



Upgrading Memory on the Second-Generation Versatile Interface Processor (VIP2)

Product Numbers: VIP2-10/15-UPG, VIP2-10/40-UPG, VIP2-15/40-UPG, VIP2-20/40-UPG, MEM-VIP240-64MB-D=, MEM-VIP240-64MB-10PK=, MEM-VIP250-8M-S=, MEM-VIP250-64M-D=, MEM-VIP250-128M-D=, MEM-VIP250-128M-10PK=

Customer Order Number: DOC-783323=

This configuration note includes procedures for upgrading the field-upgradeable memory devices on the following five second-generation Versatile Interface Processor (VIP2) products:

- VIP2-10(=)
- VIP2-15(=)
- VIP2-20(=)
- VIP2-40(=)
- VIP2-50(=)



Note

You might need to upgrade the static random-access memory (SRAM) and dynamic random-access memory (DRAM) devices on your VIP2-10(=), VIP2-15(=), or VIP2-20(=), the DRAM devices on your VIP2-40(=), or the synchronous DRAM (SDRAM) and/or SRAM on your VIP2-50(=). Use this publication in conjunction with the configuration note *Second-Generation Versatile Interface Processor (VIP2) Installation and Configuration* (Document Number 78-2658-xx, where xx refers to the latest version shipping with the VIP2).



Note

The VIP2-15 is no longer an orderable product as of September, 2000.



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Document Contents

The following sections are included in this configuration note:

- [VIP2 Memory Upgrade Overview, page 2](#)
- [Locating the VIP2 in the Cisco 7000 Series Routers, page 3](#)
- [Locating the VIP2 in the Cisco 7500 Series Routers, page 5](#)
- [VIP2 Upgrade Prerequisites, page 7](#)
- [Safety Guidelines, page 8](#)
- [Removing a VIP2, page 11](#)
- [Installing the VIP2-10, VIP2-15, VIP2-20, VIP2-40 and VIP2-50 Memory Upgrade Kits, page 14](#)
- [Installing the VIP2-50 Memory Upgrade Kits, page 20](#)
- [Replacing a VIP2, page 28](#)
- [Checking the VIP2 Memory Upgrade, page 29](#)
- [Obtaining Documentation, page 31](#)
- [Obtaining Technical Assistance, page 32](#)
- [Obtaining Additional Publications and Information, page 34](#)

VIP2 Memory Upgrade Overview

The VIP2 products can be used in Cisco 7500 series routers, and in Cisco 7000 series routers with the 7000 Series Route Switch Processor (RSP7000) and 7000 Series Chassis Interface (RSP7000CI) installed. The following SRAM and DRAM (or SDRAM) configurations are available as VIP2 memory-upgrade products:

- VIP2-10—512 kilobytes (KB) of SRAM and 64 megabytes (MB) of DRAM as the minimum configuration
 - VIP2-10/15-UPG—Includes SRAM required to upgrade VIP2-10 to VIP2-15
 - VIP2-10/40-UPG—Includes SRAM and DRAM required to upgrade VIP2-10 to VIP2-40
- VIP2-15—1 MB of SRAM and 8 MB of DRAM as the minimum configuration
 - VIP2-15/40-UPG—Includes SRAM and DRAM required to upgrade VIP2-15 to VIP2-40
- VIP2-20—1 MB of SRAM and 16 MB of DRAM as the minimum configuration
 - VIP2-20/40-UPG—Includes SRAM and DRAM required to upgrade VIP2-20 to VIP2-40
- VIP2-40—2 MB of SRAM and 32 MB of DRAM as the minimum configuration
 - MEM-VIP240-64MB-D=—Includes 64 MB of DRAM for the VIP2-40
- VIP2-50—4 MB of SRAM and 32 MB of SDRAM as the minimum configuration
 - MEM-VIP250-8M-S=—Includes an 8-MB SRAM daughter card
 - MEM-VIP250-64M-D=—Includes a 64-MB SDRAM DIMM
 - MEM-VIP250-128M-D=—Includes a 128-MB SDRAM DIMM

**Note**

The VIP2-10, VIP2-15, VIP2-20, and VIP2-40 use the same motherboard; they are differentiated by their respective DRAM and SRAM configurations. The VIP2-50 uses a different motherboard and SDRAM and SRAM memory devices than the other VIP2 models; therefore, you cannot install VIP2-50 SDRAM or SRAM memory devices on the earlier VIP2 models, and you cannot install DRAM or SRAM memory devices from earlier VIP2 models on the VIP2-50.

Locating the VIP2 in the Cisco 7000 Series Routers

For complete hardware installation and maintenance information on the Cisco 7000 series and Cisco 7500 series routers, and the VIP2, refer to the following publications:

- The hardware installation and maintenance manual and/or user guide that shipped with your Cisco 7000 series router
- *Second-Generation Versatile Interface Processor (VIP2) Installation and Configuration*

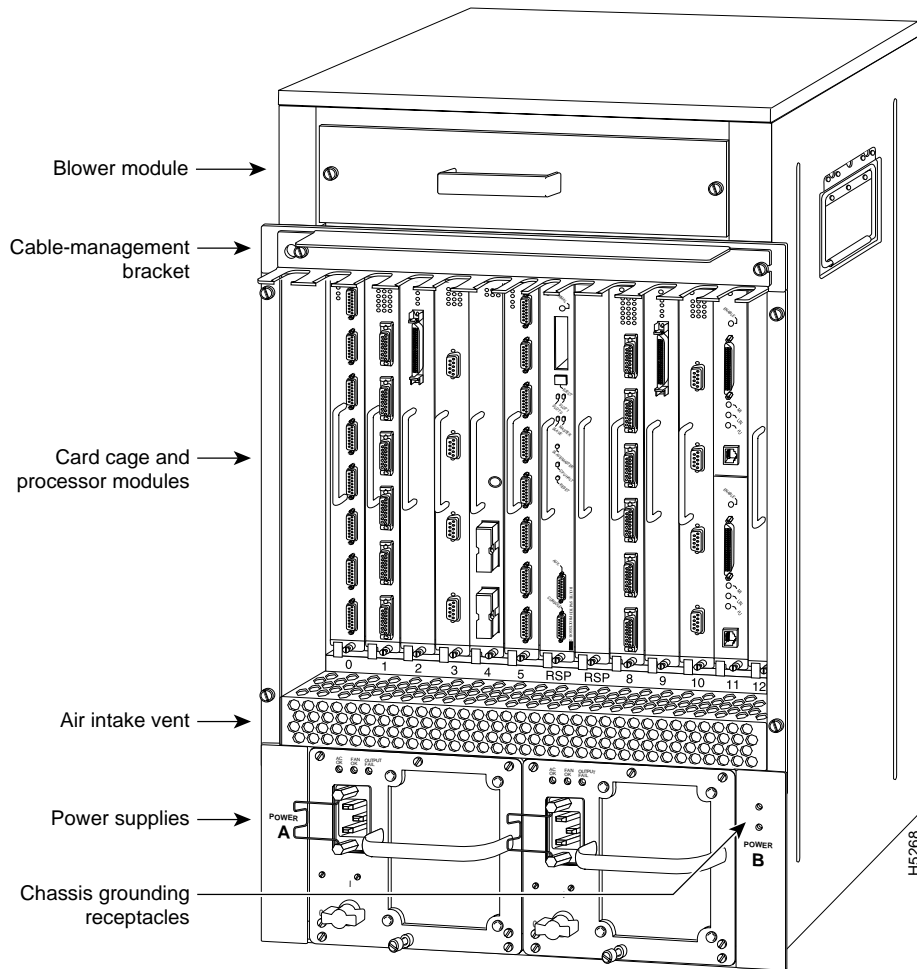
The Cisco 7000 series consists of the Cisco 7000 and Cisco 7010 routers.

**Note**

The VIP2 operates in all Cisco 7000 series routers providing these routers have the 7000 Series Route Switch Processor (RSP7000) and the 7000 Series Chassis Interface (RSP7000CI) installed.

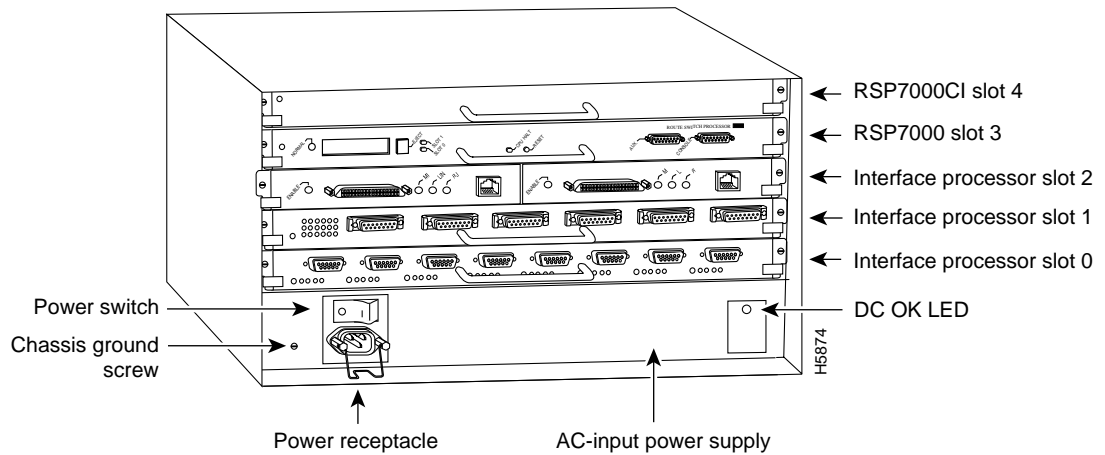
[Figure 1](#) and [Figure 2](#) show the rear of the Cisco 7000 series routers: the seven-slot Cisco 7000 and the five-slot Cisco 7010, respectively. In the Cisco 7000, slots 0 through 4 are reserved for interface processors. [Figure 1](#) shows a VIP2 in interface processor slot 2.

Figure 1 Cisco 7000 with RSP7000 and RSP7000CI Installed (Interface Processor End)



In the Cisco 7010, slots 0 through 2 are reserved for interface processors. [Figure 2](#) shows a VIP2 in interface processor slot 2.

