



Maintaining Your Cisco 7505 Router

Your Cisco 7505 router is configured to your order and is ready for installation and startup when it leaves the factory. After you install and configure your Cisco 7505 router, you might have to perform specific maintenance procedures and operations to ensure that the router is operating properly, to upgrade specific system components, or to replace components with spare parts or field-replaceable units (FRUs). This chapter describes maintenance operations required to maintain your Cisco 7505 router; it includes procedures for installing, adding, and replacing internal router components and replaceable spare parts.



Note

Detailed, up-to-date instructions (called *configuration notes*) are available on Cisco.com.

The replaceable system components fall into two categories: those that support online insertion and removal (OIR) and those that do not (requiring you to turn off the system power before replacement). For example, you can remove interface processors and replace them while the system is operating; however, you must shut down the system power before removing the RSP and the single power supply in a Cisco 7505 with one power supply installed, or before accessing the chassis interior for any other reason.

This chapter contains specific component replacement instructions for upgrading, removing, or replacing the following components:

- Front panel
- Fan tray
- Chassis interface (CI) board
- Power supply



Caution

To help prevent problems, before performing any procedures in this chapter, review the [“Safety Recommendations” section on page 2-2](#).



Note

Interface processor-specific configuration information is included in the companion *Interface Processor Installation and Configuration Guide*, which shipped with your Cisco 7505 router, as well as in the individual configuration notes that shipped with your spare interface processors.

Tools Required for Maintenance Procedures

You need the following tools to replace any one of the Cisco 7505 internal spares:

- 3/16-inch flat-blade or number 1 Phillips screwdriver to loosen the captive screws on the chassis cover panel and the DC-input terminal connections on the DC-input power supply
- Number 1 Phillips screwdriver for the power harness cover
- Number 2 Phillips screwdriver for the M4 Phillips screws on the power supply and the fan tray

Overview of Maintenance Procedures for the Cisco 7505

To replace internal spares, you must remove the chassis cover panel and expose the chassis interior. To replace the power supply components, you must also remove the power harness cover, which exposes the backplane power connection.



Warning

If the power is not shut down before removing the chassis cover panel, the high current on the fan tray and fan control board can be a hazard. When the power harness cover is removed, the high current present in the wiring and on the backplane can also be a hazard. Removing the cover panel when the system is operating compromises the EMI integrity of the system. Therefore, always turn off the system power before removing the cover panel; remove the cover panel only when it is necessary to replace internal components.

The Cisco 7505 fan tray comprises six individual fans (the fan array) and a fan control printed circuit board mounted on a metal tray (see [Figure 5-2](#)); the entire assembly is called the *fan tray*. The fan tray slides into the right side of the chassis (when you view the chassis from the noninterface processor end). The fans draw cooling air through the inlet vents on the left side of the chassis (when you view the chassis from the noninterface processor end) and force the air out through the exhaust vents on the right side of the chassis.

The fan control board distributes power to the fans, controls the fan speed, and monitors and reports fan failures to the system through the backplane.

The power harness cover (see [Figure 5-4](#)) shields the wiring harness that delivers DC power from the power supply to the backplane. The power harness, which is part of all power supplies, carries DC voltages from the power supply to the backplane. The backplane distributes the operating voltages to all of the internal chassis components.

For the AC-input power supply, an external modular power cable delivers AC source power to the external AC receptacle on the interface processor end of the power supply.

For the DC-input power supply, a three-lead, 10-AWG power cable that you provide delivers DC source power to the terminal block on the power supply.

The power supply rests on the floor of the chassis, under the card cage and backplane. The noninterface processor end of the power supply has handles for pulling it out of the chassis. Before inserting a power supply, remove the cable retention clip (or secure it with tape); otherwise, it will catch on the chassis floor and prevent the chassis from sliding into the power supply bay.

The backplane cover shields the noninterface processor side of the backplane as well as the arbiter and chassis interface.

Maintenance Procedures for the Cisco 7505

The specific maintenance procedures for your Cisco 7505 router are described in the following sections:

- [Removing and Replacing the Cisco 7505 Cover Panel, page 5-3](#)

- [Removing and Replacing the Cisco 7505 Fan Tray, page 5-5](#)
- [Removing and Replacing the Cisco 7505 Power Harness Cover, page 5-7](#)
- [Removing and Replacing the Cisco 7505 Backplane Cover, page 5-9](#)
- [Removing and Replacing the Chassis Interface in the Cisco 7505, page 5-11](#)
- [Removing and Replacing the Cisco 7505 Power Supply, page 5-13](#)



Warning

Before working on a system that has an on/off switch, turn OFF the power and unplug the power cord.

Removing and Replacing the Cisco 7505 Cover Panel

The two captive slotted screws are the only fasteners on the cover panel. Five shallow tabs at the bottom edge of the panel fit into slots at the base of the chassis opening. The tabs act as a pivot point for pulling the top of the panel away from the chassis opening, and as guides to align the panel when replacing it. If the chassis cover does not seal the end of the chassis, the flow of cooling air inside the chassis can be misrouted, which can result in an overtemperature condition.

