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# applicationDEC 433MP Technical Configuration and Option Installation Guide

Order Number: EK-PS100-CG-001

**February 1991**

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

**Digital Equipment Corporation  
Maynard, Massachusetts**

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**First Printing, February 1991**

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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 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, ISA Bus 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.

## The applicationDEC 433MP Documentation Set

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

**Table 1 applicationDEC 433MP Documentation Set**

Manual	Part Number	Purpose
System Installation Guide	EK-PS100-IG	Installation of hardware components; meant to be used once at initial installation.
Software Installation Roadmap	EK-PS100-SR	An overview guide to the Santa Cruz Operation, Inc. operating systems that can be installed on the applicationDEC 433MP. This manual should be read prior to installing the operating system. Actual instructions for installation of the operating system are shipped with the SCO UNIX products.
Using the System	EK-PS100-RC	User information; this manual shows, in easily referenced format, how to operate the system hardware.
System Overview	EK-PS100-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-PS100-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 applicationDEC 433MP Related Digital Equipment Documentation**

Manual	Part Number	Purpose
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 VGA Adapter Installation and User's Manual	ER-PS1XG-IG	Installation of the VGA adapter, 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:

- Ctrl/x                    A sequence such as Ctrl/x indicates that you must hold down the key labeled Ctrl while you simultaneously press another key.
- Return                    A key name is shown enclosed to indicate that you press a key on the keyboard.
- boldface text**            Boldface text is used to indicate SCO UNIX device names.
- italic text*                    Italic text is used to represent the name of a command.

---

# General Information

This part describes general hardware information and covers the following topics:

- Hardware overview
- Boot sequence
- Overview of possible ways to support SCSI bus options
- Overview of the ISA options and address settings

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## Hardware Overview

This chapter describes some of the hardware features of the applicationDEC 433MP system.

Table 1-1 lists some of the hardware features of the applicationDEC 433MP system.

**Table 1-1 Hardware Features**

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Processors	Up to four Intel 80486 processors.
System Memory	Up to 64 MB system memory.
Media Devices	Support for 3.5-inch, 5.25-inch floppy, 320/525 MB tape, and CD-ROM.
Storage Devices	Up to six 209 MB internal disks, plus external expansion.
Dual Bus Design	System processors and memory communicate over a dedicated high speed bus; I/O options use a separate I/O bus.
Industry Standard Architecture (ISA) I/O Bus	For installation of any industry standard option module.

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The standard applicationDEC 433MP system includes one base processor and bridge module, 8 MB of system memory, one 3.5-inch diskette drive, and one 209 MB hard disk. All of the other media and storage devices are optional items.

Figure 1-1, applicationDEC 433MP Internal Components, Right Side and Figure 1-2, applicationDEC 433MP Internal Components, Left Side, illustrate where the storage and media devices are located in the system.

## 1.1 Processing Environment

The applicationDEC 433MP is a symmetrical multiprocessing computer. Symmetrical multiprocessing is an architecture which divides system resources evenly across all of the CPUs in the system.

Processors are available on three types of modules:

- Base Processor: One 80486 processor.
- CPU/SIO: One 80486 processor and serial input/output logic for connection of terminal concentrators.
- CPU/SCSI: One 80486 processor and SCSI adapter logic.

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

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

## 1.2 System Memory

The applicationDEC standard system comes with 8 MB of ECC memory. System memory is upgradeable in units of 4 MB to a maximum of 64 MB of memory. Single Inline Memory Modules (SIMMs) are used for easy upgrading of system memory.

Up to four memory modules can be installed. Each memory module can contain up to 16 MB of memory. This provides a total system memory of 64 MB.

## 1.3 Storage Devices

The standard applicationDEC 433MP system comes with a single 209 MB hard disk drive. Additional mounting spaces within the system box allow up to five additional hard disk drives to be installed. This provides a total of 1.2 GB within the system. For additional storage, external storage expansion boxes are available.

All storage devices are SCSI-compliant.

## 1.4 Media Devices

The applicationDEC supports the following media devices:

- 3.5-inch diskettes
- 5.25-inch floppy diskettes
- CD-ROM
- 525 MB Quarter Inch (QIC) Tape

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 floppy diskette drive reads and writes high density and reads double density diskettes. The CD-ROM is a High Sierra compatible Compact Disk-Read Only Memory drive.

Each applicationDEC 433MP comes standard with a single 3.5-inch diskette drive.

## 1.5 Dual Bus Design

For increased system performance, the applicationDEC 433MP 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.

### 1.5.1 High Speed System Bus

The system bus in an applicationDEC 433MP operates at 64 MB/s. This means that processor requests for system memory data are filled quickly, and allows processors to spend as little time idle as possible.

### 1.5.2 ISA I/O Bus

The applicationDEC 433MP uses an ISA I/O bus to provide an open system environment for option modules. Up to seven ISA expansion modules can be installed in an applicationDEC system.

Each applicationDEC 433MP comes standard with two ISA modules already installed. These include a SCSI adapter for control of hard disks, and a serial/parallel module for communications. Five additional ISA slots are available for system expansion.

## Hardware Overview

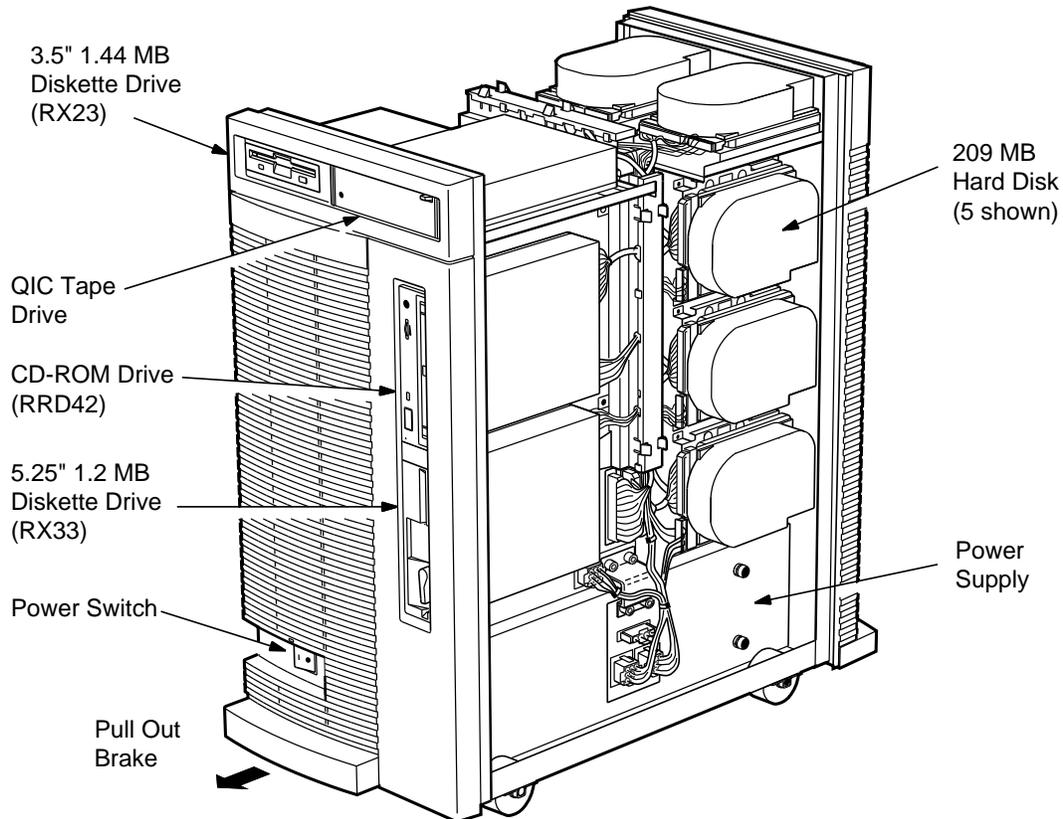
### 1.5 Dual Bus Design

#### 1.5.3 EISA Ready

The applicationDEC 433MP is EISA ready. The EISA, or Extended Industry Standard Architecture, is an enhanced version of the ISA bus. EISA bus data transfers occur at 33 MB/s, allowing faster I/O transactions.

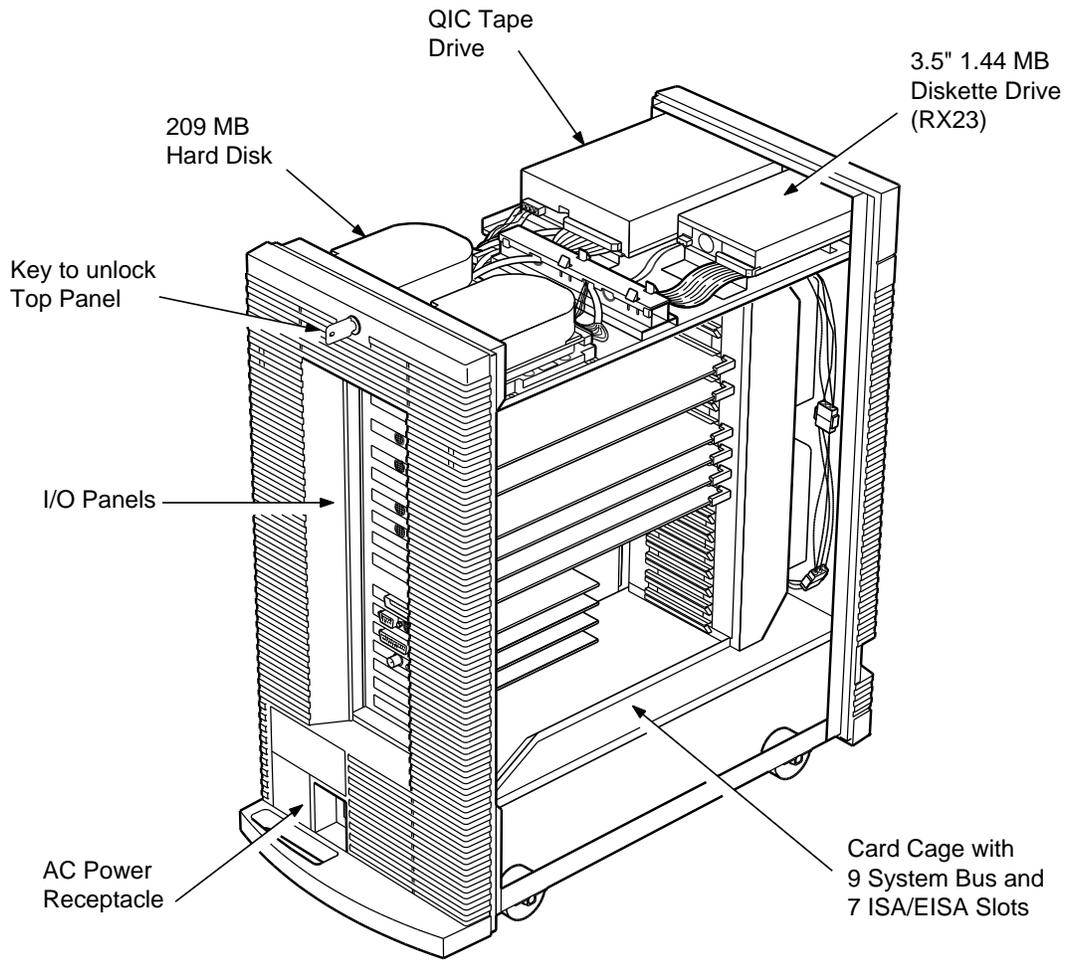
To install EISA I/O options in the applicationDEC 433MP, it is necessary to upgrade the system bus modules with EISA compliant system bus modules. The backplane slots in a standard applicationDEC 433MP are EISA slots that will accept EISA modules directly.

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



TA-0752-AC

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



TA-0753-AC

---

## Booting the System

This chapter describes the applicationDEC 433MP 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 BIOS firmware prepares the system for operation, and then begins the boot sequence.

The boot sequence has the following four basic steps:

- Power-on Self Tests (POST)
- ROM Resident Diagnostics (RRD) Prompt (if enabled)
- Boot from Floppy (if diskette is present)
- Boot from Hard Disk SCSI ID 0 (if there was no boot from a floppy 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 floppy diskette Drive A.

The ROM Resident Diagnostics prompt is displayed only if the RRD is enabled in the setup screen. See Chapter 5, *Setup Program*, for details on how to enable RRD. When the RRD diagnostics are enabled, the system pauses at the RRD prompt and waits for your input. You can either enter *runall* to run the diagnostics, or you can enter *b* to skip the boot sequence and continue the boot procedure. See Chapter 7, *ROM Resident Diagnostics*, for details on running the diagnostics.

## Booting the System

### 2.1 The Boot Sequence

The system always attempts to boot from the floppy diskette drive first. The boot floppy diskette drive is Drive A. Drive A is factory configured to be the 3.5-inch floppy diskette drive. The 5.25-inch diskette drive can be configured to be Drive A, the boot drive, if desired. See Section 14.1.3, Bridge Module Jumper Settings, 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 or application 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 the press the reset switch on the bridge module if the system is already powered up.
3. If the RRD prompt was enabled, the RRD prompt appears. Type *b* at the RRD prompt.
4. The system begins the boot sequence as described above and then loads and begins execution of the program on the diskette.

## Booting the System

### 2.2 Booting the System

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.
2. If the RRD prompt is enabled, the RRD prompt appears. Type *b* at the RRD prompt.
3. The system loads the operating system from the hard disk and begins execution.

---

## 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 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, as shown in Table 3-1. Each SCSI bus has its own adapter.

**Table 3-1 SCSI Bus Possibilities**

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

### 3.3 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 six meters (18 feet).

#### 3.3.1 Single ISA-based SCSI Bus

The factory-configured base application DEC 433MP system uses an ISA bus 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 ISA bus cable, but these connections are for use when a dual SCSI Bus cable is added. Up to seven devices can be installed on the standard ISA SCSI bus.

Four of the SCSI devices on the bus controlled by the ISA SCSI adapter may be hard disks.

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, of which four can be hard disks.

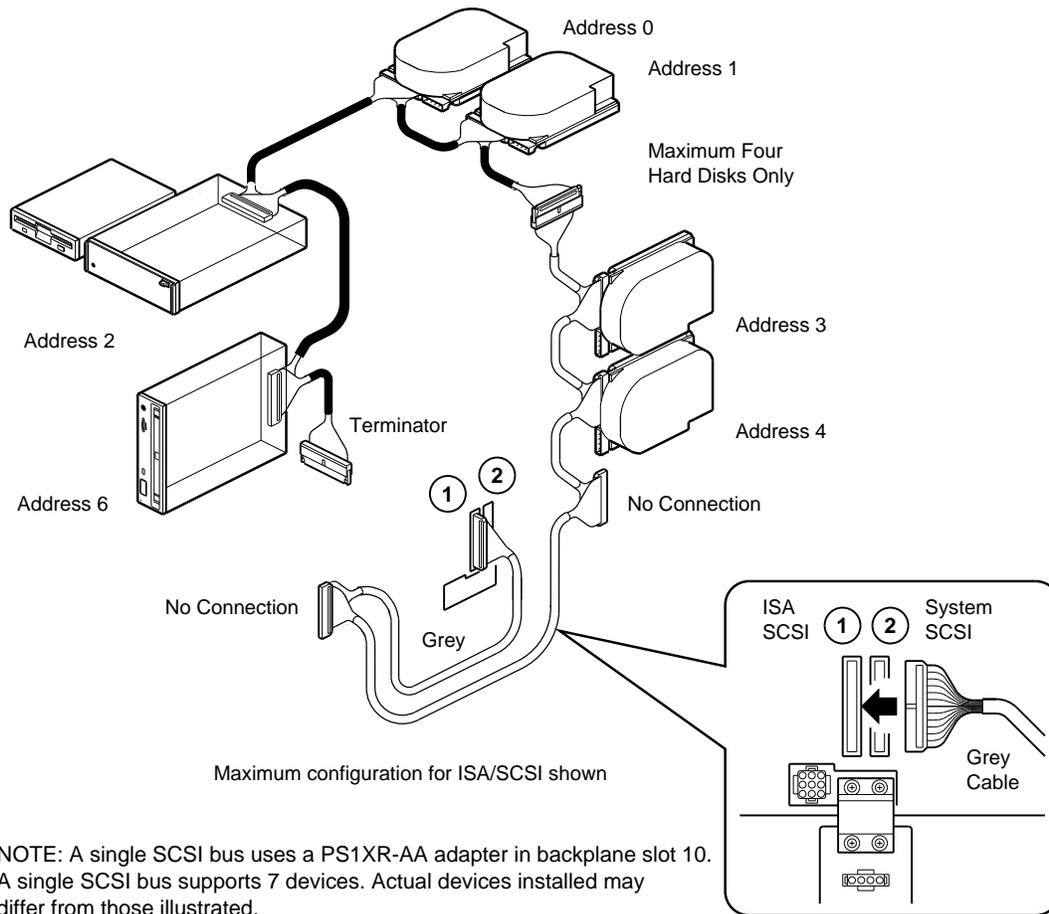
Use the PS1XR-xx Storage Expansion Box for external SCSI storage expansion. See Section 3.7.

Devices on the ISA-based SCSI bus are defined using the *mkdev* command under SCO UNIX.

## SCSI Bus Schemes

### 3.3 SCSI Bus Configuration Guidelines

**Figure 3-1 Single ISA SCSI Bus Cabling Diagram**



TA-0733-AC

#### 3.3.2 Adding a Second ISA SCSI Adapter

The applicationDEC 433MP is factory-configured for one ISA SCSI adapter. The ISA SCSI adapter can control the following devices:

- Seven SCSI devices total
- Four hard disks

## SCSI Bus Schemes

### 3.3 SCSI Bus Configuration Guidelines

A second ISA SCSI adapter can be added, however, the limit of four hard disks applies to the entire system. This is a restriction of SCO UNIX 3.2v2. Therefore, the total number of hard disks attached to both ISA SCSIs must not exceed four. The four hard disks can be external or internal and divided between the two adapters in any way.

The second ISA SCSI adapter can be used for external expansion only.

Table 3–2 offer a configuration for the maximum amount of storage space using ISA SCSI adapters only.

**Table 3–2 Maximum Storage Capacity Using ISA SCSI Adapters**

Adapter	Internal Hard Disks	External Hard Disks
First adapter	One 209 MB (Disk 0)	One PS1XR-FA (or -F3) Storage Expansion Box that contains one 1.2 GB disk
Second adapter	None	One PS1XR-EA (or -E3) Storage Expansion Box that contains two 1.2 GB disks

This provides a total system storage capacity of 3.8 GB, using ISA SCSI adapters only.

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

#### 3.3.3 Dual Internal SCSI Buses

For increased performance, the applicationDEC 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.

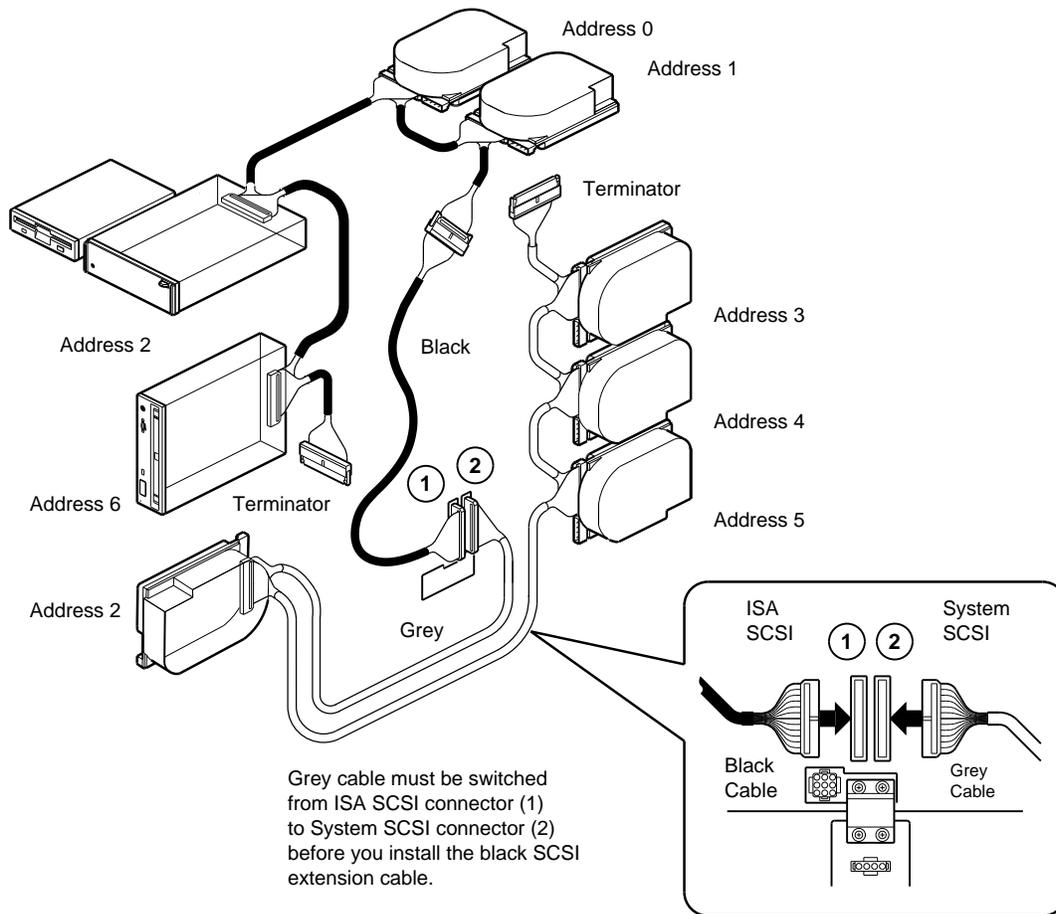
Use the *mkdev corollary* command to define devices on the CPU/SCSI adapter. See the *SCO MPX Release and Installation Notes* for full information.

The dual bus cabling scheme is designed so that most of your 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.

## SCSI Bus Schemes

### 3.3 SCSI Bus Configuration Guidelines

**Figure 3–2 Dual SCSI Bus Cabling**



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

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.

## SCSI Bus Schemes

### 3.3 SCSI Bus Configuration Guidelines

Use the PS1XR-xx Storage Expansion Box for external SCSI storage expansion. See Section 3.7 for more information on external storage expansion.

#### 3.3.4 Dual SCSI Buses with External SCSI Expansion

For additional expansion beyond the dual internal SCSI bus configuration, an additional CPU/SCSI adapter can be 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 to attach external storage devices. Up to two storage expansion boxes can be connected. See Section 3.7.

Devices on this external system bus SCSI bus are defined by using the *mkdev corollary* command. See the *SCO MPX Release and Installation Notes* for full information.

### 3.4 SCSI ID Addresses

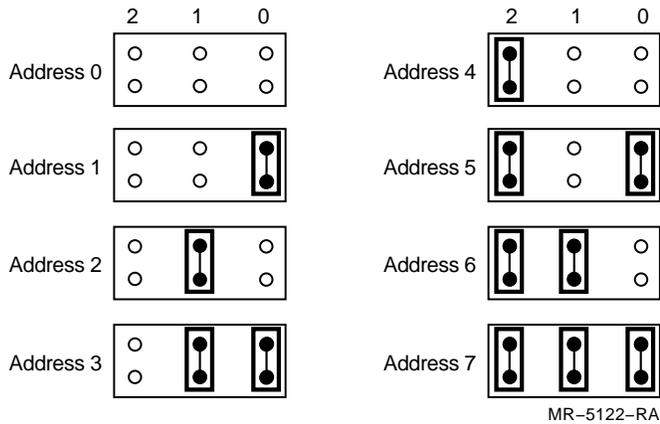
The SCSI architecture allows for eight addressable devices to be connected to the SCSI bus. This includes the adapter, which controls SCSI bus requests and data transfers. In an applicationDEC system, the adapters use SCSI address 7. Each storage device connected to a SCSI bus must have a unique address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

A SCSI storage device address is typically set on the device with jumpers. All applicationDEC SCSI storage devices use jumpers to set the SCSI address. There are three address jumpers, used to represent binary numbers between 0 and 7. When a jumper is installed, it represents a one in that address position. Thus, if no jumpers are installed on the three jumper pins, the address is set to zero. If a jumper is installed on the middle jumper pins, the address is set to two. Figure 3-3 shows how jumpers are installed to set SCSI addresses.

### 3.5 Recommended SCSI Device Addresses

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

**Figure 3-3 SCSI Address Jumpers**



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

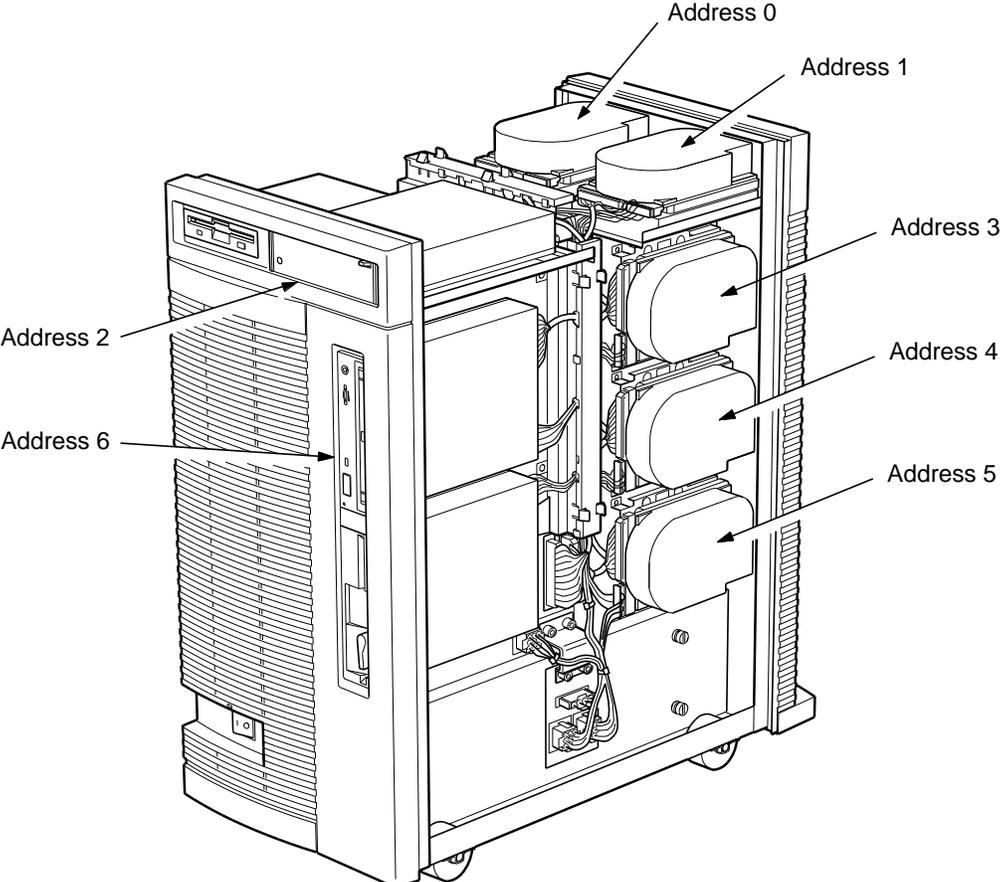
### 3.6 SCSI Terminators

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.

