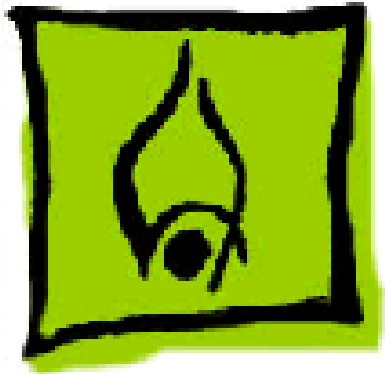




Power Macintosh G3/  
Macintosh Server G3  
(Blue and White)





## Hot Issues

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Power Macintosh G3/Macintosh  
Server G3 (Blue and White)





## Introduction

This chapter is designed to highlight unique or high-priority product issues that you should be aware of before servicing the Power Macintosh G3 (Blue and White) /Macintosh Server G3 (Blue and White) computer. **Note:** To avoid confusion with other products called “G3”, Service Source and Price Pages documentation added the words “Blue and White” after the product name.

This chapter alerts you to important issues and provides pointers to other areas in the manual where more complete information can be found.

To familiarize yourself with a new product family, always read the Basics chapter in its entirety. You should also refer to the Troubleshooting chapter for basic theory of operations information.





## Processor Module Vs. Card

Whereas previous Power Macintosh computers featured a user-installable processor card, this logic board uses a processor module that must not be removed by the customer (see “Processor Module” in the Take-Apart chapter).

## Processor Module Jumper

The Power Macintosh G3/Macintosh Server G3 logic board has a processor module jumper installed at J25. The processor jumper is color coded for the speed of processor module used (white jumper for 400 MHz, black jumper for 300 MHz, and blue jumper for 350 MHz). Failure to install the correct jumper may result in a computer that won't boot up. (See “Jumper Location) in the Troubleshooting chapter.







## Warranty Sticker

There is a warranty sticker that covers the processor module jumper. The customer's warranty is void if this sticker is tampered with. Service Providers must replace this sticker if they have removed it during servicing to protect the customer's warranty. (See "Processor Module" in the Take-Apart chapter.)

## Power Supply Voltage Setting

There is a switch on the back of the power supply that controls the voltage setting. The voltage switch must be set correctly to avoid damaging the computer. (See "Voltage Switch" in the Basics chapter for more information, including an international voltage chart.)





## I/O Card

Some I/O functions on the Power Macintosh G3/Macintosh Server G3 logic board are handled through a removable I/O card that must be installed for the computer to operate properly.

## SDRAM DIMMS

The DIMM modules used in any previous Power Macintosh or Power Macintosh G3 computer model are **not** compatible with the Power Macintosh G3/Macintosh Server G3 (Blue and White) described in this manual. The SDRAM DIMM modules **must be** PC-100 compliant, 168-pin, 3.3-volt, unbuffered, and rated at 125 MHz (8ns) or faster.





## **Characteristics of the memory to be used in Power Macintosh G3/Server G3 (Blue and White) are:**

- PC-100 SDRAM
- 3.3 Volt unbuffered ONLY
- 168 pin module
- Data width = 64 bits wide
- Contains a correctly programmed Serial Presence Detect ROM (256 bytes)
- Sizes of 32 MB, 64 MB, 128 MB in 64 Mbit technology are qualified.
- Sizes of 128 MB and 256 MB in 128 Mbit technology are qualified.
- Maximum DIMM height £ 2.0”
- PC-100 SDRAM includes a sticker that clearly shows “PC-100”





Do **NOT** use:

- Parity SDRAM DIMMs.
- ECC (error correcting) SDRAM DIMMs.
- Registered or buffered SDRAM
- DIMMs with fewer than 4 or more than 16 devices (irrespective of any PC-100 sticker or claims)

(For more information see “SDRAM DIMMs” in the Basics chapter or refer to the Memory Guide.)

“PC-100” is an Intel-driven standard for DIMMs compatible with Intel 100 MHz systems. Intel requires prominent marking of the DIMM as PC-100, and requires the speed code to be listed as well. Power Macintosh G3/Server G3 (blue and white) is compatible with 3-2-3 (slowest), 3-2-2, and 2-2-2 (fastest) speed codes. Power Macintosh G3/Server G3 (blue and white) will read the presence detect ROM for information about all the DIMMs installed in the





machine, and set memory timing equal to the slowest DIMM.

Therefore, for maximum performance use only 2-2-2 speed codes. However, the difference in application performance between the speed codes is small. Power Macintosh G3/Server G3 (blue and white) typically ships with a single 3-2-2 DIMM. This may change over time.

Power Macintosh G3/Server G3 (blue and white) is NOT compatible with ALL defined PC-100 DIMM sizes and organizations. In particular, do not use DIMMs using 256 Mbit SDRAMs; also, do not use DIMMs employing 32-bit wide SDRAM's.

Power Macintosh G3/Server G3 (blue and white) cannot use the older EDO or Fast Page Mode DRAMs. In general, you will not be able to re-use DRAM from past Macintoshes (8500, 8600, PM G3, iMac) in your Power Macintosh G3/Server G3 (blue and white). However, there have been some recent





efforts to qualify PC100 SDRAM for later versions of G3.

Zero MB of memory is soldered to the Power Macintosh G3/Server G3 (blue and white) main logic board. If the all four of the DIMM slots are empty, the machine will not operate. A single-frequency tone will be generated indicating that no memory is installed.

The DRAM DIMMs can be installed one or more at a time. There are no performance gains when two DIMMs of the same size are installed. Any supported size DIMM can be installed in any DIMM slot, and the combined memory of all of the DIMMs installed will be configured as a contiguous array of memory.

Using all four of Power Macintosh G3/Server G3 (blue and white)'s DRAM DIMM slots, the maximum memory configuration will be 1024 Mbytes (1.0 Gigabyte). When using 256 Mbyte DIMMs in a Power Macintosh G3/Server G3





(blue and white), be sure that the device technology that comprises the DIMM is 128 Mbit and not 64Mbit or 256 Mbit.

## SGRAM Video Memory

The Power Macintosh G3 computer does not include built-in video RAM nor a slot for video RAM expansion on the main logic board. The accelerated graphics card installed in the computer includes 16 MB of SDRAM video memory and does not support video RAM expansion.



## Basics

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Power Macintosh G3 (Blue and White) / Macintosh Server G3







## Overview

The Power Macintosh G3 computer is Apple's leading performance and multiple configuration system for creative content customers. This Power Macintosh G3 provides a fast system architecture supported by improved and faster microprocessors, memory access, PCI bus and I/O.

Click the movie icon at the left to view a QuickTime VR movie of the Power Macintosh G3.



movie.studio





## Features

There are standard features available with every Power Macintosh G3 computer as well as build-to-order features that are optional. The standard and optional features are listed below:

- **Microprocessor:** PowerPC G3 microprocessor running at a clock frequency of 300 MHz, 350 MHz, or 400 MHz depending on model and configuration.
- **Cache:** 512 KB of back-side second-level (L2) cache on processor module. The cache runs at half the clock frequency of the microprocessor.
- **Processor system bus:** 64-bit wide data and 32-bit wide address, 100 MHz clock, supporting split address and data tenures.





- **RAM:** four DIMM slots for 168-pin industry standard SDRAM (synchronous dynamic access memory) DIMMs (dual inline memory modules). Maximum memory with all four slots occupied is 1024 MB.
- **ROM:** New World ROM-in-RAM implementation with 1 MB of BootROM.
- **Graphics acceleration:** 2D and 3D hardware graphics acceleration using the ATI RAGE 128 GL graphics controller on the 66 MHz 2D/3D accelerated graphics card. Software support through Macintosh QuickDraw 3D and QuickDraw 3D RAVE (rendering acceleration virtual engine) APIs.
- **Sound:** supports 16 bits/channel stereo input and output on built-in 3.5mm line-level stereo input and output jacks, one built-in speaker.





- **Hard disks:** Standard Macintosh configurations include one internal Ultra ATA hard disk, or one, two, or three internal Wide Ultra2 SCSI drives.
- **Expansion bays:** three expansion bays, one of which is occupied by an Ultra DMA/33 hard disk or one Wide Ultra2 SCSI drive. Two bays are available for adding other devices connected to a PCI controller card.
- **CD-ROM drive:** internal 24X-speed ATAPI CD-ROM drive.
- **DVD-ROM drive:** optional ATAPI DVD-ROM drive providing support for 32X-speed CD-ROM and 5X-speed DVD-ROM media, as well as DVD-Video playback with DVD MPEG2 decode module. The DVD MPEG2 decode module is connected to the PCI graphics card in DVD configurations.





- **Zip drive:** optional 100 MB ATAPI Zip drive. If the Zip drive option is not installed at the time of purchase, data and power connectors are provided to add an ATAPI Zip drive to the system. A bezel for the Zip configuration will need to be installed. The Zip device should be device-select jumpered as Device 1.
- **USB ports:** The computer comes with two USB ports; a USB mouse and a USB keyboard that has two additional USB ports.
- **ADB port:** one ADB port for ADB devices or ColorSync control of Apple monitors.
- **Ethernet:** built in Ethernet port for a 10Base-T and 100Base-TX operation with an RJ-45 connector.
- **FireWire ports:** two IEEE-1394 high-speed serial FireWire ports, which support transfer rates of 100, 200, and 400 Mbps.
- **Modem:** optional Apple 56Kbps modem. The modem supports K56flex and V.90 modem standards.





- **Keyboard:** Apple USB keyboard with function keys and inverted-T cursor motion keys. It is also a bus-powered USB hub with two USB ports.
- **Mouse:** Apple USB mouse operating as a low-speed (1.5 Mbps) USB device.
- **PCI card expansion slots:** three slots for 33 MHz, 32-bit or 64-bit, up to a 12-inch PCI card; one slot for a 66 MHz 32-bit PCI card, normally occupied by the accelerated graphics card.
- **Power switch:** soft power controlled from the Apple USB keyboard and front power button.
- **Voltage switch:** can be set to either 115 for voltages of 100–130 V or 230 for voltages of 200–250 V, depending on the voltage where the computer is installed. The voltage selection must be set manually.





- **Fan speed control:** The speed of the fan is thermally controlled and is automatically set to the lowest possible speed to minimize noise. The fan speed varies according to the temperature inside the enclosure. This is a function provided by the fan, and is not under software control.
- **Energy saving:** sleep, startup, and shutdown scheduling can be controlled with an Energy Saver control panel.



## Build-to-Order Option

The build-to-order option that follows is available from the Apple Store.

- Internal 56K Modem card







## Front and Rear View

Front View

Rear View





## Right Side View



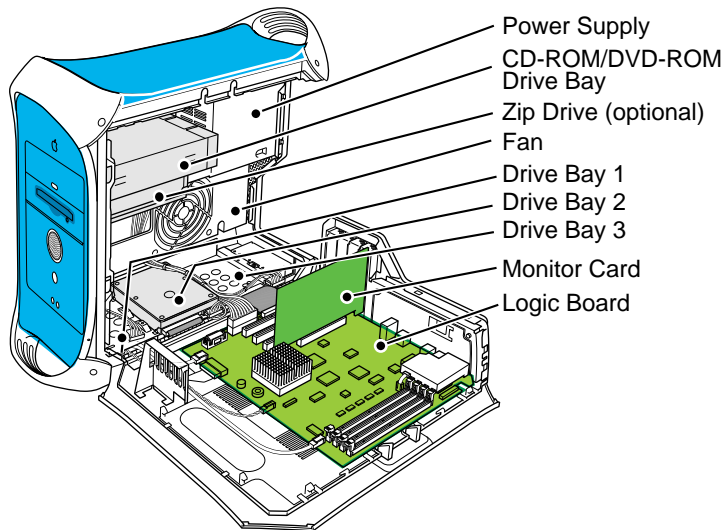


## Left Side View



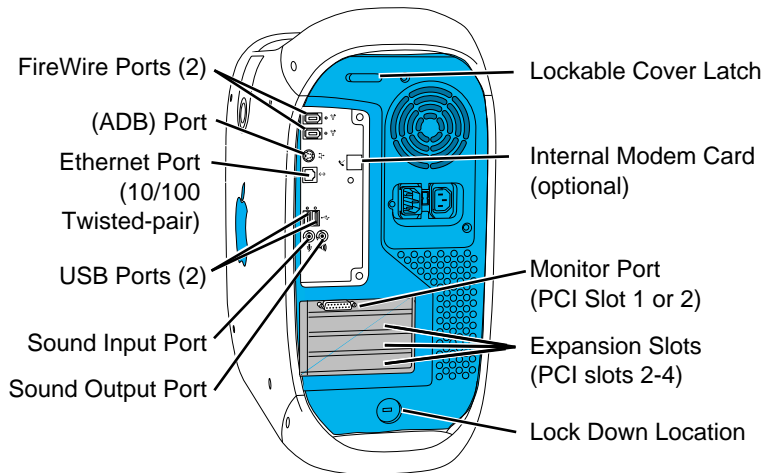


## Internal Locator



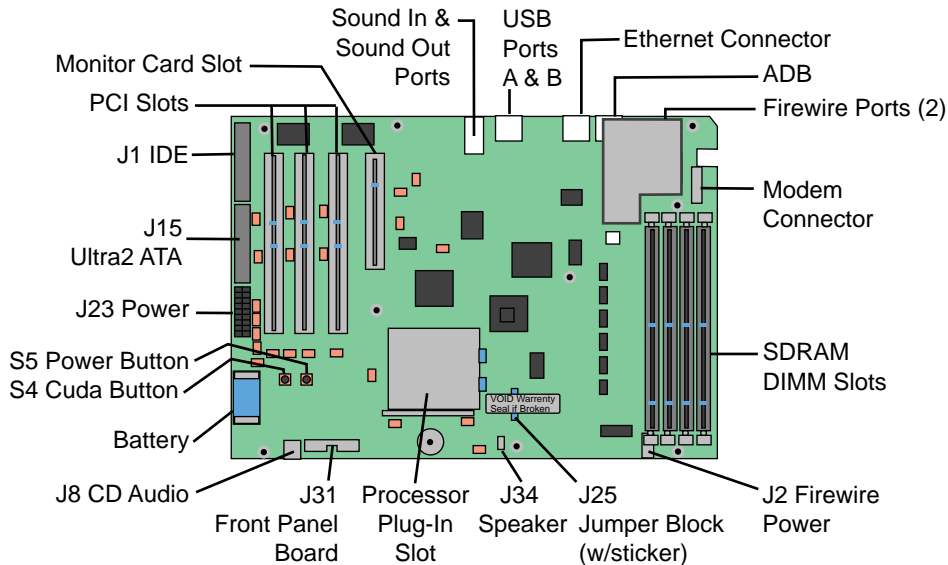


## I/O Panel/Rear View





# Logic Board Diagram





## RAM Expansion

The Power Macintosh G3 logic board provides four PC-100 DIMM slots, supporting a maximum of 256 MB per DIMM, for a total of 1 GB.

Compatible DRAM DIMMs must meet all the following specifications:

- PC-100 Synchronous DRAM (SDRAM)
- 3.3 volt
- 64-bit wide, 168-pin module
- Maximum of 16 memory devices on the DIMM
- Unbuffered; do not use registered or buffered Synchronous DRAM (SDRAM)
- Maximum height of 2.0 inches.

DIMMs from older Macintosh computers may physically fit in the slots, but they are not compatible and should not be used.





**Note:** Zero MB of memory is soldered to the Power Macintosh G3 logic board. If all four of the DIMM slots are empty, the machine will not operate. A single-frequency tone will be generated indicating that no memory is installed.

## No Video RAM Expansion

The Power Macintosh G3 computer does not include built-in video RAM nor a slot for video RAM expansion on the main logic board. The accelerated graphics card that will be installed in the computer includes 16 MB of SDRAM video memory and does not support video RAM expansion.







## No L2 Cache Expansion

The back-side L2 cache is integrated into the design of the microprocessor module. No cache expansion is possible without replacing the entire module.



## DVD-ROM and DVD MPEG2 Decode Card Module

The DVD-ROM drive configuration includes an DVD MPEG2 decode card module. The DVD MPEG2 decode card module supports viewing DVD video movies on a monitor connected to the 15-pin video output port on the PCI 2D/3D accelerated graphics card. DVD digital audio from the DVD media is sent to a DAC (digital-to-analog converter) and then to the Burgundy IC for analog stereo sound output to the currently selected sound output port.





## Peripheral Component Interconnect (PCI)

The Power Macintosh G3 computer includes four PCI expansion slots. Three of the slots are 5V, 64-bit, 33 MHz slots that support both 32-bit and 64-bit PCI cards that are compliant with the PCI V2.1 specification. The other slot, is a 3.3V, 32-bit, 66 MHz slot dedicated to a 2D/3D accelerated graphics card.

The 66 MHz PCI slot conforms to the PCI V2.1 specification with the exception that its clock speed is fixed at 66 MHz so it does not accept 33 MHz cards. The 66 MHz PCI slot is keyed for 3.3V only operation. Older 5V cards cannot be installed in the 66 MHz PCI slot.

The 3.3V 66 MHz PCI graphics card that comes installed in the 66 MHz PCI slot cannot be used in one of the 33 MHz PCI slots.





## Expansion Card Power Requirements

The combined power consumption of expansion cards must not exceed the limits specified for the Macintosh model. To avoid damaging the computer and expansion card, do not install any expansion card without first checking the documentation for that card.

You can use the three 33 MHz expansion slots to install

- three 15 W cards
- one 15 W or 25 W card
- two 15 W or 25 W cards
- one 15 W card and one 25 W card





## Drives Installed

There are five internal drive bays. Three are in the lower part of the computer and two are in front on top. In many configurations, a single hard disk occupies the rear position on the lower drive carrier, and a CD-ROM or DVD-ROM drive and Zip drive fill the upper bays.

The computer supports additional SCSI drives, which fit on the lower drive carrier. Depending on the configuration purchased, one or two additional SCSI drives can go in the unoccupied positions on the carrier. (Some drives also require a PCI card to function.)





The computer provides support for the following types of internal hard disk drives:

- ATA devices (includes ATA, ATA-2, and ATA-3 devices, which are also called IDE or EIDE devices)
- Ultra ATA devices (sometimes called ATA-4 devices)
- Fast SCSI (with the PCI card)
- Ultra SCSI (with the PCI card)
- Standard SCSI (with the PCI card)
- Wide Ultra SCSI devices (with the PCI card included in some configurations)
- Wide Ultra2 SCSI devices (with the PCI card included in some configurations)
- ATAPI drives, including CD-ROM, DVD-ROM, and Zip drives

Standard Macintosh configurations include one internal Ultra ATA hard disk, or one, two, or three internal Wide Ultra2 SCSI drives.





## Ultra ATA Drives

The Power Macintosh G3 accommodates one internal ATA device in the lower drive carrier. If the Power Macintosh G3 model has an Ultra ATA drive in it, the drive sits in the rear of the carrier in position number 3.

## Wide Ultra2 SCSI Drives

Standard Macintosh configurations include one internal Ultra ATA hard disk, or one, two, or three internal Wide Ultra2 SCSI drives.

If the model has at least one internal Wide Ultra2 SCSI drive, a PCI card and cable inside the computer, it is possible to connect additional internal and external Wide Ultra2 SCSI devices. You can connect up to three internal SCSI drives or connect additional SCSI devices to the port the card provides on the rear of the computer.





If the computer came with one Wide Ultra2 SCSI drive, it is installed in the lower drive in position 1, near the front of the computer. If it came with two drives, the second one is installed in position 2. If a third drive is installed, it's in position 3. The factory sets the drive in position 1 to start up. The startup drive can be changed in the Control Panel.

Additional internal Wide Ultra2 SCSI devices connect to the data cable supporting the drive that came with the computer. This cable has a built-in terminator so you don't need to add one.

You must assign a SCSI ID number to every additional device and the number must not conflict with the ID number already assigned to a drive on the SCSI chain. If the computer came with one Wide Ultra2 SCSI drive, it has ID 0. If the Macintosh came with two drives, they have ID 0 and 1. A third factory-installed drive has ID 2. The SCSI PCI card has ID 7.







## Other Types of SCSI Drives

The SCSI card inside the Power Macintosh G3 supports other types of Wide Ultra SCSI drives, as well as Wide Ultra2 SCSI devices. However, if you mix the different kinds, the system will operate at the speed of the slowest device. If you want optimal performance using the card, use only Wide Ultra2 SCSI devices. To maintain optimal performance using another kind of SCSI device, add a PCI card that supports the device.





## ATAPI CD-ROM Drive

The Power Macintosh G3 computer has a 24X-speed internal ATAPI CD-ROM drive. The CD-ROM drive supports the worldwide standards and specifications for CD-ROM and CD-digital audio discs described in the Sony/Philips Yellow Book and Red Book. The drive can read CD-ROM, CD-ROM XA, CD-I, and PhotoCD discs as well as play standard audio discs.

The CD-ROM drive has a sliding tray to hold the disc. The drive features a mechanism that supports 4X, 8X, 12X, and 24X data transfer rates and a data buffer that further enhances performance. The CD is configured as device 0 (master) in a ATA Device 0/1 (master/slave) configuration.

0=master

1=slave





## Optional ATAPI Zip Drive

The Zip drive is an ATAPI drive and is connected as device 1 (slave) in an ATA Device 0/1 (master/slave) configuration on the ATA-3 channel of the main logic board.

## Optional DVD-ROM Drive

The optional DVD-ROM drive is fully compatible with existing CD-ROM media. The drive supports CD-ROM at 32x speed maximum and DVD at 5x constant linear velocity (CLV). The DVD-ROM drive supports the following disc formats:

- DVD-ROM (One- or two-layer, one- or two-sided)
- CD-ROM (Modes 1 and 2), CD-ROM XA (Mode 2, Forms 1 and 2),
- CD-Audio, Photo CD, CD-RW, CD-R, CD-Extra
- CD-I (Mode 2, Forms 1 and 2), CD-I Ready, CD-I Bridge
- Video CD





## I/O Ports

### **ADB Port**

The Power Macintosh G3 computer has an Apple Desktop Bus (ADB) port for ADB devices and ColorSync control of Apple monitors. The (ADB) port is functionally the same as on other Macintosh computers.

### **USB Ports**

The Power Macintosh G3 computer has two Universal Serial Bus (USB) ports that are used to connect the keyboard and mouse as well as additional I/O devices such as printers, scanners, and low-speed storage devices. The USB ports take the place of the serial I/O ports found on earlier Macintosh computers. The Power Macintosh G3 uses a USB keyboard and





mouse similar to the USB keyboard and mouse introduced with the iMac computer.

## **Keyboard**

The computer comes with an Apple USB keyboard. An extension cable is provided for installations where the computer is located on the floor or away from the immediate desktop area.

## **Mouse**

The Apple USB mouse is designed to work with the computer by way of the USB ports. The mouse case is round and has the same two-tone color design as the case of the computer.





## FireWire Ports

The computer includes two external FireWire IEEE 1394 ports on the rear panel of the enclosure. The features of the FireWire ports are:

- High-speed serial I/O supports 100, 200, and 400 Mbps (megabits per second)
- Provide 15 watts of power when the computer system is on
- Accepts external power input on FireWire bus when system is off

## No SCSI Ports

The Power Macintosh G3 computer does not include built-in internal or external SCSI device connectors. Adding an internal or external SCSI device requires the use of a SCSI PCI card.





## Ethernet Port

The Power Macintosh G3 computer has a built-in 10/100 Mbps Ethernet port. The user can connect it to either a 10Base-T or a 100Base-TX hub; the port will automatically sense which type of hub is connected.

The connector for the Ethernet port is a an RJ-45 connector on the back of the computer.

The Ethernet interface in the Power Macintosh G3 computer conforms to the ISO/IEC 802.3 specification, where applicable.





## Internal Modem

The Power Macintosh G3 computer includes an option for an internal modem. The modem interface to the main logic board is a 70-pin connector. The external I/O connector for the modem is an RJ-11 connector located on the rear of the computer. The modem has the following features:

- modem bit rates up to 56 Kbps (supports K56flex and V.90 modem standards)
- fax modem bit rates up to 14.4 Kbps

The modem appears to the system as a serial port that responds to the typical AT commands. The modem provides a sound output for monitoring the progress of the modem connection.







## Sound

The Power Macintosh G3 is not configured as a typical AV style Power Macintosh in that it does not have RCA jacks for sound in and out, nor additional video in and out ports. Instead it relies on external FireWire devices for providing advanced audio/video capabilities.

### Sound System

The sound system for the Power Macintosh G3 computer supports 44.1 kHz 16-bit stereo sound output and input, available simultaneously.

Like other AV class Macintosh computers, the sound circuitry and system software can create sounds digitally and either play the sounds through speaker inside the enclosure or send the sound signals out through the sound





output jack. The Power Macintosh G3 computer also records sound from several sources: an analog sound source connected to the line-level sound input jack, analog sound from the modem card connected to the internal modem connector, or a compact disc in the CD-ROM player. With each sound input source, sound playthrough can be enabled or disabled.

## Sound Output

The Power Macintosh G3 computer provides one 3.5-mm mini jack for sound output on the back of the enclosure. The output jack is connected to the sound amplifier; the mini jack is intended for connecting a pair of headphones or amplified external speakers. Inserting a plug into the sound output mini jack disconnects the internal speaker. The enclosure has one built-in speaker.





The Burgundy IC provides the stereo sound output to both the internal speakers and the sound output jack. The sound output jack has the following electrical characteristics:

- output sound signal to noise ratio (SNR) <90 dB unweighted (typical) when sound playback is from system hard disk drive or main memory
- output sound SNR <80 dB unweighted (nominal) when playback is from CD
- overall output sound SNR <90 dB unweighted (typical)

## Sound Input

The Power Macintosh G3 computer provides a stereo sound input jack on the back of the enclosure for connecting an external PlainTalk microphone or other sound source. The sound input jack accepts a standard 3.5-mm stereophonic phone plug (two signals plus ground).





**Note:** The Apple PlainTalk microphone requires power from the main computer, which it obtains by way of an extra-long, 4-conductor plug that makes contact with a 5-volt pin inside the sound input jack.

The sound input jack has the following electrical characteristics:

- input impedance: 20 kW
- maximum input level without distortion: 2.5 V peak to peak (Vpp) maximum
- line-level microphone voltage range of 0.28 V to 2.1 V peak to peak
- input SNR <90 dB unweighted (typical) for recording to system hard disk drive or system main memory





## Digitizing Sound

The sound circuitry digitizes and records sound as 44.1 kHz 16-bit samples. If a sound sampled at a lower rate on another computer is played as output, the Sound Manager transparently upsamples the sound to 44.1 kHz prior to outputting the audio to the Burgundy sound IC.

The preferred sound sampling rate for output is specified in the Monitors and Sound control panel when the sound input is not in use. The preferred output sampling rate is overridden by the setting of the input sampling rate, because the input and output sampling rates are physically locked together. The sound output sampling rate is always 44.1 kHz.

When recording sound from a microphone, applications that are concerned about feedback should disable sound playthrough by calling the Sound Manager APIs.





The Burgundy IC provides separate sound buffers for input and for stereo output so that the computer can record and send digitized sound to the sound outputs simultaneously.



## The Cuda Chip

The Cuda is a microcontroller chip. Its function is to

- Turn system power on and off
- Manage system resets from various commands
- Maintain parameter RAM (PRAM)
- Manage the Apple Desktop Bus (ADB)
- Manage the real-time clock

Many system problems can be resolved by resetting the Cuda chip (see Symptom Charts for examples). Press the Cuda reset button on the logic board to reset the Cuda chip. (The Cuda reset button (S4) is near the battery. See “Logic Board Diagram” earlier in this chapter.) If you continue to experience system problems, refer to “Resetting the Logic Board” in the Troubleshooting chapter.





## Resetting the Logic Board

Resetting the logic board can resolve many system problems (refer to “Symptom Charts” for examples). Whenever you have a unit that fails to power up, you should follow this procedure before replacing any modules.

- 1 Unplug the computer.
- 2 Remove the battery from the logic board.
- 3 Disconnect the power supply cable from the logic board and then press the Power On button. (See “Logic Board Diagram” later in this chapter to locate the Power On button.)
- 4 Wait at least 10 minutes before replacing the battery.
- 5 Make sure the battery is installed in the correct +/- direction.







6 Reassemble the computer and test the unit.

**Note:** This procedure resets the computer's PRAM. Be sure to check the computer's time/date and other system parameter settings afterwards.





## Voltage Switch

The power supply is not self-configuring for different input voltages. The voltage switch is delivered preconfigured for the input voltage of the region in which the unit is originally purchased. If the computer is moved to another location where the input voltage is different, a voltage switch **must** be adjusted to accommodate the voltage change. The switch has two positions that support voltage ranges of 100 to 130 V or 220 to 270 V.



## Repair Strategy

Service the Power Macintosh G3/Macintosh Server G3 computers through module exchange and parts replacement. Customers can request on-site service from an Apple Authorized Service Provider Plus (AASP+) Apple Assurance (US only), or Apple Canada Technical Answerline (Canada only). They can also choose carry-in service from an AASP.

## Ordering

Apple Service Providers planning to support the computer systems covered in this manual may purchase Service modules and parts to develop servicing capability. To order parts, use the AppleOrder (US only) or ARIS (Canada only) system and refer to the Power Macintosh G3 (Blue and





White) and Macintosh Server G3 (Blue and White) “Service Price Pages.”

Large businesses, universities, and K-12 accounts must provide a purchase order on all transactions, including orders placed through the AppleOrder (US only) or ARIS (Canada only) system.

### **USA Ordering**

US Service providers not enrolled in AppleOrder may fax their orders to Service Provider Support (512-908-8125) or mail them to

Apple Computer, Inc.  
Service Provider Support  
MS 212-SPS  
Austin, TX 78714-9125





For US inquiries, please call Service Provider Support at 800-919-2775 and select option #1.

