

# Venturis FX-2 and Celebris FX-2

---

## Service Maintenance Manual

Part Number: ER-DW0WW-SM. A01

Digital Equipment Corporation

**March 1997**

---

The information in this document is subject to change without notice and should not be construed as a commitment by Digital Equipment Corporation.

Digital Equipment Corporation assumes no responsibility for any errors that might appear in this document.

The software described in this document is furnished under a license and may be used or copied only in accordance with the terms of such license. No responsibility is assumed for the use or reliability of software or equipment that is not supplied by Digital Equipment Corporation or its affiliated companies.

Restricted Rights: Use, duplication, or disclosure by the U.S. Government is subject to restrictions as set forth in subparagraph (c) (1) (ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013.

*Venturis FX-2 and Celebris FX-2 Service Maintenance Manual*

Copyright© Digital Equipment Corporation.

All Rights Reserved.

DEC, Celebris, Venturis, and the Digital logo are registered trademarks of Digital Equipment Corporation

Intel is a registered trademark of Intel Corporation.

Pentium and Pentium-Pro are registered trademarks of Intel Corporation

Microsoft, Windows 95, and Windows NT are registered trademarks of Microsoft Corporation.

All other trademarks and registered trademarks are the property of their respective holders.

## **FCC Notice**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

Any changes or modifications made to this equipment may void the user's authority to operate this equipment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

The user may find the following booklet prepared by the Federal Communications Commission helpful: How to Identify and Resolve Radio-TV Interference Problems. This booklet is available from the U.S. Government Printing Office, Washington, D.C., 20402. Stock No. 004-00398-5.

All external cables connecting to this basic unit need to be shielded. For cables connecting to option boards, see the option manual or installation instructions.

## **Canadian DOC Notice**

This digital apparatus does not exceed the Class B limits for radio noise emissions set out in the radio interference regulations of the Canadian Department of Communications.

## VCCI Notice

This equipment is in the 2nd Class category (information equipment to be used in a residential area or an adjacent area thereto) and conforms to the standards set by the Voluntary Control Council For Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in such residential area.

When used near a radio or TV receiver, it may become the cause of radio interference.

Read the instructions for correct handling.

## German Ergonomic Notice

This equipment meets or exceeds the ergonomic requirements of ZH1/618 and is certified to bear the GS mark by TUV Rheinland of Germany.

## Safety Requirements

This equipment meets or exceeds requirements for safety in the U.S. (UL 1950), Canada (CSA C22.2 No. 950), and Europe (EN 60950/IEC 950) with Nordic requirements.



**WARNING:** There is a danger of battery explosion if a lithium battery is incorrectly replaced. To prevent damage to your computer, be sure the + side faces up when installing a new battery. Also, be sure you replace the battery with either a Digital (P/N 12-41474-05), Toshiba (P/N CR2032), or equivalent 3 V dc lithium battery.

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



**ADVARSEL:** Der er fare for, at et lithiumbatteri eksploderer, hvis det udskiftes ukorrekt. Undgå, at beskadige din computer - HUSK, at + siden skal vende opad, når du installerer et nyt batteri. Du skal udskifte batteriet med enten et Digital (delnummer 12-41474-05), Toshiba (delnummer CR2032), eller tilsvarende 3 V jævnstrøms lithiumbatteri.

Afhængig af dit lokalområde, er det muligt, at din computers batteri betragtes som farligt affald. Husk, at følge evt. miljølove og lokale bestemmelser, når du kasserer det gamle batteri.



**VAROITUS:** Litiumpatterit voivat räjähtää, jos ne asennetaan väärin. Estääksesi tietokoneesi vaurioitumisen varmista, että patteria asentaessasi sen positiivinen (+) puoli on ylöspäin. Tarkista myös, että käyttämäsi uusi patteri on joko Digital (osa no. 12-41474-05), Toshiba (osa no. CR2032) tai vastaavanlainen 3 voltin tasavirtalitiumpatteri.

Asuinpaikastasi riippuen tietokoneesi patteria voidaan pitää ongelmajätteenä. Pidä huoli, että hävität vanhan patterin voimassa olevien lakien ja asetusten mukaisesti.



**WARNING!** Det kan förekomma en batteriexplosion om ett litiumjonbatteri byts ut på felaktigt sätt. Förhindra att datorn skadas genom att se till att plussidan (+) är uppåtvänd när du sätter i ett nytt batteri. Det gamla batteriet får endast bytas ut mot ett Digital-batteri (artikelnummer 12-41454-05), ett Toshiba-batteri (artikelnummer CR2032) eller ett motsvarande litiumbatteri på 3 volt likström.

Datorbatterier anses vara miljöfarligt avfall i många länder. Du måste följa alla lokala bestämmelser när du avyttrar ett gammalt batteri.

## **Laser Safety Notices**

All CD-ROM drives included in Digital computers are classified as Class 1 laser products and comply with safety standards as set by U.S. government and applicable European agencies.

No hazardous radiation is emitted from this CD-ROM drive; the laser beam is completely enclosed in the CD-ROM subassembly during all customer operation and maintenance. In the event that repair or service of the CD-ROM subassembly is required, only authorized Digital service personnel should perform such repairs.

## **Energy Star Compliant**

The Venturis FX-2 and Celebris FX-2 series of computers are ENERGY STAR compliant when used with Windows 95. Digital advises that you do not use the enable Power Management features with operating systems that do not allow for power management, such as SCO UNIX, Windows NT, or OS/2.

To ensure that the entire computer system remains ENERGY STAR compliant, an ENERGY STAR compliant monitor must be used, that is, a monitor that supports the DPMS protocol.

# Contents

## Preface

### 1

#### Product Description

Introduction .....	1-1
Venturis FX-2 Low Profile Model 1 .....	1-3
Venturis FX-2 Short Tower Model 1 .....	1-4
Venturis FX-2 Models with 1.2 GB IDE HDD .....	1-5
Venturis FX-2 Models with 2 GB IDE HDD (Low Profile).....	1-6
Venturis FX-2 Models with 2 GB IDE HDD (Short Tower).....	1-7
Venturis FX-2 Models with 3.2 GB IDE HDD (Low Profile).....	1-8
Venturis FX-2 Models with 3.2 GB IDE HDD (Short Tower).....	1-8
Celebris FX-2 Low Profile Model1 .....	1-9
Celebris FX-2 Short Tower Model1 .....	1-10
Celebris FX-2 Low Profile with 2 GB IDE HDD .....	1-11
Celebris FX-2 Short Tower with 2 GB IDE HDD .....	1-13
Celebris FX-2 Short Tower with 3 GB IDE HDD .....	1-14
Related Material .....	1-16
Latest Product Information and Updates .....	1-17

### 2

#### BIOS Setup Utility

Running the BIOS Setup Utility .....	2-1
Helpful Hints .....	2-2
BIOS Setup Utility Options.....	2-3
Main .....	2-4
Advanced .....	2-10

## Contents

Security Options .....	2-14
Power.....	2-17
Boot .....	2-18
Flash Utility .....	2-19

### 3

#### System Software

Introduction .....	3-1
Factory Installed Software .....	3-2
Digital On-Line Documentation .....	3-3
Applications.....	3-4
Integrated Desktop Manageability.....	3-6
ClientWORKS.....	3-6
Remote Network Wake-Up .....	3-7
Self Monitoring Analysis Technology (S.M.A.R.T.).....	3-7
Operating System Kit .....	3-8
System Software CD and Supplied Diskettes .....	3-9
Configuring Video.....	3-10
Configuring Networking .....	3-11
Configuring Additional Hardware.....	3-11
Using Diagnostics.....	3-12
Restoring the Computer's Software .....	3-13
Additional Device Drivers.....	3-14

### 4

#### Troubleshooting

Initial Troubleshooting.....	4-1
Pass/Fail Criteria .....	4-3
Diagnostics .....	4-4
Digital ClientWORKS and DMI .....	4-5
Self Monitoring Analysis Technology (S.M.A.R.T.) .....	4-7
Advanced Troubleshooting .....	4-8
Computer Troubleshooting .....	4-9
Disk Drive Troubleshooting.....	4-22
Monitor Troubleshooting .....	4-24
Audio Troubleshooting.....	4-26
CD-ROM Troubleshooting .....	4-28
Network Interface Troubleshooting .....	4-29
Error Messages.....	4-30
POST Messages .....	4-31
POST and Boot Messages .....	4-32

POST Execution Messages .....	4-35
Beep Codes .....	4-36

## 5

### Parts Replacement

Introduction .....	5-1
Venturis/Celebris FX-2 Low Profile IPB List.....	5-2
Enclosure .....	5-4
Cables.....	5-5
Nameplates.....	5-5
Options .....	5-6
Venturis/Celebris FX-2 Short Tower IPB List.....	5-7
Enclosure .....	5-10
Cables.....	5-11
Nameplates.....	5-11
Options .....	5-12
Service Procedures .....	5-13
Recommended Tools .....	5-13
Other Materials Needed.....	5-13
Special Tools Required.....	5-13
Remedial Diagnostic Test Software.....	5-14
Virus Software Information.....	5-14
BIOS Version Information .....	5-15
Disconnecting External Devices and Power .....	5-15
Removing the Outside Cover.....	5-16
SecureBOX.....	5-18
Computer Components .....	5-18
Main Logic Board Components .....	5-18
Main Logic Board Connectors (Rear Panel).....	5-20
Main Logic Board Connectors.....	5-21
Low Profile Backplane Components and Connectors .....	5-22
Short Tower Backplane Components and Connectors .....	5-24
Audio Card Connectors (Not Available on Some Models).....	5-26
Expansion Slot Locations (Low Profile) .....	5-28
Expansion Slot Locations (Short Tower).....	5-30
Main Logic Board Jumper and Switch Settings.....	5-32
Processor Clock Speed Switch Settings.....	5-34
Installing Additional Computer Memory.....	5-36
Memory Configurations.....	5-38
Removing and Replacing Components .....	5-39
Removing the Main Logic Board .....	5-40

## Contents

Removing an Adapter Card.....	5-42
Removing the DIMMs .....	5-44
Removing Video Memory.....	5-46
Removing the Lithium Battery.....	5-48
Removing the Processor Heat Sink.....	5-50
Removing the Processor.....	5-52
Removing the Voltage Regulator Module (VRM) .....	5-53
Removing the Backplane (Low Profile).....	5-55
Removing the Backplane (Short Tower).....	5-57
Removing Expansion Boards .....	5-59
Removing the Power Supply (Low Profile).....	5-61
Removing the Power Supply (Short Tower).....	5-63
Removing the Control Panel Assembly (Low Profile) .....	5-65
Removing the Front Air Duct (Short Tower).....	5-67
Removing the Control Panel Assembly and Cable (Short Tower).....	5-69
Removing the Option Card Guide and Speaker Assembly (Short Tower) .....	5-71
Removing the Top-Rear Fan Assembly (Short Tower).....	5-73
Removing the Wire Assembly, Headphone/Microphone (Short Tower) .....	5-74
Removing a 3½-Inch Device from Front Bay (Low Profile).....	5-76
Removing a 5¼-Inch Device (Low Profile).....	5-78
IDE Drive Connections (Low Profile) .....	5-80
Removing the Internal 3½-Inch Device (Low Profile) .....	5-82
Removing the Diskette Drive (Low Profile) .....	5-84
Diskette Drive Connections (Low Profile) .....	5-86
Removing the Front Bezel (Short Tower) .....	5-88
Removing a 3½-Inch Device from Front Bay (Short Tower).....	5-90
Removing a 5¼-Inch Device (Short Tower).....	5-92
Removing an Internal 3½-Inch Device (Short Tower) .....	5-94
IDE Drive Connections (Short Tower) .....	5-96
SCSI Drive Connections (Short Tower) .....	5-98
Removing the Diskette Drive (Short Tower) .....	5-100
Diskette Drive Connections (Short Tower).....	5-102

**6**

**Device Mapping**

Introduction .....	6-1
Full Range Processor Memory Address Map .....	6-2
I/O Address Map .....	6-3
Computer Interrupt Levels .....	6-5
DMA Channel Assignment.....	6-6

**A**

<b>Service Notes</b> .....	A-1
----------------------------	-----

# Preface *P*

---

This *Service Maintenance Manual* is a troubleshooting guide that can be used for reference when servicing Venturis FX-2 and Celebris FX-2 computers.

Digital reserves the right to make changes to this *Service Maintenance Manual* without notice. Accordingly, the illustrations and procedures in this document might not apply to all Venturis FX-2 and Celebris FX-2 computers 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 individual boards and subassemblies, no one should attempt to make repairs at the component level or make modifications to any printed circuit board. Improper repairs can create a safety hazard. Any indications of component replacement or circuit board modifications might void any warranty or exchange allowances.

# Product Description

---

# 1

## Introduction

Venturis FX-2 and Celebris FX-2 computers are high-performance personal computers featuring the latest in computing technology. They can be used as stand-alone computers or as clients in a network environment. Developed using the following state-of-the-art technology, these computers are the most value packed computers in their class.

- *Microprocessor*— ZIF Socket7-compatible processor with 16 KB level 1 and 256 KB or 512 level 2 external cache
- *Memory*— Up to 256 MB of SDRAM, using 3 DIMMs
- *Plug and Play*— Optional Plug and Play compatible expansion boards are automatically configured for easy installation
- *PCI local bus*— The computer's PCI architecture represents the latest in local bus technology

## Product Description

- *Onboard video*
  - *Venturis FX-2* — S3 Trio64V2/GX PCI graphics controller supports 2D using Sequential Graphic Random Access Memory (SGRAM) technology. 1 MB SGRAM standard, expandable up to 2 MB. Supports DDC1/2b.
  - *Celebris FX-2* — S3 ViRGE/GX PCI graphics controller, supports 2D/3D performance using SGRAM-based technology. Built-in video playback acceleration to enhance multimedia applications. 2 MB SGRAM standard, expandable up to 4 MB. Supports DDC1/2b.
- *Onboard Ethernet* — Single-chip Digital 21143 PCI Ethernet LAN controller (not available on all models). Supports 10Base-T (Twisted-Pair) and 100Base-TX (Fast Ethernet) connections
- *Onboard audio* — Crystal CS4236B single-chip controller with 16-bit stereo audio, dual DMA support, and full duplex operation (not available on all models)

## Venturis FX-2 Low Profile Model 1

Part Number	Description	Video	HDD (IDE)	RAM	Additional Features
FR-DW001-AT	5133 LP	S3 Trio64 V2/GX 2D	None	16 MB	1.44 Diskette drive, 256 KB external cache, Model 1 Country Kit required, Media Kit
FR-DW001-AM	5150 LP	S3 Trio64 V2/GX 2D	None	16 MB	1.44 Diskette drive, 256 KB external cache, Model 1 Country Kit required, Media Kit
FR-DA001-AN	5166 LP	S3 Trio64 V2/GX 2D	None	16 MB	1.44 Diskette drive, 256 KB external cache, US Model 1 Country Kit, Media Kit
FR-DW001-AN	5166 LP	S3 Trio64 V2/GX 2D	None	16 MB	1.44 Diskette drive, 256 KB external cache, Model 1 Country Kit required, Media Kit
FR-DA001-AP	5166 MMX LP	S3 Trio64 V2/GX 2D	None	16 MB	1.44 Diskette drive, 256 KB external cache, US Model 1 Country Kit, Media Kit
FR-DW001-AO	5166 MMX LP	S3 Trio64 V2/GX 2D	None	16 MB	1.44 Diskette drive, 256 KB external cache, Model 1 Country Kit required, Media Kit
FR-DA001-AT	5200 MMX LP	S3 Trio64 V2/GX 2D	None	32 MB	1.44 Diskette drive, 256 KB external cache, US Model 1 Country Kit, Media Kit
FR-DW001-AP	5200 MMX LP	S3 Trio64 V2/GX 2D	None	16 MB	1.44 Diskette drive, 256 KB external cache, Model 1 Country Kit required, Media Kit

## Venturis FX-2 Short Tower Model 1

Part Number	Description	Video	HDD (IDE)	RAM	Additional Features
FR-DW001-AU	5150 ST	S3 Trio64 V2/GX 2D	None	16 MB	1.44 Diskette drive, 256 KB external cache, Model 1 Country Kit required, Media Kit
FR-DW001-AQ	5166 ST	S3 Trio64 V2/GX 2D	None	16 MB	1.44 Diskette drive, 256 KB external cache, Model 1 Country Kit required, Media Kit
FR-DW001-AR	5166 MMX ST	S3 Trio64 V2/GX 2D	None	16 MB	1.44 Diskette drive, 256 KB external cache, Model 1 Country Kit required, Media Kit
FR-DW001-AS	5200 MMX ST	S3 Trio64 V2/GX 2D	None	16 MB	1.44 Diskette drive, 256 KB external cache, Model 1 Country Kit required, Media Kit

## Venturis FX-2 Models with 1.2 GB IDE HDD

Part Number	Description	Video	HDD (IDE)	RAM	Additional Features
FR-DW001-AA	5133 LP	S3 Trio64 V2/GX 2D	1.2 GB	16 MB	1.44 Diskette drive, 256 KB external cache, Country Kit required
FR-DAA01-AB	5150 LP	S3 Trio64 V2/GX 2D	1.2 GB	16 MB	1.44 Diskette drive, 256 KB external cache, US Country Kit, Windows 95
FR-DW001-AB	5150 LP	S3 Trio64 V2/GX 2D	1.2 GB	16 MB	1.44 Diskette drive, 256 KB external cache, Country Kit required
FR-DW001-AV	5150 ST	S3 Trio64 V2/GX 2D	1.2 GB	16 MB	1.44 Diskette drive, 256 KB external cache, Country Kit required
FR-DAA01-AD	5166 LP	S3 Trio64 V2/GX 2D	1.2 GB	16 MB	1.44 Diskette drive, 256 KB external cache, US Country Kit, Windows 95
FR-DW001-AD	5166 LP	S3 Trio64 V2/GX 2D	1.2 GB	16 MB	1.44 Diskette drive, 256 KB external cache, Country Kit required
FR-DAA01-AN	5166 MMX LP	S3 Trio64 V2/GX 2D	1.2 GB	16 MB	1.44 Diskette drive, 256 KB external cache, US Country Kit, Windows 95

## Venturis FX-2 Low Profile with 2 GB IDE HDD

Part Number	Description	Video	HDD (IDE)	RAM	Additional Features
FR-DJA01-AA	5133 LP	S3 Trio64 V2/GX 2D	2 GB	16 MB	Trimode Diskette drive, 256 KB external cache, 12x CD-ROM, 2 MB SGRAM, Japanese Country Kit, Windows 95
FR-DAA01-AE	5166 LP	S3 Trio64 V2/GX 2D	2 GB	16 MB	1.44 Diskette drive, 256 KB external cache, US Country Kit, Windows 95
FR-DW001-AE	5166 LP	S3 Trio64 V2/GX 2D	2 GB	16 MB	1.44 Diskette drive, 256 KB external cache, Country Kit required
FR-DJA01-AB	5166 LP	S3 Trio64 V2/GX 2D	2 GB	16 MB	Trimode Diskette drive, 256 KB external cache, 12x CD-ROM, 2 MB SGRAM, Japanese Country Kit, Windows 95
FR-DAA01-AF	5166 MMX LP	S3 Trio64 V2/GX 2D	2 GB	16 MB	1.44 Diskette drive, 256 KB external cache, US Country Kit, Windows 95
FR-DW001-AF	5166 MMX LP	S3 Trio64 V2/GX 2D	2 GB	16 MB	1.44 Diskette drive, 256 KB external cache, Country Kit required
FR-DJA01-AC	5200 LP	S3 Trio64 V2/GX 2D	2 GB	32 MB	Trimode Diskette drive, 256 KB external cache, 12x CD-ROM, 2 MB SGRAM, Japanese Country Kit, Windows 95
FR-DW001-AX	5200 LP	S3 Trio64 V2/GX 2D	2 GB	16 MB	1.44 Diskette drive, 256 KB external cache, Country Kit required
FR-DAA01-AR	5200 MMX LP	S3 Trio64 V2/GX 2D	2 GB	32 MB	1.44 Diskette drive, 256 KB external cache, 12x CD-ROM, US Country Kit, Windows 95
FR-DW001-AH	5200 MMX LP	S3 Trio64 V2/GX 2D	2 GB	32 MB	1.44 Diskette drive, 256 KB external cache, Country Kit required

## Venturis FX-2 Short Tower with 2 GB IDE HDD

Part Number	Description	Video	HDD (IDE)	RAM	Additional Features
FR-DW001-AW	5133 ST	S3 Trio64 V2/GX 2D	2 GB	16 MB	1.44 Diskette drive, 256 KB external cache, Country Kit required
FR-DW001-AJ	5150 ST	S3 Trio64 V2/GX 2D	2 GB	16 MB	1.44 Diskette drive, 256 KB external cache, Country Kit required
FR-DAA01-AC	5166 ST	S3 Trio64 V2/GX 2D	2 GB	16 MB	1.44 Diskette drive, 256 KB external cache, US Country Kit, Windows 95
FR-DW001-AC	5166 ST	S3 Trio64 V2/GX 2D	2 GB	16 MB	1.44 Diskette drive, 256 KB external cache, Country Kit required
FR-DW001-AK	5166 MMX ST	S3 Trio64 V2/GX 2D	2GB	32 MB	1.44 Diskette drive, 256 KB external cache, 12x CD-ROM, Country Kit required
FR-DAA001-AP	5166 MMX ST MM	S3 Trio64 V2/GX 2D	2 GB	16 MB	1.44 Diskette drive, 256 KB external cache, 12x CD-ROM, Sound card, microphone, headphones, 2 MB SGRAM, US Country Kit, Windows 95
FR-DW001-AY	5200 ST	S3 Trio64 V2/GX 2D	2 GB	32 MB	1.44 Diskette drive, 256 KB external cache, Country Kit required
FR-DAA01-AL	5200 MMX ST	S3 Trio64 V2/GX 2D	2 GB	32 MB	1.44 Diskette drive, 256 KB external cache, 12x CD-ROM, US Country Kit, Windows 95

## Venturis FX-2 Low Profile with 3.2 GB IDE HDD

Part Number	Description	Video	HDD (IDE)	RAM	Additional Features
FR-DAA01-AG	5166 MMX LP	S3 Trio64 V2/GX 2D	3.2 GB	32 MB	1.44 Diskette drive, 256 KB external cache, US Country Kit, Windows 95
FR-DW001-AG	5166 MMX LP	S3 Trio64 V2/GX 2D	3.2 GB	32 MB	1.44 Diskette drive, 256 KB external cache, Country Kit required
FR-DW001-AI	5200 MMX LP	S3 Trio64 V2/GX 2D	3.2GB	32 MB	1.44 Diskette drive, 256 KB external cache, Country Kit required

## Venturis FX-2 Short Tower with 3.2 GB IDE HDD

Part Number	Description	Video	HDD (IDE)	RAM	Additional Features
FR-DAA01-AK	5166 MMX ST	S3 Trio64 V2/GX 2D	3.2 GB	16 MB	1.44 Diskette drive, 256 KB external cache, 12x CD-ROM, US Country Kit, Windows 95
FR-DAA01-AM	5166 MMX ST MM	S3 Trio64 V2/GX 2D	3.2 GB	32 MB	1.44 Diskette drive, 256 KB external cache, 12x CD-ROM, Sound card, microphone, headphones, 2 MB SGRAM, US Country Kit, Windows 95
FR-DJA01-AD	5200 ST	S3 Trio64 V2/GX 2D	3.2 GB	32 MB	Trimode Diskette drive, 256 KB external cache, 12x CD-ROM, 2 MB SGRAM, Japanese Country Kit, Windows 95
FR-DW001-AL	5200 MMX ST	S3 Trio64 V2/GX 2D	3.2 GB	32 MB	1.44 Diskette drive, 256 KB external cache, 12x CD-ROM, Country Kit required

## Celebris FX-2 Low Profile Model1

Part Number	Description	Video	HDD (IDE)	RAM	Additional Features
FR-DA004-AN	5166 LP	S3 ViRGE/GX 2D/3D	None	16 MB	1.44 Diskette drive, 512 KB external cache, US Model 1 Country Kit, integrated audio, integrated 10/100 networking
FR-DW004-AG	5166 LP	S3 ViRGE/GX 2D/3D	None	16 MB	1.44 Diskette drive, 512 KB external cache, Model 1 Country Kit required, integrated audio, integrated 10/100 networking
FR-DA004-AQ	5166 MMX LP	S3 ViRGE/GX 2D/3D	None	16 MB	1.44 Diskette drive, 512KB external cache, U.S. Model 1 Country Kit, integrated audio, integrated 10/100 networking
FR-DA004-AS	5200 MMX LP	S3 ViRGE/GX 2D/3D	None	32 MB	1.44 Diskette drive, 512KB external cache, U.S. Model 1 Country Kit, integrated audio, integrated 10/100 networking
FR-DW004-AL	5200 MMX LP	S3 ViRGE/GX 2D/3D	None	32 MB	1.44 Diskette drive, 512KB external cache, Model 1 Country Kit required, integrated audio, integrated 10/100 networking

## Celebris FX-2 Short Tower Model1

Part Number	Description	Video	HDD (IDE)	RAM	Additional Features
FR-DA004-AU	5166 ST	S3 ViRGE/GX 2D/3D	None	16 MB	1.44 Diskette drive, 512KB external cache, US Model 1 Country Kit, integrated audio, integrated 10/100 networking
FR-DA004-AR	5166 MMX ST	S3 ViRGE/GX 2D/3D	None	32 MB	1.44 Diskette drive, 512KB external cache, US Model 1 Country Kit, integrated audio, integrated 10/100 networking
FR-DW004-AK	5166 MMX ST	S3 ViRGE/GX 2D/3D	None	32 MB	1.44 Diskette drive, 512KB external cache, Model 1 Country Kit required, integrated audio, integrated 10/100 networking
FR-DA004-AT	5200 MMX ST	S3 ViRGE/GX 2D/3D	None	32 MB	1.44 Diskette drive, 512KB external cache, US Model 1 Country Kit, integrated audio, integrated 10/100 networking
FR-DW004-AM	5200 MMX ST	S3 ViRGE/GX 2D/3D	None	32 MB	1.44 Diskette drive, 512KB external cache, Model 1 Country Kit required, integrated audio, integrated 10/100 networking

## Celebris FX-2 Low Profile with 2 GB IDE HDD

Part Number	Description	Video	HDD (IDE)	RAM	Additional Features
FR-DAA04-AA	5166 LP	S3 ViRGE/GX 2D/3D	2 GB	16 MB	1.44 Diskette drive, 512KB external cache, US Country Kit, Windows 95, integrated audio, integrated 10/100 networking
FR-DAB04-AA	5166 LP	S3 ViRGE/GX 2D/3D	2 GB	16 MB	1.44 Diskette drive, 512KB external cache, US Country Kit, Windows NT 4.0 Workstation, integrated audio, integrated 10/100 networking
FR-DAA04-AC	5166 MMX LP	S3 ViRGE/GX 2D/3D	2 GB	32 MB	1.44 Diskette drive, 512KB external cache, US Country Kit, Windows 95, integrated audio, integrated 10/100 networking
FR-DAB04-AC	5166 MMX LP	S3 ViRGE/GX 2D/3D	2 GB	32 MB	1.44 Diskette drive, 512KB external cache, US Country Kit, Windows NT 4.0 Workstation, integrated audio, integrated 10/100 networking
FR-DJA04-AA	5166 MMX LP	S3 ViRGE/GX 2D/3D	2 GB	32 MB	Trimode Diskette drive, 512KB external cache, 16x CD-ROM, Windows 95, Japanese Country Kit, integrated audio, integrated 10/100 networking
FR-DJB04-AA	5166MMX LP	S3 ViRGE/GX 2D/3D	2 GB	32 MB	Trimode Diskette drive, 512 KB external cache, 16x CD-ROM, Windows NT 4.0 Workstation, Japanese Country Kit, integrated audio, integrated 10/100 networking
FR-DW004-AA	5166 MMX LP	S3 ViRGE/GX 2D/3D	2 GB	16 MB	1.44 Diskette drive, 512KB external cache, Country Kit required, integrated audio, integrated 10/100 networking
FR-DW004-AC	5166 MMX LP	S3 ViRGE/GX 2D/3D	2 GB	16 MB	1.44 Diskette drive, 512KB external cache, 16x CD-ROM, Country Kit required, integrated audio, integrated 10/100 networking

