

digital

Service Maintenance Manual

PRIORIS ZX Server

K-MN-SD00000-20-JG00.B



**MCS LOGISTICS
ENGINEERING
-
NIJMEGEN
THE NETHERLANDS**

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Revision History

<i>Revision</i>	<i>Date</i>	<i>Description of Change</i>
A01	March 96	First release of the Service Maintenance Manual describing the PRIORIS ZX MP Server.
B01	April 96	Update due to layouts, MLB, CPU, memory discrepancies.

Preface

The Digital PRIORIS ZX MP Service Maintenance Manual is a troubleshooting guide that can be used for reference when servicing the PRIORIS ZX MP Server series.

Digital Equipment Corporation reserves the right to make changes to the Digital PRIORIS ZX MP Server without notice. Accordingly, the diagrams and procedures in this document may not apply to the computer(s) that are serviced since many of the diagnostic tests are designed to test more than one product.



CAUTION

Digital recommends that only A+ certified engineers attempt to repair this equipment. All troubleshooting and repair procedures are detailed to support subassembly/module level exchange. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard. Any indications of component replacement or printed wiring board modifications may void warranty or exchange allowances.

Chapter 1

Product Description

Product Introduction

The Prioris ZX MP server family is a family of high-performance, highly-scalable network and application servers featuring the latest in modular CPU and storage technology. The Prioris ZX MP family of servers also provide investment protection through CPU upgrade technology. This technology enables to easily upgrade to a higher-performance CPU by simply installing a new CPU module or modules.

The Prioris ZX MP family of servers provide the following features:

- ◇ One, two or four 133 MHz Pentium processors in one enclosure
- ◇ Total of nine option cards: four EISA, three PCI slots and two shared EISA or PCI
- ◇ 512 KB (1P) and 1MB (2P and 4P) write-back burst cache memory per processor
- ◇ Supports up to 768 MB of ECC memory.
- ◇ On-board graphics controller with 512KB video memory, upgradable to 1MB video RAM
- ◇ 12 SIMM sockets per memory board. System supports up to two memory boards
- ◇ On-Board two channel PCI Fast Wide SCSI-2 controller
- ◇ Optional single and two channel SCSI-2 controllers
- ◇ Optional PCI RAID Fast Wide one and multi channel SCSI-2 controller options
- ◇ Total connectable storage capacity over 1000 GB
- ◇ Eleven front bays: two 5.25" half height, one 1" floppy drive, one 1"CD-ROM, seven 3.5" half height Hot Swap supporting seven Fast Narrow and Fast Wide SCSI-2 drives
- ◇ Autosensing Power supplies
- ◇ CD-ROM and floppy disk drives

Product Models Information

PRIORIS ZX MP Systems

<i>Model</i>	<i>CPU</i>	<i>Memory</i>	<i>Options</i>
FR-A60WW-AA	Single Pentium 133 MHz	32 MB ECC	None
FR-A60WW-AB	Single Pentium 133 MHz	32 MB ECC	RAID 3 x 2GB
FR-A60WW-AC	Single Pentium 133 MHz	32 MB ECC	RAID
FR-A60WW-AX	Single Pentium 133 MHz	None	None
FR-A61WW-AA	Two Pentium 133 MHz	64MB ECC	None
FR-A61WW-AB	Two Pentium 133 MHz	64MB ECC	RAID 3 x 2GB
FR-A61WW-AC	Two Pentium 133 MHz	64MB ECC	RAID
FR-A61WW-AX	Two Pentium 133 MHz	None	None

Chapter 2 Server Utilities & Configuration

Server Utilities

Introduction

This chapter provides additional information about the server's supplied software and support documentation, restarting the server, identifying server model and serial numbers, providing a comfortable working environment and obtaining help.

NOTE You might have ordered additional options such as hard disk drives, tape back-up systems, CD-ROMs or modems that have been factory installed in the server. The documentation and any related diskettes for these options have also been provided. Save this material for future reference.

The following software and support documentation is supplied with the server:

- ◆ ServerWORKS software kit contains ServerWORKS Quick Launch and ServerWORKS Manager.
 - ◇ ServerWORKS Quick Launch contains a bootable CD-ROM disk and reference guide. The Quick Launch program steps through the initial server setup and operating system installation process.
 - ◇ ServerWORKS Manager contains the software and documentation for installing the ServerWORKS Manager LAN management tool.
Refer to the Installation Guide and the README files on the ServerWORKS Quick Launch CD-ROM disk for more information.

- ◆ Server documentation box contains this User's Guide, an Installation Guide, a Documentation Overview, Warranty information, a Diagnostics manual, Options manuals and Registration Card. Diagnostic software and support documentation came with the server. This software contains an advanced set of diagnostic utilities that can be used to identify and correct problems that might be encountered when installing, configuring or using the server.

There are two ways to access the supplied diagnostic software:

- 1) During the operating system installation process, the diagnostic software is automatically copied to a subdirectory on the MS-DOS partition. This enables to run the diagnostic software anytime from the created MS-DOS partition.
- 2) When using the Install Software Conventional method in ServerWORKS Quick Launch, a bootable diagnostic software diskette can be created. This enables to run the diagnostic software anytime using the created diskette.

For additional information, read any README files that are on the created diagnostic diskette.

The following utilities are supplied with the server:

- ◆ Flash Utility. This utility enables to update or restore the server's BIOS.
- ◆ SCSISelect Utility. This utility enables to configure and view settings of the installed Adaptec SCSI controllers and SCSI devices.
- ◆ RAID Configuration Utility. This utility is available for RAID-ready servers only. This utility enables to configure the RAID array.
- ◆ System Configuration Utility (SCU). This utility enables to configure the server when relocating, adding, or removing EISA/ISA/PCI expansion boards and when changing the server's factory-defined BIOS Setup options.

Flash BIOS Update Procedure and Recovery BIOS Procedure

The flash contains two BIOSs, one is the normal boot BIOS that happens every time the system is booted, and the other is a 'recovery BIOS'. The 'recovery BIOS' has just enough brains for reloading the normal boot BIOS from floppy back into flash. This recovery BIOS was loaded into flash at the factory and is protected by the hardware jumper J7C1. It is protected by jumper because if the recovery block was corrupted during a flash update, the recovery BIOS will be garbage and baseboard will require installation of a new flash part.

The recover process very similar to standard FMUP BIOS flash update process. Since it has no video capability, it gathers all the needed information from the AUTOEXEC.BAT file and uses the file extension of .REC for selecting the recovery BIOS. When looking at the tables below, these are the minimum files needed for successful recovery to a another version of BIOS 1.00.01.BG0_. Note that these files are taken from the FMUP disk must be on a bootable floppy.

FileName	Size	FileName	Size
AUTOEXEC BAT	45	FMUP EXE	188,120
BIOSBG0 TBL	4,224	BIOSBG0_TBL	4,224
BEEP COM	35	BIOSBG0 REC	65,664
BIOSBG0 RE1	65,664	BIOSBG0 RE2	65,664
BIOSBG0 RE3	65,664	BIOSBG0 RE4	65,664
BIOSBG0 RE5	41,088		

Flash Memory Update Program (PHLASH.EXE)

All servers have BIOS software in a read-only, non-volatile memory (ROM) chip. This BIOS initializes hardware and boots the operating system when the server is turned on. The BIOS also provides access to other services such as keyboard and disk drives.

The server comes equipped with flash memory. This means that the server's BIOS can be restored simply by running the flash memory update utility. The server's BIOS can also be upgraded to future releases by running the flash memory update utility along with any flash BIOS update diskette if necessary.

The flash memory update program and BIOS updates are available on the Digital Bulletin Board.

The BIOS Configuration Utility is stored in the 512KB Flash memory device and contains compressed configuration/overlay (CFG/OVL) files used to set the various system features. The Configuration Utility is decompressed into a secure memory location and executed during system boot by pressing [F1] during the Power On Self Test (POST). By clearing the NVRAM (switch S8C1-1) both the CMOS setup configuration and NVRAM configuration are reset to factory defaults. These values assume that no hard drive is installed, an unknown single processor module is installed, but a 3½-inch floppy as drive A: is present. The clearing of NVRAM assumes the user will immediately execute the Configuration Utility to fully configure the server.

The BIOS setup displays configuration information is on four pages, which are accessed by using the Page Up and Page Down keys:

- ◆ The [F10] key saves the BIOS Setup configuration, exits the Setup utility and reboots the system.
- ◆ The [F5] function key loads known default configuration values (different than factory/NVRAM default values) for all four BIOS Setup utility pages for use with a Pentium processor module.
- ◆ The [F6] function deletes any changes made while in the BIOS Setup utility and goes to the previous values stored in CMOS before entering Setup via the [F1] key. Although the BIOS Setup utility can fully configure the system, it is strongly recommended the System Configuration Utility (SCU) be used to set the system configuration. The System Configuration Utility ensures that the information located in Flash memory is synchronized with the configuration information stored in CMOS.

<i>Location</i>	<i>Size</i>	<i>Description</i>
FF000h-FFFFFFh	64K	Compressed Code modules and BIOS Loader
FEC00h-FEFFFh	16K	Boot Block BIOS code
FEA00h-FEBFFFh	8K	(reserved)
FE800h-FE9FFFh	8K	User Flash Area
FE000h-FE7FFFh	32K	Compressed Code modules and Language Code
FC000h-FDFFFFh	8K	Compressed Code modules and Language Code
FA000h-FBFFFFh	128K	Configuration Utility Block #2
F8000h-F9FFFh	128K	Configuration Utility Block #1
F0000h-FFFFFFh	512KB	AMI System BIOS core
F000h-FFFFh	64K	AMI System BIOS core
EE000h-EFFFFh	8K	BIOS Boot Block
EC000h-EDFFFh	8K	(reserved)
E8000h-EBFFFh	32K	Reserved for I/O ROM; user selectable
E000h-E7FFFh	32K	Reserved for I/O ROM; user selectable

BIOS SETUP UTILITIES OPTIONS

BIOS SETUP OPTIONS (Main Section)

<i>BIOS Setup Field</i>	<i>Settings</i>	<i>Comments</i>
System Date	Month, Day, Year	
System Time	Hour:Minute:Seconds	
Diskette A	3.5" 1.44MB	Select size and density of floppy drive A: Either disabled, 5.25" 360KB, 5.25" 1.2MB, 3.5" 720KB, 3.5" 1.44MB, or 3.5" 2.88MB.
Diskette B	Disabled	Select size and density of Drive B: Either disabled, 5.25" 360KB, 5.25" 1.2MB, 3.5" 720KB, 3.5" 1.44MB, or 3.5" 2.88MB.
Onboard IDE	Enabled / Disabled	By disabling the onboard IDE interface, an alternate hard drive controller may be added to the system.
Hard Disk C	Not Installed	Selects hard drive size and parameters. Not Installed assumes the SCSI interface will be used, but can be reconfigured for IDE drives.
Hard Disk D	Not Installed	Same as Hard Disk C
Hard Disk E	Not Installed	Same as Hard Disk C
Hard Disk F	Not Installed	Same as Hard Disk C
Language	English / French / Spanish / German / Italian	Selects the language used in the BIOS Setup Utility.
Boot Options	Press Enter	Contains many options such as Boot Sequence, System cache setting, Boot speed, Numeric Lock, Setup Prompt, Hard Disk pre-delay time, and typematic rate.
Video Mode	Auto Sense	Selects whether using monochrome, CGA, EGA, or VGA monitors.
Mouse	Auto Sense	Selects whether a PS/2 mouse is installed upon boot-up.
Base Memory	Auto Sense	The amount of base memory seen; normally 640KB.
Extended Memory	Auto Sense	The amount of extended memory seen upon boot-up.

Default Values listed in **Boldface**

BIOS SETUP OPTIONS (Advanced Section)

<i>BIOS Setup Field</i>	<i>Settings</i>	<i>Comments</i>
Processor Type	Auto Sense	Select the type of Intel processor(s) being used in the system.
Processor Speed	Auto Sense	Selects the speed of the Intel processor(s) being used in the system.
Peripheral Configuration	Press Enter	Selects the Configuration mode for the hard drives (auto/manual), the floppy interface, the IDE interface, serial and parallel port addresses / IRQs.
Advanced ChipSet Configuration	Press Enter	General Purpose Registers and some Performance Enhancement Settings are available. The Default is AutoSensed, except for the BACKOFF setting which should be disabled.
Plug and Play Configuration	Press Enter	PCI Bus Latency timing. Default is 66 clocks. Controls the length of time a PCI agent can hold the bus when another agent has requested the PCI bus. Some audio/network cards (with small buffers) are latency sensitive, but I/O intensive applications the latency timer can be increased for slightly improved performance.

Default Values listed in **Boldface**

BIOS SETUP OPTIONS (Security Section)

<i>BIOS Setup Field</i>	<i>Settings</i>	<i>Comments</i>
User Password	Enabled / Disabled	If enabled, must be entered before getting this far.
Admin Password	Enabled / Disabled	If enabled, must be entered before getting this far.
Set User Password	Press Enter	Allows user to set the password upon boot-up.
Set Admin Password	Press Enter	Allows user to set the administrator password for setting all changes via the BIOS Setup Utility and System Configuration Utility.
Keyboard Inactivity Timer	10	Default when enabled is 10 minutes. Choose between 1 to 127 minutes.
Video Blanking	Enabled / Disabled	Turns off video screen until keyboard HOT KEY sequence is entered.
Floppy Writes	Enabled / Disabled	When disabled protects the floppy from being written to.
Reset + Power Switch	Enabled / Disabled	Allows user to press Reset/Power On buttons on front panel.

BIOS SETUP OPTIONS (Exit Section)

BIOS Setup Field	Settings	Comments
Exit Saving Changes	Press Enter	Same as hitting [F10] key
Exit Discarding Changes	Press Enter	All that work for nothing. No changes will be saved to the CMOS/NVRAM areas.
Load Setup Defaults	Press Enter	Same as hitting [F5] key.
Discard Changes	Press Enter	Gives user another chance to make the required changes with re-booting the system.

Default Values listed in **Boldface**

SCSISelect Utility

The Prioris server comes with an Adaptec controller and a SCSISelect configuration utility. This utility enables to change host controller settings without opening the server or handling the SCSI controller board.

Use SCSISelect to:

- ◆ Check factory default settings for each device on the SCSI bus.
- ◆ Change SCSI device settings that might conflict with other SCSI devices.
- ◆ Perform low-level formatting on new SCSI disk drives.

To start the SCSISelect configuration utility:

- 1) Press **Ctrl + A** when the BIOS banner appears during the boot process.
- 2) When the SCSISelect configuration utility appears, follow the instructions on the screen to configure the SCSI controller and run SCSI disk drive utilities.

RAID Configuration Utility

RAID-ready Prioris ZX 5000 MP servers include a Mylex RAID controller and RAID configuration utility. If the RAID controller was factory installed, the RAID configuration utility appears when the server is booted with the ServerWORKS Quick Launch CD-ROM disk. Use this utility to configure the RAID array.

Refer to the Mylex User's Manuals for more information.

System Configuration Utility (SCU)

The SCU enables to check or change the server's configuration. The SCU is PCI-aware, and complies with both EISA and ISA plug and play standards. You must run the SCU each time you add, remove, or relocate an EISA or ISA expansion board. Running the SCU is optional for plug and play and PCI expansion boards.

Each EISA expansion board comes with a diskette that contains a configuration (.CFG) file. The .CFG file describes the board's characteristics and the server resources that the board requires. The configuration registers on PCI and plug and play expansion boards contain the same type of information that an EISA .CFG file does. The server's main logic board also comes with a .CFG file.

The SCU uses the information provided by .CFG files, configuration registers, NVRAM, and the information that is entered, to specify a particular configuration. The SCU then configures the server by writing the configuration information to flash memory

The SCU stores most of the configuration values in the battery-maintained memory (NVRAM) of the real-time clock (RTC), and the rest of them in flash memory. These values take effect each time you boot the server. POST checks the values against the actual hardware configuration; if they do not agree, it generates an error message. You must then run the SCU to specify the correct configuration before the server boots. Pressing F1 on the keyboard, in response to the BIOS prompt during POST, activates the BIOS Setup

The SCU modifies the CMOS RAM and EISA NVRAM, under your direction. The BIOS POST routines and the ISA plug and play Auto Configuration Manager (ACM) actually configure the hardware.

The SCU always updates the checksums for both areas so that the BIOS can detect any potential data corruption before the actual hardware configuration takes place. If the data is corrupted, the BIOS requests to configure the server before it can boot.

