



CISCO SYSTEMS

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Upgrading the Cisco 4000 Flash EPROM Card

Cisco Product Number MEM-NP4F

This publication describes the procedures for upgrading your Cisco 4000 Flash EPROM (Flash erasable programmable read-only memory chip) card from 2 MB to 4 MB of Flash memory by the addition of eight Flash EPROMs and the replacement of a PAL (programmable array logic chip), (part number 17-1248-01 replaces 17-1186-01). Read this publication before upgrading your Cisco 4000 Flash EPROM card.

This publication contains the following sections which step you through the procedure:

- Safety Recommendations, page 1
- Safety with Electricity, page 2
- Required Tools, page 3
- Removing the Component Tray, page 3
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Warning Before working on the router, be sure the power is off and the power cord unplugged.



Caution Before opening the Cisco 4000 chassis, be sure you have discharged all static electricity from your body. Before performing procedures described in this publication, review the following sections: “Safety Recommendations,” “Safety with Electricity,” “Required Tools,” and “Removing the Component Tray.”

Safety Recommendations

Follow these guidelines to ensure general safety:

- Keep the chassis area clear and dust-free during and after installation.
- Put removed chassis covers in a safe place.

- Keep tools away from walk areas where you or others could trip over them.
- Do not wear loose clothing that could get caught in the chassis. Fasten your tie or scarf and sleeves.
- Wear safety glasses when working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.

Safety with Electricity



Warning Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or can weld to the terminals.

Follow these guidelines when working on equipment powered by electricity:

- Locate the emergency power-off switch in the room in which you are working. Then, if an electrical accident occurs, you can act quickly to shut the power off.
- Before working on the system, turn off the power and unplug the power cord.
- Disconnect all power before doing the following:
 - Installing or removing a chassis
 - Working near power supplies
 - Performing a software upgrade
- Never assume that power has been disconnected from a circuit. Always check.
- Do not work alone when potentially hazardous conditions exist.
- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, and missing safety grounds.
- If an electrical accident occurs, proceed as follows:
 - Use caution; do not become a victim yourself.
 - Turn off power to the system.
 - If possible, send another person to get medical aid. Otherwise, assess the victim's condition and then call for help.
 - Determine if the person needs rescue breathing and/or external cardiac compressions; then take appropriate action.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. It occurs when electronic printed circuit cards are improperly handled and can result in complete or intermittent failures.

Always follow ESD prevention procedures when removing and replacing cards. Ensure that the chassis is electrically connected to earth ground. Wear an ESD wrist strap, ensuring that it makes good skin contact. Connect the clip to an unpainted chassis frame surface to safely channel unwanted ESD voltages to ground. To properly guard against ESD damage and shocks, the wrist strap and cord must operate effectively.

If no wrist strap is available, ground yourself by touching the metal part of the chassis.

Required Tools

The following tools are required for the Flash EPROM card upgrade procedures:

- ESD cord and wrist strap
- Screwdrivers, No. 1 and No. 2 Phillips
- PAL extraction tool or a small flatblade screwdriver

Removing the Component Tray

To gain access to the Flash EPROM card, you must remove the component tray.



Warning Hazardous voltages may exist in or near the power supply, so *use extreme caution* when working near the power supply. Before starting any of these procedures, turn off power to the system, unplug the power cord, disconnect any cables at the ports, and connect your ESD protection.

Follow these steps to remove the component tray:

- Step 1** Turn the system power switch off.
- Step 2** Slip on your ESD-protection wristband.
- Step 3** Remove all network and power cables.
- Step 4** Loosen the (nonremovable) screw in the back of the chassis, labeled *Chassis release screw* in Figure 1.

Figure 1 Chassis Component Tray

- Step 5** Slide the component tray out of the chassis shell while facing the chassis rear panel, pulling the handle on the right side of the chassis until the safety latch catches (see Figure 2).

Figure 2 Your Hand Supporting the Component Tray During Removal



Warning Before releasing the safety latch, support the component tray from underneath either on your work surface or with your hands to prevent it from falling (see Figure 2).

Step 6 While supporting the component tray with one hand, push down on the safety latch tab while pulling out on the tray.

Step 7 Set the component tray (see Figure 3) down on your work surface.

Figure 3 Cisco 4000 Component Tray

Proceed to the section, “Adding Flash EPROM Memory.”

Adding Flash EPROM Memory

Once the Flash EPROM card is exposed, follow the procedures in this section to install additional Flash EPROMs and to replace the PAL.

Note It is not necessary to remove the Flash EPROM card for this upgrade procedure. Do not try to remove the existing Flash EPROMs; they are permanently installed..



Caution The correct placement of the Flash EPROMs and PAL is crucial. If improperly positioned, the new components could be damaged when the system is powered on. Read through all of the instructions before proceeding. To prevent damage to the EPROMs and PAL from ESD (when handling the system and its components), follow the ESD procedures described earlier. Also, be careful not to damage or scratch the printed circuit card under the EPROMs.

Installing Flash Memory EPROMs

To install the eight new Flash EPROMs in the eight open sockets (U141–U148) on the Flash EPROM card (see Figure 4), insert the Flash EPROMs in the sockets, being careful not to bend or crush any of the pins. (To straighten out a bent pin, use needle-nosed pliers.) Align the notch in the EPROM with the notch in the EPROM socket.

All the Flash EPROM sockets should now be filled (as shown in Figure 4).

Replacing the Flash EPROM Card PAL

Figure 4 shows the Flash EPROM card with all the Flash EPROM sockets fully populated as well as the PAL at location U2.

Figure 4 Flash EPROM Card

Follow these steps to replace the PAL at location U2.

- Step 1** Using the PAL extraction tool or small flatblade screwdriver, gently lift the existing PAL at location U2 out of its socket, exerting care not to damage the underlying printed circuit card. Set the old PAL (17-1186-01) aside.

- Step 2** With your fingertips, gently align the replacement PAL (part number 17-1248-01) with its socket, being careful not to bend or crush any of the pins. (To straighten out a bent pin, use needle-nosed pliers.) Align the notch in the PAL with the notch in the PAL socket.

Flash Jumper Settings

To configure the Flash EPROM card jumpers for write enable or to disable settings, refer to Figure 4. Viewing the Flash EPROM card with the notched edges on top, the software update jumper is on the upper left of the card. To allow for software update (the factory-set default), the jumper should be on the left two pins. To inhibit software update, the jumper should be on the right two pins. Refer to the appropriate software publication for more information on using Flash memory.

Replacing the Component Tray

Follow these steps to replace the component tray in the chassis shell:

- Step 1** Reinsert the component tray into the shell, pushing on the back of the tray while at the same time pressing on the chassis release screw (as shown in Figure 1) with the thumb of your right hand.
- Step 2** Retighten the chassis release screw (see Figure 1).

Note If you experience trouble during the installation or need additional upgrade or product information, contact a customer service representative or the Cisco Systems Technical Assistance Center (TAC) for assistance. TAC telephone and e-mail numbers follow: 800 553-2447, 415 903-7209, tac@cisco.com.
