AlphaServer 2000 Series

MS452 Memory Module Installation and Upgrade

Order Number: EK—MS452—IN. A01

October 1994

This document describes how to install MS452-AA/BA memory modules and MS452-UA/UB SIMM memory upgrades for AlphaServer 2000 series systems.

Digital Equipment Corporation
Maynard, Massachusetts

October 1994

Digital Equipment Corporation makes no representations that the use of its products in the manner described in this publication will not infringe on existing or future patent rights, nor do the descriptions contained in this publication imply the granting of licenses to make, use, or sell equipment or software in accordance with the description.

Copyright © Digital Equipment Corporation, 1994. All Rights Reserved.

The following are trademarks of Digital Equipment Corporation: AlphaServer, Alpha AXP, AXP, DECchip, Digital, and the DIGITAL logo.

All other trademarks and registered trademarks are the property of their respective holders.

FCC Notice: The equipment described in this manual generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such radio frequency interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference, in which case the user at his own expense may be required to take measures to correct the interference

S2709

Memory Installation and Upgrade

Use this document to install MS452 memory modules and SIMM add-on memory packages for AlphaServer 2000 systems.

MS452 Memory Configurations

The standard AlphaServer 2000 system comes with 64 megabytes of installed memory. It can be configured with a maximum of 640 megabytes using two memory modules: one fully populated module with 4-megabyte SIMMs (single in-line memory modules) and one fully populated module with 16-megabyte SIMMs.

On a fully populated module, all four banks—each bank consisting of eight SIMMs—are filled.

MS452 Memory Module and Upgrades

MS452 memory modules and add-on packages are available in 4-megabyte and 16-megabyte (70-nanosecond) variations:

MS452 Memory Modules: SIMM Carrier with 1 Bank, 8 SIMMs	
MS452-AA	32-megabyte memory module (SIMM carrier with eight 4-megabyte SIMMs)
MS452-BA	128-megabyte memory module (SIMM carrier with eight 16-megabyte SIMMs)
SIMM Add-On Packages: 1 Bank, 8 SIMMs	
MS452-UA	32-megabyte memory add-on package (eight 4-megabyte SIMMs for MS452-AA)
MS452-UB	128-megabyte memory add-on package (eight 16-megabyte SIMMs for MS452-BA)

Memory Capacities

Memory capacities per memory module or carrier using 4-megabyte or 16 megabyte SIMM add-on packages are shown in the following table.

No. of Banks	4-MB SIMMs	16-MB SIMMs
1	32 MB (MS452-AA)	128 MB (MS452-BA)
2	64 MB (MS452-AA + 1 x MS452-UA)	256 MB (MS452-BA + 1 x MS452-UB)
3	96 MB (MS452-AA + 2 x MS452-UA)	Not supported
4	128 MB (MS452-AA + 3 x MS452-UA)	512 MB (MS452-BA + 3 x MS452-UB)

Memory Configuration Rules

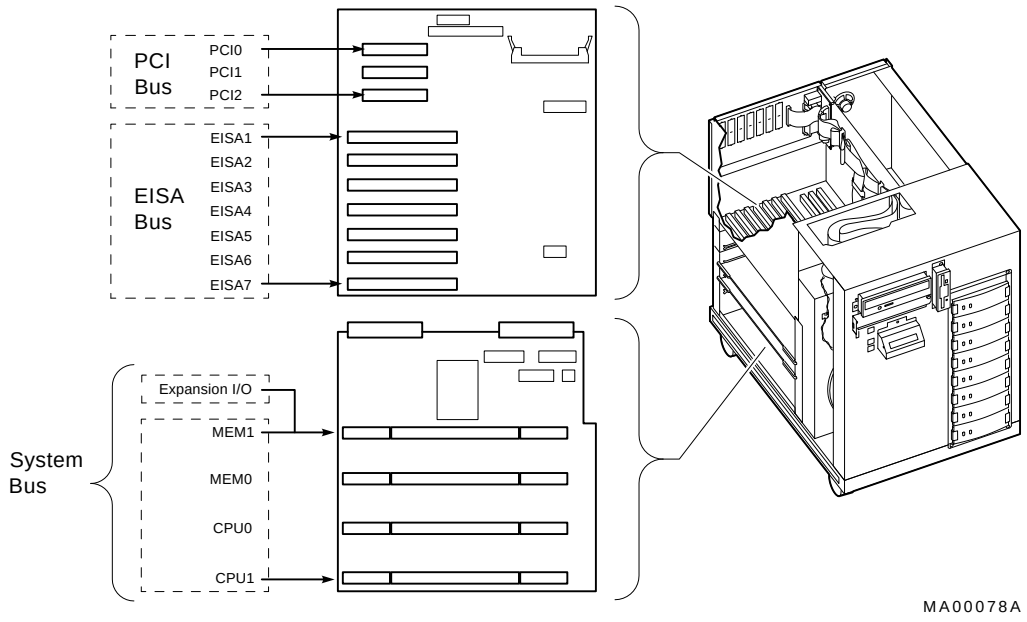
Observe the following rules when configuring memory on the AlphaServer 2000 system:

