Technical Information

for the Workgroup Server 9150/120

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1 Infinite Loop
Cupertino, CA 95014-2084
(408) 996-1010

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Technical Information for the Workgroup Server 9150/120

This booklet contains the following technical information about your Workgroup Server 9150/120:

- Expanding your server
- Specifications

WARNING If you have a problem with your server and nothing in the manuals that came with the server solves the problem, consult the service and support information that came with your server for information on how to contact an Apple-authorized service provider or Apple for assistance.

Expanding your Workgroup Server 9150/120

Your Workgroup Server 9150/120 was designed to grow with your needs—you can add new capabilities or improve its performance as you wish. You can plug in a number of external devices into its ports. You or your dealer can also install a number of enhancements within the case that houses the computer.

Apple recommends that you have the following equipment installed by an Apple-authorized dealer:

- additional dynamic random access memory (DRAM), up to a total of 264 megabytes (MB)
- any additional internal 3.5- or 5.25-inch device, such as a digital audio tape (DAT) drive or hard disk

You can install the following yourself:

- up to four NuBus™ cards, such as a specialized communications or video card
- a processor-direct slot (PDS) card, such as a specialized video card

Choosing the right components

As explained in the next two sections, you must make sure each component you add is compatible with your server and does not exceed its maximum power allowance.

Compatibility

Your dealer or the manufacturer of a component can provide compatibility details. However, you might find these points useful:

- In general, NuBus cards designed for older Macintosh computers also work with the Workgroup Server 9150/120.
- The Workgroup Server 9150/120 uses 32-bit-wide, 72-pin RAM Single Inline Memory Modules (SIMMs), which must be installed in matched pairs (for example, two 8 MB SIMMs). Your server's SIMMs are fast-paged mode, 80-nanosecond RAM access time or faster. SIMMs from older Macintosh computers may not be compatible. For more detailed information, see "RAM Configurations" later in this booklet.

Power allowances

The Workgroup Server 9150/120 meets Apple's NuBus power specifications. Check the information that came with your expansion card to make sure the card does not exceed these specifications.

For more detailed information, see "Expansion Cards and Devices" later in this booklet.

Specifications

This section lists hardware specifications for the Workgroup Server 9150/120.

Main unit

Processor

- PowerPC 601 at 120 megahertz (MHz)
- 32 kilobytes (KB) of on-chip cache

Memory

- A minimum of 16 MB of DRAM, expandable to a maximum of 264 MB (8 MB are soldered to the motherboard)
- 4 MB read-only memory (ROM)
- 256 bytes of nonvolatile parameter memory
- 1 MB of static RAM used as a Level 2 cache for the PowerPC processor; an optional 256 KB available through special ordering

Disk drives

- Apple SuperDrive 1.4 MB high-density floppy disk drive
- Internal Apple SCSI hard disk drive (1/3- or 1/2-height)
- Internal 5.25-inch quadruple-speed CD-ROM player
- Optional internal 3.5-inch DAT drive
- Up to seven SCSI devices may be connected internally (five hard disk drives and two removable media drives, such as DAT or CD-ROM)

A maximum of 14 SCSI devices (internal and external) can be used.

Monitors

Table 1 shows the image size for monitors connected to the monitor port, along with the number of colors or grays supported.

Table 1 Colors or grays supported*

Monitor	Resolution	Colors or grays
12" Color	512 x 384	thousands
13" Color	640 x 480	thousands
15" Portrait	640 x 870	256
16" Color	832 x 624	256
VGA	640 x 480	256

*Larger monitors and additional colors can be supported with the addition of video RAM (VRAM), which can be added only by means of an expansion card.

Audio system

- Custom sound circuitry, including stereo generator (D/A) capable of driving stereo miniplug headphones or audio equipment, and stereo sampling hardware (A/D) for recording samples
- 16-bit stereo in and out
- Sample rates of 44.1 and 22.05 kilohertz (kHz)
- *Input line level (stereo miniplug):* 2 volts peak-to-peak (Vpp) nominal, into 6.5 kilohm (kΩ) impedance
- *Input line level (RCA-type):* 2 Vpp nominal, into ≤1 kΩ impedance
- *Output line level (stereo miniplug):* 2.2 Vpp nominal, into 1 kΩ impedance
- *Input through output signal-to-noise ratio (SNR):* > 86 decibels (dB) with no audible discrete tones
- *Bandwidth:* 10 hertz (Hz) –19 kHz (+/– 2 dB) at 44.100 kHz sample rate
- *Total harmonic distortion plus noise (THD+N):* Less than 0.06%; measured 30 Hz–16 kHz with a 2-Vpp sine wave input

