Doc. No. 78-1054-02

Arbiter Replacement Instructions

Cisco Part Number MAS-7KARB=

This document contains instructions for replacing the arbiter in the Cisco 7000 Series routers: the Cisco 7000 and the Cisco 7010. On both models, the arbiter mounts directly to the front of the backplane inside the chassis. You must turn off all system power before opening the chassis to access the arbiter.

The sections in this document include the following:

Warning You must turn OFF all system power and remove the front chassis panels to access the arbiter. The system backplane, which is exposed when the front panels are removed, carries dangerous current levels. Before opening the chassis, read “Safety Guidelines” on page 4 to avoid injury.

Product Overview

Following are brief descriptions of the Cisco 7000 Series routers and the arbiter.

Cisco 7000 Series Overview

The Cisco 7000 Series comprises the seven-slot Cisco 7000 and the five-slot Cisco 7010. Both models use the same route processor (RP), switch processor (SP), CxBus interface processors (IPs), and arbiter (MAS-7KARB). The Cisco 7000 provides five interface slots and offers a second modular power supply for redundant power. The Cisco 7010 provides three interface slots that support fewer interfaces, but which offer the same performance as the Cisco 7000 at a lower cost. Figure 1 shows the IP end of both models.

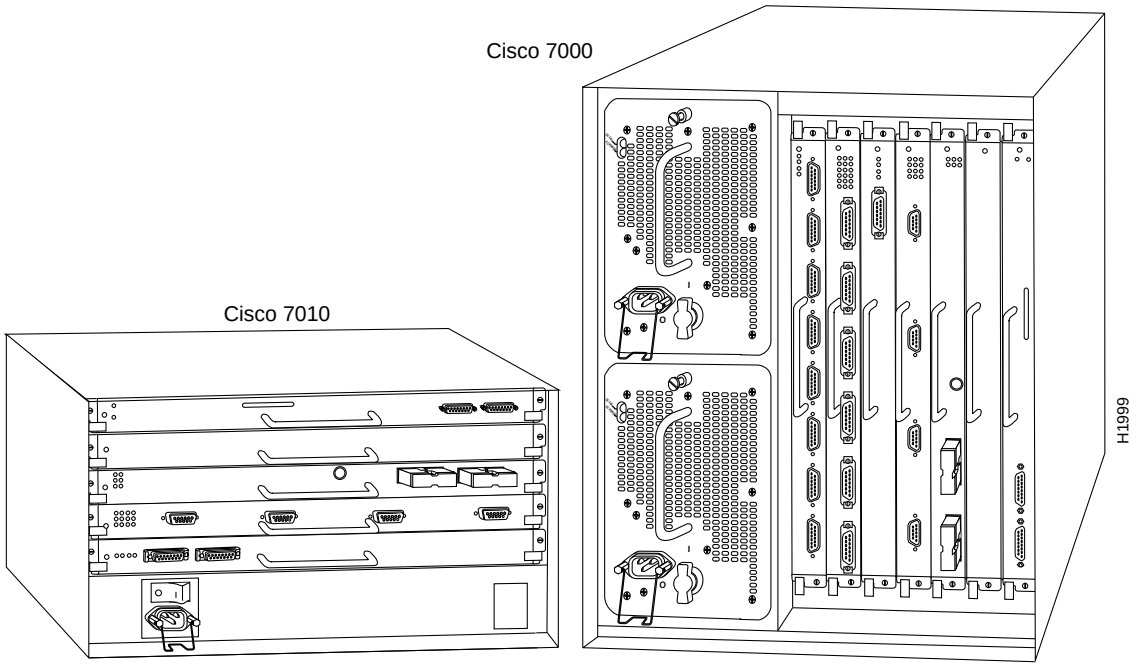

Figure 1 Cisco 7000 Series Routers

Arbiter Overview

The arbiter is a printed circuit board that is mounted to the front (non-IP side) of the backplane. The arbiter arbitrates traffic across the CxBus by prioritizing access requests from IPs to ensure that each request is processed. The arbiter provides the following services for the system:

- CxBus clock generation—The arbiter generates the 16.667 MHz clock and provides a private copy of the clock to the SP and each IP.
- CxBus arbitration—The arbiter arbitrates IP requests to transmit commands on the CxBus; arbitration is based on a round-robin priority scheme to ensure that all IPs have access to a known portion of the CxBus bandwidth.
- Global lock arbitration—The arbiter arbitrates IP and SP requests for the global lock, a synchronization primitive used to control SP and IP access to shared data structures.

Figure 2 shows the interior of the seven-slot Cisco 7000 at the front (non-IP end) of the chassis, with the top and bottom front chassis panels removed to show the internal components.

Figure 3 shows the interior of the five-slot Cisco 7010 at the non-IP end, with the cover panel removed to show the internal components.