*continued*

Product Description

<b>Part Number</b>	<b>Description</b>	<b>Video</b>	<b>HDD (IDE)</b>	<b>RAM</b>	<b>Additional Features</b>
FR-DAA04-AE	5200 MMX LP	S3 ViRGE/GX 2D/3D	2 GB	32 MB	1.44 Diskette drive, 512 KB external cache, 16x CD-ROM, US Country Kit, Windows 95, integrated audio, integrated 10/100 networking
FR-DAB04-AE	5200 MMX LP	S3 ViRGE/GX 2D/3D	2 GB	32 MB	1.44 Diskette drive, 512 KB external cache, 16x CD-ROM, Windows NT 4.0 Workstation, US Country Kit , integrated audio, integrated 10/100 networking
FR-DJA04-AB	5200 MMX LP	S3 ViRGE/GX 2D/3D	2 GB	32 MB	Trimode Diskette drive, 512 KB external cache, 16x CD-ROM, Windows 95 Japanese Country Kit, integrated audio, integrated 10/100 networking
FR-DJB04-AB	5200 MMX LP	S3 ViRGE/GX 2D/3D	2 GB	32 MB	Trimode Diskette drive, 512 KB external cache, 16x CD-ROM, Windows NT 4.0 Workstation, Japanese Country Kit, integrated audio, integrated 10/100 networking
FR-DW004-AE	5200 MMX LP	S3 ViRGE/GX 2D/3D	2 GB	16 MB	1.44 Diskette drive, 512KB external cache, 16x CD-ROM, Country Kit required, integrated audio, integrated 10/100 networking

## Celebris FX-2 Short Tower with 2 GB IDE HDD

Part Number	Description	Video	HDD (IDE)	RAM	Additional Features
FR-DAA04-AH	5166 MMX ST	S3 ViRGE/GX 2D/3D	2 GB	16 MB	1.44 Diskette drive, 512 KB external cache, 16x CD-ROM, US Country Kit, Windows 95, integrated audio, integrated 10/100 networking
FR- DAA04-AG	5200 MMX ST	S3 ViRGE/GX 2D/3D	2 GB	32 MB	1.44 Diskette drive, 512 KB external cache, US Country Kit, Windows 95, integrated audio, integrated 10/100 networking
FR- DAB04-AG	5200 MMX ST	S3 ViRGE/GX 2D/3D	2 GB	32 MB	1.44 Diskette drive, 512 KB external cache, US Country Kit, Windows NT 4.0 Workstation, integrated audio, integrated 10/100 networking

## Celebris FX-2 Short Tower with 3 GB IDE HDD

Part Number	Description	Video	HDD (IDE)	RAM	Additional Features
FR-DAA04-AD	5166 MMX ST	S3 ViRGE/GX 2D/3D	3 GB	32 MB	1.44 Diskette drive, 512 KB external cache, 16x CD-ROM, US Country Kit, Windows 95, integrated audio, integrated 10/100 networking
FR-DAB04-AD	5166 MMX ST	S3 ViRGE/GX 2D/3D	3 GB	32 MB	1.44 Diskette drive, 512 KB external cache, 16x CD-ROM, US Country Kit, Windows NT 4.0 Workstation, integrated audio, integrated 10/100 networking
FR-DW004-AD	5166 MMX ST	S3 ViRGE/GX 2D/3D	3 GB	32 MB	1.44 Diskette drive, 512 KB external cache, 16x CD-ROM, Country Kit required, integrated audio, integrated 10/100 networking
FR-DAA04-AF	5200 MMX ST	S3 ViRGE/GX 2D/3D	3 GB	32 MB	1.44 Diskette drive, 512 KB external cache, 16x CD-ROM, US Country Kit, Windows 95, integrated audio, integrated 10/100 networking
FR-DAB04-AF	5200 MMX ST	S3 ViRGE/GX 2D/3D	3 GB	32 MB	1.44 Diskette drive, 512 KB external cache, 16x CD-ROM, US Country Kit, Windows NT 4.0 Workstation, integrated audio, integrated 10/100 networking
FR-DJA04-AC	5200 MMX ST	S3 ViRGE/GX 2D/3D	3 GB	32 MB	Trimode Diskette drive, 512 KB external cache, 16x CD-ROM, Japanese Country Kit, Windows 95, integrated audio, integrated 10/100 networking

*continued*

Product Description

<b>Part Number</b>	<b>Description</b>	<b>Video</b>	<b>HDD (IDE)</b>	<b>RAM</b>	<b>Additional Features</b>
FR-DJB04-AC	5200 MMX ST	S3 ViRGE/GX 2D/3D	3 GB	32 MB	Trimode Diskette drive, 512 KB external cache, 16x CD-ROM, Japanese Country Kit, Windows NT 4.0 Workstation, integrated audio, integrated 10/100 networking
FR-DW004-AF	5200 MMX ST	S3 ViRGE/GX 2D/3D	3 GB	32 MB	1.44 Diskette drive, 512 KB external cache, 16x CD-ROM, Country Kit required, integrated audio, integrated 10/100 networking

## Related Material

The following related material is available:

Document Title	Order Number	Description
Service Quick Reference	ER-DW0WW-SR	Provides troubleshooting information that can be used when servicing Venturis FX-2 and Celebris FX-2 computers.
Quick Setup Guide	ER-B00WW-IM (Multilanguage)* ER-B00WW-I2 (simple Chinese)	Describes how to initially setup Venturis FX-2 and Celebris FX-2 computers.
System Reference	ER-DW0WW-UA (English) ER-DW0WW-UJ (Japanese) ER-DW0WW-U2 (simple Chinese)	Describes how to operate, configure, and upgrade Venturis FX-2 and Celebris FX-2 computers.
System Solutions	ER-PCDSS-UA (English) ER-PCDSS-UM (Multilanguage)** ER-PCDSS-UJ (Japanese) ER-PCDSS-U2 (simple Chinese)	Provides end-user troubleshooting information should a Venturis FX-2 or Celebris FX-2 computer fail to operate after initial setup or after installing optional devices.
System Software	ER-B00WW-GA (English) ER-B00WW-GM (Multilanguage)** ER-B00WW-GJ (Japanese) ER-B00WW-G2 (simple Chinese)	Provides information on the operating system, utilities, and device drivers that came with Venturis FX-2 and Celebris FX-2 computers.
Feature Connector Installation Guide	TBD	Describes how to install the feature connector
Warranty and Service	ER-PCWAR-CM (Multilanguage)* EK-PCJHW-RI (Japanese) EK-DCPCS-RC (simple Chinese)	Provides warranty information and a listing of phone numbers for technical support.
Backup Media	QC-04VAB-HW QC-05EAA-HW QC-05JAA-HC1.0 QC-05JJA-HC1.0	Celebris FX-2 System Software CD Venturis FX-2 System Software CD Digital Startup Diskette (English) Digital Startup Diskette (Japanese)

• \* Multilanguage includes: English, French, Italian, German, Spanish, and Japanese.

\*\* Multilanguage includes: English, French, Italian, German, and Spanish.

README files come with the factory installed software and on the supplied backup CD-ROM disk. These files contain useful setup, configuration, and operation information. Read this information first.

## Latest Product Information and Updates

You can access product information and download the latest BIOS, device drivers, and software updates using the Internet at:

**<http://www.windows.digital.com>**

1. To get to the file library, choose **Service & Support**.
2. At the next screen, under **Firmware & Drivers**, select the Intel-based System Library.
3. Choose the correct Celebris or Venturis model from the displayed list.
4. From the file list, choose the file to download.

You can also access software updates through Digital's Bulletin Board Service (BBS) by calling:

**In the United States: (508) 496-8800**

**In Europe: +33 92 96 03 12**

Digital hosts a number of conferences on CompuServe featuring a wide range of topics. Enter GO DEC to reach Digital's main menu page. For information on PC integration, enter: GO DEC PC.

# BIOS Setup Utility **2**

---

## Running the BIOS Setup Utility

The BIOS Setup utility enables you to select and store permanently information about the computer's 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 any time you run setup.

You should use the BIOS Setup utility if you experience problems with the hard disk or if you need to reconfigure or expand the computer. In addition, the BIOS Setup utility might need to be used to modify the configuration after adding or removing hardware, or changing computer settings.



**CAUTION:** The computer was setup for normal operation at the factory and will operate properly without additional configuring.

It is important for you to read carefully and understand this chapter before attempting to modify the computer's factory settings. Changing some settings might cause the computer to operate improperly.

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

- 1 Turn on the computer and allow the Power-On Self Test (POST) to complete.
- 2 Make a note of any configuration errors listed, and then 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 you computer.

## Helpful Hints

- Several keyboard keys are assigned to help you select menus and sub-menus, options, change option values, and display 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 anytime during the setup process and appears at the right of the setup screen when an option is highlighted. This on-line help provides information about a highlighted option.
- Select *Save Changes & Exit* to save all Setup values and exit Setup.
- Select *Exit Without Saving Changes* to exit Setup without recording any changes.
- Select *Get Default Values* to set all Setup options to their default values.
- Select *Load Previous Changes* to restore all CMOS values from the last session.
- Select *Save Changes* to save all selections without exiting Setup.
- Press [Esc] to exit the BIOS Setup utility.

## BIOS Setup Utility Options

The following Help topics list the BIOS options that can be updated or modified by using the BIOS Setup utility, according to the various sub-menus under which they appear.

- Main Menu Options — Sets basic computer configuration options (time, date, video, etc.).
- Advanced Options — Sets advanced features to increase computer performance (COM ports, LPT ports, etc.).
- Security Options — Sets passwords and user privileges.
- Power Options — Sets power saving options to increase the life of the computer.
- Boot Options — Sets the boot sequence of the computer.
- Exit — Provides options for saving changes and leaving the BIOS Setup utility. Refer to “Navigating,” in the BIOS Setup utility, for additional information.



**NOTE:** The following tables list the BIOS Setup Menu options available for Venturis FX-2 and Celebris FX-2 computers. Note that an “ \* ” that follows an option in the Settings column indicates the factory default setting.

## Main

Menu Fields	Settings	Comments
System time	Current time	Displays the current time.
System date	Current date	Displays the current date.
Language	English*	Language default.
Diskette drive A/ Diskette drive B	1.44 MB, 3½* 2.88 MB, 3½  Not Installed* 360 KB, 5¼ 1.2 MB, 5¼ 720 KB, 3½	Sets the size and density of diskette drives.
Integrated IDE adapter	Disabled Both* Primary Secondary	Enabled or disables the local bus IDE adapter. Both enables both the primary and secondary adapters. Primary enables only the primary adapter and Secondary enables only the secondary adapter.
<b>IDE Adapter 0/1 Master/Slave</b>		
Autotype fixed disk	[Press Enter]	Press [Enter] to detect and fill in the installed hard disk drive parameters in the remaining fields.
Type <sup>(1)</sup>	None 1 to 14 Rsrv 16 to 39 User Auto* CD	Selecting 1 to 14 and 16 to 39 automatically fills in the remaining fields in this menu.  Selecting User enables the remaining fields to be filled in manually, using the installed hard disk drive's parameters. <sup>(2)</sup>  If a CD-ROM drive is used for the IDE drive, you must select CD. You can select Auto for an HDD.

<sup>(1)</sup> These fields are automatically filled in if the computer auto-detected an installed hard disk drive.

<sup>(2)</sup> Incorrect settings can cause the computer to malfunction.

*continued*

Menu Fields	Settings	Comments
Cylinders <sup>(1)</sup>	0 to 4095	Displays the number of cylinders.
Heads <sup>(1)</sup>	1 to 64	Displays the number of heads.
Sectors/track <sup>(1)</sup>	0 to 63	Displays the number of sectors/track.
Write precomp <sup>(1)</sup>	0 to 4095 None	Displays the number of cylinders that have their write timing changed.
Multi-sector transfers <sup>(1)</sup>	Disabled 2 sectors 4 sectors 8 sectors 16 sectors Auto	Determines the number of sectors per block for multiple sector transfers.  Auto refers to the size the disk returns when queried.
LBA mode control	Disabled Enabled	Enabling this option causes Logical Block Addressing (LBA) instead of cylinders and heads. Select <code>Disabled</code> for IDE hard disk drives that are up to 528 MB in size. When using an IDE drive larger than 528 MB and an operating system that supports LBA, select <code>Enable</code> . MS-DOS and Windows are examples of operating systems that support LBA.
32-bit I/O	Enabled Disabled	Enables or disables the 32-bit, hard disk drive data transfer option. Enabling this option speeds up data transfers; ensure that the HDD supports 32-bit I/O transfers.
Ultra DMA transfer mode	Disabled Mode 0 Mode 1 Mode 2	Selects the Ultra DMA method to transfer data to and from the HDD.
Transfer mode <sup>(1)</sup>	Standard Fast PIO1 Fast PIO2 Fast PIO3 Fast PIO4 Fast DMA A Fast DMA B Fast DMA F PCI Bus Master DMA	Selects the method to transfer data to and from the HDD. If you select the user autotype for the HDD, Setup automatically selects the optimum transfer mode.

<sup>(1)</sup> These fields are automatically filled in if the computer auto-detected an installed hard disk drive.

*continued*

## BIOS Setup Utility

<b>Menu Fields</b>	<b>Settings</b>	<b>Comments</b>
Video system	EGA / VGA* CGA 80x25 Monochrome	Sets the video controller type.
<b>Memory and Cache:</b>		
Internal cache	Enabled* Disabled	Enables or disables the processor's internal cache.
External cache	Enabled* Disabled	Enables or disables the external cache.
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.  Enabled is the recommended setting.
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 because video BIOS instructions can be executed in cache instead of RAM.  Enabled is the recommended setting.

*continued*

Menu Fields	Settings	Comments
System BIOS shadow	Enabled*	Always set to Enabled.
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 video BIOS ROM is shadowed, the ROM information is copied into an appropriate area in DRAM. This increases the computer's performance because the video BIOS instructions are in fast DRAM instead of ROM.  Enabled is the recommended setting.
Shadow memory region C800 - CBFF: CC00 - CFFF: D000 - D3FF: D400 - D7FF: D800 - DBFF: DC00 - DFFF:	Enabled Disabled*	Enables or disables shadowing of individual segments of ROM to increase computer performance.  <b>CAUTION:</b> Some option ROMs do not operate properly when shadowed.
AT bus space	Disabled*  F00000h, 1 MB	Memory hole not available; upper memory is contiguous.  Sets the memory hole at address F00000 with 1 MB memory available.
Extended memory report	Compatibility* Non-compatibility	Select the BIOS report mechanism for the amount of external memory.  Select <i>Compatibility</i> when using a conventional operating system.  Select <i>Non-compatibility</i> for extended memory above 64 MB under Windows NT.

*continued*

## BIOS Setup Utility

Menu Fields	Settings	Comments
<b>Boot Options</b>		
Setup prompt	Enabled* Disabled	Enables or disables the <F2> setup prompt each time the computer boots.  If you select <code>Disable</code> , you only disable the prompt informing you when to press <F2> to enter Setup. You can still enter Setup by pressing <F2> before POST completes.
POST errors	Enabled* Disabled	Enabling this option 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.
Quiet boot	Enabled Disabled*	Enables or disables the display of POST messages. Quiet Boot, when enabled, displays the Digital logo, instead of POST messages.
Summary screen (Venturis only)	Enabled* Disabled	Enabling this option causes the computer to display configuration parameters (in the form of a summary screen) during boot.
Floppy check	Enabled Disabled*	Enabled permits verification of FDD type at boot. Disabled prevents FDD verification and speeds up the boot process.
FLASH Update (Celebris only)	Enabled* Disabled	When enabled, protects against unauthorized FLASH BIOS update for the next boot.
Acpi 4 sec	Enabled Disabled*	Enable or disable Acpi 4 sec power off system.

*continued*

Menu Fields	Settings	Comments
<b>Keyboard Features</b>		
NumLock	Auto* On Off	Turns NumLock on or off each time the computer boots.  If <code>Auto</code> is 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	2/sec 6/sec 10/sec 13.3/sec 18.5/sec 21.8/sec 26.7/sec 30/sec*	Sets the number of times a second to repeat a keystroke while the key is held down.
Keyboard auto-repeat delay	1/4 sec 1/2 sec* 3/4 sec 1 sec	Sets the delay time after a key is held down before it begins to repeat a keystroke.
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.

## Advanced

Menu Fields	Settings	Comments
<b>Integrated Peripherals</b>		
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.  <b>NOTE:</b> Two devices cannot share the same IRQ. Also, choosing Disabled makes the parallel port unusable.  Auto is the recommended setting.
Parallel port mode	Compatible mode  Bi-directional mode*  EPP 1.7 EPP 1.9    ECP-DMA1 mode ECP-DMA3 mode	Sets the onboard parallel port mode.  Standard printer connection.  PS/2 compatible mode and able to receive data.  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. If this information cannot be located, use the default setting.  Extended capabilities port mode.

*continued*

Menu Fields	Settings	Comments
Serial port	Auto Disabled 3F8, IRQ 4* 2F8, IRQ 3 3E8, IRQ4 2E8, IRQ3	Enables or disables onboard serial port 1 at the specified address.  Select <code>Auto</code> unless interrupts IRQ4 and/or IRQ3 are allocated as a computer resource.  Two devices cannot share the same IRQ. Choosing <code>Disabled</code> makes serial port 1 unusable. If you select <code>Auto</code> , Setup configures COM1 to address = 3F8h and IRQ = 4 if they are available.  <code>Auto</code> is the recommended setting.
Diskette controller	Enabled* Disabled	Enables or disables the onboard diskette controller.
Exchange diskette drives	Disabled* Enabled	Logically exchanges physical diskette drive designations.
Diskette write protection	Disabled* Enabled	Enables or disables the selected diskette drive's write protect option.
Integrated audio (if available)	Enabled* Disabled	Enables or disables the Sound Blaster Pro-compatible audio chip.
Audio Base I/O	220H* 240H 260H 280H	Onboard audio I/O address.
IRQ Channel	IRQ5* IRQ7 IRQ9 IRQ11	Determines the system IRQ resource that the sound chip is to use.
DMA Channel for playback (Celebris only)	DMA0 DMA1 DMA3*	Determines the system DMA resource that the sound chip is to use for playback.
DMA Channel for capture (Celebris only)	DMA0 DMA1* DMA3	Determines the system DMA resource that the sound chip is to use for sound capture.

*continued*

## BIOS Setup Utility

<b>Menu Fields</b>	<b>Settings</b>	<b>Comments</b>
FM Synthesis I/O address	388H* 390H 398H 3A0H	Sets base I/O address for FM synthesis device.
WSS I/O address	530H* 604H E80H F40H	Sets base I/O address for Windows Sound System device.
4236 Control Base (Celebris only)	Enabled* Disabled	Enables or disables setting the Crystal 4236 Control I/O base.
4236 Control I/O Base Address (Celebris only)	F00H* F10H F20H F30H	Sets Crystal 4236 Control I/O base.

*continued*

Menu Fields	Settings	Comments
Plug & Play O/S	Yes No*	Select <b>Yes</b> if using a Plug & Play operating system such as Windows 95. Otherwise, select <b>No</b> .
Reset configuration data	Yes No*	Select <b>Yes</b> to clear the system configuration data if you suspect it is corrupted, which sometimes occurs after a power outage. This option also clears the Plug & Play databases.  After you input correct settings (or accept the default settings), the computer switches this setting back to <b>No</b> .  If you do not need to clear system configuration data, leave the setting at <b>No</b> .
Large disk access mode	DOS* Other	Select <b>DOS</b> if you have MS-DOS installed.  Select <b>Other</b> if you have another operating system installed.  A large disk drive constitutes one that has more than 1024 cylinders, 16 heads, or 63 tracks per sector.
Integrated network controller (if available)	Enabled* Disabled	Enables or disables the onboard Digital 21143 Network controller.
Remote Network Wake-up (Celebris only)	Disabled* Magic Packet SecureON	“Magic Packet” provides basic wake-up capabilities allowing the system to be powered up remotely. Selecting “SecureON” increases security by requiring a password for access to the network.
Client operation (Celebris only)	Enabled* Disabled	Setting to <b>Disabled</b> blanks the screen and disables the keyboard or mouse input during remote network wake-up event.

## Security Options

Menu Fields	Settings	Comments
Supervisor password is	Not user selectable (Disabled)*	Indicates whether or not the supervisor's password is enabled or disabled.
User password is	Not user selectable (Disabled)*	Indicates whether or not the user's password is enabled or disabled.
Set supervisor password	Press [Enter]	<p>Allows a supervisor password to be set.</p> <p>The supervisor password must be set if a user password is to be used.</p> <p><b>NOTE:</b> Entering Setup with a supervisor password provides full access to all BIOS Setup utility menus.</p>
Set user password	Press [Enter]	<p>Allows a user password to be set.</p> <p>This password can be set only if a supervisor password is entered.</p> <p>When the user has entered his or her name but the supervisor is not logged in, only the following information is accessible:</p> <p>Supervisor password is Enabled.</p> <p>User password is Enabled.</p> <p>Set user password [press enter] to enter a user password.</p> <p>Password on boot Enabled/Disabled (which ever is in effect). This option is not allowed to change.</p> <p>Custom sign on banner Enabled/Disabled (which ever is in effect). This option is not allowed to change.</p>

*continued*

Menu Fields	Settings	Comments
Password on boot	Enabled Disabled*	<p>Enables or disables the enter password on boot option.</p> <p>If you enable this option, a user or supervisor password must be entered in order for the boot process to complete. If a user or supervisor password is not entered, the operating system cannot be accessed.</p>
Custom sign on banner is	Not user selectable (Disabled)*	Indicates whether the custom sign on banner is enabled or disabled.
Custom sign on banner	Press [Enter]	<p>Press [Enter] to enter a custom sign on banner that displays during POST.</p> <p>For example, the user might enter "Welcome to John's machine." The maximum number of characters is 50.</p>
Diskette access	Supervisor* User	<p>Controls who has access to diskette drives.</p> <p>If <code>Supervisor</code> is selected, access to the diskette drive is limited to the supervisor, who must enter his or her password. If <code>User</code> is selected, the diskette drive can be accessed by entering either the supervisor or the user password.</p> <p>Whatever setting is chosen, it only becomes functional if both a <code>Supervisor Password</code> and a <code>User Password</code> have been set (if you choose <code>User</code> for the setting).</p>

*continued*

## BIOS Setup Utility

<b>Menu Fields</b>	<b>Settings</b>	<b>Comments</b>
Fixed disk boot sector (Venturis only)	Normal* Write protect	Write protects the boot sector on the hard disk drive.
System Backup Reminder (Venturis only)	Enabled Disabled*	When enabled, displays a backup reminder message at boot (can be set to daily, every Monday, or 1 <sup>st</sup> of every month)
Virus Check Reminder (Venturis only)	Enabled Disabled*	When enabled, displays a reminder message to check for viruses at boot (can be set to daily, every Monday, or 1 <sup>st</sup> of every month)

## Power

Menu Fields	Settings	Comments
Power management	Enabled* Disabled	Enable this field to use any of the power management options. If this field is enabled and the other fields are disabled, only minimal power reduction is affected.
System standby timer	Disabled* 1 min. 5 min. 10 min. 20 min. 30 min.	<p>After a set period of computer inactivity, the BIOS places the computer in a standby state (medium power savings), that is, the monitor and CPU are set to power management. Any mouse or keyboard activity quickly returns the computer to operation.</p> <p>Alternately, you can choose to disable this option and thereby not use this feature. Power management must be enabled to use this option.</p>
System suspend timer	Disabled* 1 hour 1.5 hour 2 hour 3 hour 4 hour	<p>After a set period of computer inactivity, the BIOS places the computer in a suspended state (maximum power savings), that is, the monitor and fan are shut off and the CPU and hard disk are powered down. Any mouse or keyboard activity quickly returns the computer to operation.</p> <p>If you set a timer for the field, you should also set Power Management to Enabled.</p> <p>Alternately, you can choose to disable this option and thereby not use this feature. Power management must be enabled to use this option.</p>

\* Power Management must be enabled and Suspend Mode must be supported.

*continued*

## BIOS Setup Utility

Menu Fields	Settings	Comments
Resume on Modem Ring	Off* On	When ON, wakes up the system when an incoming call is detected on the modem.
Resume on Time	Off* On	When ON, wakes up the system at a specific time, set by the Programmable Power On feature.
Programmable Power On	Disable* Enable	Sets the time for system wake up by Resume on Time.

## Boot

Menu Fields	Settings	Comments
Boot device sequence	1. Diskette Drive* 2. Hard Drive* 3. CD-ROM Drive*	<p>The numbers refer to the order in which the devices are addressed for the system files needed to boot the system.</p> <p>To change the order, use the <b>↑</b> and <b>↓</b> cursor keys to select the device you want to move. Then use the <b>+</b> and <b>-</b> keys, on the numeric keypad, to move the device to the desired boot order.</p>

## Flash Utility

All Venturis FX-2 and Celebris FX-2 computers have BIOS software in a read-only, non-volatile memory (ROM) chip. 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 you can restore the computer's BIOS simply by running the flash utility. If necessary, you can also upgrade the computer's BIOS to future releases by running the flash utility along with any flash BIOS update diskette.

You can download BIOS updates along with the flash utility and instructions on how to flash the computer's BIOS from the Internet or Digital's Bulletin Board Service (BBS).

# System Software **3**

---

## Introduction

Venturis FX-2 and Celebris FX-2 computers come with the Windows NT Workstation or Windows 95 operating system and the necessary device drivers pre-installed on the hard disk drive. The operating system, utilities, and device drivers are optimized for the computer's configuration and are ready for use.

- This chapter describes:
- The software and documentation that you receive on the hard disk drive
- The operating system software kit
- The System Software CD-ROM and supplied software diskette
- Configuring System Parameters
- How to use the diagnostic software
- How to restore the hard disk drive software using the supplied backup CD-ROM
- Other device drivers
- How to get updates

## Factory Installed Software

The following table describes the software installed on the hard disk drive:

<b>Software</b>	<b>Description</b>
Operating system	Either Windows NT or Windows 95. Associated on-line documentation is included with the operating system.
Digital supplied on-line documentation.	See "Digital On-Line Documentation."
Application software	See "Applications."
Device drivers	These can include drivers, such as video, mouse, and IDE, that you need for the computer. Some configurations also include audio, network, CD-ROM, or SCSI drivers

## Digital On-Line Documentation

Digital provides an on-line resource library for all available product information. The resource library includes Windows-based help files, electronic reference guides, and Readme files. Electronic reference guides are available in Adobe Portable Document Format (PDF). These documents can be displayed and printed exactly as the original. The Adobe Acrobat Reader is pre-installed on the hard disk drive. If the PDF files installed on the computer aren't in the local language, check the System Software CD-ROM. Translated versions of the referenced PDF files may be located there.

The following table lists the on-line documentation available for the computer. These files are located in the Digital program group or Digital folder.

On-Line Documentation	Description
<i>System Reference</i>	The on-line System Reference guide describes how to operate, upgrade, and configure the computer. You can view and print the guide using the Adobe Acrobat Reader.
Using The Computer	Windows-based on-line help file that describes the computer's features.
Readme.txt	Readme.txt files help you set up, operate, and configure the computer. Digital recommends that you read this information first.

There are other on-line documentation files available. Many of these relate to specific applications. Check the application program folder. Also check the applications themselves for the on-line help that is integrated into the applications.

## Applications

Digital's factory installed software includes several applications designed to make the computer easier to use. The following tables list the software that is available for the computer. Included in the table is information on where to locate the listed items and a brief description. Note that Windows 95 and Windows NT instructions all begin from Start in the Task Bar.

<b>Applications</b>	<b>Location</b>	<b>Description</b>
ClientWORKS	Select Programs, then ClientWORKS.	ClientWORKS is Digital's client management software designed to help network administrators lower the total cost of ownership by automating asset management tasks and managing computers remotely.
Remote Network Wake-up (Celebris FX-2 only)	Loaded and transparent to user.	Software that allows easy system management of networked client computers, even if the system power switch is turned off. Also provides greater system protection against unauthorized network intrusion using SecureON and Magic Packet technology.
Diagnostics	Select Programs then AMI Diagnostics.	Diagnostic software that can help troubleshoot the computer.  Also, diagnostic diskette images have been provided with the computer. These can be used to troubleshoot the computer if you are unable to access the software through Windows 95 or Windows NT. Digital recommends that you create these diskettes as soon as possible. For instructions, see the CD-Info.TXT file on the System Software CD-ROM.
PC Care (Windows 95 only)	Select Programs, then PC Care.	PC Care is a diagnostic, computer information, and computer optimization tool. (See "Using Diagnostics.")

