



## Removing and Installing Port Adapters

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This chapter describes how to remove the PA-2CE1 port adapter from supported platforms and also how to install a new or replacement port adapter. This chapter contains the following sections:

- Handling Port Adapters, page 3-2
- Online Insertion and Removal, page 3-2
- Warnings and Cautions, page 3-3
- Port Adapter Removal and Installation, page 3-4
- Connecting a PA-2CE1 Interface Cable, page 3-7
- Setting the PA-2CE1 Jumpers, page 3-8

Each port adapter circuit board is mounted to a metal carrier and is sensitive to electrostatic discharge (ESD) damage.



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### Note

When a port adapter slot is not in use, a blank port adapter must fill the empty slot to allow the router or switch to conform to electromagnetic interference (EMI) emissions requirements and to allow proper airflow across the port adapters. If you plan to install a new port adapter in a slot that is not in use, you must first remove the blank port adapter.

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### Caution

When powering off the router, wait a minimum of 30 seconds before powering it on again.

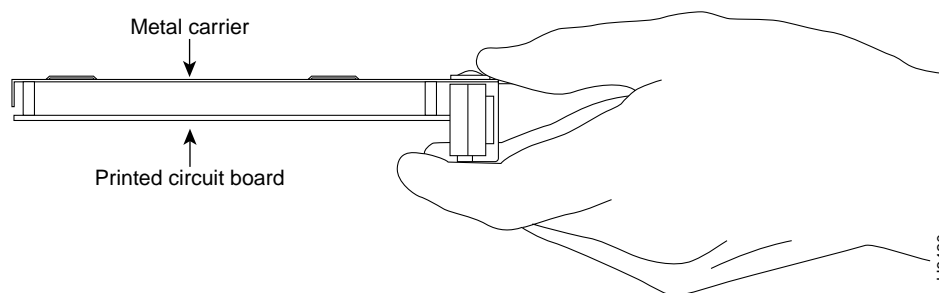
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# Handling Port Adapters


**Caution**

Always handle the port adapter by the carrier edges and handle; never touch the port adapter components or connector pins. (See Figure 3-1.)

**Figure 3-1 Handling a Port Adapter**



## Online Insertion and Removal

Several platforms support online insertion and removal (OIR) of port adapters; therefore, you do not have to power down routers when removing and replacing a PA-2CE1 in Cisco 7200 series routers.

Although the VIP2 supports online insertion and removal, individual port adapters do not. To replace port adapters, you must first remove the VIP2 from the chassis and then install or replace port adapters as required. If a blank port adapter is installed on the VIP2 on which you want to install a new port adapter, you must first remove the VIP2 from the chassis and then remove the blank port adapter.


**Caution**

To prevent system problems, do not remove port adapters from the VIP2 motherboard or attempt to install other port adapters on the motherboard when the system is operating. To install or replace port adapters, first remove the VIP2 from its interface processor slot.

It is wise to gracefully shut down the system before removing a port adapter that has active traffic moving through it. Removing a module while traffic is flowing through the ports can cause system disruption. Once the module is inserted, the ports can be brought back up.


**Note**

As you disengage the module from the router or switch, online insertion and removal (OIR) administratively shuts down all active interfaces in the module.

OIR allows you to install and replace modules while the router is operating; you do not need to notify the software or shut down the system power, although you should not run traffic through the module you are removing while it is being removed. OIR is a method that is seamless to end users on the network, maintains all routing information, and preserves sessions.

The following is a functional description of OIR for background information only; for specific procedures for installing and replacing a module in a supported platform, refer to the “Port Adapter Removal and Installation” section on page 3-4.

Each module has a bus connector that connects it to the router. The connector has a set of tiered pins in three lengths that send specific signals to the system as they make contact with the module. The system assesses the signals it receives and the order in which it receives them to determine if a module is being removed from or introduced to the system. From these signals, the system determines whether to reinitialize a new interface or to shut down a disconnected interface.

Specifically, when you insert a module, the longest pins make contact with the module first, and the shortest pins make contact last. The system recognizes the signals and the sequence in which it receives them.