### **Canadian Ordering**

Canadian Service providers not enrolled in ARIS may fax their orders to Service Provider Support in Canada (1-800-903-5284). For Canadian inquiries, please call Service Provider Support at 905-513-5782 and select option #3.





# Warranty/AppleCare/ARIS

## **US Only**

The Power Macintosh G3 / Macintosh Server G3 computers are covered under the Apple One-Year Limited Warranty. The AppleCare Service Plan is also available for these products. Service Providers are reimbursed for warranty and AppleCare repairs made to these computers. For pricing information, refer to “Service Price Pages.”

## **Canada Only**

The Power Macintosh G3 / Macintosh Server G3 computers are covered under AppleCare. The Extended AppleCare Service Plan is also available for these products. Service Providers are reimbursed for warranty and AppleCare repairs made to these computers. For pricing information, refer to “Service Price Pages.”





## Specifications

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Power Macintosh G3 (Blue and White) / Macintosh Server G3



# Introduction

Specifications information for this product can be found in the Spec Database, which you can access in one of three ways:

- Launch it directly by double-clicking the Apple Spec Database runtime alias at the top level of the Main Service Source CD.
- Select "Apple Spec Database" from the Service Source drop-down main menu.
- Click the Acrobat toolbar icon for the database, which is near the right end of the toolbar with the letters "SP."







## Take Apart

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Power Macintosh G3 (Blue and White) / Macintosh Server G3





## Tools

- Flatblade screwdriver
- Phillips screwdriver
- Allen wrench (2.5 mm), to remove the power supply, side panels, top and rear handles, and front and rear supports
- Jeweler's screwdriver, to remove the I/O panel cover
- Needlenose pliers, to remove the right and left side panels
- ESD Mat





## Opening the Computer

No preliminary steps are required before you begin this procedure.





- 1 Lift the latch to unlock the right side panel.

**Note:** Make sure security bar is in the unlock position.

- 2 Gently lower the side panel onto a clean, ESD mat, to avoid scratching the case. Lower the side panel until it lies flat.

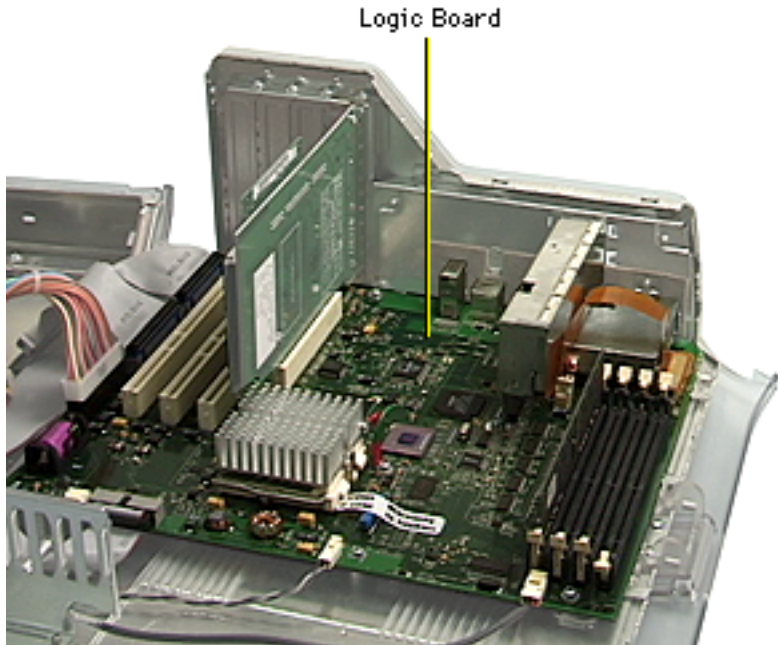


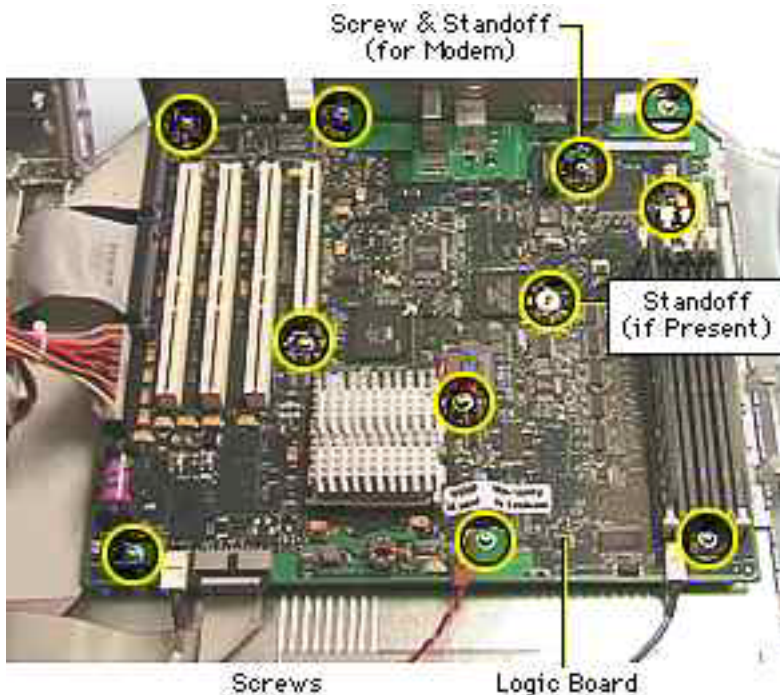


## Logic Board

Before you begin, open the side access panel and remove the following:

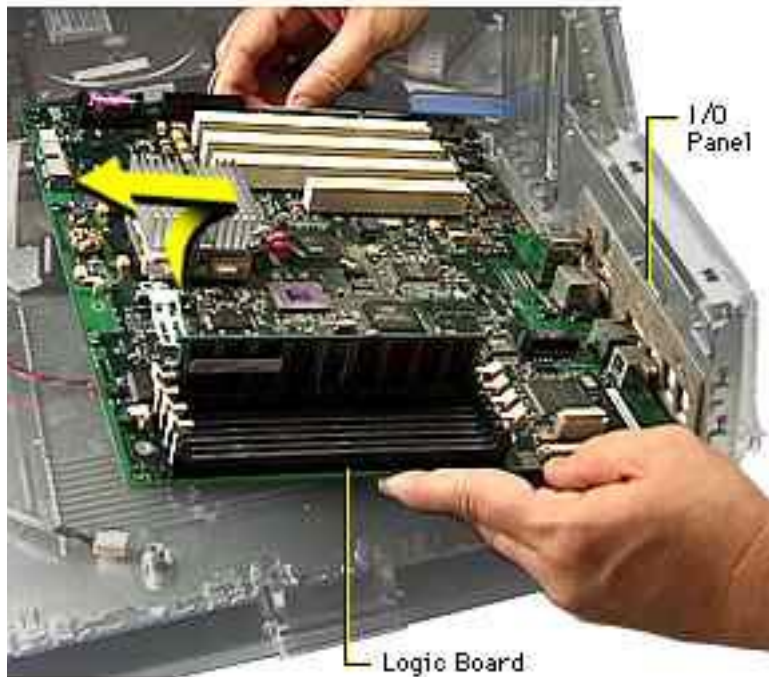
- PCI cards (if present)
- Video card
- FireWire board (if present)
- Modem (if present)





- 1 Disconnect all the cables from the logic board.
- 2 Using a Phillips screwdriver, remove the logic board mounting screws and standoff which attaches to the FireWire board (if present).





- 3 Tilt the logic board so that the ports clear the openings in the I/O panel.
- 4 Lift the board out of the computer.

**Important:** If you are replacing the logic board, you must transfer the processor module, processor jumper, and DRAM from the original logic board to the replacement board. See the take-apart instructions for the “Processor Module” for more information. You must



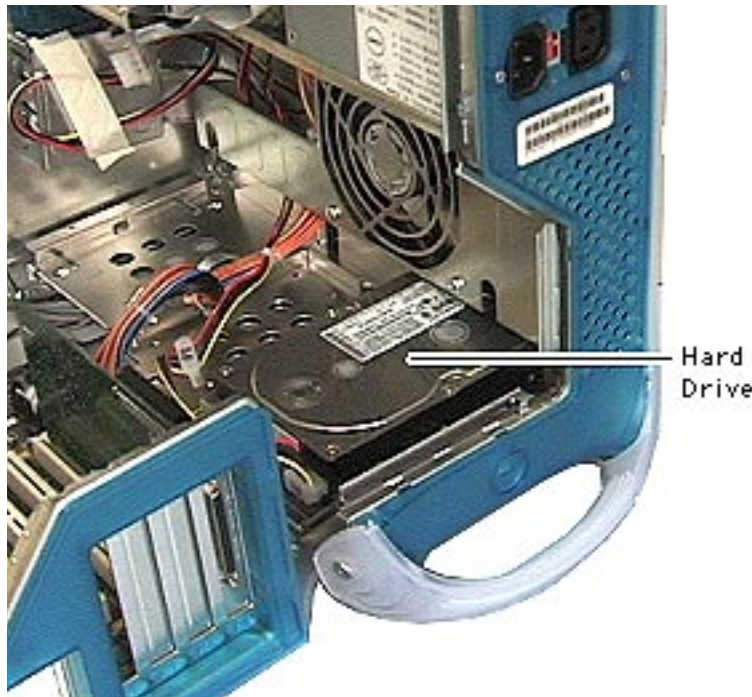


also cover the processor jumper with a new warranty sticker, which comes with the replacement logic board. This sticker must be in place to protect the customer's product warranty.

**Note:** Before returning the logic board to Apple, remove the processor module, processor jumper block and warranty sticker, DRAM, the Video I/O card, and any PCI cards (if present).





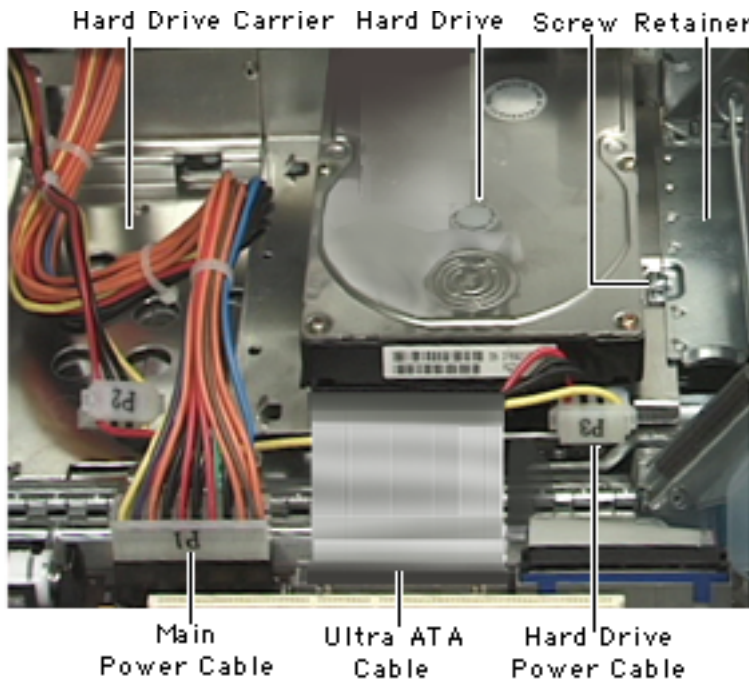


## Hard Drive, IDE / ATA

Before you begin, open the side access panel.

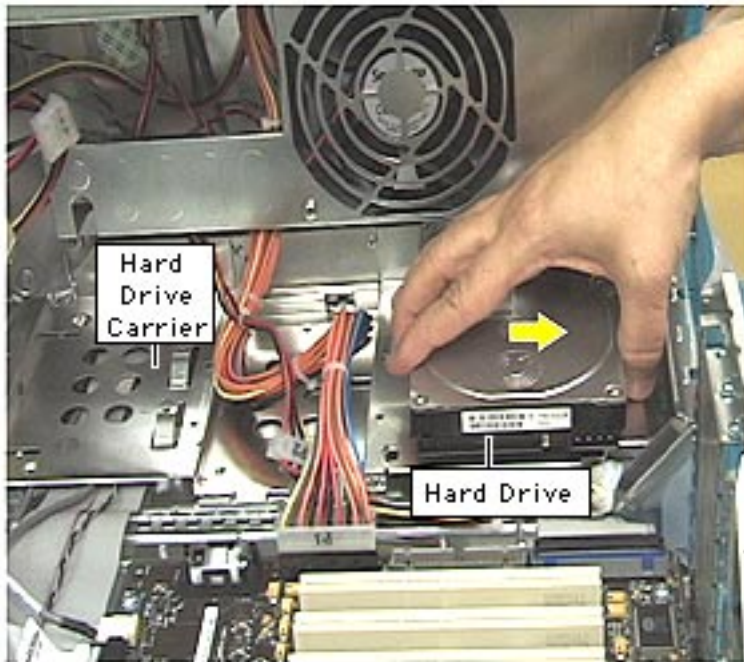
**Note:** This computer can accommodate one internal ATA device in the lower drive carrier. If this model was purchased with an Ultra ATA drive in it, the drive sits in the rear of the carrier in drive bay number 3. The hard drive carrier is etched with the drive bay numbers, 1, 2, and 3.





- 1 Disconnect the main power cable and the Ultra ATA hard drive cable from the logic board.
- 2 Disconnect the hard drive power cable (P3) from the back of the hard drive in bay 3.
- 3 Remove the screw securing the hard drive carrier and the retainer.





- 4 Slide the carrier toward the rear of the computer to unhook the carrier from the tabs on the chassis. Lift the carrier (with the drive still attached) out of the chassis.

### **Replacement Note:**

The power cables attach to the hard drives in the following manner:

P5 attaches to Bay 1

P2 attaches to Bay 2

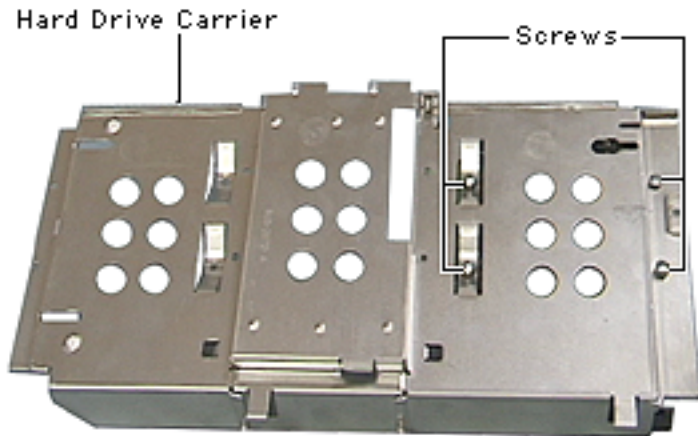
P3 attaches to Bay 3

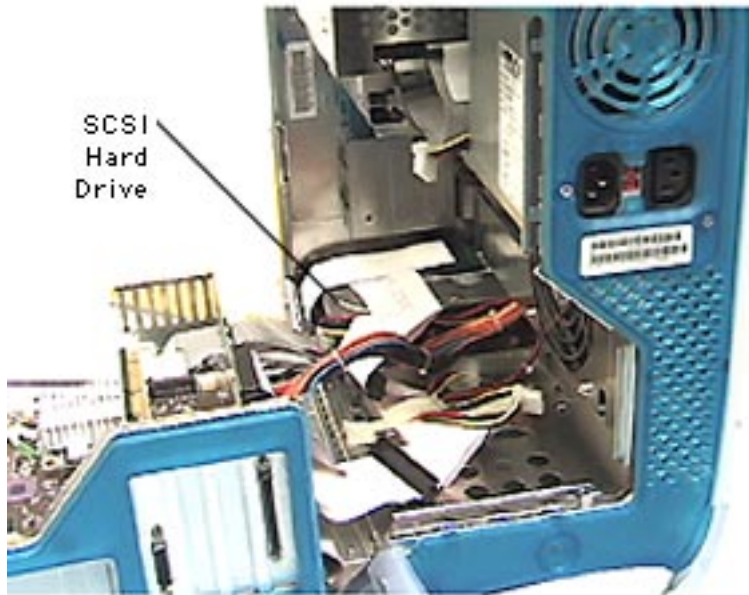




- 5 Remove the four screws from the underside of the hard drive carrier.
- 6 Lift the hard drive off the carrier.

**Note:** Return drives without cables or carriers. Exchange Apple hard drive modules in Apple packaging. Failure to comply with this requirement may result in a packaging noncompliance charge. Refer to the parts database for more information.

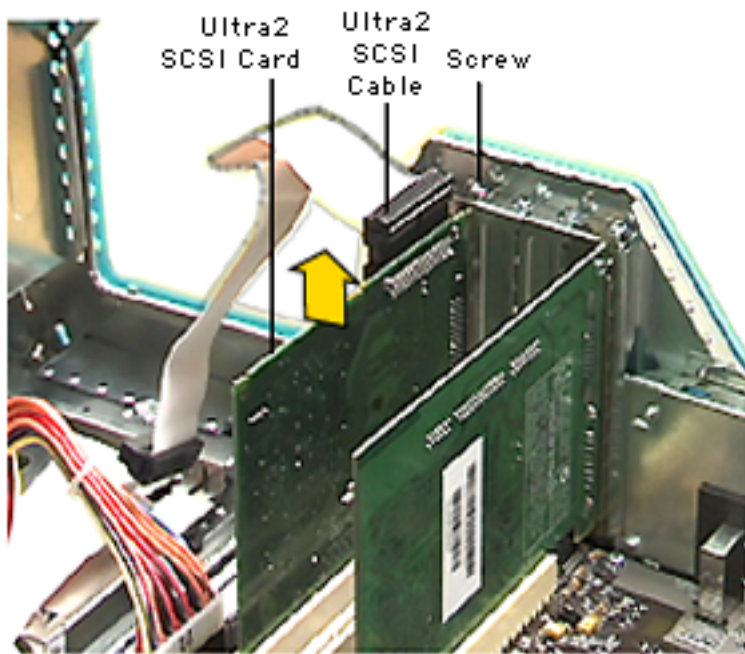




## Hard Drive, Wide Ultra2 SCSI

Before you begin, open the right side access panel.

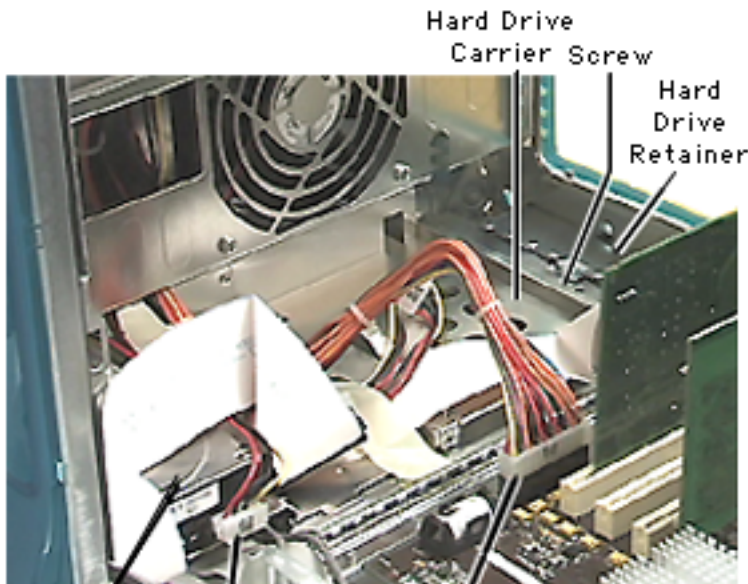




- 1 Disconnect the Ultra2 SCSI cable from the Ultra2 SCSI card.





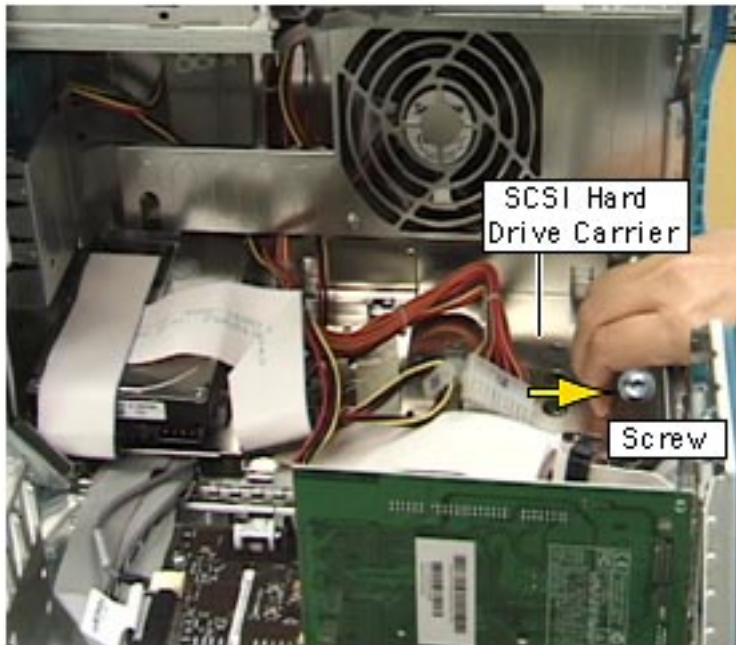


SCSI Hard Drive  
SCSI Hard Drive Power Cable

Main Power Cable

- 2 Disconnect the main power cable and the SCSI hard drive power cable (P5).
- 3 Remove the screw on the hard drive retainer.
- 4 Remove the hard drive retainer.

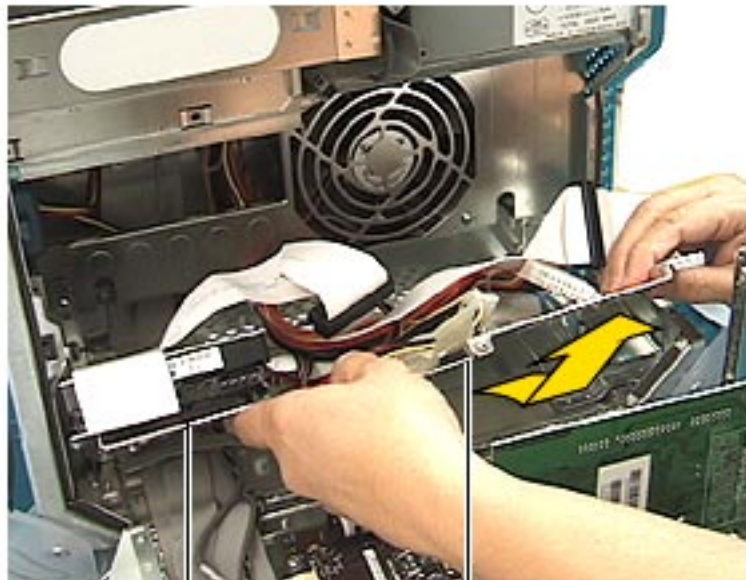




- 5 Pull the hard drive carrier toward the rear of the computer to unhook the carrier from the chassis.





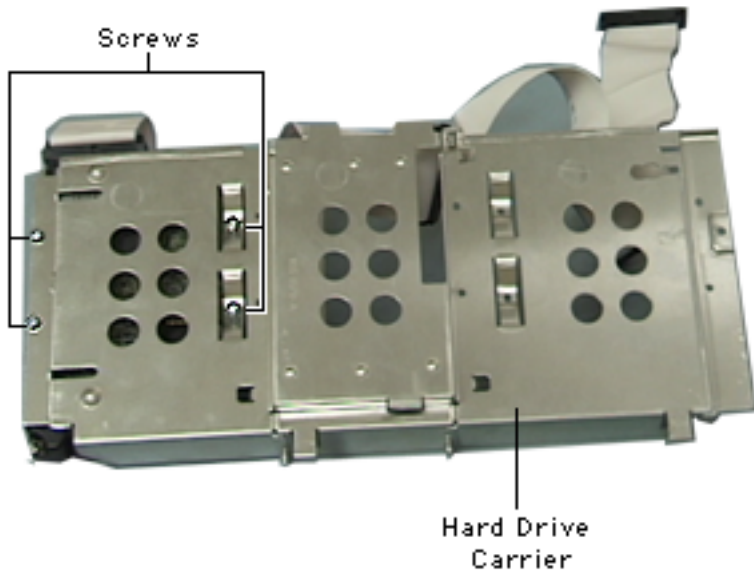


SCSI  
Drive

Hard Drive  
Carrier

- 6 Lift the carrier (with the drive still attached) out of the chassis
- 7 Remove the SCSI cable from the top of the SCSI drive in bay 1. The SCSI cable and terminator is attached to the top of the drive with double-stick foam tape. Remove the terminator housing (black plastic) also.
- 8 Disconnect the SCSI cable from the back of the SCSI drive (s).





9 If you're returning the drive to Apple, remove the four screws from the hard drive carrier.

10 Lift the hard drive from the carrier.

**Note:** Return drives without cables or carriers. Exchange Apple hard drive modules in Apple packaging. Failure to comply with this requirement may result in a packaging noncompliance charge. Refer to the service parts database for more information.





## **Additional Wide Ultra2 SCSI Drives**

Standard Macintosh configurations include one internal Ultra ATA hard disk, or one, two, or three internal Wide Ultra2 SCSI drives.

If the model has at least one internal Wide Ultra2 SCSI drive, a PCI card and cable inside the computer, it is possible to connect additional internal and external Wide Ultra2 SCSI devices. You can connect up to three internal SCSI drives or connect additional external SCSI devices to the port the card provides on the rear of the computer.

If the computer came with one Wide Ultra2 SCSI drive, it is installed in the lower drive carrier in position 1, near the front of the computer. If it came with two drives, the second one is installed in position 2. If a third drive is installed, it's in position 3. Usually the computer uses the drive in position 1 to start up.





Additional internal Wide Ultra2 SCSI devices connect to the data cable supporting the drive that came with the computer. This cable has a built-in terminator so you don't need to add one.

You must assign a SCSI ID number to every additional device and the number must not conflict with the ID number already assigned to a drive on the SCSI chain. If the computer came with one Wide Ultra2 SCSI drive, it has ID 0. If the Macintosh came with two drives, they have ID 0 and 1. A third factory-installed drive has ID 2. The SCSI PCI card has ID 7.

**Replacement Note:** The power cables attach to the hard drives in the following manner:

P5 attaches to Bay 1

P2 attaches to Bay 2

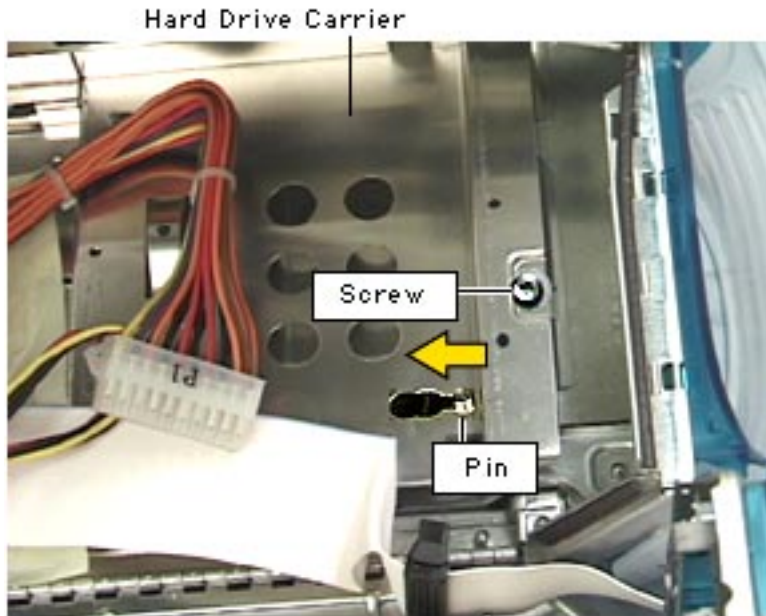
P3 attaches to Bay 3

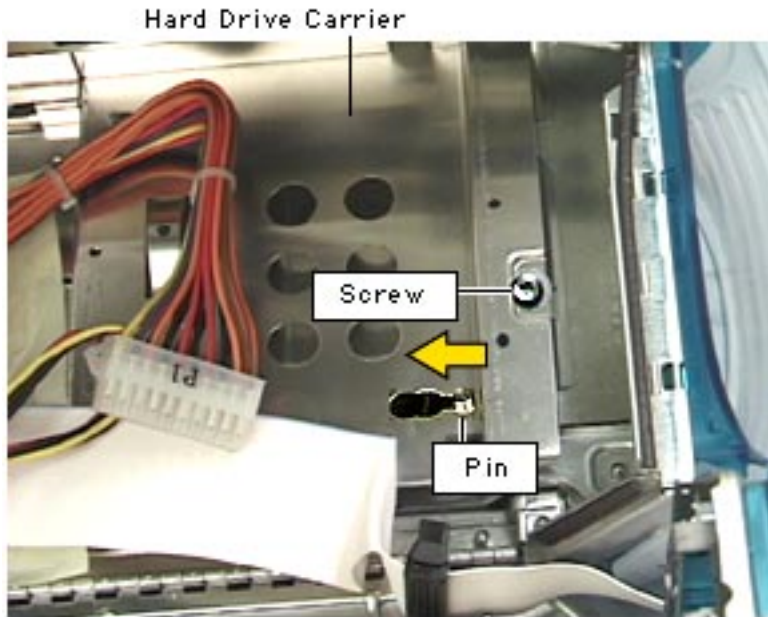




## HDA Carrier Replacement

- 1 Make sure any cables underneath the hard drive carrier are lying flat in place.
- 2 Install the drive carrier into the computer.
- 3 Align the carrier tabs on the front of the carrier into the chassis slots. Push down and forward on the carrier as you slide the carrier into the slots, toward the front of





the computer until the pin locks into position.