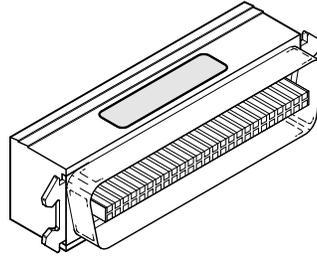
**SCSI Bus Schemes**  
**3.6 SCSI Terminators**

**Figure 3-4 Recommended SCSI Addresses**



TA-0713-AC

Figure 3–5 SCSI Terminator H8574-A



MLO-002346

### 3.7 External SCSI Storage Devices in the PS1XR-xx Storage Expansion Box

The PS1XR-xx Storage Expansion Box can be used to provide 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. Two storage expansion boxes can be chained together to create maximum storage expansion.

The PS1XR-xx box is connected to the external connector of the CPU/SCSI. If the CPU/SCSI module is installed in slot 5 of the backplane, the total number of SCSI devices on the bus, both internal and external, must not exceed seven.

If the CPU/SCSI module is installed in slot 6 of the backplane, two storage expansion boxes can be connected to the CPU/SCSI.

The -xx variant on the part 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.

Two storage expansion boxes can be connected together. By connecting two PS1XR-EA, (or -E3) boxes to a CPU/SCSI in slot 6, 4.8 GB of external storage is available. This is in addition to a possible 1.2 GB of storage inside the system box.

Table 3–3 lists the storage expansion boxes available.

## SCSI Bus Schemes

### 3.7 External SCSI Storage Devices in the PS1XR-xx Storage Expansion Box

**Table 3–3 External Storage Expansion Options**

Option	Disks 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 1.2 GB RZ57	1.2 GB
PS1XR-EA, E3	Two 1.2 GB RZ57	2.4 GB

The second letter in the -xx variations of the PS1XR-xx order numbers designates power supply requirements. A -xA variation indicates a 120V power supply. A -x3 variation (such as -C3) designates a 240V power supply.

Expansion kits are also available for adding additional 665 MB or 1.2 GB hard disks to the PS1XR-C and PS1XR-F expansion storage boxes, as listed in Table 3–4.

**Table 3–4 Storage Expansion Box Options**

Options	Contents	Storage Added
PS1XR-DA	One 665 MB RZ56 disk	665 MB
PS1XR-GA	One 1.2 GB RZ57 disk	1.2 GB

---

# ISA Bus Addresses and Interrupts

This chapter provides configuration information for ISA options.

## 4.1 Description

The Industry Standard Architecture Bus (ISA) provides you with an open architecture for installation of any ISA-compliant option module.

The applicationDEC system provides seven ISA option slots for installation of any ISA option.

## 4.2 IRQ Interrupt Lines

Prior to installation in the ISA 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 bus.) The ISA bus supports 16 IRQ lines, numbered from 0 to 15. However, not all of these assignments are available on each ISA option. Many ISA 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 IRQ 7. 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.

## ISA Bus Addresses and Interrupts

### 4.2 IRQ Interrupt Lines

**Table 4-1 IRQ Priority Levels**

IRQ line	Priority	
IRQ9	Highest	
IRQ10		
IRQ11		
IRQ12		
IRQ13		
IRQ14		
IRQ15		
IRQ2		
IRQ3		
IRQ4		
IRQ5		
IRQ6		
IRQ7		Lowest

Table 4-2 summarizes the available IRQ settings for all standard applicationDEC ISA option modules.

**Table 4-2 ISA Bus Interrupt Lines**

Option	Available IRQs	Set By SW/HW
PS1XG-AA VGA Adapter	2,3,4,5	Set by SW utility.
Serial/Parallel Adapter		
COM Port	2,3,4,5	Selectable by jumper.
Parallel Port	5,7	Selectable by jumper.
Terminal Multiplexer	10, 11, 12, 15	Set during SW installation.
ISA SCSI Adapter	9-12, 14,15	Selectable by jumpers.

Table 4-5 summarizes the recommended IRQ settings for each module.

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

When you install an ISA 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 ISA Option I/O Addresses

ISA options are also assigned an I/O address. This address must be unique as the CPU uses it to identify the option.

Many ISA options have selectable addresses. Generally, this is designed to allow 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 Adapter		
Video Port	3B0 - 3DF	Fixed.
Mouse Port (Primary)	23CH - 23FH	Default.
Mouse Port (Secondary)	238H - 23BH	Selectable by SW utility.
Serial/Parallel Adapter		
Port as COM1:	3F8 - 3FF	Selectable by jumpers.
Port as COM2:	2F8 - 2FF	This is factory default. COM1: is the console connector on the bridge module.
Parallel Port	3BC, 378, 278	Selectable by jumper.
ISA SCSI Adapter	330	Selectable by jumper.

Table 4–6 lists the recommended I/O address settings for each ISA option.

### 4.4 ISA Use of System Memory

Some ISA modules use system memory space. This memory space must be designated as ISA address space. Memory designated as I/O space is not cached since I/O options do not have the hardware to set cache validity flags when the option changes data.

Memory is specified as ISA address space by setting switches on the base processor module. System memory, which is specified as ISA address space, is not cached. See Section 13.2 for information on how to set these switches.

## ISA Bus Addresses and Interrupts

### 4.4 ISA Use of System Memory

Table 4-7 lists the recommended address space for ISA modules.

---

#### Note

---

When you install an ISA option to an existing system, it may be necessary to set or change the switch settings on the base processor board. After you install an ISA option, but prior to closing the system box, check the switch settings on the base processor board. The switchpack is visible without removing the base processor board from the backplane.

---

See Section 13.2, Base Processor Memory Switch for more information.

## 4.5 Recommended Configuration for ISA Modules

Table 4-4 lists the recommended configurations for application DEC 433MP ISA option modules. This table is useful when installing one of the Digital Equipment Corporation options listed.

When installing 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.

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

## ISA Bus Addresses and Interrupts

### 4.5 Recommended Configuration for ISA Modules

**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:0, L:D )
Second Terminal Multiplexer	15		E20000 - E2FFFF (Switches: H:E, L: 0)
Bus Mouse	5		
3COM 35C03 Network	2	310	Memory Disabled
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
3	COM2:
4	COM1:
5	Bus mouse
6	Floppy diskette
7	LPT1:
8	Real time clock
9	WD8003
10	MPX software interrupt
11	ISA SCSI Adapter
12	Terminal multiplexer host adapter

(continued on next page)

## ISA Bus Addresses and Interrupts

### 4.5 Recommended Configuration for ISA Modules

**Table 4-5 (Cont.) ISA Module IRQ Assignments**

IRQ Line	Device Allocation
13	FPU error
14	Unused (available for second ISA SCSI adapter)
15	Unused (available for second terminal multiplexer)

**Table 4-6 I/O Address Allocation**

I/O Address	Device Allocation
23C-23F	Bus mouse
240-25F	WD80003
2F8-2FF	COM2:
378-37F	LPT1:
330-332	ISA SCSI Adapter
3F0-3F7	Floppy diskette
3F8-3FF	COM1:

**Table 4-7 Memory Address Allocation**

Memory Address	Device Allocation
0A0000-BFFFF	VGA
0C0000-C7FFF	Video BIOS
0C8000-CBFFF	ISA SCSI Adapter BIOS
0CC000-CFFFF	WD8003 Shared RAM
0D0000-DFFFF	Terminal Multiplexer Host Adapter
0E0000-E7FFF	Diagnostic RAM

## ISA Bus Addresses and Interrupts

### 4.5 Recommended Configuration for ISA Modules

**Table 4-8 DMA Channel Allocation**

<b>DMA Channel</b>	<b>Device Allocation</b>
0	Spare
1	Spare
2	Floppy diskette
3	Spare
5	ISA SCSI Adapter
6	Spare
7	Spare

---

# Firmware Setup and Software Diagnostics

This part describes the firmware setup screen, the ROM Resident Diagnostics and the System Exerciser Diagnostics.

---

## 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:

- System date and time
- Designation of disk drive A and B
- Definition of non-SCSI disk drives
- Specification of memory size
- Specification of extended memory size
- Specification of graphics adapter
- Specification of ISA bus DRAM
- Specification of boot drive location
- Store specifications

### 5.2 Accessing the Setup Program

To get to the setup menu, press the keys as shown in Table 5-1:

**Table 5-1 Getting to the Setup Menu**

Console Type	Key Sequence
Graphics monitor (VGA)	Press Ctrl/Alt/S
Terminal (COM1)	Press Ctrl/3; then press Shift/S

### 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 one of the key sequences shown in Table 5-1, 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> Current Date.....: 09/19/1990
2> Current Time.....: 19:42:05
3> Diskette Drive A.....: 3.50-inch (1.44 MB)
4> Diskette Drive B.....: Not Installed
5> Fixed Disk Drive 0 Type.....: None
6> Fixed Disk Drive 1 Type.....: None
7> Base Memory Size (KB).....: 640
8> ISA Extended Memory Size (KB): 7168
9> Video Adapter.....: EGA/VGA/Super VGA
10> Base Processor Cache.....: On
11> RRD Menu Status.....: Off
12> Memory Refresh.....: Off
13> Boot Device.....: AT Bus
14> Save Current Options
```

Select option to change [0 to Exit]: 1

To change the value of an option, enter the number (1 to 14) in parentheses at the left of the option you want to change. Then enter either the new value or a number specifying the new value.

For example, to change the time, enter 1, press Return, and enter the new time. To exit the setup program, enter 0 and press Return.

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

## Setup Program

### 5.3 Changing Setup Parameters

You can change the following parameters:

#### 1> Current Date

This option sets the system date. The date is normally kept accurate by the battery system, but you may need to adjust it occasionally.

Select option to change [0 to Exit]: 1

Enter correct date as MM-DD-YY :

Enter the date in the format MM-DD-YY where MM is the month, 01 to 12, DD is the day, 01 to 31, and YY is the year.

Enter correct date as MM-DD-YY : 09-13-90

You do not have to enter leading zeros for single-digit months and days. For example, you can enter 2-1-91.

#### 2> Current Time

This option sets the system time. The time is normally kept accurate by the battery system, but you may need to adjust it occasionally.

Select option to change [0 to Exit]: 2

Enter 24 hour time as HH:MM:SS :

Enter the desired time in the format HH:MM:SS, where HH is hours, 01 to 23, MM is minutes, 01 to 59, and SS is seconds, 01 to 59.

Enter 24 hour time as HH:MM:SS : 18:35:10

You do not have to enter leading zeros for single-digit hours, minutes, and seconds. For example, you can enter 2:9:7.

#### 3> Diskette Drive A

This option prompts you for the type (size) of diskettes in Drive A, the RX23 diskette drive. 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]: 3

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]:

## Setup Program

### 5.3 Changing Setup Parameters

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.

Enter Diskette Drive A type [0..4]: 4

By default, the RX23, 3.5-inch, 1.44 MB diskette drive is Drive A, the boot drive. The setting of the jumpers on the bridge module can be changed to designate which drive is Drive A. For more information, see Chapter 14.

---

#### Note

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Setting the diskette drive sizes with the Setup Screen does not designate which drive is Drive A. The Drive A designation is made with jumpers on the bridge module. See Chapter 14, Bridge Module .

---

#### 4> Diskette Drive B

This option prompts you for the type (size) of diskettes in Drive B, the RX33 diskette drive. 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]: 4

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, enter 0 to indicate that Drive B is not installed, or enter 1, 2, 3, or 4 to specify the size of your diskette drive.

Enter Diskette Drive B type [0..4]: 2

## Setup Program

### 5.3 Changing Setup Parameters

#### 5> Fixed Disk Drive 0 Type

This option prompts you for the type of disk Drive 0. If the disk were a non-SCSI disk, you would have to provide certain information. Since the applicationDEC 433MP system has only SCSI disks, enter 0 to specify None (not a non-SCSI disk).

Select option to change [0 to Exit]: 5

Type	Cyl	H	WP	S	Type	Cyl	H	WP	S	Type	Cyl	H	WP	S
1	306	4	128	17	17	977	5	300	17	33	830	7	None	17
2	615	4	300	17	18	977	7	None	17	34	830	10	None	17
3	615	6	300	17	19	1024	7	512	17	35	1024	5	None	17
4	940	8	512	17	20	733	5	300	17	36	1024	8	None	17
5	940	6	512	17	21	733	7	300	17	37	615	8	128	17
6	615	4	None	17	22	733	5	300	17	38	1024	8	None	26
7	462	8	256	17	23	306	4	0	17	39	925	9	None	17
8	733	5	None	17	24	612	4	305	17	40	1024	9	None	17
9	900	15	None	17	25	612	2	300	17	41	918	15	None	17
10	820	3	None	17	26	614	4	None	17	42	1024	15	None	17
11	855	5	None	17	27	820	6	None	17	43	823	10	None	34
12	855	7	None	17	28	977	5	None	17	44	969	5	None	34
13	306	8	128	17	29	1218	15	None	36	45	969	7	None	34
14	733	7	None	17	30	1224	15	None	17	46	969	9	None	34
15	Reserved				31	823	10	512	17	47	User Defined Type			
16	612	4	0	17	32	809	6	128	17					

Fixed Disk Drive 0 Type...: None

Enter Fixed Disk Drive 0 type [0..46, 47: User Type]: 0

#### 6> Fixed Disk Drive 1 Type

This option prompts you for the type of disk Drive 1. If the disk were a non-SCSI disk, you would have to provide certain information. Since the applicationDEC 433MP system has only SCSI disks, enter 0 to specify None (not a non-SCSI disk).

Select option to change [0 to Exit]: 6

## Setup Program

### 5.3 Changing Setup Parameters

Type	Cyl	H	WP	S	Type	Cyl	H	WP	S	Type	Cyl	H	WP	S
1	306	4	128	17	17	977	5	300	17	33	830	7	None	17
2	615	4	300	17	18	977	7	None	17	34	830	10	None	17
3	615	6	300	17	19	1024	7	512	17	35	1024	5	None	17
4	940	8	512	17	20	733	5	300	17	36	1024	8	None	17
5	940	6	512	17	21	733	7	300	17	37	615	8	128	17
6	615	4	None	17	22	733	5	300	17	38	1024	8	None	26
7	462	8	256	17	23	306	4	0	17	39	925	9	None	17
8	733	5	None	17	24	612	4	305	17	40	1024	9	None	17
9	900	15	None	17	25	612	2	300	17	41	918	15	None	17
10	820	3	None	17	26	614	4	None	17	42	1024	15	None	17
11	855	5	None	17	27	820	6	None	17	43	823	10	None	34
12	855	7	None	17	28	977	5	None	17	44	969	5	None	34
13	306	8	128	17	29	1218	15	None	36	45	969	7	None	34
14	733	7	None	17	30	1224	15	None	17	46	969	9	None	34
15	Reserved				31	823	10	512	17	47	User Defined Type			
16	612	4	0	17	32	809	6	128	17					

Fixed Disk Drive 1 Type...: None

Enter Fixed Disk Drive 1 type [0..46, 47: User Type]: 0

#### 7> Base Memory Size (KB)

This option prompts you for the base memory size.

Select option to change [0 to Exit]: 7

The base memory options are:

- 0> 256 KB
- 1> 512 KB
- 2> 640 KB

Enter Base Memory option [0..2]:

For an applicationDEC 433MP system, the base memory size is always 640 KB.  
Enter 2.

Enter Base Memory option [0..2]: 2

#### 8> ISA Extended Memory Size (KB)

This option prompts you for the size of the ISA extended memory. The maximum ISA extended memory is 14 MB.

Select option to change [0 to Exit]: 8

Enter ISA Memory size in multiples of 64 KB [0..16384]:

The ISA extended memory sizes for various total system memory sizes are shown in Table 5-2.

**Table 5-2 ISA Extended Memory Size**

Total System Memory	ISA Extended Memory Size
8 MB	7168 KB
12 MB	11264 KB
16 MB or greater	14336 KB <sup>1</sup>

<sup>1</sup>Enter 13312 if S1 switch 7 is set on base processor board to accommodate a terminal mux board.

Enter one of the sizes shown in Table 5-2. For example, for 8 MB of total system memory, enter 7168.

Enter Extended Memory size in multiples of 64KB [0..16384]: 7168

### 9> Video Adapter

This option prompts you for the type of video adapter attached to the video port on the backplane.

Select option to change [0 to Exit]: 9

The video adapter options are:

- 0> EGA/VGA/Super VGA
- 1> CGA 40 X 25
- 2> CGA 80 X 25
- 3> Monochrome

Enter Video Adapter type [0..3]:

Enter 0, 1, 2, or 3 to specify the type of video adapter on your system. For example, if a VGA adapter is installed on your system, enter 0.

Enter Video Adapter type [0..3]: 0

If no video adapter is installed, the video adapter option can be 0, 1, 2, or 3.

### 10> Base Processor Cache

This option prompts you to turn on or off the internal cache of the Intel 486 chip.

Select option to change [0 to Exit]: 10

The base processor cache options are:

- 0> Off
- 1> On

Base Processor Cache.....:

## Setup Program

### 5.3 Changing Setup Parameters

Set the 486 internal cache to On. Enter 1.

System Memory Cache.....: 1

#### 11> 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]: 11

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 enter commands to run diagnostic tests. See Chapter 7.

RRD Menu Status.....: 1

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

#### 12> Memory Refresh

This option prompts you to set memory refresh to on or off on the ISA bus.

Select option to change [0 to Exit]: 12

The memory refresh options are:

- 0> Off
- 1> On

Memory Refresh.....:

For the applicationDEC 433MP system, set memory refresh to Off. Enter 0.

Memory Refresh.....: 0

#### 13> Boot Device

This option specifies the location of the boot hard disk drive, the drive from which the operating system is booted. The boot drive can be located on the SCSI bus whose adapter is on the ISA 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.

## Setup Program

### 5.3 Changing Setup Parameters

Select option to change [0 to Exit]: 13

The boot device options are:

- 0> ISA Bus
- 1> System Bus

Boot Device .....

**If the boot drive is a device on the ISA-based SCSI bus, enter 0. If the boot drive is a device on the system bus, enter 1.**

Boot Device .....: 0

#### **14> 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]: 14

**The options that you have specified are now saved.**

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

Select option to change [0 to Exit]: 0

Configuration has been modified. Save options before you exit. [Y/N]?

**Enter Y to save your options before you exit.**

---

# System Exerciser Diskette - Installation Verification Procedure

This chapter describes the system exerciser diskette.

## 6.1 Description

The system exerciser diskette is a self-contained bootable diskette used to diagnose the complete system. It contains testing for additional sections of the system beyond the testing 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 test can be run in destructive or nondestructive mode. Destructive mode erases and destroys any data currently present on hard disks. Destructive mode provides a more thorough testing of the hard disks, but should only be used when you are certain that you do not need any data present on a disk. It is primarily designed for disks on which you have not yet loaded any information.

In general, nondestructive testing identifies most hard disk failures, and should be used for systems that are in current use.

## 6.2 Running the Installation Verification Procedure

The following steps explain how to load the system exerciser:

1. Insert the system exerciser floppy diskette into the 3.5-inch floppy diskette drive.
2. Boot the system from the floppy diskette in either of the following ways:
  - Powerup (turn the system off and then on again).
  - Press the reset switch on the bridge module I/O panel.

## System Exerciser Diskette - Installation Verification Procedure

### 6.2 Running the Installation Verification Procedure

When the system exerciser has been booted, configuration information and the list of system exerciser tests are displayed on the screen and you are prompted to choose destructive or nondestructive testing at the HLT> prompt.

Select the non-destructive testing.

At the HLT> prompt, enter *ivp*:

```
HLT> ivp
```

This will perform a 15 minute system installation verification procedure. (Ctrl/C halts the system exerciser, if necessary.)

After fifteen 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 slot number, SCSI ID number, or by directly naming the device that failed a test.

If a module or device is identified by the system exerciser as failed, further investigation is usually required before replacing the module or device. For example, all connections to modules or devices should be checked. Modules should be reseated in the backplane. Cable connections to a device should be checked to make sure the connection is complete.

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

---

# ROM Resident Diagnostics

This chapter describes how to use the ROM Resident Diagnostics (RRD).

## 7.1 Description

The ROM resident diagnostics (RRD) are firmware diagnostics that provide testing of all modules 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.

## 7.2 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 powerup tests complete, the system displays the RRD prompt.

To run the ROM resident diagnostics, enter the *runall* command at the asterisk (\*) prompt as follows:

```
* runall
```

As each test executes successfully, the number and name of the test are displayed on the console screen.

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.

## ROM Resident Diagnostics

### 7.2 Running the RRD

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  
* runall
```

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. Modules should be reseated in the backplane and the test rerun.

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

---

#### Note

---

At the RRD prompt, if you do not enter a command, the RRD diagnostics time out and the system continues with the boot sequence.

---

### 7.3 Enabling RRD with Setup

The RRD diagnostics must be enabled in the setup screen 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 RRD is not enabled, the RRD firmware is bypassed during the boot procedure and the system boots from the floppy disk drive or hard disk directly after the powerup self tests conclude.

To get to the setup screen, press the keys as shown in Table 7-1:

**Table 7-1 Getting to the Setup Menu**

Console Type	Key Sequence
Graphics monitor (VGA)	Press Ctrl/Alt/S
Terminal (COM1)	Press Ctrl/3; then press Shift/S

Select item 11 from the setup menu and enter 1 to enable the RRD diagnostics. See Chapter 5, Setup Program for complete information on the RRD diagnostics.

## 7.4 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, type *b* at the RRD prompt, as shown below.

\* b

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

---

# Connecting Terminals and Monitors

This part describes connection of serial terminals, the console terminal, VGA monitors, and printers.

---

## Connecting a Console Terminal

This chapter describes how to specify and connect a console monitor or terminal.

### 8.1 Description

The console is the terminal or monitor to which the system sends system error messages, communicates with ROM resident diagnostics, and other system functions. The console can either be a serial terminal connected to COM1:, or a VGA monitor attached to the VGA adapter.

The applicationDEC 433MP BIOS firmware automatically looks at the VGA address, and if a VGA adapter is detected, configures the console as the VGA monitor. If there is no VGA adapter installed in the system, the firmware configures COM1: the console address.

The serial connector on the bridge module is factory-configured to have COM1: as its address. It can be configured as COM2: by changing jumpers on the bridge module. The serial connector on the serial/parallel module is factory-configured as COM2:. The serial port can be configured as COM1: by changing jumpers on the serial/parallel module.

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

## **8.2 Using a VGA Monitor as the Console**

If a VGA adapter is installed, 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 ahead of booting the system in order to ensure that all system messages are received.

Installing the VGA adapter is described in Chapter 20. Installing a VGA monitor is described in Chapter 9.

## **8.3 Using a Serial Terminal as the Console**

COM1: is selected as the console if there is no VGA adapter installed in the system.

The serial connector on the bridge module is a 9-pin D-subminiature connector.

If your terminal is supplied with a compliant 9-pin D-subminiature connector/cable, you can attach this connector directly to the bridge module. If your terminal uses a modified modular jack (MMJ), use the 9-pin to MMJ adapter, part number H8571-J. Two of these adapters are supplied with your applicationDEC system.

---

## Attaching a VGA Monitor

This chapter describes how to install a VGA monitor to the VGA adapter in the ISA backplane. 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 further information on the monitor.

### 9.1 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 Installation

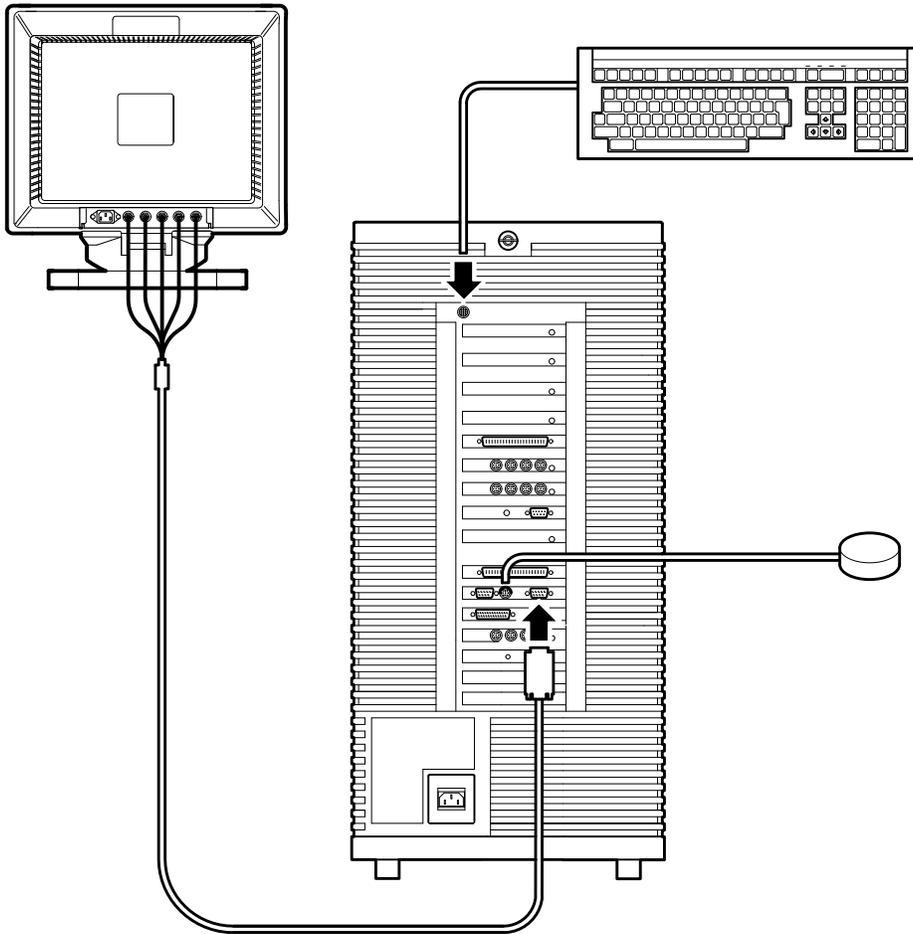
The VRC16 is factory-shipped with the tilt-swivel base installed and the cable attached to the connectors on the back of the monitor. Therefore, installation of the VRC16 consists solely of the following tasks:

- 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.

## Attaching a VGA Monitor 9.2 Installation

Figure 9-1 Connecting a VRC16 VGA Monitor



TA-0745-T1

### 9.3 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.

### 9.4 Attaching the VGA Keyboard

The following Digital Equipment Corporation keyboards are recommended for use with the applicationDEC 433MP system:

- PC4XL-BB USA
- PC6XL-CB Belgium
- PC6XL-CD Danish
- PC6XL-CE UK/Ireland
- PC6XL-CF Finnish/Swedish
- PC6XL-CG German
- PC6XL-CI Italian
- PC6XL-CL Swiss/French German
- PC6XL-CN Norwegian
- PC6XL-CP French
- PC6XL-CS Spanish
- PC6XL-CT Israel
- PC6XL-CV Portugal
- PC6XL-CX Greek/Latin

The 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. The cable connector must be inserted well into the socket to make full contact.