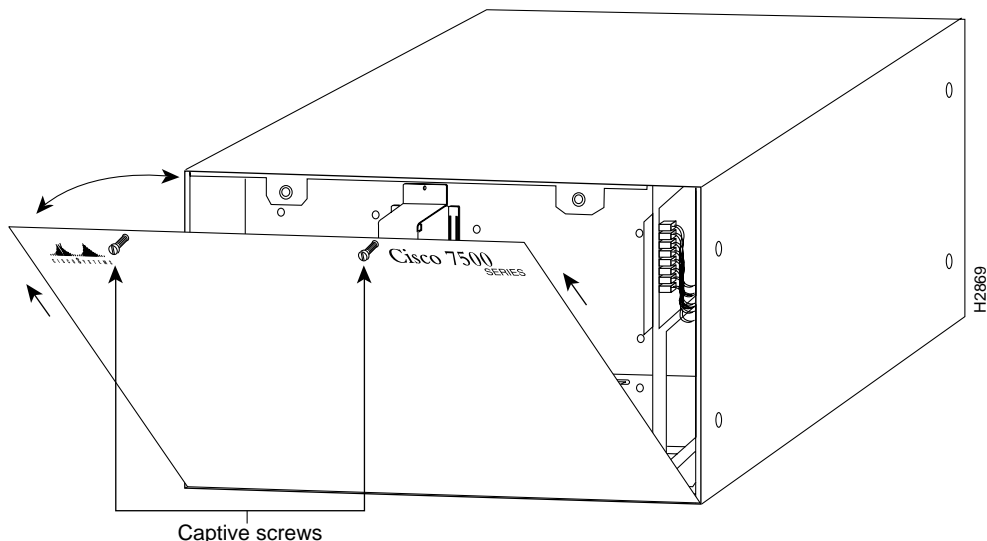


Warning

Before working on the chassis or near power supplies, disconnect the power cable on AC units or disconnect the power at the circuit breaker on DC units.

Use the following procedure to remove the chassis cover panel:

Figure 5-1 Removing and Replacing the Cisco 7505 Cover Panel



-
- Step 1** Use a 3/16-inch flat-blade screwdriver to loosen the two captive screws on the front of the cover panel.
- Step 2** Pull the top of the panel out about 3 inches (7.62 cm); then grasp the sides of the panel and pull it upward and away from the chassis.



Note See the appropriate sections depending on the replacement procedures you need to perform. Then, to replace the chassis cover panel, proceed to the following procedure.

Use the following procedure to replace the chassis cover panel:

-
- Step 1** Hold the sides of the cover panel with both hands and tilt the top of the panel back slightly (toward you). (See [Figure 5-1](#).)
- Step 2** Slide the guide tabs into the slots in the bottom edge of the chassis.
- Step 3** Using the guides as a pivot point, push the top half of the panel back toward the chassis opening until the panel is flush with the edges of the chassis.
- Step 4** Hold the top front of the panel in place, if necessary, while you tighten the two captive screws with a 3/16-inch flat-blade screwdriver.
-

This completes the chassis cover panel removal and replacement procedure.

Removing and Replacing the Cisco 7505 Fan Tray

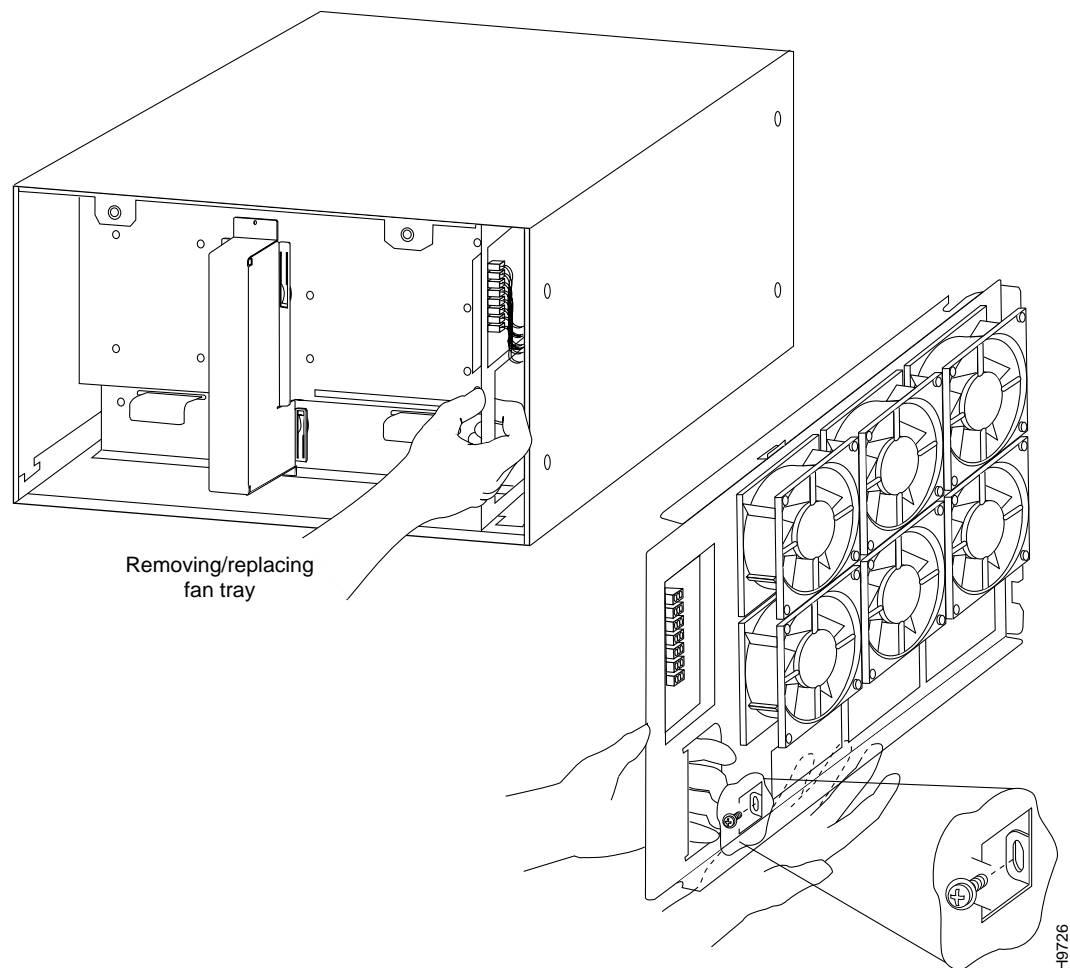
The fans on the fan tray provide cooling air to the internal system components. If the system detects that a fan has failed, it will display a 2-minute warning and then shut down the system until all of the fans are operational.