- 4 Install the hard drive carrier bracket and screw into place.
- 5 Connect all cables going to the hard drive(s).

### Replacement Note:

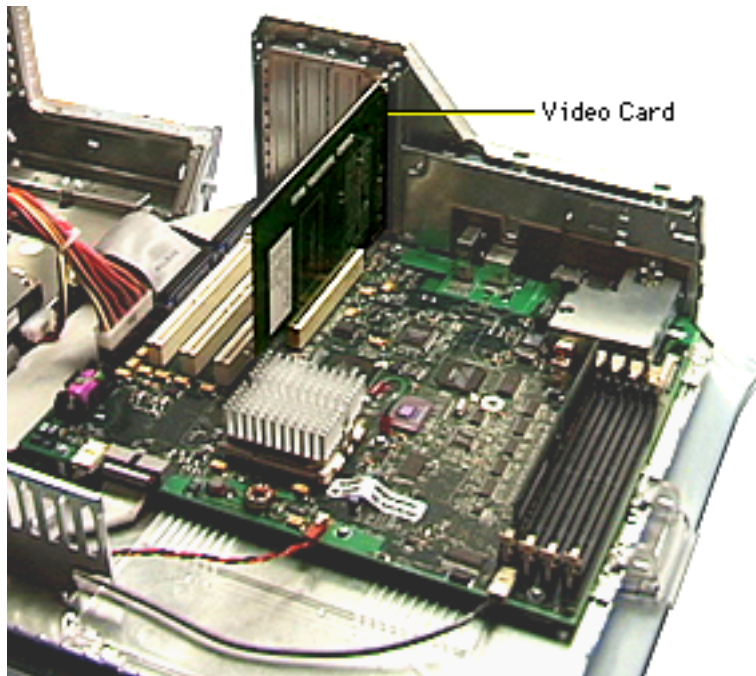
The power cables attach to the hard drives in the following manner:

P5 attaches to Bay 1

P2 attaches to Bay 2

P3 attaches to Bay 3





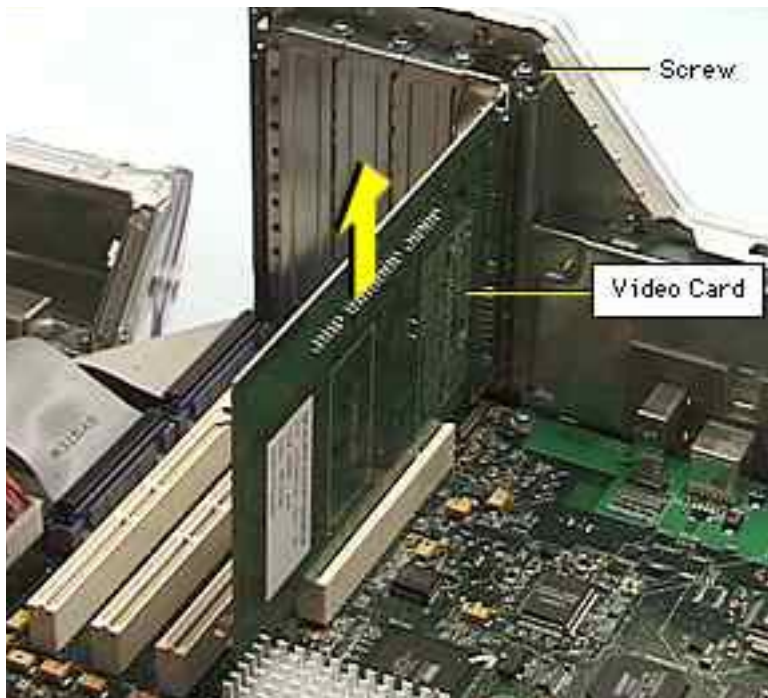
## Video Card

Before you begin, do the following:

- Open the side access panel
- Remove the external video cable

**Note:** The video card is always installed in the short PCI slot, slot 1. The slot numbers are stamped on the rear access I/O panel.





- 1 Remove the video card mounting screw.
- 2 Gently lift up on the video card to remove it from the PCI slot.

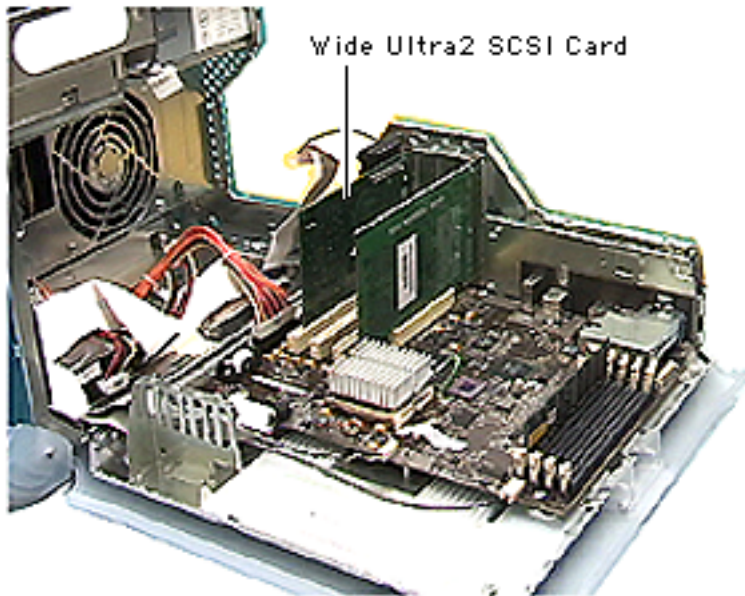


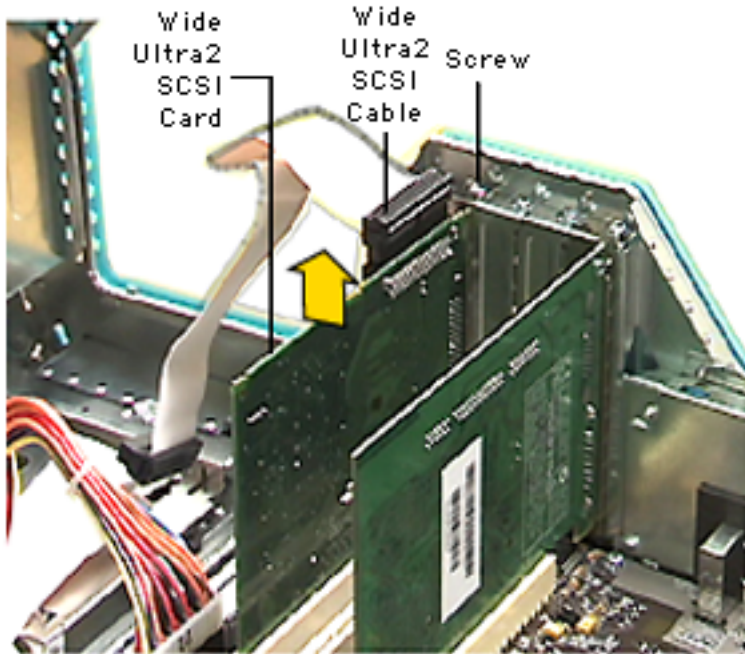




## Wide Ultra2 SCSI Card

Before you begin, open the side access panel.



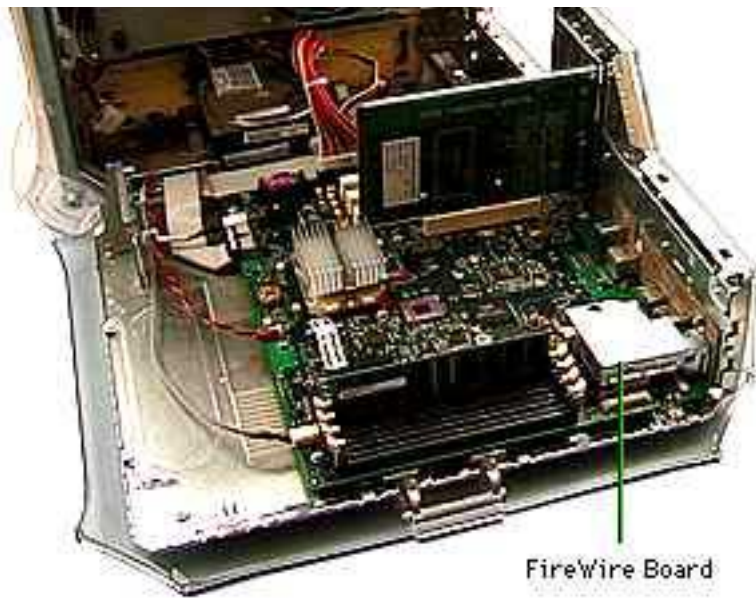


- 1 Remove the Ultra2 SCSI card mounting screw.
- 2 Disconnect the Wide Ultra2 SCSI cable from the PCI card.

**Note:** Make sure no other cable is attached (externally, or on the second internal connector if using the dual channel SCSI PCI card).

- 3 Gently lift up on the Ultra2 SCSI card to remove it from the PCI slot.

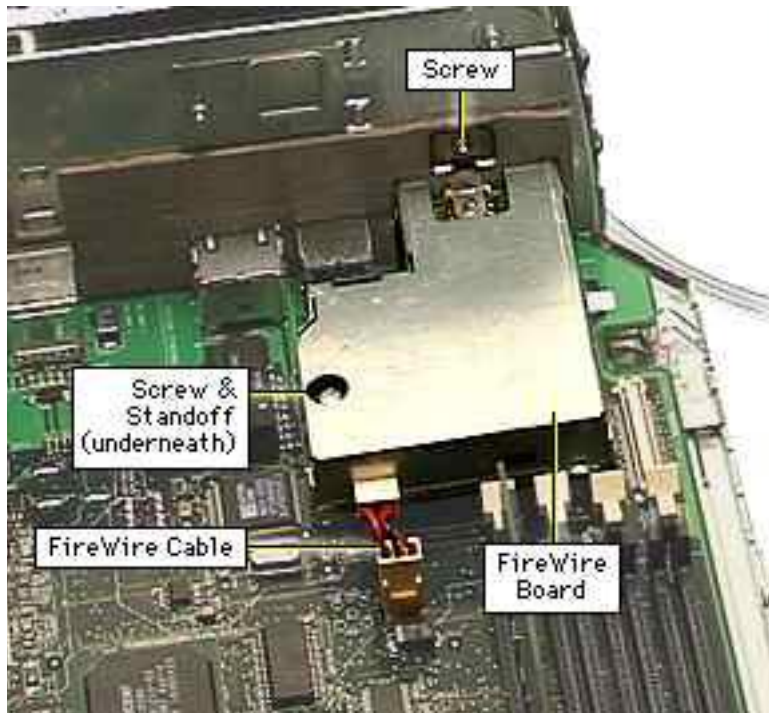




## FireWire Board

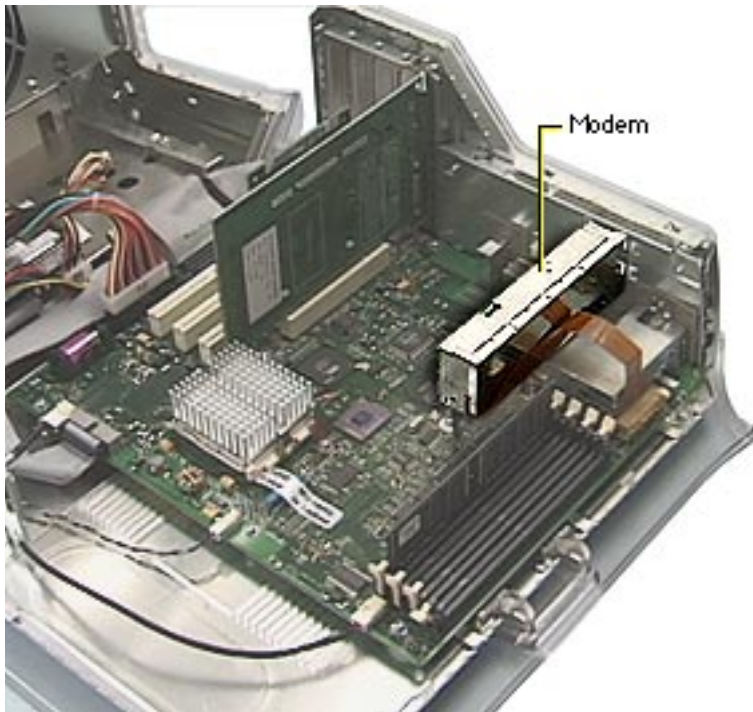
Before you begin, open the side access panel.





- 1 Remove the screw securing the FireWire board to the I/O panel.
- 2 Remove the screw that secures the FireWire board to the metal standoff.
- 3 Disconnect the FireWire cable, the short 3-pin cable from the back of the FireWire board or logic board.
- 4 Gently lift up the FireWire board to remove it from the logic board connector.



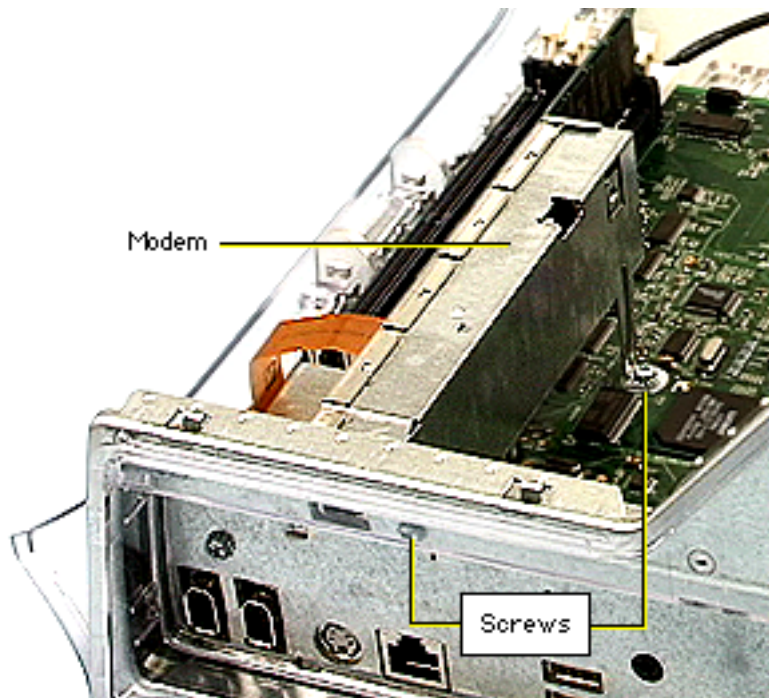


## Modem

Before you begin, open the side access panel.

**Note:** The modem is a build-to-order option. If installing a modem for the first time, remove the modem plug from the I/O bracket.

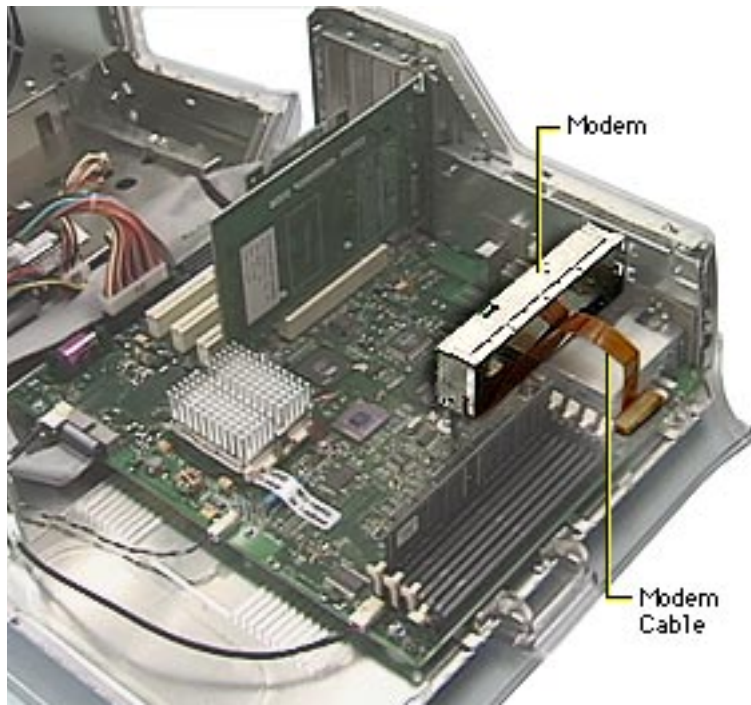




- 1 Remove the screw securing the modem to the I/O panel.
- 2 Remove the screw that secures the modem leg standoff to the logic board.







- 3 Carefully disconnect the modem cable from the logic board.

**Important:** The modem cable is very fragile. Remove it from the logic board very carefully.

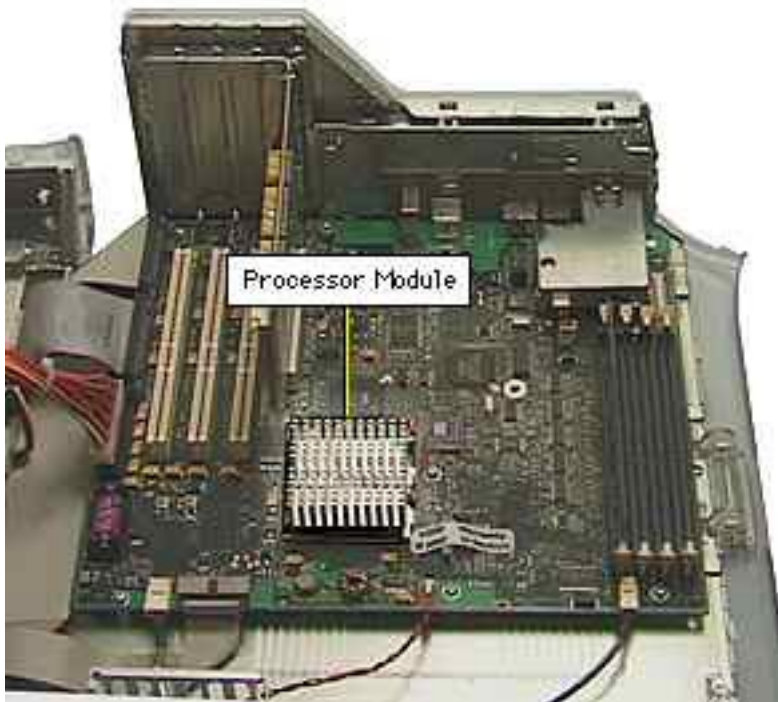
- 4 Gently lift up the modem to remove it from the logic board.



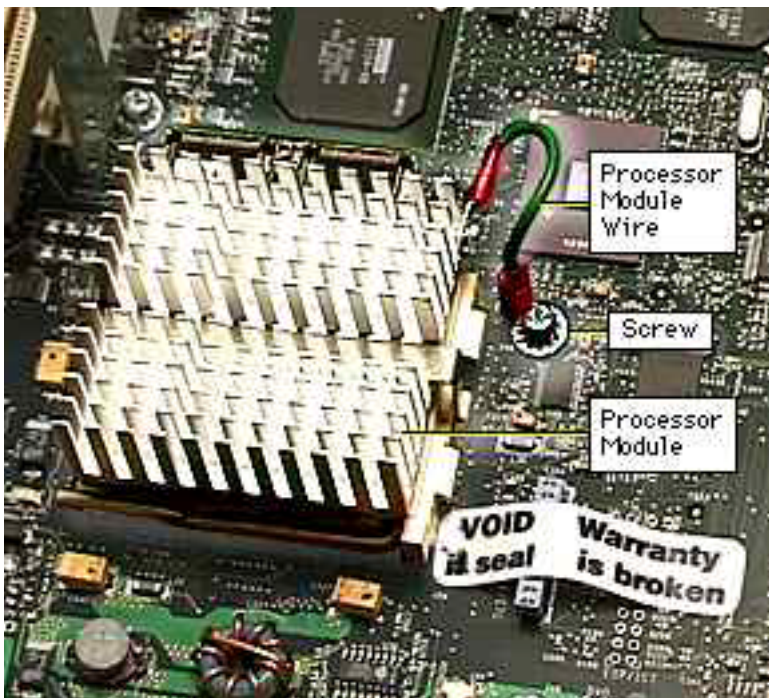


## Processor Module

Before you begin, open the side access panel.

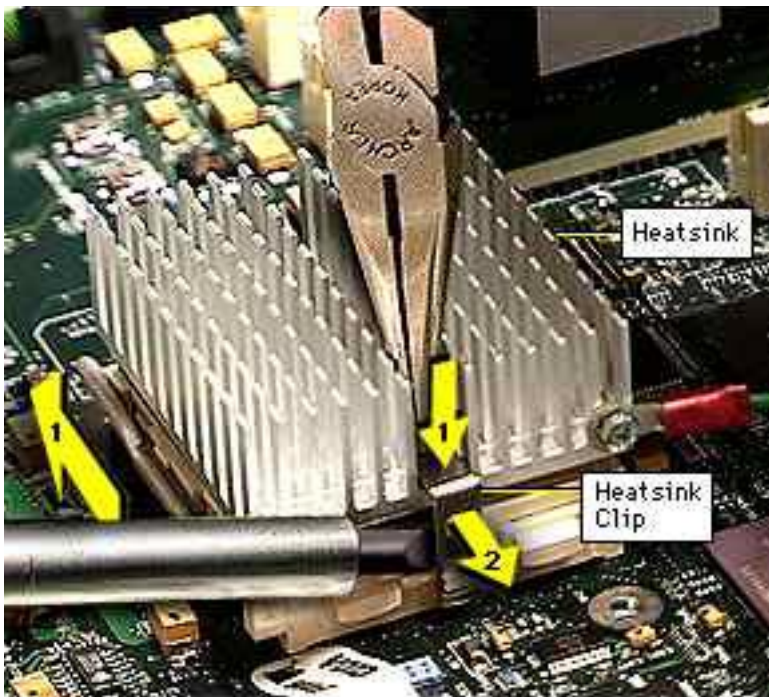






- 1 Remove the screw that attaches the ground wire to the logic board. (Note: the processor and ground wire on your unit may be in a different location than shown in this graphic.)





**⚠ Warning:** The heatsink may be hot to the touch.

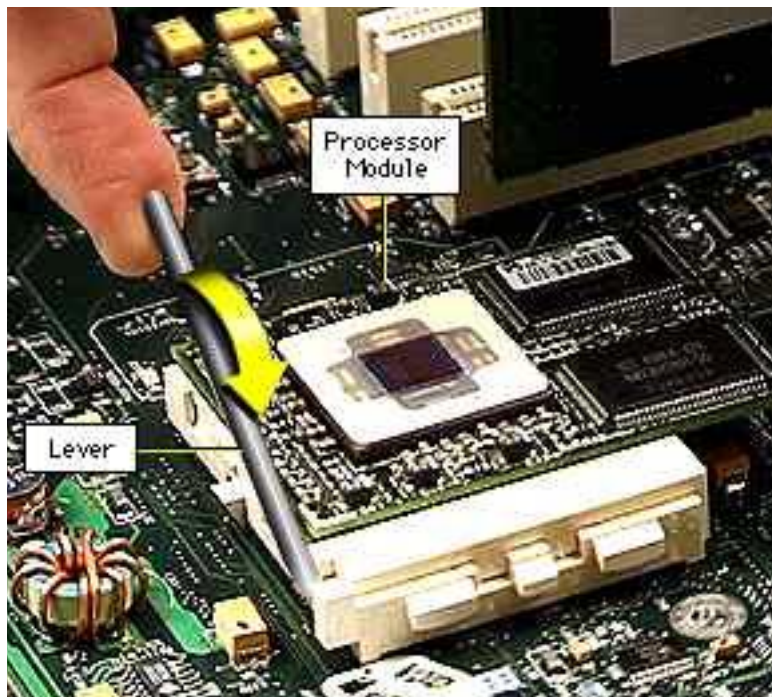
- 2 While pressing down on the top of the heatsink clip, use a small flatblade screwdriver to lift up and out on the front tab of the clip to release the heatsink clip.
- 3 Remove heatsink clip.





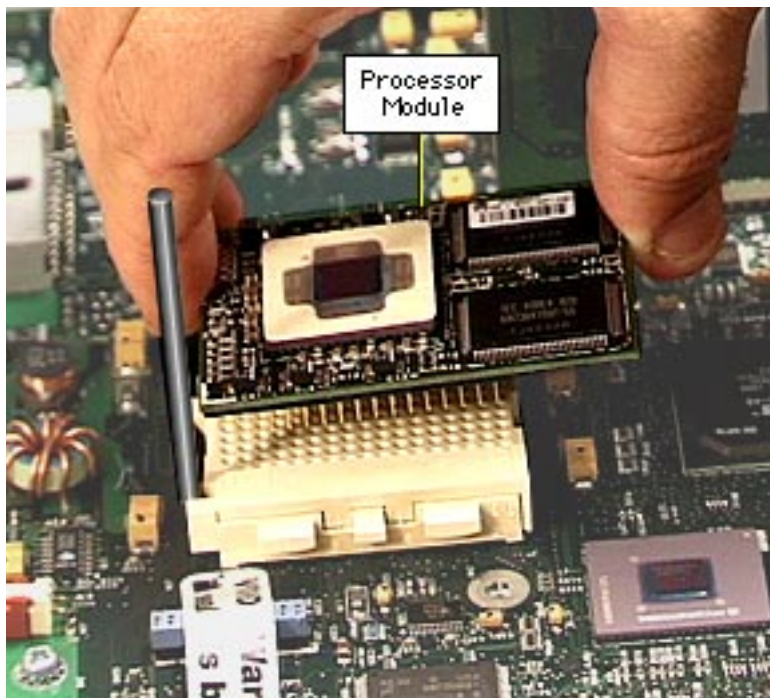
- 4 Lift up the heatsink to remove it from the processor module.





- 5 Lift the lever to release the processor module.



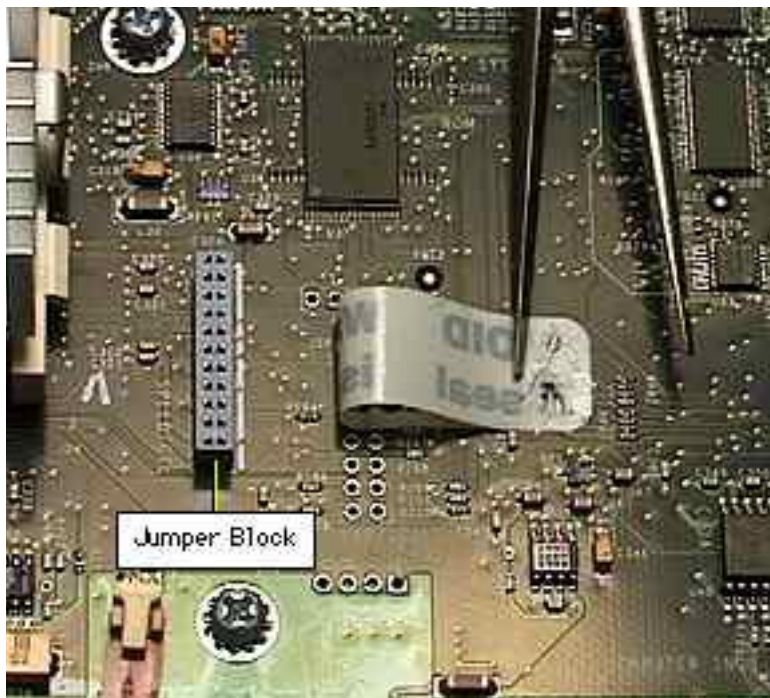


- 6 Handle the processor by the edges and gently lift it straight up to remove. Be careful not to bend the pins underneath the module.

**Important:** If you are only replacing the processor module, stop here. If, however, you are removing the processor module in order to replace the logic board, continue on to the next page.







- 7 Remove the warranty sticker and jumper block if replacing the logic board only.

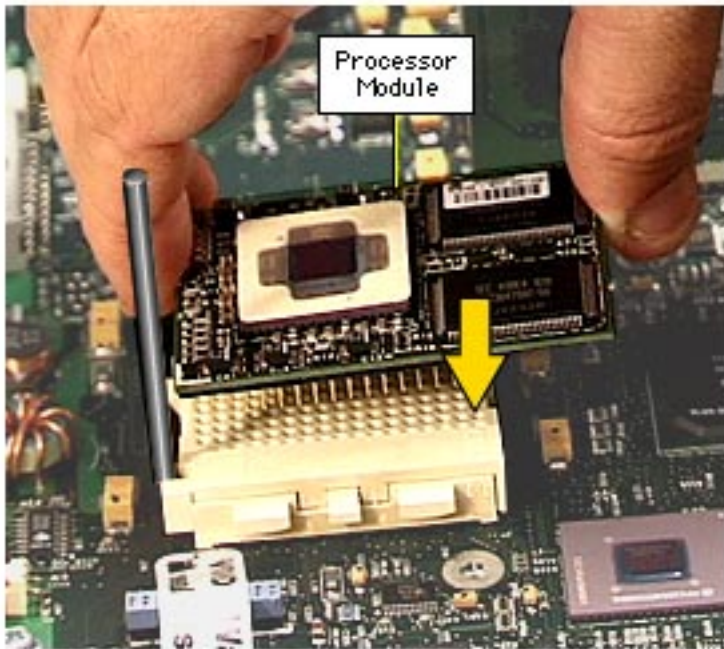
White jumper: 400 MHz

Blue jumper: 350 MHz

Black jumper: 300 MHz

**Important:** When replacing the processor module, you must change the processor jumper block and warranty sticker to be compatible with the processor module you are installing. Failure to install the jumper block properly will result in a unit that does not power on.





### Replacement Note:

Position the processor module evenly over the processor module slot and make sure the card is seated evenly. Press down gently on the processor module to install it. Never force the module into place or you may damage the gold connector pins on the underside. Rotate the lever down, flat against the logic board to lock the processor in place.

