Connecting Power for AC Systems

AC Input Power

The AC power assembly can be configured with either a single primary input AC source or optionally both primary and secondary (redundant) input AC sources. AC power is supplied through connectors on the rear panel.

Available Power

The AC power assembly holds up to six independent 875 watt power supplies each of which supplies power to a common output bus. Power is then available for AXIS shelves through connectors on the rear panel.

The number of power supplies that are configured in the assembly depends upon the number of AXIS shelves that have to be supported. The maximum number of AXIS shelves that can be supported by a single AC power assembly is four.

In a worst-case fully loaded configuration each AXIS shelf requires 500 watts. Therefore, a power assembly equipped with three power supplies, totaling 2625 watts, can supply enough power for a four shelf rack. A power assembly equipped with four power supplies, totaling 3500 watts, provides enough power for a four shelf rack even in the event of a single power supply failure. More power supplies provide even more protection in the event of multiple power supply failures.

Monitoring Power Supply Status

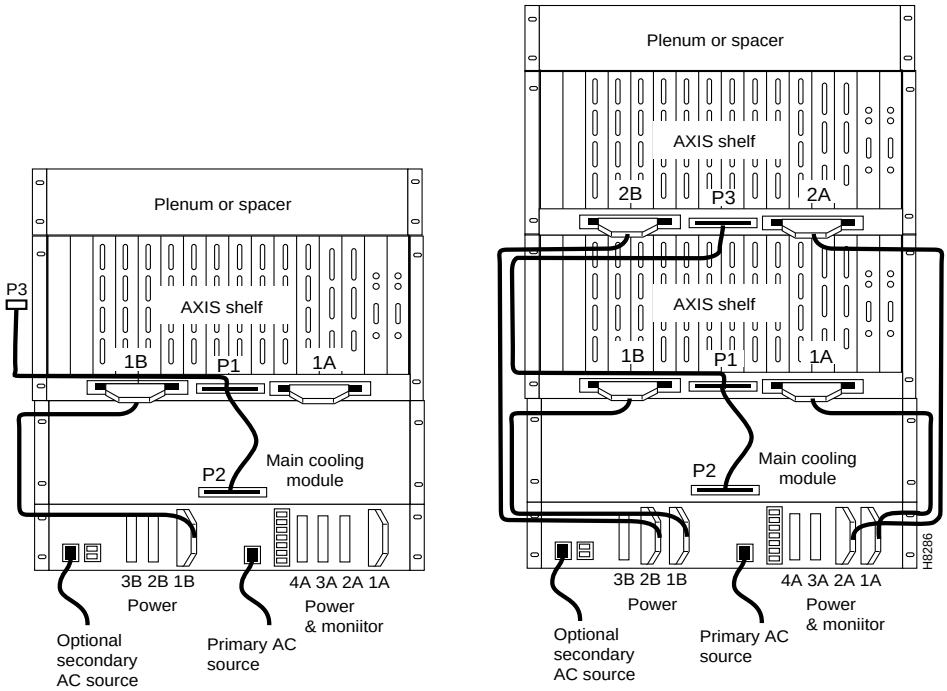
In addition to supplying power, each power supply provides a signal that indicates the status of the power supply.

Rear Panel Connectors

The rear panel has:

- A primary AC input connector and, optionally, a secondary AC input connector.
- A group of four output connectors on the right (looking towards the rear panel), each of which can be used to connect to an AXIS shelf.
- A group of three output connectors on the left (looking towards the rear panel), each of which can be used to connect to an AXIS shelf.

Figure 6-13 AC Power Assembly Block Diagram



Referring to Figure 6-13, power is available at each of the four connectors on the right of the rear panel and a cable from any of these four connectors can be connected to any shelf in the rack.

Each of the rightmost three connectors of the group of four also provides a power supply status signal for monitoring power supply performance by an AXIS shelf. Each of these connectors provides a status signal for a particular power supply as shown in the diagram.

The group of three connectors on the left of the rear panel supply status signals only for any remaining power supplies that may be configured in the assembly.

Refer to Figure 6-14 and Figure 6-15 when performing the following steps.

1 Using the special cables supplied with the power assembly, use one or two cables for each shelf. Each shelf should use one cable from the right connectors and optionally one cable from the left connectors. For each shelf connect one end of a cable to one of the right connectors and one end of another cable to one of the left connectors

2 The other end of the cables have a connector and a fixture for attaching to the power entry aperture on the rear of the shelf. Insert each of the two cables into one of the power entry apertures on the shelf and secure with the provided screws. The cable from the left side of the power assembly is connected to the left power entry connector in the AXIS shelf. Likewise, the cable from the right side of the power assembly is connected to the right power entry connector in the AXIS shelf.