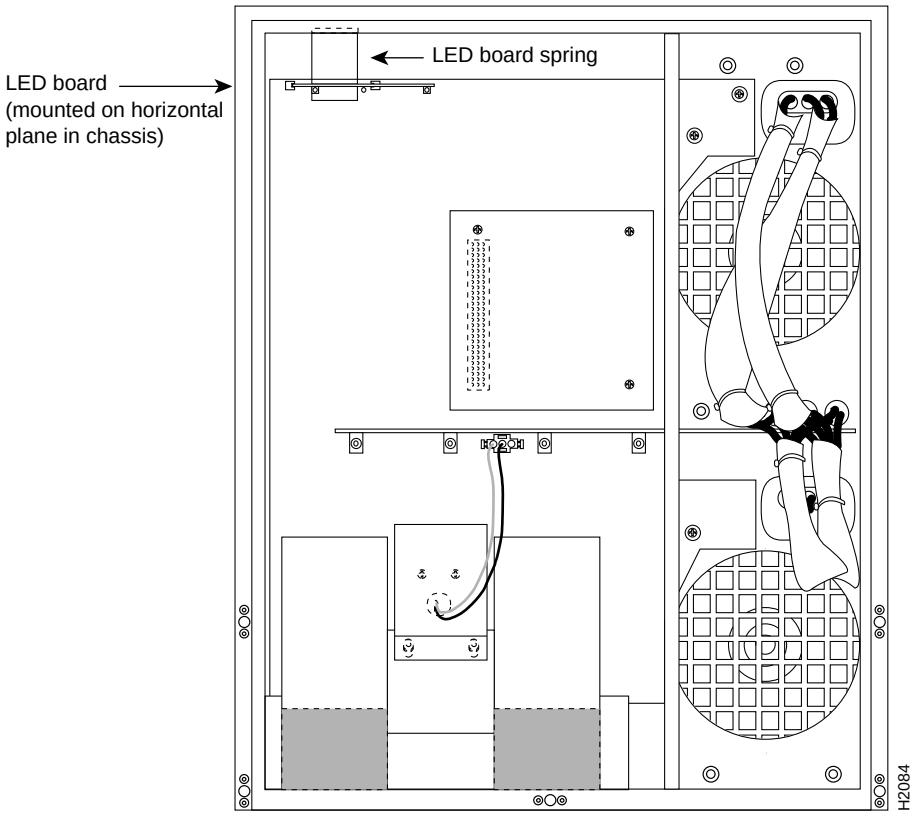

Figure 2 Cisco 7000 Internal Chassis Components, Non-IP End

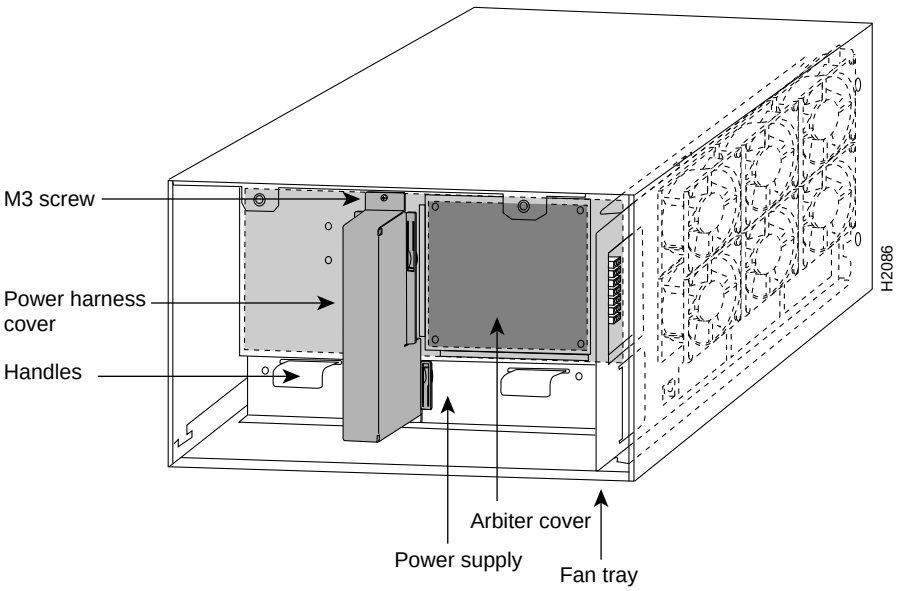

Figure 3 Cisco 7010 Internal Chassis Components, Non-IP End

On both models, a 96-pin connector on the back of the arbiter plugs into a backplane receptacle, and standoff screws secure the arbiter to the backplane. The replacement instructions that follow describe specifically how the arbiter is mounted to the backplane on each model.

Opening the chassis exposes the power distribution wiring on the backplane. If the power is not shut down, the high current present on the backplane becomes a hazard. Also, removing the cover compromises the electromagnetic interference (EMI) integrity of the system. Therefore, always make sure that the system power switch is turned off before removing any internal components or interior chassis panels.

Prerequisites

Before you begin this installation, review the safety guidelines in this section to avoid injuring yourself or damaging the equipment.

Safety Guidelines

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

- Always turn all power supplies OFF and disconnect power cords before opening the chassis. Dangerous current levels are present on the backplane when power is on.
- Do not work alone when potentially hazardous conditions exist.
- Carefully examine your work area for possible hazards such as moist floors, ungrounded power extension cables, and missing safety grounds.
- Before beginning any procedures requiring access to the chassis interior, locate the emergency power-off switch for the room in which you are working.
- Never assume that power has been disconnected from a circuit; always check.

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 has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

Preventing Electrostatic Discharge (ESD) Damage

Electrostatic discharge (ESD) damage, which can occur when electronic boards or components are improperly handled, results in complete or intermittent failures. The RP, SP, and IPs each comprise a printed circuit board that is fixed in a metal carrier. EMI shielding, connectors, and a handle are integral components of the carrier. However, the arbiter is a printed circuit board that is not intended to be handled and has no frame or shielding. Handle the arbiter by the board edges only; never touch the board components, traces, or connector pins.

Caution Handle an arbiter by the edges only; avoid touching the board components, traces, or connector pins.

Following are guidelines for preventing ESD damage:

- Always use an ESD wrist strap or ankle strap and ensure that it makes good skin contact.
- When removing or installing an arbiter, connect the equipment end of a ground strap to an unpainted surface of the chassis, such as the metal chassis frame in the Cisco 7000 model, or a power supply handle in the Cisco 7010 model.
- Handle printed circuit boards, such as the arbiter, by the edges only; avoid touching the board components, traces, or connector pins.
- Place a removed board component-side-up on an antistatic surface or in a static shielding bag. If you are returning the arbiter to the factory, immediately place it in a static shielding bag to avoid ESD damage to the board.
- Avoid contact between the board and clothing. The wrist strap only protects the board from ESD voltages on the body; ESD voltages on clothing can still cause damage.

Note For safety, periodically check the resistance value of the antistatic strap. The measurement should be within the range of 1 and 10 Mohms.

List of Parts and Tools

Following are the tools and equipment that you will need to complete this replacement:

- ESD-prevention equipment (a disposable wrist strap is included with all spares and upgrade kits)
- Antistatic mat, foam pad, or bag for the removed arbiter (immediately place a removed board into an antistatic bag if you will return it to the factory)

To replace the arbiter in a Cisco 7000 model, you also need the following tools:

- No. 2 Phillips or 3/16-inch flat-blade screwdriver to remove the top front chassis panel. Earlier chassis (the first several hundred shipped) use slotted screws, and later chassis use Phillips screws to secure the top front panel to the chassis. No tools are required to remove the bottom front chassis panel.
- No. 2 Phillips screwdriver to remove the three screws that secure the arbiter to the backplane.

To replace the arbiter in a Cisco 7010 model, you also need the following tools:

- 3/16-inch flat-blade screwdriver to loosen the captive screws on the chassis cover panel
- No. 1 Phillips screwdriver to remove the M-3 Phillips screws on the power harness cover, backplane cover, and arbiter
- No. 2 Phillips screwdriver to remove the M-4 screw on the fan tray

Replacing the Arbiter

To replace the arbiter, you must turn off all system power and open the chassis. Proceed to the appropriate replacement procedure for your Cisco 7000 Series model:

- To replace the arbiter in a seven-slot Cisco 7000 model, proceed to the following section, “Replacing the Arbiter in a Cisco 7000.”
- To replace the arbiter in a five-slot Cisco 7010 model, proceed to “Replacing the Arbiter in a Cisco 7010” on page 11.

Replacing the Arbiter in a Cisco 7000

In the Cisco 7000 model, the arbiter mounts directly to the backplane above the power bus bar. (See Figure 2.) A connector on the back of the arbiter plugs into a backplane receptacle, and three Phillips screws hold the board in place. To access the arbiter, you must turn off all system power and remove the top and bottom front chassis panels.

Warning Before accessing the chassis interior, turn all power switches to OFF (O) and unplug the power cords. Dangerous current levels are present on the backplane when the system power is on.