Replace the heatsink on top of the processor module.





Secure the heatsink by inserting the clip into the slot at the rear of the processor and then swinging the clip down over the heatsink.

Press the clip into the front latch to fasten in place.

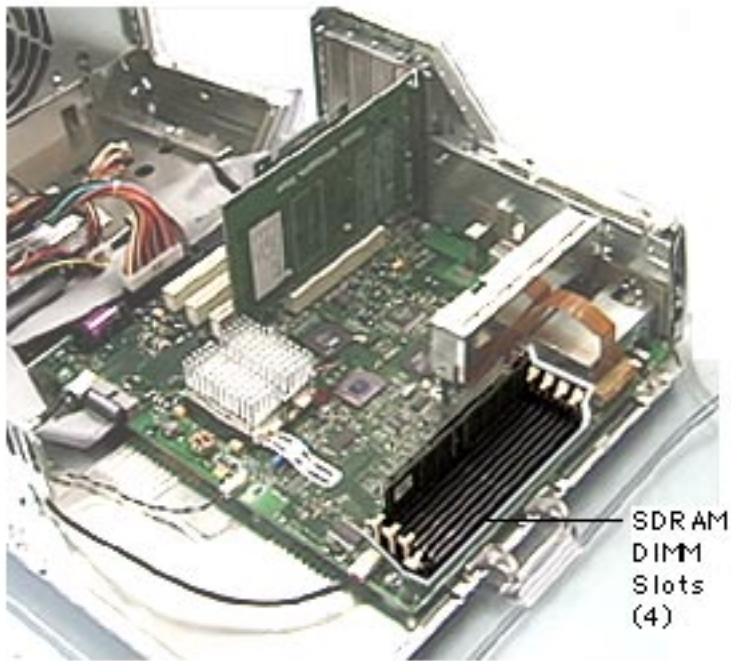
Attach the ground wire to the logic board.





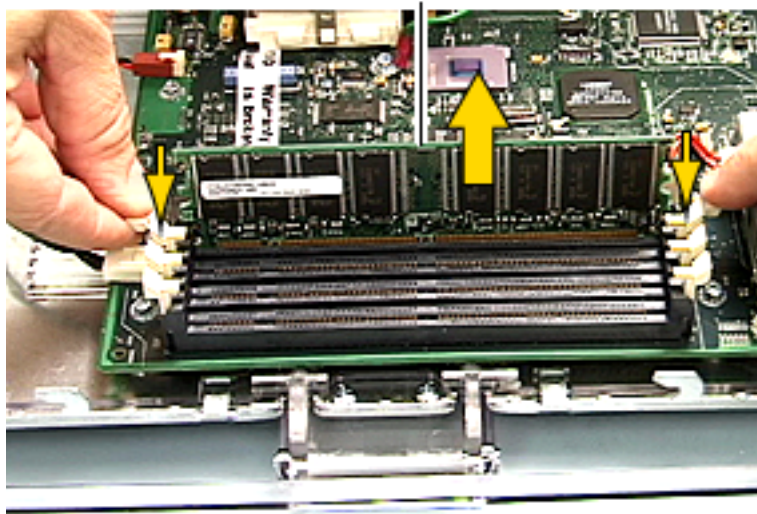
## SDRAM DIMM

Before you begin, open the side access panel.





SDRAM DIMM



- 1 Push down on the connector clips to unlock the DIMM.
- 2 Lift the memory module out of the slot.

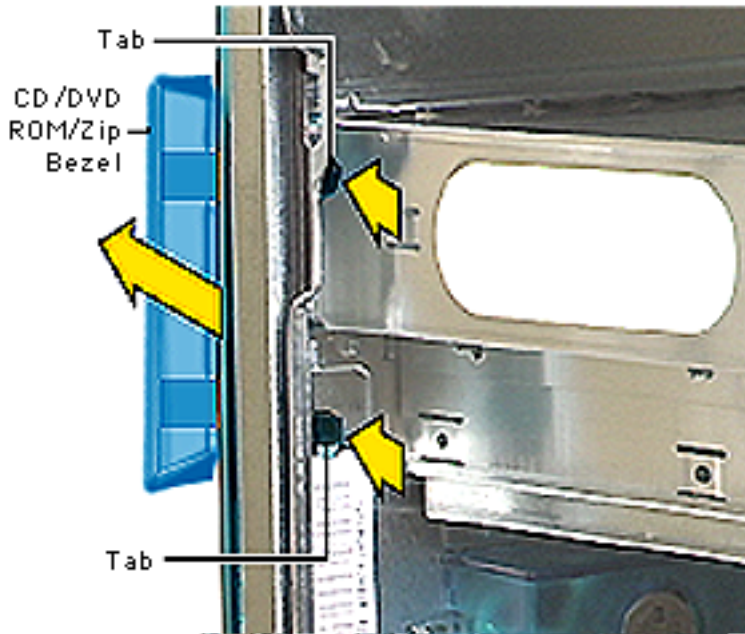




## CD-ROM/DVD-ROM/Zip Drive Bezel

Before you begin, open the side access panel.





- 1 From inside of the chassis, behind the front panel, push the two bezel tabs forward to release the drive bezel from the front panel.
- 2 Disconnect the bezel from the hinge on the front left side to remove the bezel from the computer.

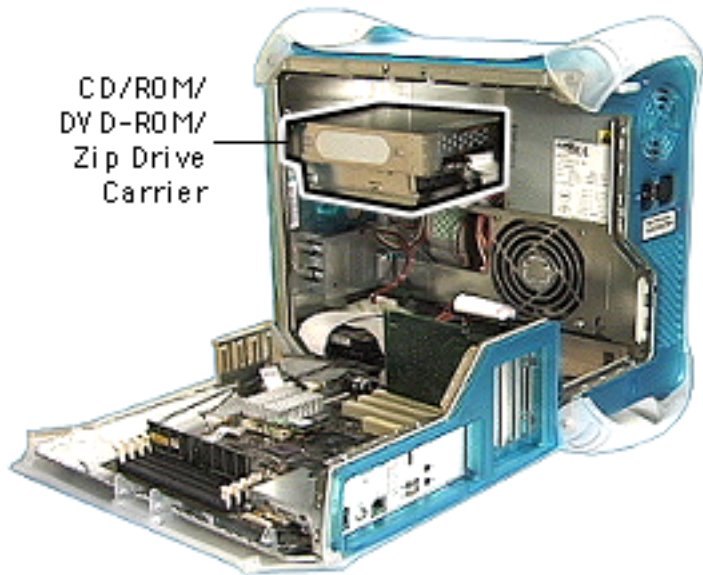




## CD-ROM or DVD-ROM Drive

Before you begin, do the following:

- Open the side access panel
- Remove the CD-ROM/DVD-ROM/Zip drive bezel

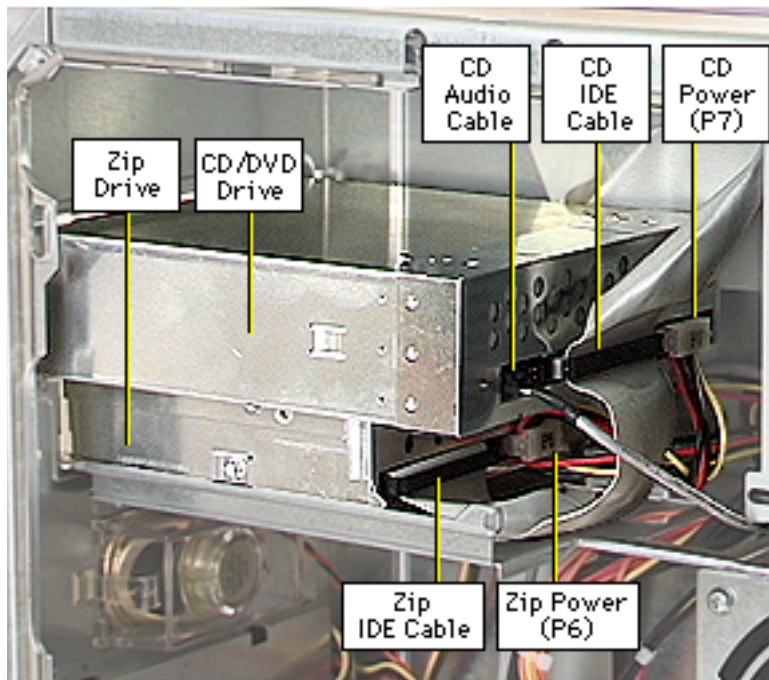




- 1 Remove the two screws on the drive carrier.

**Note:** The drive carrier is removed from the computer as a unit. The drives are screwed to the carrier.

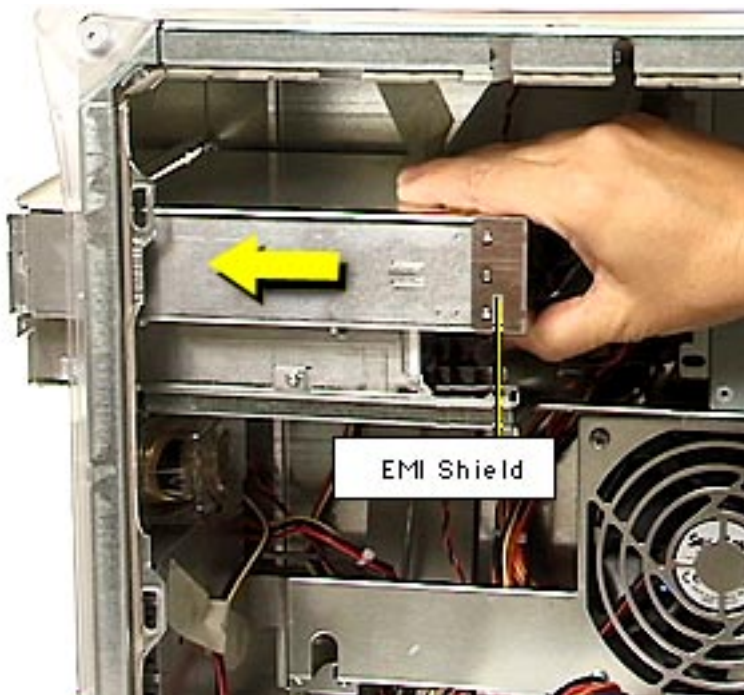




- 2 From inside the chassis, push the drive carrier forward about one inch.
- 3 Disconnect the following cables from the back of the CD-ROM or DVD-ROM drive:
  - Power cable (P7)
  - IDE data cable
  - Audio cable
- 4 Disconnect the following cables from the back of the Zip drive (if present):
  - Power cable (P6)
  - IDE data cable



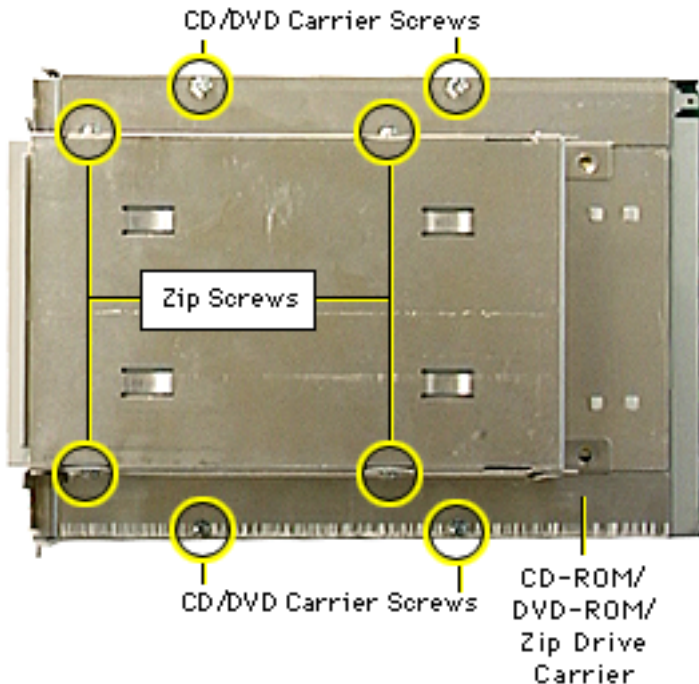




- 5 Continue sliding the drive carrier out of the computer.
- 6 Remove the EMI shield from the back of the CD-ROM when the carrier is out of the computer.







**Note:** Perform the following procedure if you are replacing the CD-ROM, DVD-ROM, or the Zip drive.

- 7 Using a Phillips screwdriver, remove the four CD-ROM, DVD-ROM, or Zip drive carrier mounting screws.
- 8 Slide the drive(s) out of the carrier.



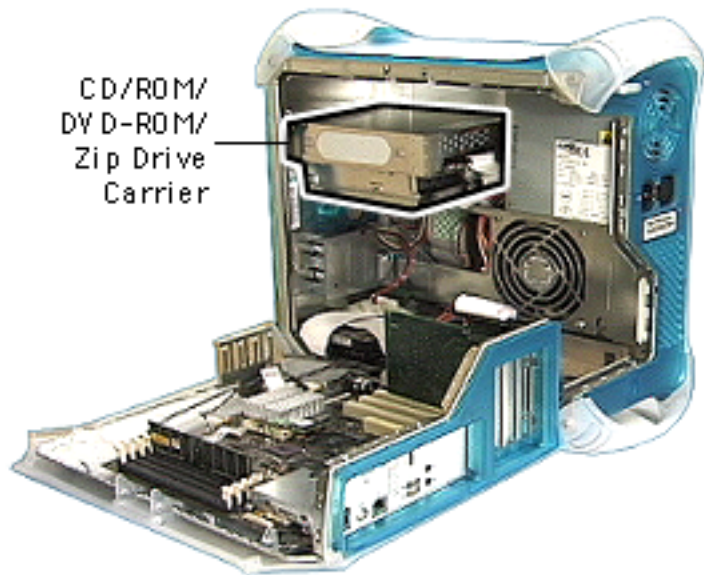


**Replacement Note:** When inserting the drive carrier into the computer, make sure the carrier tab slides into the hole on the stationary drive shelf.



## Zip Drive

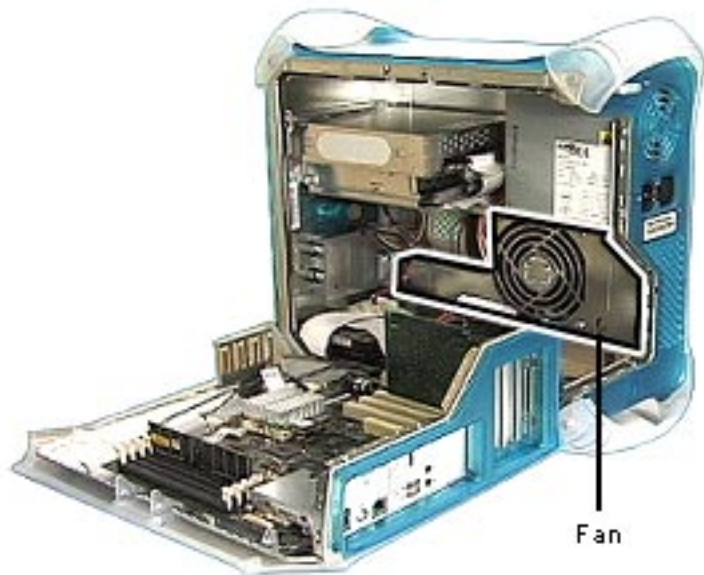
If removing the Zip drive, follow the procedures for removing the CD-ROM or DVD-ROM Drive.





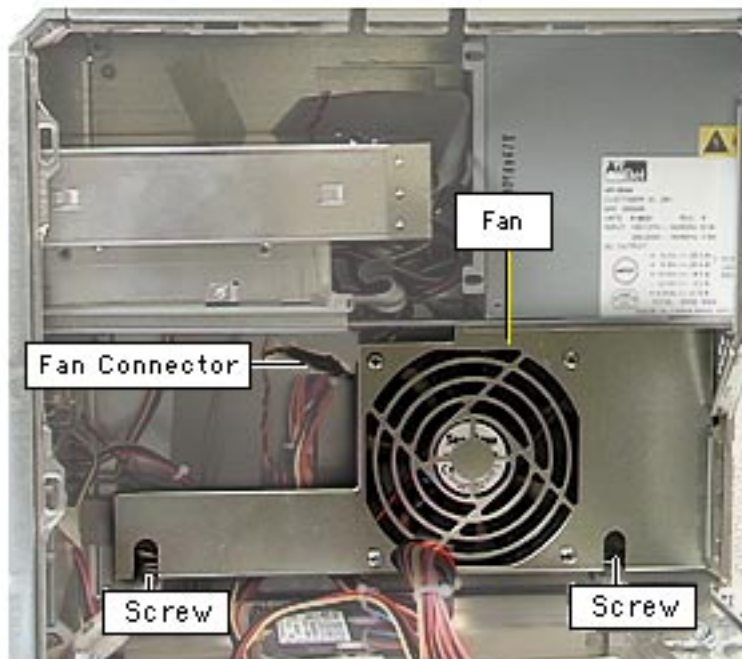
## Fan

Before you begin, open the side access panel.



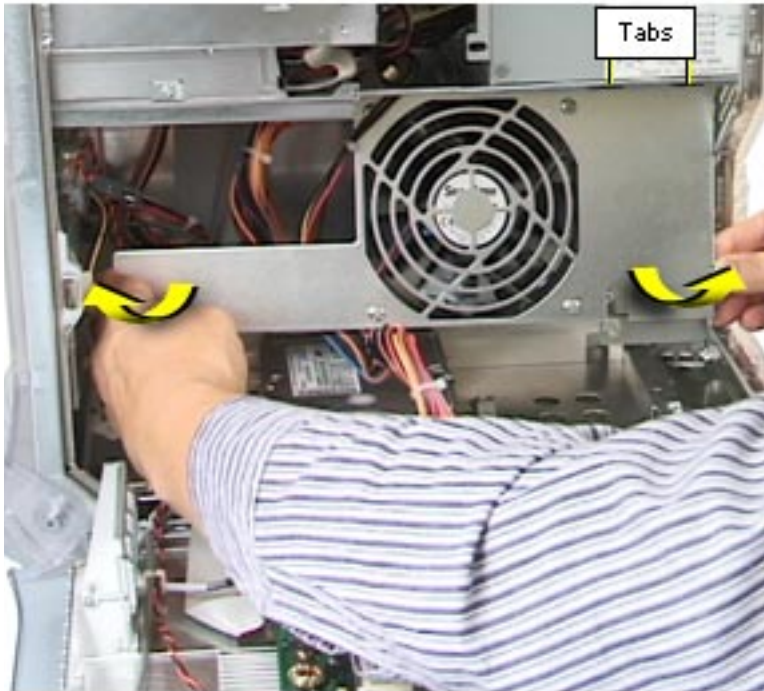
Fan





- 1 Remove the two screws on the fan bracket.
- 2 Pull the fan bracket down to access the power-to-fan connector.
- 3 Disconnect the power-to-fan connector.

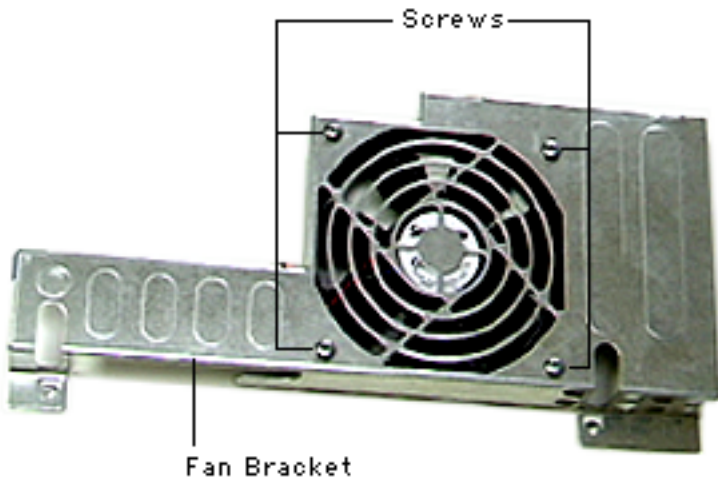




- 4 Lift fan bracket out of the computer.

**Replacement Note:** The fan bracket has two holes (on the top) that join with two tabs on the chassis. If the tabs aren't inserted in the holes, the screws that secure the fan bracket to the chassis won't align properly.





Perform the following procedure only if you are replacing the fan.

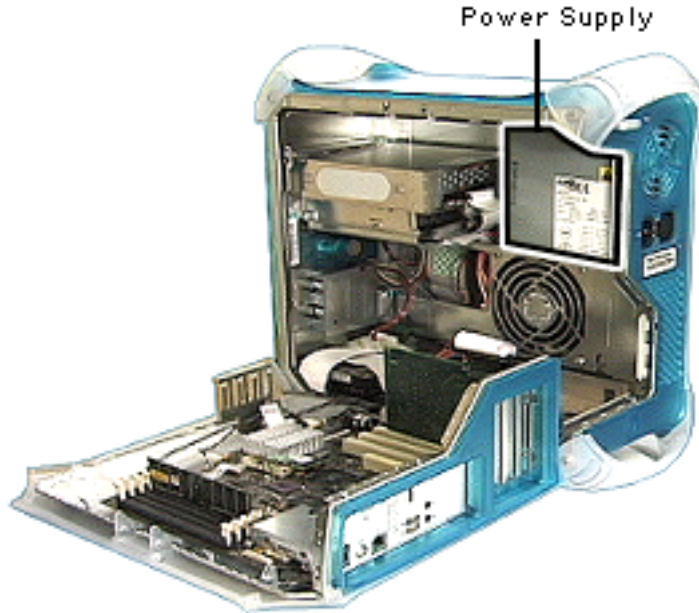
- 5 Using a Phillips screwdriver, remove the four screws securing the fan to the fan bracket.
- 6 Lift the fan from the fan bracket.



## Power Supply

Before you begin, do the following:

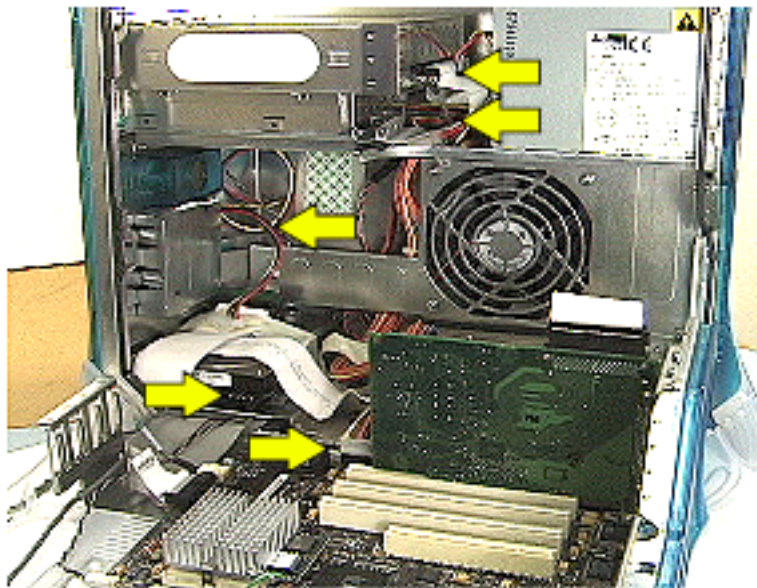
- Open the side access panel
- Remove the CD/DVD-ROM/Zip bezel
- Move the CD/DVD-ROM/Zip drive carrier forward 1 inch
- Remove the fan bracket







Power Cable Locations



- 1 Disconnect the following power cables:
  - Cables P6 and P7, going to the CD-ROM/Zip drive
  - Cable P4 going to the front panel board
  - Main power cable going to the logic board
  - Cable(s) to other hard drives (if present)





Allen  
Screws

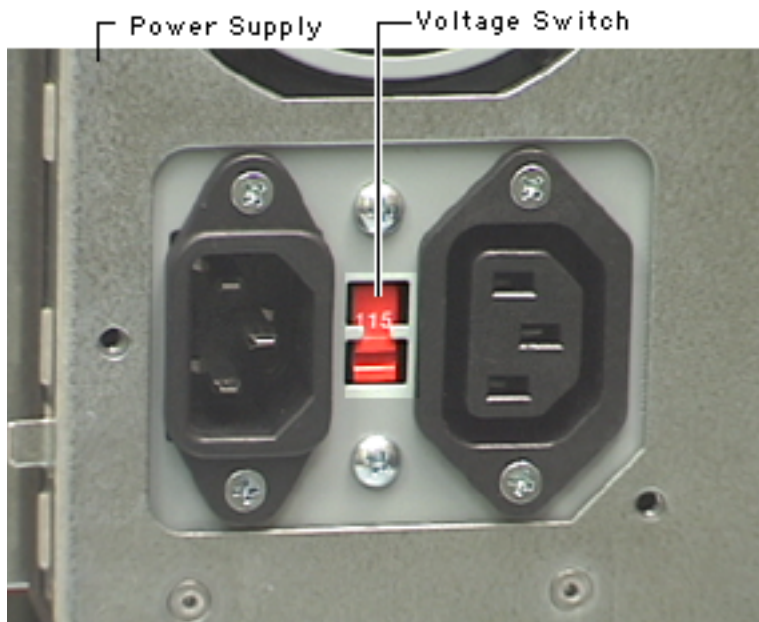
- 2 Using a 2.5 mm allen wrench, remove the three screws on the rear vented panel.





- 3 On the inside of the computer, remove one screw that attaches the power supply to the power supply bracket
- 4 Slide the power supply forward and carefully tilt and lift the power supply and its cables out of the chassis.





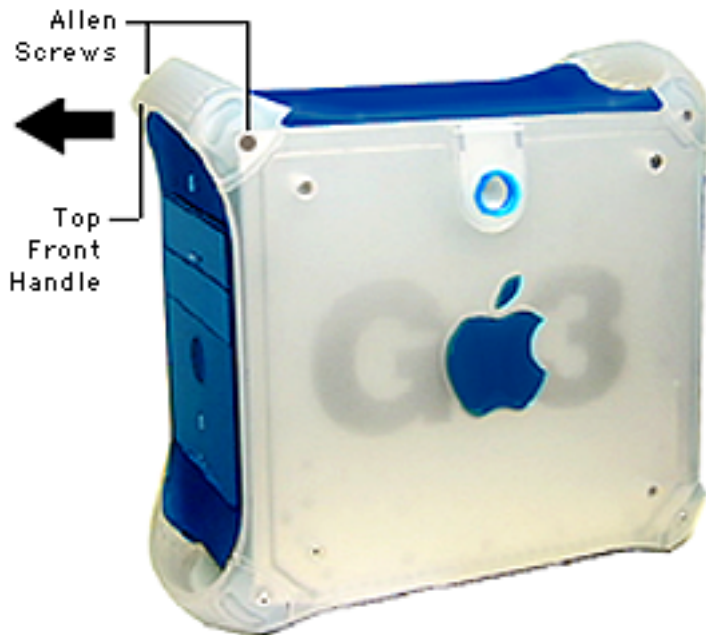
**Replacement Note:** You must set the power supply voltage switch to the correct setting (115V in the U.S.) to avoid damaging the computer.



## Handle, Top Front

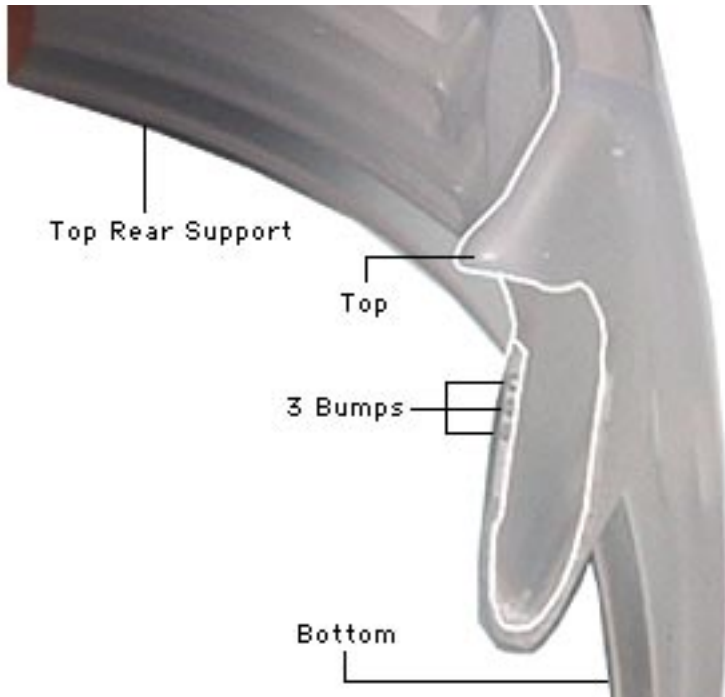
No preliminary steps are required before you begin this procedure.





- 1 Using a 2.5 mm allen wrench, remove the two allen screws.
- 2 Lift the handle from the computer.



**Replacement Note:**

When installing the handles (top front and top rear) orient them so that the three tiny bumps on the handle are in the orientation shown in the photo. The handle won't fit if it's turned upside down. The top front and top rear handles are interchangeable.





## Handle, Top Rear

No preliminary steps are required before you begin this procedure.







- 1 Using a 2.5 mm allen wrench, remove the two allen screws.
- 2 Lift the handle from the computer.

**Replacement Note:**

See prededing replacement note for orientation of the handles under "Handle, Top Front."



