and cannot be changed.

7.8 Configuring Your System with the ECU for ISA Modules

When you have ISA modules in your system, you must install an ISA CFG file for that module. The ISA CFG file is used to record the settings of the ISA module. The settings must be accurate since the ECU uses the settings when determining available resources for auotconfiguration of EISA modules.

7.8.1 Adding an ISA CFG File

1. Boot the ECU.

2. Select "Configure computer."

3. Select "Add or remove boards."

4. With the arrow keys, highlight the backplane slot in which the module is (will be) installed and press Enter.

5. A menu choice is shown. Press Enter to see a list of available ISA CFG files on the system configuration diskette. The ISA CFG files for use with the three supplied ISA modules are shown in Table 7–2. To view ISA CFG files on the library diskette, replace the system configuration diskette with the library diskette and press Enter.

6. Use the arrow keys to select the desired ISA CFG file and press Enter.

7. The ISA CFG file is now installed in the slot you selected.

Table 7–2 ISA CFG Files for applicationDEC 433MP ISA Modules

ISA Module	ISA CFG File on System Configuration Diskette
ISA SCSI adapter (factory installed in slot 10)	ADP0100.CFG Adaptec AHA-1540/1542 ISA SCSI Host Adapter
Serial/parallel adapter (factory installed in slot 11)	DEC0040.CFG DEC Serial/Parallel Adapter
VGA adapter (factory installed in slot 12)	ATI0060.CFG VGA Wonder+
Terminal multiplexer host adapter (option module, any slot)	ISAC001.CFG Corollary 8x4 MUX

If the ISA module you are installing does not have an ISA CFG file shipped with it, and there is not one listed on the library diskette, you can use the generic ISA configuration file, "ISA0000.CFG." This file can be used to specify the I/O address, IRQ setting, DMA channel, and memory resources used by your ISA module.

You must configure the ISA CFG file to accurately represent the configuration of your ISA module. Use the "View or edit details" step to do this.

1. Select "View or edit details" from the "Configure computer" menu.

2. Use the arrow keys to highlight the module feature you need to set. Items such as addresses are shown.

3. Press F6 to see a list of resources used by the system. These resources include items such as IRQ settings. Many resources displayed by the F6 key are informational only and cannot be changed. If a resource can be changed, it is displayed with a plus (+) or minus (–) symbol. Press the plus or minus symbol at the top of the keyboard to select the resource used by your module.

_____ **Note** _____

Setting an ISA module feature in the ECU does not set the feature on the module. You must ensure that the ISA feature in the ECU matches the physical configuration of the module.

_____

_____ **Note** _____

ISA modules which use memory in any range between 8 MB and 15 MB must have an ISA CFG file installed in the ECU. The ISA CFG file must be used to identify memory locations used by the option. When an ISA module uses memory between 8 MB and 15 MB, the ECU marks that memory location as noncacheable. Options that use memory locations which do not have ISA CFG files installed will cause system memory conflicts.

_____

7.9 Configuring Your System with EISA Option Modules

EISA options are shipped with an EISA CFG file. This EISA CFG file must be installed on your system configuration diskette to enable the ECU to recognize all of the features selectable on your EISA module. The ECU can automatically configure your module using the available resources.

Although your system will detect the EISA option automatically, you must install the EISA CFG file to set all the configurable options on the module. The EISA CFG file is installed using the "Add or remove boards" step of the "Configure computer" menu. This EISA CFG file must be removed if the module is removed.

When EISA options are removed from a system, you must use "Add or remove boards" to tell the ECU that the option has been removed. Highlight the removed EISA module and press delete to remove it from the configuration.

When you make a selection for an EISA module in the "View or edit details" step, the selections are made on the module when you exit. No physical configuration of the module is necessary.

7.10 Automatic Configuration

The ECU will configure your system automatically. If you have only EISA modules installed, the configuration is completely automatic. The ECU scans the EISA modules you have installed, and selects available IRQs, I/O addresses, and memory options for each module. When you exit from the ECU, the selected settings will be configured for each EISA module.

When ISA modules are installed, and you select an I/O address or IRQ for the module, the ECU automatically checks to see if that resource is available. If it is not available, the ECU identifies the conflicting resource and suggests a change.

Automatic configuration can be disabled for the entire system:

1. Select the advanced configuration screen from the "View or edit details" menu by pressing F7. A submenu is displayed.

2. Highlight the "Set verification mode" item and press Enter.

3. Use the arrow keys to highlight the "Manual" item and press Enter.

In manual verification mode, the ECU will not identify resource conflicts until you select the "Verify" option during the "View or edit details" menu. The "Verify" option does not appear unless you are in manual verification mode.

Automatic configuration can be disabled for individual modules. By "locking" a board, you prevent the ECU from automatically changing the module's resources, or suggesting a change. To lock a module:

1. Select the advanced configuration screen from the "View or edit details" menu by pressing F7. A submenu is displayed.

2. Highlight the "Lock/unlock boards" item.

3. The list of slots with the modules installed is displayed. Use the arrow keys to select the module whose resources you do not want to change.

4. Press Enter to lock the board.

In all displays of the system, locked boards are designated with an exclamation mark (!).

7.11 Viewing Total System Configuration

The "Add or remove boards" step provides a complete view of all boards installed in your system. To view a summary of all system resources being used, press F7 during this display. The resources available are shown by resource. Thus, if you need to know what IRQ or I/O addresses are available, use this feature.

_____ **Note** _____

The available system amperage resource is for future use. Any number displayed in this resource should not be relied upon since not all ISA CFG files contain information about the amperage used by the board.

_____

7.12 Library Diskette

The EISA architecture is backwards compatible with the ISA architecture. However, since ISA modules were created and used before ISA CFG files were created, many ISA modules are in use which were shipped without ISA CFG files. In order to use these modules in EISA systems, ISA CFG files are required. To assist users of older ISA modules, many vendors have submitted ISA CFG files to the EISA consortium. These ISA CFG files are contained on the library diskette shipped with the ECU.

When you install an ISA module for which you have no ISA CFG file, look on the library diskette. The files are listed by their EISA standard file name, as well as by the vendor product name. The ISA CFG file for your ISA module can be installed in your system configuration file. Under the "Add or remove boards" step of the "Configure computer" menu, you have the option of inserting the library diskette to search for an ISA CFG file. Files for many popular ISA CFG files are contained on this diskette.

_____ **Note** _____

ISA CFG files contained on the Library Diskette are submitted to the EISA consortium by individual vendors. Digital Equipment Corporation has not qualified or tested any of the files on the library diskette and these files are provided as is.

_____

8

System Exerciser - Installation Verification Procedure

This chapter describes how to run the installation verification procedure (IVP) on the system exerciser diskette.

8.1 Description

The system exerciser diskette is a self-contained bootable diskette used to diagnose the complete system. It contains tests for additional sections of the system beyond the tests done by the ROM resident diagnostics. The system exerciser is bootable; you do not need an operating system installed to run the system exerciser.

The system exerciser device tests can be run in destructive (write/read) or nondestructive (read only) mode. Destructive mode erases and destroys any data currently present on a device. Destructive mode provides a more thorough testing of a device, but should only be used when you are certain that you do not need any data present on the device. It is primarily designed for devices on which you have not yet loaded any information.

In general, nondestructive (read only) testing identifies most device failures, and should be used for systems that are in current use.

_____ **Note** _____

Before you run the system exerciser, run the EISA configuration utility (ECU) to verify proper system configuration.

_____

8.2 Running the Installation Verification Procedure

The following steps explain how to load the system exerciser and run the installation verification procedure (IVP):

1. Insert the system exerciser diskette into the 3.5-inch diskette drive.

2. Boot the system from the diskette in either of the following ways:

   • Turn the system power off and then on again.

   • Press the reset switch on the bridge module I/O panel.

   When the system exerciser has been booted:

   a. System configuration information is displayed on the screen.

   b. You are prompted to load scratch media into all drives to be tested in write/read mode, and then to press any key when ready.

   c. Your are prompted for printer connection information.

   d. The system exerciser displays a message that it is sizing the SCSI and EISA. (Please wait about 5 minutes.)

   e. You are prompted to choose destructive or nondestructive device testing.

      Press [Enter] to select nondestructive testing for each device.

   f. A list of system exerciser tests is displayed on the screen

3. At the HLT> prompt, type the **ivp** command and press [Enter]:

   HLT> ivp [Enter]

   The system exerciser performs the 15-minute system installation verification procedure. (Ctrl/C halts the system exerciser, if necessary.)

   After 15 minutes, a success message is displayed, indicating that the system is functional.

   If an error is detected, the error message identifies the failing unit by naming the slot number, SCSI ID number, or device that failed a test.

4. If the system exerciser identifies a module or device as failed, further investigation is usually required before replacing the module or device. For example, check all connections to modules or devices. Reseat modules in the backplane. Check cable connections to a device to make sure the connection is complete.

5. If you do not find any other reason for receiving an error message, contact your service provider.

9

Console Monitor

This chapter describes the console monitor required for use with the applicationDEC 433MP system.

9.1 Description

The console is the monitor to which the system sends system error messages and communicates with the ROM resident diagnostics, the EISA configuration utility (ECU), and other system functions. The console must be a VGA monitor attached to the VGA adapter.

The standard applicationDEC 433MP system includes a video graphics adapter (VGA), and the VGA monitor is automatically configured as the console. No special setup or firmware changes are required. Note that the firmware detects a VGA adapter, but cannot detect at boot time whether the monitor is attached or powered up. The VGA monitor should always be powered up before you boot the system to ensure that all system messages are received.

The console is the only monitor to which system error messages are sent. In addition, the console is the only monitor from which setup, RRD, ECU, and system exerciser diagnostics can be run. The console monitor also displays prompts during software installation. Therefore, it is necessary to have a console monitor attached to the system.

The console also functions as a regular user interface to the system and does not need to be dedicated to system control functions such as RRD, installing software, or other system tasks.

Installing the VGA adapter is described in Chapter 20.

9.2 Attaching a VGA Monitor

This section describes how to install a VGA monitor and connect it to the VGA adapter. The VRC16 High Resolution Color Multisync monitor is the recommended monitor for use with the applicationDEC 433MP system. However, any monitor supported by the PS1XG-AA VGA adapter can be used.

The VRC16 is shipped with the *VRC16 Color Multisync Monitor User and Installation Guide* (ER-VRC16-IG), which contains more information on the monitor.

9.2.1 VRC16 Description

The VRC16 is a high resolution, 17-inch VGA color monitor that provides resolutions up to 1280 x 1024. It is compatible with VGA, Super VGA, and 8514/A standards.

9.2.2 VRC16 Installation

The VRC16 is shipped with the tilt-swivel base installed and the cable attached to the connectors on the back of the monitor. Therefore, installation of the VRC16 consists of the following tasks:

* Attaching the power cord to the monitor.

* Attaching the monitor cable to the PS1XG-AA VGA adapter. The cable is attached directly to the 9-pin analog connector on the VGA board.

Figure 9–1 shows the connection of the VRC16 to the PS1XG-AA adapter.

9.2.3 VRC16 Signal Detection

The VRC16 contains ten factory-installed configurations for various VGA and VGA compatible resolutions and refresh rates. The monitor contains an automatic detection circuit that interprets the signal presented from the VGA adapter. The monitor then configures itself for that resolution and refresh rate. See the *VRC16 Color Monitor User and Installation Guide* for more details.

9.3 Connecting a PC Keyboard

The PC keyboard for the VGA monitor is connected to the keyboard connector on the upper left rear of the system, just above the I/O distribution panel See Figure 9–1. The cable connector must be inserted well into the socket to make full contact.

9.4 Connecting a Bus Mouse

A bus mouse is supplied with the PS1XG-AA VGA adapter and is connected directly to the mouse connector on the VGA adapter. (This mouse is also available separately. The order number is PS1XS-AA.) Figure 9–1 shows how the bus mouse is installed.

Under SCO UNIX System V Release 3.2 Version 2.0, the bus mouse is configured as a Logitech mouse.

9.5 PC4XC-BB Monitor Adapter Cable

The PC4XC-BB monitor adapter cable is intended for use with monitors that ship without a power cord.

The PC4XV-A2 monitor was designed for direct power connection to a DECstation 3xx system box and does not have a power cord for use with a wall socket. The PC4XC-BB monitor adapter cable can be used to convert the power cord to a standard 120 V, three-prong wall socket.

Figure 9–1 Connecting a VRC16 VGA Monitor

TA-0745-TI

10
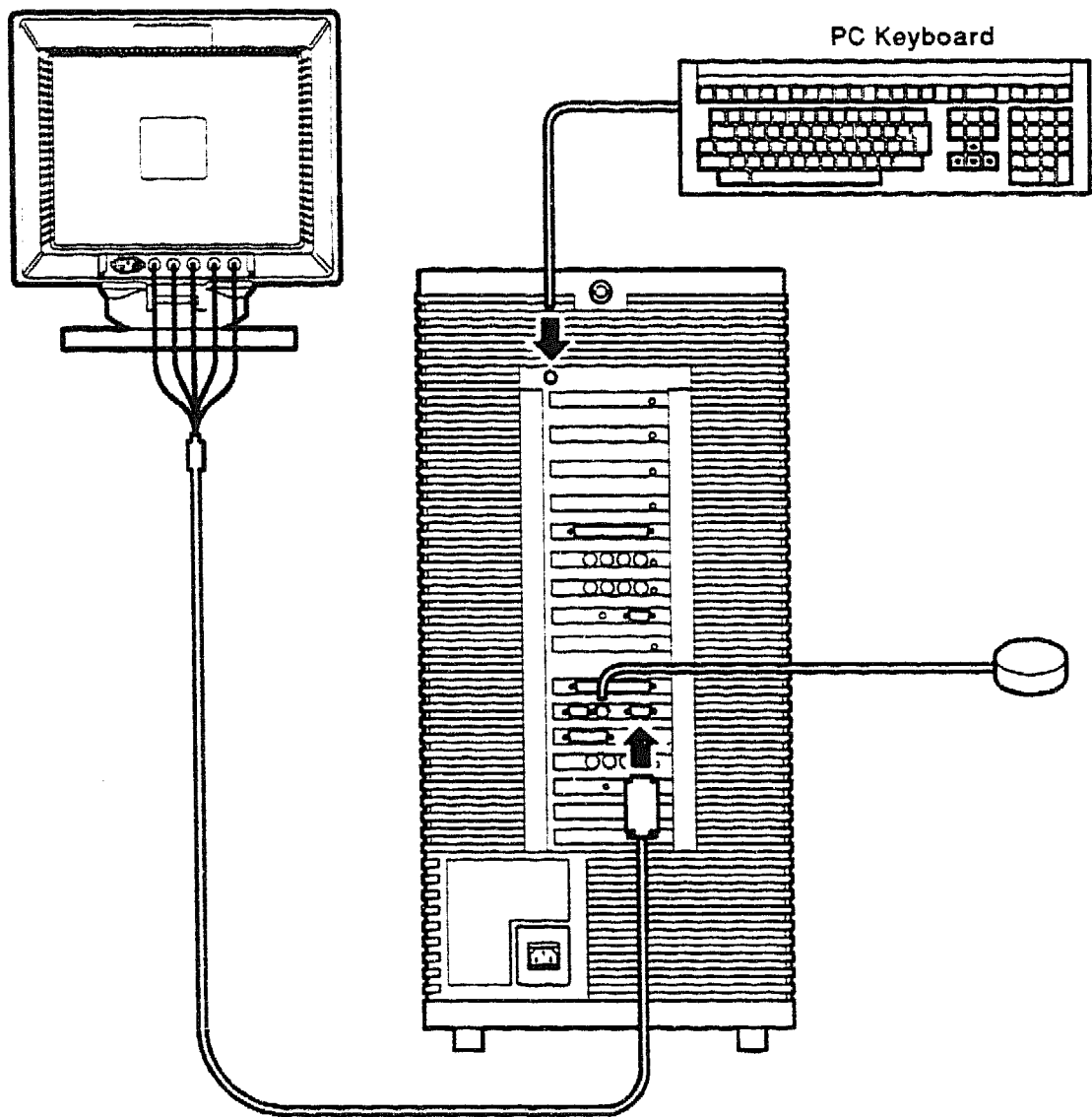
Connecting Terminals Using the Terminal Concentrator

This chapter describes how to use the terminal concentrator to attach serial terminals.

10.1 Terminal Concentrator Description

The terminal concentrator is used to connect up to eight serial terminals using RS-232 serial lines. The terminal concentrator is then connected to either a CPU/SIO module or ISA terminal multiplexer module. The CPU/SIO and terminal multiplexer support up to four terminal concentrators.

The terminal concentrator receives its power through the cable to the CPU/SIO or terminal multiplexer module. This cable allows the terminal concentrator to be installed within 10 feet of the system. To install a terminal concentrator more than 10 feet from the system, the PC4XD-DC terminal extension kit must be used. See Section 10.2 and the *Terminal Multiplexer Intelligent I/O Subsystem Installation Guide* for additional information.

The front panel of the terminal concentrator is illustrated in Figure 10–1. Each of the eight ports has two LEDs for status. The green LED blinks when both terminal and host adapter are ready to transmit data (when DSR and DCD signals are both asserted), but the operating system has not yet opened the terminal line. The green LED becomes steady when the terminal line is opened.

The yellow LED lights whenever the terminal concentrator receives data from the terminal or the host adapter.

When a printer is connected to the terminal concentrator, the green LED blinks while data is being received from the host adapter. The green LED then becomes steady until the print request is complete.

The host LED is a single green LED. This LED blinks when the terminal concentrator has power, but the driver is not running.

The host LED is a steady green when communication packets are being received from the host adapter. Communication packets are exchanged between the host adapter and the terminal concentrator, even when data is not being exchanged.

The back panel of the terminal concentrator has eight terminal connection ports, the host connection, and a power connection. The back panel is shown in Figure 10–2.

Figure 10–1 Terminal Concentrator Front Panel

TA-0738-AC
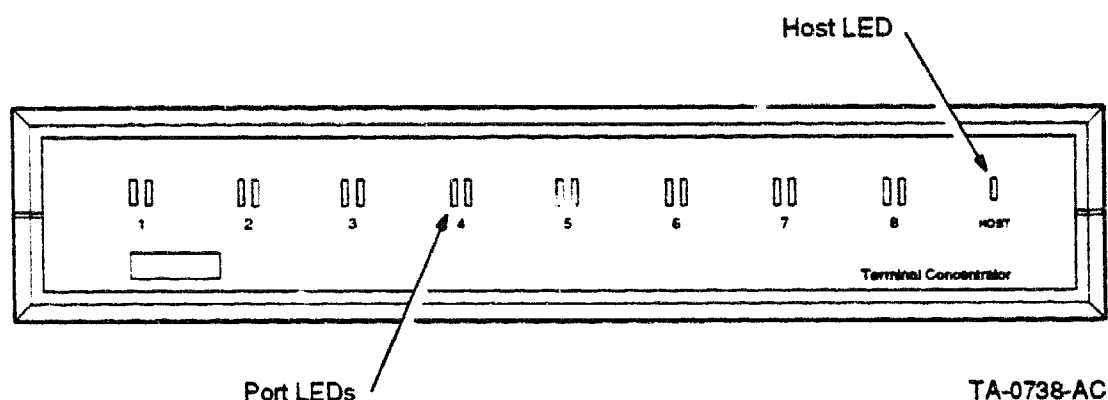
Figure 10–2 Terminal Concentrator Back Panel

TA-0739-AC
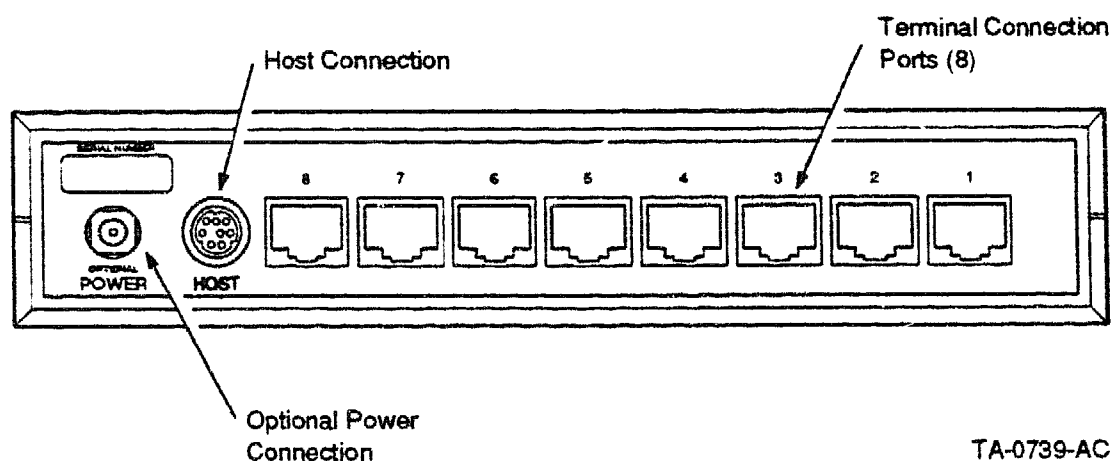
The terminal connection ports accept 8-pin RJ45 telephone plugs. The ports carry signals that comply with RS-232 serial transmission standards.

The connection labeled HOST is for connection of the host-adapter-to-terminal-concentrator cable. The cable carries data and power signals for the terminal concentrator.

The connection labeled POWER is for use with the terminal concentrator extension kit.

10.2 Terminal Concentrators More Than 10 Feet From the System

Each terminal concentrator receives its power from the terminal multiplexer host adapter. This power is delivered to the terminal concentrator through the terminal multiplexer cable.

Use the terminal concentrator extension kit when the terminal concentrator is more than 10 feet from the host adapter. The kit provides a wall-mounted power supply that has a cable for connection to this power connection. The kit also contains two adapters for connection to the host adapter and the terminal concentrator. You supply the cable that runs between the two adapters and completes the host-adapter-to-terminal-concentrator connection. Refer to the *Terminal Multiplexer Intelligent I/O Subsystem Installation Guide* for complete details.

10.3 Connecting Terminals to the Terminal Concentrator

Up to eight terminals can be connected to each terminal concentrator. Many terminals can be connected directly to the ports on the terminal concentrator.

If your terminal has a modified modular jack (MMJ) connector, use an H8577-A adapter to convert the MMJ cable connection to an RJ45 connection for use with the terminal concentrator. (VT400-series terminals, for example, have MMJ connectors.)

Figure 10–3 illustrates how terminals are connected to the terminal concentrator.

Figure 10–3 Connecting Serial Terminals

The terminal concentrator can be connected to terminal multiplexer po on the CPU/SIO module or the ISA terminal multiplexer module.

System Bus CPU/SIO

ISA Terminal Multiplexer

Terminal Concentrator

H8577-A Adapter

VT420 Terminal
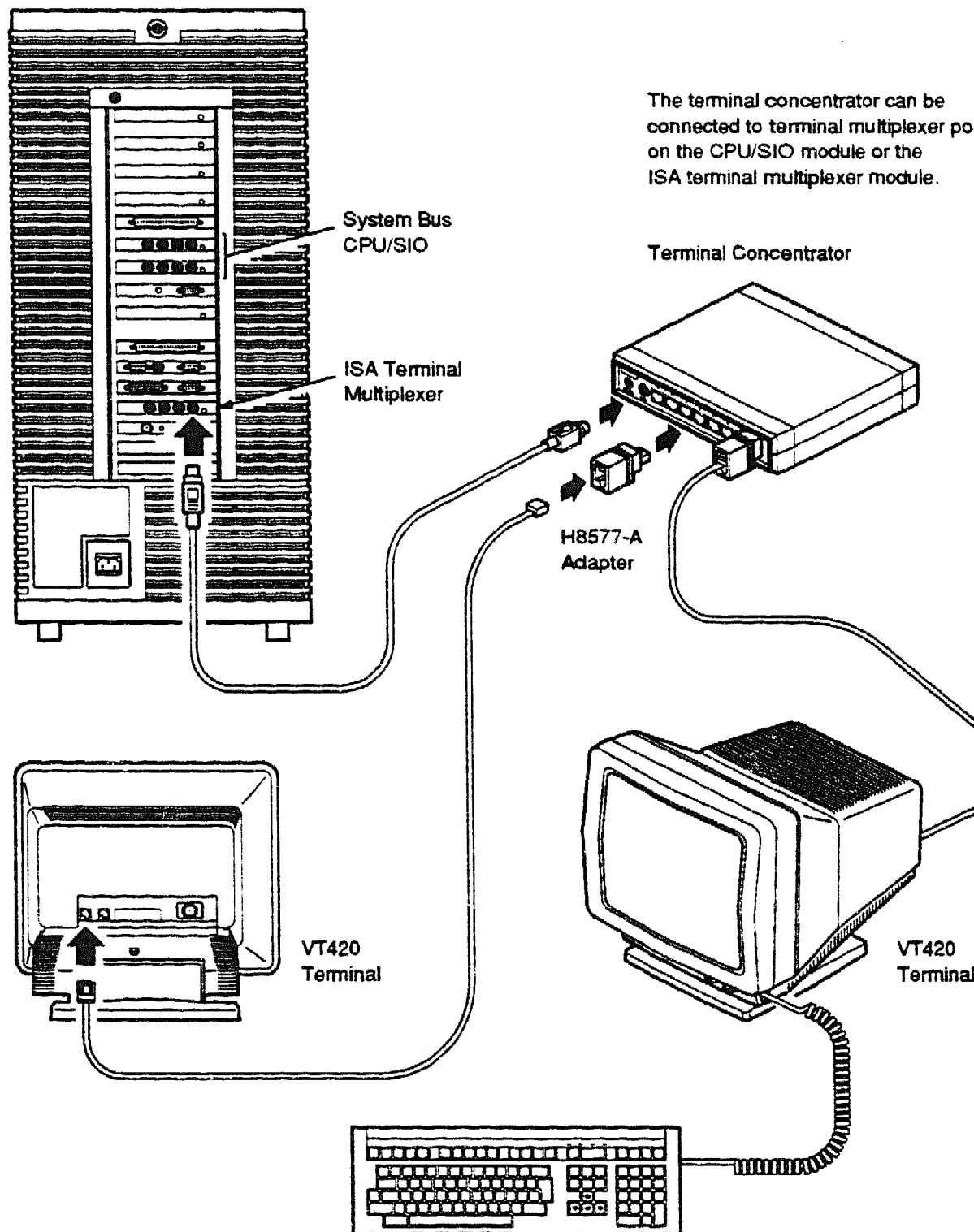
VT420 Terminal

TA-0742-AC

10–4 Connecting Terminals Using the Terminal Concentrator

10.4 Using a VT420 Terminal with SCO UNIX

To use SCO UNIX, you must alter the VT420 terminal's factory default settings. You should also make some changes to the initialization files for your account (*.profile*) and for the vi editor (*.exrc*).

10.4.1 Changing VT420 Setup Features

To use SCO UNIX, you must change the default setup characteristics for the VT420 terminal. Instruction for the setup changes are as follows:

1. Press F3 on the keyboard to invoke the VT420 setup screen.

2. In setup, use the arrows keys to highlight your selection. Press Enter to invoke the next menu or to select a feature.

3. Select the Display menu.

4. Use the arrow keys to highlight the "No Auto Wrap" feature. Press Enter to change the selection to "Auto Wrap."

5. Change the "Smooth-2 Scroll" selection to "Jump Scroll."

6. Return to the main directory and select the Keyboard menu.

7. Change the "<X]" selection from "Delete" to "Backspace."

8. Change the "<> Key" selection from its default setting to "Sends '~."

9. Change the "~ Key" selection from its default setting to "Sends ESC." (This makes the key marked "ESC" send an ESC character.)

10. Return to the main setup menu and SAVE the setup features. These setup features will be used every time the terminal is powered on.

All other default terminal setup features can be used in their default settings.

10.4.2 Arrow Keys in the vi Editor

When you use the vi editor, enter command mode and issue the command **set notimeout**. This will enable the VT420 arrow keys in the vi editor.

To make the notimeout setting permanent, edit the *.exrc* file in your user account and enter the **set notimeout** command. The *.exrc* file is an initialization file for the vi editor. If the file does not exist in your directory, create it to add this command.

If you wish to make the notimeout setting apply to all users on the system, edit the */etc/profile* file and add these commands:

```
EXINIT = "set notimeout"
export EXINIT
```

In C-shell environments, the above commands are not valid and the following command should be added to the */etc/profile* file:

```
setenv EXINIT "set notimeout"
```

10.4.3 Interrupt Character

Because the delete key, marked <X], was redefined to mean "backspace," you should set the UNIX interrupt character to Ctrl/C. This is done with the command:

```
stty intr "^C"
```

To make this change permanent, edit the *.profile* file for your account and add the command to the file. The command is then executed when you log in. You may also wish to comment out the **eval** command, if you edit the */dev/ttytype* file to define the terminal.

10.4.4 Defining the VT420 tty type

To ensure proper display of graphics on the terminal, edit the */etc/ttytype* file to set the tty type to 'vt320'.

10.4.5 VT420 Function Keys

On the VT420 terminal, the keys labeled F1, F2, F3, and F4 are dedicated to terminal control. Use the keys marked PF1, PF2, PF3, and PF4 when UNIX applications require the F1, F2, F3, or F4 keys.

See the *Installing and Using the VT420 Video Terminal* manual for full information on key definitions.

10.4.6 Other Notes on VT420 Terminals

The following notes may be helpful when using the VT420 terminal.

- When running 'sysadmsh' you may occasionaly have to enter the escape character twice for the screen to react.

- Occasionally, an application may place the VT420 terminal in line drawing mode. The screen display is garbled and garbage characters may be displayed. For example, this mode might be invoked if you try to examine a binary file. To clear this condition, issue the following commands:

  ```
  stty sane ^j
  tput reset
  ```

  If these commands have no effect, try using the Clear Comm selection in the setup menu, or cycle the power on the terminal.

- If you wish to examine control characters sent by the host, you can change the Interpret Controls feature to Display Controls. This selection is made in the VT420 setup screen.

- To examine a terminal's current line settings, use the following command:

  ```
  stty -a
  ```

10.5 Software Support

Each terminal connected to the terminal concentrator must be configured as a device under SCO UNIX. To configure a terminal attached to a CPU/SIO module, use the **mkdev corollary** command. This command is described in the *SCO MPX Release Notes and Installation Guide*. To configure a terminal attached to the terminal multiplexer, refer to the *Terminal Multiplexer Intelligent I/O Subsystem Installation Guide*.

11

Installing a Printer

This chapter describes the installation of a serial or parallel printer.

11.1 Connection Choices

You can install printers in four ways on an applicationDEC 433MP system:

- As a device on a terminal concentrator
- As a transparent device on the auxiliary port of a terminal
- As a device on a serial port on the bridge module or serial/parallel module
- As a device on the parallel port of the serial/parallel module

The following sections describe each of these ways to connect a printer.

11.2 Serial Printers on Terminal Concentrators

A serial printer can be installed as a device on a terminal concentrator. When connected to a terminal concentrator, the device name used should be a lower case device name, and not a modem control device name. The device naming convention is established by either SCO MPX or by the terminal multiplexer software driver. Refer to the *SCO MPX Release Notes and Installation Guide* for information on configuring devices on the CPU/SIO module. Refer to the *Terminal Multiplexer Intelligent I/O Subsystem Installation Guide* for information on configuring devices attached to the terminal multiplexer.

11.3 Intelligent Transparent Printing

Intelligent transparent printing is a means of using the printer port present on many terminals. When connected to a port on a terminal concentrator, the device name **ttyalp** should be used to designate the printer device. Do not use the modem device name.

Refer to the *Terminal Multiplexer Intelligent I/O Subsystem Installation Guide* for more details.

