digital

Service Maintenance Manual

CELEBRIS XL & XL^{DP} PC

K-MN-SD00000-11-JG00. B

MCS LOGISTICS
ENGINEERING
-
NIJMEGEN
THE NETHERLANDS

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Revision History

Revision A01	This was the original release of the Service Maintenance Manual describing the CELEBRIS XL & XL^{DP} PC in its original configuration.
Revision B01	This revision of the CELEBRIS XL & XL^{DP} PC Service Maintenance Manual, incorporates updated configurations and various models that have been added.

Preface

The Digital CELEBRIS XL & XL^{DP} Service Maintenance Manual is a troubleshooting guide that can be used for reference when servicing the CELEBRIS XL & XL^{DP} line of PC's.
Digital Equipment Corporation reserves the right to make changes to the Digital CELEBRIS XL & XL^{DP} series without notice. Accordingly, the diagrams and procedures in this document may not apply to the computer(s) to be 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 indivual 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

Digital CELEBRIS XL & XLDP computers are high-performance personal computers featuring the latest in microprocessor and PCI local bus technology. They can be used as stand-alone computers, as clients, or as servers in a network environment. Developed using the latest in modular CPU, PCI local bus, PCI-based SCSI technology, and a host of high-performance options, the CELEBRIS XL family offers the most advanced computers in their class. It also includes Pentium-Pro (P6) models.

The following models are available:

- CELEBRIS XL 590 90 MHz Pentium
- CELEBRIS XL 590 DP 90 MHz Pentium (Dual Processor)
- CELEBRIS XL 5100 100 MHz Pentium
- CELEBRIS XL 5100 DP 100 MHz Pentium (Dual Processor)
- CELEBRIS XL 5120 120 MHz Pentium
- CELEBRIS XL 5133 133 MHz Pentium
- CELEBRIS XL 5133 DP 133 MHz Pentium (Dual Processor)
- CELEBRIS XL 5166 166 Mhz Pentium
- CELEBRIS XL 5166 DP 166 Mhz pentium (dual processor)
- CELEBRIS XL 150 Mhz Pentium Pro

Significant features include:

- PCI local bus technology
- Also available as 150 MHz Pentium-Pro processor
- Upgradable ZIF (Zero Insertion Force) socket 2 x ZIF 5
- 8MB system RAM minimum, expandable to 384MB, 512MB for pentium pro
- Alpha AXP upgradable
- 256KB asynchronous cache on single pentium processor variants
- 512KB asynchronous cache on dual processor variants
- Plug and Play
- On-board IDE/FDU controller
- flash BIOS
- On-board PCI SCSI-2 Controller, supports Fast SCSI-2
- Two PCI slots, one PCI/ISA interleaved, three ISA expansion slots (one PCI slot used for VGA adapter)

Choice ofvideo cards:

- S3 864 PCI/VGA card, 2MB DRAM, upgradable to 4MB
- High performance DIAMOND STEALTH PCI/VGA card, 2MB DRAM, upgradable to 4MB
- High performance Matrox Millennium PCI card
- 2MB WRAM upgradable to 8MB
  - ◊ 1600x1200, 256 colors, 60-72 Hz *
  - ◊ 1280x1024, 256-65K colors, 60-90 Hz *
  - ◊ 1024x768, 256-65K colors, 60-120 Hz *
  - ◊ 800x600, 256-16.7M colors, 60-120 Hz *
  - ◊ 640x480, 256-16.7M colors, 60-120 Hz *

  ** The maximum values when supported by the monitor*

Also for pentium pro:

- AccelGraphics AG300 dedicated 3D accelerator
- 5MB VRAM / frame-buffer
- 1280x1024, 65K-16.7M colors, 60-74 Hz
- 1024x768, 65K-16.7M colors, 60-74 Hz
- 2.5MB DRAM / 16 bit Z-buffer
- OpenGL support
- Dual Screen support
- VGA adapter required
  See also: http://www.accelgraphics.com
- Flash BIOS
- “Energy Star” compliant
- 300 W power supply

Front access bays:

- Three 5,25” x 1.6” bay
- One 3.5” x 1” bay for floppy

Internal access bays:

- One 3.5” x 1.6” bay for disks

Product Models Information

EC = English, French, German, Italian and Spanish.
ED = Danish, Dutch, English, Finnish, French (France excluded), Norwegian and Swedish.

CELEBRIS XL & XL^{DP} Models (FR-8xxWW)

Product	*Model*	*HDD*	*Memory*	*Cache*	*Video adapter*	*Options*
CELEBRIS XL590	FR-873WW-AD	-	8MB	256KB	None	
	FR-873WW-WH	540MB SCSI-2	8MB	256KB	S3 864 Video card	
	FR-873WW-WN	1GB SCSI-2	16MB	256KB (Sync.B)	Diamond Stealth 64	CD-ROM
CELEBRIS XL590 DP	FR-874WW-AD	-	16MB	512KB (Sync.B)	None	
CELEBRIS XL5100	FR-875WW-AD	-	16MB	256KB (Sync.B)	None	
	FR-875WW-WN	1GB SCSI-2	16MB	256KB (Sync.B)	Diamond Stealth 64	CD-ROM
CELEBRIS XL5100 DP	FR-876WW-AD	-	16MB	512KB (Sync.B)	None	

CELEBRIS XL & XL^{DP} Models (FR-AxxWW)

Product	*Model*	*HDD*	*Memory*	*Cache*	*Video adapter*	*Options*
CELEBRIS XL5100	FR-A03WW-AD	-	16MB	256KB	None	
	FR-A03WW-CN	1GB SCSI-2	16MB	256KB	Matrox Millennium	4x SCSI CD-ROM
CELEBRIS XL5100 DP	FR-A04WW-AD	-	16MB	512KB	None	
	FR-A04WW-CN	1GB SCSI-2	16MB	512KB	Matrox Millennium	4x SCSI CD-ROM
CELEBRIS XL5120	FR-A05WW-AD	-	16MB	256KB	None	
	FR-A05WW-CN	1GB SCSI-2	16MB	256KB	Matrox Millennium	4x SCSI CD-ROM
CELEBRIS XL5133	FR-A07WW-AD	-	16MB	256KB	None	
	FR-A07WW-CN	1GB SCSI-2	16MB	256KB	Matrox Millennium	4x SCSI CD-ROM
CELEBRIS XL5133 DP	FR-A08WW-AD	-	16MB	512KB	None	
	FR-A08WW-CN	1GB SCSI-2	16MB	512KB	Matrox Millennium	4x SCSI CD-ROM
CELEBRIS XL 5166	FR-A11WW-AD	-	16MB	256KB	None	
	FR-A11WW-CN	1 GB SCSI-2	16MB	256KB	Matrox Millennium	4x SCSI CD-ROM
CELEBRIS XL 5166 DP	FR-A12WW-AD	-	16MB	512KB	None	
	FR-A12WW-CN	1 GB SCSI-2	16MB	512KB	Matrox Millennium	4x SCSI CD-ROM

Celebris XL Pentium-Pro models

Product	*Model*	*HDD*	*Memory*	*Cache*	*Video adapter*	*Options*
Celebris XL 6150	FR-A31WW-AD	-	16MB	256KB	None	
	FR-A31WW-CC	1 GB SCSI-2	16MB	256KB	Matrox Millennium	4x SCSI CD-ROM
	FR-A31WW-CN	2 GB Wide SCSI with Ultra Wide SCSI adapter	32MB	256KB		4x SCSI CD-ROM
CELEBRIS XL6180	FR-A33WW-AD	-	16MB	256KB	None	
	FR-A33WW-CC	1GB SCSI-2	16MB	256KB	Matrox Millennium	4x SCSI CD-ROM
	FR-A33WW-CN	2GB Wide SCSI with Ultra Wide SCSI adapter	32MB	256KB	3D Graphics Accelrator	4x SCSI CD-ROM
CELEBRIS XL6200	FR-A34WW-AD	-	16MB	256KB	None	
	FR-A34WW-CC	1GB SCSI-2	16MB	256KB	Matrox Millennium	4x SCSI CD-ROM
	FR-A34WW-CN	2GB Wide SCSI with Ultra Wide SCSI adapter	32MB	256KB	3D Graphics Accelrator	4x SCSI CD-ROM

Chapter 2 System Utilities & Configuration

System Utilities

This chapter describes how to use the utilities and SCSI drivers supplied with the CELEBRIS XL computer. In most cases, these utilities and drivers are factory installed on the hard disk drive and supplied on diskettes.

- System utilities consisting of:
  - ◊ EPP3NS.EXE – Enables to configure the computer for EPP operation.
  - ◊ Logitech mouse drivers – Enables the computer to operate using a Logitech mouse.
  - ◊ KP.EXE– Enables to set a keyboard and mouse password.

- Multilingual BIOS diskette consisting of:
  - ◊ PHLASH.EXE (and associated runtime files).
  - ◊ Binary multilingual BIOS images.
  - ◊ PHLASH**.BAT files, where ** represents the multilingual BIOS. Run this file to upgrade the BIOS to the desired language.
    Refer to the section *"PHLASH.EXE"* later in this chapter, for additional information.

- MS-DOS/Windows, Windows NT, Netware, and OS/2 NCR SCSI Drivers – For additional information on the directory structure for locating the desired driver file, see the README.TXT file supplied with the SCSI driver.

- NCR SCO UNIX SCSI Drivers – For additional information on the directory structure for locating the desired driver file, see the README.TXT file supplied with the SCSI driver.

Before Using System Utilities

When not familiar with utility programs and their uses, carefully read and understand this chapter before attempting to use any of the utilities.

Restoring Win95 Factory-Installed Software

To restore all factory-installed software, proceed as follows:

1) With the computer off, put the WIN 95 Companion CD into the CD drive.
2) Insert the CELEBRIS XL Win 95 Setup/Restore diskette into the diskette drive.
3) Turn the computer on.
   The computer boots automatically from the diskette and prompts for confirmation.
4) Enter **[Y]** to proceed and the system software will then be copied to the hard disk drive.
5) When prompted to do so, insert the CELEBRIS XL Win 95 Setup/Restore diskette into the CD drive, which will load the Getting Started and related help files and utilities.
6) When the files have been successfully copied, remove the boot diskette and the CD ROM.
7) Reboot the computer.
   All system software is now loaded to the out-of-box factory condition.

NOTE If the computer can still perform basic functions, we recommend that the customer makes backup diskettes of all important personal files. Restoring all factory-installed software will re-format the hard disk and erase all files.

Restoring WFW Factory-Installed Software

For Windows for Workgroups, run Make Media Master to create backup operating system and utilities/drivers diskettes.
The Make Media Master program prompts to place diskettes in drive A and then automatically copies the files to drive A.

To restore all factory-installed software, proceed as follows:

1) With the computer off, put disk 1 for the DOS setup into the diskette drive.
2) Turn the computer on. The computer will boot automatically from the diskette and prompts to install the other diskettes.
3) When the files have been successfully copied, remove the boot diskette.
4) Reboot the computer.
   All system software is now loaded to the out-of-box factory condition.

NOTE If the computer can still perform basic functions, we recommend that the customer makes backup diskettes of all important personal files. Restoring all factory-installed software will re-format the hard disk and erase all files.

Restoring Windows NT Factory-Installed Software

To restore all factory-installed software, proceed as follows:

1) With the computer off, put the Windows NT OS CD into the CD drive.
2) Insert disk 1 of the Windows NT Setup diskettes into the diskette drive.
3) Turn the computer on.
   The computer boots automatically from the diskette and prompts when to insert the other setup diskettes. Follow the instructions in the Windows NT manual.
4) When prompted to do so, insert the CELEBRIS XL Software Restore CD into the CD drive, which will load the related help files.
5) When the files have been successfully copied, remove the boot diskette and the CD ROM.
6) Reboot the computer.
   All system software is now loaded to the out-of-box factory condition.

NOTE If the computer can still perform basic functions, we recommend that the customer makes backup diskettes of all important personal files. Restoring all factory-installed software will re-format the hard disk and erase all files.

Using System Utilities

These utilities enable to upgrade or restore the BIOS and set the parallel port to EPP mode (only if the printer supports EPP mode). If this is the first time using these utility programs, it is recommended to follow the procedures in the order given.

1) Turn on or reboot the computer. If POST detects an error, refer to *Chapter 4,"Troubleshooting"* for possible causes and suggested solutions.
2) If necessary, run PHLASH.EXE to restore or upgrade the BIOS to a new one provided.
3) Run EPP3NS.EXE to configure the computer for EPP operation.

PHLASH.EXE

All computers have BIOS software on a chip on the main logic board. This BIOS initializes hardware and boots the operating system when the computer is turned on. The BIOS also provides access to other services such as keyboard and disk drives.
The computer comes equipped with flash memory. This means that the BIOS can simply be restored by running the PHLASH.EXE utility. The BIOS can also be upgraded to future releases by running PHLASH.EXE along with any flash BIOS update diskette if necessary.

Before Using PHLASH.EXE

Before using PHLASH.EXE to upgrade the BIOS, create a crisis recovery diskette. This diskette can than be used to reprogram the BIOS in case the flash process built into the computer fails.

Have the following items available:

- A blank 3½-inch 1.44MB formatted diskette
- A diskette copy of the multilingual BIOS upgrade diskette

Creating a Crisis Recovery Diskette

To create a crisis recovery diskette:

1) Turn on the computer 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 computer.
   Insert the multilingual BIOS diskette into the diskette drive and enter: ***a:dir***
   The entry should show the following files are on the diskette:
   MINIDOS.SYS
   PHLASH.EXE
   MAKEBOOT.EXE
   MAKECRD.EXE
   Note that there are some additional files as well. Refer to the README file on the diskette for additional information.
3) Create an upgrade directory on the hard disk drive. For example, if the hard disk drive is **c:**>, enter at the DOS prompt: ***md upgrade***.
4) Copy the files from the multilingual BIOS diskette into the upgrade directory on the hard disk drive. For example, from the DOS prompt enter: ***copy a:\upgrade*.* c:\upgrade*.****.
5) Insert a blank formatted diskette into drive A.
6) On drive A, make a directory for the files previously copied. For example, from the DOS prompt enter:
   md ugrade.
7) Return to the hard disk drive and copy the files. From the DOS prompt enter: ***makecrd***.
   The `makecrd` command prompts for a recovery diskette to be placed in drive A and then automatically copies the files to drive A.
8) Remove the crisis recovery diskette from drive A and store it in a safe place.