Removing the Cisco 7000 Front Chassis Panels

You must remove the bottom front panel before you can remove the top front panel. The inner side of the bottom front panel has ball studs that snap into the chassis frame. The top front panel is attached to the chassis with two screws. The EMI shielding around the outer edge of the top front panel acts as a spring and compresses when you push the panel into the chassis to keep the panel fitted tightly into the chassis opening.

To remove the front panels, perform the following steps:

Step 1 Grasp the bottom edge of the bottom chassis panel.

Step 2 Pull the bottom of the panel out about one inch, then place your fingers behind the sides of the panel and pull it outward and down off the chassis. (See Figure 4.)

Figure 4 Removing the Cisco 7000 Bottom Front Panel

Step 3 On the top front panel, use a screwdriver to loosen the two captive screws at the bottom edge of the panel frame.

Step 4 Place one hand against the top front center of the panel to brace it. (See Figure 5a.) The top of the panel acts as a pivot point when you pull the bottom out and away from the chassis.

Figure 5 Removing the Cisco 7000 Top Front Panel

Step 5 With your other hand, grasp the front of the panel by inserting your fingers into the opening on the underside of the bezel. (See Figure 5a.)

Step 6 While pushing slightly against the top of the panel to constrain it, pivot the bottom edge of the frame outward about two inches. (See Figure 5a.) Because of the tightly compressed EMI shielding, you will have to use significant force to pull the bottom of the panel outward. However, be careful that you do not pull the panel more than two inches away from the chassis, or you can damage the inner bezel or LED board.

Step 7 When the bottom of the frame clears the chassis opening, keep your hands in the same positions and pull the panel downward and off the chassis. (See Figure 5b.)

Removing the Arbiter

After you remove the front chassis panels, remove the existing arbiter as follows:

Step 1 If you have not already done so, slip on an ESD-prevention grounding strap. (A disposable wrist strap is included with all spare boards.) Connect the equipment end of the strap to an unpainted surface inside the chassis, such as the metal frame that is exposed when the front panels are removed.

Step 2 Locate the arbiter (see Figure 2), which is mounted directly to the upper part of the backplane above the power bus bar. The arbiter is held in place by the connector and three Phillips screws. Figure 3 shows the orientation of the arbiter on the Cisco 7000 backplane.

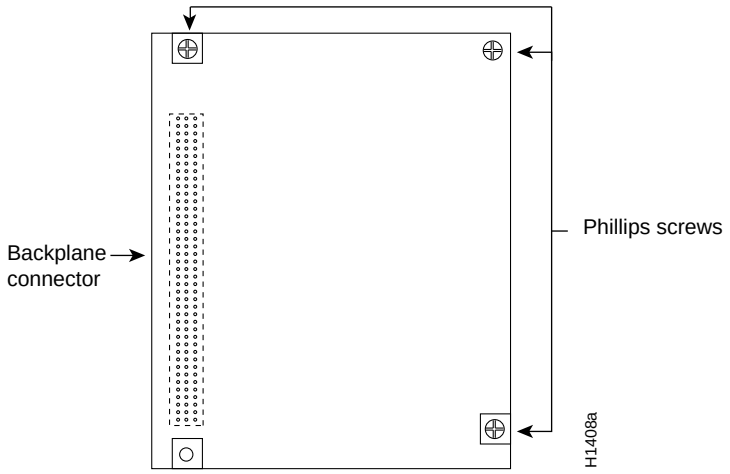

Figure 6 Arbiter, Cisco 7000 Orientation

Step 3 Use the Phillips screwdriver to loosen each of the three screws by turning each counterclockwise two full turns. When all three screws are loosened, unscrew them completely from the board and put them aside. You will need them to install the new arbiter.

Step 4 Handling the arbiter by the edges only, grasp the edges of the board and pull the board straight out, keeping the arbiter parallel to the backplane. If necessary, gently rock the board from top to bottom to dislodge the board connector from the backplane.

Step 5 Place the board in an antistatic bag for return to the factory if required.

Installing the New Arbiter

Install the new arbiter as follows:

Step 1 Ensure that the power supplies are still turned off and disconnected from the power source and that you are still wearing a ground strap.

Step 2 Handling the arbiter by the edges only, hold the board in the orientation shown in Figure 3. The connector should be on the left, on the back side of the board (the side facing away from you), and the component side of the board should be facing you.

Step 3 Holding the edges of the board with your fingers, position the arbiter bus connector over the backplane receptacle and align the three holes in the corners of the board with the standoffs on the backplane.

Step 4 Push the board straight in toward the backplane until the board connector is fully seated in the backplane connector.

Step 5 The board should be flush against the standoffs, and the holes on the top and lower right of the board should be aligned with those in the standoffs. If they are not, remove the arbiter and ensure that the pins are not damaged, then repeat steps 3 and 4.

Step 6 Replace the three Phillips screws in the top left, top right, and lower right holes in the board, and turn each two full turns to secure the board in the backplane. When all screws are in place and the board is aligned, tighten all three screws.

Step 7 Proceed to the next section to replace the top and bottom front chassis panels before you restart the system to verify the installation.

Replacing the Cisco 7000 Front Chassis Panels

Follow these steps to replace the front chassis panels:

Step 1 Grasp the sides of the top panel with both hands. (See Figure 7a.)

Step 2 Two guide tabs at the top edges of the panel fit into two slots in the top edges of the chassis opening. Tilt the top of the panel back (away from you) about 30 degrees from vertical and slide the two guide tabs into the chassis slots. (See Figure 7a.)

Step 3 Check the top of the panel and make sure it is lined up with the top of the chassis opening. Failure to align the panel at this point can result in equipment damage when performing the next step.

Step 4 Push the panel upward to push the tabs into the slots (see Figure 7a) and pivot the bottom of the panel toward the chassis until the panel frame meets the chassis. (See Figure 7b.) Maintain a steady upward pressure to keep the guide tabs in the chassis slots.

Step 5 When the panel is flush against the front of the chassis, push the panel upward until the bottom of the panel is level with the bottom of the chassis opening. (See Figure 7c.)

Step 6 While holding the panel in place, place one palm against the top front center of the panel to brace it, and place the other against the lip near the bottom edge of the frame. (See Figure 7d.)

Step 7 Push the panel upward and back into the chassis opening until the tabs on the front sides of the panel are flush against the front of the chassis. (See Figure 7d.) You will have to use significant force to compress the EMI shielding enough to fit into the opening. If the panel resists, pull it slightly downward and make sure that the panel is lined up with the top and sides of the opening in the chassis.

Step 8 When the tabs on the front sides of the panel are flush against the sides of the chassis, tighten the two captive screws in the bottom edge of the frame.

Step 9 To replace the bottom front panel, place the ball studs on the back of the panel over the holes in the front lip of the chassis and push the panel onto the chassis until the ball studs snap into place.

This completes the installation. Proceed to the next section to verify the installation.

