CHAPTER 5

Additional Components

This chapter explains how to install the following additional components in your LightStream 2020 multiservice ATM switch (LS2020 switch):

- Switch cards
- Network processor (NP) modules
- Power trays
- Line cards

In performing the procedures in this chapter, it is assumed that your LS2020 switch has been operational for some time and that you now wish to install new components in the chassis.

You can install additional components in the chassis and make them fully operational without rebooting the system or disrupting normal operations. However, installing a switch card may present a special circumstance, as described in the section entitled "Installing a Switch Card."

Caution Before adding components to the LS2020 chassis, read the section "Safety Precautions" in the preface entitled "About This Manual." If you handle components without taking appropriate ESD precautions, damage to the system may result.

Installing a Switch Card

To install an additional switch card, perform the following steps:

Step 1 Remove the front and rear blank filler panels on the LS2020 chassis that correspond to the switch card slot (A or B) in which you intend to install the new switch card.

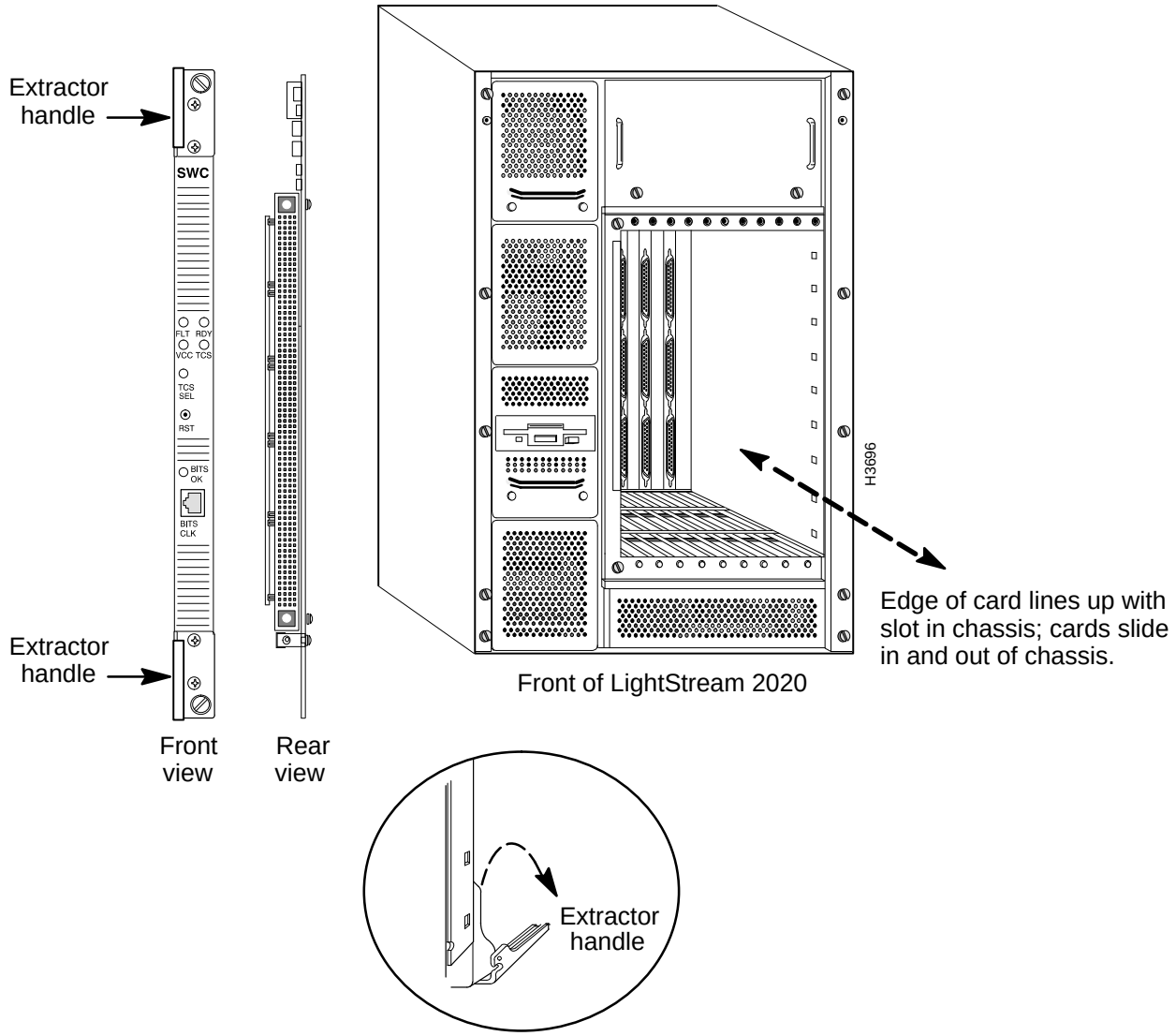
Step 2 Insert the new switch card into the unoccupied slot (A or B) in the front of the LS2020 chassis (see Figure 5-1). Seat the card firmly in the midplane.