*continued*

<b>Applications</b>	<b>Location</b>	<b>Description</b>
S.M.A.R.T. Monitor (Windows 95)	Loaded automatically in Startup. Click on the icon in the tool bar to view S.M.A.R.T. information	If the computer's hard disk drive is S.M.A.R.T. aware, Digital's S.M.A.R.T. Monitor will keep you apprised as to how the hard disk drive is operating.
Power Management	Select Programs, Digital, and then Power Management Utility.	Digital's Power Management technology enables you to reduce the computer's power consumption during computer inactivity. The power management software allows you to set the computer's power management features. Alternatively, power management features can be set in BIOS Setup.
Alta Vista Personal Search (Celebris FX-2 only)	Located on System Software CD. For installation instructions, see CD-INFO.TXT on the CD.	Digital's powerful and comprehensive Internet search engine.
Desktop Wellness	Select Programs, Digital, and then Desktop Wellness.	A tutorial that contains ergonomic information to assist you to work comfortably. This tutorial can be used to find aspects of the tasks and work environment that can be adjusted to suit the needs.
Audio Applications (only available on some models)	Select Programs then Audio Applications.	The Audio Applications software allows those with onboard integrated audio to take advantage of their computer's audio capabilities. These utilities provide the convenience of having the controls all in one place.
Video Utilities	Select the Control Panel and then Display	These include utilities such as Matrox MGA or the S3 Refresh, whichever is applicable to the computer. Refresh utilities allows you to set the refresh rate of the display.
Adobe Acrobat Reader	Select Programs then Adobe Acrobat.	The Adobe Acrobat Reader software allows you to read and print electronic documents.

## **Integrated Desktop Manageability**

### **ClientWORKS**

ClientWORKS, Digital's client management software, contains a powerful set of utilities designed to help you get the most out of the networking environment. Based on the Desktop Management Interface (DMI) industry-standard, ClientWORKS reduces total cost of ownership and makes Digital PCs more manageable than the competition. Included, at no charge, on all new Digital Celebris and Venturis computers, ClientWORKS saves MIS personnel time, reduces travel costs when diagnosing remote PCs, and improves accuracy of analysis of clients on the network.

ClientWORKS includes:

- Enhanced 32-bit DMI service layers for Windows 95 and Windows NT, and a 16-bit service layer for Windows for Workgroups.
- Digital's enhanced system Management Information Format (MIF) file for industry-standard desktop management.
- Enhanced ClientWORKS browser, offering identification of DMI components, both locally and remotely.
- SNMP agent software, including a MIF-to-MIB converter for powerful remote management in heterogeneous environments.
- MIFMAKER, Digital's unique utility designed to make DMI data available to Microsoft Systems Management Server (SMS).
- Diagnostics for enhanced system troubleshooting.

ClientWORKS comes factory-installed on the Digital Celebris or Venturis computer. ClientWORKS includes SNMP subagents that make the computer visible to an SNMP console. Although these subagents are pre-installed, they are disabled in the factory-installed software. Before you can enable the subagents, you must first install TCP/IP, which is part of Windows 95. To install TCP/IP, follow the Windows 95 help instructions for installing a network protocol. Once you have installed TCP/IP, you must install the Microsoft SNMP Master Agent. For installation instructions, refer to the ClientWORKS online help and user documentation.

*For additional information, including last-minute release notes, please see the README.TXT and RELNOTES.TXT files in the ClientWORKS folder on the Digital computer.*

## Remote Network Wake-Up

The Celebris FX-2 features remote network wake-up technology that allows easy system management of networked client computers, even if the system power switch is turned off. Utilizing Magic Packet software, developed by AMD, the system hardware design provides standby power to the integrated network interface controller. The controller can then power on the system when it receives an authorized network wake-up signal.

Additional system security is provided by SecureON, a feature that provides greater system protection against unauthorized network intrusion by requiring a password for remote wake-up.

*For more information, refer to the ClientWORKS and/or System Reference documentation.*

## Self Monitoring Analysis Technology (S.M.A.R.T.)

If the Celebris FX-2's hard disk drive is S.M.A.R.T. aware and you are running Windows 95, Digital S.M.A.R.T. Monitor will keep you apprised as to how the hard disk drive is operating. S.M.A.R.T. Monitor is launched when Windows 95 starts and then immediately minimized, the icon placed in the toolbar. The S.M.A.R.T. aware drive is periodically polled to monitor the performance of the motors, media, heads, and electronics of the drive. If problems are detected, you will be notified and advised to take appropriate action. By clicking on the icon at any time, you can review the status and history of any S.M.A.R.T. devices. You can also modify the setup of Digital S.M.A.R.T. Monitor.

*For more information, refer to the ClientWORKS and/or System Reference documentation.*

## Operating System Kit

The computer comes with an operating system kit, which matches the operating system installed on the computer's hard disk drive. You receive one of the following:

*Windows 95*

Windows 95 CD-ROM, software license, and the manual. *Introducing Microsoft Windows 95* describes how to use the Windows 95 operating system.

*Windows NT  
Workstation*

Windows NT Workstation: CD-ROM, setup diskettes, software license. *Microsoft Windows NT Installation Guide* and other documentation.

*Microsoft Windows NT Installation Guide* describes how to install and use Windows NT, including information about additional networking services that you can install.

The CD-ROM and setup diskettes are for restoring the operating system. Be sure to put them away in a safe place.

## System Software CD and Supplied Diskettes

Included in the accessories are a System Software CD-ROM and a Digital Startup diskette. These are described in the following table:

<i>System Software CD-ROM</i>	This CD-ROM contains the applications, utilities, device drivers, and on-line documentation necessary to restore the computer. This disc does not contain the operating system. See CD-INFO.TXT on the CD-ROM for non-operating system installation and configuration information.
<i>Digital Startup diskette</i>	Use this diskette to boot the computer and access the CD-ROM drive to install the operating system and software applications in the event of a hard disk failure.
<i>Diagnostic diskettes</i>	The Digital System Software CD-ROM includes the disk images for Diagnostics diskettes. Digital recommends that you create Diagnostic diskettes as soon as possible. In the event that the computer fails to boot, you can use these diskettes to access the hard disk drive and troubleshoot the problem.  <i>For details on creating these diskettes, see the CD-INFO.TXT file on the System Software CD</i>
<i>ISA Configuration Utility (ICU) (for non-Plug and Play operating systems, such as Windows NT Workstation only)</i>	Use the ICU to configure ISA non-Plug and Play or legacy expansion boards for operation in the Windows NT Workstation computer. You should run the ICU before installing non-Plug and Play ISA expansion boards or legacy boards to determine what computer resources are available. (See "Configuring Additional Hardware.")

## Configuring Video

The Celebris/Venturis FX-2 computer systems support Display Data Channel (DDC 1/2b) specifications. DDC technology offers true Plug and Play auto-configuration by providing for direct communication between the monitor, video controller, and the operating system. Full DDC capability requires DDC support by all system components. DDC will automatically set the video parameters for optimum monitor resolution. If the monitor does not include DDC support, then the video settings may need to be changed.

The Control Panel Display option can be used in most cases to change the default settings. Utilities such as Matrox MGA or S3 Refresh, whichever is applicable to the computer, work with Windows 95 or Windows NT Display selections to set the video controller monitor refresh rates. These utilities have been pre-installed on the computer and configured at the factory to meet most monitor resolution needs.

*Refer to the Windows 95 User's Guide or the Windows NT Workstation Installation Guide and any related on-line help for configuration information.*

Before changing the resolution or resetting the monitor type, check the monitor documentation. Make sure the new selections are based on what the monitor can support.

## Configuring Networking

For those computers with onboard network capabilities, configuration information is available on the System Software CD-ROM.

Check the root directory on the System Software CD-ROM for the CD-INFO.TXT file. Read this file first for configuration and installation information.

For Celebris FX-2 computers with Windows 95 installed, use the Easy Network application to configure the computer with a network and to use the Internet browser.

## Configuring Additional Hardware

Adding additional hardware requires configuring the computer resources, such as IRQ and DMA settings. With a Plug and Play operating system, such as Windows 95, and Plug and Play hardware, the process is simplified. Windows 95 can automatically determine the appropriate resource settings and then set them.

Some boards are not Plug and Play. These are known as "legacy" boards. Windows 95 can also handle these.

*See the Microsoft Windows 95 documentation for information on configuring new hardware.*

For those computers with the Windows NT Workstation operating system, these settings must be manually set. Use the ISA Configuration Utility (ICU) diskette to help determine the available resources.

*See the ICU on-line help for complete instructions.*

## Using Diagnostics

For Celebris FX-2 computers with the Windows 95 operating system, the PC Care diagnostic software is included with the factory-installed software. Use this software to troubleshoot the computer.

For those computers with the Windows NT Workstation operating system, the factory installed software includes an Administrative Tools group in the Program Manager menu. This program group includes a Windows NT Diagnostics icon for launching the Diagnostic software. Use this software to troubleshoot the computer.

Venturis FX-2 and Celebris FX-2 computers also come with diagnostic diskette images on the System Software CD-ROM. Create these diskettes, if this has not already been done (for instructions on this, see the CD-INFO.TXT file on the CD-ROM).

Once created, these diskettes can be used to examine the computer's current configuration, locate faulty components, and troubleshoot problems. If the hard disk drive fails to boot or the diagnostic software is inaccessible from Windows 95 or Windows NT Workstation, proceed as follows:

1. Insert the diagnostics diskette labeled "For Emergency Use" into the diskette drive and power on the computer.
2. Once the program begins, follow the instructions displayed on the monitor screen.

*See the Readme.txt file on each of the Diagnostics diskettes for installation instructions and for additional information about the Diagnostics package.*

## Restoring the Computer's Software

Use the following instructions to restore the computer's operating system, device drivers, and any other utilities or applications.

1. If possible, back up data and any applications.
2. Reformat the hard disk drive, if necessary. Reformat the hard disk drive if it completely failed or if it was replaced with a new one.
3. Install the operating system.

*Refer to the supplied Windows 95 and Windows NT Workstation documentation for additional information.*

4. Install the necessary device drivers.

*Refer to the CD-INFO.TXT file on the System Software CD-ROM for installation and configuration information.*



**NOTE:** Device drivers are often subject to change. If necessary, download the latest device drivers using the Internet or through Digital's Bulletin Board service (See "Latest Product Information and Update").

5. Install the supplied applications from the System Software CD-ROM.
6. Install the appropriate applications.

## Additional Device Drivers

Most of the device drivers are installed at the factory. However, if additional device drivers are required and they were not factory installed, use the supplied System Software CD-ROM to install them. Network, IDE, audio, CD-ROM, and video device drivers are some of the drivers available for the following operating systems:

- Windows 95
- Window NT
- Windows for Workgroups
- OS/2
- SCO UNIX
- Novell NetWare



**NOTE:** Not all device drivers on the CD-ROM are supported by Digital.

Check the root directory on the System Software CD-ROM for the CD-INFO.TXT file. Read this file first for configuration and installation information.

## Initial Troubleshooting

The following sections 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 the additional options if problems are encountered after installation.*

- Keep it simple, only troubleshoot one problem at a time. Also, only make one change at a time. For example, if the IDE hard disk drive fails to boot, do not try all the suggested actions at once. Instead, start with one suggestion such as checking the cables. After securing the cables, try booting the computer. If it does not work, try another suggestion.
- Look for abnormal computer, keyboard, and monitor LED indications. For example, make sure the power on LED lights when you turn on the computer and the drive access indicators light when using either the diskette drive or hard disk drive.
- If there are Power On Self Test (POST) error(s), run the BIOS Setup utility and fix the problem(s) identified by the POST error(s).
- If you installed external devices, make sure all cables are correctly connected to the appropriate devices.
- If you installed devices inside the computer, make sure nothing was bumped or jarred loose, and that all cable connections are securely in place.
- Make sure all device drivers are installed correctly.

## Troubleshooting

- If the computer hangs, soft boot the computer (press the [Ctrl] + [Alt] + [Del] keys). If the computer fails to boot, turn it off, wait until all disk drives completely spin down, and then turn it back on.
- Pay close attention to any error message that appears on the screen.

If the error message is computer related, refer to the “Error Messages” section at the end of this chapter.

If the error message is Windows related, refer to any on-line help and the appropriate Windows documentation supplied with the computer.

- Listen carefully for computer errors in the form of beeps. Record the number of beeps and their pattern then refer to the “Beep Codes” section at the end of this chapter.
- README files might be factory installed, on the CD-ROM disk, or as printed material. This README information can help you setup, configure, and operate the computer.
- Run the diagnostics software. Refer to the following section for information on accessing and running the supplied diagnostics program.
- If the computer will not boot into Windows, use the Emergency Repair Disk you created during setup to gain access to the computer’s hard disk drive. Afterwards, troubleshoot the computer using the information in this guide and correct any problems.

## Pass/Fail Criteria

As a 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 AMI module tests (one pass):**

System Board	(All Tests)
Memory	(All Tests)
Video	(All Tests)
Hard Disk	(All Tests except: sequential write/read and sequential write/random read)
Floppy Disk	(All Tests)
Keyboard	(All Tests)
COM Port	(All Tests)
LPT Ports	(All Tests)
Pointer Device	(All Tests)

- 3. Successful bootstrap of the computer installed operating system.**

Operating systems supported:

- Windows 95
- Windows NT Workstation

## Diagnostics

Computers with the Windows 95 operating system installed have PC Care diagnostics software factory installed on the hard disk drive. Use this software to troubleshoot the computer.

Computers with the Windows NT Workstation operating system have factory installed software that includes an Administrative Tools group in the Program Manager menu. This program group includes a Windows NT Diagnostics icon for launching the Diagnostic software. Use this software to troubleshoot the computer.

The diagnostic diskettes (that can be created from images on the System Software CD) can be used to examine the computer's current configuration, locate faulty components, and troubleshoot the computer if you are unable to access the diagnostic software from Windows 95 or Windows NT Workstation.



**NOTE:** For instructions on creating the diagnostic diskettes, refer to the CD-INFO.TXT file on the System Software CD-ROM.

To access the diagnostic software:

1. Insert the "For Emergency Use" diskette into the diskette drive and then type:

```
A: \AMIDIAG
```

2. If you are unable to boot from the hard disk drive, you can instead boot directly from the "For Emergency Use" diskette.
3. Once the program begins, follow the instructions displayed on the monitor screen.

*Refer to the README file on the "For Emergency Use" diskette for additional information.*

## Digital ClientWORKS and DMI

ClientWORKS is a Desktop Management Interface (DMI) based software application that has been developed by Digital Equipment Corporation.

ClientWORKS for Windows 95 and Windows NT Workstation can be used to help you, the system manager, or system administrator to identify the computer's current hardware configuration. This feature is useful, for example, if you need to see if you have sufficient memory or a large enough hard disk drive for the applications you want to run. System managers or system administrators can access ClientWORKS data through Simple Network Management Protocol (SNMP) consoles. This feature means the company can protect its current investment in SNMP software and network monitors. Other features include:

- If there is a known computer component that needs to be replaced, under Windows 95 or Windows NT Workstation, a system manager or administrator can access ClientWORKS and get the Field Replaceable Unit (FRU) part number. This part number can then be relayed to the service provider to expedite ordering.
- Serial numbers can easily be identified to obtain warranty service.

## Troubleshooting

- The amount and type of computer memory you have installed can easily be identified using ClientWORKS. This is especially useful if you need to know the computer's capabilities prior to loading software.
- A system manager or administrator can use ClientWORKS to remotely access computer configurations that are attached to a network. This feature enables a system manager or administrator to easily maintain an accurate equipment log.

*Refer to the supplied ClientWORKS factory installed on-line help or the supplied CD-ROM disk for detailed information on using or installing either program.*

## **Self Monitoring Analysis Technology (S.M.A.R.T.)**

If the computer's hard disk drive is S.M.A.R.T. aware and you are running Windows 95, Digital's S.M.A.R.T. Monitor will keep you apprised as to how the hard disk drive is operating.

When Windows 95 starts, Digital S.M.A.R.T. Monitor is launched and then immediately minimized, placing the icon in the Windows 95 taskbar. Digital S.M.A.R.T. Monitor then periodically polls the S.M.A.R.T. aware devices in the computer and by clicking on the icon, you can review the status of these devices. You can also review general information, the history of the drives, and modify the setup of Digital S.M.A.R.T. Monitor.

If problems are detected in the computer's devices, a dialog box will appear displaying an error message.

For more information on Digital S.M.A.R.T. Monitor, refer to the System Reference, ClientWORKS, and/or System Software documentation.

## Advanced Troubleshooting

Digital has a Customer Replaceable Unit (CRU) process during the warranty period for:

- Digital monitors with screens less than 20 inches
- Mice
- Keyboards
- Speakers
- Other parts as defined by Digital as CRUs

The Digital CRU process provides for overnight shipment of the part directly to the customer site. The Service provider gives the customer instructions for installing the replacement unit and for returning the defective part. Customers are billed for the specified part if they fail to return the part to Digital within ten days of the replacement unit shipment.

In the following troubleshooting tables, “CRU Process” means that when a process is determined to be broken, the Service provider should use the previously-described CRU process.



**NOTE:** The following troubleshooting suggestions are not in any specific order. They are merely a list of possible problems and solutions.

## Computer Troubleshooting

Problem	Possible Cause	Action
No response when the computer is turned on.	Computer is not plugged in.	Turn off the computer, plug it in, and then turn it back on again.
	No power at the wall outlet.	Use another wall outlet.
	Main logic board failure.	Replace the main logic board.
	Main logic board jumpers incorrectly set.	Set all appropriate jumpers (Refer to the computer's <i>System Reference</i> guide).
	CPU has failed.	Replace the CPU.
	Power supply has failed.	Replace the power supply.
	Voltage select switch is set incorrectly.	Make sure the setting on the back of the computer matches the country's voltage requirements. Refer to the supplied <i>Quick Setup</i> guide for more information.
Power is on, screen is on, but the computer does not respond.	Keyboard not connected, mouse not connected, or both might be in the wrong port.	Connect the keyboard and/or mouse. If already connected, confirm that each device is in the appropriate port.
Power is on, but there is no screen display.	Brightness and contrast controls are not correctly set.	Adjust the brightness and contrast controls.
	Monitor is in power saving mode.	Make sure the power light on the monitor is green. If not, and the Power Saving light is lit, press the [Shift] key to reactivate monitor.
	Monitor is off.	Turn on the monitor.
	Monitor cable is incorrectly installed.	Check all monitor connections.
	Incorrect video drivers installed.	Install the correct video drivers.
	Video controller has failed. Monitor has failed.	Replace the main logic board. Try another monitor. If the new monitor operates correctly, replace the old monitor following the Customer Replacement Unit process described in the <i>Warranty and Information</i> booklet.

*continued*

## Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Computer operates incorrectly after installing an optional expansion board.	Expansion board installed incorrectly.	Remove the expansion board and reinstall.
	Did not run the ISA Configuration Utility (ICU) to configure a non-Plug and Play expansion board before installation.	Run the ICU to properly configure expansion board and then reboot the computer. Refer to any supplied ICU, Windows 95, and Windows NT Workstation documentation.
	<b>Note:</b> Plug and Play expansion boards are automatically configured. Expansion board has failed.	Remove expansion board and reboot. If computer boots without errors, replace expansion board.
Computer operates incorrectly after installing optional DIMMs.	DIMMs installed incorrectly.	Remove DIMMs and reinstall.
	DIMMs have failed.	Replace DIMMs.

*continued*

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Computer fails to retain setup information.	Computer battery has failed.	Replace computer battery.
	Discharge CMOS jumper set to "Discharge."	Set discharge CMOS jumper to "Normal." Refer to the computer's <i>System Reference</i> guide.
Computer displays HIMEM.SYS errors.	Unstable memory at the specified address.	Run diagnostics. Replace faulty DIMM(s).
Computer displays an illegal action message (Windows 95).	Insufficient computer resources for a given operation.	Close all unnecessary applications. Close and restart Windows 95. Reboot computer.
Computer displays a System Error F002 message (Windows NT Workstation)	Faulty hardware.	Run the supplied diagnostic software to identify the faulty hardware. Replace the faulty hardware.

*continued*

## Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
"Couldn't Find NTLDR" (Windows NT Workstation)	NTLDR file is missing from the root directory of the hard disk drive.	<p>Copy the NTLDR file to the hard disk drive's root directory.</p> <p>If using the supplied Windows NT Workstation CD-ROM disk, make the CD-ROM the current drive and then type:</p> <pre>copy\i386\ntldr c:\</pre> <p>at the command line prompt.</p> <p>If using the supplied Windows NT Workstation Setup disks, insert Setup Disk #2 into the diskette drive and then type:</p> <pre>expand ntlldr.\$ C:\ntldr</pre> <p>at the command line prompt.</p>
"Error 000001E" (Windows NT Workstation)	The hard disk drive might have corrupted system files.	<p>Run chkdsk on the hard disk drive to correct any corrupted files. Also make sure the optional hardware is on the supplied <i>Microsoft Windows NT Hardware Compatibility List</i>.</p>

*continued*

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
"Error 0x00000069 or 0x00000067" (Windows NT Workstation)	Windows NT Workstation unable to communicate with the computer's hard disk drive controller.	<p>Using the BIOS Setup utility, slow down the DMA transfer rate of the controller.</p> <p>Make sure both ends of the SCSI bus are terminated.</p> <p>Make sure there are no IRQ or memory address conflicts.</p> <p>Make sure NTDETECT.COM is in the root directory of the boot drive partition.</p> <p>Make sure there are no missing Windows NT Workstation system files.</p> <p>Reload the Windows NT Workstation operating system files.</p>
"NMI Hardware Error" (Windows NT Workstation)	Faulty hardware.	<p>Make sure all main logic board SIMMs, DIMMs, CPU, VRM, video memory, and expansion board connectors are clean and properly seated in their respective sockets.</p> <p>Run the supplied diagnostic software to identify the faulty hardware. Replace the faulty hardware.</p>
Services or subsystems do not start properly (Windows NT Workstation)	Improper configuration, files missing or files not installed.	<p>Use the <i>Services</i> or <i>Devices</i> icons in the <i>Control Panel</i> menu to check for status. Also, check the system log in the <i>Event Viewer</i> for entries relating to the problem.</p>

*continued*

## Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Computer does not boot from an IDE hard disk drive.	IDE drive type incorrect.	Run the BIOS Setup utility to identify the correct drive type.  See drive type label on drive or consult drive documentation.
	Loose cable connectors.	Secure all cable connections.
	Onboard IDE interface disabled.	Run the BIOS Setup utility and set the Local Bus IDE Adapter to "Primary," "Secondary", or "Both."
Hard disk boot sector is missing.	Hard disk boot sector is missing.	Repartition and reformat the hard disk drive.  <b>Caution:</b> This procedure erases what is currently on the hard disk drive.  You might want to try repairing the hard disk drive using a disk drive repair utility. Disk drive repair utilities can be purchased from the local software supplier.  If you do repartition and reformat the hard disk drive, proceed as follows for DOS-based operating systems such as Windows 95 and Windows NT Workstation.  Boot from a DOS diskette then enter the following commands:  c : cd \dos fdisk  Follow the instructions on the monitor screen to create a new hard disk boot sector.
		There might be a boot sector virus.

*continued*

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Computer does not boot from an IDE hard disk drive.	IDE hard disk is connected to the wrong IDE connector.	Connect the boot disk to the primary IDE connector on the backplane.
	Operating system software is not installed on the IDE hard disk drive.	Install the appropriate operating system.
	IDE hard disk drive is not correctly formatted or the requested partition does not exist.	Format the IDE hard disk drive or partition the IDE hard disk drive using the supplied operating system software.
	There is no software on the requested partition.	Install software on the requested partition.
	IDE hard disk drive jumpers incorrectly set.	Refer to the supplied IDE hard disk drive kit installation instructions.
	IDE hard disk drive has failed.	Replace the IDE hard disk drive.
	IDE hard disk drive ribbon cable has failed.	Replace the ribbon cable.
	IDE controller has failed.	Replace the backplane.

*continued*

## Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Computer does not recognize an internal or external SCSI hard disk drive or device.	SCSI device jumpers incorrectly set.	Refer to the supplied SCSI device kit installation instructions.
	SCSI ID conflicts.	Refer to the supplied SCSI device kit installation instructions on setting SCSI IDs.
	Terminating resistors not removed from the SCSI device.	Remove terminating resistors. Refer to the supplied kit installation instructions.
	SCSI option not enabled in BIOS Setup utility.	Run the BIOS Setup utility and enable SCSI option.
	SCSI cable not terminated.	Terminate each end of the SCSI cable.
	SCSI device not plugged in.	Check power and SCSI cables.
Loose cable connectors.	Secure all cable connections.	

*continued*

Problem	Possible Cause	Action
<p>Computer does not recognize an internal or external SCSI hard disk drive or device.</p>	<p>Hard disk boot sector is missing.</p>	<p>Repartition and reformat the hard disk drive.</p> <p><b>Caution:</b> This procedure erases what is currently on the hard disk drive.</p> <p>You might want to try repairing the hard disk drive using a disk drive repair utility. Disk drive repair utilities can be purchased from the local software supplier.</p> <p>If you do repartition and reformat the hard disk drive, proceed as follows for DOS-based operating systems such as Windows 95 and Windows NT Workstation.</p> <p>Boot from a DOS diskette then enter the following commands:</p>
	<p>There might be a boot sector virus.</p>	<p>Run anti-virus software.</p>
	<p>Loose cable connectors.</p>	<p>Secure all cable connections.</p>
	<p>SCSI adapter has failed.</p>	<p>Replace the SCSI adapter.</p>
	<p>SCSI ribbon cable has failed.</p>	<p>Replace the ribbon cable.</p>
<p>SCSI device has failed.</p>	<p>Replace the SCSI device.</p>	

*continued*

## Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Computer does not boot from an internal SCSI hard disk drive.	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 onboard IDE interface.  <b>Note:</b> If you have both IDE and SCSI hard disk drives installed, the computer uses the IDE hard disk drive as the boot device.
	Operating system software is not installed on the SCSI hard disk drive.	Install the appropriate operating system.
	Requested partition does not exist.	Partition the SCSI hard disk drive and then reload the operating software.
	Loose cable connectors.	Secure all cable connections.
	SCSI adapter has failed.	Replace the SCSI adapter.
	SCSI ribbon cable has failed.	Replace the ribbon cable.
SCSI hard disk drive has failed.	Replace the SCSI hard disk drive.	

*continued*

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Computer does not boot from a target diskette drive.	Onboard diskette controller disabled.	Run the BIOS Setup utility and set the diskette controller option to "Enabled."
	Diskette drive not enabled.	Run the BIOS Setup utility to enable the diskette drive
	BIOS Setup diskette write option enabled.	Enter the user password. If a supervisor password is required, see the system supervisor or system manager.
	Incorrect diskette drive type.	Run the BIOS Setup utility and select the correct drive type.
	Diskette boot option disabled.	Run the BIOS Setup utility and set the proper boot sequence.
	Diskette might not be bootable.	Use a bootable diskette.
	Diskette does not contain start-up files.	Insert a diskette with the correct start-up files.
	Diskette drive is empty.	Insert a diskette that contains an operating system.
	Diskette is worn or damaged.	Try another diskette.
	Loose cable connectors.	Secure all cable connections.
	Diskette access requires a supervisor password.	See the supervisor or system manager.
Diskette access requires a user password.	Enter the user password.	

*continued*

## Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
No response to keyboard commands.	Keyboard is password protected.	Enter the keyboard password.
	Keyboard is not connected.	Power down the computer and connect the keyboard.
	Keyboard is connected to the mouse port.	Power down the computer and connect the keyboard to the keyboard port.
	Computer operation halted.	Reboot computer.
	Keyboard has failed.	If available, try another keyboard. If the new keyboard operates correctly, replace the old keyboard following the Customer Replacement Unit process described in the <i>Warranty and Information</i> booklet.
	Keyboard controller has failed.	Replace the main logic board.

