Main Unit

Processor

PowerPC™ G3 processor with a minimum speed of 233 megahertz (MHz). To find out the exact speed of your PowerPC G3 processor, use Apple System Profiler, available in the Apple (🍎) menu.

Memory

Dynamic random-access memory

The computer comes with a minimum of 64 megabytes (MB) of Synchronous Dynamic Random-Access Memory (SDRAM), supplied in removable Dual Inline Memory Modules (DIMMs). The main logic board has three expansion slots that accept DIMMs that meet these specifications:

- 8, 16, 32, 64, or 128 MB
- 3.3 volt (V), unbuffered, 64-bit wide, 168-pin
- 100 MHz/10 nanosecond (ns) cycle time or faster

Important Power Macintosh G3 computers use SDRAM DIMMs. DIMMs from older Macintosh computers are not compatible with your computer and should not be used even though they will fit into the DRAM DIMM slots.

The maximum amount of DRAM you can install in your computer using standard DIMMs is 384 MB. To increase DRAM to the maximum of 384 MB, fill all three slots with 128 MB DIMMs. You may be able to exceed the maximum amount of memory by using DIMMs designed specifically for your Power Macintosh G3 computer. See your Apple-authorized dealer for more information.

Video memory

Your computer comes with 2 MB of Synchronous Graphic RAM (SGRAM) video memory built into the logic board. The logic board contains a video memory expansion slot that accepts a Small Outline DIMM (SO-DIMM) to increase video memory up to a maximum of 6 MB. Depending on the configuration you purchased, an SO-DIMM may already be installed in the slot. The DIMM must meet these specifications:

- A 2 MB or 4 MB SGRAM SO-DIMM
- 64-bit wide, 144-pin
- 100 MHz/10 ns cycle time or faster

Important Use only an SGRAM SO-DIMM. Never use a 256K or 512K video memory DIMM from an older Macintosh computer.

Other memory

- 4 MB of read-only memory (ROM)
- 8 kilobytes (K) of nonvolatile parameter memory
- 512K to 1 MB of static RAM used as a level 2 cache integrated into the processor module

For more information and instructions on expanding your DRAM or video memory, see Chapter 3, "Installing PCI Cards, Memory, and Internal Storage Devices," in the *Setting Up Your Macintosh Server* manual.

Video Display Modes

The table that follows shows the modes available for monitors that can be connected to the monitor port, along with the number of colors or grays supported with 2 MB of video memory (SGRAM) and with the optional expansion to 4 MB or 6 MB of SGRAM. The table also lists the screen refresh rates in hertz (Hz) and kilohertz (kHz).

Peripheral component interconnect (PCI) expansion cards that can support other monitors and special video requirements are available from other manufacturers. See your Apple-authorized dealer for information.

Note: On some monitors from manufacturers other than Apple, the connector pinout designates one pin for both green video and timing synchronization. These "sync on green" monitors are not compatible with Power Macintosh computers. If you're not sure what type of monitor you have, check with your dealer.

You can use the Monitors & Sound control panel or the Control Strip to set a display mode that is supported by both your monitor and the built-in video circuitry. Refer to the manual that came with your monitor for a list of display modes that it supports.

Display modes and color depths

Mode	Screen refresh rate		Pixel	Maximum color depth[1] (bits per pixel)		
	Vertical (Hz)	Horizontal (kHz)	Clock (MHz)	2 MB	4 MB	6 MB
512 x 384	70.130	31.488	21.160	32	32	32
640 x 480	59.940	31.469	25.175	32	32	32
640 x 480	66.667	35.000	30.24	32	32	32
640 x 480	72.809	37.861	31.500	32	32	32
640 x 480	75.000	37.500	31.500	32	32	32
640 x 480	85.008	43.269	36.000	32	32	32

[1] Image bit depths: 32 bits = millions of colors, 16 bits = thousands of colors, 8 bits = 256 colors

(continued)