When you remove or insert a module, the pins send signals to notify the system of changes. The router then performs the following procedure:

1. Rapidly scans the system for configuration changes.
2. Initializes newly inserted port adapters or administratively shuts down any vacant interfaces.
3. Brings all previously configured interfaces on the module back to their previously installed state. Any newly inserted interface is put in the administratively shutdown state, as if it was present (but not configured) at boot time. If a similar module type is reinserted into a slot, its ports are configured and brought online up to the port count of the originally installed module of that type.

**Note**

Before you begin installation, read Chapter 2, “Preparing for Installation,” for a list of parts and tools required for installation.

## Warnings and Cautions

Observe the following warnings and cautions when installing or removing port adapters.

**Caution**

Do not slide a port adapter all the way into the slot until you have connected all required cables. Trying to do so disrupts normal operation of the router or switch.

**Note**

If a port adapter lever or other retaining mechanism does not move to the locked position, the port adapter is not completely seated in the midplane. Carefully pull the port adapter halfway out of the slot, reinsert it, and move the port adapter lever or other mechanism to the locked position.

**Caution**

To prevent jamming the carrier between the upper and the lower edges of the port adapter slot, and to ensure that the edge connector at the rear of the port adapter mates with the connection at the rear of the port adapter slot, make certain that the carrier is positioned correctly, as shown in the cutaway in the following illustrations.

**Warning**

When performing the following procedures, wear a grounding wrist strap to avoid ESD damage to the card. Some platforms have an ESD connector for attaching the wrist strap. Do not directly touch the midplane or backplane with your hand or any metal tool, or you could shock yourself.

# Port Adapter Removal and Installation

In this section, the illustrations that follow give step-by-step instructions on how to remove and install port adapters. This section contains the following illustrations:

- Cisco 7200 Series—Removing and Installing a Port Adapter, page 3-5
- VIP2—Removing and Installing a Port Adapter, page 3-6

## Cisco 7200 Series—Removing and Installing a Port Adapter

### Step 1

To remove the port adapter, place the port adapter lever in the unlocked position. (See A.) The port adapter lever remains in the unlocked position.

### Step 2

Grasp the handle of the port adapter and pull the port adapter from the router, about halfway out of its slot. If you are removing a blank port adapter, pull the blank port adapter completely out of the chassis slot.

### Step 3

With the port adapter halfway out of the slot, disconnect all cables from the port adapter. After disconnecting the cables, pull the port adapter from its chassis slot.

### Step 4

To insert the port adapter, carefully align the port adapter carrier between the upper and the lower edges of the port adapter slot. (See B.)

### Step 5

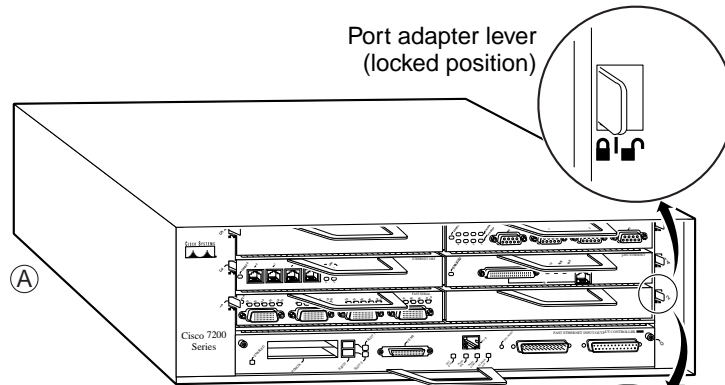
Carefully slide the new port adapter halfway into the port adapter slot. (See B.)

### Step 6

With the port adapter halfway into the slot, connect all required cables to the port adapter. After connecting all required cables, carefully slide the port adapter all the way into the slot until the port adapter is seated in the router midplane.

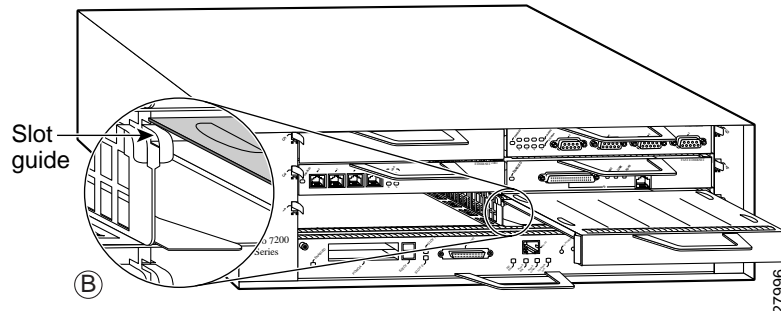
### Step 7

After the port adapter is properly seated, lock the port adapter lever. (See A.)