Checking the Cisco 7000 Installation

Perform the following steps to verify that the new arbiter is installed correctly:

Step 1 Turn all power supplies back ON. The AC Power LED on all power supplies should go on. If any do not, do the following:

- If no power supply LEDs are on, or if the DC Fail LED is on, ensure that the power supply is fully inserted into the power supply bay and that the captive installation screw on the top of the supply is tightened. The switch will not turn completely to the ON (|) position unless the supply is installed correctly.
- Ensure that the power cord is fully seated in the power supply port and that the retention clip is snapped up around the cable connector.
- Check the cable connection at the power source and ensure that it is connected properly.
- If the AC Power on the power supply still fails to light, suspect a power supply failure. If a second (redundant) power supply is available and functioning properly, proceed to the next step to continue the installation checkout.

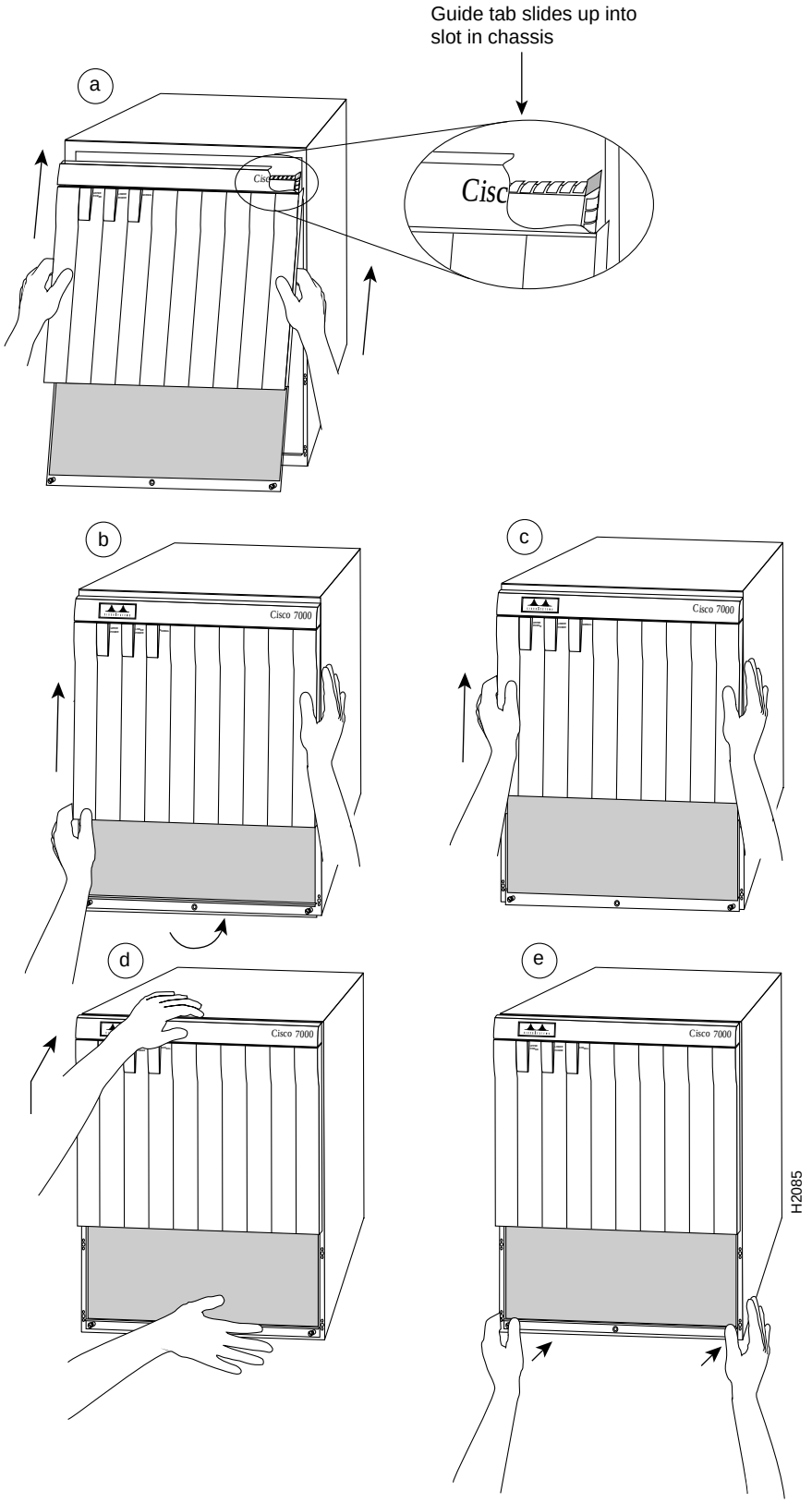

Figure 7 Replacing the Cisco 7000 Top Front Panel

Step 2 After the system software boots, verify that the RP Normal LED is on. If it is not, the system software has failed to boot properly. Do the following:

- Turn all power supplies OFF and reseat the arbiter by following steps 2 through 6 in "Installing the New Arbiter" on page 8.
- Toggle the power supplies OFF then ON again and observe the behavior of the LEDs on the RP (so that you can report it to a service representative if you need to call for technical assistance).

Step 3 Verify that the Enabled LED on the SP goes on and remains on. If it does not, and if the RP Normal LED is on, suspect that the arbiter is not installed properly. Repeat the instructions in the previous step.

If after several attempts, the arbiter does not appear to be functioning properly, or if you experience trouble with the installation (for instance, if the holes in the board do not align with the backplane holes), contact a service representative or the Technical Assistance Center (TAC). (For the TAC phone number and email address, refer to the end of this document.)

This completes the arbiter replacement in the Cisco 7000. If you are returning the arbiter to the factory, refer to "Returning Parts to the Factory" on page 20 for instructions.

Replacing the Arbiter in a Cisco 7010

In the Cisco 7010 model, the arbiter mounts directly to the non-IP side of the backplane, behind the backplane cover. (See Figure 3.) A connector on the back of the arbiter plugs into a backplane socket, and the corners of the arbiter butt up against four standoffs. When the backplane cover is in place, four long Phillips screws extend through the cover, arbiter, and standoffs to secure the cover and the arbiter to the backplane. To replace the arbiter, you must remove the chassis cover panel and remove the fan tray, power harness cover, and backplane cover.

You must remove the fan tray in order to remove the backplane cover. To remove the fan tray, you need only remove a single M-4 pan-head screw that anchors the fan tray to the interior chassis frame. The fan tray slides into the right side of the chassis (when viewing the chassis from the non-IP end).

Because the power harness cover straddles both the power supply and backplane cover, you must remove it to access the arbiter. The power harness cover shields the wiring harness that delivers DC power from the power supply to the backplane. A tab at the bottom of the cover fits into a slot in the chassis floor; a single Phillips screw secures the top of the harness cover to the backplane cover.