- You cannot mix 4-megabyte SIMMs and 16-megabyte SIMMs on an individual memory module.
- Fill your first memory module to capacity before adding memory to the second module.
- The second memory module can be filled with 1, 2, or 4 banks of SIMMs.

Note: The second memory module cannot be filled with 3 banks of memory.

- Maximum memory is 640 megabytes using one fully populated module with 4-megabyte SIMMs and one fully populated module with 16-megabyte SIMMs.
- The maximum height for SIMMs in the AlphaServer 2000 system is 1.1 inches.

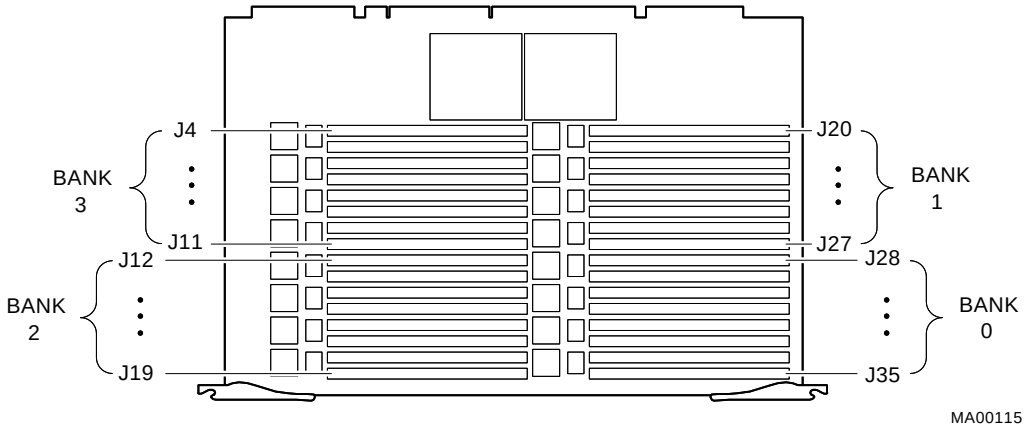
System Bus Configuration



Note: Use of an expansion I/O option eliminates MEM1.

The following illustration shows the layout of the MS452-AA/BA memory module. The module that holds the SIMMs is called a carrier.

MS452-AA/BA Carrier Layout



Before Installing or Upgrading Memory

If you plan to move SIMMs from one board to another in order to complete your memory configuration, follow the steps below to ensure that none of these SIMMs have errors logged against them on the SIMM carrier module. The position of a failing SIMM is reported using the `show error` command.

1. **Enter the `show fru` command to check for events logged for memory.** In the following example, a symptom-directed (SDD) error is logged for MEM1.

```
P00>>>show fru
                          Rev                    Events   Logged
Slot  Option   Part #     Hw Sw   Serial #       SDD      TDD
  0   IO       B2111-AA   H2 0    ML41100003     00       00
  2   CPU0     B2020-AA   B2 9    ML43400028     00       00
  3   MEM0     B2023-BA   A1 0    AY34915430     00       00
  4   MEM1     B2023-BA   A1 0    AY34398735     01       00
  .
  .
  .
P00>>>
```

2. **Enter `show error mem1` to determine the type of error and position of the failing SIMM.** In the following example, an uncorrectible error is logged for the SIMMs at positions J31 and J34.

Note: Correctible errors are indicated by event type 00. If five or more correctible errors are logged for the same memory carrier, the specified SIMMs should be replaced.

For all uncorrectible errors, indicated by event types 01 and 10, you should replace the failing SIMM(s).

Only two bad memory data bits at a time are captured by the system diagnostics. If more than two SIMMs are bad, you may need to repeat the SIMM isolation and replacement procedures until all bad SIMMs are replaced.

```
P00>>>show error mem1
MEM1 Module EEROM Event Log
Test Directed Errors
No Entries Found
Symptom Directed Errors
Entry  Fail Address Bits/Syndrome  Bank #  ASIC # Source  Event Type
  00    00000040    70(J31),76(J34)  0      0       1        01
P00>>>
```

3. **Replace failing SIMMs, install carrier, and clear errors that were logged against the SIMMs using the `clear_error` command.**

Individual replacement SIMMs are available to replace failing SIMMs:

ME524-DE	1 x 4MB SIMM
ME644-DE	1 x 16MB SIMM

Refer to "Installing and Removing SIMM Memory" for instructions on how to replace a SIMM.