Step 3 Lock down the extractor handles on the new switch card and tighten the screws adjacent to the handles to secure the card in the chassis.

Step 4 To provide sufficient working space within the chassis to attach the free end of the modem/console assembly ribbon cable (see Figure 5-2) to its mating connector on the midplane, you may have to temporarily remove one or more adjacent filler panels or access cards from the rear of the chassis.

Make this determination and proceed accordingly. Carefully set aside for the moment any removed filler panels or access cards.

Figure 5-1 LS2020 Switch Card Replacement



Step 5 Attach the free end of the modem/console assembly ribbon cable to its mating connector on the midplane. Make sure the ribbon cable is firmly seated. Install the modem/console assembly into the appropriate slot in the rear of the chassis directly opposite the new switch card. Secure the modem/console assembly by tightening down the mounting screws.

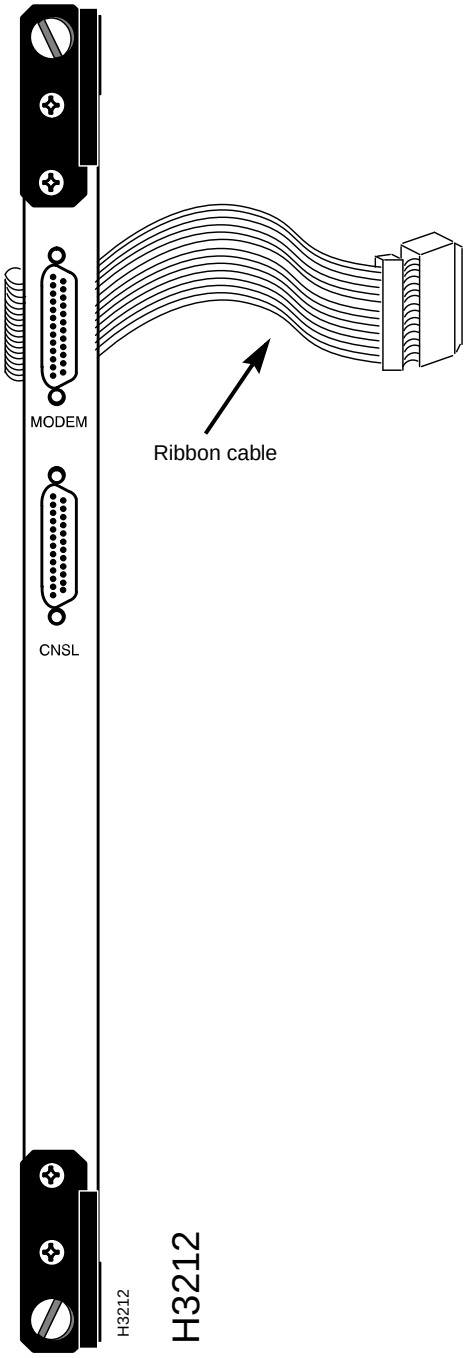
Step 6 Re-install any filler panels or access cards removed in Step 4.