## **9.5 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 module. (This mouse is also separately orderable under the order number PS1XS-AA.) Figure 9-1 shows how the bus mouse is installed.

Under SCO UNIX 3.2v2.0, the bus mouse is configured as a "Logitech" mouse.

## **9.6 Other VGA Monitors**

Any VGA monitor supported by the VGA adapter can be connected to the VGA adapter. These include the following Digital Equipment Corporation monitors:

- PC4XV-A2 14-inch monochrome video display (120V)
- PC6XV-A3 12-inch monochrome video display (240V)
- PC6XV-A4 12-inch monochrome video display (240V) southern hemisphere variation

## **9.7 PC4XV-A2 Monitor and Adapter**

The Digital Equipment Corporation PC4XV-A2 monitor can be connected to the applicationDEC 433MP system. This 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. However, the PC4XC-BB adapter can be used to convert the supplied power cord to a 120V standard three-prong wall socket.

---

## 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 ten feet of the system. To install a terminal concentrator more than ten 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 port, 1-8, has two LEDs for status. The green LED blinks when both the terminal and the host computer are both ready to transmit data (when the DSR and DCD signals are both asserted) but the operating system has not yet opened the terminal line. The green LED becomes a steady illumination when the operating system opens the terminal line. The yellow LED lights as the concentrator receives data from the terminal or the host adapter.

When a printer is connected to the terminal concentrator port, the green LED blinks until data is received from the host adapter. The green LED is then steadily illuminated until the print request is complete.

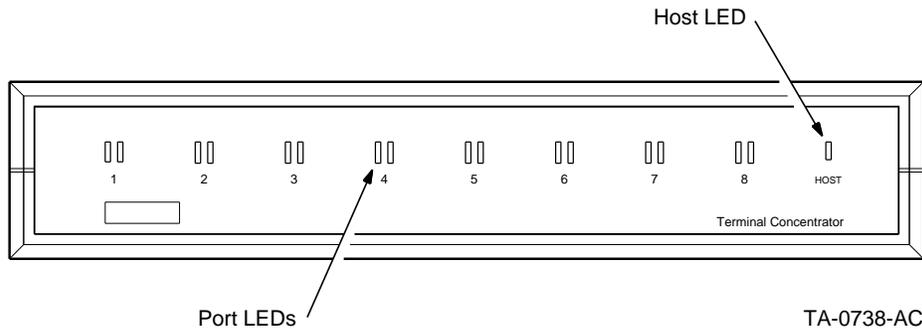
## Connecting Terminals Using the Terminal Concentrator

### 10.1 Terminal Concentrator Description

The host LED is a single green LED. This LED blinks when the unit has power, but is not being polled by the host. The driver continually polls the terminal concentrator, therefore the LED will only blink when the driver is not running. This might occur during System Maintenance mode, while diagnostics are being run, or if the driver is not yet installed.

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

Figure 10–1 Terminal Concentrator Front Panel



The rear panel of the terminal concentrator has eight terminal connection ports, the host connection cable, and a power connection.

The terminal ports are 8-pin RJ45 phone plugs, for connection of serial lines from terminals or printers. The terminal concentrator ports carry signals that comply with RS-232 serial transmission standards.

The connector labeled Host is for connection of the host-to-terminal concentrator cable. This cable is supplied with each terminal concentrator. The cable carries data and power signals for the terminal concentrator.

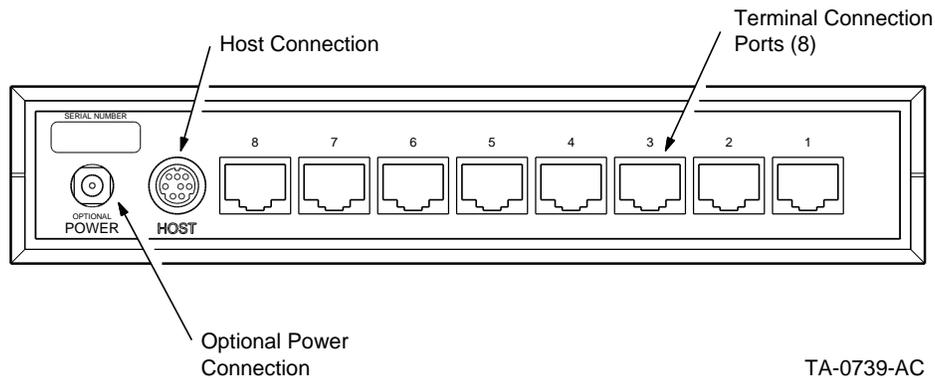
The connector labeled Power is for use with the Terminal Concentrator Extension Kit.

## 10–2 Connecting Terminals Using the Terminal Concentrator

## Connecting Terminals Using the Terminal Concentrator

### 10.1 Terminal Concentrator Description

Figure 10–2 Terminal Concentrator Rear Panel



TA-0739-AC

## 10.2 Terminal Concentrators More Than Ten Feet From System

Each terminal concentrator receives its power from the terminal multiplexer host adapter. This power is delivered through the terminal concentrator to terminal multiplexer cable. This cable must not exceed ten feet in order to preserve the power signals.

To install the terminal concentrator at a distance greater than ten feet, you must use the Terminal Concentrator Extension Kit. This kit provides a wall mounted power supply for the terminal concentrator. The kit also contains two adapters for connection to the host adapter and the terminal concentrator. You supply the cable that is connected to the two adapters, completing the host adapter to terminal concentrator connection. Refer to the *Terminal Multiplexer Intelligent I/O Subsystem User and Installation Manual* 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 directly connected to the ports on the terminal concentrator.

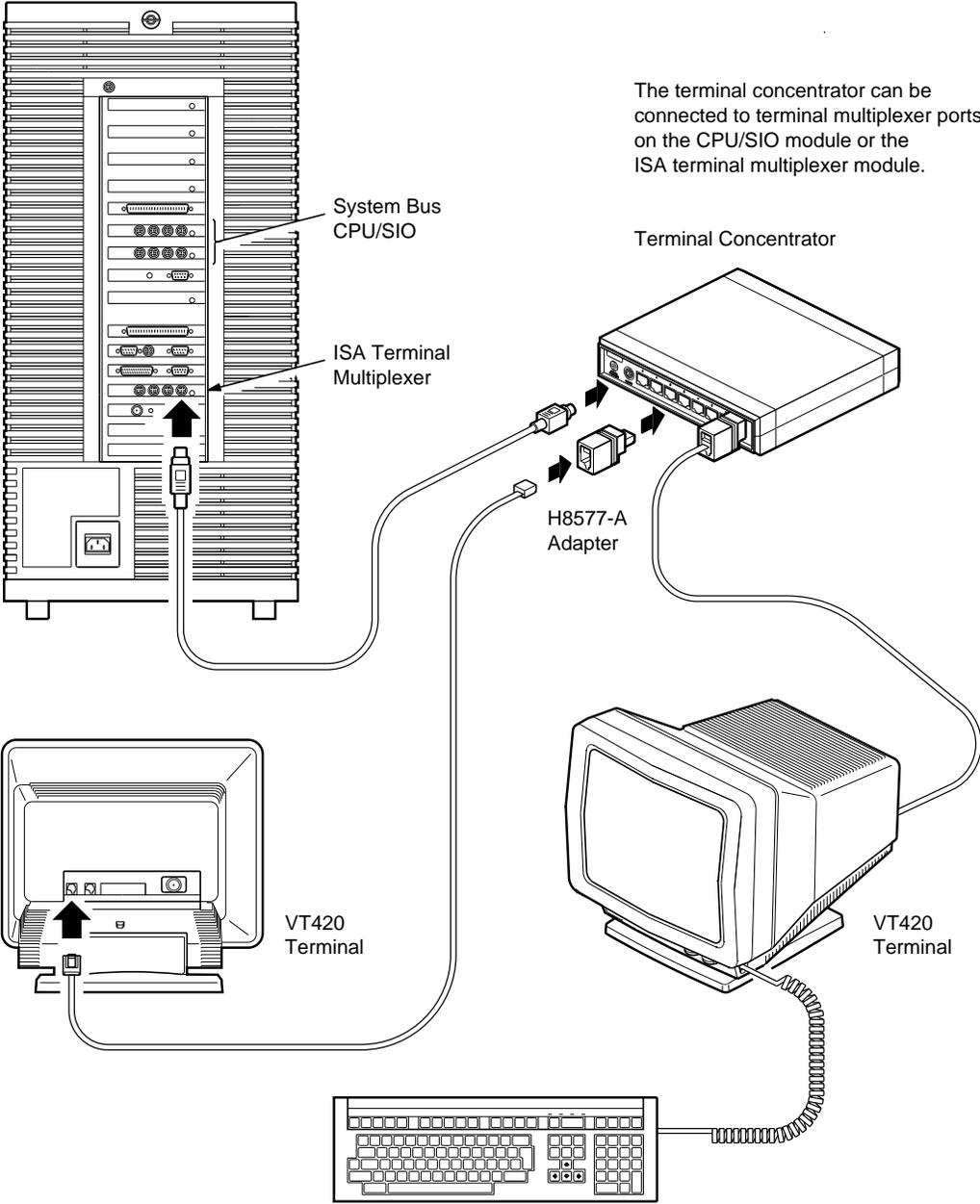
If your terminal uses a modified modular jack (MMJ) cable, such as used by Digital Equipment Corporation VT400-series terminals, use an H8577-A adapter to convert the MMJ cable connection to an RJ45 connection for use with the terminal concentrator.

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

# Connecting Terminals Using the Terminal Concentrator

## 10.3 Connecting Terminals to the Terminal Concentrator

Figure 10-3 Connecting Serial Terminals



TA-0742-AC

## 10.4 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 and Installation Notes*. To configure a terminal attached to the terminal multiplexer, refer to the *Terminal Multiplexer Intelligent I/O Subsystem User and Installation Guide*.

---

## Installing a Printer

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

### 11.1 Connection Choices

Printers can be installed in four different ways on an applicationDEC system:

- As a device on a terminal concentrator
- 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
- As a transparent device on the auxiliary port of a terminal

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 and Installation Notes* for information on configuring devices on the CPU/SIO module. Refer to the *Terminal Multiplexer Intelligent I/O Subsystem Installation* guide for 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 **ttya1p** should be used to designate the printer device. Do not use the modem device name.

## Installing a Printer

### 11.3 Intelligent Transparent Printing

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

### 11.4 Serial Printers on the Serial Connectors

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

- Console 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 3.2v2 provides support for IBM Proprinter compatible printers. Digital Equipment Corporation printers can support this mode when operated in the "Other" protocol selection provided for on the printer. For example, the LA75 printer has a Protocol button on the front panel. Press this button to place the printer in the "Other" protocol position.

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 and redirecting output to the printer device. Alternatively, the printer can be configured as the default printer using the command *lp*. 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 non-modem control device name as the name for the printer. This is a device name such as *ttya1* 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 and User's Guide* for details on attaching printers using the terminal concentrator and intelligent transparent printing.

## Installing a Printer 11.6 Software Support for Printers

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

---

# Opening the System Cabinet

This part describes information on how to open the system cabinet.

---

## Opening the System

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

### 12.1 Description

You must open the applicationDEC system box 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

Prior to opening the system you must do the following:

- Type *shutdown*, if the operating system is running, to shut down the operating system. This provides for an orderly shutdown of the entire system; it closes all open files and prepares hard disk drives and other hardware for loss of power.
- Remove any diskettes from the diskette drives. (When power is reapplied, the system will attempt to boot from the diskette drive if a diskette is installed.)
- Remove power from the system. Turn the ON/OFF switch to the OFF or (o) position. Remove the power cord from the wall socket.

## Opening the System

### 12.3 Procedure to Open the System Box

## 12.3 Procedure to Open the System Box

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 as shown in Figure 12–1 and described as follows:

1. Disconnect the power cord.
2. Unlock the system lock by turning the key counter-clockwise to the unlocked position.
3. Pull the top cover back and then up to release it.
4. Remove the side panels by lifting them up and away from the system.

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

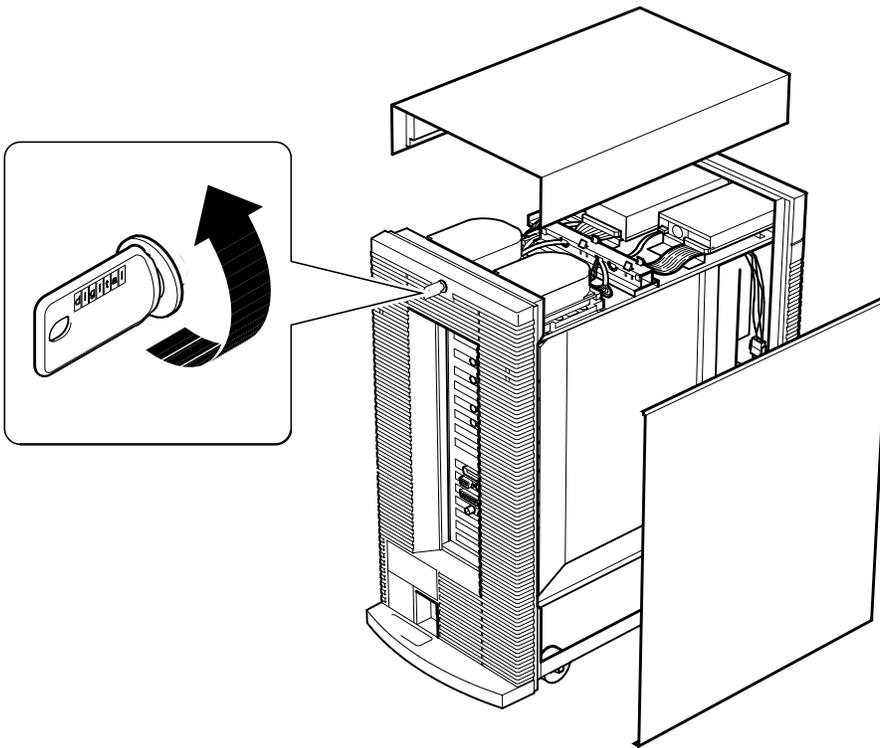
### 12.3.2 Removing the Card Cage Door

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 holding the door, as shown in Figure 12–2.
2. Pull the door open slightly and pull the door out of the slot in the left-hand side of the chassis.
3. Remove the card cage door.

## Opening the System 12.3 Procedure to Open the System Box

Figure 12–1 Top Cover and Side Panel Removal



TA-0700-TI

Reverse the above steps to replace the card cage door.

---

### Note

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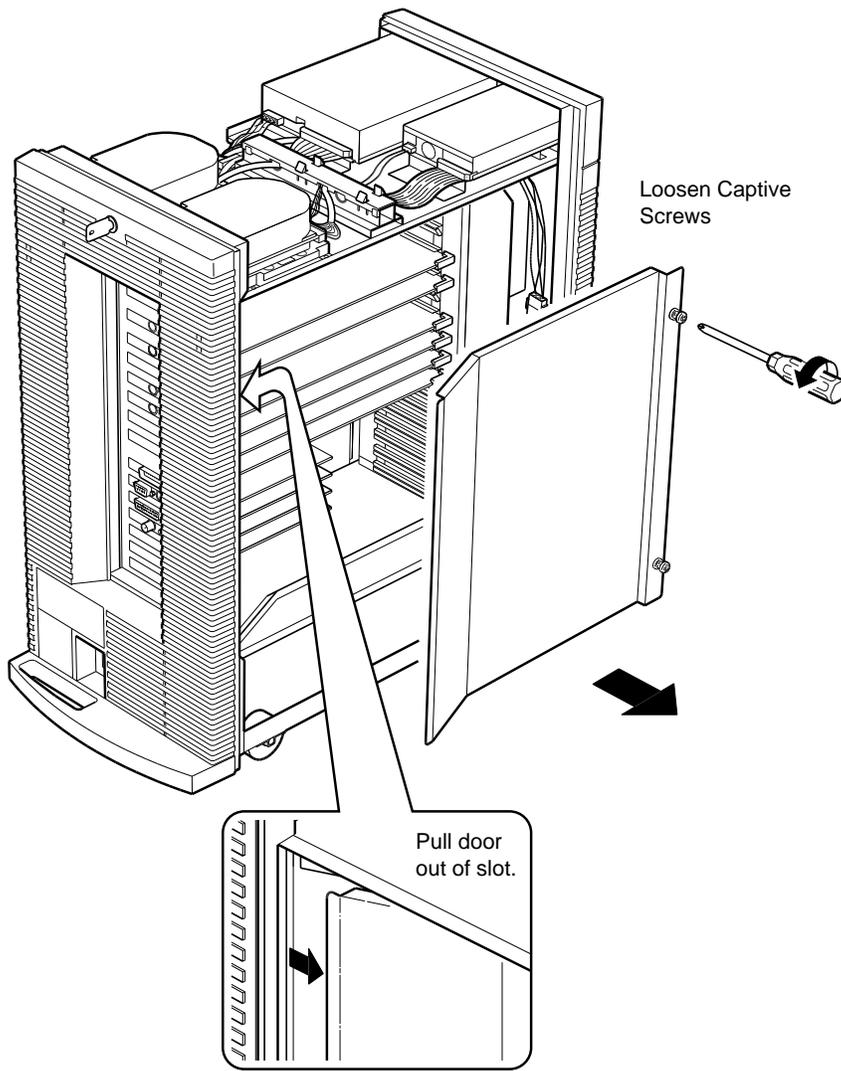
When you reinsert the card cage door, make certain that the door is inserted into the retaining slot prior to tightening the captive screws.

---

## Opening the System

### 12.4 Backplane Description

Figure 12–2 Removing Card Cage Door



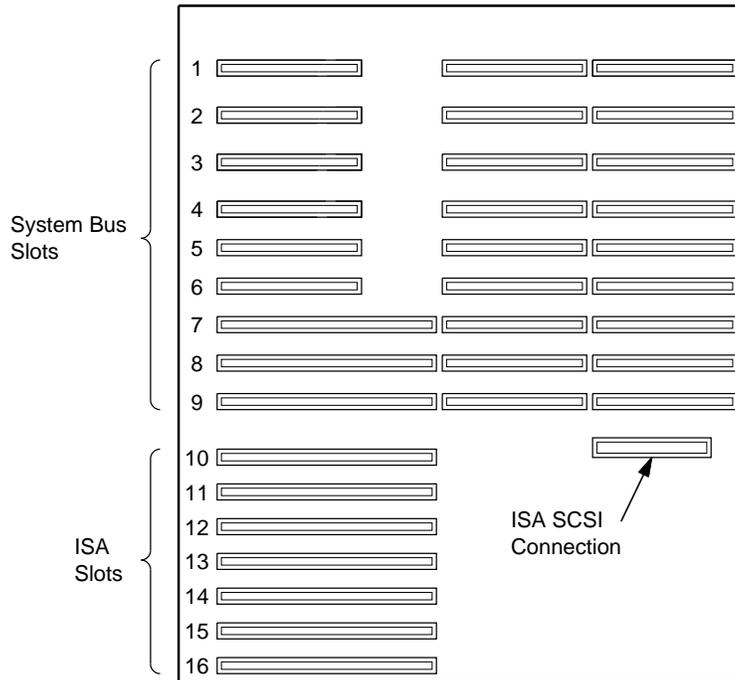
TA-0701-AC

## 12.4 Backplane Description

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

12–4 Opening the System

Figure 12-3 Backplane



TA-0702-AC

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

The top nine slots (slots 1 - 9) in the backplane are system bus slots. The bottom seven slots (slots 10 - 16) are ISA slots. Any industry standard ISA 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.

## Opening the System

### 12.4 Backplane Description

**Table 12–1 applicationDEC 433MP Backplane Slot Configuration Options**

Slot	Bus	Use
1	System bus	Memory
2	System bus	Memory
3	Sytem 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	ISA	ISA SCSI Controller
11	ISA	Serial Parallel Adapter
12	ISA	Terminal Multiplexer (slot when installed at factory; may be installed in any slot)
13	ISA	ISA Option
14	ISA	ISA Option
15	ISA	ISA Option
16	ISA	ISA Option

There are no restrictions on ISA backplane slots for ISA boards. 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

All system bus modules are installed in a similar fashion. 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.
2. The blank distribution panel will not be reused. (Save the distribution panel for future use if the module is ever removed.)
3. Hold the module by the finger grips and slide the module into the backplane slot with the component side facing up. Make certain that the fingers of the module are fully inserted into the backplane slot.

## 12.5 Installing a System Bus Module in the Backplane

4. Align the module's distribution panel with the screw hole in the chassis and tighten the captive screw.
5. The system bus module is now installed in the backplane.
6. Replace the card cage door and install the top cover and side panels before you apply power to the system.

---

**Note**

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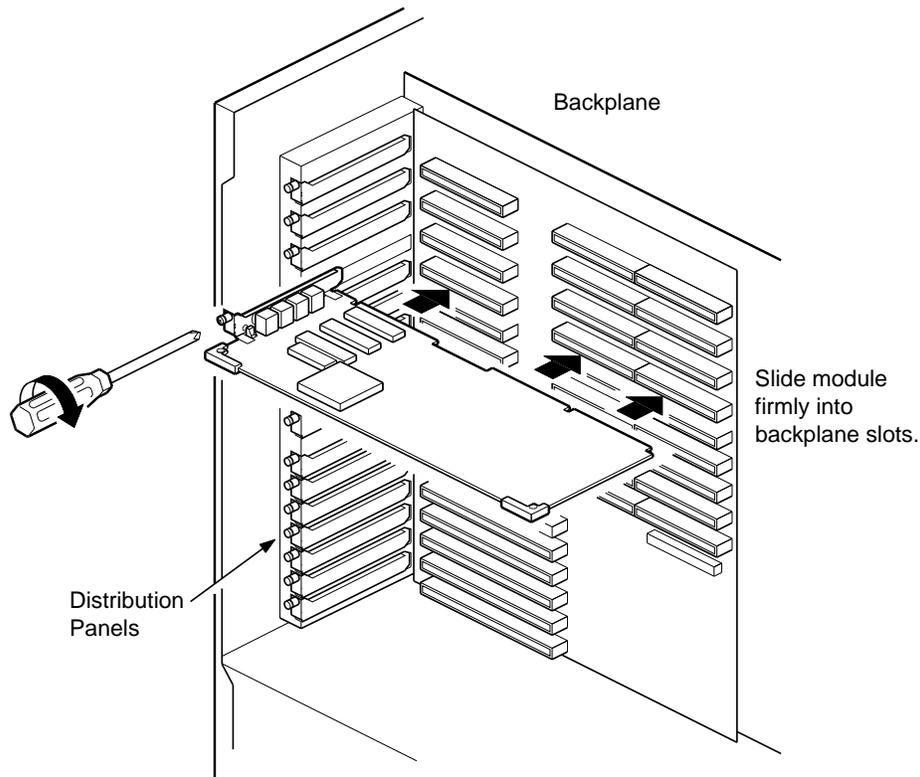
Because system bus modules must be inserted in certain slots, the backplane receptacles for the module fingers are keyed for each module. Make certain that the system bus slot into which you are installing a module is appropriate for the module. If you encounter resistance installing a system bus module, 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.

---

## Opening the System

### 12.5 Installing a System Bus Module in the Backplane

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



TA-0703-AC

### 12.6 Installing an ISA Module in the Backplane

ISA option modules may be installed in any ISA slot in the backplane. All ISA modules are installed in a similar fashion. This procedure is illustrated in Figure 12-5 and described as follows:

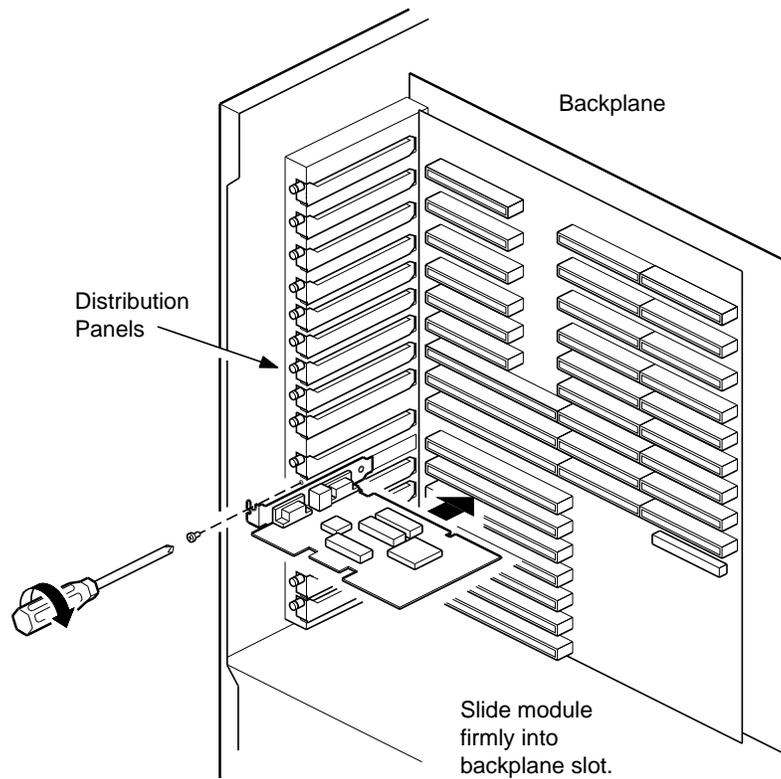
1. Detach the blank distribution panel, if present, by removing the screw holding the panel to the chassis. Be careful not to drop the screw onto a module as it is removed from the chassis. Save the screw.
2. Remove the blank distribution panel. It will not be reused. (Save the distribution panel for future use if the module is ever removed.)

## Opening the System

### 12.6 Installing an ISA Module in the Backplane

3. Slide the module into the backplane slot with the component side facing up. Make certain that the fingers of the module are fully inserted into the backplane slot.
4. Align the module's distribution panel with the screw hole in the chassis and insert the screw saved from step 1.
5. The ISA module is now installed in the backplane.
6. Replace the card cage door and install the top cover and side panels before applying power to the system.

Figure 12-5 Installing an ISA Module in the Backplane



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 applicationDEC 433MP system box. The distribution panels are part of each module.

---

# Installing Modules in the Backplane

This part describes installation of option modules in the backplane.

---

## Base Processor Module

The base processor module is a standard feature of all applicationDEC 433MP systems. This chapter describes features of the base CPU module.

