C I S C O S Y S T E M S

Doc. No. 78-1296-02

Upgrading the DRAM SIMM in the Cisco 2500 Series Routers

Product Numbers MEM-1X4D=, MEM-1X8D=, MEM-1X16D=, MEM-6M=, and MEM-18M=

This document explains how to upgrade the primary memory dynamic random-access memory (DRAM) single in-line memory module (SIMM) on your Cisco 2500 Series product. You can upgrade to 4 MB, 8 MB, or 16 MB of primary DRAM.

This document contains the following sections:

- Opening the Chassis

- Opening the Chassis

- Installing Primary-Memory DRAM SIMMs

- Closing the Chassis

- Cisco Information Online

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) is a discharge of stored static electricity that can damage equipment and impair electrical circuitry. It occurs when electronic components are improperly handled and can result in complete or intermittent failures.

Following are guidelines for preventing ESD damage:

- Before you open a chassis, ensure that power to the unit is off, but that the power cord is connected to the wall receptacle. Having the power cord connected ensures a ground path for any ESD voltages.

- Always use an ESD-preventive wrist or ankle strap and ensure that it makes good skin contact.

- Connect the equipment end of the strap to an unpainted surface of the chassis frame or another proper grounding point or surface. Attach it to the inside bottom of the chassis or to the rear panel (inside or outside) without making contact with any connectors or appliques.

- Avoid contact between equipment and clothing. The wrist or ankle strap only protects the equipment from ESD voltages on the body; ESD voltages on clothing can still cause damage.

- Handle printed circuit cards and appliques by the edges only; avoid touching the components, traces, or any connector pins.

- Place a removed card component side up on an antistatic surface or in a static shielding bag. If the component is being returned to the factory, immediately place it in a static shielding bag.

- Do not remove the wrist or ankle strap until the installation is complete.

Caution   To avoid damaging the equipment, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 megohms (Mohms).

Opening the Chassis

This section explains how to open the chassis by removing the chassis cover.

Tools Required

The following tools are required to open the chassis:

- Medium-sized flat-blade screwdriver (1/4 inch [0.625 cm])
- Size M 3.5 (metric) hex-head nut driver (optional)

Cover Removal

Refer to Parts A and B in Figure 1 and follow these steps to remove the chassis cover:

Step 1   Turn OFF power, but to channel ESD voltages to ground, do not unplug the power cable.

Step 2   Attach an ESD-preventative wrist strap.

Step 3   Remove all interface cables from the rear panel of the router.

Warning   Network hazardous voltages are accessible in the BRI cable. If you detach the BRI cable, detach the end away from the router first to avoid possible electric shock. Network hazardous voltages also are accessible on the system card in the area of the BRI port (RJ-45 connector), even when power is turned OFF. (See Figure 2.)

Step 4 Turn the unit upside down so that the top of the chassis is resting on a flat surface, and the front of the chassis is toward you. (See Figure 1, Part A.)