Figure 2 Cisco 7010 with RSP7000 and RSP7000CI Installed (Interface Processor End)



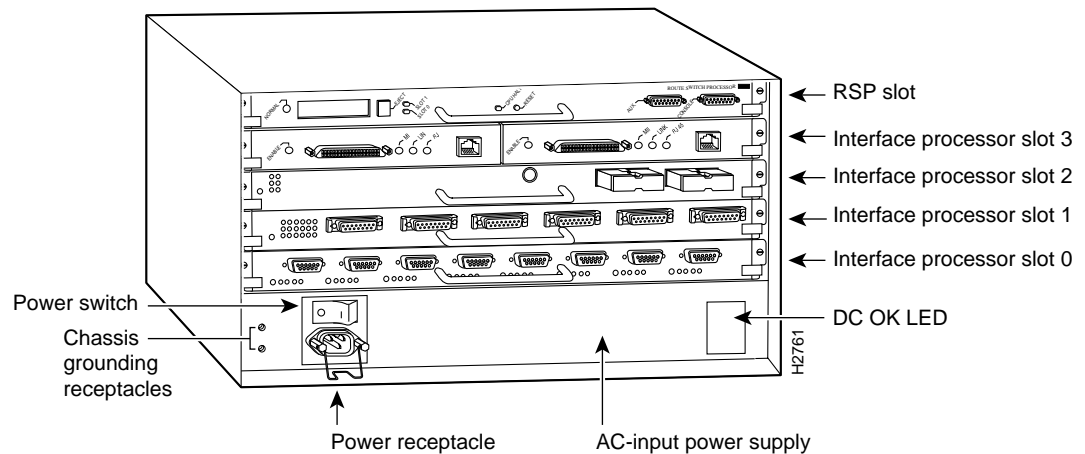
Locating the VIP2 in the Cisco 7500 Series Routers

For complete hardware installation and maintenance information on the Cisco 7500 series routers, and the VIP2, refer to the following publications:

- The installation and configuration guide that shipped with your Cisco 7500 series router
- *Second-Generation Versatile Interface Processor (VIP2) Installation and Configuration*

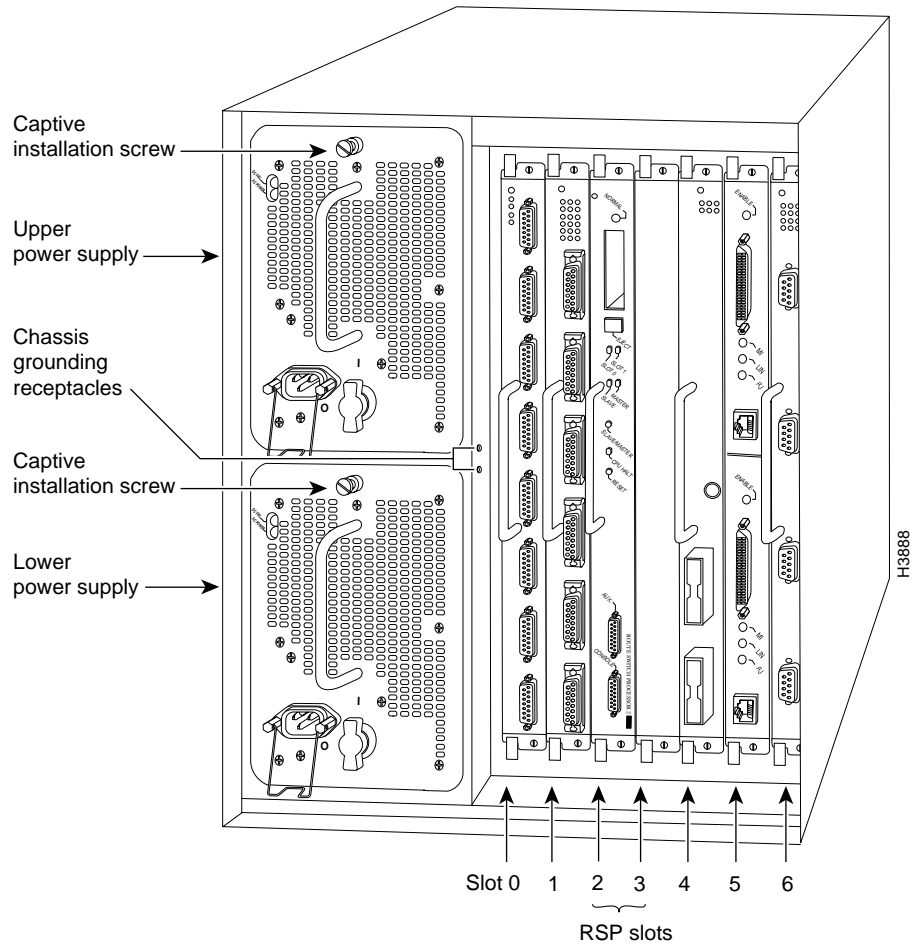
The Cisco 7500 series consists of the Cisco 7505, Cisco 7507, and Cisco 7513 routers. The VIP2 operates in all Cisco 7500 series routers. [Figure 3](#), [Figure 4](#), and [Figure 5](#) show the rear of the Cisco 7500 series routers: the five-slot Cisco 7505, the seven-slot Cisco 7507, and the thirteen-slot Cisco 7513, respectively. In the Cisco 7505, slots 0 through 3 are reserved for interface processors. [Figure 3](#) shows a VIP2 in interface processor slot 3.

Figure 3 Cisco 7505 (Interface Processor End)



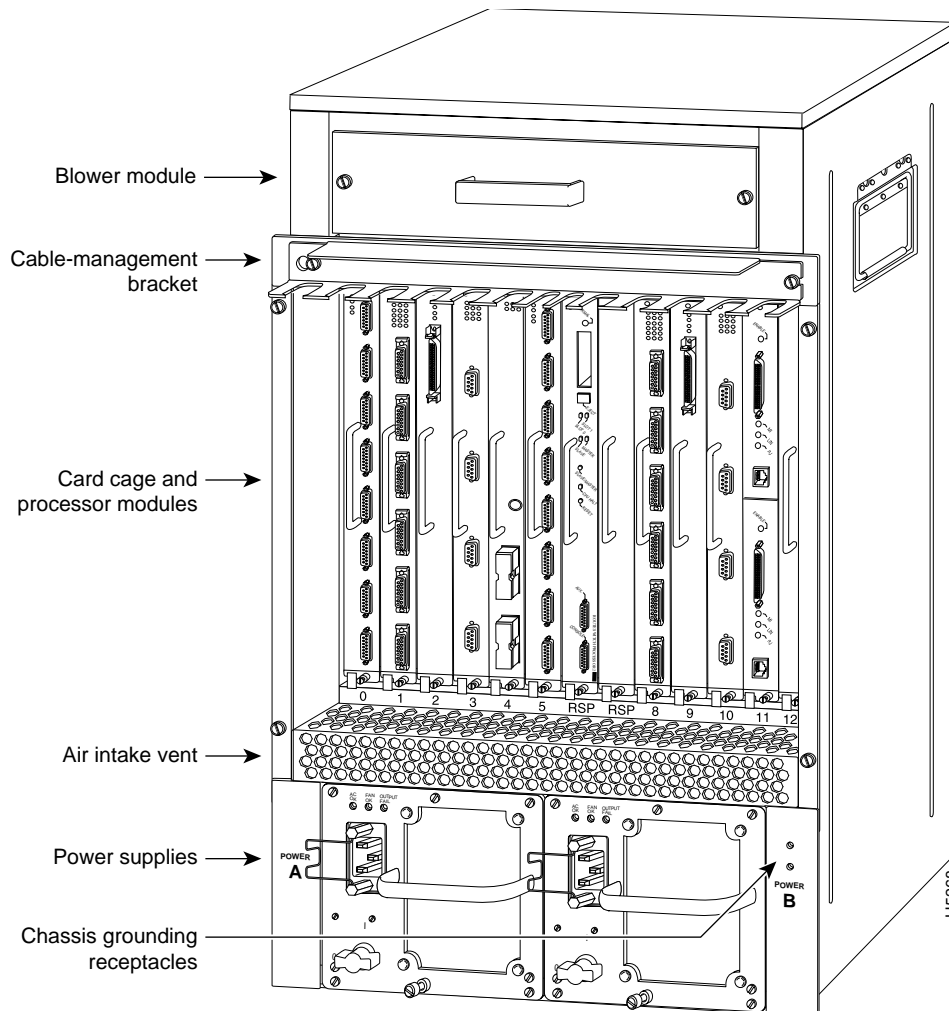
In the Cisco 7507, slots 0 and 1 and 4 through 6 are reserved for interface processors. [Figure 4](#) shows a VIP2 in interface processor slot 5.

Figure 4 Cisco 7507 (Interface Processor End)



In the Cisco 7513, slots 0 through 5 and 8 through 12 are reserved for interface processors. [Figure 5](#) shows a VIP2 in interface processor slot 11.

Figure 5 Cisco 7513 (Interface Processor End)



VIP2 Upgrade Prerequisites

This section provides guidelines for when to upgrade the SRAM and DRAM (or SDRAM) on your VIP2 and a list of parts and tools you will need to perform the upgrade; it also includes safety and ESD-prevention guidelines to help you avoid injury and damage to the equipment.

DRAM and SRAM Upgrade Guidelines

Use the following recommended guidelines to determine when to upgrade DRAM (or SDRAM) and SRAM and your VIP2. You cannot use DRAM designed for the Route Switch Processor (RSP) on the VIP2 models.



Note

The minimum recommended VIP2 model is a VIP2-15; however, the maximum transmission unit (MTU) sizes available for two high-speed, high-bandwidth port adapters on a VIP2 might require the additional VIP2 SRAM available on the VIP2-40 model or greater, to ensure adequate packet buffers.

Table 1 provides information about which VIP2 models to use for distributed switching (DSW) and distributed services (DS).

Table 1 *VIP2 Model Requirements for Using DSW and DS*

VIP2 Model	DSW Support	DS Support
VIP2-10: 512 KB of SRAM and 64 MB of DRAM ¹	No	No
VIP2-15: 1 MB of SRAM and 64 MB of DRAM	No	No
VIP2-20: 1 MB of SRAM and 64 MB of DRAM ²	Yes ³	No
VIP2-40: 2 MB of SRAM and 64 MB of DRAM	Yes ⁴	Yes ⁴
VIP2-50: 4 to 8 MB of SRAM and 64 to 128 MB of SDRAM	Yes ⁵	Yes ⁵

1. The VIP2-10 is no longer available as a new product, but is still supported in the field.
2. The VIP2-20 is no longer available as a new product, but is still supported in the field.
3. A software license is required to use DSW with the VIP2-20.
4. Software licenses are required to use DSW and DS with the VIP2-40.
5. Software licenses are required to use DSW and DS with the VIP2-50.



Note

When DSW is enabled, the routing table generated by the RSP or RSP7000 is downloaded to VIP2 DRAM. Depending on the size of the routing table, it may become necessary to upgrade to the VIP2-40 if you are using a VIP2-20.

List of Parts and Tools

You need the following tools and parts to upgrade a VIP2. If you need additional equipment, contact a service representative for ordering information.