Note: This adapter removal applies to any port or service adapter.

Port adapter lever (unlocked position)



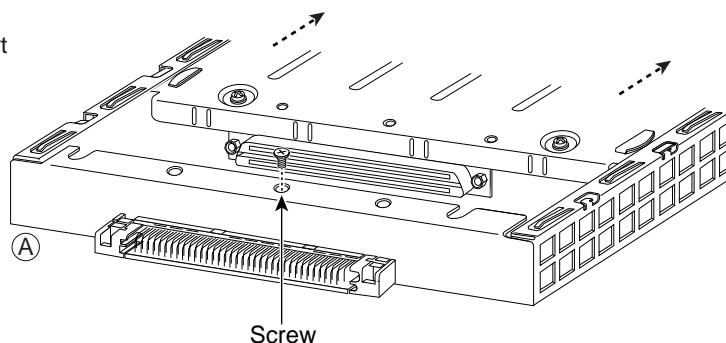
## Cisco uBR7200 Series—Removing a Port Adapter

## VIP2—Removing and Installing a Port Adapter

Note: You must first remove the VIP from the chassis before removing a port adapter from the VIP.

### Step 1

To remove the port adapter, remove the screw that secures the port adapter (or blank port adapter). (See A.)

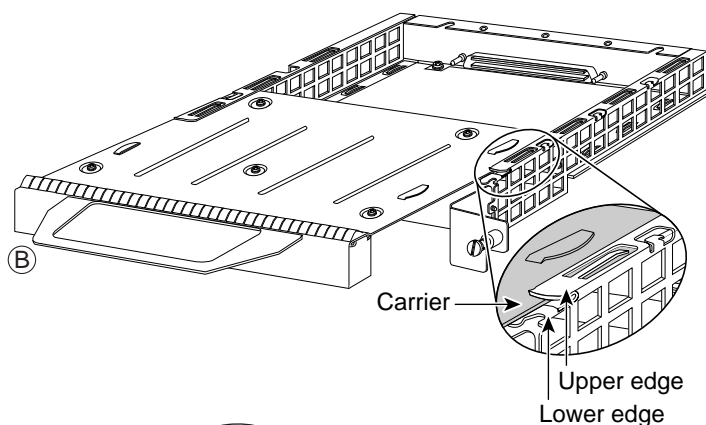


### Step 2

With the screw removed, grasp the handle on the front of the port adapter (or blank port adapter) and carefully pull it out of its slot, away from the edge connector at the rear of the slot. (See A.)

### Step 3

To insert the port adapter, carefully align the port adapter carrier between the upper and the lower edges of the port adapter slot. (See B.)

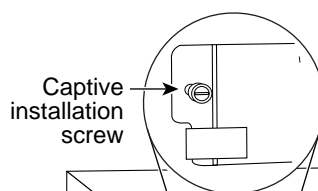


### Step 4

Carefully slide the new port adapter into the port adapter slot until the connector on the port adapter is completely seated in the connector at the rear of the port adapter slot. (See B.)

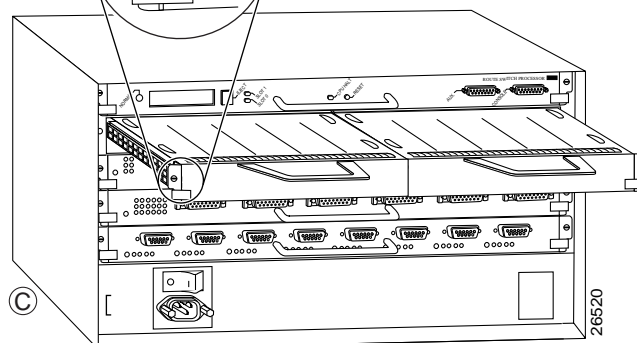
### Step 5

Install the screw in the rear of the port adapter slot on the VIP. Do not overtighten the screw. (See A.)