11.4 Serial Printers on the Serial Port

There are two serial ports on the applicationDEC 433MP system that you can use to attach serial printers:

* Serial connector on the bridge module (normally configured as COM1:)

* Serial connector on the serial/parallel module (normally configured as COM2:)

11.5 Parallel Printers on the Parallel Port

Parallel printers can be connected to the parallel port of the serial/parallel module.

The default address of the parallel port is LPT1:.

11.6 Software Support for Printers

SCO UNIX Sytem V Release 3.2 Version 2.0 provides support for IBM ProPrinter compatible printers. Digital Equipment Corporation printers can support this mode when operated in the "Other" protocol. For example, the LA75 Companion printer has a Protocol button on the front panel. Press this button to place the printer in the "Other" protocol.

Printer devices need to be enabled under SCO UNIX using the **enable** command. Once a printer is enabled, printing can be directed to the printer using the **cat** command.

Alternatively, the printer can be configured as the default printer using the command **lp**. Use the command **lpadmin** to specify the default printer. Refer to the *SCO UNIX System Administrator's Guide* for information on configuring printers.

If printers are attached to the terminal concentrator ports, it is important to use the nonmodem control device name as the name for the printer. This is a device name such as *ttyal* with a small letter port designation.

For intelligent transparent printing, the printer port must be configured using the **sprinter** command.

See the *Terminal Multiplexer Intelligent I/O Subsystem Installation Guide* for details on attaching printers to the terminal concentrator and intelligent transparent printing.

Refer to the *Important Notes about SCO UNIX on Digital Systems* for further information on configuring printers for use with the applicationDEC 433MP system.

12

Opening the System

This chapter describes how to open the applicationDEC 433MP system cabinet to gain access to the modules and media devices inside.

12.1 Description

You must open the system cabinet to perform the following functions:

- Add additional modules to the backplane

- Add additional storage devices to the system

- Change jumper or switch settings on an installed module

- Upgrade from a single SCSI adapter to dual SCSI adapters for additional storage and faster performance

12.2 Precautionary Steps

Before you open the system cabinet, shut the system down:

- Type **shutdown** on the system console. This command closes all open files and prepares hard disk drives and other hardware for loss of power.

- Remove any diskettes from the diskette drives. (If you leave a diskette in the drive, the system will try to boot from the diskette drive when power is reapplied to the system.)

- Remove power from the system by turning the ON/OFF switch to the OFF (0) position.

- Unplug the power cord from the wall socket.

12.3 Procedure to Open the System Cabinet

To add a module to the backplane, it is necessary to:

1. Remove the top cover.

2. Remove the left side panel.

3. Remove the card cage door.

To add a storage or media device to the system, it is necessary to:

1. Remove the top cover.

2. Remove the right side panel. (If installing a QIC tape drive or 3.5-inch diskette drive, it may not be necessary to remove the side panel.)

You do not have to remove the front and rear bezels.

12.3.1 Removing Top Cover and Side Panels

The top cover and side panels are easily removed (Figure 12–1) as follows:

1. Unplug the power cord.

2. Insert the system key and turn it fully to the left. This unlocks the top cover.

3. Remove the top cover by lifting it straight up.

4. Remove the side panels by lifting them up and away from the system.

Reverse the above procedure to install the top cover or side panels.

Figure 12–1 Top Cover and Side Panel Removal
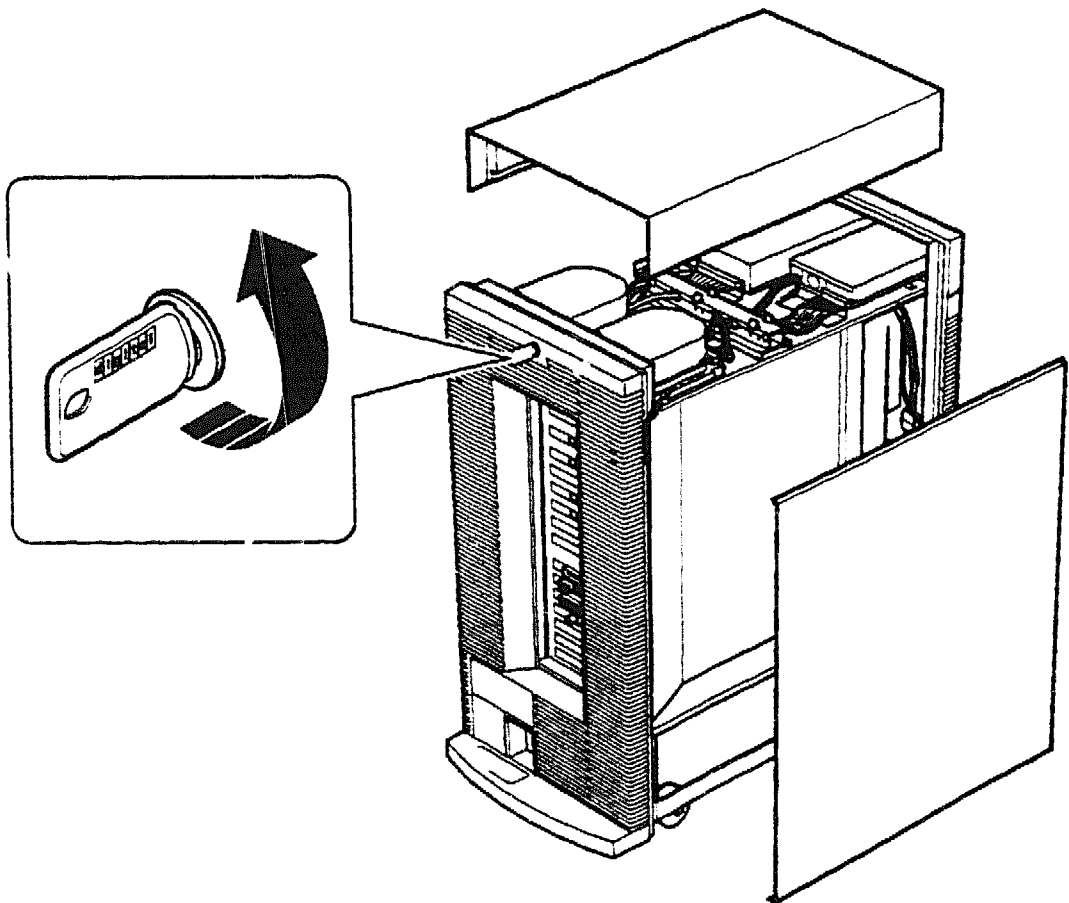
TA-0700-TI

12.3.2 Removing the Card Cage Door

To gain access to the backplane, you must remove the card cage door.
Figure 12–2 illustrates the following steps:

1. Loosen the two captive screws on the right side of the door.

2. Pull the right side of the door open slightly.

3. Pull the door out of the slot in the left side of the chassis.

Reverse the above steps to replace the card cage door.

_____ Note _____

When you replace the card cage door, make sure that the door is seated
in the retaining slot before you tighten the captive screws.

_____

Figure 12–2 Removing Card Cage Door

Loosen Captive
Screws

Pull door
out of slot.
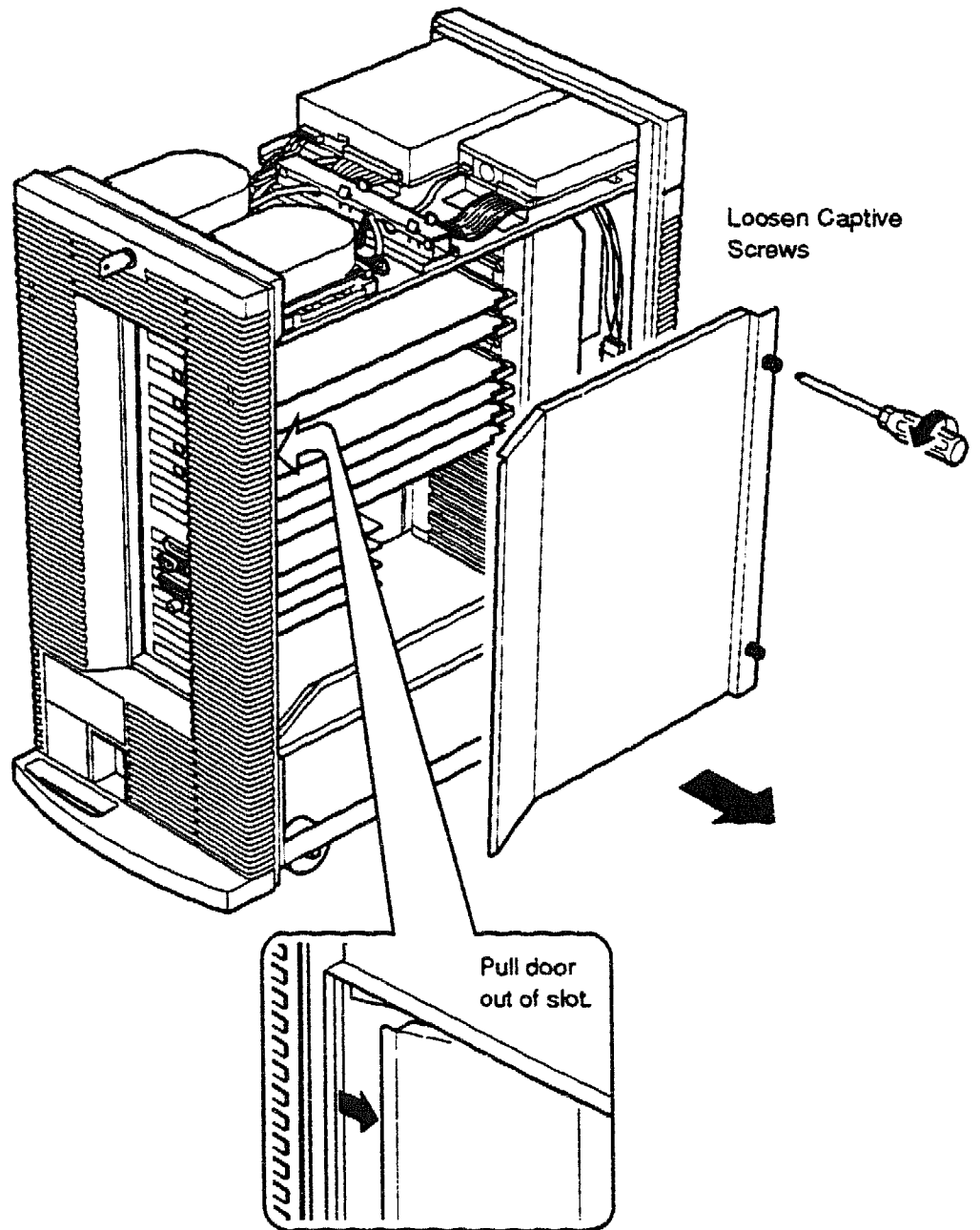
TA-0701-AC

12.4 Backplane Description

With the card cage door removed, the backplane is accessible. The backplane is shown in Figure 12–3.

The applicationDEC 433MP backplane contains two separate buses. The system bus provides a high speed private interconnect for CPU and memory interactions. The extended industry standard architecture bus, or EISA bus, provides an open bus for installation of industry standard I/O modules and other optional modules.

Figure 12–3 Backplane
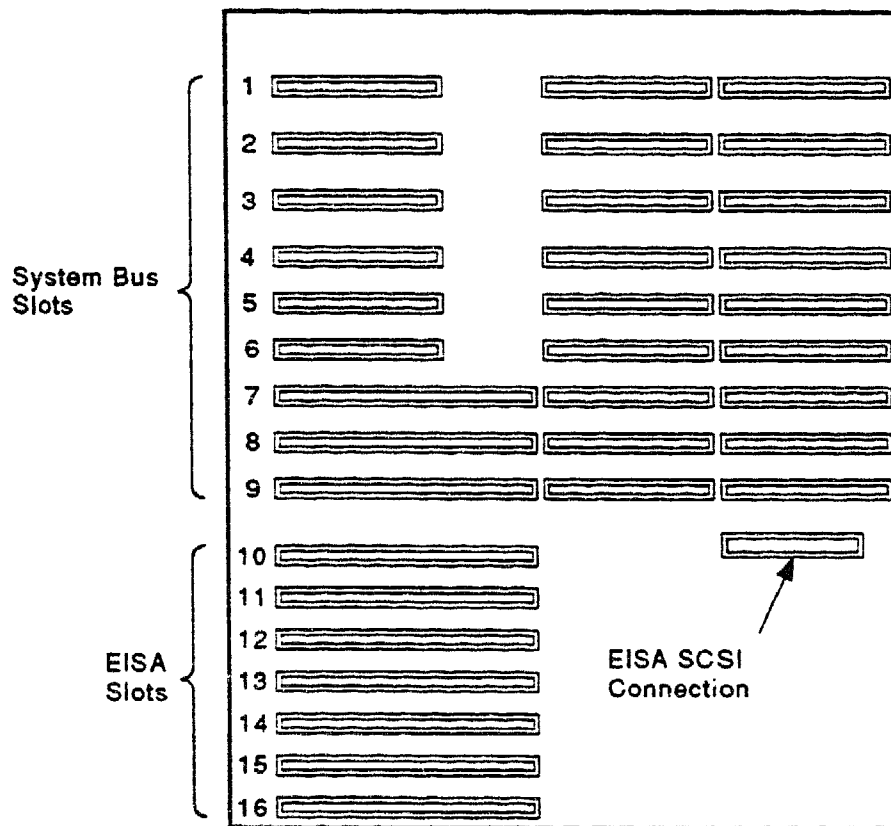
MR-0553-91DG

The top nine slots (slots 1 through 9) in the backplane are system bus slots. The bottom seven slots (slots 10 through 16) are EISA slots. Any industry standard ISA or EISA option module may be placed in any of the bottom seven slots. The top nine slots are for Digital Equipment Corporation system bus modules only. Table 12–1 lists configuration possibilities for each backplane slot.

Table 12–1 applicationDEC 433MP Backplane Slot Configuration Options

Slot	Bus	Use
1	System bus	Memory
2	System bus	Memory
3	System bus	Memory
4	System bus	Memory
5	System bus	CPU/SIO or CPU/SCSI
6	System bus	CPU/SIO or CPU/SCSI
7	System bus	CPU/SIO
8	System bus	Bridge module
9	System bus	Base CPU
10	EISA	ISA SCSI adapter
11	EISA	Serial/parallel module
12	EISA	VGA module
13	EISA	Terminal multiplexer (factory default slot; may be installed in any EISA slot)
14	EISA	ISA or EISA option
15	EISA	ISA or EISA option
16	EISA	ISA or EISA option

There are no restrictions on EISA backplane slots for ISA or EISA modules. However, the ISA SCSI adapter should always be installed in slot 10 to simplify internal cabling.

12.5 Installing a System Bus Module in the Backplane

You follow the same procedure to install all system bus modules. This procedure is illustrated in Figure 12–4.

1. Remove the blank distribution panel, if present, by loosening the captive screw holding the panel to the chassis.

   The blank distribution panel will not be reused. (Save the distribution panel for future use if the module is ever removed.)

2. Hold the module by the finger grips and slide the module into the backplane slot with the component side facing up. Make sure that the fingers of the module are fully inserted into the backplane slot.

3. Align the module's distribution panel with the screw hole in the chassis and tighten the captive screw.

4. Replace the card cage door and install the top cover and side panels before you apply power to the system.

_____ **Note** _____

Because system bus modules must be inserted in certain slots, the backplane receptacles for the module fingers are keyed for each module. Make sure that the system bus slot into which you are installing a module is appropriate for the module. If you encounter resistance installing a system bus module, double check that the slot is correct. If you attempt to install a system bus module in an incorrect slot, you may damage the module.

Figure 12–4 Installing a System Bus Module in the Backplane

Backplane

Slide module
firmly into
backplane slots.

Distribution
Panels
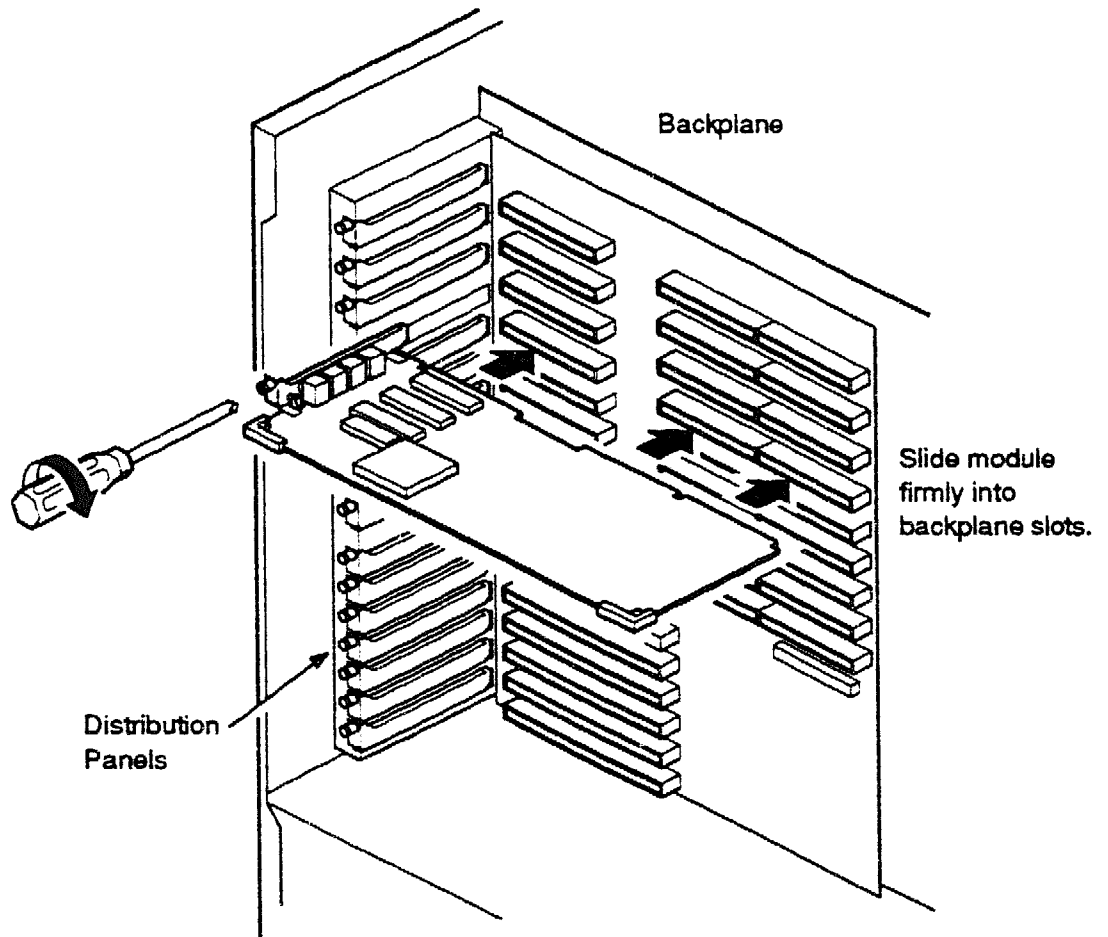
TA-0703-AC

12.6 Installing an ISA or EISA Module in the Backplane

You can install ISA or EISA option modules in any EISA slot in the backplane. You follow the same procedure to install all EISA bus modules. This procedure is illustrated in Figure 12-5.

_____ Caution _____

Before you install any option in the applicationDEC 433MP system, make sure that the operating system has been halted with the **shutdown** command and that power is removed from the system.

_____

1. Remove the blank distribution panel, if present, by removing the screw holding the panel to the chassis. Be careful not to drop the screw onto a module as it is removed from the chassis. Save the screw.

   The blank distribution panel will not be reused. (Save the distribution panel for future use if the module is ever removed.)

2. Slide the module into the backplane slot with the component side facing up. Make sure that the fingers of the module are fully inserted into the backplane slot.

_____ Caution _____

Electrostatic discharge (ESD) can damage integrated circuits and circuit modules. To prevent costly ESD damage, handle the modules by their finger grips and wear an antistatic wrist strap attached to chassis ground.

_____

3. Align the module's distribution panel with the screw hole in the chassis and insert the screw saved from step 1.

4. Replace the card cage door and install the top cover and side panels before you apply power to the system.

Figure 12–5 Installing an ISA or EISA Module in the Backplane

Backplane

Distribution
Panels

Slide module
firmly into
backplane slot.
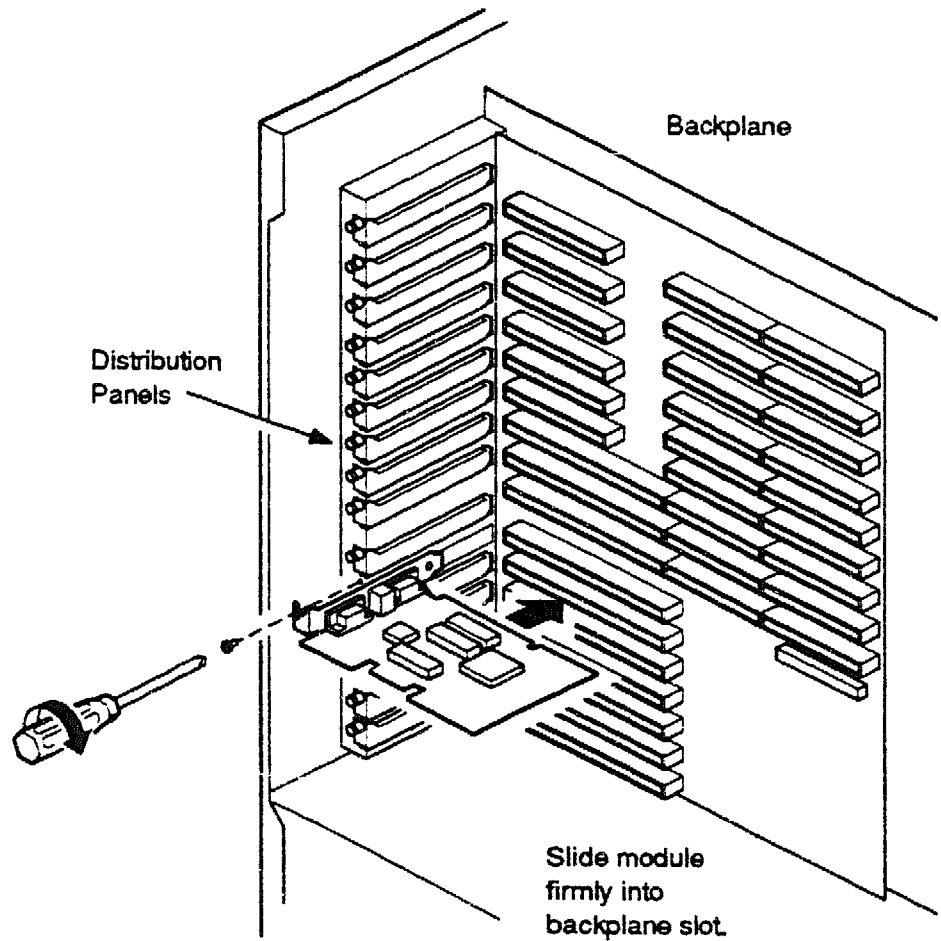
TA-0732-AC

12.7 Cabling and Connections

All connections to modules installed in the backplane are made through the
distribution panels in the back of the system cabinet. The distribution panels
are part of each module.

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13

Base Processor Module

The base processor module is a standard feature of all applicationDEC 433MP systems and is factory installed in backplane slot 9. This chapter describes features of the base CPU module.

13.1 Description

The applicationDEC 433MP base processor module includes an Intel 80486 processing chip for system and user code execution. It also contains logic for communication with the bridge module through the EISA bus.

The base CPU module is shown in Figure 13–1.

Figure 13–1 Base CPU Module
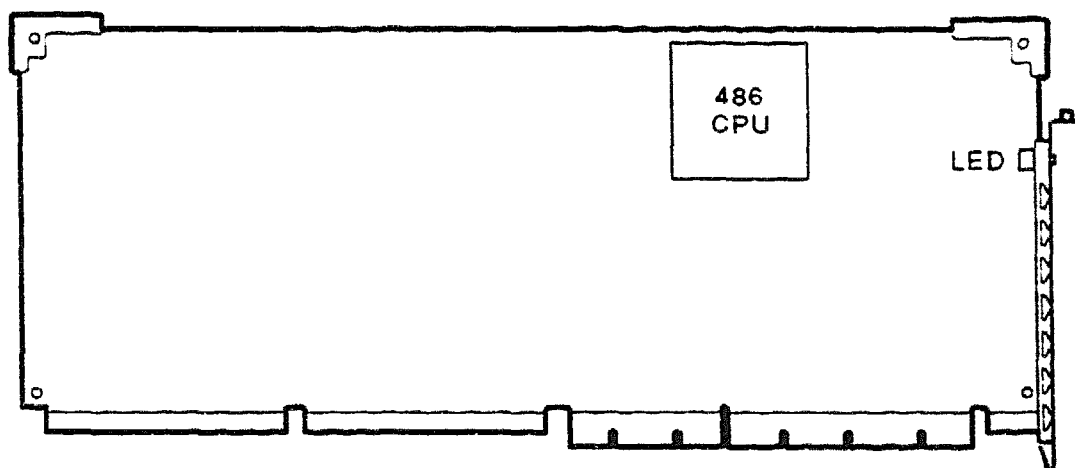
MR-0188-91DG

The base CPU module has the following features:

- Intel 80486 processor: provides execution of system code and user code

- LED: indicates power and processor activity

- EISA compliant: EISA bus data transfers occur at 33 MB/second, allowing faster I/O transactions

The Intel 80486 processor on the base processor module provides execution of both system and user code. The base processor module is standard with every applicationDEC 433MP system and is the only processor in single-processor versions of the system. Although the applicationDEC 433MP system is designed for multiprocessor expansion, the system is fully functional with only the base processor installed. In a single-processor configuration, the SCO MPX multiprocessor extensions are not required.

Expansion CPUs such as the CPU/SIO and CPU/SCSI cannot be used as single processors. Both of these modules require that the base processor module be already installed.

14

Bridge Module

The bridge module is a standard feature of all applicationDEC 433MP systems and is factory installed in backplane slot 8. This chapter describes the features and installation of the bridge module.

14.1 Description

The bridge module provides the data link between the EISA bus and the system bus. The bridge module also contains a general purpose serial connector (configured as COM1:) for use with a serial printer or other serial device. Additional logic on the module provides control for the 3.5-inch, 1.44 MB diskette drive and the optional 5.25-inch, 1.2 MB diskette drive.

The bridge module is shown in Figure 14–1.

Figure 14–1   Bridge Module
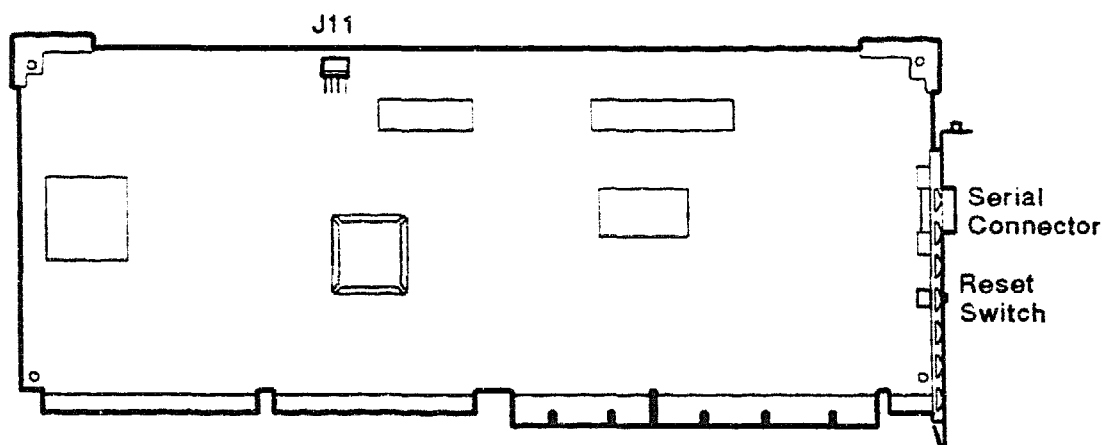
MR-0187-91DG

The bridge module has the following features:

- General purpose serial connector

- Reset switch (S1)

- Clock for system time

- On-board battery for RAM data retention in the event of power loss

- Jumpers for selection of default boot diskette drive (J11)

- Connector to base processor module through the EISA bus

14.1.1 Serial Connector

The serial connector is a 9-pin D connector that has COM1: as its address. This connector allows for direct connection of serial printers or other serial devices. If your device has a modified modular jack (MMJ) connector, use the H8571-J adapter provided with the applicationDEC 433MP system. Connect the adapter directly to the bridge module serial connection and connect the MMJ cable to the adapter.

14.1.2 Reset Switch

The reset switch provides an external means of resetting the system in the event that the system hangs or has a software failure. The reset switch restores all components of the system to their initial power-up states.

If the operating system is installed, pushing reset causes the system to reboot.

14.1.3 Bridge Module Jumper Settings

Jumper pack J11 on the bridge module controls the designation of the boot diskette drive. Jumper pack J11 controls whether the 3.5-inch or the optional 5.25-inch diskette drive is designated as the boot drive (drive A). The boot diskette drive is the drive from which the system attempts to boot when it goes through its power-on sequence.

_____ **Note** _____

Do not leave nonbootable diskettes in drive A during the boot sequence. If nonbootable diskettes are in drive A during the boot sequence, the system attempts to boot from the diskette and will hang.

_____

To desig e the 3.5-inch diskette drive as the boot drive, place a four-pin jumper on the upper pin pairs in J11. The factory configuration is for the 3.5-inch diskette drive to be the boot drive. Figure 14–2 shows jumper pack J11 in the factory configuration.

To designate the 5.25-inch diskette drive as the boot drive, place the four-pin jumper on the lower pin pairs.

14.2 Diskette Cabling

The bridge module also controls the 3.5-inch 1.44 MB RX23 diskette drive and the 5.25-inch 1.2 MB RX33 diskette drives. The cable connecting the module to the diskette drives is factory installed as part of the cable harness. Figure 14–3 illustrates this cable in the cable harness.

14.3 Software Support

The bridge module requires no special software support.