*continued*

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Keyboard keys type incorrectly.	Incorrect language selected.	Select the correct language.
	Keyboard has failed.	If available, try another keyboard. If the new keyboard operates correctly, replace the old keyboard following the Customer Replacement Unit process described in the <i>Warranty and Information</i> booklet.
No response to mouse activity.	Mouse is not connected.	Power down the computer and connect the mouse.
	Mouse is connected to the keyboard port.	Power down the computer and connect the mouse to the mouse port.
	Computer operation halted.	Reboot computer.
	Mouse driver not installed.	Install the appropriate mouse driver. Refer to the supplied application software documentation.
	Onboard mouse controller disabled.	Run the BIOS Setup utility and set the mouse port option to "Enable."
	Mouse has failed.	If available, try another mouse. If the new mouse operates correctly, replace the old mouse following the Customer Replacement Unit process described in the <i>Warranty and Information</i> booklet.
	Mouse controller has failed.	Replace the main logic board
Mouse sticks.	Dirty mouse ball.	Remove the mouse ball and clean it. Also clean the rollers.

## Disk Drive Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
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/SCSI hard disk drive is not correctly formatted or partitioned.	Format and partition as required using the supplied operating system.
	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 Local Bus IDE Adapter to "Both."
	IDE/SCSI hard disk drive has failed.	Replace the IDE/SCSI hard disk drive.
	IDE/SCSI controller has failed.	Replace the backplane.
IDE/SCSI ribbon cable has failed.	Replace the ribbon cable.	

*continued*

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Target diskette drive cannot read or write information.	Diskette is not formatted.	Format the diskette.
	Diskette is worn or damaged.	Try another diskette.
	Diskette is write-protected.	Slide the write-protect switch so the hole is not visible (3½-inch diskette) or uncover the write-protect notch (5¼-inch diskette).
	Diskette drive is empty.	Insert a diskette.
	Onboard diskette controller disabled.	Run the BIOS Setup utility and set the diskette controller option to "Enabled".
	Diskette write protection is enabled.	Run the BIOS Setup utility and set the diskette write protection to "Disabled."
	Loose cable connectors.	Secure all cable connections.
	Diskette drive has failed.	Replace the diskette drive.
	Diskette drive controller has failed.	Replace the backplane.
	Diskette drive ribbon cable has failed.	Replace the ribbon cable.
Target diskette drive does not format diskettes.	Diskette access requires supervisor password.	Reboot computer and enter supervisor password. Afterwards, run BIOS Setup utility and set "Diskette Access" option to "User."
	Diskette drive has failed.	Replace the diskette drive.

## Monitor Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Monitor power indicator is not on.	Monitor is turned off.	Turn on the monitor.
	Power cord is not connected.	Connect the power cord to the computer.
	No power at wall outlet.	Use another outlet.
	Monitor is in power saving mode.	Make sure the power light on the monitor is green. If not, and the Power Saving light is lit, press the [Shift] key to reactivate monitor.
	Monitor has failed.	If available, try another monitor. If the new monitor operates correctly, replace the old monitor following the Customer Replacement Unit process described in the Warranty and Information booklet.
	Video controller has failed.	Replace the main logic board.
	Power indicator is defective.	Follow the Customer Replacement Unit process to replace the monitor.
No screen display.	Configuration error.	Run the BIOS Setup utility to configure the computer for correct video operation.
	Monitor brightness and contrast controls are incorrectly set.	Adjust the monitor brightness and contrast controls.
	The monitor-off timer shut off the monitor.	Press [Shift] to reactivate monitor.
No monitor display while loading Windows video drivers.	Monitor type incorrectly set.	Set the correct monitor type using the appropriate utility.
	Wrong Windows driver loaded.	Load the correct video driver.

*continued*

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Distorted, rolling, or flickering screen display, or wrong/uneven color.	Monitor incorrectly adjusted.	Adjust accordingly.
	Monitor signal cable incorrectly installed.	Straighten any bent connector pins and then reconnect.
	Wrong refresh rate set in Windows 95 or Windows NT Workstation.	If using Windows 95, reboot the computer in safe mode and then correct the refresh rate according to the documentation supplied with the computer. If using Windows NT Workstation, select VGA mode to boot at a default rate and then correct the refresh rate.
Color monitor displaying monochrome.	Computer was turned on before the monitor was turned on.	Turn off the computer, turn on the monitor, then turn the computer back on.
Monitor fails to switch to high-resolution mode.	Appropriate high-resolution video drivers are not installed or incorrectly installed.	Correctly install all appropriate high-resolution video drivers. Refer to the documentation supplied with the monitor.
Monitor display not centered while loading Windows video drivers.	Monitor type incorrectly set.	Set the correct monitor type.
Monitor display disappears.	Screen display sized incorrectly.	Correctly size screen display.

## Audio Troubleshooting

Problem	Possible Cause	Action
Audio does not work.	Power to speakers not turned on.	Check the batteries or AC adapter connection to be sure speakers are getting power. Make sure the power switch on the master speaker is set to ON.
	Sound, MIDI, mixer drivers not installed.	Check the error messages for the necessary drivers. In Windows Control Panel, select "System", then "Device Manager" and install the necessary driver(s).
	Address contention. Two or more devices might be trying to access the same address.	Check IRQ, I/O address, and DMA settings in Windows 95, Windows NT Workstation, or BIOS Setup. Change settings as required.
	Cables loose or not properly connected.	Make sure speaker and microphone plugs are in correct jacks. Reconnect cables. Refer to the <i>System Reference</i> guide for jack locations.
	Volume control in Windows 95 not adjusted correctly.	Check the volume settings using the Control Panel, Multimedia. Make sure the volume control is not set too low and that the mute box is unchecked.
	Onboard audio controller disabled.	Run the BIOS Setup utility and set the Integrated Audio to "Enabled."
	Bad audio chip or sound card.	Replace the backplane or sound card.
	Main logic board has failed.	Replace the main logic board.
External speakers do not work.	Speakers not connected or improperly connected.	Properly connect the speakers. Refer to the <i>System Reference</i> guide for more information.

*continued*

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
External speakers do not work.	Speaker batteries or ac adapter have failed.	Replace speaker batteries or AC adapter. Refer to the documentation that came with the speakers.
	Speakers have failed.	If available, try another set of speakers. If the new speakers operate correctly, replace the old speakers following the Customer Replacement Unit process described in the <i>Warranty and Information</i> booklet.
Microphone does not work.	Microphone not connected or improperly connected.	Properly connect the microphone. Refer to the <i>System Reference</i> guide for more information.
	Microphone has failed.	If available, try another microphone. If the new microphone operates correctly, replace the old microphone following the Customer Replacement Unit process described in the <i>Warranty and Information</i> booklet.
Headphones do not work.	Headphones not connected or improperly connected.	Properly connect the headphones. Refer to the <i>System Reference</i> guide for more information.
	Headphones have failed.	If available, try another set of headphones. If the new headphones operate correctly, replace the old headphones following the Customer Replacement Unit process described in the <i>Warranty and Information</i> booklet.

## CD-ROM Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Cannot access the CD-ROM drive. Error message reading drive x.	Device drivers not installed.	Install correct device drivers.
	No disk in the CD-ROM drive.	Insert a disk.
	CD-ROM drive tray is open.	Close the tray.
	Onboard IDE interface disabled (if IDE CD-ROM)	Run the BIOS Setup utility and set the Local Bus IDE Adapter to "Enabled."
	CD-ROM has failed.	Replace the CD-ROM
Power is on but CD-ROM drive indicator shows no activity.	Cables have failed.	Replace the cable(s).
	No CD-ROM disk or CD-ROM drive tray is open.	Insert a disk and close the tray.
	Check cable connections.	Make sure cables are correctly connected.
	CD-ROM has failed.	Replace the CD-ROM
CD-ROM disk is spinning but CD-ROM drive is idle.	Cable(s) have failed.	Replace the cable(s).
	Application software not running.	Run application software.

## Network Interface Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Power is on, LAN address is installed on computer; system hangs.	Incorrect software installed or software installed incorrectly.	Contact system administrator or network coordinator.
Network doesn't start.	Network cable not connected or is loose.	Connect cable. Also, make sure no more than one Ethernet cable is connected at one time.
	Adapter card is not seated securely	Turn the computer off, reset the adapter card, then turn the computer back on.
	Conflict exists with another device adapter; incorrect IRQ setting.	Check BIOS setup, Windows 95, or Windows NT Workstation settings.
	Network cable has failed.	Contact the system administrator or network coordinator.
	Onboard network controller disabled.	Run the BIOS Setup utility and set Integrated Ethernet to "Enabled."
Onboard network controller has failed.	Replace the main logic board.	

## **Error Messages**

This section lists computer messages you might see or hear when you turn on power. The computer messages are grouped as follows:

- POST and boot computer messages
- POST execution messages
- Beep codes

## POST Messages

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

Each time the POST displays a message on the screen, the computer's speaker beeps twice. If an error occurs before the monitor is initialized, specific beep codes sound to alert you to a problem. The following table lists a general grouping of computer messages. In addition, each message is accompanied by text describing the message and in most cases, a recommended solution to the problem.



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

## POST and Boot Messages

Message	Description/Solution
Asynchronous Synchronous Burst Synchronous Pipeline Burst Passed	Where <i>nnnn</i> is the amount of computer cache (in kilobytes) that tested successfully.
Diskette drive A error	Run the BIOS Setup utility. Check all connections. If the problem persists, replace the diskette drive.
Diskette drive B error	
Entering SETUP	BIOS Setup utility runs.
Extended RAM Failed at offset: <i>nnnn</i>	Extended memory failed or configured incorrectly. Make sure DIMMs are installed correctly (Refer to <i>System Reference</i> manual). If the problem persists, replace any faulty DIMMs. Run the BIOS Setup utility and restore all settings to original values.
Extended RAM Passed	Where <i>nnnn</i> is the amount of extended memory (in kilobytes) that tested successfully.
Failing Bits: <i>nnnn</i>	<i>nnnn</i> 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 any faulty DIMMs.
Fixed Disk 0 Failure	Run the BIOS Setup utility. Check all connections. If the problem persists, replace the hard disk drive.
Fixed Disk 1 Failure	Fixed disk controller failure

*continued*

<b>Message</b>	<b>Description/Solution</b>
Incorrect Drive A type - run SETUP	Diskette drive A and/or B not correctly identified in the BIOS Setup utility.
Incorrect Drive B type - run SETUP	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 main logic board.
Keyboard controller error	Check the keyboard connection. If the connection is secure, the keyboard or keyboard controller might have failed. If the problem persists, replace the main logic board or keyboard.
Keyboard error	
Keyboard locked - Unlock key switch	
Monitor type does not match CMOS - Run SETUP	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.
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	Battery failed BIOS test. Replace battery and then run the BIOS Setup utility to restore previous configuration information.
Shadow RAM Failed at offset: <i>nnnn</i>	Shadow RAM failed. Run the BIOS Setup utility and disable failed shadow memory region.

*continued*

## Troubleshooting

Message	Description/Solution
<i>nnnn</i> Shadow RAM passed	Where <i>nnnn</i> is the amount of shadow RAM (in kilobytes) that tested successfully.
RTC is dead - Replace and run SETUP	Replace the battery and then run the BIOS Setup utility to restore previous configuration information.
System BIOS shadowed	This indicates that the computer's BIOS was successfully copied to shadow RAM.
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 faulty processor.
System CMOS checksum bad - run SETUP	Correct the address conflict using the BIOS Setup utility. If the problem persists, replace the main logic board.
System RAM failed at offset: <i>nnnn</i>	System RAM failed. Run the BIOS Setup utility and restore all settings to original values. If the problem persists, replace any faulty DIMMs.
<i>nnnn</i> System RAM passed	Where <i>nnnn</i> is the amount of system RAM (in kilobytes) that tested successfully.
System timer error	The computer's timer test failed. Run the BIOS Setup utility and restore all settings to original values. If the problem persists, replace the main logic board.
UMB upper limit segment address: <i>nnnn</i>	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 computer's video BIOS was successfully copied to shadow RAM.
Invalid system configuration data. Please run the configuration utility.	Run the BIOS Setup utility. Under the "Advanced" section, toggle down to the "Reset Configuration Data" selection. Change the setting to "YES", save changes and then exit the BIOS Setup utility. The computer will then reboot without displaying the error message.

## POST Execution Messages

The following messages appear at the bottom of the screen during POST execution.

<b>Message</b>	<b>Description</b>
230	Unexpected interrupts test
220	Shadow ROMs
210	Test RAM between 512K and 640K
200	Extended memory test
190	Set cache registers
180	Cache configuration
170	Real-time clock test
160	Keyboard test
150	Initial hardware interrupt
140	Co-processor test
130	Serial ports test
120	Parallel ports test
110	Initiate onboard SIO
100	Mouse test
95	CD-ROM initialize
90	Testing diskette drives
80	Testing hard disk drives
30	Setup power management
20	Enable IRQs
10	Setting time of day

## 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 and places a value in I/O port 80h. During POST, if the video configuration fails or if an external ROM module fails a checksum test, then the 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 (DIMM, BIOS, computer battery, etc.).

Beep Code	Error
1	One short beep before boot
1-2	Search for option ROMs
1-2-2-3	BIOS ROM checksum
1-3-1-1	Test DRAM refresh
1-3-1-3	Test keyboard controller
1-3-4-1	Test 512K base address lines
1-3-4-3	Test 512K base memory
1-4-1-1	Test memory bus
2-1-2-3	Check ROM copyright notice
2-2-3-1	Test for unexpected interrupts

# Parts Replacement **5**

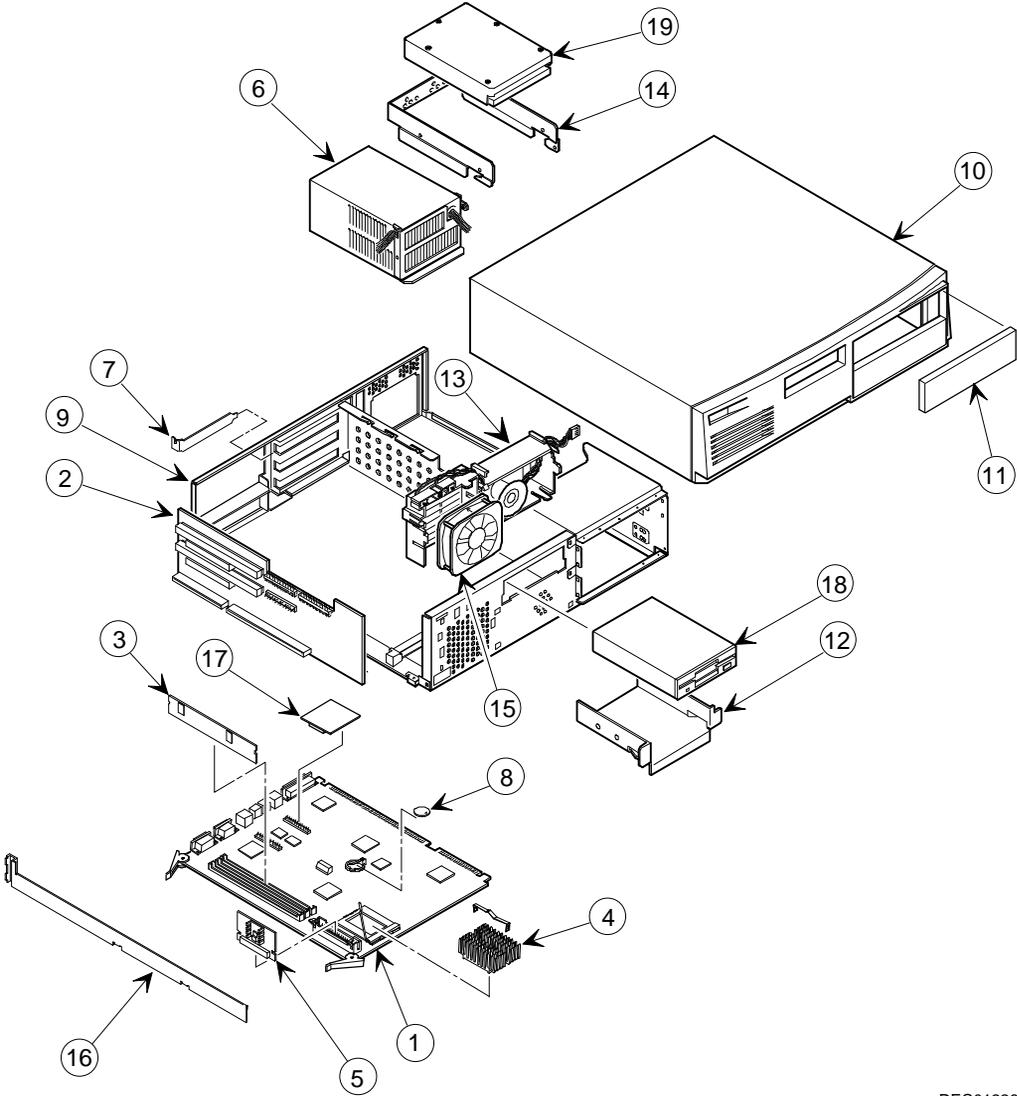
---

## **Introduction**

The following sections list the Illustrated Parts Breakdown (IPB) part numbers and related replacement procedures.

## Venturis/Celebris FX-2 Low Profile IPB List

Figure Legend	Spare Part Number	Exchangeable Part Number	Description
1	54-24616-01		Main logic board (Venturis FX-2)
	54-25308-02		Main logic board (Celebris FX-2)
2	54-24618-01		Riser card (Venturis only)
	54-25292-02		Riser card with integrated audio and network (Celebris only)
3	54-25084-AA	20-47177-D2	DIMMs, SDRAM, 16 MB, 100 MHz
	54-25084-CA	20-47474-D2	DIMMs, SDRAM, 32 MB, 100 MHz
	54-25092-AA	20-45672-D3	DIMMs, SDRAM, 64 MB, 100 MHz
	54-25092-CA	20-45671-D3	DIMMs, SDRAM, 128 MB, 100 MHz
4	90-08268-00		Compound, thermal joint
	21-43828-03		CPU assembly, P54CS-133 MHz
	21-43975-01		CPU assembly, P54CS-166 MHz
	21-47440-01		CPU assembly, P55C-166 MHz
	21-47440-03		CPU assembly, P55C-200 MHz
	12-41706-06		Heat sink and clips
5	12-46680-02		Module, voltage regulator (P54C 120/133 MHz)
	54-24516-01		Module, voltage regulator (P54C 166 MHz)
	54-24516-02	54-24614-02	Module, voltage regulator (P54C 166/200 MHz)
	54-25300-01		Module, voltage regulator (P55C 166/200 MHz)
6	30-48269-01		Power supply (low profile 100 W)
7	74-50747-01		Option filler plate
8	12-41474-05		Battery, 3 VDC lithium, CR2032
9	70-32677-01		Enclosure, low profile
10	70-32675-01		Top cover, with bezel and filler panel
	70-32893-01		Bezel, with filler panels
11	70-50742-01		Bezel blank, 5.25" Drive
12	74-50762-01		Bracket, 3.5" FDD
13	70-32692-01		Assembly, control panel
14	74-50734-01		Internal drive bracket
15	12-45246-03		Fan, 3.15" brushless DC, ball bearings
16	74-50733-01		Bracket, base side, low profile
17	54-24622-01		SGRAM, 1 MB upgrade
	54-24622-02		SGRAM, 2 MB upgrade
18	PCXRJ-AD	PCXRA-AC	1.44 MB floppy disk drive frost white flat bezel
19	PCXRA-AF	PCXRA-AJ	HDD, IDE, 1.2 GB, 3.5-inch
	PCXRA-AN	PCXRA-AP	HDD, IDE, 2.1 GB, 3.5-inch



DEC01226

Figure 5-1. Venturis/Celebris FX-2 Low Profile

## Enclosure

Spare Part Number	Exchangeable Part Number	Description
12-44147-01		Screw, captive 6-32
12-47296-01		Key lock
54-24526-01		Front audio panel
54-24538-02		Rear audio panel
74-48510-01		Expansion bracket, 5.25" to 3.5"
74-49365-01		Holder, drive rail
74-49836-01		Bumper for MLB
74-50737-01		Card guide, MLB
74-50752-01		Bracket EMI shield, 5.25"
74-50798-01		Air duct, low profile
74-50804-01		Rubber feet
74-50911-01		Bracket, I/O expansion
74-50912-01		3.5" FDD shield, blank
74-50913-01		Bezel, 3.5" FDD blank
74-50958-01		Bracket, hasp, low profile
90-08020-01		Screw, machine 6-32 pan .187 XRCS (HDD)
90-11334-01		Screw, machine 6-32 pan .256 XRCS CSZ
90-40217-01		Screw, machine M3 pan 5mm XRCS CSZ (FDD and CD-ROM)

## Cables

Spare Part Number	Exchangeable Part Number	Description
17-03460-12		Cable assembly, flat, 34 position, 430 mm
17-03460-13		Floppy cable assembly, flat, 34 position, 400 mm
17-03461-12		IDE cable assembly, flat, 40 position, 200 mm, one connector
17-03461-13		Cable assembly, flat, 40 position, 265 mm
17-03461-14		Cable assembly, flat, 40 position, 295 mm
17-04372-01		Cable, control panel
70-31909-03		Cable assembly, microswitch, 14.2 inch
70-31909-04		Cable assembly, microswitch, 7.0 inch

## Nameplates

Spare Part Number	Exchangeable Part Number	Description
74-48816-01		Digital medallion, front panel
74-51175-07		Nameplate, Venturis
74-51175-08		Nameplate, Celebris
74-51176-47		Speed button, FX-2

## Options

<b>Spare Part Number</b>	<b>Exchangeable Part Number</b>	<b>Description</b>
DE500-AA		10/100Base Ethernet adapter
PCXBJ-DG		Labtech speakers
PCXJD-AB		Sound Blaster PnP Sound Card
PCXLA-NA		Keyboard, frost white, North America
PCXLN-AB		Mouse, 2-button, frost white, single pack
PCXLN-AD		Mouse, 3-button, frost white, single pack
PCXRJ-AA		Trimode 3.5" FDD
PCXRN-AH	PCXRN-AI	12X IDE CD-ROM drive
PCXRN-AJ		16X IDE CD-ROM drive

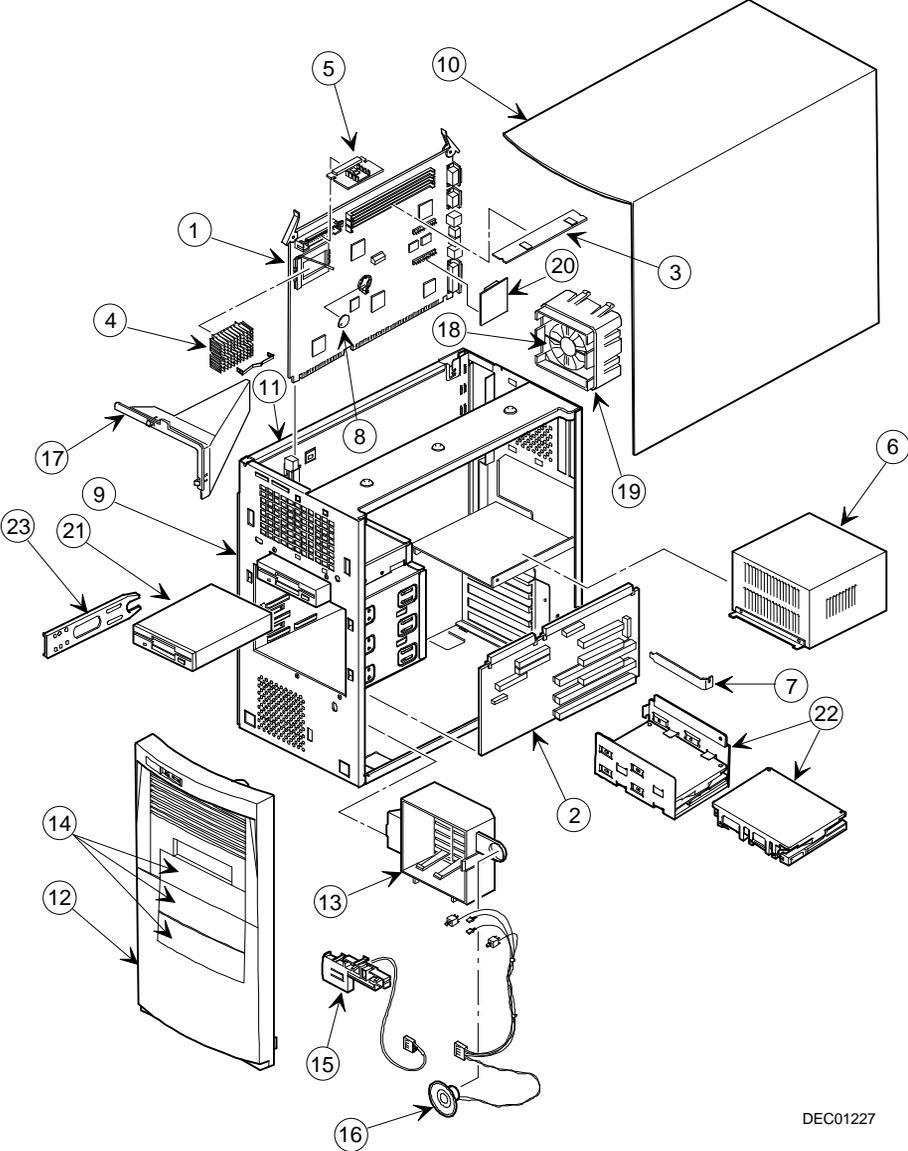
## Venturis/Celebris FX-2 Short Tower IPB List

Figure Legend	Spare Part Number	Exchangeable Part Number	Description
1	54-24616-01		Main logic board (Venturis FX-2)
	54-25308-02		Main logic board (Celebris FX-2)
2	54-24620-01		Riser card (Venturis only)
	54-25294-02		Riser card, with audio (Celebris only)
3	54-25084-AA	20-47177-D2	DIMMs, SDRAM, 16 MB, 100 MHz
	54-25084-CA	20-47474-D2	DIMMs, SDRAM, 32 MB, 100 MHz
	54-25092-AA	20-45672-D3	DIMMs, SDRAM, 64 MB, 100 MHz
	54-25092-CA	20-45671-D3	DIMMs, SDRAM, 128 MB, 100 MHz
4	90-08268-00		Compound, thermal joint
	21-43828-03		CPU assembly, P54CS-133 MHz
	21-43975-01		CPU assembly, P54CS-166 MHz
	21-47440-01		CPU assembly, P55C-166 MHz
	21-47440-03		CPU assembly, P55C-200 MHz
	12-41706-06		Heat sink and clips
5	12-46680-02		Module, voltage regulator (P54C 120/133 MHz)
	54-24516-01		Module, voltage regulator (P54C 166 MHz)
	54-24516-02	54-24614-02	Module, voltage regulator (P54C 166/200 MHz)
	54-25300-01		Module, voltage regulator (P55C 166/200 MHz)
6	30-48258-01		Power supply, short tower, 200 W
7	74-50747-01		Option filler plate
8	12-41474-05		Battery, 3 VDC lithium, CR2032
9	70-32678-01	70-32678-04	Enclosure, short tower (Celebris FX-2)
10	70-32803-01		Cover, L-shape, short tower
11	74-50757-01		Side panel, left
12	70-32680-01		Bezel, with filler panels, short tower

*continued*

## Parts Replacement

<b>Figure Legend</b>	<b>Spare Part Number</b>	<b>Exchangeable Part Number</b>	<b>Description</b>
13	74-50755-01		Guide, option cards, short tower
14	74-50860-01		Bezel blank, 5.25" drive, top
	74-50861-01		Bezel blank, 5.25" drive, middle
	74-50862-01		Bezel blank, 5.25" drive, bottom
15	74-50863-01		Control panel
16	17-04372-02		Speaker/LED, switch wire harness assembly
17	74-51237-01		Air duct
18	12-45246-04		Fan
19	74-51236-01		Fan mount, universal
20	54-24622-01		SGRAM, 1 MB upgrade
	54-24622-02		SGRAM, 2 MB upgrade
21	PCXRJ-AD		1.44 MB floppy disk drive frost white flat bezel
22	PCXRA-AF	PCXRA-AJ	HDD, IDE, 1.2 GB, 3.5-inch
	PCXRA-AN	PCXRA-AP	HDD, IDE, 2.1 GB, 3.5-inch
	PCXRA-AO		HDD, IDE, 3.2 GB, 3.5-inch
23	74-49365-01		Drive rail



DEC01227

Figure 5-2. Venturis FX-2 and Celebris FX-2 Short Tower

## Enclosure

Spare Part Number	Exchangeable Part Number	Description
12-44147-01		Screw, captive 6-32
12-47296-01		Key lock
74-48510-01		Expansion bracket, 5.25" to 3.5"
74-49836-01		Bumper for MLB
74-50737-01		Card guide, MLB
74-50752-01		Bracket EMI shield, 5.25"
74-50804-01		Rubber feet
74-50911-01		Bracket, I/O expansion
74-51001-01		Bracket, hasp, short tower
74-51171-01		3.5" FDD shield, blank
74-51239-01		Filler, vent cover, bottom front
74-51733-01		Support, MLB, short tower
90-08020-01		Screw, machine 6-32 pan .187 XRCS (HDD)
90-11334-01		Screw, machine 6-32 pan .256 XRCS CSZ
90-40217-01		Screw, machine M3 pan 5mm XRCS CSZ (FDD and CD-ROM)

## Cables

Spare Part Number	Exchangeable Part Number	Description
17-03460-12		Floppy cable assembly, flat, 34 position, 430 mm
17-03460-13		Floppy cable assembly, flat, 34 position, 400 mm
17-03461-10		IDE, flat cable, HDD
17-03461-11		IDE, flat cable, short tower
17-03461-12		IDE cable assembly, flat 40 position, 200 mm, one connector
17-04372-02		Cable, control panel, short tower

## Nameplates

Orderable Spare Part	Exchangeable Spare Part	Description
74-48816-01		Digital medallion, front panel
74-51175-07		Nameplate, Venturis
74-51175-08		Nameplate, Celebris
74-51176-47		Speed button, FX-2

## Options

<b>Spare Part Number</b>	<b>Exchangeable Part Number</b>	<b>Description</b>
DE500-AA		10/100Base Ethernet adapter
PCXBJ-DG		Labtech speakers
PCXJD-AB		Sound Blaster PnP Sound Card
PCXLA-NA		Keyboard, frost white, North America
PCXLN-AB		Mouse, 2-button, frost white, single pack
PCXLN-AD		Mouse, 3-button, frost white, single pack
PCXRJ-AA		Trimode 3.5" FDD
PCXRN-AH	PCXRN-AI	12X IDE CD-ROM drive
PCXRN-AJ		16X IDE CD-ROM drive

## Service Procedures

The following sections provide detailed service instructions for Venturis FX-2 and Celebris FX-2 computers.