- The appropriate memory upgrade kit for your VIP2 model
- Number 1 Phillips and a 3/16-inch, flat-blade screwdriver
- Your own ESD-prevention equipment or the disposable grounding wrist strap included with all upgrade kits

Safety Guidelines

Following are safety guidelines that you should follow when working with any equipment that connects to electrical power or telephone wiring.



Warning

Only trained and qualified personnel should be allowed to install or replace this equipment.

Safety Warnings



Warning

This warning symbol means *danger*. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.

Waarschuwing

Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen. Voor vertalingen van de waarschuwingen die in deze publicatie verschijnen, kunt u het document *Regulatory Compliance and Safety Information* (Informatie over naleving van veiligheids- en andere voorschriften) raadplegen dat bij dit toestel is ingesloten.

Varoitus

Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista. Tässä julkaisussa esiintyvien varoitusten käännökset löydät laitteen mukana olevasta *Regulatory Compliance and Safety Information* -kirjastesta (määräysten noudattaminen ja tietoa turvallisuudesta).

Attention

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions d'avertissements figurant dans cette publication, consultez le document *Regulatory Compliance and Safety Information* (Conformité aux règlements et consignes de sécurité) qui accompagne cet appareil.

Warnung

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt. Übersetzungen der in dieser Veröffentlichung enthaltenen Warnhinweise finden Sie im Dokument *Regulatory Compliance and Safety Information* (Informationen zu behördlichen Vorschriften und Sicherheit), das zusammen mit diesem Gerät geliefert wurde.

Avvertenza

Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti. La traduzione delle avvertenze riportate in questa pubblicazione si trova nel documento *Regulatory Compliance and Safety Information* (Conformità alle norme e informazioni sulla sicurezza) che accompagna questo dispositivo.

Advarsel	Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du være oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker. Hvis du vil se oversettelser av de advarslene som finnes i denne publikasjonen, kan du se i dokumentet <i>Regulatory Compliance and Safety Information</i> (Overholdelse av forskrifter og sikkerhetsinformasjon) som ble levert med denne enheten.
Aviso	Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes. Para ver as traduções dos avisos que constam desta publicação, consulte o documento <i>Regulatory Compliance and Safety Information</i> (Informação de Segurança e Disposições Reguladoras) que acompanha este dispositivo.
¡Advertencia!	Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes. Para ver una traducción de las advertencias que aparecen en esta publicación, consultar el documento titulado <i>Regulatory Compliance and Safety Information</i> (Información sobre seguridad y conformidad con las disposiciones reglamentarias) que se acompaña con este dispositivo.
Varning!	Denna varningssymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador. Se förklaringar av de varningar som förekommer i denna publikation i dokumentet <i>Regulatory Compliance and Safety Information</i> (Efterrättelse av föreskrifter och säkerhetsinformation), vilket medföljer denna anordning.

Electrical Equipment Guidelines

Follow these basic guidelines when working with any electrical equipment:

- Before beginning any procedures requiring access to the chassis interior, locate the emergency power-off switch for the room in which you are working.
- Disconnect all power and external cables before moving a chassis.
- Do not work alone when potentially hazardous conditions exist.
- Never assume that power has been disconnected from a circuit; always check.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Carefully examine your work area for possible hazards such as moist floors, ungrounded power extension cables, and missing safety grounds.

Telephone Wiring Guidelines

Use the following guidelines when working with any equipment that is connected to telephone wiring or to other network cabling:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.

- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damage, which can occur when electronic cards or components are improperly handled, results in complete or intermittent failures. Port adapters and processor modules consist of printed circuit boards that are fixed in metal carriers. Electromagnetic interference (EMI) shielding and connectors are integral components of the carrier. Although the metal carrier helps to protect the board from ESD, use a preventive antistatic strap during handling.

Following are guidelines for preventing ESD damage:

- Always use an ESD wrist or ankle strap and ensure that it makes good skin contact.
- Connect the equipment end of the strap to an unfinished chassis surface.
- When installing a component, use any available ejector levers or captive installation screws to properly seat the bus connectors in the backplane or midplane. These devices prevent accidental removal, provide proper grounding for the system, and help to ensure that bus connectors are properly seated.
- When removing a component, use any available ejector levers or captive installation screws to release the bus connectors from the backplane or midplane.
- Handle carriers by available handles or edges only; avoid touching the printed circuit boards or connectors.
- Place a removed component board-side-up on an antistatic surface or in a static shielding container. If you plan to return the component to the factory, immediately place it in a static shielding container.
- Avoid contact between the printed circuit boards and clothing. The wrist strap only protects components from ESD voltages on the body; ESD voltages on clothing can still cause damage.
- Never attempt to remove the printed circuit board from the metal carrier.



Caution

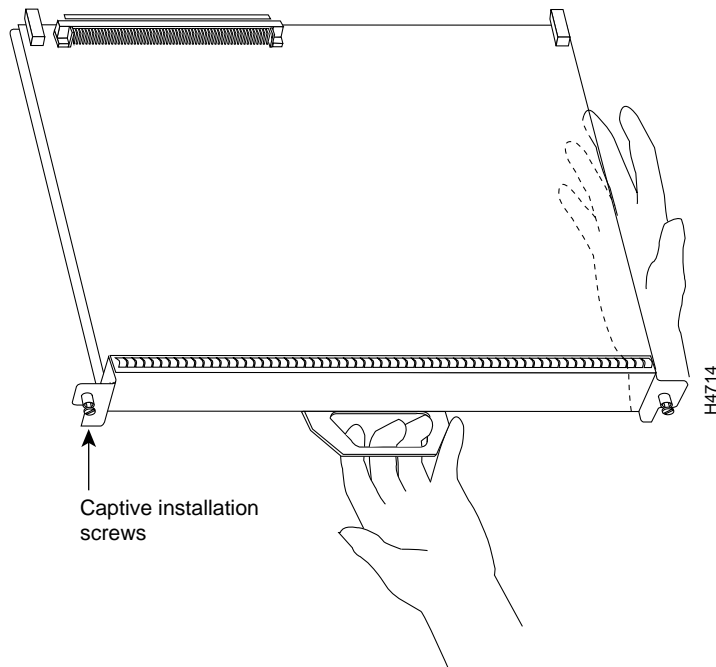
For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 megohms.

Removing a VIP2

The VIP2 supports online insertion and removal (OIR); therefore, you do not need to shut down the interface or the system power when removing a VIP2. Further, you do not need to disconnect cables from VIP2 ports before you remove a VIP2.

Figure 6 shows proper handling of an interface processor during installation.

Figure 6 Handling Processor Modules for Installation and Removal (Horizontal Orientation Shown)



Use the following procedure to remove a VIP2:

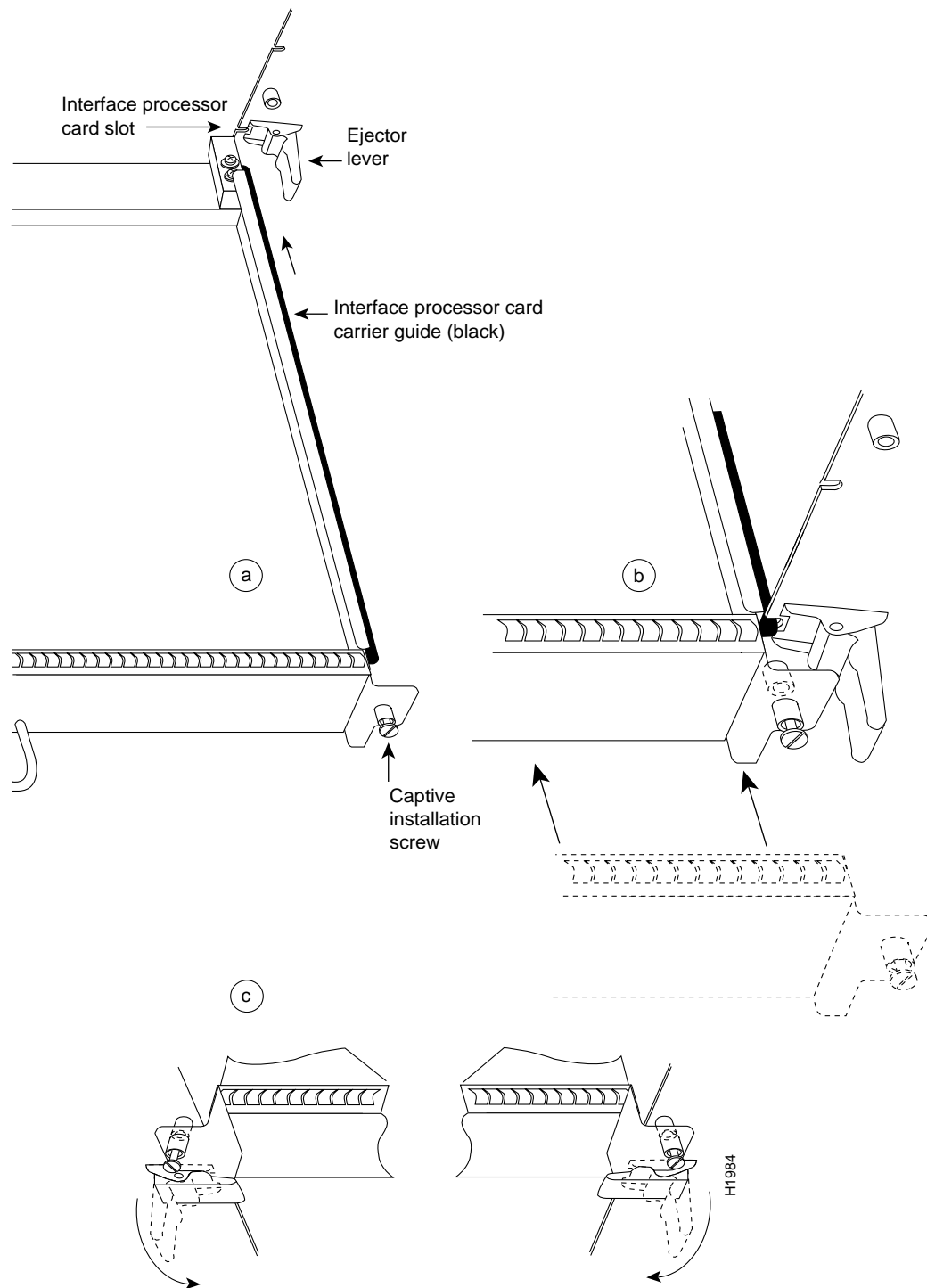
- Step 1** Use a screwdriver to loosen the captive installation screws on the VIP2. (See [Figure 7](#).)



Caution Always use the ejector levers to remove or install the VIP2. Failure to do so can cause erroneous system error messages indicating a board failure.

