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Cisco 7513, Cisco 7513-MX, and Cisco 7576 Card Cage and Backplane Assembly Replacement Instructions

Product Numbers: MAS-7513CDCAGE= (Cisco 7513), MAS-7513MX-CDCAGE= (Cisco 7513-MX), MAS-7576CDCAGE= (Cisco 7576)

This publication provides the procedures to replace the card cage and backplane assembly in the Cisco 7513, Cisco 7513-MX, and Cisco 7576 routers. The card cage and backplane assembly for the Cisco 7513, Cisco 7513-MX, and Cisco 7576 chassis can be replaced in the field. The assembly is a single field-replaceable unit (FRU) that requires replacement by a Cisco-certified service provider only.

This publication assumes you have already performed troubleshooting on your chassis and system and determined that this replacement is required.

Document Contents

This publication includes the following sections:

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Caution Before replacing the card cage and backplane assembly, read the "Safety Guidelines" section on page 7. The specific procedures for removing and installing the card cage and backplane assembly might require two people to perform.

Product Overview

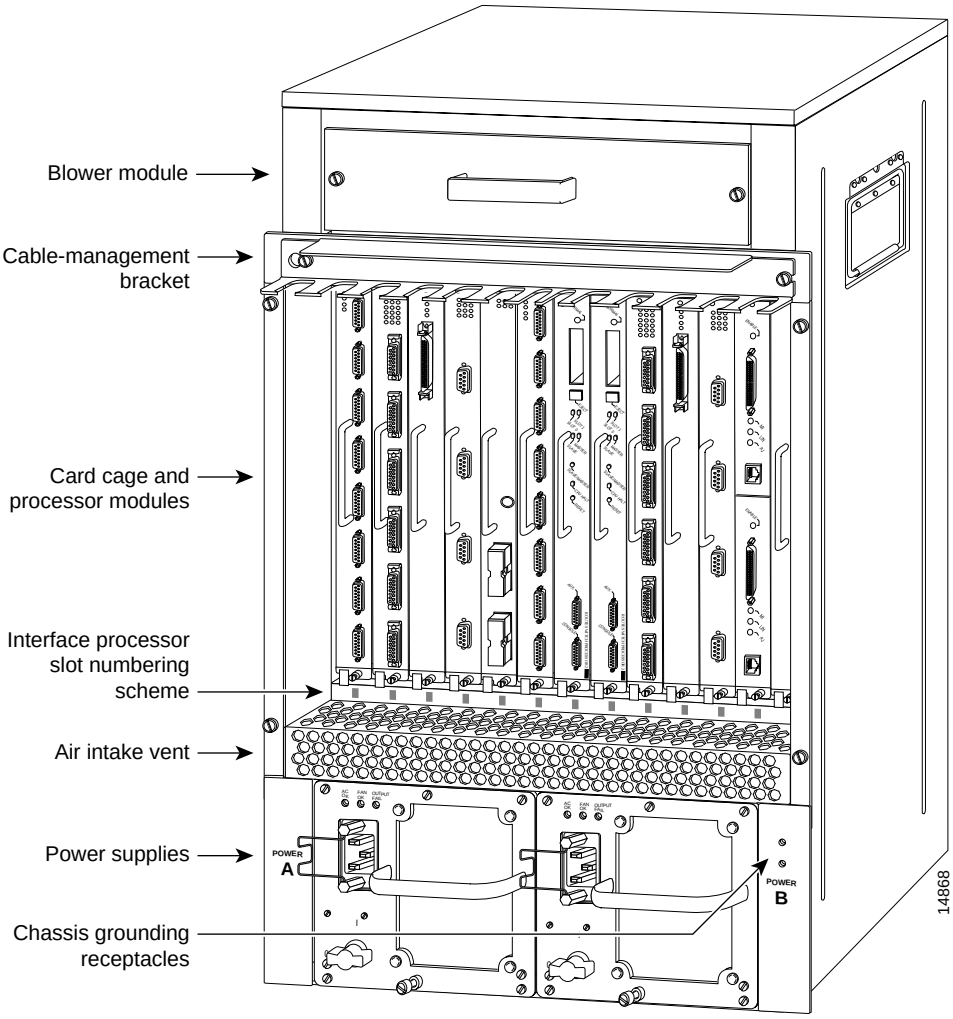
The Cisco 7513, Cisco 7513-MX, and Cisco 7576 card cage holds the processor modules used by the system. Figure 1 shows the rear view of the system.

The card cage and backplane are one assembly. The Cisco 7513 and Cisco 7513-MX include the card cage, backplane, dual arbiter, chassis interface, and the electrically erasable programmable read-only memory (EEPROM) device that contains the system MAC addresses. The dual arbiter and chassis interface are printed circuit boards that are attached to the rear of the backplane. The dual arbiter and chassis interface are replaced when the card cage and backplane assembly is replaced.

The Cisco 7576 is a dual independent router system that includes two dual arbiters, two chassis interfaces, and two EEPROM devices.

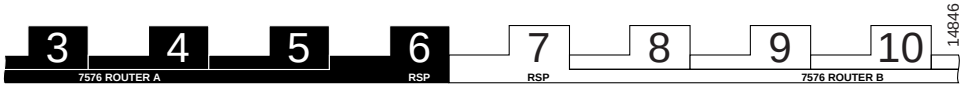
Note You *must* transfer the EEPROM device from your old card cage to the new card cage for your system to retain all of its MAC addresses. You must then install the new EEPROM device on the old card cage before you return the old card cage to Cisco. This procedure only applies if you are replacing an equivalent card cage. It does not apply if you are upgrading a Cisco 7513 to a Cisco 7576.

Figure 1 Cisco 7513, Cisco 7513-MX, and Cisco 7576—Rear-Panel View



Note The Cisco 7513, Cisco 7513-MX, and Cisco 7576 use the same chassis, power supplies, accessories, and slot numbering scheme. The Cisco 7513 or Cisco 7513-MX chassis contains a single router that uses slot 0 though slot 12. The Cisco 7576 chassis contains two routers. Router A uses slot 0 through slot 6, and router B uses slot 7 through slot 12. See Figure 2 for an enlarged view of the Cisco 7576 interface processor slot numbering scheme. The Cisco 7513-MX backplane includes connectors for time-division mutliplexing (TDM)-compatible hardware. These connectors allow you to connect the Cisco 7513-MX to future TDM hardware as it becomes available.

Figure 2 Enlarged View of the Cisco 7576 Interface Processor Slot Numbering Scheme



Note To provide a viewable image, slot numbers 0, 1, 2, 11, and 12 are not shown in Figure 2. The slot numbering scheme uses color coding to assist in identifying routers and CyBus assignments. Refer to the "Identifying Cisco 7576 Independent Routers and CyBuses" section in the *Cisco 7500 Series Installation and Configuration Guide* for detailed information on the slot numbering scheme.