Using the Crisis Recovery Diskette

The crisis recovery diskette must be used only if the BIOS fails or if a BIOS upgrade was unsuccessful.

If the BIOS failed to flash properly or is corrupted in some way, the following sequence of events occur:

1) POST detects an error after a normal boot cycle or a BIOS upgrade.
   Messages appear on the monitor screen to inform that the BIOS did not flash properly or has failed.
2) The BIOS in the bootblock memory automatically executes.
3) The computer attempts to find the correct BIOS files to execute the correct boot cycle.
4) The computer beeps several times.
   This means the computer cannot properly boot using the BIOS files that were just copied during the flash update.
5) The diskette drive begins searching for the crisis recovery diskette to restore the BIOS to its previous known state.

Restore the BIOS to its previous known state by performing the following procedures:

1) Turn off the computer, unlock and remove the left-side cover, and set the recovery jumper **(J34)** to enabled. Also, make sure that **J35** is enabled.
   Jumper **J34** controls whether the computer is in recovery (Enabled) or normal (Disabled) operation. Jumper **J35** allows for (Enabled) or prevents (Disabled) flashing of the BIOS.
2) Replace the left-side cover, insert the crisis recovery diskette into drive A, and then power on the computer.
   The computer automatically boots from drive A and upgrades the BIOS. Upon completion, the computer sounds a beep code and attempts to restart.
3) After the BIOS is restarted, turn off power to the computer and remove the crisis recovery diskette from drive A.
4) Remove the left-side cover and set the recovery jumper **(J34)** to disabled.
5) Replace and lock the left-side cover and turn the power back on for normal operation.

Upgrading The BIOS

Perform the following steps to update the BIOS in flash memory:

1) Create a crisis recovery diskette if not already done so.
2) Insert the multilingual BIOS diskette in the diskette drive.
3) Turn on the computer and allow the POST to complete.
   The computer now boots from the multilingual BIOS diskette.
   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 computer.
4) At the MS-DOS prompt, type: ***upgrade****phlash***
   A screen appears on the monitor warning that you are about to erase the computer's BIOS.
5) Press **[Enter]** to continue. Else, press **[Esc]** to cancel.
   When pressing **[Enter]**, PHLASH.EXE automatically updates the computer's BIOS.
   After the flashing process completes, the computer automatically reboots itself so changes immediately take effect.
6) Remove the multilingual BIOS diskette.

Upgrading the BIOS to a New Language

Perform the following steps to upgrade the BIOS to a new language:

1) Turn on the computer and allow 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 computer.
2) Insert the multilingual BIOS diskette into drive A.
3) At the DOS prompt, type**: *phlash****
   where ** represents the appropriate BIOS language as follows:
   GR German
   FR French
   IT Italian
   EN English
   For example, to switch to a Spanish BIOS enter: ***phlashSP***
   A screen appears on the monitor warning that you are about to erase the BIOS.
4) Press **[Enter]** to continue. Else, press **[Esc]** to cancel.
   When pressing **[Enter]**, PHLASH.EXE automatically updates the BIOS.
   After the flashing process completes, the computer automatically reboots itself so changes immediately take effect.
5) Remove the multilingual BIOS diskette.

Using EPP3NS.EXE to Configure an EPP Parallel Port

EPP3NS.EXE is a device driver for configuring the parallel port as an enhanced parallel port (EPP). Before loading this device driver, check the documentation for the device to be connected to the parallel port and make sure it supports EPP mode. If it does not, there is no need to load this device driver.

If the device does support EPP mode, perform the following:

1) Either copy EPP3NS.EXE to the hard disk drive or locate it on the hard disk drive's factory installed software (Note the path where the driver is located).
2) Edit the CONFIG.SYS file to enter the path for EPP3NS.EXE.
   Refer to the DOS documentation for information on editing the CONFIG.SYS file. For example a line in the CONFIG.SYS might be: *device=C:\epp3ns.exe*
3) Save the new version of the CONFIG.SYS file.
4) Press **[Ctrl] + [Alt] + [Del]** to reboot the computer.
5) Before POST completes, press **[F2]** to enter Setup.
6) Choose the Advanced Menu in Setup and select Parallel Port Mode.
7) Choose EPP mode.
8) Select *Save Changes and Exit* to save the new setting.
   The computer will then automatically reboot.
   The parallel port is now configured as an EPP port.

Loading SCSI Drivers

Refer to the supplied *NCR SCSI Device Management System (SDMS) User's Guide* for information on loading the following NCR SCSI device drivers:

- MS-DOS/Windows
- Windows NT
- Netware
- OS/2
- SCO Unix

BIOS Setup Utility

This section provides information on how to configure the computer using the BIOS Setup utility. If the computer was delivered with factory-installed software, it has already been configured.
When familiar with utility programs and their uses, refer to the appropriate sections in this chapter to setup or update the computer. Otherwise, carefully read and understand this chapter before attempting to modify the computer's configuration settings.

Running the BIOS Setup Utility

The BIOS Setup utility enables to select and permanently store information about the hardware and software in the battery-backed memory of the CMOS RAM. This information takes effect each time the computer boots and can be changed each time you run setup.
Use the BIOS Setup utility when experiencing problems with the hard disk or when there is a need to reconfigure the computer. In addition, the BIOS Setup utility may be necessary to modify the configuration after adding or removing hardware, or changing computer settings.

To run the BIOS Setup utility, perform the following steps:

1) Turn on the computer.
2) Before POST completes, press **[F2]** to display the main menu.
3) Follow the instructions on the monitor screen and any on-line help pop-up screens to configure the computer.

Manoeuvring through Setup

There are five major headings visible on the initial Setup screen. These headings are: Main, Advanced, Security, Power and Exit. The following illustration shows a partial listing of topics that are available under each of these headings.

To run the BIOS Setup utility, perform the following steps:

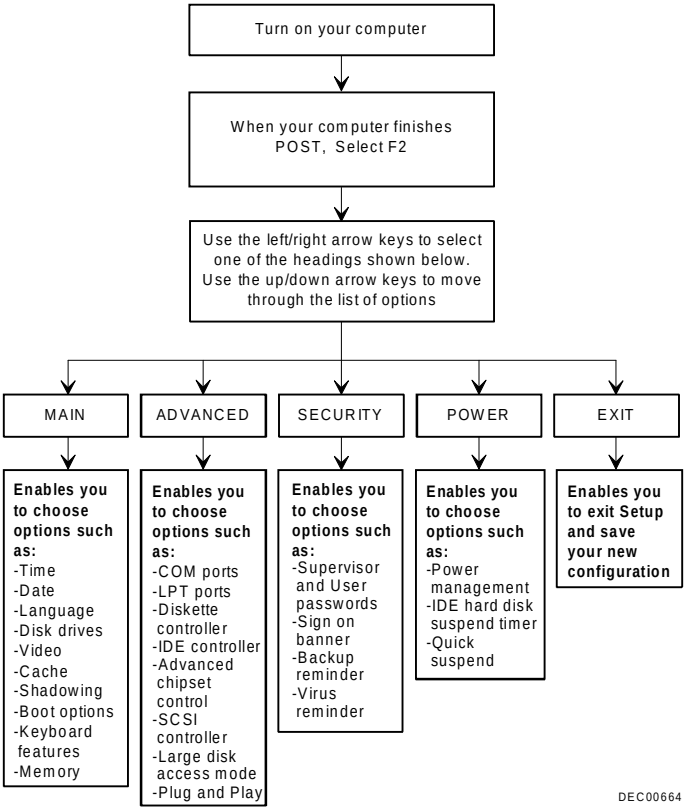

Figure 2 - 1 BIOS Setup Utility Flow Chart

Updating The Configuration

The following sections list the BIOS Setup utility options that can be updated or modified using the following menu selections:

- **Main** Enables to set basic computer configuration options (time, date, video, etc.).
- **Advanced** Enables to set advanced features to increase computer performance (COM ports, LPT port, etc.).
- **Security** Enables to set passwords and backup data reminders.
- **Power** Enables to set power saving options to save energy.
- **Exit** Enables to quit and save the changes.

NOTE Once a supervisor password is set, a user might not be able to change some BIOS Setup utility options.

Helpful Hints

Below are some helpful hints when using the BIOS Setup utility:

- Several keyboard function keys and numeric keypad keys are assigned to help selecting menus and sub-menus, options, changing option values and displaying help information. These keys are displayed at the bottom of the main menu and from the General Help pop-up screen.
- Item-specific help is available at anytime during the setup process and appears at the right of the setup screen each time an option is highlighted. This on-line help provides information about a highlighted option.
- Select *"Save Changes & Exit"* from the exit menu to save all Setup values.
- Select *"Discard Changes & Exit"* from the exit menu to exit Setup without recording any changes.
- Select *"Get Default Values"* from the exit menu to set all Setup options to their default values.
- Select *"Load Previous Changes"* from the exit menu to restore all CMOS values from the last session.
- Select *"Save Changes"* from the exit menu to save all selections without exiting Setup.
- Press **[Esc]** to exit a sub-menu and return to the main menu.
- Press **[Esc]** from the main menu to go to the exit menu.

Main Menu Options

Menu Fields	*Settings*	*Comments*
System time	Current time	Displays the current time.
System date	Current date	Displays the current date.
Language	English Español Français Deutsch Italiano	This field only displays the current language of the BIOS. The setting in Setup can not be changed. Instead, use PHLASH** to change the BIOS, where ** is the language extension. The BIOS Setup utility supports only one language per computer.
Diskette drive A **Diskette drive B**	1.44MB, 3½ 2.88MB, 3½ Not Installed 1.2MB, 5¼ 720KB, 3½	Sets the size and density of diskette drives.
Autotype fixed disk	Press [Enter]	Press [Enter] to detect and fill in the installed hard disk drive parameters in the remaining fields.
Type(1)	1 to 39 User	Selecting 1 to 39 automatically fills in the remaining fields in this menu. Selecting User prompts to fill in the remaining fields with the installed hard disk drive's parameters.(2)
Cylinders(1)	0 to 4095	Displays the number of cylinders.
Heads(1)	1 to 64	Displays the number of heads.
Sectors/track(1)	0 to 63	Displays the number of sectors/track.
Write precomp(1)(2)	0 to 4095 None	Displays the number of cylinders that have their write timing changed.
Multi-sector transfers	2 sectors 4 sectors 8 sectors 16 sectors Auto Disabled	Determines the number of sectors per block for multiple sector transfers. Auto refers to the size the disk returns when queried.
LBA control mode	Disabled Enabled	Enables or disables the LBA hard disk drive addressing option.
Video system	EGA / VGA CGA 80x25 Monochrome	Sets the video controller type.

(1) These fields are automatically filled in if the computer auto-detected an installed hard disk drive.
(2) Incorrect settings can cause the computer to malfunction.

Memory and Cache Options

Menu Fields	*Settings*	*Comments*
Internal cache	Enabled Disabled	Enables or disables the internal cache. **Note**: The internal cache is internal to the CPU.
External cache	Enable (WB) Enable (WT) Disable	The external cache operates in Write-Back (WB) Mode if Enable has been selected. The external cache operates in Write-Through (WT) Mode if Enable has been selected. For optimal computer performance, keep this setting at Enabled (WB).
System BIOS shadow	Not user selectable, permanently set to Enabled.	The main logic board reserves an area of DRAM for a copy of system BIOS ROM. This DRAM called "shadow memory" is write-protected and has the same addresses as the system BIOS ROM locations. When shadowing system BIOS ROM, the ROM information is copied into an appropriate area in DRAM. This increases the performance because the system BIOS instructions are in fast DRAM instead of ROM.
Cache system BIOS	Enabled Disabled	This option enables the system BIOS to be cached in the internal cache and external cache (if installed). This increases computer performance because BIOS instructions can be executed in cache instead of RAM.
Video BIOS shadow	Enabled Disabled	The main logic board reserves an area of DRAM for a copy of video BIOS ROM. This DRAM called "shadow memory" is write-protected and has the same addresses as the video BIOS ROM locations. When shadowing video BIOS ROM, the ROM information is copied into an appropriate area in DRAM. This increases the performance because the video BIOS instructions are in fast DRAM instead of ROM.
Cache video BIOS	Enabled Disabled	This option enables the video BIOS to be cached in the internal cache and external cache (if installed). This increases computer performance as video BIOS instructions can be executed in cache instead of RAM.
Shadow option ROM's **C800-CBFF** **CC00-CFFF** **D000-D3FF** **D400-D7FF** **D800-DBFF** **DC00-DFFF**	Enabled Disabled	Allows to enable or disable shadowing of individual segments of ROM to increase computer performance. **Caution**: Some option ROMs do not operate properly when shadowed.
AT bus space	Disabled C00000h, 4MB E00000h, 2MB F00000h, 1MB	Memory hole not available, upper memory is contiguous. Sets the memory hole at address C00000 with 4MB memory available. Sets the memory hole at address E00000 with 2MB memory available. Sets the memory hole at address F00000 with 1MB memory available.
System memory	Not user selectable	Displays the amount of base (conventional) memory each time the computer boots.
Extended memory	Not user selectable	Displays the amount of extended memory each time the computer boots.

Memory and Cache Options (continued)

Menu Fields	*Settings*	*Comments*
Extended memory report	Compatibility Non-compatibility	Selects the BIOS report mechanism for memory amount. Select Compatibility when using a conventional operating system. Select Non-Compatibility for extended memory above 64MB under Windows NT V3.1.

Boot Options

Menu Fields	*Settings*	*Comments*
Boot sequence	A: only A: then C: C: then A: C: only	Each time the computer boots, it will load the operating system from the selected sequence.
SETUP prompt	Enabled Disabled	Enables or disables the <F2> setup prompt each time the computer boots. When Disabled is selected, only the prompt informing you when to press <F2> to enter Setup is disabled. Setup can still be entered by pressing <F2> before POST completes.
POST errors	Enabled Disabled	Enabling this options causes the computer to pause and display a setup entry or resume the boot prompt if an error occurs at boot. Disabling this option causes the computer to always attempt to boot regardless of a setup entry or error.
Floppy check	Enabled Disabled	Enabling this option causes the computer to verify the diskette type each time the computer boots. Disabling this option speeds up the boot process.
Summary screen	Enabled Disabled	Enabling this option causes the computer to display configuration parameters (in the form of a summary screen) during boot.