**CAUTION:** 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. To prevent damage to circuit boards and/or components:

- Before touching any circuit board or component, touch the metal frame of the computer to discharge any static electricity.
- Keep circuit boards and components away from non-conductors.

## Recommended Tools

Have the following tools available:

- Multimeter (4½-inch digit)
- Phillips screwdriver
- Antistatic wrist strap (recommended, but not required)

## Other Materials Needed

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

## Special Tools Required

None.

Parts Replacement

## **Remedial Diagnostic Test Software**

Supplier information:

AMI Diagnostics  
6145-F Northbelt Parkway  
Norcross, GA 30071, U.S.A.  
Voice: 1-770-246-8600  
FAX: 1-770-246-8791  
Support: 1-770-246-8645  
Internet: <http://www.megatrends.com>

## **Virus Software Information**

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

Supplier information:

North America, South America, Australia and New Zealand  
Command software Systems Inc.  
Tel: +1-407-575 3200  
FAX: 1-407-575-3026

## **BIOS Version Information**

Refer to the Digital Bulletin Board Service (BBS) for the latest information on BIOS upgrades by calling:

**In the United States: (508) 496-8800**

## **Disconnecting External Devices and Power**

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

## Removing the Outside Cover

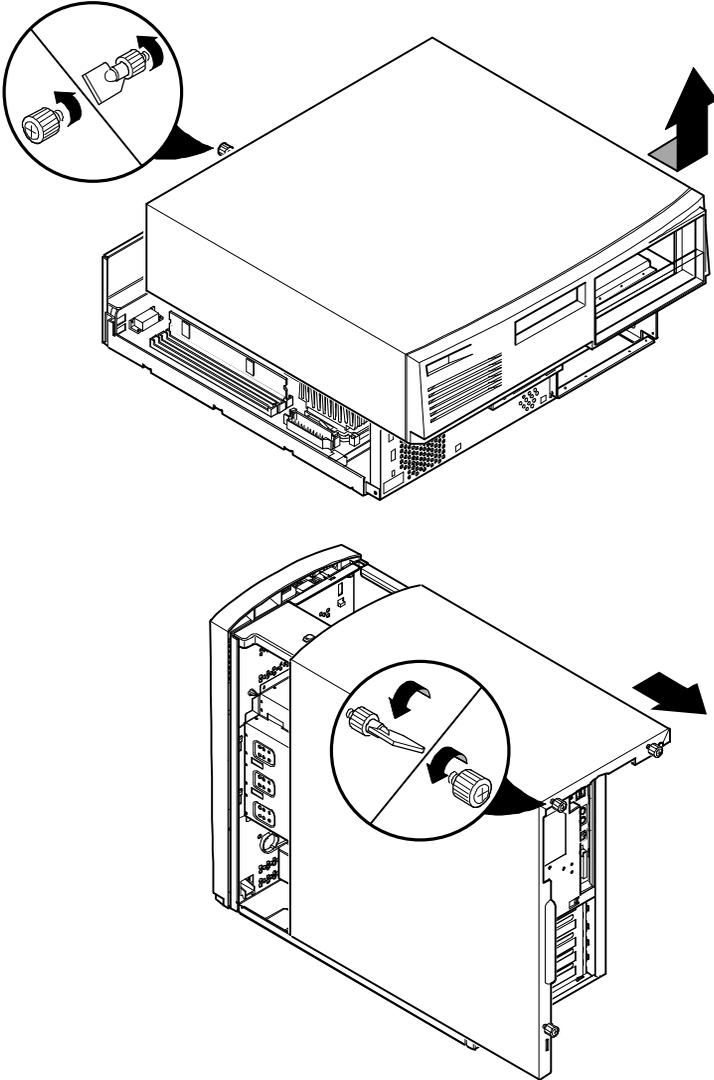
To remove your computer's outside cover:

1. Turn off power to all external devices connected to your computer.
2. Turn your computer off.
3. Unplug your computer and monitor power cord from the wall outlet.
4. For computers without a chassis lock, go to step 4a. For computers with a chassis lock, go to step 4b.
  - a. Release the outside cover by loosening the rear-panel thumbscrew(s).
  - b. Unlock the outside cover by inserting the key and turning it counter clockwise.
5. Slide the outside cover forward for the low profile and backwards for the short tower.
6. Carefully lift the outside cover away from the chassis.



**CAUTION:** 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. To prevent damage to circuit boards and/or components:

- Before touching any circuit board or component, touch the metal frame of your computer to discharge any static electricity.
- Keep circuit boards and components away from non-conductors.



DEC01173-2

Figure 5-3. Removing the Outside Cover

## SecureBOX

Celebris FX-2 computers feature SecureBOX circuitry that detects the removal of the computer cover to improve asset management of remote networked clients. If the computer cover is removed, SecureBOX circuitry will log the event with system management software. SecureBOX features are implemented within the computer hardware and BIOS design for use with ClientWORKS and/or other system management software.

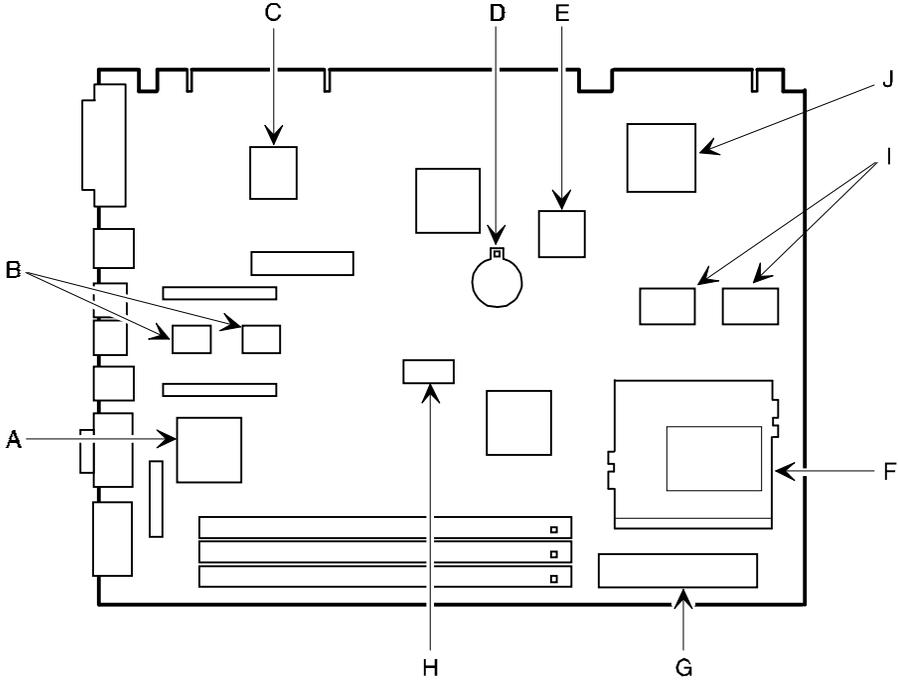
## Computer Components

The following sections identify the Venturis FX-2 and Celebris FX-2 computer components including: main logic components, main logic board connectors, backplane components, expansion slots, main logic board jumper locations, and memory configurations.

### Main Logic Board Components

Figure Legend	Component
A	Video controller
B	Onboard video memory
C	Ethernet controller <sup>(1)</sup>
D	Computer battery
E	Computer flash and video BIOS
F	Pentium processor (CPU)
G	Voltage regulator module
H	Dip switches
I	Onboard 512/256 KB Pipeline Burst cache
J	Super I/O controller

<sup>(1)</sup> Not available on all models

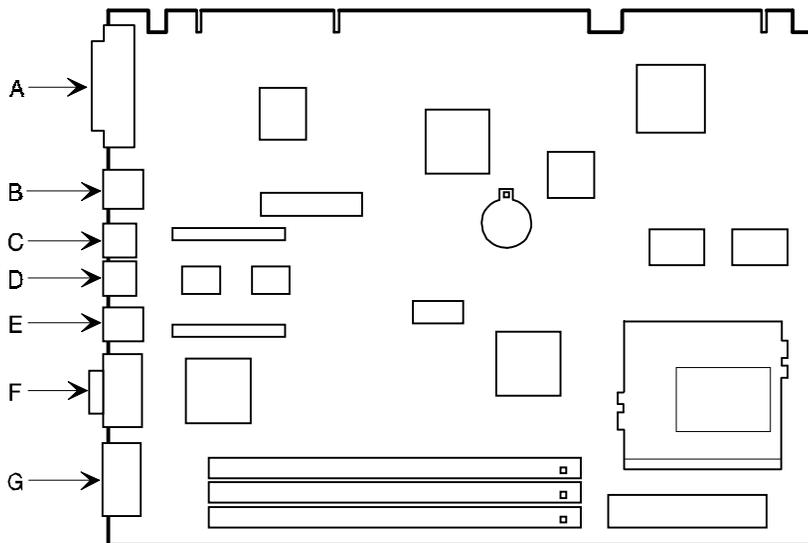


DEC01188-2

Figure 5-4. Main Logic Board Components

## Main Logic Board Connectors (Rear Panel)

Figure Legend	Connector
A	Parallel port
B	10/100BaseTX network port (not available on all models)
C	Keyboard port
D	Mouse port
E	Two USB ports
F	Video (VGA) port
G	Serial port

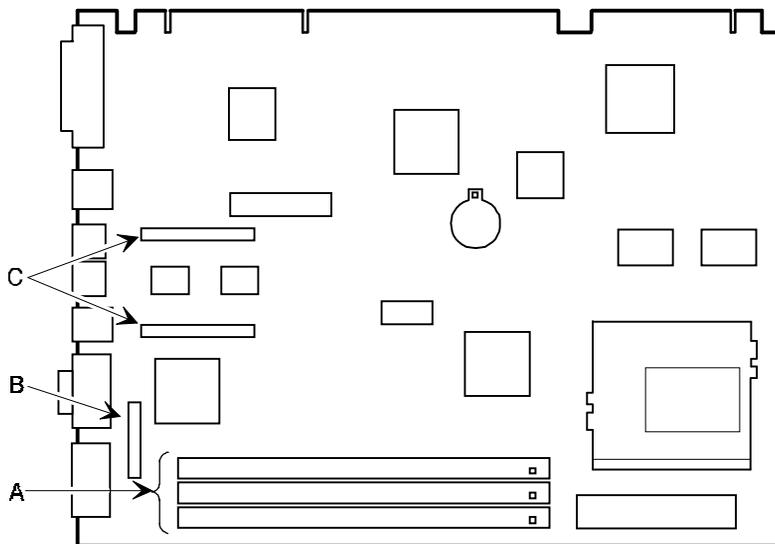


DEC01186-14

Figure 5-5. Main Logic Board Components (Rear Panel)

## Main Logic Board Connectors

Figure Legend	Connector
A	Three 168-pin, DIMM, 64-bit SDRAM sockets
B	VGA feature connector (output only)
C	Video memory (SDRAM) upgrade connectors



DEC01186-3

Figure 5-6. Main Logic Board Connectors

## Low Profile Backplane Components and Connectors

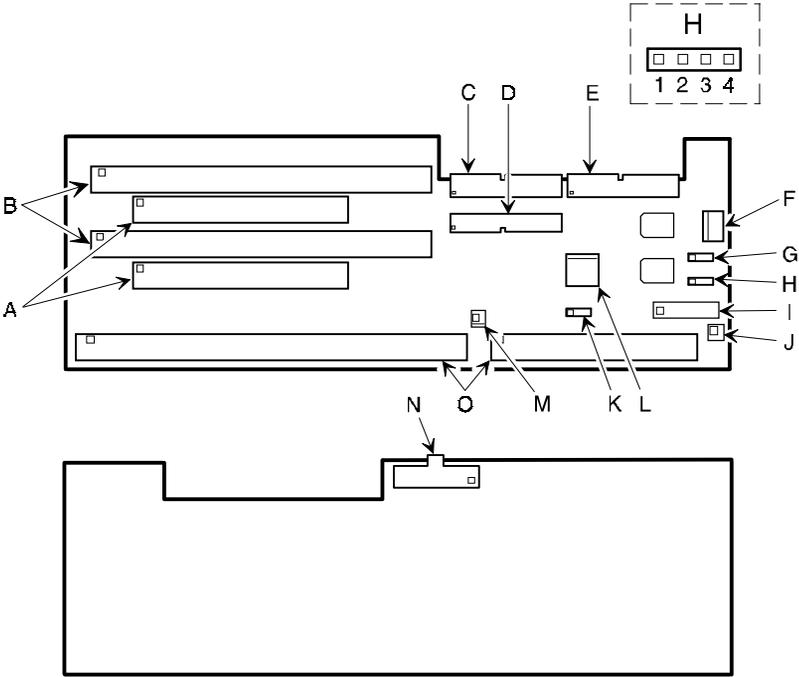
Figure Legend	Connector
A	PCI expansion board connectors
B	ISA expansion board connectors
C	Primary IDE drive connector
D	Secondary IDE drive connector (recommended for an installed CD-ROM drive)
E	Diskette drive connector
F	Audio rear panel connector <sup>(2)</sup>
G	CD-ROM audio input connector (CD-IN) <sup>(2)</sup>
H	Fax/modem audio input connector (F/M IN) <sup>(1)</sup>
I	Control panel connector
J	Fan connector
K	SCSI LED connector
L	Crystal CS4236B audio controller <sup>(2)</sup>
M	Micro switch connector <sup>(2)</sup>
N	Power connector
O	Main logic board connectors

(1) This connector is used for Fax/Modems with speaker phone capabilities.

(2) Not available on all models

**Low Profile Fax/Modem Audio Input Connector (F/M IN)**

Item H, Figure 5-7	Description
Pin 1	Audio in (fax/modem)
Pin 2	Ground
Pin 3	Ground
Pin 4	Microphone in (fax/modem)



DEC01192-2

**Figure 5-7. Low Profile Backplane Components and Connectors**

## Short Tower Backplane Components and Connectors

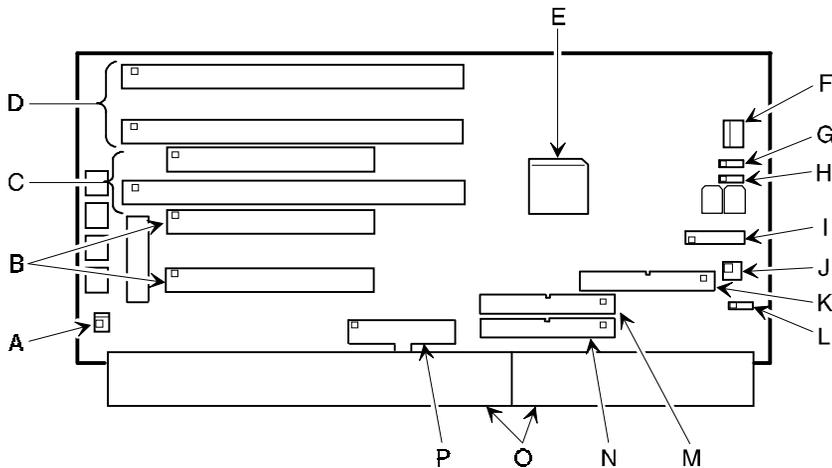
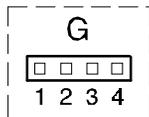
Figure Legend	Connector
A	Micro switch connector <sup>(2)</sup>
B	PCI expansion board connectors
C	ISA/PCI expansion board connectors - shared slot
D	ISA expansion board connectors
E	Crystal CS4236B audio controller <sup>(2)</sup>
F	Audio rear panel connector <sup>(2)</sup>
G	CD-ROM audio input connector (CD-IN) <sup>(2)</sup>
H	Fax/modem audio input connector (F/M IN) <sup>(1)</sup>
I	Control panel connector
J	Fan connector
K	Diskette drive connector
L	SCSI LED connector
M	Secondary IDE drive connector (recommended for an installed CD-ROM drive)
N	Primary IDE drive connector
O	Main logic board connectors
P	Power connector

(1) This connector is used for Fax/Modems with speaker phone capabilities.

(2) Not available on all models

### Short Tower Fax/Modem Audio Input Connector (F/M IN)

Item G, Figure 5-8	Description
Pin 1	Audio in (fax/modem)
Pin 2	Ground
Pin 3	Ground
Pin 4	Microphone in (fax/modem)



DEC01191-2

Figure 5-8. Short Tower Backplane Components and Connectors

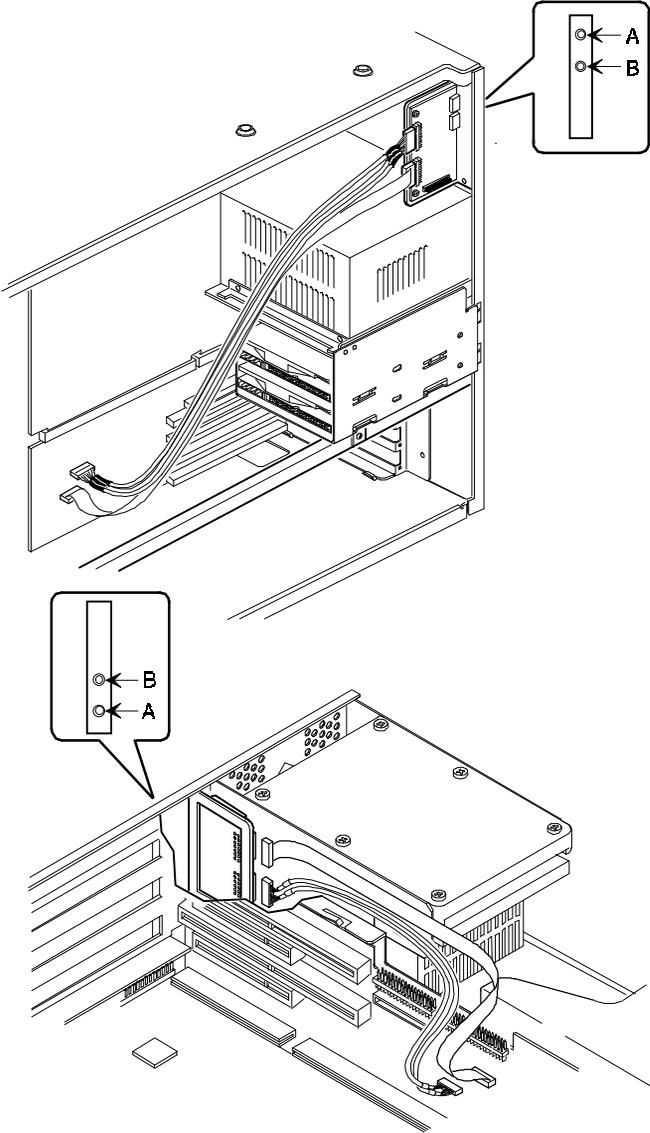
## Audio Card Connectors (Not Available on Some Models)

Computers with the Crystal CS4236B sound chip come with an audio adapter card installed. This card allows you to connect speakers to the computer.



**NOTE:** The location of this adapter card might vary depending on the computer model.

Figure Legend	Connector
A	Line in
B	Speaker out



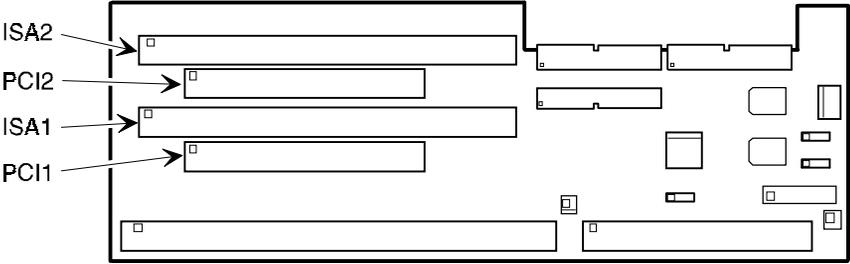
DEC01189

Figure 5.9. Audio Adapter Card Connectors

## Expansion Slot Locations (Low Profile)

Expansion Slot Designation	Description
ISA2	Supports half-length industry-standard 16-bit ISA expansion boards Uses the top expansion slot at the rear panel
PCI2	Supports full-length 32-bit PCI local bus expansion boards Uses the middle expansion slot at the rear panel Designated as a shared slot with ISA slot ISA1 <sup>(1)</sup>
ISA1	Supports full-length industry-standard 16-bit ISA expansion boards Uses the middle expansion slot at the rear panel Designated as a shared slot with PCI slot PCI2 <sup>(1)</sup>
PCI1	Supports half-length 32-bit PCI local bus expansion boards Uses the bottom expansion slot at the rear panel

<sup>(1)</sup> Only one expansion board can reside in slot PCI2 and ISA1 at any one time. These slots have to share the middle expansion slot opening at the rear panel, thus, a maximum of three expansion boards can be supported at any one time.



DEC01192-3

**Figure 5-10. Expansion Board Slots (Low Profile)**

## Expansion Slot Locations (Short Tower)

Expansion Slot Designation	Description
ISA3	Supports full-length industry-standard 16-bit ISA expansion boards Uses the first (bottom) expansion slot at the rear panel
ISA2	Supports full-length industry-standard 16-bit ISA expansion boards Uses the second expansion slot at the rear panel
PCI3	Supports full-length 32-bit PCI local bus expansion boards Uses the third expansion slot at the rear panel Designated as a shared slot with ISA slot ISA1 <sup>(1)</sup>
ISA1	Supports half-length industry-standard 16-bit ISA expansion boards Uses the third expansion slot at the rear panel Designated as a shared slot with PCI slot PCI2 <sup>(1)</sup>
PCI2	Supports full-length 32-bit PCI local bus expansion boards Uses the fourth expansion slot at the rear panel
PCI1	Supports half-length 32-bit PCI local bus expansion boards Uses the fifth (top) expansion slot at the rear panel

<sup>(1)</sup> Only one expansion board can reside in slot PCI3 and ISA1 at any one time. These slots have to share the third expansion slot opening at the rear panel, thus, a maximum of five expansion boards can be supported at any one time.



DEC02003-3

Figure 5-11. Expansion Board Slots (Short Tower)

## Main Logic Board Jumper and Switch Settings



**NOTE:** Some switch settings are marked OPEN and CLOSED rather than ON and OFF (OPEN = OFF and CLOSED = ON).

Feature	Function	Setting	Description
Bus clock	66 MHz	SW1-1, ON <sup>(1)</sup>	Determines the processor and PCI clock speed for the installed processor. This switch must be set along with the SW1-7 and SW1-8 CPU Core/Bus frequency Ratio switches. Refer to the Processor Clock Speed Switch Settings table.
	60 MHz	SW1-1, OFF	
Clear Password	Clear	SW1-2, ON	If you forget your password, via BIOS Setup, set this switch to ON and then restart the computer.
	Normal <sup>(1)</sup>	SW1-2, OFF <sup>(1)</sup>	
Recovery mode	Recovery	SW1-3, ON	If your flash BIOS upgrade failed, set this switch to ON so you can boot the computer from a Crisis Recovery diskette. Refer to the README.TXT provided with the flash BIOS upgrade.
	Normal <sup>(1)</sup>	SW1-3, OFF <sup>(1)</sup>	

(1) Factory default setting

*continued*

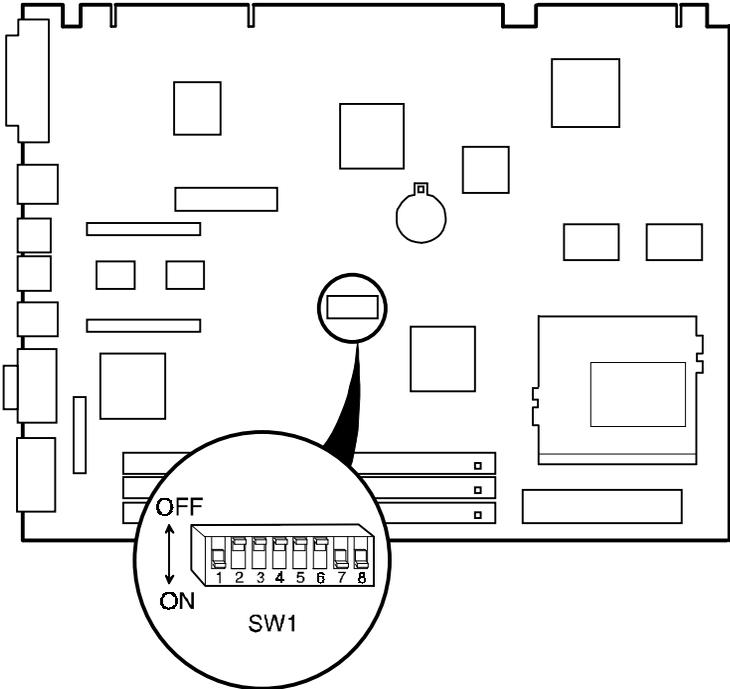
Feature	Function	Setting	Description
Clear CMOS	Clear Normal <sup>(1)</sup>	SW1-4, ON SW1-4, OFF <sup>(1)</sup>	Clears CMOS of all BIOS setup information. Use the Clear setting when the computer will not boot, and BIOS setup cannot be accessed due to configuration data corruption. This switch must be set back to Normal before rebooting the computer.
BIOS write	Enable Disable <sup>(1)</sup>	SW1-5, ON SW1-5, OFF <sup>(1)</sup>	When disabled, prevents corruption or reprogramming of BIOS boot block data. Updating the BIOS boot block data is normally reserved for factory use only, unless instructed otherwise by your Service provider.
Reserved	Reserved	SW1-6, ON SW1-6, OFF <sup>(1)</sup>	Reserved for future use.
CPU core/ Bus frequency ratio	2/1	SW1-7, ON SW1-8, OFF	Sets processor clock speed x 2
	3/1	SW1-7, OFF SW1-8, ON	Sets processor clock speed x 3
	3/2	SW1-7, OFF SW1-8, OFF	Sets processor clock speed x 1.5
	5/2	SW1-7, ON <sup>(1)</sup> SW1-8, ON <sup>(1)</sup>	Sets processor clock speed x 2.5 Must be set with SW1-1 processor/bus clock speed switch to match CPU clock speed. For example, 66 MHz x 3 = 200 MHz processor. Refer to the Processor Clock Speed Switch Settings table.