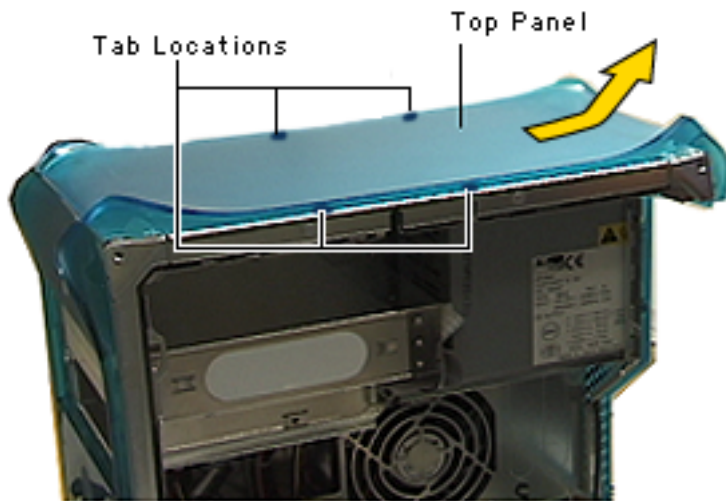


## Panel, Top

Before you begin, remove the following:

- Top front handle
- Top rear handle





- 1 Slide the top panel back, towards the power supply, to unhook the tabs.
- 2 Lift the top panel from the chassis.



## Panel, Front

Before you begin, remove the following:

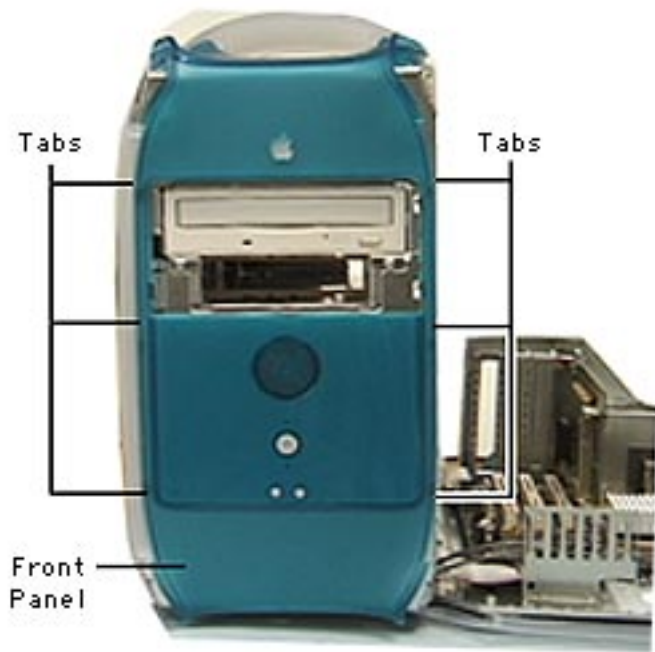
- Top front handle
- Lower front support
- Lower front panel
- CD-ROM/DVD-ROM/Zip drive bezel

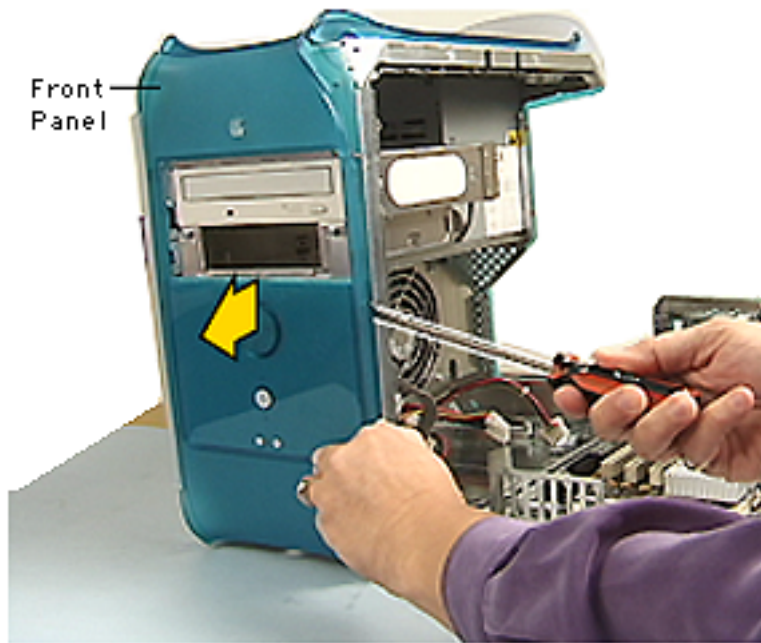
**⚠ Warning:** When the lower support is removed, the computer can be unstable.





- 1 Open the side access panel. Locate the front panel tabs.





- 2 Using a screwdriver, carefully push the tabs inward to release them from the chassis.
- 3 Pull the front panel off the chassis.



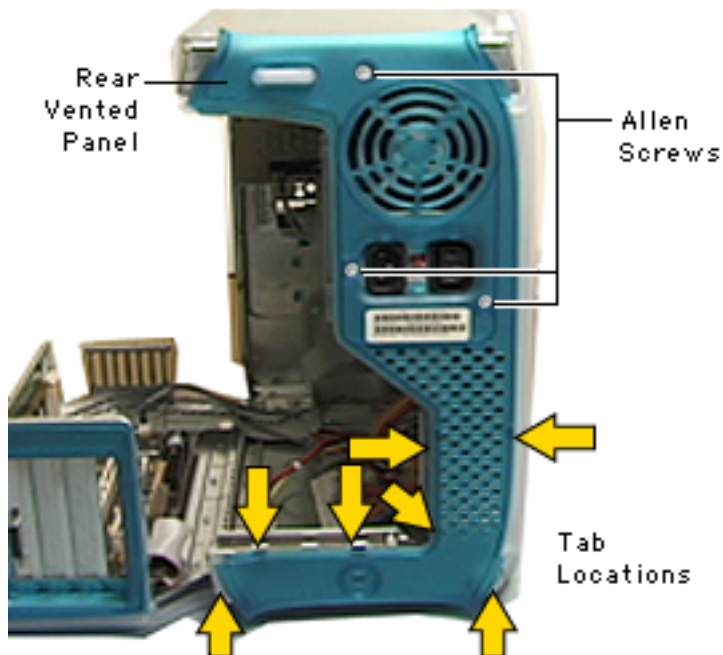
## Panel, Rear, Vented

Before you begin, remove the following:

- Top rear handle
- Lower rear support

**⚠ Warning:** When the lower support is removed, the computer can be unstable.





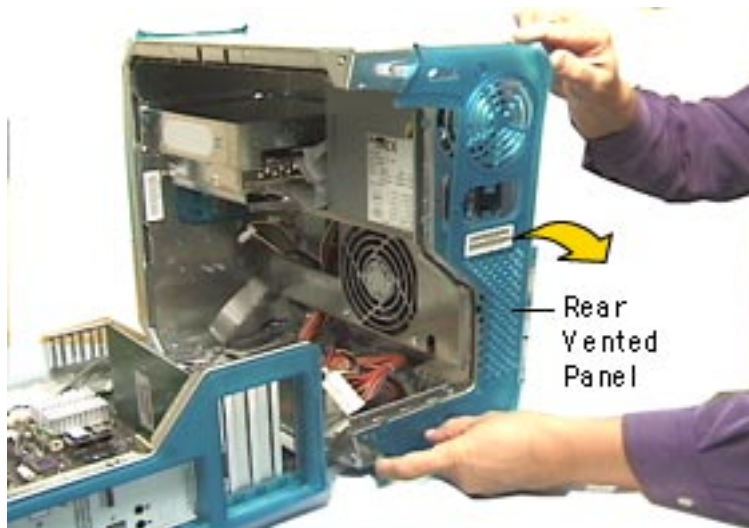
- 1 Open the side access panel.
- 2 Remove the three 2.5 mm allen screws.
- 3 Push in on the six tabs to release the panel from the chassis.







- 4 Once the tabs are released, carefully pull the rear panel forward to remove.





## Panel, Side, Right

Before you begin, remove the following:

- PCI cards (if present)
- Video card
- FireWire board (if present)
- Modem (if present)
- Main logic board
- I/O panel
- Latch panel



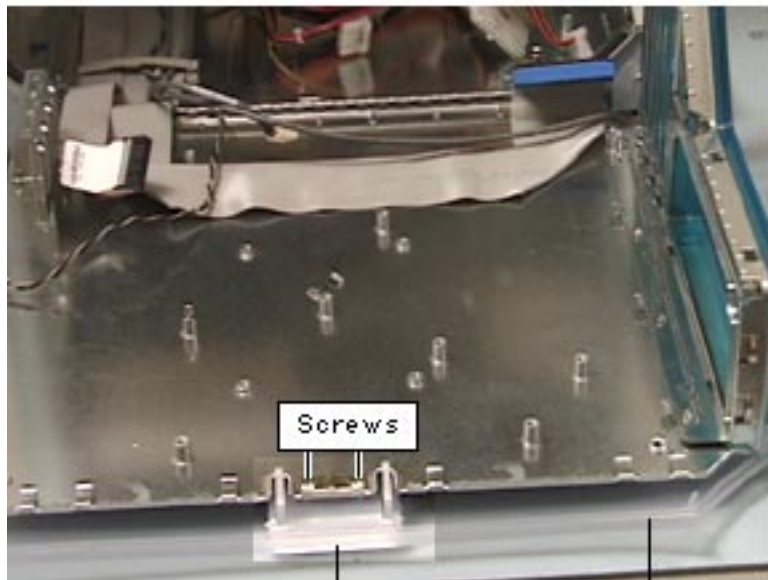
Right Side Panel





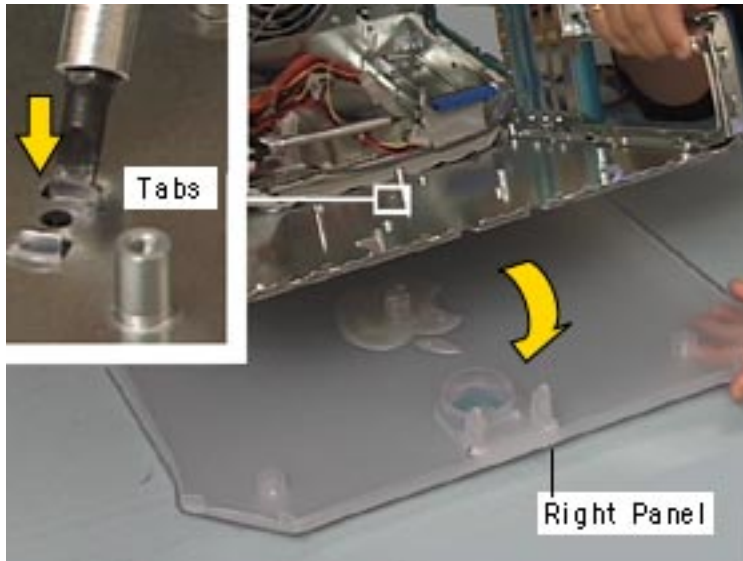
- 1 Remove the four 2.5 mm allen screws on the side panel.





- 2 Open the side access panel.
- 3 Remove the two Phillips screws attaching the side chassis frame to the panel latch.





- 4 Using a flatblade screwdriver or needlenose pliers, push or squeeze the plastic tabs (protruding through the side chassis panel), to release the right panel from the metal chassis.
- 5 Remove the right side panel off the chassis.



## Panel, Side, Left

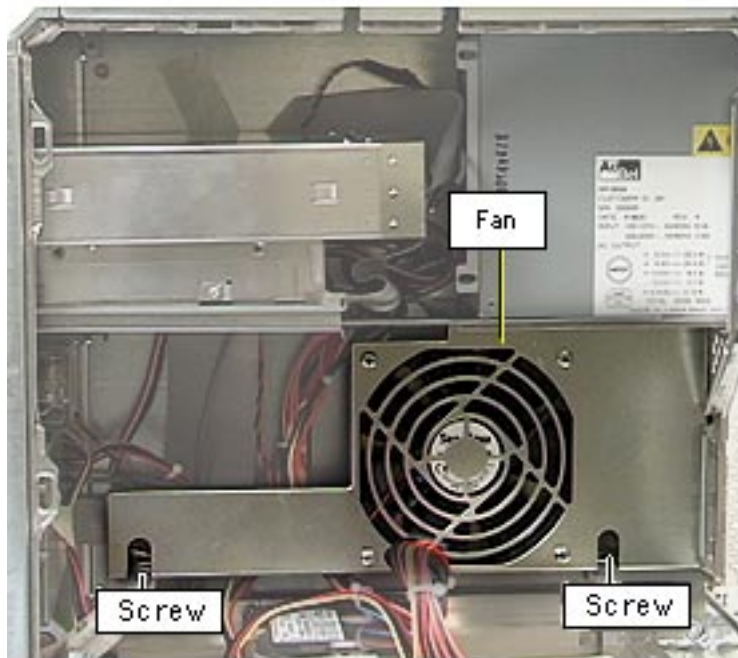
No preliminary steps are required before you begin this procedure.





- 1 Remove the four 2.5 mm allen screws on the side panel.

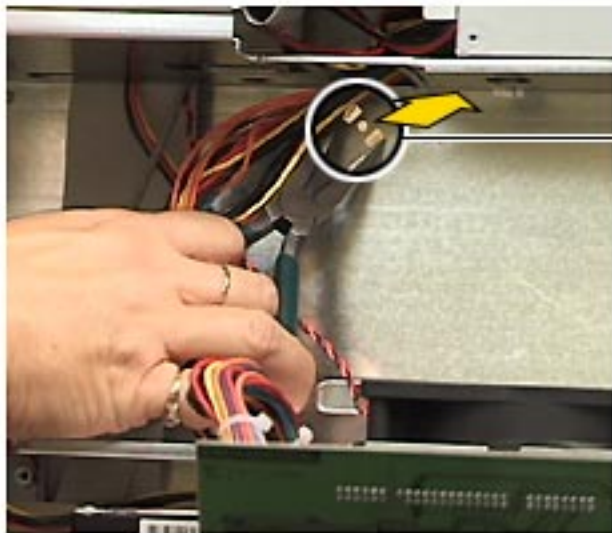




- 2 Open the side access panel.
- 3 Remove the fan screws and drop the fan bracket down to access the plastic panel tabs (protruding through the side chassis) on the left side panel.

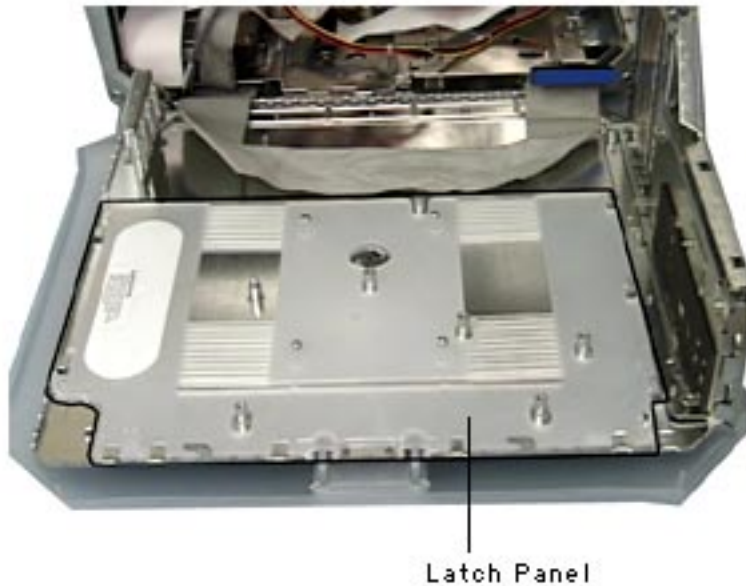






Tab

- 4 Using a needlenose pliers, squeeze the tabs (located behind the fan bracket) to release the left side panel from the metal chassis.
- 5 Lift the left side panel off the chassis.

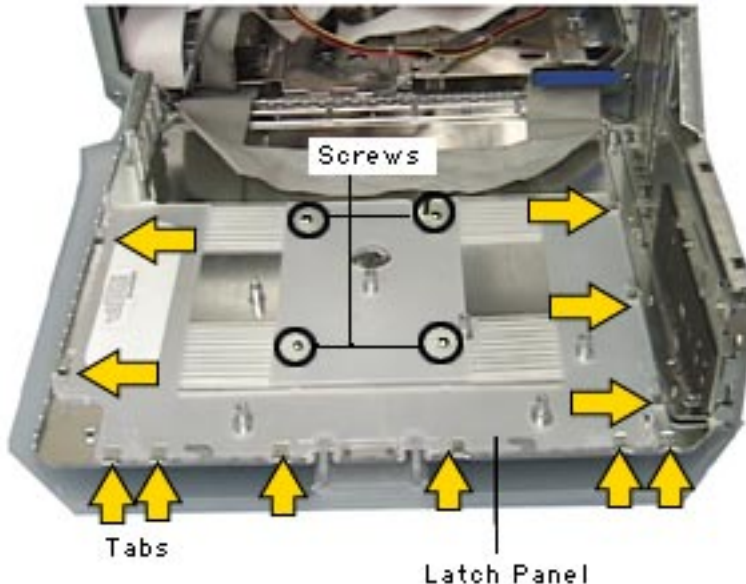


## Panel, Latch

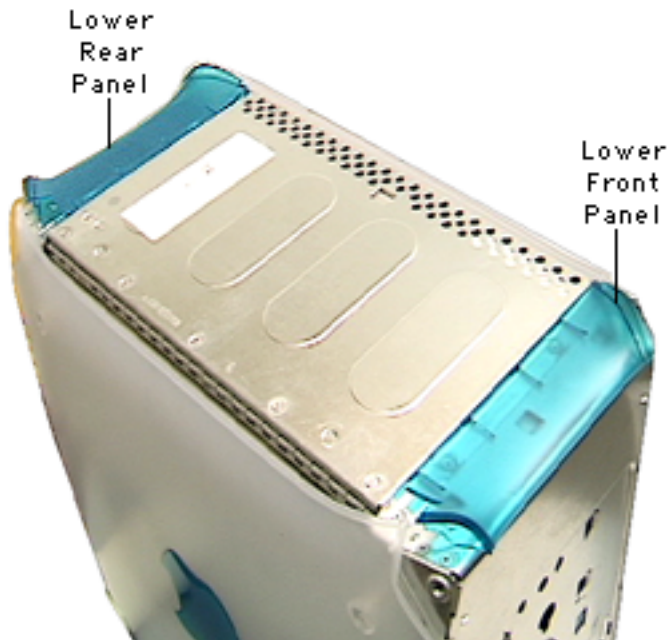
Before you begin, open the side access panel and remove the following:

- PCI cards (if present)
- Video card
- FireWire board (if present)
- Modem (if present)
- Logic board
- I/O panel





- 1 Remove the four Phillips screws holding the panel to the chassis.
- 2 **Note:** Yellow arrows indicate tab locations.  
Slide the panel toward the hard drives, freeing the latch panel from the tabs on the chassis.
- 3 Remove the latch panel.



## Panels, Lower Front and Lower Rear

Before you begin, do the following:

- Place the computer on its side
- Remove the front and/or rear support

**⚠ Warning:** When the lower support is removed, the computer can be unstable.

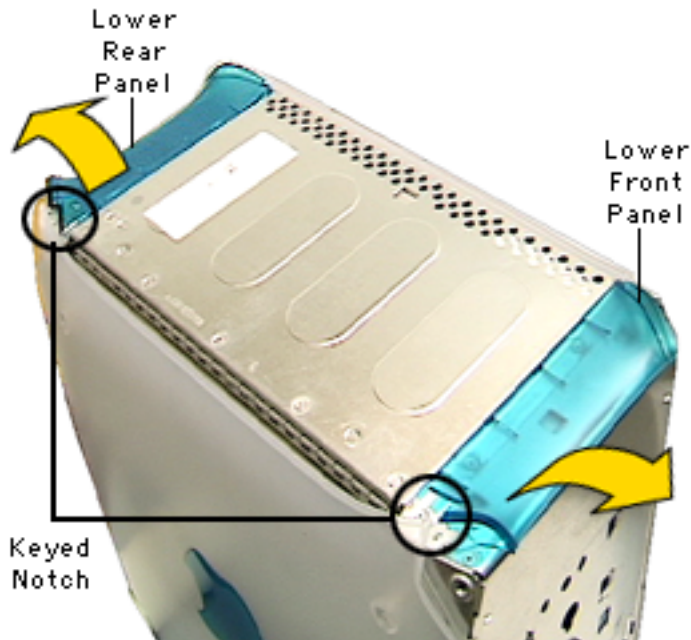




**Note:** The computer is shown upsidedown.

- 1 Lift the lower front panel or the lower rear panel from the chassis. There are no screws holding these panels to the chassis. The front and rear supports (legs) hold them in place.

**Important:** These panels are keyed. The notch goes on the access panel side.



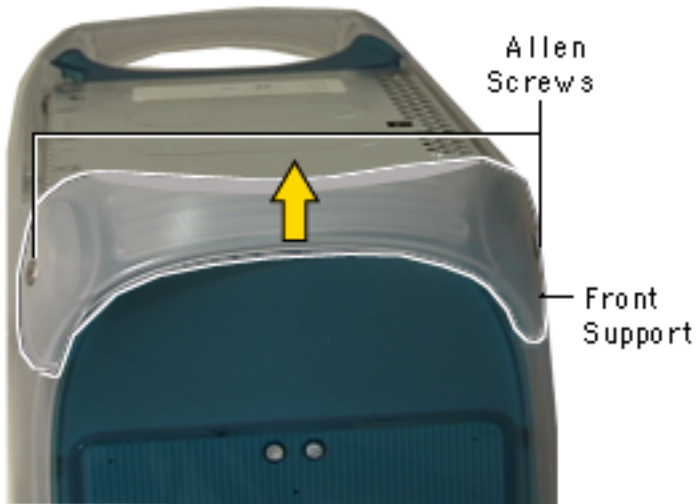


## Supports, Front and Rear

Before you begin, place the computer on an ESD mat and turn the unit upsidedown.

**⚠ Warning:** When the lower supports are removed, the computer can be unstable.

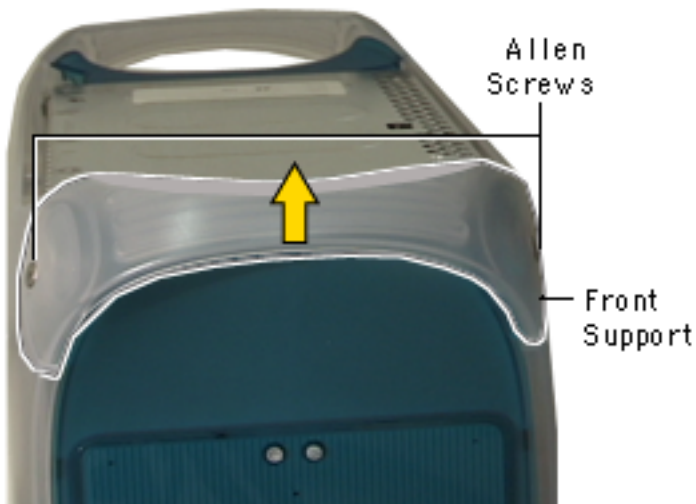




- 1 Using a 2.5 mm allen wrench, remove the four allen screws, two screws for each support.



- 2 Lift the support off the computer.







## Panel, I/O Cover

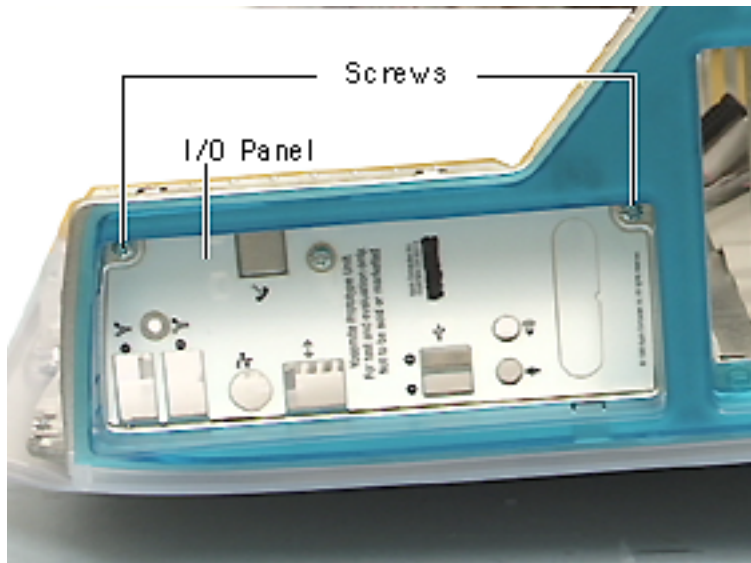
Before you begin, do the following:

- Open the side access panel
- Remove the main logic board



I/O Panel Cover



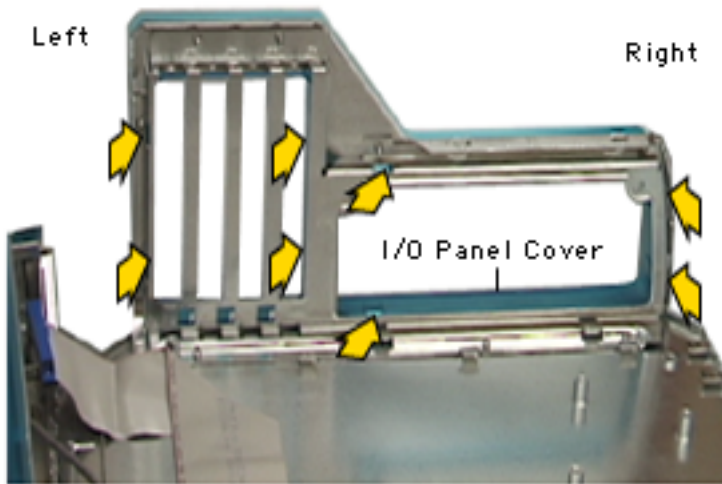


- 1 Remove the two screws on the I/O panel.
- 2 Push the I/O panel inward to remove it from the chassis frame.





### Tab Locations



**Note:** The I/O cover is difficult to remove, take your time prying the plastic tabs.

- 3 Using a jeweler's screwdriver, working from right to left, carefully pry the plastic tabs away from the metal frame. As each tab is released, pull the I/O cover away from the frame.



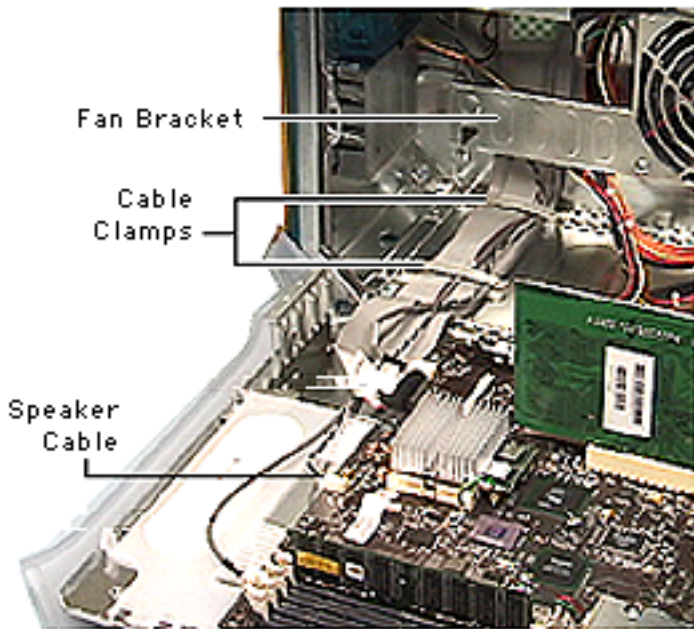


## Speaker

Before you begin, do the following:

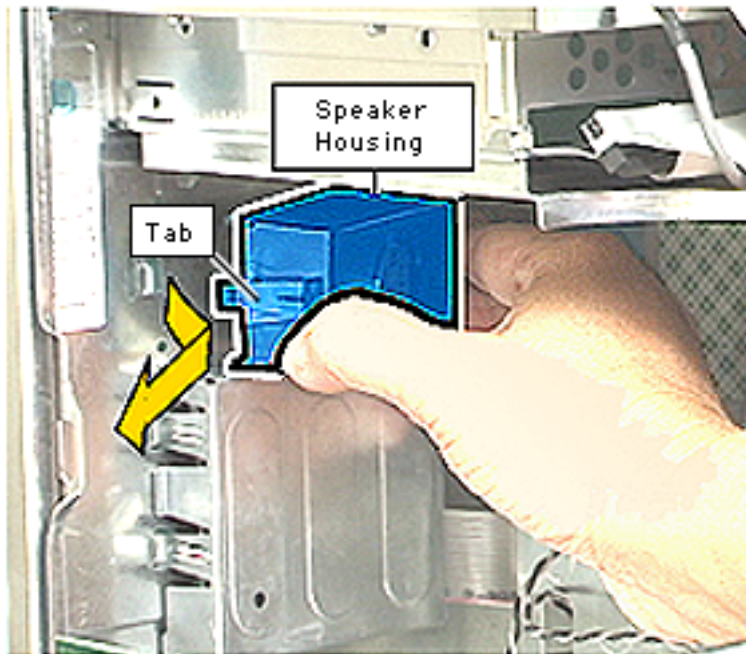
- Open the side access panel
- Remove the hard drive carrier
- Disconnect the main power cable from the logic board





- 1 Open the cable clamps.
- 2 Disconnect the speaker cable from the main logic board at J34.
- 3 Free the cable from the cable clamps and the fan bracket.





- 4 Push the speaker tab in and pull the speaker housing back to release. .
- 5 Remove the speaker housing from the computer.
- 6 Remove the speaker from the speaker housing. **Note:** The speaker and speaker housing are separate parts.