Keyboard Features

Menu Fields	*Settings*	*Comments*
Numlock	Auto On Off	Turns Numlock on or off each time the computer boots. **Note**: When Auto has been selected, the computer will turn on Numlock if it detects a numeric keypad.
Key click	Disabled Enabled	Enables or disables the audible key click feature.
Keyboard auto-repeat rate	30/sec 2/sec 6/sec 10/sec 13.3/sec 18.5/sec 21.8/sec 26.7/sec	Sets the number of times a second to repeat a keystroke while holding the key down.
Keyboard auto-repeat delay	1/2 sec 3/4 sec 1 sec 1/4 sec	Sets the delay time after a key is held down before it begins to repeat a keystroke.

Integrated Peripherals

Menu Fields	*Settings*	*Comments*
Mouse port	Disabled Enabled	Enables or disables the mouse port.
Parallel port	Auto Disabled 3BC, IRQ 7 378, IRQ 7 278, IRQ 5	Enables or disables the onboard port at the specified address. **Note**: Two devices cannot share the same IRQ. Also, choosing disable makes the parallel port unusable.
Diskette controller	Enabled Disabled	Enables or disables the onboard diskette controller.
Exchange diskette drives	Disabled Enabled	Enables to logically exchange physical diskette drive designations.

Integrated Peripherals (continued)

Menu Fields	*Settings*	*Comments*
Diskette write protection	Disabled Enabled	Enables or disables the selected diskette drive's write protect option.
Parallel port mode	Compatible mode Bi-directional mode ECP mode EPP 1.7 EPP 1.9	Standard printer connection. PS/2 compatible mode and able to receive data. Extended capabilities port mode. Enhanced parallel port mode. Selection based on what EPP version the printer supports. Only choose a mode that the parallel port device (such as a printer) supports. Check the parallel port device documentation for this information.
Serial port 1	Auto Disabled 3F8, IRQ 4 2F8, IRQ 3 3E8, IRQ4 2E8, IRQ3	Enables or disables onboard serial port 1 at the specified address. Select Auto unless interrupts IRQ4 and/or IRQ3 have been allocated as a computer resource. Two devices cannot share the same IRQ. Choosing Disable makes serial port 1 unusable. When selecting Auto, setup configures COM1 to address = 3F8h and IRQ = 4.
Serial port 2	Auto Disabled 3F8, IRQ 4 2F8, IRQ 3 3E8, IRQ4 2E8, IRQ3	Enables or disables onboard serial port 2 at the specified address. Select Auto unless having interrupts IRQ4 and/or IRQ3 allocated as a computer resource. Two devices cannot share the same IRQ. Choosing Disable makes serial port 2 unusable. When Auto has been selected, setup configures COM2 to address = 2F8h and IRQ = 3.
IDE controller	Enabled Disabled	Enables or disables the onboard IDE controller.
On-board SCSI device	Enabled Disabled	Enables or disables the onboard PCI SCSI device.
External SCSI device	Disabled Enabled	Enables or disables the main logic board's external SCSI port.

Advanced Chipset Control Options

NOTE The following advanced chipset control options should normally stay at their default values.

Menu Fields	*Settings*	*Comments*
CPU to PCI write buffers	Disabled Enabled	Enables or disables the CPU to PCI write buffers. These buffers enable data to be temporarily stored before writing the data.
VGA palette snoop	Enabled Disabled Default	This option controls how VGA devices handle accesses to their palette areas. Enabling this option causes special palette behavior (a device must not respond to normal accesses). Disabling this option causes a device to treat palette accesses like any other device access. Enable VGA Palette Snoop when a second video adapter is connected to the feature connector of the installed VGA adapter for multi-media devices.
PCI parity	Enabled Disabled	Enables or disables the parity checking feature of the PCI bus. Enabled gives higher reliability on PCI bus transfers. Disabled may be required for some PCI options that do not properly support this PCI feature.
PCI arbiter priority(1)	System default Pure rotating ISA slot Onboard SCSI CPU PCI slot 1 PCI slot 2 PCI slot 3	Use the BIOS default value. BIOS will select optimal settings based on the current computer hardware configuration. The priority rotates for all PCI devices. ISA slot has the highest priority. Onboard SCSI has the highest priority. CPU has the highest priority. PCI slot 1 has the highest priority. PCI slot 2 has the highest priority. PCI slot 3 has the highest priority.
On-board SCSI latency timer	40h, 48h 50h, 58h 60h, 68h 70h, 78h 80h, 88h 90h, 98h A0h, A8h B0h, B8h C0h, C8h D0h, D8h E0h, E8h F0h, F8h Default 08h, 10h 18h 20h, 28h 30h, 38h	Each PCI device has a latency timer register. This register specifies, in PCI clocks, the value of the latency timer for a particular PCI device master.

Advanced Chipset Control Options (continued)

Menu Fields	*Settings*	*Comments*
PCI slot 1-3 latency timer	40h, 48h, 50h, 58h, 60h, 68h, 70h, 78h, 80h, 88h, 90h, 98h, A0h, A8h, B0h, B8h, C0h, C8h, D0h, D8h, E0h, E8h, F0h, F8h, Default, 08h, 10h, 18h, 20h, 28h, 30h, 38h	Each PCI device has a latency timer register. This register specifies, in PCI clocks, the value of the latency timer for a particular PCI device master.
Plug & Play O/S	Yes No	Select Yes when using a Plug & Play operating system. Otherwise, select No.
Large disk access mode	DOS Other	Select DOS if MS-DOS has been installed. Select Other if another operating system has been installed. A large disk drive constitutes one that has more than 1024 cylinders, 16 heads, or 63 tracks per sector.

(1) The PCI arbiter priority selection for factory installed PCI expansion boards should stay at the factory default settings.

Modification to the default settings can cause computer failure.

Security Options

Menu Fields	*Settings*	*Comments*
Supervisor password is	Not user selectable	Tells whether or not the supervisor's password is enabled or disabled.
User password is	Not user selectable	Tells whether or not the user's password is enabled or disabled.
Set supervisor password	Press [Enter]	Enables to set a supervisor password. It is necessary to set the supervisor password when intending to allow the user password to be used. When the supervisor later enters his or her password, all user selectable features are accessible. **Note**: Entering Setup with a supervisor password provides full access to all BIOS Setup utility menus.

Security Options (continued)

Menu Fields	*Settings*	*Comments*
Set user password	Press [Enter]	Enables to set a user password. This password can only be set if a supervisor password is entered. When the user has entered his or her name but the supervisor is not logged in, only the following information is accessible: Supervisor password is Enabled. User password is Enabled. Set user password [press enter] to enter a user password. Password on boot Enabled/Disabled (whichever is in effect). This option is not allowed to change. Custom sign on banner Enabled/Disabled (whichever is in effect). This option is not allowed to change. **Note**: Entering Setup with a user password restricts access to certain BIOS Setup utility menus. Also, this option requires prior setting of the supervisor password.
Password on boot	Enabled Disabled	Enables or disables the enter password on boot option. **Note**: This option requires prior setting of the supervisor/user password.
Custom sign on banner is	Not user selectable	Tells if the custom sign on banner is enabled or disabled.
Custom sign on banner	Press [Enter]	Press [Enter] to enter a custom sign on banner that displays during POST. For example, you might enter *"Welcome to John's machine"*. The maximum number of characters is 50.
Diskette access	Supervisor User	Enables to control who has access to diskette drives. When selecting Supervisor, access to the diskette drive is limited to the supervisor, who must enter his or her password. When selecting User, the diskette can be accessed by entering either the supervisor or the user password. Whatever setting has been chosen, it only becomes functional if you have set a Supervisor Password and a User Password (when User has been chosen for the setting).
Fixed disk boot sector	Normal Write protect	Enables to write protect the boot sector on the hard disk drive.
Network server	Enabled Disabled	This option keeps the computer from being accessed during network operation.
System backup reminder	Disabled Daily Weekly Monthly	Enables or disables the system backup reminder message.
Virus check reminder	Disabled Daily Weekly Monthly	Enables or disables the virus check reminder message.

Power Options

Menu Fields	*Settings*	*Comments*
Power management	Enabled Disabled	Enables or disables the following power management options.
Hard disk suspend timer	Enabled Disabled	Allows to disable or enable the hard disk suspend timer feature or after a set period of disk drive inactivity (approximately 21 minutes), allows the hard disk drive to spin down its motor to save power. For IDE hard disk drives only.
System suspend timer	Disabled 30 min. 1 hour 1.5 hours 2 hours 3 hours 4 hours	After a set period of computer inactivity, the BIOS places the computer in a suspend state (maximum power savings), that is, the monitor, hard disk, CPU and fan are shut off. When a timer for the field has been set, also set Power Management to Enabled. Alternately, this option may be disabled.
Quick suspend	Enabled Disabled	Enabling this option allows to put the computer in suspend mode by pressing [Ctrl] + [Alt] + [Esc].

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 and 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 applied 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 Panel

Before removing the side panel, perform the following:

1) Turn off power to all external devices connected to the computer.
2) Turn computer off.
3) Unplug power cord from wall outlet.
4) Disconnect power cord and monitor cord from computer.

WARNING
You might injure yourself or damage the computer if you attempt to remove the side panel before unplugging the ac and monitor power cords.

To unlock the side panels, turn the chassis key clockwise to a horizontal position (see Figure 3-1).
To remove the side panels, pull each one toward the rear of the computer and then lift away.

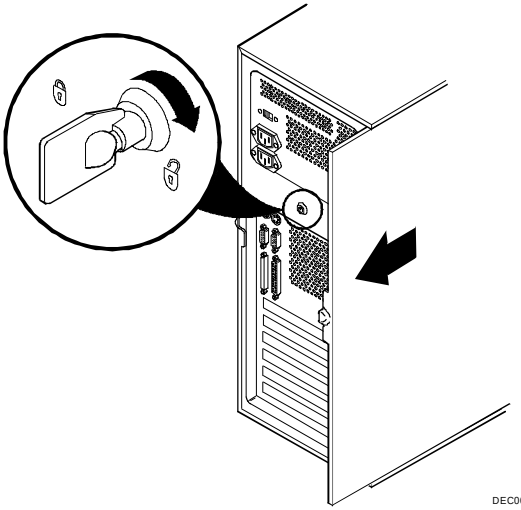

Figure 3 - 1 Unlocking and Removing the Side Panels

Computer Components

Legend	*Component*
A	Power supply
B	ISA and PCI 32-bit local bus expansion slots
C	CPU module
D	Main logic board
E	3½-inch diskette drive
F	Three 5¼-inch half-height drive bays
G	Hidden 3½-inch half-height drive bay

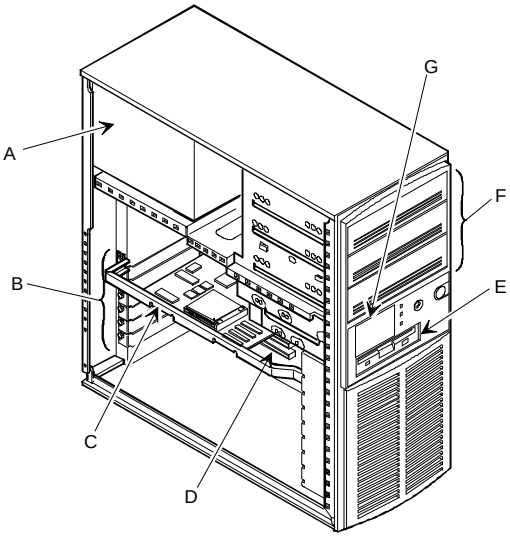

Figure 3 - 2 Model 870WW Computer Components

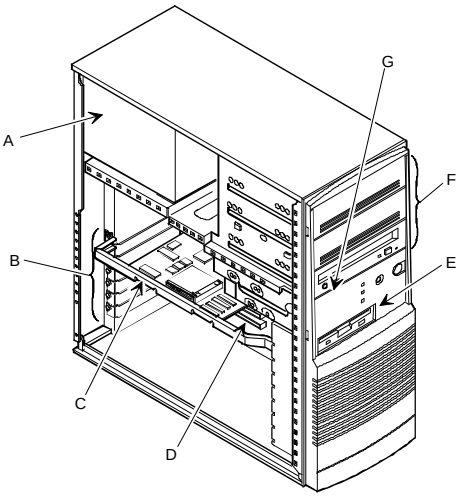

Figure 3 - 3 Model A03 WW Computer Components

Expansion Slots

The CELEBRIS XL computer contains seven expansion board slots (refer to Figure 3 - 4). Four of the slots support industry-standard 16-bit ISA expansion boards. The remaining three PCI local bus expansion slots support 32-bit PCI local bus expansion boards. This enables the computer to deliver maximum performance by using a wider data path for higher computing speed. It also improves the expandability of the computer.

Expansion Slot	*Slot Type*	*Description*
J7, J8, J9	ISA	Supports industry-standard 16-bit ISA expansion boards.
J6	ISA	Supports industry-standard 16-bit ISA expansion boards. Designated as a shared slot with PCI slot J13.(1)
J11/PCI slot 1	PCI	Supports bus mastering 32-bit PCI expansion boards. Digital recommends to install the 32-bit PCI video adapter in this slot.
J12/PCI slot 2	PCI	Supports bus mastering 32-bit PCI expansion boards. Digital recommends to install 32-bit bus mastering PCI expansion boards in this slot.
J13/PCI slot 3	PCI	Supports bus mastering 32-bit PCI expansion boards. Designated as a shared slot with ISA slot J6.(1)

(1) Only one expansion board can reside in slot J6 and J13 at any time. These slots have to share the expansion slot opening at the rear panel.

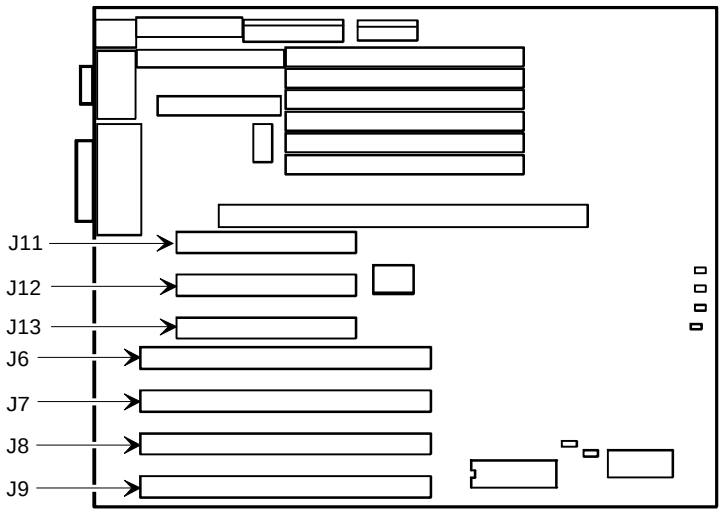

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Figure 3 - 4 CELEBRIS XL Expansion Board Slots

Main Logic Board Switches/Jumpers

The following table lists the main logic board switches/jumpers and factory-default settings. Figure 3 - 5 shows the locations of the main logic board switch/jumper pins.