<sup>(1)</sup> Factory default

## Processor Clock Speed Switch Settings

The following table provides the switch settings for a number of available Pentium processors. The switches are set correctly for the processor that came with the computer. Only change the processor switch settings, that is SW1, for an upgrade to another processor.

<b>Processor Speed</b>	<b>SW1-1</b>	<b>SW1-7</b>	<b>SW1-8</b>
90 MHz	Off	Off	Off
100 MHz	On	Off	Off
120 MHz	Off	On	Off
133 MHz	On	On	Off
150 MHz	Off	On	On
166 MHz	On	On	On
180 MHz	Off	Off	On
200 MHz	On	Off	On



DEC01186-13

**Figure 5-12. Main Logic Board Switch Settings**

## Installing Additional Computer Memory

The computer supports 168-pin DIMM memory modules utilizing Synchronous Dynamic Random Access Memory (SDRAM) technology. SDRAMs operate at speeds of 66 MHz (or greater) over a local memory bus, which is much faster than SIMMs using ECC or EDO memory.

Depending on the model ordered, the computer came with either 16 MB or 32 MB of computer memory. Adding more memory enables the computer to run larger, more complicated software and run it more quickly. DIMMs are available in 16 MB, 32 MB, 64 MB, and 128 MB memory module sizes to expand computer memory up to 256 MB. Contact the local Digital sales representative for ordering information.

Computer memory is installed using the three DIMM sockets located on the main logic board as shown in Figure 5-13. Sockets J7 and J6 can accept single or dual bank DIMMs, while socket J5 can accept only single bank DIMMs.

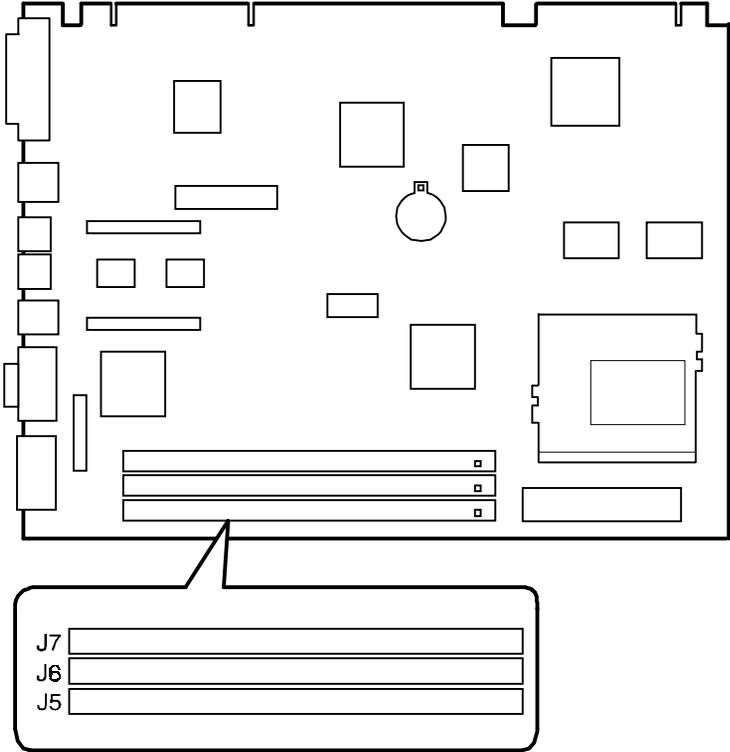
When adding memory make sure to reference the memory configuration table and follow these memory expansion guidelines:

- Install 168-pin DIMMs using 66 MHz (or faster), 64-bit SDRAMs.



**NOTE:** Install DIMMs supplied by Digital Equipment Corporation and qualified vendors. Digital does not support computer performance, product warranty, or service calls resulting from installation of non-qualified DIMMs.

- Single bank DIMMs are available in 16 MB and 64 MB memory modules. Single bank DIMMs have memory chips on only one side of the module.
- Dual bank DIMMs are available in 32 MB and 128 MB memory modules. Dual bank DIMMs have memory chips on both sides of the module.
- Memory sockets J7 and J6 support both single and dual bank DIMMs. Memory socket J5 supports only single bank DIMMs.



DEC01186-4

**Figure 5-13. DIMM Socket Locations**

## Memory Configurations

Socket J5	Socket J6	Socket J7	Total
		16 MB	16 MB
	16 MB	16 MB	32 MB
16 MB	16 MB	16 MB	48 MB
64 MB	16 MB	16 MB	96 MB
		32 MB	32 MB
	32 MB	32 MB	64 MB
16 MB	32 MB	32 MB	80 MB
64 MB	32 MB	32 MB	128 MB
		64 MB	64 MB
	64 MB	64 MB	128 MB
16 MB	64 MB	64 MB	144 MB
64 MB	64 MB	64 MB	192 MB
		128 MB	128 MB
	16 MB	128 MB	144 MB
16 MB	16 MB	128 MB	160 MB
	32 MB	128 MB	160 MB
16 MB	32 MB	128 MB	176 MB
	64 MB	128 MB	192 MB
64 MB	32 MB	128 MB	224 MB
	128 MB	128 MB	256 MB

## Removing and Replacing Components

The following sections provide removal and replacement procedures for the following Venturis FX-2 and Celebris FX-2 components:

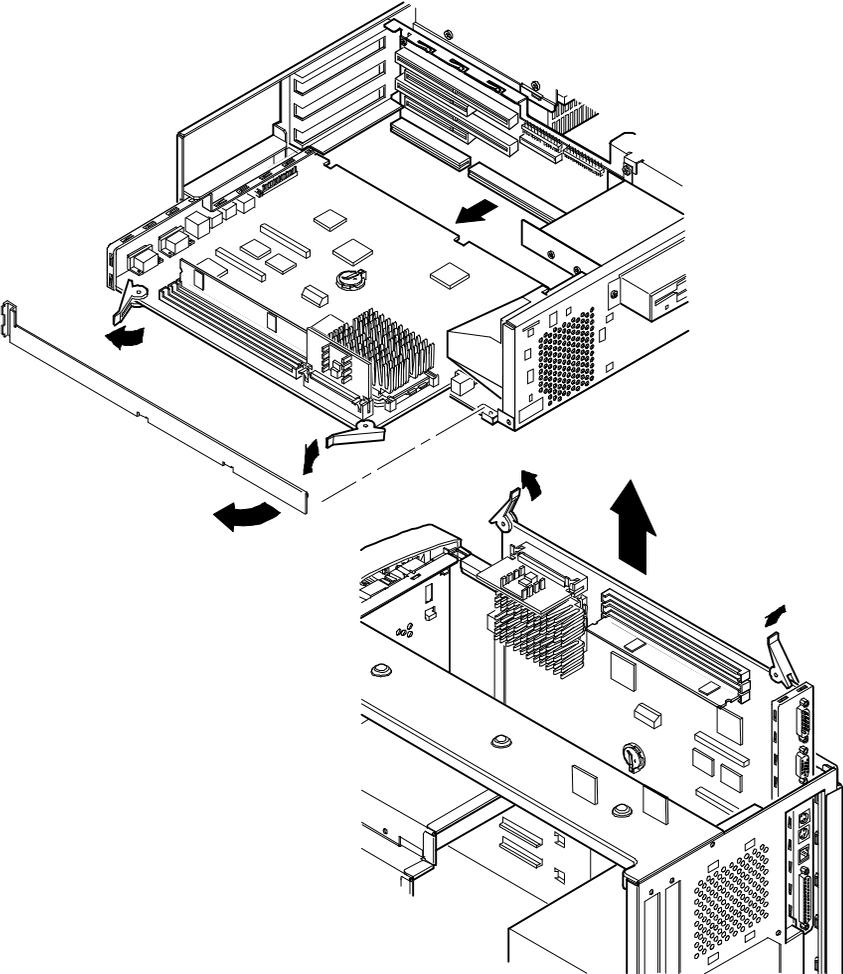
- Main logic board
- Adapter cards
- DIMMs
- Video memory
- Battery
- Heat sink
- Processor
- VRM
- Backplanes
- Expansion boards
- Power supplies
- Control panels
- Air duct
- Fans
- 3½-inch mass storage devices
- 5¼-inch mass storage devices

## Removing the Main Logic Board

1. Turn off the computer and monitor.
2. Disconnect all external devices, ac power, and monitor power.
3. Remove the outside cover.
4. Swing the brace away from the chassis (low profile computers only).
5. Pull up on the two latches attached to the main logic board.  
This separates the main logic board from the backplane.
6. Carefully remove the main logic board from the chassis.



**NOTE:** If you are replacing the main logic board, you might need to move the processor and other components such as DIMMs to the new main logic board. The processor chip and heat sink assembly should be removed and reinstalled as a single assembly, there is no need to disassemble the processor and heat sink.

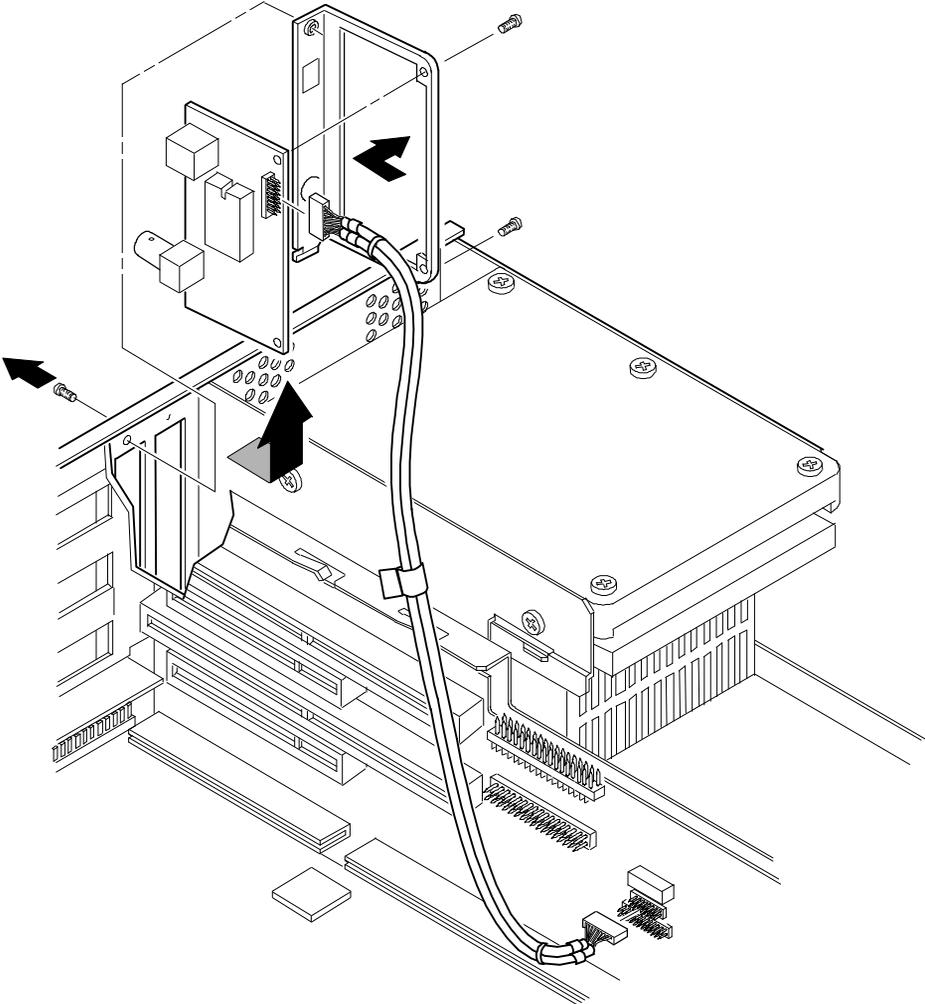


DEC01188

Figure 5-14. Removing the Main Logic Board

## **Removing an Adapter Card**

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Disconnect the adapter card cable(s).
4. Remove the adapter card.
5. Remove the adapter card from the bracket by unscrewing the two screws that hold the adapter card to the bracket.

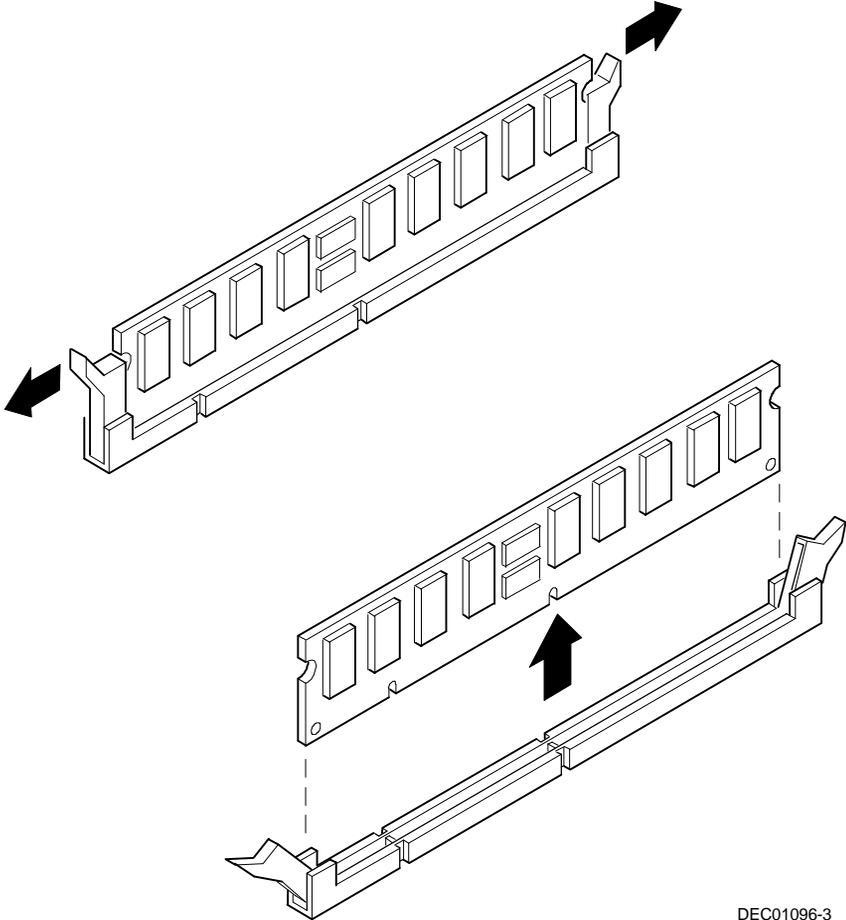


DEC00934

Figure 5-15. Removing an Adapter Card

## **Removing the DIMMs**

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Press the DIMM retaining clips out.
4. Pull the DIMM out of the socket.



DEC01096-3

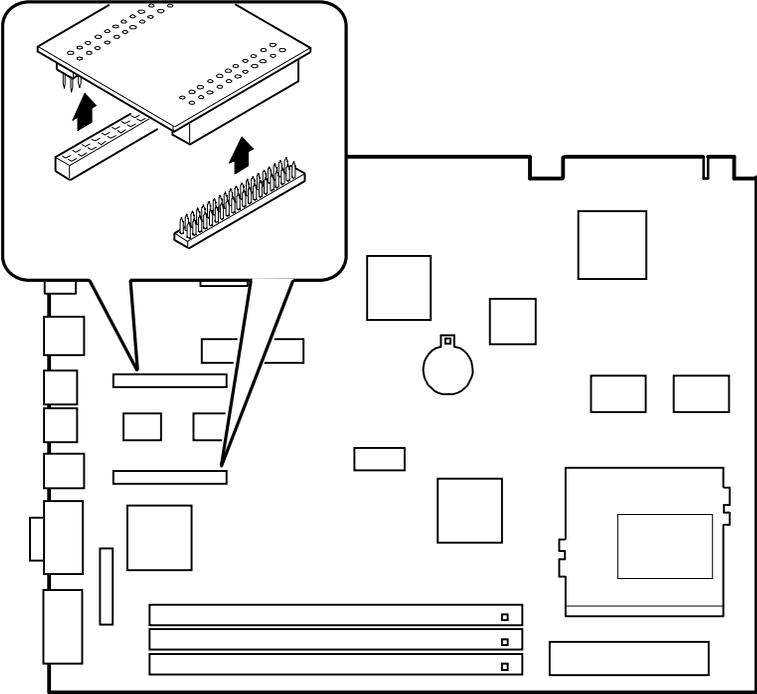
Figure 5-16. Removing DIMMs

## Removing Video Memory

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Remove the video memory by gently, but firmly, pulling out the video memory daughter card.



**CAUTION:** Be careful not to damage or bend the pins.



DEC00869-16

**Figure 5-17. Removing Video Memory**

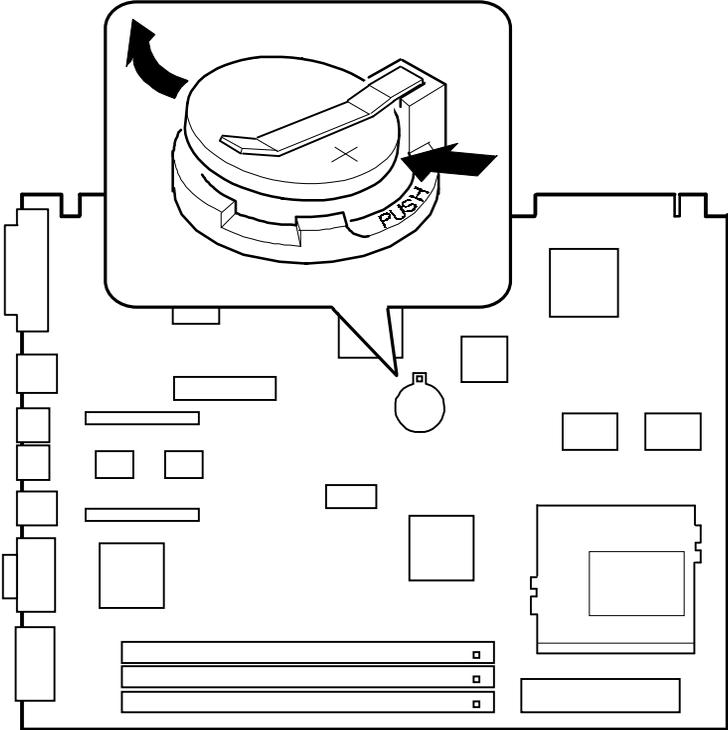
## Removing the Lithium Battery

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. If the computer is a short tower, remove the main logic board. For low profile computers, skip to step 4.
4. Remove the old battery by lifting the retaining clip slightly and then by pushing on the battery from the side to slide it out.



**WARNING:** There is a danger of battery explosion if a lithium battery is incorrectly replaced. To prevent damage to the computer, be sure the + side faces up when installing a new battery. Also, be sure you replace the battery with either a Digital (P/N 12-41474-05), Toshiba (P/N CR2032), or equivalent 3 V dc lithium battery.

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



DEC01186-7

**Figure 5-18. Removing the Lithium Battery**

## Removing the Processor Heat Sink

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Using a small screwdriver, release the retaining clip on the heat sink.

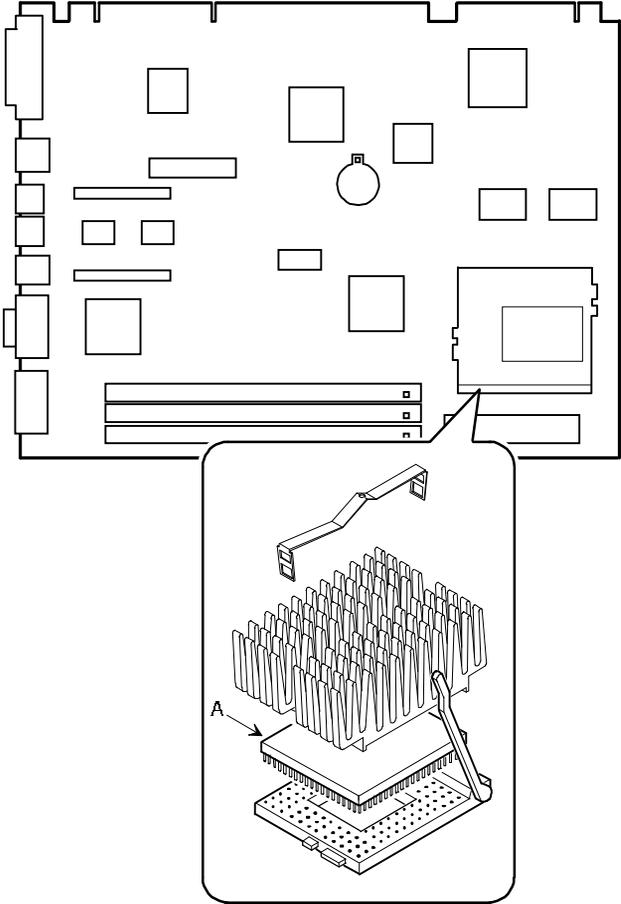
Use caution so as to avoid damaging the main logic board.

4. Separate the heat sink from the processor.

To remove the heatsink, slide it off to the side. Do not try to lift it straight up.



**NOTE:** Between the heat sink and the processor is thermal compound to form a tight fit. When you replace the processor and heat sink, first insert the processor chip in the socket and move the lever down. Clean the bottom of the heat sink with a clean cloth dampened with isopropyl alcohol. Spread a smooth thin coat of thermal compound on the bottom of the heat sink. Place the heat sink on top of the processor and then secure the heat sink with the heat sink clip.



DEC01186-11

Figure 5-19. Removing the Processor Heat Sink

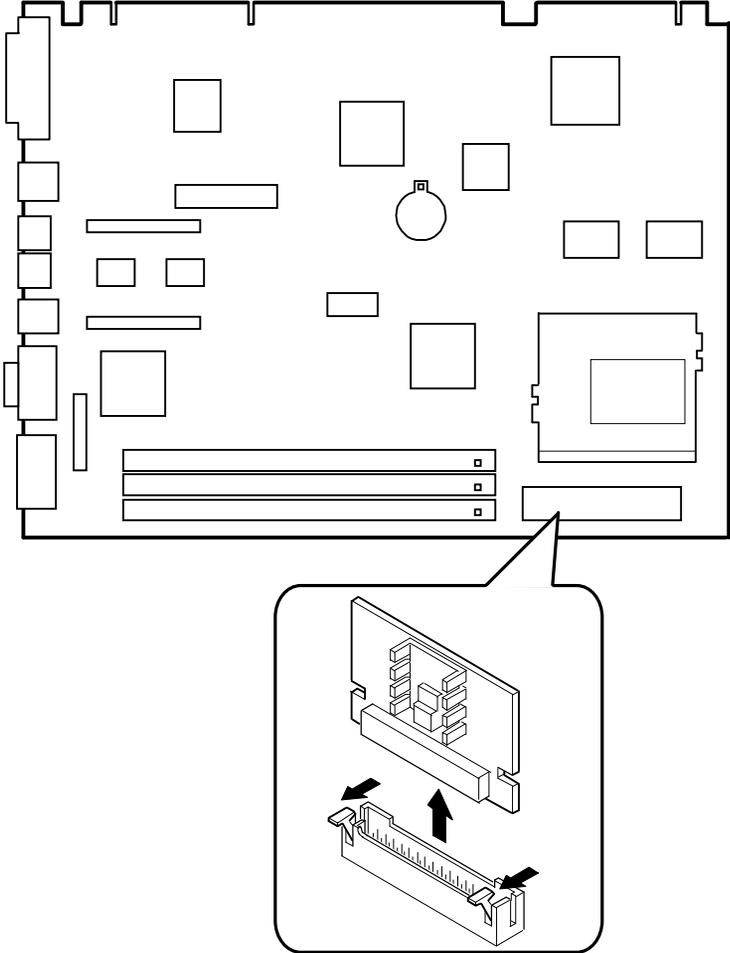
## Removing the Processor

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. If necessary, remove the VRM.
4. Remove the heat sink.
5. Lift the lever out and then up.
6. Remove the processor. (A, Figure 5-19)

*Refer to "Removing the Processor Heat Sink" for processor replacement procedures.*

## **Removing the Voltage Regulator Module (VRM)**

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Push the clips back and then down to release the VRM.
4. Remove the VRM by pulling it straight up.

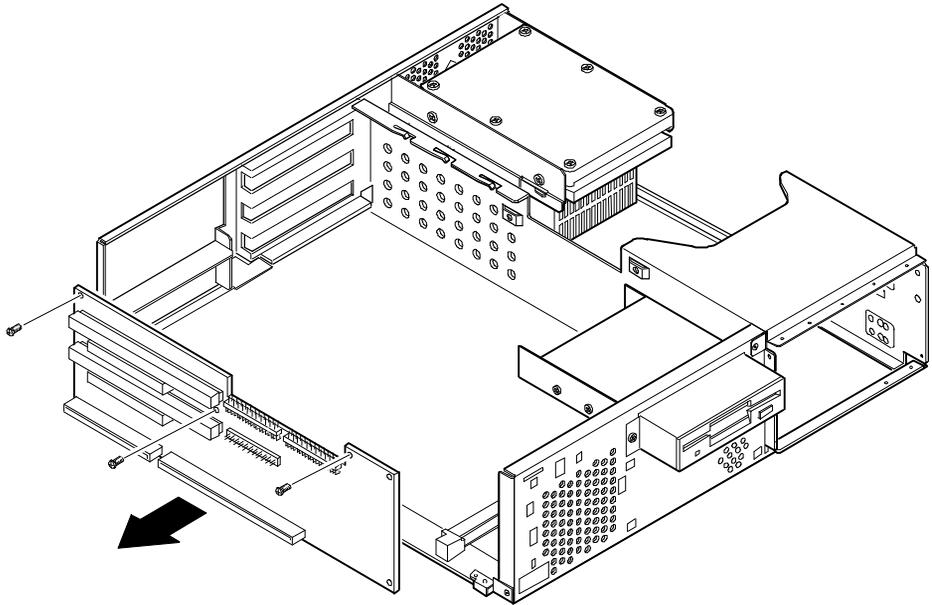


DEC01186-12

**Figure 5-20. Removing the VRM**

## **Removing the Backplane (Low Profile)**

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Disconnect all power, video, disk and diskette cables.
4. Remove any expansion boards.
5. Remove the diskette drive.
6. Remove the main logic board.
7. Remove the screws.
8. Remove the backplane.

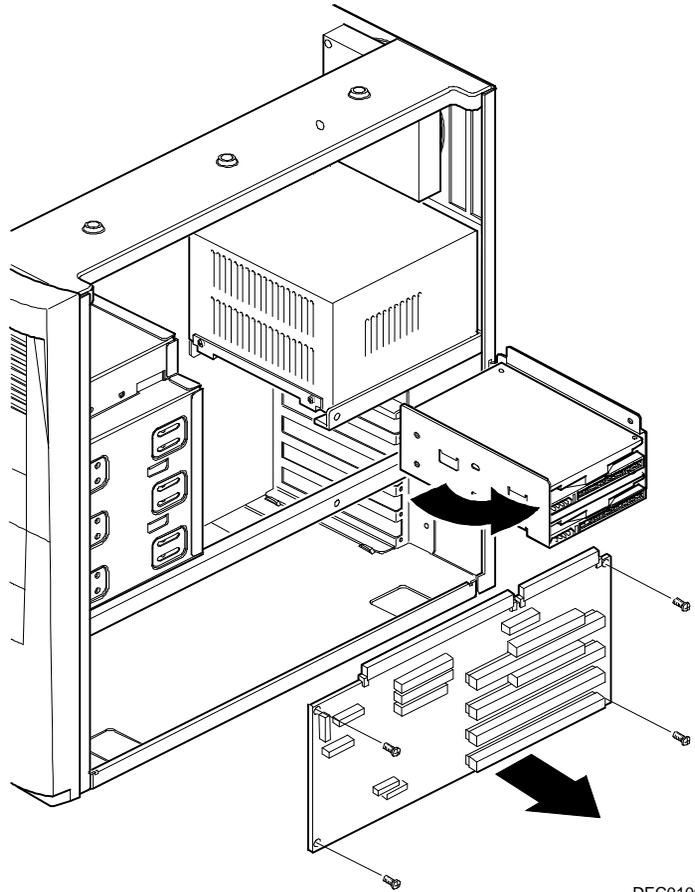


DEC00891

**Figure 5-21. Removing the Backplane (Low Profile)**

## **Removing the Backplane (Short Tower)**

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Remove the screw from the internal drive bay.
4. Swing the drive bay away from the chassis.
5. Remove any expansion boards.
6. Disconnect all power, video, disk and diskette cables.
7. Remove the main logic board.
8. Remove the screws at the rear holding the backplane to the chassis.
9. Remove the backplane.