Note

You cannot replace individual fans; if a fan fails, you must replace the entire fan tray assembly.

Figure 5-2 Replacing the Cisco 7505 Fan Tray

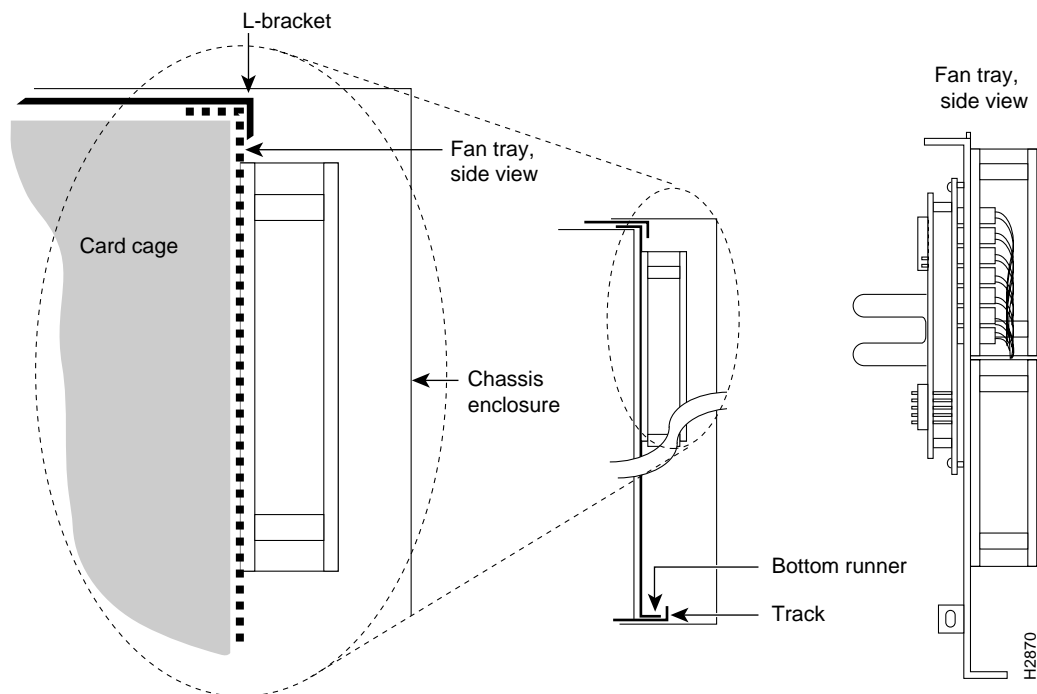


When you view the chassis from the noninterface processor end, the fan tray is on the far right. See [Figure 5-2](#).

A cutout in the front of the tray provides a handle for pulling the tray out of the chassis. An M4 Phillips screw anchors a tab on the bottom edge of the tray to the interior chassis frame, just below the right power supply ear.

When the fan tray is fully inserted in the chassis, an edge connector on the fan control board slides into the backplane electrical connector. The bottom of the tray is a metal runner that guides the tray along a metal track on the chassis floor. (See [Figure 5-3](#).) Also, a bracket on the chassis ceiling helps guide the tray into the chassis.

Figure 5-3 Fan Tray Tracks and Guides in the Cisco 7505

**Warning**

Before working on the chassis or near power supplies, disconnect the power cable on AC units or disconnect the power at the circuit breaker on DC units.


Use the following procedure to remove the fan tray:

- Step 1 Turn off the system power switch and disconnect the power cable from the power source.
- Step 2 Remove the chassis cover panel. (Follow Step 1 and Step 2 in the [“Removing and Replacing the Cisco 7505 Cover Panel”](#) section on page 5-3.)
- Step 3 Attach an ESD-preventive strap between you and an unpainted surface on the chassis.
- Step 4 Locate the fan tray, which is in the far right of the noninterface processor end of the chassis. On the lower left side of the fan tray, locate the tab that anchors the chassis frame.
- Step 5 Remove the M4 Phillips screw from the tab on the lower left side of the fan tray using a number 2 Phillips screwdriver.
- Step 6 Grasp the cutout handle in the front of the tray and pull the fan tray straight out of the chassis. (See [Figure 5-2](#).) After the fan control board connector clears the backplane socket, the fan tray will slide easily along the track and out of the chassis.
- Step 7 Place the removed fan tray in an antistatic bag for storage or return to the factory.