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 computer chassis. A static discharge from your fingers can result in permanent damage to electronic components.

Main Logic Board Jumper Settings

Feature	*Description*	*Setting*
Flash ROM upgrade	Enable(1) Disable	J35, jumpered(1) J35, open
Recovery mode	Normal(1) Recovery mode	J34, open(1) J34, jumpered
Display type	Mono(1) Color	J33, open(1) J33, jumpered
Password clear	Normal(1) Password clear (MFG test)	J32, open(1) J32, jumpered
Clear CMOS to default settings	Normal operation(1) Clear CMOS	J29, open(1) J29, jumpered
Reprogrammed boot block	Disable (1)(2) Enable	J40, pins 1 and 2 jumpered(1) J40, pins 2 and 3 jumpered

(1) Factory default setting.
(2) Disabling this jumper prevents corruption of the boot block when a boot block update is not required.

Main Logic Board Jumper Locations

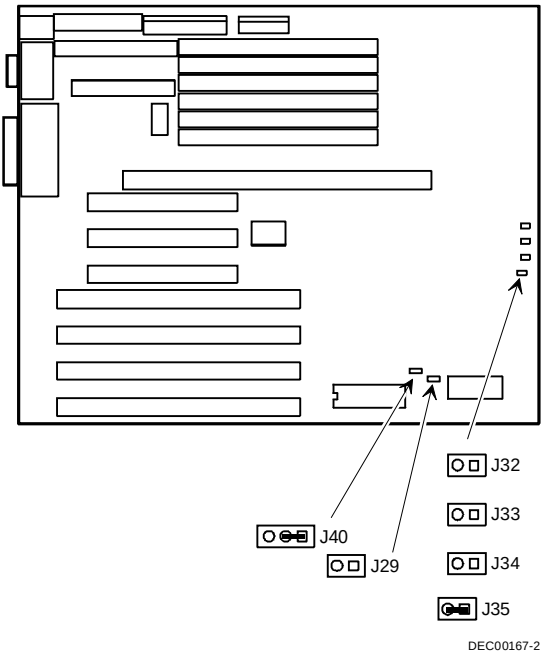


Figure 3 - 5 Main Logic Board Jumper Locations

Computer Memory Configurations

Adding more memory allows the computer to run larger, more complicated software and to run it faster. The amount of memory the computer supports depends on the type of CPU module that has been installed. When the Pentium PCI Series CPU module has been installed, the computer will support up to 192MB using 32MB SIMMs on SIMM banks 0 through 5.
The computer is shipped with at least 8MB of memory. 4MB, 8MB, 16MB, 32MB, or 64MB (future) single in-line memory modules (SIMMs) may be added.

When installing SIMMs take care of the following:

- SIMMs must be installed in pairs. For example, a 32MB SIMM in bank 0 and a 32MB SIMM in bank 1. Different SIMM sizes can not be mixed within banks.
- SIMMs must be the same type, size, and speed.
- SIMMs must have an access time of 70 ns or less.

For Celebris XL 6150 Pentium-Pro:

- Memory must be upgraded in pairs in non-interleaved mode. (Two memory SIMMs of equal capacity)
- Memory must be upgraded in increments of 4 in interleaved mode (Two pairs of equal capacity SIMMs)
- System auto-detects capability to enter interleaved mode
- System auto-detects use of 60 ns memory.
- Only those configurations listed below are allowed
- Maximum 192MB

Only those configurations listed below are allowed:

Memory Configurations (Pentium series)

Bank 0	*Bank 1*	*Bank 2*	*Bank 3*	*Bank 4*	*Bank 5*	*Total*
4MB	4MB					8MB
4MB	4MB	4MB	4MB			16MB
8MB	8MB					16MB
4MB	4MB	4MB	4MB	4MB	4MB	24MB
4MB	4MB	8MB	8MB			24MB
8MB	8MB	8MB	8MB			32MB
4MB	4MB	4MB	4MB	8MB	8MB	32MB
16MB	16MB					32MB
4MB	4MB	8MB	8MB	8MB	8MB	40MB
4MB	4MB	16MB	16MB			40MB
8MB	8MB	16MB	16MB			48MB
8MB	8MB	8MB	8MB	8MB	8MB	48MB
4MB	4MB	8MB	8MB	16MB	16MB	56MB
16MB	16MB	16MB	16MB			64MB
32MB	32MB					64MB
4MB	4MB	32MB	32MB			72MB

Memory Configurations (Pentium series) (continued)

Bank 0	*Bank 1*	*Bank 2*	*Bank 3*	*Bank 4*	*Bank 5*	*Total*
4MB	4MB	16MB	16MB	16MB	16MB	72MB
4MB	4MB	4MB	4MB	32MB	32MB	80MB
8MB	8MB	16MB	16MB	16MB	16MB	80MB
8MB	8MB	32MB	32MB			80MB
4MB	4MB	8MB	8MB	32MB	32MB	88MB
8MB	8MB	8MB	8MB	32MB	32MB	96MB
16MB	16MB	16MB	16MB	16MB	16MB	96MB
16MB	16MB	32MB	32MB			96MB
8MB	8MB	16MB	16MB	32MB	32MB	112MB
32MB	32MB	32MB	32MB			128MB
16MB	16MB	16MB	16MB	32MB	32MB	128MB
4MB	4MB	32MB	32MB	32MB	32MB	136MB
8MB	8MB	32MB	32MB	32MB	32MB	144MB
16MB	16MB	32MB	32MB	32MB	32MB	160MB
32MB	32MB	32MB	32MB	32MB	32MB	192MB
32MB	32MB	32MB	32MB	64MB	64MB	256MB
64MB	64MB	64MB	64MB			256MB
4MB	4MB	64MB	64MB	64MB	64MB	264MB
8MB	8MB	64MB	64MB	64MB	64MB	272MB
16MB	16MB	64MB	64MB	64MB	64MB	288MB
32MB	32MB	64MB	64MB	64MB	64MB	320MB
64MB	64MB	64MB	64MB	64MB	64MB	384MB

Memory Configurations for Pentium-Pro

The following tables show the recommended memory upgrade paths. When using non-interleaved mode, upgrade the system memory in pairs, by installing two SIMMs of equal capacity (one on each side of the CPU module).

Non-Interleaved Modes

Bank 0 (J1-J4)	*Bank 1 (J8-J11)*	*Total*
4MB x 2		**8MB**
4MB x 2	4MB x 2	**16MB**
4MB x 2	8MB x 2	**24MB**
4MB x 2	16MB x 2	**40MB**
4MB x 2	32MB x 2	**72MB**
4MB x 2	64MB x 2	**136MB**
8MB x 2		**16MB**
8MB x 2	8MB x 2	**32MB**
8MB x 2	16MB x 2	**48MB**

Non-Interleaved Modes (continued)

Bank 0 (J1-J4)	*Bank 1 (J8-J11)*	*Total*
8MB x 2	32MB x 2	**80MB**
8MB x 2	64MB x 2	**144MB**
16MB x 2		**32MB**
16MB x 2	16MB x 2	**64MB**
16MB x 2	32MB x 2	**96MB**
16MB x 2	64MB x 2	**160MB**
32MB x 2		**64MB**
32MB x 2	32MB x 2	**128MB**
32MB x 2	64MB x 2	**192MB**
64MB x 2		**128MB**
64MB x 2	64MB x 2	**256MB**

64MB SIMMs are a future option.

Interleaved Modes

Interleave 0		*Interleave 1*		
Bank 0 (J1, J2)	*Bank 1 (J3, J4)*	*Bank 0 (J8, J9)*	*Bank 1 (J10, J11)*	*Total*
4MB x 2		4MB x 2		**16MB**
4MB x 2	4MB x 2	4MB x 2	4MB x 2	**32MB**
4MB x 2	8MB x 2	4MB x 2	8MB x 2	**48MB**
4MB x 2	16MB x 2	4MB x 2	16MB x 2	**80MB**
4MB x 2	32MB x 2	4MB x 2	32MB x 2	**144MB**
4MB x 2	64MB x 2	4MB x 2	64MB x 2	**272MB**
8MB x 2		8MB x 2		**32MB**
8MB x 2	8MB x 2	8MB x 2	8MB x 2	**64MB**
8MB x 2	16MB x 2	8MB x 2	16MB x 2	**96MB**
8MB x 2	32MB x 2	8MB x 2	32MB x 2	**160MB**
8MB x 2	64MB x 2	8MB x 2	64MB x 2	**288MB**
16MB x 2		16MB x 2		**64MB**
16MB x 2	16MB x 2	16MB x 2	16MB x 2	**128MB**
16MB x 2	32MB x 2	16MB x 2	32MB x 2	**192MB**
16MB x 2	64MB x 2	16MB x 2	64MB x 2	**320MB**
32MB x 2		32MB x 2		**128MB**
32MB x 2	32MB x 2	32MB x 2	32MB x 2	**256MB**
32MB x 2	64MB x 2	32MB x 2	64MB x 2	**384MB**
64MB x 2		64MB x 2		**256MB**
64MB x 2	64MB x 2	64MB x 2	64MB x 2	**512MB**

When using interleaved mode, install **four** SIMMs: Install two pairs of equal capacity SIMMs on each side of the CPU module.

Installing Single In-Line Memory Modules (SIMMs)

To install a SIMM, perform the following:

1) Turn off the computer. Disconnect any external devices and unplug the power cord from the wall outlet. Unplug the power cord and monitor cord from the back of the computer.
2) Unlock and remove the left side panel.
3) Unplug the power connector from J6 on the CPU module and remove the module, placing it on an anti-static surface.
4) Locate the memory sockets on the CPU module and plan the configuration layout. For optimum performance, use the interleaved mode:

Interleave 1		***Interleave 0***	
Bank 1	***Bank 0***	***Bank 1***	***Bank 0***
J11	J9	J4	J2
J10	J8	J3	J1

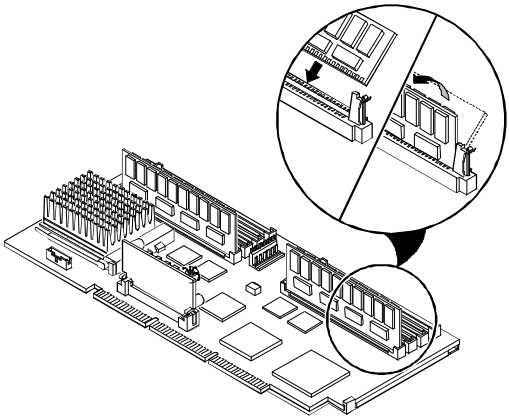
CAUTION

Static electricity can cause damage to components. Before handling any module, make sure to discharge all static electricity from your body by touching an exposed metal surface of the chassis.

6) Remove the new memory SIMMs from their anti-static packaging, handling them only by the edges.
7) When installing SIMMs, use the following sequence starting with the sockets closest to the center of the module (See Figures 3 - 6 and 3 - 7) 1 J1 and J8
   2 J2 and J9
   3 J3 and J10
   4 J4 and J11
8) Install the SIMM into the socket at a 45 degree angle, as shown Figure 3 - 6. Rock the SIMM gently until it is seated in the socket. Tip the SIMM upright until the retaining clips at the ends of the socket both engage.

CAUTION

Use care when installing SIMMs. The retaining clips on the sockets can break when seating the SIMM incorrectly.



DEC00716-5

Figure 3 - 6 Installing a SIMM

9) Install and secure the CPU module to the main logic board.
10) Reconnect the power cable to J6 of the CPU module.
11) Replace and lock the left side panel.
12) Reconnect the power cord and monitor cord to the back of the computer. Reconnect any external devices and plug the power cord into the wall outlet.
13) Run the BIOS Setup utility, reboot and press [F2] before POST completes.
14) Select `Save Changes and Exit`.
The computer reboots and now recognizes the amount of new memory. When returning to Setup, the Extended Memory field reflects the additional memory

Main Logic Board SIMM Socket Locations

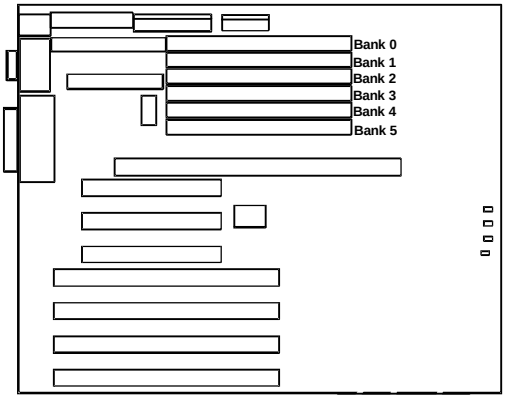


Figure 3 - 7 Main Logic Board SIMM Socket Locations

Part Removal and Replacement Procedures

Removing Devices in the Upper Drive Bay Area

To remove a device from the upper drive bay area perform the following steps:

1) Turn off the computer. Disconnect any external devices and unplug the power cord from the wall outlet. Unplug the power cord and monitor cord from the back of the computer.
2) Unlock and remove both side panels.
3) Disconnect power and ribbon cables.
4) Remove screws securing device to chassis.
5) Slide device drive out of the upper drive bay.