Figure 3 shows the location of the dual arbiter and chassis interface on the rear of the Cisco 7513 and Cisco 7513-MX backplane.

Figure 3 Location of the Dual Arbiter and Chassis Interface on the Rear of the Cisco 7513 and Cisco 7513-MX Backplane

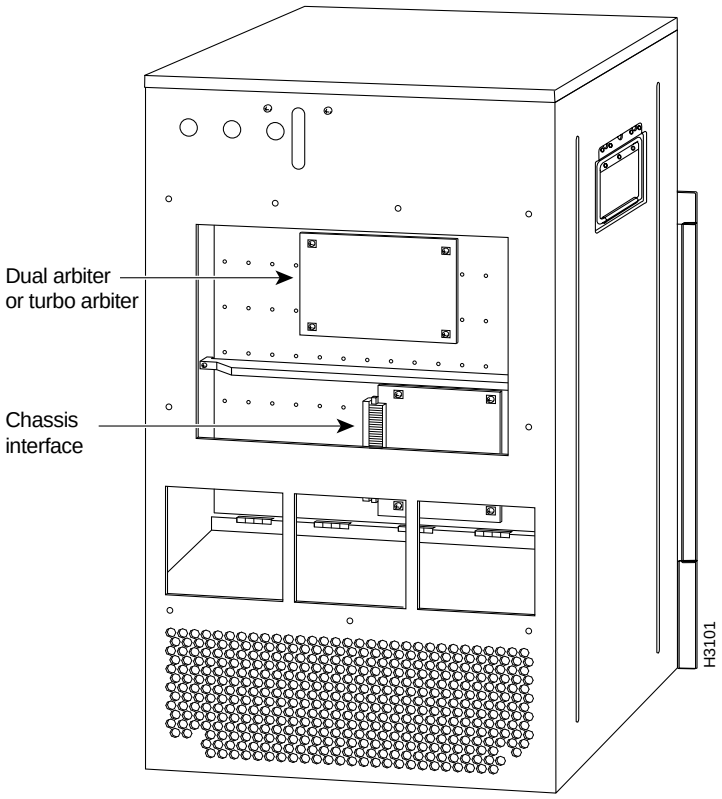
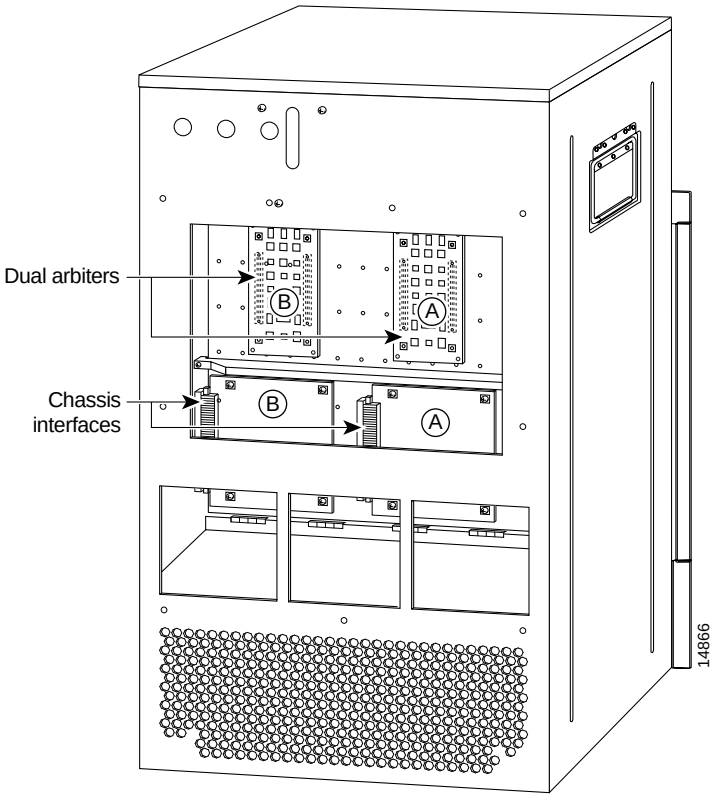


Figure 4 shows the location of the Cisco 7576 dual arbiters and chassis interfaces on the rear of the backplane.

Figure 4 Location of the Cisco 7576 Dual Arbiters and Chassis Interfaces on the Rear of the Backplane



Note When you view the rear of the card cage, the dual arbiter and chassis interface on the right side are used with router A, and the dual arbiter and chassis interface on the left side are used with router B.

Installation Safety, ESD Precautions, and Tools Required

Before you begin replacing the backplane and card cage assembly, review the safety guidelines in this section to avoid injuring yourself or damaging the equipment. This section also lists the tools and parts you need to perform this procedure.

Safety Warnings

Safety warnings appear throughout this publication in procedures that, if performed incorrectly, may harm you. A warning symbol precedes each warning statement.

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* -kirjasesta (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 vare 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 *Regulatory Compliance and Safety Information* (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 *Regulatory Compliance and Safety Information* (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 *Regulatory Compliance and Safety Information* (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 förkommer i denna publikation i dokumentet *Regulatory Compliance and Safety Information* (Efterrättelse av föreskrifter och säkerhetsinformation), vilket medföljer denna anordning.

Safety Guidelines

Follow these guidelines to ensure your safety and protect the equipment. This list is not inclusive of all potentially hazardous situations, so *be alert*.

- Never try to lift the chassis by yourself; two people are *required* to lift a Cisco 7513, Cisco 7513-MX, or Cisco 7576.
- Always disconnect all power cords and interface cables before moving the chassis.
- Keep tools and chassis components away from walk areas.
- Do not work alone if potentially hazardous conditions exist.
- 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.

Safety with Electricity

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 if potentially hazardous conditions exist.
- Never assume that power is 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.

In addition, use the guidelines that follow when working with any equipment that is connected to telephone wiring or 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 is 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 boards or components are handled improperly, can result in complete or intermittent failures.

Following are guidelines for preventing ESD damage:

- Always use an ESD-preventive wrist strap or ankle strap and ensure that it makes good skin contact.
- When removing or installing an ESD-sensitive component, connect the equipment end of a ground strap to an unpainted surface of the chassis, such as the chassis frame.
- If you are returning a replaced part to the factory, immediately place it in a static shielding bag to avoid ESD damage to the board.
- The wrist strap only protects the board from ESD voltages on the body; ESD voltages on clothing can still cause damage.