**Note**

See the appropriate sections depending on the replacement procedures you need to perform. Then, to replace the fan tray, proceed to the following procedure.

Use the following procedure to replace the fan tray:

-
- Step 1** Replace the fan tray. Hold the fan tray assembly in the position shown in [Figure 5-2](#). Keep the tray as straight as possible, or you might have trouble inserting it into the chassis.
-  **Note** Before inserting the fan tray, compare the hardware inside the chassis to [Figure 5-3](#). The runner on the bottom of the fan tray has to slide along in the track on the floor. At the same time, the runner on the top of the tray has to slide through the notch at the top of the chassis opening, then over the top of the card cage while staying to the left of the L-bracket on the chassis ceiling.
-
- Step 2** Insert the top runner of the fan tray through the notch in the top of the chassis. Continue pushing the tray into the chassis, ensuring that the bottom runner slides into the track on the floor of the chassis. If the tray hangs up, pull it back out a few inches and try pushing it back in again. If the runners seem to be catching on the brackets, push the tray slightly toward the left when inserting it again.
- Step 3** Slide the tray back into the chassis, pushing it all the way in until the circuit board snaps into the backplane socket.
- Step 4** Replace the M4 screw in the tab and tighten it with a number 2 Phillips screwdriver. (See the cutaway view of this screw in [Figure 5-2](#).)
- Step 5** Replace the cover panel. (Follow Step 1 through Step 4 in the procedure for replacing the cover panel in the [“Removing and Replacing the Cisco 7505 Cover Panel”](#) section on page 5-3.)
-

This completes the fan tray replacement procedure.

Removing and Replacing the Cisco 7505 Power Harness Cover

You must remove the power harness cover to access the power supply. A single M3 Phillips screw secures the power harness cover to the backplane cover.

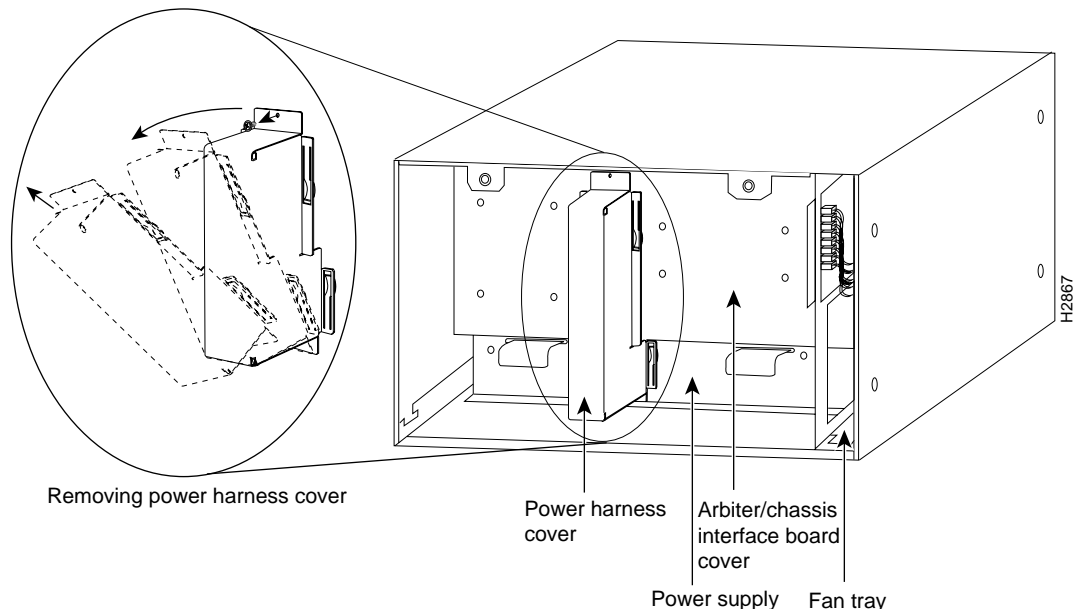


Before working on the chassis or near power supplies, disconnect the power cable on AC units or disconnect the power at the circuit breaker on DC units.

Use the following procedure to remove the power harness cover:

-
- Step 1** Turn off the system power switch and disconnect the power cable from the power source.
- Step 2** Remove the chassis cover panel. (Follow Step 1 and Step 2 in the procedure for removing the chassis cover panel in the [“Removing and Replacing the Cisco 7505 Cover Panel”](#) section on page 5-3.)

Figure 5-4 Removing the Cisco 7505 Power Harness Cover



- Step 3** Remove the M3 screw that secures the top of the harness cover to the backplane using a number 1 Phillips screwdriver. (See the cutaway in [Figure 5-4](#).)
- Step 4** Holding the cover with one hand, tilt the top of the cover back toward you, then pull it upward slightly so that the tab clears the slot in the chassis floor.
- Step 5** When the tab clears the slot, pull the cover straight back off the harness and out of the chassis.