### Step 6

Carefully slide the VIP motherboard into the interface processor slot until the connectors at the rear of the VIP are completely seated in the connectors at the rear of the interface processor slot. Use the ejector levers to seat the VIP in the interface processor slot. Tighten the captive installation screws on the VIP. (See C.)



# Connecting a PA-2CE1 Interface Cable

On a single PA-2CE1, you can use up to two G.703 serial connections.

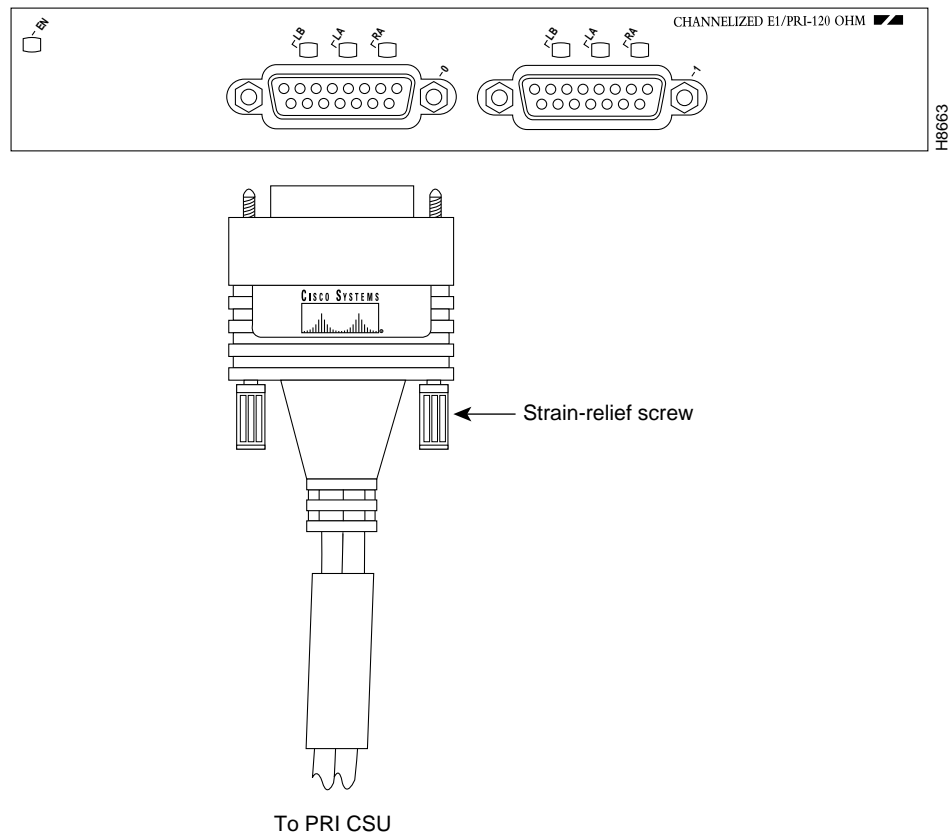
Use the following procedure to connect a PA-2CE1 interface cable:

- Step 1** Attach the cable directly to the receptacle on the PA-2CE1 and tighten the strain-relief screws. (See Figure 3-2.)



**Note** Port adapters have a handle attached, but this handle is not shown to allow a detailed view of each port adapter faceplate.

**Figure 3-2** Connecting a PA-2CE1 Interface Cable (Front View—Shown without Handle)



- Step 2** Attach the network end of the cable to your Primary Rate Interface (PRI) channel service unit (CSU) and tighten the strain-relief screws.
- Step 3** Repeat Step 1 and Step 2 for additional cables you want to install.

This completes the procedure for attaching a PA-2CE1 interface cable.

## Setting the PA-2CE1 Jumpers

configuration of both PA-2CE1 interfaces for balanced 120-ohm connections or unbalanced 75-ohm connections. 75-ohm connections on the 2CE1 printed circuit board See the “Cables, Connectors, and Pinouts” section on page 1-3 for 2CE1 interface cable types. The following steps explain how to set 2CE1 jumpers for or unbalanced 75-ohm connections.