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

Tools Required

You need the following tools to install or replace the backplane and card cage assembly:

- 1/4-inch flat-blade screwdriver to loosen the captive screws on the power supplies and card cage
- Number 1 Phillips or 1/4-inch, flat-blade screwdriver to remove any blank processor module carriers (fillers) and to tighten the captive installation screws that secure the processor module in its slot
- Spare card cage assembly—includes the card cage with the chassis interface (attached) and dual arbiter (attached)
- ESD-preventive wrist strap
- Small piece of masking or clear cellophane tape to mark the new EEPROM device
- Antistatic packaging in which the old card cage assembly should be placed

Removing and Replacing Processor Modules

Before you can replace the card cage and backplane assembly, you need to remove all processor modules installed in the card cage, and then replace them after the new card cage assembly is in place. The term *processor module* refers to the RSP2, RSP4, or RSP8 and all interface processors.

Note 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 hang and subsequently crash.

Timesaver To save time when you reinstall the processor modules in the card cage and reconnect interface cables, use the "Port and Slot Configuration Worksheet" section on page 23 to note which cables are connected to which interface processor ports.

Timesaver Before you can remove the card cage and backplane assembly, you *must* remove all processor modules and both power supplies. Plan this procedure so that you can minimize its effects on your system.

Removing Processor Modules

To remove processor modules, follow these steps:

Step 1 Turn off power to the chassis. If two power supplies are installed, the power switch on each supply must be in the off (O) position.

Step 2 Attach an ESD-preventive strap between you and an unpainted chassis surface.

Step 3 If there is not enough slack in the network interface cables to remove the processor module without straining the cables, disconnect any cables attached to the interface ports.

Step 4 You must pull each processor module straight out of its slot. Ensure that there are no obstructions that will prevent you from doing so, such as a power strip on a rack post, network connection devices attached to adjacent processor modules, or extensive cabling in front of the processor slots.

Step 5 Use a screwdriver to loosen the captive installation screws at both ends of the processor module. (See Figure 5a.)

Step 6 Place your thumbs on the ejector levers on both ends of the processor module (see Figure 5c) and simultaneously pull them both outward to release the processor module from the backplane connector.

Step 7 Grasp the processor module handle with one hand and place your other hand under the carrier to support it. Pull the processor module straight out of the slot, keeping it at a 90-degree orientation to the backplane. (See Figure 7 on page 12.)

Step 8 Place the removed processor modules in the black cardboard racks that were provided with the original equipment packaging. (See Figure 6.) You can place all 13 processor modules in these holders.

Figure 5 Ejector Levers and Captive Installation Screws

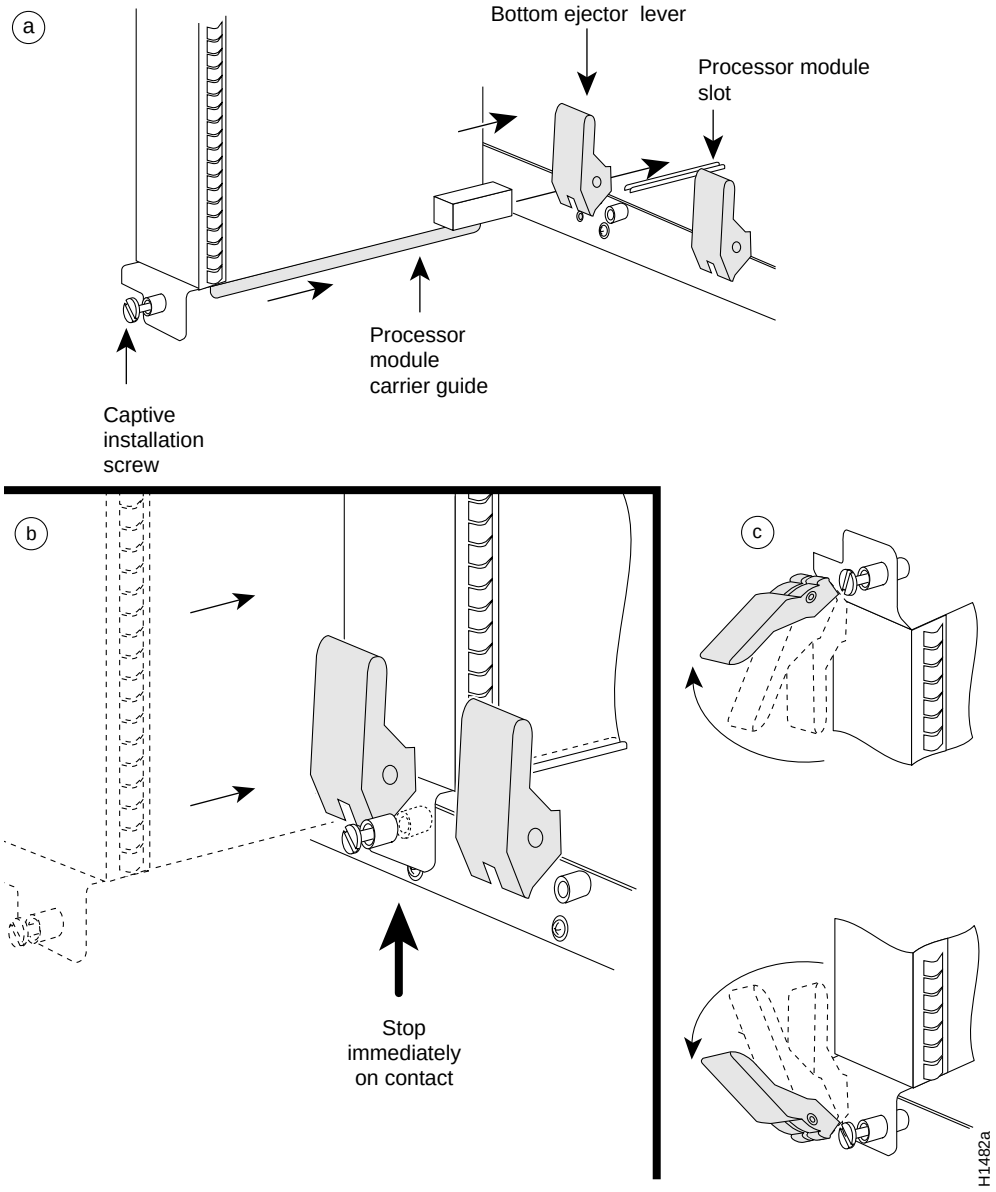
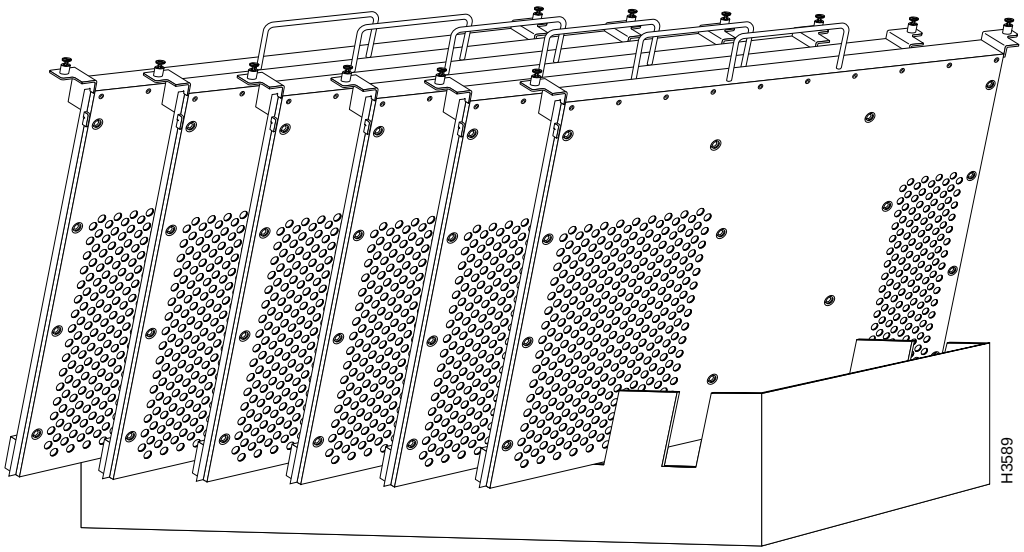