Mode	Screen refresh rate		Pixel	Maximum color depth[1] (bits per pixel)		
	Vertical (Hz)	Horizontal (kHz)	Clock (MHz)	2 MB	4 MB	6 MB
640 x 870	75.000	68.850	57.283	16	32	32
800 x 600	56.250	35.156	36.000	32	32	32
800 x 600	60.317	37.879	40.000	32	32	32
800 x 600	72.188	48.077	50.000	32	32	32
800 x 600	75.000	46.875	49.500	32	32	32
800 x 600	85.061	53.674	56.250	32	32	32
832 x 624	74.550	49.725	57.283	32	32	32
1024 x 768	60.004	48.363	65.000	16	32	32
1024 x 768	70.069	56.476	75.000	16	32	32
1024 x 768	75.029	60.023	78.750	16	32	32
1024 x 768	74.927	60.241	80.000	16	32	32
1024 x 768	84.997	68.677	94.500	16	32	32
1152 x 870	75.062	68.681	100.00	16	32	32
1280 x 960	75.000	75.000	126.000	8	16	32
1280 x 1024	60.020	63.981	108.000	8	16	32
1280 x 1024	75.025	79.976	135.000	8	16	32
1280 x 1024	85.024	91.146	157.50	8	16	32
1600 x 1200	60.000	75.000	162.000	8	16	16
1600 x 1200	65.000	81.250	175.500	8	16	16
1600 x 1200	70.000	87.500	189.000	8	16	16
1600 x 1200	75.000	93.750	202.500	8	16	16
1920 x 1080	59.994	70.313	180.000	8	16	16
1920 x 1080	71.992	84.375	216.000	8	16	16

[1] Image bit depths: 32 bits = millions of colors, 16 bits = thousands of colors, 8 bits = 256 colors

Internal Disk Drives

The following drives come factory-installed in your computer:

- Apple SuperDrive 1.4 MB high-density floppy disk drive
- 24x-speed ATAPI (AT Attachment Packet Interface) CD-ROM drive or a DVD-ROM drive (The type of drive depends upon the configuration you ordered.)
- One or more Apple hard disk drives (The number and capacity of drives depend on the configuration you ordered.)

Interfaces

- One ADB port supporting up to three ADB input devices (such as a keyboard, mouse, or trackball) daisy-chained through a low-speed, synchronous serial bus
- Monitor port supporting color and grayscale monitors of various sizes and resolutions (See "Video Display Modes" earlier in this booklet.)
- Two internal EIDE connectors: one supports the built-in ATAPI CD-ROM drive
- Three internal expansion card slots supporting PCI expansion cards (some of these may be filled depending on the configuration you ordered). Install only expansion cards that come with Macintosh drivers and are compliant with the PCI 2.1 standard. NuBus™ cards cannot be used in these expansion slots.
- One printer port and one modem port. Both ports are RS-232/RS-422 serial ports, 230.4 kilobit (Kbit) per second maximum (up to 2.048 megabit [Mbit] per second if clocked externally).
- One built-in 10Base-T Ethernet RJ-45 connector for direct connection to 10Base-T networks
- One 3.5-mm sound output port for headphones or amplified speakers
- One 3.5-mm sound input port for stereo sound input. The sound input port supports the Apple PlainTalk Microphone that comes with some Macintosh computers. The sound input port also supports a standard stereo (miniplug-to-RCA) cable adapter for connecting stereo equipment to your computer.

  The sound input port does not support the omnidirectional microphone (the round microphone shipped with some earlier models of Macintosh) or the attenuated RCA adapter provided with some Macintosh models.
- *Optional:* A 10/100Base-T Ethernet RJ-45 connector supplied by a 10/100Base-T Ethernet card, for direct connection to 10Base-T or 100Base-T networks

SCSI interfaces

SCSI-1: Your computer has a Narrow SCSI-1 bus, capable of transferring data at up to 5 MB per second. The Narrow SCSI-1 bus supports internal and external SCSI-1 devices. The computer's external SCSI connector is located on the back panel.