Locating the SCU

The SCU is located on the ServerWORKS Quick Launch CD-ROM disk. The SCU can be used in one of three ways:

- 1) During the Quick Launch boot process, when selecting to create a MS-DOS partition, the SCU is copied to the MS-DOS partition on the hard disk drive. This enables to run the SCU anytime from the MS-DOS partition.
At the MS-DOS prompt change to the SCU directory and type:
SCU .BAT
- 2) Using the *Install Software Conventional* method in ServerWORKS Quick Launch, a bootable SCU diskette can be created. This enables to run the SCU anytime using the diskette you created.
- 3) The SCU can be runned by inserting the Quick Launch CD-ROM disk, rebooting the server, and pressing the right [ALT] key during the boot process to display the SCU.

NOTE If EISA or PCI cards have been added to the server, the SCU will be invoked automatically when you boot from the Quick Launch CD-ROM disk. The .SCI file is not saved when using this method to run the SCU.

Starting and Using the SCU

To start and run the SCU:

- 1) Turn on the server and allow the POST to complete.
- 2) If POST detects an error refer to *Chapter 4, "Troubleshooting"* and take the appropriate steps to correct the problem. After the problem has been resolved, restart the server.
- 3) Start the SCU from the DOS partition or insert the SCU diskette into drive A and soft boot (reset) the server.

From the MS-DOS Startup menu select one of the following:

- 1) Execute AMISCU
- 2) Execute AMISCU (baseboard configuration only)
- 3) Execute AMISCU using the Overlay Lite
- 4) When the SCU title appears, press any key to continue.
Afterwards, follow the instructions on the screen to access the SCU main menu.
- 5) From the main menu, press the up or down arrow to highlight an item and then press [Enter] to select it. When using a mouse, point to an item and double-click the left button to select it. Press [F1] at any time for help about a selection.
- 6) When needing additional information about configuring the server, select "Step 1: About System Configuration."

Additional Security Features

Additional Security Features are available as options in the scu and through main logic board jumpers.

The SCU includes the following setup options to improve server security:

- ◆ Display <F1> for Setup Message during POST - Setting this option to disabled prevents unauthorized personnel from entering the BIOS Setup utility each time the server is turned on or reset.
Display <F1> for Setup Message during POST appears as an <F1> Setup prompt on the monitor screen each time the server boots
When selecting Disabled, the server does not inform when to press <F1> to enter Setup. Setup can still be entered by pressing <F1> before POST completes.
- ◆ Floppy Writes - Setting this option to Disabled prevents unauthorized personnel from writing data to a diskette.
- ◆ Video Blanking - Setting this option to Enabled requires a password to reactivate the monitor after a set period of keyboard inactivity.
- ◆ Reset and Power Switch Locking - Setting this option to Enabled prevents the power and reset switches from being locked out during secure mode.

The main logic boards Enable Flash Write switch (S8C1-3) should also be set to OFF to prevent unauthorized personnel from loading a new server BIOS. Loading a new server BIOS might enable someone to override other server security features or introduce a virus in the server

SCU Options

The following tables list the options that are available in the SCU (Change Configuration Settings). Use the keyboard function keys to help to select options, change values, and display help information.

NOTE The server also has a BIOS Setup utility available to change the server's BIOS settings. Although the BIOS Setup utility is separate from the SCU, the SCU will automatically update the BIOS settings. In most cases, the server will operate according to the most recent changes regardless of which utility you use to make changes. However, Digital recommends to use the SCU to configure the server each time you add hardware, remove hardware, or change server settings to ensure that the server operates properly.

The following menu fields might not reflect current BIOS or SCU revisions. Refer to the BIOS Setup utility screens, the SCU, and any associated on-line help for more information.

Systems Group

Menu Fields	Settings	Comments
System identification and version information System identification string	Not user selectable	Displays the server identification string.
Config and overlay version	Not user selectable	Displays the configuration and overlay version.
BIOS version string	Not user selectable	Displays the BIOS version string.
MP spec version	Not user selectable	Displays the multi-processor specification version.

System Processor Modules

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
CPU 1 in slot 1	Not user selectable	Displays the installed CPU type.
CPU 2 in slot 1	Not user selectable	Displays the installed CPU type.
CPU 1 in slot 2	Not user selectable	Displays the installed CPU type.
CPU 2 in slot 2	Not user selectable	Displays the installed CPU type.

System Processor Status

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
CPU 1 in slot 1	Not user selectable	Displays the fault status of the installed CPU.
CPU 2 in slot 1	Not user selectable	Displays the fault status of the installed CPU.
CPU 1 in slot 2	Not user selectable	Displays the fault status of the installed CPU.
CPU 2 in slot 2	Not user selectable	Displays the fault status of the installed CPU.

System Performance

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
Power-on speed option	Fast Slow	Determines the CPU speed used by the server each time it is turned on or rebooted.
Secondary IOAPIC control option	Enable secondary IOAPIC Disable secondary IOAPIC	

Memory Subsystem Group

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
Base memory options	640KB base memory 512KB base memory	Displays the current amount of base (conventional) memory.
Shadowing ISA ROMs options: C0000 C4000 C8000 CC000 D0000 D4000 D8000 DC000 E0000 E4000	Enable Disable	Allows to enable or disable shadowing and caching of individual segments of ROM to increase server performance. Caution: Some option ROMs do not operate properly when shadowed. Note: Press Ctrl-E to enable all addresses; press Ctrl-D to disable all addresses.
Extended memory options: Cache	Cache mode: Write-back Disabled Write-through	Selects the installed cache module type or enables to disable the installed cache module.
1MB ISA hole	1MB ISA hole control: Disabled Enabled	Allows to enable or disable the dedicated 1 MB ISA memory hole. Enable this option if an ISA expansion board requires this memory space.

Onboard Disk Controllers

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
Onboard floppy controller	Enabled Disabled	Enables or disables the onboard diskette controller.

Onboard Communication Devices

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
Serial port 1 configuration	COM1: 3F8-IRQ 4 COM2: 2F8-IRQ 3 COM3: 3E8-IRQ4 COM4: 2E8-IRQ3 Port 1 disable	Enables or disables onboard serial port 1 at the specified address. Note: If the server is connected to a network, see the System Administrator.
Serial port 2 configuration	COM2: 2F8-IRQ 3 COM1: 3F8-IRQ 4 COM3: 3E8-IRQ4 COM4: 2E8-IRQ3 Port 2 disable	Enables or disables onboard serial port 2 at the specified address. Note: If the server is connected to a network, see the System Administrator.
Parallel port 1	LPT1: 378-IRQ 7 LPT2: 278-IRQ 5 LPT3: 3BC-IRQ 7 Parallel port disable	Enables or disables the onboard port at the specified address.

Onboard Communication Devices (continued)

Menu Fields	Settings	Comments
Parallel port mode	Parallel port mode ISA-compatible Parallel port mode PS/2 Parallel port mode: ECP on LPT1 ECP on LPT2 ECP on LPT3 Parallel port mode extended (not valid with LPT3)	Compatible mode - standard printer connection. Bi-directional mode - PS/2 compatible mode and able to receive data. Sets the extended capabilities port mode. Sets the enhanced parallel port mode.
Parallel port DMA (valid only with ECP mode)	No DMA DMA channel 3 DMA channel 5 DMA channel 7	Allows to select one of three DMA channels when using the parallel port mode ECP option.

Floppy Drive Subsystems Group

Menu Fields	Settings	Comments
Floppy drive A	3.5 inch 1.44/1.25 MB drive 5.25 inch 360 KB drive 5.25 inch 1.2 MB drive 3.5 inch 720 KB drive 3.5 inch 2.88 MB drive Disabled or not installed	Sets the size and density of diskette drives.

Floppy Drive Subsystems Group (continued)

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
Floppy drive B	3.5 inch 1.44/1.25 MB drive 5.25 inch 360 KB drive 5.25 inch 1.2 MB drive 3.5 inch 720 KB drive 3.5 inch 2.88 MB drive Disabled or not installed	Sets the size and density of diskette drives.

Language Support Group

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
Current language	English (US) Español (SP) Italiano (IT) Français (FR) Deutsch (GR)	Enables to select a desired language.

KB and Mouse Subsystem Group

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
Numlock	Off at boot On at boot	Selects the keyboard Numlock option.
Typematic speed	Auto Fast (7 char. sec) Medium (4 char. sec) Slow (1 char. sec)	Sets the number of times a second to repeat a keystroke while holding the key down.
Mouse control option	Mouse auto detected	This option auto detects whether or not a mouse is connected to the server.

Console Redirection

Menu Fields	Settings	Comments
Select COM port for redirection	Disable redirection Redirection on COM1 Redirection on COM2	Enables to redirect the server's COM1 or COM 2 serial ports.
Serial port baud rate	2400 baud 9600 baud 19.2K baud 115.2K baud	Enables to set a specific baud rate for modem data transfers.
Hardware flow control	None CTS/RTS CTS/RTS & Xoff/Xon	Enables to set hardware flow control options for modem data transfers.
Select terminal type	ANSI	Enables to select the ANSI terminal type for modem data transfers.

Security Subsystems Group

Menu Fields	Settings	Comments
Administrative password option	Enter password	Type your administrative password in the enter password field.
	Verify password	Verify your administrative password by typing it in the verify password field.
User password option	Enter password	Type your user password in the enter password field.
	Verify password	Verify your user password by typing it in the verify password field.
Hot key option	Enable Disable	Enables or disables the server's hot key option.
Lock out timer	10 minutes to 127 minutes	Enter the number of minutes of keyboard inactivity to lock the server's keyboard. Once locked, an administrative or user password is required to unlock the keyboard.
Secure boot mode	Enable Disable	Enables or disables the server's secure boot mode option.
Video blanking	Enabled Disabled	Enables or disables the server's video blanking option.
Floppy writes	Enabled Disabled	Enabling this option keeps unauthorized personnel from copying server data onto diskettes.

Boot Subsystem Group

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
Boot options: First boot device Second boot device Third boot device Fourth boot device	Boot disabled Boot floppy Boot hard disk Boot IDE CD-ROM Boot network	Each time the server boots, it will load the operating system from the sequence selected.
Display <F1> for setup message during POST	Enabled Disabled	Enables or disables the <F1> setup prompt each time the server boots.
Require user interaction on POST errors	Enabled Disabled	Enabling this option causes the server to pause and display a setup entry or resume the boot prompt if an error occurs at boot. Disabling this option causes the server to always attempt to boot regardless of a setup entry or error.

SCSI ROM BIOS Options Group

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
SCSI-A ROM BIOS scan	Enable Disable	Enables or disables the server's SCSI-A ROM BIOS scan option.
SCSI-B ROM BIOS scan	Enable Disable	Enables or disables the server's SCSI-B ROM BIOS scan option.

LCD Subsystem Group

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
LCD display string enable or disable	Enable Disable	Enables or disables the server's LCD display string option.
LCD display string before OS boot	Enable Disable	Enables or disables the server's LCD display string before OS boot option.

Management Subsystem Group

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
Temperature/voltage limit control	Press <Enter> to display limits	Enables to set temperature and voltage limits to ensure proper server operation.
A/D channel enable switch	Press <Enter> to display A/D channels	Enables to enable or disable A/D channel switches to ensure proper server operation.
Speaker options	Enable Disable	Enables to turn on or turn off the server's speaker.
Scan user flash area	Enable Disable	Allows to scan the server's flash BIOS area.
System management options: System management mode SMM time stamp source Event logging	Enable Disable POST capture Real-time clock Disable Enable	Enables or disables the server's system management mode option. Determines the SMM time stamp source. Enables or disables the server's event logging option.

Memory Boards Subsystem Group

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
ECC memory: First board Second board	Not user selectable	Displays whether or not an ECC memory module is installed in one or both memory slots.

Reserved System Resources

<i>Menu Fields</i>	<i>Settings</i>	<i>Comments</i>
Reserved VGA resources	Not user selectable	Allows to disable the server's onboard VGA controller. Otherwise, this option auto detects the VGA controller

Server Security Features

Server security is important to prevent theft or accidental loss of software and hardware. The Prioris HX 5133MP Server provides the following levels of protection:

- ◆ Left and right security door lock—located at the front of the server.
- ◆ Left and right side panel lock—located at the rear of the server
- ◆ Administrative and user password
- ◆ Additional security features

Left and Right Door Security Lock

The server has a three-way keylock used to prevent unauthorized access to the left- and right-front security doors.

To unlock:

- 1) Insert key into keylock at bottom position.
- 2) Turn key clockwise to first unlock position to open left-front security door.
- 3) Turn key clockwise to second unlock position to open right-front security door.

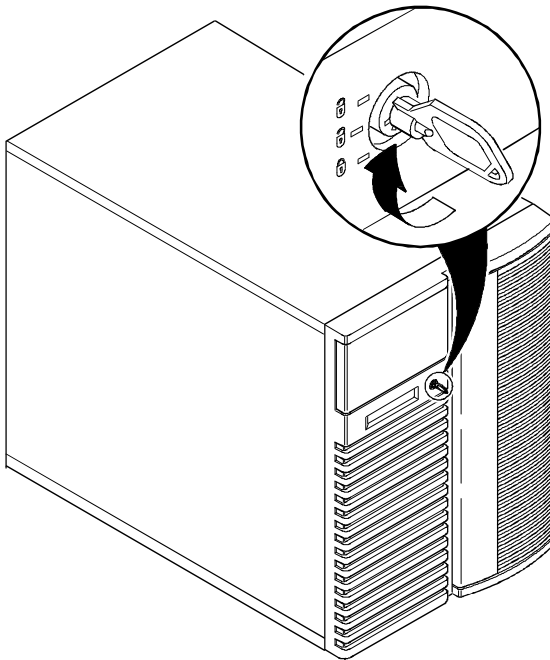


Figure 2 - 1 Front Panel Security Doors Lock

DEC00406

Administrator Password

The server has a password level that can be set to prevent unauthorized access to the server files. When setting a supervisor password, you will be prompted to enter it prior to accessing the SCU. If “Password On Boot” is enabled, you will be prompted to enter a password before the operating system boots.

Perform the following steps to set a supervisor password:

- 1) Turn on the server and allow the POST to complete.
If POST detects an error refer to *Chapter 4, “Troubleshooting,”* and take the appropriate steps to correct the problem. After the problem has been resolved, restart the server.
- 2) Start the SCU from the MS-DOS partition or insert the SCU diskette into drive A and soft boot (reset) the server.
- 3) Highlight the `Security Options Group` and then press [Enter].
- 4) Highlight the `Administrative Password` field and then press [Enter].
- 5) Select `Installed`.
- 6) Type in a supervisor password and then press [Enter].
To confirm, type in the supervisor password a second time and then press [Enter].
- 7) Highlight the `Password On Boot` field and select `Enabled` if desired.
- 8) Exit the SCU and reboot the server so changes immediately take effect.
The computer runs the POST and then prompts for the supervisor password to set.

If You Forget Your Password

Use the following procedure to erase a password from the server:

- 1) Turn off the server and remove the left side panel.
- 2) Change the switch S8C1 position 2 to password clear (on position).
Refer to “*Jumper and Switcher settings*” for switch location and setting.
- 3) Reconnect the server and turn it on.
Booting the server with this switch on erases the existing password(s).
- 4) Turn off the server and remove the left side panel.
- 5) Change the switch to its normal position (off position).
- 6) Reconnect the server and turn it on.
- 7) Using the SCU, assign a new password.

Chapter 3

Service Procedures

Safety Requirements

**WARNING**

Static electricity collects on non-conductors such as paper, cloth, or plastic. A static discharge can be damaging even though you often cannot see or feel it.

The following safety precautions must be observed to insure product and personal safety and prevent damage to circuit boards and/or components:

- ◆ Always wear an ESD wrist strap when handling ESD sensitive material. Be sure it is properly connected.
- ◆ Keep circuit boards and components away from non-conductors.
- ◆ Keep clothing away from circuit boards and components.
- ◆ Keep circuit boards in anti-static bags.
- ◆ Be cautious when AC power is exposed when working on an assembly.
- ◆ Always use an ISOLATION TRANSFORMER when diagnosing any terminals, monitors or power supplies when AC power is applied.
- ◆ Be cautious of very high voltage potentials when working with monitors.

There should be an approved insulating mat (for technician safety) in front of any workbench where monitors, terminals or power modules are being serviced when power is applied.

NOTE

Do NOT wear ESD straps when working on terminals, monitors or power supplies when AC power is applied. This is to avoid the hazard of electrical shock.

Recommended Tools

The following tools will be needed for servicing Digital PC systems. Note that test equipment must be in calibration.

- ◆ Multimeter (4 1/2 digit)
- ◆ A philips screwdriver
- ◆ An antistatic wrist strap

Other Needed Materials

Cleaning agent should be an all purpose cleaner that is used in-house.

Required Special Tools

None.

Remedial Diagnostic Test Software

- ◆ *QAPLUS/fe* , PC Advanced Diagnostic Software, latest version.
Partnumber : 22-00908-06

Recommended Virus Detection and Cleanup Software

- ◆ *F-PROT* , Virus Detection and Cleanup Software, latest version.