Figure 14–2 Bridge Module J11 Factory Configuration

J11
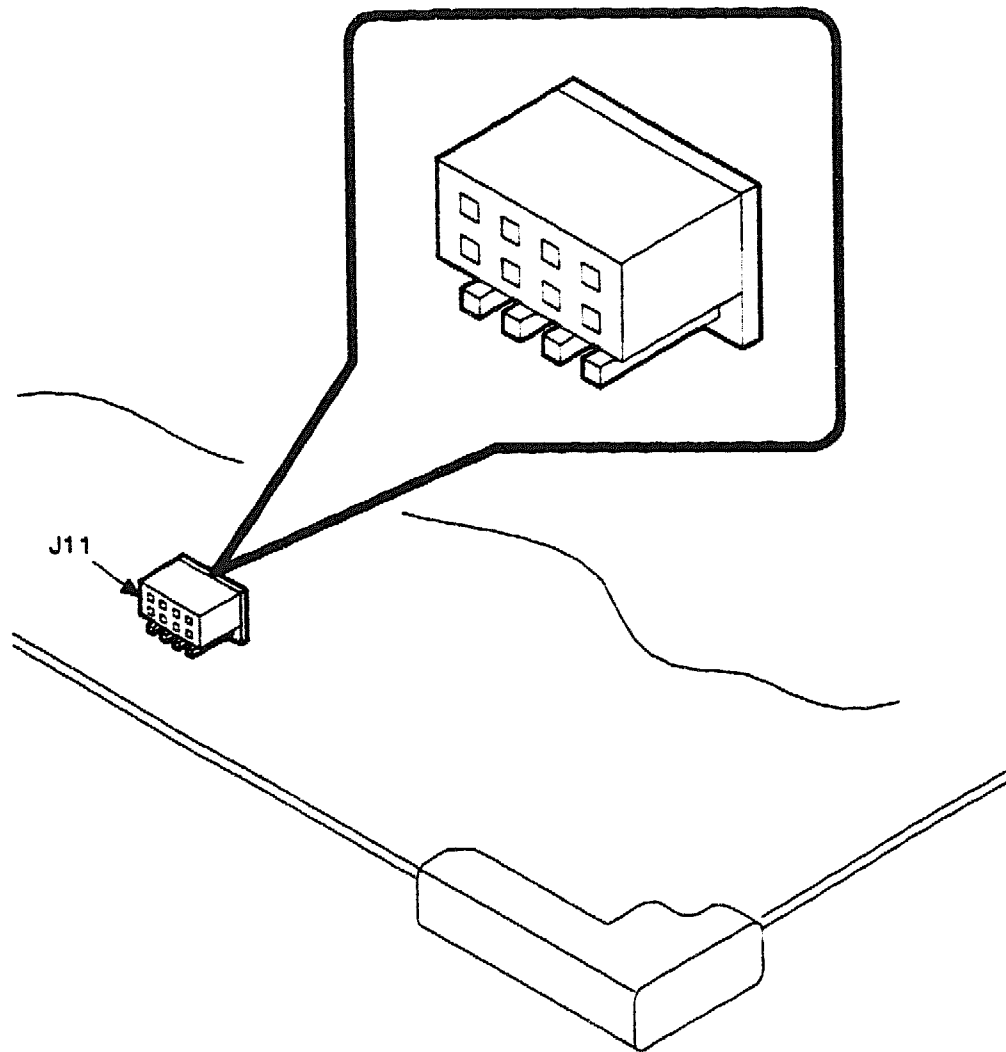
MR-0543-91DG

Figure 14-3 Diskette Cabling From Bridge Module to Cable Duct

3.5 Inch Diskette Drive

Floppy Cable

5.25 Inch
Diskette Drive

Connection To
Backplane

MR-0098-91DG

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15

Memory Modules and SIMMs

A memory module is a standard feature of all applicationDEC 433MP systems and is factory installed in backplane slot 1. This chapter describes the following:

- Installation of memory modules

- Installation of SIMMs for additional memory on a module

- ECC error code correction

15.1 Description

The applicationDEC 433MP system accommodates a maximum of 64 MB of system memory. Each memory module provides 16 MB of memory; four memory modules can be installed.

Single inline memory modules (SIMMs) are used for memory capacity. The SIMMs contain 1 MB of memory each and are inserted in slots on the memory module. Memory must be added in increments of 4 MB. SIMMs are available in packages of five SIMM modules each; four are used for memory and one is used for error checking. There are 20 slots for SIMMs on the memory module, allowing 16 MB of total memory per memory module.

Each applicationDEC 433MP system has at least one factory-installed memory module with at least 8 MB of memory. Additional PS1XM-AA memory modules are sold with no SIMMs installed. SIMMs are available in packages of 4 MB (5 SIMMs) or 100 MB (25 sets of 4 MB SIMMs). These packages have part numbers PS1XM-BA and PS1XM-BB, respectively.

SCO MPX includes an error correction code (ECC) daemon program which uses the fifth SIMM for error detection and correction.

15.2 Minimum Recommended Memory

Generally, you should have at least 8 MB of system memory for every processor in your system. This is shown in Table 15–1.

Table 15–1 Minimum Memory Recommendations

CPUs Installed	Memory (MB)
1	8
2	16
3	24
4	32

15.3 Features

The memory module, shown in Figure 15–1, has the following features:

- SIMM sockets for increasing memory

- LED for ECC error detection. The ECC daemon software detects and corrects single-bit errors.

Figure 15–1 Memory Module
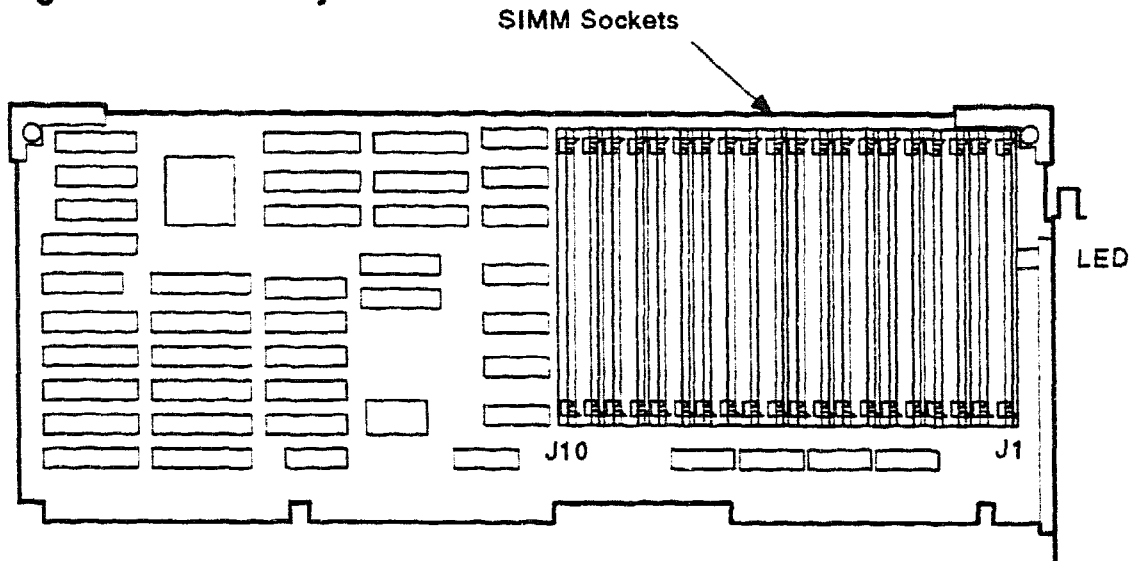
TA-0711-TI

15.4 Installation

The following steps describe the installation procedure for the memory module.

_____ **Caution** _____

Before you install any option in the applicationDEC 433MP system, make sure that the operating system has been halted with the **shutdown** command and that power is removed from the system.

_____

1. Remove the top cover and left side panel, as described in Section 12.3.1.

2. Remove the card cage door as described in Section 12.3.2.

3. Install any additional SIMMs. See Section 15.4.1. Option level memory modules are shipped with no SIMMs installed.

4. Install additional the memory modules into backplane slots 2 through 4. Memory modules must be installed in the top four slots of the backplane. These are slots 1, 2, 3, and 4, as shown in Figure 15–2. Memory modules should be installed sequentially starting from the top slot. The first memory module (factory-installed) is in slot 1, the second in slot 2, the third in slot 3, and a fourth in slot 4.

_____ **Caution** _____

Electrostatic discharge (ESD) can damage integrated circuits and circuit modules. To prevent costly ESD damage, handle the modules by their finger grips and wear an antistatic wrist strap attached to chassis ground.

_____

The memory module is a standard system bus module and follows the installation procedure described in Section 12.5.

5. Replace the card cage door, the top cover, and the side panel.

Figure 15-2 Memory Module Backplane Locations
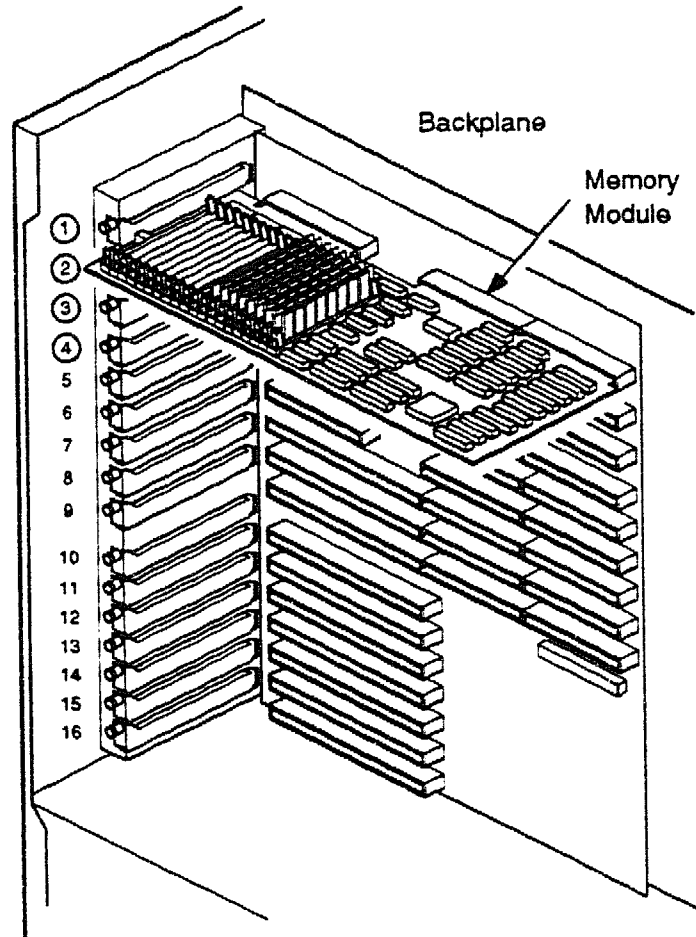
TA-0712-AC

15.4.1 Installing SIMMs

SIMMs allow for incremental increases in the amount of memory on each memory module. Each SIMM adds 1 MB of memory to the module. SIMMs are installed in 4 MB increments, which require five SIMMs.

Additional memory modules should not be installed until the currently installed memory module is completely filled with SIMMs.

SIMMs are installed in slots in the memory module. SIMMs must be inserted in the module as shown in Figure 15-3. SIMMs must be inserted sequentially starting with slot J10 and descending to J1. There must be no empty slots between SIMMs.

Figure 15–3 Installing SIMMs

SIMM Modules

J10

2

1

Insert SIMM into the
socket at oblique angle,
then rotate vertically until
SIMM snaps into place.

Sockets

J1
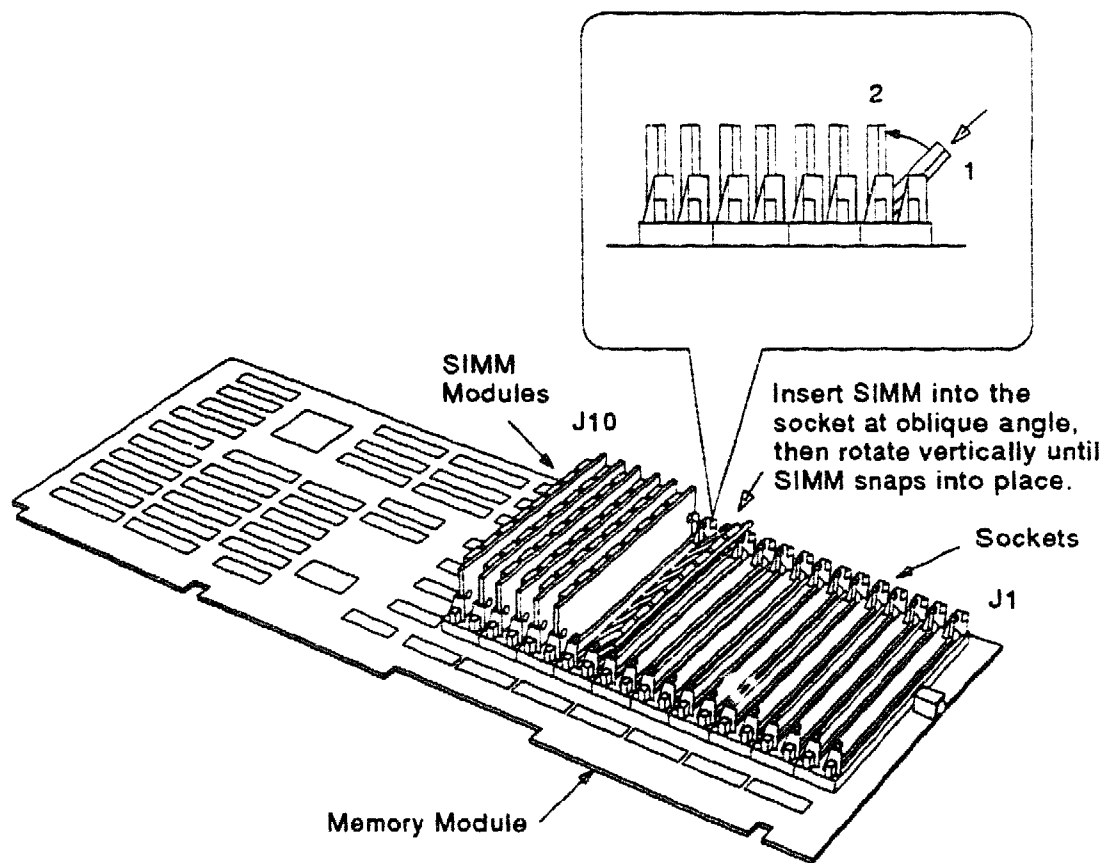
Memory Module

MR-0554-91DG

15.5 Software Support

Additional memory modules are recognized by the system. No additional
software installation is required.

15.6 ECC Daemon

The ECC daemon is a software feature of SCO MPX. This program executes
in the background at a frequency you select. Each time the program runs, it
scans all memory locations and runs error correction code, or ECC. This code
uses the fifth SIMM in every package of four SIMMs to perform cross-check
computations on every bit in the memory.

The program is capable of detecting and correcting single-bit errors. A single-
bit error occurs when one bit in the array is set incorrectly. The ECC software
can detect single bits and reverses the state of the incorrect bit to its proper
setting. When a single-bit error is detected, the memory module's LED is
illuminated.

A double-bit error occurs when the ECC daemon discovers that at least two
bits in the array are incorrectly set. The ECC daemon issues a *panic* error
message and shuts down the system.

The ECC daemon software logs all error messages to the console monitor and
to the file */usr/adm/messages*.

More detail about the ECC daemon can be found in the *SCO MPX Release
Notes and Installation Guide*.

16

CPU/SIO

This chapter describes the features and installation of the CPU/SIO module.

16.1 Description

Two types of additional CPUs can be installed in an applicationDEC 433MP system to provide multiprocessing capabilities: the CPU/SIO module and the CPU/SCSI module. Both provide additional CPU processing power.

The CPU/SIO module provides symmetrical multiprocessing capability for the applicationDEC 433MP system. The CPU/SIO module contains complete terminal multiplexer logic for support of up to 32 terminals. The CPU/SIO module is shown in Figure 16-1.

Figure 16-1 CPU/SIO Module
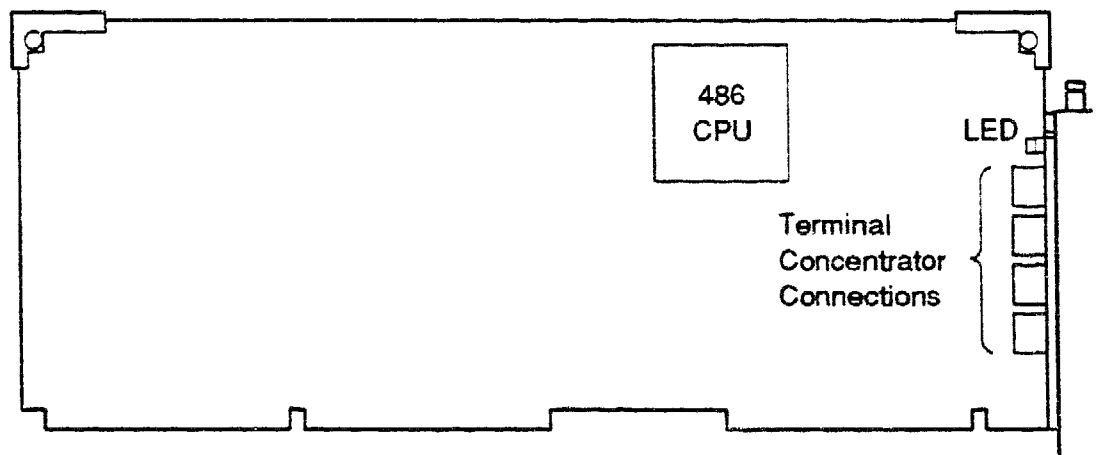
TA-0708-AC

Features of the CPU/SIO module include:

- Intel 80486 CPU for additional processing power

- Four terminal concentrator ports for connection of terminal concentrators (for a maximum of 32 terminal lines)

- LED for indicating CPU activity

The Intel 80486 processor provides additional processing power for symmetrical multiprocessing. SCO MPX provides support for the CPU/SIO module's processor. One copy of SCO MPX must be installed for each CPU/SIO module installed on your system.

At the I/O distribution panel, four mini-DIN connectors are available for connection of up to four terminal concentrators.

PC4XD-DB terminal concentrators are used to make connection to the ports on the CPU/SIO module. Terminal concentrators are not included with the CPU/SIO module and are ordered separately. Up to four terminal concentrators can be connected to each CPU/SIO module. Up to eight terminals can be connected to each of the terminal concentrators. This provides a total of 32 serial lines for each CPU/SIO module.

16.2 Installation

The following steps describe the installation procedure for the CPU/SIO module.

There are no jumpers or switches on the CPU/SIO module.

_____ **Caution** _____

Before you install any option in the applicationDEC 433MP system, make sure that the operating system has been halted with the **shutdown** command and that power is removed from the system.

_____

1. Remove the top cover and left side panel, as described in Section 12.3.1.

2. Remove the card cage door as described in Section 12.3.2.

3. The CPU/SIO module must be installed in backplane slots 5 through 7 as shown in Figure 16–2. (If you plan to install a CPU/SCSI module now or in the future, you should reserve slot 5 or slot 6 for the CPU/SCSI module. See Chapter 17.)

_____ **Caution** _____

Electrostatic discharge (ESD) can damage integrated circuits and
circuit modules. To prevent costly ESD damage, handle the modules by
their finger grips and wear an antistatic wrist strap attached to chassis
ground.

_____

The CPU/SIO module is a standard system bus module and follows the
installation procedure described in Section 12.5.

Figure 16–2 Installing a CPU/SIO Module
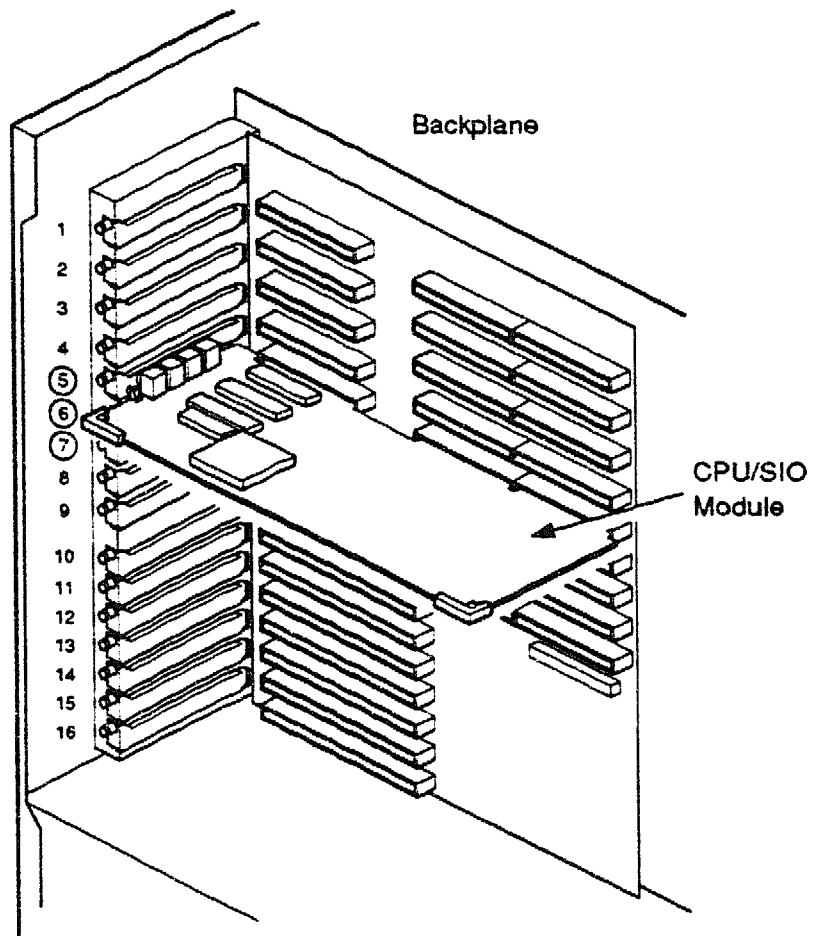
TA-0709-AC

4. Replace the card cage door, the top cover, and the side panel.

5. Connect any terminal concentrators to the CPU/SIO terminal multiplexer ports. Connect terminals to the terminal concentrator ports. See Chapter 10.

16.3 Software Support

Each terminal multiplexer port on the CPU/SIO module is identified by a letter (A through D). The port names are used to identify the tty device under SCO UNIX. The device naming convention used by SCO MPX allows you to define a device as a terminal, printer, modem, or intelligent transparent printer.

For each CPU/SIO module installed in the system, you must install one copy of SCO MPX. Refer to the *SCO MPX Release Notes and Installation Guide* for information on how to define the terminal devices used on the CPU/SIO module and for details on how to install SCO MPX.

17

CPU/SCSI

This chapter describes the features and installation of the CPU/SCSI module. It also describes the cabling for the high-speed SCSI bus, and external storage expansion with the CPU/SCSI module.

17.1 Description

Two types of additional CPUs can be installed in an applicationDEC 433MP system to provide multiprocessing capabilities: the CPU/SIO module and the CPU/SCSI module. Both provide additional CPU processing power.

The CPU/SCSI module provides additional logic that allows the module to be a SCSI adapter. The CPU/SCSI module is shown in Figure 17-1.

Figure 17-1   CPU/SCSI Module

TA-0735-AC
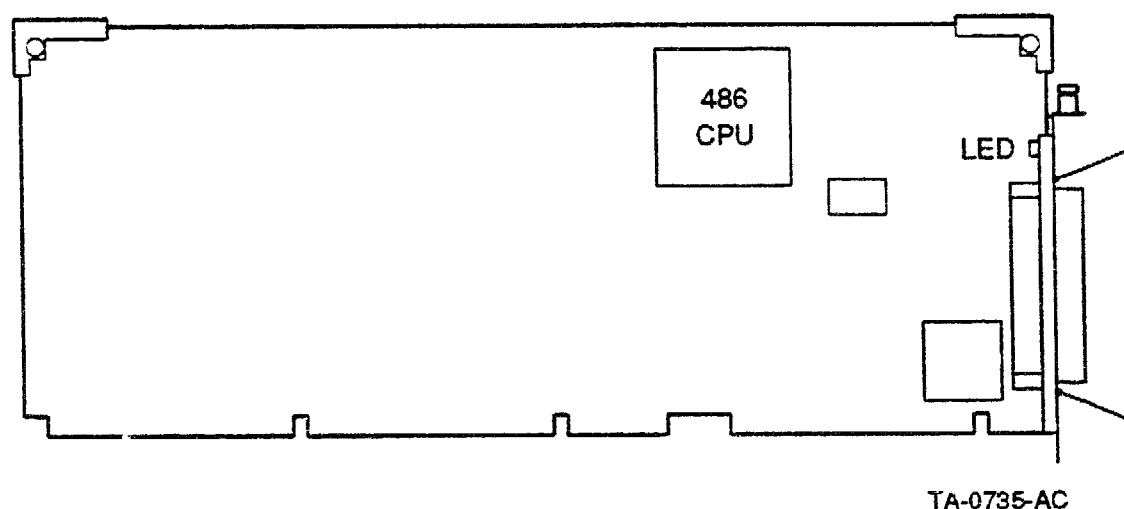
Features of the CPU/SCSI module include:

- Intel 80486 processor for increased processing capability

- SCSI adapter logic

- External SCSI connector

The Intel 80486 processor provides additional processing power for symmetric multiprocessing. The SCO MPX multiprocessor extensions provide support for the CPU/SCSI module's processor. You must install one copy of SCO MPX for each CPU/SCSI installed on your system.

The CPU/SCSI module provides logic for an additional SCSI adapter. The CPU/SCSI adapter provides higher performance SCSI transactions than the ISA SCSI adapter. Since the CPU/SCSI module resides in the system bus, SCSI transactions can occur without data transfer through the slower EISA bus.

There are no terminator resistors on the CPU/SCSI module. When the CPU/SCSI module is installed in slot 5, both ends of the SCSI bus are terminated by placing terminators on the cable ends (or the CPU/SCSI external connector if there is no external expansion). When the CPU/SCSI module is installed in slot 6, the internal end of the SCSI bus is terminated by resistors in the backplane. The external end of the SCSI bus is terminated by placing a terminator at the end of the external SCSI bus expansion.

The CPU/SCSI module always uses SCSI ID 7 as its address. There are no SCSI ID jumpers on the module.

The CPU/SCSI module also provides an external SCSI connector. This connector can be used to provide a complete external SCSI bus, or to extend the internal SCSI bus to external devices.

17.2 Installation

There are no jumpers or switches on the CPU/SCSI module.

To control devices internal to the system box, install the CPU/SCSI module in backplane slot 5. There are direct connections from the CPU/SCSI module fingers to the system bus SCSI connector on the storage device side of the chassis. A CPU/SCSI module installed in slot 5 can also have devices attached to its external connector, if desired.

To control devices external to the system box, install the CPU/SCSI module in backplane slot 6. Slot 6 allows for the maximum number of external devices to be connected to the CPU/SCSI module.

Use the following steps to install the CPU/SCSI module.

_____ **Caution** _____

Before you install any option in the applicationDEC 433MP system, make sure that the operating system has been halted with the **shutdown** command and that power is removed from the system.

_____

1. Remove the top cover and left side panel, as described in Section 12.3.1.

2. Remove the card cage door as described in Section 12.3.2.

3. Install the module into backplane slot 5 or 6. Slot 5 is for control of the internal SCSI bus in a dual SCSI system. Slot 6 is for control of the external SCSI bus only. See Figure 17-2.

_____ **Caution** _____

Electrostatic discharge (ESD) can damage integrated circuits and circuit modules. To prevent costly ESD damage, handle the modules by their finger grips and wear an antistatic wrist strap attached to chassis ground.

_____

The CPU/SCSI module is a standard system bus module and follows the installation procedure described in Section 12.5.

Figure 17–2 CPU/SCSI Backplane Location
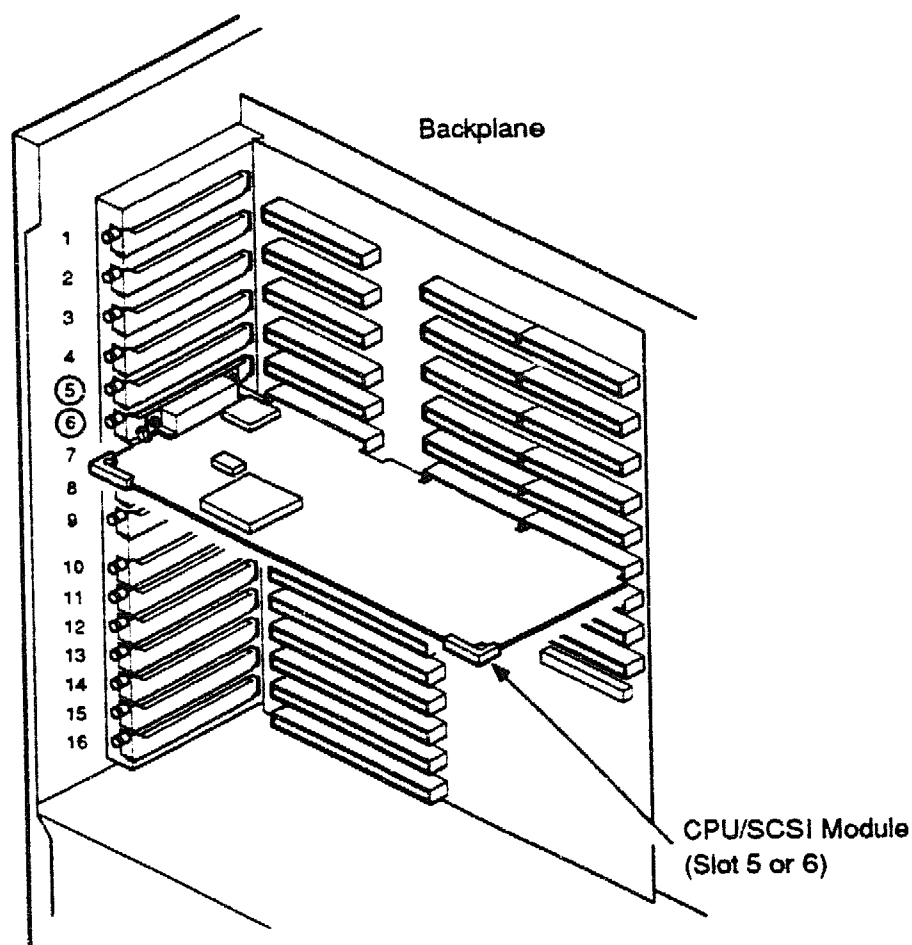
TA-0714-AC

4. If you install the CPU/SCSI as an upgrade from a single SCSI system to a dual SCSI system, you need to modify the SCSI cabling for the storage devices. See Section 17.3.

5. Replace the card cage door, the top cover, and the side panel.

Table 17–1 summarizes the slots used for the CPU/SCSI module.

Table 17–1 CPU/SCSI System Bus Slot Locations

Slot	Use
5	Adapter for internal SCSI bus, and external, if desired
6	Adapter for external connections only

_____ **Note** _____

If only one CPU/SCSI is being installed, future upgrades will be easier
if you install the single CPU/SCSI in slot 5. See Section 3.5 for more
information.

_____

17.3 Installation of the Dual SCSI Cables

The standard applicationDEC 433MP system comes with a single ISA SCSI
adapter. This adapter can control up to seven SCSI devices, four of which can
be hard disks. See Section 3.3, Software Hard Disk Drive Limitations.

The CPU/SCSI module is capable of controlling up to seven SCSI devices, any
number of which can be hard disks.

When you upgrade the applicationDEC 433MP system to a dual SCSI bus
system, you need to modify the factory default cabling system. The standard
ISA SCSI cable consists of two cable segments connected together. One portion
of the cable is black; one is grey. A third black cable segment is shipped with
the CPU/SCSI module. After the installation of the dual SCSI cables, the SCSI
bus controlled by the ISA SCSI adapter will use black cables and the system
bus, or high performance SCSI bus, will use grey cables.

Install the system bus SCSI cabling using the following steps:

1. Disconnect the SCSI cable from the ISA SCSI backplane connector. This
    connector is shown in Figure 17–3 as SCSI connector number 1.