- Step 2** Place your thumbs on the ejector levers and simultaneously pull both of the ejectors outward (in the opposite direction from that show in [Figure 7c](#)) to release the VIP2 from the backplane connector.
- Step 3** Using the VIP2 handle, carefully pull the VIP2 straight out of the slot, keeping your other hand under the carrier to guide it. (See [Figure 6](#).) Keep the VIP2 parallel to the backplane.
- Step 4** Place the removed VIP2 on an antistatic mat or foam pad, or place it in an antistatic bag if you plan to return it to the factory.
- Step 5** If the interface processor slot is to remain empty, install a filler (MAS7K-BLANK) to keep dust out of the chassis and to maintain proper air flow inside the chassis. *Do not* leave the interface processor slot open.

Figure 7 Ejector Levers and Captive Installation Screws on the VIP2 (Horizontal Orientation Shown)



**Note**

After you remove the VIP2, proceed to the [“Installing the VIP2-10, VIP2-15, VIP2-20, VIP2-40 and VIP2-50 Memory Upgrade Kits”](#) section on page 14, or to the [“Installing the VIP2-50 Memory Upgrade Kits”](#) section on page 20, and then to the [“Replacing a VIP2”](#) section on page 28.

This completes the removal of a VIP2 procedure.

Installing the VIP2-10, VIP2-15, VIP2-20, VIP2-40 and VIP2-50 Memory Upgrade Kits

This section provides the guidelines and procedures for upgrading the VIP2-10, VIP2-15, VIP2-20, VIP2-40, and VIP2-50 memory devices.

The following memory kits are compatible with the VIP2-10, VIP2-15, and VIP2-20:

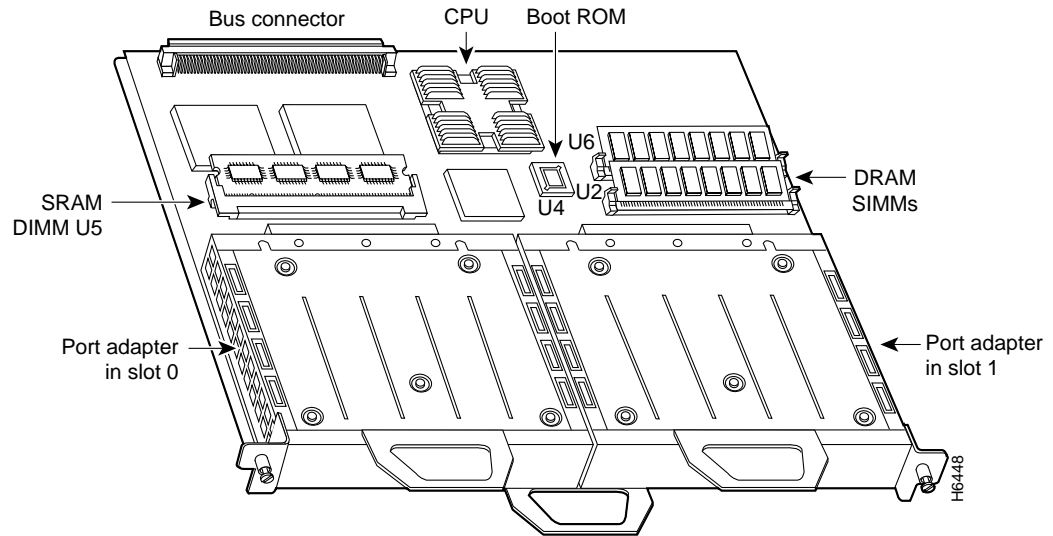
- VIP2-10/15-UPG—Upgrades a VIP2-10 to a VIP2-15, with one 1-MB SRAM DIMM
- VIP2-10/40-UPG—Upgrades a VIP2-10 to a VIP2-40, with one 2-MB SRAM DIMM and two 16-MB DRAM SIMMs
- VIP2-15/40-UPG—Upgrades a VIP2-15 to a VIP2-40, with one 2-MB SRAM DIMM and two 32-MB DRAM SIMMs
- VIP2-20/40-UPG—Upgrades a VIP2-20 to a VIP2-40, with one 2-MB SRAM DIMM and two 16-MB DRAM SIMMs

The following memory kit is compatible with the VIP2-40: MEM-VIP240-64MB-D=, which upgrades a VIP2-40 to 64 MB of DRAM, with two 32-MB DRAM SIMMs. This memory kit is available in a 10 package, part number MEM-VIP240-64MB-10PK=.

The following memory kits are compatible with the VIP2-50: MEM-VIP250-64MB-D=, which upgrades a VIP2-50 to 64 MB of DRAM, with two 32-MB DRAM SIMMs, and the MEM-VIP250-128MB-D=, which upgrades a VIP2-50 to 128 MB of DRAM, with one 128-MB DRAM SIMMS. These memory kits are available in a 10 package, part numbers MEM-VIP250-64MB-10PK= and MEM-VIP250-128-10PK=.

To upgrade memory on your VIP2-10, VIP2-15, and VIP2-20, you must replace both the SRAM *and* DRAM (except the memory kits MEM-VIP240-64MB-D=, MEM-VIP250-64MB-D=, and MEM-VIP250-128MB-D=, which requires you to replace only the DRAM SIMMs on your VIP2-40 or VIP2-50). Only 70-nanosecond (ns) DRAM SIMMs and a 12-ns SRAM DIMM should be used. A Cisco manufacturing part number appears on the SIMMs and the DIMM.

[Figure 8](#) shows the locations of the DRAM SIMMs and the SRAM DIMM on the VIP2-10, VIP2-15, VIP2-20, and VIP2-40.

Figure 8 Location of DRAM SIMMs and SRAM DIMM on the VIP2-10, -15, -20, and -40

The following sections provide DRAM and SRAM upgrade procedures for the VIP2-10, VIP2-15, VIP2-20, and VIP2-40 (DRAM only) models:

- ,
- [Replacing the VIP2-10, VIP2-15, or VIP2-20 SRAM DIMM, page 18](#)

Replacing VIP2-10, VIP2-15, VIP2-20, VIP2-40, or VIP2-50 DRAM SIMMs

The 70-nanosecond (ns) DRAM on the VIP2-10, VIP2-15, VIP2-20, VIP2-40, VIP2-50 (hereafter called the VIP2) is contained in two single in-line memory modules (SIMMs) located in sockets U2 and U6. (See [Figure 8](#).) Depending on your system configuration, a memory upgrade may be required. Also, if you determine that a system problem is caused by a SIMM, a SIMM replacement may be required.



Note

The memory kit MEM-VIP240-64MB-D= requires you to replace only the DRAM SIMMs on your VIP2-40.



Caution

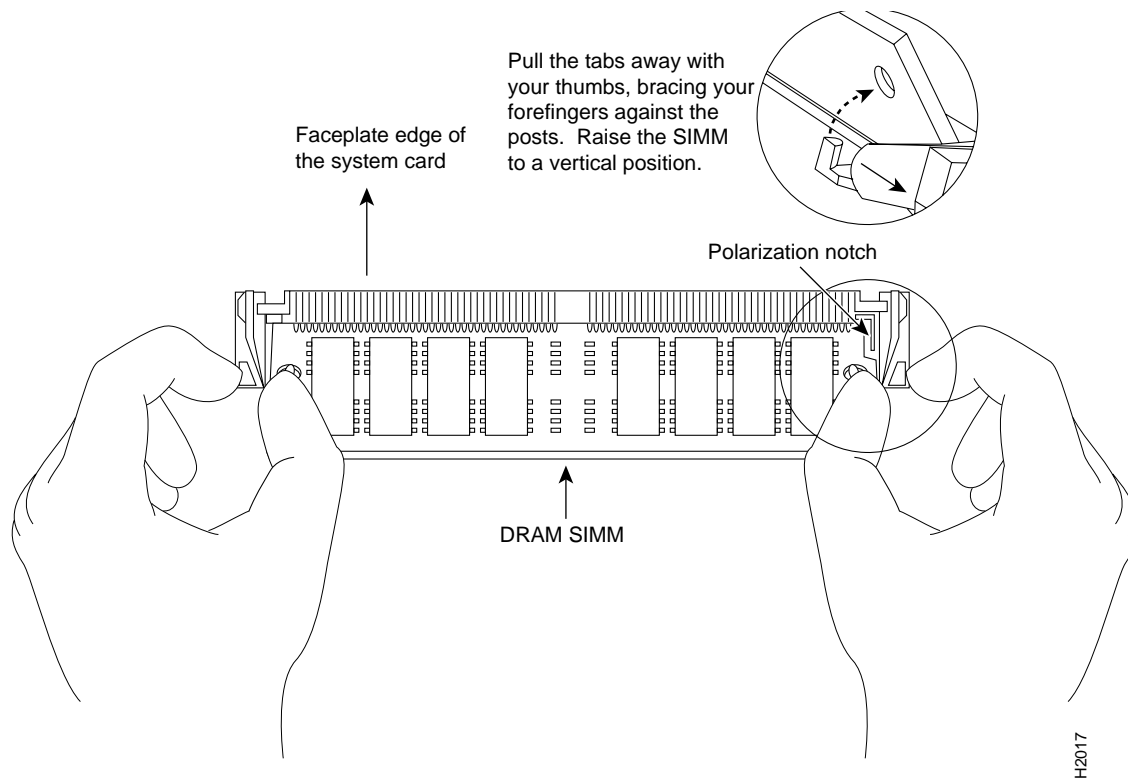
To prevent ESD damage, handle SIMMs by the card edges only. Place removed SIMMs on an antistatic mat and store them in an antistatic bag.

Removing VIP2 DRAM SIMMs

Use the following procedure to remove DRAM SIMMs:

- Step 1 Turn off the system power and remove the VIP2 from the system. (Follow the steps in the “[Removing a VIP2](#)” section on page 11.)
- Step 2 Place the VIP2 on an antistatic mat or pad, and ensure that you are wearing an antistatic device, such as a wrist strap. Position the VIP2 so that the handle is away from you, and the bus connector is toward you—opposite of the position shown in [Figure 8](#).
- Step 3 Locate the SIMMs. The DRAM SIMMs occupy sockets U2 and U6. (See [Figure 8](#).)
- Step 4 Release the spring clips from the SIMM that you want to remove and release the SIMM from the socket. (See [Figure 9](#).)