Network locations:

North America, South America, Australia and New Zealand:
MINOTR::USER6:[VIRUS.F-PROT]

Europe, Africa, Middle and Far East:
VARDAF::EUROPUB:[VIRUS_SCANNER.F-PROT]

ECO/FCO Information

BIOS version information.

Refer to the Digital DECpc Bulletin Board Support , for the latest information on BIOS upgrades

Network locations:

North America, South America, Australia and New Zealand:
PCBUHD::DKB300:[WC30.BBSFILES]

Europe, Africa, Middle and Far East:
SUTRA::D6:[PUBLIC].

Removing the Side Panels

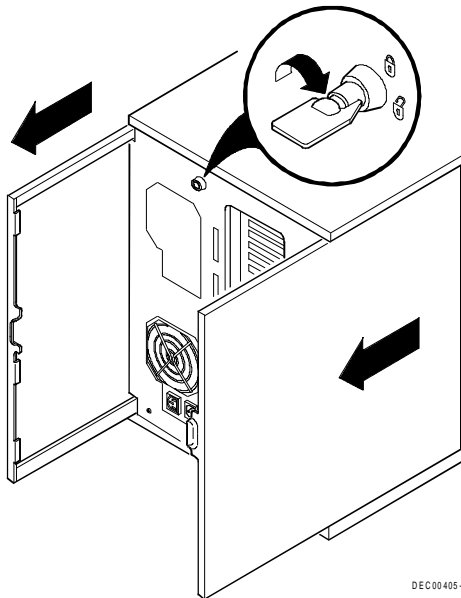
Before removing the side panel, perform the following:

- 1) Secure server using brake.
- 2) Turn off power to all external devices connected to server.
- 3) Turn server off.
- 4) Unplug power cord from wall outlet.
- 5) Disconnect power cord and monitor cord from server.



WARNING

Removing the side panels activates the power interlock switches located at the top-left and top-right of the server. These switches turn off power to the server. You might injure yourself or damage the server if attempt to bypass these switches.



To remove the side panel, perform the following:

- 1) Unlock side panel.
- 2) To remove the side panels, push them towards the rear of the server and then slide them off.

Figure 3 - 1 Unlocking and Removing the Side Panel

Server Components (left Side)

Legend	Component
A	CD-ROM drive
B	3½-inch diskette drive
C	Front access 5¼-inch half-height drive bays
D	3-way security lock
E	Integral hot-swap device bay for storage building blocks (SBBs)
F	Power, OCP, and reset buttons
G	Operator control panel (OCP)
H	Power indicator
I	Cooling fans
J	CPU module 1 (CPU 1)
K	Casters
L	Expansion board slots: four ISA/EISA and three PCI and two ISA/PCI combo slots
M	Memory module 1 (MEM 1)
N	CPU module 2 (CPU 2)
O	Main logic board
P	Power switch interlock
Q	Brake
R	Redundant fans
S	Memory module 2 (MEM 2)
T	Power fan and control board (inside server between fans and front bezel)

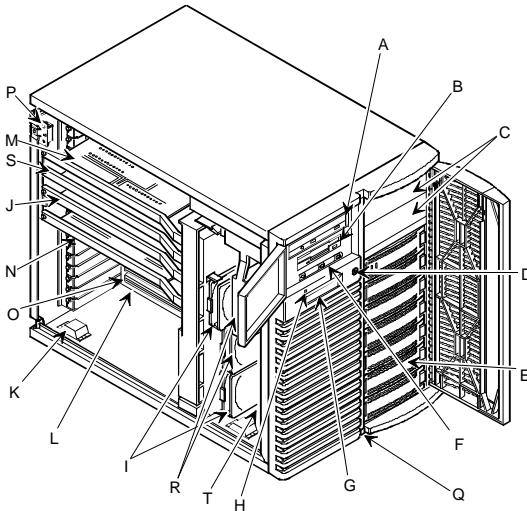


Figure 3 - 2 Server Components (Left Side)

DEC00725-2

Server Components (Right Side)

Legend	Component
A	Keylock
B	SCSI knockouts (back panel)
C	Keyboard (left) and mouse (right) ports
D	Parallel port (right)
E	Video port (left)
F	Serial port 1 (right) serial port 2 (left)
G	Monitor plug
H	AC power plug
I	Secondary rear cooling fan or redundant power supply
J	Power interlock switch
K	Power supply
L	Storage backplane SCSI terminator
M	Storage backplane
N	Jumper cable
O	Power plug
P	68-pin SCSI connector

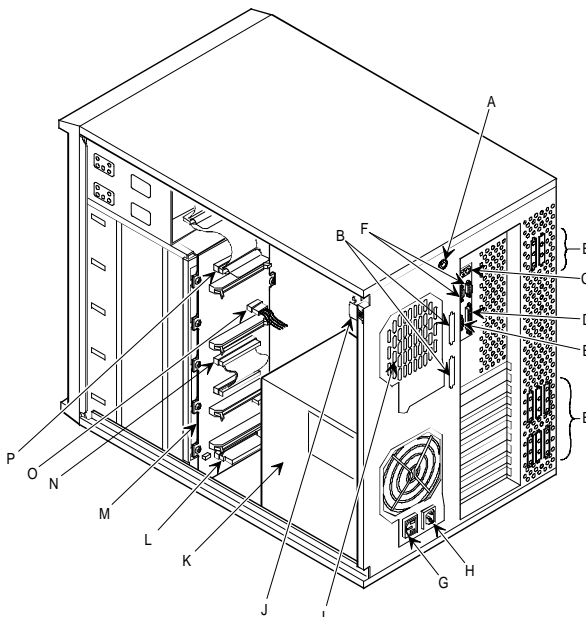


Figure 3 - 3 Server Components (Right Side)

DEC00736-2

Components and Connectors

Main Logic Board Components and Connectors

<i>Legend</i>	<i>Components</i>
A	6-pin power connectors (PS3 and PS4)
B	+3.3 V dc power connector (PS5)
C	12-pin power connector (PS1 and PS2)
D	Power supply enable connector
E	Diskette drive connector
F	Power fan and control board connector
G	Memory slot 1 connector (primary)
H	Memory slot 2 connector (expansion)
I	CPU module slot 1 connector (primary)
J	CPU module slot 2 connector (secondary)
K	Wide SCSI channels A (right) and B (left) connectors
L	EISA master expansion board slot 6 (M6)
M	PCI expansion board slots (P2-1 and P2-2)
N	PCI +3.3 V dc power connector (PS6)
O	EISA master expansion board slots 1-5 (M1-M5)
P	PCI expansion board slots (P1-1, P1-2, and P1-3)
Q	Video memory socket
R	Parallel port (top) and VGA port (bottom) connectors
S	Serial ports 1 (top) and 2 (bottom) connectors
T	PS/2-compatible keyboard (bottom) and mouse (top) connectors
U	Real-time Clock (RTC)
V	26-pin VGA feature connector (output only)

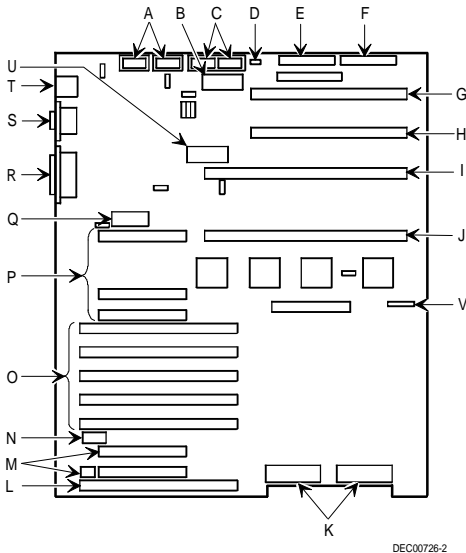


Figure 3 - 4 Main Logic Board Components / Connectors

CPU Module Components and Connectors

<i>Legend</i>	<i>Component</i>
A	CPU voltage regulator
B	Cache chips
C	CPU LIF socket (tool necessary)
D	Multi Processor Bus interface.

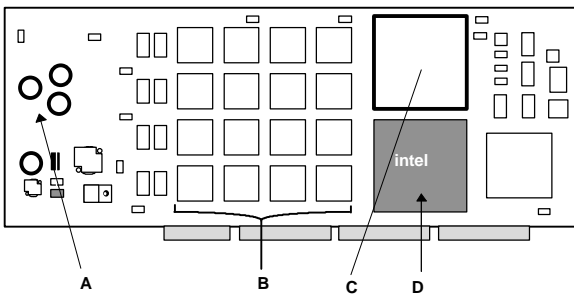


Figure 3 - 5 CPU Module Components and Connectors

Power Fan and Control Board Connectors

Legend	Component
A	Power connector
B	Doorlock 2 connector
C	Doorlock 1 connector
D	Fan 1 connector
E	Fan 2 connector
F	Fan 3 connector
G	MLB2 connector
H	Fan 4 connector
I	MLB1 connector
J	RSM connector
K	Main logic board control and data connector
L	OCP connector

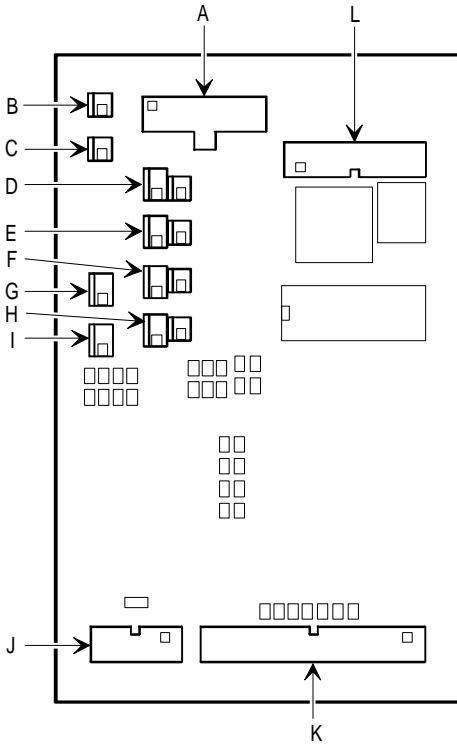


Figure 3 - 6 Power Fan and Control Board Connectors

DEC00798-2

Expansion Slots

The Prioris ZX 5000 MP Series Server’s main logic board contains 11 expansion board slots for installing up to nine EISA or PCI expansion boards. Six of the slots support industry-standard 32-bit EISA expansion boards. Bus ownership occurs in this EISA slot sequence: M1, M2, M3, M4, M5, M6, M1, M2, etc. The remaining five expansion slots support 32-bit PCI local bus expansion boards.

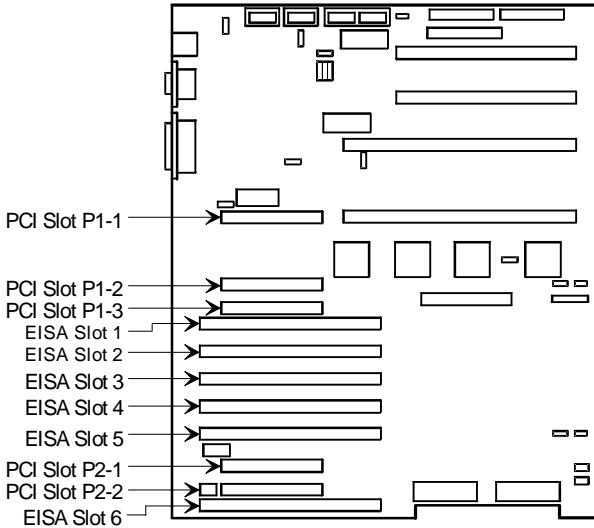


Figure 3 - 7 Prioris ZX 5000 MP Series Server Expansion Board Slots

The server’s EISA bus provides:

- ◆ 32-bit memory addressing
- ◆ Type A transfers at 5.33 MB per second
- ◆ Type B transfers at 8 MB per second
- ◆ Burst transfers at 33 MB per second
- ◆ 8-, 16-, or 32-bit data transfers
- ◆ Automatic translation of bus cycles between EISA and ISA masters
- ◆ Interrupt sharing

Slot Designation	Description
EISA slot 1 (M1)	Supports extended industry-standard 32-bit EISA expansion boards Designated as a shared slot with PCI slot P1-3 ⁽¹⁾
EISA slots 2 through 5 (M2-M5)	Supports extended industry-standard 32-bit EISA expansion boards
EISA slot 6 (M6)	Supports extended industry-standard 32-bit EISA expansion boards Designated as a shared slot with PCI slot P2-2 ⁽¹⁾

⁽¹⁾ Only one expansion board can reside in EISA slot 1 and 6 or PCI slot P1-3 and P2-2 at any one time. These slots have to share the expansion slot opening at the rear panel.

The five PCI bus slots on the main logic board support bus mastering 32-bit PCI expansion boards for performance enhancement.

NOTE One of the PCI slots (P1-1) is in line with a CPU module slot (CPU 2). When installing a CPU module in this slot, the PCI slot cannot be used.

The PCI bus provides:

- ◆ 32- and 64-bit memory addressing
- ◆ +5 V dc and +3.3 V dc signaling environments
- ◆ Burst transfers at 133 MB per second
- ◆ 8-, 16-, or 32-bit data transfers
- ◆ Plug-and-play configuration
- ◆ PeerBus to maximize throughput

<i>Slot Designation</i>	<i>Description</i>
PCI slots P1-1, P1-2	Supports bus mastering 32-bit PCI expansion boards
PCI slot P1-3	Supports bus mastering 32-bit PCI expansion boards Designated as a shared slot with EISA slot 1 ⁽¹⁾
PCI slot P2-1	Supports bus mastering 32-bit PCI expansion boards
PCI slot P2-2	Supports bus mastering 32-bit PCI expansion boards Designated as a shared slot with EISA slot 6 ⁽¹⁾

⁽¹⁾ Only one expansion board can reside in EISA slot 1 and 6 or PCI slot P1-3 and P2-2 at any one time. These slots have to share the expansion slot opening at the rear panel.

NOTE Read the optional expansion board's documentation before running the SCU and before installing it

Jumpers and Switches

Main Logic Board Jumpers and Switches

The following table lists the main logic board switches/jumpers and factory-default settings.



CAUTION

Do not touch any electronic component unless you are safely grounded. Wear a grounded wrist strap or touch an exposed metal part of the system box chassis. A static discharge from your fingers can result in permanent damage to electronic components.

Switch	Description	Setting	Description
S8C1-1	Clear CMOS Protect CMOS ⁽¹⁾	SW1, On SW1, Off ⁽¹⁾	Keep this switch in the factory default (OFF) position at all times and only use when instructed by a Digital service representative. Unauthorized use can cause the server to operate incorrectly.
S8C1-2	Clear password Enable password ⁽¹⁾	SW2, On SW2, Off ⁽¹⁾	If you forget your password, set this switch to (ON) and then restart the server. Refer to Chapter 2, “ <i>Server Utilities & Configuration</i> ” for more information.
S8C1-3	Enable flash write ⁽¹⁾ Disable flash	SW3, On ⁽¹⁾ SW3, Off	The main logic board’s flash upgrade switch must be set to (disable flash) to prevent unauthorized personnel from loading a new server BIOS. Loading a new server BIOS might allow someone to override other server security features or introduce a virus into the server.

⁽¹⁾ Factory default setting

The table below shows the jumper settings:

Jumper	Description	Setting	Description
Test development vehicle	Enable ⁽¹⁾ Disable	J4H1, pins 1 and 2 ⁽¹⁾ J4H1, pins 2 and 3	Enables to install and use a TDV module in slot CPU2.
Video Sleep	Register 46E8 Register 3C3 ⁽¹⁾	J6A1, pins 1 and 2 J6A1, pins 2 and 3 ⁽¹⁾	After a period of keyboard inactivity, the video sleep register blanks out the monitor. You must enter a password to reactivate the monitor and keyboard.
Program boot block	Disable ⁽¹⁾ Enable	J7C1, pins 1 and 2 ⁽¹⁾ J7C1, pins 2 and 3	Set this jumper to disable to prevent unauthorized personnel from changing the BIOS boot block.
Boot block	Disable ⁽¹⁾ Enable	J7D2, pins 1 and 2 ⁽¹⁾ J7D2, pins 2 and 3	If the BIOS upgrade failed, refer to the README.TXT file that came with the BIOS upgrade.
Floppy drive 1 (FD1)	1.44 MB ⁽¹⁾ 2.88 MB	J9B1, pins 1 and 2 ⁽¹⁾ J9B1, pins 2 and 3	Enables to configure the diskette drive port for 2.88 MB drives that support automatic size detection.
Floppy drive 0 (FD0)	1.44 MB ⁽¹⁾ 2.88 MB	J9C1, pins 1 and 2 ⁽¹⁾ J9C1, pins 2 and 3	Enables to configure the diskette drive port for 2.88 MB drives that support automatic size detection.
Power control	Enable ⁽¹⁾ Disable	J9C3, pins 1 and 2 ⁽¹⁾ J9C3, pins 2 and 3	Enables power supply maintenance voltage control using the RTC.