Figure 1   Chassis Cover Removal—Parts A (Top) and B (Bottom)
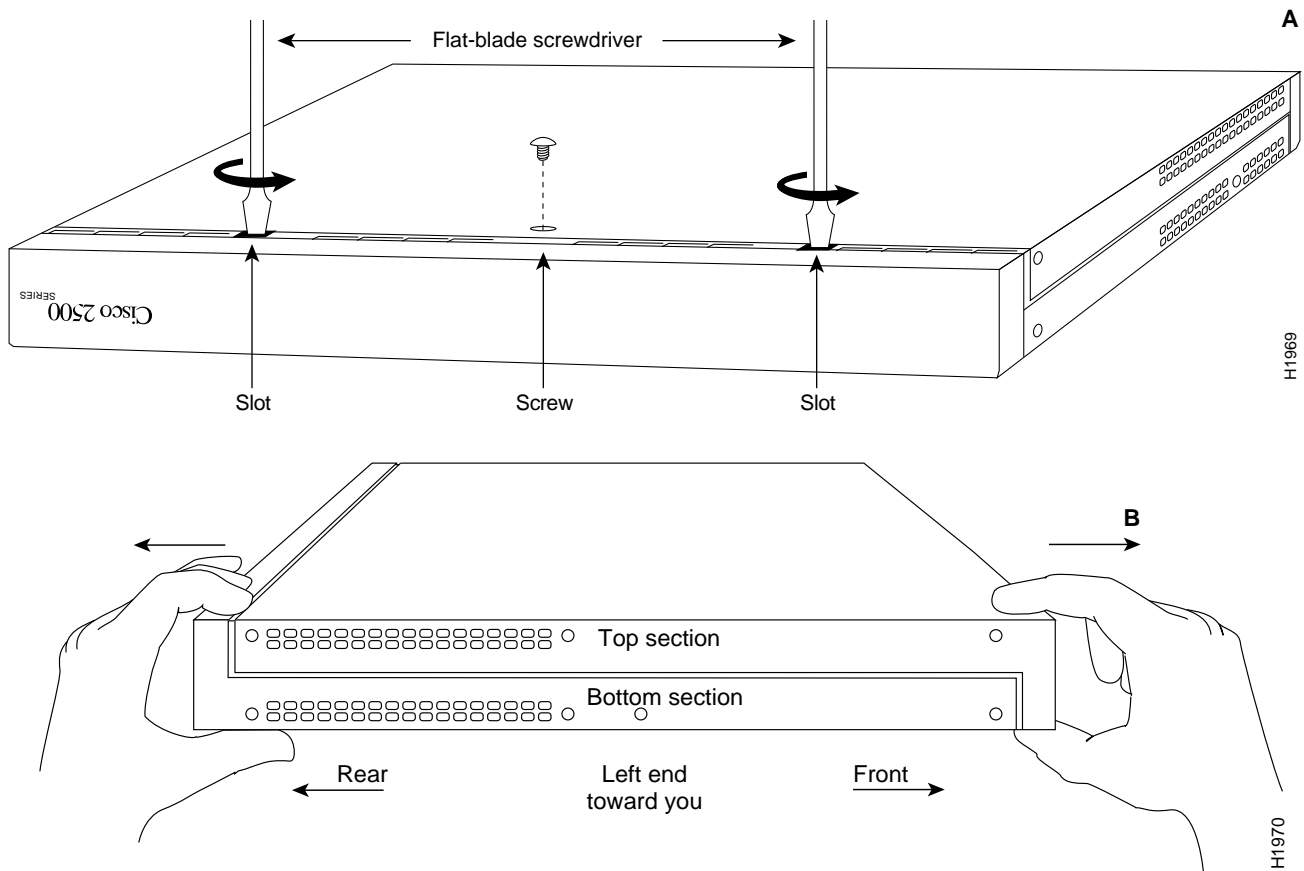
Step 5 Remove the single screw located on the bottom of the chassis (on the chassis side closest to you). Note that the chassis is comprised of two sections: top and bottom.

Step 6 If necessary, insert a medium flat-blade screwdriver into the slots shown in Figure 1, Part A, and gently rotate the blade so that the top and bottom sections separate slightly.

Step 7 Holding the chassis with both hands, position it as shown in Figure 1, Part B.

Step 8 Gently pull the top section away from the bottom section. (See Figure 1, Part B.) The fit is very snug. It might be necessary to work the chassis sections apart at one end and then the other until the top section is removed from the bottom section.

Step 9 When the top section is removed, set it aside. Figure 2 shows the layout of the system board, which is attached to the bottom section of the chassis.