2. Connect this SCSI cable to the high performance SCSI cable connector,
    SCSI connector number 2 in Figure 17–3.

Figure 17–3 Dual SCSI Bus Cabling Diagram
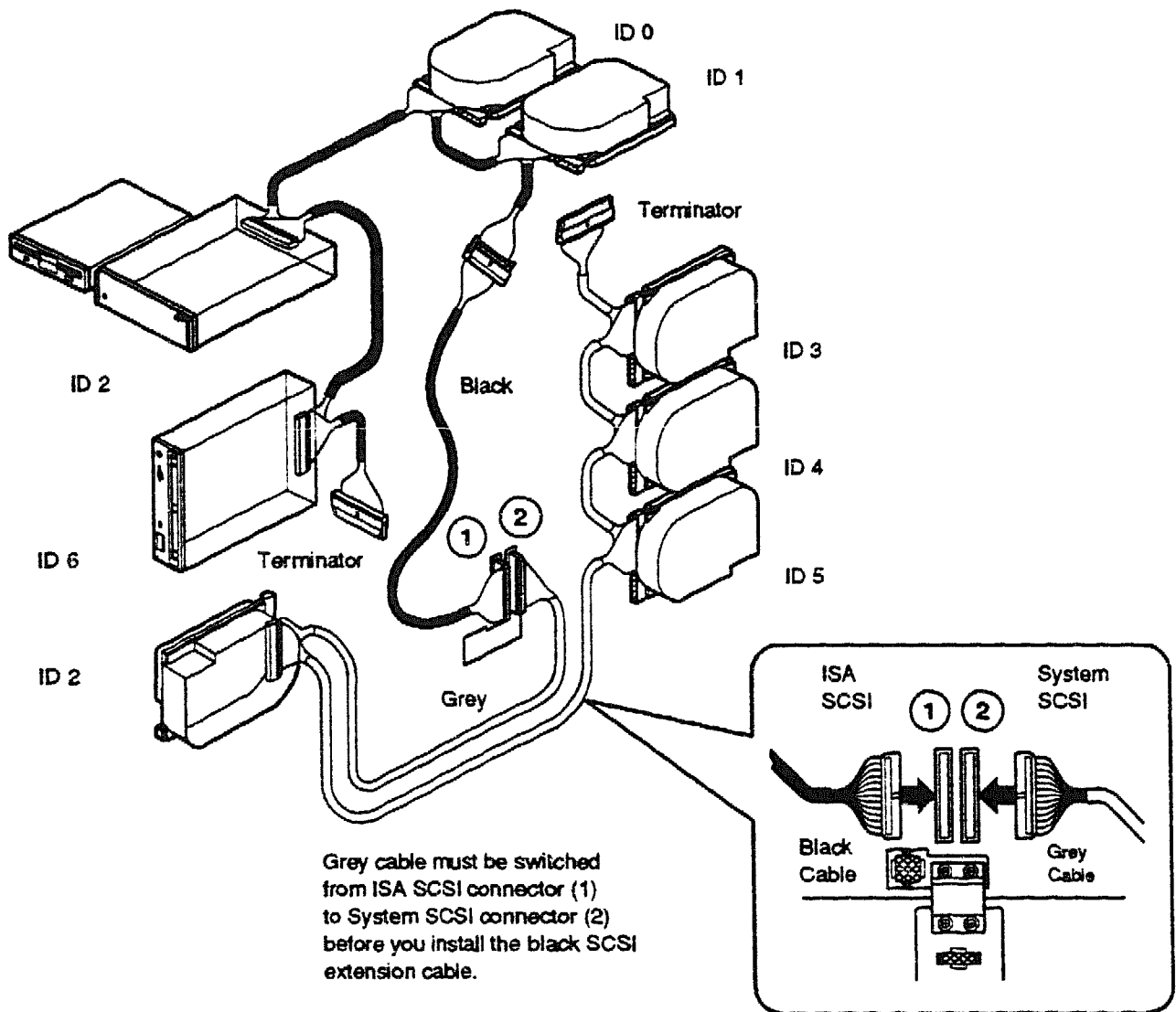
Grey cable must be switched
from ISA SCSI connector (1)
to System SCSI connector (2)
before you install the black SCSI
extension cable.

NOTE: Dual SCSI buses use a PS1XR-AA adapter in backplane slot 10
and a CPU SCSI adapter in backplane slot 5. Refer to this manual for
complete installation details.

TA-0734-AC

3. At disk drive 1, there is a male-female connection in the SCSI cable. Turn the connector wings down and pull the cable ends apart to remove the male-female connection.

4. Install the supplied SCSI terminator on the male end of the SCSI cable.

5. Install the supplied SCSI extension cable on the ISA SCSI backplane connector.

6. Install the other end of the SCSI extension cable on the female end of the SCSI cable at disk drive 1.

7. Disk drives 3, 4, and 5 are now on the high performance SCSI cable.

8. Disk drives 0 and 1 and the CD-ROM (SCSI ID 6) are now on the ISA SCSI bus.

17.4 Installing a Sixth Hard Disk

With a dual SCSI cable scheme, you can install a sixth RZ24 or RZ25 hard disk when the five other locations for hard disks have been used. The mounting bracket used for the 5.25-inch diskette drive can be converted to a disk drive mounting bracket. Instructions for installing this sixth hard disk are in Section 23.4.

17.5 Using the CPU/SCSI for External Connections

External devices can be connected to CPU/SCSI modules in either slot 5 or slot 6. Slot 6 is recommended to connect the maximum number of external SCSI devices.

In slot 5, the external SCSI devices are also part of the internal SCSI bus. Therefore, the number of external devices that can be connected to a CPU/SCSI module in slot 5 is limited by the number of devices installed internally. The total number of devices, both internal and external, must not exceed seven.

In slot 6, the CPU/SCSI module can support a complete SCSI bus of up to seven external devices. External connection is made to the CPU/SCSI module using a standard SCSI cable connector. A terminator must be attached at the external end of the SCSI bus.

See Section 3.9 and Section 3.10 for information on installing external storage boxes.

17.6 Terminator

The CPU/SCSI module has an external connector for attachment of additional SCSI devices. When external devices are not connected, a SCSI terminator (Digital part number H8574-A) must be installed on this connector to terminate the SCSI bus. Figure 17–4 shows the terminator needed.

Figure 17–4   SCSI Terminator
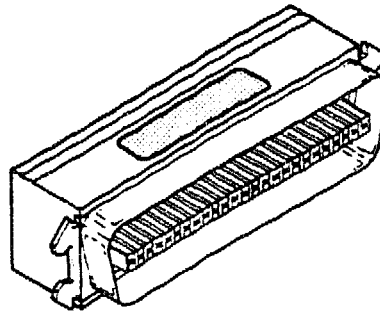
MLO-002346

17.7 Software Support

For each CPU/SCSI installed in the system, you must install one copy of SCO MPX.

Devices on the SCSI bus controlled by the CPU/SCSI module are defined using the **mkdev corollary** command. Refer to the *SCO MPX Release Notes and Installation Guide* for details.

18

ISA SCSI Host SCSI Adapter

The ISA SCSI host adapter is a standard feature of all applicationDEC 433MP systems and is factory installed in backplane slot 10. This chapter describes the following:

* Factory default jumper settings

* Terminator resistor packs

* Installation and use of a second ISA SCSI adapter

18.1 Description

The ISA SCSI adapter is is functionally equivalent to an Adaptec 1540B SCSI adapter and is fully supported by the SCO UNIX drivers for an Adaptec 1540B.

The ISA SCSI adapter supports up to seven SCSI devices, of which four can be hard disks.

See Chapter 3 for additional information on the SCSI bus schemes available in the applicationDEC 433MP system.

18.2 Configuration Jumpers

The configurable features of an ISA SCSI adapter are shown in Table 18–1.

Table 18–1   ISA SCSI Adapter Configurable Features and Defaults

Feature	Default Setting
Address	330H
IRQ and interrupt channel	IRQ11
Synchronous negotiation	Disabled
SCSI parity	Enabled
SCSI ID	ID7
DMA channel	Channel 5
DMA request/acknowledge levels	5
DMA transfer speed	5.7 MB/second
BIOS	Enabled
BIOS address	C8000
BIOS wait states	Zero wait states

Figure 18–1 shows the ISA SCSI adapter and the location of jumpers J5, J6, J7, and J9. The factory default jumper configurations are shown.

All of the selectable features are chosen using jumper packs J5, J6, J7, and J9. Figure 18–2 shows the factory configuration for jumper pack J5. Figure 18–3 shows the factory configuration for jumper pack J6. Figure 18–4 shows the factory configuration for jumper pack J7. Figure 18–5 shows the factory configuration for jumper pack J9.

Figure 18–1   ISA SCSI Adapter
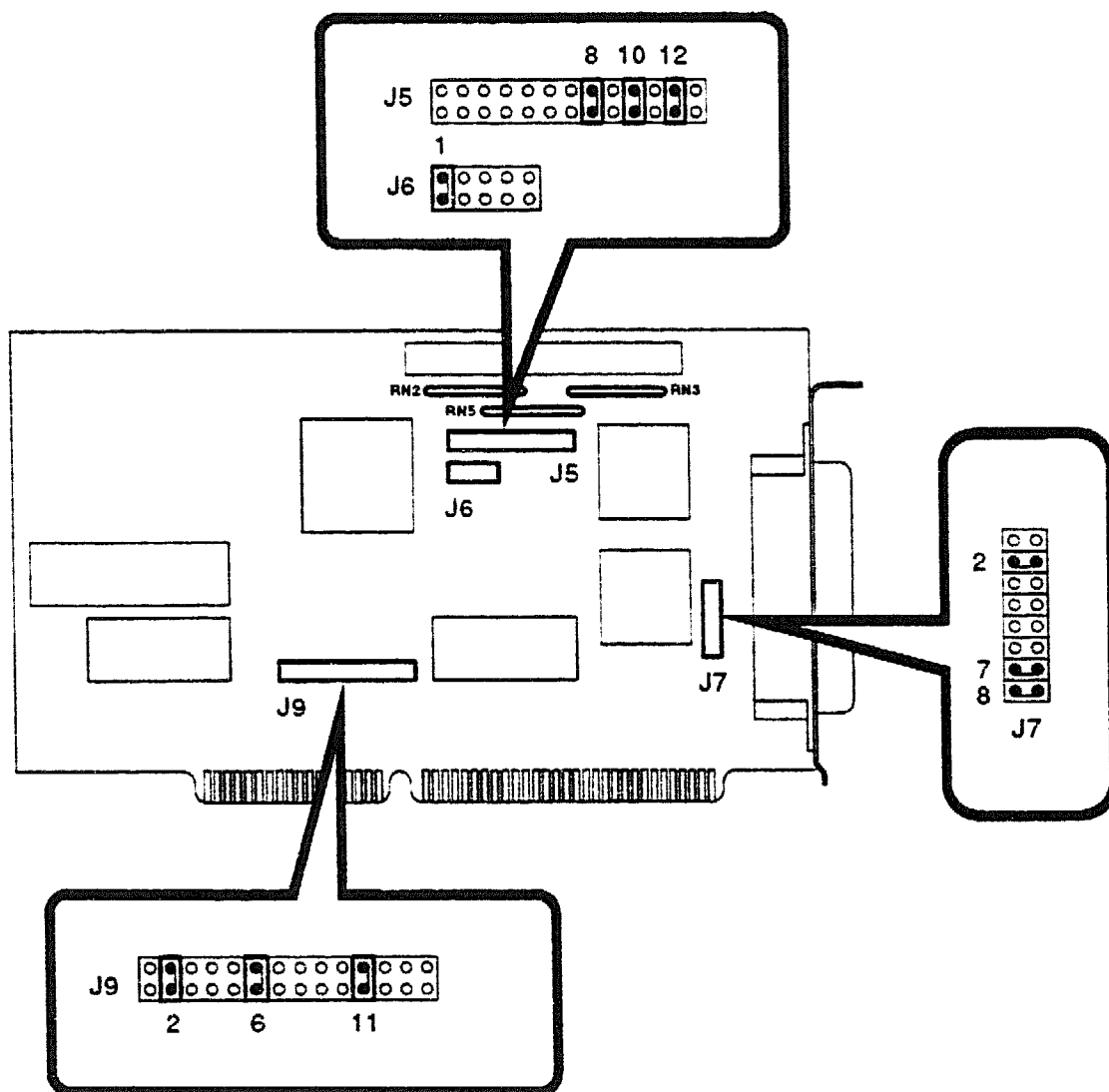
TA-0717-TI

Figure 18-2 SCSI Adapter: Factory Configuration J5

```
          J5
       ┌────────┐
Pin 1  │ O   O  │ Synchronous Transfer
       │ O   O  │ Diagnostics
       │ O   O  │ SCSI Parity
       │ O   O  │ SCSI ID Bit 0
       │ O   O  │ SCSI ID Bit 1
       │ O   O  │ SCSI ID Bit 2
       │ O   O  │ DMA Channel 0  ⎫
Pin 8  │[●──●] │ DMA Channel 1  ⎬ J9 must also be set.
       │ O   O  │ Interrupt Channel 0 ⎫
Pin 10 │[●──●] │ Interrupt Channel 1 ⎬ J9 must also be set.
       │ O   O  │ Interrupt Channel 2 ⎭
Pin 12 │[●──●] │ DMA Transfer Speed
Pin 13 │ O   O  │ DMA Transfer Speed
       └────────┘
```

● = Jumper Installed
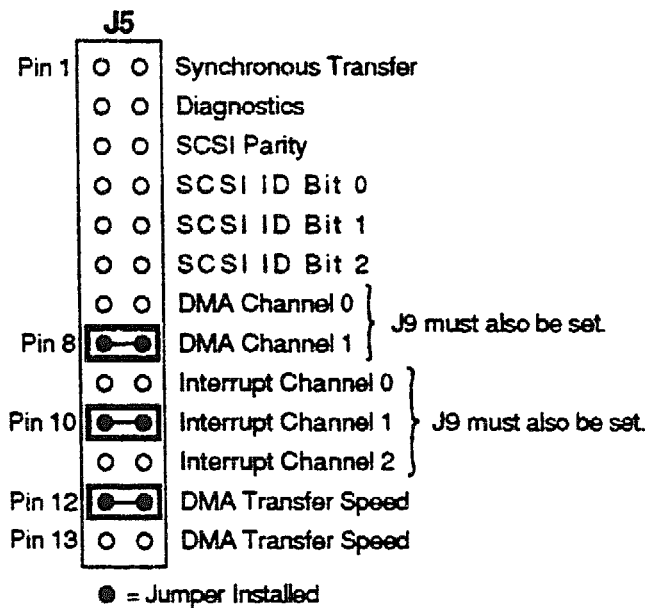
MR-5110-RA

Figure 18-3 SCSI Adapter: Factory Configuration J6

```
          J6
       ┌────────┐
Pin 1  │[●──●] │ BIOS Enable
       │ O   O  │ Spare 1 *
       │ O   O  │ Spare 2 *
       │ O   O  │ Spare 3 *
       │ O   O  │ Disable Auto Sense *
       └────────┘
```

● = Jumper Installed

* = Do not install jumpers.
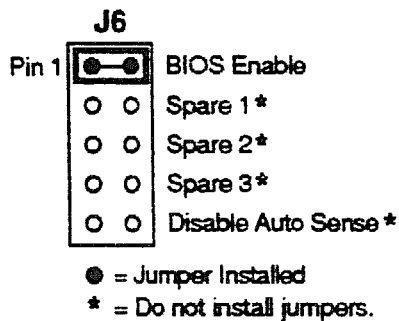
MR-5115-RA

Figure 18-4 SCSI Adapter: Factory Configuration J7

```
        J7
Pin 1 | O  O |  Floppy Secondary Address
      |●──●|  Port Address Select Bit 0
      | O  O |  Port Address Select Bit 1
      | O  O |  Port Address Select Bit 2
      | O  O |  Wait State Bit 0
      | O  O |  Wait State Bit 1
      |●──●|  BIOS Address Select Bit 0
      |●──●|  BIOS Address Select Bit 1

      ● = Jumper Installed
```
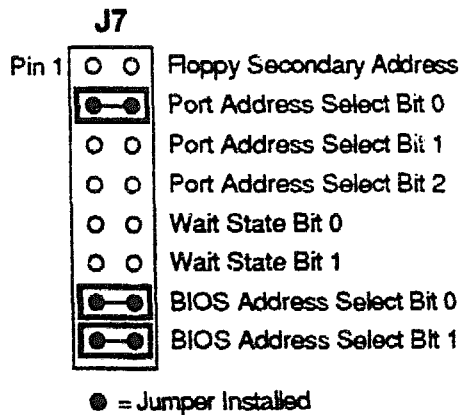
MR-5116-RA

Figure 18-5 SCSI Adapter: Factory Configuration J9

```
         J9
Pin 1 | O  O |  DREQ Channel 0
      |●──●|  DREQ Channel 5
      | O  O |  DREQ Channel 6
      | O  O |  DREQ Channel 7
      | O  O |  DACK Channel 0
      |●──●|  DACK Channel 5
      | O  O |  DACK Channel 6
      | O  O |  DACK Channel 7
Pin 9 | O  O |  IRQ Channel 9
      | O  O |  IRQ Channel 10
      |●──●|  IRQ Channel 11
      | O  O |  IRQ Channel 12
      | O  O |  IRQ Channel 14
Pin 14| O  O |  IRQ Channel 15
```
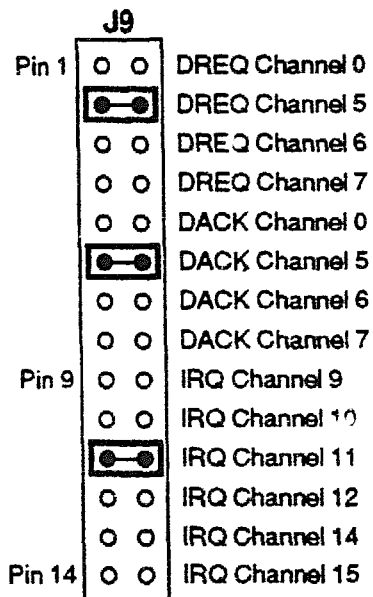
MR-4841-RA

Following are descriptions of the selectable features.

18.2.1 ISA Address

The ISA port address of the SCSI adapter can be set to any one of the following addresses:

- 330 (default)
- 334
- 234
- 230
- 134
- 130

Pin pairs 2, 3, and 4 on jumper pack J7 control which address is selected, as shown in Figure 18-6.

Figure 18-6 ISA Address Jumper Settings

J7			
Pin 1	O O		
Pin–Pair 2	●—●	Port Address Select Bit 0	
Pin–Pair 3	O O	Port Address Select Bit 1	
Pin–Pair 4	O O	Port Address Select Bit 2	
	O O		
	O O		
	●—●		
	●—●		

ISA Port Address			
Bit 2 A9 4	Bit 1 A8 3	Bit 0 A2 2	Select Bit 1 Address Pin–Pair
O	O	O	334H
O	O	●	330H*
O	●	O	234H
O	●	●	230H
●	O	O	134H
●	O	●	130H
●	●	O	Not Used
●	●	●	Not Used

● = Jumper Installed
* = Default

MR–5117–RA
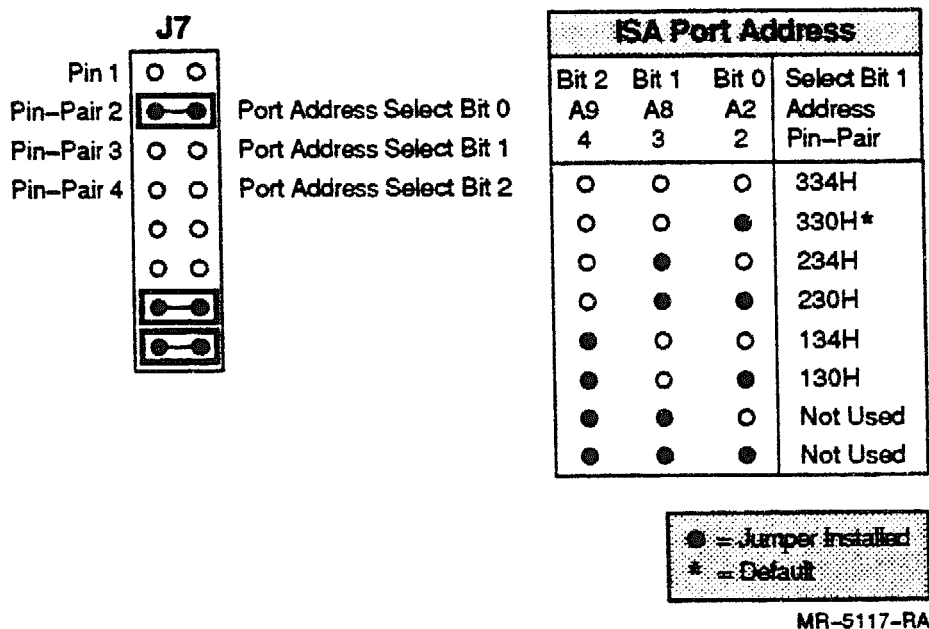
18.2.2 IRQ and Interrupt Channel

The IRQ and interrupt channel must be set to identical values. The IRQ and interrupt channel may be set to 9, 10, 11, 12, 14, or 15.

Pin pairs 9, 10, and 11 on jumper pack J5 control the interrupt channel assigned to the SCSI adapter. Pin pairs 9 through 14 on jumper pack J9 control the IRQ channel. Both jumper packs must be set to the same value. Figure 18–7 shows how values are selected in these jumper packs.

18.2.3 DMA Channel

The DMA channel can be set to 0, 5, 6, or 7. The default setting is DMA channel 5. The DREQ and DACK channels must be set to match the DMA channel selected. The default setting is for DMA channel 5.

Pins 7 and 8 on J5 and pins 1 through 8 on J9 control the DMA channel and DREQ and DACK channel settings. Figure 18–8 shows how the DMA channel is specified.

Figure 18-7 IRQ and Interrupt Channel Jumper Settings

J5

Pin 1

Pin-Pair 9 — Interrupt Channel Select Bit 0
Pin-Pair 10 — Interrupt Channel Select Bit 1
Pin-Pair 11 — Interrupt Channel Select Bit 2

J5 Interrupt Channels			
Pin-Pair			Interrupt
9	10	11	Channel
O	O	O	9
●	O	O	10
O	●	O	11*
●	●	O	12
O	O	●	14
●	O	●	15

● = Jumper installed
* = Default

J9

Pin 1

Pin 9 — IRQ Channel 9
— IRQ Channel 10
— IRQ Channel 11
— IRQ Channel 12
— IRQ Channel 14
Pin 14 — IRQ Channel 15
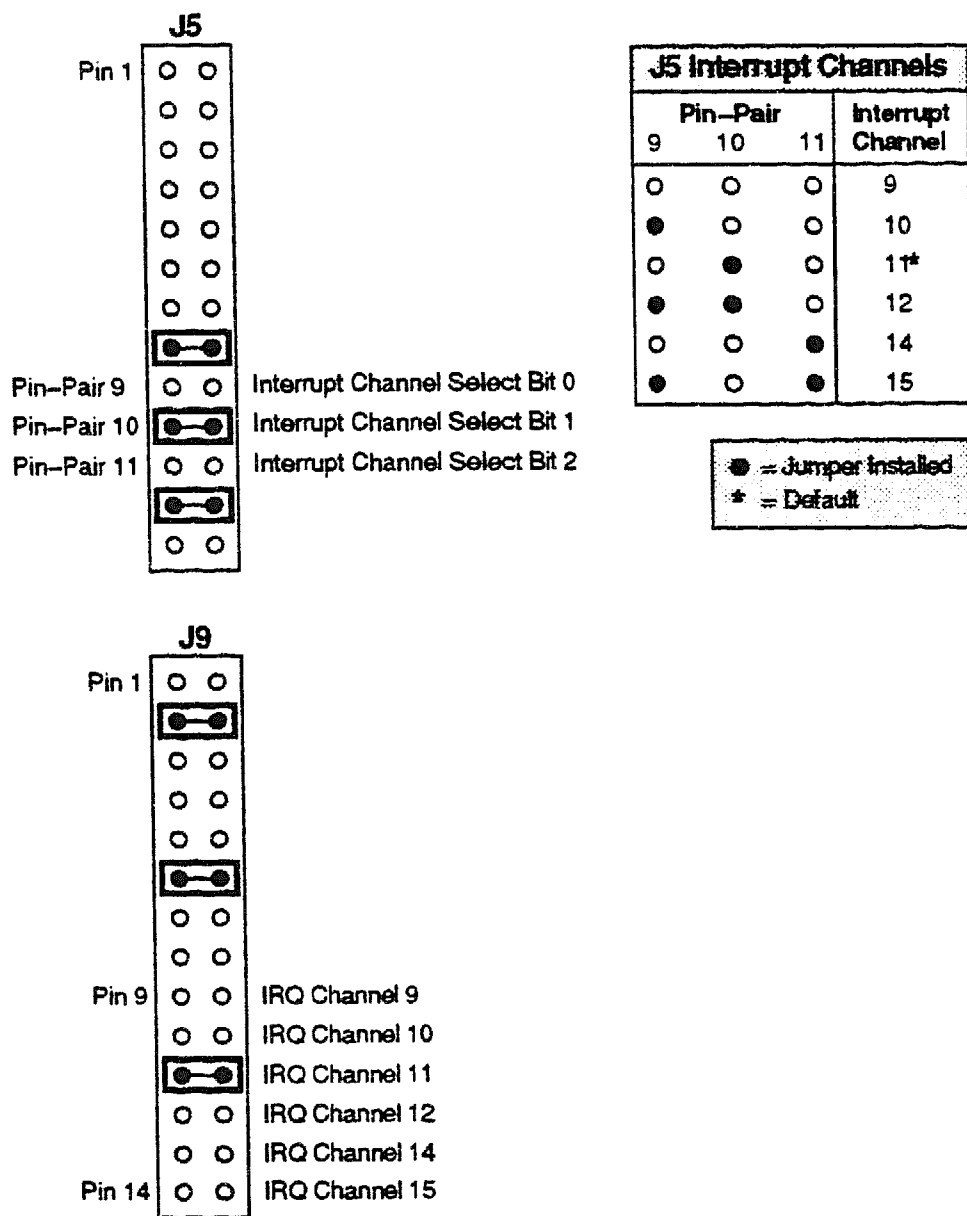
MR-5113-RA

Figure 18-8 DMA Channel Jumper Settings

J5

Pin 1	○ ○
	○ ○
	○ ○
	○ ○
	○ ○
	○ ○
Pin-Pair 7	○ ○ DMA Channel Select Bit 0
Pin-Pair 8	●—● DMA Channel Select Bit 1
	○ ○
	●—●
	○ ○
	●—●
	○ ○

J5 DMA Channel Jumpers		
Pin–Pair 7	8	DMA Channel
○	○	7
●	○	6
○	●	5*
●	●	0

● = Jumper Installed
* = Default

J9

Pin 1	○ ○ DREQ Channel 0
	●—● DREQ Channel 5
	○ ○ DREQ Channel 6
	○ ○ DREQ Channel 7
	○ ○ DACK Channel 0
	●—● DACK Channel 5
Pin-Pair 7	○ ○ DACK Channel 6
Pin-Pair 8	○ ○ DACK Channel 7
	○ ○
	○ ○
	●—●
	○ ○
	○ ○
	○ ○

DREQ and DACK must match DMA Channel set in J5.
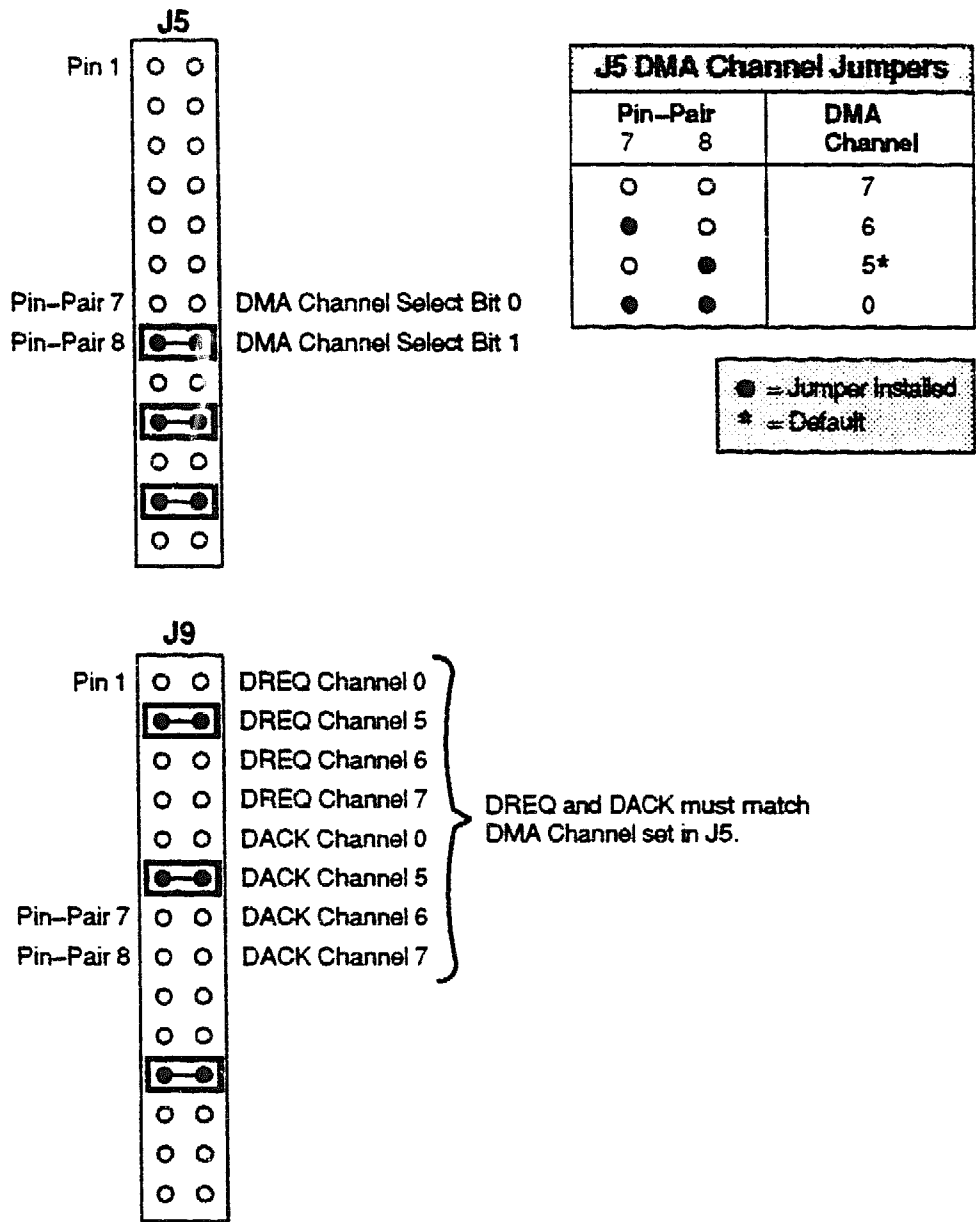
MR-5112-RA

18.2.4 DMA Transfer Rate

The DMA transfer rate can be set to 5.0, 5.7, 6.7, or 8.0 MB/second. The default setting is 5.7 MB/second.

Pins 12 and 13 control the setting of the DMA transfer rate, as shown in Figure 18-9.

Figure 18-9 DMA Transfer Rate Jumper Settings

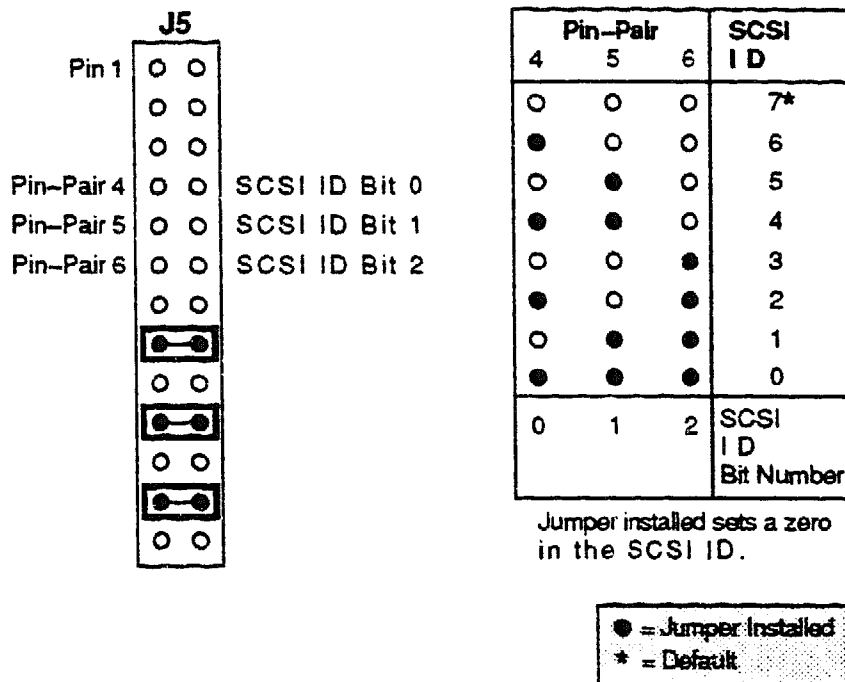| Pin-Pair 12	13	DMA Speed
O	O	5.0 MB/s
●	O	5.7 MB/s*
O	●	6.7 MB/s
●	●	8.0 MB/s

● = Jumper installed
* = Default
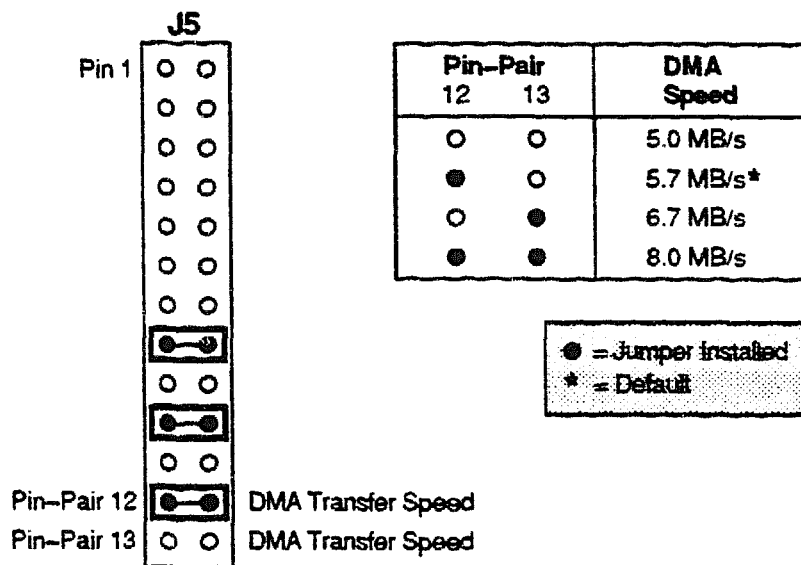
MR-5114-RA

18.2.5 SCSI ID Address

The SCSI ID address of the adapter can be set between 0 and 7. The default setting is 7.