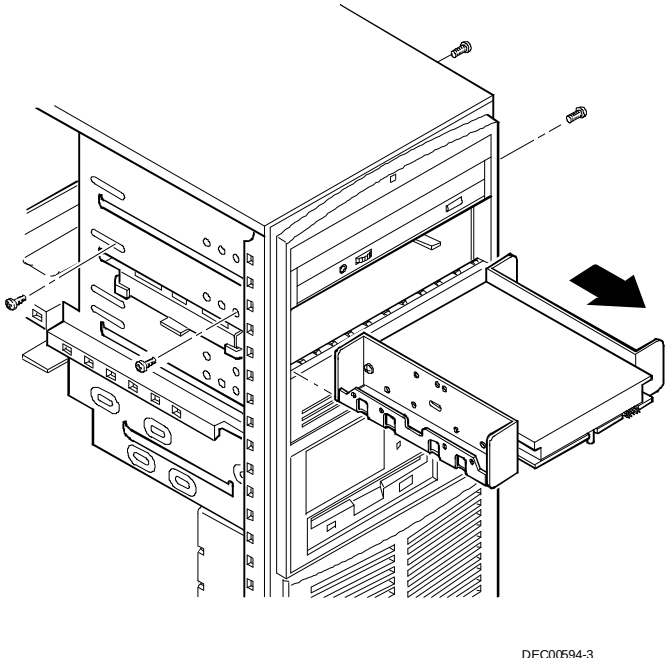


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Figure 3 - 8 Removing a Device from the Upper Drive Bay Area

Removing Devices in the Lower Drive Bay Area

The lower drive bay area holds two 3½-inch devices, typically a diskette drive and a hard drive. To remove the devices in the lower drive bay area, remove the entire drive bay assembly from the computer and then remove the devices from the assy.

Perform the following steps:

1) Turn off the computer. Disconnect any external devices and unplug the power cord from the wall outlet.
2) Unplug the power cord and monitor cord from the back of the computer.
3) Unlock and remove the left side panel.
4) Remove the cables from the devices in the lower drive bay.
5) Note the position of the cables so that they can be reconnected to the correct devices later.
6) Lift up on the retaining clip at the rear top of the drive bay assembly and slide the assembly to the rear of the computer (A, Figure 3 - 9).
7) Remove a device by removing the screws on the side and sliding the device out of the lower bay assembly.

CAUTION

Be sure to support the drive bay assembly so that it does not fall and damage circuit boards.

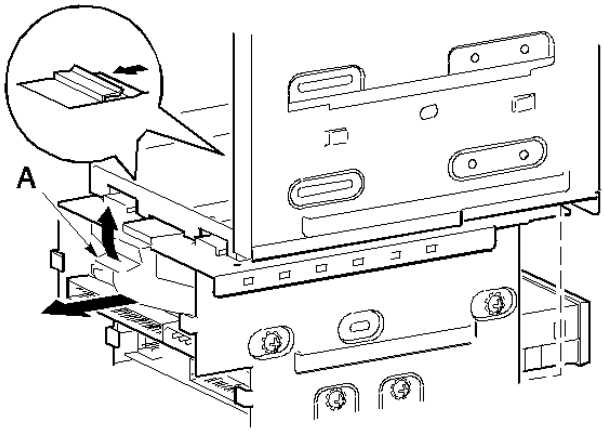
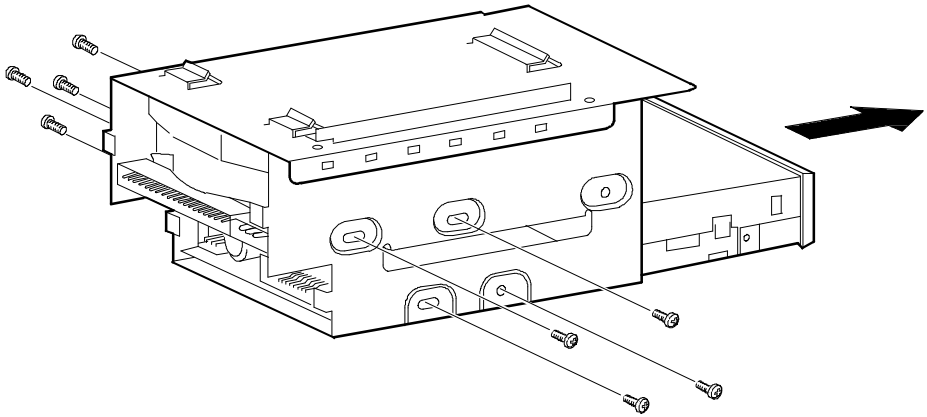


Figure 3 - 9 Removing the Lower Drive Bay Assembly

Removing Devices in the Lower Drive Bay Area (continued)



DEC00601

Figure 3 - 10 Removing the Lower Drive Bay Devices

Removing Main Logic Board

To remove the main logic board:

1) Turn off external devices and computer.
2) Disconnect external devices, ac power and monitor power.
3) Unlock and remove side panel.
4) Remove all connectors (A - F).
5) Remove CPU module retaining bracket and CPU module.
6) Remove all expansion boards.
7) Remove mounting screws (G).
8) Carefully rotate the main logic board out, bottom first.

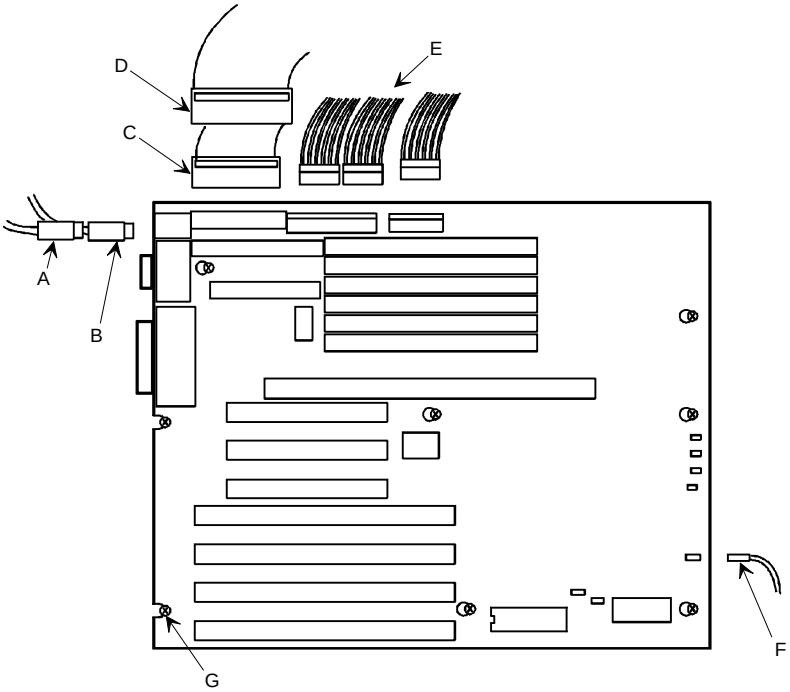


Figure 3 - 11 Removing the Main logic Board

Removing Fan / Speaker Assembly

To remove the Fan/Speaker Assembly perform the following steps:

1) Turn off the computer. Disconnect any external devices and unplug the power cord from the wall outlet. Unplug the power cord and monitor cord from the back of the computer.
2) Unlock and remove the left side panel.
3) Remove fan and speaker connections.
4) Depress tabs.
5) Pull Fan/Speaker assembly forward.

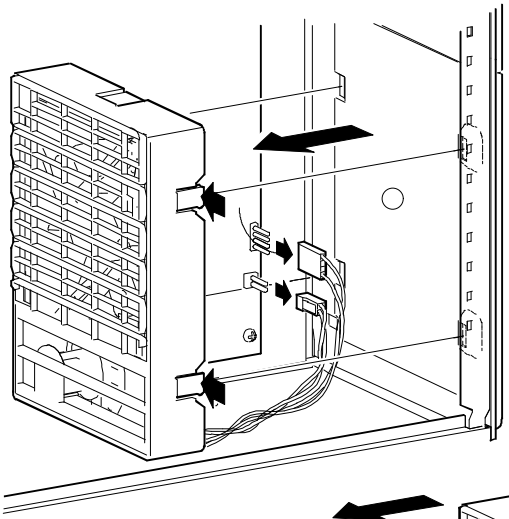


Figure 3 - 12 Removing the Fan / Speaker Assembly (Pentium)

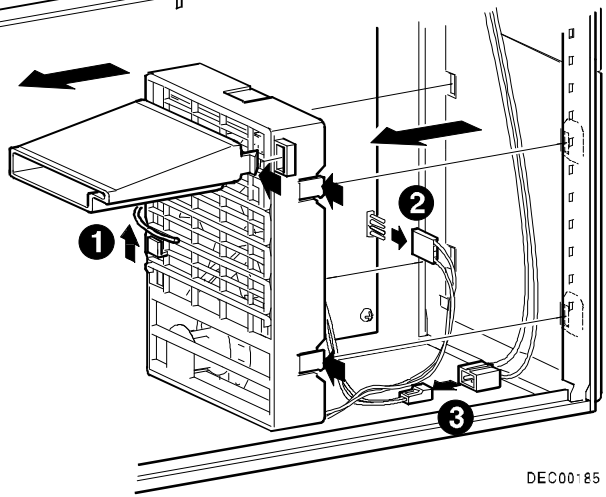


Figure 3 - 13 Removing the Fan / Speaker Assembly (Pentium-Pro)

Removing Power Supply

To remove the power supply:

1) Turn off external devices and computer.
2) Disconnect external devices, ac power, and monitor power.
3) Unlock and remove side panel.
4) Remove metal shield.
5) Remove the upper and lower devices.
   Step 1: Remove **ON/OFF** switch (Figure 3-14).
   Step 2: Remove screw from the Powerplug and pull out the Power Plug (Figure 3-15).
   Step 3: Remove four screws from the rear, and remove Power Supply (Figure 3-16).

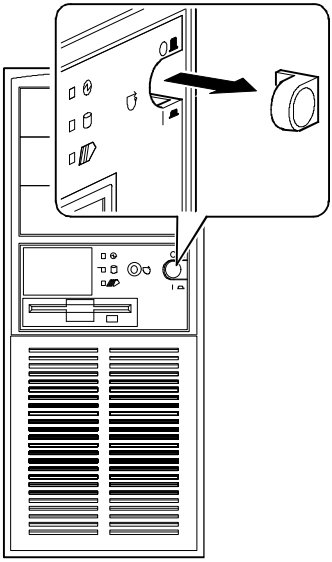


Figure 3 - 14 Removing the ON/OFF Switch

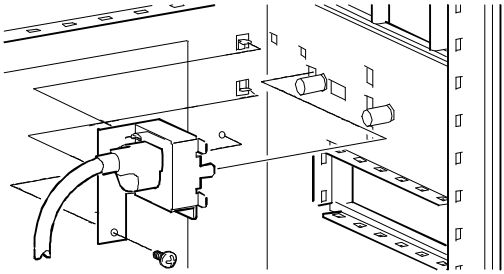


Figure 3 - 15 Removing the power plug

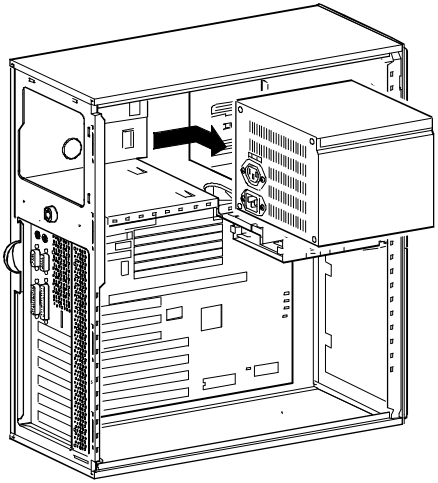
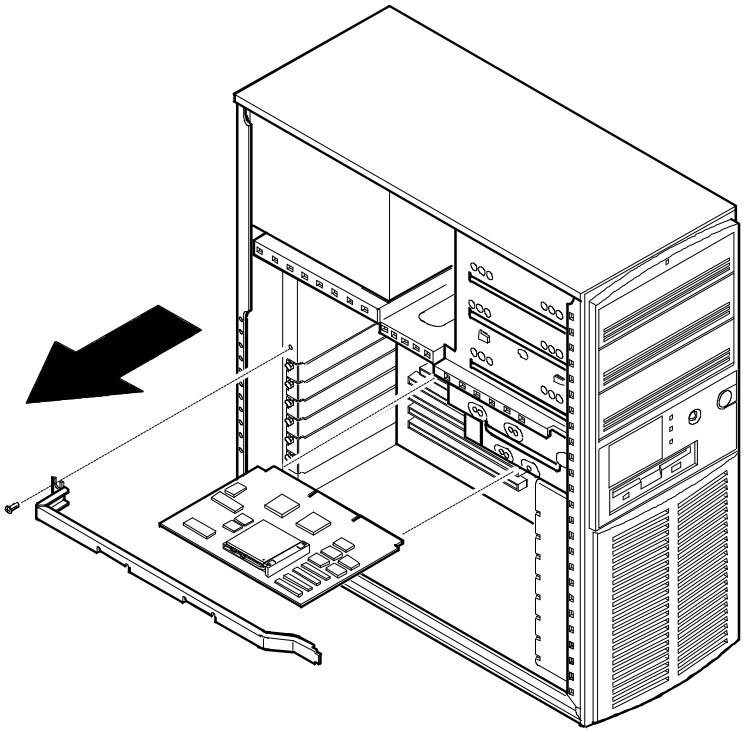


Figure 3 - 16 Removing the screws at the rear and Power Supply

Removing the CPU Module

To Remove the CPU module:

1) Turn off the computer. Disconnect any external devices and unplug the power cord from the wall outlet. Unplug the power cord and monitor cord from the back of the computer.
2) Unlock and remove the left side panel.
3) Remove the screw that secures the CPU module to the rear panel.
4) Grasping both ends of the CPU module, carefully remove it from the main logic board.
5) Store the CPU module in an anti-static package.



DEC00174-2

Figure 3 - 17 Removing the CPU Module

Replacing the Computer Battery/Real Time Clock (RTC)

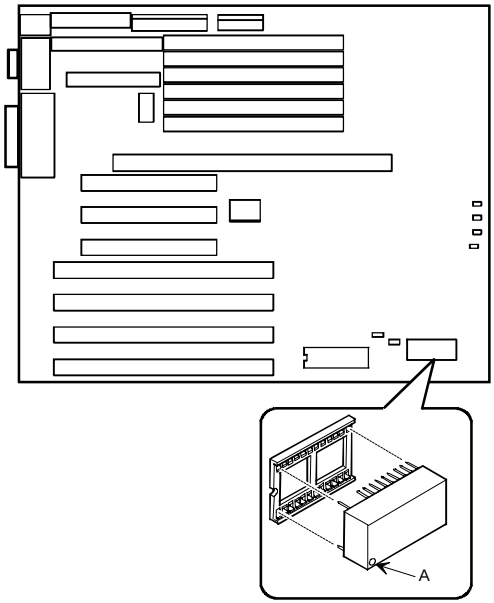
The computer battery/real time clock (battery) runs the computer clock and retains any setup information when it is turned off.