Figure 2   System Board Layout—Model 2503 Shown (Chassis, Fan, and Power Supply Not Shown)
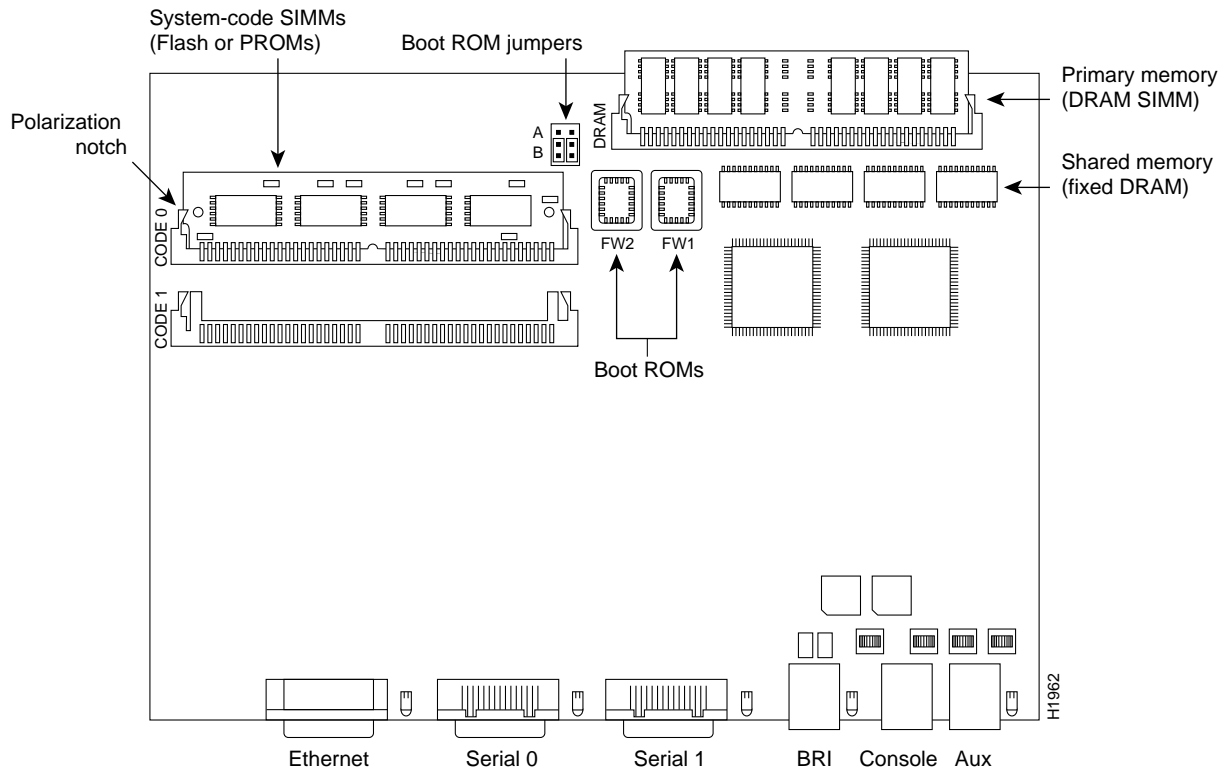
Note To locate components in the following procedures, refer to Figure 2.

Warning To prevent shock hazard and injury, do not touch the power supply and fan assemblies. These components are not user-serviceable.

Installing Primary-Memory DRAM SIMMs

The router contains primary and shared (or *packet*) memory. Primary memory size, in kilobytes (KB), is displayed in the system banner on the console screen. Primary and shared memory are 1 MB each of the dynamic random-access memory (DRAM) on the system board.

After booting your system, the system banner displays the amount of primary memory installed. The following example shows a system with 1 MB (1024 KB) of primary memory. (The system does not display shared memory.)

```
System Bootstrap, Version (2.1), SOFTWARE
Copyright (c) 1986-1993 by cisco Systems
2500 processor with 1024 Kbytes of main memory
>
```

If you use very large routing tables or many protocols, you might need to expand primary memory. This expansion might also be necessary when the router is set up as a connection device between large external networks and your internal network.

Tools and Equipment Required

- Medium-sized flat-blade screwdriver (1/4 inch [0.625 cm])
- ESD-preventive wrist strap
- The appropriate DRAM SIMM for your router model

Primary Memory Configurations

You can upgrade to 4 MB, 8 MB, or 16 MB of DRAM. Table 1 lists the upgrade amounts and corresponding memory configurations.

Table 1   Memory Configurations

Upgrade DRAM	Memory Configuration
4 MB	1 MB x 36 DRAM SIMM
8 MB	2 MB x 36 DRAM SIMM
16 MB	4 MB x 36 DRAM SIMM

Approved DRAM SIMMs

You can order DRAM SIMMs from Cisco Systems or an approved vendor.

Table 2 lists the upgrade amounts and corresponding Cisco Systems product numbers.

Table 2   Cisco Systems DRAM SIMMs

Upgrade DRAM	Cisco Systems Product Number
4 MB (1 MB x 36, 70 ns DRAM SIMM)	MEM1X4D=, MEM-6M=
8 MB (2 MB x 36, 70 ns DRAM SIMM)	MEM-1X8D=
16 MB (4 MB x 36, 70 ns DRAM SIMM)	MEM-1X16D=, MEM-18M=

Table 3 lists approved 70 nanosecond (ns) DRAM SIMM vendors.