Repeat steps 1. and 2. for any other shelves in the rack being powered from the same power assembly.

3 The AC power source is connected to the IEC receptacle(s) on the rear of the power module. The power assembly is available in two versions; one with a single AC power input and one with dual (redundant) AC power inputs. The AC power cord(s) should be plugged into a 115/240V AC, single phase, wall outlet capable of supplying 15 amps. The house circuit should be protected with a 20 amp circuit breaker.

The ground (green) wire of the AC power cord is connected to the AXIS system for safety ground. Make sure that the building AC receptacle is properly grounded.

4 If the left hand power connector on an AXIS shelf is not used (see Shelf 4 in Figure 6-15), the Cover Power Entry (PN# 217076-00) must be installed in the empty position to assure proper cooling of the rear cards.

Warning The power to the shelf is OFF at this point. DO NOT apply power until later.

Figure 6-14 AC Cabling for One and Two Shelf Racks

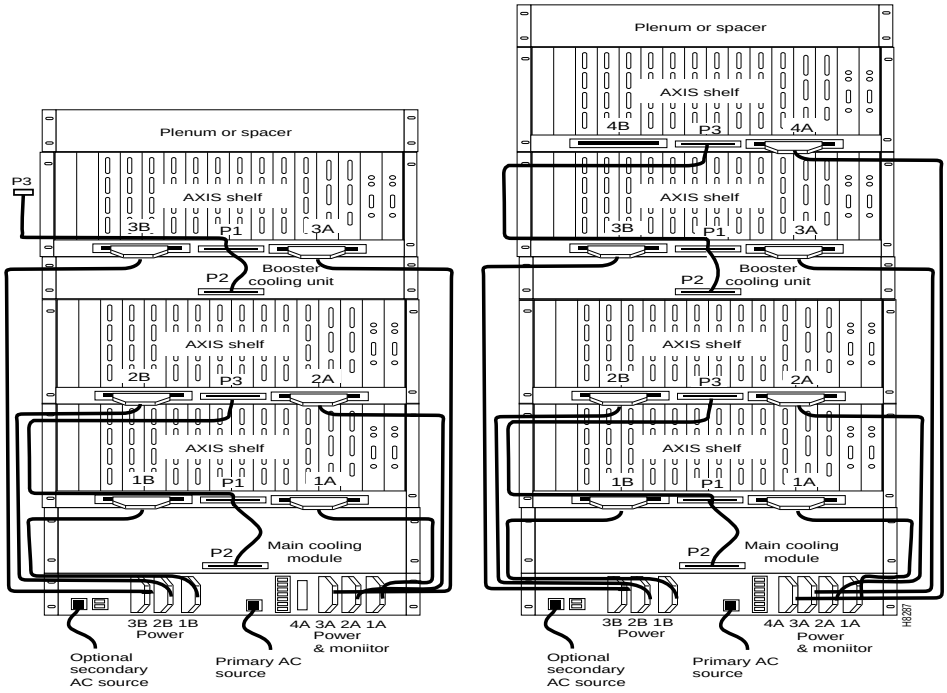
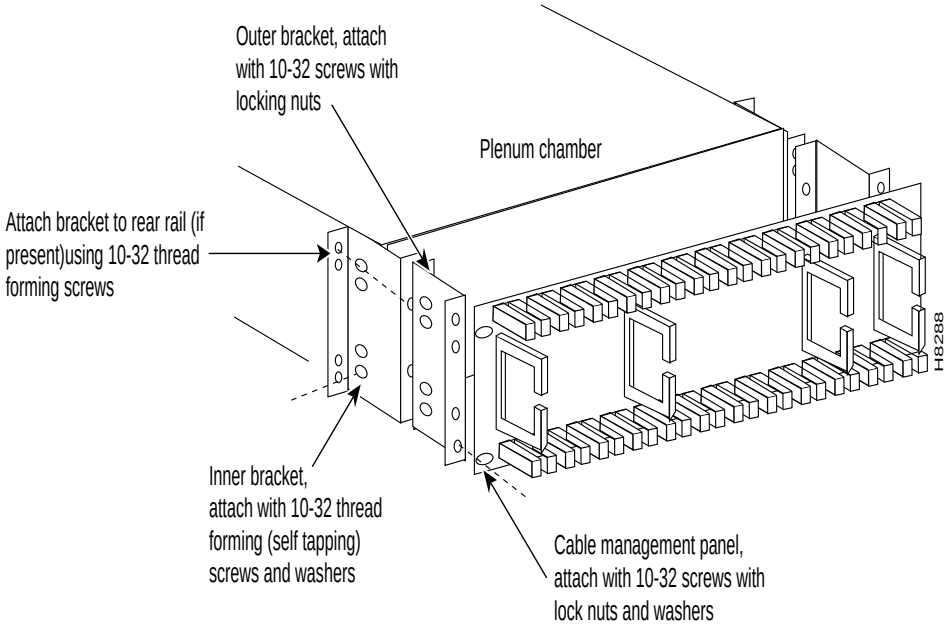