Pins 4, 5, and 6 control the SCSI ID address, as shown in Figure 18–10.

Figure 18–10 SCSI ID Jumper Settings

| Pin–Pair | | | SCSI |
4	5	6	I D
O	O	O	7*
●	O	O	6
O	●	O	5
●	●	O	4
O	O	●	3
●	O	●	2
O	●	●	1
●	●	●	0
0	1	2	SCSI I D Bit Number

Jumper installed sets a zero in the SCSI ID.

● = Jumper Installed
* = Default

MR–5111–RA

18.2.6 SCSI Parity

SCSI parity checking can be enabled or disabled. The default is parity checking enabled. Pin 3 of jumper pack J5 controls this setting. If the pin is installed, parity checking is disabled. If the pin is removed, parity checking is enabled.

18.2.7 SCSI Synchronous Transfer

SCSI synchronous negotiation transfers can be enabled or disabled. The default is disabled synchronous transfers. This means that the adapter supports synchronous transfers if initiated by another device.

18.2.8 BIOS Memory, Enable, and Wait State Selections

The BIOS PROM can be enabled with a jumper on pin 1 on jumper pack J6. This jumper must always be installed, as shown in Figure 18–3.

The starting address of memory space for the on-board BIOS can be set to the following values:

* DC000

* CC000

* D8000

* C8000

The default setting is for C8000.

Pins 7 and 8 on jumper pack J7 control the BIOS memory address space, as shown in Figure 18–11.

Figure 18–11 BIOS Memory Jumper Settings

BIOS SEL 0	BIOS SEL 1	Address
–	–	DC000
●	–	CC000
–	●	DB000
●	●	C8000*

● = Jumper Installed
– = Jumper Not Installed
* = Default
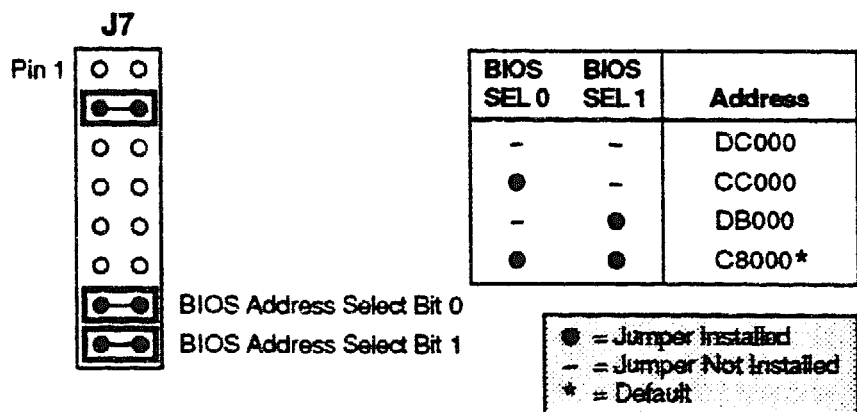
MR–5119–RA

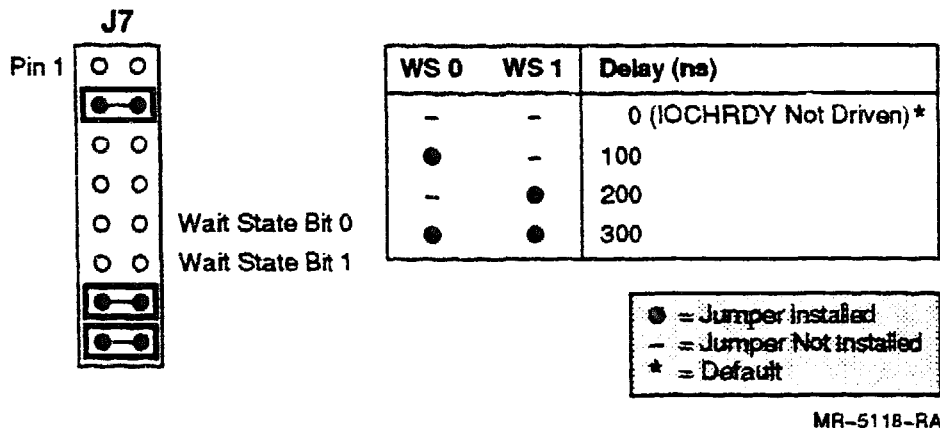BIOS wait states can be set to 0, 100, 200, or 300 nanoseconds. The default setting is for zero wait states. Pins 5 and 6 on jumper pack J7 control the BIOS wait state selection, as shown in Figure 18–12.

Figure 18–12 BIOS Wait State Jumper Settings

WS 0	WS 1	Delay (ns)
–	–	0 (IOCHRDY Not Driven) *
●	–	100
–	●	200
●	●	300

● = Jumper Installed
– = Jumper Not Installed
* = Default

MR–5118–RA

18.3 Terminator Resistor Packs

Each end of a SCSI bus must be terminated. Terminator resistor packs are used on a module to terminate the SCSI bus when only one end of the SCSI bus terminates with a cable terminator. The terminator resistor packs are RN2, RN3, and RN5, as shown in Figure 18–1.

Factory-installed ISA SCSI adapters have terminator resistor packs removed. The internal end of the SCSI bus is terminated with a cable terminator. The external end of the SCSI bus is terminated with the H8574-A 50-pin SCSI terminator.

When installing a PS1XR-AA ISA SCSI adapter, the terminator resistor packs are present on the module and should be left in place. The resistor packs serve to terminate the internal end of the SCSI bus. The external end is terminated with the 50-pin SCSI terminator.

18.4 ISA CFG File

The ISA CFG file for use with the ISA SCSI host adapter is the file for an Adaptec 1540B ISA SCSI adapter. This file is on the system configuration diskette and is labeled "ADP0100.CFG Adaptec AHA-1540/1542 ISA SCSI Host Adapter." This file should have been installed during the initial system installation. (Instructions for installation are contained in the *applicationDEC 433MP EISA System Installation Guide*, EK-PS110-IG.

The instructions below summarize how to install the ISA CFG file for the ISA SCSI host adapter.

1. Boot the ECU from the 3.5-inch diskette drive.

2. From the main menu, select "Configure computer."

3. Select step 2, "Add or remove boards."

4. Use the arrow keys to highlight EISA slot 10 (the factory default slot for the ISA SCSI adapter).

5. Press [Enter] to list the available ISA CFG files.

6. Use the arrow keys to select the ISA CFG file, "ADP0100.CFG Adaptec AHA-1540/1542 ISA SCSI Host Adapter."

7. Press [F10] to return to the "Configure computer" menu.

8. Select "View or edit details."

9. Use the arrow keys to highlight the ISA SCSI adapter.

10. All of the default settings for the Adaptec 1540B can be used except for the following: DMA transfer speed; and BIOS memory address.

11. Use the arrow keys to highlight the BIOS memory address. Press [Enter] and use the arrow keys to select C8000 as the memory address. This reflects the default jumper settings of the applicationDEC 433MP system ISA SCSI adapter.

12. Use the arrow keys to highlight the DMA transfer speed. Press [Enter] and use the arrow keys to change the DMA transfer rate to 5.7 MB/second. This reflects the default jumper settings of the applicationDEC 433MP system ISA SCSI adapter.

13. Press [F10] to return to the "Configure computer" menu.

14. Select "Save and exit" to write the system configuration file to your system and to the ECU diskette.

18.5 Terminator

The ISA SCSI adapter has an external connector on it for attaching additional SCSI devices. When external devices are not connected, an H8574-A SCSI terminator must be installed on this connector to terminate the SCSI bus. Figure 18–13 shows how to install the terminator.

18.6 External Expansion

The ISA SCSI adapter is used primarily to control internal hard disks. However, the ISA SCSI adapter can be used for external SCSI devices as well. The external connector on the ISA SCSI adapter can be used to extend the internal SCSI bus externally, subject to the following conditions:

- The total number of internal and external hard disks on the ISA SCSI system must not exceed four.

- The total number of devices on the ISA SCSI bus must not exceed seven.

- The total cable length of the entire SCSI bus must not exceed 6 meters (18 feet). The internal cable length is approximately 6 feet.

- The end of the SCSI bus must be terminated.

See Section 3.9 and Section 3.10 for further information on the types of external storage expansion boxes available.

If the ISA SCSI bus is not extended externally, the external connector on the ISA SCSI module must be terminated. A 50-pin SCSI terminator is supplied with the applicationDEC 433MP system for this purpose.

18.7 Installation of a Second ISA SCSI Adapter

A second ISA SCSI adapter can be installed for additional SCSI device support. SCO UNIX System V Release 3.2 Version 2.0 allows a maximum of four hard disks on ISA SCSI adapters per system. The four hard disks can be installed internally or externally and can be split between the two adapters in any configuration desired. The second ISA SCSI adapter can be used for external storage expansion only.

Section 3.4.2 contains more information on the storage expansion possibilities using a second ISA SCSI adapter.

If a second ISA SCSI adapter is installed, the configurable features should be changed from the defaults as listed in Table 18–2.

Figure 18–13 SCSI Terminator Installed on External Connector
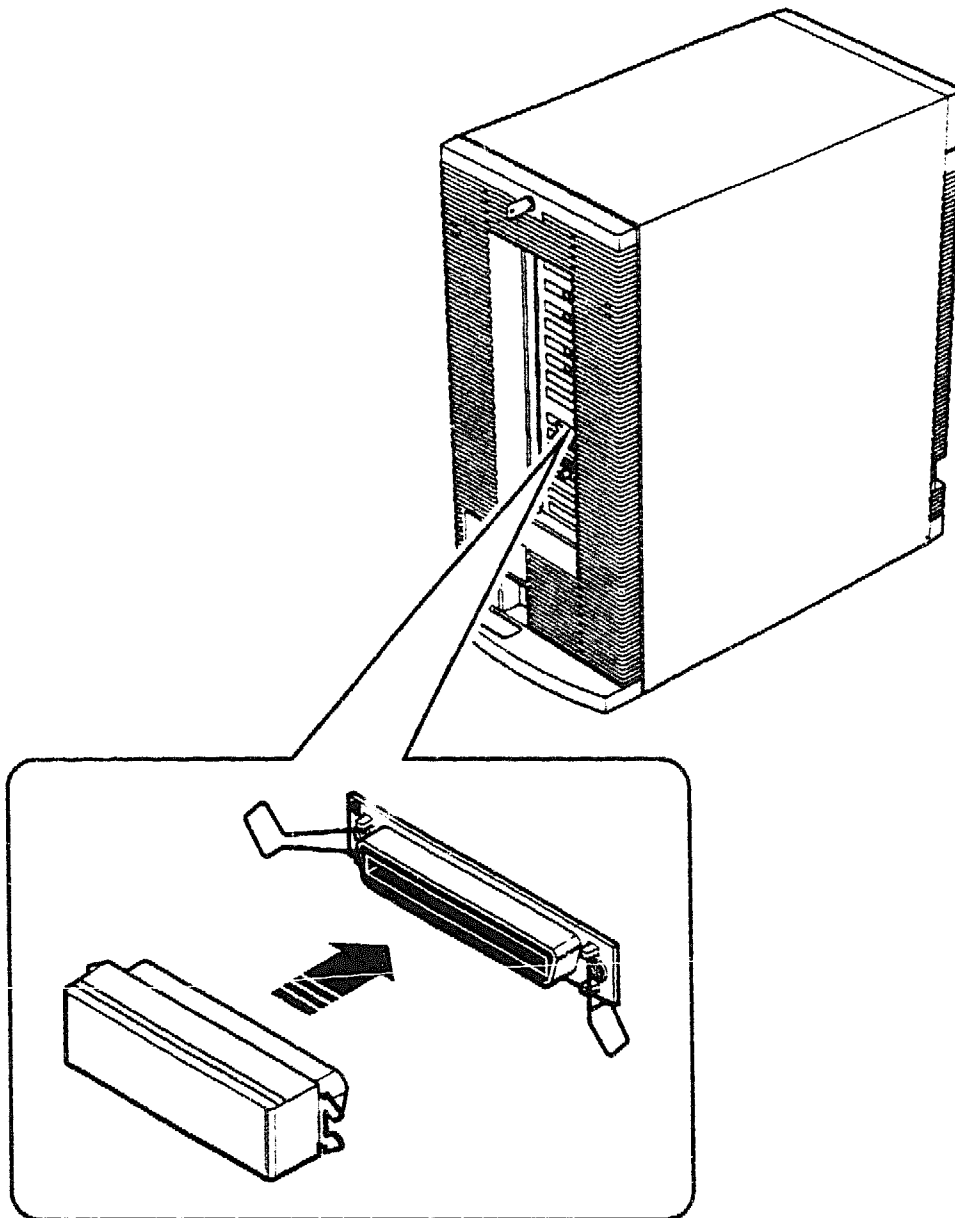
TA-0743-TI

Table 18–2 Jumper Settings for Second ISA SCSI Adapter

Feature	Setting	Jumper Changes
Base add: .s	230	Add a jumper on J7 pin 3
IRQ	14	Move jumper on J5 from pin 10 to pin 11 Move jumper on J9 from pin 11 to pin 13
DMA c: ..nnel	6	Move jumper on J5 from pin 8 to pin 7 Move jumper on J9 from pin 2 to pin 3 Move jumper on J9 from pin 6 to pin 7
BIOS	Disabled	Remove jumper on J6 pin 1

In addition, the terminator resistor packs must remain installed on the adapter. The PS1XR-AA ISA SCSI adapter, when ordered separately, is shipped with the terminator resistor packs installed. The ISA SCSI adapter which is factory installed in an applicationDEC 433MP system has the terminator resistor packs removed.

Install the second ISA SCSI adapter using the following steps:

_____ **Caution** _____

Before you install any option in the applicationDEC 433MP system, make sure that the operating system has been halted with the **shutdown** command and that power is removed from the system.

_____

1. Remove the top cover and left side panel, as described in Section 12.3.1.

2. Remove the card cage door as described in Section 12.3.2.

3. Install the second ISA SCSI adapter. The installation is described in Section 12.6.

   The second ISA SCSI adapter can be installed in any available slot in the EISA backplane.

_____ **Caution** _____

Electrostatic discharge (ESD) can damage integrated circuits and circuit modules. To prevent costly ESD damage, handle the modules by their finger grips and wear an antistatic wrist strap attached to chassis ground.

_____

4. Replace the card cage door, the top cover, and the side panel.

After installation of the second ISA SCSI adapter, the device must be configured. This involves editing of kernel link files as described below.

1. Boot the system in Maintenance mode and log in as *root*.

2. Set directory to the kernel link area using the command:

   ```
   cd /etc/conf/cf.d [Enter]
   ```

3. Use an editor to edit the file *mdevice*. Search for the line *ad*.

   ```
   ad iI iHroCc aha 34 34 1 2 5
   ```

4. Remove the "o" in the third field to make the line read:

   ```
   ad iI iHrCc aha 34 34 1 2 5
   ```

5. Change your directory using the command below.

   ```
   cd /etc/conf/sdevice.d [Enter]
   ```

6. Edit the file *ad* using any editor. Add the following line:

   ```
   ad Y 1 6 1 14 230 232 0 0
   ```

   The new file *ad* will look as follows:

   ```
   ad Y 1 5 1 11 330 332 0 0
   ad Y 1 6 1 14 230 232 0 0
   ```

   The **sdevice(F)** manpage can provide additional information.

7. Use the **mkdev hd** command to configure the devices on the second ISA SCSI adapter. The **mkdev hd** command must be run twice. The first execution updates the internal kernel configuration tables, followed by a kernel relink and a reboot. The second execution, with same **mkdev hd** parameters, establishes a partition table. Refer to the **fdisk(ADM)** documentation and **divvy(ADM)** documentation for more information.

   For example, to configure disk ID 3 on the second ISA SCSI adapter, use the following command:

   ```
   mkdev hd 3 SCSI-1 0 [Enter]
   ```

18.7.1 ISA CFG File

The ISA CFG file for use with the second ISA SCSI host adapter is the file for an Adaptec 1540B ISA SCSI adapter. This file is on the system configuration diskette and is labeled "ADP0100.CFG Adaptec AHA-1540/1542 ISA SCSI Host Adapter."

The instructions below summarize how to install the ISA CFG file for the second ISA SCSI host adapter.

1. Boot the ECU from the 3.5-inch diskette drive.

2. From the main menu, select "Configure computer."

3. Select step 2, "Add or remove boards."

4. Use the arrow keys to highlight the EISA slot in which you installed the second ISA SCSI adapter.

5. Press ⌷Enter⌷ to list the available ISA CFG files.

6. Use the arrow keys to select the ISA CFG file, "ADP0100.CFG Adaptec AHA-1540/1542 ISA SCSI Host Adapter."

7. Press ⌷F10⌷ to return to the "Configure computer" menu.

8. Select "View or edit details."

9. Use the arrow keys to highlight the ISA SCSI adapter.

10. The settings in the ISA CFG file must be altered to match the settings of the board you have just installed. These include: base address of 230; IRQ of 14; DMA channel of 6; and BIOS disabled.

11. Use the arrow keys to highlight the address setting. Press ⌷Enter⌷ to display the choices available, and select 230. Press ⌷Enter⌷ to select 230.

12. Use the arrow keys to highlight the BIOS memory address. Press ⌷Enter⌷ and use the arrow keys to select "Disabled" for the BIOS memory. Press ⌷Enter⌷.

13. Use the arrow keys to highlight the DMA transfer speed. Press ⌷Enter⌷ and use the arrow keys to change the DMA transfer rate to 5.7 MB/second. This reflects the default jumper settings of the PS1XR-AA ISA SCSI adapter.

14. Use the arrow keys to highlight the DMA channel selection. Press ⌷Enter⌷ and choose Channel 6.

15. Use the arrow keys to highlight the IRQ setting and select 14 for the IRQ. These settings now reflect the true jumper configuration of the module as set in Table 18–2.

16. Press [F10] to return to the "Configure computer" menu.

17. Select "Save and exit" to write the system configuration file to your system and to the ECU diskette.

19

Serial/Parallel Adapter

The serial/parallel adapter is a standard feature of all applicationDEC 433MP systems and is factory installed in backplane slot 11. This chapter describes the serial/parallel adapter.
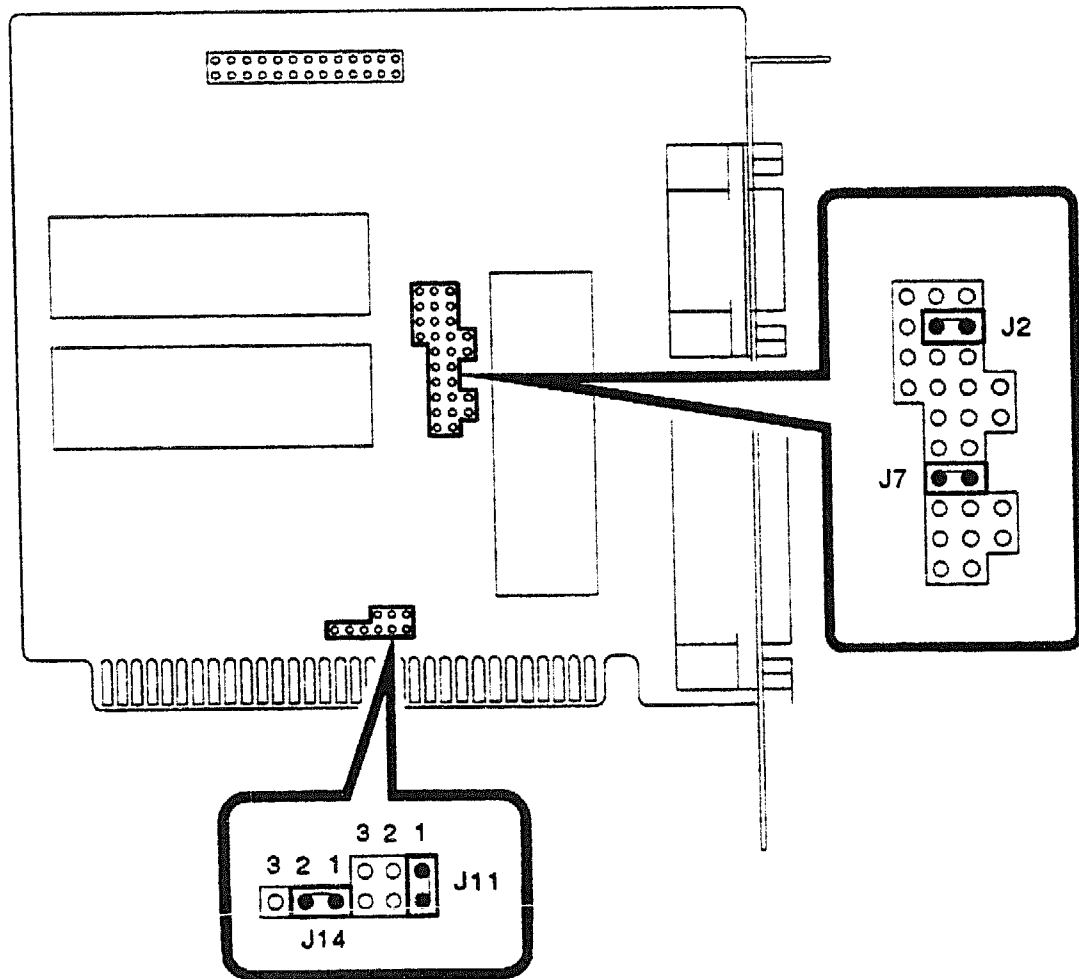
19.1 Description

The serial/parallel adapter is a factory-installed ISA module that provides one serial port and one parallel port.

The serial port is factory configured to have COM2: as its address. The parallel port is factory configured to have 387H (LPT1:) as its address.

The serial/parallel adapter is shown in Figure 19–1.

Figure 19–1 Serial/Parallel Adapter

TA-0736-TI

19.2 Configuration

The address and IRQ line for each port can be set by jumpers.
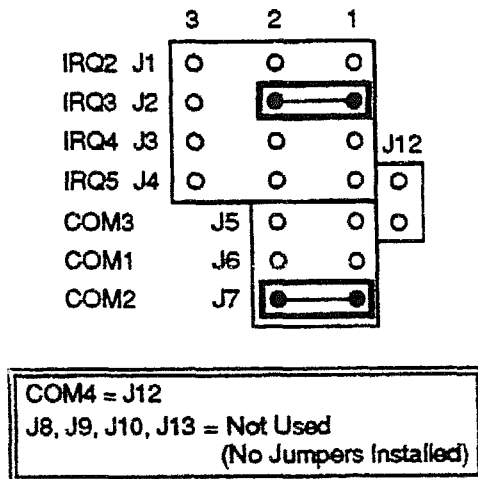
19.2.1 Serial Port Address and IRQ Line

The serial port address is controlled by jumpers. The address can be set to COM1:, COM2:, COM3:, or COM4:. The default setting is COM2:. Figure 19–2 illustrates how to install jumpers for the different address settings.

_____ **Note** _____

The address of the serial port on the serial/parallel adapter should not be set to COM1:. During system configuration, the ECU automatically assigns the COM1: address to the serial port on the bridge module.

_____

The IRQ line for the serial port can be set to IRQ2, IRQ3, IRQ4, or IRQ5. The default setting is IRQ3.

Figure 19–2 Serial Port Jumpers


```
                 3    2    1
    IRQ2  J1   | O    O    O |
    IRQ3  J2   | O   [●————●] |
    IRQ4  J3   | O    O    O |  J12
    IRQ5  J4   | O    O    O |  O
    COM3     J5  | O    O |  O
    COM1     J6  | O    O |
    COM2     J7  |[●————●]|
```

```
COM4 = J12
J8, J9, J10, J13 = Not Used
                   (No Jumpers Installed)
```

MR–5109–RA

Table 19–1 lists the addresses possible for the serial port.

———————————————— **Note** ————————————————

The address of the serial port on the serial/parallel adapter should not be set to COM1:. During system configuration, the ECU automatically assigns the COM1: address to the serial port on the bridge module.

Table 19–1 Serial Port Addresses

Address Name	Address	Jumper Installed
COM1:	3F8–3FF	J6
COM2:	2F8–2FF	J7 (factory default)
COM3:	3E8–3EF	J5
COM4:	2E8–2EF	J12
Disabled	N/A	None

Table 19–2 lists the IRQ settings possible for the serial port.

Table 19–2 Serial Port IRQ Settings

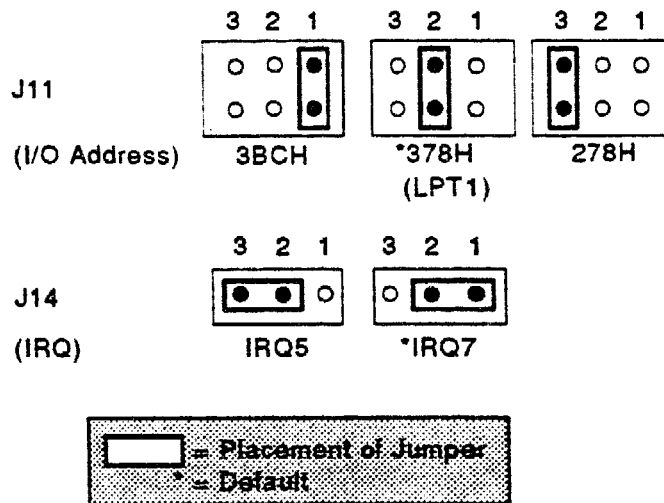| IRQ Setting	Jumper Installed
IRQ2	J1 pins 1–2
IRQ3	J2 pins 1–2 (factory default)
IRQ4	J3 pins 1–2
IRQ5	J4 pins 1–2

Pin pairs 2–3 in J1 through J4 should be left open (no jumper installed).

19.2.2 Parallel Port Address and IRQ Line

The parallel port address is controlled by jumpers. The address can be set to 378H (LPT1:), 278H, or 3BCH. The default setting is for 378H (LPT1:). Figure 19–3 illustrates how to install jumpers for the different address settings.

The IRQ line for the parallel port can be set to IRQ5 or IRQ7. The default setting is IRQ7.

Figure 19–3 Parallel Port Jumpers

MR-0536-91DG

Table 19–3 lists the addresses available for the parallel port.

Table 19–3 Parallel Port Addresses

Address	Jumper Installed
3BC	J11 pin 1
378 (LPT1:)	J11 pin 2 (factory default)
278	J11 pin 3

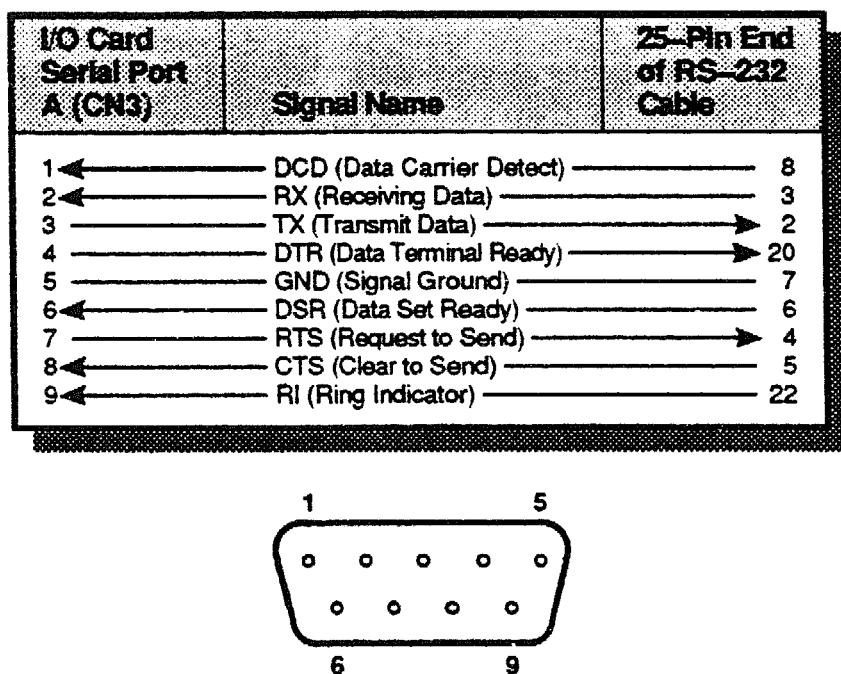Table 19–4 lists the IRQ settings available for the parallel port.

Table 19–4   Parallel Port IRQ Settings

IRQ	Jumper Installed
IRQ5	J14 pins 2–3
IRQ7	J14 pins 1–2 (factory default)

19.3 Signal Pinouts

Figure 19–4 shows the signals presented on the serial port connector.
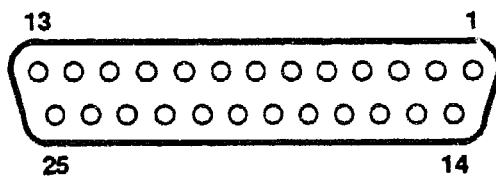
Figure 19–4   Serial Port Pinout

I/O Card Serial Port A (CN3)	Signal Name	25–Pin End of RS–232 Cable
1	DCD (Data Carrier Detect)	8
2	RX (Receiving Data)	3
3	TX (Transmit Data)	2
4	DTR (Data Terminal Ready)	20
5	GND (Signal Ground)	7
6	DSR (Data Set Ready)	6
7	RTS (Request to Send)	4
8	CTS (Clear to Send)	5
9	RI (Ring Indicator)	22

MR–5123–RA

Figure 19–5 shows the signals presented on the parallel port connector.

Figure 19–5 Parallel Port Pinout

Pin	Signal	In/Out
1	–STROBE	Out
2	Data Bit 0	Out
3	Data Bit 1	Out
4	Data Bit 2	Out
5	Data Bit 3	Out
6	Data Bit 4	Out
7	Data Bit 5	Out
8	Data Bit 6	Out
9	Data Bit 7	Out
10	–ACK	In
11	BUSY	In
12	PE	In
13	SLCT	In
14	–AUTO FEED XT	Out
15	–ERROR	In
16	–INIT	In
17	–SLCT IN	Out
18–25	GND	–

MR–5124–RA

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20

Video Graphics Adapter (VGA)

The video graphics adapter (VGA) is a standard feature of all applicationDEC 433MP systems and is factory installed in backplane slot 12. This chapter describes the PS1XG-AA video graphics adapter. Full details on the VGA can be found in the *PS1XG-AA High Resolution Graphics Adapter Installation and User Manual*, ER-PS1XG-IG.