To replace the battery, perform the following steps:

1) Turn off the computer. Disconnect any external devices and unplug the power cord from the wall outlet. Unplug the power cord and monitor cord from the back of the computer.
2) Unlock and remove the left side panel.
3) Remove the battery.
4) Install the new battery.
5) Replace and lock the left side panel.
6) Connect the power cord and monitor cord to the back of the system box.
7) Connect any external devices and plug the power cord into the wall outlet.

CAUTION

Make sure pin 1 on the battery is correctly aligned with the pin 1 location on the socket (A, Figure 3-18). The pin 1 location on the battery is designated by a white dot in the lower left corner of the battery. Incorrect installation may cause faulty computer operation.



DEC00167-4

Figure 3 - 18 Installing the Computer Battery/Real-Time Clock

Upgrading Procedures

Identification

The computer has a CPU processor chip that has an internal speed of 150 MHz or higher speed. The speed is marked on the large heat sink for this processor chip on the CPU module.
Example: The 6150 CPU module is marked 150 MHz. The model 6150 CPU is 150 MHz; the 6180 CPU is 180 MHz; and the 6200 CPU is 200 MHz.

CAUTION

Static electricity can cause damage to components. Before handling any module, CPU, or memory chips, make sure to discharge all static electricity from your body by touching an exposed metal surface of the computer's chassis.

Upgrading the CPU module

CELEBRIS XL computers are equipped with Intel Pentium™ CPU modules. The Pentium CPU and related high-performance caching circuitry are located on a CPU module which is connected to the main logic board inside the computer.

Features of these CPU modules include:

- Intel Pentium microprocessor operating at one of the following speeds:
  - 90 MHz internally, 60 MHz externally
  -100 MHz internally, 66 MHz externally
- Secondary cache memory
  -Upgradeable secondary cache memory module
- ZIF socket for CPU upgrades
- Secondary ZIF socket for future overdrive processor upgrades
  Additional CPU modules with more or different features may become available at a later date.

NOTE Both CPU ZIF sockets will be occupied on CELEBRIS XL computers which support dual processing.

To install a higher performance CPU:

1) Remove the CPU module.
2) Place the CPU module on an anti-static surface.
3) Lift up on the release lever for the empty ZIF socket.
4) Install the new CPU and return the release lever to its original position.
5) Make sure pin 1 on the CPU is aligned with pin 1 on the ZIF socket (A, Figure 3 - 19). Pin 1 is located at the notched corner of the CPU (the notched corner can be seen by looking at the CPU from the pin side).
6) Also, the CPU is keyed so it cannot be installed incorrectly.
7) Set any appropriate jumpers. Refer to *"CPU Module Jumper Settings"* later in this chapter.
8) Install and secure the CPU module to the main logic board.

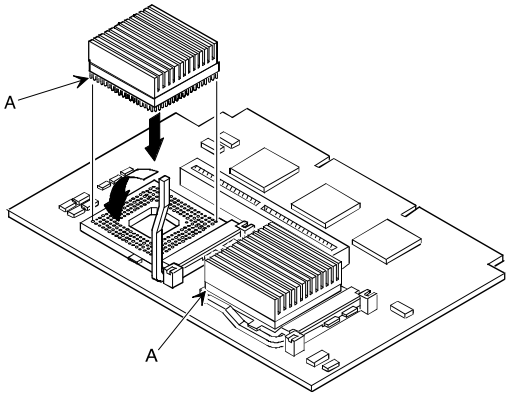


Figure 3 - 19 Installing a New CPU

CPU Module Jumper Settings (Pentium modules)

Voltage regulator sockets may not be present on some CPU modules, or may appear different on different CPU modules.

Factory default settings are given in ***Bold Italics.***

Feature	*Description*	*Setting*
CPU external clock	60 MHz (90 MHz internal) 66 MHz (100 MHz internal)	J2, pin 1 and 2 jumpered J2, pin 2 and 3 jumpered
CPU core/bus frequency ratio	2/1 speed bus ***3/2 speed bus***	J4, jumpered ***J4, open***
Reserved	***Factory use only***	***J8, jumpered***

Below settings apply to 166 Mhz versions CPU boards.

Feature	*Description*	*Setting*
CPU external clock	60 MHz 66 MHz	J2, pin 2 and 3 jumpered J2, pin 1 and 2 jumpered
CPU core/bus frequency ratio	5/2 speed bus	J11, jumpered, J4 jumpered
CPU pipeline mode	***Factory use only***	***J8, jumpered***

NOTE Earlier versions of the CPU Module did not have voltage regulator sockets as shown in B of Figure 3-17.

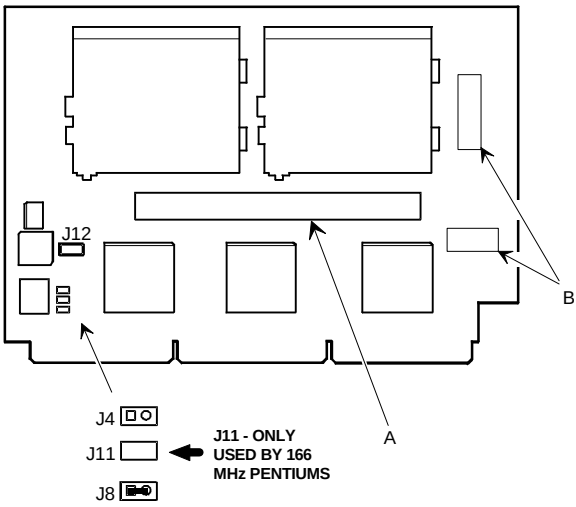


Figure 3 - 20 Secondary Cache Upgrade Socket and Jumper Locations

Upgrading the CPU (Pentium-Pro modules)

The CPU module has a Socket 8 type ZIF socket capable of supporting Intel Pentium® Pro processors. Contact the Digital sales representative for availability and ordering information for the computer.

To release a higher performance processor:

1) Turn off the computer. Disconnect any external devices and unplug the power cord from the wall outlet. Unplug the power cord and monitor cord from the back of the computer.
2) Unlock and remove the left side panel.
3) Unplug the power connector from J6 on the CPU module and remove the module, placing it on an anti-static surface.
4) Lift up on the release lever to release the Pentium® Pro processor chip assembly. Note its pin 1 orientation, located at the notched end of the chip.

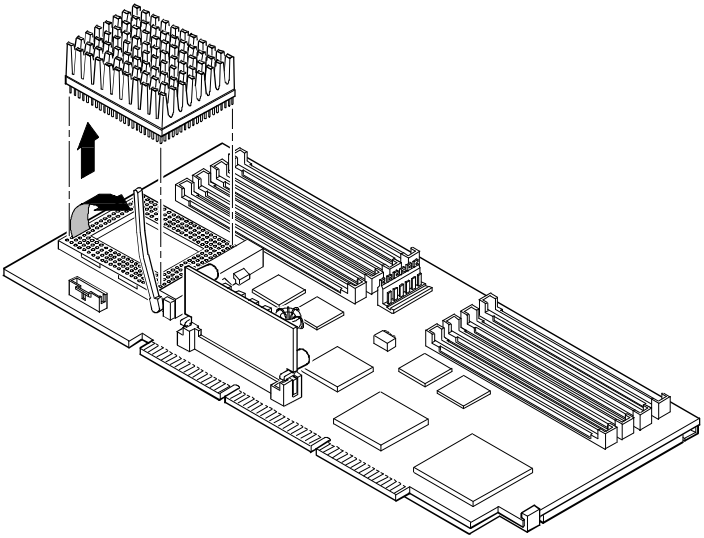
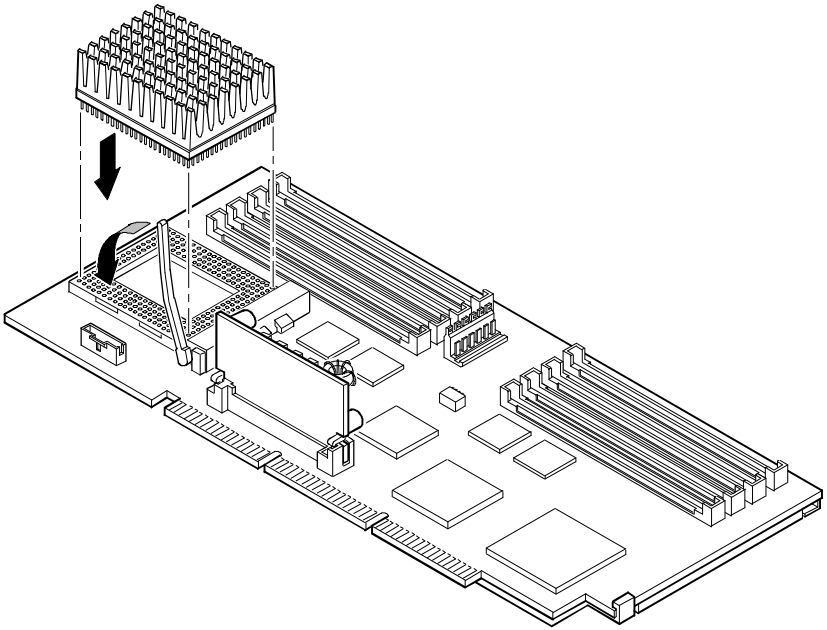


Figure 3 - 21 Releasing the Pentium® Pro Processor Assembly

NOTE This illustration is an example only. The CPU module may have its processor chip in a different orientation, but the procedure for removing it is the same.

To install a higher performance processor:

1) Install the new Pentium® Pro processor chip assembly (Figure 3 - 22). The arrangement of the pins is keyed for correct placement.
2) Return the release lever to its original position.
3) Set any appropriate switches. Refer to the following section entitled *"CPU Module Component Locations."*
4) Install and secure the CPU module to the main logic board.
5) Reconnect the power cable to J6 of the CPU module.
6) Replace and lock the left side panel.
7) Reconnect the power cord and monitor cord to the back of the computer. Reconnect any external devices and plug the power cord into the wall outlet.



DEC00716-3

Figure 3 - 22 Installing a New Pentium® Pro Processor Assembly

CPU Module Component Locations (Pentium-Pro)

Figure 3 - 23 shows the location of the components on the CPU module. E20 is the Pentium® Pro processor. J1--J4, J8--J9 are sockets for SIMMs. J6 is the power connector. J7 is the voltage regulator socket. J19--J22 are voltage regulator jumpers. J5 is a switch (shown in Figure 3 - 24) for setting the clock frequency and the bus speed. The tables that follow Figure 4 list the settings of the switch to set the clock frequency and the bus speed.

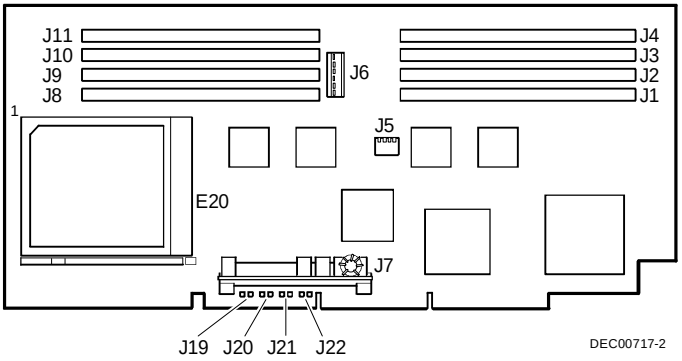


Figure 3 - 23 CPU Module Component Locations

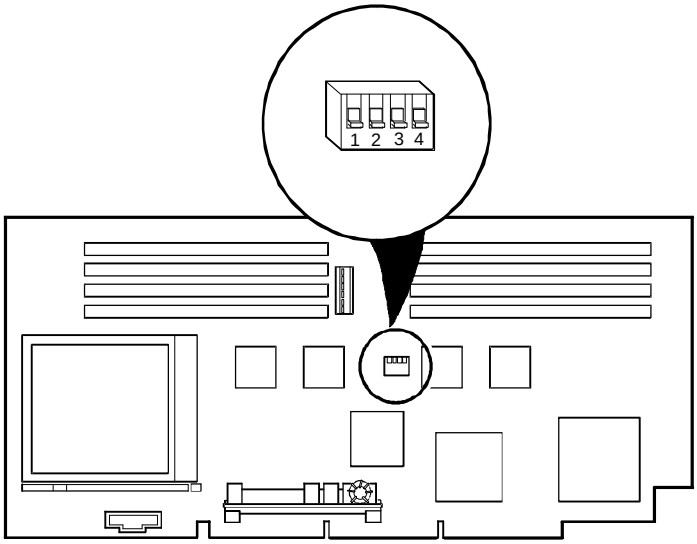


Figure 3 - 24 J5 Switch Location

Setting Clock Frequency

Feature	*Model*	*J5 pin 1*	*Clock Frequency*
CPU clock input	6150, 6180 6200	Off On	**60 MHz** **66 MHz**

NOTE Default depends on the CPU installed at the factory.

Setting Bus Speed

Bus Speed	*Clock Ratio*	*J5 pin 2, 3, 4*	*CPU Speed*	*Model*
60 MHz	2 x bus speed 3 x bus speed	On, On, On On, Off, On	120 MHz 180 MHz	 **6180**
	4 x bus speed 5 x bus speed	On, On, Off On, Off, Off	240 MHz 300 MHz	
	5/2 x bus speed	Off, On, On	150 MHz	**6150**
	7/2 x bus speed 9/2 x bus speed 11/2 x bus speed	Off, Off, On Off, On, Off Off, Off, Off	210 MHz 270 MHz 330 MHz	
66 MHz	2 x bus speed 3 x bus speed	On, On, On On, Off, On	132 MHz 198 MHz	 **6200**
	4 x bus speed 5 x bus speed	On, On, Off On, Off, Off	264 MHz 330 MHz	
	5/2 x bus speed 7/2 x bus speed	Off, On, On Off, Off, On	166 MHz 231 MHz	
	9/2 x bus speed 11/2 x bus speed	Off, On, Off Off, Off, Off	297 MHz 363 MHz	

Replacing the Voltage Regulator Card (Pentium-Pro)

To remove the card, press outward on the tab at the end of the card holder and lift out the card (Figure 3 - 25). To replace the card, press the card in its holder until its tabs click to hold it secure.