Figure 6-15 AC Cabling for Three and Four Shelf Racks



Cable Management

A fully loaded multi-AXIS rack may have between 150 and 200 cables attached to the rack's modules. Cable Management kits are available for installation on the rear of rack modules. These kits provide the means to route the power and data cables in a neat and orderly fashion to and from the modules in the rack.Depending upon the number of racks in the shelf and the number of cables connected to the shelves, one or more cable management kits may be required.

The cable management kits are installed to rear of the Cooling Module, the Booster Cooling Module and the Plenum as required. Note that a cable management kit cannot be installed on the spacer unit.

There are two basic cable management kits, one for the plenum chamber and another for the cooling and booster cooling modules.

Plenum Chamber Kit

The plenum chamber kit consists of a cable management panel and the necessary brackets, screws and washers for rear mounting on the plenum as follows:

Table 6-1 Plenum Chamber Kit Bill of Material

Part No.	Description	Quantity
204532	# 10 flat washer	8
212885-06	10-32, 0.375" long screws with locking nuts	8
212897-06	10-32, 0.375" long thread forming screws	4
215961-00	Inner bracket	2
215963-00	Outer bracket	2
216164-01	Cable management panel	1

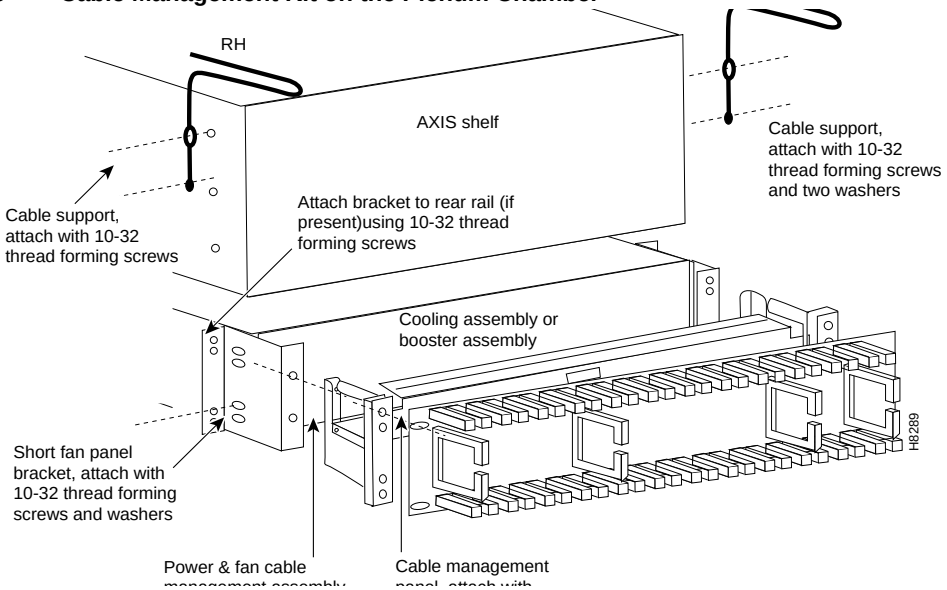
A cable management kit for the plenum is shown in Figure 6-16. Referring to this figure, install the kit as follows:

Step 1 Install the two inner brackets on to the sides of the plenum chamber, one each side using two thread forming screws for each bracket. If a rear rail is being used to mount the plenum, use the protruding flange to attach to the rail using two thread forming screws and washers (supplied with the plenum install kit). If there is limited access, use the procedures described in the "Rack Mounting the Modules" section under Limited Access.

Step 2 Install the two outer brackets onto the two inner brackets using two screws with locking nuts for each bracket.

Step 3 Install the cable management panel onto the outer brackets using two screws, locking nuts, and washers for each bracket.