DEC01007

**Figure 5-22. Removing the Backplane (Short Tower)**

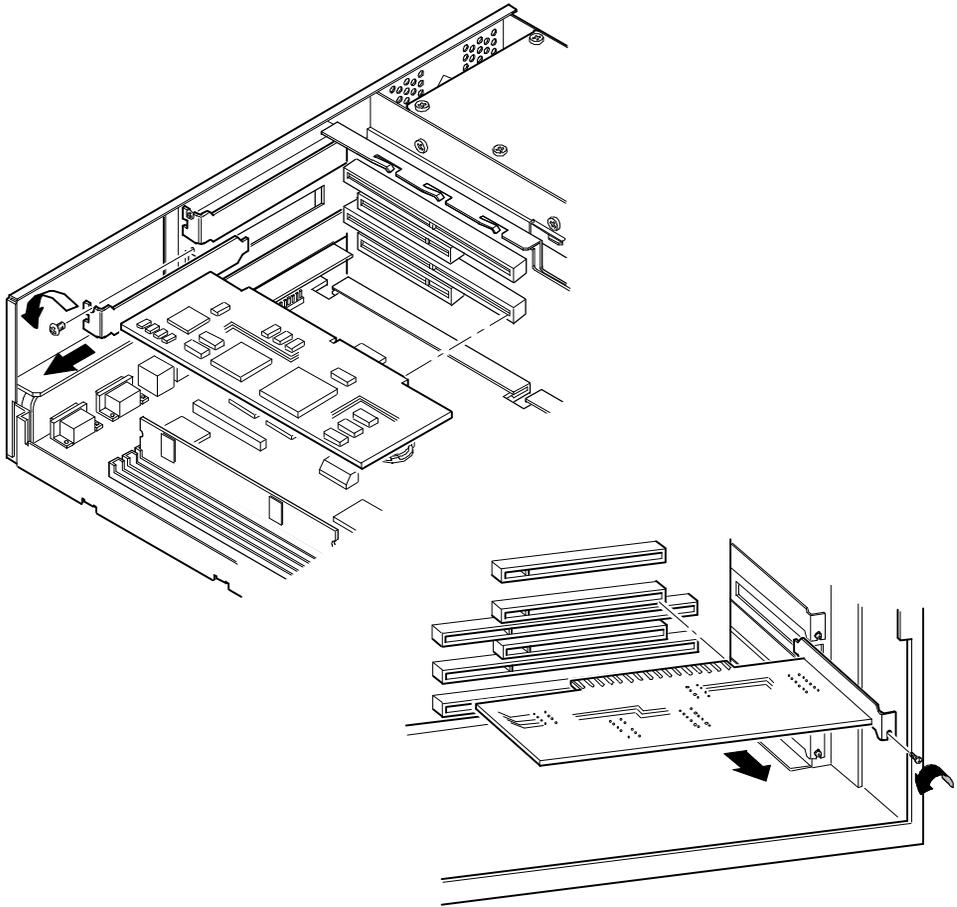
## Removing Expansion Boards



**NOTE:** You do not have to remove the main logic board to remove an expansion board.

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Remove the screw.
4. Gently pull the expansion board from its socket.

## Parts Replacement



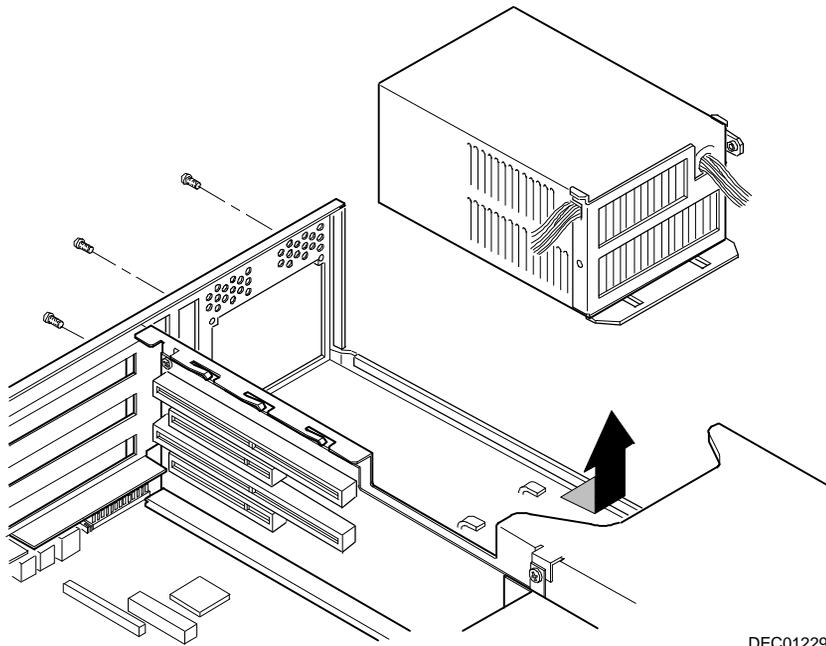
DEC01190-4

**Figure 5-23. Removing Expansion Boards**

## Removing the Power Supply (Low Profile)

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Remove the internal hard disk drive.  
*Refer to "Removing Internal 3½-Inch Device (Celebris FX-2 low profile)."*
4. Disconnect the power cable from the backplane.
5. Disconnect all power cables from all devices.
6. Remove the screws.
7. Remove the power supply and bracket from the chassis.
8. Remove the bracket from the power supply.

Parts Replacement

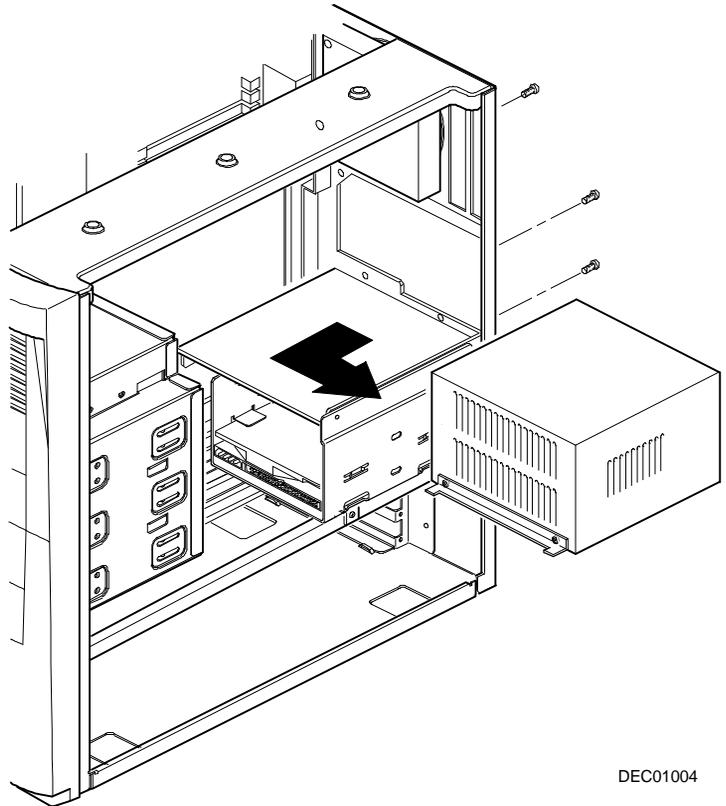


DEC01229

**Figure 5-24. Removing the Power Supply (Low Profile)**

## **Removing the Power Supply (Short Tower)**

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Disconnect the power cable from the backplane.
4. Disconnect all power cables from all devices.
5. Remove the screws from the power supply.
6. Remove the power supply.

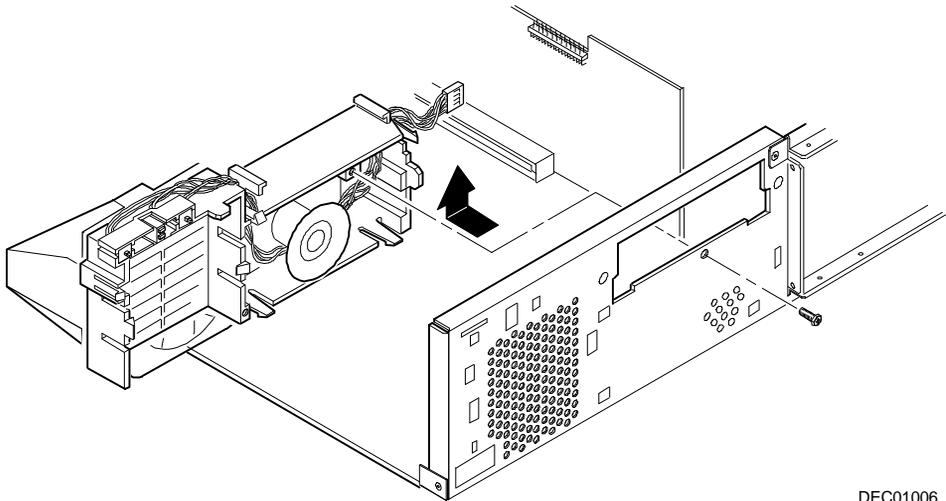


DEC01004

**Figure 5-25. Removing the Power Supply (Short Tower)**

## Removing the Control Panel Assembly (Low Profile)

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Remove the diskette drive and the bracket.  
*Refer to "Removing the Diskette Drive (Celebris FX-2 low profile)."*
4. Remove the main logic board.
5. Remove the main logic board guide.
6. Remove the screws securing the control panel assembly to the chassis.
7. Remove the control panel assembly.
8. Unplug the control panel cable from the backplane.

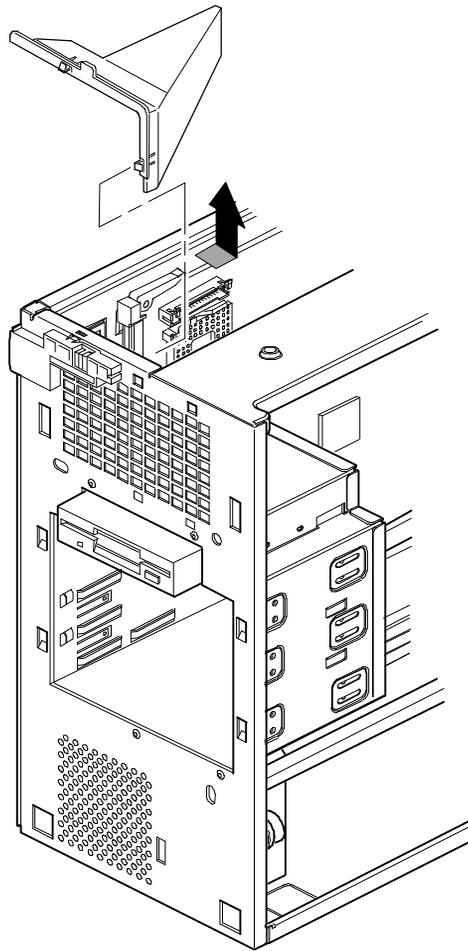


DEC01006

**Figure 5-26. Removing the Control Panel Assembly (Low Profile)**

## **Removing the Front Air Duct (Short Tower)**

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Remove the front bezel.
4. Press in on the tabs to release the front air duct.
5. Remove the front air duct.



DEC01008

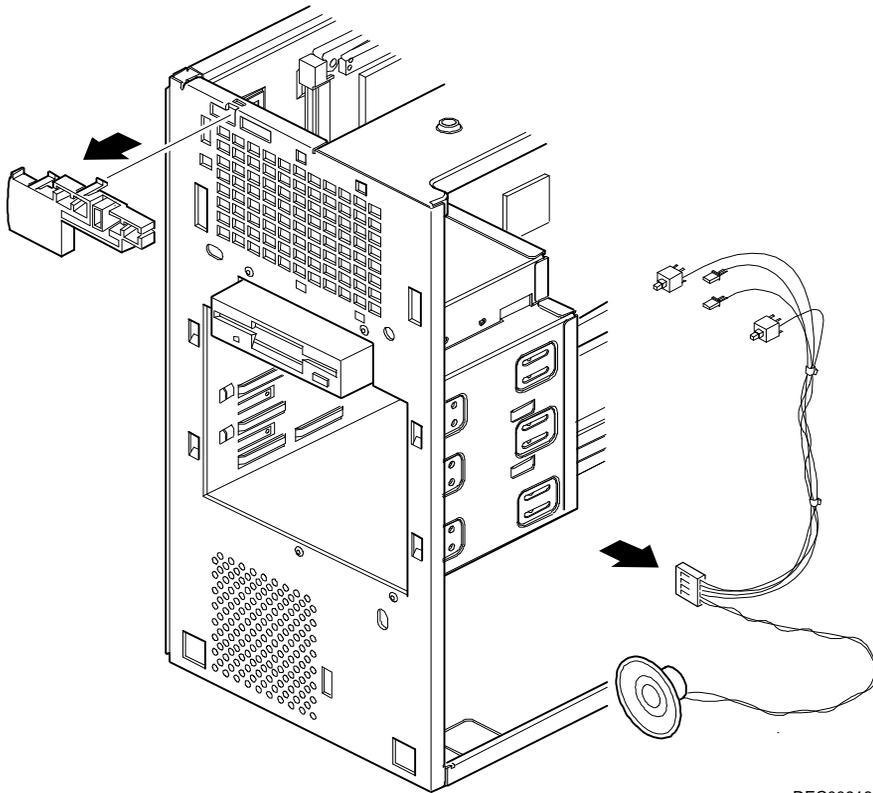
**Figure 5-27. Removing the Front Air Duct (Short Tower)**

## Removing the Control Panel Assembly and Cable (Short Tower)

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Remove front bezel.
4. Remove the front air duct.
5. Push in on the tabs to disengage the control panel assembly.
6. Disconnect the cables from the control panel assembly noting the following when you reconnect.
  - White and black is the reset switch.
  - White, black, and red is the power switch.
  - Red and black is hard disk drive activity LED.
  - Yellow and black is the power LED. It is on top of the hard disk drive indicator.
7. Slide the cables through the slots.

The cables and their attached switch or indicators are now inside the computer.
8. Unplug the cable connection from the backplane.
9. Rotate the speaker to remove it from the option card assembly.
10. Remove the control panel assembly cables from the computer.

## Parts Replacement

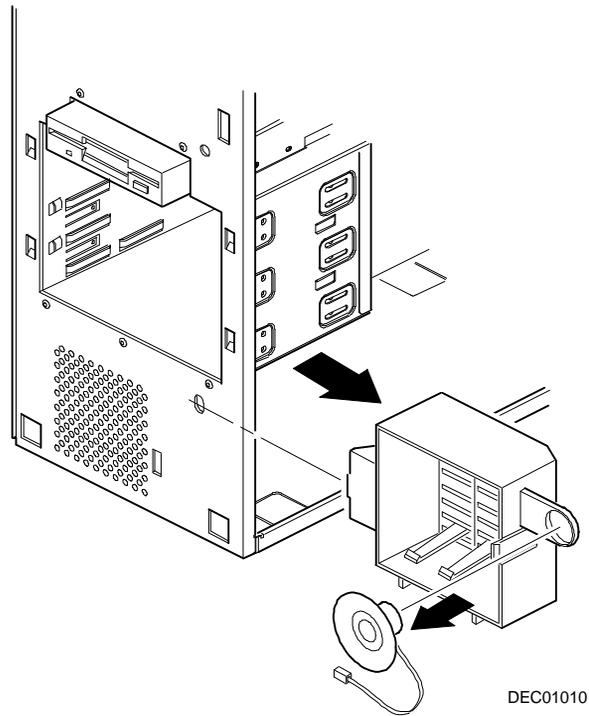


DEC00916

**Figure 5-28. Removing the Control Panel Assembly and Cable (Short Tower)**

## **Removing the Option Card Guide and Speaker Assembly (Short Tower)**

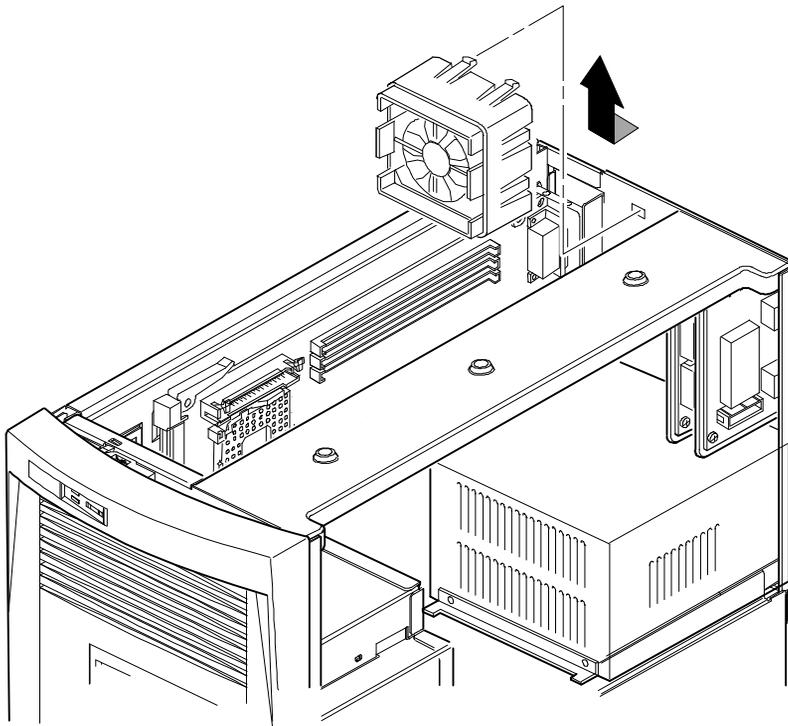
1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Push in on the tab to release the option card guide and speaker assembly.
4. Remove the option card guide and speaker assembly.



**Figure 5-29. Removing the Option Card Guide and Speaker Assembly (Short Tower)**

## Removing the Top-Rear Fan Assembly (Short Tower)

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Disconnect the fan assembly from the backplane.
4. Push in on the tabs to release the fan assembly.
5. Remove the fan assembly.



DEC01231

**Figure 5-30. Removing the Top-Rear Fan Assembly (Short Tower)**

## **Removing the Wire Assembly, Headphone/Microphone (Short Tower)**

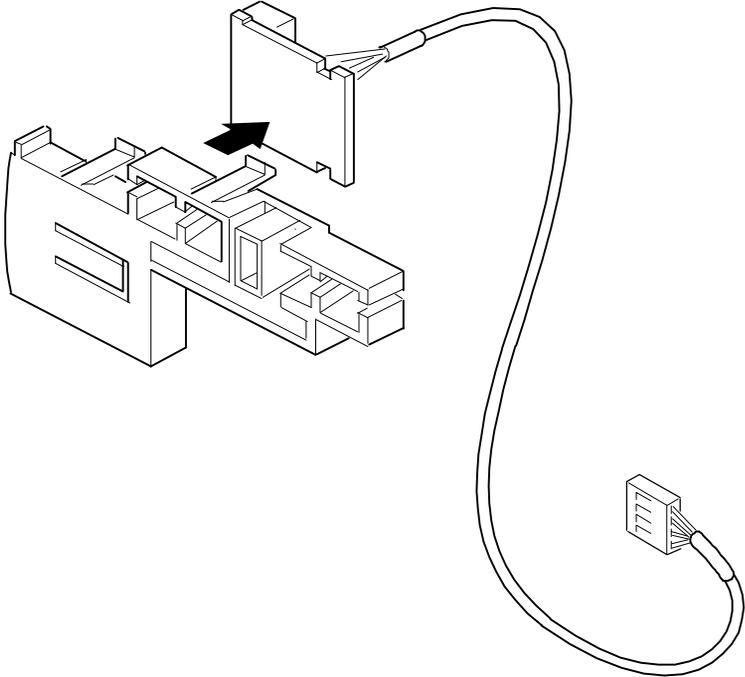
1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Remove the front bezel.
4. Push in on the tabs to disengage the control panel assembly.

The headphone and microphone connections are on a card inside the control panel assembly. This card is attached to the cable.

5. Remove the headphone and microphone card from the control panel assembly.

Push down on the headphone and microphone card to release it from the tabs and then slide the card back.

6. Unplug the other side of the cable from the backplane.
7. Slide the card through the appropriate front slot and then remove the headphone and microphone cable.

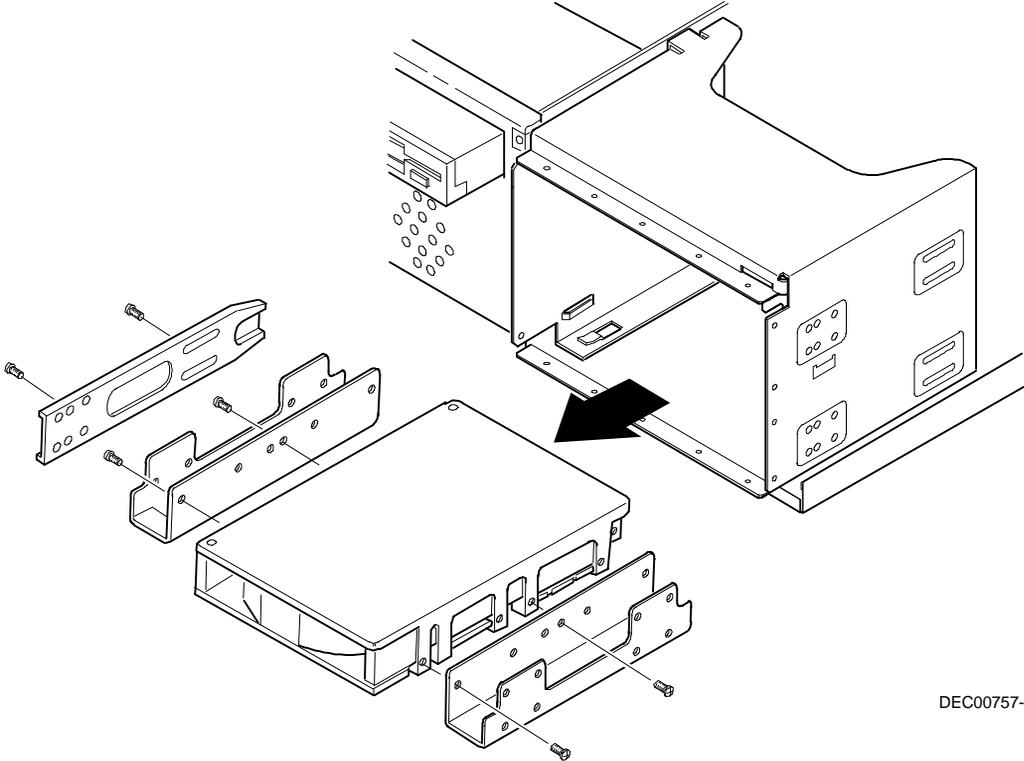


DEC00917

**Figure 5-31. Removing the Wire Assembly, Headphone/Microphone (Short Tower)**

## **Removing a 3½-Inch Device from Front Bay (Low Profile)**

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Disconnect all power and data cables.
4. Remove the screws holding the drive to the bay.
5. Remove the 3½-inch device, which includes the rail and the brackets.
6. Remove the rail from the device.
7. Remove the brackets from the device.

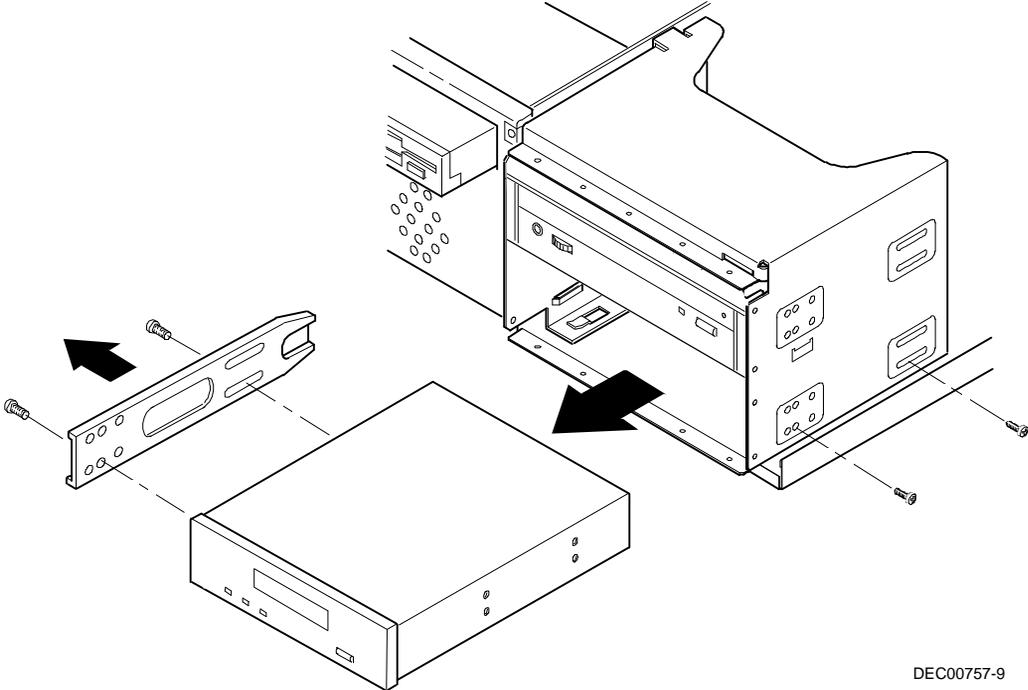


DEC00757-€

**Figure 5-32. Removing a 3 1/2-Inch Device from Front Bay (Low Profile)**

## **Removing a 5¼-Inch Device (Low Profile)**

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Disconnect all power and data cables.
4. Remove the screws holding the drive to the bay.
5. Remove the 5¼-inch device, which includes the rail.
6. Remove the rail from the device.



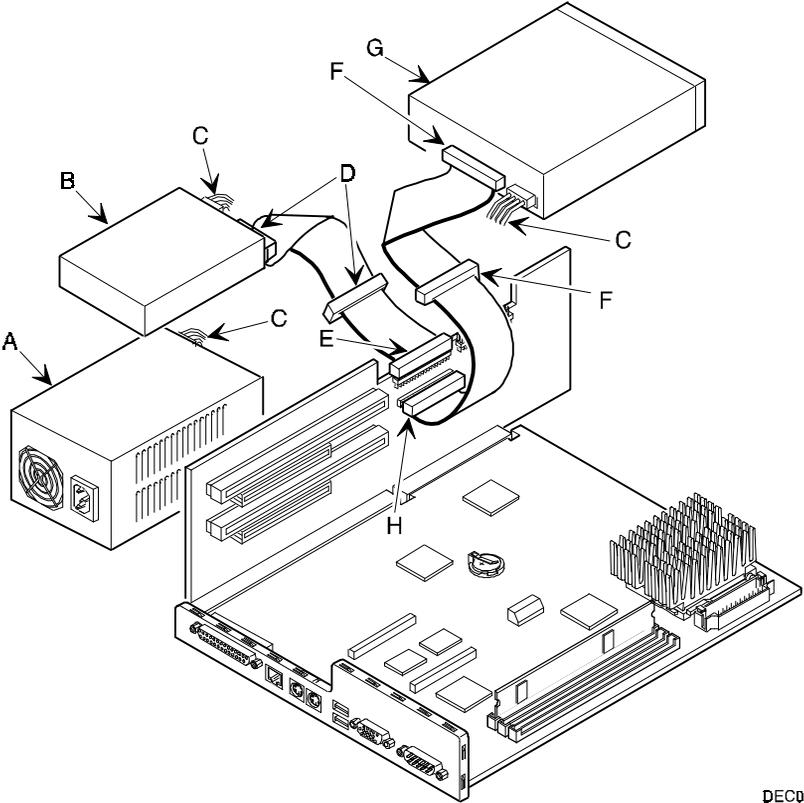
DEC00757-9

**Figure 5-33. Removing a 5 1/4-Inch Device (Low Profile)**

## IDE Drive Connections (Low Profile)

<b>Figure Legend</b>	<b>IDE Drive Component</b>
A	Power supply
B	Primary IDE hard disk drive
C	Power connections
D	Primary IDE hard disk drive connections
E	Backplane IDE drive connection (primary)
F	Secondary IDE hard disk drive connections
G <sup>(1)</sup>	CD-ROM drive (not available on all models)
H	Backplane IDE drive connection (secondary)

<sup>(1)</sup> The CD-ROM drive is connected to the secondary IDE port and configured as a master drive.