Note See the appropriate sections depending on the replacement procedures you need to perform. Then, to replace the power harness cover, proceed to the following procedure.

Use the following procedure to replace the power harness cover:

- Step 1** Replace the power harness cover. Hold the power harness cover with one hand, with the tab on the bottom and the open side facing away from you. Tilt the top of the panel back slightly (toward you).
- Step 2** Insert the tab on the bottom of the cover into the slot in the chassis floor. (See [Figure 5-4](#).)
- Step 3** While pushing the cover downward slightly to keep the bottom tab in the slot, push the top of the cover back over the harness wires until the sides are flush against the backplane cover. Ensure that all the harness wires are under the cover.
- Step 4** Insert the M3 screw through the top of the harness cover, and use a number 1 Phillips screwdriver to tighten it. (See the cutaway in [Figure 5-4](#).)
- Step 5** Replace the cover panel. (Follow Step 1 through Step 4 in the procedure for replacing the cover panel in the [“Removing and Replacing the Cisco 7505 Cover Panel”](#) section on page 5-3.)

This completes the power harness cover removal and replacement procedures.

Removing and Replacing the Cisco 7505 Backplane Cover

The backplane cover provides EMI and ground protection for the backplane, the arbiter, and the chassis interface (CI). To access the CI, you must remove the backplane cover using number 1 and number 2 Phillips screwdrivers. Following is the procedure for removing and replacing the backplane cover. This procedure assumes that you have already removed the chassis cover panel, the fan tray, the power harness cover, and the power harness. If not, see the appropriate sections in this publication to remove these items.

Use the following procedure to remove the backplane cover:

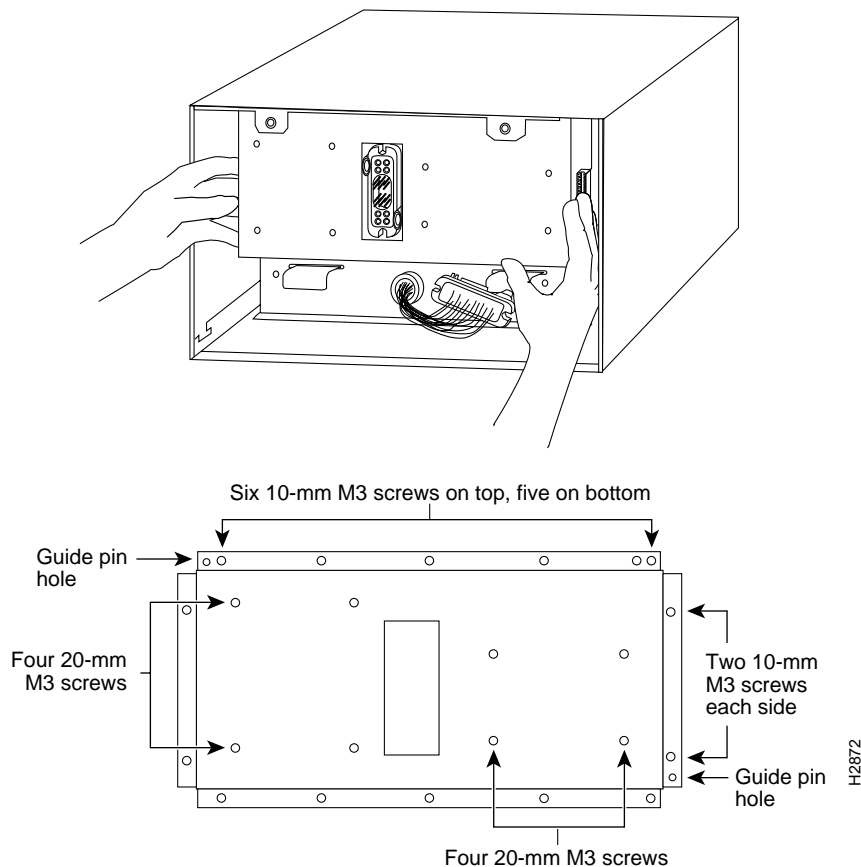
-
- Step 1** Attach an ESD-preventive strap between you and an unpainted chassis surface.
 - Step 2** With the fan tray removed, remove the eight 20-mm M3 standoff screws that secure the backplane cover to the arbiter and CI standoffs. These screws are located on the face of the backplane cover. (See [Figure 5-5](#).)
 - Step 3** Remove the fifteen 10-mm M3 Phillips that secure the backplane cover to the backplane. These screws are located around the flange of the backplane cover (two on each side, six along the top, and five along the bottom). (See [Figure 5-5](#).)

**Caution**

To prevent loosening the backplane from the chassis, remove only those screws that secure the backplane cover to the backplane. *Do not remove any adjacent screws.*

- Step 4** With all screws removed, carefully guide the backplane cover out and away from the backplane, arbiter, and CI. (See [Figure 5-5](#).)
-

Figure 5-5 Removing and Replacing the Cisco 7505 Backplane Cover



Note

See the appropriate sections depending on the replacement procedures you need to perform. Then, to replace the backplane cover, proceed to the following procedure.

