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Power Macintosh 7300,7600,8600,9600: New Features (2/97)

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TOPIC -----

What are the new features of the Power Macintosh 7300, 7600, 8600, and 9600 computers?

DISCUSSION -----

The table below outlines the primary differences among the Power Macintosh 7500, 7600, 8600, and 9500 computers and the Power Macintosh 7300, 7600, 8600, and 9600 computers. These new features are described in more detail in the sections following the table.

New models	Previous models	Major changes
Power Macintosh 7300/166 Power Macintosh 7300/180 Power Macintosh 7300/200	Power Macintosh 7500/100	Clock speeds 166-200 MHz,256K L2 Cache installed, 2 GB hard drive, 12X-speed CD-ROM drive
Power Macintosh 7600/200	Power Macintosh 7600/120 Power Macintosh 7600/132	Clock speed 200 MHz, 2 GB hard drive, 12X-speed CD-ROM drive
Power Macintosh 8600/200	Power Macintosh 8500/150 Power Macintosh 8500/180	Clock speed 200 MHz, new tower enclosure, 2 GB AV-capable hard drive, 12X-speed CD-ROM drive, internal Zip cartridge drive

Power Macintosh 9600/200	Power Macintosh 9500/200	New tower enclosure, 12X-speed CD-ROM drive, new accelerated display card
Power Macintosh 9600/200MP	Power Macintosh9500/180MP	Clock speed 200 MHz, dual PPC604e microprocessors, new tower enclosure, 12X-speed CD-ROM drive, new accelerated display card

Summary of Changes

The new features in the faster Power Macintosh 7300, 7600, 8600, and 9600 computers include:

* PowerPC 604e microprocessor in all models
* Dual microprocessor configuration (Power Macintosh 9600/200MP)
* Faster processor speeds, ranging from 166 to 200 MHz
* Second-level (L2) cache in all models
* Larger size internal hard disks: 2 or 4 GB
* AV-capable hard disk (Power Macintosh 8600 only)
* Built-in 12X-speed CD-ROM drive
* Built-in Iomega Zip removable cartridge drive (Power Macintosh 8600 only)
* New accelerated display card (Power Macintosh 9600 only)
* Security bar on the Power Macintosh 7300 and 7600 models
* New tower enclosure with easy access and security lock (Power Macintosh 8600 and 9600 models)
* Mac OS in the new models is Macintosh System 7.5.5

PowerPC 604e Microprocessor

All the new models use the PowerPC 604e microprocessor. The PowerPC 604e is a version of the PowerPC 604 with the following enhancements:

* On-chip data and instruction caches of 32 KB each
* Processor clock speed up to 5 times the bus clock speed

Dual Processor Configuration

In the 9600/200MP model, two PowerPC 604e microprocessors are on the processor card. With applications that support the new multiprocessor API, the MP configuration provides up to 2 times the performance of the equivalent single-processor computers. The operation of the dual-processor configuration is asymmetric multiprocessing. One processor is the primary processor: it runs the Mac OS and handles interrupts from the I/O systems. The second processor runs MP tasks as set up by the primary processor.

Processor Clock Speeds

The clock speeds for the microprocessors in the Power Macintosh 7300, 7600, 8600, and 9600 computers are increased over their earlier counterparts. The table below shows the microprocessor clock speeds along with the corresponding processor bus speeds.

Model	Processor clock speed	Processor bus speed
Power Macintosh 7300/166	168 MHz	48.0 MHz
Power Macintosh 7300/180	180 MHz	45.0 MHz
Power Macintosh 7300/200	200 MHz	50.0 MHz
Power Macintosh 7600/200	200 MHz	50.0 MHz
Power Macintosh 8600/200	200 MHz	50.0 MHz
Power Macintosh 9600/200	200 MHz	50.0 MHz
Power Macintosh 9600/200MP	200 MHz	50.0 MHz

Second-Level Cache

All the new models include a second-level (L2) cache. The L2 cache provides a performance improvement of up to 40% over machines without such a cache. The L2 cache in the Power Macintosh 9600/200 and 9600/200MP consists of 512 KB of fast static RAM on the main logic board. The L2 cache in the other models consists of a 256 KB DIMM installed in a slot.

Hard Disk Sizes

The built-in hard disks in the new Power Macintosh computers are either 2 or 4 GB.

AV-Capable Hard Disk

The 2 GB hard disk in the Power Macintosh 8600 can support AV applications. It can transfer video data at 30 frames per second with no dropped frames.

12X-Speed CD-ROM Drive

All the new models include a built-in 12X-speed CD-ROM drive, an AppleCD 1600i. The AppleCD 1600i 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 AppleCD 1600i CD-ROM drive has a sliding tray to hold the disc. The drive features an 12X-speed mechanism that supports sustained data transfer rates of 1600 KB per second and a data buffer that further enhances performance.

Built-in Removable Cartridge Drive

One of the new models, the Power Macintosh 8600, has a built-in Iomega Zip removable cartridge drive. The built-in Zip drive is similar to its external counterpart. The user has the option of placing a system folder on a Zip cartridge and starting up the computer from the Zip drive.