(1) Factory default setting

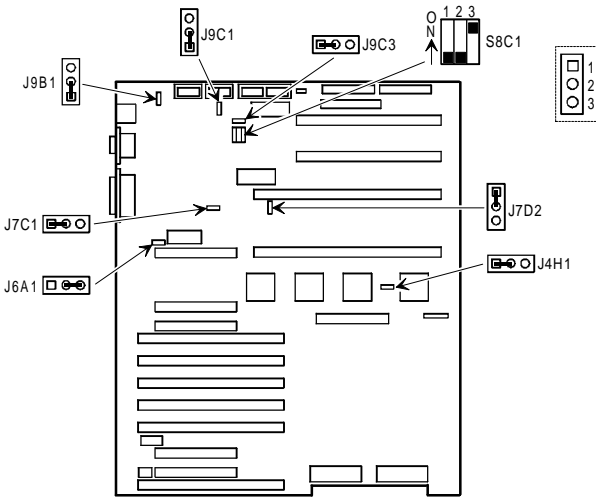
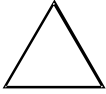


Figure 3 - 8 Main Logic Board Jumper Locations

CPU Module Jumper Settings

There are no jumpers on the CPU board.



CAUTION

Do not touch any electronic component unless you are safely grounded. Wear a grounded wrist wrap or touch an exposed metal part of the server's chassis.

Supported CPU and Memory configurations

Supported Common Configurations

CPU Slot 1	CPU Slot 2	MEM Slot 1	MEM Slot 2
Pentium processor module	None	64-bit ECC	None
None	Pentium processor module	64-bit ECC	None
Pentium processor module (same MHz)	Pentium processor module (same MHz)	64-bit ECC	None
Pentium processor module (same MHz)	Pentium processor module (same MHz)	64-bit ECC	64-bit ECC
Dual Pentium processor module	None	64-bit ECC	None
Dual Pentium processor module (same MHz)	Dual Pentium processor module (same MHz)	64-bit ECC	None
Dual Pentium processor module (same MHz)	Dual Pentium processor module (same MHz)	64-bit ECC	64-bit ECC
Dual Pentium processor module (same MHz)	Pentium processor module (same MHz)	64-bit ECC	None
Dual Pentium processor module (same MHz)	Pentium processor module (same MHz)	64-bit ECC	64-bit ECC
Pentium processor module (same MHz)	Dual Pentium processor module (same MHz)	64-bit ECC	None
Pentium processor module (same MHz)	Dual Pentium processor module (same MHz)	64-bit ECC	64-bit ECC
None	P6 module	64-bit ECC	64-bit ECC
None	Dual P6 module	64-bit ECC	64-bit ECC

NOTE Due to height limitations, do not install SIMMs taller than one inch. Installing SIMMs taller than one inch can interfere with an adjacent CPU module or memory module.

Removing and Replacing a Memory Module

The server comes with a single memory module installed in the primary (MEM 1) slot. The memory module supports up to 384 MB of memory, a 64-bit memory interface, and 2-way interleaving. The server's overall performance can be increased by adding memory to the existing memory module or by installing an additional memory module in the memory expansion (MEM 2) slot. Adding a second memory module enables the server to support up to 768 MB of memory.

NOTE Due to height limitations, do not install SIMMs taller than one inch. Installing SIMMs taller than one inch can interfere with an adjacent CPU module or memory module.

Also, make sure to completely fill the primary memory module (MEM 1 slot) before installing a second memory module in the memory expansion (MEM 2 slot).

The following procedure can be used to remove and replace any memory module.

- 1) Turn off the server.
- 2) Disconnect external devices, ac power, and monitor power.
- 3) Unlock and remove left side panel.
- 4) Remove memory module retaining bracket.
- 5) Carefully remove memory module from main logic board and place it on an antistatic surface.
- 6) Add additional server memory onto existing memory module.
Refer to "*Installing Additional Server Memory*" for more information.
- 7) Replace memory module and secure with retaining bracket.
- 8) Replace and lock left side panel.
- 9) Connect external devices and restore power.
- 10) Run the SCU to configure the server for the additional amount of memory.

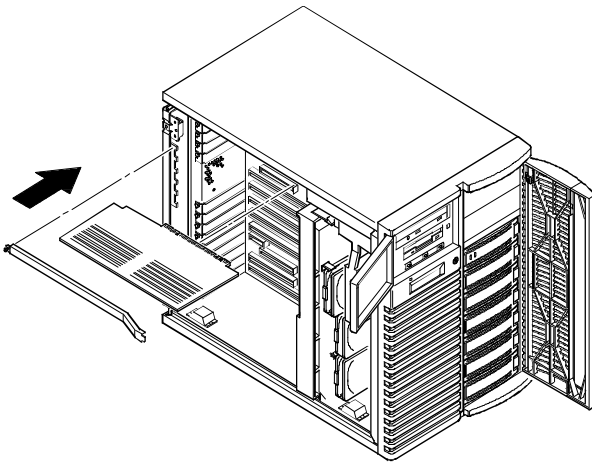


Figure 3 - 9
Removing/Installing a
Memory Module

DEC00727-3

Installing Additional Server Memory

Adding more memory to the existing memory module or installing an additional memory module enables the server to run larger, more complicated software and run it quicker.

Each memory module contains three sets of memory banks (banks 1 through 3). Each bank consists of four SIMM sockets. The server comes with at least 32 MB of memory installed in bank 1.

When adding additional memory make sure to:

- ◆ Install 36-bit SIMMs having an access time of 80 ns or less.
- ◆ Fill one bank (four sockets) at a time using the same SIMM size, type, and speed (8 MB, 16 MB, and 32 MB densities are available).
- ◆ Fill bank 1 before bank 2 and banks 1 and 2 before bank 3.



CAUTION

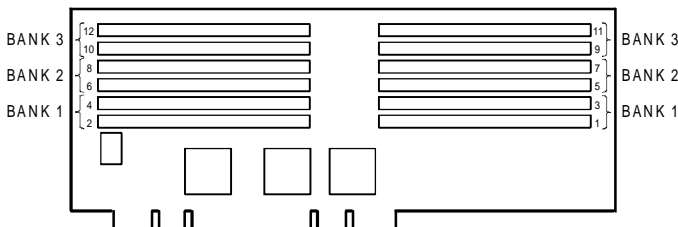
Mixing dissimilar metals might cause SIMM failure. Install SIMMs with tin-lead alloy plated edge connectors only in tin-lead alloy plated sockets. Install SIMMs with gold-lead alloy plated edge connectors only in gold-lead alloy plated sockets.

Refer to “*Memory Configurations*” for a list of SIMM combinations supported by the Prioris ZX 5000 MP Series Servers and to “*Installing a SIMM*” for detailed instructions on installing SIMMs.

In addition, the physical memory addresses shift depending on the SIMM size and the number of sockets filled on the ECC memory module. Starting with bank 1, address 0 is always in the last row of SIMM-filled sockets.

For example:

- ◆ When installing SIMMs in only sockets 1-4, then memory address 0 is in sockets 3 and 4 of bank 1.
- ◆ When installing SIMMs in sockets 1-8, then memory address 0 shifts to sockets 7 and 8 of bank 2.
- ◆ When installing SIMMs in sockets 1-12, then memory address 0 shifts to sockets 11 and 12 of bank



DEC00728

Figure 3 - 10 SIMM Socket Locations and Bank Designations

Memory Configurations

The following table lists the SIMM combinations supported by the Prioris ZX 5000 MP Series Server for the primary memory module. This table also applies to a second memory module that can be installed in the memory expansion (MEM 2) slot.

Bank 1 (sockets 1-4)	Bank 2 (sockets 5-8)	Bank 3 (sockets 9-12)	Total Memory
8 MB			32 MB
8 MB	8 MB		64 MB
16 MB			64 MB
8 MB	8 MB	8 MB	96 MB
16 MB	16 MB		128 MB
32 MB			128 MB
16 MB	16 MB	16 MB	192 MB
32 MB	32 MB		256 MB
32 MB	32 MB	32 MB	384 MB

Installing a SIMM

To install a SIMM, perform the following:

- 1) Turn off the server.
- 2) Disconnect external devices, ac power, and monitor power.
- 3) Unlock and remove left side panel.
- 4) Remove memory module retaining bracket and memory module (see Figure 3 - 11).
- 5) Orient notched edge of SIMM (A, Figure 3 -11) so its facing toward center of memory module. The small notch at middle of bottom edge of SIMM mates with raised area in SIMM socket.
- 6) Position SIMM at a 45 degree angle relative to socket on memory module (A, Figure 3 - 12).
- 7) Beginning with bank 1 (sockets 1-4), insert bottom edge of SIMM into socket. Rock SIMM gently until it completely engages bottom of socket. Tip SIMM upright until both retaining clips engage (B, C, Figure 3 - 12).
- 8) Replace memory module (component side down)and secure with retaining bracket.
- 9) Replace and lock left side panel.
- 10) Connect external devices and restore power.
- 11) Run the SCU to configure the server for the additional memory.

Refer to *Chapter 2, "Server Utilities & Configuration"* for information on running the SCU.

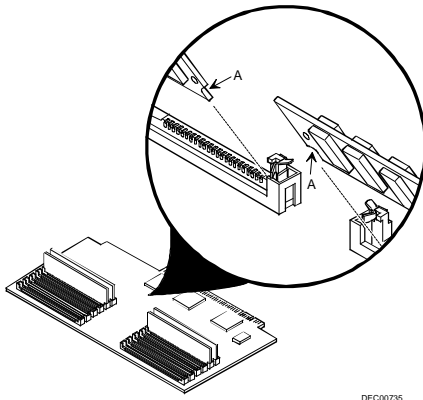
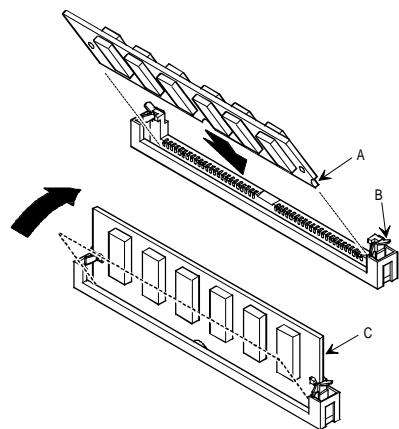


Figure 3 - 11 SIMM Orientation

Figure 3 - 12 Installing a SIMM



DEC00729-2

Storage Installation

Installing a Half-Height 5¼-Inch Device into the Top-Right Drive Bay

To install a half-height 5¼-inch device into one of the top-right drive bay slots, perform the following:

- 1) Turn off the server.
- 2) Disconnect external devices, ac power and monitor power.
- 3) Unlock and remove side panels.
- 4) Unlock and open door.
- 5) Remove plastic filler panel by pushing it out from inside server.
- 6) Remove bracket from drive bay (inside, left) and attach it to device.
- 7) Insert device into drive bay slot from front.
- 8) Secure device to slot using supplied mounting screws.
- 9) If applicable, replace plastic filler panel.

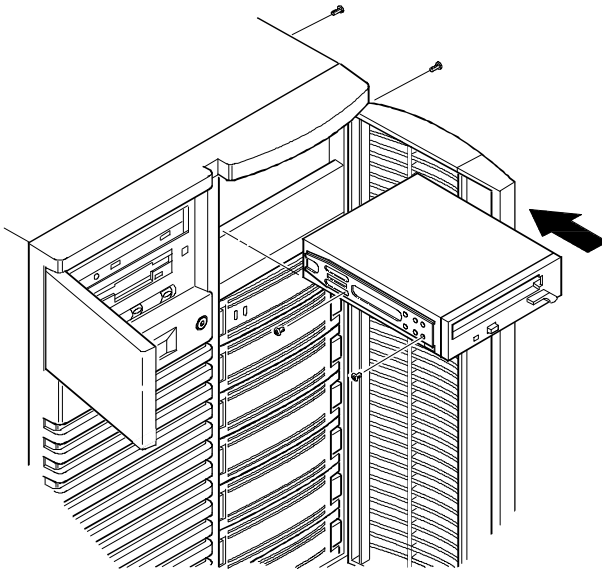


Figure 3 - 13 Installing a Half-Height 5¼-Inch Device Into Top-Right Drive Bay

DEC00409-2

Installing a Full-Height 5¼-Inch Device into the Top-Right Drive Bay

To install a full-height 5¼-inch device into the top-right drive bay slots, perform the following:

- 1) Turn off the server.
- 2) Disconnect external devices, ac power and monitor power.
- 3) Unlock and remove side panels.
- 4) Unlock and open door.
- 5) Remove both plastic filler panels by pushing them out from inside server.
- 6) Remove bottom brackets from inside of drive bay and attach them to device.
- 7) Remove divider bracket from right side of drive bay (A, Figure 3 - 14).
- 8) Insert device into drive bay from front.
- 9) Secure device using the four supplied mounting screws.
- 10) Replace plastic filler panels.

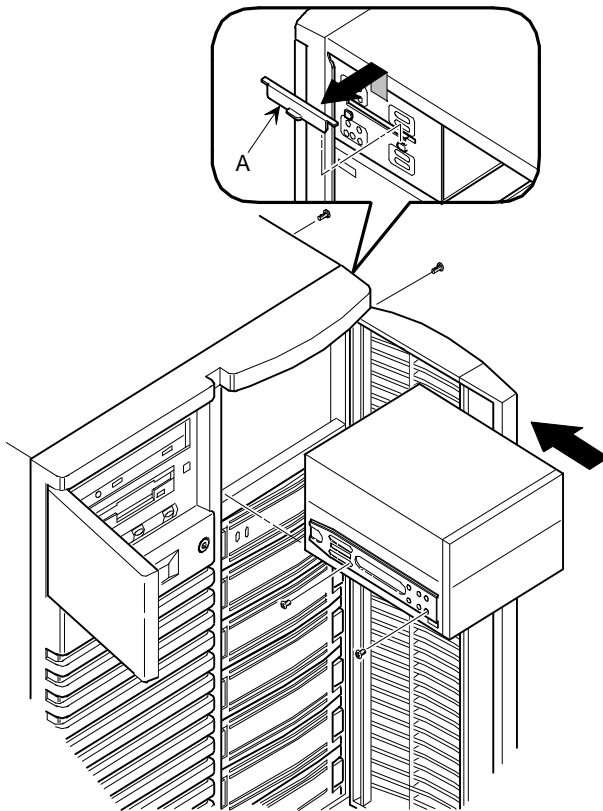


Figure 3 - 14 Installing a Full-Height 5¼-Inch Device Into Top-Right Drive Bay

DEC00634-2

Expansion Brackets

Install 3½-inch half-height devices in the top-right drive bay. When planning to install a 3½-inch device in a 5¼-inch drive bay slot, first install expansion brackets onto the device. Expansion brackets are either supplied with the device or can be purchased from Digital.

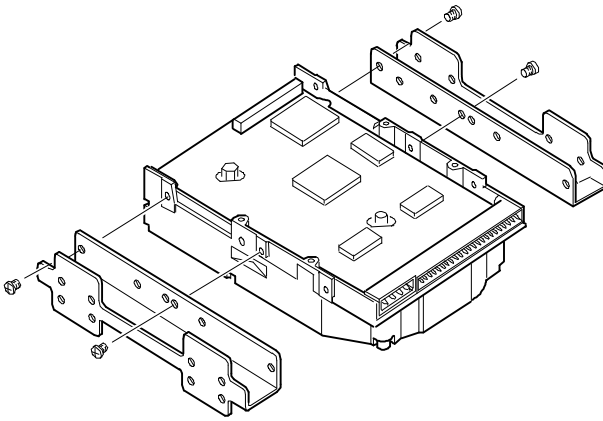


Figure 3 - 15 Installing Expansion Brackets

DEC00723

Installing an Optional Power Supply

To increase the server's reliability, a second power supply can be added. Each power supply provides uninterrupted backup should one power supply fail.

To install an optional power supply, perform the following:

- 1) Turn off the server.
- 2) Disconnect external devices, ac power, and monitor power.
- 3) Unlock and remove right side panel.
- 4) Remove secondary rear cooling fan.
- 5) Install optional power supply making sure it fully engages two locking tabs on inside (center plane) wall of chassis.
Secure power supply to rear of chassis.
- 6) Connect remaining power cables from the wiring harness in same manner as lower power supply.
- 7) Replace and lock left side panel.
- 8) Connect external devices and restore power.