The backplane cover shields the non-IP side of the backplane and the arbiter (the arbiter cover is integrated with the backplane cover). Fourteen Phillips screws secure the four flanged sides of the cover to the interior chassis frame and, near the center of the cover, two additional screws secure the cover to two standoffs mounted to the backplane (behind the cover). The arbiter standoff screws secure the backplane cover and the arbiter to the four arbiter standoffs mounted to the backplane. Removing the backplane cover exposes the entire backplane, including the arbiter, which remains attached to the backplane by the 96-pin connector.

Removing the Cisco 7010 Chassis Cover Panel

The two captive slotted screws are the only fasteners on the cover panel. Five 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 panel away from the chassis opening, and as guides to align the panel when replacing it.

Warning Before opening the chassis, turn OFF the system power and unplug the power cord. When the power is on, conductors carrying high current are exposed on the fan tray and backplane.

Follow these steps to remove and replace the chassis cover panel:

Step 1 On the front of the cover panel, use a 3/16-inch flat-blade screwdriver to loosen the two captive screws. (See Figure 8.)

Step 2 Pull the top of the panel out about three inches, then grasp the sides of the panel and pull it upward and away from the chassis.

Step 3 Put the cover aside, then proceed to the next procedure to remove the fan tray.

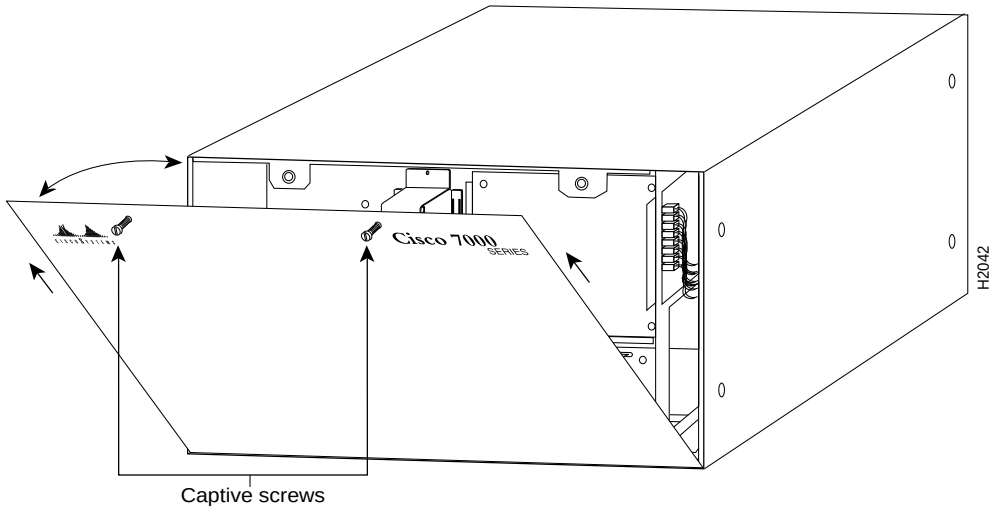

Figure 8 Removing and Replacing the Cisco 7010 Chassis Cover Panel

Removing the Fan Tray

When viewing the chassis from the non-IP end, the fan tray is on the far right. (See Figure 3.) A cutout in the front of the tray provides a handle for pulling the tray out of the chassis. An M-4 Phillips screw anchors a tab on the lower left side 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 snaps 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. Also, a bracket on the chassis ceiling helps guide the tray into the chassis. Refer to Figure 9 while performing the following procedure.

After removing the chassis cover, follow these steps to remove the fan tray:

Step 1 Put on an antistatic strap (your own or the one supplied with the spare arbiter) and connect the equipment end to a power supply handle or any unpainted surface on the chassis body.

Step 2 Locate the fan tray, which is in the far right of the non-IP end of the chassis. (See Figure 3.) On the lower left side of the fan tray, locate the tab that is anchored to the chassis frame with an M-4 Phillips screw.

Step 3 Use a No. 2 Phillips screwdriver to remove the M-4 Phillips screw that secures the fan tray.

Step 4 Grasp the cutout handle in the front of the tray and pull the fan tray straight out of the chassis. (See Figure 9.) After the fan control board connector becomes free of the backplane socket, the fan tray will slide easily along the track and out of the chassis.

Step 5 Place the removed fan tray aside and proceed to the next section to remove the power harness cover.

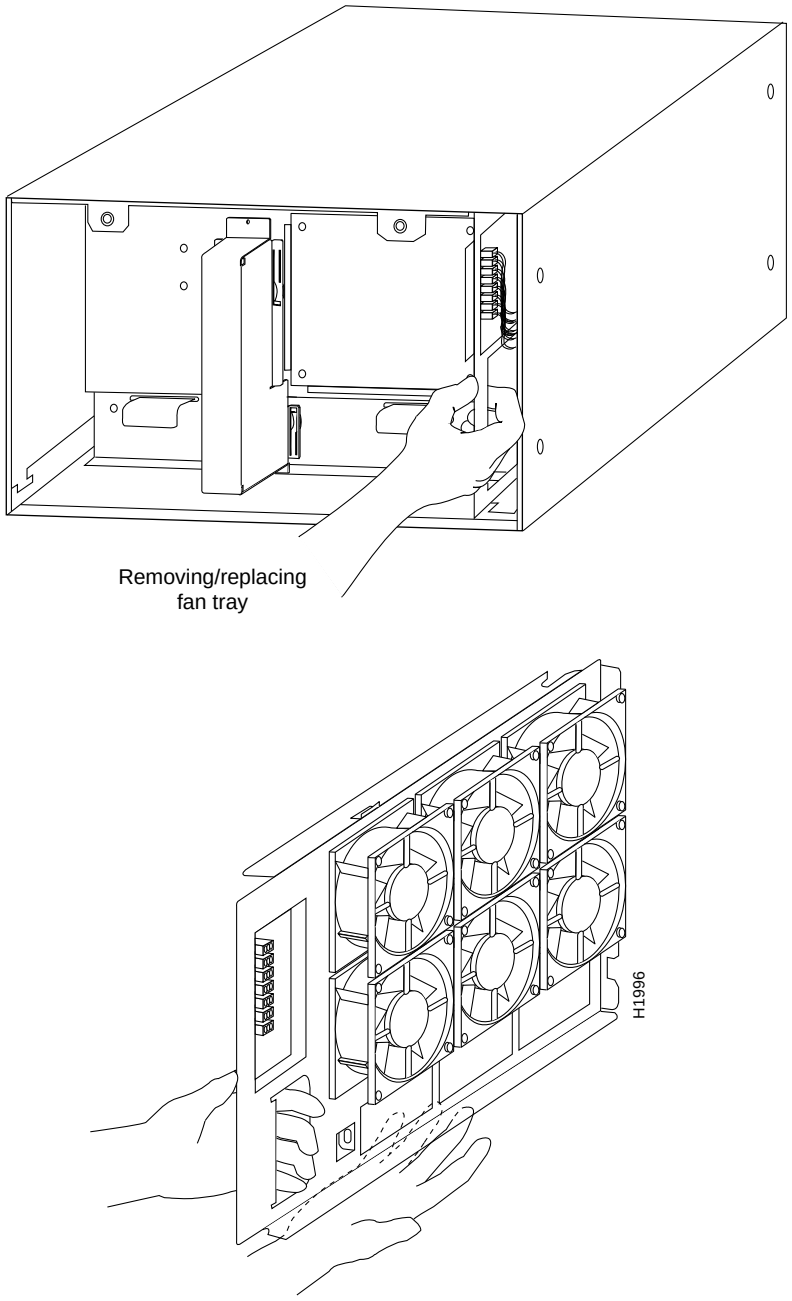

Figure 9 Removing and Replacing the Fan Tray

Removing the Power Harness and Cover

You must remove the power harness cover in order to remove the backplane cover and access the arbiter. A single M-3 Phillips screw secures the power harness cover to the backplane cover.