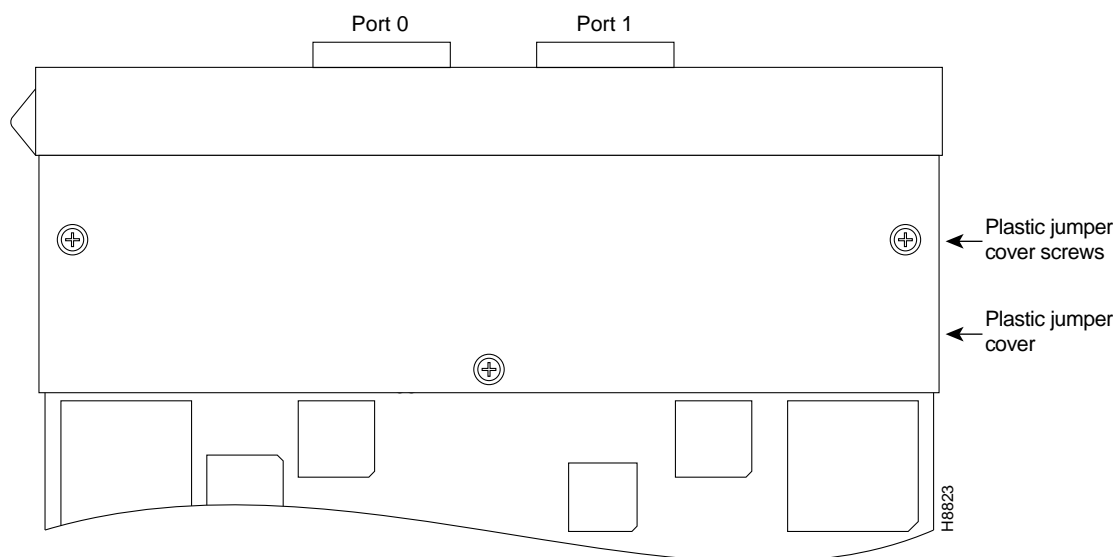


### Note

Both 2CE1 ports must be configured for balanced 120-ohm or unbalanced 75-ohm connections. The PA-2CE1 does not support a mixed connection configuration.

- Step 4** *Second-Generation Versatile Interface Processor (VIP2) Installation and Configuration*
- Step 5** Remove the installed PA-2CE1 from the VIP2. See the “VIP2—Removing and Installing a Port Adapter” section on page 3-6 for port adapter removal procedures.
- Step 6** With the PA-2CE1 on an antistatic mat, use a number 1 Phillips screwdriver to remove the three screws that secure the plastic jumper cover to the 2CE1 printed circuit board. (See Figure 3-3.) Save the screws.

**Figure 3-3** Removing the Jumper Cover (Bottom View of the PA-2CE1)



- Step 7** Set the ten jumpers on the 2CE1 printed circuit board for balanced 120-ohm or unbalanced 75-ohm interface connections.

Jumper locations J2, J3, J5, J8, J9, J11, J12, and J14 have three pins, and jumper locations J4 and J10 have two pins. Each jumper location is configured by placing an insulated jumper over two pins (leaving the third pin of a three-pin jumper location exposed). In balanced 120-ohm configurations, the insulated jumper covers both pins of jumper locations J4 and J10. In unbalanced 75-ohm configurations, the insulated jumper is not present on jumper locations J4 and J10. Table 3-1 lists the 2CE1 jumper locations and their jumper settings. Figure 3-4 and Figure 3-5 show balanced 120-ohm and unbalanced 75-ohm 2CE1 jumper configurations, respectively.