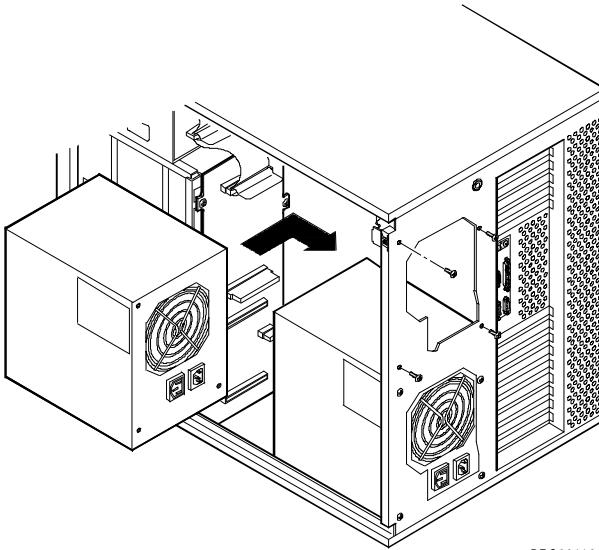


Figure 3 - 16 Installing an Optional Power Supply

DEC00419-2

Upgrade Procedures

Upgrading the CPU Module Configuration

The Prioris ZX 5000 MP Series Server one or two (1P, 2P) processor configurations include a single CPU module. The Prioris ZX 5000 MP Series Server three or four (3P, 4P) processor configurations include two CPU modules.

The following procedure can be used to upgrade 1P or 2P CPU modules to 3P or 4P CPU modules:

- 1) Turn off the server.
- 2) Disconnect external devices, ac power, and monitor power.
- 3) Unlock and remove left side panel.
- 4) Install the new CPU module and secure with retaining bracket in CPU slot 2.
- 5) Replace and lock left side panel.
- 6) Connect external devices and restore power.
- 7) Run the SCU to configure the server for the new CPU module(s).

Refer to *Chapter 2, "Server Utilities & Configuration"* for information on running the SCU
See previous section supported CPU configurations.

NOTE The server will not power up with the side panel removed.

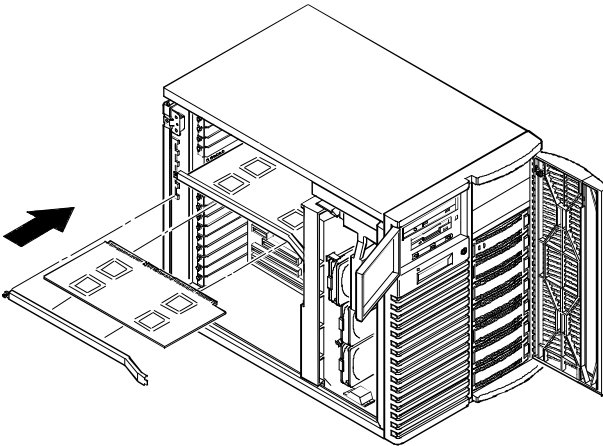


Figure 3 - 17 Installing a CPU Module

Part Removal and Replacement Procedures

Replacing a Device Into the Hot-Swap Drive Bay

Hot-swapping allows to remove or install an SBB (Storage Building Block) while the server remains online and active, eliminating interference with the server's operation. For SBBs, the hot-swap method can be used to replace a device providing that the device is not active (green activity LED is off).

NOTE Not all SCSI host adapters support the hot-swap method. Refer to the SCSI host adapter documentation to determine if the hot-swap method is supported. Also, it might be necessary to reconfigure the server to recognize the devices that is installed.

Use the following procedure to replace an SBB:

- 1) Unlock and open door.
- 2) Remove filler panel or SBB by pressing the two tabs together to pull filler panel or SBB out.
- 3) Insert SBB into the guide slots and push it in until it is fully seated and the mounting tabs engage the shelf.
- 4) Close and lock door.

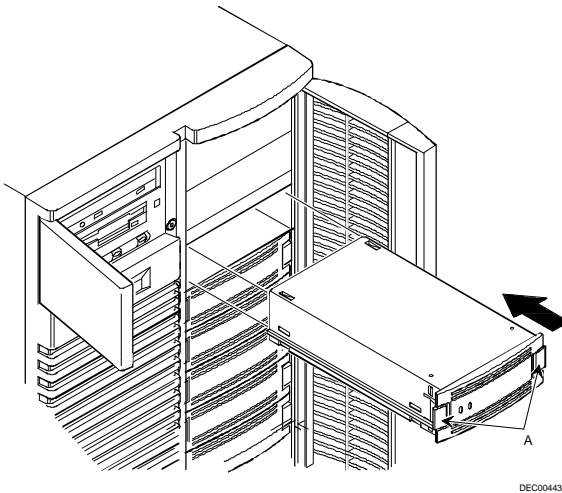


Figure 3 - 18 Installing a Device Into the Hot-Swap Drive Bay

Replacing the Server's Battery/Real Time Clock (RTC)



CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions

The server's battery runs the server clock and retains any setup information when it is turned off. If the server ever fails to retain the correct date, time, or configuration settings when it is turned on, it is necessary to replace the server's battery.

To replace the server battery, perform the following:

- 1) Turn off the server.
- 2) Disconnect external devices, ac power, and monitor power.
- 3) Unlock and remove left side panel.
- 4) Remove old battery.
- 5) Install new battery. Make sure pin 1 of the battery is aligned with pin one on the socket (A, Figure 3-11).
- 6) Replace and lock left side panel.
- 7) Connect external devices and restore power.
- 8) Run the SCU to restore the configuration settings to the RTC.
- 9) Refer to *Chapter 2, "Server Utilities & Configuration"* for information on running the SCU.



WARNING

Depending on your locality, the server's battery might be considered hazardous waste. Make sure you follow any state or local statute to properly dispose of the old battery

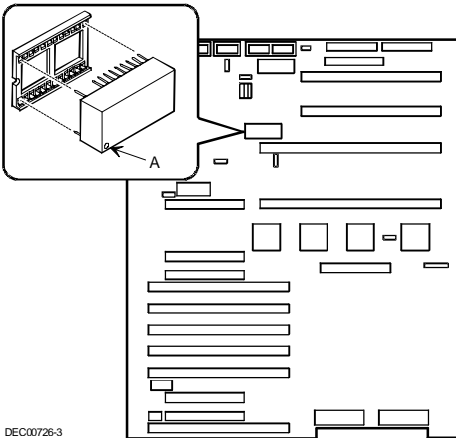


Figure 3 - 19 Replacing the Server Battery

DEC00726-3

Replacing the Secondary Rear Cooling Fan

Replace the secondary rear cooling fan as follows:

- 1) Turn off the server, disconnect external devices, ac power, and monitor power.
- 2) Unlock and remove the right side panel.
- 3) Disconnect fan's 15-pin power cable from the power harness.
- 4) Remove screws securing cooling fan and metal plate to rear of server.
Remove cooling fan and metal plate.
- 5) Install new cooling fan and metal plate.
Secure using screws removed in step 4.
- 6) Connect the fan's 15-pin power cable to the power harness.
- 7) Replace and lock right side panel.
- 8) Connect external devices and restore power.

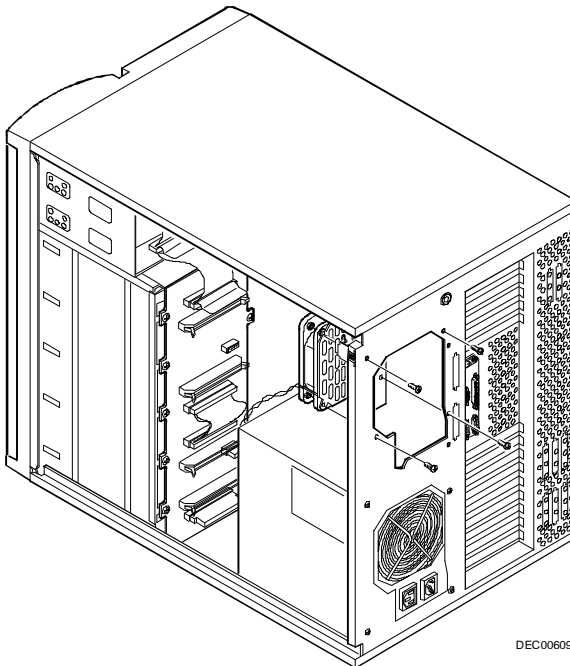


Figure 3 - 20 Replacing the Secondary Rear Cooling Fan

Mass Storage Devices

The server has three drive bay areas. Mass storage devices such as SCSI hard disk drives, floppy diskette drives, SCSI CD-ROM drives, and SCSI tape backup systems are installed in these drive bay areas.

The three drive bay areas are:

- ◆ Left-front access drive bay area—This area has one 5¼-inch SCSI CD-ROM drive and one 3½-inch diskette drive (standard on all Prioris ZX 5000 MP Series Servers).
- ◆ Top-right front access drive bay area—This area has room for two wide (68-pin) or narrow (50-pin) 5¼-inch or 3½-inch half-height SCSI devices or one full-height, 5¼-inch device .
- ◆ Lower-right front access drive bay area—This area has room for seven 3½-inch, wide or narrow Fast SCSI-2, hot-swap devices.

Onboard SCSI Controllers

The main logic board includes two Adaptec® AIC-7870 wide/fast SCSI-2 controller chips—channels A and B—integrated as PCI bus masters. These controllers support data path widths of 8-bit (narrow SCSI) at a data transfer rate of 10 MB/sec and 16-bit (wide SCSI) at a data transfer rate of 20 MB/sec. As PCI bus masters, these controllers support data transfer rates of 133 MB/sec.

You can connect up to seven 8-bit narrow SCSI devices or up to fifteen 8-bit fast and/or 16-bit wide SCSI devices (as long as no more than seven 8-bit fast devices are used), with one controller to each channel. For example, tape drives, printers, optical media drives, and other devices.

The SCSI controller provides active negation outputs, controls for external differential transceivers, a disk activity output, and a SCSI terminator power-down control.

Active negation outputs reduce the chance of data errors by actively driving both polarities of the SCSI bus and avoiding indeterminate voltage levels and common-mode noise on long cable runs. The SCSI output drivers can directly drive a 48 mA, single-ended SCSI bus with no additional drivers.

No additional logic, termination, or resistor loads are required to connect up to seven 8-bit narrow SCSI devices or up to fifteen 16-bit wide SCSI devices to each SCSI-2 channel on the main logic board.

SCSI Configuration Guidelines

The server configuration, SCSI adapter(s), and all SCSI devices must work together for optimum performance.

When installing SCSI devices, use the following guidelines:

- ◆ The last physical SCSI devices on each end of the SCSI bus must be terminated. The server is supplied with the necessary cables and terminators. If the SCSI device came with terminators installed, the terminator has to be removed or disabled from the device before completing the installation.
Refer to the SCSI device's manufacturer documentation for the terminator location.
- ◆ Each SCSI device (including the SCSI controller) must be configured with a unique ID number. SCSI controllers usually default to ID 7. The SCSI CD-ROM drive defaults to ID 5. Use the remaining IDs 0 through 4 and 6 (narrow and wide adapters) and 8 through 15 (wide adapters only) to configure hard disk drives and other SCSI devices. Hard disk drives should be configured to start with SCSI ID 0 and the lower ID numbers. Also, note that the storage backplane has pre-configured ID settings.
Refer to "*SCSI Drive IDs*" later in this chapter.
- ◆ SCSI device drivers are required to operate the SCSI devices. The SCSI device drivers are located on the supplied CD-ROM disk. These SCSI device drivers can be copied onto diskettes using the ServerWORKS Quick Launch program on the CD-ROM disk.
Refer to the Adaptec 7800 Family Manager Set User's Guide for more information.
- ◆ Use the SCSI*Select* configuration utility to check or change SCSI device settings.

SCSI Cables

The server is supplied with the following cables:

- ◆ One wide (68-pin) five connector cable assembly. This cable assembly includes:
 - ◆ One wide 68-pin connector to connect to the SCSI controller.
 - ◆ Three wide-to-narrow adapters to connect the narrow (50-pin) CD-ROM drive and the two 5.25" bay devices for SCSI operation.
 - ◆ One wide (68-pin) connector to connect the SCSI controller to Channel A of the hot-swap backplane (if required). A cable terminator is supplied if this connector is not used to connect to Channel A.
 - ◆ One 68-pin-to-68-pin jumper cable to connect the two hot-swap backplane segments together to make a single SCSI channel.
 - ◆ Two 68-pin internal backplane terminators (one for channel A and one for channel B).
 - ◆ Two additional wide cables with two 68-pin unshielded connectors to split the backplane.

SBB LED Status Indicators

The hot-swap backplane monitors shelf status to identify error conditions or failures. This status is displayed on the SBB LEDs. The left LED displays the device activity status and the right LED displays the fault status.

- ◆ The left LED (green) is the activity status LED and is on or flashing when the SBB is active.
- ◆ For RAID servers, the right LED (amber) is the SBB fault LED and indicates an error condition when it is either on or flashing.



CAUTION

For non-RAID servers, removing a SBB when the left LED is on or flashing can cause the loss or corruption of data.

SBB Status LEDs

<i>Activity Status LED</i>	<i>Fault Status LED</i>	<i>Indication</i>
On	Off	Device is operating properly.
Flashing	Off	Device is operating properly.
Off	Off	Device is inactive and operating normally. There is no fault.
On	On	Fault status, device is hung. Replace SBB.
Off	On	Fault status, device is inactive and spun down. Replace SBB.
On	Flashing	Fault status, device is active and spinning down due to a fault.

Connecting SCSI Devices

The server supports up to 10 internal SCSI devices. Additional SCSI devices can be added to the server by using the main logic board's SCSI B connector or by installing an EISA- or PCI-based SCSI controller installed in an available expansion slot in conjunction with an external SCSI expansion box.

Storage Backplane

The storage backplane supports seven hot-swap devices split between two SCSI bus sections (see Figure 3 - 21). SCSI bus A and SCSI bus B. SCSI bus A is the upper section and consists of four SCSI device connections. SCSI bus B is the lower bus section and consists of three SCSI device connections. These buses can be configured as two independent SCSI buses or as one SCSI bus by installing a wide SCSI jumper cable. (Figures 3 - 22 through 3 - 25 show the available cable configurations.

Contact the Digital sales representative for ordering information about SCSI cables and devices.

Figure Legend	Description
A	Wide SCSI connectors
B	Narrow SCSI connectors
C	Power connectors
J181 (W1, W2, and W3)	SCSI ID jumper block

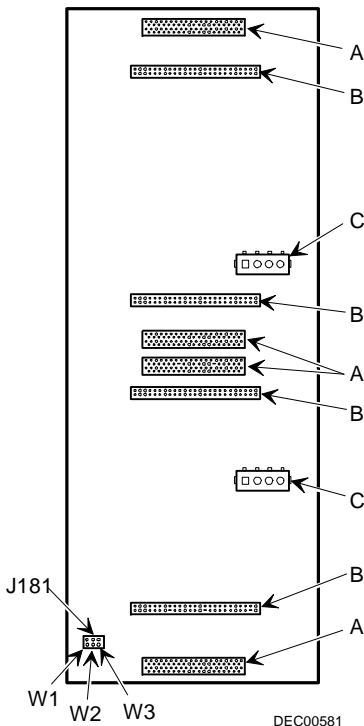


Figure 3 - 21 Storage Backplane

SCSI Drive IDs

SCSI bus device addresses are automatically assigned in the hot-swap drive bay depending on the slot number in which they are installed. The address jumper on the storage backplane is used to override the default addresses. The default settings are listed in the following table and can be set manually to different addresses at your option. The storage backplane can be configured as two separate SCSI buses or as a single SCSI bus using a jumper cable.

Note that:

- ◆ The SCSI ID addressing is independent of the single or dual SCSI bus arrangement. Make sure to select unique SCSI IDs for all SCSI devices on the SCSI bus.
- ◆ You must use a wide SCSI host adapter to set SCSI IDs greater than seven.
- ◆ The CD-ROM drive and tape IDs must be set manually. Refer to the manufacturer's documentation for information on setting drive IDs.

NOTE Narrow SCSI devices can be added to a wide SCSI bus, however, because of the ID settings, narrow devices take up two IDs selections on a wide bus.