20.1 Description

The video graphics adapter (VGA) provides graphics capabilities for the console monitor. One graphics monitor can be connected to a VGA. This high resolution graphics adapter includes the following features:

* High resolution up to 1024 x 768 and Super VGA 800 x 600 on multisync monitors

* High 72 Hz refresh rate

* Compatible with VGA, EGA, CGA, MDA, and Hercules graphics modes

* Bus mouse support

The VGA contains automatic monitor detection circuitry, which allows it to configure itself for the attached monitor. If the adapter is unable to determine the monitor type and resolution, utility software is provided with the adapter to configure it for the monitor attached.

The Digital Equipment Corporation VRC16 Color Multisync monitor is the recommended monitor for use with the applicationDEC 433MP system. However, the VGA supports many monitors from various vendors.

20.2 Bootable Utility Diskette

The VGA is shipped with a bootable utility diskette, which can be used to configure the adapter for your monitor (if the VGA is unable to automatically detect the monitor). The utility diskette contains a program called VGASETUP, which allows you to configure the VGA and specify an IRQ level and address for the bus mouse. In addition, the diskette contains a diagnostic test program that verifies proper operation of the VGA.

20.3 Preinstallation Configuration

There are no jumpers or switches on the VGA. All address and IRQ selections are either software configurable or fixed.

20.4 ISA Address and IRQ Selection

The VGA address port and memory port are not selectable. The VGA address is configured for 3B0–3DF. The memory port is configured for A0000–BFFFF.

An IRQ line must be selected for the bus mouse. This IRQ line must be unique and not conflict with any IRQ already assigned to an option in the ISA bus. The IRQ line is set with the utility software and can be any IRQ between 2 and 5, inclusive, or disabled. The factory configuration is for the mouse IRQ to be disabled. You must use the bootable utility diskette supplied with the VGA to configure the mouse for an IRQ setting and a primary or secondary address.

Select IRQ 5 for the bus mouse.

The bus mouse address is selectable between the primary address (23C–23F) and the secondary address (238–23B). The bus mouse should be configured for the primary address in an applicationDEC 433MP system.

20.5 ISA CFG File

The ISA CFG file for use with the VGA is the file for an ATI VGA Wonder+. This file is contained on your system configuration diskette and is labeled "ATI0060.CFG VGA Wonder+." This file should have been installed during the initial system installation. (Instructions for installation are contained in the *applicationDEC 433MP EISA System Installation Guide*, EK-PS110-IG.

The instructions below summarize how to install the ISA CFG file for the VGA.

1. Boot the ECU from the 3.5-inch diskette drive.

2. From the main menu, select "Configure computer."

3. Select step 2, "Add or remove boards."

4. Use the arrow keys to highlight EISA slot 12 (the factory default slot for the VGA).

5. Press ‾Enter‾ to list the available ISA CFG files.

6. Use the arrow keys to select the ISA CFG file, "ATI0060.CFG VGA Wonder+."

7. Press ‾F10‾ to return to the "Configure computer" menu.

8. Select "View or edit details."

9. Use the arrow keys to highlight the VGA.

10. Select the "Primary/secondary" address for the mouse.

11. Press ‾F6‾ and check that the IRQ is set to 5 for the mouse. Note that this does not enable the mouse; VSETUP on the bootable utility diskette sets these features for the mouse.

12. Ensure that the "16-bit ROM" is selected.

13. Press ‾F10‾ to return to the "Configure computer" menu.

14. Select "Save and exit" to write the system configuration file to your system and to the ECU diskette.

20.6 Cabling and Connections

The cable can be connected directly to the analog connector on the adapter, as shown in Figure 9–1.

20.7 Connecting a Bus Mouse

A bus mouse is supplied with the PS1XG-AA VGA and is connected directly to the mouse connector on the VGA. You must enable the mouse and select an IRQ and address. To do this, use the bootable utility diskette shipped with the VGA.

20.8 Utility Software

A bootable utility diskette is provided with the VGA to configure the adapter in the event it is unable to detect the type of monitor you have attached. Refer to the *PS1XG-AA High Resolution Graphics Adapter Installation and User Manual* for complete details on how to use the utility software.

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21

Terminal Multiplexer Host Adapter

This chapter describes the terminal multiplexer host adapter.

21.1 Description

The terminal multiplexer host adapter, shown in Figure 21–1, is an ISA module that allows connection of up to 32 serial terminals. Each terminal multiplexer adapter has four connectors for installation of a terminal concentrator. Each terminal concentrator allows up to eight terminals to be connected.

The terminal concentrator is connected to the terminal multiplexer or the CPU/SIO.

21.2 Terminal Multiplexer Installation

You must set the memory address of the terminal multiplexer before it is installed. The memory address should be set as shown in Table 21–1. Figure 21–2 shows the rotary switches that set the module address.

Figure 21–1 Terminal Multiplexer Host Adapter
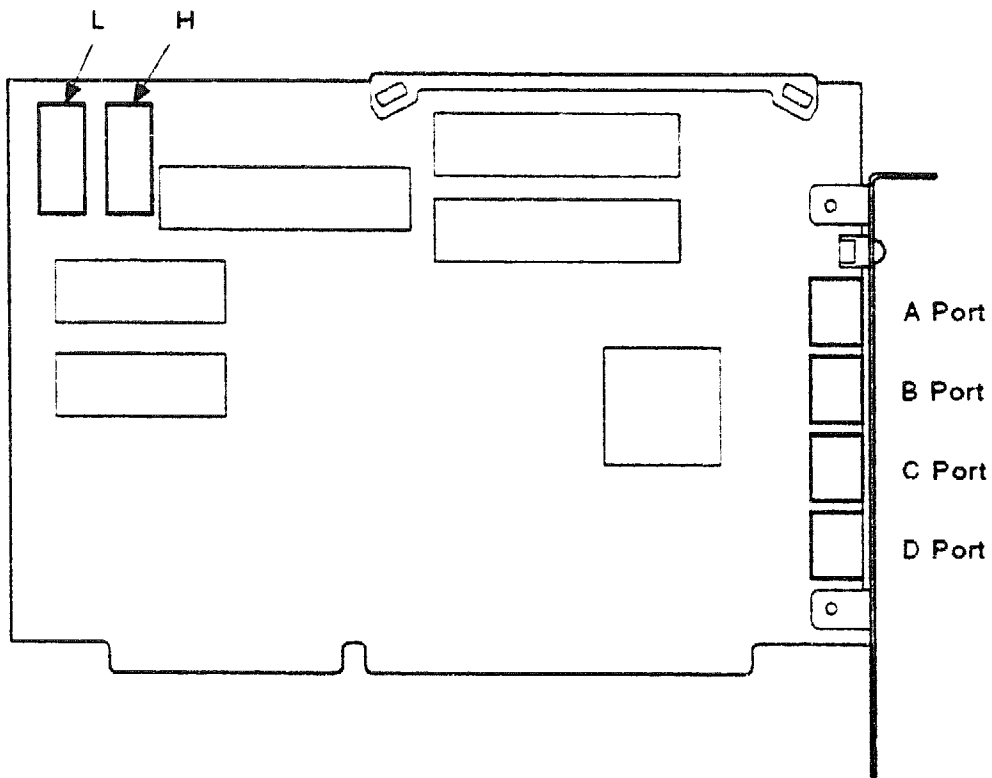
MR-0082-91DG

Table 21-1 Terminal Multiplexer Memory Address Settings

Terminal Multiplexer	Memory Address	H Switch	L Switch
First installed	E10000–E1FFFF	E	1
Second installed	E20000–E2FFFF	E	2

_____ **Note** _____

Check to ensure that the multiplexer memory address switches
(H and L) are set correctly before installing the terminal multiplexer
host adapter in the system.

Figure 21-2 Terminal Multiplexer Rotary Switch Settings
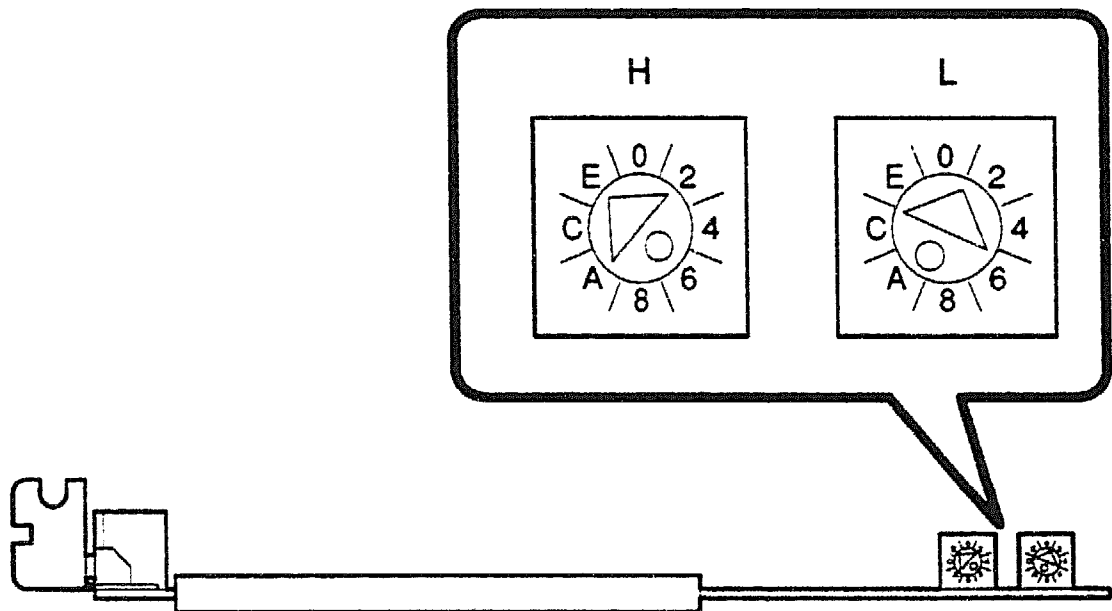
TA-0746-TI

You must select an IRQ line for the terminal multiplexer. During installation of the software driver, you will be asked to specify the IRQ. Select IRQ 12 for the ISA terminal multiplexer host adapter. This IRQ can be used for both host adapters, if two are installed.

_____ **Note** _____

IRQ 12 is used only by the ISA terminal multiplexer host adapter. Terminal concentrators attached to the CPU/SIO use the SCO MPX software interrupt.

_____

21.3 Installation

Use the following instructions to install the terminal multiplexer module.

_____ **Caution** _____

Before you install any option in the applicationDEC 433MP system, make sure that the operating system has been halted with the **shutdown** command and that power is removed from the system.

_____

1. Remove the top cover and left side panel, as described in Section 12.3.1.

2. Remove the card cage door as described in Section 12.3.2.

3. Remove the blank distribution panel by removing the screw holding the panel to the chassis. Be careful not to drop the screw onto a module as it is removed from the chassis. Save the screw.

4. Install the terminal multiplexer in any available EISA slot (13 through 16) in the backplane, as shown in Figure 21–3. Slide the module into the backplane slot with the component side facing up. Make sure that the fingers of the module are fully inserted into the backplane slot.

_____ **Caution** _____

Electrostatic discharge (ESD) can damage integrated circuits and circuit modules. To prevent costly ESD damage, handle the modules by their finger grips and wear an antistatic wrist strap attached to chassis ground.

_____

5. Align the module's distribution panel with the screw hole in the chassis and insert the screw saved from step 3.

6. Replace the card cage door, the top cover, and the side panel.

Figure 21–3 Terminal Multiplexer Backplane Locations

Backplate

Terminal
Multiplexer
Adapter
Module
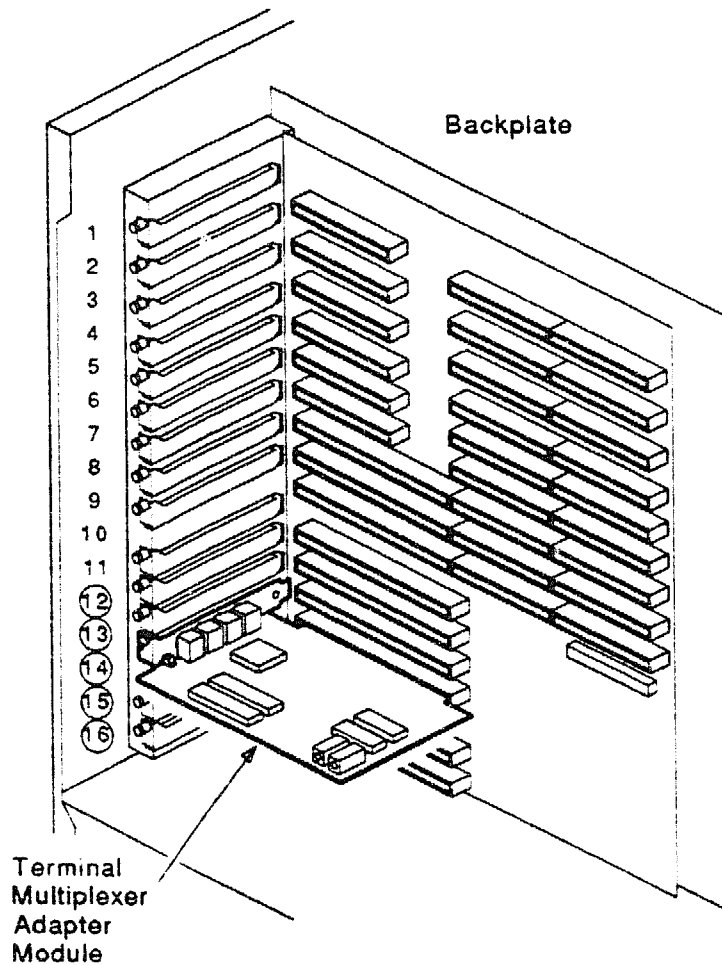
TA-0740-TI

21.4 Update System Configuration with ECU

After you install the terminal multiplexer host adapter, you must also update the system configuration file by running the ECU.

———————————————— **Note** ————————————————

The terminal multiplexer host adapter uses memory locations reserved for system memory. Therefore, you must run the ECU and update the system configuration file to specify that the terminal multiplexer uses the 14 MB memory space. This sets the 14 MB memory space as noncacheable.

——

Use the following instructions to update the file with the ECU.

1. Boot the ECU from the 3.5-inch diskette drive.

2. From the main menu, select "Configure computer."

3. Select step 2, "Add or remove boards."

4. Use the arrow keys to highlight the EISA slot in which you installed the terminal multiplexer host adapter.

5. Press [Enter] to list the available ISA CFG files.

6. Use the arrow keys to select the ISA CFG file, "ISAC001.CFG Corollary 8x4 MUX."

7. Press [F10] to return to the "Configure computer" menu.

8. Select "View or edit details."

9. Use the arrow keys to highlight the terminal multiplexer.

10. Select the memory range, 14 MB, for the terminal multiplexer.

11. Press [F6] and ensure that the IRQ is set to 12.

12. Press [F10] to return to the "Configure computer" menu.

13. Select "Save and exit" to write the system configuration file to your system and to the ECU diskette.

21.5 Connecting Terminal Concentrators

The terminal multiplexer host adapter has four external mini-DIN connectors on the distribution panel. One terminal concentrator can be attached to each connector. This allows for a maximum of 32 terminals connected to each terminal multiplexer host adapter.

21.6 Software Driver Installation

Complete instructions on installing the terminal multiplexer software driver are contained in the *Terminal Multiplexer Intelligent I/O Subsystem Installation Guide*.

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22

Network Connections

This chapter describes the supported means of connecting the applicationDEC 433MP system to an Ethernet network. Both TCP/IP and DECnet protocol environments are supported.

22.1 TCP/IP and DECnet Support

The applicationDEC 433MP system uses Ethernet transport for networking communications.

For TCP/IP protocol environments, the Santa Cruz Operation offers SCO TCP/IP. This is a layered product for SCO UNIX but is included with the SCO Open Desktop software kit. SCO TCP/IP supports either a Western Digital WD8000 or a 3Com 3c503 Ethernet module.

For DECnet protocol environments, Digital Equipment Corporation offers DECnet for SCO UNIX. DECnet protocol can allow the applicationDEC 433MP system to be fully integrated into a DECnet environment including: VMS for VAX systems; ULTRIX; MS–DOS; Apple Macintosh; and OS/2 systems. Existing DECnet enviroments such as TOPS–10 and TOPS–20, RSX–11, and RSTS/E are also supported by DECnet for SCO. DECnet for SCO UNIX is a DECnet Phase IV end-node implementation. DECnet for SCO UNIX allows for the concurrent use of DECnet and TCP/IP on the same system using a single supported Ethernet module. DECnet for SCO supports the Digital EtherWORKS Turbo module and both the Western Digital WD8000 and the 3Com 3c503 modules.

22.2 Supported Ethernet Options

To connect the applicationDEC 433MP system to an Ethernet network, the following network modules are recommended:

- Western Digital 8003 (for TCP/IP or DECnet environments)
- 3Com 3c503 (for TCP/IP or DECnet environments)
- Digital EtherWORKS Turbo DE200-AC (for DECnet environments)

22.3 Installation

You can install an Ethernet network module in any available EISA slot. Follow the module installation procedure described in Section 12.6.

Tables 22–1 and 22–2 illustrate the recommended address and IRQ settings for the supported Ethernet modules.

Table 22–1   Ethernet Network Module Configurations: TCP/IP Environment

Setting	Western Digital 8003	3Com 3c503
ISA address	240–25F	310
IRQ	IRQ9 (2 alias)	IRQ2
Memory	CC000–CFFFF	Disabled

Table 22–2   Ethernet Network Module Configurations: DECnet Environment

Setting	Western Digital 8003	3Com 3c503	EtherWORKS Turbo
ISA address	240–25F	310	300
IRQ	IRQ9 (2 alias)	IRQ2	IRQ15
Memory	CC000–CFFFF	CC000–CFFFF	D0000

_____ **Note** _____

In an environment where both DECnet and TCP/IP coexist, use the DECnet module configuration settings.

_____

22.4 Network File Sharing: SCO NFS

For network file sharing in a TCP/IP environment, SCO NFS can be used.
This product, which runs on top of TCP/IP, allows the applicationDEC 433MP
system to share files and filesystems with other SUN compatible NFS systems.
Files on other systems can be transparently accessed by the applicationDEC
433MP system as if they were local files.

—————————————————— **Note** ——————————————————

When using SCO NFS with the 3Com 3c503, set the rsize and wsize
parameters to 2048 for maximum performance.

23

SCSI Hard Disk Drives

This chapter describes the RZ24-S and RZ25-S disk drives.

23.1 Description

Table 23-1 lists Digital-supplied SCSI hard disk drives that can be installed in the applicationDEC 433MP system.

Table 23-1 Hard Disk Drives

Formatted Capacity	Model Number	Order Number	Size
209 MB	RZ24-S	RZ24-S	Half-height (3.5-inch)
426 MB	RZ25-S	RZ25-S	Half-height

Half-height (3.5-inch) SCSI hard disk drives supplied by other vendors can also be installed in an applicationDEC 433MP system. See Section 23.5, Installing Other Vendor's SCSI Hard Disk Drives.

One RZ24-S disk drive comes with every applicationDEC 433MP system. Up to four hard disk drives can be installed on the ISA SCSI bus in the applicationDEC 433MP system. Up to six hard disk drives can be installed in the applicationDEC 433MP chassis, if a dual SCSI bus scheme is used.

23.2 Preinstallation Configuration

Before you install a SCSI hard disk drive in the applicationDEC 433MP system, set its SCSI ID with the jumpers located on the drive. Figures 23-1 and 23-2 show the location of the SCSI ID jumpers on the RZ24 and RZ25 drives. Table 23-2 shows you how to set the jumpers.

Figure 23–1   RZ24-S Jumpers
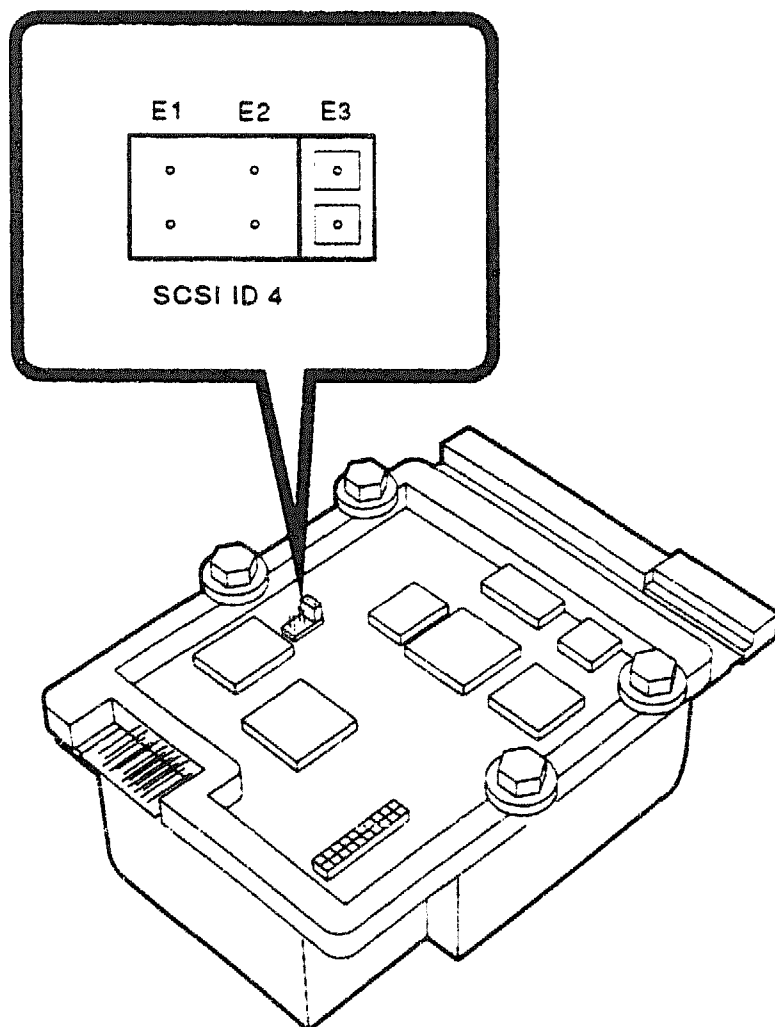
TA-0721-TI

Table 23–2   SCSI ID Jumper Settings

SCSI ID	E1 (0)	E2 (1)	E3 (2)
0	Out	Out	Out
1	In	Out	Out
2	Out	In	Out
3	In	In	Out
4	Out	Out	In
5	In	Out	In
6	Out	In	In

Figure 23–2 RZ25-S Jumpers
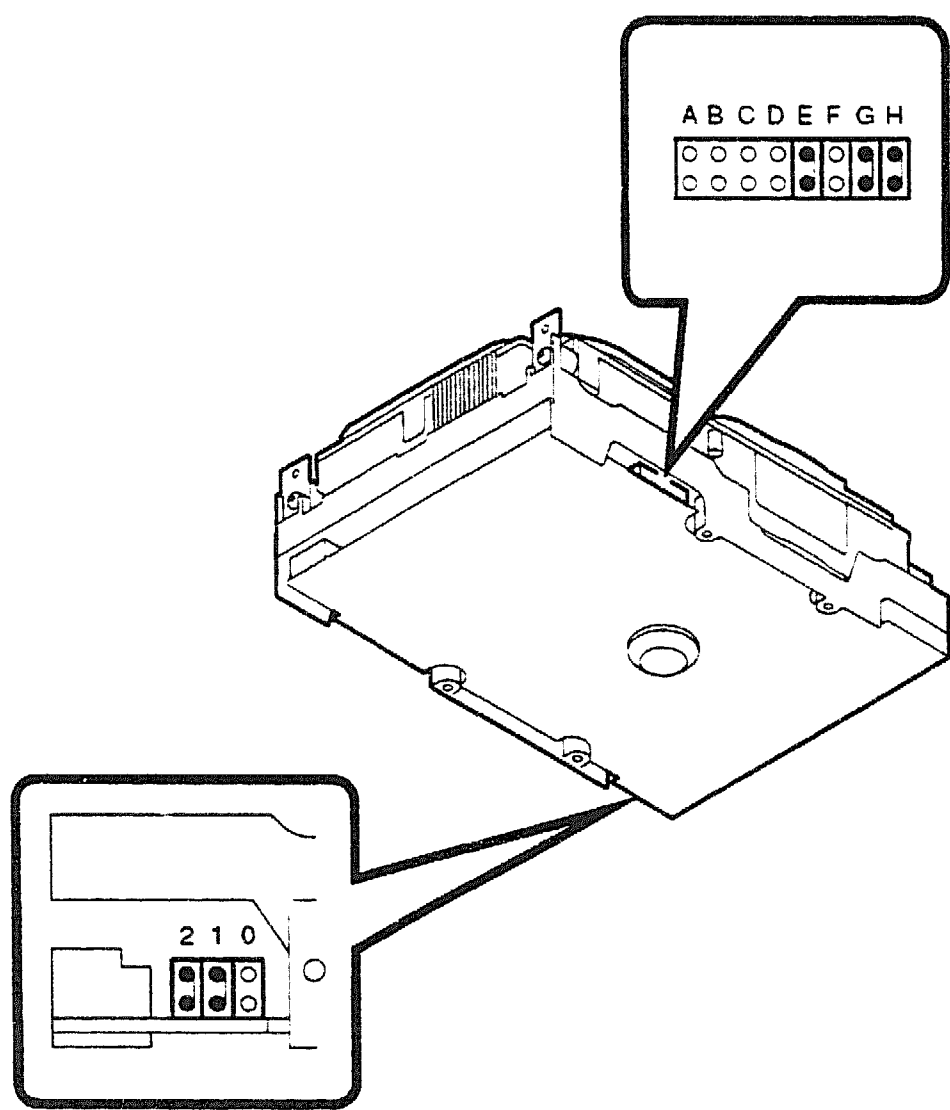
MR-0552-91DG

When you set the ID jumpers to define the SCSI ID, remember:

* Each drive on a SCSI bus must have a unique ID number.

* The applicationDEC 433MP system supports dual SCSI buses.

* ID addresses for one SCSI bus have no bearing on ID addresses for another SCSI bus.

Therefore, each drive connected to a SCSI bus must have a unique SCSI ID from 0 to 6, and each drive connected to the second SCSI bus must have a unique SCSI ID from 0 to 6. For each bus, SCSI ID 7 is generally reserved for the SCSI adapter.

Before you install an RZ25 drive in the applicationDEC 433MP system, verify that configuration jumpers A through H are installed as shown in Figure 23–2. Table 23–3 describes the jumpers.

Table 23–3   RZ25-S Configuration

Jumper	Operating Position	Description
A	Out	Factory use only.
B	Out	Spin-up on power up when removed. Spin-up on command when installed.
C	Out	Spin-up delay (valid only if jumper B is removed). Drive spins up after n-second delay when installed (n = 16 x SCSI ID setting). Drive spins up immediately when removed.
D	Out	Write-protect. Drive is write protected when installed.
E	In	Parity checking. Parity checking is enabled when installed.
F	Out	Reserved. Do not install jumper.
G	In	Terminator power source. The drive supplies power to SCSI bus, pin 26.
H	In	Terminator power source. The drive supplies power to its own terminators. Jumpers G and H should both be installed.

23.3 Installation

Use the following steps to install an RZ24 or RZ25 hard disk drive:

_____ _____ **Caution** _____

Before you install any option in the applicationDEC 433MP system, make sure that the operating system has been halted with the **shutdown** command and that power is removed from the system.

_____

1. Remove the top cover and right side panel, if necessary, as described in Section 12.3.1.

2. On an RZ24 drive, install the four mounting bolts with attached grommets (supplied with the drive) on the bottom of the drive chassis.

   On an RZ25 drive, install the I-shaped bracket (supplied with the drive) on the bottom of the drive chassis. Use the four mounting bolts (with attached grommets) as shown in Figure 23–3.

Figure 23–3 RZ25-S Bracket Installation

Shims face
toward drive
bottom.

Bracket

Ridges face
away from
drive.
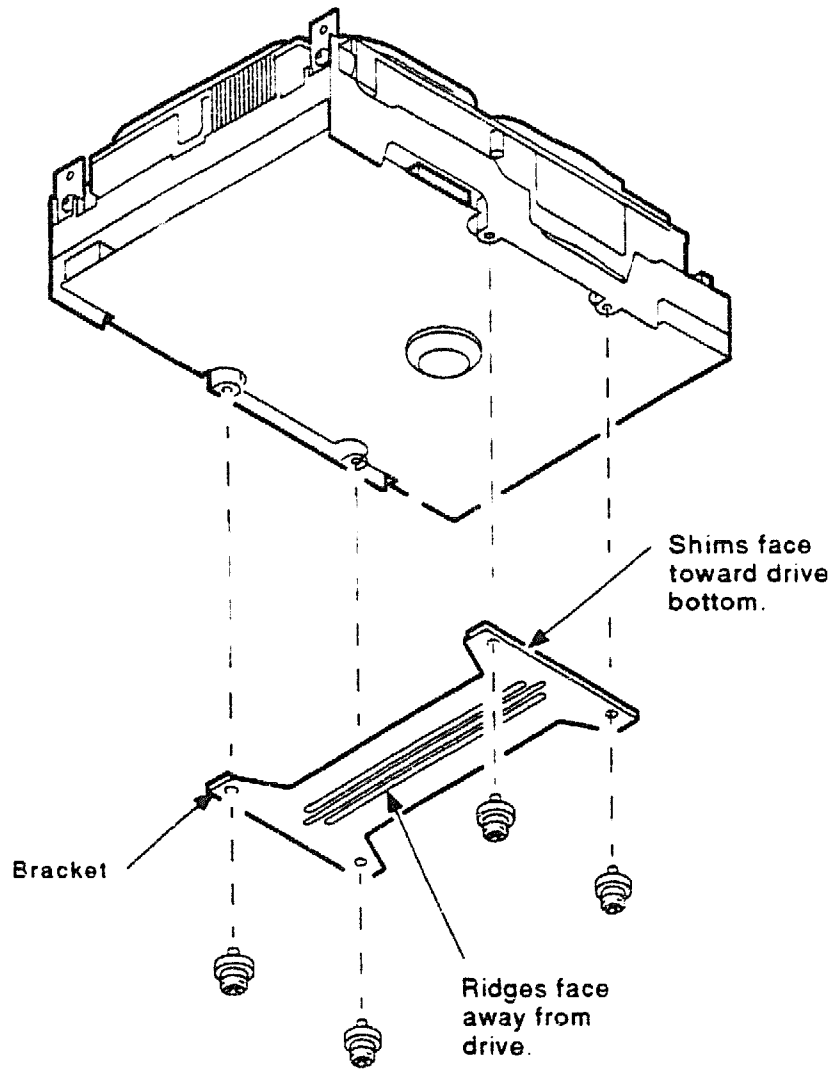
MR-0550-91DG

3. Align the disk drive mounting bolts with the mounting bracket holes on the applicationDEC 433MP system. The grommets over the mounting bolts provide protection against shock and vibration. See Figure 23–4.

4. Insert the disk drive mounting bolts into the mounting bracket holes.

5. Slide the disk drive sideways to lock the mounting bolts into the bracket holes. A metal lip on the mounting bracket locks the drive in place.