Figure 6 Board Rack with Processor Modules



Caution To prevent damage to the processor modules, do not stack them on top of each other.

Replacing Processor Modules

You can replace an interface processor in any of the 11 interface processor slots, 0 through 5, and 8 through 12, from left to right. (See Figure 1.) slot 6 and slot 7 are reserved for the RSP. Blank processor module fillers are installed in slots without processor modules to maintain consistent airflow through the card cage. Refer to the *Cisco 7500 Series Installation and Configuration Guide* for complete information on RSP slot assignments and placement.

To replace processor modules, follow these steps:

Step 1 Turn off power to the chassis. If two power supplies are installed, the power switch on each supply must be in the off (O) position.

Step 2 Note that processor modules are secured with two captive installation screws. Use a number 1 Phillips or a 1/4-inch flat-blade screwdriver to loosen the two captive installation screws and remove the processor module filler (or the existing processor module) from the slot to be filled.

Step 3 Hold the processor module handle with one hand, and place your other hand under the carrier to support it. (See Figure 7.) Avoid touching the board.

Step 4 Place the back of the processor module in the slot and align the carrier guides along the sides of the processor module with the grooves in the top and bottom of the slot. (See Figure 5a.)

Step 5 While keeping the processor module at a 90-degree orientation to the backplane, carefully slide the processor module into the slot until the processor module faceplate makes contact with the ejector levers.

Step 6 Using your thumbs, simultaneously push both ejector levers inward until they push the processor module completely into the slot. The ejector levers should be in approximately the same orientation as the processor module faceplate. (See Figure 5c.)

Caution Always install blank processor module fillers in empty processor slots to maintain the proper flow of cooling air through the chassis.

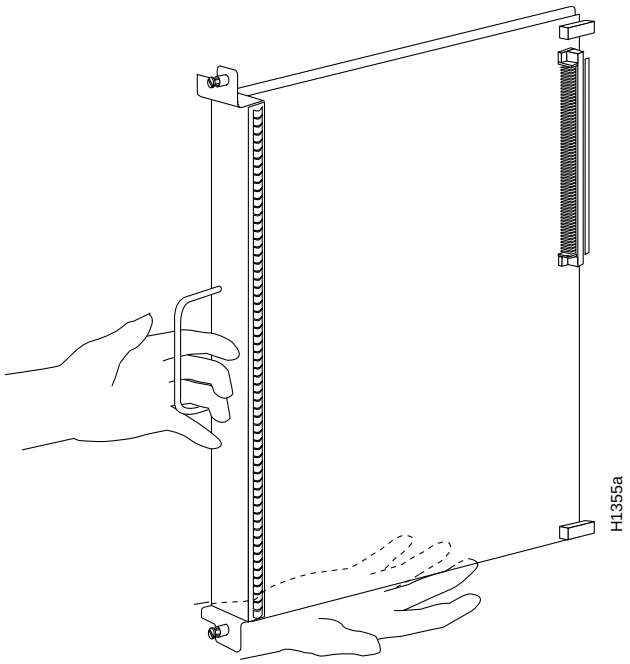
Step 7 Use a screwdriver to tighten both captive installation screws on each processor module.

Step 8 Attach network interface cables or other devices to the interface ports. Use the notes you made in the "Port and Slot Configuration Worksheet" section on page 23.

Step 9 After you reconnect power and turn it on, check the status of the interfaces as follows:

- Enter the **show interfaces** [*type*] or **show controllers** [*type*] command to verify that the system has acknowledged the interfaces and brought them up.
- Enter the **configure** command or the **setup** command facility to configure any new interface(s) you might have installed. This does not have to be done immediately, but the interfaces will not be available until you configure them.

Figure 7 Handling a Processor Module During Installation



Caution To prevent ESD damage, handle processor modules by the handles and carrier edges only.

Removing Power Supplies

Before you can replace the card cage and backplane assembly, you need to remove power supplies (and the power supply blank, shown in Figure 10, if one is installed in a system with one power supply), and then replace them after the new card cage assembly is in place.

To remove a power supply, follow these steps:

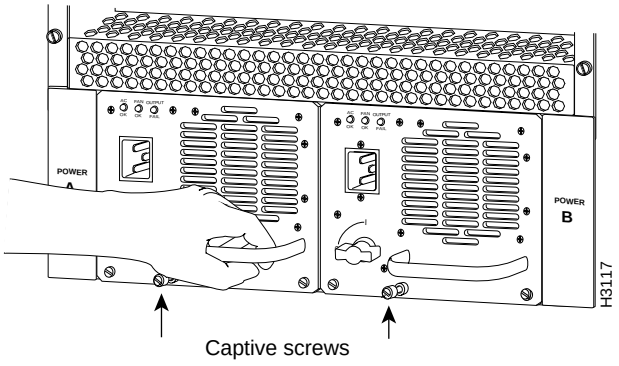
Step 1 Turn off (O) the system power switch on each power supply you plan to remove.

Step 2 Disconnect the power supply cables from the power supplies.