Single/Dual SCSI Bus Target ID Settings

<i>SCSI Bus 1</i>								
<i>Jumpers Set</i>	<i>None</i>	<i>W1</i>	<i>W2</i>	<i>W3</i>	<i>W1+W2</i>	<i>W1+W3</i>	<i>W2+W3</i>	<i>W1+W2+W3</i>
SBB slot0 ID=	0	0	8	0	8	0	8	8
SBB slot1 ID=	1	1	9	1	9	1	9	9
SBB slot2 ID=	2	2	10	2	10	2	10	10
SBB slot3 ID=	3	3	11	3	11	3	11	11

<i>SCSI Bus 2 or Jumper Cable</i>								
<i>Jumpers Set</i>	<i>None</i>	<i>W1</i>	<i>W2</i>	<i>W3</i>	<i>W1+W2</i>	<i>W1+W3</i>	<i>W2+W3</i>	<i>W1+W2+W3</i>
SBB slot4 ID=	0	4	0	8	4	12	8	12
SBB slot5 ID=	1	5	1	9	5	13	9	13
SBB slot6 ID=	2	6	2	10	6	14	10	14

Single Channel SCSI Configuration

To connect SCSI devices to a single SCSI channel, perform the following:

- 1) Connect the SCSI cables as shown in Figure 3-22.
- 2) If using top 5¼-inch drive bay, connect appropriate power cable to device.
- 3) Replace and lock side panels.
- 4) Connect external devices and restore power.
- 5) Run *SCSISelect* to configure the server.
Refer to *Chapter 2, "Server Utilities & Configuration"* and to the SCSI documentation for additional configuration information.

NOTE Server's with this configuration are shipped with an additional terminator to enable to split the storage backplane

Legend	Component
A	Adaptec 7870 narrow/wide SCSI connector (SCSI bus A)
B	68-pin-to-50-pin adapter cable to CD-ROM drive
C	68-pin-to-50-pin adapter cable to top-right drive bay
D	Backplane, 68-pin connector
E	Terminator ⁽¹⁾
F	Jumper cable
G	External SCSI connector

⁽¹⁾ This terminator might be removed and replaced with a 68-pin wide cable to connect to an external SCSI device.

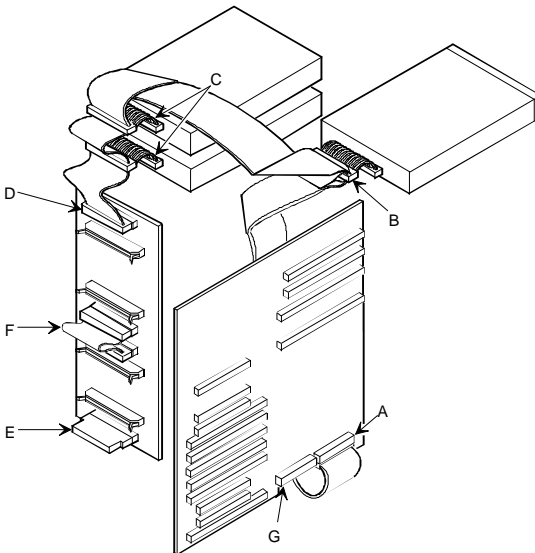


Figure 3 - 22 Single Channel SCSI Configuration

DEC00733-2

Two Channel SCSI Configuration

To connect SCSI devices to two separate SCSI channels, perform the following:

- 1) Connect the cables as shown in Figure 3-23.
- 2) If using top 5¼-inch drive bay, connect appropriate power cable to device.
- 3) Replace and lock side panels.
- 4) Connect external devices and restore power.
- 5) Run *SCSISelect* to configure the server.
Refer to *Chapter 2, "Server Utilities & Configuration"* and to the SCSI documentation for additional configuration information.

NOTE Server's with this configuration are shipped with an additional terminator to enable you to split the storage backplane.

Figure Legend	Component
A	Adaptec 7870 narrow/wide SCSI connector (SCSI bus A)
B	Adaptec 7870 narrow/wide SCSI connector (SCSI bus B)
C	Backplane terminator
D	Jumper cable
E	Backplane, 68-pin connector
F	Cable terminator
G	68-pin-to-50-pin adapter cable to top-right drive bay
H	68-pin-to-50-pin adapter cable to CD-ROM drive

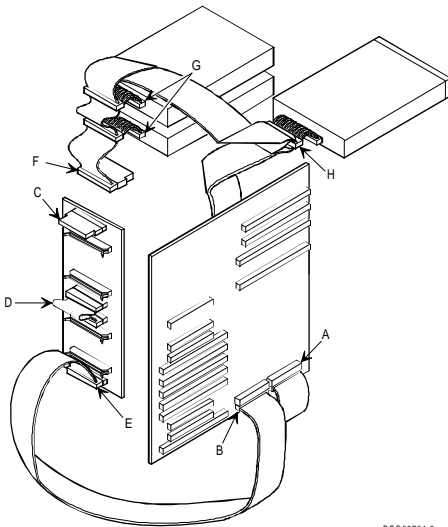


Figure 3 - 23 Two Channel SCSI Configuration

DEC00731-2

Single Channel SCSI and Single Channel RAID Configuration

To connect devices to a single channel SCSI and single channel RAID configuration, perform the following:

- 1) Connect the cables as shown in Figure 3 - 24.
- 2) If using top 5¼-inch drive bay, connect appropriate power cable to device.
- 3) Replace and lock side panels.
- 4) Connect external devices and restore power.
- 5) Run SCSI*Select* and/or RAID utilities to configure the server.
Refer Chapter 2, “*Server Utilities & Configuration*” and to the SCSI and RAID documentation for additional configuration information.

NOTE Server’s with this configuration are shipped with an additional terminator to enable you to split the storage backplane

<i>Legend</i>	<i>Component</i>
A	Adaptec 7870 narrow/wide SCSI connector (SCSI bus A)
B	Mylex RAID controller (channel 1)
C	Adaptec 7870 narrow/wide SCSI connector (SCSI bus B)
D	Backplane terminator
E	Jumper cable
F	Backplane, 68-pin connector
G	Cable terminator
H	68-pin-to-50-pin adapter cable to top-right drive bay
I	68-pin-to-50-pin adapter cable to CD-ROM drive
J	External SCSI connector

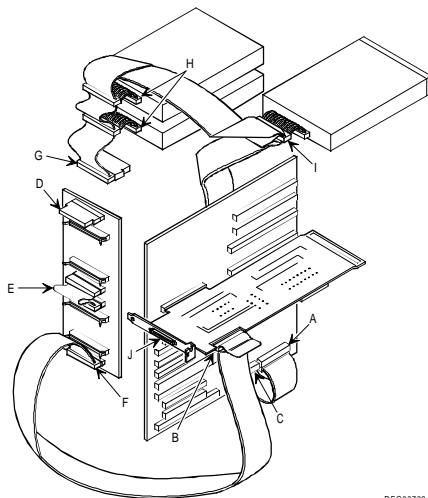


Figure 3 - 24 Single Channel SCSI and Single Channel RAID Configuration

DEC00732-2

Single SCSI and Dual RAID Channel Configuration

To connect devices to a single channel SCSI and a dual channel RAID configuration, perform the following:

- 1) Connect the SCSI cables as shown in Figure 3 - 25.
- 2) If using top 5¼-inch drive bay, connect appropriate power cable to device.
- 3) Replace and lock side panels.
- 4) Connect external devices and restore power.
- 5) Run *SCSISelect* and/or RAID utilities to configure the server.
Refer to *Chapter 2, "Server Utilities & Configuration"* and to the SCSI and RAID documentation for additional configuration information.

Legend	Component
A	Adaptec 7870 narrow/wide SCSI connector (SCSI bus A)
B	External SCSI connector
C	68-pin-to-50-pin adapter cable to CD-ROM drive
D	68-pin-to-50-pin adapter cable to top-right drive bay
E	Cable terminator
F	Mylex RAID controller (channel 1)
G	Mylex RAID controller (channel 0)
H	Backplane terminator
I	Backplane, 68-pin connector

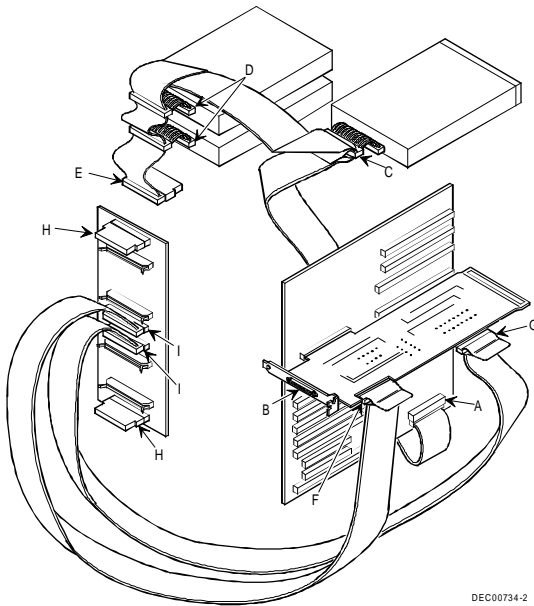


Figure 3 - 25 Single Channel SCSI and Dual Channel RAID Configuration

DEC00734-2

Using Multiple or Multi-Channel SCSI Controllers

The following guidelines apply when configuring the server using multiple or multi-channel SCSI controllers:

- ◆ The SCSI controller with the lowest BIOS address is identified by the server as the “primary” SCSI controller. When loading the operating system from a SCSI hard disk drive, this primary or boot drive must be connected to the primary SCSI controller. The SCSI address of the primary SCSI hard disk drive must be set to the lowest SCSI address connected to the SCSI controller.
- ◆ To improve server performance, you might want to distribute the SCSI devices across the SCSI controllers. When arranging SCSI devices, make sure each device connected to a SCSI controller is assigned a unique SCSI address.
- ◆ Each operating system has different limitations regarding the number of SCSI controllers that are supported. Refer to the operating system documentation for additional information.
- ◆ SCSI IDs on one channel do not interfere with the IDs on another channel. This applies when using two SCSI controllers that implement a different bus as well as dual channels on a single SCSI controller.

External SCSI Bus

Additional SCSI cables and/or controllers can be used to connect external SCSI devices to the server. Consult the Digital sales representative for information on SCSI options and cables.

To connect the storage backplane to an external SCSI bus:

- 1) Remove the terminator from the storage backplane for the bus you want to connect.
- 2) Connect the 68-pin unshielded cable connector (part no. FR-PCXAR-WG) to the storage backplane (A, Figure 3-26).
- 3) Using a screwdriver, gently pry away one of the SCSI knockouts at the rear panel (see Figure 3-26).
- 4) Screw the 68-pin or 50-pin external shielded connector to the rear panel (B, Figure 3-26).
- 5) Connect the external SCSI device making sure the external device is properly terminated.

NOTE You can also connect directly to the main logic board's SCSI bus B connector.

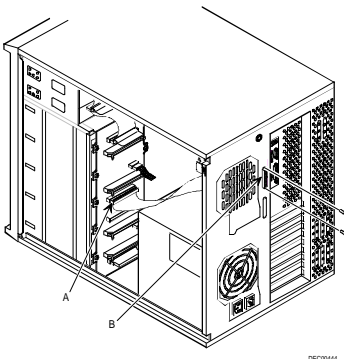


Figure 3 - 26 External SCSI Bus Connections

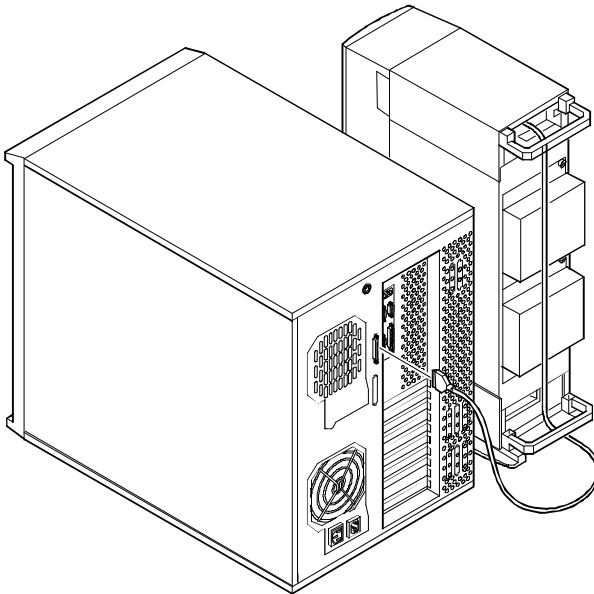
Connecting an External SCSI Storage Box

To connect an external SCSI storage box, follow these instructions:

- 1) Connect the storage backplane to an external SCSI bus.
- 2) Refer to “*External SCSI Bus*” later in this chapter.
Connect the external device making sure the SCSI bus is properly terminated.
- 3) Run *SCSISelect* and/or RAID utilities to configure the server.

External SCSI Bus Guidelines

- ◆ Make sure that the SCSI addresses that is selected for the external SCSI devices do not conflict with other devices in the server.
- ◆ Make sure that the external SCSI bus is terminated properly.
- ◆ For proper operation, the length of the SCSI cable must not exceed 1 meter (3.28 ft).
- ◆ Use only a high-density external connector.



DEC00626

Figure 3 - 27 Connecting an External SCSI Storage Box

Chapter 4 Troubleshooting

The following pages provide initial troubleshooting procedures and tables listing specific problems, probable causes and recommended actions to take if the computer fails after configuration or after installing optional hardware or software.

Refer to the documentation supplied with additional options when experiencing problems with specific installed options.

Initial Troubleshooting

Follow these general procedures to troubleshoot the PRIORIS ZX MP Server:

- ◆ Record all configuration information and have it readily available.
- ◆ Turn off the server, wait until all hard disk drives completely spin down and then turn it back on. If the POST detects an error refer to *Chapter 4, "Troubleshooting"* and take the appropriate steps to correct the problem. After the problem has been resolved, restart the server.
- ◆ Ensure that all cables and connections are secure.
- ◆ Make sure all necessary video, printer and application device drivers are properly installed.
- ◆ Try not to troubleshoot more than one problem at a time.
- ◆ Try to duplicate the problem.
- ◆ Run the diagnostic software.
- ◆ Run the SCU.
Refer to *Chapter 2, "Server Utilities & Configuration"* to ensure the server is correctly configured for all installed hardware and software.
- ◆ When having problems after connecting a SCSI device, open *SCSISelect* and verify that all settings have been correctly changed.
Refer to *Chapter 2, "Server Utilities & Configuration"* for additional information.

NOTE If you need to return a failed component, pack it in its original container and return it to Digital for service.

Fill in the appropriate fields of the Part Exchange Form with the relevant error information!!

Beep Codes

When POST finds an error and cannot display a message, the server's speaker emits a series of beeps to indicate the error and places a value in I/O port 80h. During POST, if the video configuration fails or if an external ROM module fails a checksum test, then the server beeps three times (one long beep and two short beeps).

The following table lists other fatal errors and their associated beep codes. Each code represents the number of short beeps that are grouped together. Fatal errors (errors that lock up the server) are generally the result of a failed main logic board or some other add-on component (SIMM, BIOS, server battery, etc.).

Beeps	Error Message	Conditions
1	Refresh failure	Memory refresh circuitry on the main logic board is faulty
2	Parity error can't be reset	Parity error in the first 64 KB memory
3	Base 64 KB memory failure	Memory failure in first 64 KB memory
4	Timer not operational	Timer on main logic board not operational or memory failure in first 64 KB memory
5	Processor failure	CPU on main logic board generated an error
6	8042 gate A20 failure	BIOS cannot switch to protected mode Keyboard controller might be bad
7	Processor exception interrupt error	Processor exception interrupt error
8	Display memory read/write error	Video controller is missing or its memory is faulty (not a fatal error)
9	ROM checksum error	ROM checksum value does not match encoded value in BIOS
10	CMOS shutdown register read/write error	Shutdown register for CMOS RAM failed

POST and Boot Messages

The POST displays messages to alert to errors in hardware, software and firmware or to provide operating information about the server.

Each time the POST displays a message on the screen, the server's speaker beeps twice. If an error occurs before the monitor is initialized, specific beep codes sound to alert to a problem. The BIOS indicates errors by writing an error code to the PS/2-standard logging area in the Extended BIOS Data Area, and by displaying a message on the screen, which is preceded by the POST Error Code. The BIOS logs the error code in the Critical Event Logging area.

NOTE Italics indicate variable parts of a message such as memory addresses, hexadecimal values and so on. These messages can differ at each occurrence.