The following example shows how to clear errors that were logged against SIMMs on carrier or memory module 1.

```
P00>>>clear_error mem1
P00>>>
```

Installing or Removing a Memory Module

Complete the following steps when installing or removing a memory module or carrier.

Step 1: Perform power shutdown.

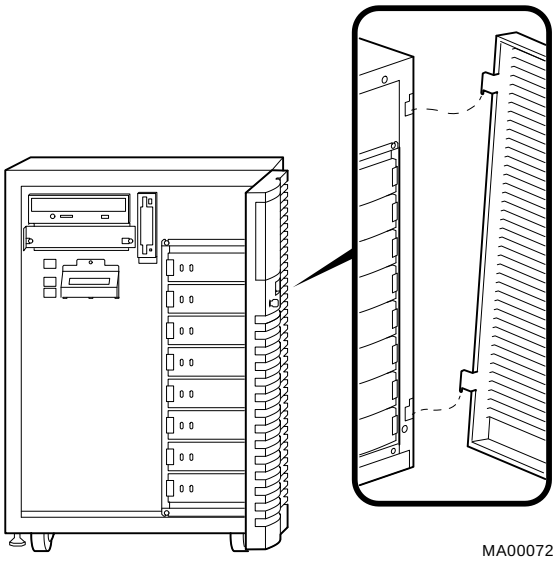
Caution: Before removing the system cover:

1. Perform orderly shutdown of the operating system.
2. Set the DC power switch on the operator control panel to off.
3. Unplug AC power cords.

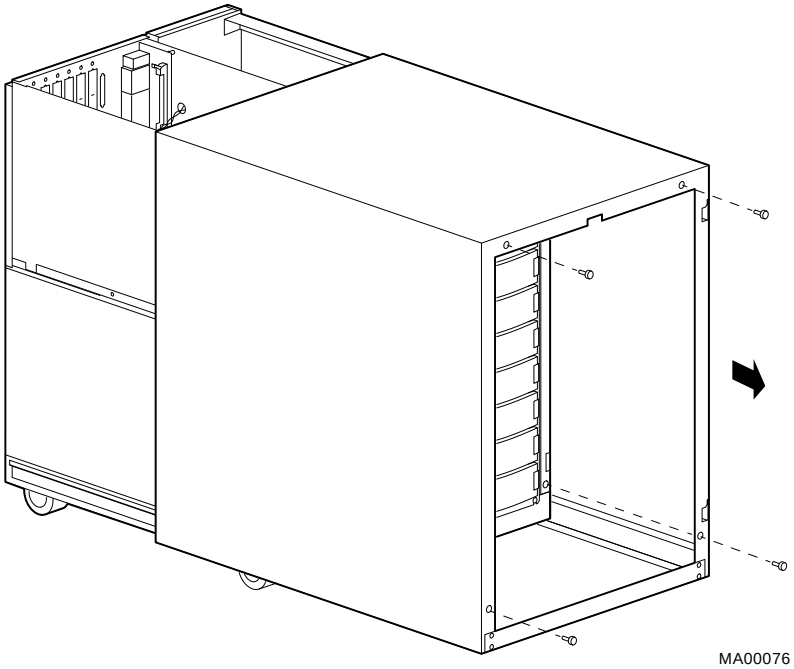
Warning: Memory and CPU modules have parts that operate at high temperatures. Wait 2 minutes after power is removed before handling these modules.

Caution: Static electricity can damage integrated circuits. Always use a grounded wrist strap and grounded work surface when working with internal parts of a computer systems

Step 2: Remove the front door.