### 13.1 Description

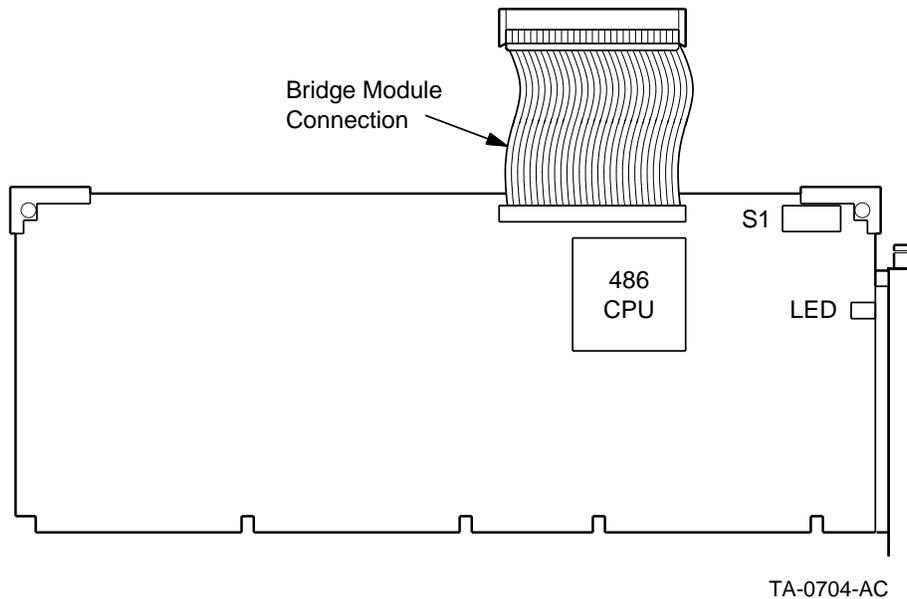
The applicationDEC 433MP base processor module includes an Intel 80486 processing chip for system and user code execution. It also contains logic for communication with the bridge module through a ribbon cable.

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

## Base Processor Module

### 13.1 Description

Figure 13-1 Base CPU Module



Features on the base CPU module include:

- Intel 80486 processor: provides execution of system code and user code
- Memory allocation switch S1: allocates sections of memory for use by ISA modules
- Cable for connection to bridge module
- LED: indicates power and processor activity

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 system and is the only processor in single processor versions of the system. Although the applicationDEC 433MP is designed for multiprocessor expansion, the system is fully functional with only the base processor installed. In a single processor configuration, the SCO MPX software 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.

## 13.2 Base Processor Memory Switch

Figure 13–2 shows switchpack 1 on the base processor.

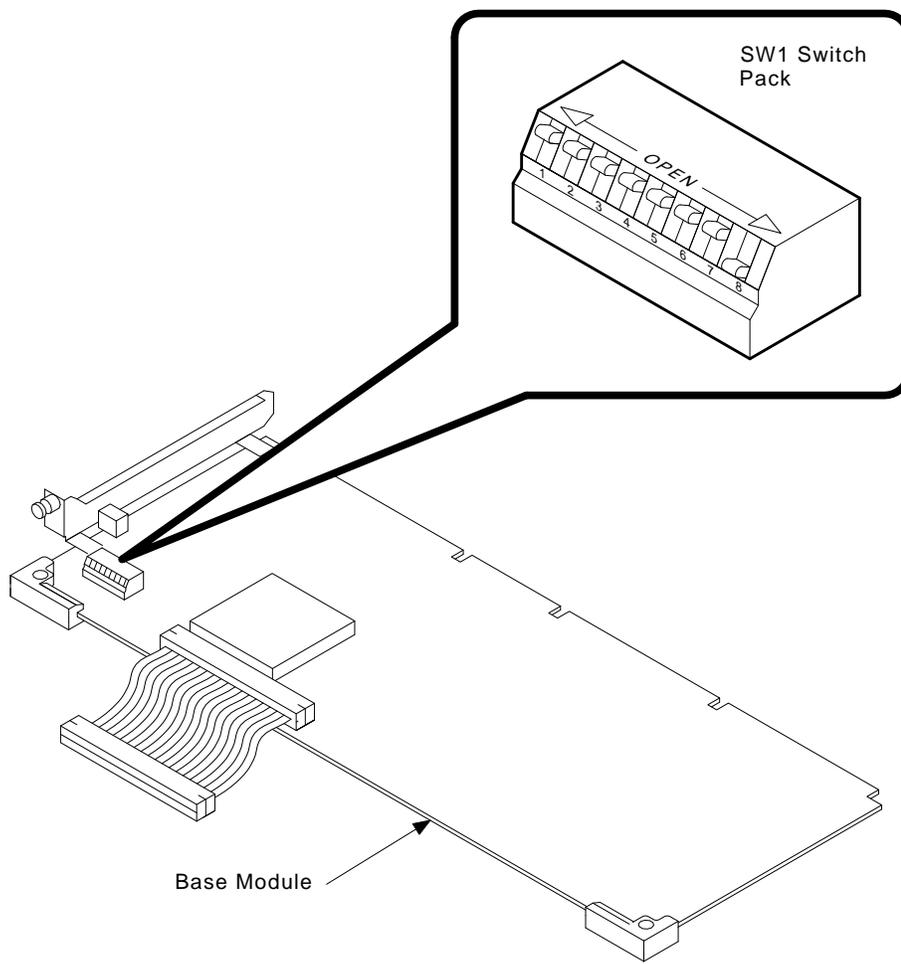
This switch controls how memory locations between 8 MB and 15 MB are allocated. Each switch controls 1 MB of memory, as shown in Table 13–1. If the switch is set ON, that 1 MB of memory is allocated to the ISA bus. ISA options can then use this space to read and write data. If the switch is set OFF, that 1 MB of memory is allocated to the system bus space.

Memory allocated to the ISA I/O space by these switches is not cached by system processors. This is necessary because ISA options change data in this space without activating cache coherency flags. The only method to ensure that ISA I/O data is always valid is to block it from being cached. These switches, when set, prevent any processor from caching memory in this space.

For maximum performance, memory should only be allocated for I/O options if necessary. If a memory space is not needed by an ISA option currently installed, the memory space should be allocated to the system bus.

**Base Processor Module**  
**13.2 Base Processor Memory Switch**

**Figure 13–2 SW1 Switchpack; Memory Allocation Switches**



TA-0744-T1

**Table 13–1 Base Processor Switchpack 1**

Switch	Memory Range	On	Off (Open)
S1	8 MB - 9 MB	ISA	System bus
S2	9 MB - 10 MB	ISA	System bus
S3	10 MB - 11 MB	ISA	System bus
S4	11 MB - 12 MB	ISA	System bus
S5	12 MB - 13 MB	ISA	System bus
S6	13 MB - 14 MB	ISA	System bus
S7	14 MB - 15 MB	ISA	System bus
S8	VGA BIOS Cache	Always set ON, switch down	Not applicable

### 13.3 Setting Memory Switches for the applicationDEC 433MP

The only ISA option which requires that memory space be designated as ISA space is the terminal multiplexer host adapter.

The memory switches need to be set if you have one or two terminal multiplexers installed. Set the switches as shown in Table 13–2. The memory switches are set differently for systems with 8 MB, 12 MB, or 16 MB or greater of memory.

**Table 13–2 Memory Switch Settings**

Terminal Multiplexers	8 MB	12 MB	16 MB and up
First at E10000 Second at E20000	1 through 7	5 through 7	7 only <sup>1</sup>

<sup>1</sup>When switch 7 is set in system with greater than 16 MB, change setup option 8, ISA extended memory size, to 13312.

## **13.4 Installation**

The following steps describe the installation procedure for the base processor module.

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**WARNING**

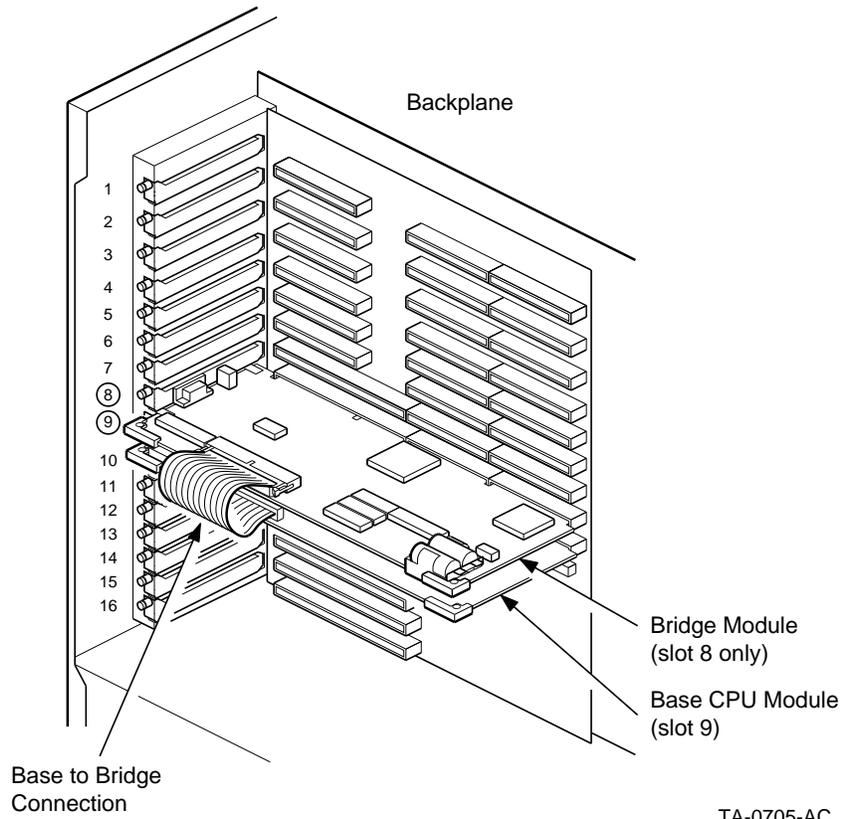
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Prior to installing any option in the applicationDEC system, ensure that the operating system has been safely halted, with the *shutdown* command and that power is removed from the system.

---

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. Set the switches in S1 to designate ISA memory space needed by your ISA options. See Section 13.2.
4. Install the module into backplane slot 9, as shown in Figure 13-3.
5. The base processor module is a standard system bus module and follows the installation procedure described in Section 12.5.
6. Connect the attached cable from the base processor to the bridge module. See Figure 13-3.
7. The base processor is now installed. Close the system by replacing the card cage door and the side panel and top cover.

Figure 13-3 Installing Base Processor



---

## Bridge Module

This chapter describes the features and installation of the bridge module.

### 14.1 Description

The bridge module is a standard feature of all applicationDEC 433MP systems. The bridge module provides the data link between the ISA bus and the system bus. The bridge module also contains a connector for the console terminal. Additional logic on the board provides control for the 3.5-inch 1.44 MB diskette drive and the 5.25-inch 1.2 MB diskette drive.

The bridge module is shown in Figure 14-1.

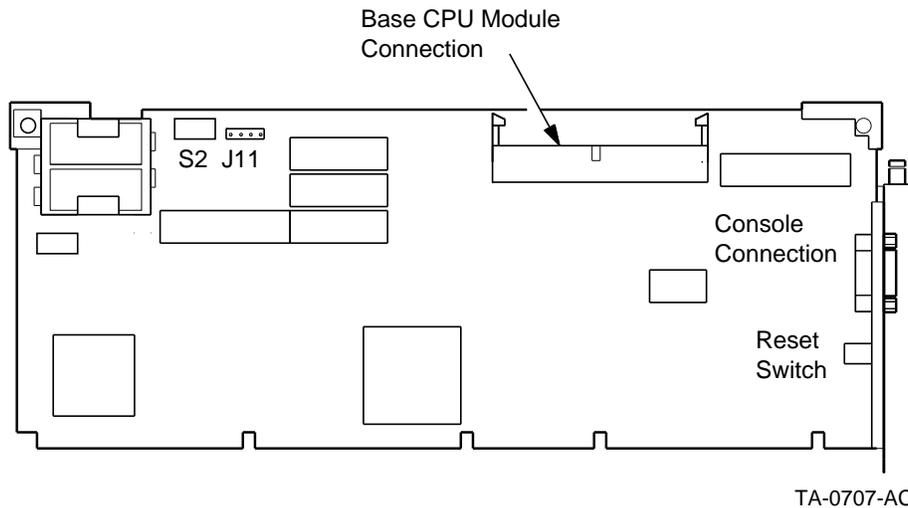
Features of the bridge module include:

- Console terminal 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)
- Jumpers for designation of console port as COM1: or COM2: (S2)
- Connector for cabling to base processor module

## Bridge Module

### 14.1 Description

Figure 14–1 Bridge Module Layout



#### 14.1.1 Console Connector

The console connector can have COM1: or COM2: as its address. This selection is made with jumpers on the bridge module. See Section 14.1.3.

The console connector is a 9-pin D subminiature connector. This connector allows for direct connection of some terminals. If the terminal you are using requires MMJ connectors (modified modular jacks, used by some Digital terminals) use a converter (part number H8571-J) provided with the applicationDEC 433MP system. Connect the converter directly to the bridge module console connection and connect the MMJ cable to the converter.

#### 14.1.2 Reset Switch

The reset switch provides an external means of resetting the system in the event that the system becomes hung or there is 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**

Jumpers and switches on the bridge module control two features:

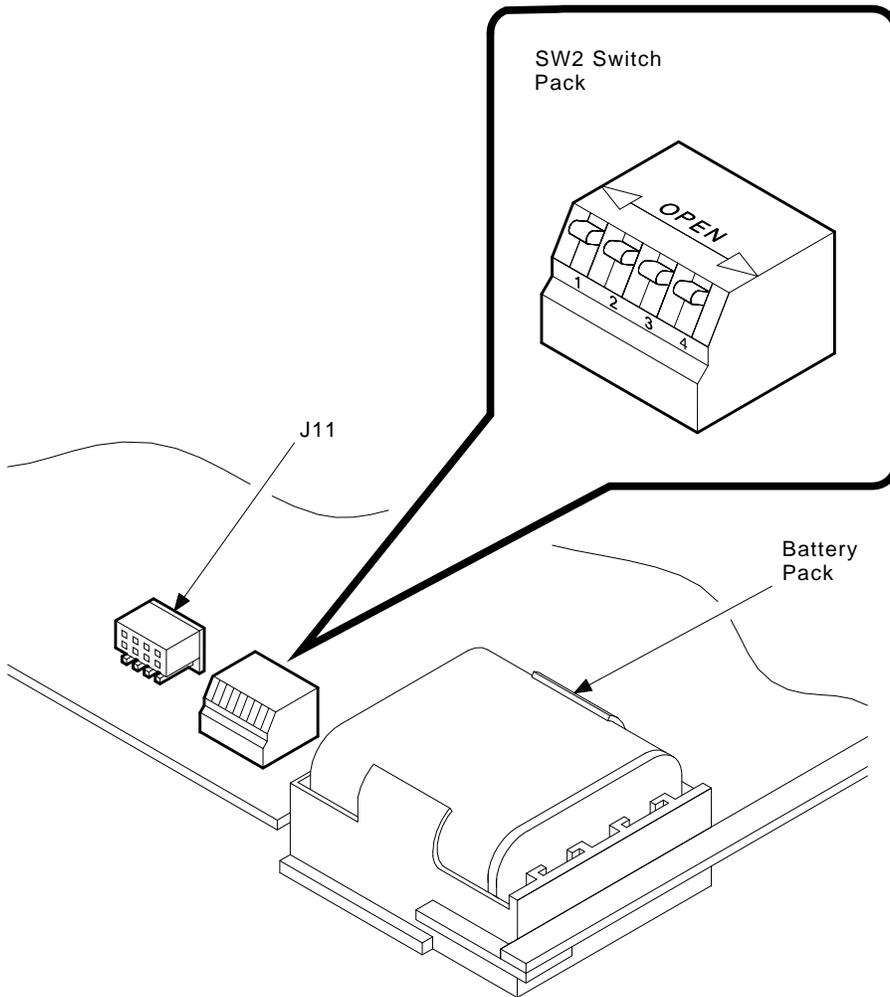
- Designation of the console connector as COM1: or COM2: (controlled by switch S2)
- Designation of the boot diskette drive (controlled by jumper pack J11)

Figure 14–2 shows jumper pack J11 and switch S2.

## Bridge Module

### 14.1 Description

Figure 14–2 Bridge Module J11 and S2 Locations



MR-0090-91DG

Jumper pack J11 controls whether the 3.5-inch or 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:**

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If there is a diskette in the boot diskette drive when the system is powered up, the system attempts to boot from the diskette drive. If the diskette is not a bootable diskette, the system hangs. You must ensure that nonbootable diskettes are not in the boot drive when the system is power up or reset.

---

A four-pin jumper is placed on the upper pin pairs in J11 to designate the 3.5-inch diskette drive as the boot drive. To designate the 5.25-inch diskette drive as the boot drive, place the four-pin jumper on the lower pin pairs.

The factory configuration is for the 3.5-inch diskette drive to be the boot drive.

Switch 2 on switchpack S2 controls the address of the serial connector on the bridge module. When switch 2 on switchpack S2 is in the up (open) position, COM1: is the address of the serial connector. When switch 2 is in the lower (closed) position, COM2: is the address of the serial connector. The default setting is in the open position for a COM1: address.

The other switches on S2 must always be in the open, or up, position.

## 14.2 Installation

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

---

**WARNING**

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Prior to installing any option in the applicationDEC system, ensure that the operating system has been safely halted, with the *shutdown* command and that power is removed from the system.

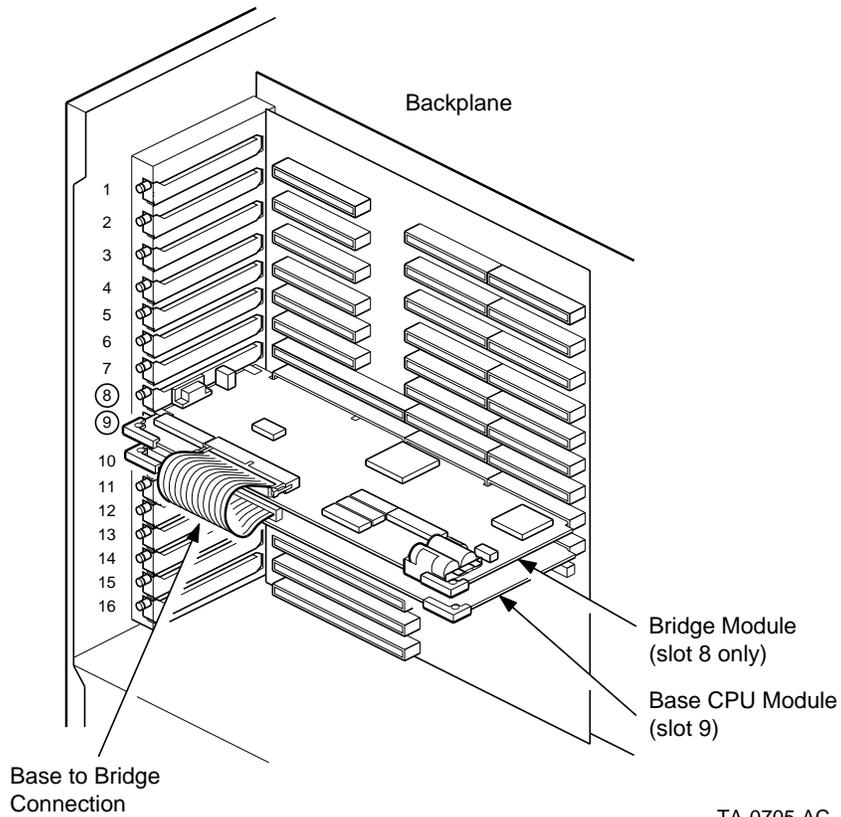
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1. Remove the top cover and left side panel, as described in Section 12.3.1.
2. Remove the card cage door as described in Section 12.3.2.
3. Verify that the switches in S2 to configure the console connector as COM1 or COM2 and designate which diskette drive is drive A, the boot drive, are set as desired. See Section 14.1.3.
4. Install the module into backplane slot 8. See Figure 14-3.
5. The bridge module is a standard system bus module and follows the installation procedure described in Section 12.5.

## Bridge Module 14.2 Installation

6. Connect the bridge module to the base processor module with the base processor's short ribbon cable.
7. Close the system box by replacing the card cage door and the top and side panels.

Figure 14–3 Cabling from Bridge Module to Base Module



### 14.3 Diskette Cabling

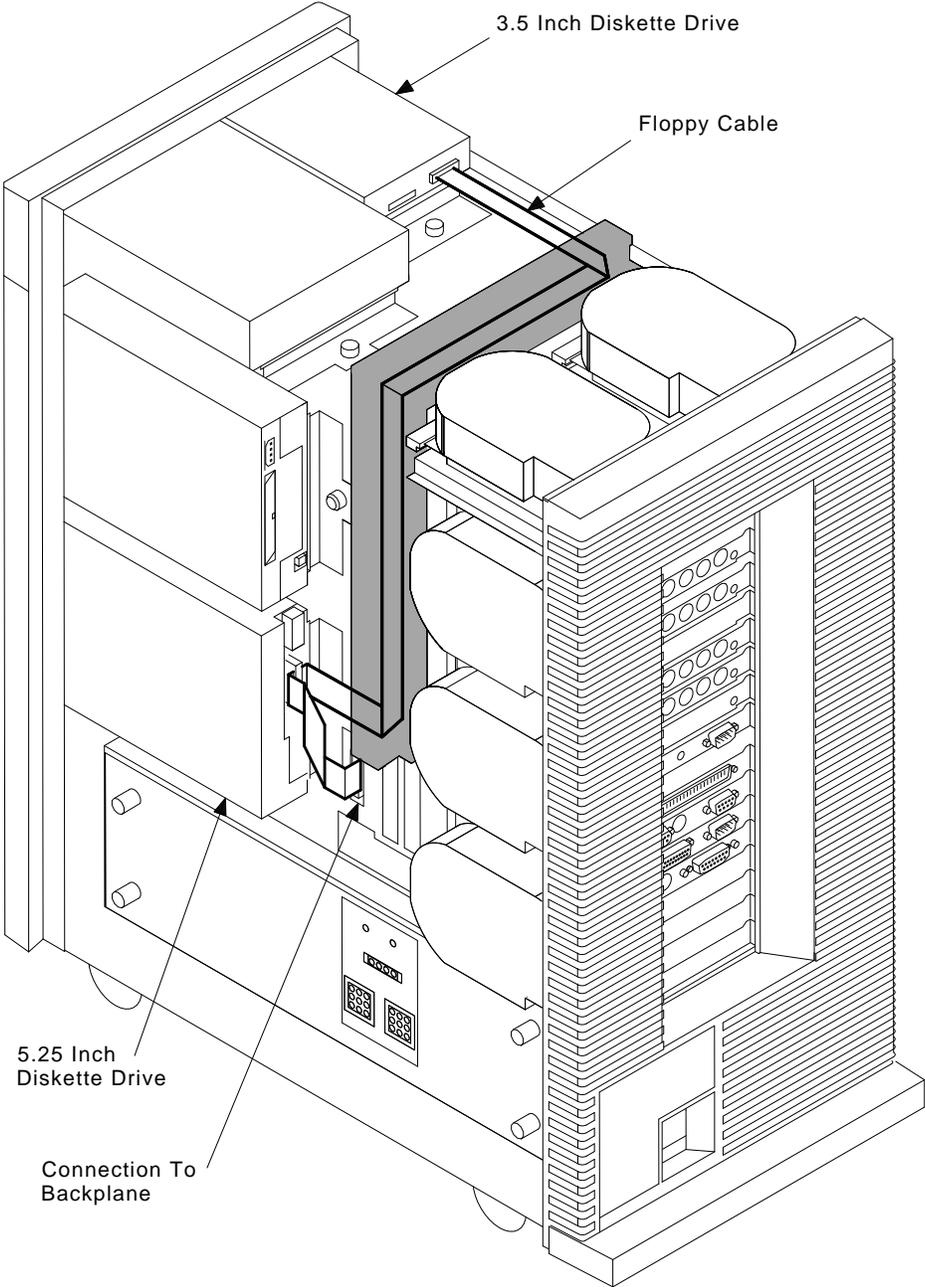
The bridge module also controls the 1.44 MB 3.5-inch RX23 diskette drive and the 1.2 MB 5.25-inch RX33 diskette drives. The cable connecting the module to the diskette drives is factory installed as part of the cable harness. Figure 14-4 illustrates this cable in the cable harness.

### 14.4 Software Support

The bridge module requires no special software support.

**Bridge Module**  
**14.4 Software Support**

**Figure 14-4 Diskette Cabling From Bridge Module to Cable Duct**



MR-0098-91DG

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## Memory Modules and SIMMs

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 may 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 has at least one factory installed memory module with at least 8 MB of memory. Additional memory modules, part number PS1XM-AA, are sold without any SIMMs installed. SIMMs are available in packages of 4 MB (5 SIMMs), part number PS1XM-BA, or in packages of 100 MB, (25 sets of 4 MB SIMMs), part number PS1XM-BB.

SCO MPX includes an Error Correction Code (ECC) Daemon program which uses the fifth SIMM for error detection and correction.

## Memory Modules and SIMMs

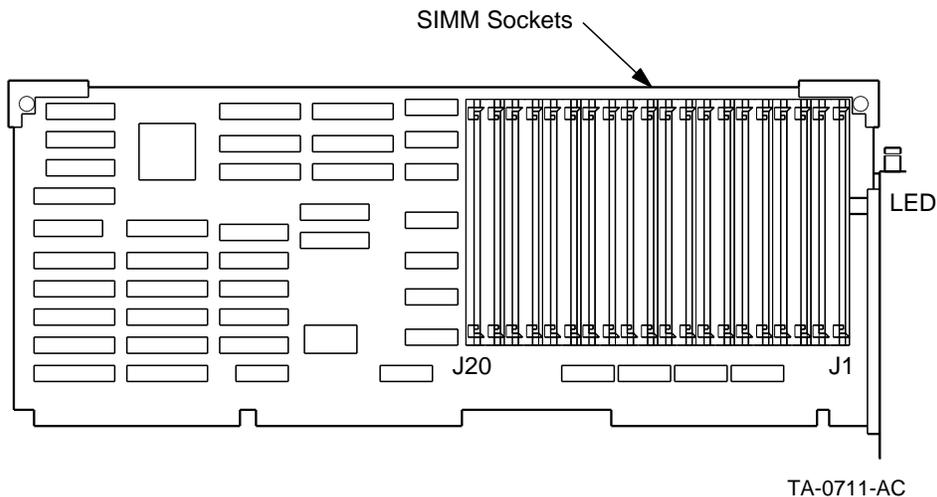
### 15.1 Description

#### 15.1.1 Features

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

- SIMM Sockets for increasing memory
- LED: indicates ECC error detected. The ECC Daemon software detects and corrects single bit errors.

Figure 15–1 Memory Module



### 15.2 Installation

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

---

#### WARNING

---

Prior to installing any option in the applicationDEC system, ensure that the operating system has been safely 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 15.2.1. Option level memory modules are shipped without SIMMs installed.
4. Install the module into backplane slot 1 through 4. Memory modules can 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. In other words, the first memory module should be in slot 1, the second in slot 2, the third in slot 3, and a fourth in slot 4.
5. The memory module is a standard system bus module and follows the installation procedure described in Section 12.5.
6. Close the system by replacing the card cage door and the top cover and side panel.