Setting Voltage Regulation

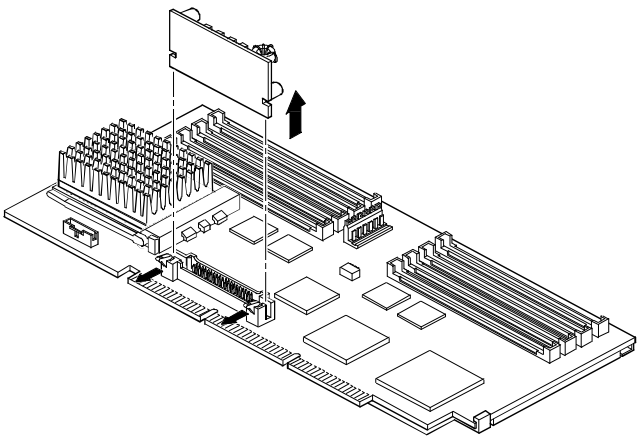
There are four jumpers on the CPU module that determine the output of the voltage regulator -- J19, J20, J21, J22 -- shown in th table below.

For each pair of pins, install a jumper to set them to either an On or an Off condition according to the following table where:

Off or **1** means install the jumper on the left pin only (pin **1**).
On or **0** means install the jumper to connect both pins **1** and **0**.

Voltage	*J19*		*J20*		*J21*		*J22*		*Model No.*
3.3 V	0	On	1	Off	0	On	0	On	
3.1 V*	0	On	0	On	1	Off	0	On	6150
2.9 V	0	On	1	Off	1	Off	0	On	
2.7 V	0	On	0	On	0	On	1	Off	
2.5 V	0	On	1	Off	0	On	1	Off	

* Default settings for Model 6150 (P6 rev. B0) with Pentium® Pro processor.



DEC00716-4

Figure 3 - 25 Voltage Regulator Card

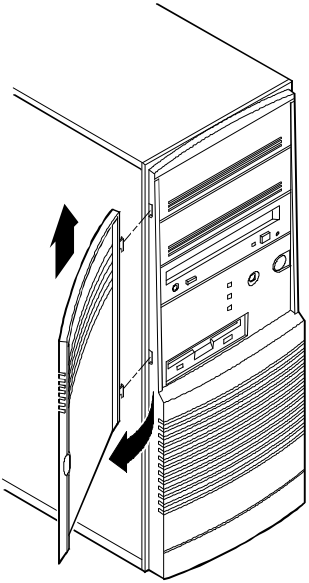
Installing Mass Storage Devices

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

- **Upper drive bay area**
  This area has room for three 5¼-inch half-height devices. Each drive bay is equipped with a removable panel to accommodate devices requiring front panel access. The bottom two bays of this area can be used to mount one full-height drive. The drive rails are removable to accommodate a full-height device.
- **Lower drive bay area**
  This area has a drive bay assembly that holds a 3½-inch diskette drive (standard on all CELEBRIS XL computers) and one hidden 3½-inch half-height device that needs no front panel access. This hidden bay is typically used for mounting the primary 1-inch or 1.6-inch hard disk drive.

To install a device in the upper drive bay area perform the following steps:

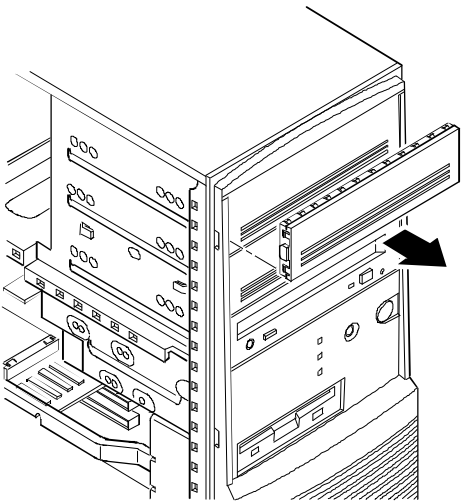
1) Remove the front door (Figure 3 - 27).
2) Turn off the computer. Disconnect any external devices and unplug the power cord from the wall outlet. Unplug the power cord and monitor cord from the back of the computer.
3) Unlock and remove both side panels.
4) Using a screwdriver from either side, remove the plastic filler panel by pushing it out from inside the computer (Figure 3 - 26).



DEC00659

Figure 3 - 27 Removing the Front Door

Figure 3 - 26 Removing Plastic Filler Panel from Upper Drive Bay



DEC00662-2

5) Insert the new device into the drive bay from the front (Figure 3 - 28).
6) Connect the data cable to the device.
The data cable is usually a ribbon cable. Figure 3- 29 shows a cabling configuration using two IDE drives and one diskette drive. Figure 3 - 30 shows a cabling configuration for two SCSI devices.

NOTE Figures 3 - 29 and 3 -30 show sample configurations. Other configurations are possible.

Also, refer to Appendix A for thermal considerations when using disk drives with high power consumption.

Be sure the cable is connected with the correct orientation. Most cables and sockets are keyed so that they cannot be connected backwards. If the cables or drives are not keyed, pin 1 of the cable has to be connected to pin 1 of the socket.

Pin 1 of the cable is on the edge with the colored stripe. Pin 1 of the socket should be marked number "1" at one end of the socket or with a number "1" printed on the circuit board near one end of the socket.

7) Connect a power cable to the device. Use one of the 4-pin connectors from the power supply.
8) Secure the device with two screws on each side. Use the screws that came with the device.
9) If the device is an internal device that has no front panel, replace the plastic filler panel.
10) Replace and lock both side panels.
11) Connect the power cord and monitor cord to the back of the computer. Connect any external devices and plug the power cord into the wall outlet.
12) If necessary, run the BIOS Setup Utility (Setup) to reconfigure the
13) for the new storage drives.

NOTE It isn't necessary to run Setup when installing a SCSI drive and if the onboard SCSI controller is already enabled. However, Setup has to be runned if the SCSI controller is disabled or when installing an IDE drive. Refer to *Chapter 2, "Utilities and Configuration"* for instructions on running the BIOS Setup utility.

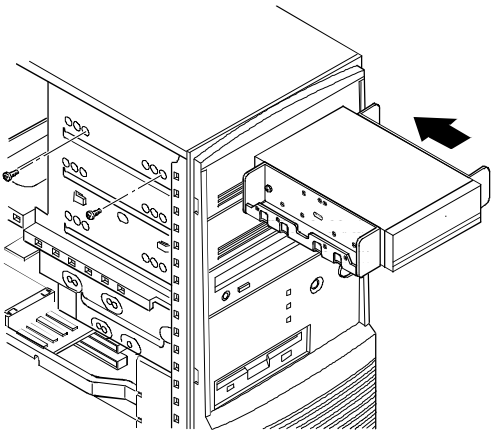


Figure 3 - 28 Inserting a Device into Upper Drive Bay

Connecting Devices

Diskette Drive and IDE Drive Data Cable Connections

Legend	*Component*
A	Power supply
B	Power connections
C	Diskette drive connection
D	IDE Drive connection
E	Diskette drive
F	Hard drive
G	Optional storage devices

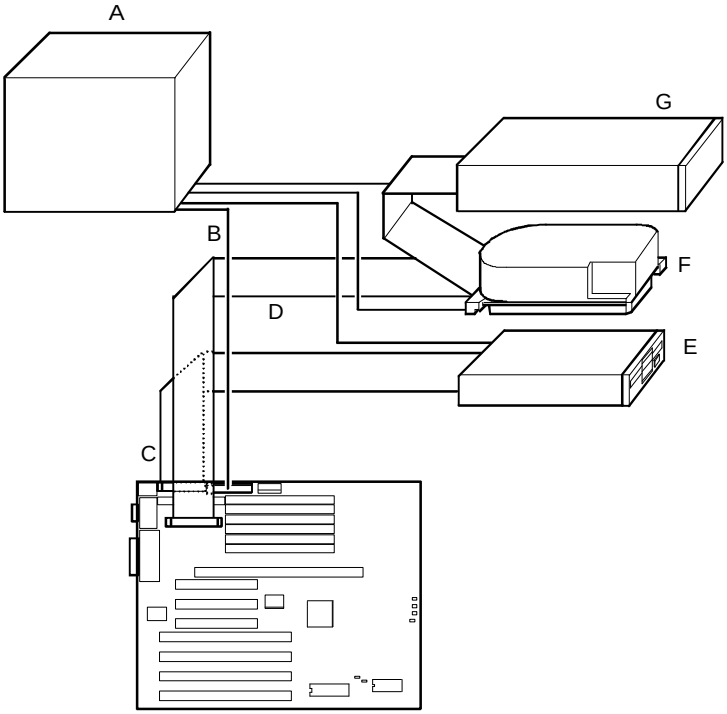


Figure 3 - 29 Diskette Drive and IDE Drive Data Cable Connections

SCSI Cable Connections

Legend	*Component*
A	Power supply
B	Power connections
C	Internal SCSI cable
D	SCSI connector
E	SCSI hard disk drive
F	CD-ROM drive (or other SCSI device)

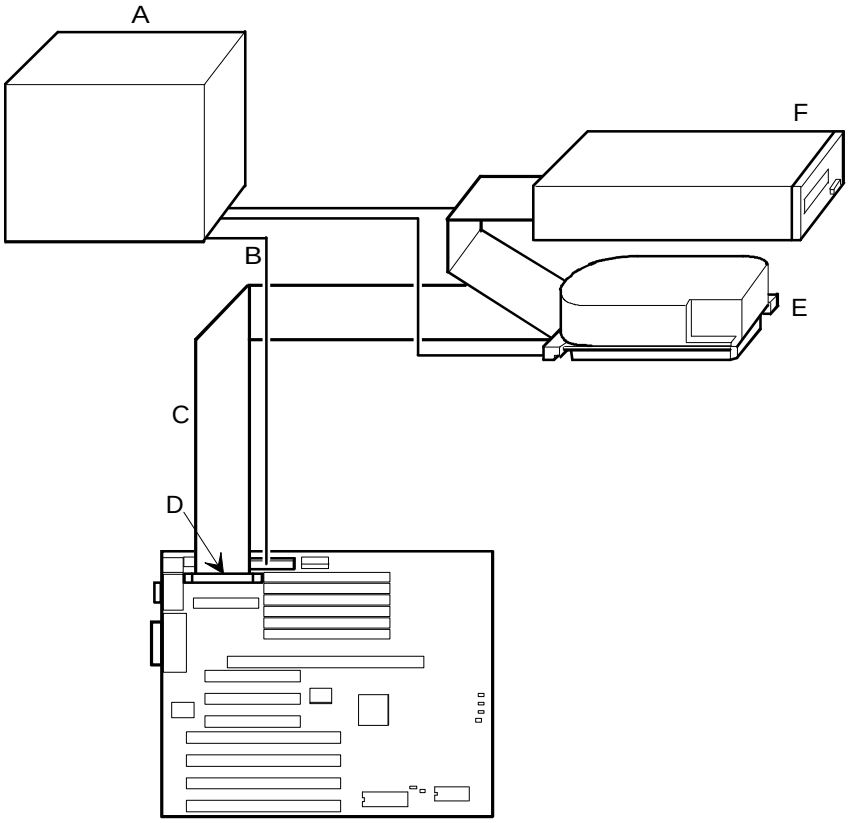


Figure 3 - 30 SCSI Cable Connections

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 configuring it or after installing optional hardware or software.
Refer to the documentation supplied with additional options when experiencing problems with specific options that have been installed.

Initial Troubleshooting

Follow the general procedure below to troubleshoot the CELEBRIS XL computer series:

1) Press **[Ctrl] + [Alt] + [Del]**. If the computer fails to boot, turn it off, wait until all hard disk drives are spun down completely and then turn it back on.
2) 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 computer.
3) Run the BIOS Setup utility.
4) Make sure all necessary changes have been made to the CONFIG.SYS and AUTOEXEC.BAT files.
5) Make sure all necessary video, printer, and application device drivers are properly installed.
6) Ensure that all cables and connections are secure.
7) Run the ***QAPLUS/fe*** advanced diagnostic software.
8) If these steps do not identify and/or correct the problem, perform the specific troubleshooting procedures appropriate to the circumstances.

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 computer's speaker emits a series of beeps to indicate the error. During POST, if the video configuration fails or if an external ROM module fails a checksum test, then the computer 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 computer) are generally the result of a failed main logic board or some other add-on component (SIMM, BIOS, computer battery, etc.).

Each code represents the number of short beeps that are grouped together.

Beep Code	*Error Message*
1-2	Video failure or configuration error
2-2-3	BIOS ROM checksum
3-1-1	Test DRAM refresh
3-1-3	Test keyboard controller
3-4-1	Test 512K base address lines
3-4-3	Test 512K base memory
2-1-2-3	Check ROM copyright notice
2-2-3-1	Test for unexpected interrupts

POST and Boot Messages

The POST displays messages to alert to errors in hardware, software, and firmware or to provide operating information about the computer.
Each time the POST displays a message on screen, the computer's speaker beeps twice. If an error occurs before the monitor is initialized, specific beep codes sound to alert to a problem.

POST and Boot Error Messages

The following error messages are arranged in alphabetical order.

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 Error Messages (continued)

Message	*Problem*	*Solution*
Diskette drive A error **Diskette drive B error**	Diskette drive has failed.	Run the BIOS Setup utility. Check all connections. If the problem persists, replace the defective diskette drive and/or drive cable.
Extended RAM Failed at offset: *nnnn*	Extended memory failed or configured incorrectly.	Make sure SIMMs are installed correctly If the problem persists, replace defective SIMMs.
Failing Bits: *nnnn*	*nnnn* is a map of the bits at the RAM address which failed the memory test.	Run the BIOS Setup utility and restore all to original values. If the problem persists, replace the defective memory.
Fixed Disk 0 Failure **Fixed Disk 1 Failure** **Fixed Disk Controller failure**	Hard disk drive and/or controller failed.	Run the BIOS Setup utility. Check all connections. If the problem persists, replace the defective hard disk drive and/or controller.
Incorrect Drive A type - run SETUP **Incorrect Drive B type - run SETUP**	Diskette drive A and/or B not correctly identified in the BIOS Setup utility.	Run the BIOS Setup utility and properly identify diskette drive A and/or B.
Invalid NVRAM media type	NVRAM access failed.	Run the BIOS Setup utility and restore all settings to original values. If the problem persists, replace the defective component.
Keyboard controller error **Keyboard error** **Keyboard locked - Unlock key switch**	Keyboard and/or keyboard controller failed.	Check the keyboard connection. If the connection is secure, the keyboard or keyboard controller might have failed. If the problem persists, replace the defective keyboard and/or controller.
Monitor type does not match CMOS - Run SETUP	Monitor type has been incorrectly specified.	Run the BIOS Setup utility and set the correct monitor type.
Operating system not found	The operating system cannot be found on drive A or drive C.	Run the BIOS Setup utility and correctly identify drive A or drive C. Correctly install the operating system. Refer to the supplied operating system documentation.
Parity check 1 *nnnn* **Parity check 2 *nnnn***	Parity error found in the computer bus. The BIOS attempts to locate the address and displays it on the monitor screen.	Run the BIOS Setup utility and restore all settings to original values. If the problem persists, replace the main logic board.
Press <F1> to resume, <F2> to Setup	This message appears after any recoverable error message.	Press <F1> to reboot or <F2> to enter the BIOS Setup utility to make any necessary changes.
Real time clock error	Real-time clock failed BIOS test.	Replace real-time clock and then run the BIOS Setup utility to restore previous configuration information.