POST and Boot Messages (continued)

Code	Error Message
0002	Primary Boot Device Not Found
0010	Cache Memory Failure Do Not Enable Cache
0015	Primary Output Device Not Found
0016	Primary Input Device Not Found
0041	EISA ID Mismatch for Slot
0043	EISA Invalid Configuration for Slot
0044	EISA config. NOT ASSURED!
0045	EISA Expansion Board Not Ready in Slot
0047	EISA CMOS Configuration Not Set
0048	EISA CMOS Checksum Failure
0049	EISA NVRAM Invalid
0060	Keyboard Is Locked ... Please Unlock It
0070	CMOS Time & Date Not Set
0080	Option ROM has bad checksum
0083	Shadow of PCI ROM Failed
0084	Shadow of EISA ROM Failed
0085	Shadow of ISA ROM Failed
0131	Floppy Drive A:
0132	Floppy Drive B:
0135	Floppy Disk Controller Failure
0140	Shadow of System BIOS Failed
0170	Disabled CPU slot #
0171	CPU Failure - Slot 1, CPU # 1
0172	CPU Failure - Slot 1, CPU # 2
0173	CPU Failure - Slot 2, CPU # 1
0174	CPU Failure - Slot 2, CPU # 2
0171	Previous CPU Failure - Slot 1, CPU # 1
0172	Previous CPU Failure - Slot 1, CPU # 2
0173	Previous CPU Failure - Slot 2, CPU # 1
0174	Previous CPU Failure - Slot 2, CPU # 2
0175	CPU modules are incompatible
0180	Attempting to boot with failed CPU
0191	CMOS Battery Failed
0195	CMOS System Options Not Set
0198	CMOS Checksum Invalid
0289	System Memory Size Mismatch
0295	Address Line Short Detected
0297	Memory Size Decreased
0299	ECC Error Correction failure
0301	ECC Single bit correction failed, Correction Disabled
0302	ECC Double bit Error
0310	ECC Address failure, Partition #
0370	Keyboard Controller Error

POST and Boot Messages (continued)

Code	Error Message
0373	Keyboard Stuck Key Detected
0375	Keyboard and Mouse Swapped
0380	ECC SIMM failure, Board in slot 1 SIMM #
0392	ECC SIMM failure, Board in slot 2 SIMM #
0430	Timer Channel 2 Failure
0440	Gate-A20 Failure
0441	Unexpected Interrupt in Protected Mode
0445	Master Interrupt Controller Error
0446	Slave Interrupt Controller Error
0450	Master DMA Controller Error
0451	Slave DMA Controller Error
0452	DMA Controller Error
0460	Fail-safe Timer NMI Failure
0461	Software Port NMI Failure
0465	Bus Timeout NMI in Slot
0467	Expansion Board NMI in Slot
0501	PCI System Error
0510	PCI Parity Error
0710	System Board Device Resource Conflict
0711	Static Device Resource Conflict
0800	PCI I/O Port Conflict
0801	PCI Memory Conflict
0802	PCI IRQ Conflict
0803	PCI Error Log is Full
0810	Floppy Disk Controller Resource Conflict
0811	Primary IDE Controller Resource Conflict
0812	Secondary IDE Controller Resource Conflict
0815	Parallel Port Resource Conflict
0816	Serial Port 1 Resource Conflict
0817	Serial Port 2 Resource Conflict
0820	Expansion Board Disabled in Slot
0900	NVRAM Checksum Error, NVRAM Cleared
0903	NVRAM Data Invalid, NVRAM Cleared
0905	NVRAM Cleared By Jumper
0982	I/O Expansion Board NMI in Slot
0984	Expansion Board Disabled in Slot
0985	Fail-safe Timer NMI
0986	System Reset caused by Watchdog Timer
0987	Bus Timeout NMI in Slot

Server Troubleshooting

Problem	Possible Cause	Action
No response when the server is turned on	Server is not plugged in.	Turn off the server, plug it in, and then turn it back on again.
	No power at the wall outlet. Main logic board failed.	Use another wall outlet.
	Main logic board jumpers incorrectly set.	Contact the Digital service representative. Set all appropriate jumpers.
	CPU module has failed.	Reset the CPU module. If failure continues, contact the Digital service representative. Install SIMMs and memory module.
	No memory module or SIMMs installed.	
	Side panels removed.	Install side panels.
	Power supply failed.	Contact the Digital service representative.
Power is on, but there is no screen display	Monitor brightness and contrast controls are not correctly set.	Adjust the brightness and contrast controls.
	Monitor is off.	Turn on the monitor.
	Monitor cable is incorrectly installed.	Check all monitor connections.
	Incorrect video drivers installed.	Install the correct video drivers.
	Video controller has failed.	Contact the Digital service representative.
	Monitor has failed.	Contact the Digital service representative.
Power is on but no OCP display	OCP button not turned on or OCP backlight is disabled in SCU.	Press any keyboard key or OCP button at the front of the server. Make sure OCP backlight is set to ON in the SCU.
	OCP has failed.	Contact the Digital service representative.
Power is on but cooling fans do not work	Fans disconnected from main logic board.	Connect the fans.
	One or more fans failed.	Replace the fan(s) or contact the Digital service representative.

Server Troubleshooting (continued)

Problem	Possible Cause	Action
Server operates incorrectly after installing a CPU module	<p>CPU module installed incorrectly.</p> <p>Primary CPU module has failed.</p> <p>Secondary CPU module has failed.</p>	<p>Reinstall CPU module.</p> <p>Replace CPU module.</p> <p>Remove CPU module and reboot. If server boots without errors, replace CPU module.</p>
Server operates incorrectly after installing optional expansion board	<p>Expansion board installed incorrectly.</p> <p>Did not run SCU to configure expansion board after installation.</p> <p>Did not install CFG file for expansion board.</p> <p>Expansion board has failed.</p>	<p>Remove expansion board and reinstall.</p> <p>Run the SCU to properly configure expansion board. Refer to <i>Chapter 2, "Server Utilities & Configuration"</i></p> <p>Run SCU and add CFG file (if necessary).</p> <p>Remove expansion board and reboot. If server boots without errors, replace expansion board.</p>
Server operates incorrectly after installing optional memory (SIMMs)	<p>SIMMs installed incorrectly.</p> <p>SIMMs have failed.</p> <p>Memory module installed incorrectly.</p> <p>Memory module failed.</p>	<p>Remove SIMMs and reinstall.</p> <p>Reorder SIMMs. Make sure SIMMs are installed in the appropriate memory banks and are completely filled. If problem persists, replace SIMMs.</p> <p>Reinstall memory module.</p> <p>Replace memory module.</p>
No response to keyboard commands	<p>Keyboard might be password protected by a local or remote control program.</p> <p>Keyboard is not connected.</p> <p>Keyboard is connected to the mouse port.</p> <p>Keyboard failed.</p>	<p>Enter the keyboard password.</p> <p>Power down the server and connect the keyboard.</p> <p>Power down the server and connect the keyboard to the keyboard port.</p> <p>Replace keyboard or contact the Digital service representative.</p>

Server Troubleshooting (continued)

Problem	Possible Cause	Action
No response to mouse commands	Mouse might be password protected by a local or remote control program.	Enter the keyboard and mouse password.
	Mouse is not connected.	Power down the server and connect the mouse.
	Mouse is connected to the keyboard port.	Power down the server and connect the mouse to the mouse port.
	Mouse driver not installed.	Install the appropriate mouse driver.
	Mouse trackball dirty.	Clean trackball.
	Mouse failed.	Replace mouse or contact the Digital service representative.
Server operates correctly but application software does not	Application software installed incorrectly.	Refer to the application software documentation.
	CPU speed setting causes conflict with application software.	Run the SCU and reduce CPU speed setting. Refer to <i>Chapter 2, "Server Utilities & Configuration"</i> .
	Having system cache enabled causes conflict with application software.	Run the SCU and disable system cache. Refer to <i>Chapter 2, "Server Utilities & Configuration"</i> .
	SCSI device has failed.	Contact the Digital service representative.
Server does not boot from CD-ROM drive	CD-ROM drive is not connected to the Adaptec controller.	Connect the CD-ROM drive to the onboard 7870 Adaptec controller. Refer to <i>Chapter 3, "Service Procedures"</i> .
	CD-ROM drive not configured as a bootable device.	Change the CD-ROM setting to "bootable" using <i>SCSISelect</i> .
	CD-ROM disk is not bootable.	CD-ROM disk media must be bootable to boot from CD-ROM disk.
	SCSI device has failed.	Make sure CD-ROM disk is bootable. If failure continues, contact the Digital service representative

Server Troubleshooting (continued)

Problem	Possible Cause	Action
Target diskette drive cannot read or write information	Diskette is not formatted.	Format the diskette.
	Diskette is worn or damaged.	Try another diskette.
	Diskette is write-protected.	Slide the write-protect switch so the hole is not visible.
	Diskette drive is empty.	Insert a diskette.
	Diskette write protection enabled.	Run the SCU and set the Diskette Write Protection option to "Disabled."
	Diskette drive has failed.	Secure ribbon cable and other connectors on back of diskette drive. If failure continues, contact the Digital service representative.

Disk Drive Troubleshooting

Problem	Possible Cause	Action
Server does not recognize an internal SCSI device	SCSI device jumpers incorrectly set.	Refer to the supplied kit installation instructions.
	SCSI ID conflicts.	Refer to the supplied kit installation instructions.
	Terminating resistors not removed from the SCSI device.	Remove terminating resistors. Refer to the supplied kit installation instructions.
	SCSI controller has failed.	Contact the Digital service representative.
	Loose SCSI cable.	Secure all cable connections.
	SCSI cable incorrectly installed between SCSI controller, SCSI device or backplane.	Refer to "SCSI Guidelines" for cabling information.

Disk Drive Troubleshooting (continued)

Problem	Possible Cause	Action
Server does not recognize an external SCSI device	SCSI device jumpers incorrectly set.	Refer to the supplied kit installation instructions.
	SCSI ID conflicts.	Refer to the supplied kit installation instructions
	Terminating resistors not removed from the SCSI device.	Remove terminating resistors. Refer to the supplied kit installation instructions.
	SCSI controller has failed.	Contact the Digital service representative.
	Loose SCSI cable.	Secure all cable connections.
	SCSI cable incorrectly installed between SCSI controller and rear panel connector or external SCSI device and rear panel connector.	Refer to “ <i>SCSI Guidelines</i> ” for cabling information.
Server does not boot from an internal SCSI hard disk drive	SCSI boot hard disk drive not formatted.	Format the SCSI hard disk drive.
	SCSI device drivers not installed or incorrectly installed on SCSI boot hard disk drive.	CAUTION: Formatting the SCSI hard disk drive will destroy all the data on the drive. Properly install all required SCSI device drivers. Refer to “ <i>SCSI Guidelines</i> ”.
	Operating system software is not installed on the SCSI boot hard disk drive.	Install the appropriate operating system.
	Requested partition does not exist.	Partition the SCSI hard disk drive and then reload the operating software.
	SCSI boot hard disk drive at wrong SCSI address.	Set SCSI boot hard disk drive to lowest “primary” SCSI address.

Disk Drive Troubleshooting (continued)

Problem	Possible Cause	Action
Server does not boot from a target diskette drive	Drive ID incorrectly set.	Make sure the drive ID is correctly set. Refer to the documentation that was supplied with the diskette drive.
	Diskette drive not enabled.	Run the BIOS Setup utility to enable the diskette drive.
	Diskette boot option disabled.	Run the SCU and set boot option A then C.
	Diskette does not contain start-up files. Diskette drive is empty.	Insert a diskette with the correct start-up files. Insert a diskette that contains an operating system.
	Diskette is worn or damaged.	Try another diskette.
SCSI hard disk drive cannot read or write information	Loose cables.	Secure all cable connections.
	Incorrect disk drive jumper settings.	Refer to the supplied kit installation instructions. Make sure all cables are correctly installed.
	Loose or incorrectly installed cables.	Format and partition as required using the supplied operating system.
	SCSI hard disk drive is not correctly formatted or partitioned. SCSI hard disk has failed.	Secure ribbon cable and other connectors on back of SCSI hard disk drive. If failure continues, contact the Digital service representative.
SBB failure	Check SBB status LEDs for a drive failure indication.	Refer to <i>Chapter 3, "Service Procedures"</i> for additional information.

Monitor Troubleshooting

Problem	Possible Cause	Action
Monitor power indicator is not on	Monitor is turned off.	Turn on the monitor.
	Power cord is not connected.	Connect the power cord to the server.
	No power at wall outlet.	Use another outlet.
	Power indicator is defective.	Contact the Digital service representative
No screen display	Configuration error.	Run the SCU to configure the server for VGA operation.
	Monitor brightness and contrast controls are incorrectly set.	Adjust the monitor brightness and contrast controls.
	Monitor has failed.	Secure all cables and power connections. If failure continues, contact the Digital service representative.

Monitor Troubleshooting (continued)

Problem	Possible Cause	Action
No monitor display while loading Windows video drivers	Monitor type incorrectly set.	Set the correct monitor type.
Distorted, rolling, or flickering screen display, or wrong/uneven color	Monitor incorrectly adjusted. Monitor signal cable incorrectly installed.	Adjust accordingly. Straighten any bent connector pins and then reconnect.
Color monitor displaying monochrome	Server was turned on before the monitor was turned on.	Turn off the server, turn on the monitor, then turn the server back on.
Monitor fails to switch to high-resolution mode	Appropriate high-resolution video drivers are not installed or incorrectly installed.	Correctly install all appropriate high-resolution video drivers. Refer to the documentation supplied with the monitor.
Monitor display not centered while loading Windows video drivers	Monitor type incorrectly set.	Set the correct monitor type.

CD-ROM Troubleshooting

Problem	Possible Cause	Action
Cannot access the CD-ROM drive. Error message reading drive x.	Device drivers not installed.	Install correct device drivers.
	No disk in the CD-ROM drive.	Insert a disk.
	Accessing wrong drive.	Make sure correct SCSI ID is assigned. Refer <i>Chapter 3, "Service Procedures"</i> .
	Tray open.	Close the tray.
Power is on but indicator shows no activity.	No disk or tray is open.	Insert a disk and close the tray.
	Check cable connections.	Make sure cables are correctly connected.
Disk is spinning but drive is idle.	Application software not running.	Run application software.

Tape Drive Troubleshooting

Problem	Possible Cause	Action
Tape will not load	Tape inserted incorrectly.	Insert the tape with the arrow on the cassette pointing towards the drive.
Cannot write data to a tape	Tape write-protected.	Slide the write-protect tab on the cassette to the closed position.
Tape will not eject	Tape jammed in drive.	Using a small screwdriver, rotate the motor shaft clockwise to bring threading mechanism to the initial loading position. If necessary, press the ratchet mechanism to tighten the tape before ejecting. Continue to turn the motor shaft clockwise until the tape can be lifted out of the drive mechanism and ejected from the drive.

Diskette Drive Troubleshooting

Problem	Possible Cause	Action
Target diskette drive cannot read or write information	Diskette is not formatted.	Format the diskette.
	Diskette is worn or damaged.	Try another diskette.
	Diskette is write-protected.	Slide the write-protect switch so the hole is not visible.
	Diskette drive is empty.	Insert a diskette.
Server does not boot from a target diskette drive Cannot write to target diskette drive	Diskette write protection enabled.	Run the SCU and set the Diskette Write Protection option to "Disabled."
	Drive ID incorrectly set.	Make sure the drive ID is correctly set. Refer to the documentation that came with the diskette drive.
	Diskette drive not enabled.	Run the SCU and enable the diskette drive.
	Diskette boot option disabled.	Run the SCU and set boot option A then C.
	Diskette does not contain start-up files.	Insert a diskette with the correct start-up files.
	Diskette drive is empty.	Insert a diskette that contains an operating system.
	Diskette is worn or damaged.	Try another diskette.
	Loose cables.	Secure all cable connections.
Diskette drive write protected.	Run the SCU and disable the diskette write protection option.	

RAID Troubleshooting

Problem	Possible Cause	Action
SBB fault LED lit	Disk drive failed.	Replace disk drive.
SBB activity and fault LEDs lit	Disk drive hung or has failed.	Replace disk drive.
SBB fault LED flashing	Disk drive failed and is spinning down.	Replace disk drive.
SBB fault status is either on or off; fault status LED flashing	Disk drive is active and spinning down due to a fault.	Correct the fault or replace the disk drive.
Replaced SBB drive does not spin up to speed	SBB drive not seen by RAID controller.	Manually rebuild the SBB drive. Remove the SBB drive, wait 20 seconds, reinsert SBB drive. Wait one minute and then rebuild the SBB drive.
Multiple SBB drives have failed	No power available.	Restore power, run the RAID configuration utility and change the state of any failed (FLD) SBB drive to optimal (OPT). Run the RAID configuration utility and check for bad blocks on the SBB drives. Repair any bad blocks.
SBB drive not seen by RAID host adapter	SCSI cable not connected. Incorrect SCSI termination. Duplicate SCSI IDs on the bus. Defective SBB drive. SBB drive improperly inserted. Defective RAID host adapter SCSI channels.	Check all SCSI connections. Properly terminate the SCSI bus. Check SBB drive SCSI ID settings. Replace SBB drive. Reinsert SBB drive. Replace the RAID host adapter.