### **15.2.1 Installing SIMMs**

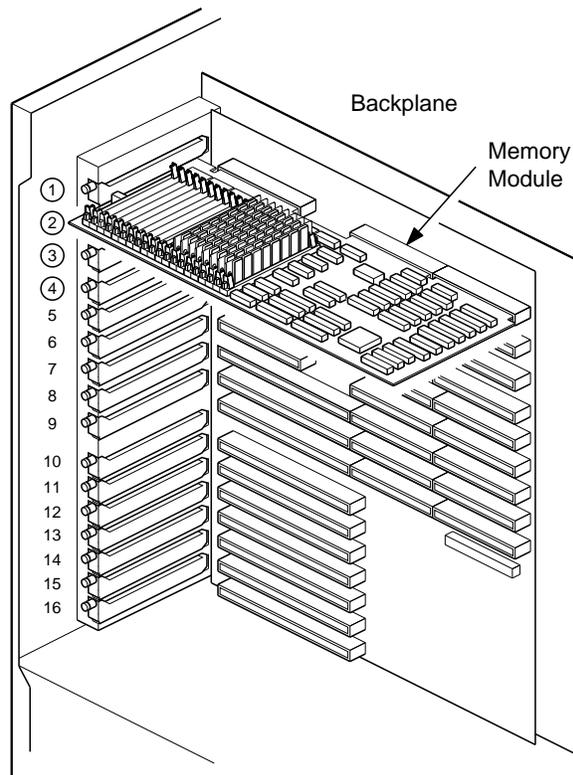
Single Inline Memory Modules allow for incremental increases in the amount of memory on each memory module. Each SIMM adds an additional 1 MB of memory to the module. SIMMs are installed in increments of 4 MB of memory, which require 5 MB of SIMMs.

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

## Memory Modules and SIMMs

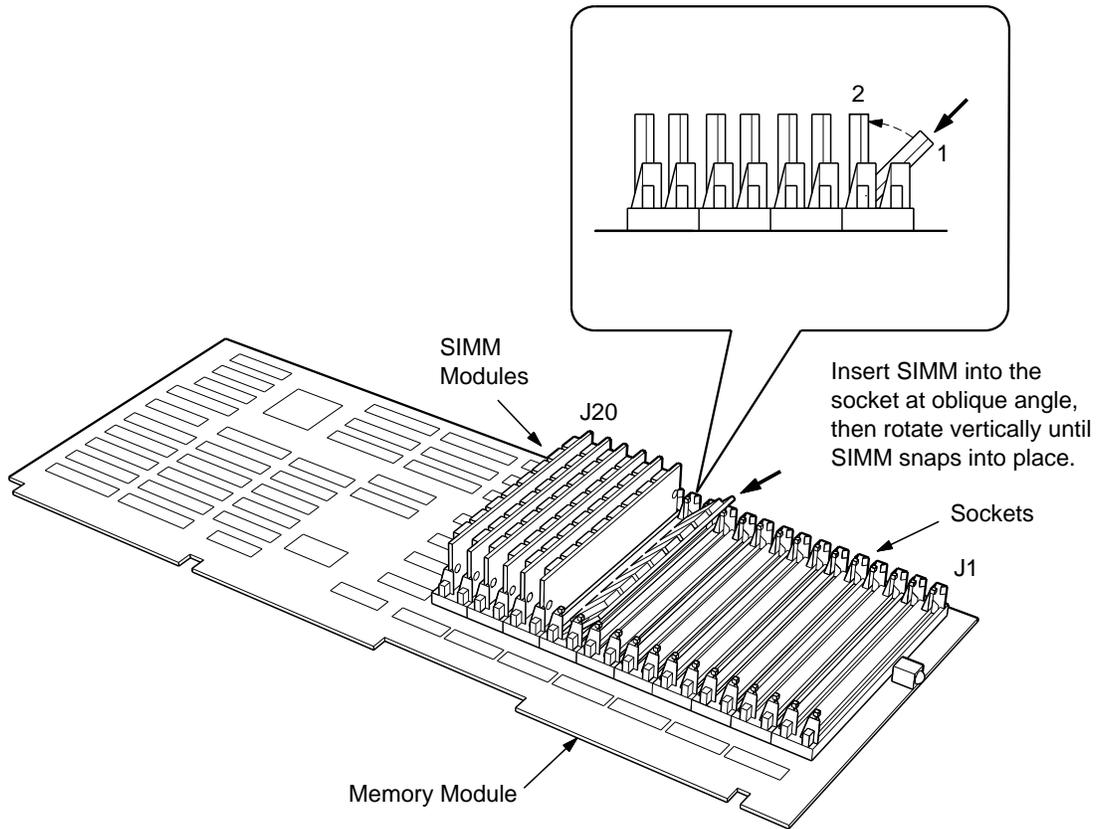
### 15.2 Installation

Figure 15–2 Memory Module Backplane Locations



TA-0712-AC

Figure 15-3 Installing SIMMs



TA-0710-AC

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 J20 and descending to J1. There must be no empty slots between SIMMs.

### 15.3 Software Support

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

## 15.4 ECC Daemon

The ECC Daemon is a software feature of the SCO MPX extensions. 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 makes use of 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.

Detection of a single bit error causes the memory module's LED to become illuminated.

A double bit error occurs when the ECC daemon discovers that at least two bits in the array are incorrectly set. It is not possible to correct a double bit error and the ECC daemon issues a *panic* error message and shuts down the system.

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

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

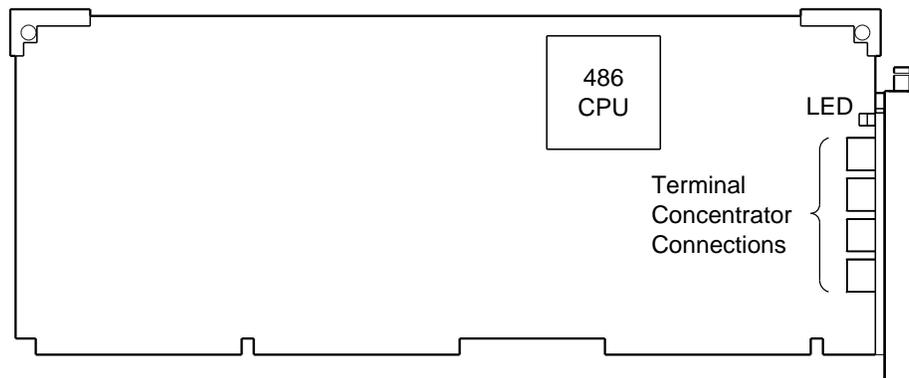
This chapter describes the features and installation of the CPU/SIO module.

### 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 provides symmetrical multiprocessing capability for the applicationDEC system. The CPU/SIO board contains a 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 Layout



TA-0708-AC

## CPU/SIO

### 16.1 Description

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: indicates CPU activity

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

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

Terminal concentrators (part number PC4XD-DB) used to make connection to the ports on the CPU/SIO module are not included with the CPU/SIO option and are ordered separately. Up to four terminal concentrators can be connected to each CPU/SIO. 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.

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#### WARNING

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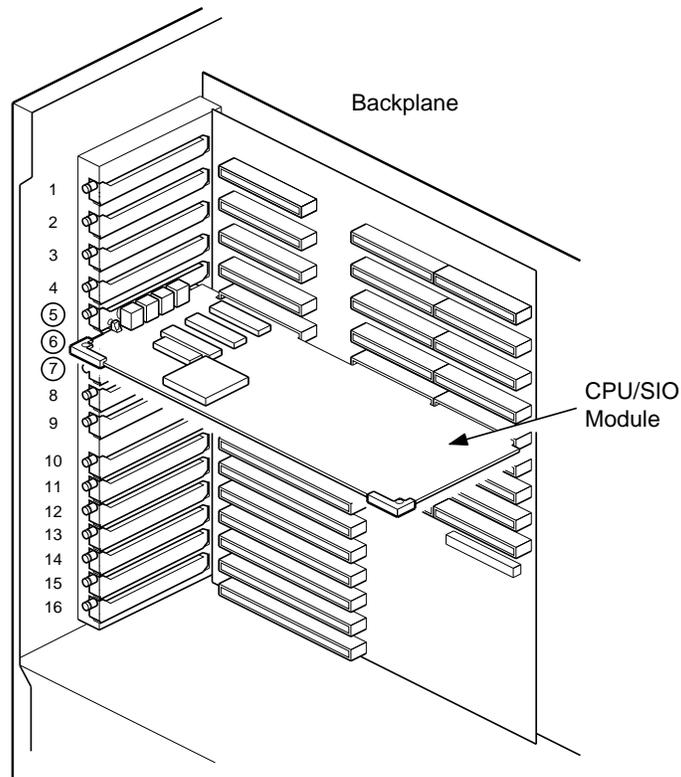
Prior to installing any option in the applicationDEC system, ensure that the operating system has been safely halted, with the *shutdown* command and that power is removed from the system.

---

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 may be installed in backplane slots 5-7 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.)
4. The CPU/SIO module is a standard system bus module and follows the installation procedure described in Section 12.5.

5. Close the system by replacing the card cage door and top cover and side panel.
6. Connect any terminal concentrators to the CPU/SIO terminal multiplexer ports. Connect terminals to the terminal concentrator ports. See Chapter 10.

**Figure 16-2 CPU/SIO Installation**



TA-0709-AC

## 16.3 Software Support

Each terminal multiplexer port on the CPU/SIO module is identified by a letter A-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. Refer to the *SCO/UNIX MPX Release and Installation Notes* for information on how to define the terminal devices used on the CPU/SIO

For each CPU/SIO board installed in the system, you must install one license and copy of the MPX extensions. Refer to the *SCO MPX Release Notes and Installation Guide* for details on how to install the MPX extensions.

---

## CPU/SCSI Adapter

This chapter describes the following:

- Description of the CPU/SCSI module
- Installation of the CPU/SCSI module in the system bus
- Installation of the cabling for the high-speed SCSI bus
- External storage expansion using the CPU/SCSI module

### 17.1 Description

There are two types of additional CPUs that you can install in an applicationDEC 433MP system to provide multiprocessing capabilities. These are 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, shown in Figure 17–1, has the following features:

- Intel 80486 processor for increased processing capability
- SCSI adapter logic
- External SCSI connector

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

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

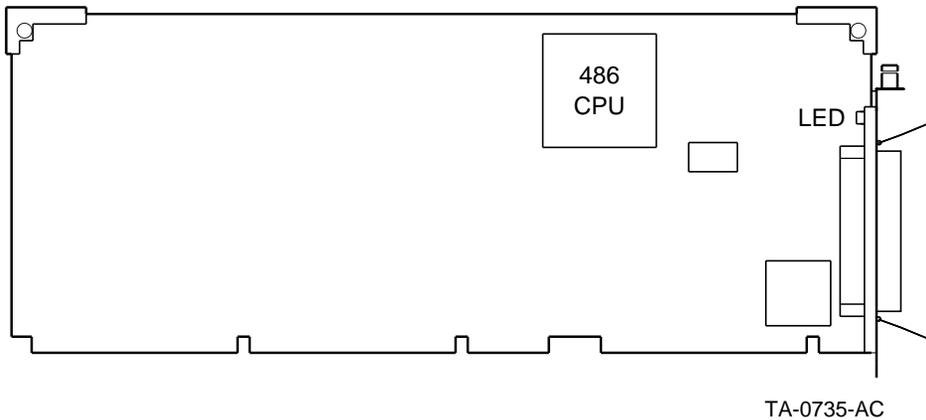
The CPU/SCSI adapter always uses SCSI ID 7 as its address.

## CPU/SCSI Adapter

### 17.1 Description

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.

**Figure 17-1 CPU/SCSI Module**



## 17.2 Module Installation

There are no switch settings or jumpers to be set on the CPU/ SCSI adapter.

To use the CPU/SCSI for control of devices internal to the system box, the CPU/SCSI must be installed in slot 5. 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 board installed in slot 5 can also have devices attached to its external connector, if desired.

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

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

**WARNING**

Prior to installing any option in the applicationDEC system, ensure that the operating system has been safely 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.
4. The CPU/SCSI module is a standard system bus module and follows the installation procedure described in Section 12.5.
5. 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.

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

### 17.3 Installation of the Dual SCSI Cables

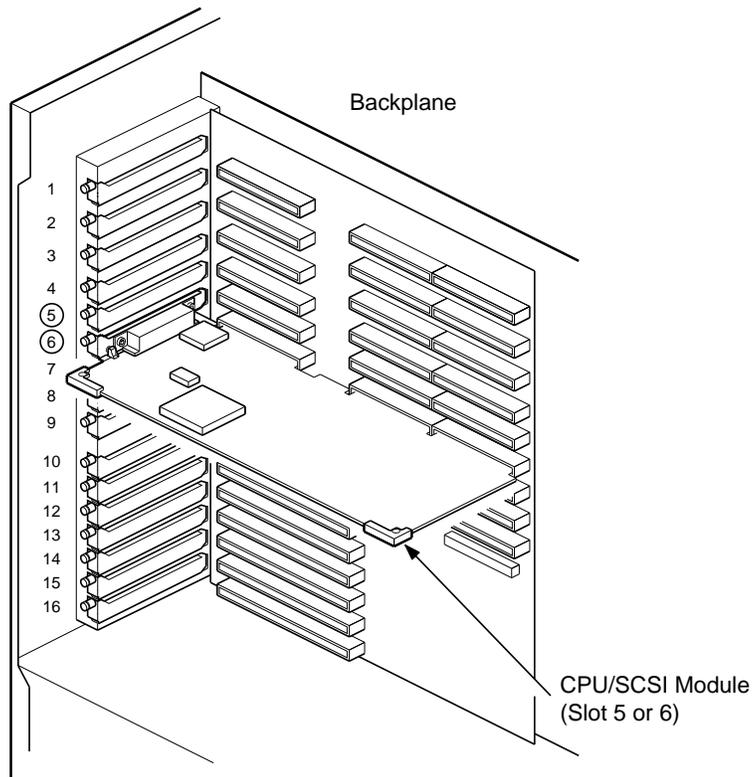
The standard applicationDEC 433MP system comes with a single ISA bus SCSI adapter. This adapter is capable of controlling up to seven SCSI devices with up to four hard disks attached.

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

## CPU/SCSI Adapter

### 17.3 Installation of the Dual SCSI Cables

Figure 17-2 CPU/SCSI Backplane Location



TA-0714-AC

When you upgrade the applicationDEC system to a dual SCSI bus system, you need to modify the factory default cabling system. The standard ISA adapter 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 option. After the installation of the dual SCSI cables, the SCSI bus controlled by the ISA SCSI adapter will be all black cables and the system bus, or high performance, SCSI bus cables will be grey.

Install the system bus SCSI cabling using the following steps:

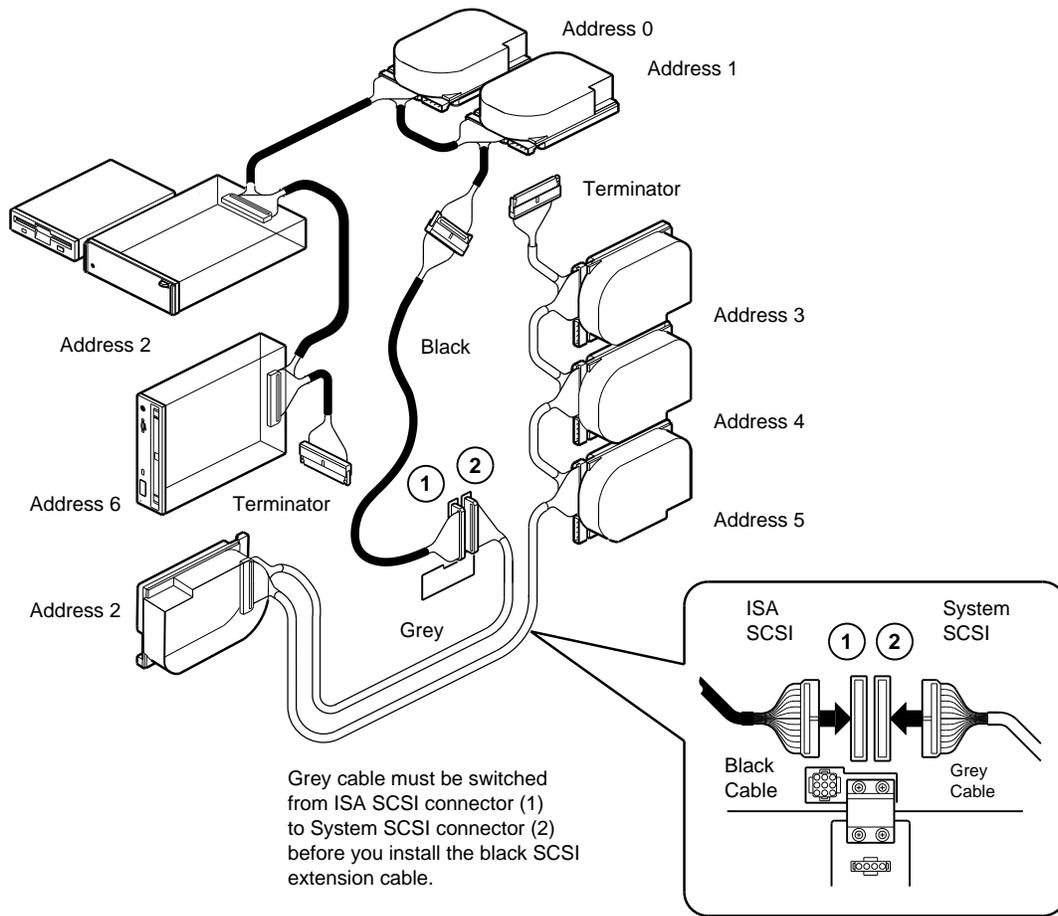
1. Disconnect the currently attached SCSI cable from the ISA-SCSI backplane connector. This connector is shown in Figure 17-3.
2. Connect this SCSI cable to the high performance SCSI cable connector.

**CPU/SCSI Adapter**  
**17.3 Installation of the Dual SCSI Cables**

3. At disk drive ID1, 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 onto the male end of the SCSI cable.
5. Install the supplied SCSI extension cable to the ISA-SCSI backplane connector.
6. Install the other end of the SCSI extension cable to 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 address 6) are now on the ISA SCSI bus.

**CPU/SCSI Adapter**  
**17.3 Installation of the Dual SCSI Cables**

**Figure 17-3 Dual SCSI Bus Cabling Diagram**



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

## 17.4 Installing a Sixth RZ24 Hard Disk

With a dual SCSI cable scheme, you can install a sixth RZ24 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 can be found in Section 23.4.

## 17.5 Using the CPU/SCSI for External Connections

External devices can be connected to CPU/SCSIs 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 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.

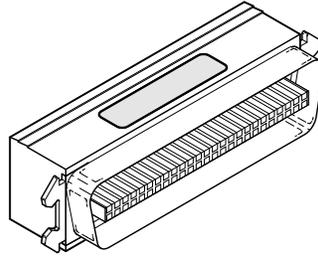
In slot 6, the CPU/SCSI adapter can support a complete SCSI bus of up to seven external devices. External connection is made to the CPU/SCSI module using a standard SCSI cable connector. A terminator must be attached at the external end of the SCSI bus.

See Section 3.7 for information on installing external storage boxes.

## 17.6 Terminator

The CPU/SCSI adapter has an external connector for attachment of additional SCSI devices. When external devices are not connected, a SCSI terminator (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 and license of the SCO MPX software.

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

---

## ISA Bus 16-Bit SCSI Host Adapter

This chapter describes the following:

- Factory default jumper settings
- Terminator Resistor Packs
- Installation of the ISA Bus 16-bit SCSI host adapter
- Installation and use of a second ISA SCSI adapter

### 18.1 Description

The ISA bus 16-bit SCSI host adapter is a factory-installed ISA bus SCSI adapter. It 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 system.

### 18.2 Configuration Jumpers

The configurable features which can be selected on a ISA SCSI adapter are shown in Table 18-1.

## ISA Bus 16-Bit SCSI Host Adapter

### 18.2 Configuration Jumpers

**Table 18–1 ISA SCSI Adapter Configurable Features and Defaults**

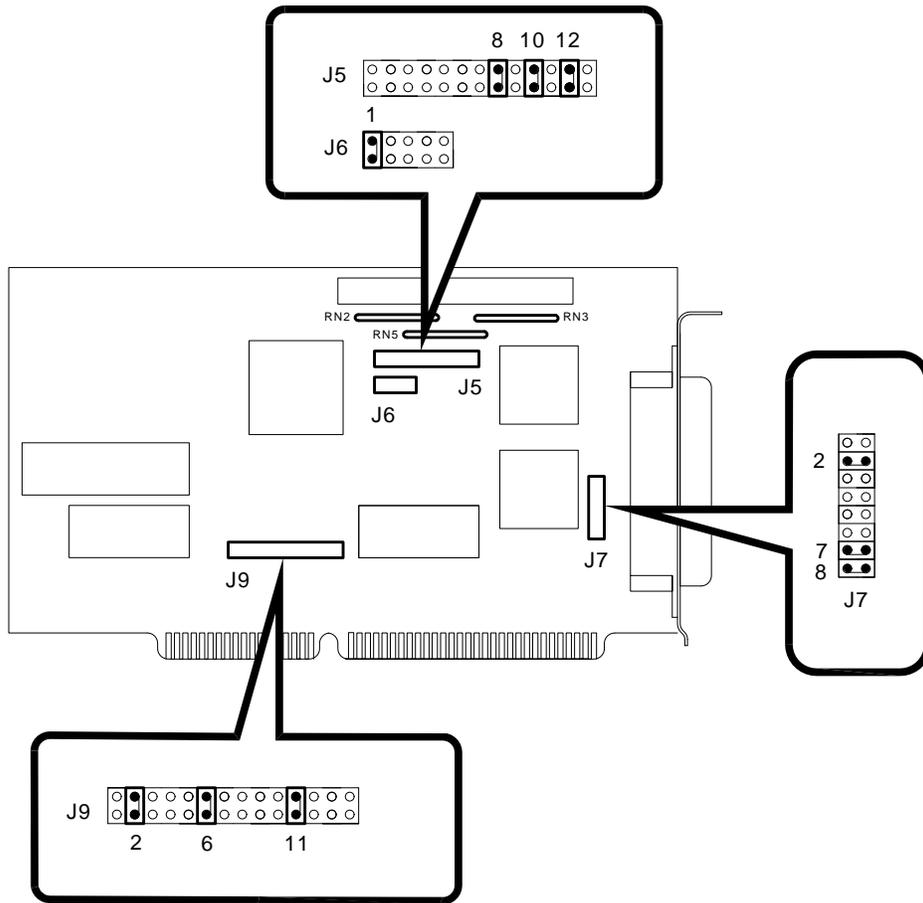
<b>Feature</b>	<b>Default Setting</b>
Address	330H
IRQ and interrupt channel	IRQ11
Synchronous negotiation	disabled
SCSI Parity	enabled
SCSI Address	ID7
DMA Channel	Channel 5
DMA Request/Acknowledge Levels	5
DMA Transfer Speed	5.7 MB/sec
BIOS	Enabled
BIOS Address	C8000
BIOS Wait states	Zero wait states

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.

# ISA Bus 16-Bit SCSI Host Adapter 18.2 Configuration Jumpers

Figure 18–1 ISA SCSI Adapter Module

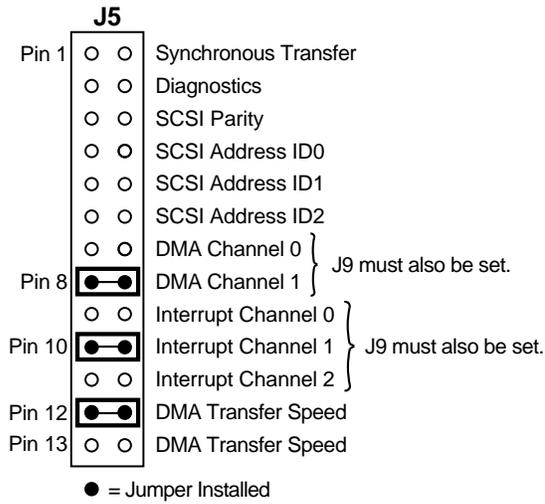


TA-0717-TI

# ISA Bus 16-Bit SCSI Host Adapter

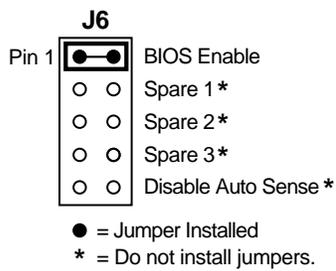
## 18.2 Configuration Jumpers

**Figure 18–2 SCSI Adapter: Factory Configuration J5**



MR-5110-RA

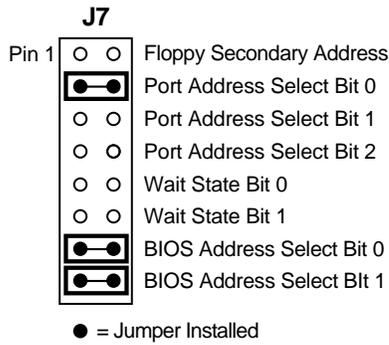
**Figure 18–3 SCSI Adapter: Factory Configuration J6**



MR-5115-RA

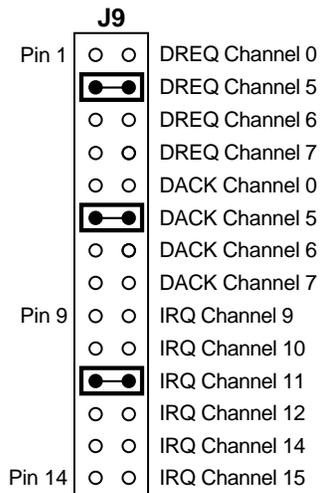
## ISA Bus 16-Bit SCSI Host Adapter 18.2 Configuration Jumpers

**Figure 18–4 SCSI Adapter: Factory Configuration J7**



MR-5116-RA

**Figure 18–5 SCSI Adapter: Factory Configuration J9**



MR-4841-RA

Following are descriptions of the selectable features.