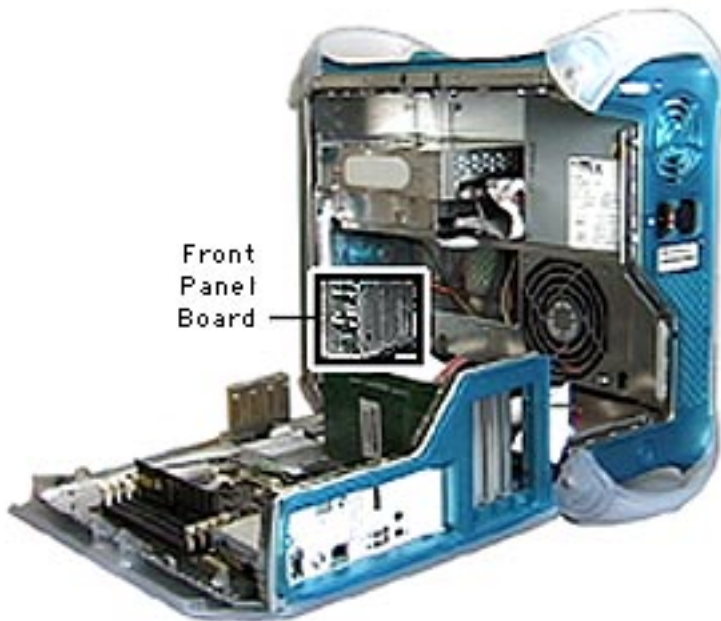




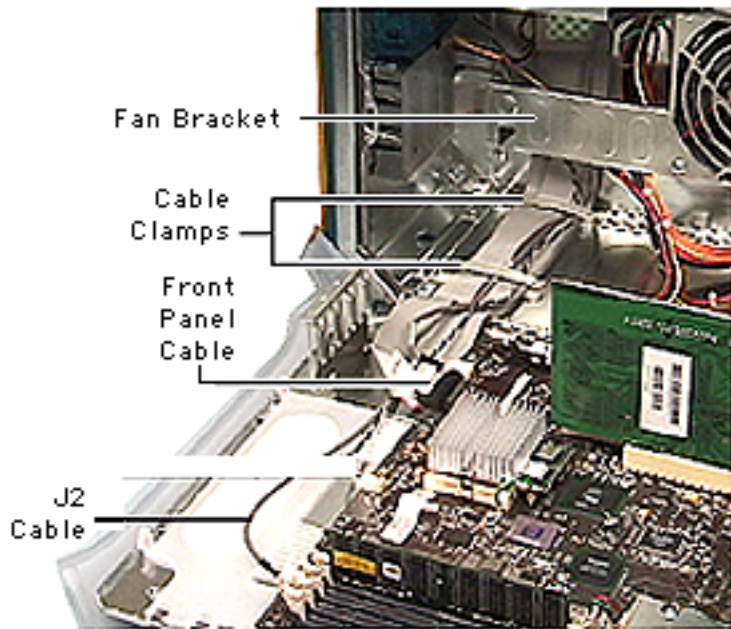
## Front Panel Board

Before you begin, do the following:

- Open the side access panel
- Remove the hard drive carrier to access the front panel cable
- Disconnect the main power cable from the logic board



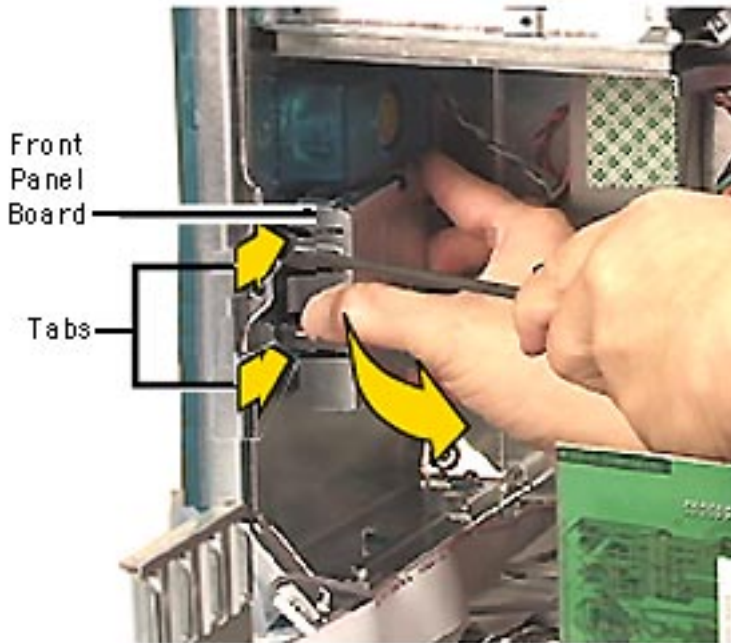




- 1 Disconnect the front panel cable, J2 cable (FireWire), and open the cable clamps.





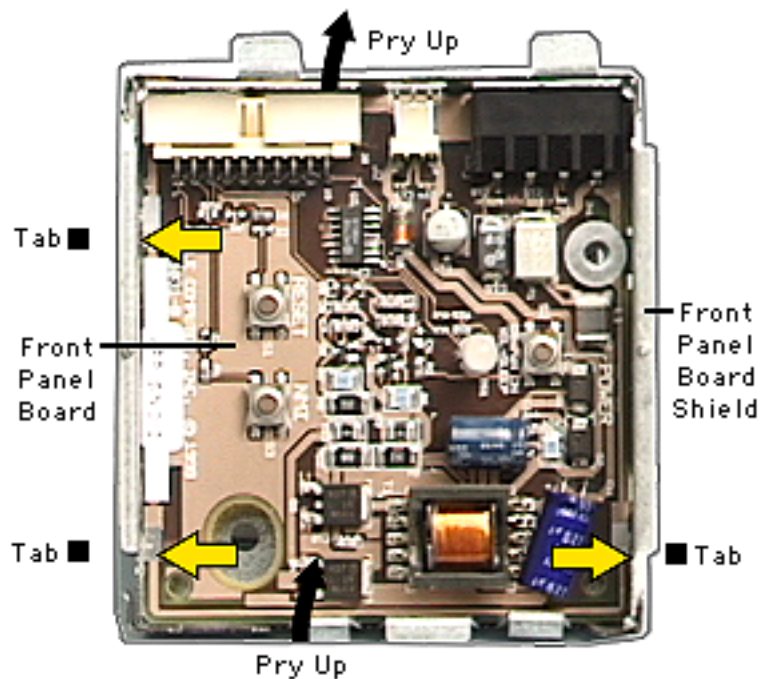


- 2 Using a screwdriver, press tabs in on the front panel shield.
- 3 Pull the front panel shield away from the chassis.
- 4 Disconnect the three cables attaching to the front panel board.

**Replacement Note:**

Power cable P4 connects to the front panel board.





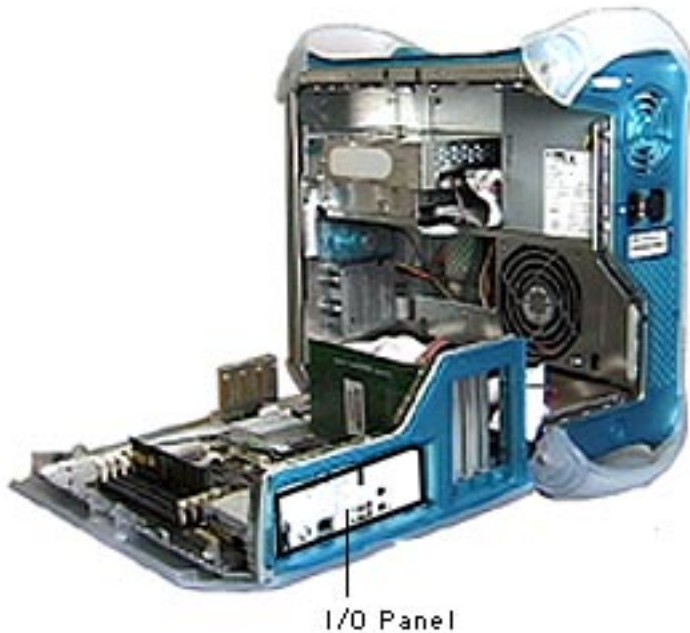
- 5 Push in and pry up on the three tiny metal tabs to release the front panel board from the front panel shield.



## I/O Panel

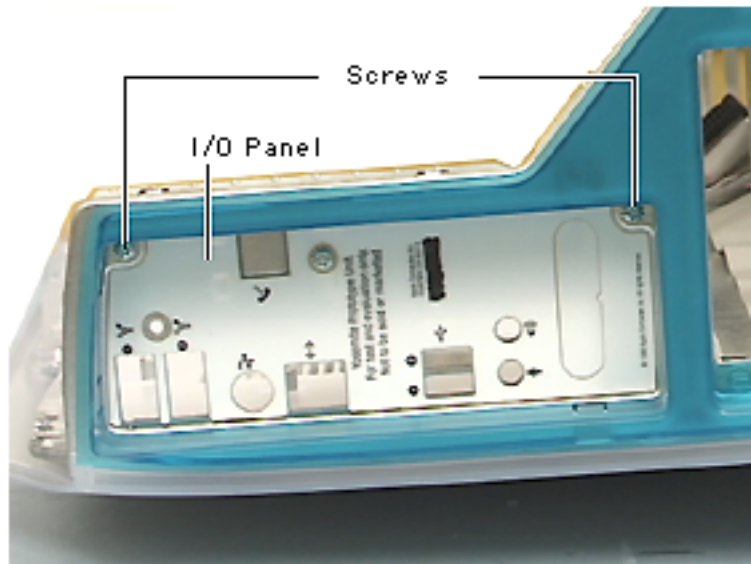
Before you begin, do the following:

- Open the side access panel
- Remove the main logic board



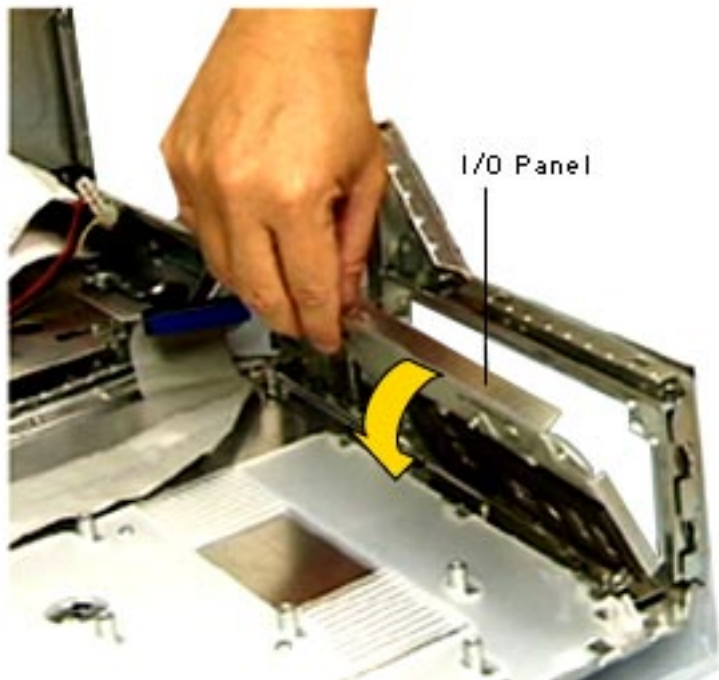


- 1 Remove the two screws on the I/O panel.





- 2 Tilt the I/O panel forward and remove.





## Troubleshooting

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Power Macintosh G3 (Blue and White) /Macintosh Server G3





## General

The Symptom Charts included in this chapter will help you diagnose specific symptoms related to the Power Macintosh G3 (Blue and White) and Macintosh Server G3 product. Because cures are listed on the charts in the order of most likely solution, try the cures in the order presented. Verify whether or not the product continues to exhibit the symptom. If the symptom persists, try the next cure. (Note: If you have replaced a module, reinstall the original module before you proceed to the next cure.)

For additional assistance, contact Apple Technical Support.





## Architecture of the Main Logic Board

The architecture of the main logic board is based on the PowerPC G3 microprocessor and three buses: the processor bus and two PCI buses, a primary 32-bit 66 MHz bus and a secondary 64-bit 33 MHz bus. The processor bus connects the microprocessor, cache, and main memory; the primary PCI bus is for an Apple graphics card solution; the secondary PCI bus connects the I/O devices. The I/O devices on the secondary PCI bus are:

- Ultra DMA/33 (ATA-4) disk interface
- USB interface
- FireWire interface
- Paddington I/O controller IC
- PCI 33.33 MHz 64-bit slots #2, #3, and #4
- DEC/Intel 21154 PCI-PCI bridge IC

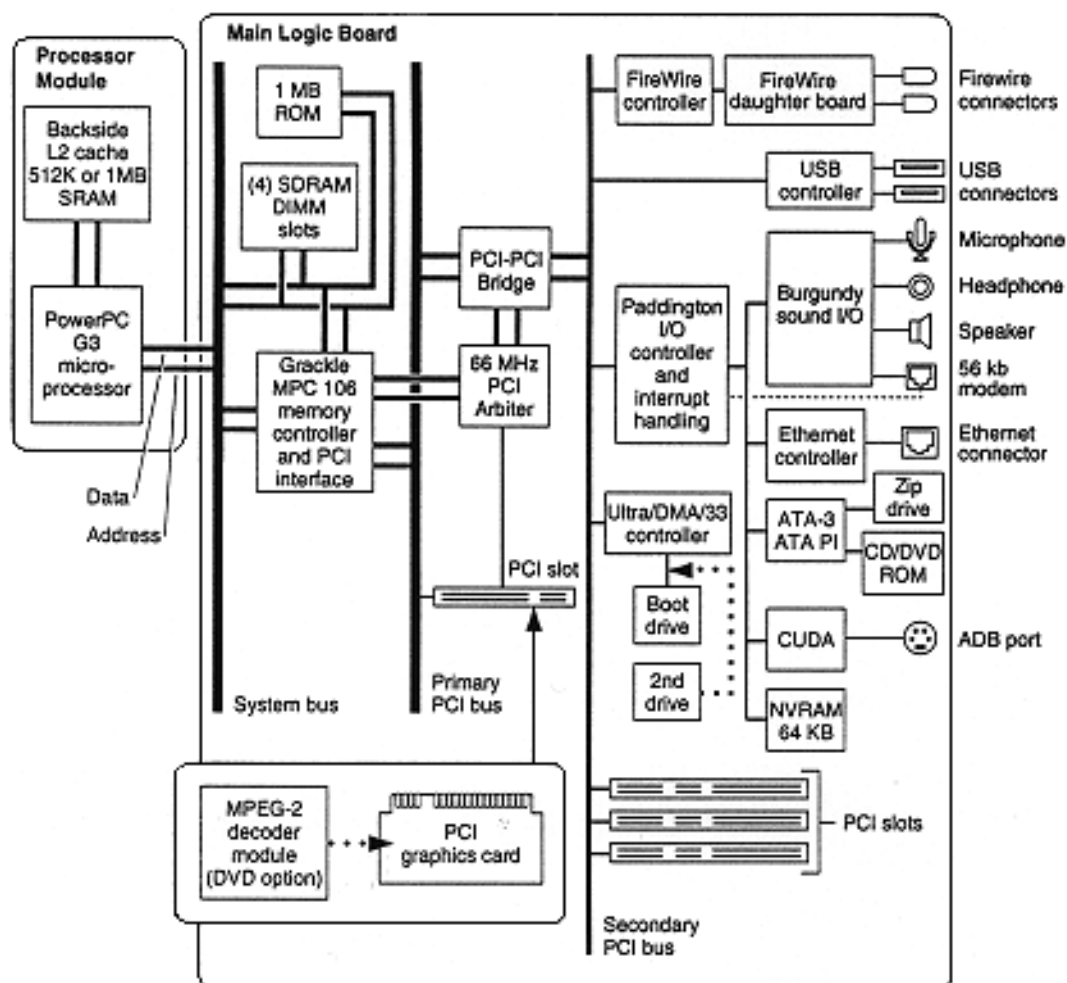






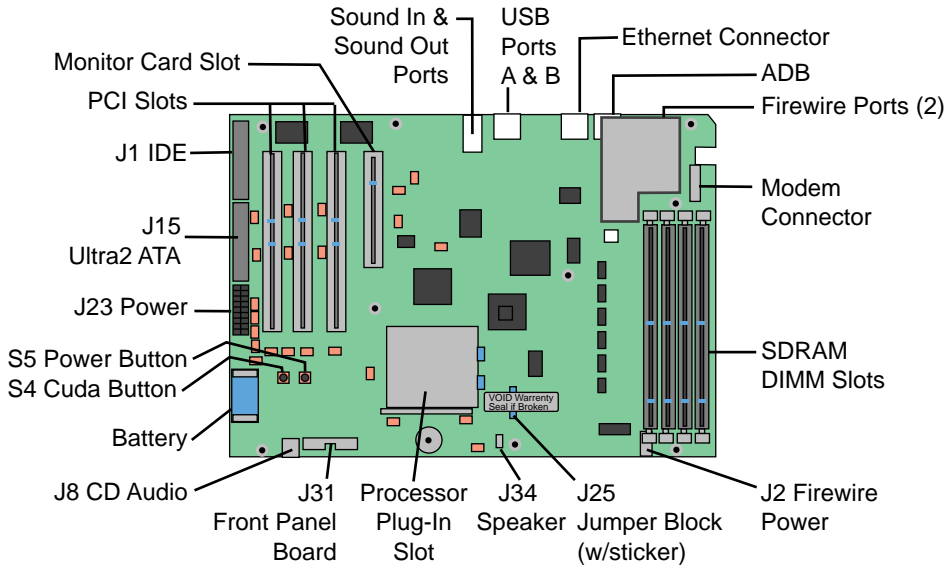
## Block Diagram

The following illustration provides an overview of the Power Macintosh G3 / Macintosh Server G3 internal components and shows how they are connected.





## Logic Board Diagram





## Processor Module

The logic board comes with a removable processor module. You can replace this module when the logic board or processor module fails. The processor module sits in a ZIF socket for easy removal. Processor modules can be ordered from Service, and each is shipped with the appropriate jumper configuration block to place in location J25. The processor should rarely fail. Replace it only as a last resort.

When replacing the processor module, you must change the processor jumper block and warranty sticker to be compatible with the processor module you are installing. Failure to install the jumper block properly will result in a unit that does not boot up. Refer to “Jumper 25 Orientation” on the following pages for installation instructions.





# Jumper Location J25

The jumper block you place at location J25 configures the board to work with different processor modules. Use the appropriate jumper block, identified by color, for each processor module. Refer to “Processor Module” in Take-Apart for instructions.

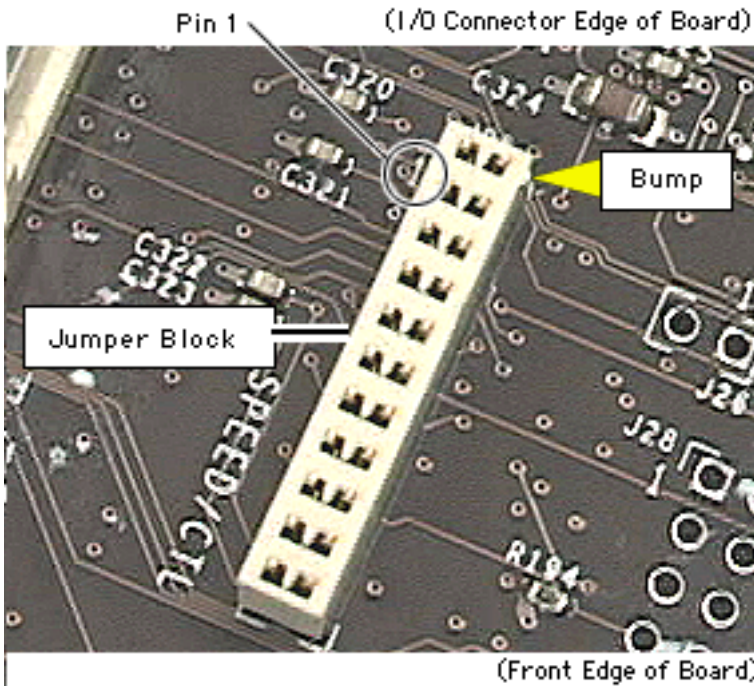
Processor Speed	Jumper Color
300	Black
350	Blue
400	White

The jumper block is protected by a void-warranty sticker. End users are not allowed to remove this jumper block. If the sticker has been tampered with on a unit you receive for repair, do not honor the service warranty on the system.





## Jumper J25 Orientation



Jumper orientation is important. If the processor jumper is not in the correct position, the computer will not startup properly. Make sure the bump (shown above) on the jumper is towards the top of the logic board and across from pin #1.





## PCI Expansion Slots

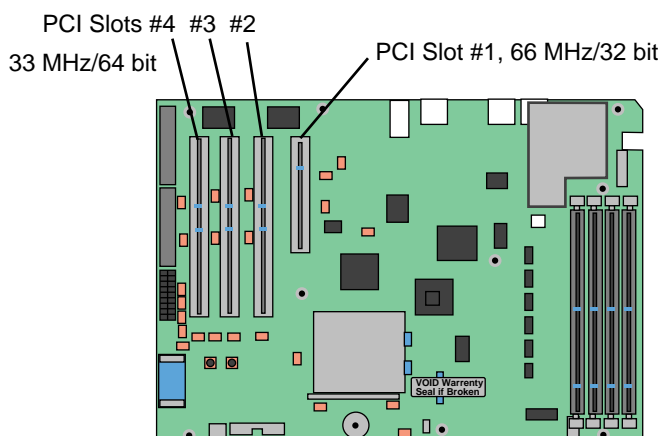
The logic board uses the industry-standard peripheral component interconnect (PCI) bus for an I/O expansion bus. The Power Macintosh G3 has a primary 66 MHz bus and a secondary 33 MHz PCI bus. The 66 MHz bus is a 32-bit multiplexed address and data bus. The 33 MHz bus is a 64-bit multiplexed address and data bus.

The primary PCI bus, includes slot #1, (see graphic below) which accommodates only 32-bit 66 MHz +3.3V PCI cards. However, the Power Macintosh G3 computer is always configured with an Apple 2D/3D accelerated graphics card installed in slot #1, therefore it is not available for PCI card expansion unless the card is removed.

The secondary PCI bus includes slots #2, #3, and #4, (see graphic below) which accommodate both 32-bit and 64-bit 33 MHz +5V or 3.3V PCI cards. The logic board accepts standard 6.88-inch and 12.283-inch PCI cards as defined by the PCI Local Bus Specification, Revision 2.1. PCI cards are required to use the standard ISA fence described in the specification.

The PCI slots support all the required PCI signals and certain optional PCI signals. The three 33 MHz PCI slots on the logic board support the optional 64-bit bus extension signals and cache support signals.

A total of 15 watts of power is provided for each of the PCI expansion slots. Both 5 volts and 3.3 volts are supplied; the total power consumed by both voltages must not exceed the 15-watt maximum.





## I/O Cards

Power Macintosh G3/Macintosh Server G3 computers require an I/O card that moves video from the main logic board. These cards are placed in slot #1 on the main logic board. (The slots are labeled on the back of the I/O panel cover.) If the card is not seated correctly, different symptoms appear. Look in the Symptom Charts for details on troubleshooting these cards.

**Note:** the computer will boot up without the I/O card installed, but they will not operate properly.





## SDRAM Do's and Don'ts

**Note:** The Power Macintosh G3/Macintosh Server G3 can only use "PC-100" SDRAM.

Make sure the SDRAMs are:

- PC-100 SDRAM
- 3.3 Volt unbuffered ONLY
- 168 pin module
- Data width = 64 bits wide
- Contains a correctly programmed Serial Presence Detect ROM (256 bytes)
- Sizes of 32 MB, 64 MB, 128 MB in 64 Mbit technology are qualified.
- Sizes of 128 MB and 256 MB in 128 Mbit technology are qualified.







- Maximum DIMM height  $\leq 2.0$ "
- PC-100 SDRAM includes a sticker that clearly shows "PC-100"

Do **NOT** use:

- Parity SDRAM DIMMs.
- ECC (error correcting) SDRAM DIMMs.
- Registered or buffered SDRAM
- DIMMs with fewer than 4 or more than 16 devices (irrespective of any PC-100 sticker or claims)

The Power Macintosh G3/Macintosh Server G3 is NOT compatible with ALL defined PC-100 DIMM sizes and organizations. In particular, do not use DIMMs using 256 Mbit SDRAMs; also, do not use DIMMs employing 32-bit wide SDRAMs.

The Power Macintosh G3/Macintosh Server G3 cannot use the





older EDO or Fast Page Mode DRAMs. In general, you will not be able to re-use DRAM from past Macintoshes (8500, 8600, PM G3, iMac) in your Power Macintosh G3/Macintosh Server G3. However, there have been some recent efforts to qualify PC100 SDRAM for earlier versions of G3.

Zero MB of memory is soldered to the Power Macintosh G3/Macintosh Server G3 main logic board. If the all four of the DIMM slots are empty, the machine will not operate. A single-frequency tone will be generated indicating that no memory is installed. The DRAM DIMMs can be installed one or more at a time. There are no performance gains when two DIMMs of the same size are installed. Any supported size DIMM can be installed in any DIMM slot, and the combined memory of all of the DIMMs installed will be configured as a contiguous array of memory.





## The Cuda Chip

The Cuda is a microcontroller chip. Its function is to

- Turn system power on and off
- Manage system resets from various commands
- Maintain parameter RAM (PRAM)
- Manage the real-time clock

Many system problems can be resolved by resetting the Cuda chip (see the Symptom/Cure tables for examples). Press the Cuda reset button on the logic board to reset the Cuda chip. The Cuda reset button is located on the logic board to the right of the battery. Refer to the Logic Board Diagram earlier in this chapter for location information. If you continue to experience system problems, refer to “Resetting the Logic Board” in this chapter.





## Resetting the Logic Board

Resetting the logic board can resolve many system problems (see the Symptom/Cure tables for examples). Whenever you have a unit that fails to power up, you should follow this procedure before replacing any modules.

- 1 Unplug the computer.
- 2 Press the Power On button on the front of the unit.
- 3 Open the side access panel.
- 4 Remove the battery from the logic board.
- 5 Wait at least 10 minutes before replacing the battery.
- 6 Make sure the battery is installed in the correct +/- direction.
- 7 Reassemble the computer and test the unit.

**Note:** This procedure resets the computer's PRAM. Be sure to check the computer's time/date and other system parameter settings afterwards.





## Power-On Self Test

There is a power-on self test that resides in the ROM of the Power Macintosh G3/Macintosh Server G3. This test automatically runs whenever the Power Macintosh G3 is powered on after being fully shut down (the power-on self test does not run if the machine is only restarted). If a problem is detected during the test, you will not hear a normal startup chime. Instead, the system will beep as explained below.

- **1 Beep:** No RAM is installed or detected.
- **2 Beeps:** Incompatible RAM types installed (for example, both SDRAM and EDO installed)
- **3 Beeps:** No RAM banks passed memory testing.
- **4 or 5 Beeps:** Bad checksum for the remainder of the boot ROM block. The ROM is bad and probably cannot be fixed.





## Logic Board LEDs

There are seven LEDs on the Power Macintosh G3/Macintosh Server G3 computer. A graphic follows that identifies their logic board location.

### **DS1= ATA drive activity**

If a CD and/or Zip are attached to the ATA bus, this LED will illuminate at power/on restart time for a few seconds. After that, it is unlikely it will illuminate again in a trouble-free system. If this light stays on for a prolonged period, this is a sign of trouble on the ATA bus. If devices are connected to the ATA bus and this LED is dark at boot time, that is also likely a sign of trouble. If a hard disk drive were attached to this bus, the LED would flicker regularly indicating drive activity (reads/writes).

**Note:** There is no DS2 or DS3 on the board



**DS4 and DS5= USB power for downstream devices**

DS5 = USB port 1- lower

DS4 = USB port 2- upper

When illuminated, these LEDs indicate that the computer is providing power (+5V) to downstream USB ports. USB devices do not need to be connected in order for these LED's to illuminate. However, if one or both of the LEDs is not illuminated and a USB device is/was attached (and the system has completed its boot process), then the logic board has removed downstream power because of a trouble condition.

Since the downstream power is controlled individually for each port, it is possible to have these LEDs in a different state: one off and one on. This way if one port has troubled USB devices then the other port can still be functional. These LEDs are not immediately illuminated at the beginning of a restart or cold power-on. During a successful/normal boot, the sequence will look like:





1. Unit is powered on and other LEDs will illuminate while DS4 and DS5 are off.
2. Then DS4 and DS5 on for a second or two
3. Then Off very briefly (1 sec)
4. Then back on (confirms secondary PCI bus is initialized and power now available)

These two LEDs are often useful when troubleshooting an unpredictable system. If they stay on (step 4) then the secondary PCI bus has been initialized which happens relatively late in the boot/hardware initializing process.

**DS6 = Ultra ATA bus activity**

DS6 indicates Ultra ATA bus activity.





**DS7 & DS8 = Power Indication**

In a working unit, these LEDs should be in sync with each other: both on or both off. If one LED is on and the other is off, there is a problem.

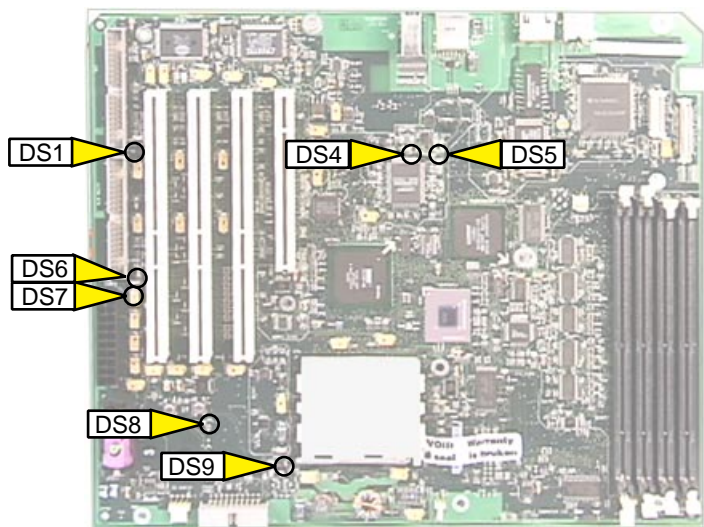
**DS9=CPU Bus Request**

When illuminated, this LED indicates that the CPU is requesting the bus. This LED will rarely glow as brightly as the others (like the Ultra ATA LED) given that the CPU is not always requesting the bus, and when it does, the period of time is short. As a result, you may need to watch this LED much more carefully than the others to tell if there is activity. If this LED is ever on continuously and bright, then the system is troubled and likely hung.