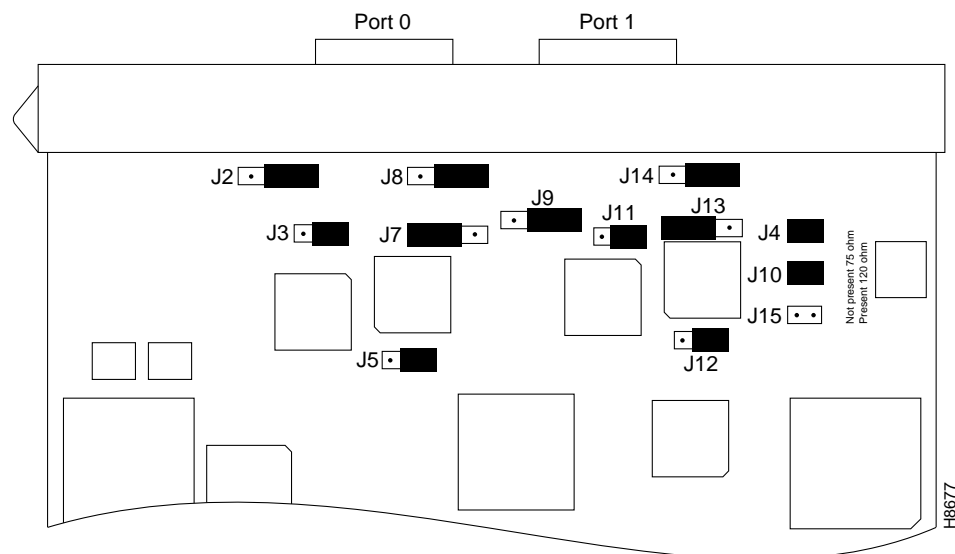
Note

In balanced 120-ohm and unbalanced 75-ohm configurations, an insulated jumper covers the left two pins of jumper locations J7 and J13; it is not present on jumper location J15. (See Table 3-1.)

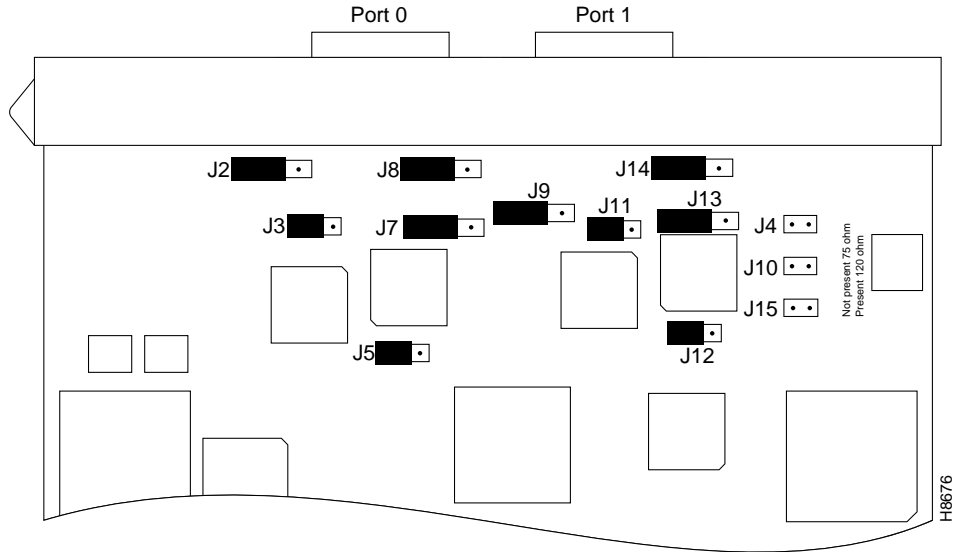
**Table 3-1 2CE1 Jumper Locations and Settings**

Balanced 120-Ohm Configuration		Unbalanced 75-Ohm Configuration	
Jumper Location	Jumper Setting	Jumper Location	Jumper Setting
J2	Right two pins	J2	Left two pins
J3	Right two pins	J3	Left two pins
J5	Right two pins	J5	Left two pins
J7	Left two pins	J7	Left two pins
J8	Right two pins	J8	Left two pins
J9	Right two pins	J9	Left two pins
J11	Right two pins	J11	Left two pins
J12	Right two pins	J12	Left two pins
J13	Left two pins	J13	Left two pins
J14	Right two pins	J14	Left two pins
J4	Present	J4	Not present
J10	Present	J10	Not present
J15	Not present	J15	Not Present

**Figure 3-4 2CE1 Balanced 120-Ohm Jumper Configuration (Bottom View of the PA-2CE1—Cover Removed)**



**Figure 3-5** 2CE1 Unbalanced 75-Ohm Jumper Configuration (Bottom View of the PA-2CE1—Cover Removed)



- Step 8** Replace the plastic jumper cover over the 2CE1 jumpers and secure it to the port adapter printed circuit board using a number 1 Phillips screwdriver and the screws that you saved in Step 6.
- Step 9** Replace the PA-2CE1 in the VIP2. See the “VIP2—Removing and Installing a Port Adapter” section on page 3-6 for port adapter replacement procedures.

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*Second-Generation Versatile Interface Processor (VIP2) Installation and Configuration*