Power Macintosh 5400 & Performa 6400: Adding Memory (11/96)

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TOPIC ---

I need to add memory to my Power Macintosh 5400/120 computer, but I'm not sure what type of memory I need to purchase. Does this computer use SIMMs or DIMMs?

DISCUSSION --

Compatibility
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The Power Macintosh 5400 and 6400; Macintosh Performa 6400 series; and Macintosh Performa 6360/160 computers use JEDEC-standard 168-pin DIMMs (dual inline memory module) DRAM cards rather than the 72-pin SIMM DRAM cards used in the Power Macintosh 5200 and 6200 computers. The DIMMs should be 64-bit-wide, 168-pin fast-paged mode, 70ns RAM access time or faster, and 2K refresh rate. Although you can use EDO memory in the Power Macintosh 5400 and 6400; Macintosh Performa 6400 series; and Macintosh Performa 6360/160 computers, you will not experience any benefit from doing so. SIMMs from older Macintosh computers are not compatible with your computer and should not be used.

Additionally, you cannot necessarily use the same DIMMs as you can in other PCI-based Power Macintosh computers such as the 7200, 7500, 7600, 8500, and 9500 series computers. These other Power Macintosh computers can support DIMMs with either a 2K or 4K refresh rate. However, the Power Macintosh 5400 and 6400; Macintosh Performa 6400 series; and Macintosh Performa 6360/160 computers can only support DIMMs with a maximum of a 2K refresh rate*. DIMMs incorporating 4K refresh parts will function in these computers but at half the memory density. For example, the computers will only recognize 16 MB of a 32 MB DIMM, and so on.

To prevent compatibility problems, Apple has contacted major RAM developers in several ways. In the Developer Notes for the Power Macintosh 5400/120 and for the Macintosh Performa 6400 series, the following note was added:

"DRAM DIMM developers should note that the PSX memory controller on the main logic board of the Power Macintosh 5400 computer does not provide support for 4 M by 4 bits (12 by 10 addressing) or 1 M by 16 bits (12 by 8 addressing) DRAM devices."

Additionally, Apple sent a message to specific vendors which stated:

"The PSX memory controller does not support 4Mx4 DRAM devices with 12 by 10 addressing nor 1Mx16 devices with 12 by 8 addressing. Other 16 MBit devices are compatible, for a full list refer to the Developer Note."

The following RAM developers received this note:
• Vikking
• Techworks
• SQP
• Southland
• PNY
• Newer Technology
• Lifetime, Kingston
• Delta Lu, Comtech
• Apple Japan

DIMMs available from Apple Computer are 2K refresh rate only so you can safely use them in your Power Macintosh 5400 and 6400; Macintosh Performa 6400 series; and Macintosh Performa 6360/160 computers.

*Notes:
- Refresh rates lower than 2K, such as 256K or 1K are also supported.
- The only memory devices with a 4K refresh rate which is supported on the Power Macintosh 5400/120 and Macintosh Performa 6400 series are 2M x 8 devices with 12 x 9 addressing.

Expansion
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The Power Macintosh 5400 and 6400; Macintosh Performa 6400 series; and Macintosh Performa 6360/160 computers have two RAM expansion slots on the logic board. You can use any DRAM configuration with DIMMs of these sizes: 8, 16, 32, or 64 MB. The exact configuration depends on the density of the DRAM chips that are mounted on the DIMMs.

You can increase your computer's DRAM to up to a maximum of 136 MB (the 8 MB that comes on your computer's logic board, plus an additional 128 MB for a total 136 MB).

DIMMs can be installed one or more at a time. The Power Macintosh 5400 and 6400; Macintosh Performa 6400 series; and Macintosh Performa 6360/160 computers support only linear memory organization. Therefore, no performance gains are seen when two DIMMs of the same size are installed. Any size DIMM can be installed in either DIMM slot, and the combined memory of all of the DIMMs installed will be configured as a contiguous memory space.

Article Change History:
26 Nov 1996 - Clarified refresh rate support.
15 Nov 1996 - Added 6360.
17 Sep 1996 - Corrected expansion information.

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