Figure 6-16 Cable Management Kit on the Plenum Chamber



Main Cooling and Booster Cooling Kit

For the cable management kit that is installed on the cooling module and booster cooling module, the kit consists of a set of brackets, a power routing assembly, and the cable management panel as follows:

Table 6-2 Cooling and Booster Kit Bill of Materials

Part No.	Description	Quantity
204532	# 10 flat washer	12
212885-06	10-32, 0.375” long screws with locking nuts	8
212897-06	10-32, 0.375” long thread forming screws	8
216303-00	Cable support	2
216749-00	Power & fan cable management assembly	2
216751-00	Short fan panel bracket	2
216164-01	Cable management panel	1

A cable management kit for the cooling and booster units is shown in Figure 6-17. Referring to this figure, install the kit as follows:

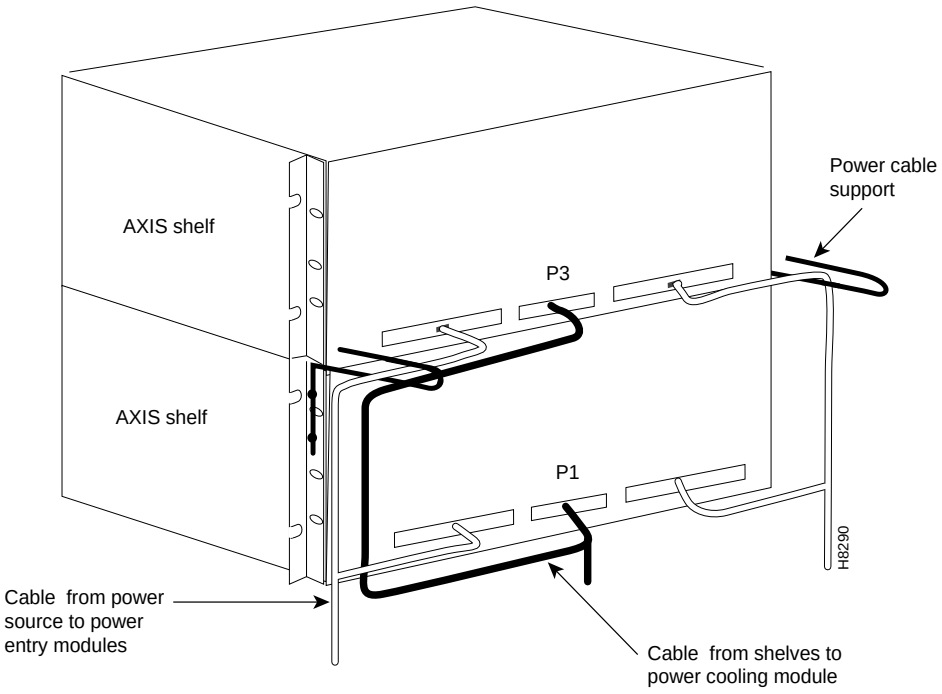
Step 1 Install the two short fan panel brackets on to the sides of the cooling unit, one each side using two thread forming screws for each bracket. If a rear rail is being used to mount the plenum, use the protruding flange to attach to the rail using two thread forming screws and washers (supplied with the cooling unit install kit). If there is limited access, use the procedures described under Limited Access.

Step 2 Install the power and fan cable management assembly onto the two short fan panel brackets using two screws with locking nuts for each bracket.

Step 3 Install the cable management panel onto the outer brackets using four screws, locking nuts, and washers for each bracket.

Step 4 Install one or both cable supports onto the AXIS shelf above cooling module using a 10-32 thread forming screw for each support. Use two washers between the cable support on the left hand support only.

Figure 6-17 Installation of Cable Management Kit on Cooling Module



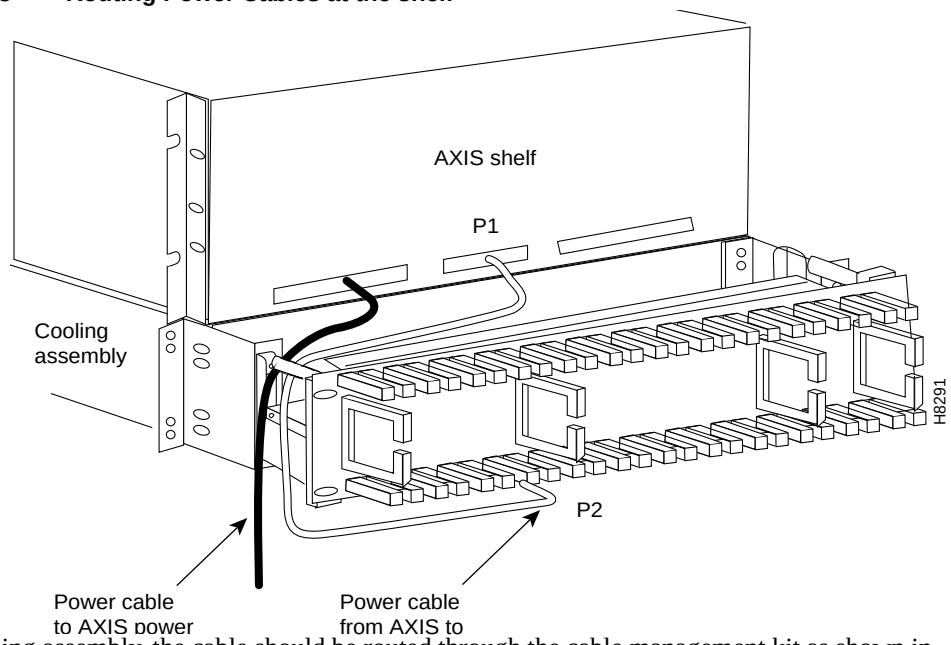
Cable Routing

Power Cable Routing

There are two kinds of power cables on an AXIS shelf. The first are the power cables that power the shelf, either directly from a 48 VDC source or from a StrataCom power supply module. The second are those power cables that power the cooling module and booster module.