# ISA Bus 16-Bit SCSI Host Adapter

## 18.2 Configuration Jumpers

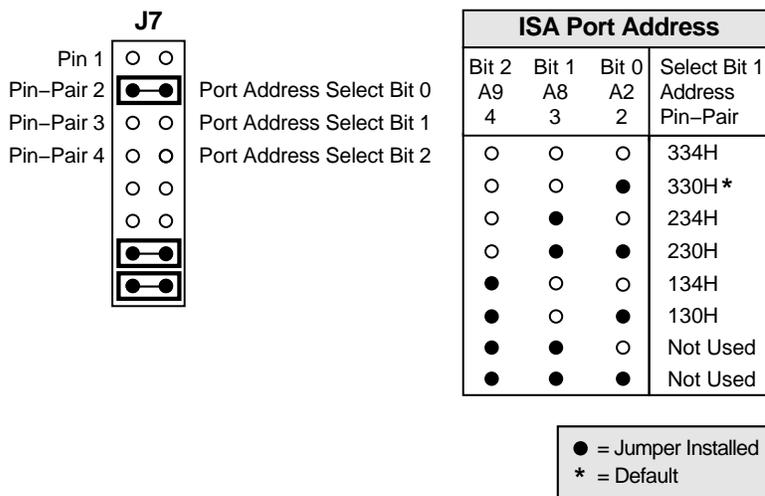
### 18.2.1 ISA Address

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**



MR-5117-RA

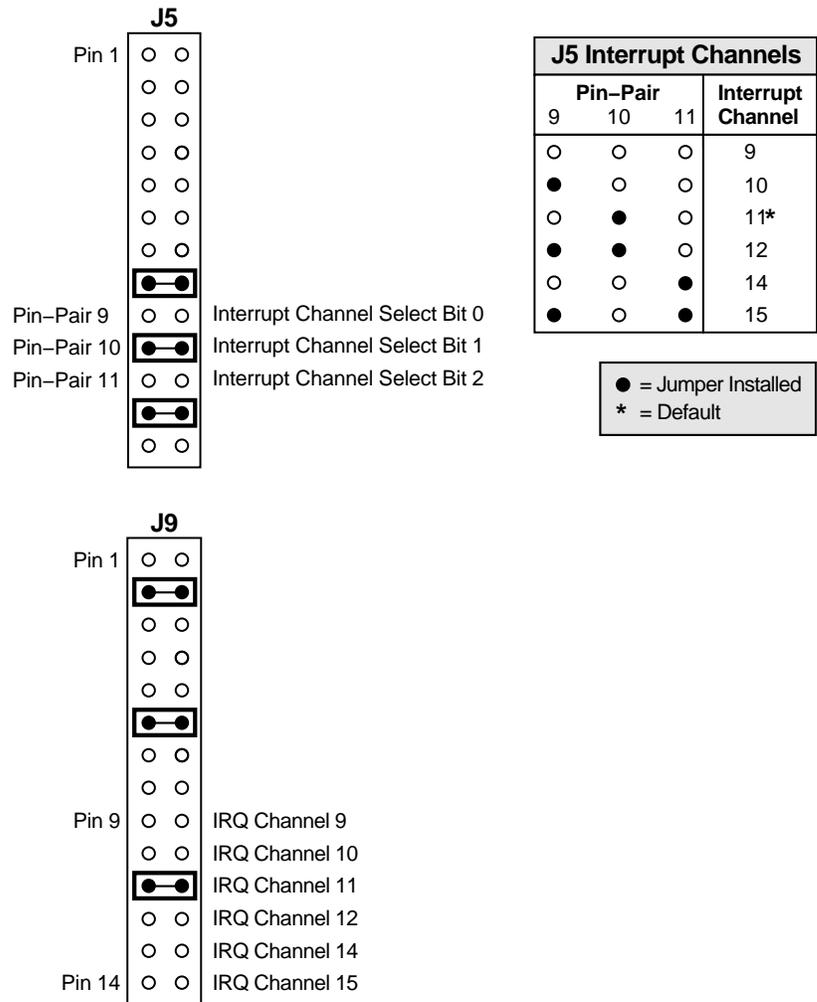
### 18.2.2 IRQ and Interrupt Channel

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.

**ISA Bus 16-Bit SCSI Host Adapter**  
**18.2 Configuration Jumpers**

**Figure 18–7 IRQ and Interrupt Channel Jumper Settings**



MR-5113-RA

**18.2.3 DMA Channel**

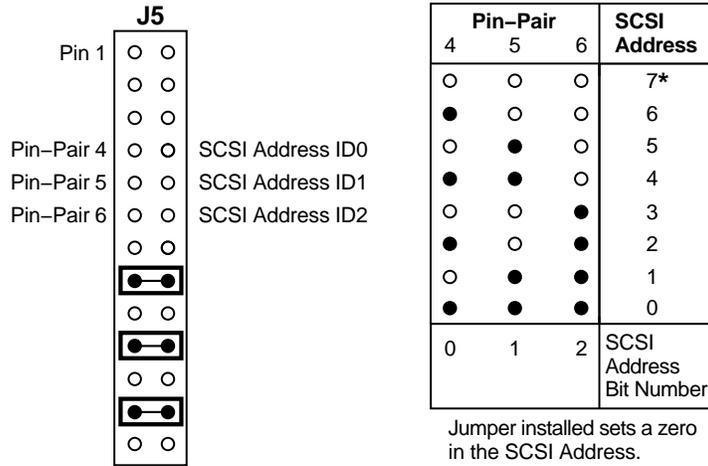
The DMA channel can be set to 0, 5, 6, or 7. The default setting is DMA channel 5. The DREQ and DACK channels must be set to match the DMA channel selected. The default setting is for DMA channel 5.





## ISA Bus 16-Bit SCSI Host Adapter 18.2 Configuration Jumpers

**Figure 18–10 SCSI Address Jumper Settings**



● = 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 6. 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

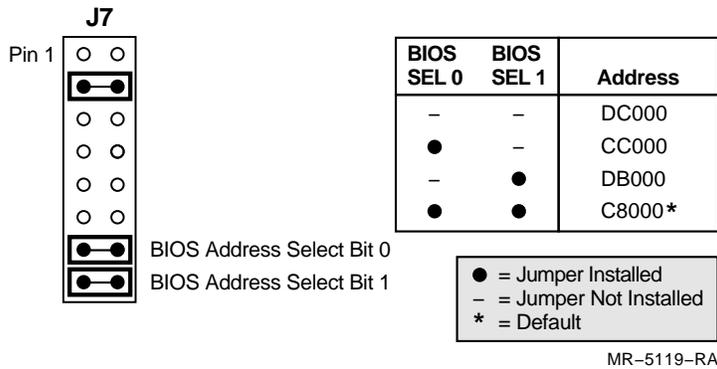
## ISA Bus 16-Bit SCSI Host Adapter 18.2 Configuration Jumpers

- 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.

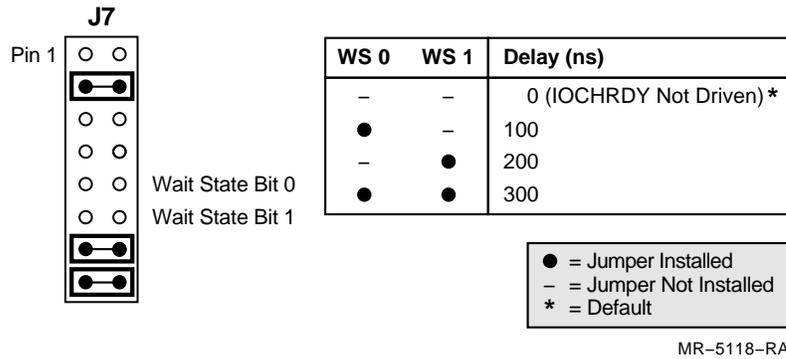
**Figure 18–11 BIOS Memory Jumper Settings**



BIOS wait states can be set values of 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.

## ISA Bus 16-Bit SCSI Host Adapter 18.2 Configuration Jumpers

**Figure 18–12 BIOS Wait States Jumper Settings**



### 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 a 50-pin SCSI terminator, part number H8574-A.

When installing a PS1XR-AA ISA SCSI adapter option, the terminator resistor packs are present on the board 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 Installation

Install the ISA SCSI adapter using the following steps:

**WARNING**

Prior to installing any option in the applicationDEC system, ensure that the operating system has been safely halted, with the *shutdown* command and that power is removed from the system.

## ISA Bus 16-Bit SCSI Host Adapter

### 18.4 Installation

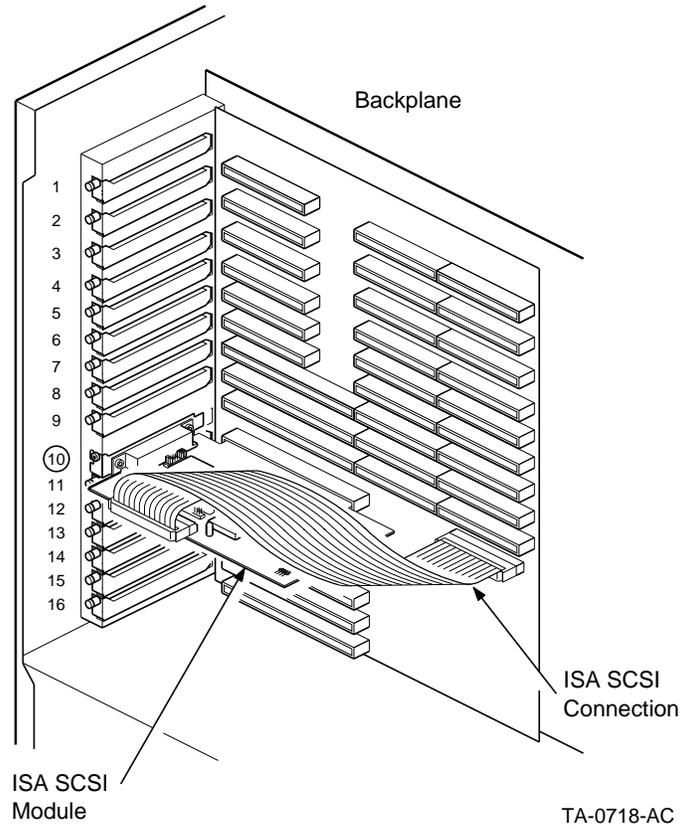
1. Remove the top cover and left side panel, as described in Section 12.3.1.
2. Remove the card cage door as described in Section 12.3.2.
3. The ISA SCSI adapter must be installed in backplane slot 10, the top ISA backplane slot, directly below the base CPU module, as shown in Figure 18–13.
4. Installation of an ISA module is described in Section 12.6.
5. Connect the attached ribbon cable to the ISA SCSI connector in the backplane. The ISA SCSI adapter must be cabled to a connector in the backplane. Figure 18–13 shows this connection. Signals on this connector appear on the other side of the system chassis as the ISA SCSI connector.  
Close the system box by replacing the card cage door and reinstalling the side and top panels.

### 18.5 Terminator

The ISA SCSI adapter has an external connector on it for attaching additional SCSI devices. When external devices are not connected, a SCSI terminator (H8574-A) must be installed on this connector to terminate the SCSI bus. Figure 18–14 shows the terminator needed.

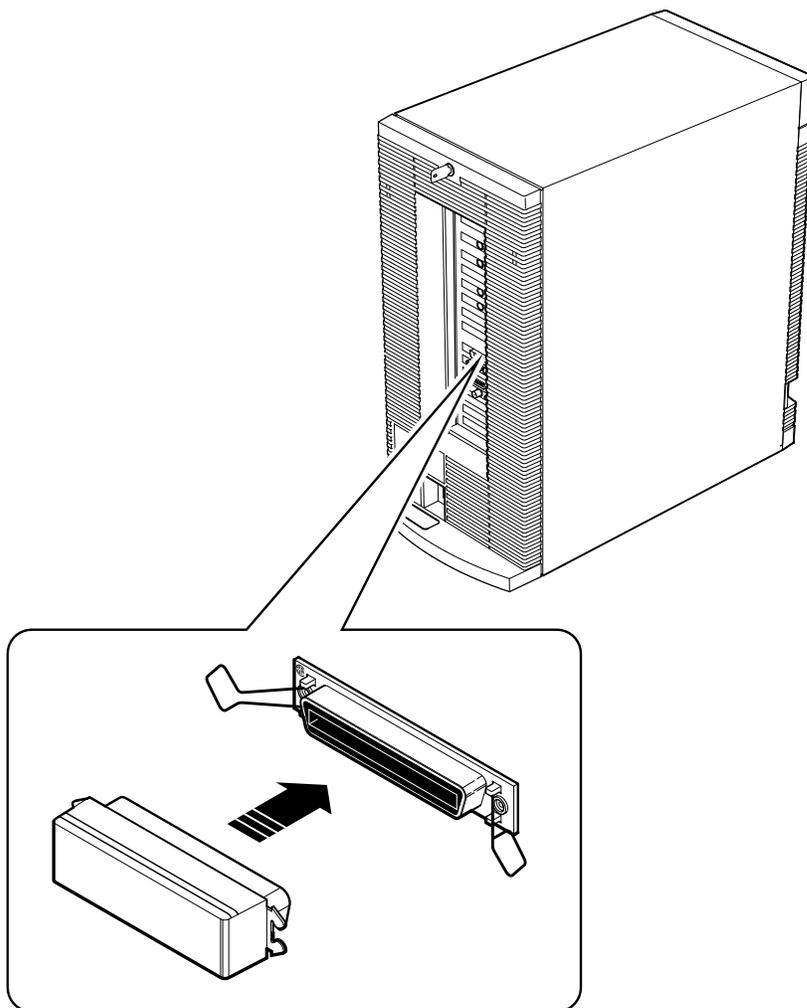
ISA Bus 16-Bit SCSI Host Adapter  
18.5 Terminator

Figure 18-13 ISA SCSI Adapter Installation and Cabling



## ISA Bus 16-Bit SCSI Host Adapter 18.5 Terminator

Figure 18–14 SCSI Terminator Installed on External Connector



TA-0743-TI

## 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 six meters (18 feet). The internal cable length is approximately six feet.
- The end of the SCSI bus must be terminated.

See Section 3.7 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 3.2v2 allows a maximum of four hard disks on ISA SCSI adapters per system. The four hard disks can be installed internally or externally and split between the two adapters in any configuration desired. The second ISA SCSI can only be used for external storage expansion.

Section 3.3.2 contains more information on the storage expansion possibilities using a second ISA controller.

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

**Table 18-2 Jumper Settings for Second ISA Adapter**

Feature	Setting	Jumper Changes
Base Address	230	Add a jumper on J7 pin 3
IRQ	14	Move jumper on J5 from pin 10 to pin 11
DMA Channel	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 option module, when ordered separately, is shipped with the terminator resistor packs installed. The ISA SCSI module which is factory-installed in an applicationDEC 433MP system has the terminator resistor packs removed.

## ISA Bus 16-Bit SCSI Host Adapter

### 18.7 Installation of a Second ISA SCSI Adapter

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

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

1. After installing the second ISA SCSI, 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
```

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
```

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

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

7. 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.

8. 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 further information.

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

```
mkdev hd 3 SCSI-1 0
```

---

## Serial/Parallel Adapter

This chapter describes the serial/parallel module.

### 19.1 Description

The serial/parallel module 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 LPT1: as its address.

The serial/parallel module is shown in Figure 19-1.

### 19.2 Configuration

The address and IRQ line for each port can be set by jumpers.

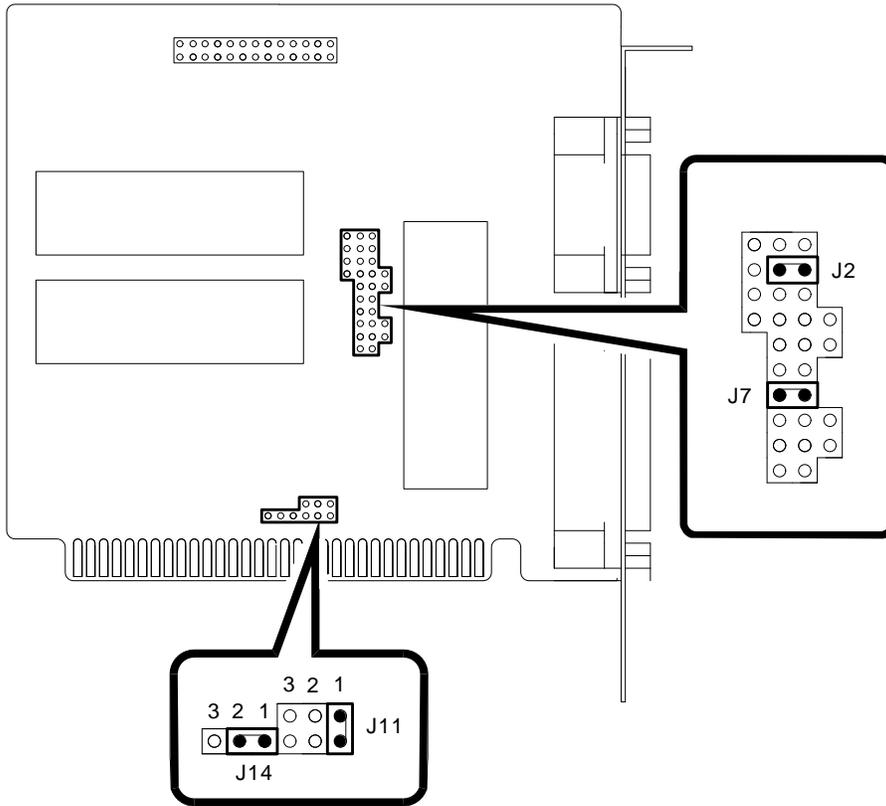
#### 19.2.1 Serial Port Address

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.

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

# Serial/Parallel Adapter 19.2 Configuration

Figure 19–1 Serial/Parallel Module



TA-0736-T1

Figure 19–2 Serial Port Jumpers

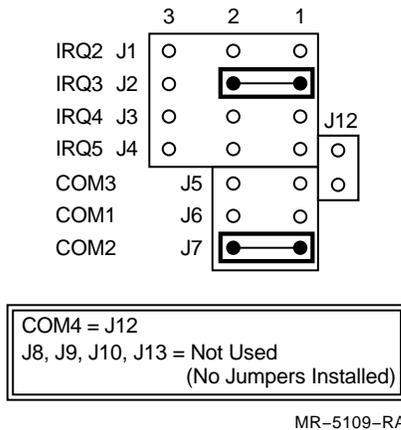


Table 19–1 lists the addresses possible for the serial port.

Table 19–1 Serial Port Addresses

Address Name	Address	Jumper Installed
COM1:	3F8-3FF	J6
COM2:	2F8-2FF	J7
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
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).

## Serial/Parallel Adapter 19.2 Configuration

### 19.2.2 Parallel Port Address

The parallel port address is controlled by jumpers. The address can be set to LPT1:, LPT2:, or LPT3:. The default setting is for 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**

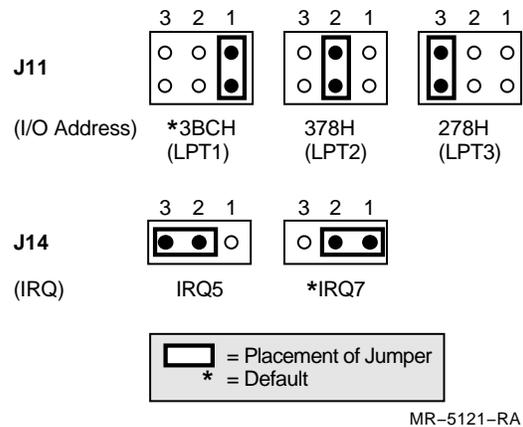


Table 19–3 lists the addresses available for the parallel port.

**Table 19–3 Parallel Port Addresses**

Address Name	Address	Jumper Installed
LPT1:	3BC	J11 - Pin 1
LPT2:	378	J11 - Pin 2
LPT3:	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

## 19.3 Installation

Use the following steps to install the serial/parallel module.

**WARNING**

Prior to installing any option in the applicationDEC system, ensure that the operating system has been safely 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. Installation of an ISA module is described in Section 12.6.
4. The serial/parallel module is factory-installed in slot 11 as shown in Figure 19–4. If replacing the factory-installed serial/parallel module, install it into slot 11.
5. There are no internal cables or other connections to the module.
6. Close the system box by replacing the card cage door and top and side panels.

## 19.4 Signal Pinouts

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

## Serial/Parallel Adapter 19.4 Signal Pinouts

Figure 19–4 Installing the Serial/Parallel Board in the Backplane

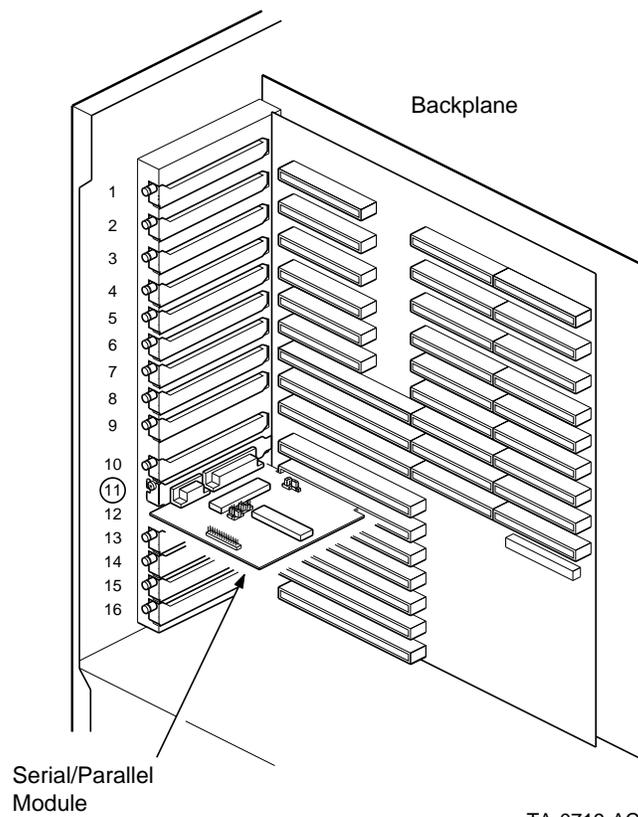
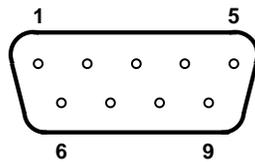


Figure 19-5 Serial Port Pinout

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



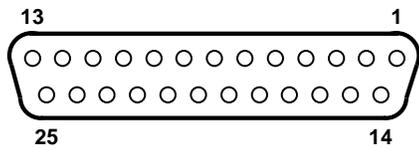
MR-5123-RA

**Serial/Parallel Adapter**  
**19.4 Signal Pinouts**

Figure 19–6 shows the signals presented on the parallel port connector.

**Figure 19–6 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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## Video Graphics Adapter (VGA)

This chapter describes the PS1XG-AA video graphics adapter module. Full details on the VGA adapter can be found in the *PS1XG-AA VGA High Resolution Graphics Adapter User and Installation Guide*, ER-PS1XG-IG.

### 20.1 Description

The Video Graphics Adapter, VGA, provides graphics capabilities for graphics monitors. One graphics monitor can be connected to each VGA card. This high resolution graphics adapter includes the following features:

- High resolution up to 1024x768 and Super VGA 800x 600 on multisync monitors
- High 72Hz refresh rate
- Compatible with VGA, EGA, CGA, MDA, and Hercules graphics modes
- Bus mouse support

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

### 20.2 Bootable Utility Diskette

The VGA adapter is shipped with a bootable utility diskette, which can be used to configure the adapter for your monitor (if the VGA adapter is unable to automatically detect the monitor). The utility diskette contains a program called VGASETUP, which allows you to configure the VGA adapter 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 adapter.

## 20.3 Preinstallation Configuration

There are no jumpers or switches on the VGA module. 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 adapter 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 system.

## 20.5 Installation

The VGA module is installed in the ISA bus. These are backplane slots 10-16. Use the following steps to install the VGA adapter in the applicationDEC system.

---

**WARNING**

---

Prior to installing any option in the applicationDEC system, ensure that the operating system has been safely halted, with the *shutdown* command and that power is removed from the system.

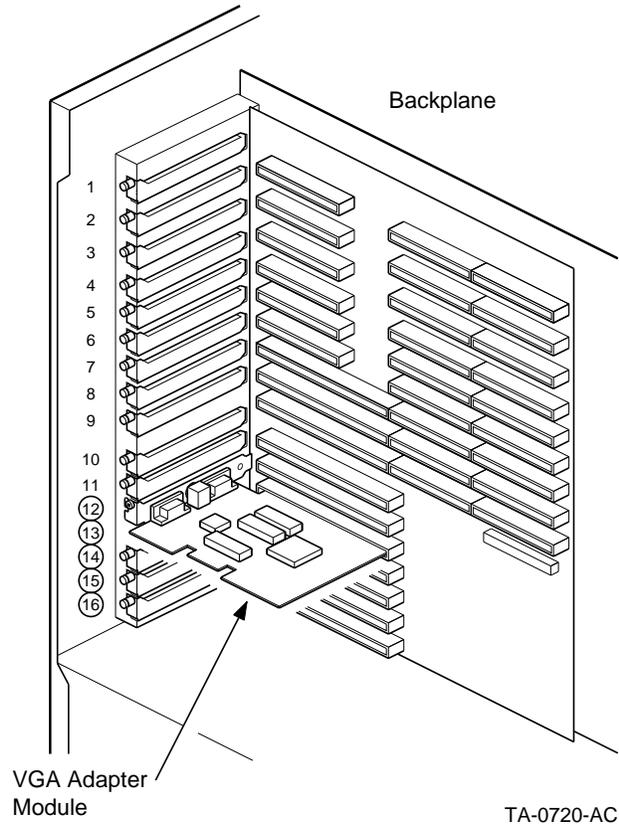
---

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. Installation of an ISA module is described in Section 12.6.

## Video Graphics Adapter (VGA) 20.5 Installation

4. The VGA adapter can be installed in any ISA backplane slot, as shown in Figure 20-1.
5. The VGA adapter is now installed. Close the system box.

**Figure 20-1 VGA Graphics Adapter Backplane Location**



## **20.6 Cabling and Connections**

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

## **20.7 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 module. You must enable the mouse and select an IRQ and address. Use the bootable utility diskette shipped with the VGA adapter to do this.

## **20.8 Utility Software**

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

---

## Terminal Multiplexer Host Adapter

This chapter describes the terminal multiplexer host adapter option.

### 21.1 Description

The terminal multiplexer host adapter, shown in Figure 21-1, is an ISA bus option 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 can be used with the terminal multiplexer option, or with the CPU/SIO option.

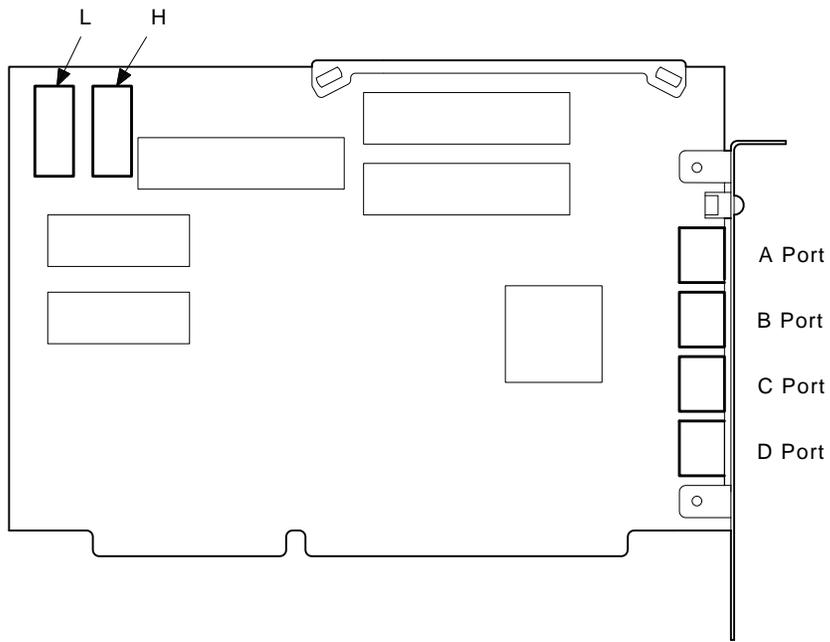
### 21.2 Terminal Multiplexer Installation

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's address.