Video Input

The new Power Macintosh 7600 has the same video input capabilities as the Power Macintosh 8500 and 8600 models. The back of the computer has a small panel with RCA jacks for stereo pairs of audio inputs and outputs, an RCA jack for composite video input, and a multipin connector for S-video input.

Accelerated Display Card

The Power Macintosh 9600 includes a video display card that supports acceleration of 2D graphics and text. The display card has 4 MB of buffer memory and cannot be expanded. The display card supports pixel depths of 8, 16, and 24 bits per pixel on small and medium-sized monitors, and 8 and 16 bits on large monitors, as shown in the table below.

Resolution (pixels)	Vertical frequency (Hz)	Pixel depths (bits per pixel)
512 by 384	60	8, 16, or 24
640 by 480	67	8, 16, or 24
640 by 870	75	8, 16, or 24
800 by 600	75	8, 16, or 24
832 by 624	75	8, 16, or 24
1024 by 768	75	8, 16, or 24
1152 by 870	75	8, 16, or 24
1280 by 960	75	8 or 16
1280 by 1024	75	8 or 16
1600 by 1200	60, 67, or 75	8 or 16

Security Bar

The Power Macintosh 7300 and 7600 models have a security bar that conceals the latches for the top cover. The security bar snaps into place on the front of the case and is held in place by a screw.

New Tower Enclosure

The new tower enclosure has the following new features:

* More space for internal storage devices
* Larger power supply
* Easier access to internal components
* Locking feature
* Space for larger-size DIMMs

Internal Storage Devices

The new tower enclosure has spaces for up to seven internal storage devices. Four of those spaces are accessible from the front; of those four, three can accommodate 5.25-inch devices and one can accommodate a 3.5-inch device. The other spaces are not accessible from the front; they can accommodate three 3.5-inch devices or one 5.25-inch device and one 3.5-inch device.

Larger Power Supply

The power supply in the new tower enclosure now provides a total of 390 watts to support the larger number of drives and the faster processor. The table below shows the maximum power available for additional internal devices such as expansion cards and storage devices. The power supply can support as many as six 15-watt cards or four 25-watt cards.

Device	Voltage	Current	Power
Expansion card (15 watts)	+5 V	3 A	15 W
	+12 V	0.5 A	6 W
	–12 V	0.1 A	1.2 W
	+3.3 V	2 A	6.6 W
Expansion card (25 watts)	+5 V	5 A	25 W
	+12 V	0.5 A	6 W
	–12 V	0.1 A	1.2 W
	+3.3 V	2 A	6.6 W
Storage devices	+5 V	9 A	45 W
	+12 V	3 A	36 W
	+12 V	7.5 A peak*	--

Access to Internal Components

Two features of the new tower enclosure makes it easier to obtain access to the internal components:
- Removable side panel
- Hinged subchassis

* Removable Side Panel

The entire side panel on the left side of the enclosure is removable. The panel is held in position by a latch with a pushbutton at the top of the enclosure. To remove the side panel takes three steps:

Step 1

Gently tilt the computer onto its right side, as viewed from the front. Small rubber bumpers on the right side act as feet when the computer is on its side.

Step 2

Press down on the button at the top of the side panel and pull the panel away from the enclosure at the top.

Step 3

Pull the side panel to the right (the top of the enclosure) to release it from the bottom of the enclosure, then lift it up and away.

With the side panel out of the way, you have access to the components at the bottom of the computer: PCI expansion slots, the DAV connector, and the space for internal RAID storage devices. Press the button and lift the cover up a few inches.

* Hinged Subchassis
As in earlier Power Macintosh 8500 and 9500 models, access to the DIMM slots is obstructed by the power supply and disk drives. In the new tower enclosure, those components are mounted on a hinged subchassis that can be tilted out of the enclosure.

With the side panel removed, moving the hinged subchassis out of the way takes two steps:

Step 1

Raise the two plastic catches at the top of the open area to release the subchassis. With the computer on its side, and viewed from the front, the catches are at the right of the open space.

Step 2

Grasp the large plastic handle below the catches and slowly lift up, tilting the subchassis to the right. When the subchassis is clear of the internal components, it will rest on its top.

With the computer on its right side, and the subchassis in the open position,

the main logic board with its array of expansion slots is facing up. The user can now insert expansion DIMMs into the appropriate slots.

Locking Feature

The new tower enclosure for the Power Macintosh 8600 and 9600 has a locking feature. A tab on the back of the enclosure connects to an internal latching mechanism for the removable side panel. Pulling out the tab engages the locking mechanism and exposes a hole in the tab. By inserting a security cable or a padlock through the hole, you can secure the tab in the locked position.

Taller RAM DIMM

The method of RAM expansion in the new models is the same as in their earlier counterparts. However, Apple Computer has made the following change to the mechanical specification for the RAM DIMM:

The JEDEC MO-161 specification shows three possible heights for the 8-byte DIMM. All Power Macintosh computers can accommodate DIMMs with the shortest of the three specified heights: 1.100 inches. The new Power Macintosh 8600 and 9600 can also accommodate DIMMs with a height of 1.255 inches.

System Software

The system software has been modified to support the new hardware features. The Mac OS for the new models is a modified version of System 7.5.5 with a new enabler.

Note: The information contained in this article was taken from the Power Macintosh 7300, 7600, 8600, and 9600 Developer Note.

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