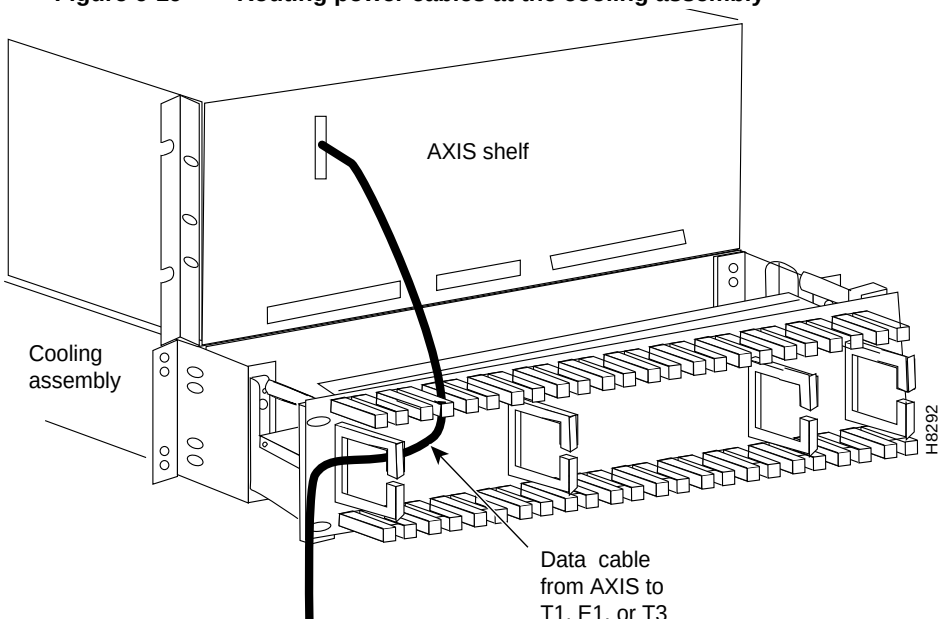
At the AXIS shelf end the cables should be routed through the power cable support so that they can be routed down the side of the rack as shown in Figure 6-18.

Figure 6-18 Routing Power Cables at the shelf



At the cooling assembly, the cable should be routed through the cable management kit as shown in Figure 6-19

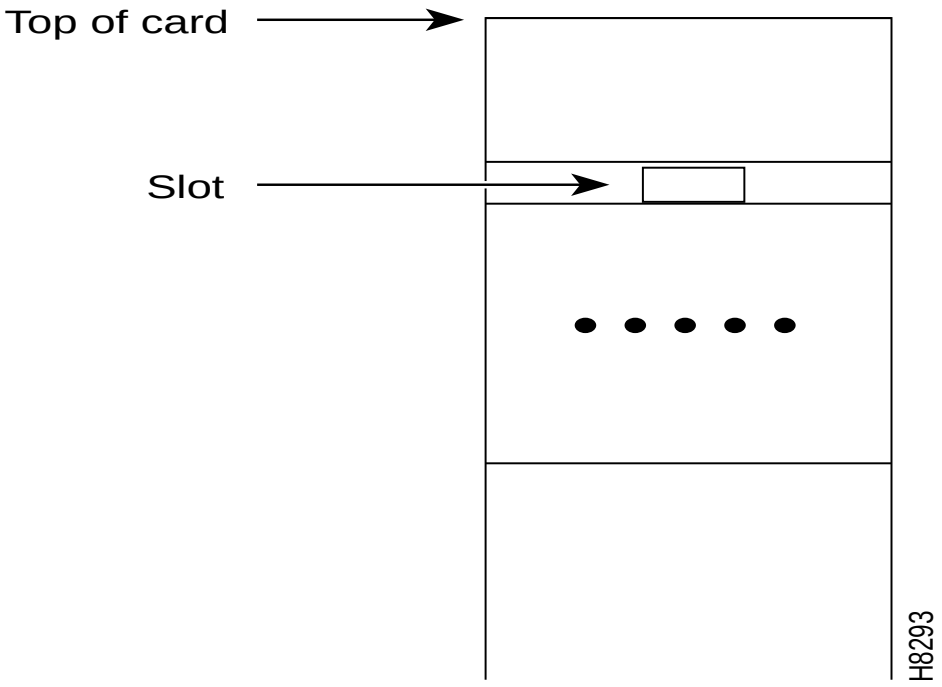
Figure 6-19 Routing power cables at the cooling assembly



Routing Data Cables

Data Cables connected to the AXIS shelf back cards are routed up or down to cable management panel where is fed through the fingers and then routed left or right to the side of the rack. The cables can then be routed to their appropriate equipment (router, for example).