Step 7 Ensure that flash memory contents of the existing switch card and the newly installed switch card are at the same revision level. Flash memory contains executable code that is essential to proper switch card operation. Thus, flash memory for cards of the same type in an LS2020 chassis must be identical.

For detailed information about verifying and loading flash memory in a newly installed switch card, refer to the *LightStream 2020 Hardware Reference & Troubleshooting Guide.*

Note After completing this procedure, check the front and back of the system to ensure that all boards, disks, blowers, bulkheads, filler panels, and covers are in place and secured firmly to the chassis. When in place, these items form an enclosure that prevents electromagnetic radiation and maintains the flow of cooling air through the chassis.

Figure 5-2 LS2020 Console/Modem Assembly



Installing an NP Module

To install a backup NP module (consisting of an NP card, an NP access card, and a disk assembly), perform the following steps:

Step 1 Unscrew and remove the cover panel on the empty disk assembly slot on the left front side of the LS2020 chassis.

Warning When you remove this cover panel, live circuitry in the LS2020 chassis is exposed. Do not insert hands or tools into the chassis or the disk assembly when installing a new NP module.

Step 2 Slide the new disk assembly into the enclosure. When the connector pins begin to engage, push gently to avoid pin damage. Seat the disk assembly firmly in place.

Step 3 Tighten the two screws on the disk assembly that secure it to the chassis.

Step 4 Remove both the front and rear blank filler panels from the slot in the LS2020 chassis where you intend to install the new NP module.

Step 5 Insert the new NP card into the unoccupied slot (slot 1 or 2) in the left front side of the chassis. Seat the new NP card firmly in the midplane.

Step 6 Lock down the extractor handles on the new NP card. Tighten the screws adjacent to the handles to secure the NP card in the slot.

Step 7 Insert the new NP access card in the unoccupied slot (slot 1 or 2) in the right rear side of the chassis directly opposite the newly installed NP card. Seat the NP access card firmly in the midplane.

Step 8 Lock down the extractor handles on the new NP access card. Tighten the screws adjacent to the handles to secure the NP access card in the slot.

Note Check the front and back of the system to ensure that all boards, disks, blowers, bulkheads, filler panels, and covers are in place and firmly secured to the chassis. When in place, these enclosures prevent electromagnetic radiation and maintain the flow of cooling air through the chassis.

Step 9 Ensure that the platform software installed on each hard disk is at the same revision level.

Note A disk assembly is shipped containing the most recently released version of platform software.

The new disk assembly that you just installed may contain a later version of platform software than your older hard disk. In this case, you can either install the latest software on the older hard disk, or install older software on the new hard disk.

You can determine the version number of the platform software installed on each NP hard disk by observing the herald when you start the CLI or by issuing either of the following CLI commands from the console:

```
cli> show chassis all
cli> show chassis general
```

The **show chassis all** command displays extensive information about the LS2020 switch, including lines which identify the LS2020 release number (for example, *R2.2*) and the platform software version number (for example, *Software Version: xxxx*). The **show chassis general** command also displays these lines, but with a less extensive set of chassis information.

Step 10 Install the new platform software on the LS2020 hard disk, if necessary. Refer to the *LS2020 Network Operations Guide* for applicable procedures.

Step 11 Ensure that Flash memory contents of the existing NP card and the newly installed NP card are at the same revision level. Flash memory is executable code essential to proper LS2020 operation. Hence, Flash memory for cards of like type in an LS2020 chassis must be identical.

For detailed information about verifying and loading Flash memory in a newly installed NP card, refer to the *LightStream 2020 Hardware Reference & Troubleshooting Guide.*

Step 12 Follow the instructions in the chapter entitled "Installing Network Management Software Applications." Refer to the section entitled "Basic LS2020 Configuration Tasks" in this chapter to accomplish applicable configuration procedures by means of your NMS.

Step 13 Use the StreamView configurator software to configure the new NP card for use in your LS2020 switch. Load the updated configuration information into the LS2020 node. See the *LightStream 2020 Configuration Guide* for information about using the StreamView configurator.