You can connect up to seven SCSI devices (internal and external combined) to the Narrow SCSI-1 bus. For information on installing internal SCSI-1 devices or connecting external SCSI-1 devices to your server, see the setup manual that came with your server. If you want to connect an internal SCSI-1 device, contact your Apple-authorized server provider to obtain a cable. An internal SCSI ribbon cable is not included with your server unless it is configured with a tape drive.

Some older SCSI devices may require updated drivers. (A "driver" is special software that is installed in your System Folder.) Contact the device manufacturer for information on obtaining driver software.

SCSI-3: Some servers come with an internal Ultra Wide SCSI PCI card installed. The Ultra Wide SCSI-3 bus is capable of transferring data at up to 40 MB per second and supports up to three internal devices. The number of hard disk drives connected to the SCSI-3 bus depends on the configuration you ordered. You cannot connect external devices to the Ultra Wide SCSI card that supports the internal drives.

If your server came with a second Ultra Wide SCSI card, you can use it to connect external devices. You can connect four external devices to the second card if total cable length is no longer than 1.5 meters (about 4.5 feet). The cable length is the combined length of the cable inside the SCSI device itself and the cable that connects one external device to another. For more information on connecting external Ultra Wide SCSI devices, see the setup manual that came with your server.

Clock/Calendar

- CMOS custom circuitry with long-life battery

Warning Do not attempt to replace the clock battery yourself. If the clock begins to lose accuracy, have an Apple-authorized service provider replace the battery. The service provider will dispose of the battery according to the local environmental guidelines.

Audio System

- Custom sound circuitry, including a stereo generator (digital-to-analog converter, or DAC) capable of driving stereo miniplug headphones or audio equipment, and stereo sampling hardware (analog-to-digital converter, or ADC) for recording stereo sound
- 16-bit stereo input and output

- Sample rates of 44.1 and 22.05 kilohertz (kHz)
- Preamplifier enabled for input gains greater than 22.5 decibels (dB)

Typical audio specifications

Sound input using the sound input port (🎙)

- *Input impedance (preamplifier off):* more than 80 kilohm (kΩ)
- *Maximum input voltage (preamplifier off):* 1 Volt (V_{rms}) = 2.8 Volts peak-to-peak (V_{pp}), nominal
- *Input impedance (preamplifier on):* more than 5 kΩ
- *Maximum input voltage (preamplifier on):* 62 millivolts (mV_{rms}) = 175 mV_{pp}, nominal

Sound output using the sound output port (🔊)

- *Output impedance:* 33 Ω, nominal
- *Maximum output voltage:* 0.94 V_{rms} = 2.65 V_{pp}

Noise, distortion, and bandwidth

- *Sound input signal-to-noise ratio (SNR):* 85 dB unweighted (add +8 dB to estimate A weighting)
- *Total harmonic distortion:* 0.05%
- *Bandwidth:* 20 Hz–20 kHz at 44.1-kHz sample rate (Other sample rates scale the upper cutoff frequency.)

Sound input using the optional RCA-type audio input ports (🔊)

- *Input impedance (preamplifier off):* more than 80 kΩ
- *Maximum input voltage (preamplifier off):* 1 V_{rms} = 2.8 Volts peak-to-peak (V_{pp}), nominal
- *Input impedance (preamplifier on):* more than 5 kΩ
- *Maximum input voltage (preamplifier on):* 62 millivolts (mV_{rms}) = 175 mV_{pp}, nominal

Sound output using the optional RCA-type audio output ports (🔊)