- For DC-input power supplies, refer to the configuration note *1200-Watt DC-Input Power Supply Replacement Instructions* (Publication Number 78-1899-xx) that shipped with your Cisco 7513, Cisco 7513-MX, or Cisco 7576 chassis equipped with DC-input power supplies.
- For AC-input power supplies, refer to the configuration note *1200-Watt AC-Input Power Supply Replacement Instructions* (Publication Number 78-1900-xx) that shipped with your Cisco 7513, Cisco 7513-MX, or Cisco 7576 chassis equipped with AC-input power supplies.

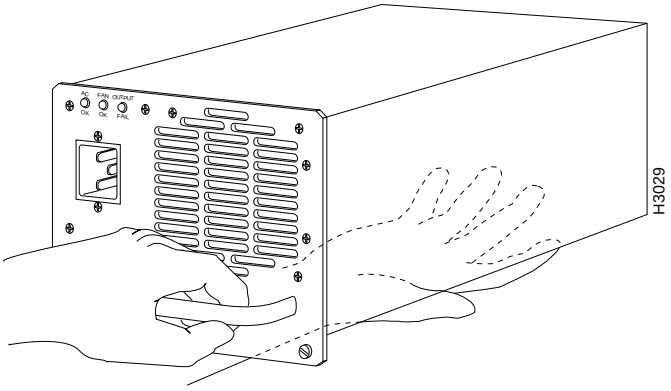
Step 3 Use a large slotted screwdriver to loosen the captive screw that secures the power supply to the chassis frame. (See Figure 8.)

Figure 8 Removing a Power Supply (AC-Input Power Supplies Shown)



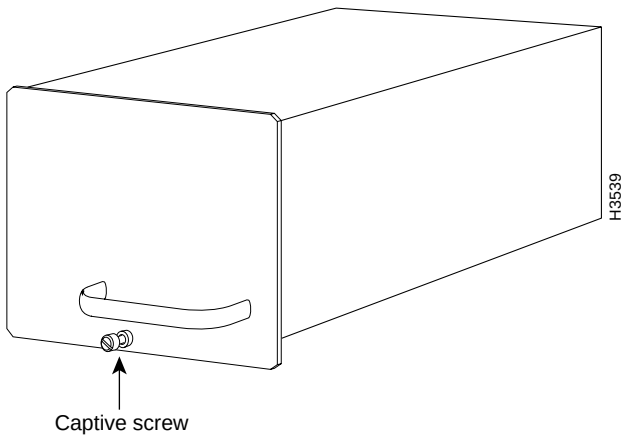
Step 4 Grasp the power supply handle and pull the power supply about halfway out of the bay. With your other hand under the power supply, pull the power supply completely out of the bay. (See Figure 9.)

Figure 9 Supporting the Power Supply (AC-Input Power Supply Shown)



Caution To maintain agency compliance requirements and meet electromagnetic interference (EMI) emissions standards in a Cisco 7513 or Cisco 7576 chassis with a single power supply, the power supply blank must remain in the power supply bay adjacent to the power supply. (See Figure 10.) Replace this blank in the chassis after you replace the card cage assembly. To prevent system problems, do not mix AC-input and DC-input power supplies in the same chassis.

Figure 10 Power Supply Blank



Step 5 Repeat Step 1 through Step 4 for a second power supply, if one is installed.

Repeat Step 3 and Step 4 for the power supply blank, if one is present.

This completes the power supply removal procedure.

Removing the Old Card Cage and Backplane Assembly

The card cage and backplane consist of one assembly that can be removed and replaced as required. There are no wires, harnesses, or connectors. The assembly slides into and out of the chassis and attaches to the chassis frame with four slotted captive screws. (See Figure 11.)

For this procedure, you need one large flat-blade screwdriver, an antistatic bag for each removed processor module, or several antistatic mats or pieces of antistatic foam.

Timesaver Before you can remove the card cage and backplane assembly, you must remove all processor modules and both power supplies. Plan this procedure so that you can minimize its effects on your system.

To remove the card cage and backplane assembly, follow these steps:

Step 1 Turn the power switch on each power supply to the off position (O).

Step 2 Disconnect the power supplies.

- For DC-input power supplies, refer to the configuration note *1200-Watt DC-Input Power Supply Replacement Instructions* (Publication Number 78-1899-xx) that shipped with your Cisco 7513, Cisco 7513-MX, or Cisco 7576 chassis equipped with DC-input power supplies.
- For AC-input power supplies, refer to the configuration note *1200-Watt AC-Input Power Supply Replacement Instructions* (Publication Number 78-1900-xx) that shipped with your Cisco 7513, Cisco 7513-MX, or Cisco 7576 chassis equipped with AC-input power supplies.

Step 3 Using the directions in the appropriate configuration note, remove each power supply and set it aside.

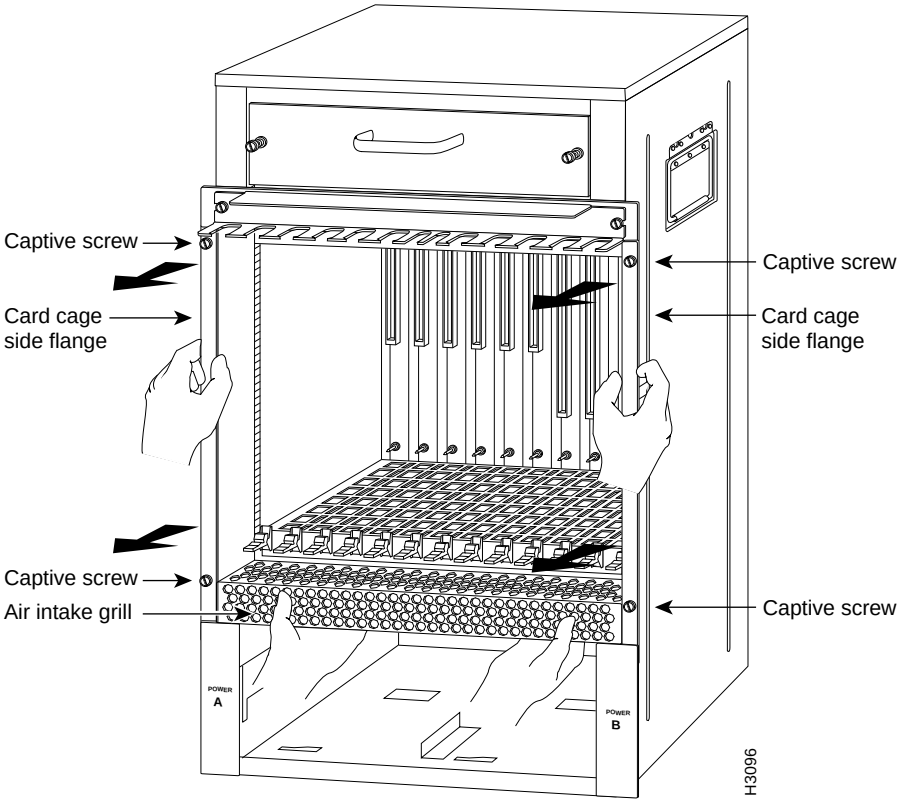
Step 4 Remove all processor modules from the chassis and carefully store them in antistatic bags or on an antistatic mat. (See the "Removing and Replacing Processor Modules" section on page 9.)