Note If you intend to remove an NP card from the chassis (whether it is redundant or not), or if you intend to remove a nonredundant switch card from the chassis, you should first issue the **reboot -n** command, as a precautionary measure, to kill any UNIX process(es) that may be active on the node. In an LS2020 chassis equipped with a redundant switch card, you can remove the secondary switch card at any time. However, removing the primary switch card will result in a momentary disruption of service until cutover to the secondary switch card occurs. You can avoid this momentary disruption of service by forcing the switch card to become active (or backup) by means of CLI commands, as described in the *LightStream 2020 Network Operations Guide*. Thus, you need not power down/power up the chassis or deactivate/activate the applicable slot when removing an NP card or nonredundant switch card from the chassis; nevertheless, you should issue the **reboot -n** command for the reason stated above before removing these components from the chassis.

Installing Power Trays

The procedures in this section explain how to install both AC and DC power trays. Figure 2-5 shows the location of power trays at the rear of the LS2020 chassis.

Installing AC Power Trays

To install a second AC power tray, perform the following steps:

Step 1 Remove the cover panel on the empty power tray slot at the back of the LS2020 chassis.

Warning When you remove the power tray cover, high AC voltage levels, as well as 48VDC, are exposed. Exercise care to touch only the front lip and sides of the power tray. Do not insert hands or tools into the power supply tray or elsewhere in the chassis.

Step 2 Slide the new power tray into the chassis. Ensure that the power tray seats snugly.

Step 3 Tighten the two screws that secure the power tray assembly to the chassis.

Step 4 Do the following, as appropriate:

- *If you are installing a Release 2.1AC power tray* (equipped with a circuit breaker and power inlet), secure it in place with the two captive screws. Connect the AC power cord.
- *If you are installing a Release 1 AC power tray* (not equipped with a circuit breaker and power inlet), replace the cover panel that you removed in Step 1 and secure it in place with the two captive screws.

Step 5 Turn on system power.

Step 6 Verify that the green LED power indicator is lit.

On power trays equipped with a circuit breaker, the LED is below the switch. On power trays not equipped with a circuit breaker, the LED power indicator is built into the power tray and is visible through the power tray cover.

Note When you complete this procedure, check the front and back of the system to ensure that all boards, disks, blowers, bulkheads, filler panels, and covers are in place and secured to the chassis. When in place, these items form an enclosure that prevents electromagnetic radiation and maintains the flow of cooling air through the chassis.

Installing DC Power Trays

To install a second DC power tray, you must first accomplish an orderly power shutdown (see the following section, “Performing Orderly Shutdown”). After doing so, proceed to the section “Installing Power Trays” later in this chapter.

Performing Orderly Shutdown

This section explains how to shut down an LS2020 switch gracefully. Two procedures are presented: one for LS2020 switches equipped with two NPs, and one for switches equipped with a single NP.

Shutting Down Switch with Two NPs

To shut down a system with two NPs, perform the following steps:

Step 1 Alert anyone who may be affected by a shutdown that you are planning to take the LS2020 system out of service.

Step 2 Log in to the root account on the LS2020 switch you want to shut down.

Step 3 Determine which NP is active (primary) by starting the CLI and issuing the command **`show chassis general`**. In the resulting display, look for the entry “Slot of Primary NP.” Opposite this entry will be the number “1.” This number identifies the NP that you will reboot **last**.

Step 4 Log in to the backup NP (the one whose slot number was ***not*** displayed in Step 3 above and do the following:

- Enter `'.` to obtain the TCS hub prompt.
- At the TCS hub prompt, issue the command **`connect <slot#>`** to connect to the backup NP. (In this step, it is assumed that you are connecting to the NP in slot 2.)

  `TCS` **`hub<<A>> connect 2`**

- Log in to the root account.

Step 5 From the prompt, enter the following:

`bash#` **`reboot -n`**

Step 6 Enter `'.` to return to the TCS hub prompt.