POST and Boot Error Messages (continued)

Message	*Problem*	*Solution*
Shadow RAM Failed at offset: *nnnn*	Shadow RAM failed.	Run the BIOS Setup utility and disable failed shadow memory region.
System battery is dead - Replace and run SETUP	Battery/real-time clock failed.	Replace the battery and then run the BIOS Setup utility to restore previous configuration information.
System cache error - Cache disabled	RAM cache failed.	Run the BIOS Setup utility and restore all settings to original values. If the problem persists, replace the defective cache memory.
System CMOS checksum bad - run SETUP	Battery/real-time clock failed.	Correct the address conflict using the BIOS Setup utility. If the problem persists, replace the battery/real-time clock.
System RAM failed at offset: *nnnn*	System RAM failed.	Run the BIOS Setup utility and restore all settings to original values. If the problem persists, replace the defective memory.
System timer error	The timer test failed.	Run the BIOS Setup utility and restore all settings to original values. If the problem persists, replace the defective component.

POST and Boot Informational Messages

Message	*Description*
***nnnn* Cache SRAM Passed**	Where *nnnn* is the amount of computer cache (in kilobytes) that tested successfully.
Entering SETUP	BIOS Setup utility runs.
Extended RAM Passed	Where *nnnn* is the amount of extended memory (in kilobytes) that tested successfully.
***nnnn* Shadow RAM passed**	Where *nnnn* is the amount of shadow RAM (in kilobytes) that tested successfully.
System BIOS shadowed	This indicates that the BIOS has been successfully copied to shadow RAM.
***nnnn* System RAM passed**	Where *nnnn* is the amount of system RAM (in kilobytes) that tested successfully.
UMB upper limit segment address: *nnnn*	Displays the address of the upper limit of UMB. This indicates the released segments of the BIOS that can be reclaimed by a virtual memory manager.
Video BIOS shadowed	This indicates that the video BIOS has been successfully copied to shadow RAM.

Computer Troubleshooting

Problem	*Possible Cause*	*Action*
No response when the computer is turned on	Main logic board failure. Main logic board jumpers incorrectly set. CPU has failed.	Replace main logic board. Set all appropriate jumpers (Refer to *"Main logic Board Jumpers"*). Replace CPU.
Power is on, but there is no screen display	Brightness and contrast controls are not correctly set. The monitor-off timer has shut the monitor off. Monitor cable is incorrectly installed. Incorrect VGA drivers installed. Video controller has failed.	Adjust the brightness and contrast controls. Press [Shift] to reactivate monitor. Check all monitor connections. Install the correct VGA drivers. Replace the video controller.
Computer operates incorrectly after installing optional expansion board	Expansion board installed incorrectly. Did not run ICU to configure expansion board before installation. Expansion board has failed.	Remove expansion board and reinstall. Run the ICU to properly configure expansion board and then reboot the computer. Refer to the supplied ICU documentation. Remove expansion board and reboot. If computer boots without errors, replace expansion board.
Computer operates incorrectly after installing optional SIMMs	SIMMs installed incorrectly. Did not rerun BIOS Setup utility. BIOS Setup utility changes not saved before exiting. SIMMs have failed.	Remove SIMMs and reinstall. Rerun BIOS Setup utility. Rerun BIOS Setup utility and save changes. Remove SIMMs and reinstall. Make sure bank 0 is filled with the correct SIMM size, speed, and type. Replace SIMMs.
Computer operates incorrectly after installing optional external cache module	External cache module installed incorrectly. External cache module has failed.	Remove external cache module and reinstall. Replace external cache module.

Computer Troubleshooting (continued)

Problem	*Possible Cause*	*Action*
Computer fails to retain setup information	Computer battery has failed.	Replace computer battery.
Computer does not boot from an IDE hard disk drive	Operating system software is not installed on the IDE hard disk drive. IDE hard disk drive is not correctly formatted or the requested partition does not exist. There is no software on the requested partition. IDE hard disk drive jumpers incorrectly set. IDE drive type incorrect. Loose cables. Onboard IDE interface disabled. IDE hard disk is connected to the wrong IDE connector. There might be a boot sector virus. Hard disk boot sector is missing.	Install the appropriate operating system. Format the IDE hard disk drive or partition the IDE hard disk drive using the supplied operating system software. Install software on the requested partition. Refer to the supplied IDE hard disk drive kit installation instructions. Run the BIOS Setup utility to identify the correct drive type. Secure all cable connections. Run the BIOS Setup utility and set the IDE controller option to “Enabled”. Connect the boot disk to the inner IDE connector on the main logic board. Run appropriate software to detect and remove viruses (F-PROT). For DOS, boot from a DOS diskette then enter the following commands: c: cd\dos fdisk/mbr
No response to mouse commands	Mouse is password protected. Mouse is connected to the keyboard port. Mouse driver not installed.	Enter the keyboard and mouse password. Power down the computer and connect the mouse to the mouse port. Install the appropriate mouse driver.
No response to keyboard commands	Keyboard is password protected. Keyboard is connected to the mouse port.	Enter the keyboard password. Power down the computer and connect the keyboard to the keyboard port.

Computer Troubleshooting (continued)

Problem	*Possible Cause*	*Action*
Computer does not recognize an internal or external SCSI device	SCSI device jumpers incorrectly set.	Refer to the supplied SCSI device kit installation instructions.
	SCSI cable not terminated.	Terminate each end of the SCSI bus.
	SCSI device not plugged in.	Check power and SCSI cables.
	Terminating resistors not removed from the SCSI device.	Remove terminating resistors.
	SCSI adapter failure.	Replace SCSI adapter.
	SCSI ID conflicts.	Set SCSI IDs correct.
Computer does not boot from an internal SCSI hard disk drive	Operating system software is not installed on the SCSI hard disk drive.	Install the appropriate operating system on the SCSI hard disk drive.
	Requested partition does not exist.	Partition the SCSI hard disk drive and then reload the operating software.
	Computer not configured for SCSI hard disk drive operation.	Run the BIOS Setup utility and set the IDE controller option to “Disabled”. This disables the IDE interface. **Note**: When both IDE and SCSI hard disk drives have been installed, the computer uses the IDE hard disk drive as the boot device.
Computer does not boot from a target diskette drive	Drive ID incorrectly set.	Make sure the drive ID is correctly set.
	Diskette drive not enabled.	Run the BIOS Setup utility to enable the diskette drive.
	Diskette boot option disabled.	Run the BIOS Setup utility and set and set the proper boot sequence.
	Onboard diskette controller disabled.	Run the BIOS Setup utility and set the diskette controller option to “Enabled”.
	Diskette does not contain start-up files.	Insert a diskette with the correct start-up files.

Disk Drive Troubleshooting

Problem	*Possible Cause*	*Action*
IDE/SCSI hard disk drive cannot read or write information	Incorrect disk drive jumper settings.	Refer to the supplied kit installation instructions.
	Loose or incorrectly installed cables.	Make sure all cables are correctly installed.
	IDE drive type incorrect.	Run the BIOS Setup utility to identify the correct drive type.
	Onboard IDE interface disabled.	Run the BIOS Setup utility and set the IDE controller option to "Enabled".
	IDE/SCSI hard disk drive is not correctly formatted or partitioned.	Format and partition as required using the supplied operating system.
Target diskette drive cannot read or write information	Onboard diskette controller disabled.	Run the BIOS Setup utility and set the diskette controller to "Enabled".
	Diskette write protection is enabled.	Run the BIOS Setup utility and set the diskette write protection to "Disabled".

Monitor Troubleshooting

Problem	*Possible Cause*	*Action*
Monitor power indicator is not on	Monitor is turned off.	Turn on the monitor.
	No power at wall outlet.	Use another outlet.
	Power indicator is defective.	Replace the failed component.
No screen display	Configuration error.	Run the BIOS SETUP UTILITY to configure the computer for VGA operation. Set the jumper for VGA operation. Refer to *"Main Logic Board Jumpers"*.
	Monitor brightness and contrast controls are incorrectly set.	Adjust the monitor brightness and contrast controls.
No monitor display while loading Windows video drivers	Monitor type incorrectly set.	Set the correct monitor type. Refer to appropriate video driver documentation.

Monitor Troubleshooting (continued)

Problem	*Possible Cause*	*Action*
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	Computer was turned on before the monitor was turned on. Video jumper incorrectly set.	Turn off the computer, then turn the computer back on. Set the jumper for VGA operation.
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 and/or video drivers.
Monitor display not centered while loading Windows video drivers	Monitor type incorrectly set.	Set the correct monitor type. Refer to appropriate video driver documentation.

CD-ROM Troubleshooting

Problem	*Possible Cause*	*Action*
Cannot access the CD-ROM drive. Error message reading drive x.	No disc in the CD-ROM drive. Tray open.	Insert a disc. Close the tray.
Power is on but indicator shows no activity.	No disc or tray is open. Check cable connections.	Insert a disc and close the tray. Make sure cables are correctly connected.
Disc is spinning but drive is idle.	Application software not running.	Run application software.

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 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.

CPU Memory Address Map (Full Range)

Range	*Function*	*Notes*
0KB to 512KB	Main memory	PC compatibility range
512KB to 1024KB	Main memory	PC compatibility range (EISA/ISA memory lower limit)
1MB to 16MB	Main memory Memory space gap	EISA/ISA memory upper limit PCI memory hole (4MB max. size)
16MB to 128MB(1)	Main memory	
128MB to 4 GB	PCI memory	

(1) For P54C CPUs, it can expand up to 384MB.

Memory Address Map (Full Range, 6150 and higher CPUs)

Range	*Function*	*Notes*
0KB to 512KB	Main memory	PC compatibility range
512KB to 1024KB	Main memory	PC compatibility range (EISA/ISA memory lower limit)
1MB to 16MB	Main memory Memory space gap	ISA memory upper limit
16MB to 512MB(1)	Main memory	Computer memory upper limit
512MB to 4 GB(1)	PCI memory	

(1) When using interleaved mode, 512 MB is the maximum for the Celebris XL Server with Pentium® Pro processor; when using non-interleaved mode, 256 MB is the maximum.

CPU Memory Address Map (PC Compatibility Range)

Address Range	*Function*	*Size*
0000 to 7FFFF	Main memory	512KB
80000 to 9FFFF	Main/PCI/ISA memory	128KB
A0000 to BFFFF	PCI/ISA video buffer memory	128KB
C0000 to C7FFF	Video memory BIOS	32KB
C8000 to DFFFF	PCI/ISA card BIOS and buffer memory	96KB
E0000 to EBFFF	Used by BIOS Setup during POST only	48KB
EC000 to EFFFF	SCSI BIOS (if enabled)	16KB
F0000 to FFFFF	System BIOS memory	64KB

CPU I/O Address Map

Range (hexadecimal)	*Function*
0000 to 0CF7	PCI I/O space
0CF8	Configuration space enable register
0CF9	Turbo and reset control register
0CFA to BFFF	PCI I/O space
C000 to CFFF	PCI configuration space
D000 to FFFF	PCI I/O space

I/O Address Map

Range (hexadecimal)	*Function*
060 to 064	Keyboard/mouse controller
0F0 to 0FF	Math co-processor
1F0 to 1F7	IDE controller (if enabled)
278 to 27F	LPT2 (if enabled)
2F8 to 2FF	COM2 (if enabled)
378 to 37F	LPT1 (if enabled)
3BC to 3BE	LPT3 (if enabled)
3F0 to 3F7	Diskette controller (if enabled)
3F8 to 3FF	COM1 (if enabled)

Computer Interrupt Levels

Interrupt Number	*Interrupt Source*
IRQ1	Keyboard controller
IRQ3	COM2 (if enabled)
IRQ4	COM1 (if enabled)
IRQ6	Diskette drive (if enabled)
IRQ7	LPT1, LPT2, LPT3 (if enabled)
IRQ9	Onboard SCSI (if enabled)
IRQ12	Mouse interrupt
IRQ13	Math co-processor
IRQ14	Hard disk drive (if enabled)

DMA Channel Assignment

Channel	*Controller*	*Function*
0	**1**	Refresh
1	**1**	Not used
2	**1**	Diskette controller (if enabled)
3	**1**	ECP mode (if enabled)
4	**2**	Cascade DMA
5	**2**	Not used
6	**2**	Not used
7	**2**	Not used

PCI Configure Space Address Map

Range (hex)	*Function*
C0xx	CPU bridge
C1xx	Onboard PCI SCSI (if applicable)
C2xx	EISA/ISA bridge
C6xx	PCI slot 1
C7xx	PCI slot 2
C8xx	PCI slot 3

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 (destructive test !!) 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 tests (all tests)

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

Operating Systems Supported:

- MS-DOS version 6.22
- Windows for Workgroups v3.11
- Windows 95
- Windows NT Workstation 3.51
- Windows NT Server 3.51
- OS/2
- SCO UNIX System V Release 3.2.4.2

Remove any software that was put on the hard drive to enable repair of the system before shipping. When completed carefully clean the outside of the unit with cleaning solution.

Appendix A Service Notes

This appendix contains the current Service Notes for the CELEBRIS XL product line.

Appendix B Useful Information

Related Documentation

Document Titles	*Order Numbers*
CELEBRIS XL Quick reference Guide	EK-A0834-RG
CELEBRIS XL Quick Setup Guide	ER-870WW-IA
CELEBRIS XL User's Guide	ER-870WW-UA / ER-A03WW-UA
PENTIUM CPU Modules	ER-780WW-CA
NCR SCSI Device Management System User's Guide	ER-870WW-AA
ISA Configuration Utility (ICU) User's Guide	ER-PNPAL-UA
Service Maintenance Manual Spares Catalogue	EK-A0815-SV

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 ;
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