Figure 9 Releasing the SIMM Spring Clips



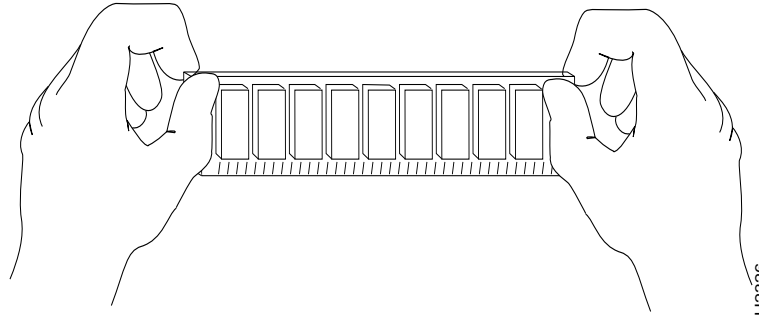
- Step 5 When both ends of the SIMM are released from the socket, grasp the ends of the SIMM with your thumb and forefinger and pull the SIMM completely out of the socket. Handle the edges of the SIMM only; avoid touching the memory module, pins, or traces (*the metal fingers*) along the socket edge. (See [Figure 10](#).)
- Step 6 Place the SIMM in an antistatic bag to protect it from ESD damage.
- Step 7 Repeat Steps 4 through 6 for the remaining SIMM, as required for this replacement.

This completes the SIMM removal procedure. Proceed to the next section to install the new SIMMs.

Installing New VIP2 DRAM SIMMs

SIMMs are sensitive components that are susceptible to ESD damage. Handle SIMMs by the edges only; avoid touching the memory modules, pins, or traces (the metal *fingers* along the connector edge of the SIMM). (See [Figure 10](#).)

Figure 10 Handling a DRAM SIMM



Caution

To prevent ESD damage, handle DRAM SIMMs as shown in [Figure 10](#).



Note

The memory kit MEM-VIP240-64MB-D= requires you to replace only the DRAM SIMMs on your VIP2-40.

Use the following procedure to install new DRAM SIMMs:

- Step 1** With the VIP2 in the same orientation as the previous procedure (with the handle away from you and the bus connector toward you), you will install the first SIMM in the socket farthest from you and install the last SIMM in the socket closest to you.
- Step 2** Hold the SIMM between your thumbs and forefingers, component-side-up, with the connector edge (the metal *fingers*) away from you.
- Step 3** Tilt the SIMM to approximately the same angle as the socket and insert the connector edge into the socket.



Caution

When inserting SIMMs, use firm but not excessive pressure. If you damage a socket, you will have to return the VIP2 to the factory for repair.

- Step 4** Gently push the SIMM into the socket until the spring clips snap over the ends of the SIMM. If necessary, rock the SIMM gently back and forth to seat it properly.
- Step 5** Repeat Steps 2 through 5 for the remaining SIMMs.
- Step 6** When both SIMMs are installed, check all four alignment holes (two on each SIMM) and ensure that the spring clip is visible. If it is not, the SIMM is not seated properly. If any SIMM appears misaligned, carefully remove it and reseat it in the socket. Push the SIMM firmly back into the socket until the spring clips snap into place.

This completes the DRAM SIMM replacement procedure. If you need to replace the SRAM DIMM, proceed to the [“Replacing the VIP2-10, VIP2-15, or VIP2-20 SRAM DIMM”](#) section on page 18, and then reinstall the VIP2 in the chassis. (Follow the steps in the [“Replacing a VIP2”](#) section on page 28.)

If you do not need to replace the SRAM DIMM, refer to the [“Checking the VIP2 Memory Upgrade”](#) section on page 29, as required.

Replacing the VIP2-10, VIP2-15, or VIP2-20 SRAM DIMM

The SRAM on the VIP2-10, VIP2-15, and VIP2-20 (hereafter called the VIP2) is contained in one dual in-line memory module (DIMM) located in socket U5. (See [Figure 8](#) on page 15.) Depending on your system configuration, a memory upgrade may be required. Also, if you determine that a system problem is caused by the DIMM, a DIMM replacement may be required.



Caution

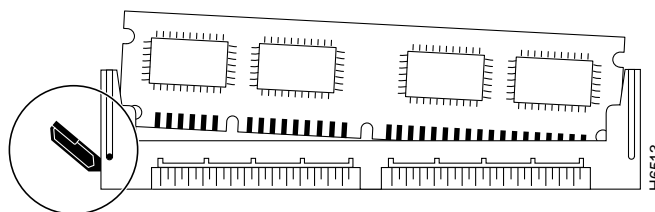
To prevent ESD damage, handle the DIMM by the edges only. Place a removed DIMM on an antistatic mat and store it in an antistatic bag.

Removing the VIP2 SRAM DIMM

Use the following procedure to remove the SRAM DIMM:

- Step 1** Turn off the system power and remove the VIP2 from the system. (Follow the steps in the [“Removing a VIP2”](#) section on page 11.)
- Step 2** Place the VIP2 on an antistatic mat or pad, and ensure that you are wearing an antistatic device, such as a wrist strap. Position the VIP2 so that the handle is toward you and the bus connector is facing away from you, approximately as shown in [Figure 8](#).
- Step 3** Locate the DIMM. The SRAM DIMM occupies socket U5. (See [Figure 8](#).)
- Step 4** Locate the release lever on the DIMM socket (see circle in [Figure 11](#)) and release the DIMM from the socket as shown.
- Step 5** When one end of the DIMM is released from the socket, grasp the ends of the DIMM with your thumb and forefinger and pull the DIMM completely out of the socket. Handle the edges of the DIMM only. (See [Figure 12](#).)

Figure 11 Releasing the SRAM DIMM



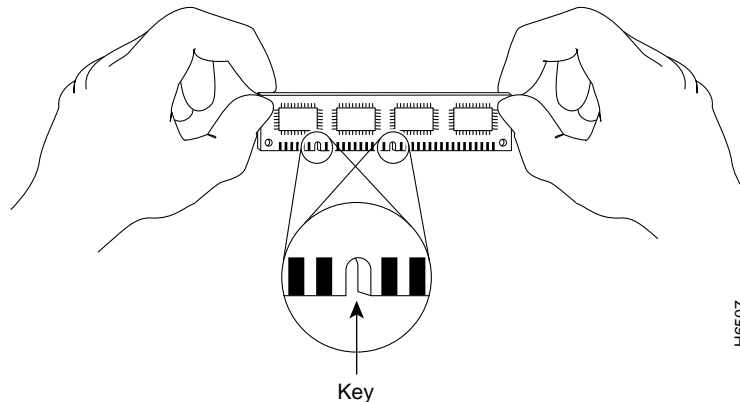
- Step 6** Place the DIMM in an antistatic bag to protect it from ESD damage.

This completes the DIMM removal procedure. Proceed to the next section to install the new DIMM

Installing a New VIP2 SRAM DIMM

The SRAM DIMM is a sensitive component that is susceptible to ESD damage. Handle the DIMM by the edges only; avoid touching the memory modules, pins, or traces (the metal *fingers* along the connector edge of the DIMM). (See [Figure 12](#).)

Figure 12 Handling an SRAM DIMM



Caution

To prevent ESD damage, handle the DIMM as shown in [Figure 12](#).

Use the following procedure to install a new SRAM DIMM:

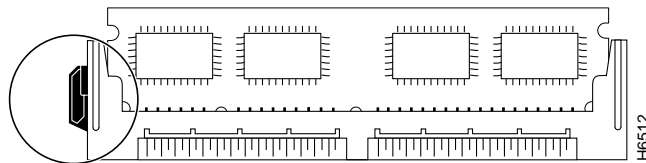
- Step 1** With the VIP2 in the same orientation as the previous procedure (with the handle toward you and the bus connector away from you), you will install the DIMM in socket U5.
- Step 2** Hold the DIMM between your thumbs and forefingers, component-side-up, with the connector edge (the metal *fingers*) down. (See [Figure 12](#).)
- Step 3** Tilt the DIMM to approximately the same angle as the socket and insert the connector edge into the socket. Note the two notches (keys) on the connector edge of the DIMM. (See [Figure 12](#).) These keys are intended to assure correct orientation of the DIMM in the socket.



Caution

When inserting the DIMM, use firm but not excessive pressure. If you damage a socket, you will have to return the VIP2 to the factory for repair.

- Step 4** Note the orientation of the socket key on the SRAM DIMM and the DIMM socket, and gently push the DIMM into the socket until the release lever is flush against the side of the DIMM socket (see [Figure 13](#)) and the DIMM edge connector is fully inserted. If necessary, rock the DIMM gently back and forth to seat it properly.

Figure 13 Installing an SRAM DIMM in the Socket

- Step 5** When the DIMM is installed, check that the release lever is flush against the side of the DIMM socket. (See [Figure 13](#).) If it is not, the DIMM may not be seated properly. If the DIMM appears misaligned, carefully remove it according to the removal procedure, and reseal it in the socket. Push the DIMM firmly back into the socket until the release lever is flush against the side of the DIMM socket.
- Step 6** Reinstall the VIP2 in the chassis. (Follow the steps in the [“Replacing a VIP2”](#) section on page 28.)

This completes the SRAM DIMM replacement procedure.

Proceed to the [“Replacing a VIP2”](#) section on page 28 to replace the VIP2 in the chassis; then restart the system for an installation check. Refer to the [“Checking the VIP2 Memory Upgrade”](#) section on page 29, as required.

Installing the VIP2-50 Memory Upgrade Kits

This section provides the guidelines and procedures for installing VIP2-50 memory devices. The 10-nanosecond (ns) SDRAM on the VIP2-50 is contained in one dual in-line memory module (DIMM), and the SRAM on the VIP2-50 is contained in one proprietary daughter card. (See [Figure 14](#).)

Depending on your system configuration, a memory upgrade may be required. Also, if you determine that a system problem is caused by the SDRAM DIMM or SRAM daughter card, a replacement may be required.