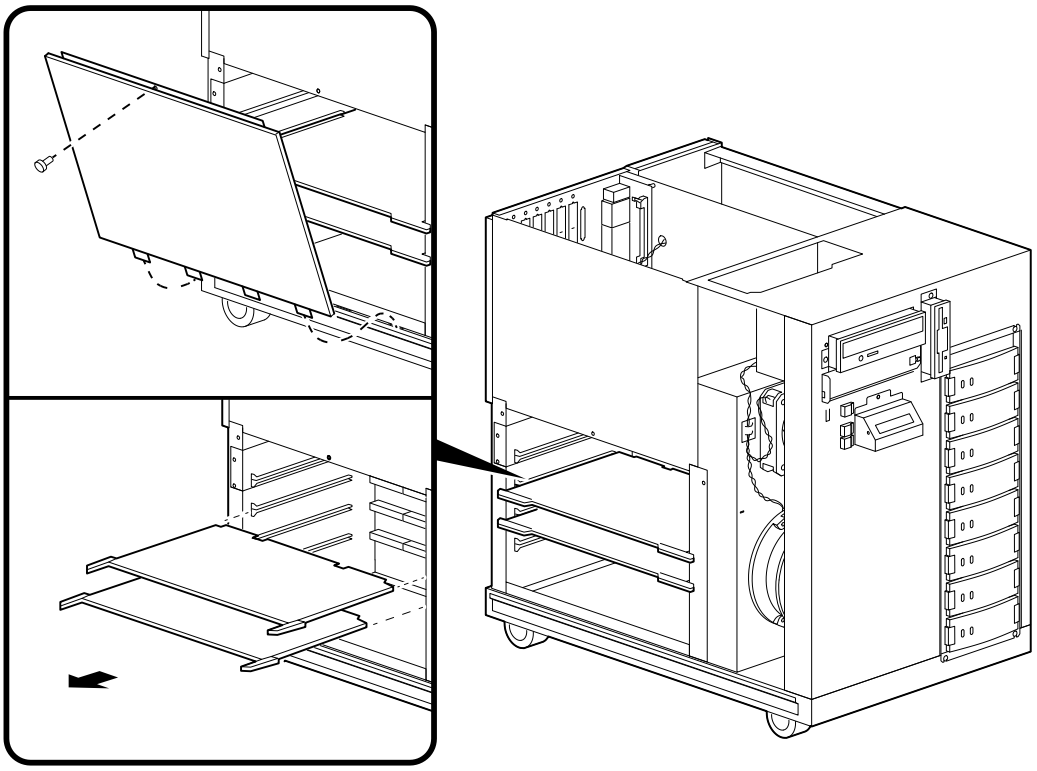


Step 3: Remove the system cover.



MA00076

Step 4: Remove the system bus cover and install or remove the memory module.



MA00100A

Note: All system bus slots must be populated with a printed circuit board (PCB) module or a clear plastic module to assure proper airflow over each PCB module.

Installing or Removing SIMM Memory

Caution: Static electricity can damage integrated circuits. Always use a grounded wrist strap and grounded work surface when working with internal parts of a computer systems

Installing SIMMs

Each MS452-UA memory upgrade package provides eight 4-megabyte SIMMs (one bank of memory) for the MS452-AA memory module.

Each MS452-UB memory upgrade package provides eight 16-megabyte SIMMs (one bank of memory) for the MS452-BA memory module.

Observe the configuration rules on page 2 when adding SIMM memory upgrades. Fill memory banks in increasing order, 0 to 3.

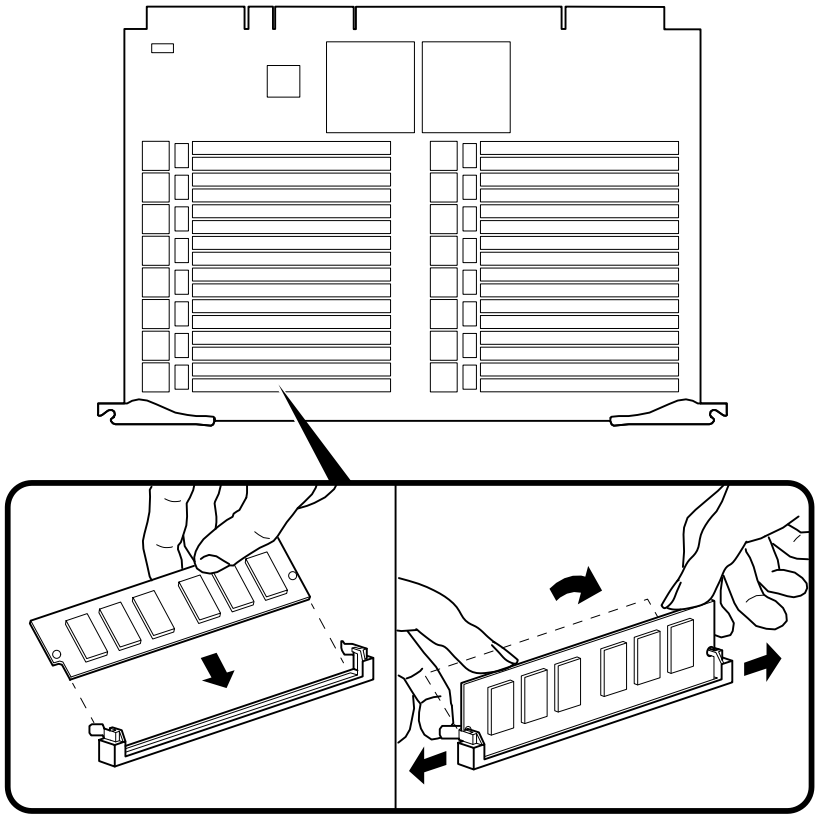
SIMMs can only be installed in decreasing order. For example, to install SIMMs in bank 1, start with position J27 and finish at J20.