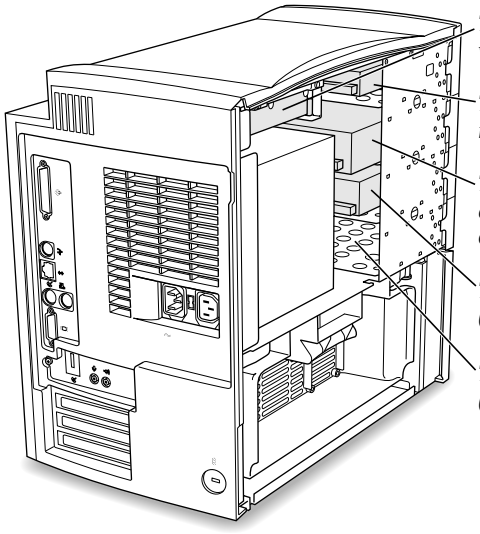
- *Output impedance:* 400 Ω
- *Maximum output voltage:* 1 V_{rms} = 2.8 V_{pp}, nominal

Noise, distortion, and bandwidth

- *Audio input signal-to-noise ratio (SNR):* 85 decibels (dB) unweighted (add +8 dB to estimate A weighting)
- *Total harmonic distortion:* 0.05%
- *Bandwidth:* 20 Hz–20 kHz at 44.1-kHz sample rate (Other sample rates scale the upper cutoff frequency.)

Drive Bay Specifications

The following illustration shows all of the internal storage expansion options.



An Apple-authorized dealer or service provider can replace existing internal storage devices with others, along with any necessary data cables or brackets to secure each device inside the computer.

AC Line Input

- *Line voltage:* 100–120 volts alternating current (V AC) and 200–240 V AC, RMS, single phase, manually set by voltage selector switch
- *Frequency:* 50–60 Hz
- *Power:* 960 volt-amperes (VA) maximum continuous; 1070 VA peak input

AC Line Output

- *Output receptacle:* 100–120 V AC; 3 amperes (A) maximum, or 200–240 V AC; 1.5 A maximum (determined by actual input voltage)

DC Power

- *Continuous output:* 145 watts (W)
- *Peak output (for 12 seconds at startup):* 167 W

Output voltage	Maximum current[1]
+5 V	18.0 A[2]
+5 V (trickle)	0.10 A
+3.3 V	10.0 A[2]
+12 V	4.2 A
–12 V	0.4 A

1 Total continuous power output cannot exceed 145 W.
2 Not more than 90 W total +3.3V/+5V combined power.

Keyboard

- Supports all Apple Desktop Bus (ADB) keyboards

Mouse

- Supports all models of the ADB mouse

Power Requirements for Devices You Can Connect

Apple Desktop Bus (ADB)

- The mouse draws up to 10 milliamperes (mA).
- The keyboard draws 25–80 mA (varies with keyboard model used).
- The maximum current available for all ADB devices is 500 mA.

The ADB port can support up to three ADB devices.

Audio and telecommunications devices

The following table shows power allowances for external devices connected to input ports.

Device	Voltage	Current	Power
Microphone	+5 V	20 mA	100 mW
A device connected to the printer port or modem port	+5 V	500 mA	2.5 W

Expansion cards and other internal devices

If you add an expansion card or a storage device to your computer, make sure the component's power requirements don't exceed the maximum power allowances allocated to it by the computer.

The maximum power allowances for expansion cards in your computer can accommodate three 15-watt cards, two 25-watt cards, or one 15-watt card and one-25 watt card. The maximum power allowance for each individual internal storage device is 10 watts.

Environment

- *Operating temperature:* 10° C to 35° C (50° F to 95° F)
- *Storage temperature:* –40° C to 47° C (–40° F to 116.6° F)
- *Relative humidity:* 5% to 95% (noncondensing)
- *Altitude:* 0 to 3048 m (0 to 10,000 ft.)

Size and Weight

Weight	Height	Width	Depth
Main unit			
15 kg[1]	385 mm	245 mm	435 mm
33.1 lb.[1]	15.15 in.	9.64 in.	17.75 in.

[1] Weight depends on type of hard disk and may be greater if optional devices are installed.