Step 7 At the prompt, issue the command **`connect <slot#>`** to connect to the primary (active) NP. (In this step, it is assumed that you are connecting to the NP in slot 1.)

`TCS` **`hub<<A>> connect 1`**

Step 8 If necessary, enter the **`quit`** command to exit from the CLI and return to the `bash#` prompt.

Step 9 From the prompt, enter the following:

`bash#` **`reboot -n`**

Step 10 Turn off system power.

Shutting Down Switch with Single NP

To shut down a system with a single NP, perform the following steps:

Step 1 Alert anyone who may be affected by a shutdown that you are planning to take the LS2020 system out of service.

Step 2 Log in to the root account on the switch that you plan to shut down.

Step 3 From the `bash#` prompt, enter the following:

`bash#` **`reboot -n`**

Step 4 Turn off system power.

Installing Additional Power Trays

To install an additional power tray, perform the following steps:

Step 1 At the back of the LS2020 chassis, unscrew and remove the cover panel on the empty power tray slot.

Warning When you remove the power tray cover, 48VDC is exposed. Exercise care to touch only the front lip and sides of the power tray. Do not insert hands or tools into the power supply tray or elsewhere in the chassis.

Step 2 Slide the new power tray into the chassis. Ensure that the power tray seats snugly.

Step 3 Tighten the two mounting screws to secure the power tray assembly to the chassis.

Step 4 Reconnect the power wires and alarm wires (if any) to the terminals on the front of the power tray. (For detailed instructions, see the section “Wiring a DC-Powered System” in the “Hardware Installation” chapter.)

Note Check the front and back of the LS2020 to ensure that all boards, disks, blowers, bulkheads, filler panels, and covers are in place and firmly secured to the chassis. When in place, these items form an enclosure that prevents electromagnetic radiation and maintains the flow of cooling air through the chassis.

Step 5 Turn on system power.

Step 6 Verify that the green LED power indicator below the circuit breaker switch on the power tray is lit.

Installing a Line Card

Adding a new interface to an LS2020 switch requires that you install, in matching slots, both a line card in the front of the chassis and an access card in the back of the chassis.

This section describes how to install additional line cards. However, before performing this procedure, note the installation considerations in the following section.