Caution: Do not use any metallic tools or implements including pencils to release SIMM latches. Static discharge can damage the SIMMs.

When installing SIMMs, make sure that the SIMMs are fully seated. The two latches on each SIMM connector should lock around the edges of the SIMMs.

The following illustration shows how to install SIMM memory onto the carrier.

Installing SIMM Memory



MA00116

After installing the SIMMs, refer to "Installing and Removing Memory Modules" for instructions on installing the module.

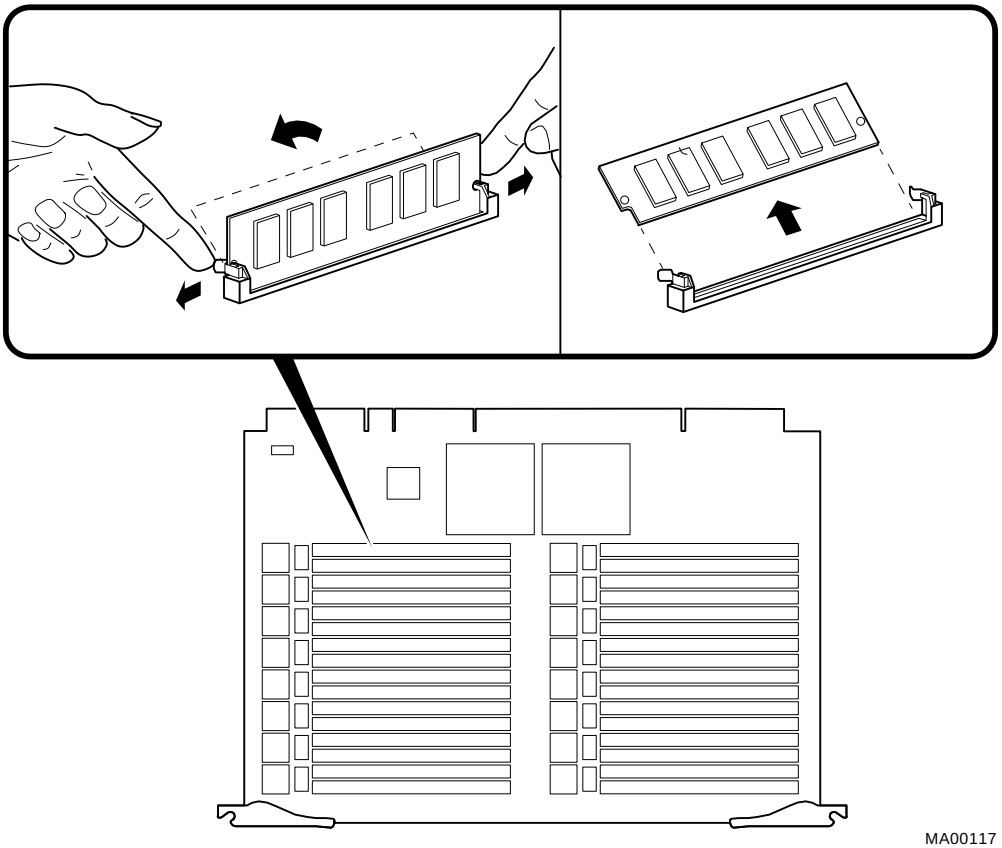
Removing SIMMs

SIMMs can only be removed in successive order. For example; to remove a SIMM at position J35, SIMMs at J20 through J34 must first be removed.

Caution: Do not use any metallic tools or implements including pencils to release SIMM latches. Static discharge can damage the SIMMs.

The following illustration shows how to remove SIMM memory from the carrier.

Removing SIMM Memory



Related Documentation

For more information, refer to the following documents:

AlphaServer 2000 Owner's Guide, EK-400MP-OP

AlphaServer 2000/2100/2100 RM/2100 CAB Series Service Guide, EK-KN450-SV