The following Cisco Systems memory kits are available and compatible with the VIP2-50:

- MEM-VIP250-8M-S=—Upgrades a VIP2-50 to 8 MB of SRAM
- MEM-VIP250-64M-D=—Upgrades a VIP2-50 to 64 MB of SDRAM
- MEM-VIP250-128M-D=—Upgrades a VIP2-50 to 128 MB of SDRAM

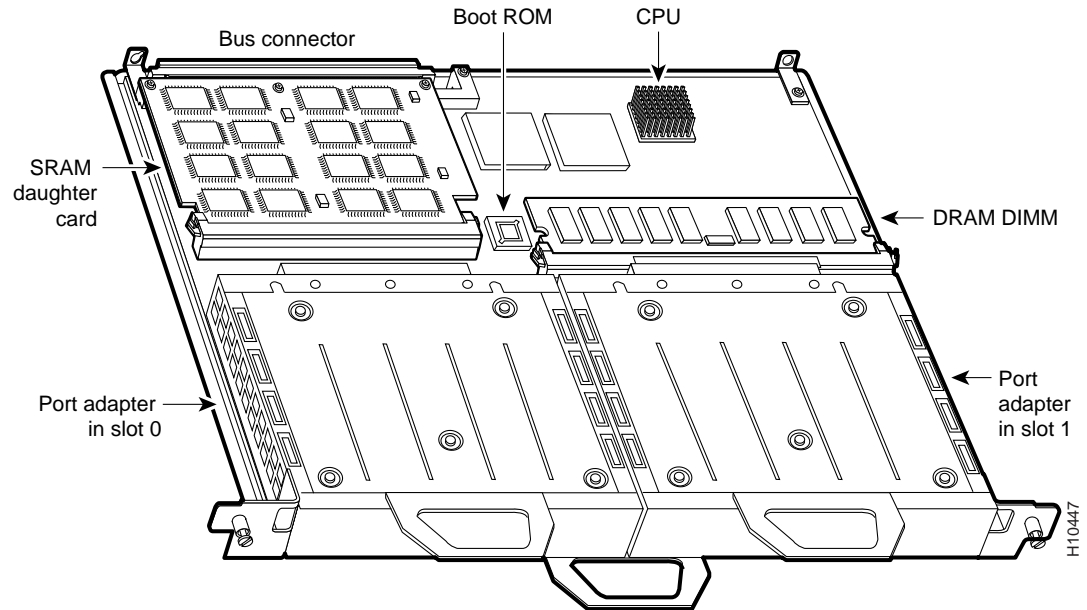


Note

To upgrade the memory on your VIP2-50, you can replace SRAM, SDRAM, or both; that is, you can use any combination of these VIP2-50 SDRAM and SRAM configurations on the VIP2-50.

Figure 14 shows the locations of the SRAM daughter card and SDRAM DIMM on the VIP2-50.

Figure 14 Location of SRAM Daughter Card and SDRAM DIMM on the VIP2-50



The following sections provide SDRAM and SRAM upgrade procedures for the VIP2-50:

- [Replacing the VIP2-50 SDRAM DIMM, page 21](#)
- [Replacing the VIP2-50 SRAM Daughter Card, page 24](#)

Replacing the VIP2-50 SDRAM DIMM

The procedures in this section are required only if you have a VIP2-50 and need to upgrade or replace the SDRAM DIMM.



Note

Use only the SDRAM DIMM from Cisco Systems. A Cisco manufacturing part number appears on the SDRAM DIMM.



Caution

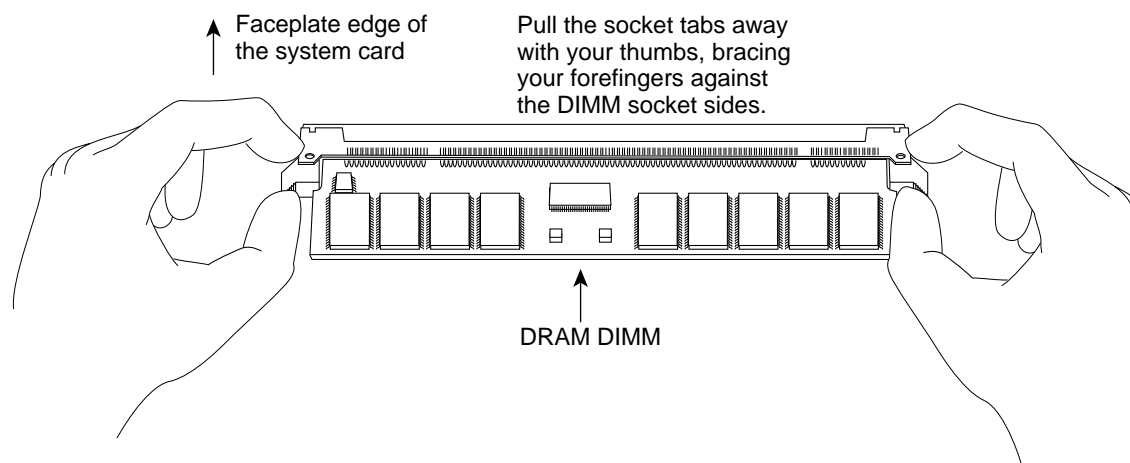
To prevent ESD damage, handle the DIMM by the card edges only. (See [Figure 17](#) on page 23.) Place a removed DIMM on an antistatic mat and store it in an antistatic container.

Removing a VIP2-50S DRAM DIMM

Use the following procedure to remove the existing DIMM:

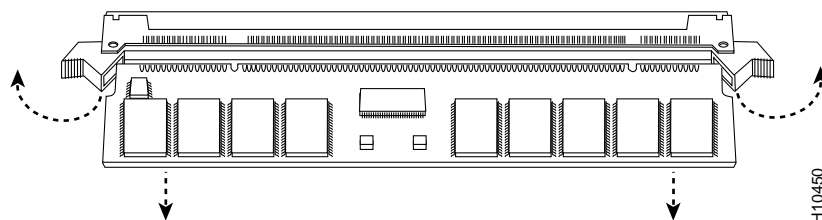
- Step 1 Turn off the system power and remove the VIP2-50 from the system. (Follow the steps in the “[Removing a VIP2](#)” section on page 11.)
- Step 2 Place the VIP2-50 on an antistatic mat or pad and ensure that you are wearing an antistatic device, such as a wrist strap. Position the VIP2-50 so that the handle is away from you and the bus connector is toward you—opposite of the position shown in [Figure 14](#).
- Step 3 Locate the DIMM. (See [Figure 14](#).)
- Step 4 Open the DIMM socket tabs on the DIMM to release the DIMM from the socket. (See [Figure 15](#).) The DIMM is under tension in the socket; therefore, the DIMM may release from the socket with some force.

Figure 15 Opening DIMM Socket Tabs



- Step 5 With the DIMM socket tabs open, grasp the ends of the DIMM between your thumbs and forefingers and pull the DIMM completely out of the socket. (See [Figure 16](#).) Handle the edges of the DIMM only; avoid touching the memory module, pins, or traces (the metal *fingers*) along the socket edge. (See [Figure 17](#).)

Figure 16 Removing the DIMM



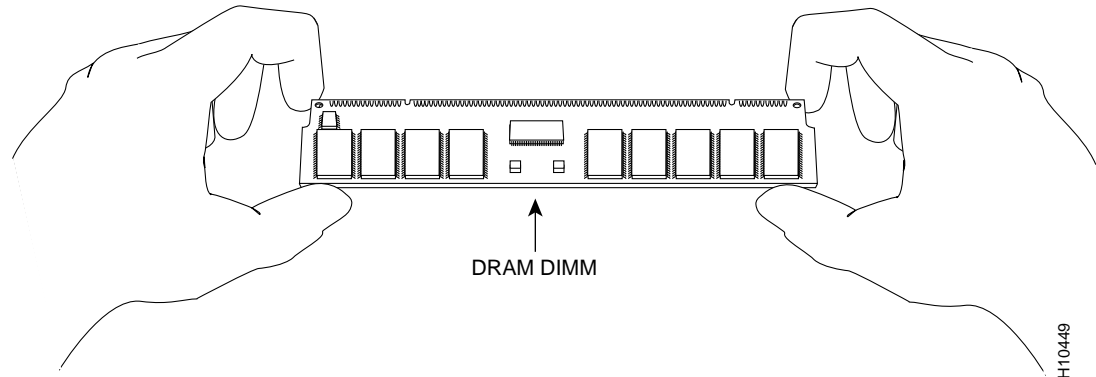
- Step 6 Place the DIMM in an antistatic container to protect it from ESD damage.

This completes the DIMM removal procedure. Proceed to the next section to install a new DIMM.

Installing a New VIP2-50 SDRAM DIMM

The DIMM is a sensitive component that is susceptible to ESD damage. Handle the DIMM by the edges only; avoid touching the memory modules, pins, or traces (the metal *fingers* along the connector edge of the DIMM). (See [Figure 17](#).)

Figure 17 Handling the DIMM



Caution

To prevent ESD damage, handle the DIMM as shown in [Figure 17](#).

With the VIP2-50 in the same orientation as the previous procedure (with the handle toward you and the bus connector away from you), you will install the SRAM daughter card in the socket, as described in the following procedure:

- Step 1** Remove the new DIMM card from its antistatic container.
- Step 2** Hold the DIMM between your thumbs and forefingers component-side-up. (See [Figure 17](#).)
- Step 3** Tilt the DIMM to approximately the same angle as the socket and insert the connector edge into the socket.

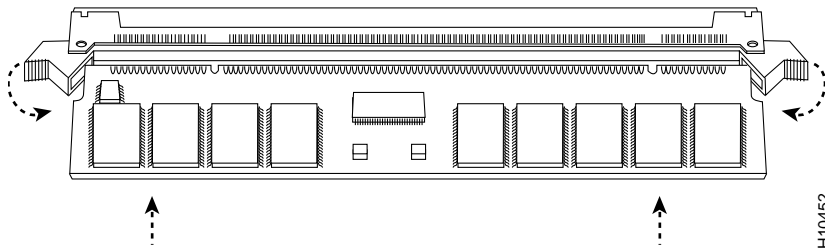


Caution

When inserting the DIMM, use firm but not excessive pressure. If you damage a socket, you will have to return the VIP2-50 to the factory for repair.

- Step 4** Gently push the DIMM into the socket until the socket tabs close over the ends of the DIMM. (See [Figure 18](#).) If necessary, rock the DIMM gently back and forth to seat it properly.

Figure 18 Inserting the DIMM



- Step 5** When the DIMM is installed, check to see it is seated properly. If the DIMM appears misaligned, carefully remove it and reseat it in the socket. Push the DIMM firmly back into the socket until the socket tabs move into place.

This completes the DIMM replacement procedure. If required, proceed to the [“Replacing the VIP2-50 SRAM Daughter Card”](#) section on page 24. Otherwise, reinstall the VIP2 in the chassis. (Follow the steps in the [“Replacing a VIP2”](#) section on page 28.) Refer to the [“Checking the VIP2 Memory Upgrade”](#) section on page 29, as required.

Replacing the VIP2-50 SRAM Daughter Card

The procedures in this section are required only if you have a VIP2-50 and need to upgrade or replace the SRAM daughter card.



Note

Use only the SRAM daughter card from Cisco Systems. A Cisco manufacturing part number appears on the SRAM daughter card.



Caution

To prevent ESD damage, handle the SRAM daughter card by the edges only. Place a removed SRAM daughter card on an antistatic mat and store it in an antistatic container.