Figure 6-20 Routing Data Cables at the cooling assembly



Readying the Cards

Warning Before handling any cards, ground yourself by clipping the wrist strap that is supplied with AXIS to a convenient metallic contact on the shelf and to your wrist. This simple procedure prevents static electrical damage to the cards.

Systems may be shipped with empty slots with filler cards or with plug-in cards installed. If filler cards are installed in any of the slots, they may need to be replaced with functional cards. Remove, replace and install front and back cards as necessary to obtain the correct configuration.

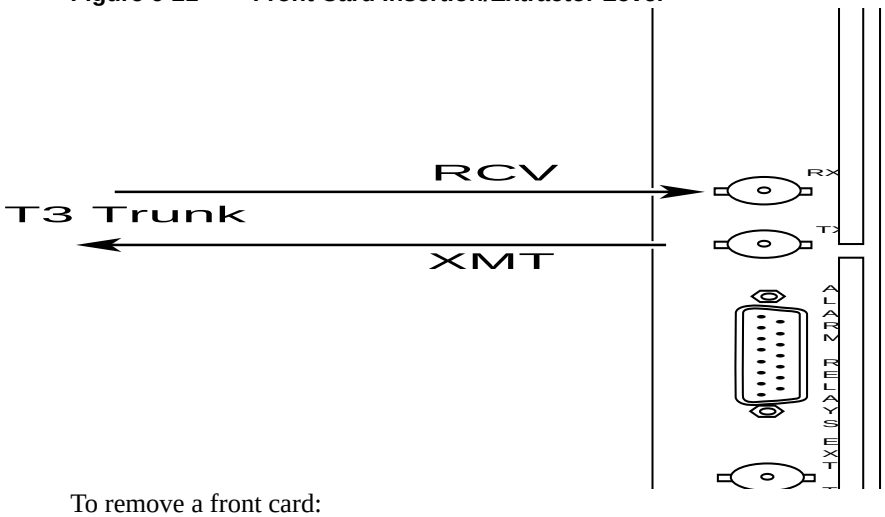
Note Both the front card and the back card of all card sets in the shelf must be present for proper operation of the shelf.

If a back card is removed and reseated or changed for another back card, the associated front card must be reset.

Removing and Installing the Front Cards

When seated, AXIS front cards are retained by a mechanical latch attached to the card.

Figure 6-21 Front Card Insertion/Extractor Lever



To remove a front card:

Step 1 Insert a small flat head screwdriver into the slot in the insertion/extractor lever and press until the latch springs open, approximately 10˚, continue to lift the insertion/extractor lever to disconnect the connector.

Step 2 Gently pull the card out of the card cage.

To install a front card:

Step 1 Position the rear card guides over the appropriate slot at the top and bottom of the card cage.

Step 2 Gently slide the card all the way into the slot and press the insertion/extractor lever until it snaps into the vertical position.

Note The card should slide in and out with only slight friction on the adjacent board's EMI gaskets. Do not use force. Investigate any binding.

Removing and Installing the Back Cards

Back cards are retained through two screws: one at the top of the faceplate and one at the bottom of the faceplate.

To remove a back card:

Step 1 Remove any cables connected to the back card.

Step 2 Use a flat screwdriver to undo the two retaining screws in the back card's faceplate

Step 3 Pull both of the two extractor levers out to the horizontal position, this will start the removal of the card. Gently pull the card out of the card cage.

To install a back card:

Step 1 Ensure that the two extractor levers are in the "in" position. When the card is being inserted into the slot, the levers should be vertical along the line of the back card.

Step 2 Position the rear card guides over the appropriate slot at the top and bottom of the card cage.

Step 3 Gently slide the card all the way into the slot and tighten the two captive screws on the back card's faceplate. Tighten the upper and lower screws a small amount alternately to prevent mis-alignment of the card. Do not overtighten, tighten the screws only enough to secure the card.

