



Memory Upgrade for Apple PowerMac 8500 & 9500 Installation Guide



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IMPORTANT: Like most electrical components inside computers, memory is susceptible to damage by static electricity. NEVER handle memory or computer parts if you have any static electricity buildup. Before working with sensitive electronics, touch a large metal object to ground yourself. If you have an antistatic grounding strap, use it while working with your computer.

Step 1 - Shut down the Computer, Disconnect the Cables, and Remove the Computer's Casing

Shut down the computer as recommended in your owner's manual (do not put the computer to sleep!). Disconnect all cables from the back of the computer. Turn the computer tower so you are facing the back of the case.

Loosen the four large slotted screws (six on the 9500) on the rear panel that secure the case cover using a flat-blade screwdriver. Once these screws are loosened, grasp the sides of the case and slide the case top forward about two inches and then lift it up and away from the computer's chassis. Set the casing aside.

Touch any metal shield on the computer's chassis (e.g., the CD-ROM drive) to help dissipate static electricity before touching any of the computer's components. If you have a grounding strap, connect it now according to the strap manufacturer's directions.



Figure 1. PowerMac 9500 Expansion Card Cavity

Step 2 - Prepare for Motherboard Removal

Remove the video card

Turn the computer so you are facing the open cavity of the computer (the side away from the motherboard). Locate the video card which is inserted into one of the PCI connectors on the motherboard. You can verify if a card is the video card by looking for the 15-pin monitor connector at the back of the computer which is attached to the video card. Remove the card by pulling it firmly from the socket toward your body.

Remove any expansion cards from the PCI slots

Remove any cards that have been installed into the PCI slots on your Macintosh. These may be removed by simply pulling the card from the slot on the motherboard.

Remove the CPU card

Locate the CPU card assembly just below the power supply. Squeeze the plastic mounting clips and tilt the processor card holder downward. Remove the card from the socket on the motherboard by pulling the card firmly, BUT CAREFULLY, toward you.

Remove the ribbon cable from the motherboard located next to the CPU Card Slot, by gently pulling the connector out of the slot (8500 only).

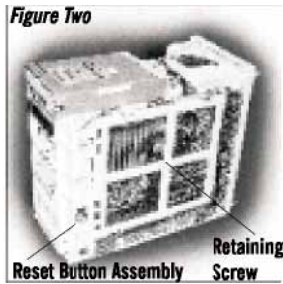
Remove the reset button assembly

Locate the reset button assembly near the front right side of the computer's chassis. You should notice one tab at the top of the assembly and one at the bottom. Press the tabs inward and slide the assembly through the front of the case wall. The button assembly holds the green power LED. Note its location. Pull the LED out of the plastic assembly. (It will still be attached to the motherboard.)

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Remove the screw that secures the motherboard

On the back side of the motherboard (right side of the computer) there is a plastic "cage" that is attached to the back side of the motherboard. Remove the Phillips head screw located in the center of that cage (see Figure Two).

Disconnect the data and power cables from the motherboard

Disconnect all the data and power cables from the top of the motherboard. Gently pull each cable upward to disconnect it; pulling lightly and pulling upward seems to help with the disconnection. The power supply connector (large white connector with multicolored wires) has a LATCH on its connector. You must press inward on this latch button while pulling upward on it.

Step 3 - Remove the Motherboard

With all of Step two complete, the motherboard should be ready to remove from the chassis. Slide the motherboard toward the front of the chassis about 1/4" to 1/2" then tilt the front of the motherboard outward from the chassis (see Figure Three). The motherboard will "hinge" near the back of the chassis. There may be a securing tab near the top of the motherboard; if so, gently pull upward on this tab when tilting the motherboard from the case. Rest the motherboard on a flat work surface, preferably a wooden table where static electricity can be kept to a minimum.



Figure Three

Step 4 - Locate the RAM DIMM Sockets and Install the New Memory

Locate the DIMM sockets on the motherboard (see diagrams located at right). Each socket should be labeled on the motherboard. You will need to install your new DIMMs in an available socket on the motherboard. If you happen to have all of the sockets filled, you will need to remove a DIMM to install a new DIMM. See Figure Four for socket layouts. Each socket will be labeled on the motherboard. You will need to install your new DIMMs in an available socket. If you happen to have all of the sockets filled, you must remove a DIMM to install a new DIMM.



Figure Four

The Power Macintosh 8500s & 9500s support memory interleaving, which can increase the performance of the computer. Memory interleaving uses two DIMMs as a single, logical memory bank which allows reading or writing to two DIMMs at the same time thereby increasing the computer's performance. To take advantage of memory interleaving for a memory bank, you must do the following:

- 1) The DIMMs to be interleaved must be in the correct paired slots on the motherboard (e.g., one DIMM in socket A1 & one DIMM in socket B1 on the 9500)
- 2) The DIMMs to be interleaved must be the same size.