# Logic Board LEDs Locator





## HFS+ Formatted Drives

Some Power Macintosh G3 computers ship with hard drives that are formatted with HFS and some later models ship with hard drives that are formatted with HFS+ (also referred to as Mac OS Extended format). The hard drives in the Power Macintosh G3 (Blue and White) and all Macintosh Server G3 computers are formatted with HFS+.

Norton Utilities version 3.5 is not compatible with HFS+ (or Mac OS Extended format), and in fact, can destroy data on the hard drive. Norton Utilities version 3.5.3 or 3.5.2 will not attempt to repair a drive formatted with Mac OS Extended format and versions 3.5.1 and earlier cannot recognize that a hard drive is in Mac OS Extended format and can result in hard drive corruption and loss of all data on the drive.





**Note:** When diagnosing hard drive problems, it is important to verify whether or not the customer may have used the wrong disk repair software for their drive before assuming that the problem is hardware related.

If you experience problems with a hard drive that has been formatted with HFS+, Apple Computer recommends using the version of Disk First Aid included on the system software CD that shipped with the unit.

Some other disk utility and disk locking programs are incompatible with Mac OS Extended format. Before you attempt to use a disk utility or disk locking program, make sure the version you have is compatible with Mac OS Extended format. Check the documentation that came with the program or contact the manufacturer or the vendor that supplied the program.

Use the Get Info command in system 8.5 to determine how a hard drive has been formatted. Drives formatted with HFS will appear





as “Mac OS Standard”, while drives formatted with HFS+ will appear as “Mac OS Extended.”

For more information on HFS+ formatting of hard drives, refer to the Technical Info Library, article # 30344.





## Cleaning Procedure for Card Connectors

It is possible for residue to build up on the gold edge connector pins on some PCI cards, which could cause a variety of symptoms.

If you are having problems with a PCI card, inspect the connector pins with a magnifying glass. If you find residue, use a pencil eraser to gently clean the pins. Remember, never handle the PCI cards by the gold connectors.





## Logic Board Battery

The battery on the logic board controls the stored system settings, such as date and time. It is important to note that the battery does not affect power at startup.

The battery should be replaced if your system loses date and time settings.

**Note:** The Power Macintosh G3/ Macintosh Server G3 uses a lithium battery which must be disposed of in accordance with hazardous waste regulations.





## VGA-to-Macintosh Adapters

To avoid symptoms, “No video” or “Black Screen” situations do not use two VGA-to-Macintosh adapters (one on each end) on the video cable that connects a Power Macintosh G3/Macintosh Server G3 to a monitor with a captive VGA connector.

If you need to connect a VGA monitor to the Power Macintosh G3/Macintosh Server G3 connect it in one of the following ways:

- VGA monitor --> to a VGA cable with VGA connectors on both ends--> to the video card on the Power Macintosh G3
- VGA monitor---> to a mixed cable, a cable that has a VGA connector on one end and a Macintosh connector on the other end--> to the video card on the Power Macintosh G3.







## Symptom Charts

### System

Fan on power supply is running, but no startup tone, screen is black, drive not accessed at startup, and no LED on front of system

- 1 Verify power supply voltage switch is set correctly for your region (see “Voltage Switch” in Basics chapter for more information).
- 2 Check jumper block configuration at J25. Make sure jumper block is correct color for processor type installed (see “Jumper Location J25” earlier in this chapter for more information) and that it is installed in the correct direction.
- 3 Reseat processor module. Make sure locking arm is in down position.
- 4 Reseat DIMMS.
- 5 Reset the logic board. Refer to “Resetting the Logic Board” mentioned earlier in this chapter.
- 6 Replace logic board.





7 Replace processor module.

Fan is running, LED is on, drive is accessed at startup, no startup chime, and screen is black

- 1 Reseat SDRAM DIMMs.
- 2 Check jumper block configuration at J25. Make sure jumper block is correct color for processor type installed (see “Jumper Location J25” earlier in this chapter for more information) and that it is installed in the correct direction.
- 3 Check cable connections to the monitor and to the speaker/microphone ports on the rear of the unit. Are the cables connected to the correct ports?

Memory error dialog box message appears on the screen

- 1 Reseat SDRAM DIMMs. (Note: the computer does not ship with any on-board memory. You must have a DRAM DIMM installed for the computer to boot properly.)
- 2 Verify that only PC-100 SDRAM DIMMs are installed and not EDO memory.
- 3 Run Mac TestPro to locate the bad SDRAM. Replace the SDRAM with a known-good DIMM.





Computer begins to power up, the fan and hard drive are spinning, the power LED is lit, but there is no video.

- 1 Reseat SDRAM DIMMs. Refer to the “Power-On Self Test” section mentioned earlier in this chapter.
- 2 Test for a bad SDRAM DIMM by removing the DIMMs one at a time (replacing each one afterwards). Replace any faulty SDRAM DIMMs.
- 3 Check jumper block configuration at J25. Make sure jumper block is correct color for processor type installed (see “Jumper Location J25” earlier in this chapter for more information) and that it is installed in the correct direction.
- 4 Reseat the processor card.
- 5 Verify internal SCSI cabling is secure.
- 6 Verify all cards are seated properly.
- 7 Remove all cards (except video card) and disconnect hard drives from the logic board. Do you have video?
- 8 Replace the video card.
- 9 Replace the logic board.
- 10 Replace the processor.





Clicking, chirping,  
thumping, or rubbing

- 1 Remove all PCI cards and test unit. If problem does not occur with cards removed, begin replacing cards one at a time to determine which card is causing problem. Replace problem card with known-good card.
- 2 Reseat the CD-ROM/Zip drive carrier and cables.
- 3 Remove hard drive. If problem no longer occurs, replace hard drive with a known-good drive.
- 4 Replace power supply.
- 5 Replace processor module.
- 6 Replace logic board.
- 7 Replace I/O card.

System shuts down  
intermittently

- 1 Check that the fan cable is connected and the fan is operational.
- 2 Make sure air vents are clear. Do not operate the computer with the access panel open, the heatsink could overheat.
- 3 Make sure power cord is plugged in firmly.
- 4 Replace power cord.





- 5 Check battery.
- 6 Reset Cuda chip. (Refer to “The Cuda Chip” in this chapter for instructions.)
- 7 Reset logic board. (Refer to “Resetting the Logic Board” in this chapter for instructions.)
- 8 Replace power supply.
- 9 Replace logic board.
- 10 Replace processor module.

System  
intermittently  
crashes or hangs

- 1 Verify system software is version 8.5.1 with Mac OS ROM 1.2.
- 2 Verify software is known-good. Do a clean install of system software with the CD that came with the unit.
- 3 Verify software is Power Macintosh compatible (contact developer). Also, try booting with extensions off to determine if there are system init problems.
- 4 Run Disk First Aid.
- 5 Test for bad memory. Run MacTest Pro in loop mode





overnight to test the memory. If MacTest Pro finds a bad memory module, or other hardware, replace the hardware in question with a known-good module.

- 6 Clear parameter RAM. Hold down <Command> <Option> <P> <R> during startup but before “Welcome to Macintosh” appears.
- 7 Remove all SDRAM DIMMs and try replacing them one at a time to test. Replace any bad DIMMs.
- 8 Reset the logic board. Refer to “Resetting the Logic Board” mentioned earlier in this chapter.
- 9 Replace logic board.
- 10 Replace processor module.





- |   |   |
|---|---|
| During startup, following message is displayed, "This startup disk will not work on this Macintosh model...." | <ol style="list-style-type: none"><li>1 Verify startup disk is good.</li><li>2 Verify system software is version 8.5.1 with Mac OS ROM 1.2.</li><li>3 Do a clean install of system software with the CD that came with the unit.</li></ol>  |
| System freezes during normal operation  | <ol style="list-style-type: none"><li>1 Use the Extension Manager in Controls Panels. Boot with Extensions off by holding down the Shift key during startup. Begin adding back the system Extensions one at a time and starting up the system after each addition.</li><li>2 Do a clean install of system software with the CD that came with the unit.</li><li>3 Check for bad USB devices. Turn off the computer and disconnect all USB devices. Next, power on the system using the power button on the front of the unit, and begin adding back the USB devices one at time, beginning with the keyboard and then the mouse, and so on. If the system</li></ol> |





hangs only after you reconnect a particular USB device, replace that USB device.

- 4 Test for bad memory. Run MacTest Pro in loop mode overnight to test the memory. If MacTest Pro finds a bad memory module, or other hardware, replace the hardware in question with a known-good module.
- 5 Reset the logic board. Refer to “Resetting the Logic Board” mentioned earlier in this chapter.
- 6 Replace the logic board.
- 7 Replace the processor module.







## No Power

System is completely dead

- 1 Check LEDS DS7 and DS8 on the logic board. In a working unit, these LEDs should be in sync with each other: both on or both off. If one LED is on and the other is off, there is a problem.
- 2 Verify the power outlet is good. Try a known-good power cord.
- 3 Make sure the voltage switch on the back of the power supply is set to the correct voltage.
- 4 Check for +5V trickle voltage on pin 20 at the power supply connector, J23. If there is a +5V reading, you know the power supply is likely OK. However, if there's no +5V trickle power, replace the power supply.
- 5 Disconnect the keyboard and power-on the system via the reset button on the front of the computer. If the unit powers on, replace the USB keyboard. If not, go to next step.
- 6 Reset the CUDA chip and try again. If the problem persists,





reset the logic board. (See “The CUDA Chip” and “Resetting the Logic Board” earlier in this chapter for instructions.)

- 7 Replace the logic board if the problem persists.





## Error Beeps

Computer beeps once at startup

- 1 One beep means that no RAM is installed or detected.
- 2 Reseat the SDRAM and try again.
- 3 If no SDRAM is present, install a known-good PC-100 SDRAM DIMM in the top slot and try again.
- 4 If DRAM is present, replace it (one DIMM at a time, starting with the top DIMM slot) with a known-good PC-100 SDRAM DIMMs.
- 5 Reseat processor module and try again.
- 6 Replace processor module and try again.
- 7 Replace logic board.

Computer beeps twice at startup

- 1 Two beeps means that incompatible RAM types may be installed. Verify that only PC-100 SDRAM DIMMs are installed and not EDO memory.
- 2 Replace the existing SDRAM one DIMM at a time with known-





good PC-100 SDRAM DIMMs.

- 3 Reseat processor module and try again.
- 4 Replace processor module and try again.
- 5 Replace logic board.

Computer beeps three times at startup

- 1 Three beeps means that no RAM banks passed memory testing.
- 2 Replace the existing SDRAM one DIMM at a time with known-good PC-100 SDRAM DIMMs.
- 3 Reseat processor module and try again.
- 4 Replace processor module and try again.
- 5 Replace logic board.

Computer beeps four or five beeps at startup

- 1 Four or five beeps means that beeps means that the ROM is probably bad and cannot be fixed.
- 2 Replace logic board.





## Video

Screen is black, but boot tone is present, drive operates, fan is running, and LED is lit

- 1 Check video cable/card connections. If using a VGA to Macintosh adapter refer to “VGA-to-Macintosh Adapter” earlier in this chapter.
- 2 Reseat SDRAM DIMMS. Make sure DIMMS are PC-100 DIMMS. Refer to “SDRAM DIMMS Do’s and Don’ts” in this chapter.
- 3 Remove all SDRAM DIMMs and try replacing them one at a time to test. Replace any bad DIMMs.
- 4 Check jumper block configuration at J25. Make sure jumper block is correct color for processor type installed (see “Jumper Location J25” earlier in this chapter for more information) and that it is installed in the correct direction.
- 5 Clear parameter RAM. Hold down <Command> <Option> <P> <R> during startup but before “Welcome to Macintosh” appears.
- 6 Reset Cuda chip. (Refer to “The Cuda Chip” in this chapter





for instructions.)

- 7 Reset logic board. (Refer to “Resetting the Logic Board” in this chapter for instructions.)
- 8 Replace monitor cable.
- 9 Test with known-good monitor. Replace monitor if necessary. Refer to appropriate monitor manual to troubleshoot defective monitor.
- 10 Replace logic board.
- 11 Replace processor module.

Screen is black, no boot tone and drive does not operate, but fan is running and LED is lit

- 1 Check video cable/card connections. If using a VGA to Macintosh adapter refer to “VGA-to-Macintosh Adapter” earlier in this chapter.
- 2 Check jumper block configuration at J25. Make sure jumper block is correct color for processor type installed (see “Jumper Location J25” earlier in this chapter for more information) and that it is installed in the correct direction.
- 3 Reset Cuda chip. (Refer to “The Cuda Chip” in this chapter





for instructions.)

- 4 Reset logic board. (Refer to “Resetting the Logic Board” in this chapter for instructions.)
- 5 Reseat the video card.
- 6 Reseat the SDRAM DIMMs.
- 7 Remove all SDRAM DIMMs and try replacing them one at a time to test. Replace any bad DIMMs.
- 8 Replace monitor cable.
- 9 Replace the video card.
- 10 Replace logic board.
- 11 Replace power supply.
- 12 Replace processor module.

Boot tone is present and screen lights up, but nothing is displayed on screen

- 1 Check video cable/card connections. If using a VGA to Macintosh adapter refer to “VGA-to-Macintosh Adapter” earlier in this chapter.
- 2 Reset Cuda chip. (Refer to “The Cuda Chip” in this chapter for instructions.)





- 3 Reset logic board. (Refer to “Resetting the Logic Board” in this chapter for instructions.)
- 4 Reseat all PCI cards and SDRAM.
- 5 Replace monitor cable.
- 6 Test with known-good monitor. Replace monitor if necessary. Refer to appropriate monitor manual to troubleshoot defective monitor.
- 7 Replace logic board.
- 8 Replace processor module.

#### Distorted Video

- 1 Adjust the focus using the Display Adjustment Utility on the MacTest Pro CD.
- 2 Check the video cable.
- 3 Check the video adapter is using one. Refer to “VGA-to-Macintosh Adapter” earlier in this chapter.
- 4 Adjust the screen geometry using the Display Adjustment Utility on the MacTest Pro CD.
- 5 Adjust the cutoff or white balance using the Display







Adjustment and Display Service Utilities on the MacTest Pro CD. Refer to the monitor's owner's manual for additional information.

Erroneous text or characters appear on the screen

- 1 Check the keyboard and the keyboard connection.
- 2 The system software may be corrupted. Reinstall system software. You must use the system software CD that came with the unit.

Flashing question mark

- 1 Boot from the system CD to verify the hard drive can be seen on the desktop. If booting from a SCSI chain, make sure the hard drive priority numbers are set properly.
- 2 Check for OS software on the boot drive.
- 3 Run Disk First Aid. Update the driver with drive setup 1.6.2.
- 4 If the symptom is on the external SCSI drive, disconnect the external SCSI devices. Troubleshoot the SCSI chain if necessary.
- 5 Reinstall system software. You must use the system software





CD that came with the unit.

6 Replace the hard drive/CD data cable.

7 Replace the hard drive.

Screen jitter

1 Reseat the video card.

2 Replace the video card.





## Zip Drive

Zip drive does not operate

- 1 Replace Zip disk with known-good disk.
- 2 Does the drive have power? Check that light blinks on front of the Zip drive. Reseat cables on the back of the Zip drive.
- 3 Reinstall Zip software.
- 4 Check device settings; device 0 (master), device 1 (slave)
- 5 Replace IDE/ATA drive cable.
- 6 Replace Zip drive.
- 7 Replace logic board.

During system startup, Zip disk ejects

- 1 Replace Zip disk with known-good disk.
- 2 Reinstall Zip software. Reseat cables on the back of the Zip drive.
- 3 Check device settings; device 0 (master), device 1 (slave)
- 4 Replace IDE/ATA cable.
- 5 Replace Zip drive.
- 6 Replace logic board.





Zip Disk does not eject	1	Switch off computer. Hold down mouse button while you switch computer on.
	2	Reinstall Zip software.
	3	Replace Zip drive.
	4	Replace IDE/ATA drive cable.
	5	Replace logic board.
Zip drive attempts to eject disk, but doesn't	1	Reseat Zip drive bezel so bezel slot aligns correctly with drive.
	2	Replace Zip drive.
Zip drive runs continuously	1	Replace Zip disk with known-good disk.
	2	Reinstall Zip software.
	3	Replace Zip drive.
	4	Replace IDE/ATA drive cable.
	5	Replace logic board.





## Hard Drive

Single internal hard drive does not operate; drive doesn't spin

- 1 Check if you can see the drive using Drive Setup from MacTest Pro. Reinstall the software drivers for the hard drive.
- 2 Check all cable connections to the hard drive.
- 3 Replace hard drive data cable.
- 4 Verify hard drive power cable is OK. Try another power cable, such as P5, P2, or P3.
- 5 Replace hard drive. If problem resolved, reinstall IDE device driver and system software.
- 6 Replace power supply.

No internal SCSI drives operate

- 1 Verify there are no duplicate SCSI device addresses on a single SCSI bus.
- 2 Disconnect external SCSI devices and check for proper termination.
- 3 Check internal SCSI devices for proper termination.





- 4 If more than one SCSI device is on the SCSI chain, remove one device at a time and retest. Replace the bad drive.
- 5 Replace internal SCSI data cable to which non-operational devices are attached.
- 6 Reseat the SCSI PCI card. Replace the SCSI PCI card.
- 7 Replace power supply.

Works with internal  
or external SCSI  
devices but not with  
both

- 1 Verify there are no duplicate SCSI device addresses.
- 2 Reseat SCSI cable connections going to the SCSI card.
- 3 Replace terminator on external SCSI device.
- 4 Verify that SCSI device at end of internal SCSI data cable is only device terminated.
- 5 If more than one SCSI device is on the SCSI chain, remove one device at a time and retest. Replace the bad drive.
- 6 Reseat the SCSI card, then try a known-good SCSI card.
- 7 Replace SCSI drive cables one at a time.
- 8 Disconnect external SCSI chain. Refer to appropriate manual to troubleshoot defective external device.





## Input Device Problems

Cursor does not move with the USB mouse

- 1 Disconnect and reconnect the mouse securely to the USB keyboard.
- 2 Inspect inside of mouse for buildup of dirt or other contaminants. Clean mouse if necessary.
- 3 If mouse is connected to keyboard, connect the mouse to one of the USB ports on the I/O panel instead. If the mouse works, replace keyboard.
- 4 If the cursor doesn't move, replace the USB mouse.
- 5 If the mouse is connected to one of the USB ports on the I/O panel, switch to the other USB port.
- 6 If the cursor moves, replace logic board.

Cursor moves, but clicking USB mouse button has no effect

- 1 Boot from bootable CD and test.
- 2 If mouse is connected to keyboard, connect the mouse to one of the USB ports on the I/O panel instead. If the cursor moves, replace keyboard.





- 3 If connected to I/O, try the other I/O connector. Does it work? Replace logic board.
- 4 Replace USB mouse.
- 5 Replace logic board.

Double-click doesn't open application, disk, or server

- 1 Boot with Extensions off.
- 2 Remove duplicate system folders and reboot.
- 3 Clear parameter RAM. Hold down <Command> <Option> <P> <R> during startup but before "Welcome to Macintosh" appears.
- 4 Boot from bootable CD and test.

No response to any key on keyboard

- 1 Boot with Extensions off.
- 2 Check keyboard connection to USB port.
- 3 Boot from bootable CD and test.
- 4 Replace keyboard.
- 5 Replace logic board.







Known-good USB  
printer does not work

- 1 Verify you have correct version of system software and printer driver installed.
- 2 Open the Chooser and verify that you have the correct printer selected.
- 3 If the printer is connected to a third-party USB hub, switch it to one of the USB ports on the I/O panel. If the printer works now, you have a bad third-party USB hub.
- 4 Turn off unnecessary Extensions and try again.
- 5 Do clean install of system software and print driver.
- 6 Replace printer interface cable.
- 7 Replace the printer.

Known-good network  
printer does not print

- 1 Check network connections.
- 2 Verify you have correct version of system software and printer driver installed.
- 3 Open the Chooser and verify that you have the correct printer selected.
- 4 Does printer show up in Chooser? If so, do clean install of





system software and/or network and printer software.

Cursor does not move  
with the ADB mouse

- 1 Verify that the mouse is connected securely to the ADB keyboard, monitor, or I/O panel connector.
- 2 Inspect inside of mouse for buildup of dirt or other contaminants. Clean mouse if necessary.
- 3 If mouse is connected to an ADB keyboard, connect the mouse to the ADB port on the I/O panel instead. If the cursor works, replace ADB keyboard. Restart computer after changing connections.
- 4 If the cursor doesn't move, replace the ADB mouse.
- 5 If a known good keyboard and mouse don't work when connected to the I/O panel, replace logic board.





## CD-ROM Drive

CD-ROM tray won't open

- 1 Verify CD-ROM software is good. Reinstall CD-ROM software.
- 2 Reseat cables on the back of the CD-ROM drive.
- 3 Reseat the CD-ROM data cable on the logic board.
- 4 Try using known-good compact disc.
- 5 Replace CD-ROM drive mechanism.

CD-ROM icon does not appear on the desktop

- 1 Try using known-good compact disc.
- 2 Reinstall CD-ROM software.
- 3 Reseat CD-ROM data cable at the back of the CD-ROM.
- 4 Replace CD-ROM drive mechanism.
- 5 Replace CD-ROM data cable.
- 6 Replace the logic board only if other devices on the bus do not work.





## Sound

No sound from  
computer's speaker

- 1 Boot with a bootable CD and test.
- 2 Boot with Extensions off and try again.
- 3 Disconnect any microphones or external speakers.
- 4 Verify that volume setting in Control Panel is adequate and mute is not checked.
- 5 Clear parameter RAM. Hold down <Command> <Option> <P> <R> during startup, until the Macintosh restarts.
- 6 Verify speaker cable (J34) is plugged into logic board.
- 7 Plug headphones or external speakers into the external jack. If the external jack works, replace the internal speaker. If the external jack doesn't work, replace the logic board.





## Network Problems

Ethernet connection drops off line by itself

- 1 Try another Ethernet cable.
- 2 Reinstall the Ethernet driver.
- 3 Possible network problem. Troubleshoot the network.

Unable to switch to the Ethernet network option in the control panel

- 1 Use a known-good Ethernet cable and connect properly to an known-good network.
- 2 Reset parameter RAM. Hold down <Command> <Option> <P> <R> during startup but before “Welcome to Macintosh” appears.
- 3 Boot from the system CD that came with the unit. Open the Network control panel and switch to Ethernet. Are you able to switch to Ethernet and see Ethernet devices on the network now? If so, troubleshoot software Extensions or reinstall system software.





Unable to see any network devices

- 1 Open the Network control panel and select the Ethernet option. Verify that you can now see devices on the network.
- 2 Reset parameter RAM. Hold down <Command> <Option> <P> <R> during startup but before “Welcome to Macintosh” appears.
- 3 Boot from the system CD that came with the unit. Open the Network control panel and switch to Ethernet. Are you able to switch to Ethernet and see Ethernet devices on the network now? If so, troubleshoot software Extensions or reinstall system software.
- 4 Try connecting to a known-good Ethernet port at the wall or external hub.
- 5 Verify that other users are experiencing the same problem. If, so contact the network administrator. If not, go on to the next step
- 6 Replace the logic board.





## Modem

The internal modem is not recognized.

- 1 Make sure the correct CCL and extension files installed.
- 2 Reseat the flexible modem cable on the logic board.
- 3 Reinstall the CCL and modem extension. If the problem persists, reinstall the system software and try again.
- 4 Zap PRAM by holding down the Option, Command, P, and R keys.
- 5 Reseat the modem.
- 6 Replace the modem.
- 7 Replace the flexible modem cable.

Modem reports an error when dialing out

1. Make sure the correct driver is installed and the correct CCL is selected and that they are not corrupted. If necessary, reinstall the driver and/or CCL.
2. Try another cable and phone jack.





3. If the problem persists, reinstall the system and modem software.

Computer freezes  
when modem dials

Extensions are in conflict or the Mac OS is corrupted. Enable only the Mac OS files in the extensions manager and any modem drivers needed. If the problem persists, reinstall the system software

Modem is having  
trouble connecting to  
Online site

- 1 The phone line may have too much noise. If the user has a second line, try that one. The user should contact their local phone company and request their line be checked.
- 2 Check to make sure the TCP/IP control panel is correctly configured for the user's Internet Service Provider. If the TCP/IP control panel is not configured correctly, it may connect but won't be able to access any sites.
- 3 Sometimes online services use different servers for dial-up/authentication and for services. If one server is down, users may be able to login but not access any services. Contact the online service for help.







The system returns an error message when launching an internet browser

Browser software is not installed correctly. If necessary, reinstall the browser software. (**Note:** Internet Explorer 4 and greater needs to be installed and not just drag copied.)

The dialup software will not initiate a connection

Dialup software is installed incorrectly. Make sure the software is fully installed and all required extensions are enabled. If necessary, reinstall the dialup software and provide the necessary information for setup.

Modem is dropping its connection

- 1 Try another cable and phone jack.
- 2 The phone line may be too noisy to handle the higher modem speeds. Try connecting at a slower speed or use a generic CCL file. (If you are familiar with the CCL script language, you can edit the modem script to force a connection at a lower speed.) If the problem continues, contact the phone company to report the bad phone line.





- 3 Verify that the user has call waiting on that phone line. With call waiting active, an incoming call can interrupt the connection. Disable call waiting using AT commands placed in the init string of the dialup application. Usually the string is \*70.
- 4 There may be a problem with the server to which you are connecting. Servers sometimes develop problems that disconnect users without explanation. Try calling back later or use an alternate number if one is available.
- 5 Check with the Internet Service Provider.
- 6 Reseat the modem. If the problem persists, replace the modem.

Modem disconnects  
after a period of time

Timed disconnect setting is causing the modem to disconnect. Some services or software packages have a feature that will disconnect the user after a set period of time. Either increase this time setting or disable the feature if possible. Contact the ISP or network administrator for more information.





Modem is slow  
responding

- 1 Too many people are using the ISP's Internet services. When using an ISP, users need to remember that the ISP only has a limited amount of bandwidth to the Internet. If a large amount of people are dialing in, individual's speeds will be affected
- 2 Check the phone line. The quality of the phone line can limit modem performance.





## Upgrades

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Power Macintosh G3/Macintosh  
Server G3 (Blue and White)

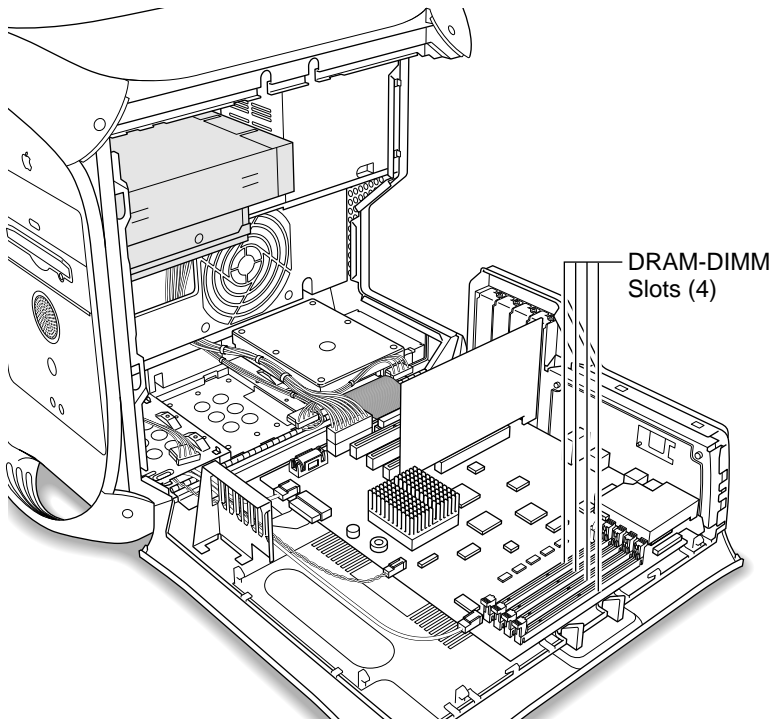




## DRAM Upgrade

The Power Macintosh G3/ Macintosh Server G3 (Blue and White) can be expanded to a maximum of 1024 MB by adding DIMMs to any of the four DRAM DIMM slots on the main logic board. DIMMs from older Macintosh computers may physically fit in the slots, but they are not compatible and should not be used.

Different size DRAM DIMMs can be installed in any order in any DIMM slot. They do





not need to be installed in pairs. It is recommended that DIMMs be installed in the first slot available closest to the center of the board (J-19), then adjacent slots J-20, J-21, and J-22.

Compatible DRAM DIMMs must meet all the following specifications:

- PC-100 Synchronous DRAM (SDRAM)
- 3.3 volt
- 64-bit wide, 168-pin module
- Maximum of 16 memory devices on the DIMM
- Unbuffered; do not use registered or buffered Synchronous DRAM (SDRAM)
- Maximum height of 2.0 inches.