# Terminal Multiplexer Host Adapter

## 21.2 Terminal Multiplexer Installation

Figure 21-1 Terminal Multiplexer Host Adapter



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## Terminal Multiplexer Host Adapter 21.2 Terminal Multiplexer Installation

**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

In addition, when you install a terminal multiplexer, you must set the base processor memory switches (on switchpack S1) as shown in Table 21–2. The base processor switches are set dependent upon the amount of system memory installed. The settings are the same regardless if one or two terminal multiplexers are installed.

**Table 21–2 Base Processor Memory Switch Settings**

Terminal Multiplexers	8 MB	12 MB	16 MB and up
First at E10000 Second at E20000	1 through 7	5 through 7	7 only <sup>1</sup>

<sup>1</sup>When switch 7 is set in system with greater than 16 MB, change setup option 8, ISA extended memory size, to 13312.

### Note

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

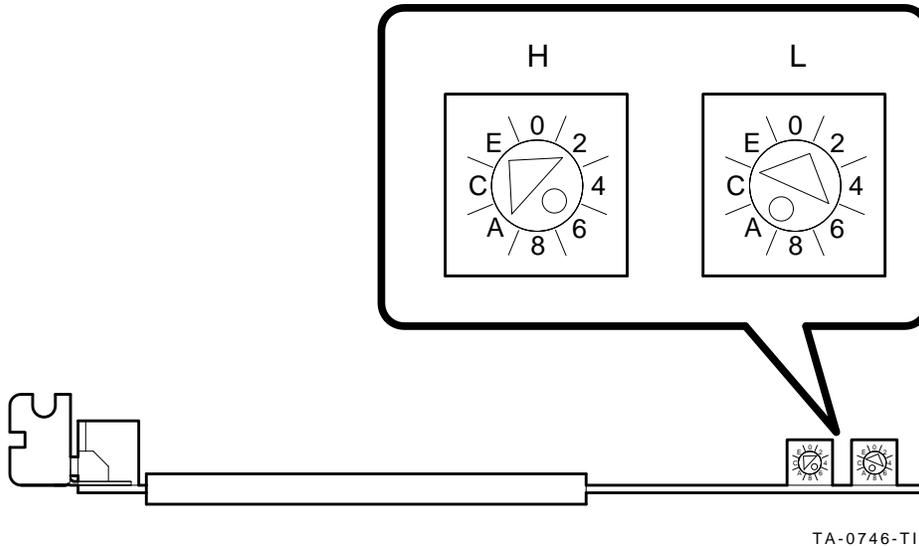
You must select an IRQ line for the terminal multiplexer. During installation of the software driver, you will be asked to specify the IRQ line. The IRQ line selected should be as shown in Table 21–3.

**Table 21–3 Terminal Multiplexer IRQ Settings**

Terminal Multiplexer	IRQ
First installed	12
Second installed	15

## Terminal Multiplexer Host Adapter 21.3 Installation

Figure 21–2 Terminal Multiplexer Rotary Switch Settings



### 21.3 Installation

Use the following instructions to install the terminal multiplexer module.

---

**WARNING**

---

Prior to installing any option in the applicationDEC system, ensure that the operating system has been safely halted, with the *shutdown* command and that power is removed from the system.

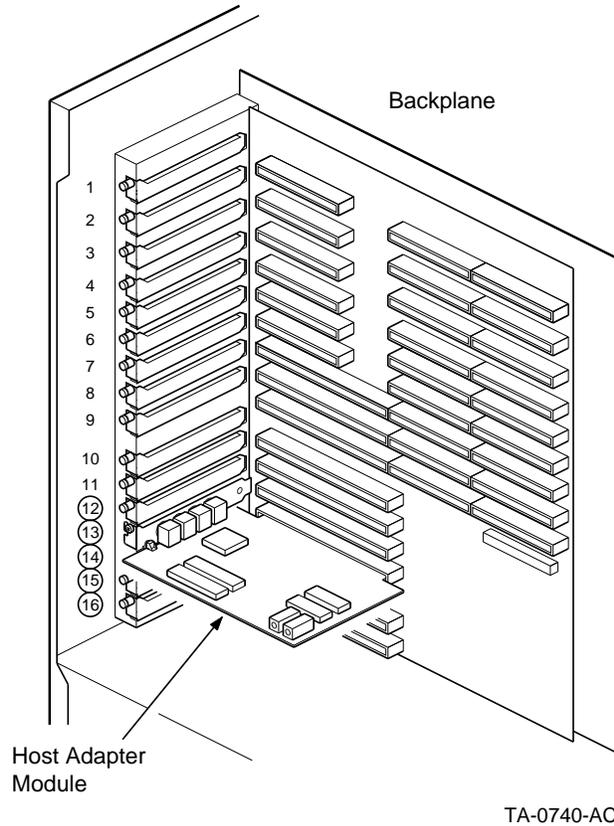
---

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 unscrewing 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. Remove the blank distribution panel.

## Terminal Multiplexer Host Adapter 21.3 Installation

5. The terminal multiplexer can be installed in any slot in the backplane, as shown in Figure 21–3. Slide the module into the backplane slot with the component side facing up. Make certain that the fingers of the module are fully inserted into the backplane slot.
6. Align the module's distribution panel with the screw hole in the chassis and insert the screw saved from step 1.
7. The module is now installed in the backplane.

**Figure 21–3 Terminal Multiplexer Backplane Locations**



## **21.4 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.

## **21.5 Software Driver Installation**

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

---

## Network Connections

This chapter describes supported means of connecting the applicationDEC 433MP to an Ethernet network.

### 22.1 Supported Options

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

- Western Digital 8003
- 3COM 3C503

These modules are supported under SCO UNIX 3.2v2.0.

### 22.2 Installation

You can install an ethernet network module in any ISA slot. Follow the general ISA module installation procedure described in Section 12.6.

When installed in the applicationDEC 433MP, the ethernet module should be configured with the ISA address, IRQ, and memory allocations as shown in Table 22-1.

**Table 22-1 Ethernet Network Module Configuration Settings**

Setting	Western Digital 8003	3COM 3C503
ISA Address	240-25F	310
IRQ	IRQ 9 (2 alias)	IRQ2
Memory	CC000-CFFFF	Disabled

## **22.3 Software Support**

SCO UNIX 3.2v2 fully supports both of the recommended network options. Refer to the SCO UNIX documentation for information on how to configure the network option into your system.

---

# Installing Storage and Media

This part describes installation of storage and media devices in the system.

---

## 209 MB Disk Drive RZ24

This chapter describes the 209 MB disk drive, model number RZ24-S.

### 23.1 Description

The RZ24 disk drive is a SCSI hard disk drive with 209 MB storage capacity. One disk drive is standard with every applicationDEC 433MP system. Up to four hard disk drives can be installed on the ISA SCSI bus in the applicationDEC system. Up to six hard disks can be installed in the applicationDEC chassis, if a dual SCSI bus scheme is used.

### 23.2 Setting SCSI Address

Before you install the RZ24 you should ensure that the SCSI address is set correctly for the device bracket into which you plan to install the drive. Figure 3-4 shows the recommended SCSI address for each device position.

Set the SCSI address with jumpers on the SCSI address jumper pack located on the bottom of the disk drive. Table 23-1 shows how to insert jumpers to obtain the proper address.

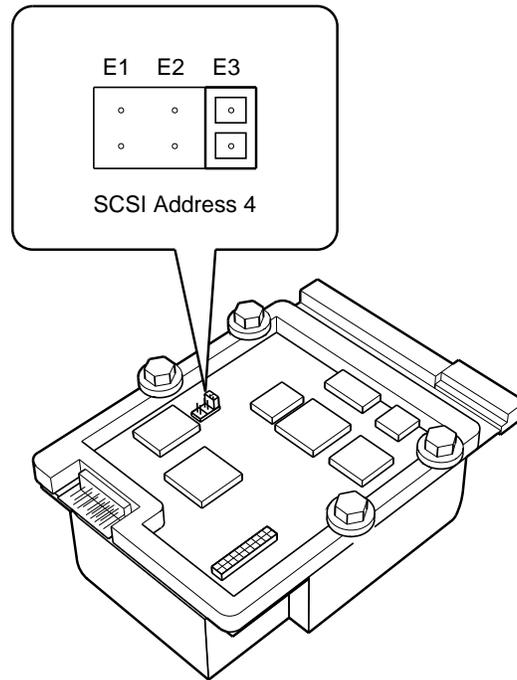
**Table 23-1 SCSI Addresses and SCSI Address Jumpers**

Address	E3	E2	E1
0	Out	Out	Out
1	Out	Out	In
2	Out	In	Out
3	Out	In	In
4	In	Out	Out
5	In	Out	In
6	In	In	Out
7	In	In	In

The SCSI address jumpers are located on the bottom of the RZ24 as shown in Figure 23-1.

**209 MB Disk Drive RZ24**  
**23.2 Setting SCSI Address**

**Figure 23–1 RZ24 Disk Drive SCSI Jumpers**



TA-0721-AC

### 23.3 Installation

Use the following steps to install the 209 MB hard disk drive:

**WARNING**

Prior to installing any option in the applicationDEC system, ensure that the operating system has been safely halted, with the *shutdown* command and that power is removed from the system.

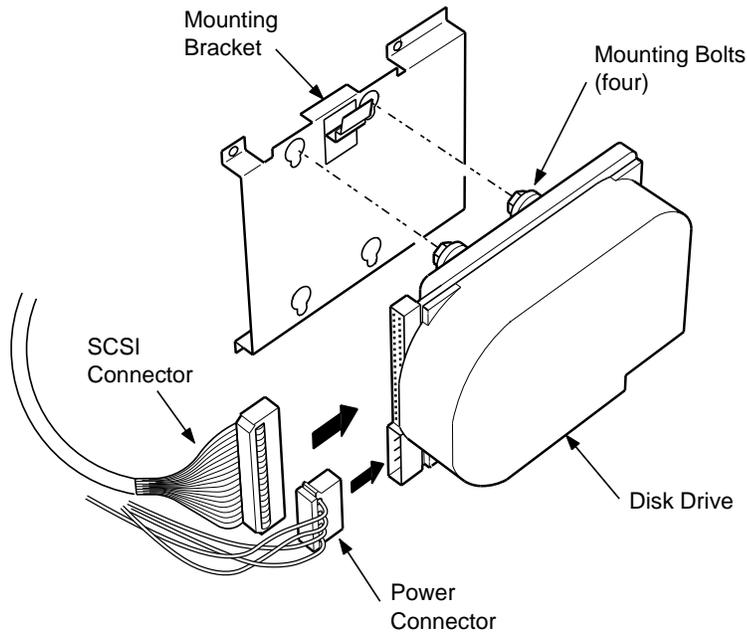
1. Remove the top cover and right side panel, if necessary, as described in Section 12.3.1.
2. Remove the disk drive mounting bracket by loosening the large set screw at the rear of the mounting bracket.

3. Align the disk drive mounting bolts with the mounting bracket holes. The grommets over the mounting bolts provide protection against shock and vibration. See Figure 23-2.
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.
6. Place the mounting bracket under the metal lip on the chassis and slide it into place. Tighten the captive screw to attach the mounting bracket to the chassis.
7. Connect the power cable to the power receptacle on the drive. See Figure 23-2.
8. Connect the SCSI cable to the drive. See Figure 23-2.
9. The disk drive is now installed. Replace the top cover and side panels.

## 209 MB Disk Drive RZ24

### 23.3 Installation

Figure 23–2 209 MB Disk Drive Installation



TA-0722-AC

## 23.4 Installing a Sixth Disk Drive

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

With a dual SCSI cabling scheme, a total of six hard disk drives can be installed for a maximum of 1.2 GB of internal storage.

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

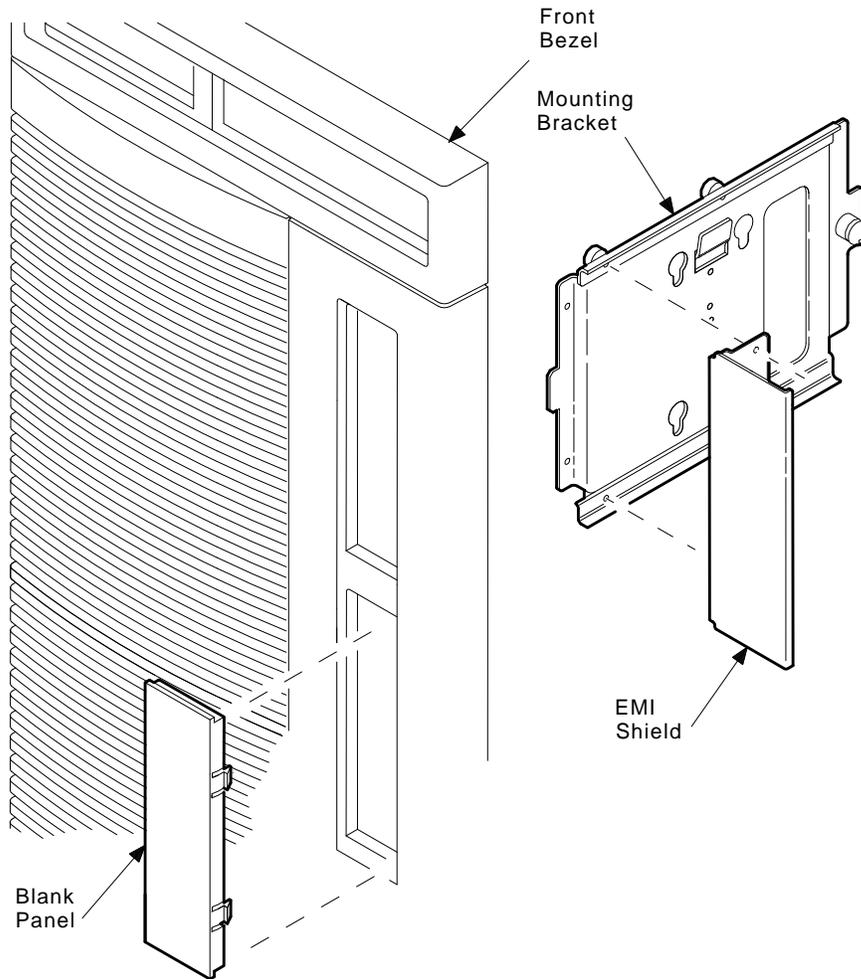
The following steps describe how to install a sixth disk drive.

1. Remove the set screw in the center top of the drive bracket. Removing this screw releases the recessed spring.

209 MB Disk Drive RZ24  
23.4 Installing a Sixth Disk Drive

2. 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 23-3. Also remove the EMI panel from the mounting bracket by loosening the small set screws at the bottom of the mounting bracket.

Figure 23-3 Removing Blank Panel Insert and EMI Shield



MR-0100-91DG

3. Set the SCSI address to 2. (Install a jumper on pins E2, the center pins, only.)

## 209 MB Disk Drive RZ24

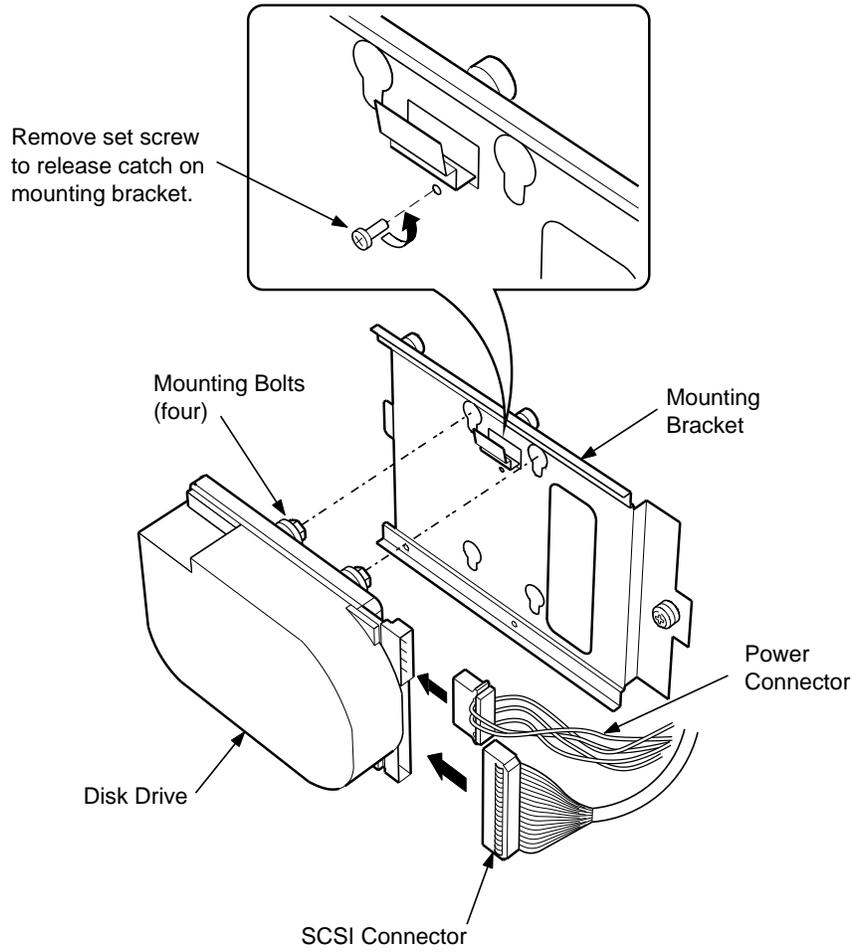
### 23.4 Installing a Sixth Disk Drive

4. Remove the small setscrew that holds down the disk drive catch on the mounting bracket, as shown in Figure 23-4.
5. Install the disk drive onto the bracket by aligning the feet on the RZ24 with the key holes on the bracket.
6. Press the disk drive onto the bracket so that the feet are in the holes.
7. Pull the disk drive down to lock the drive into place. The spring presses against the bottom of the drive to hold it in place.
8. Attach the SCSI cable connector to the back of the disk drive.
9. Attach the power connector to the back of the disk drive.
10. The disk drive is now installed on the high performance SCSI bus at SCSI address 2.

### 23.5 Software Support

Each hard disk drive must be defined as a device under SCO UNIX. For hard drives attached to the ISA SCSI bus, use the *mkdev hd* command under SCO UNIX. Refer to the *SCO UNIC System Administrator's Guide* for information on how to define each hard disk drive. For hard drives attached to the system bus SCSI (using the CPU/SCSI adapter), use the *mkdev corollary* command to define the hard disk drive. Refer to the *SCO MPX Release and Installation Notes* for information on this command.

Figure 23-4 Installing a Sixth 209 MB Hard Disk Drive



---

## 320/525 MB Quarter Inch Tape Drive TZK10

This chapter describes installation of the 320/525 MB quarter-inch cartridge (QIC) tape drive, model number TZK10.

### 24.1 Description

The TZK10 cartridge tape provides the following features:

- Ability to read and write in formats from 120 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 eight hours of use to ensure maximum longevity of the heads. This eight hour figure is a guideline and should be adjusted if your environment is particularly dirty, or the tape is particularly dirty.

The Digital Tape Cleaning Cartridge, order number TZK1X-HA, is recommended for cleaning the tape heads.

### 24.3 Retensioning Tapes

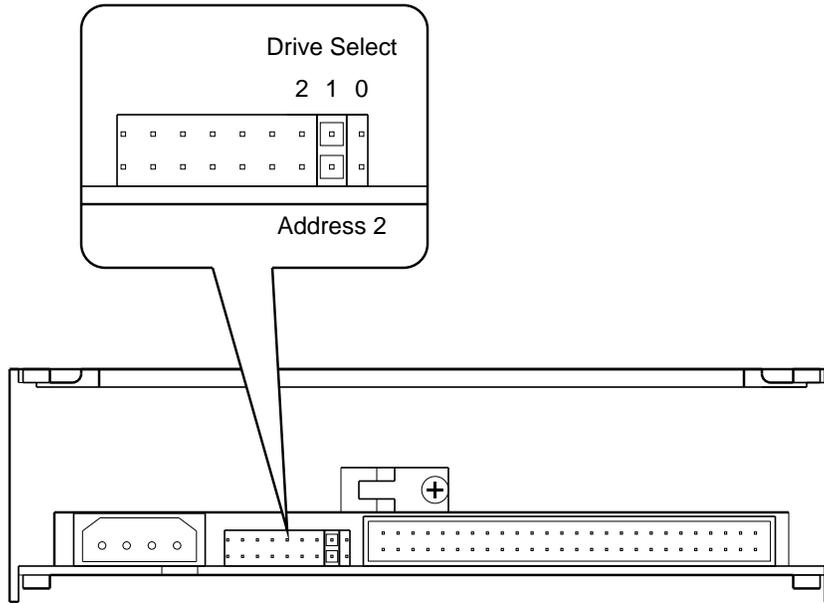
Tapes must be retensioned prior to use. To retension a tape use the SCO UNIX command:

```
$ tape -s reten
```

## 24.4 Preinstallation Configuration

Check that the address of the QIC tape is set to 2. Jumpers on the back of the QIC tape unit are used to set the SCSI ID address. See Figure 24-1.

Figure 24-1 QIC Tape SCSI Address Jumpers



TA-0726-AC

## 24.5 Installation

Install the QIC tape drive using the following steps:

---

**WARNING**

---

Prior to installing any option in the applicationDEC system, ensure that the operating system has been safely halted, with the *shutdown* command and that power is removed from the system.

---

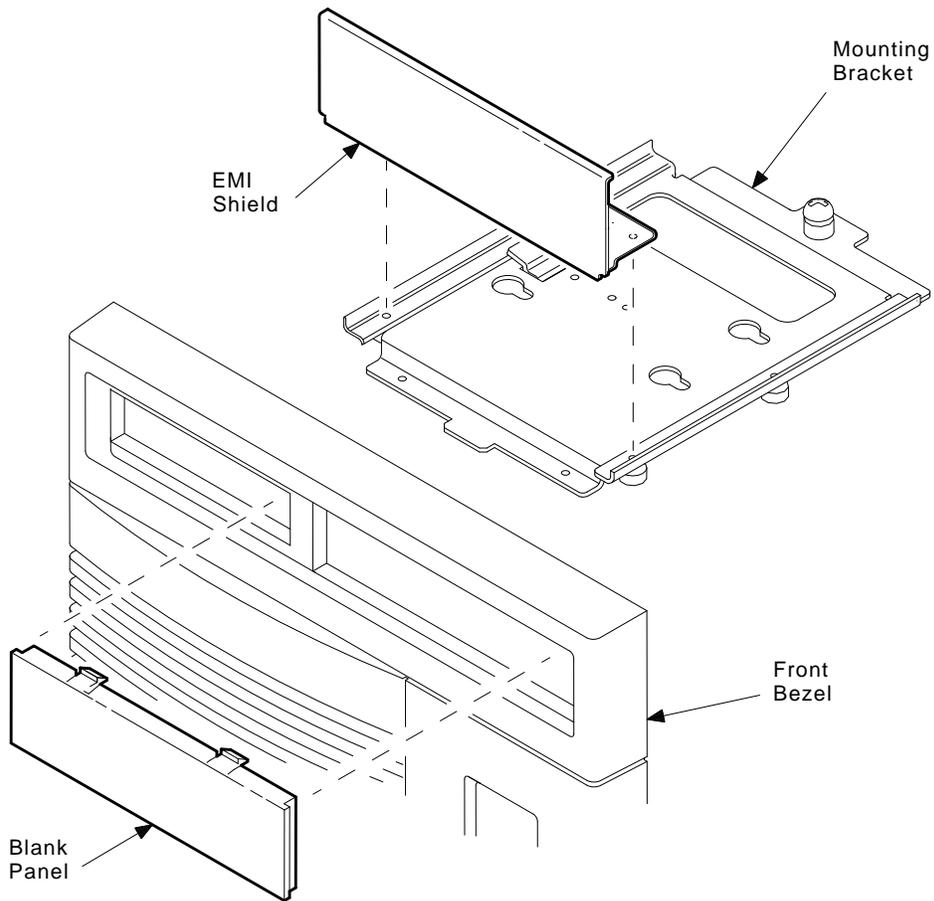
1. Remove the top cover and right side panel, as described in Section 12.3.1.

## **320/525 MB Quarter Inch Tape Drive TZK10 24.5 Installation**

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. Also remove the EMI panel from the mounting bracket by loosening the small set screws at the bottom of the mounting bracket.