To remove a DIMM, locate the white release lever at one end of the DIMM socket. Press this lever down to lift that end of the DIMM. Now, grasp the DIMM and lift it straight upward from the motherboard. Repeat this process for each DIMM you wish to remove. NOTE: Be sure to store old DIMMs in antistatic packaging to keep them from being damaged by static electricity.

To install your new memory, remove each DIMM from its antistatic package. Avoid touching the contacts along the connector edge of the DIMM. Notice that each DIMM's connector edge is divided into three sections, separated by two notches on the bottom (connector side) of the module. Open the DIMM ejector latch(es) on the DIMM socket on your computer. Hold the DIMM so the short section of the connector edge is directed toward the front of the motherboard. Insert the module into the DIMM socket and press the DIMM *firmly* into the connector. The DIMM must be firmly seated to operate properly. When the DIMM is completely and properly installed, the ejector latch(es) should close against the DIMM. Repeat this process for each new DIMM you wish to install.

Step 5 - Install the VRAM DIMMs - PowerMac 8500 ONLY!

Locate the VRAM DIMM sockets on the motherboard. The Power Macintosh 8500 should have two available VRAM sockets (2 Megabytes of VRAM are preinstalled on the motherboard). You **MUST** fill either both sockets or none of the sockets. Installing only one VRAM DIMM is NOT recommended and may affect performance.

To install your new VRAM, remove each DIMM from its antistatic package. Avoid touching the contacts along the connector edge of the DIMM. Notice that each DIMM's connector edge is divided into three sections divided by two notches. Hold the DIMM so the short section of the connector edge is directed toward the front of the motherboard. Insert the module into the DIMM socket and press the DIMM into the connector. The DIMM must be firmly seated to operate properly. When the DIMM is completely and properly installed, the ejector latches should close against the DIMM. Repeat this process for each new DIMM you need to install.

Step 6 - Reassemble Your Computer's Chassis

This step is simply the reverse of the disassembly steps outlined earlier in this guide. The following outline is given to help you in your reassembly.

- 1) Insert the back edge of the motherboard into the back wall of the chassis
- 2) Tilt the front edge of the motherboard into the chassis
- 3) Slide the motherboard toward the rear of the computer
- 4) Install the Phillips head screw into the center of the motherboard
- 5) Reconnect all of the cables to the top of the motherboard (don't forget about the Ribbon Cable located behind the CPU Card on the 8500).
- 6) Press the reset button assembly into the front chassis wall until it locks into place
- 7) Insert the CPU card into CPU card slot on the motherboard
- 8) Insert the video card into one of the PCI slots on the motherboard
- 9) Insert any other expansion cards (i.e. - PCI cards) into the appropriate slots on the motherboard

Lastly, slide the computer's case cover over the chassis and slide it firmly against the back wall of the computer. Tighten the four thumb screws at the back of the case to fasten the case cover. **DO NOT OVERTIGHTEN.** Reconnect all of the peripheral cables to the back of the computer.

Step 7 - Verify Proper Computer Operation For RAM Installations:

Boot the computer as recommended in your user's manual. You should hear the normal startup chord. The computer may have a slightly longer pause before the monitor comes on. This happens because the computer tests the memory at every startup. Soon you should see the computer's boot sequence (if the computer does not boot normally, see Troubleshooting). After the computer arrives at the desktop, choose "About This Macintosh" from the Apple Menu. The Total Memory should now be equal to the sum of all memory DIMMs installed onto the motherboard. NOTE: The number in the window is expressed in kilobytes and remember that 1024k equals one Megabyte.

For VRAM Installations

Boot the computer as recommended in your user's manual. You should hear the normal startup chord and the monitor should show a display shortly afterwards. If the computer does not boot normally, see "Troubleshooting" at the end of this guide.

After the computer arrives at the desktop screen, go to the *Monitors* control panel. You should now be able to select more colors than you previously could before the VRAM upgrade. If you do not see more color selections, check your installation and try again.

If you do not have the desired monitor configuration after installing your VRAM, check the *Graphic Modes* section of your *Technical Information* manual which you received with your computer. This section will list monitors and the available color/gray bit depths available on that monitor.

Troubleshooting

If your computer does not boot normally or you experience crashing or freezing after installing the memory, you may need to remove and reinstall the memory DIMMs to get a better connection. It is common for new memory DIMMs not to make full contact, especially on the first insertion. If two extra tries at reseating the memory do not improve your results, please e-mail or call technical support for additional assistance.

In addition to memory-related issues, you may experience problems from having disassembled your computer system. The Power Macintosh 8500 & 9500 have many cable connections on the motherboard. Be sure to check all of these cable connections if you have odd problems like a flashing disk icon or no audio produced by your CD player. In essence, be sure to double-check that you have reconnected all of your cable connections, as well as having properly seated your DIMM memory modules into their sockets.

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