POPULATING THE SHELVES

These procedures describe how to install the CompactPCI power supplies and cards into the utility and radio shelves. Table 4.4 lists the actions described in this section.

Action	Page
Insert CompactPCI Power Supplies	82
Test CompactPCI Power Supplies	83
Insert the Radio and Utility Shelf Cards	85
Cover Unused Card Slots	87

Table 4.4 Populating the Shelves Procedure Summary

NOTE: Your NPM basestation may arrive with the shelves already populated. If this is the case, ensure that the cards are properly secured in the shelf and proceed to the next section.

Depending on the configuration of your basestation, the exact number, layout, model, and faceplates of the cards may vary. See your field engineering package (FEP) for the specific layout.

WARNING: Failure to insert a card in the correct slot may result in damage to or destruction of the card or shelf. Ensure that all the cards are in the correct slots before powering on the shelves.

Shelf Layout

Utility Shelf Layout

Table 4.5 and Figure 4.11 show the layout of the front-facing cards on the utility shelf.

Slot	Front-Facing Card	Slot	Front-Facing Card
0–1	Power supply 0	12	Alarm card 0
2–3	Power supply 1	13	Alarm card 1
4–5	Power supply 2	14	Utility bus controller 1
6	Ethernet switch 0	15–16	Hard disk drive 1
7–8	Hard disk drive 0	17	Application host 3
9	Application host 0	18	Application host 1
10	Utility bus controller 0	19	Ethernet switch 1
11	Application host 2	20	—

Table 4.5 Utility Shelf Layout (Front-Facing Cards)

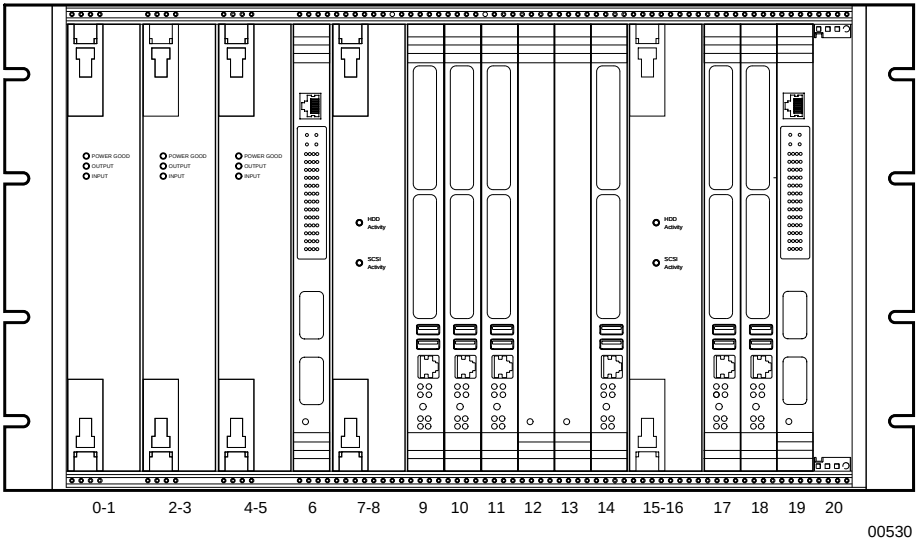

Figure 4.11 Utility Shelf Layout (Front View)

Table 4.6 and Figure 4.12 show the layout of the rear-facing cards on the utility shelf.

Slot	Rear-Facing Card	Slot	Rear-Facing Card
6–7	Ethernet switch rear I/O card	14	Utility bus controller rear I/O card
8	—	15	—
9	Application host rear I/O card	16	—
10	Utility bus controller rear I/O card	17	Application host rear I/O card
11	Application host rear I/O card	18	Application host rear I/O card
12–13	Alarm wiring card	19–20	Ethernet switch rear I/O card

Table 4.6 Utility Shelf Layout (Rear-Facing Cards)