Use the following procedure to replace the backplane cover:

- Step 1** Carefully guide the backplane cover into the chassis opening over the arbiter and CI, and over the guide pins on the backplane. (See [Figure 5-5](#).) Align the screw holes in the cover with the holes on the backplane and standoffs.
- Step 2** Loosely install the 15 screws around the flange of the backplane cover. (See [Figure 5-5](#).) *Do not tighten these screws.*
- Step 3** Loosely install the eight standoff screws in the face of the backplane cover.
- Step 4** Verify that the cover is aligned; then tighten all screws that secure the backplane cover.
- Step 5** Replace the fan tray. (Follow Step 1 through Step 5 in the procedure for replacing the fan tray in the [“Removing and Replacing the Cisco 7505 Fan Tray”](#) section on page 5-5.)
- Step 6** Reattach the power harness plug to the power harness receptacle. The harness plug and backplane receptacle are polarized with notches at the top of both guide tabs (top and bottom) on the plug. Ensure that the plug is fully seated in the receptacle.

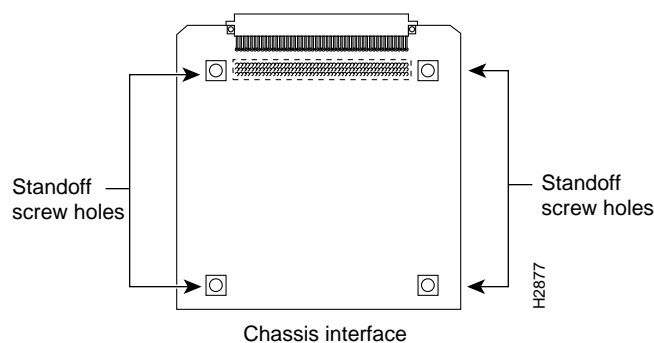
- Step 7** Replace the power harness cover. (Follow Step 1 through Step 5 in the procedure for replacing the power harness cover in the [“Removing and Replacing the Cisco 7505 Power Harness Cover”](#) section on page 5-7.)
- Step 8** Replace the cover panel. (Follow Step 1 through Step 4 in the procedure for replacing the cover panel in the [“Removing and Replacing the Cisco 7505 Cover Panel”](#) section on page 5-3.)

This completes the Cisco 7505 backplane cover removal and replacement procedure.

Removing and Replacing the Chassis Interface in the Cisco 7505

The chassis interface (CI) (shown in [Figure 5-6](#)) is a printed circuit board mounted to the noninterface processor side of the backplane, behind the backplane cover. On the back (backplane side) of the chassis are four standoffs and a connector that plugs directly into the backplane. (A spare chassis interface ships as Product Number MAS-7500CI=.)

Figure 5-6 7500 Series Chassis Interface



When the backplane cover is in place, four standoff screws extend through the backplane cover, through each corner of the CI and into the standoffs to keep both the CI and backplane cover in place.

This procedure assumes that you have already removed the chassis cover panel, the fan tray, the power harness cover, the power harness, and the backplane cover. If not, see the appropriate procedures in this section to remove these items. Replace the CI *only* if it fails.

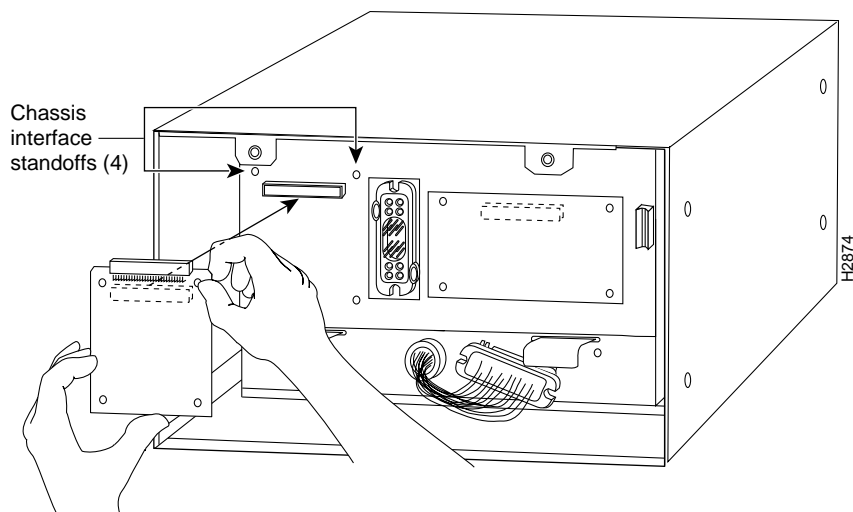
Use the following procedure to remove the CI:

- Step 1** Turn off the system power switch and disconnect the power cable from the power source.
- Step 2** Attach an ESD-preventive strap (your own or the one supplied with the FRU) between you and an unpainted chassis surface.
- Step 3** Because you already had to remove the CI standoff screws to remove the backplane cover, the CI is held in place *only* by the connector that is connected to the backplane. Grasp the edges of the CI and pull it straight out to disconnect the CI connector from the backplane socket. (See [Figure 5-7](#).)




Note If necessary, gently rock the CI from side to side *very slightly* to dislodge the pins from the backplane connector.

Figure 5-7 Removing and Replacing the CI (Cisco 7505)



Step 4 Place the CI in an antistatic bag.