Caution To prevent damage to the processor modules, do not stack them on top of each other. Use the board rack that shipped with your Cisco router. (See Figure 6.)

Caution Unless the chassis is mounted in a rack or is otherwise anchored, the chassis might move toward you when you pull out the card cage and backplane assembly. To prevent injury, have a second person hold the chassis in place while you pull the card cage and backplane assembly from the chassis in the following step.

Step 5 With the processor modules and power supplies removed, loosen the four large captive screws located to the left and the right of the card cage opening. (See Figure 11.)

Figure 11 Removing the Card Cage and Backplane Assembly



Step 6 With the captive screws loosened, carefully pull the card cage and backplane assembly straight out of the chassis until the entire assembly is clear of the chassis sides. (See Figure 11.) The assembly is not heavy but might be awkward to handle.

Step 7 When the card cage and backplane assembly is completely free of the chassis, carefully place it on an antistatic mat or foam.

Caution The electronic components on the rear of the backplane are completely exposed when the card cage and backplane assembly is removed from the chassis. To prevent damaging these components, place the card cage and backplane assembly on an antistatic mat or foam, and place the assembly in the same orientation as when it is mounted in the chassis. (See Figure 11.)

This completes the procedure for removing the old card cage and backplane assembly; proceed to the next section, “Exchanging the EEPROM Devices.”

Exchanging the EEPROM Devices

Before you install your new card cage, you must exchange the new EEPROM device(s) on the rear of the new card cage for 00the old EEPROM device(s) on the rear of your old card cage. The Cisco 7513 and Cisco 7513-MX include one EEPROM device and the Cisco 7576 includes two EEPROM devices, one for router A and one for router B. The EEPROM device(s) on your old card cage have MAC addresses programmed into them, which are necessary for your system to function properly, and these old EEPROM device(s) are required for your system.

Caution The new EEPROM device(s) that shipped on your new card cage are blank.

Note Do *not* perform these steps if you are upgrading a Cisco 7513 to a Cisco 7576. These instructions apply only to the replacement of an equivalent card cage.

The following procedure requires you to first exchange the blank EEPROM device(s) on your new card cage for the old EEPROM device(s) from your old card cage, and then place the blank EEPROM device(s) on your old card cage for return to Cisco. For this procedure, you need a small piece of masking or cellophane tape to mark the new EEPROM device(s) as blank. The old card cage is assumed to have already been removed from your Cisco 7513, Cisco 7513-MX, or Cisco 7576.

To exchange the EEPROM device(s), follow these steps:

Step 1 Attach an ESD preventive wrist strap between you and an unpainted surface of the Cisco 7513, Cisco 7513-MX, or Cisco 7576 chassis.

Step 2 Locate the blank EEPROM device(s), which are located on the rear of the new card cage, to the left of the chassis interface board. (See Figure 12 for the Cisco 7513 or Cisco 7513-MX, and Figure 13 for the Cisco 7576.)

Step 3 Remove the blank EEPROM device(s) from the new card cage, place a piece of tape on it to mark it as blank EEPROM device(s), and set it aside.

Step 4 Locate the old EEPROM device(s), which are located on the rear of your old card cage. (See Figure 12 for the Cisco 7513 or Cisco 7513-MX, and Figure 13 for the Cisco 7576.)

Figure 12 Location of the EEPROM Device on the Rear of the Card Cage (Cisco 7513 or Cisco 7513-MX)

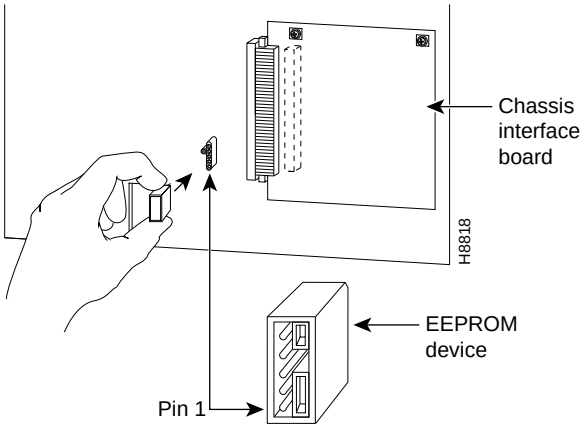
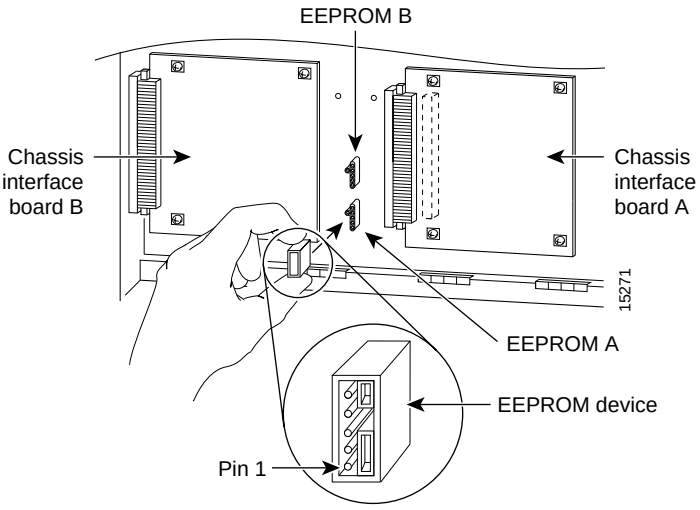


Figure 13 Location of the EEPROM Devices on the Rear of the Card Cage (Cisco 7576)



Note The Cisco 7576 features two routers on one backplane. These are designated router A and router B. The backplane of the Cisco 7576 includes two dual arbiters, two chassis interfaces, and two EEPROM devices. Figure 13 shows the specific location and designation of each EEPROM device.

Step 5 Remove the old EEPROM device(s) from the old card cage, note where pin 1 is, and immediately install them on the EEPROM socket on your new card cage. (See Figure 12 for the Cisco 7513 or Cisco 7513-MX, and Figure 13 for the Cisco 7576.)