CD-ROM Drive (ATAPI) (Optional)

Your computer has either a CD-ROM drive or a DVD-ROM drive.

Disc speed

- 24x (twenty-four-times speed)

Disc diameters supported

- 120 mm (4.7 inches)
- 80 mm (3.2 inches)

Data capacity

- 656 MB, Mode 1
- 748 MB, Mode 2

Modes supported

- Audio CD
- *CD-ROM:* Modes 1 and 2
- *CD-ROM XA:* Mode 2, Forms 1 and 2
- *CD-I:* Mode 2, Forms 1 and 2
- *Photo CD:* Single-session and multisession
- Video CD

Laser

- *Type:* Semiconductor GaAlAs laser
- *Wavelength:* 795 ± 25 nanometers
- *Output power:* 0.2 to 0.6 milliwatts
- *Beam divergence:* 55°

DVD-ROM Drive (Optional)

Your computer either has a CD-ROM drive or a DVD-ROM drive.

Disc speed

- *DVD:* 2x (2.7 MB/second)
- *CD:* maximum of 20x (3 MB/second)

Disc diameters supported

- 120 mm (4.7 inches)
- 80 mm (3.2 inches)

Data capacity

CD-ROM

- 656 MB, Mode 1
- 748 MB, Mode 2

DVD-ROM

- Single side, single layer: 4.7 gigabytes (GB)
- Single side, dual layer: 8.5 GB
- Double side, single layer: 9.4 GB
- Double side, dual layer: 17 GB

Modes supported

- *DVD-ROM:* single and double side, single and dual layer
- CD
- Audio CD
- *CD-ROM:* Modes 1 and 2
- *CD-ROM XA:* Mode 2, Forms 1 and 2
- *CD-I:* Mode 2, Forms 1 and 2
- *Photo CD:* Single-session and multisession
- Video CD

DVD-ROM laser

- *Type:* Semiconductor GaAlAs laser
- *Wavelength:* 658 ± 8 nanometers
- *Output power:* 0.95 milliwatts (typical)
- *Beam divergence:* 73.7°

CD-ROM laser

- *Type:* Semiconductor GaAlAs laser
- *Wavelength:* 790 ± 25 nanometers
- *Output power:* 0.2 milliwatts (typical)
- *Beam divergence:* 53.4°

Ultra Wide SCSI Card (Optional)

- Automatic termination
- Advanced Data Streaming Technology (ADS)
- RAID ready
- Embedded RISC I/P processor
- Ultra SCSI connector: fine pitch 68-pin "P"
- Flash ROM BIOS
- PCI 2.1 compliant
- Large command FIFO
- Supports disconnect/reconnect
- Asynchronous I/O support
- Multiple initiator support

- SCSI-3 tagged command queuing
- SCSI Manager 4.3 compatible

SCSI-3 bus

- *Adapter interface:* Special bus management hardware for video, file servers, and real-time environments
- *Maximum host transfer rate:* 133 MB/sec.
- *Maximum SCSI transfer rates:* Synchronous data rate: 40 MB/sec. per channel (single-channel mode); asynchronous data rate: 12 MB/sec.
- *SCSI Interface:* SCSI-1, SCSI-2, SCSI-3, Ultra SCSI
- *Electrical signals:* Single-ended versions
- *Extensive device support:* Up to 105 logical unit numbers (LUNs) (Wide and Narrow devices)

Cable length limits

When using Ultra Wide SCSI single-ended devices, you can connect up to 4 devices if the total cable length is no longer than 1.5 meters (about 4.5 feet). Error-free operation is not guaranteed if you exceed these limits.

With other SCSI devices, total cable length for single-ended devices is limited to 6 meters or approximately 18 feet (internal and external cable lengths combined). Keep cable lengths as short as possible to ensure high signal quality and performance.

Connecting different types of SCSI devices (such as SCSI-2 and SCSI-3) to the same SCSI chain is not recommended.