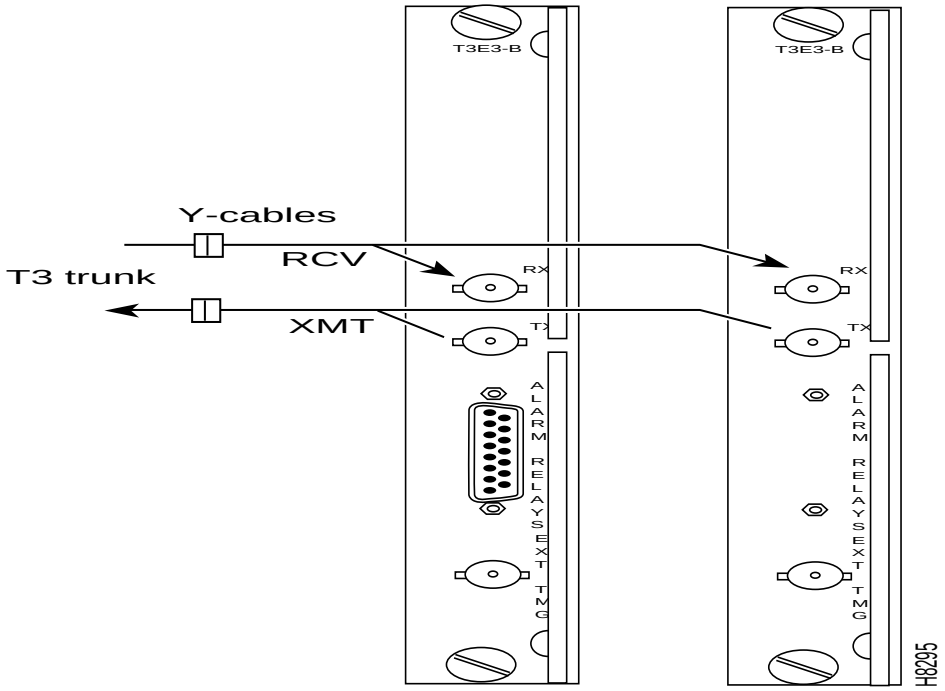
Warning Cards must be inserted only in the correct slot positions. This is particularly true with back cards. If service module back cards are inserted into slots intended only for ASC and/or BNM back cards (slots 1, 2, 3, and 4) damage to the card and backplane can result.

If you accidentally attempt to insert a service module back card into slots 1, 2, 3, or 4 and then have difficulty in operating the shelf, examine the backplane pins and the backcard connector on the wrongly inserted backcard to see if they have been bent or damaged.

Making the BNM Trunk Connection

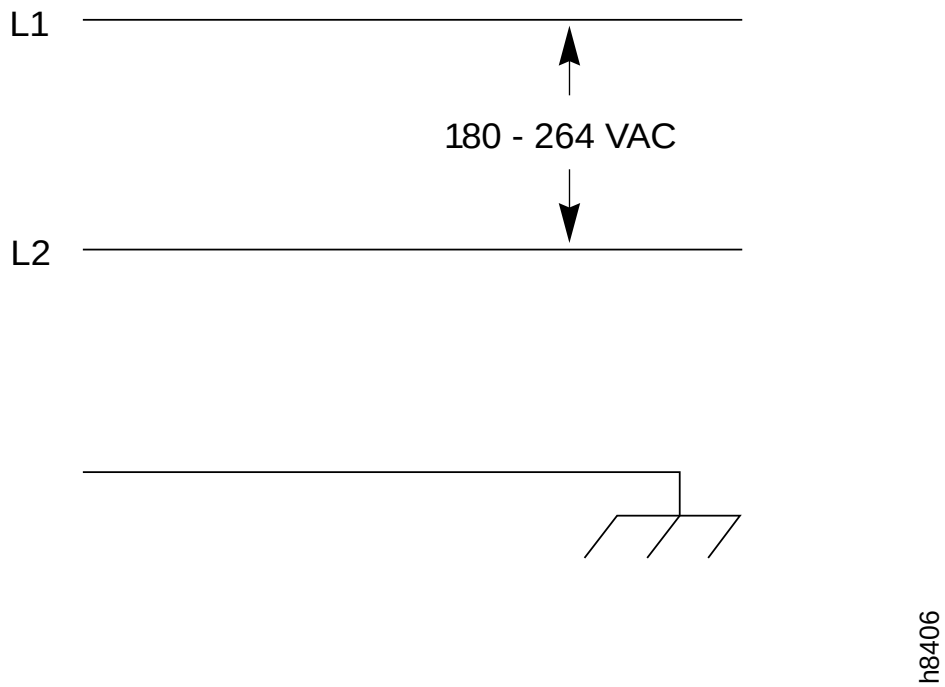
Connect two T3 coaxial cables between the T3 BNC connectors on the AXIS BNM line module card and the T3 BNC connectors on the BPX's BNI Line Module. The Transmit port on the BPX line module must connect to the Receive port on the AXIS BNM line module and vice versa, see Figure 6-22.