Use the following procedure to replace the CI:

- Step 1** Attach an ESD-preventive strap (your own or the one supplied with the FRU) between you and an unpainted chassis surface.
- Step 2** Place your fingers around the top and side edges of the CI and push it straight in toward the backplane until the connector is fully seated in the backplane socket and the standoff screw holes in the CI are aligned with the standoffs. (See [Figure 5-7](#).)
-  **Note** It might be necessary to gently rock the connectors into place.
- Step 3** Reconnect the power harness plug to the backplane receptacle; the plug and receptacle are polarized with notches on the guide tabs. If you have trouble making the connection, ensure that the notch is at the top on both guide tabs (top and bottom) on the plug.
- Step 4** Replace the backplane cover. (Follow Step 1 through Step 8 in the procedure for replacing the backplane cover in the [“Removing and Replacing the Cisco 7505 Backplane Cover”](#) section on page 5-9.)
- Step 5** Replace the power harness cover. (Follow Step 1 through Step 5 in the procedure for replacing the power harness cover in the [“Removing and Replacing the Cisco 7505 Power Harness Cover”](#) section on page 5-7.)
- Step 6** Replace the fan tray. (Follow Step 1 through Step 5 in the procedure for replacing the fan tray in the [“Removing and Replacing the Cisco 7505 Fan Tray”](#) section on page 5-5.)
- Step 7** Replace the chassis cover panel. (Follow Step 1 through Step 4 in the procedure for replacing the chassis cover panel in the [“Removing and Replacing the Cisco 7505 Cover Panel”](#) section on page 5-3.)

This completes the CI replacement procedure for the Cisco 7505.

Removing and Replacing the Cisco 7505 Power Supply

The power supply rests on the floor of the chassis under the card cage and backplane. To remove the power supply, you must remove the chassis access cover at the noninterface processor end of the router, remove the power harness cover, and disconnect the harness from the backplane receptacle. Always pull the harness out by the connector, not by the wires. Before removing the power harness cover, ensure that the system power is turned off; otherwise, the backplane voltages become a hazard.

On the AC receptacle, located on the interface processor end of the AC-input power supply, a cable-retention clip snaps up and around the modular power cable connector to prevent the cable from accidentally being pulled out or from falling out. (See [Figure 5-8](#).) When you insert the power supply, this clip can get snagged on the chassis floor. Before inserting the supply, remove the clip or tape it up out of the way.

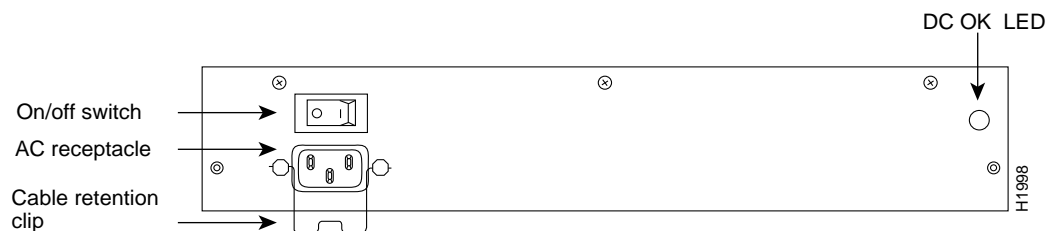
On the DC-input power supply, a nylon cable tie provides the cable strain relief. Replace this strain relief with a new nylon cable tie after you install the new DC-input power supply. The interface processor end of the DC-input power supply has a terminal block rather than the AC receptacle. (See [Figure 5-8](#).)



Warning

To prevent damage to the harness wires, always pull the connector, not the harness wires, to disconnect the power harness.

Figure 5-8 Cisco 7505 AC-Input Power Supply—Interface Processor End



The following procedure assumes you already removed the chassis cover panel, the fan tray, the power harness cover, and the power harness. If not, see the appropriate sections in this chapter. You need a number 2 Phillips screwdriver and a pair of wire cutters.

Use the following procedure to remove the power supply:

Step 1 Turn off the system power switch.