Table 3   Approved DRAM SIMM Vendors

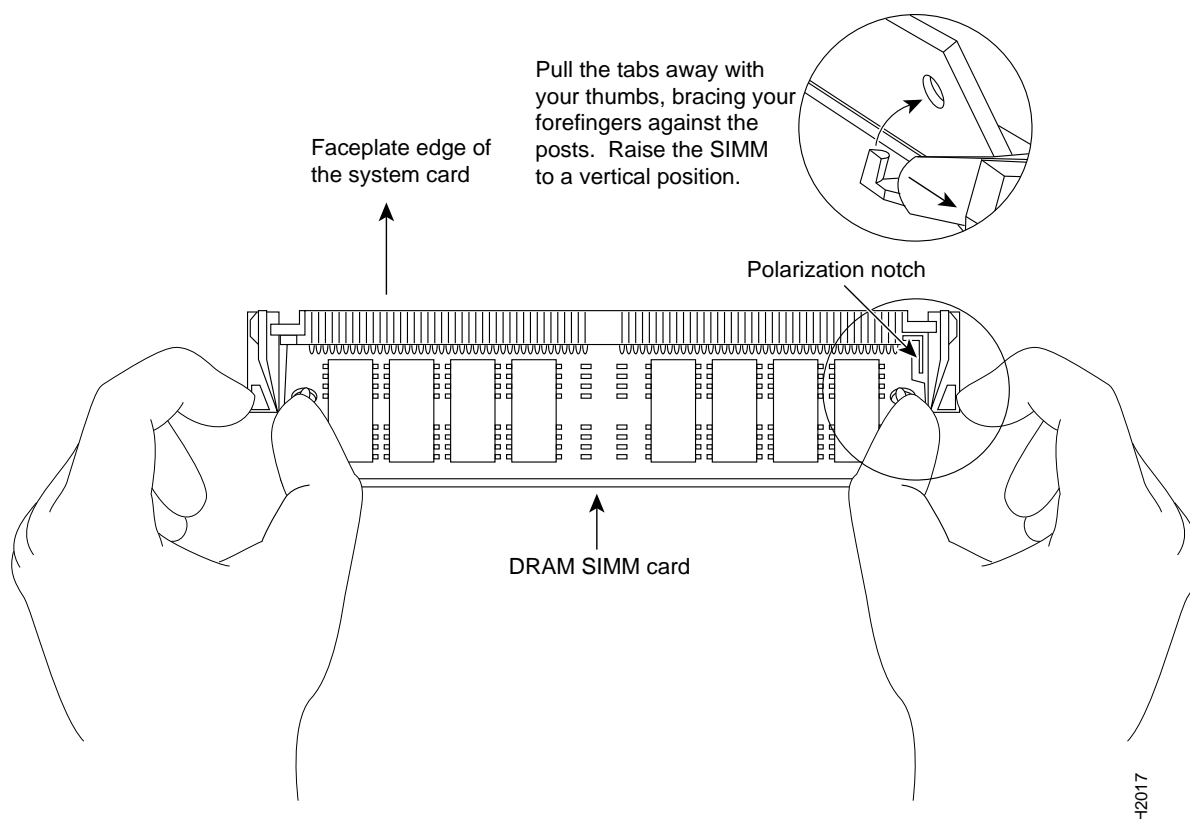| Upgrade DRAM	Vendor	Vendor Part Number
4 MB (1 MB x 36, 70 ns DRAM SIMM)	Hyundai	HYM536100AM-70
	Micron	MT9D136M-7
	Mitsubishi	MH1M36ASDJ-7
	Mitsubishi	MH1M36BNDJ-7
	NEC	MC421000A36BE-70
	OKI	MSC23136B-70BS12
	Samsung	KMM5361003C-70
8 MB (2 MB x 36, 70 ns DRAM SIMM)	Smart Modules	SM536C2000-7
16 MB (4 MB x 36, 70 ns DRAM SIMM)	Hitachi	HB56D436SBR-7AGS
	Hyundai	HYM536410M-70
	Mitsubishi	MH4M36ANXJ-7
	NEC	MC-424000A36BE-70
	Samsung	KMM5364100A-70

DRAM SIMM Installation

Following is the procedure for installing DRAM SIMMs:

Step 1   Turn OFF power, but to channel ESD voltages to ground, do not unplug the power cord.

Step 2   Attach an ESD-preventive wrist strap.

Step 3   Open the cover according to the procedure in the section "Opening the Chassis."

Step 4   Turn the chassis so the system board is opposite the position shown in Figure 2, with the primary memory DRAM SIMM socket toward you.

Step 5   Remove the existing DRAM SIMM (if installed) by pulling outward on the connectors to unlatch them (shown in Figure 3). Be careful not to break the holders on the connector.