QAPlus/FE Error Messages

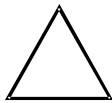
Component	Messages	Solution
CPU	Arithmetic Function Failed. General Functions Failed. Exception Interrupt in Protected Mode. Refresh Failure. Logic Functions Failed.	Reset CPU. Replace CPU.
Hard disk	Butterfly Cylinder Access Test Failed. Cylinder 0 Errors. Random Cylinder Access Failed. Linear Cylinder Access Failed.	Low-level format hard disk. Replace disk.
Hard drive /controller	Controller Diagnostic Test Failed. Questionable Controller Card. Hard drives failed.	Run Setup, Check connections, Reset controller, Replace controller, Replace disk.
Floppy diskette	Media Mismatch. Drive Not Ready. Write Protected Media. Unformatted Media.	Use known good diskette. Check size and density of diskette. Close drive door. Remove write protection. Format diskette.
Floppy drive	Floppy Drives Failed.	Check connections, Replace drive.
Battery/clock	Clock Stopped. Invalid Date. RTC Interrupt Failed.	Run Setup. Replace battery/clock.
CMOS	CMOS Clock Test Failed.	Change time from Setup menu in QAPLUS.
Serial port	COM port failed. Serial Chip Error. Serial Compare Error. Serial Timeout Error.	Check COM device. Check connections. Replace COM device. Replace COM device.
Video adapter	Video Failed. Error in Video Buffer.	Replace video adapter. Replace video adapter.

Chapter 5

Device Mapping

This section provides a series of tables listing mapping and address information related to computer memory and various main logic board devices (keyboard controller, interrupt controller, DMA controller, etc.).

The computer's memory and address locations are allocated at the factory to operate within a standard PC environment. However, due to the number of optional devices and/or expansion boards that are available, sometimes memory and address locations need to be changed. For example, some network expansion boards require a specific memory location. If that location is already allocated, a memory conflict results and the expansion board will not operate as expected. Note that some memory, I/O and interrupt locations can be changed using the BIOS Setup utility.



CAUTION

Before changing any memory or address location, refer to the documentation supplied with the optional device, expansion board, or software application and make sure adequate information is available.

Memory Map

<i>Address Range (hex)</i>	<i>Amount</i>	<i>Function</i>
0000_0000–0003_FFFF	256 KB	Base server memory (fixed)
0004_0000–0007_FFFF	256 KB	Base server memory (fixed)
0008_0000–0009_FFFF	128 KB	Base server memory or ISA memory enabled in Setup
000A_0000–000B_FFFF	128 KB	ISA video frame buffer
000C_0000–000E_FFFF	192 KB	Expansion board video BIOS (can be shadowed) AIC-7870 SCSI BIOS (can be shadowed)
000F_0000–000F_FFFF	64 KB	ISA memory, server BIOS (fixed)
0010_0000–00EF_FFFF	14 MB	Server memory or unused
00F0_0000–00FF_FFFF	1 MB	Server memory or EISA/ISA memory
0100_0000–3FFF_FFFF	1 008 MB	Server memory or unused
4000_0000–BFFF_FFFF	1 024 MB	EISA memory or I/O slave memory

Memory Map (continued)

Address Range (hex)	Amount	Function
C000_0000–C1FF_FFFF	32 MB	Memory mapped math coprocessor
C200_0000–FEBF_FFFF	944 MB	EISA memory or I/O slave memory
FEC0_0000–FEC0_0FFF	4 KB	I/O APIC #1
FEC0_1000–FEC0_1FFF	4 KB	I/O APIC #2
FEC0_2000–FEC0_2FFF	4 KB	I/O APIC #3
FEC0_3000–FEC0_3FFF	4 KB	I/O APIC #4
FEC0_4000–FFDF_4FFF	32 752 KB	EISA memory or I/O slave memory
FFE0_0000–FFFF_FFFF	32 KB	EISA (BIOS/SCU)

I/O Map

I/O Address(es)	Resource
0000–001F	DMA controller 1
0020–0021	Interrupt controller 1
0022–0023	EISA bridge configuration space access ports
0024–0025	AIP configuration space access ports
0026–0027	Configuration space access ports
0040–005F	Programmable timer
0060, 0064	Keyboard controller
0061	NMI status and control register
0070	NMI mask (bit 7) and RTC address (bits 6:0)
0071	Real-time clock (RTC)
0080–008F	DMA low page register
0092	System control port A (PC-AT control port)
00A0–00BF	Interrupt controller 2
00C0–00DF	DMA controller 2
00F0	Clear NPX error
00F8–00FF	x87 numeric co-processor
0102	Video display controller
0170–0177	Secondary hard disk controller (IDE)
01F0–01F7	Primary hard disk controller (IDE)
0200–0207	Game I/O port
0220–022F	Serial port
0238–023F	Serial port
0278–027F	Parallel port 3
02E8–02EF	Serial port 2
02F8–02FF	Serial port 2
0338–033F	Serial port 2
0370–0375	Secondary diskette drive

I/O Map (continued)

I/O Address(es)	Resource
0376	Secondary IDE
0377	Secondary IDE/diskette drive
0378–037F	Parallel port 2
03B4–03BA	Monochrome display port
03BC–03BF	Parallel port 1 (primary)
03C0–03CF	Enhanced graphics adapter
03D4–03DA	Color graphics controller
03E8–03EF	Serial port
03F0–03F5	Diskette disk controller
03F6–03F7	Primary IDE - secondary diskette drive
03F8–03FF	Serial port 1 (primary)
0400–043F	DMA controller 1, extended mode registers
0461	Extended NMI / reset control
0462	Software NMI
0464	Last EISA bus master granted
0480–048F	DMA high page register
04C0–04CF	DMA controller 2, high base register
04D0–04D1	Interrupt controllers 1 and 2 control register
04D4–04D7	DMA controller 2, extended mode register
04D8–04DF	Reserved
04E0–04FF	DMA channel stop registers
0678–067A	Parallel port (ECP)
0778–077A	Parallel port (ECP)
07BC–07BE	Parallel port (ECP)
0800–08FF	NVRAM
0C80–0C83	EISA system identifier registers
0C84	Board revision register
0C85–0C86	BIOS function control
0CF8	PCI CONFIG_ADDRESS register
0CFC	PCI CONFIG_DATA register
n000–n0FF	EISA slot n I/O space (n = 1 to F)
x100–x3FF	ISA I/O slot alias address
n400–n4FF	EISA slot n I/O space (n = 1 to F)
x500–x7FF	ISA I/O slot alias address
n800–n8FF	EISA slot n I/O space (n = 1 to F)
x900–xBFF	ISA I/O slot alias address
nC00–nCFF	EISA slot n I/O Space (n = 1 to F)
xD00–xFFF	ISA I/O slot alias address
46E8	Video display controller

EISA Slot Assignments

<i>EISA Slot (hex)</i>	<i>Device</i>
0	System board
1–8	EISA expansion boards
9–A	Embedded SCSI
B	Memory module
C	Memory module (expansion module)
D	Primary PCI segment
E	CPU1 module
F	CPU2 module

Direct Memory Access Channels

<i>Channel</i>	<i>Device</i>
0	(expansion board)
1	(expansion board)
2	Diskette drive
3	IDE hard disk drive
4	Reserved
5	(expansion board)
6	(expansion board)
7	(expansion board)

Interrupts

<i>IRQ</i>	<i>Device</i>
NMI	Parity error
0	Interval timer
1	Keyboard buffer full
2	Reserved, cascade interrupt from slave PIC
3	Onboard serial port B (COM2), if enabled
4	Onboard serial port A (COM1), if enabled
5	Parallel port LPT2, if enabled
6	Onboard diskette (floppy) controller, if enabled
7	Parallel port LPT1, if enabled
8	Real-time clock (RTC)
9	Video
10	COM3; if enabled, it can be set for EISA expansion boards using the SCU

Interrupts (continued)

IRQ	Device
11	COM4; if enabled, it can be set for EISA expansion boards using the SCU AIC-7870; if enabled, it can be set for EISA expansion boards using the SCU
12	Onboard PS/2 mouse port, if enabled
13	Math coprocessor error
14	IDE hard drive controller, if enabled
15	User definable; using the SCU, it can be set for the following: EISA expansion boards IDE hard drive controller onboard video, programmable to 9, 10, 11, or 15 onboard SCSI, programmable to 9, 10, 11, or 15 (SCU limits SCSI to three choices)

PCI Interrupts

IRQ	Device
any IRQx	SCSI channel A INTA
any IRQx	SCSI channel B INTA
any IRQx	PCI-0 INTA
any IRQx	PCI-0 slot B INTA
any IRQx	PCI-0 slot x INTB
any IRQx	PCI-0 slot A INTA
any IRQx	PCI-0 slot B INTA
any IRQx	PCI-0 slot C INTA
any IRQx	PCI-0 slot x INTB
any IRQx	PCI-0 and 1 slot x INTC
any IRQx	PCI-0 and 1 slot x INTD
any IRQ or NMI, or SMI	INT1 slot MEM1
any IRQ or NMI, or SMI	INT2 slot MEM2

Chapter 6

Pass / Fail Criteria

As Final Acceptance Test the following tests should be run to meet the Pass/Fail criteria:

1) Successful Completion of the POST tests.

2) Successful Completion of the following QAPLUS/fe module tests (one pass):

- ◆ System Board (All Tests)
- ◆ Memory (All Tests)
- ◆ Video (All Tests)
- ◆ Hard Disk (All Tests, except: Sequential write/read and Sequential write/random read)
- (Destructive Test !!)**
- ◆ Floppy Disk (All Tests)
- ◆ Keyboard (All Tests)
- ◆ COM Ports (All Tests)
- ◆ LPT Ports (All Tests)
- ◆ Pointer device (All Tests)
- ◆ SCSI Test (All Tests)

3) Successful Bootstrap of the on the computer installed Operating System.

Operating Systems Supported:

- ◇ Windows for Workgroups 3.11
- ◇ Windows NT Server
- ◇ OS/2 2.0, OS/2 SMP
- ◇ SCO Unix and MPX
- ◇ Novell NetWare 1.x and 2.0
- ◇ Banyan Vines (single processor only)
- ◇ Oracle 7.0, Oracle Workgroup Server
- ◇ Web Servers

Remove any software that was put on the hard drive to enable repair of the system before shipping.

When completed, carefully clean outside of unit with cleaning solution.

Appendix A

Service Notes

This appendix contains the current Service Notes for the PRIORIS ZX MP Server product line.

Recommended Tools

The following tools will be needed for servicing Digital PC systems. Note that test equipment must be in calibration.

- ◆ Multimeter (4 1/2 digit)
- ◆ A philips screwdriver
- ◆ An antistatic wrist strap

Other Materials Needed

Cleaning agent should be an all purpose cleaner that is used in-house.

Special Tools Required

The CPU is located on a Low Insertion Force connector. Therefore a CPU removal tool will be necessary

Server troubleshooting Hints

Multi processing test.

A self extracting copy of the diagnostic diskette is placed at the following location:

```
PCBUOA::USR18:[DIAGNOSTICS.INTEL_MP]ZX51XXMP.EXE
```

This file will create a bootable diskette when executed on a PC. It will be the same as the diskette the customer receives.

If you have problems getting to the file, contact myself or Paul Phaneuf at DTN 244-6875.

Mylex RAID Controllers

The Prioris ZX MP Series 5000 Server requires a minimum revision of 'Rev. C' of the Mylex RAID controller kit to support RAID devices. The 'Rev. C' kit contains Mylex firmware revision 2.38, Mylex BIOS revision 1.28, and Mylex driver revision 1.02. You can identify a 'Rev. C' Mylex RAID card by checking the revision level when the card is booted. It must display a minimum firmware revision level of 2.38.

NetWare 3.12

When installing NetWare and using an Adaptec 78XX controller, NetWare displays the following message on boot:

```
Slot number 81 is NOT supported and was ignored
Supported slot values are 129 & 130
Slot: 129
```

Press [Enter] to continue.

To prevent this occurrence on future server boots, make note of the slot number that NetWare assigns and edit the STARTUP.NCF file.

For example, change the disk driver command in the STARTUP.NCF file from:

```
Load AIC7870 slot=81
```

To:

```
Load AIC7870 slot=129
```

Processor Upgrade kits

Partnumber as per 22th apr 96. So partnumber can be replaced. Consult appropriate channels

FR-PCA6U-AA 1 Processor Upgrade Kit

FR-PCA6U-AB 2 Processor Upgrade Kit

Intel BIOS on the Prioris ZX

From Mike Breault, PCBU Support Engineering

Prioris ZX spares are supplied directly from Intel. At present Intel has the same BIOS numbering "Scheme" as ours, i.e. 1.00.07. Intel's 1.00.07 is not the same as our 1.00.07. Please flash all spares/replacements with the latest Digital BIOS. You can download the latest BIOS and ECU from the DEC BBS at (508) 496-8800. The file names are: BGA6107A.EXE and EGA6330A.EXE.

Prioris ZX and Diamond Stealth 928

The Diamond Stealth 928 video card (FR-PCXAG-BA) does not work in the Prioris ZX.
No systems should be shipped from manufacturing with this video card

BIOS information

Current revision is V1.00.07. Current Date is Apr. 22 1996.

Changes in FMUP.EXE from release 3.0

1. Support added for updating FLASH from 64K modules where all modules are not loaded at once.

README.TXT:

FLASH Memory Update Utility Release 3.2

This utility is used to save and update FLASH memory. It is recommended that this utility be executed from a bootable MS-DOS diskette that contains BIOS recovery files for the target system (i.e. BIOS.REC).

WARNING: This disk is NOT a DOS bootable diskette.

This utility must be executed in a system without memory managers installed. If EMM386, QEMM, 386MAX, or Windows is active, then the FLASH update is not safe. Remove any memory manager or exit Windows before executing the FLASH Memory Update Utility.

SHOWHDR.EXE: This tool is provided to display header information on the specified FLASH data image.

Usage: SHOWHDR.EXE <FLASH data image filename>

Appendix B

Useful Information

Related Documentation

<i>Document Titles</i>	<i>Orders</i>
Prioris ZX MP Server Quick Reference Guide	EK-A0896-RG
Service Maintenance Manual Spares Catalogue PC	EK-A0815-SV
Prioris ZX 5000 MP Series Server User Guide	ER-A60WW-VA

On-Line Bulletin Boards

On-Line Bulletin Boards

The most current product information and technical support is also available on line. The most current device drivers, Setup diskettes and technical tips can be found on all of these bulletin boards.

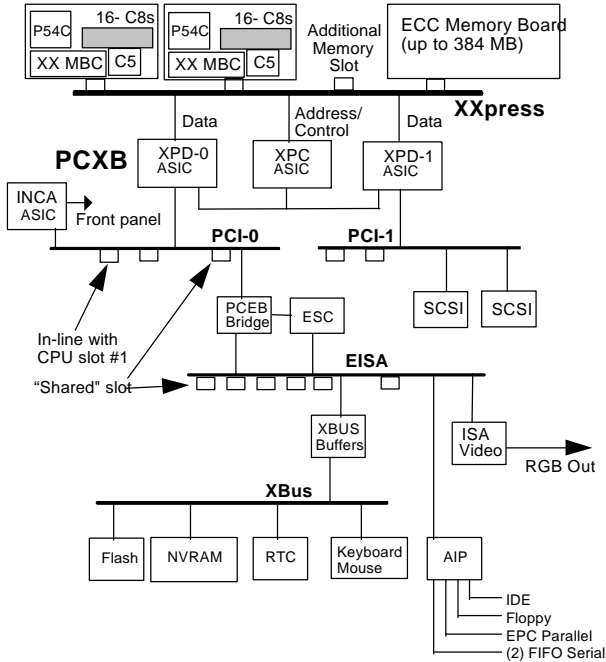
- ◆ ***DECpc Bulletin Board Server***
DECpc BBS provides an easy-to-use, menu-driven bulletin board providing on-line access to the latest PC product information, device drivers, shareware and freeware.

Network Location for ;

North America, South America, Australia and New Zealand
PCBUHD::DKB300:[WC30.BBSFILES]

Europe, Africa, Middle and Far East:
SUTRA::D6:[PUBLIC].

Server Block Diagram



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Digital Equipment Parts Center b.v.
Att: MCS Logistics Engineering Call Desk
P.O. Box 6774
6503 GG Nijmegen
Holland

If you have questions about this document please do not hesitate to get in contact with our Call Desk. The number is:

Phone: xx31-24-3529666

Fax: xx31-24-3563106

READERS COMMENTS

Digital PRIORIS ZX Server Service Maintenance Manual K-MN-SD00000-20-JG00.B

This form is for documents only. Commitments submitted on this form are used at Digital's direction.

Did you find errors in this manual? If so, specify by page.

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Is the documentation understandable, usable and sufficient for your needs? What material is missing?

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