6. Connect the power connector to the power receptacle on the drive.

7. Connect the SCSI connector to the drive.

8. Replace the top cover and side panel.

Figure 23–4 Installing a Hard Disk Disk Drive
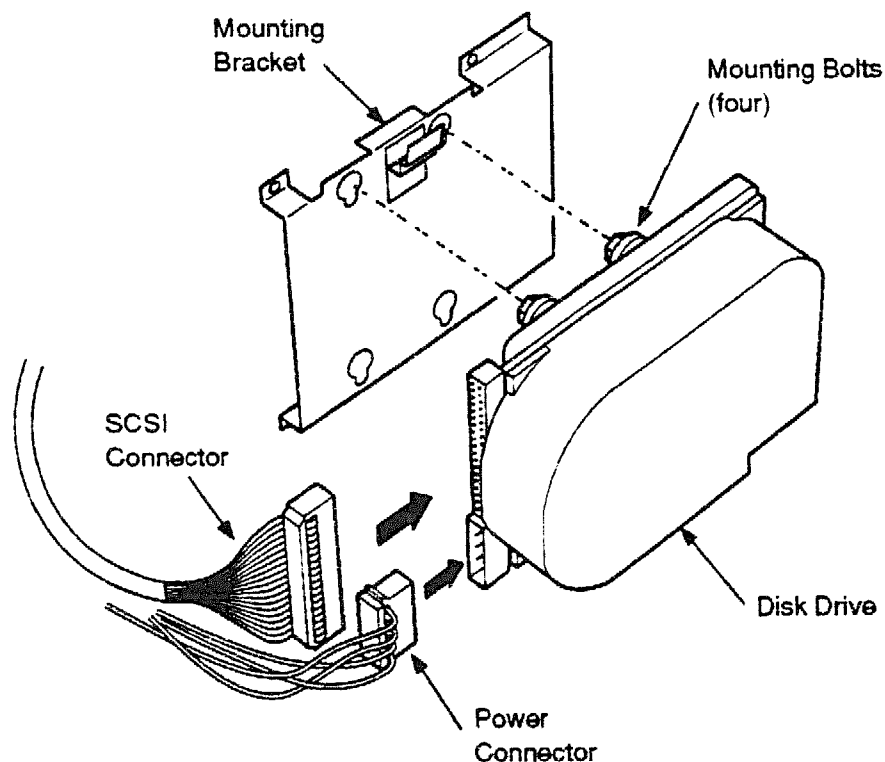
TA-0722-AC

23.4 Installing a Sixth Hard Disk Drive

The device mounting bracket below the QIC tape mounting slot can be used for either an RX33 diskette drive or a sixth hard disk drive. It is recommended that you use all five disk drive mounting brackets before you install a sixth hard disk drive in this bracket.

With a dual SCSI cabling scheme, a total of six hard disk drives can be installed for a maximum of 2.6 GB of internal storage.

The media slot in the lower right side of the chassis can be used for a 5.25-inch diskette drive or an additional sixth RZ24 or RZ25 disk drive. The disk drive will be on the high performance SCSI bus.

The following steps describe how to install a sixth disk drive.

1. Remove the blank panel insert in the bezel opening by pressing in on the tabs and pushing the blank panel forward, as shown in Figure 23–5. Then remove the EMI shield from the mounting bracket by loosening the small set screws at the bottom of the mounting bracket.

2. Set the SCSI ID to 2. Figures 23–1 and 23–2 show the location of the SCSI ID jumpers on the RZ24 and RZ25 drives.

3. On an RZ24 drive, install the four mounting bolts with attached grommets (supplied with the drive) on the bottom of the drive chassis.

   On an RZ25 drive:

   • Verify that the spin-up jumper is removed (see Figure 23–2. This enables drive spin-up when power is applied to the applicationDEC 433MP system. (RZ24-S drives are factory set to spin up when power is applied.)

   • Install the I-shaped bracket (supplied with the drive) on the bottom of the drive chassis. Use the four mounting bolts (with attached grommets) as shown in Figure 23–3.

Figure 23–5   Removing SCSI Blank Panel Insert and EMI Shield

Front
Bezel

Mounting
Bracket

EMI
Shield

Blank
Panel
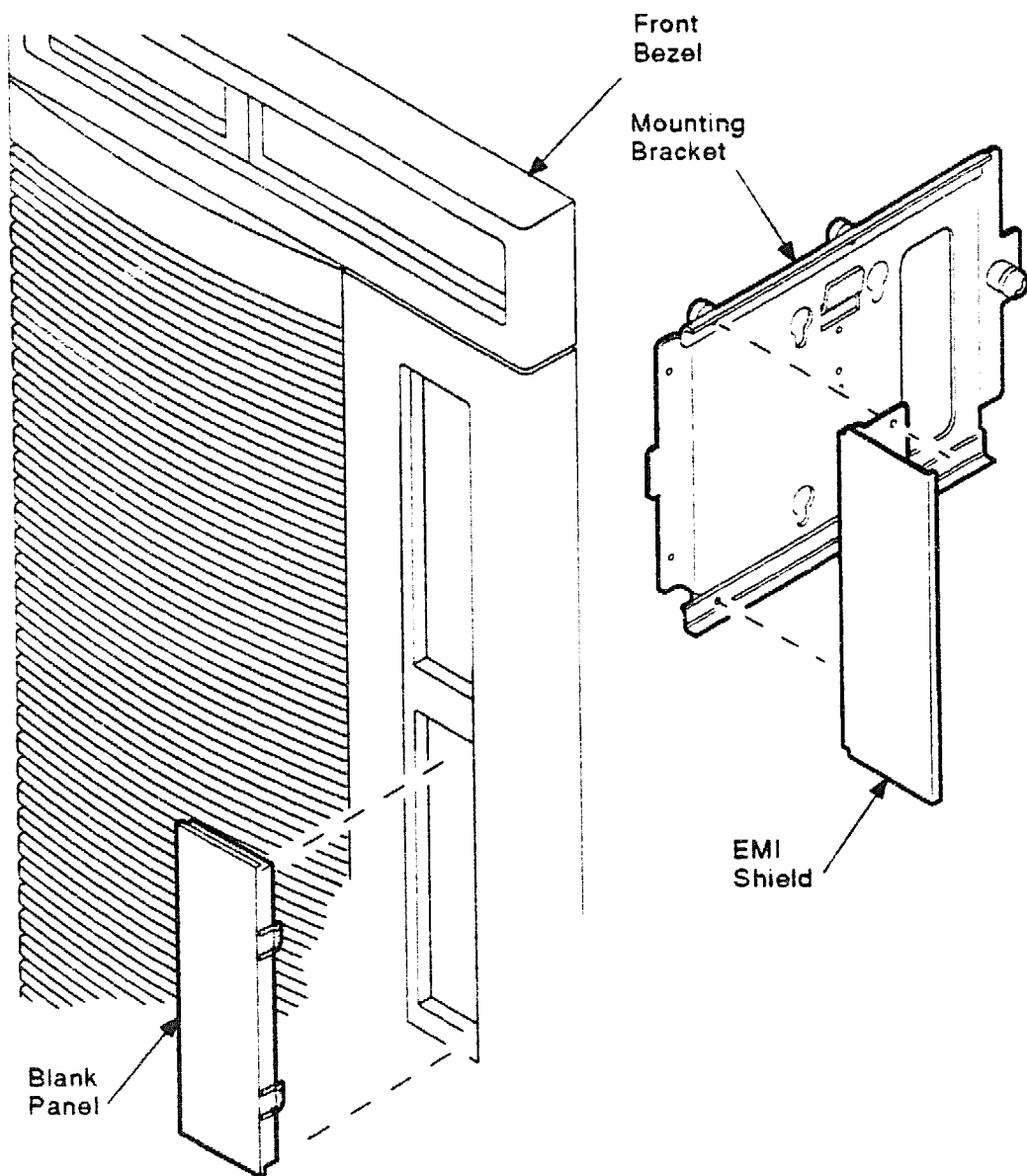
MR-0100-91DG

4. Remove the small set screw that holds down the disk drive catch on the mounting bracket, as shown in Figure 23-6.

5. Install the disk drive on the bracket by aligning the feet of the RZ24 or RZ25 drive with the mounting holes on the bracket.

6. Press the disk disk onto the bracket so that the feet are in the holes.

7. Pull the disk drive down to lock it in place. The spring presses against the bottom of the drive to hold it.

8. Attach the SCSI connector to the back of the disk drive.

9. Connect the power connector to the power receptacle on the drive.

10. Connect the SCSI connector to the drive.

The hard disk drive is now installed on the high performance SCSI bus at SCSI ID 2.

23.5 Installing Other Vendor's SCSI Hard Disk Drives

Any standard half-height (3.5-inch) SCSI hard disk drive can easily be installed in an applicationDEC 433MP system. All you need are four mounting bolts (with attached grommets) as shown in Figure 23-3.

The mounting bolts (with attached grommets) are screwed into the bottom of the drive. You can then install the drive in the applicationDEC 433MP drive mounting bracket.

The Digital part number for one mounting bolt (with attached grommet) is 12-31734-01. To order, call DECdirect at 1-800-DIGITAL.

23.6 Software Support

Each hard disk drive must be defined as a device. If this is a uniprocessor system, use the **mkdev hd** command. Refer to the *SCO UNIX System Administrator's Guide* for information on how to define each hard disk drive. If this is a multiprocessor system, use the **mkdev corollary** command for all hard disk drives, including drives controlled by the ISA SCSI adapter. Refer to the *SCO MPX Release Notes and Installation Guide* for information on this command.

Figure 23–6 Installing a Sixth 209 MB Hard Disk Drive
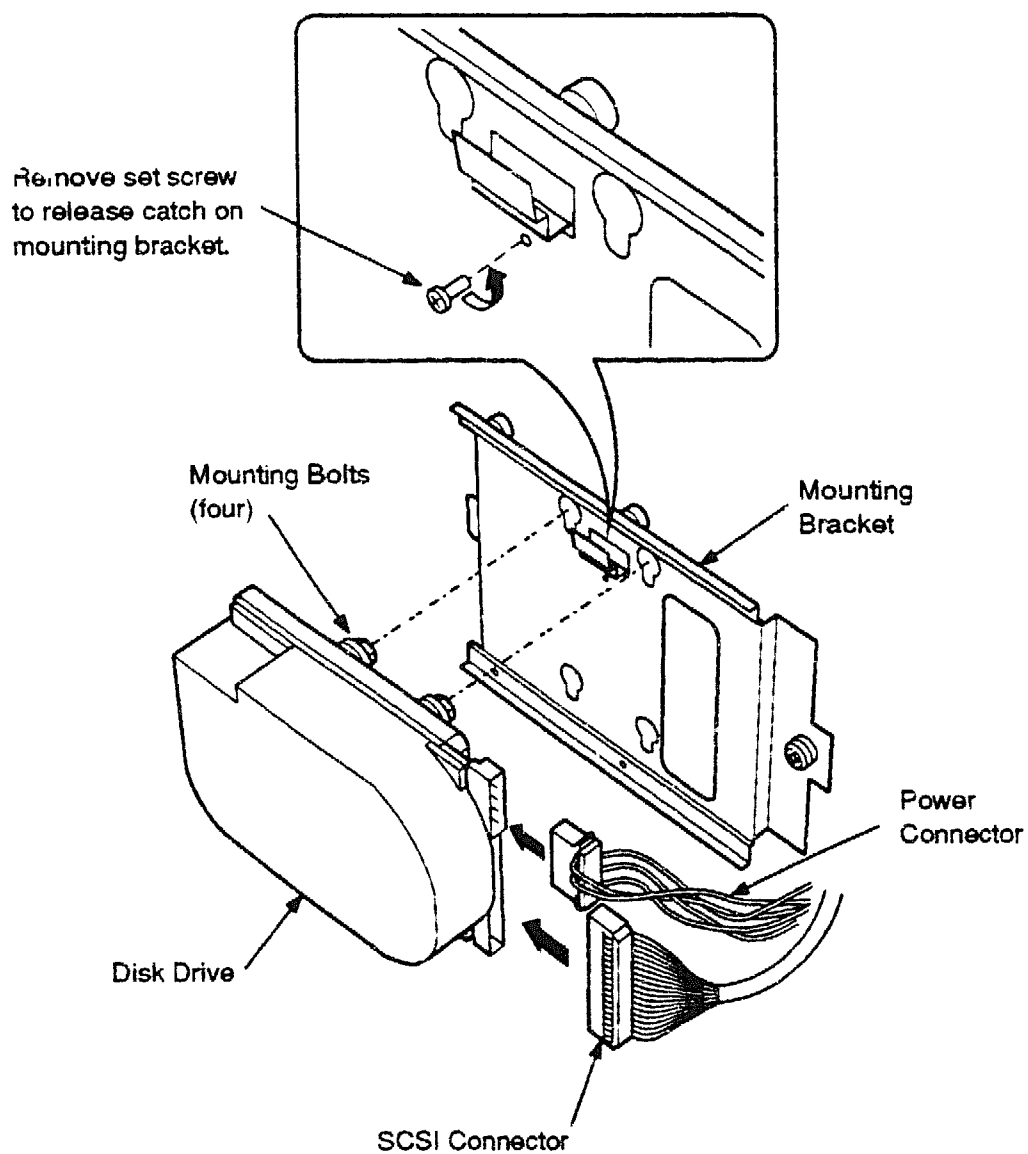
Remove set screw
to release catch on
mounting bracket.

Mounting Bolts
(four)

Mounting
Bracket

Power
Connector

Disk Drive

SCSI Connector

TA-0716-AC

24

320/525 MB QIC Tape Drive

This chapter describes installation of the 320/525 MB quarter-inch cartridge (QIC) tape drive, model number TZK10-E.

24.1 Description

The TZK10 cartridge tape provides the following features:

- Ability to read and write in formats from 320 MB to 525 MB

- Standard quarter-inch tape cartridge size

24.2 Cleaning and Maintenance

The TZK10 tape drive heads need to be cleaned after every 8 hours of use to ensure maximum longevity of the heads. This 8-hour figure is a guideline and should be adjusted if your environment is particularly dirty, or the tape is particularly dirty.

The TZK1X-HA tape cleaning cartridge is recommended for cleaning the tape heads.

24.3 Retensioning Tapes

Tapes must be retensioned prior to use. To retension a tape, use the SCO UNIX command:

```
$ tape -s reten Enter
```

24.4 Preinstallation Configuration

Before you install a QIC tape drive in the applicationDEC 433MP system, verify that the SCSI ID address is set to 2 and configuration jumpers D and T are installed as shown in Figure 24–1. Table 24–1 describes the jumpers.

Figure 24–1   QIC Tape Jumpers
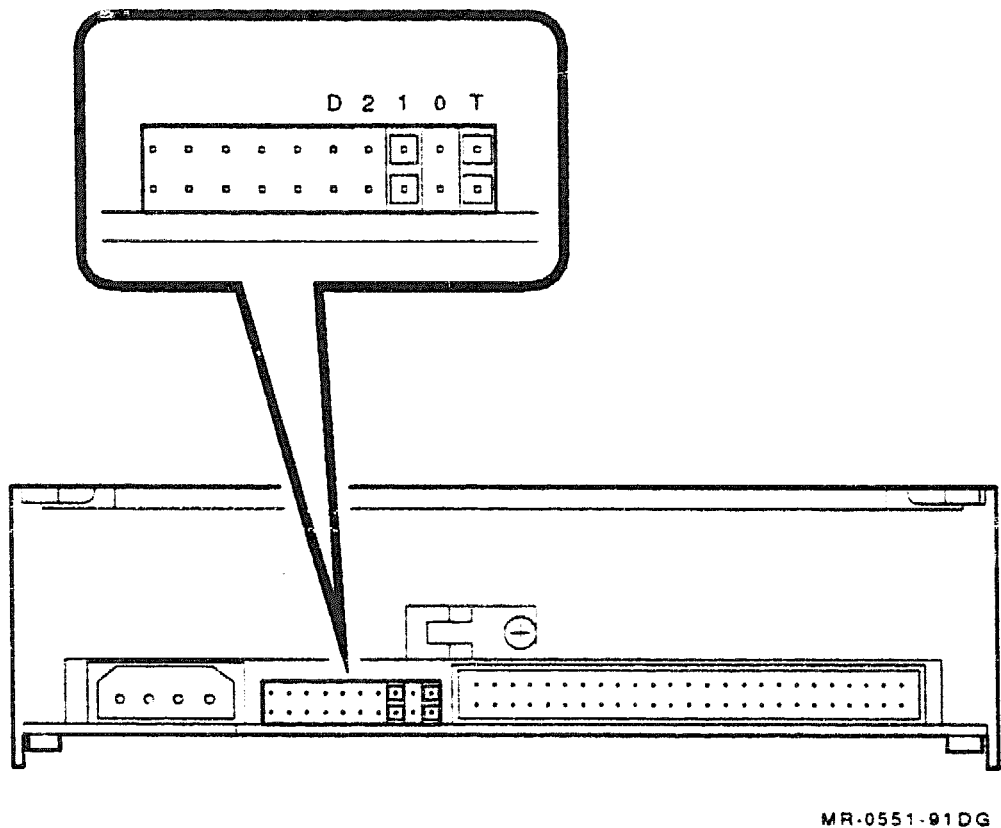
MR-0551-91DG

Table 24-1 QIC Tape Configuration

Jumper	Operating Position	Description
D	Out	Automatic density. Enables automatic density when removed.
2	Out	SCSI ID E3. This jumper must be removed.
1	In	SCSI ID E2. Select binary value 2 when installed.
0	Out	SCSI ID E1. This jumper must be removed.
T	In	Terminator power source. Power for the SCSI terminator is provided by the drive when installed.

24.5 Installation

Install the QIC tape drive using the following steps:

_____ **Caution** _____

Before you install any option in the applicationDEC 433MP system, make sure that the operating system has been halted with the **shutdown** command and that power is removed from the system.

_____

1. Remove the top cover and right side panel, as described in Section 12.3.1.

2. Remove the tape mounting bracket from the system chassis by loosening the large mounting screw at the back of the bracket.

3. Remove the blank panel insert in the bezel opening by pressing in on the tabs and pushing the blank panel forward, as shown in Figure 24–2. Then remove the EMI shield from the mounting bracket by loosening the small set screws at the bottom of the mounting bracket.

Figure 24–2 Removing QIC Blank Panel Insert and EMI Shield
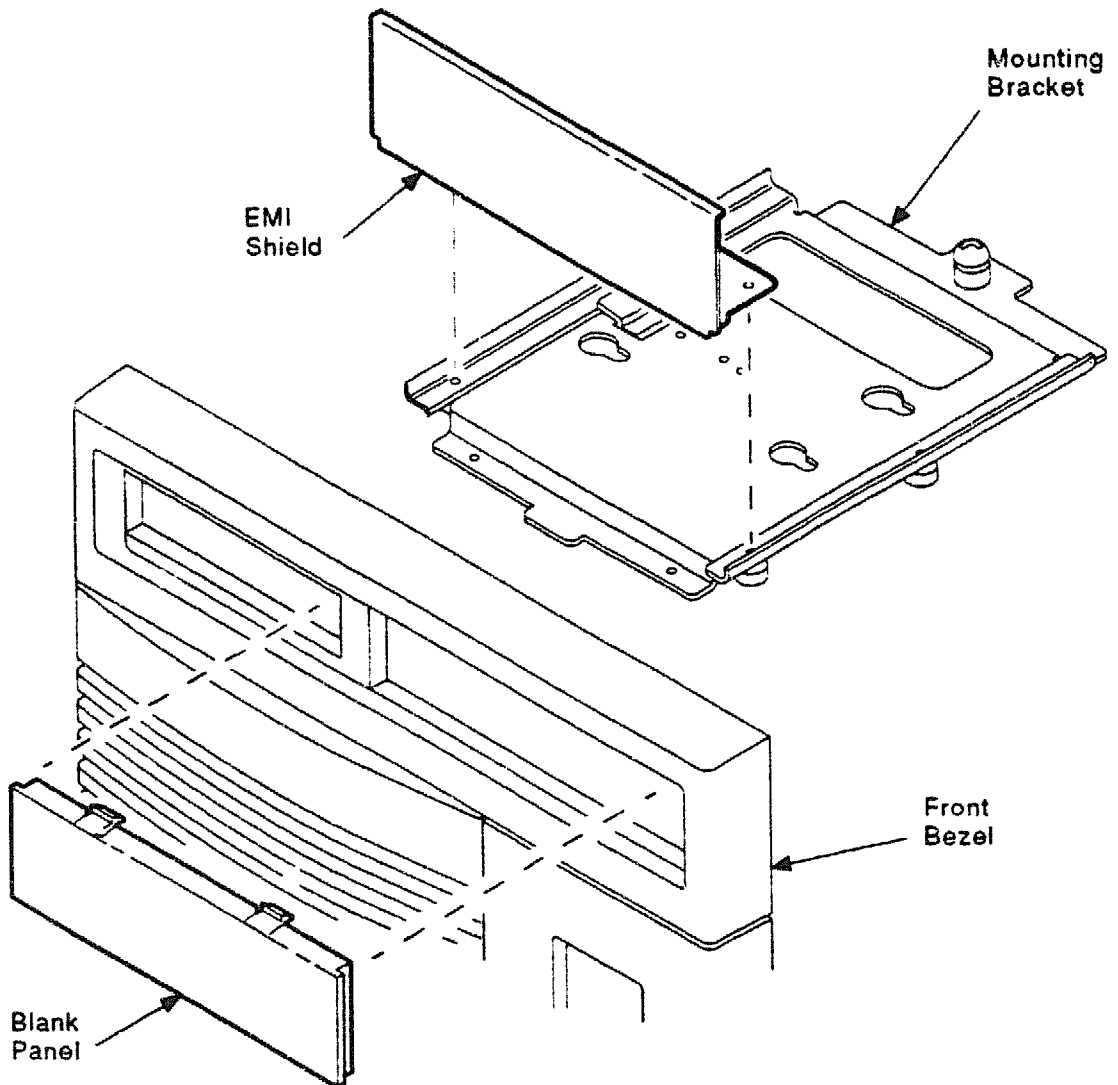
MR-0091-91DG

4. Attach the QIC tape drive to the mounting bracket. Align the four set screws with the holes in the QIC tape drive outer case and tighten the screws, as shown in Figure 24–3. The front of the QIC tape drive must be opposite the large set screw on the mounting bracket.

5. Place the front of the QIC tape drive through the front bezel opening while placing the mounting bracket tab into the metal lip of the chassis.

6. Align the mounting bracket set screw over the hole in the system chassis and tighten it to attach the mounting bracket to the chassis.

7. Connect the SCSI cable to the back of the QIC drive.

8. Connect the power cable to the back of the QIC drive.

9. Replace the top cover and side panel.

24.6 Software Support

If this is a uniprocessor system, use the **mkdev tape** command to configure the QIC tape drive. Refer to the *SCO UNIX Administrator's Guide* for further information on defining the device to the operating system. If this is a multiprocessor system, use the **mkdev corollary** command to configure the QIC tape drive. Refer to the *SCO MPX Release Notes and Installation Guide* for information on this command.

SCO UNIX and SCO Open Desktop come configured with cassette and SCSI tape support. To declare the SCSI tape as the default tape, use the **mkdev tape** command.

There can be different devices defined in your system for the tape drive. For example, the */dev/rct0* device rewinds tapes after use. The */dev/ct0* device accesses the same tape drive, but does not rewind the tape after use.

Figure 24-3 QIC Tape Mounting Bracket and Cabling Diagram

Tape Drive

Power
Cable

ISA SCSI
Cable

Set
Screw

Attach the tape drive to
the mounting bracket
with the set screws.

Slot

Mounting
Bracket

Unscrew mounting bracket
from chassis.

Insert tongue, at front of mounting
bracket, into slot on chassis.

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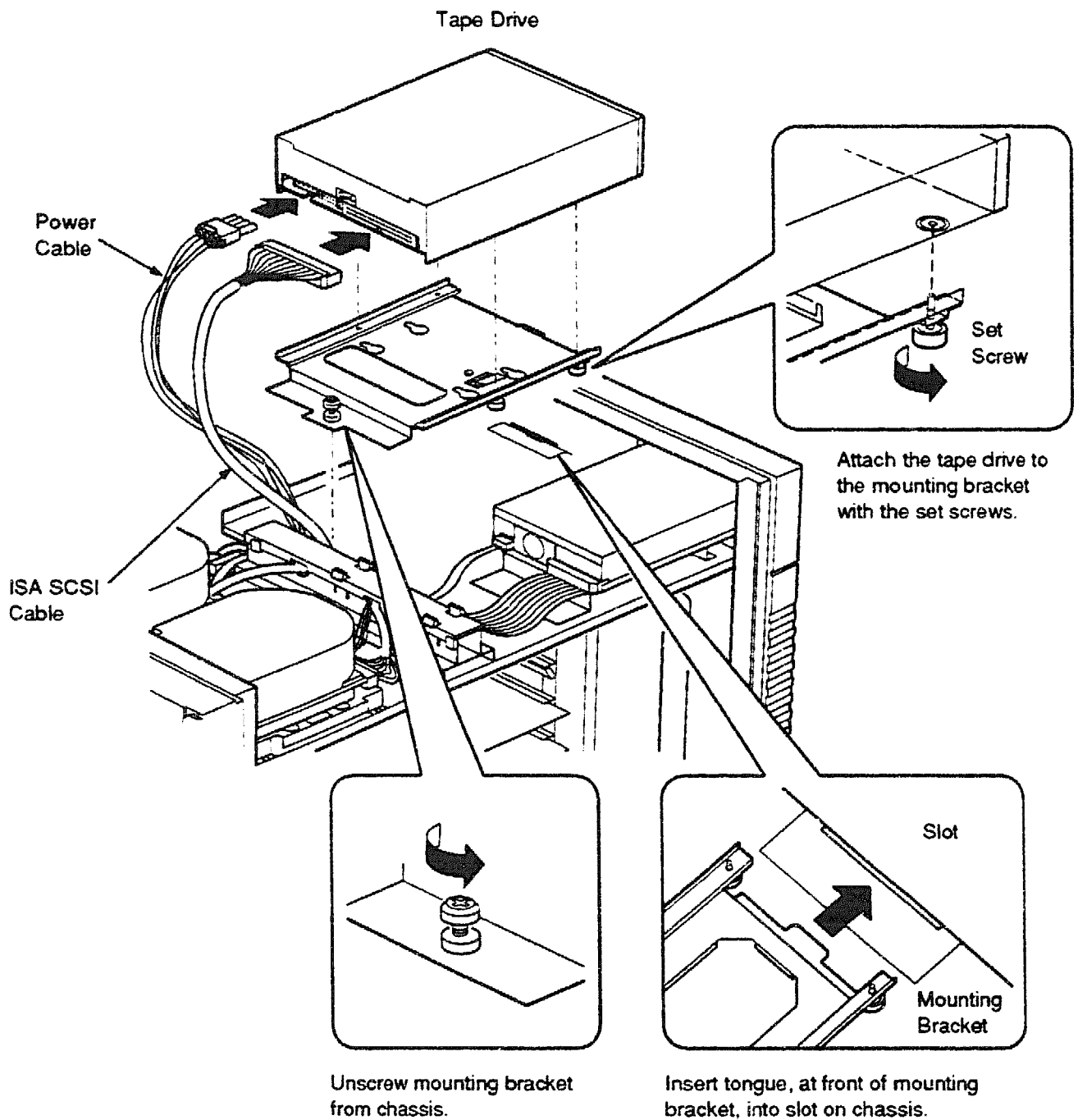
CD-ROM Drive

This chapter describes installation of the CD-ROM drive, model number RRD42.

_____ **Note** _____

At the time this guide was printed, SCO MPX did not provide support for CD-ROM devices. Therefore, Digital Equipment Corporation does not currently support the use of a CD-ROM device for SCO UNIX, SCO Open Desktop, and SCO MPX environments.

_____

25.1 Description

The RRD42 CD-ROM drive provides the ability to read High Sierra and ISO-9660 format diskettes.

25.2 Preinstallation Configuration

Before you install a CD-ROM drive in the applicationDEC 433MP system, verify that the SCSI ID is set to 6 and configuration jumper P is removed as shown in Figure 25-1. Table 25-1 describes the jumpers.

Figure 25-1 CD-ROM Jumpers
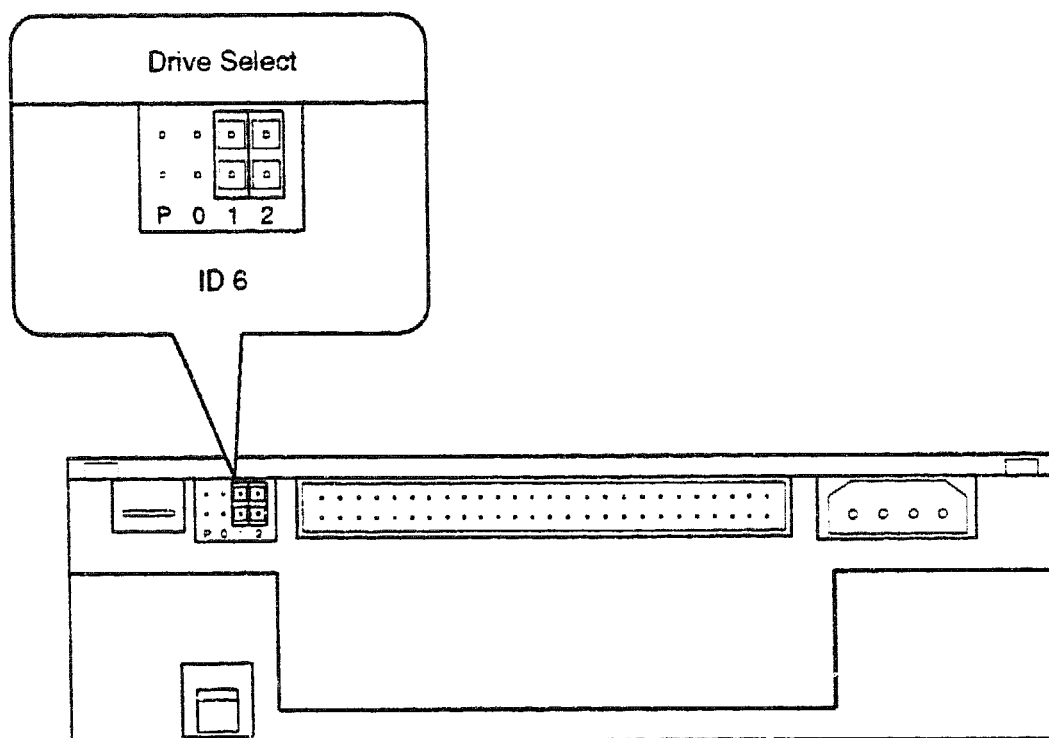
TA-0728-AC

Table 25-1 CD-ROM Configuration

| Jumper	Operating Position	Description
P	Out	Microcode select. Microcode for SCO UNIX selected when removed.
0	Out	SCSI ID E1. This jumper must be removed.
1	In	SCSI ID E2. Select binary value 2 when installed.
2	In	SCSI ID E3. Select binary value 4 when installed.

25.3 Installation

Install the CD-ROM drive using the following steps.

_____ **Caution** _____

Before you install any option in the applicationDEC 433MP system, make sure that the operating system has been halted with the **shutdown** command and that power is removed from the system.

_____

1. Remove the top cover and right side panel, as described in Section 12.3.1.

2. Remove the CD-ROM mounting bracket by loosening the large mounting screw at the rear of the mounting bracket.

3. Remove the blank panel insert in the bezel opening by pressing in on the tabs and pushing the blank panel forward, as shown in Figure 25-2. Then remove the EMI shield from the mounting bracket by loosening the small set screws at the bottom of the mounting bracket.

4. Attach the CD-ROM drive to the mounting bracket. Align the four set screws with the holes in the CD-ROM drive outer case and tighten the screws, as shown in Figure 25-3. The front of the CD-ROM drive must be opposite the large set screw on the mounting bracket.

5. Place the front of the CD-ROM drive through the front bezel opening while placing the mounting bracket tab into the metal lip of the chassis.

6. Align the mounting bracket set screw over the hole in the system chassis and tighten it to attach the mounting bracket to the chassis.