⚠ **Caution**   To prevent damage, do not push on the center of the SIMM. Handle the SIMM with care.

Figure 3   Removing and Replacing the DRAM SIMM

Pull the tabs away with your thumbs, bracing your forefingers against the posts. Raise the SIMM to a vertical position.

Faceplate edge of the system card

Polarization notch

DRAM SIMM card

H2017

Step 6   Using the system board orientation shown in Figure 2, position the new SIMM so that the polarization notch is located at the right end of the SIMM socket. Note that the orientation of the system board is opposite of that shown in Figure 3.

Step 7   Insert the new DRAM SIMM by sliding the end with the metal fingers into the SIMM connector socket at approximately a 45-degree angle to the system card. Gently rock the SIMM back into place until the latch on either side snaps into place. Do not use excessive force, or the connector could break.

Step 8 Replace the router cover using the procedure in the section "Closing the Chassis."

Step 9 Connect the router to a console terminal.

Step 10 Turn ON the power to the chassis. If error messages relating to memory are displayed, repeat steps 1 through 7, taking care to firmly seat the SIMM in its socket.

Closing the Chassis

This section explains how to close the chassis.

Tools Required

The following tools are required to replace the cover:

- Medium-sized flat-blade screwdriver (1/4 inch [0.625 cm])
- Size M 3.5 hex-head nut driver (optional)

Cover Replacement

To replace the cover, follow these steps:

Step 1 Position the two chassis sections as shown in Figure 4.

Step 2 Referring to Figure 4, press the two chassis sections together and ensure the following:

- The top section fits *into* the rear of the bottom section (See Part A in Figure 4.)
- The bottom section fits *into* the front of the top section (See Part B in Figure 4.)
- Each side of the top and bottom sections fits together (See Part C in Figure 4.)

⚠️ **Caution** To fit the two sections together, it may be necessary to work them together at one end and then the other, working back and forth; however, use care to prevent bending the chassis edges.

Figure 4 **Replacing the Chassis Cover**
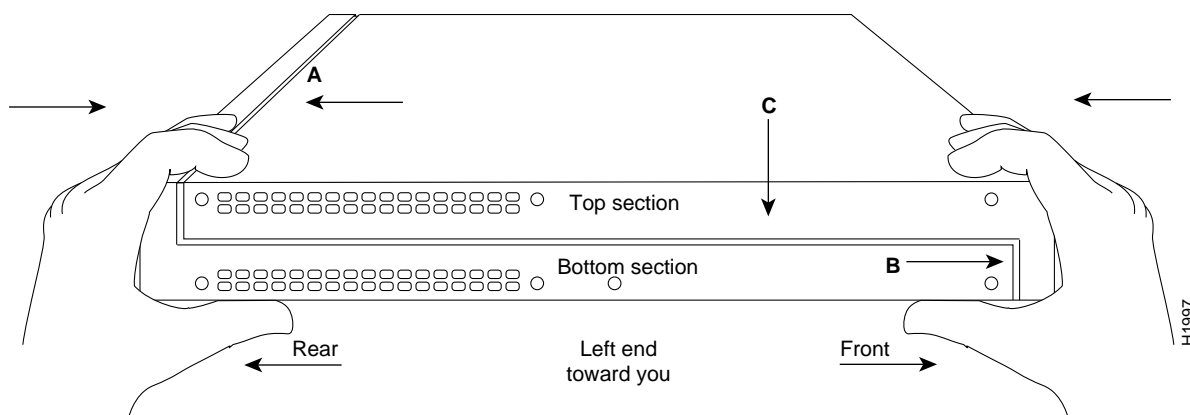
Step 3 When the two sections fit together snugly, turn the chassis so that the bottom is facing up, with the front panel toward you.

Step 4   Replace the cover screw. Tighten the screw to no more than 8 or 9 inch/pounds of torque.

Step 5   Reinstall the chassis on the wall, rack, desk, or table top.

Step 6   Replace all cables.

Cisco Information Online

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- WWW: `http://www.cisco.com`.

- Telnet: `cio.cisco.com` (198.92.32.130).

- Modem: From North America, 408 526-8070; from Europe, 33 1 64 46 40 82. Use the following terminal settings: VT100 emulation; databits: 8; parity: none; stop bits: 1; and baud rates up to 14.4 kbps.

For a copy of CIO's Frequently Asked Questions (FAQ), contact `cio-help@cisco.com`. For additional information, contact `cio-team@cisco.com`.

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