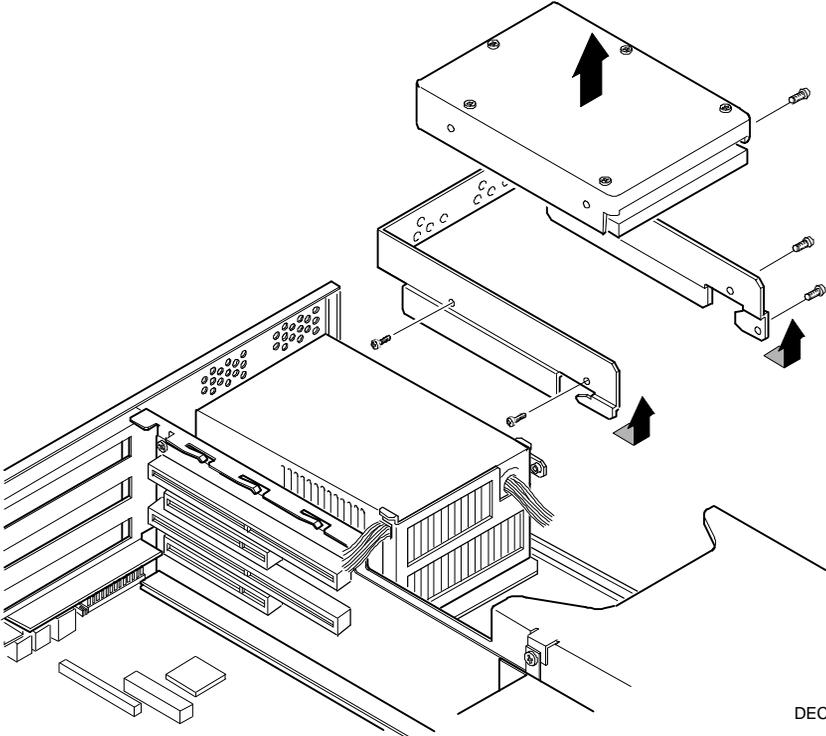


DEC01180

Figure 5-34. IDE Drive Connections (Low Profile)

## **Removing the Internal 3½-Inch Device (Low Profile)**

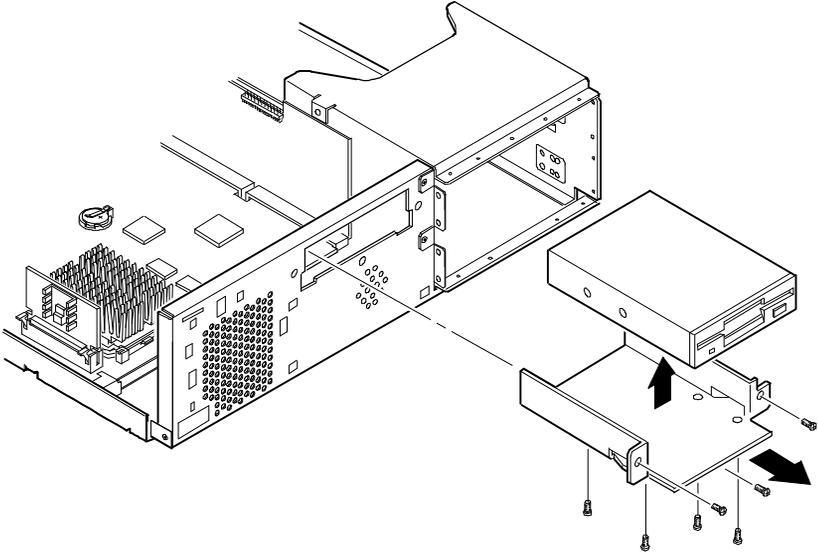
1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Disconnect all power and data cables from the device.
4. Remove the screw from the bracket.
5. Remove the 3½-inch device with the bracket by sliding the device forward and lifting.
6. Remove the 3½-inch device from the bracket.



**Figure 5-38. Removing the Internal 3 1/2-Inch Device (Low Profile)**

## **Removing the Diskette Drive (Low Profile)**

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Remove all power and data cables from the diskette drive.
4. Remove the screws from the front holding the drive and the bracket in the bay.
5. Remove the diskette drive with the bracket.

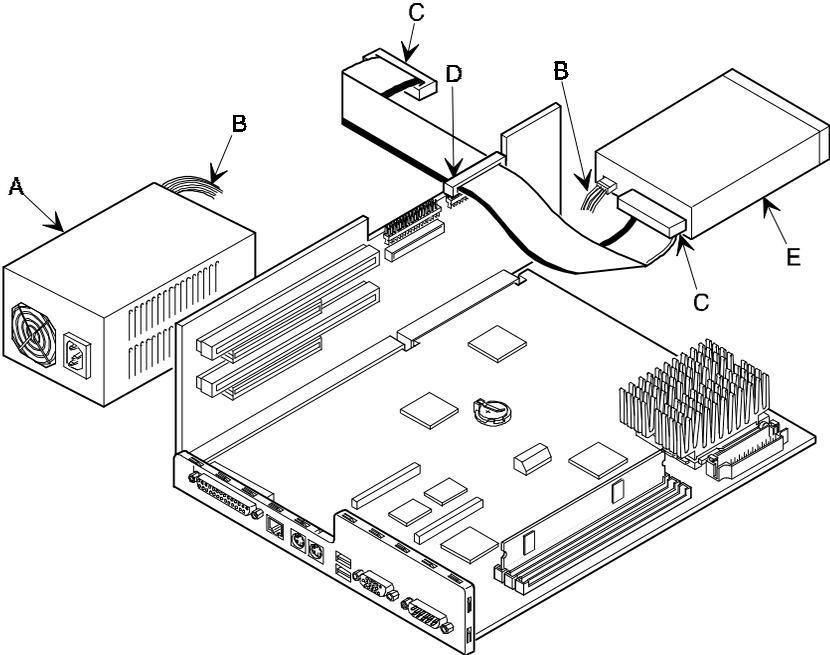


DEC01230

**Figure 5-39. Removing the Diskette Drive (Low Profile)**

## Diskette Drive Connections (Low Profile)

<b>Figure Legend</b>	<b>Diskette Drive Component</b>
A	Power supply
B	Power connections
C	Diskette drive connections
D	Backplane diskette drive connection
E	Diskette drive

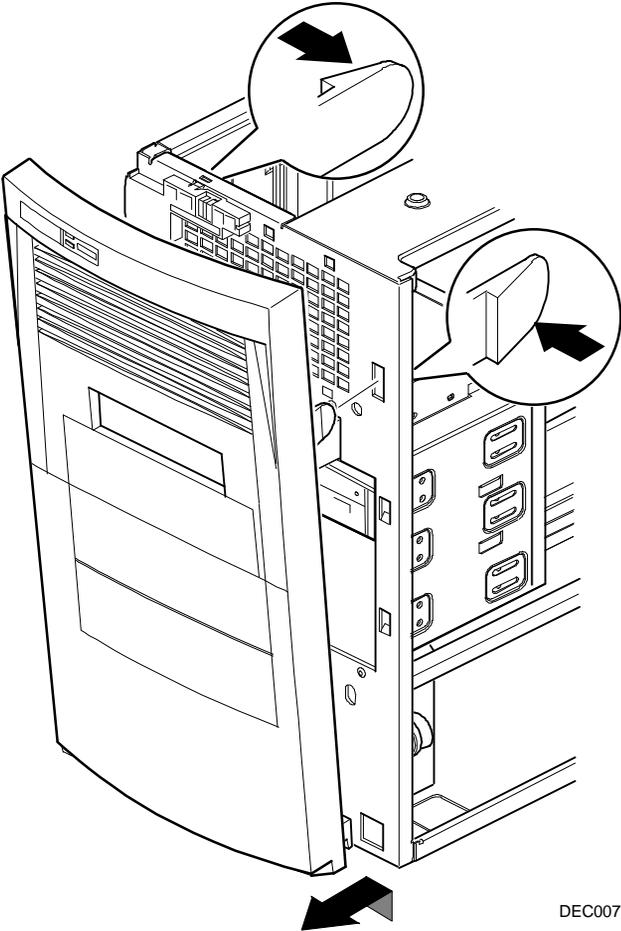


DEC01180

**Figure 5-37. Diskette Drive Connections (Low Profile)**

## **Removing the Front Bezel (Short Tower)**

1. Turn off the computer and monitor.
2. Disconnect all external devices, ac power, and monitor power.
3. Remove the outside cover.
4. From the top of the computer, looking down towards the bottom of the front of the chassis, there are two tabs from the front bezel that hold the bezel in place and secure it to the chassis. Find both tabs (one on the left and one on the right).
5. Push both tabs towards the center of the computer to release the top of the bezel.
6. Pull the top of the bezel approximately an inch away from the top of the chassis.
7. Pull up on the bezel to detach the bottom bezel mounts.

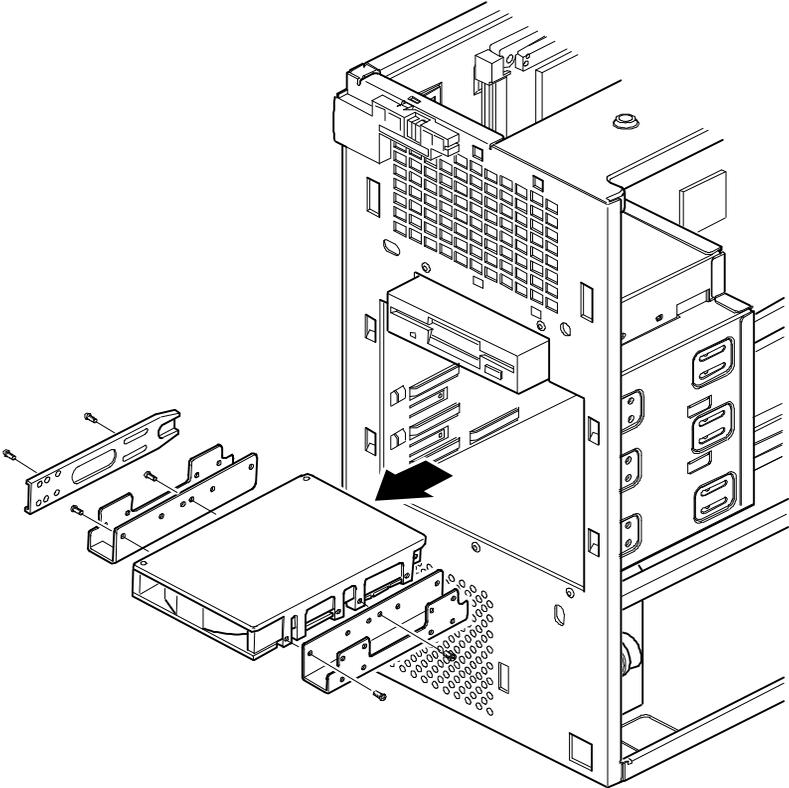


DEC00758-11

Figure 5-38. Removing the Front Bezel

## **Removing a 3½-Inch Device from Front Bay (Short Tower)**

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Remove the front bezel.
4. Disconnect all power and data cables.
5. If necessary, remove the EMI shield.
6. Remove the two screws holding the drive to the bay.
7. Remove the 3½-inch device, which includes the rail and the brackets.
8. Remove the rail from the device.
9. Remove the brackets from the device.

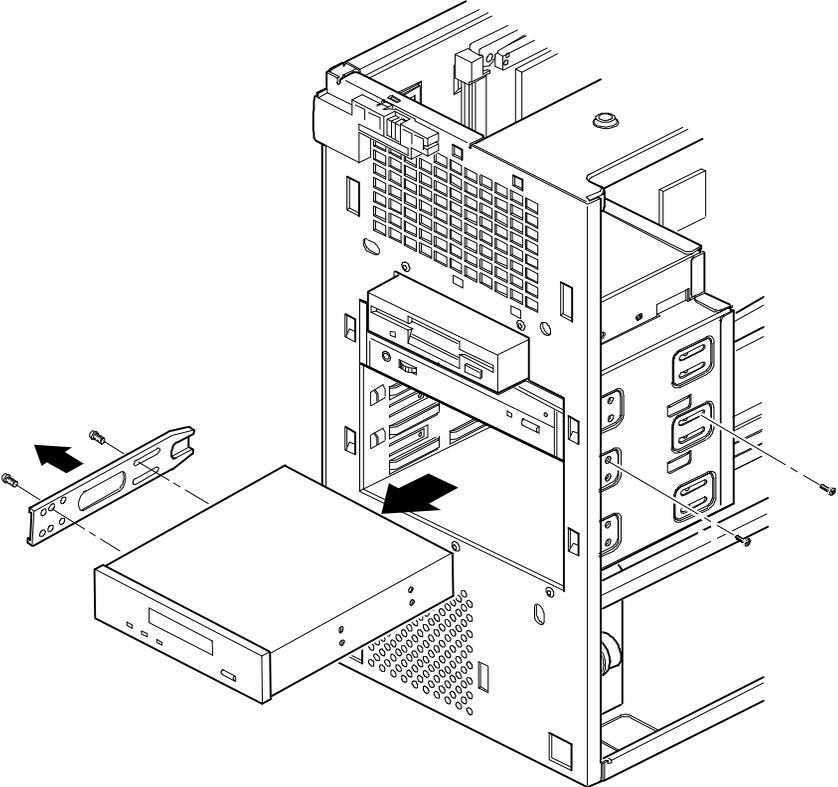


DEC00758-12

**Figure 5-39. Removing a 3½-Inch Device from Front Bay (Short Tower)**

## **Removing a 5¼-Inch Device (Short Tower)**

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Remove the front bezel.
4. Disconnect all power and data cables.
5. If necessary, remove the EMI shield.
6. Remove the two screws holding the drive to the bay.
7. Remove the 5¼-inch device, which includes the rail.
8. Remove the rail from the device.

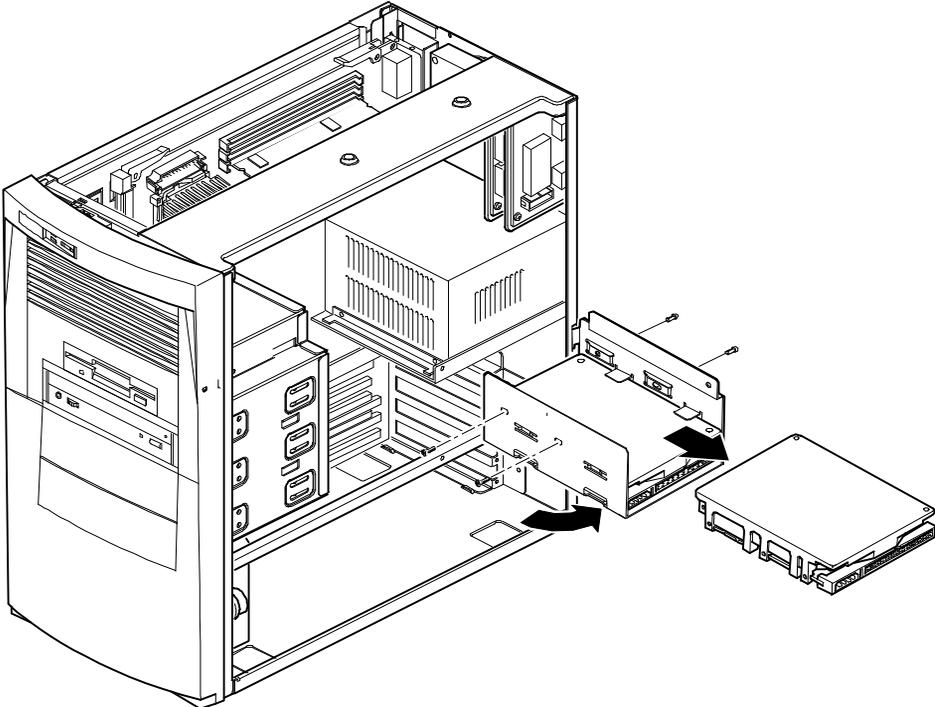


DEC00758-13

**Figure 5-40. Removing a 5 1/4-Inch Device (Short Tower)**

## **Removing an Internal 3½-Inch Device (Short Tower)**

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Disconnect all power and data cables.
4. Remove the screws securing the drive bay to the chassis.
5. Swing the device bay away from the chassis.
6. Remove the screws from the drive bay.
7. Remove the 3½-inch device.



DEC1182-5

**Figure 5-41. Removing an Internal 3 1/2-Inch Device (Short Tower)**

## IDE Drive Connections (Short Tower)

Figure Legend	IDE Drive Component
A	Backplane IDE drive connection (primary)
B	Power connections
C	Power supply
D	Primary IDE hard disk drive
E	Primary IDE hard disk drive connections
F	Backplane IDE drive connection (secondary)
G	Secondary IDE hard disk drive connections
H <sup>(1)</sup>	CD-ROM drive (not available on all models)

<sup>(1)</sup> The CD-ROM drive is connected to the secondary IDE port and configured as a master drive.



**NOTE:** When installing a CD-ROM drive, make sure that the hard disk drives are on one channel and the CD-ROM drive is on another. If you install a CD-ROM drive on the secondary/master channel and a hard disk drive on the secondary/slave channel, you might get a POST error and BIOS autodetect error. In addition, the hard disk drive on the secondary channel will be slowed to the same speed as the CD-ROM drive, resulting in poor hard disk drive performance and speed.

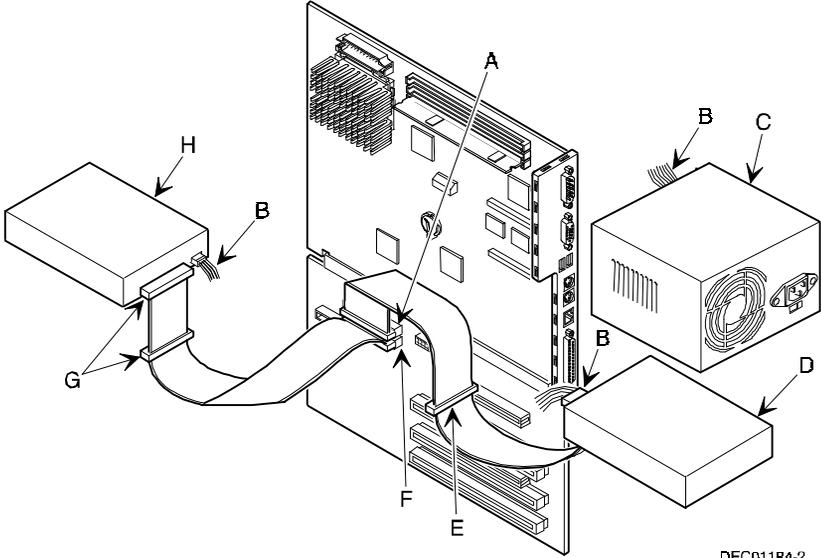
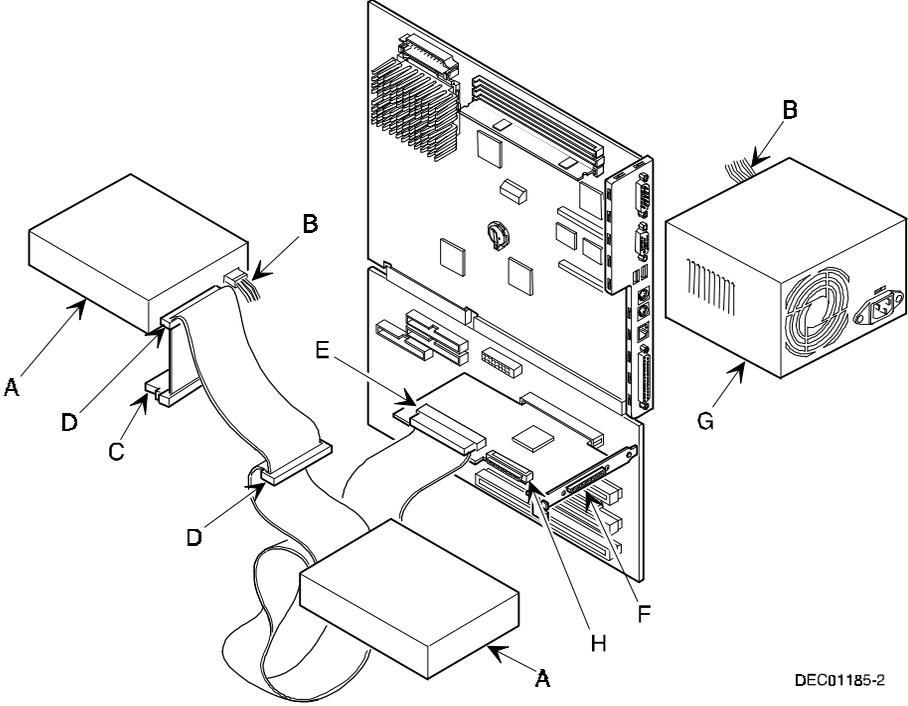


Figure 5-42. IDE Drive Connections (Short Tower)

## SCSI Drive Connections (Short Tower)

Figure Legend	Component
A	SCSI hard disk drives
B	Power connection
C	Single-ended active terminator
D	SCSI drive connectors
E	SCSI adapter connector (50-pin narrow)
F	External SCSI connector (68-pin wide)
G	Power supply
H	SCSI adapter connector (68-pin wide)

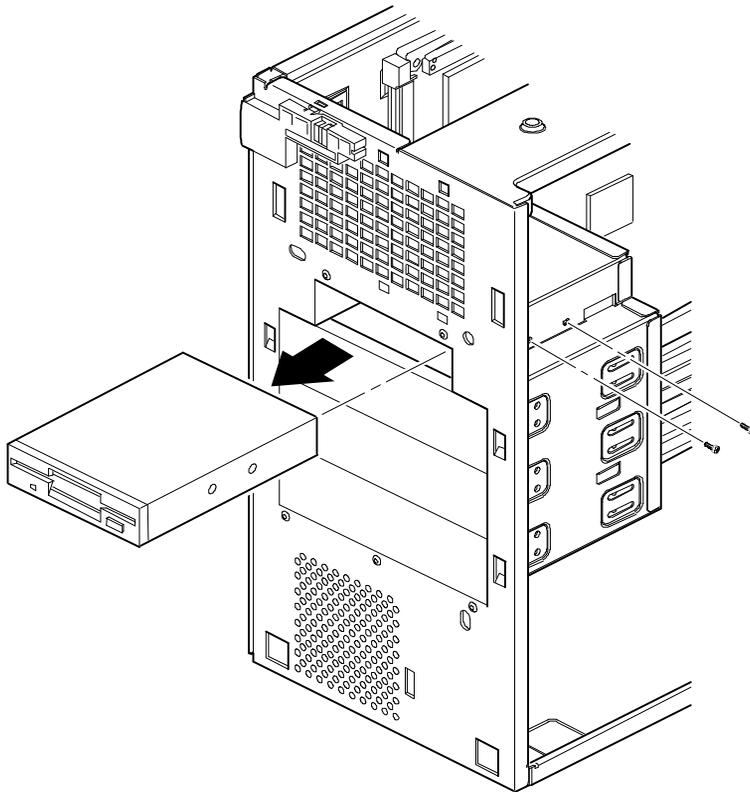


DEC01185-2

Figure 5-46. SCSI Drive Connections (Short Tower)

## **Removing the Diskette Drive (Short Tower)**

1. Turn off the computer, monitor, and then disconnect power from the computer.
2. Remove the outside cover.
3. Remove the front bezel.
4. Remove all power and data cables from the diskette drive.
5. Remove the screws.
6. Remove the diskette drive.

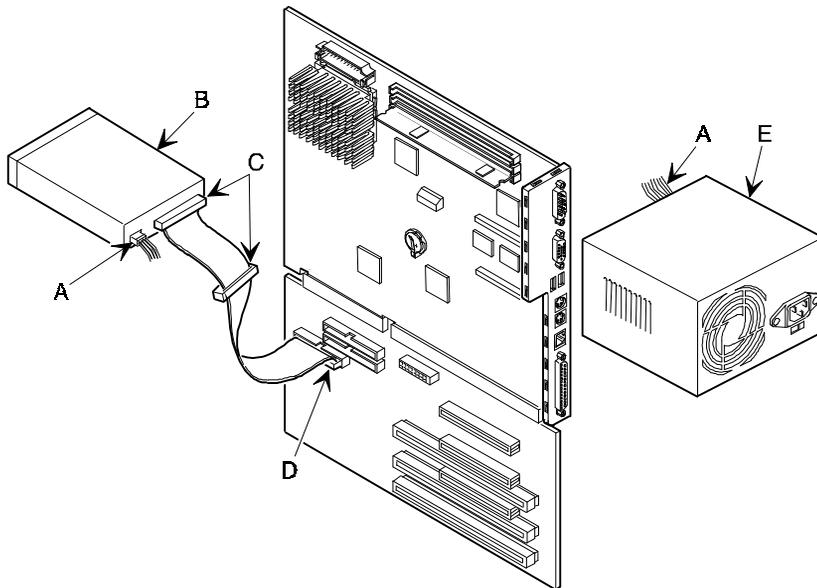


DEC00888-2

**Figure 5-47. Removing the Diskette Drive (Short Tower)**

## Diskette Drive Connections (Short Tower)

Figure Legend	Diskette Drive Component
A	Power connection
B	Diskette drive
C	Diskette drive connections
D	Backplane diskette drive connection
E	Power supply



DEC01183-2

Figure 5-48. Diskette Drive Connections (Short Tower)

## Introduction

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

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



**CAUTION:** Before changing any memory or address location, refer to the documentation supplied with the optional device, expansion board, or software application and make sure adequate information is available. If not, contact the option or software manufacturer for further information.

## Full Range Processor Memory Address Map

<b>Range</b>	<b>Function</b>	<b>Size</b>
0 to 9FFFFh	Base memory	640 KB
A0000h to BFFFFh	Video RAM	128 KB
C0000h to C7FFFh	Video BIOS	32 KB
C8000h to DFFFFh	BIOS extension ROM (AT bus used)	96 KB
E0000h to FFFFFh	PnP BIOS/APM BIOS	128 KB
100000h to FFFFFFFh	Extended memory	255 MB

## I/O Address Map

Range (hexadecimal)	Function
000 - 00F	DMA controller one
020 - 021	Interrupt controller one
040 - 043	Interval timer
060 - 06F	Keyboard controller
070 - 07F	Real-Time Clock (RTC), NMI
080 - 08F	DMA page register
0A0 - 0A1	Interrupt controller two
0C0 - 0CF	DMA controller two
0F0	Clear math co-processor busy
0F1	Reset math co-processor
0F8 - 0FF	Math co-processor
170 - 177	Secondary IDE controller
1F0 - 1F7	Primary IDE controller
220	Integrated audio I/O
278 - 27A	LPT2

*continued*

## Device Mapping

<b>Range (hexadecimal)</b>	<b>Function</b>
378 - 37A	LPT1
388	Audio, FM music synthesizer
3BC - 3BE	LPT3
3F0 - 3F7	Diskette (floppy disk) controller
3F6 - 3F7	Primary/secondary IDE controller (alt status, device address)
3F8 - 3FF	COM1
4D0	Edge/level control register - INTCNTRL1
4D1	Edge/level control register - INTCNTRL2
CF8 - CFF	PCI configure space control register
0FF0	Programming chip select
22 - 3F	Programming chip select
530	WSS I/O
F00	4236 Control I/O Base

## Computer Interrupt Levels

Interrupt Number	Interrupt Source
IRQ0	Timer tick
IRQ1	Keyboard controller
IRQ2	Cascade interrupt
IRQ3	Available
IRQ4	COM1, COM3 (if enabled)
IRQ5	Audio
IRQ6	Diskette (floppy disk) drive (if enabled)
IRQ7	LPT1, LPT3 (if enabled)
IRQ8	Real Time Clock (RTC)
IRQ9	Available
IRQ10	Available
IRQ11	Available
IRQ12	Mouse interrupt (if enabled)
IRQ13	Math co-processor
IRQ14	IDE primary (if enabled)
IRQ15	IDE secondary (if enabled)

## DMA Channel Assignment

Channel	Controller	Function
0	1	Available
1	1	Audio (if enabled)
2	1	Diskette (floppy disk) controller (if enabled)
3	1	Audio (if enabled)
4	2	Cascade DMA
5	2	Available
6	2	Available
7	2	Available

## Service Notes

---

**A**