The power distribution wiring harness from the power supply connects to the backplane through a cutout in the backplane cover. You must disconnect the power harness before you can remove the backplane cover. When disconnecting the harness, be sure to pull the connector plug; do not pull on the harness wires. Pulling on the wires can damage the wiring and break internal connections.

After you remove the fan tray, follow these steps to remove the power harness cover:

Step 1 Locate the power harness cover, which straddles the power supply and backplane cover.

Step 2 Use a No. 1 Phillips screwdriver to remove the M-3 screw that secures the harness cover to the backplane. (See Figure 10.)

Step 3 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 4 When the tab clears the slot, pull the cover back off the harness and out of the chassis.

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 11.)

Step 6 Lay the wiring harness down on the chassis floor and proceed to the next section to remove the backplane cover.

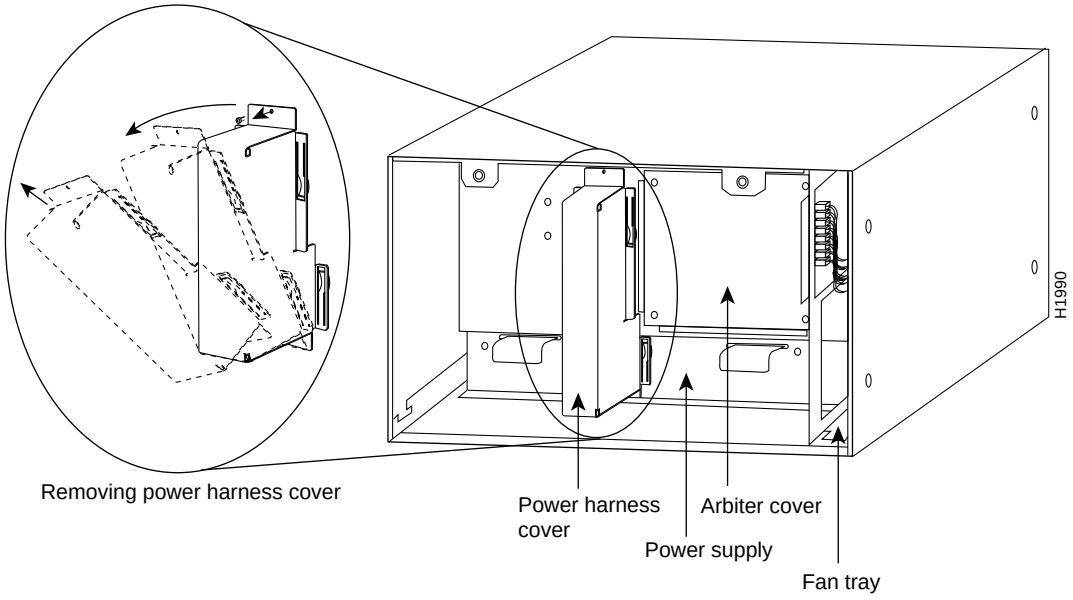

Figure 10 Removing the Power Harness Cover

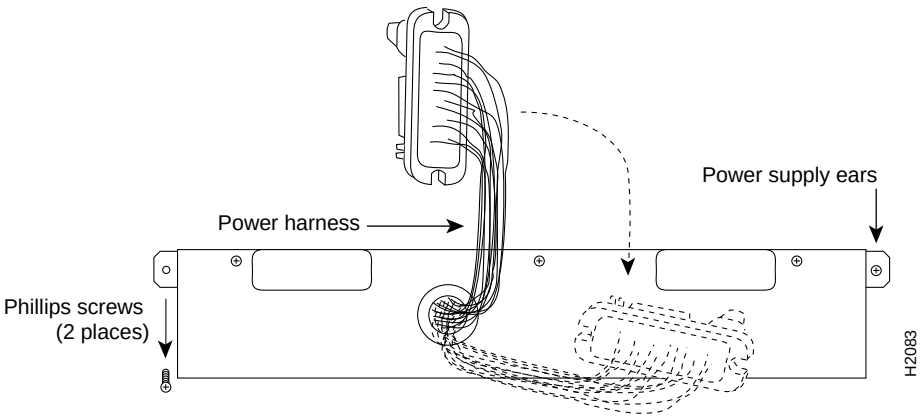

Figure 11 Disconnecting the Power Harness

Removing the Backplane Cover and Arbiter

The backplane cover is held in place with sixteen 10mm M3 pan-head screws and four 20mm M3 pan-head standoff screws. The 10mm screws secure the flanged edges of the backplane cover to the chassis frame: there are two on each side of the cover, five along the top and five along the bottom edges, and two standoffs near the center to the left of the backplane power connection. The four longer 20mm standoff screws, one at each corner of the arbiter cover, extend through the cover, arbiter, and into the backplane to anchor the arbiter.

Caution Be careful not to disconnect any backplane screws that are near the cover flanges. Before proceeding, refer to Figure 12 and locate the 20 screws so that you can remove only those that secure the backplane cover.