7. Connect the power cable to the back of the CD-ROM drive.

8. Connect the SCSI bus cable to the back of the CD-ROM drive.

9. Replace the top cover and side panel.

Figure 25–2 Removing CD-ROM Blank Panel Insert and EMI Shield

Front
Bezel

Mounting
Bracket

EMI
Shield

Blank
Panel
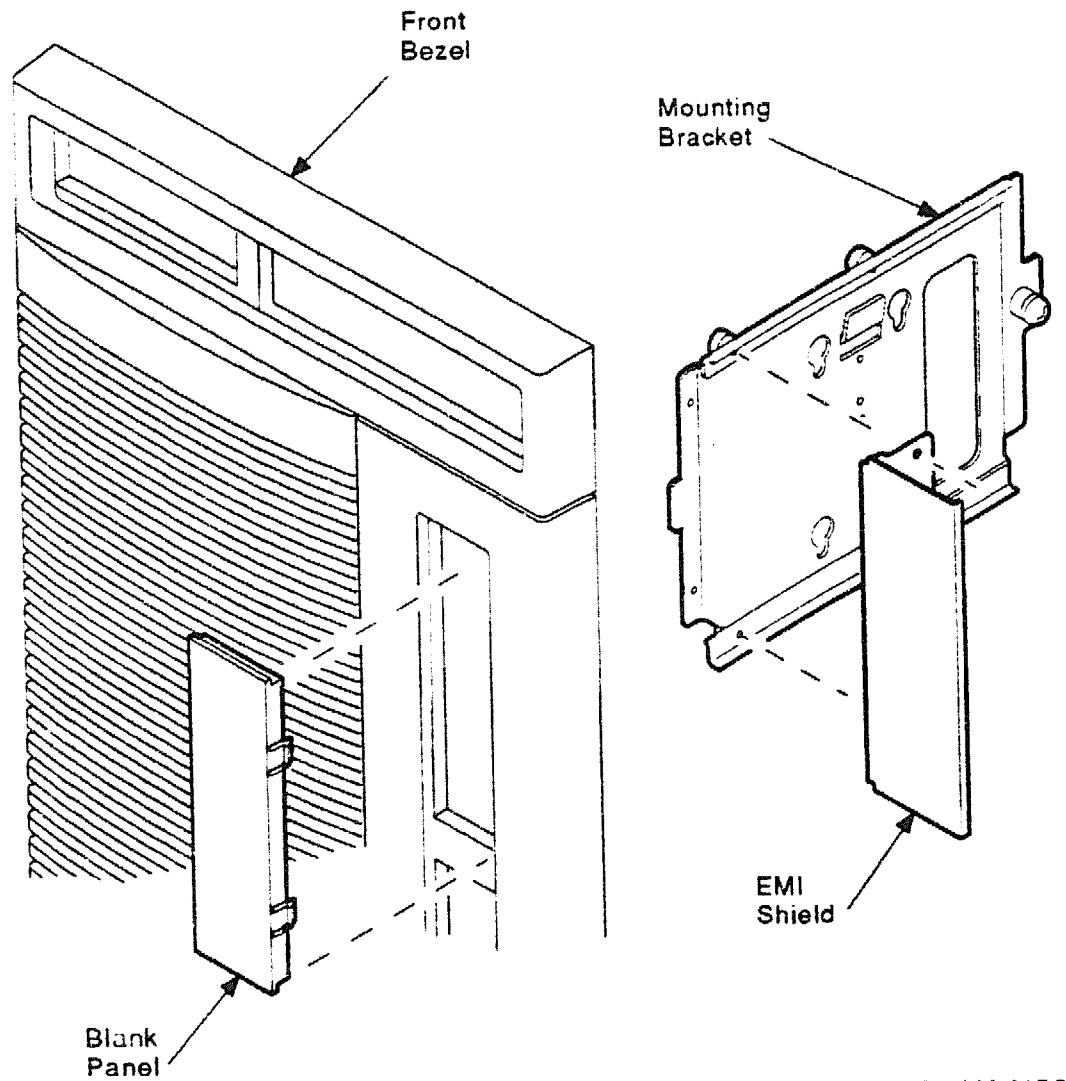
MR-0099-91DG

Figure 25-3 Installing the CD-ROM Drive

CD-ROM

Mounting
Bracket

The CD-ROM is attached
to the mounting bracket
with four set screws.

Unscrew mounting
bracket from chassis.

Power Cable

CD-ROM
Drive

SCSI Bus
Cable

TA-0727-AC
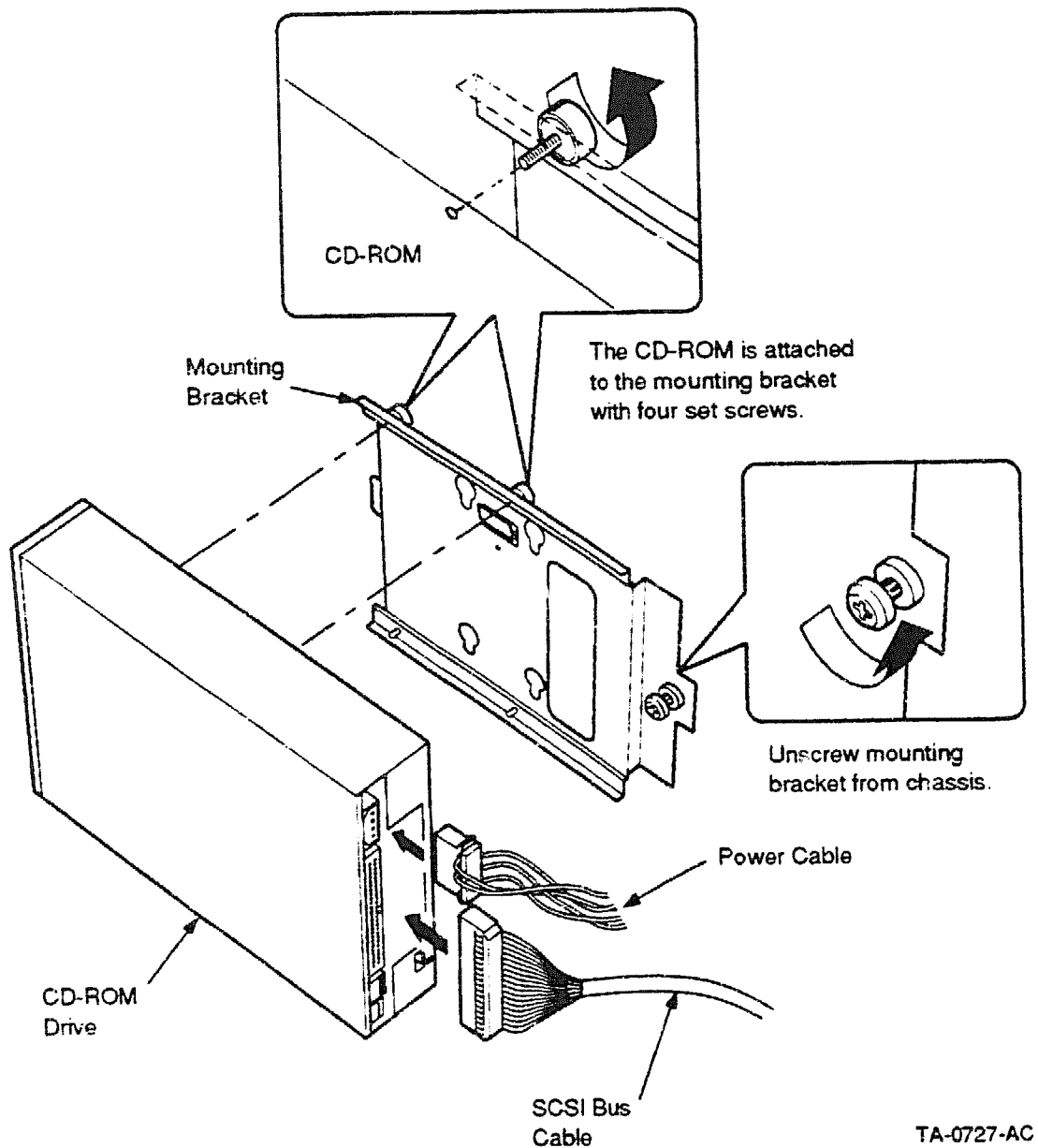
25.4 Software Support

The CD-ROM drive is defined to the operating system using the **mkdev cdrom** command. The **mkdev high-sierra** command defines the CD-ROM filesystem. Refer to the *SCO UNIX System Administrator's Guide* for further information on defining the device to the operating system.

26

3.5-Inch 1.44 MB Diskette Drive

This chapter describes the features and installation of the 3.5-inch 1.44 MB diskette drive, model number RX23.

26.1 Description

The RX23 is a 3.5-inch 1.44 MB diskette drive. The controller for this diskette drive is on the bridge module. An internal cable from the backplane connector to the RX23 drive provides control and data signals for the drive.

The RX23 diskette drive is factory configured as the boot media (drive A) for the applicationDEC 433MP system. To set the 5.25-inch diskette drive as the boot media. a jumper must be changed on the bridge module. See Chapter 14.

The RX23 drive has a formatted capacity of 1.44 MB. It has 135 tracks per inch (TPI) and can read and write industry compatible 3.5-inch, high-density diskette media. It is compatible with the field formatted industry-standard, 18-sector format on 700 Oersted type media.

The media for the RX23 diskette drive is a 3.5-inch diskette. This diskette can be either 1 or 2 MB. The existence of a 2 MB detect slot on the diskette determines the byte capacity of the diskette. If no detect slot exists, the byte capacity is 1 MB. If a detect slot exists, the byte capacity is 2 MB. A microswitch on the front of the drive detects whether there is a detect slot.

26.2 Installation

The following steps describe how to install the RX23 drive in the applicationDEC 433MP system.

_____ ____ **Caution** _____

Before you install any option in the applicationDEC 433MP system, make sure that the operating system has been halted with the **shutdown** command and that power is removed from the system.

_____

1. Ensure that the drive address switch, on the right side of the drive, is set to address 1.

2. Remove the top cover and right side panel, as described in Section 12.3.1.

3. Remove the diskette drive mounting bracket from the system chassis by loosening the single large screw at the back of the bracket. See Figure 26-1.

4. Attach the RX23 drive to the mounting bracket. Align the four set screws with the holes in the RX23 drive outer case and tighten the screws, as shown in Figure 26-1.

5. Slide the RX23 drive into position on the side of the chassis and tighten the mounting bracket screw to attach the mounting bracket to the chassis. See Figure 26-1.

6. Attach the power cable to the back of the RX23 diskette drive.

7. Attach the FDI bus cable to the back of the RX23 diskette drive. This cable comes from under the cable harness and is attached to the diskette drive.

8. Replace the top cover and side panel.

26.3 Software Support

The RX23 drive is automatically recognized by the operating system. The RX23 drive is factory configured as the boot media for the applicationDEC 433MP system. To specify the optional 5.25-inch 1.2 MB RX33 diskette drive as the boot drive, you must change a jumper setting on the bridge module. See Figure 14-2.

Figure 26-1 RX23 Diskette Drive Mounting Bracket

Power
Cable

FDI Bus
Cable

RX23 Diskette
Drive

Set
Screw

Attach the RX23 to the
mounting bracket with
the set screws.

Slot

Mounting
Bracket

Unscrew the mounting
bracket from the chassis.

Insert tongue at front of mounting
bracket into slot on chassis.

TA-0725-A(

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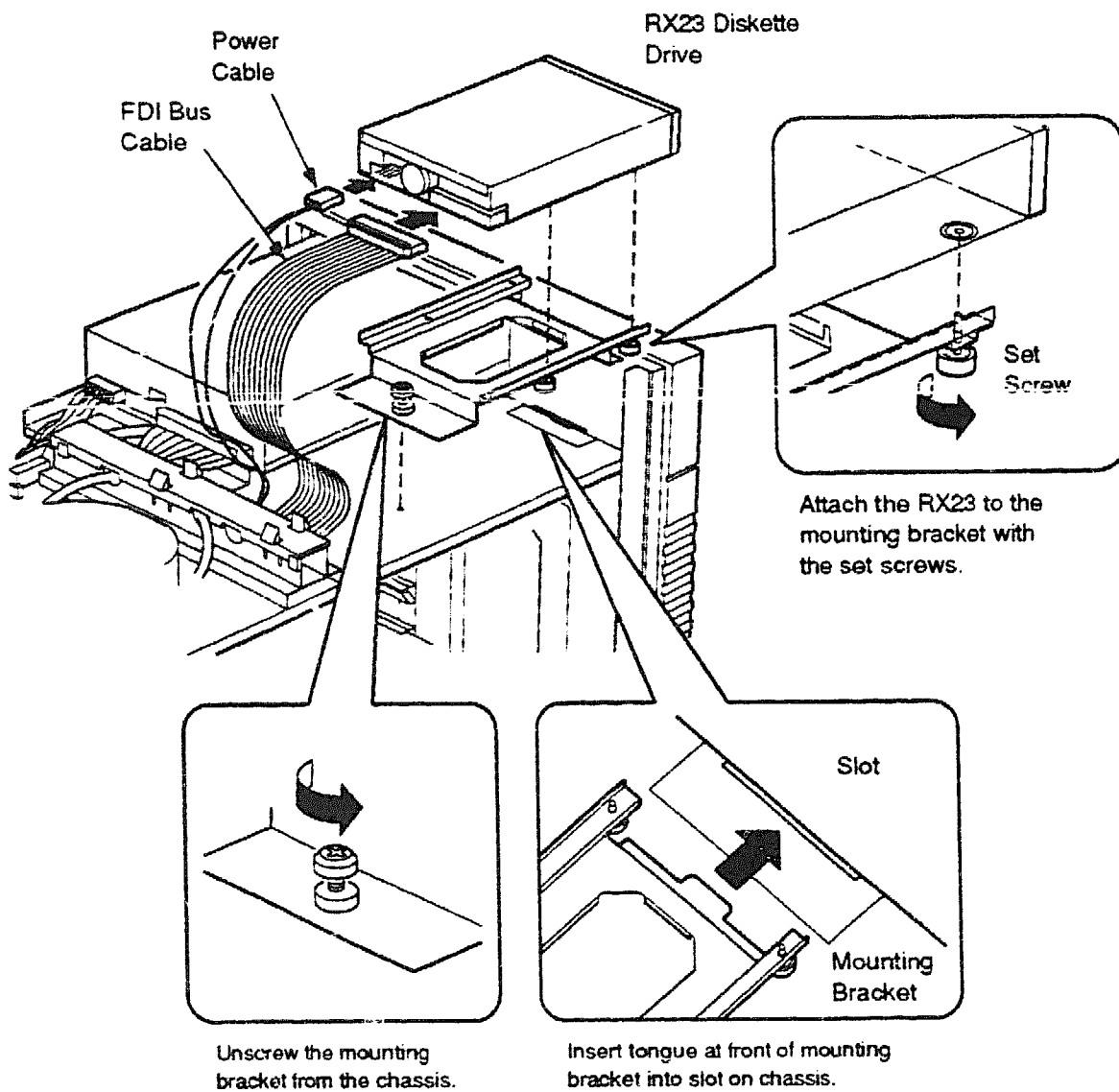
5.25-Inch 1.2 MB Diskette Drive

This chapter describes the optional 5.25-inch 1.2 MB diskette drive, model number RX33, and provides installation instructions.

27.1 Description

The 5.25-inch 1.2 MB diskette drive is an optional diskette drive for the applicationDEC 433MP system. The controller for this diskette drive is on the bridge module. Internal cabling from the backplane provides connection to the RX33 diskette drive.

27.2 Installation

Install the 5.25-inch diskette drive using the following steps.

_____ **Caution** _____

Before you install any option in the applicationDEC 433MP system, make sure that the operating system has been halted with the **shutdown** command and that power is removed from the system.

_____

1. Before you install the 5.25-inch diskette drive into the applicationDEC 433MP system, verify that the drive is configured as shown in Figure 27–1.

2. Remove the top cover and right side panel, as described in Section 12.3.1.

3. Remove the diskette drive mounting bracket from the system chassis by loosening the single large screw at the back of the bracket.

Figure 27–1 RX33 Jumpers

Grounding Jumper

Density Jumper

U1

D1

DC2
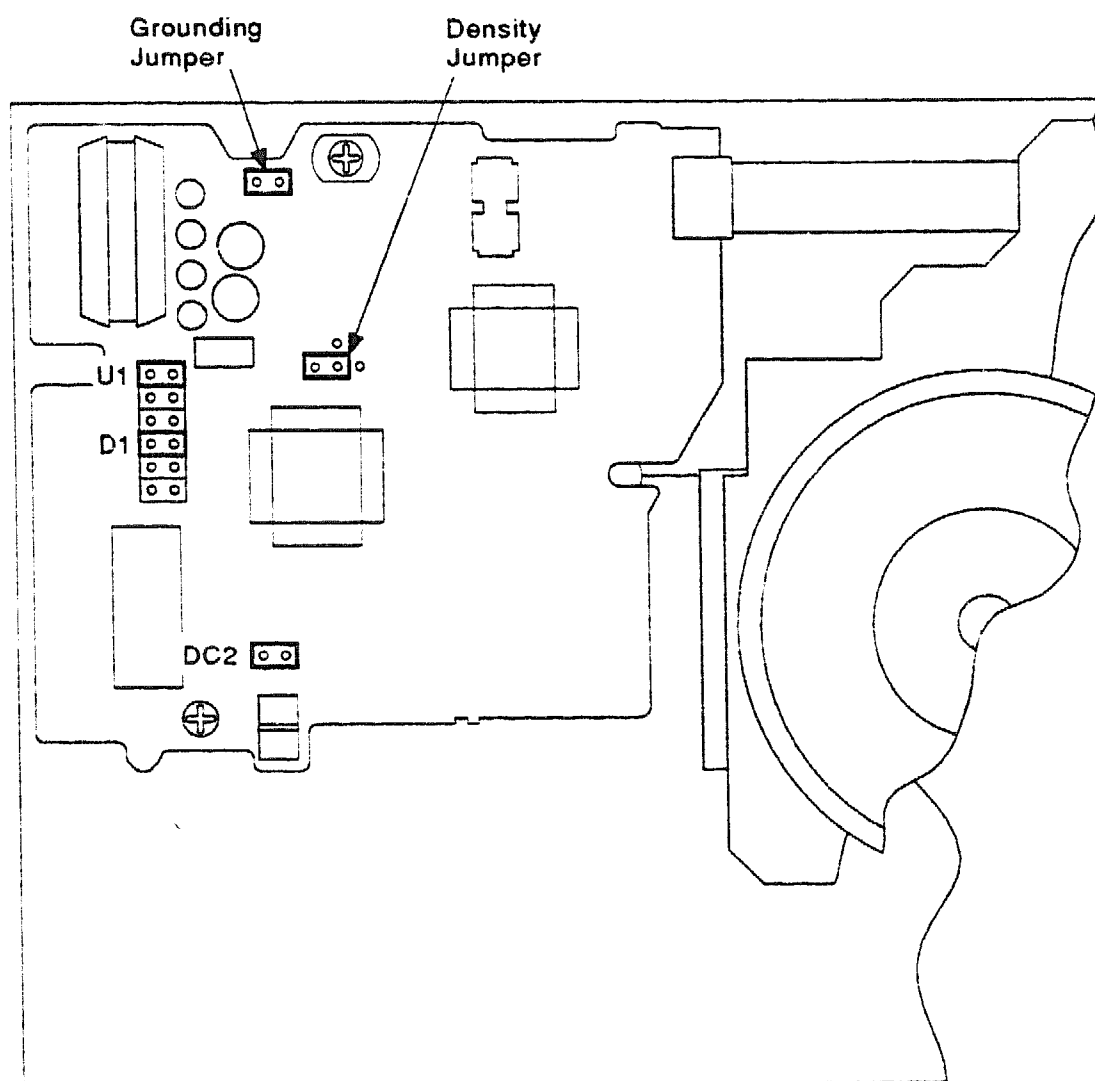
TA-0747-TI

4. Remove the blank panel insert in the bezel opening by pressing in on the tabs and pushing the blank panel forward, as shown in Figure 27-2. Then remove the EMI shield from the mounting bracket by loosening the small set screws at the bottom of the mounting bracket.

Figure 27-2 Removing RX33 Blank Panel Insert and EMI Shield
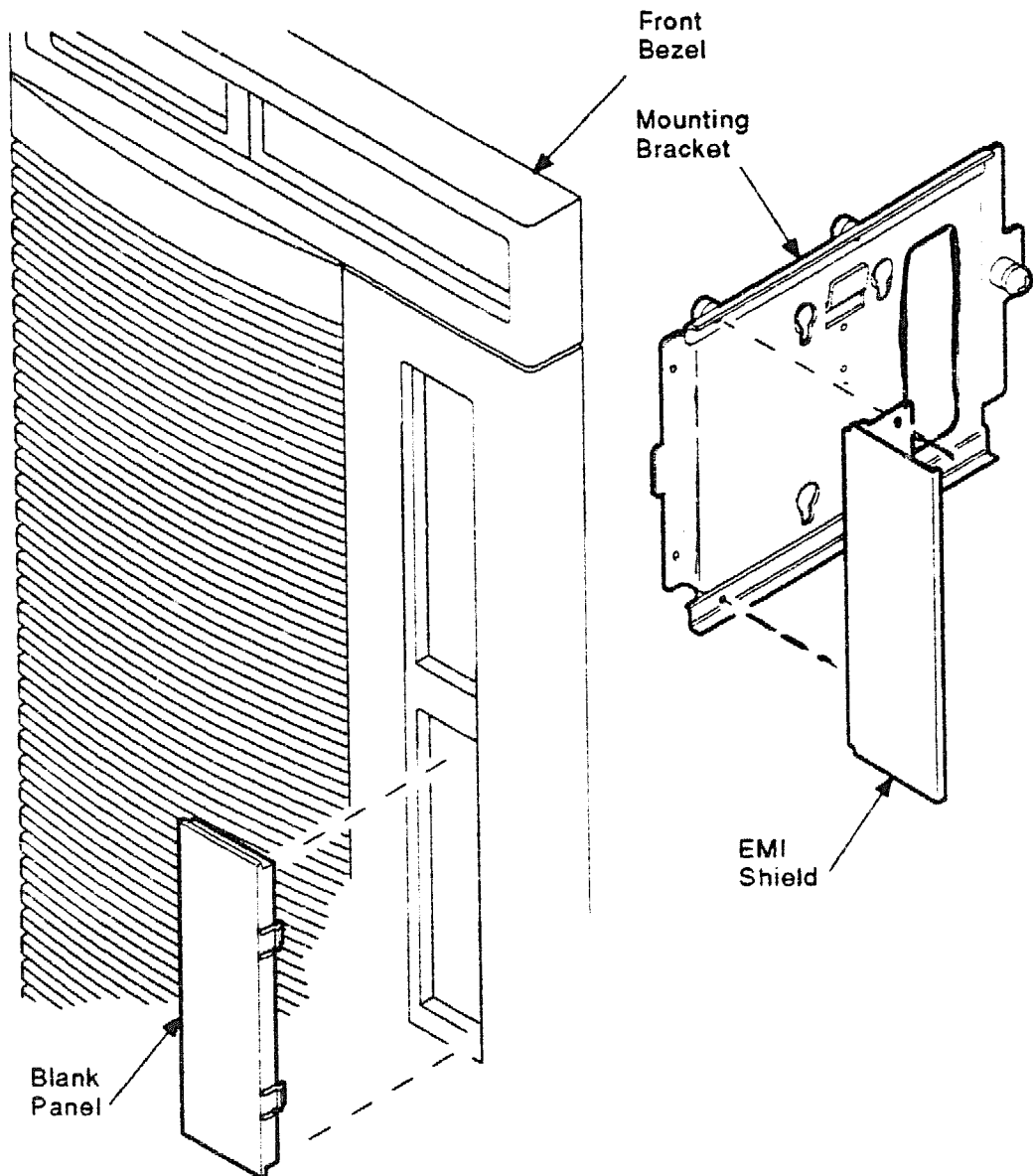
MR-0100-91DG

5. Attach the RX33 drive to the mounting bracket. Align the four set screws with the holes in the RX33 drive outer case and tighten the screws, as shown in Figure 27–3. The front of the RX33 drive must be opposite the large set screw on the mounting bracket.

6. Slide the RX33 mounting bracket through the front bezel opening and under the metal lip on the chassis.

7. Tighten the mounting bracket screw to attach the mounting bracket to the chassis. See Figure 27–3.

8. Connect the power cable to the back of the diskette drive.

9. Connect the data ribbon cable to the back of the diskette drive. This cable comes from under the cable harness and is attached to the bridge module through the backplane.

10. Replace the top cover and side panel.

Figure 27-3 Installing an RX33 Diskette Drive

RX33

The RX33 is attached to the mounting bracket with four set screws.

Mounting Bracket

Unscrew mounting bracket from chassis.

Power Cable

RX33 Diskette Drive

Data Ribbon Cable

TA-0723-AC

28
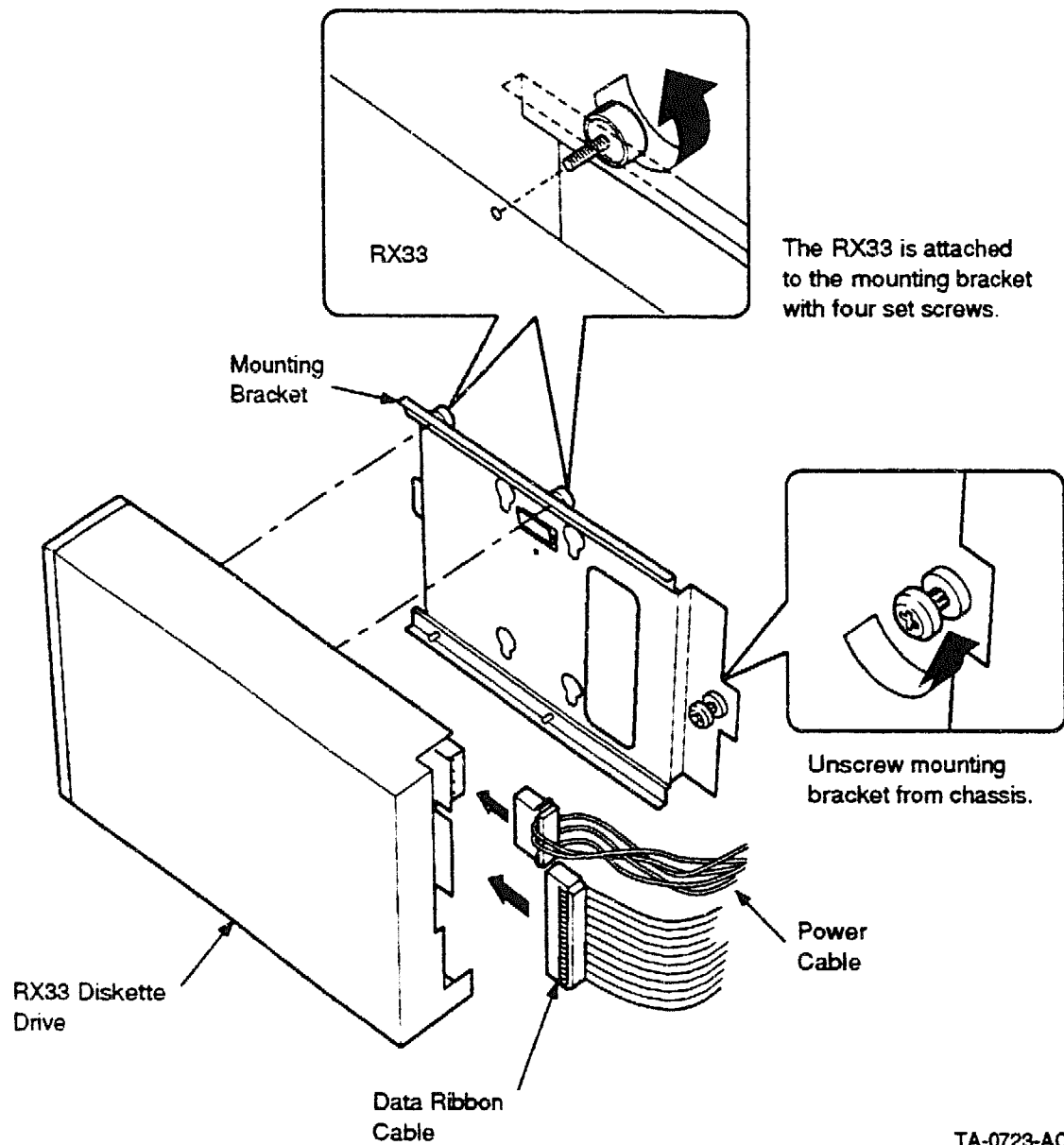
Uninterruptible Power Supply

28.1 Description

An uninterruptible power supply helps ensure that sudden loss of power to your system does not cause loss of data. To guarantee filesystem integrity, SCO UNIX must experience an orderly shutdown of the system. The UPS with intelligent shutdown software ensures an orderly shutdown, even in unattended situations.

28.2 Recommended UPS

The recommended UPS for use with an applicationDEC 433MP system is the Exide Powerware Personal 1500. The UPS and the shutdown software are available from Digital Equipment Corporation. Order numbers are shown in Table 28–1.

Table 28–1   Recommended UPS Order Numbers

Item	Digital Order Number
Exide Powerware Personal 1500 with RS-232 port	4N-AEAAF-AF
SCO UNIX Shutdown Software	4NAEAEO-AB

In the event of a power failure, this UPS provides up to 12 A of battery backup power for up to 15 minutes. The power supplied to the host system is uninterrupted. The UPS sends a signal across the RS-232 communications line indicating that power has been lost. The shutdown software detects this signal and begins an orderly shutdown of the system. Generally a complete shutdown of a SCO UNIX system takes less than 5 minutes.

28.3 Installation

Detailed installation information is included with the UPS when it is ordered.
The following is a summary of the instructions:

1. Plug the UPS into a grounded 3-prong receptacle.

2. Verify that the output switch is off (not illuminated). The output switch is
    located on the front of the UPS.

3. Connect the applicationDEC 433MP system power cord into the UPS rear
    panel output receptacles.

4. Connect one end of an RS-232 cable to the connector on rear of the UPS.
    Connect the other end of the RS-232 cable to the serial port defined COM2:
    on your system. Serial port address COM2: is factory configured as the
    serial port on the serial/parallel module.

5. Turn the computer equipment on.

6. Turn the output switch on.

7. Install the SCO UNIX shutdown software on the applicationDEC 433MP
    system.

A

Specifications

Tables A-1, A-2, and A-3 list the applicationDEC 433MP system specifications.

Table A-1 Physical Specifications

Parameter	Specification
Height	63.5 cm (25.0 in)
Width	30.1 cm (11.8 in)
Depth	
Top	55.3 cm (21.8 in)
Bottom	60.3 cm (23.8 in)
Weight	45 kg (99.2 lb)

Table A-2 Electrical Specifications

Parameter	Specification
AC voltage (nominal)	110/120 V or 220/240 V (autosensing)
Frequency (nominal)	60 or 50 Hz
AC phases	1
AC input power (maximum)	700 W

Table A–3 Environmental Specifications

Parameter	Specification
Temperature[1]	
Operating	10°C to 40°C (50°F to 104°F)
Nonoperating	10°C to 60°C (50°F to 140°F)
Humidity	
Operating	20% RH to 80% RH (noncondensing)
Nonoperating	10% RH to 90% RH (noncondensing)
Maximum humidity change	10% RH/h
Maximum wet-bulb temperature	28°C (82°F)
Minimum dew point	2°C (36°F)
Altitude	
Operating	0 to 2500 m (0 to 8208 ft)
Nonoperating	0 to 9200 m (0 to 30,183 ft)
Shock	
Nonoperating in shipping carton	20 g

[1]Reduce the maximum temperature specification by 1.8°C for each 1000-meter (1°F for each 1000-foot) increase in altitude above sea level.

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