Interfaces

- One Apple Desktop Bus (ADB) port supports a keyboard, mouse, and other devices daisy-chained through a low-speed, synchronous serial bus (recommended maximum of three devices)
- One monitor port supports color and monochrome monitors of various sizes and resolutions
- Internal expansion slots support four NuBus expansion cards and one processor-direct slot (PDS) card
- Two RS-232/RS-422 serial GeoPort ports, 230.4 kilobit (Kbit)-per-second maximum (up to 2.048 megabit (Mbit)-per-second if clocked externally)
- Built-in Apple Ethernet AAUI connector for connecting to high-speed Ethernet networks
- Two SCSI interfaces support up to fourteen SCSI devices (seven internal and seven external)
- Sound output port for stereo compact disc audio and stereo computer-generated sound
- Sound input port for stereo sound input through a stereo miniplug connector
- Line input ports for stereo sound input through phono (RCA-type) connectors

A/C line input

- *Line voltage:* 100–240 volts AC, RMS single phase, automatically configured
- *Frequency:* 50–60 Hz
- *Power:* 454 watts maximum, not including monitor power

A/C line output

- *Output receptacle:* 100–240 volts AC, RMS (determined by actual input voltage); 3 amperes (amps) maximum

DC power

- 303 watts maximum

Current type	Total
+5 V	33.0 A
+12 V (normal)	10.0 A
+12 V (start up)	18.0 A (12 seconds maximum)
–12 V	1.0 A
+5 V trickle	1.25 A

Clock/Calendar

- CMOS custom circuitry with long-life lithium battery

Keyboard

- Supports all Apple ADB keyboards

Mouse

- Supports all models of the Apple ADB mouse

RAM configurations

RAM is provided in packages called *Single Inline Memory Modules*, or *SIMMs.*

Your server can work with any of several DRAM configurations, depending on the density of the DRAM chips that are mounted on the SIMMs. The 72-pin SIMMs used in the Workgroup Server 9150/120 come in sizes of 4, 8, 16, and 32 MB.

IMPORTANT The SIMMS must be installed in matched pairs (for example, two 8 MB SIMMs).

Your server can have a maximum of 264 MB of memory

Note: 640K of DRAM is used for screen memory in place of video RAM (VRAM) to support monitors connected to the built-in monitor port. VRAM can be added only by means of an expansion card.

IMPORTANT The SIMMs should be 72-pin fast-paged mode, 80-nanosecond (ns) RAM access time or faster. The slower 100 ns, 120 ns, and 150 ns SIMMs will not work reliably in the Workgroup Server 9150/120, and SIMMs from older Macintosh computers may not be compatible. Consult an Apple-authorized dealer or service provider for information and upgrades.

WARNING To avoid damage to your server, Apple Computer recommends that only an Apple-authorized dealer or service provider install additional RAM. If you attempt to install additional RAM yourself, any damage you may cause to your equipment will not be covered by the limited warranty on your server. See an Apple-authorized dealer or service provider for additional information about this or any other warranty question.

Power requirements

Apple Desktop Bus

- Maximum power draw for all ADB devices: 500 milliampere (mA)
- Mouse draws up to 10 mA
- Keyboard draws 25–80 mA (varies with keyboard model used)

Note: It is recommended that you connect no more than three ADB devices to the Workgroup Server 9150/120.

Audio and telecommunications devices

This table shows the power allowance for an external device connected to an input port.

Device	Voltage	Current	Power
GeoPort Telecom Adapter	+5 V	500 mA	2.5 W

Expansion cards and devices

If you add a PDS or NuBus expansion card, or a 3.5- or 5.25-inch internal SCSI device to your server, make sure the component doesn't exceed its maximum power allowance from the different voltage sources. Follow these guidelines.

Device	Voltage	Current	Power
PDS card	+5 V	2.5 A	12.5 W
	+12 V	0.25 A	3.0 W
NuBus card	+5 V	2.0 A	10.0 W
(per slot—up to 4 allowed)	+12 V	0.175 A	2.1 W
	–12 V	0.150 A	1.8 W
3.5-inch or 5.25-inch SCSI device	+5 V	1.1 A	5.5 W
(per device—up to 7 allowed)	+12 V	1.3 A	15.6 W
	+12 V peak*	2.7 A	—

*Peak power is for startup only and must not occur in normal operation.

Size and weight

Weight	Height	Width	Depth
Main unit			
16.7 kg*	473 mm	224 mm	523 mm
36 lbs. 12 oz.*	18.6 in.	8.9 in.	20.6 in.
Mouse			
0.10 kg	33 mm	61.7 mm	107.3 mm
4 oz.	1.3 in.	2.4 in.	4.2 in.

*Exact weight varies depending on number and type of internal SCSI devices installed.

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

- 20% to 80% (noncondensing)

Note: If you configure the server without a DAT drive, the relative humidity range increases to 5% to 95% (noncondensing).

Altitude

- 0 to 3048 m (0 to 10,000 ft.)

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1 Infinite Loop
Cupertino, California 95014-2084
(408) 996-1010

030-7045-A
Printed in U.S.A.