Warning

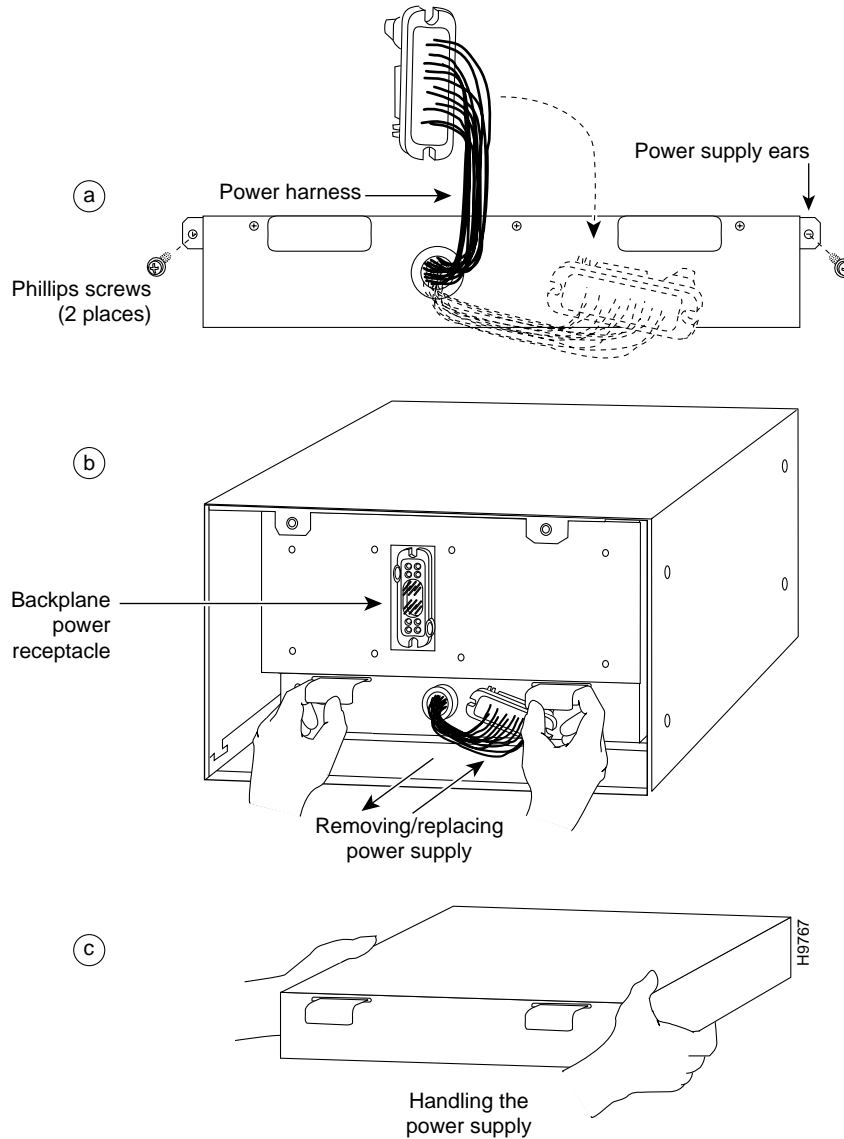
Before working on the chassis or near power supplies, disconnect the power cable on AC units or disconnect the power at the circuit breaker on DC units.

Step 2 For the AC-input power supply: Move the cable retention clip away for the power cable and disconnect the power cable from the AC receptacle.

Step 3 For the DC-input power supply: Use a wire cutter to cut the nylon cable tie that provides strain relief for the DC power cable. (You must replace this nylon cable tie with a new one after the new power supply is installed.) Remove the DC-input cable from the terminal block.

Step 4 Attach an ESD-preventive strap (your own or the one supplied with the spare) between you and any unpainted chassis surface.

Figure 5-9 Removing and Replacing the Cisco 7505 Power Supply



- Step 5** Disconnect the power harness plug from the backplane receptacle by pulling the polarized plug out of the receptacle; do not pull on the wires. (See [Figure 5-9a](#).)
- Step 6** Use a number 2 Phillips screwdriver to remove the two M4 Phillips pan-head screws that secure the power supply ears (one on each side of the power supply) to the chassis frame. (See [Figure 5-9a](#).)
- Step 7** Using both hands, grasp both of the power supply handles and pull the power supply about halfway out of the bay. (See [Figure 5-9b](#).) Then grasp the sides of the power supply and pull it out of the chassis. (See [Figure 5-9c](#).)

This completes the power supply removal procedure.

Use the following procedure to replace the power supply:

-
- Step 1** Before inserting a power supply, remove the cable retention clip from the AC receptacle on the power supply, otherwise it can catch on the floor of the chassis during the installation. Pinch the sides of the clip together until they clear the jackscrews. See [Figure 5-8](#).

**Warning**

Before working on the chassis or near power supplies, disconnect the power cable on AC units or disconnect the power at the circuit breaker on DC units.

- Step 2** Hold the power supply as shown in [Figure 5-9c](#) and slide it into the bottom of the chassis. Use the handles to push the supply all the way into the chassis until the ears on both sides are flush against the chassis frame. (See [Figure 5-9b](#).)
- Step 3** Use a number 2 Phillips screwdriver to replace the two M4 Phillips pan-head screws to secure the two power supply ears to the chassis frame.
- Step 4** Reattach the power harness plug to the backplane receptacle. The harness plug and backplane receptacle are polarized with notches at the top of both guide tabs (top and bottom) on the plug. Ensure that the plug is fully seated in the receptacle.
- Step 5** Replace the power harness cover. (Follow Step 1 through Step 5 in the procedure for replacing the power harness cover in the [“Removing and Replacing the Cisco 7505 Power Harness Cover”](#) section on [page 5-7](#).)
- Step 6** Replace the fan tray. (Follow Step 1 through Step 5 in the procedure for replacing the fan tray in the [“Removing and Replacing the Cisco 7505 Fan Tray”](#) section on [page 5-5](#).)
- Step 7** Replace the cover panel. (Follow Step 1 through Step 4 in the procedure for replacing the cover panel in the [“Removing and Replacing the Cisco 7505 Cover Panel”](#) section on [page 5-3](#).)
- Step 8** For AC-input power supplies: On the interface processor side of the power supply, replace the cable retention clip on the AC input port by pinching the sides of the retention clip together and letting the ends of the retention clip snap outward into the holes in the jackscrews.
- Step 9** For DC-input power supplies: To provide strain relief for the DC-input cable, replace the nylon cable tie (that you removed in Step 2 of the previous procedure) with a new nylon cable tie.
-

This completes the power supply replacement procedure.