Removing a VIP2-50 SRAM Daughter Card

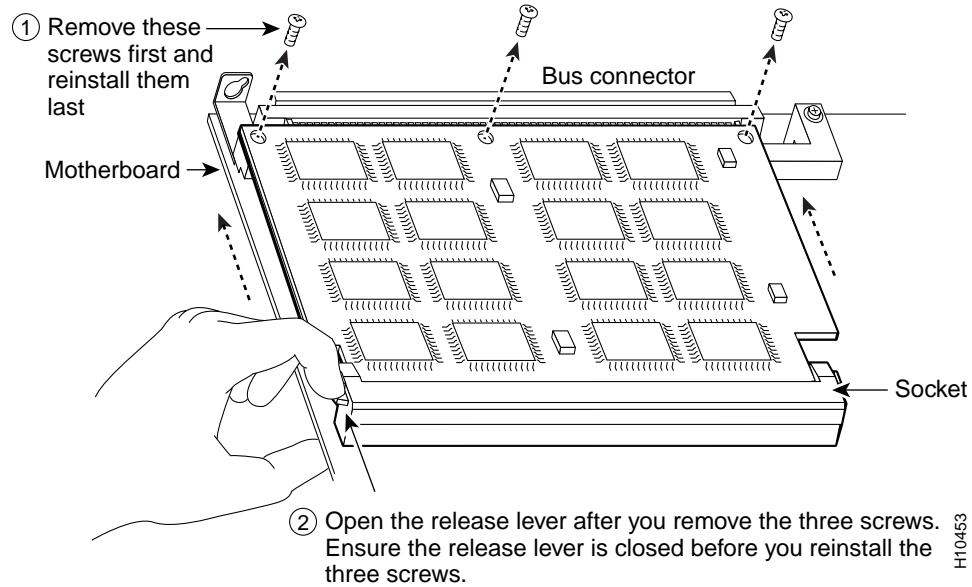
Use the following procedure to remove the existing SRAM daughter card:

- Step 1** Turn off the system power and remove the VIP2 from the system. (Follow the steps in the [“Removing a VIP2”](#) section on page 11 if required.)
- Step 2** Place the VIP2-50 on an antistatic mat or pad, and ensure that you are wearing an antistatic device, such as a wrist strap. Position the VIP2-50 so that the handle is toward you and the bus connector is facing away from you, approximately as shown in [Figure 14](#).
- Step 3** Locate the SRAM daughter card on the VIP2-50. (See [Figure 14](#).) The SRAM daughter card has a release lever that loosens the daughter card from its socket.

**Caution**

To prevent damage to the SRAM daughter card in the steps that follow, do *not* open the release lever on the daughter card's socket until after you remove the three screws located at the rear of the SRAM daughter card. (See [Figure 20](#).) Further, do not reinstall the three screws until after you install the SRAM daughter card in the socket and ensure that the release lever is flush against the side of the socket.

Figure 19 Locations of Screws on the SRAM Daughter Card and the Release Lever

**Note**

[Figure 20](#) and [Figure 21](#) show the functions of the release lever on the SRAM daughter card socket. To release an SRAM daughter card from the socket, first remove the three screws, *then* open the release lever, as shown in [Figure 19](#). When you insert an SRAM daughter card in the socket, the release lever should close automatically, as shown in [Figure 21](#).

Figure 20 Opening the Release Lever

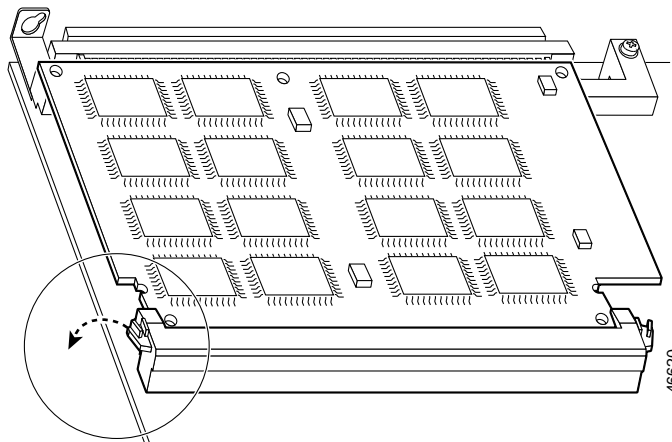
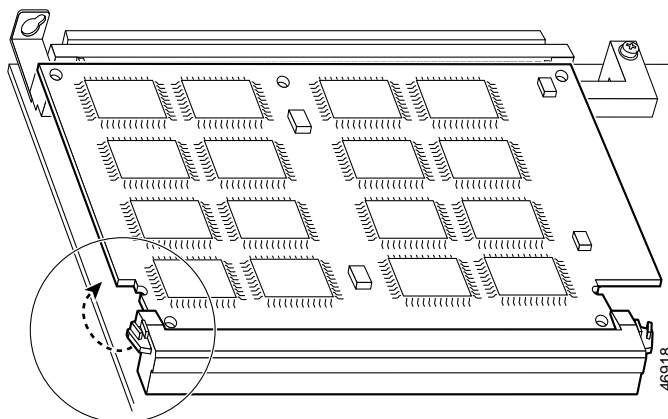


Figure 21 Ensuring the Release Lever is Closed



Step 4 Locate the three screws that secure the SRAM daughter card to the motherboard. (See item 1 in [Figure 19](#).)



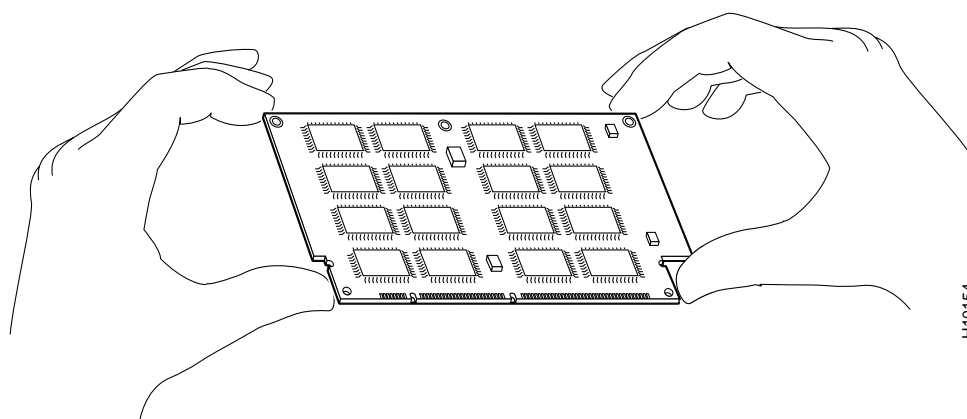
Note The SRAM daughter card lays parallel to the motherboard when the daughter card connector edge is installed in the socket.

Step 5 Using a Number 1 Phillips screwdriver, carefully remove the three screws from the SRAM daughter card (see [Figure 19](#)), and then set them aside.

Step 6 Locate the release lever on the socket. (See [Figure 19](#).) Open the release lever to release the SRAM daughter card from the socket.

Step 7 When one end of the SRAM daughter card is released from the socket, carefully pull the card away from the socket and motherboard. Handle the edges of the SRAM daughter card only. (See [Figure 22](#).)

Figure 22 Handling an SRAM Daughter Card



Step 8 Place the SRAM daughter card in an antistatic container to protect it from ESD damage.

This completes the SRAM daughter card removal procedure. Proceed to the next section to install a new SRAM daughter card.

Installing a New VIP2-50 SRAM Daughter Card

The SRAM daughter card is a sensitive component that is susceptible to ESD damage. Handle the SRAM daughter card by the edges only; avoid touching the memory modules, pins, or traces (the metal *fingers* along the connector edge of the SRAM daughter card). (See [Figure 22](#).)



Caution

To prevent ESD damage, handle the SRAM as shown in [Figure 22](#).

With the VIP2-50 in the same orientation as the previous procedure (with the handle toward you and the bus connector away from you), you will install the SRAM daughter card in the socket, as described in the following procedure:

- Step 1** Remove the new SRAM daughter card from its antistatic container.
- Step 2** Hold the SRAM daughter card between your thumbs and forefingers, component-side-up, with the connector edge (the metal *fingers*) toward you. (See [Figure 22](#).)
- Step 3** Tilt the SRAM daughter card parallel with the socket and insert the connector edge into the socket. Note the two notches (keys) on the connector edge of the SRAM daughter card. (See [Figure 23](#).) These keys are intended to assure correct orientation of the SRAM daughter card in its socket.



Caution

When inserting the SRAM daughter card, use firm but not excessive pressure. If you damage a socket, you will have to return the VIP2-50 to the factory for repair.

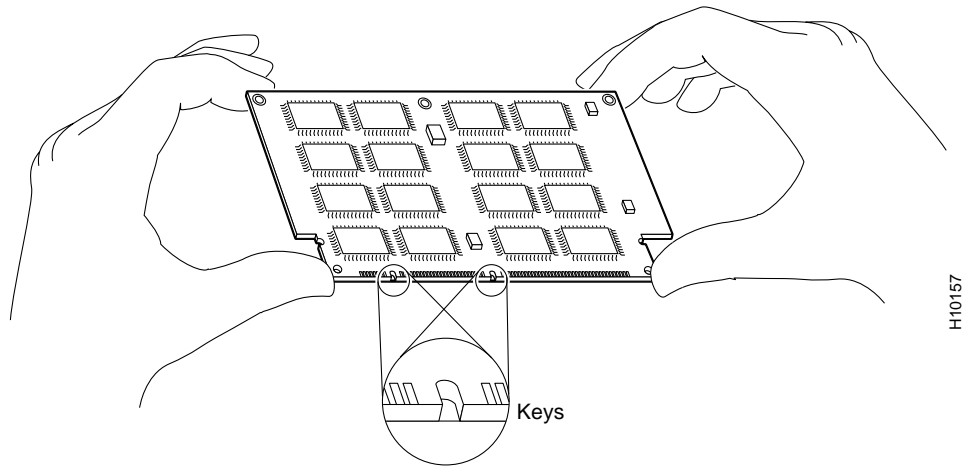
- Step 4** Note the orientation of the socket keys on the SRAM daughter card (see [Figure 23](#)) and the socket, and gently push the SRAM daughter into the socket until the release lever is flush against the side of the socket (see [Figure 21](#)) and the SRAM daughter card edge connector is fully inserted. If necessary, rock the SRAM daughter card gently back and forth to seat it properly.



Note

When the SRAM daughter card is properly inserted in the socket, the three screw holes at the rear of the card should align with the standoffs below the card, and the release lever should be flush against the side of the socket.

Figure 23 Installing an SRAM Daughter Card



- Step 5 Ensure that the release lever is flush against the side of the socket. If it is not, the SRAM daughter card may not be seated properly. If the SRAM daughter card appears misaligned, carefully remove it, and reseat it in the socket. Push the SRAM daughter card firmly back into the socket until the release lever is flush against the side of the socket.
- Step 6 Verify that the three screw holes at the rear of the SRAM daughter card align with the standoffs below the SRAM daughter card; using the Number 1 Phillips screwdriver, reinstall the three screws. (See [Figure 19](#).)
- Step 7 Reinstall the VIP2-50 in the chassis. (Follow the steps in the [“Replacing a VIP2”](#) section on page 28.