Step 6 Install the blank EEPROM device(s) (that you removed from your new card cage and marked with tape) on the EEPROM socket on your old card cage; remove the small piece of tape from the blank EEPROM device(s). Return the old card cage to Cisco.

Step 7 Repeat Step 2 through Step 6 for the second EEPROM device in the Cisco 7576.

This completes the procedure for exchanging the EEPROM device(s); proceed to the next section, "Installing the New Card Cage and Backplane Assembly."

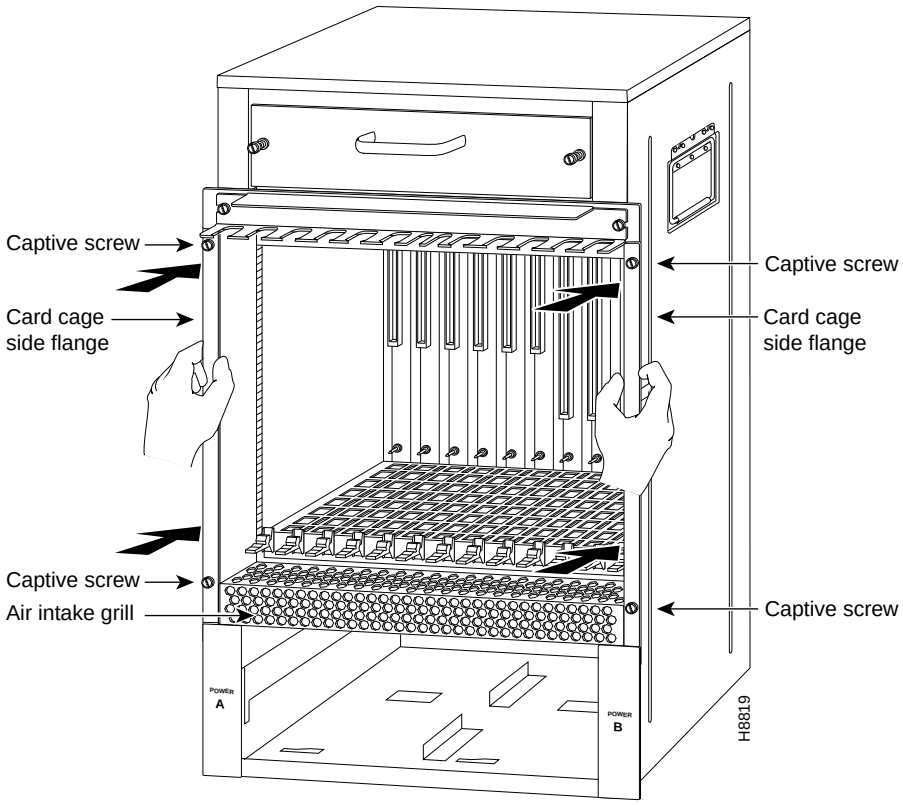
Installing the New Card Cage and Backplane Assembly

To install the new card cage and backplane assembly, follow these steps:

Step 1 To install the new card cage and backplane assembly, carefully lift the assembly, place it into the chassis opening, and slide the assembly into the chassis opening until the left and right flanges on the card cage are flush with the chassis flanges. (See Figure 14.)

Step 2 Squeeze the card cage and chassis flanges together and tighten each captive screw. (See Figure 14.) Do not overtighten the captive screws.

Figure 14 Replacing the Card Cage and Backplane Assembly



Caution The electronic components on the rear of the backplane are completely exposed when the card cage and backplane assembly is removed from the chassis. To prevent damaging these components, carefully slide the assembly into the chassis opening. (See Figure 14.)

Step 3 Replace the processor modules in the card cage. To do so, see to the “Replacing Processor Modules” section on page 11.

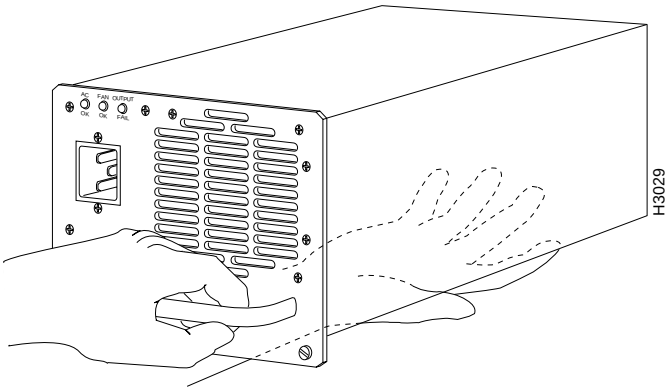
This completes the procedure for replacing the card cage and backplane assembly in the Cisco 7513, Cisco 7513-MX, and Cisco 7576. Proceed to the next section “Replacing Power Supplies.”

Replacing Power Supplies

To replace the power supply, follow these steps:

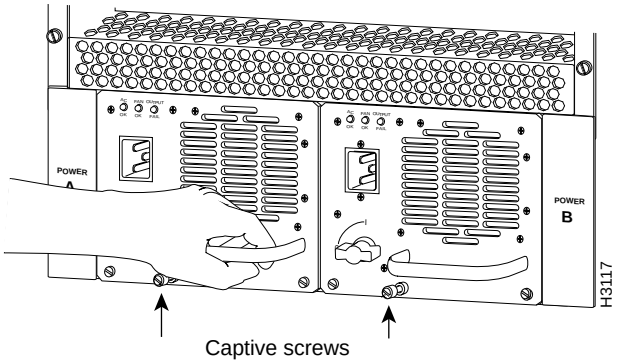
Step 1 To replace a power supply, hold it as shown in Figure 15 and slide it into the power supply bay. Push the supply all the way into the chassis until the sides are flush against the chassis frame. (See Figure 16.) Do not jam the power supply into the power supply bay.

Figure 15 Supporting the Power Supply (AC-Input Power Supply Shown)



Step 2 Apply moderate pressure against the power supply faceplate and use a large slotted screwdriver to tighten the captive screw that secures the power supply to the chassis frame. (See Figure 16.)

Figure 16 Replacing a Power Supply (AC-Input Power Supplies Shown)



Step 3 Reconnect the power supply cables to the power supply.

- For DC-input power supplies, refer to the configuration note *1200-Watt DC-Input Power Supply Replacement Instructions* (Publication Number 78-1899-xx) that shipped with the Cisco 7513, Cisco 7513-MX, or Cisco 7576 chassis equipped with DC-input power supplies.
- For AC-input power supplies, refer to the configuration note *1200-Watt AC-Input Power Supply Replacement Instructions* (Publication Number 78-1900-xx) that shipped with the Cisco 7513, Cisco 7513-MX, or Cisco 7576 chassis equipped with AC-input power supplies.