Figure 6-22 Connecting T3 Cables



If redundant BNM cards are being used, use Y-cable adapters as shown in Figure 6-23. It is recommended that specially designed short T3 or E3 Y-cables be purchased from StrataCom.

Figure 6-23 Cabling for Redundant BNM Cards



Making the Service Interface Connections

The customer's frame relay is connected to the AXIS shelf through T1 or E1 lines. T1 lines use cables terminated with DB15 connectors, E1 lines use cables terminated with either DB15 or BNC connectors (depending upon the line module configuration).

Service lines using DB 15 connectors need only one cable per port. Service lines using BNC connectors require two cables (one transmit and one receive) from the E1 port of the customer's equipment to a E1 port on an AXIS line module.

Alarm Output Connection

Dry contact relay closures are available for forwarding AXIS alarms to a user office alarm system. Separate visual and audible alarm outputs are available for both major and minor alarm outputs. The AXIS alarm outputs are available from a DB15 connector on the BNM line module faceplate. Refer to Appendix B for the pinouts on this connector. Use switchboard cable for running these connections.

Making External Clock Connections

If the AXIS node is to be synchronized to some other external equipment or a local digital central office, a connector on the back card can be used to provide a clock input.

For a T1 clock input, the DB15 connector, marked EXT TMG, on the T3E3-D line module is used.

For a E1 clock input, the BNC connector, marked EXT TMG, on the T3E3-B line module is used.

Attaching a Control Console

Dumb Terminal onto the Maintenance Port

When using an alpha-numeric (dumb) terminal to input Command Line Interface commands, the terminal must be connected directly (no modem) to the Maintenance Port DB25 connector on the ASC line module faceplate. Use a conventional RS-232 cable with a DB25 connector at each end. A so-called "Null Modem" cable is NOT required. This port should never be Y-cabled.

Workstation onto the Control Port

When using a workstation to issue commands or transfer files to and from the shelf, the workstation can be attached through the RS-232 Control Port on the ASC line module faceplate. Using this connection requires the workstation to communicate using TCP/IP and SLIP communication protocols.

The workstation can be attached either directly with no modems or remotely through modems. In either case, a conventional RS-232 modem cable should be used.

If the shelf has dual redundant ASC modules, use a Y-cable to connect the workstation or modem to the Control Port of both the ASC modules. If a modem is used, a null-modem cable is required.

Initial Start-up of AXIS

Before applying power to the AXIS shelf, check the following items:

1. The shelf is properly grounded.
2. The AC or DC power sources are properly installed and connected.
3. All the cards are present in their proper slots and are locked in place.
4. The T1, E1 and T3 cables are installed.
5. The control console is connected.

To apply power to a DC system, press the BLACK button on each of the power entry modules until they latch in the IN position.To apply power to an AC system, switch the circuit breakers on the rear of the power module to the ON position.

The LEDs on the front cards may flash for a few moments while the shelf performs a self-test and then settle down to Active or Standby.

When power is applied and the LEDs have stabilized:

- Press the HIST button on the BNM to clear the HIST LED.
- Issue a clrallcnf (Clear All Configuration) command to each card set in the shelf. Chapter 4 provides details of this command.

Initial Configuration

Before the AXIS shelf can receive commands, SNMP requests, file downloads, etc. the shelf must be assigned IP addresses for the Control port, the LAN port and the inband channel. This procedure requires a alpha-numeric terminal to be connected to the Maintenance port of the active ASC card and addresses assigned through the command line interface. Carry out the following procedure, see the AXIS Command Supplement for details of how to login and use the specific commands.

1. Press the RETURN key to indicate the presence of your terminal to the shelf. The login prompt will appear.
2. Login to the active ASC card by typing your account, your password and the ASCs slot number.
3. Configure the IP address for each port (control, LAN and inband) in turn using the **cnfifip** command (See Chapter 3 for more details).

   The **cnfifip** command is entered in the format **cnfifip -ip <ip address> -if <interface type> -msk <subnet mask address> -bc <broadcast address>** where <ip address> specifies an IP address for the destination in dotted decimal format, <interface type> is specified as 28 for the control port and 37 for the inband port and 26 for the LAN port, <subnet mask address> and <broadcast address> specify the mask and broadcast addresses in dotted decimal format.
4. While you are using the terminal, you may wish to assign a nodename for the shelf using the **cnfname,** command.

Note If you type any command mnemonic and press RETURN, the screen will display the syntax for that command. The command with the correct parameters can then be entered.

5 Logout.

Once the IP addresses have been assigned, the shelf can be managed from StrataView Plus.