This completes the VIP2-50 SRAM daughter card replacement procedure. To verify that the upgrade was successful, refer to the [“Checking the VIP2 Memory Upgrade”](#) section on page 29.

Replacing a VIP2

This section provides the procedure for replacing a VIP2 in your system. The processor modules are oriented horizontally in the Cisco 7010 and Cisco 7505 and vertically in the Cisco 7000, Cisco 7507, and the Cisco 7513. The VIP2 slides into an open interface processor slot and connects directly to the backplane. The interface processor slots are keyed to guide pins on the backplane, so the VIP2 can be installed only in an interface processor slot. [Figure 7](#) shows the functional details of inserting an interface processor and using the ejector levers. [Figure 6](#) shows proper handling of an interface processor during installation.



Caution

Remove or insert only one interface processor at a time. Allow at least 15 seconds for the system to complete its discovery and initialization before removing or inserting another interface processor. Disrupting the sequence before the system has completed verification can cause the system to interpret hardware failures.

Use the following procedure to install a VIP2:

Step 1 Ensure that a console terminal is connected to the console port (on the RSP or RSP7000) and that your console is turned on.

Step 2 Hold the VIP2 handle with one hand and place your other hand under the carrier to support the VIP2 and guide it into the slot. (See [Figure 6.](#)) Avoid touching the VIP2 or any connector pins.



Caution To prevent ESD damage, hold interface processors by the handles and carrier edges only.

Step 3 As you place the back of the VIP2 in the slot, align the notch on the carrier with the groove in the slot. (See [Figure 7.](#))

Step 4 While keeping the VIP2 parallel to the backplane, carefully slide it into the slot until the back of the faceplate makes contact with the ejector levers, then *stop*. (See [Figure 7b.](#))



Caution Always use the ejector levers when installing or removing processor modules. A module that is partially seated in the backplane will cause the system to pause indefinitely and subsequently crash, and shoving or slamming the interface processor into the slot can damage the backplane pins and board.

Step 5 Using your thumbs, simultaneously push both ejector levers inward until the VIP2 is pushed entirely into its slot. (See [Figure 7c.](#))

Step 6 Tighten both of the captive installation screws.



Caution To ensure proper electromagnetic interference (EMI) isolation for the chassis, make certain to tighten the captive installation screws on each VIP2 immediately after you install it and *before* proceeding with the installation of each remaining VIP2.

The VIP2 is now properly installed in the chassis.

Refer to the [“Checking the VIP2 Memory Upgrade”](#) section on page 29, as required.

Checking the VIP2 Memory Upgrade

After you upgrade the VIP2 and reconnect cables, verify the upgrade by observing the LED states and the console display. When the system has reinitialized all interfaces, the enabled LED on the VIP2 and on all interface processors should go on. Port adapter LEDs should be on, depending on your connection. The console screen will display a message as the system discovers each interface during its reinitialization.

If, after you have replaced SIMMs and the DIMM, the system fails to boot properly, or if the console terminal displays a checksum or memory error, check the following:

- Ensure that all SIMMs and the DIMM are installed correctly. If necessary, shut down the system and remove the VIP2. Check the SIMMs and the DIMM by looking straight down on them and then at eye level. The SIMMs and the DIMM should be aligned at the same angle and the same height when properly installed. If a SIMM or DIMM appears to stick out or rest in the socket at a different angle from the others, remove the SIMM or DIMM and reinsert it. Then replace the VIP2 and reboot the system for another installation check.
- Each VIP2-10, VIP2-15, VIP2-20, or VIP2-40 DRAM SIMM socket must contain SIMMs of the same size and speed or the system will not operate. DRAM SIMMs must be 70 ns or faster. The speed is silkscreened along one edge of the device.
- The VIP2-50 SDRAM DIMM socket must contain a 10 ns or faster DRAM device. The speed is silkscreened along one edge of the device.

If after several attempts the system fails to restart properly, contact a service representative for assistance. Before you call, make note of any error messages, unusual LED states, or any other indications that might help solve the problem.

Use the following procedure to verify that the VIP2 is installed correctly:

-
- Step 1** While the system reinitializes each interface, observe the console display messages and verify that the system discovers the VIP2 as follows:
- If you installed a new VIP2, the system should recognize all new interfaces but leave them configured as *down*.
 - If you replaced a VIP2, the system should recognize each interface and place it in the same state (*up* or *down*) each was in when you removed the VIP2.
- Step 2** When the reinitialization is complete, verify that the enabled LED on each port adapter goes on and remains on. If it does, proceed to Step 5. If it does not, proceed to the next step.
- Step 3** If the enabled LED on a port adapter fails to go on, suspect that the VIP2 board connector is not fully seated in the backplane. Loosen the captive installation screws, then firmly push both ejector levers into place until they are approximately in the same orientation as the VIP2 faceplate. Tighten the captive installation screws. After the system reinitializes the interfaces, the enabled LED on the port adapter should go on. If it does, proceed to Step 5. If it does not, proceed to Step 4.
- Step 4** If the enabled LED still fails to go on, remove the VIP2 and try installing it in another available interface processor slot.
- If the enabled LED goes on when the VIP2 is installed in the new slot, suspect a failed backplane port in the original interface processor slot.
 - If the enabled LED still fails to go on, but other LEDs on the VIP2 go on to indicate activity, proceed to Step 5 to resume the installation checkout and suspect that the enabled LED on the port adapter has failed.
 - If no LEDs on the VIP2 go on, suspect that the VIP2 is faulty. Contact a service representative to report the problem and obtain further instructions.
- Step 5** Use the **show interfaces** *type slot/port adapter/port* or **show controllers cbus** commands to verify the status of the interfaces.

- Step 6** When the interfaces are up, check the activity of each interface by observing the status LEDs, which are described in the LED section of your port adapter manual.
- Step 7** In general, if an interface's LED fails to go on and a cable is connected to the port, check the cable connection and make certain it is properly seated in the connector.
- If an error message is displayed on the console terminal, refer to the *System Error Messages* publication for error message definitions. If you experience other problems that you are unable to solve, contact a service representative for assistance.
-

This completes the VIP2 memory upgrade procedure.

Obtaining Documentation

Cisco provides several ways to obtain documentation, technical assistance, and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation on the World Wide Web at this URL:

<http://www.cisco.com/univercd/home/home.htm>

You can access the Cisco website at this URL:

<http://www.cisco.com>

International Cisco web sites can be accessed from this URL:

http://www.cisco.com/public/countries_languages.shtml

Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package, which may have shipped with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual subscription.

Registered Cisco.com users can order the Documentation CD-ROM (product number DOC-CONDOCCD=) through the online Subscription Store:

<http://www.cisco.com/go/subscription>

Ordering Documentation

You can find instructions for ordering documentation at this URL:

http://www.cisco.com/univercd/cc/td/doc/es_inpck/pdi.htm

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- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Networking Products MarketPlace:
<http://www.cisco.com/en/US/partner/ordering/index.shtml>
- Registered Cisco.com users can order the Documentation CD-ROM (Customer Order Number DOC-CONDOCCD=) through the online Subscription Store:
<http://www.cisco.com/go/subscription>
- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, U.S.A.) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

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Cisco Systems
Attn: Customer Document Ordering
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Obtaining Technical Assistance

Cisco provides Cisco.com, which includes the Cisco Technical Assistance Center (TAC) Website, as a starting point for all technical assistance. Customers and partners can obtain online documentation, troubleshooting tips, and sample configurations from the Cisco TAC website. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC website, including TAC tools and utilities.

Cisco.com

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<http://www.cisco.com>

Technical Assistance Center

The Cisco TAC is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two levels of support are available: the Cisco TAC website and the Cisco TAC Escalation Center. The avenue of support that you choose depends on the priority of the problem and the conditions stated in service contracts, when applicable.

We categorize Cisco TAC inquiries according to urgency:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration.
- Priority level 3 (P3)—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- Priority level 2 (P2)—Your production network is severely degraded, affecting significant aspects of business operations. No workaround is available.
- Priority level 1 (P1)—Your production network is down, and a critical impact to business operations will occur if service is not restored quickly. No workaround is available.

Cisco TAC Website

You can use the Cisco TAC website to resolve P3 and P4 issues yourself, saving both cost and time. The site provides around-the-clock access to online tools, knowledge bases, and software. To access the Cisco TAC website, go to this URL:

<http://www.cisco.com/tac>

All customers, partners, and resellers who have a valid Cisco service contract have complete access to the technical support resources on the Cisco TAC website. Some services on the Cisco TAC website require a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to this URL to register:

<http://tools.cisco.com/RPF/register/register.do>

If you are a Cisco.com registered user, and you cannot resolve your technical issues by using the Cisco TAC website, you can open a case online at this URL:

<http://www.cisco.com/en/US/support/index.html>

If you have Internet access, we recommend that you open P3 and P4 cases through the Cisco TAC website so that you can describe the situation in your own words and attach any necessary files.

Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses priority level 1 or priority level 2 issues. These classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer automatically opens a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to this URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

Before calling, please check with your network operations center to determine the level of Cisco support services to which your company is entitled: for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). When you call the center, please have available your service agreement number and your product serial number.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- The *Cisco Product Catalog* describes the networking products offered by Cisco Systems as well as ordering and customer support services. Access the *Cisco Product Catalog* at this URL:
http://www.cisco.com/en/US/products/products_catalog_links_launch.html
- Cisco Press publishes a wide range of networking publications. Cisco suggests these titles for new and experienced users: *Internetworking Terms and Acronyms Dictionary*, *Internetworking Technology Handbook*, *Internetworking Troubleshooting Guide*, and the *Internetworking Design Guide*. For current Cisco Press titles and other information, go to Cisco Press online at this URL:
<http://www.ciscopress.com>
- *Packet* magazine is the Cisco monthly periodical that provides industry professionals with the latest information about the field of networking. You can access *Packet* magazine at this URL:
http://www.cisco.com/en/US/about/ac123/ac114/about_cisco_packet_magazine.html
- *iQ Magazine* is the Cisco monthly periodical that provides business leaders and decision makers with the latest information about the networking industry. You can access *iQ Magazine* at this URL:
http://business.cisco.com/prod/tree.taf%3fasset_id=44699&public_view=true&kbns=1.html
- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in the design, development, and operation of public and private internets and intranets. You can access the *Internet Protocol Journal* at this URL:
http://www.cisco.com/en/US/about/ac123/ac147/about_cisco_the_internet_protocol_journal.html
- Training—Cisco offers world-class networking training, with current offerings in network training listed at this URL:
http://www.cisco.com/en/US/learning/le31/learning_recommended_training_list.html

This document is to be used in conjunction with the appropriate installation and configuration guide for your router.

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