Step 4 Repeat Step 1 through Step 3 for the second power supply if one is installed, or Step 1 and Step 2 for the power supply blank if one is present.

Note After the AC power cable or DC power cable leads are reconnected to each power supply, reconnect the power cable at the power source.

This completes the power supply replacement procedure.

Checking the System

To complete the installation, perform a final check of all connections, and then restart the system. This procedure is not for new systems; perform this procedure only if you have already connected the network interfaces and performed the first-time startup procedures discussed in the *Cisco 7500 Series Installation and Configuration Guide.*

To restart the system and verify that the system restarts successfully, follow these steps:

Step 1 Check the following components to make sure they are secure:

- Processor modules are fully inserted in the slots and all captive screws are tightened.
- Interface cable connections are secured.
- Power supplies are fully inserted in the bays, and the captive screws are tightened.
- Power supply cables are fully connected to the power supplies and the power source and are secured with appropriate strain relief.

Step 2 Ensure that a console terminal is connected to the RSP console port and turned on, or that you have a remote login to the router from another device through a Telnet session. (You need to check the startup banner and displays to ensure that the system restarts properly and that all the interfaces reinitialize in the proper state.)

Step 3 When you have checked all of the connection points, turn on the power supply in the power A bay by turning its power switch clockwise one-quarter turn. The OK LED on the power supply and the power A LED on the front of the chassis should go on.

Step 4 After the power supply in bay A is on, turn the second power supply on in bay B, if one is present for redundant power. The OK LED on each power supply and the power A (and B) LEDs on the front of the chassis should go on.

Note If you try to turn on a power supply and the switch resists, the power supply probably is not fully inserted into the bay. Turn the power switch fully counterclockwise (to O), loosen the captive screw, pull the power supply out of the bay about 2 inches (5.08 cm), and then push the power supply firmly back into the slot. Do not slam the power supply into the slot—doing so can damage the connectors on the power supply and the backplane. Tighten the captive screw before turning on the power switch.

Step 5 Listen for the system blower. You should hear it start operating immediately.

Step 6 On the console terminal, verify that the console displays the system banner and that the system and all interfaces initialize successfully.

Following is an example of this display:

```
(display text omitted)
GS Software (RSP-K), Version 10.3(571)
Copyright (c) 1986-1995 by cisco Systems, Inc.
Compiled Wed 10-May-95 25:12

RSP2 (Risc 4600) processor with 16384K bytes of memory.

(display text omitted)
```

Note The preceding Cisco IOS software display examples may differ depending on the router model and Cisco IOS software release being used.

If the power supplies do not start up, or if the system or any interfaces do not initialize properly, refer to the *Cisco 7500 Series Installation and Configuration Guide* publication that shipped with your router for additional information and installation troubleshooting procedures. If necessary, contact a service representative. (See the “Cisco Connection Online” section on page 25.)

Port and Slot Configuration Worksheet

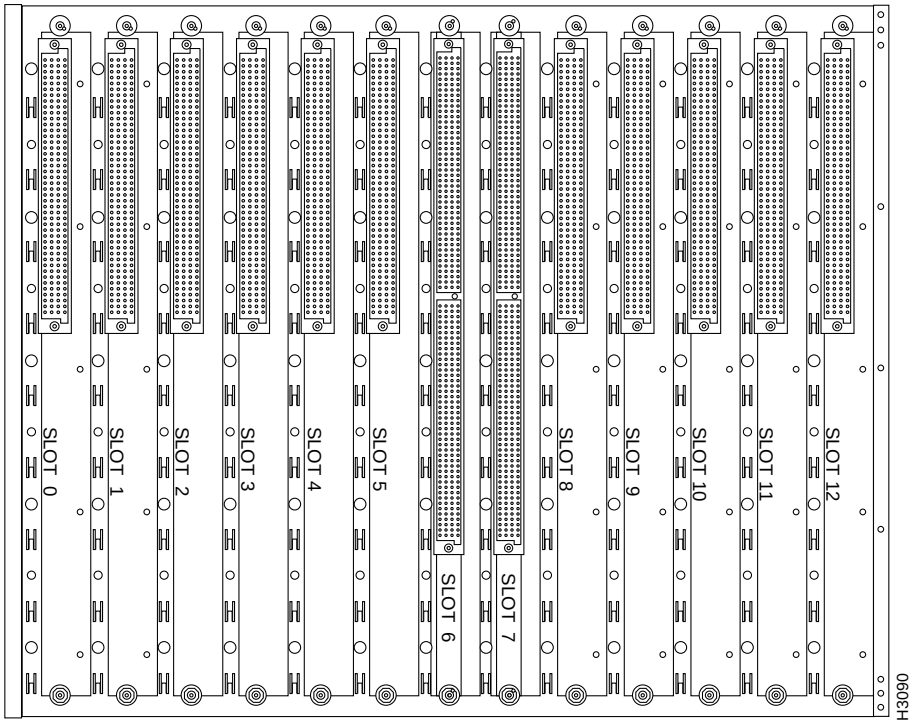
The port and slot configuration worksheet (Table 1) is used with Figure 17 to assist in planning and documenting your use of the slots in a Cisco 7513, Cisco 7513-MX, or Cisco 7576 router. Figure 17 depicts the dual CyBus backplane, minus the time division multiplexing (TDM) connectors found on the Cisco 7576.

Table 1 Port and Slot Configuration Worksheet (Refer to Figure 17)

Port	Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5[1]	Slot 8	Slot 9	Slot 10	Slot 11	Slot 12
1											
2											
3											
4											
5											
6											
7											
8											
Router Name(s)				Location				Serial Number			

1 Slots 6 and 7 are reserved for the RSPs in the Cisco 7513 and Cisco 7513-MX. However, in the Cisco 7576, slot 6 is used for router A, and slot 7 is used for router B.

Figure 17 Slot Numbering (Use with Table 1)



Cisco 7513 and Cisco 7513-MX Slot Assignments

The dual CyBus backplane has 13 slots: interface processors are placed in slots 0 through 5 and 8 through 12. RSPs are placed in slots 6 and 7.

Cisco 7576 Slot Assignments

The Cisco 7576 consists of two independent routers on a single backplane. These are designated router A and router B.

- Router A
  - Interface processors are placed in slots 0 through 5
  - An RSP is placed in slot 6
- Router B
  - Interface processors are placed in slots 8 through 12
  - An RSP is placed in slot 7

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- WWW: http://www-china.cisco.com
- Telnet: cco.cisco.com
- 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 connection rates up to 28.8 kbps.

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