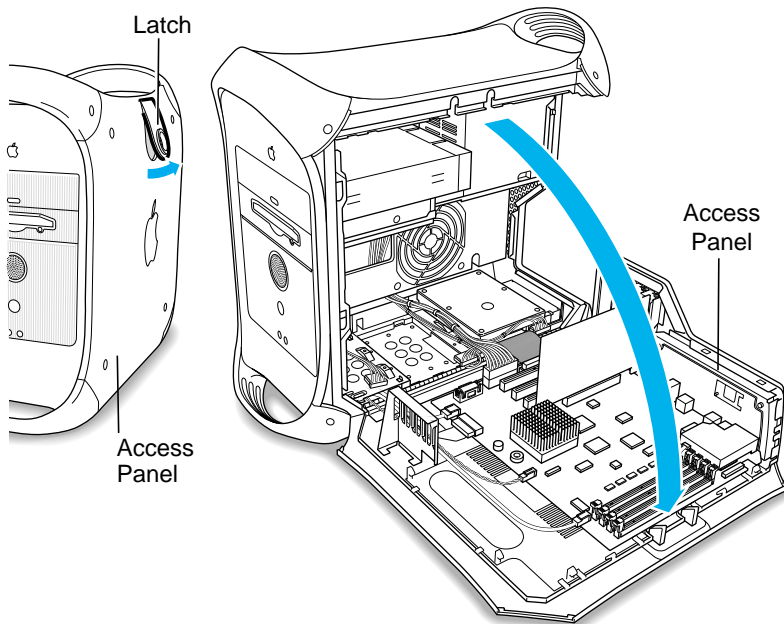
To increase DRAM to the maximum of 1024 MB, fill all four slots with 256 MB DIMMs. Any 256 MB DIMMs installed must use 128 megabit (Mbit) device technology.

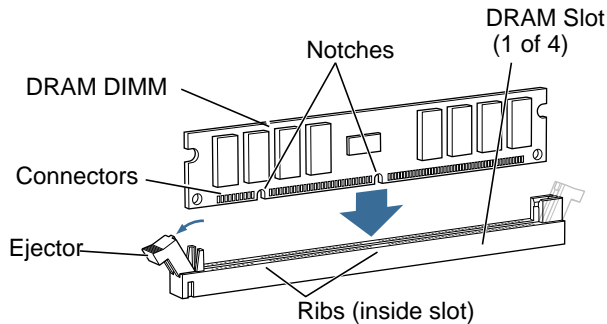




## DRAM DIMM Installation

- 1 Lift the latch on the right side of the computer.
- 2 Lower the access panel onto a clean, flat surface.





- 3 Align a DRAM DIMM in the DRAM slot so the notches line up with the ribs inside the slot.
- 4 Push the DIMM down evenly until the ejectors snap into place.

**Note:** To remove a DIMM, push down on the slot's ejectors until they open and release the DIMM. Some DRAM slots may have only one ejector.

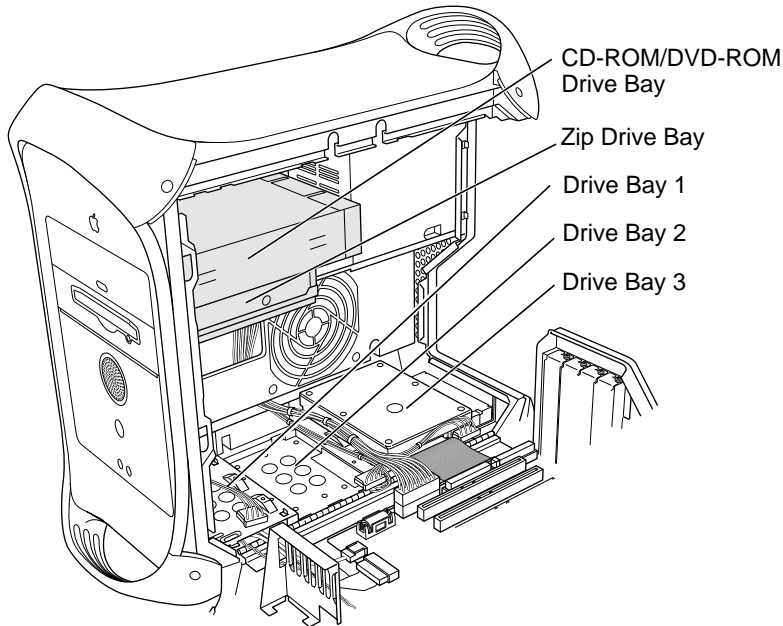




## Drive Upgrades

The Power Macintosh G3/ Macintosh Server G3 (Blue and White) has five internal drive bays: three in the lower part of the computer and two in front on top.

Standard Macintosh configurations include one internal Ultra ATA hard disk, or one, two, or three internal Wide Ultra2 SCSI drives.





## Ultra ATA Drives

The Power Macintosh G3/Macintosh Server G3 (Blue and White) can accommodate one internal Ultra ATA device in the lower drive carrier, Bay 3.

## Wide Ultra2 SCSI Drives

Connect internal and external Wide Ultra2 SCSI devices using an internal PCI card and cable. You can connect up to three internal SCSI drives (all in the lower drive area), or connect additional SCSI devices to the port the card provides on the rear of the computer.

## Other SCSI Drives

The Wide Ultra2 SCSI card supports other types of Wide Ultra SCSI drives besides the Wide Ultra2 SCSI drive. However, the system will operate at the speed of the slowest





device. For optimal performance using the Wide Ultra2 SCSI card, use only Wide Ultra2 SCSI devices. To maintain optimal performance using another kind of SCSI device, add a PCI card that supports the device.

## Supported Drives

Drives installed in the Power Macintosh G3/Macintosh Server G3 (Blue and White) must have the following dimensions:

- 102 mm (3.9 inches) wide
- 25.4 mm (1.0 inch) high
- 147 mm (5.7 inches) deep

The following internal hard disk drives are supported:

- ATA devices (includes ATA, ATA-2, and ATA-3 devices, which are also called IDE or EIDE devices)
- Ultra ATA devices (sometimes called ATA-4 devices)





- Wide Ultra SCSI devices (with the PCI card included in some configurations)
- Wide Ultra2 SCSI devices (with the PCI card included in some configurations)
- ATAPI drives, including CD-ROM, DVD-ROM, and Zip drives.

### **SCSI ID Numbers**

If the computer came with one Wide Ultra2 SCSI drive, it has SCSI ID 0. If the Macintosh came with two drives, they have ID 0 and 1. A third factory-installed drive has ID 2. the SCSI PCI card has ID 7. The drive in position 1 is the startup drive.

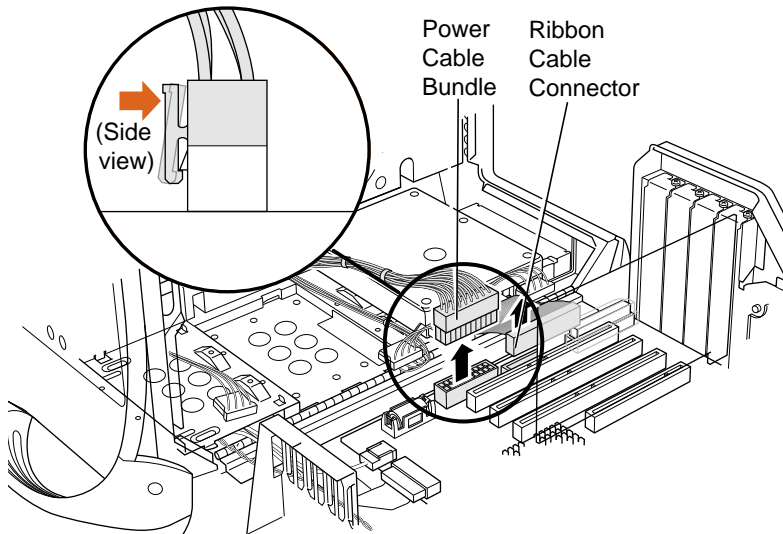




## SCSI Drive Upgrade Procedure

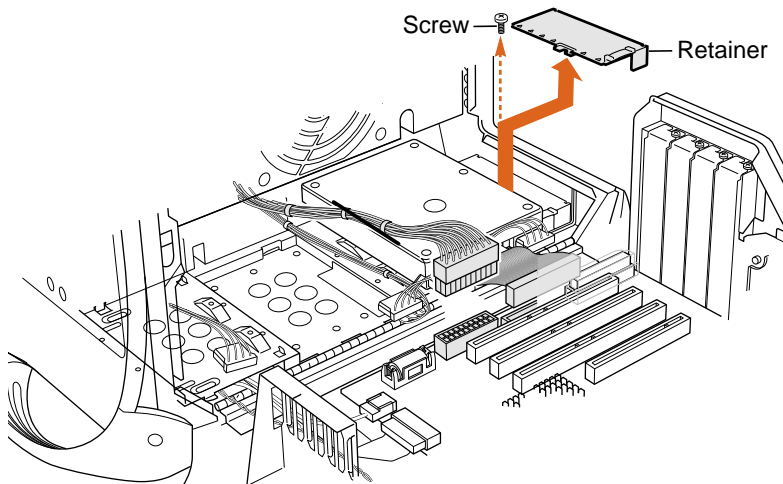
Before you begin, open the computer using the procedures in the Take Apart chapter of this manual.

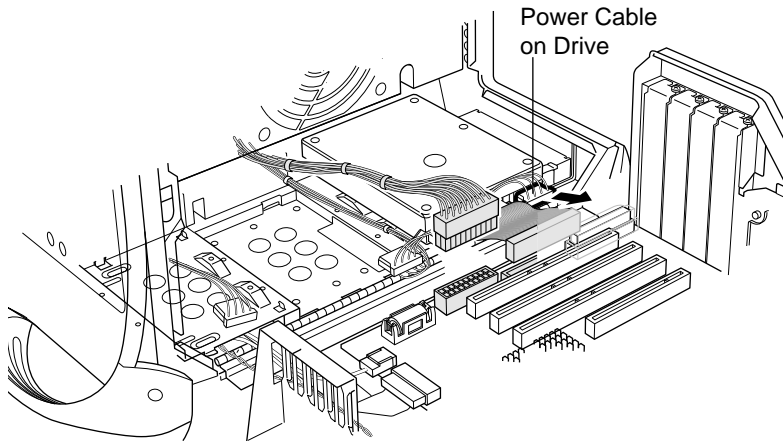
- 1 Unplug the bundled power cable and the ribbon cable from the logic board for any installed ATA drives.
- 2 Disconnect the ribbon cable from the PCI card for any installed SCSI drives.





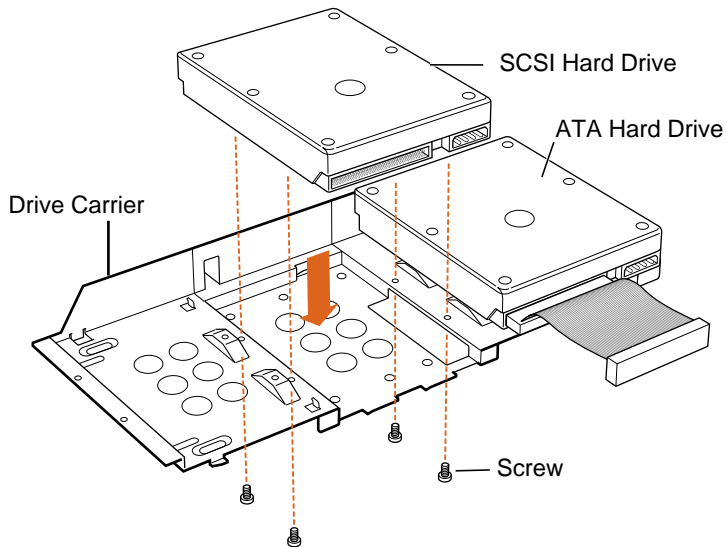
- 3 Remove the screw from the rear of the drive carrier and remove the drive carrier retainer.





- 4 Unplug the power cord from any hard disk drives attached to the drive carrier.
- 5 Slide the drive carrier assembly toward the rear of the computer and lift it out.
- 6 Assign a unique SCSI ID number to the drive being installed. See "SCSI ID Numbers" earlier in this chapter for more information.





- 7 Position the drive so that the drive's connectors face away from the sheet metal side of the drive carrier.
- 8 Screw the drive to the drive carrier with the four screws that came with the drive.
- 9 Connect the appropriate cable to the drive.

**Note:** If you are installing a Third-party SCSI card and cable, refer to the owner's manual that came with the card.



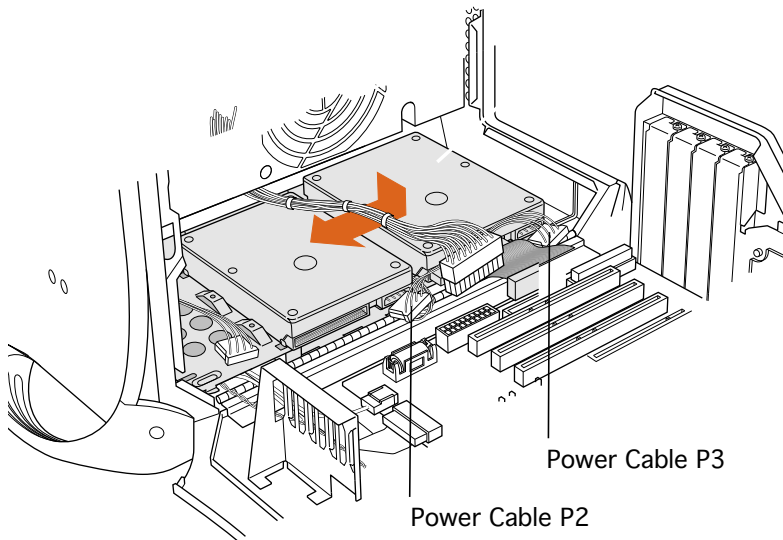




**Note:** The SCSI cable included with factory-installed SCSI drives has a built-in terminator block, so no terminator is needed.

10 Replace the drive carrier and slide it toward the front of the computer until it locks into position. Do not crimp any wires that are near or under the assembly.

11 Replace the drive carrier retainer and screw it back in place.





12 Plug the power cables into the hard disk drives.

13 Reconnect the main power cable bundle and the drives' ribbon cable.

**Note:** If you added a SCSI drive to a computer that came with an ATA drive, attach the main power cable bundle and the ATA ribbon cable to the main logic board and the SCSI ribbon cable to the SCSI PCI card.

If you added a SCSI drive to a computer that came with one or two SCSI drives, attach the main power cable bundle to the main logic board and the SCSI ribbon cable to the PCI card.

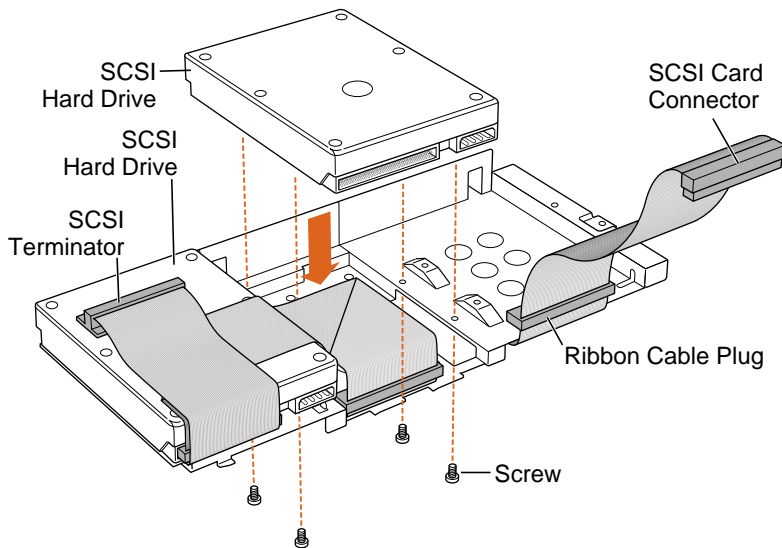




## Sample Drive and Cable Configurations

Drive position 3 will accommodate a SCSI hard disk drive or ATA hard disk drive. To install a SCSI hard disk drive, attach the ribbon cable plug to the ribbon cable connector on the drive.

To install a SCSI hard disk drive in drive position 2, put the ribbon cable on top of the drive and attach the ribbon cable plug to the ribbon cable connector on the drive. You can tape the





ribbon cable to the top of the drive with double-stick foam tape to make it lie flat.

For maximum performance, use Ultra2 devices on an Ultra2 PCI card.

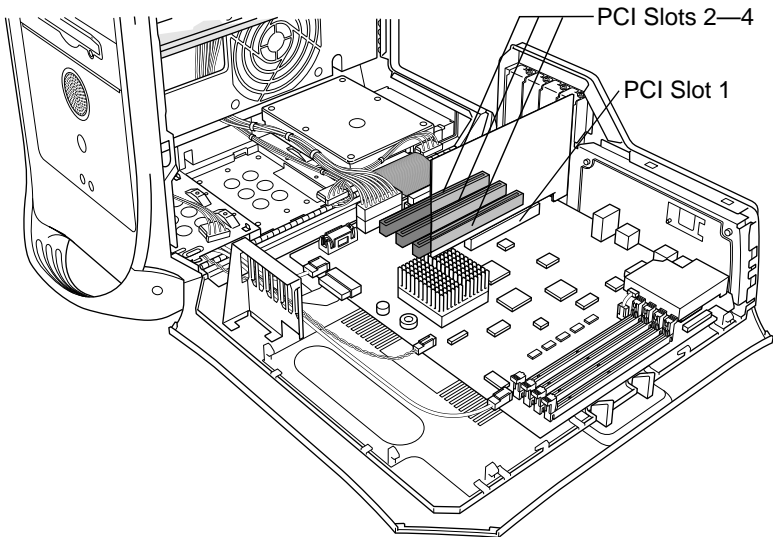




## PCI Expansion Cards

The Power Macintosh G3/ Macintosh Server G3 (Blue and White) has four expansion slots that accept PCI cards up to 12 inches long. Install only expansion cards that come with Macintosh driver software and that comply with the PCI 2.1 standard. NuBus cards cannot be used in these expansion slots.

In standard Macintosh models, a graphics card that





supplies a monitor port occupies PCI slot 1. This slot can accommodate 3.3 volt cards with 66 MHz frequency and 32-bit data widths only.

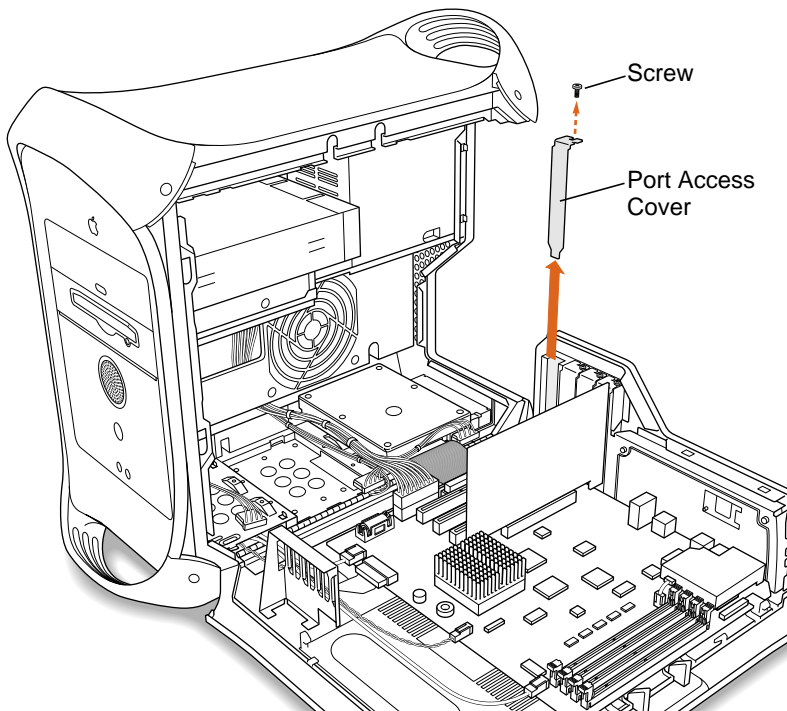
PCI slots 2, 3 and 4 can accommodate mixed voltage (5.0 V or 3.3 V) cards with a 33 MHz frequency and 32-bit or 64-bit data widths. These slots will not accommodate 66 MHz cards.

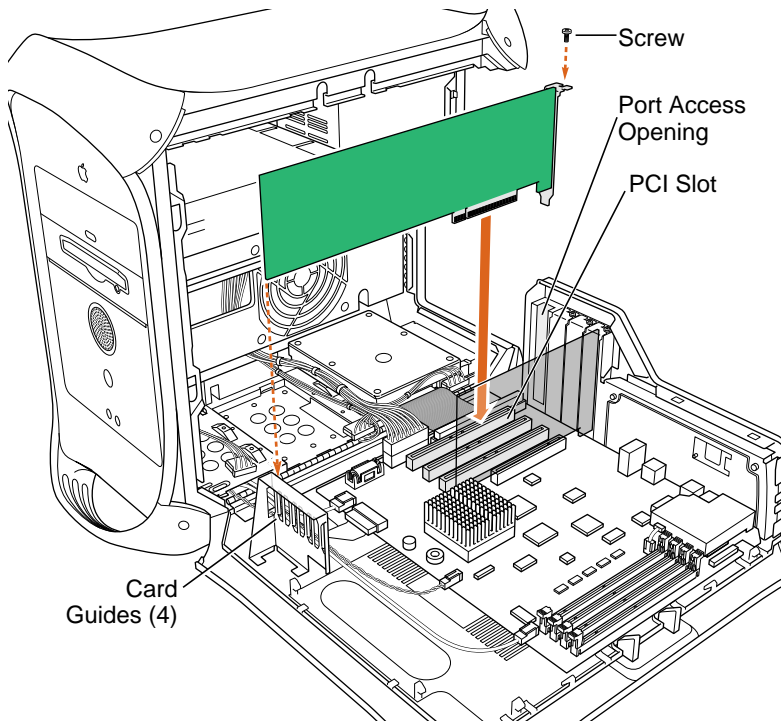


## PCI Card Installation

Before you begin, open the computer using the procedures in the Take Apart chapter of this manual.

- 1 Remove the port access cover screw.
- 2 Remove the port access cover.





- 3 Align the PCI card's connector with the expansion slot and press down firmly until the card is seated in the slot.

**Note:** If the card is full-length (12"), fit the end in one of the four card guides at the front of the computer.

- 4 Use the port access cover screw to secure the PCI card to the port access opening.
- 5 If you removed a card and are not replacing it, replace the port access







cover and the port access cover screw.

**Note:** Do not leave an empty PCI slot uncovered. An uncovered port can affect the air flow to the computer's components.





## Exploded View

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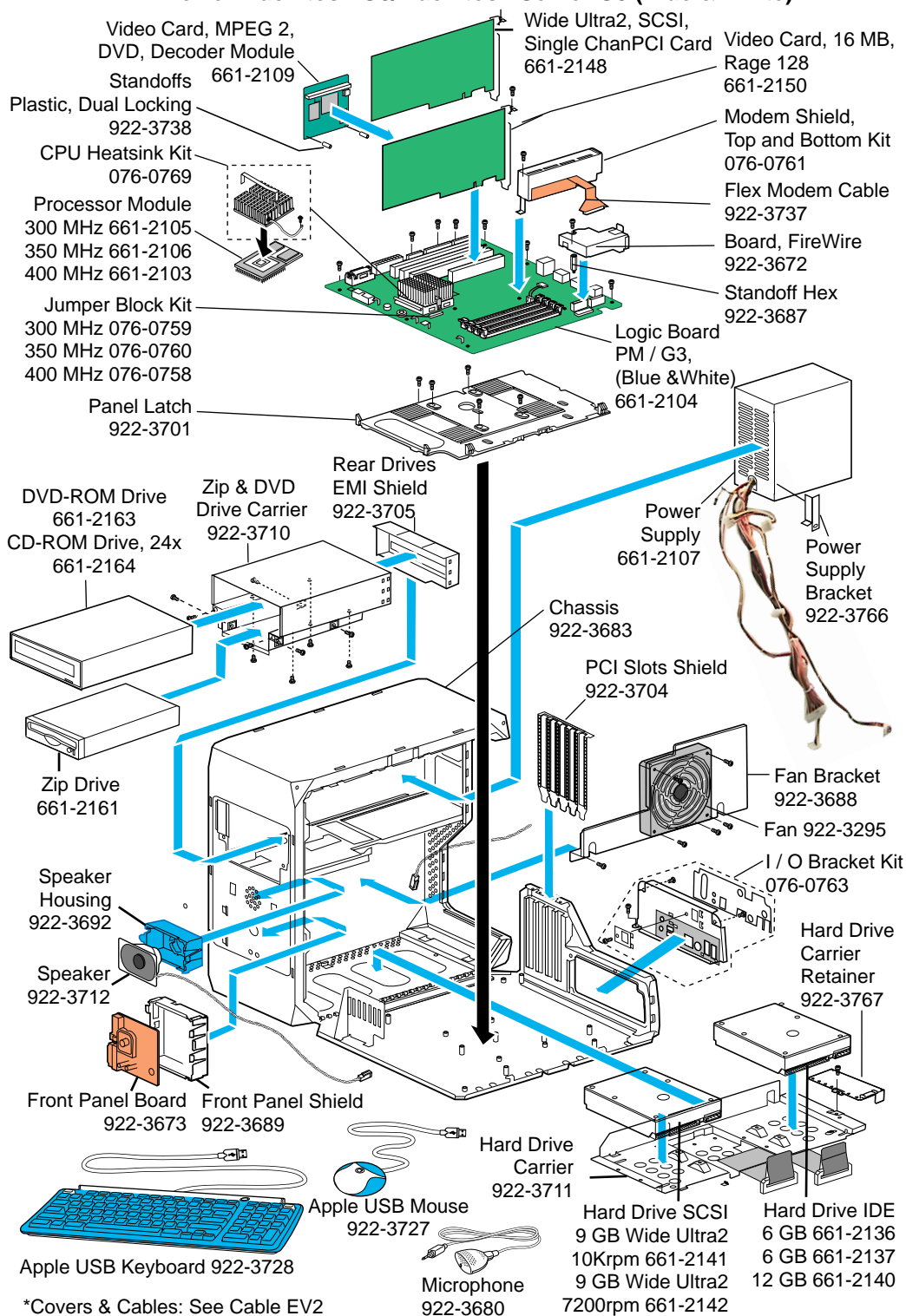
Power Macintosh G3 (Blue and White) and Macintosh Server G3





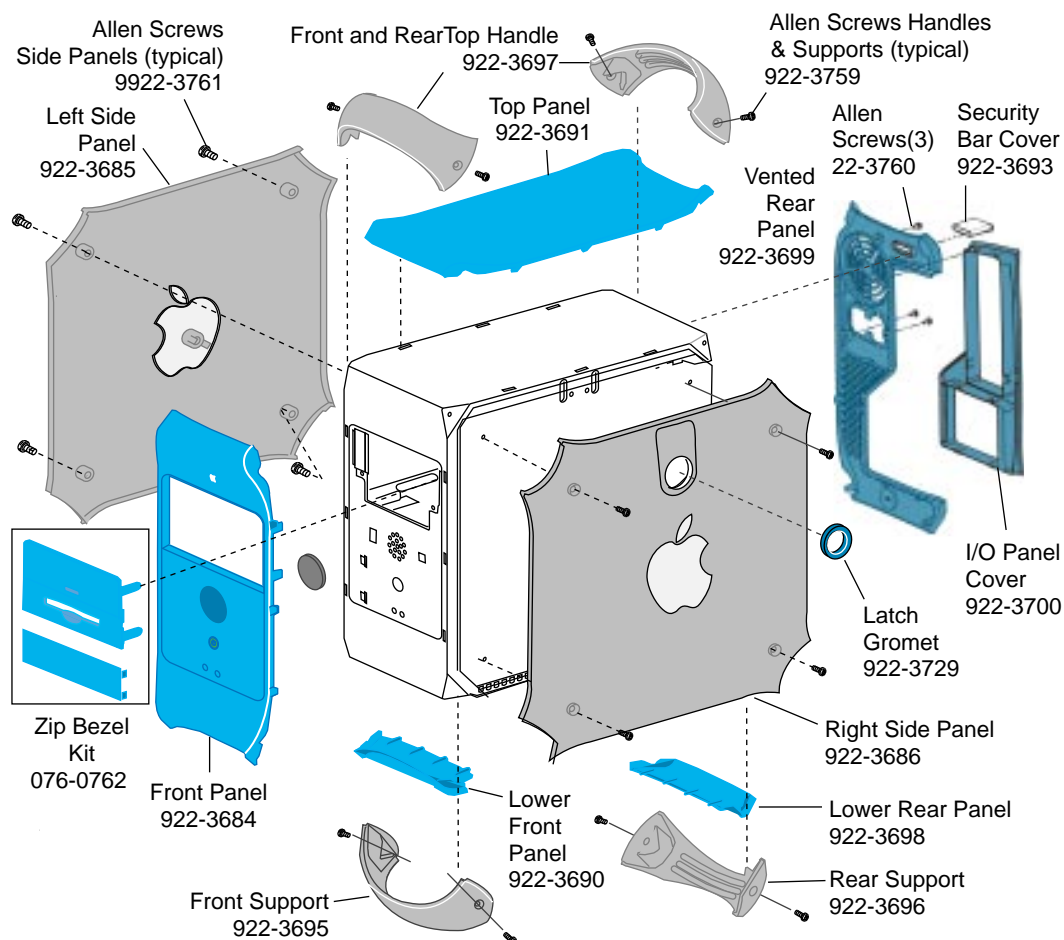
## Exploded View #1

## Power Macintosh G3/Macintosh Server G3 (Blue &amp; White)





## Exploded View #2



## Cables