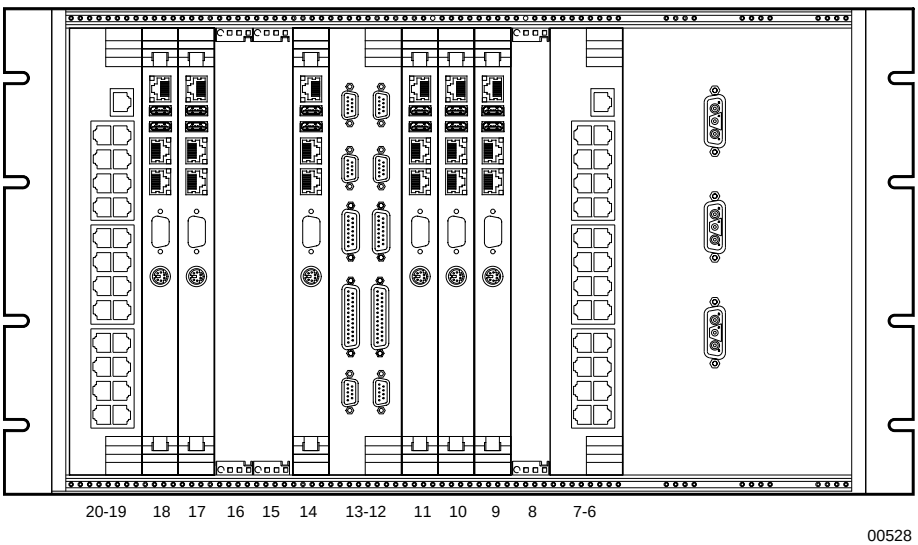

Figure 4.12 Utility Shelf Layout (Rear View)

Radio Shelf Layout

Table 4.7 and Figure 4.13 show the layout of the front-facing cards on the radio shelf.

Slot	Front-Facing Card	Slot	Front-Facing Card
0–1	Power supply 0	12	Radio sector controller
2–3	Power supply 1	13	—
4–5	Power supply 2	14	Radio sector controller
6	Radio modem 3	15–16	IF/RF card
7	Radio modem 2	17	Radio modem 0
8	Radio modem 1	18	Radio modem 1
9	Radio modem 0	19	Radio modem 2
10–11	IF/RF card	20	Radio modem 3

Table 4.7 Radio Shelf Layout (Front-Facing Cards)

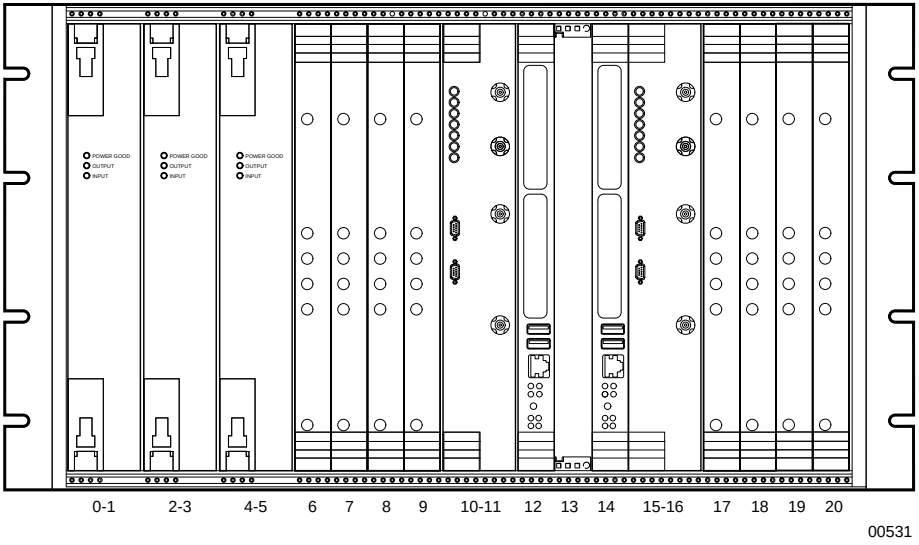

Figure 4.13 Radio Shelf Layout (Front View)

Table 4.8 and Figure 4.14 show the layout of the rear-facing cards on the radio shelf.

