

Repair and Replacement

This chapter describes periodic maintenance procedures, troubleshooting procedures, and the replacement of major parts for the **Release 3.0 AXIS**.



Caution For protection against shock hazard, verify both power cords are disconnected before servicing unit.



Caution Vergewissern sie sich, dass beide Netzkäbel vom Gerät getrennt sind, bevor Sie mit den Wärtungsarbeiten beginnen.



Caution Pour iviten tout danger, dibrancher les deux cordons d'alimentation avant toute intervention de maintenance sur cet equipement.

Preventive Maintenance

Most monitoring and maintenance of the AXIS shelf is done via the operating system software. Preventive maintenance of the AXIS shelf hardware is minimal and requires only the following:

- 1 Periodically check the node supply voltage and internal cabinet temperature. The temperature should not exceed 50° C.
- 2 Periodically check the event log with the **dsplog** command.
- 3 Periodically check the network alarm status with the **dspalms** command.
- 4 Ensure that the cooling unit intake grills and the exhaust plenum are clear.

Troubleshooting the AXIS shelf

This section describes basic troubleshooting steps to be taken for some of the more obvious node failures (refer to Table 7-1). This is not an exhaustive set of procedures, and does not take into account any of the diagnostic or network tools available to troubleshoot the AXIS shelf. Refer to the CLI Display Commands in Chapter 5, “Service Configuration”, for information on commands and command usage.



Caution StrataCom ISC can provide you with assistance in locating a fault and provide repair information. Consider calling StrataCom before proceeding with troubleshooting. Refer to Appendix C for details of available service contracts and ISC phone numbers.

General Troubleshooting Procedures

The AXIS shelf runs self tests continuously to ensure proper function. When the unit finds an error condition that affects its operation, it downs the card or line that is affected. If it is caused by a card failure and there is a redundant card, the failed card is downed and the standby card becomes the active card.

The FAIL lights on the cards indicate that the system has found these cards defective in some mode, and now considers them as failed cards. It is at this point that you would use Table 7-1 to find the cause and obtain the information on replacing the failed component.



Caution When using Table 7-1 for troubleshooting, call StrataCom ISC before performing any disruptive testing, or attempting to repair the AXIS shelf. This ensures that you have isolated the correct problem area. It also enables ISC personnel to provide assistance in performing the necessary procedures.

Table 7-1 Troubleshooting the AXIS shelf Node

Symptom	Probable Cause	Remedy
No front panel LEDs are lighted.	Circuit breakers on the AXIS shelf Power Entry Module(s) switched off.	Press in the black button on power entry modules to switch on circuit breakers. If problem persists, pull all cards and power supplies out to see if a shorted card or supply exists.
	The AXIS shelf power cord plug disconnected from AC supply.	Reconnect power cord.
Card front panel fail LED lit	Card failed self-test.	Check status of card at control console using dspecds screen. If alarm confirmed, try card reset (resetcd command). Finally, remove and replace the card.
Card stby LED on.	Card is off-line.	Not a problem as long as a primary card is active.
BNM major or minor LED on.	Service-affecting (major) or non-service affecting (minor) system fault.	Check event log to identify problem reported.
	Network trunk failed.	Observe Port LEDs on each BNM. Use control console dspln to locate failure.
	Internal temperature is higher than normal resulting from blocked air flow or defective fan.	Check front of cooling assembly for freedom of air flow. Replace the assembly that may have failed or slowed. Check free air flow in plenum chamber, remove blockage if necessary.
ASM hist LED lit.	If no other alarm indications, a fault occurred in the past but has been cleared.	Press ASM history clear button. Check NMS event log to determine cause.
BNM Port LED is red.	Trunk is in local or remote alarm.	Use short BNM loopback cable line module connector for local test of trunk. Loop trunk at DSX-3 crossconnect to check cable.
ASC fail LED flashing	Downloading system software or configuration data.	Wait for download to complete.

Replacing Parts

After an alarm occurs, use the AXIS shelf software to isolate the problem. (Refer to Troubleshooting the AXIS shelf for troubleshooting information). If an the AXIS shelf part has failed, then it must be replaced.



Caution Only authorized personnel should remove and replace parts on the AXIS shelf system.

Parts should be replaced only by qualified personnel who have taken the StrataCom training courses or have been trained by a qualified system manager. For assistance in diagnosing or replacing a failed part, call the StrataCom ISC representative.

When replacing a part, save the electrostatic bag, foam, and carton that the new part comes in. These packaging materials are needed for returning the failed part to StrataCom. Refer to *Appendix D, "Customer Support"* for instructions on ordering and returning the AXIS shelf parts.

Replacing a Front Card

The the AXIS shelf front cards are as follows:

- AXIS Shelf Controller (ASC).
- Broadband Network Module (BNM).
- Service Redundancy Module (SRM).
- Service Modules.
- ATM Inverse Multiplexer Network Module (AIMNM)



Caution Ground yourself before handling the AXIS shelf cards by placing a wrist strap on your wrist and clipping the wrist strap lead to the cabinet.

When a card has failed, the red FAIL light for that card turns on. Before replacing it, check to see if the card only needs to be reseated and check that the appropriate back card is correctly installed. After reseating the card, wait for it to run its self-tests to see if the ACTIVE light comes on. If the card is seated correctly, but the FAIL light is still on, replace the card.

When replacing a card that has no redundant equivalent, the service provided by that card will be disrupted. Replacing a non-redundant ASC or BNM card will bring down the entire shelf. Replacing a FRSM card will bring down the channels that are serviced by that card.

To remove a front card:

- Step 1** Insert a small flat head screwdriver into the slot in the retaining tab and press until the latch springs open.
- Step 2** Gently pull the card out of the card cage.

To install a front card:

- Step 1** Position the 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 retaining tab until it snaps into the vertical position.

Replacing a Line Module

Back cards are retained through two screws: one at the top of the faceplate and one at the bottom of the faceplate. Back cards contain very few active components (if any) and should rarely need replacing.

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 the two extraction levers into the horizontal position. This will start the card extraction.
- Step 4** Gently pull the card out of the card cage.

To install a back card:

- Step 1** Position the extraction levers so that they lie flush with the card's faceplate.
- 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 connector on the wrongly inserted backcard to see if they have been bent or damaged.

Replacing a DC Power Entry Module

DC Power Entry Modules (PEMs) contain few active components so they should rarely need replacement. Access is from the back of the shelf. To remove a PEM, proceed as follows:

- Step 1** Press the red button on the power entry module to be replaced to remove power from the module
- Step 2** Disconnect the 48VDC power cable from the module.
- Step 3** Pull out the power entry module from its slot.
- Step 4** Slide in the replacement module until its connector seats in its socket.
- Step 5** Replace the 48VDC power cable.
- Step 6** Press the Black button on the power entry module until it latches in the IN position.

Replacing the Cooling, Booster, Plenum, and AC Power Assemblies

To replace the assembly:

- Step 1** Remove any cables at the rear of the assembly that connect to the shelf or other modules.
- Step 2** Remove the screws attaching the assembly to the rack.
- Step 3** Pull the assembly out of the rack.
- Step 4** Slide the new assembly into the rack.
- Step 5** Use the screws to attach the assembly to the rack.
- Step 6** Re-connect the cables from the shelf or other modules to the new assembly.



Warning If you replace the cooling assembly with power applied to the shelf, you must work quickly to prevent heat buildup in the shelf which could damage the cards.