10/100Base-T Ethernet Card (Optional)

- *Open Transport:* Mac OS 8.1 or later, AppleShare, AppleTalk, NetWare for Macintosh, TCP-IP
- *Connector:* RJ-45 (for 10Base-T and 100Base-T)
- *Media, 10Base-T:* Cat 3, 4, or 5 UTP on 2 pairs up to 100 M
- *Media, 100Base-T:* Cat 5 UTP on 2 pairs up to 100 M
- *Bus interface:* PCI revision 2.0 and 2.1, share interrupt A
- *Channel speeds:* IEEE Auto Negotiation of 10Base-T and 100Base-TX
- *Communications:* IEEE 802.3u 100Base-TX; IEEE 802.3i 10Base-T
- *Controllers:* DECchip 21140, 32-bit internal processor per channel
- *Power:* 1.2A at 5 V typical

DDS-3 Tape Drive (Optional)

The internal DDS-3 tape backup drive and accompanying software can perform full or partial backup and restore procedures for all of the data on your hard disks. In addition, the drive automatically performs error correction and data compression of the files that you back up and restore. The error-correction feature helps ensure a high level of data integrity. The data-compression feature allows more data to fit on a cassette than do conventional backup mechanisms.

Compatible tapes

Your tape drive is fully compatible with tapes in DDS-3, DDS-2, DDS, and DDS-DC format. For best performance, use Sony Digital Data Storage (DDS) computer-grade tape, part number DGD 125P, with 12 GB capacity (125 M/410 ft.).

Inserting and ejecting tapes

Once you insert a tape, it takes about 24 seconds for it to load. When you eject a tape, it takes about 20 seconds for it to unload.

Cleaning the tape-drive heads

Your tape drive comes with a cleaning cassette that you should use to clean the tape-drive heads. The intervals at which you clean the tape drive depends on how often you use it. In general, if you back up daily, you should clean the tape drive weekly. If you back up weekly, you should clean the tape drive once a month. You should also clean the tape drive when the status light shows a Flash-2 pattern. Status lights are described in the next section.

When you insert the cleaning cassette into the drive, the drive automatically loads it and cleans the heads. When the cleaning process is completed, the drive automatically ejects the cassette. Keep a record of how many times you use the cleaning cassette. After 25 uses, replace it. For best results, replace the cleaning cassette with Sony part number DG5CL/2.

Status lights

Underneath the tape drive opening are three lights that inform you of the status of tape operations. The lights are labeled (left to right) Busy, Tape, and Status.

The following table lists what a light indicates when it is on, off, or flashing a pattern.

Light behavior	Busy	Tape	Status
Off	Not busy	Not loaded	
Steady on	SCSI active	Loaded	Tape is write-protected
Flash 1[1]	Drive active	Loading/unloading	Cleaning tape inserted
Flash 2[2]		Warning—tape has high number of errors	Cleaning needed
Flash 3[3]	Waiting for tape to reset	Waiting for tape to eject	
Flash 4[4]		Wrong firmware tape inserted	Self-test failure

[1] Flash 1–the light flashes .25 seconds on, .25 seconds off.
[2] Flash 2–the light flashes 3.5 seconds on, .5 seconds off.
[3] Flash 3–the light flashes .25 seconds on, one second off.
[4] Flash 4–the light flashes twice every 1.25 seconds.

Operating environment

The tape drive will not operate properly in high humidity. Be sure to adhere to the environmental requirements for the server described earlier in this booklet. In addition, follow the recommendations for use that came with your tape cassette.

Follow these guidelines to avoid temperature problems:

- Avoid exposing cassettes to extreme heat or cold. For example, don't store a cassette in a car in bright sunlight.
- Avoid transferring data to or from a tape cassette when the temperature is changing by more than 10 degrees F per hour (roughly 5 degrees C per hour).

034-0606-A
Printed in U.S.A.

Technical Information

Specifications for Macintosh Server G3 computers