**320/525 MB Quarter Inch Tape Drive TZK10**  
**24.5 Installation**

**Figure 24–2 Removing Blank Panel Insert and EMI Shield**



MR-0091-91DG

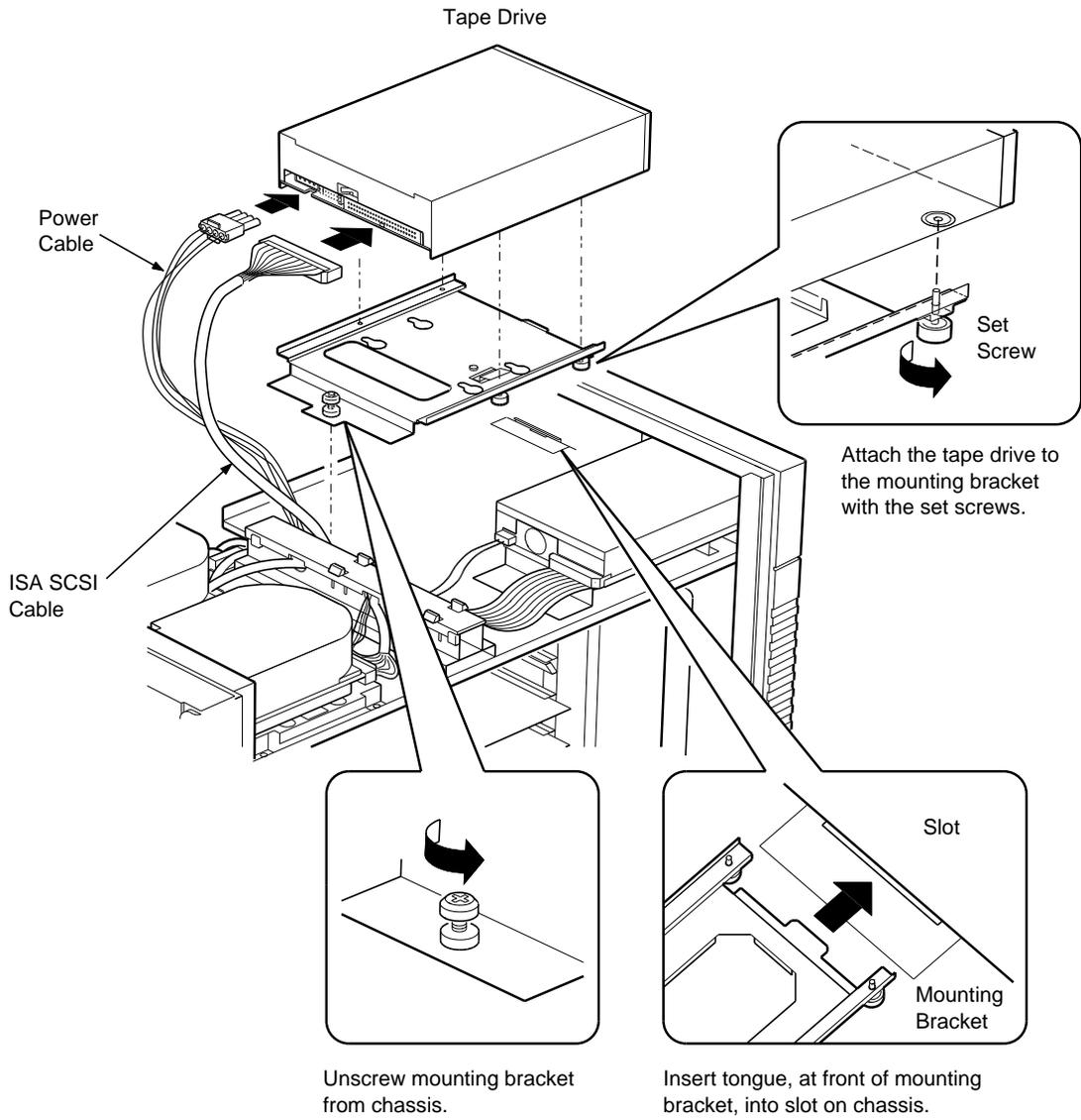
4. Attach the QIC tape drive to the mounting bracket. Align the four set-screws with the holes in the QIC tape drive outercase and tighten the screws. The front of the QIC tape must be opposite of the large set screw on the mounting bracket.
5. Place the front of the QIC tape through the front bezel 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.

**320/525 MB Quarter Inch Tape Drive TZK10  
24.5 Installation**

7. Connect the SCSI bus cable to the back of the QIC drive.
8. Connect the power connector to the back of the QIC drive.
9. This completes installation of the tape drive.

**320/525 MB Quarter Inch Tape Drive TZK10**  
**24.5 Installation**

**Figure 24-3 QIC Tape Mounting Bracket and Cabling**



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## 24.6 Software Support

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.

SCO UNIX and SCO ODT come preconfigured 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.

---

## CD-ROM Drive RRD42

This chapter describes installation of the CD-ROM drive, model number RRD42.

### 25.1 Description

The RRD42 CD-ROM provides the ability to read High Sierra and ISO-9660 format diskettes.

### 25.2 CD-ROM SCSI Address Setting

Check that the SCSI address of the CD-ROM is set to address 6. Jumpers on the back of the CDROM unit are used to set the SCSI ID address.

Figure 25-1 shows the location of the SCSI address jumpers for the CD-ROM.

### 25.3 Installation

Install the CD-ROM using the following steps.

---

**WARNING**

---

Prior to installing any option in the applicationDEC system, ensure that the operating system has been safely halted, with the *shutdown* command and that power is removed from the system.

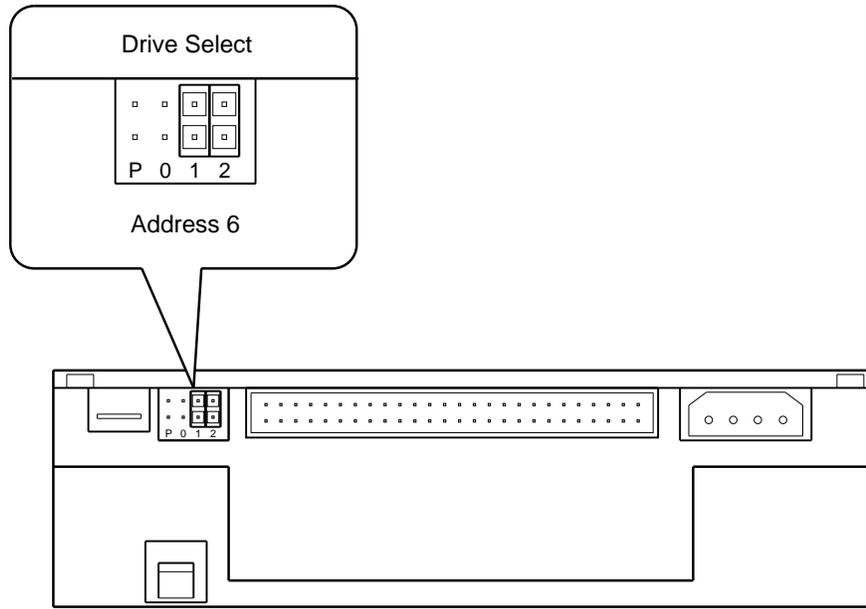
---

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.

## CD-ROM Drive RRD42

### 25.3 Installation

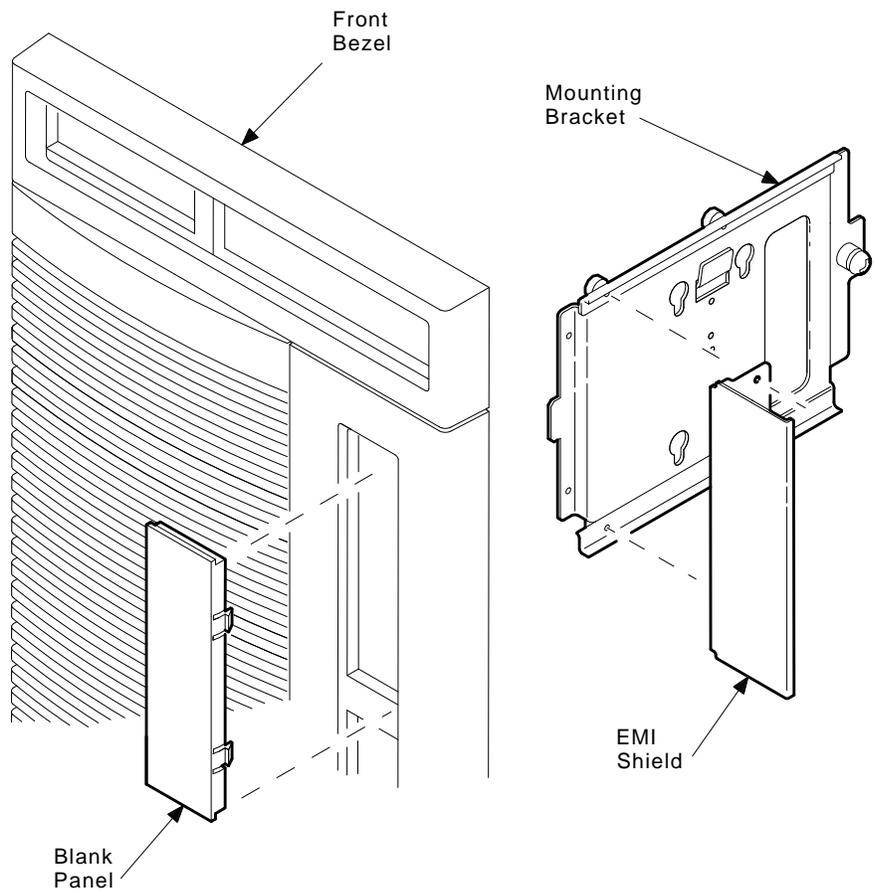
Figure 25–1 CD-ROM SCSI Jumpers



TA-0728-AC

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. Also remove the EMI panel from the mounting bracket by loosening the small set screws at the bottom of the mounting bracket.

Figure 25-2 Removing Blank Panel Insert and EMI Shield



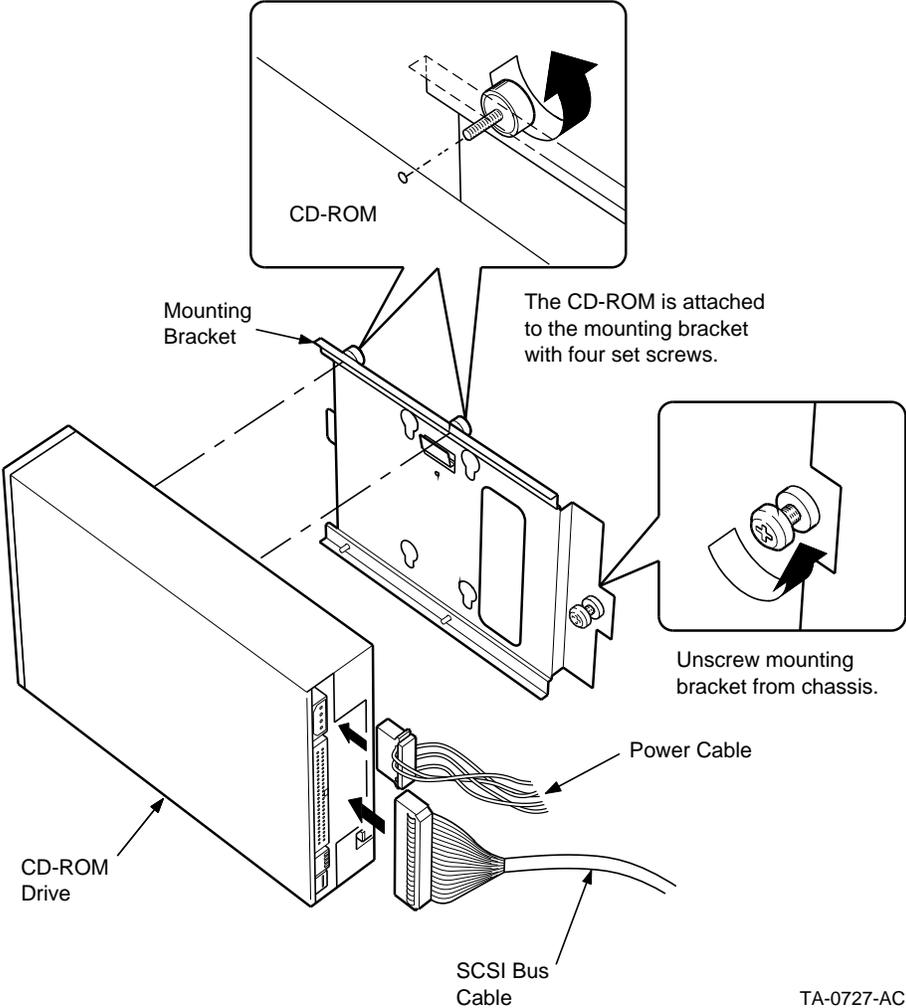
4. Attach the CD-ROM to the mounting bracket. Align the four setscrews with the holes in the CD-ROM outercase and tighten the screws. The front of the CD-ROM must be opposite the mounting bracket's large setscrew. See Figure 25-3.

## CD-ROM Drive RRD42

### 25.3 Installation

5. Place the front of the CD-ROM through the front bezel opening while placing the mounting bracket tab into the metal lip of the chassis. Align the mounting bracket setscrew over the hole in the system chassis and tighten it to attach the mounting bracket to the chassis.
6. Connect the power connector to the back of the CD-ROM.
7. Connect the SCSI bus data cable to the CD-ROM.
8. This completes installation of the CD-ROM.

Figure 25-3 CD-ROM Installation



### 25.4 Software Support

The CD-ROM is defined to the operating system using the `mkdev cdrom` command. The `mkdev high-sierra` command defines the CD-ROMs filesystem.

---

## 3.5-inch 1.44 MB Diskette Drive RX23

This chapter describes the features and installation of the 3.5-inch 1.44 MB disk drive, model number RX23.

### 26.1 Description

The RX23 is a 3.5-inch 1.44 MB disk drive. The controller for this disk drive is on the bridge module. An internal cable from the backplane connector to the RX23 provides control and data signals for the drive.

The RX23 diskette drive is factory configured as the boot media (Drive A) for the applicationDEC 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 has a formatted capacity of 1.44 MBs. 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 MBs. 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 MBs. 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 in the applicationDEC system.

---

**WARNING**

---

Prior to installing any option in the applicationDEC system, ensure that the operating system has been safely halted, with the *shutdown* command and that power is removed from the system.

---

## 3.5-inch 1.44 MB Diskette Drive RX23

### 26.2 Installation

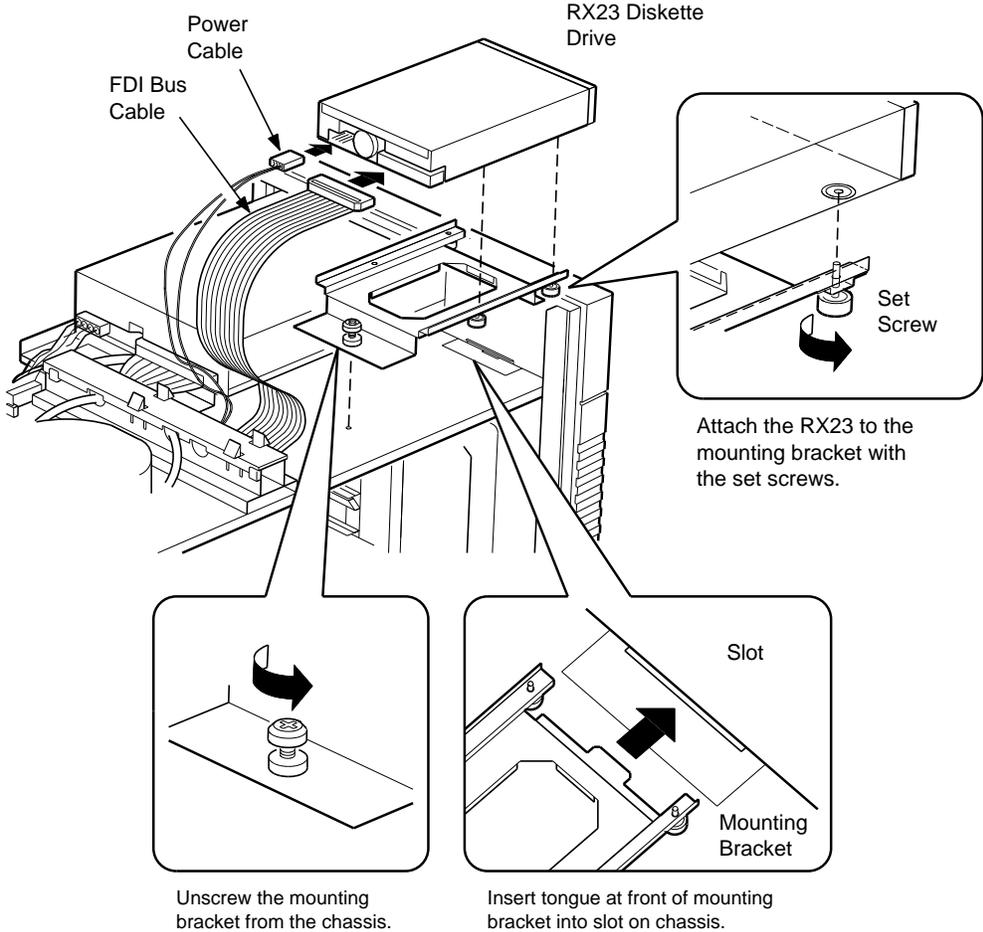
1. Ensure that the drive ID switch, on the right side of the drive, is set to ID 1.
2. Remove the top cover and right side panel, as described in Section 12.3.1.
3. Remove the diskette drive mounting bracket from the system chassis by loosening the single large screw at the back of the bracket. See Figure 26-1.
4. Attach the RX23 to the mounting bracket. Align the four set-screws with the holes in the RX23 outercase and tighten the screws. See Figure 26-1.
5. Slide the RX23 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 rear of the diskette drive.
7. Attach the data ribbon cable to the back of the diskette drive. This cable comes from under the cable harness and is attached to the diskette drive.
8. This completes installation of the 3.5-inch diskette drive.

### 26.3 Software Support

The RX23 is automatically recognized by the operating system. The RX23 is factory configured as the boot media for the applicationDEC system. To specify the optional RX33 5.25-inch 1.2 MB floppy diskette drive as the boot drive, you must change a jumper setting on the bridge module. See Section 14.1.3.

3.5-inch 1.44 MB Diskette Drive RX23  
26.3 Software Support

Figure 26-1 RX23 3.5 1.44 MB Floppy Disk Drive Mounting Bracket



TA-0725-AC

---

## 5.25-inch 1.2 MB Floppy Disk Drive RX33

This chapter describes the 5.25-inch 1.2 MB Floppy Disk Drive option and provides installation instructions.

### 27.1 Description

The 5.25-inch 1.2 MB floppy disk drive (model number RX33-AS) is an optional diskette drive for the applicationDEC 433MP system. The controller for this disk drive is on the bridge module. Internal cabling from the backplane provides connection to the RX33.

### 27.2 Installation

Install the 5.25-inch diskette drive using the following steps.

---

**WARNING**

---

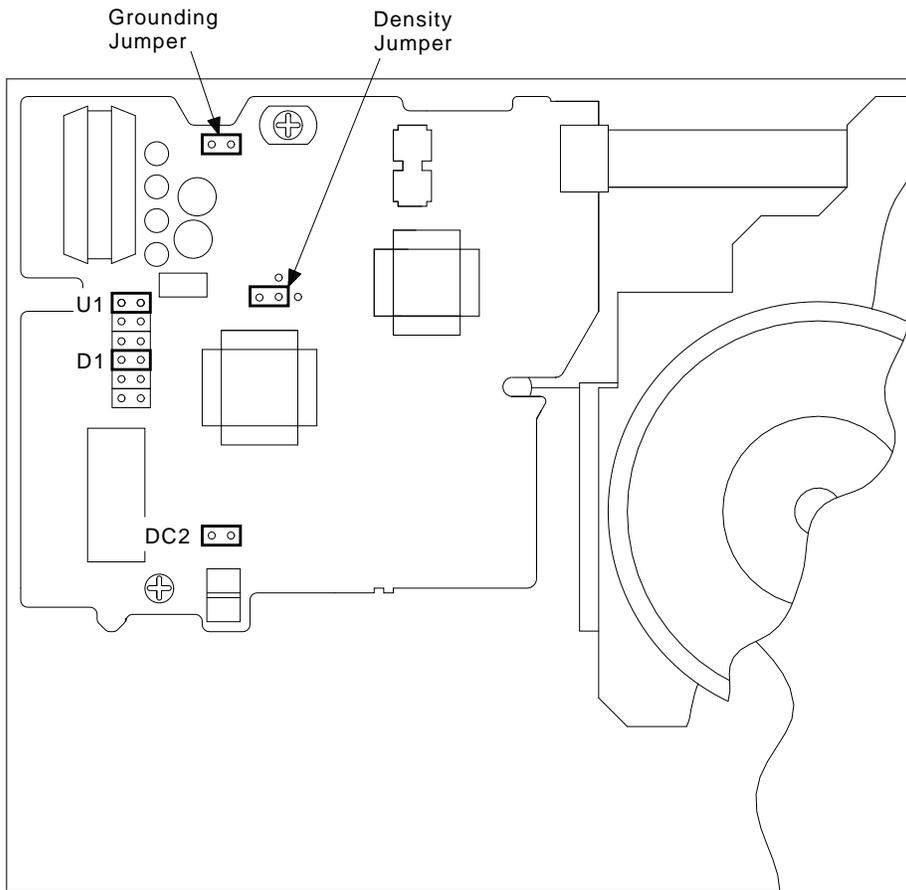
Prior to installing any option in the applicationDEC system, ensure that the operating system has been safely halted, with the *shutdown* command and that power is removed from the system.

---

1. Before you install the 5.25-inch diskette drive into the applicationDEC system, verify that the drive is jumper-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. See Figure 27-3.

## 5.25-inch 1.2 MB Floppy Disk Drive RX33 27.2 Installation

**Figure 27–1 RX33 Diskette Drive Jumper Locations**

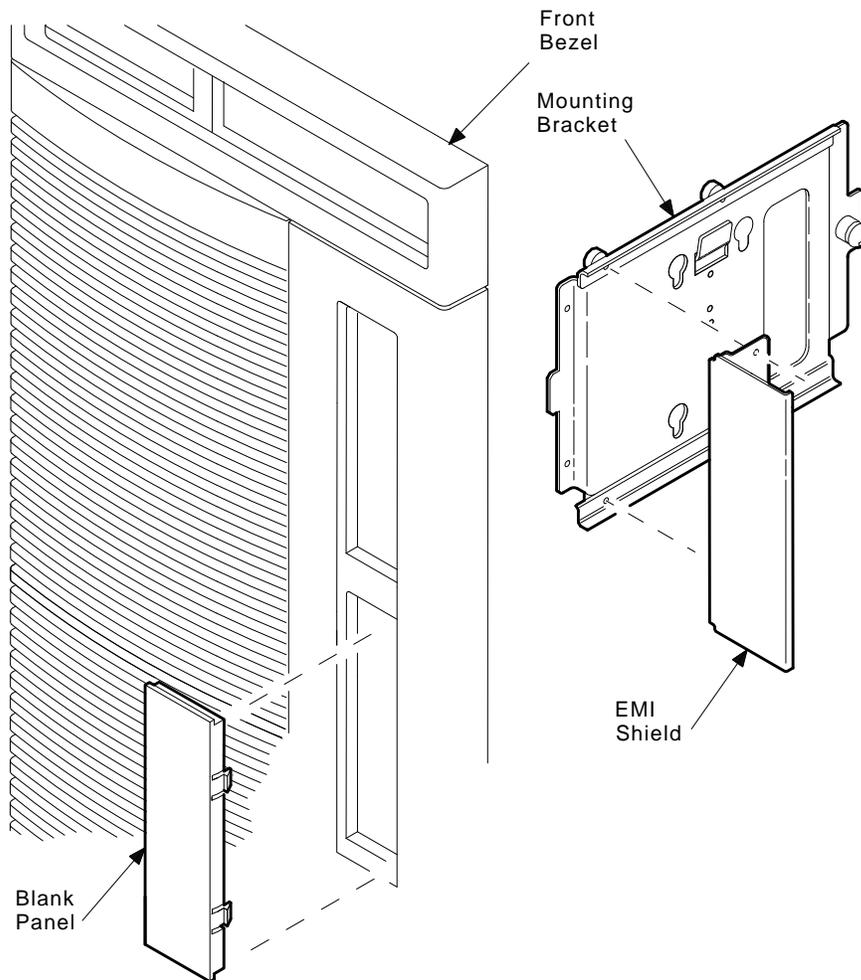


TA-0747-T1

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. Also remove the EMI panel from the mounting bracket by loosening the small setscrews at the bottom of the mounting bracket.

## 5.25-inch 1.2 MB Floppy Disk Drive RX33 27.2 Installation

**Figure 27-2 Removing Blank Panel Insert and EMI Shield**



MR-0100-91DG

5. Attach the RX33 to the mounting bracket. Align the four setscrews with the holes in the RX33 outercase and tighten the screws. The front of the RX33 must be opposite the large setscrew on the mounting bracket.
6. Slide the RX33/mounting bracket through the front bezel opening and under the metal lip on the chassis. Tighten the mounting bracket screw to attach the mounting bracket to the chassis. See Figure 27-3.

## **5.25-inch 1.2 MB Floppy Disk Drive RX33**

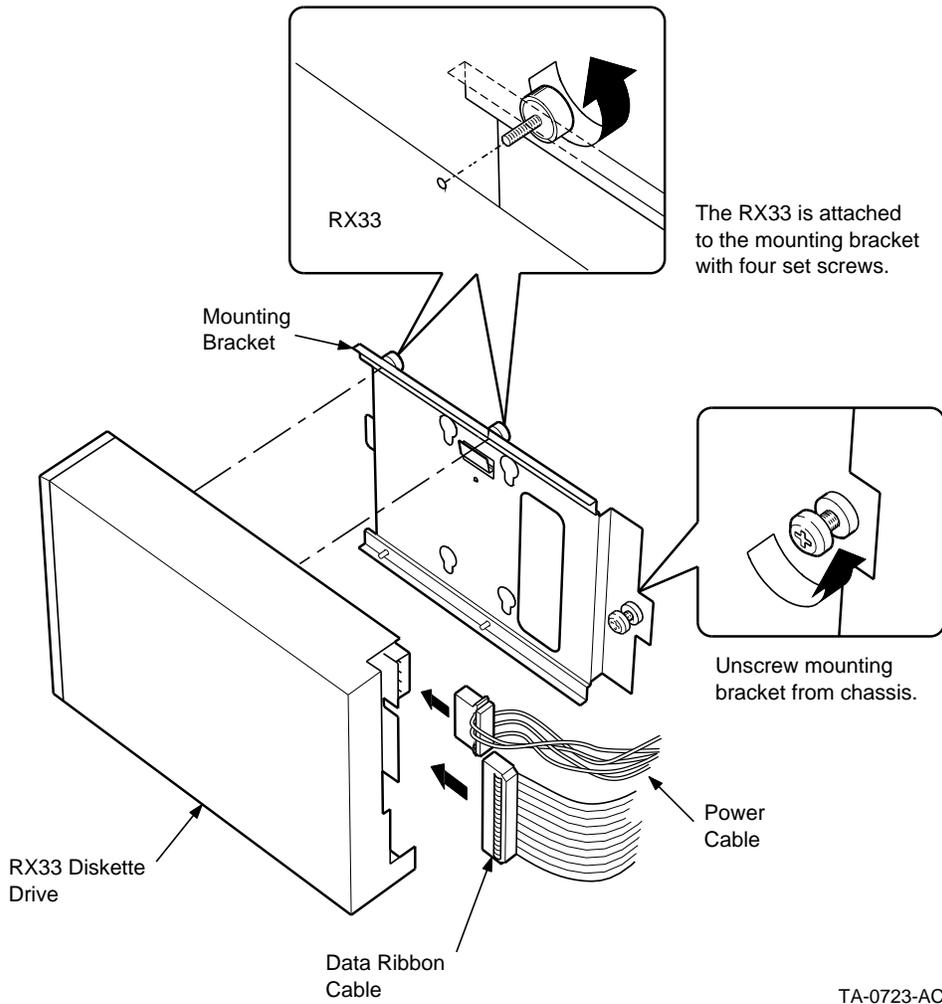
### **27.2 Installation**

7. Attach the power cable to the rear of the diskette drive.
8. Attach 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.

The 5.25-inch diskette drive is now installed and the top and side panel can be replaced.

## 5.25-inch 1.2 MB Floppy Disk Drive RX33 27.2 Installation

Figure 27-3 5.25-inch 1.2 MB Floppy Disk Drive Installation



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