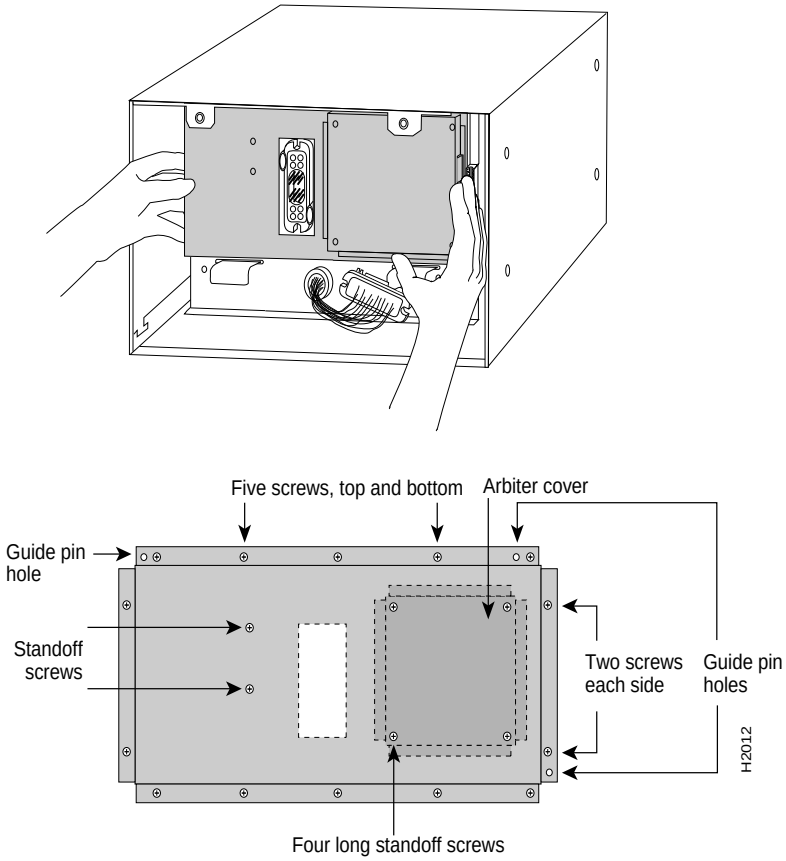

Figure 12 Removing the Backplane Cover

After you remove the power harness cover, follow these steps to remove the backplane cover:

Step 1 Use a No. 1 Phillips screwdriver to remove the sixteen 10mm M-3 Phillips pan-head screws that secure the backplane cover (two on each side, five along the top, five along the bottom, and two standoff screws near the center to the left of the backplane power connection). Be careful not to disconnect any backplane screws. (The corners of the backplane extend just beyond the corners of the backplane cover.) Remove only the screws from the aluminum cover. (See Figure 12.)

Step 2 Use a No. 1 Phillips screwdriver to remove the four longer (20mm) M-3 standoff screws from the arbiter cover. (See Figure 12.) Keep these four longer standoff screws separate so that you can replace all the screws in the proper place.

Step 3 Holding the cover at the edge of each side with your fingertips, and pull the cover straight out, away from the backplane (toward you) until it clears the three guide pins at the top and lower right corners.

Step 4 Place the removed backplane cover aside and proceed to the next section to remove the arbiter.

Removing the Arbiter

The arbiter will remain secured to the backplane by the 96-pin connector. Figures 3 and 3 show the orientation of the arbiter on the Cisco 7010 backplane.

When removing the arbiter, handle the board by the edges only to avoid damage from ESD. After you remove the backplane cover, follow these steps to remove the arbiter:

Step 1 Locate the arbiter on the right side of the backplane. The arbiter is now held in place only by the 96-pin connector that is seated in the backplane socket.

Step 2 Grasp the edges of the board and pull the board straight out from the backplane to disconnect the board connector from the backplane socket. If necessary, rock the board from side to side very slightly to dislodge the pins from the backplane.

Step 3 Place the arbiter in an antistatic bag.

Step 4 If you are returning the failed arbiter to the factory, use the packaging from the new arbiter to pack and return the old one. Refer to the specific return instructions that accompany the new arbiter, if any, or contact a service representative or the Technical Assistance Center (TAC). (For the TAC phone number and email address, refer to the end of this document.)

This completes the arbiter removal procedure; proceed to the following section to install the new arbiter.

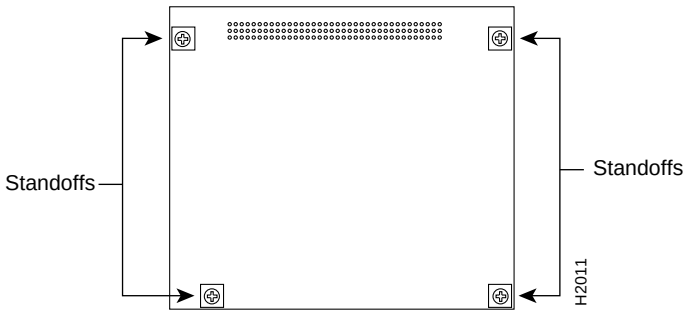

Figure 13 Arbiter, Cisco 7010 Orientation

Installing the New Arbiter

Follow these steps to install the new arbiter:

Step 1 Handling the arbiter by the edges only, hold the board in the orientation shown in Figure 3. The bus connector should be along the top, on the back side of the board (the side facing away from you), and the component side of the board should be facing you.

Step 2 Holding the edges of the board with your fingers, position arbiter bus connector over the backplane socket and align the four holes in the corners of the board with the four standoffs.

Step 3 Place your fingers around the top and side edges of the board and push the board straight in toward the backplane until the bus connector is fully seated in the backplane socket.

Step 4 The board should be flush against the standoffs, and the holes on the top and lower right of the board should be aligned with those in the standoffs. If they are not, remove the arbiter and ensure that the pins are not damaged, then repeat steps 2 and 3.

Step 5 Proceed to the next section to replace the backplane cover.

Replacing the Backplane Cover

After you install the new arbiter on the backplane, follow these steps to replace the backplane cover:

Step 1 Holding the side edges of the cover with your fingertips in the orientation shown in Figure 12, position the cover in front of the backplane, and align the holes in the top left, top right, and lower right with the guide pins. (See Figure 12.)

Step 2 Ensure that the guide pins extend through the holes in the cover, then slide the cover back towards the backplane until it is flush against the chassis frame.

Step 3 Replace the four long standoff screws at each corner of the arbiter cover, but do not tighten them until you align the cover and replace the other screws.

Step 4 Replace the 16 M-3 screws along the cover edges and in the two standoffs. When all screws are in place, tighten them all.

Step 5 Proceed to the next section to reconnect the power harness and replace the cover.

Replacing the Power Harness and Cover

After you replace the backplane cover, follow these steps to reconnect the power harness to the backplane port and replace the power harness cover:

Step 1 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 2 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). (See Figure 10.)

Step 3 Insert the tab on the bottom of the cover into the slot in the chassis floor. (See Figure 10.)

Step 4 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 of the harness wires are tucked under the cover.

Step 5 Insert the M-3 screw through the top of the harness cover and use a No. 1 Phillips screwdriver to tighten it.

Step 6 Proceed to the next section to replace the fan tray.

Replacing the Fan Tray

Before inserting the fan tray, compare the hardware inside the chassis to Figure 14. The runner on the bottom of the fan tray must slide along in the track on the floor. At the same time, the runner on the top of the tray must 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.

After you replace the power harness cover, follow these steps to replace the fan tray:

Step 1 Hold the fan tray in the position shown in Figure 9. You can hold the handle with either your right or left hand as long as you use both hands to handle the tray. However, when inserting the tray, there is little room between the tray and the right side of the chassis. Keep the tray as straight as possible, or you may have trouble inserting it into the chassis.

Step 2 Insert the top runner of the fan tray through the notch in the top of the chassis. Continue pushing the tray straight into the chassis, and ensure 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 edge connector on the fan control board snaps into the backplane socket.

Step 4 Replace the M-4 Phillips screw that secures the tab on the fan tray to the backplane, then use a No. 2 Phillips screwdriver to tighten the screw.