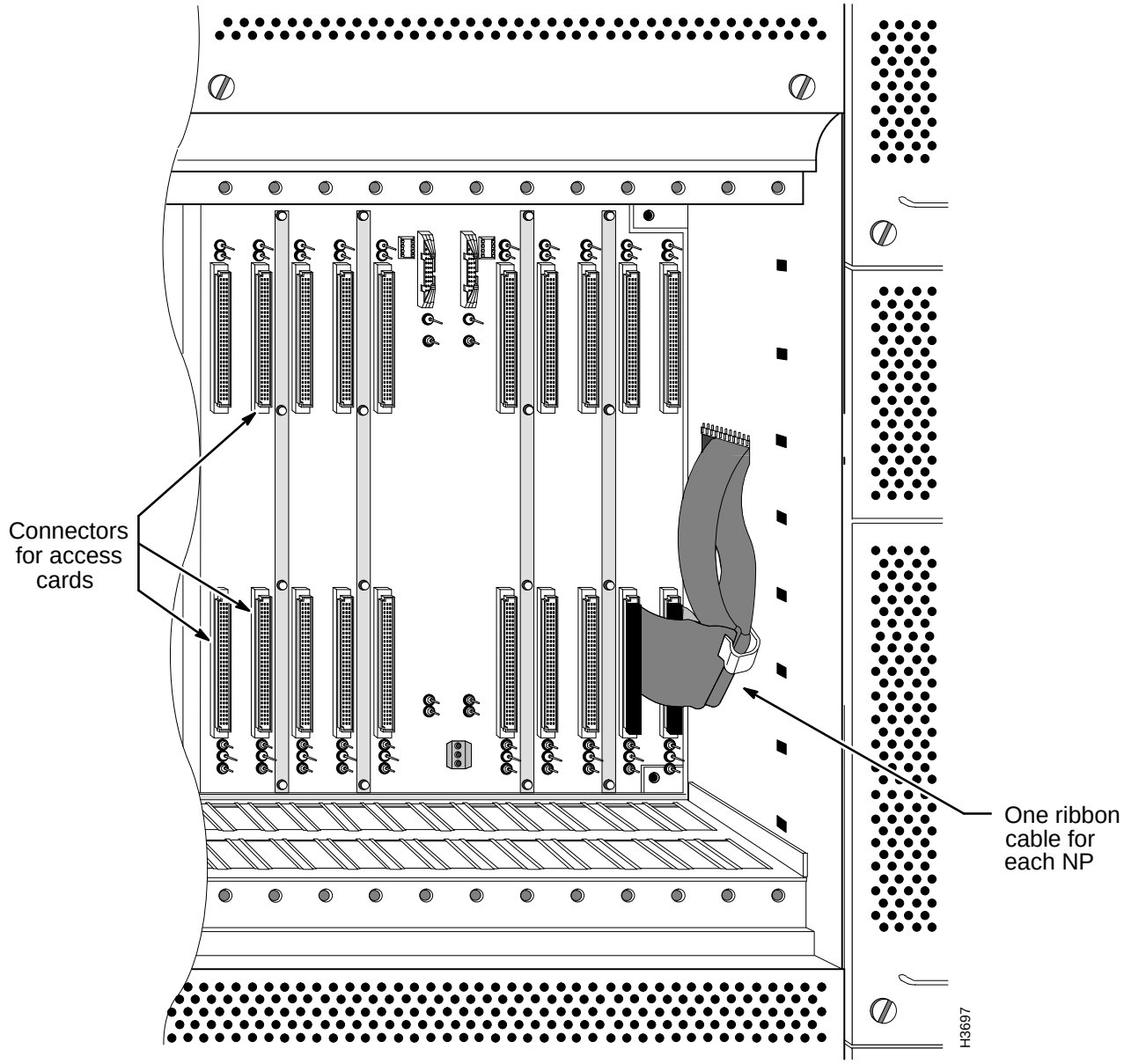
Line Card Installation Considerations

By default, an LS2020 switch is configured on shipment with a disk assembly ribbon cable attached to the rear of the midplane between the bottom connector of slot 2 and the associated disk assembly, whether or not a second disk and NP module are present in the chassis. The location of these disk assembly ribbon cables is illustrated in Figure 5-3.

In a single-NP LS2020 switch, Cisco Systems recommends that you not install an additional line card in slot 2 until all other slots are occupied.

However, if you choose to install an additional line card in slot 2 (either in place of an existing NP module or because all other slots are occupied), you must unplug the disk assembly ribbon cable from the bottom connector and position it between slots 1 and 2 in such a way that it will not interfere with the insertion of the new access card into the midplane.

Figure 5-3 Ribbon Cables Connecting NPs to Disk Assemblies



Line Card Installation Procedure

To install an additional line card in the LS2020 switch, perform the following steps:

Step 1 Remove the front and rear blank filler panels on the LS2020 chassis that correspond to the line card slot(s) in which you intend to install the new switch card(s).

Step 2 Insert the line card(s) into the desired slot(s) in the front of the chassis.

Step 3 In the corresponding slot(s) at the back of the chassis, insert the associated access card(s) in the midplane and connect all cables, as required, to make appropriate connections to your LS2020 network. The back of the LS2020 chassis provides the facilities for making these connections.

Note You need not power down the system to install additional line cards/access cards in the LS2020 chassis.

Step 4 Ensure that the contents of flash memory of all line cards in the LS2020 chassis of like type are at the same revision level. Flash memory contains executable code that is essential to proper line card operation. Thus, all cards of the same type in the LS2020 chassis must contain identical flash memory code.

For detailed instructions about verifying and loading line card flash memory, refer to the *LightStream 2020 Hardware Reference & Troubleshooting Guide.*