Step 5 Proceed to the next section to replace the cover panel.

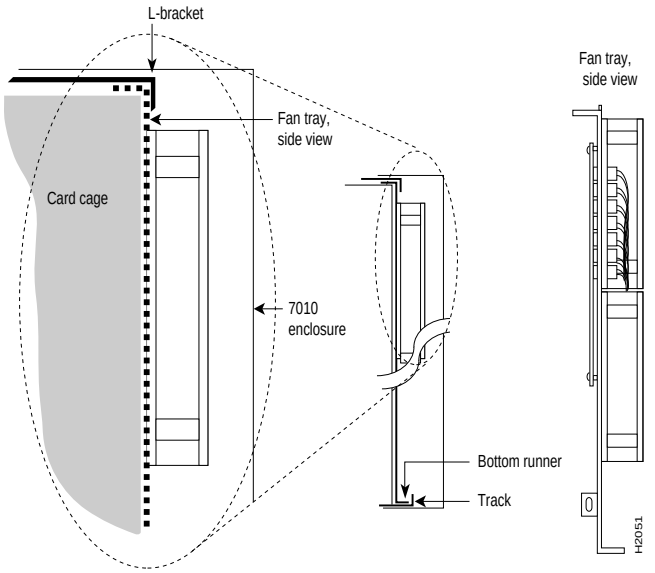

Figure 14 Fan Tray Tracks and Guides

Replacing the Cisco 7010 Chassis Cover Panel

After you replace the fan tray, follow these steps to replace the chassis cover panel:

Step 1 To replace the cover panel, hold the sides of the panel with both hands and tilt the top of the panel back slightly (toward you).

Step 2 Slide the guide tabs into the slots in the bottom edge of the chassis. (See Figure 4.)

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 slotted screws with a 3/16-inch flatblade screwdriver.

This completes the arbiter replacement. Proceed to the next section to restart the system and check the installation.

Checking the Cisco 7010 Installation

After you reassemble the chassis and replace the cover, perform the following steps to verify that the new arbiter is installed correctly and functioning properly. These steps will also help you verify that all the components that you removed or disconnected as part of this replacement procedure are returned to their previous state, when all router components (except the failed arbiter) were operating properly.

Step 1 Turn the system power switch back ON. The DC OK LED should go on immediately. If if does, proceed to the next step. If it does not, do the following:

- First ensure that the power switch is completely in the ON (|) position.
- Check the power cable, and ensure that the cord is fully inserted in the power supply receptacle, and that it is properly connected to the power source.
- If the LED still remains off, turn the power switch back OFF, remove the chassis cover, and verify that the fan tray is installed correctly. Ensure that the edge connector is fully seated in the backplane receptacle, and that the fan tray is pushed all the way back into the chassis so that the M-4 pan-head screw is tightened and holding the tab flush against the chassis frame. If not, refer to “Removing the Fan Tray” on page 12 and to “Replacing the Fan Tray” on page 18 to install the fan tray correctly, then repeat step 1.
- If the LED still remains off, turn the power switch back OFF, then remove the chassis cover and power harness cover. Verify that the power harness connector is fully seated in the backplane receptacle. Replace the power harness cover and chassis cover, then repeat step 1.
- If the DC OK LED still remains off, contact a customer service representative for further instructions. (For the TAC phone number and email address, refer to the end of this document.)

Step 2 About 10 seconds after you turn the power on, verify that the Normal LED on the RP goes on, which indicates that the system software booted successfully. If it does go on, proceed to the next step. If it does not go on, do the following:

- Reseat the arbiter to ensure that it is connected to the backplane correctly. After you turn the power switch OFF, refer to the procedures for accessing the arbiter beginning with “Removing the Cisco 7010 Chassis Cover Panel” on page 11. When you reach the arbiter, pull it out of the backplane socket, and examine the 96-pin connector (on the backplane side of the board) for bent pins or other obvious damage. If the arbiter appears damaged, contact a service representative. Otherwise, follow the instructions beginning with step 2 of “Installing the New Arbiter” on page 17.
- After you ensure that the arbiter is installed correctly and have replaced all system components, repeat step 1 of this procedure. While the system starts up, observe the behavior of the LEDs on the RP (so that you can report the behavior to a service representative if you need to call for technical assistance). If the RP Normal LED still remains off, contact a service representative for further instructions.

Step 3 Verify that the Enabled LED on the SP goes on and remains on. If it does not, and if the RP Normal LED is on, suspect that the arbiter is not installed properly. Repeat the instructions in the previous step.

If after several attempts, the arbiter does not appear to be functioning properly, or if you experience trouble with the installation (for instance, if the holes in the board do not align with the backplane holes), contact a service representative for assistance. (For the TAC phone number and email address, refer to the end of this document.)

This completes the arbiter replacement in the Cisco 7010. If you are returning the removed arbiter to the factory, refer to the next section for instructions.

Returning Parts to the Factory

If your warranty or maintenance agreement requires that you return the failed arbiter to the factory, use the packing materials from the new arbiter or spare to return the replaced arbiter. Return the old arbiter within 10 days; otherwise, Cisco will bill you for the new part.

- Place the removed arbiter in an antistatic bag, then place the bag in the shipping box from the new arbiter.
- Affix the RMA return shipping label (included with the new arbiter) to the outside of the box. If you are sending additional boxes, note the RMA number on each additional box.
- Ship the return part as follows:
  - From the United States or Canada, ship to:
    Cisco Systems, Inc.
    1335 Garrett Dr.
    Attn: RMA Dept.
    Santa Clara, CA 95054

    Customers shipping from Canada must prepare an export pro-forma/customs invoice, which must accompany the part being returned. Enclose the invoice and a pre-addressed air waybill in the clear pouch provided and affix it to the outside of the box.

    If you have any questions, please call 1 800 553-NETS or send a FAX to 1 415 903-8080.
  - From other countries (except Canada), ship to:
    Cisco Systems, Inc.
    c/o Alrod International Customs Brokers (SFO)
    1335 Garrett Dr.
    Attn: RMA Dept.
    Santa Clara, CA 95054

    To expedite your return, please ship to Cisco in care of our Customs Broker at the preceding address. Also, please note this information on your export documents and specify “U.S. Good Returned.” Be sure to prepay the return freight charges.

    If you have questions about export documents, please call Alrod International at 1 415 692-3862.

If you have questions about the order, please call 1 415 903-7208 or send a FAX to 1 415 903-8080.

Note For technical assistance, contact a service representative or the Cisco Systems Technical Assistance Center (TAC) at 800 553-2447, 415 903-7209, or `tac@cisco.com`. For upgrade or product information, contact the Customer Response Center at 800 553-6387, 415 903-7208, or `cs-rep@cisco.com`.

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This document is to be used in conjunction with the *Cisco 7000 Hardware Installation and Maintenance* and the *Cisco 7010 Hardware Installation and Maintenance* publications.