Slot	Rear-Facing Card	Slot	Rear-Facing Card
6	—	14	Radio sector controller rear I/O card
7	—	15	—
8	—	16	Clock wiring card
9	—	17	—
10	—	18	—
11	Clock wiring card	19	—
12	Radio sector controller rear I/O card	20	—
13	—		

Table 4.8 Radio Shelf Layout (Rear-Facing Cards)

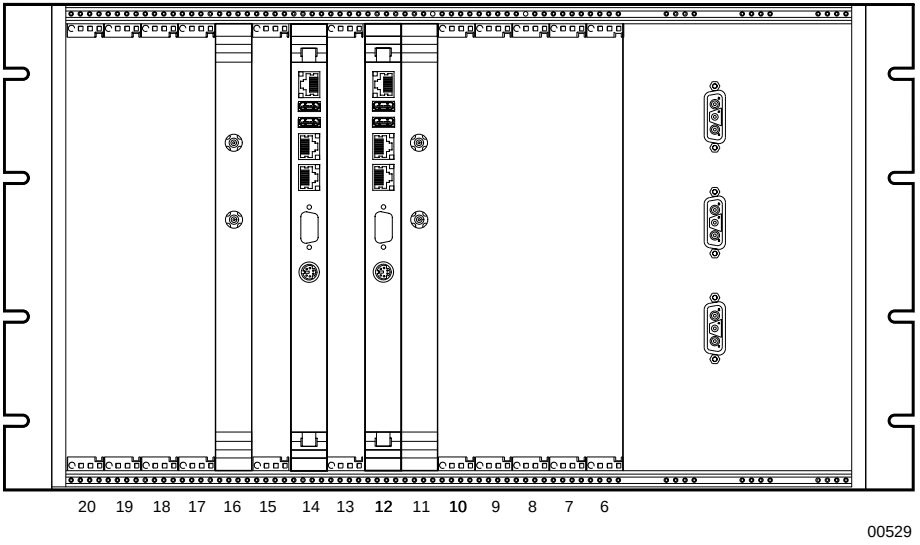

Figure 4.14 Radio Shelf Layout (Rear View)

Insert CompactPCI Power Supplies

The radio and utility shelves each contain two or three identical CompactPCI power supplies. See pages 78 and 80 for the locations of the power supplies.

Utility shelves and completely filled radio shelves use three power supplies each; half-full radio shelves require only two power supplies. This ensures that the shelves will continue to operate should one of the power supplies fail.

WARNING: The power supplies use components that are sensitive to electrostatic discharges (ESD). Make sure you are wearing an approved and regularly tested grounded wrist strap connected to the grounding point on the PDP. When you handle the power supplies, hold them by their handles or edges. Do not touch electrical connections, pins, or soldered surfaces.

To insert CompactPCI power supplies

1. Ensure that there are no obstructions in the slot or on the guide rails.
2. Remove a CompactPCI power supply from its antistatic bag.
3. Set the two ejector handles on the power supply in the open position by turning the handles away from the center of the front panel while pressing the locking tabs located at the end of each handle.

   In the open position, the ejector handles are at an approximately 30° angle from the front panel.
4. Ensure that the two mounting screws located under and beside each ejector handle are withdrawn enough to allow for the insertion of the power supply.
5. Orient the power supply so that the text on the front panel is right-side up.
6. Slide the power supply into the left-most unoccupied power slot. Use the guide rails to ensure the connectors are aligned. Apply sufficient pressure to fully mate the power supply with the shelf.
7. Lock the power supply in the slot by pressing down on the ejector handles until the handles are flush with the front panel.

   You can hear a click when the lock engages.
8. Secure the power supply in the slot using four 2.5-mm mounting screws. Torque each screw to 4 inch-pounds.
9. Repeat steps 1 to 8 for the remaining power supplies.

Test CompactPCI Power Supplies

This procedure describes how to test the CompactPCI power supplies and shelves for electrical faults. Testing the power supplies and shelves before inserting the cards ensures that, in the unlikely event that an electrical fault does occur, no cards will be damaged.

To test CompactPCI power supplies

1. Ensure that your main +24V DC power supply is powered on and is providing a power source that meets the electrical requirements listed on page 29.
2. Power on each power supply in the utility and radio shelves separately. Wait at least 10 s before powering on the next power supply.

WARNING: The red OUTPUT FAIL light on each power supply should turn off within 3 s. If the OUTPUT FAIL light remains on or flickers continuously, power down the shelf immediately and replace the power supply. If the replacement power supply also indicates a fault condition, your shelf may be damaged. Replace the shelf before continuing with the NPM basestation installation.

Table 4.9 shows the circuit breakers for each power supply.

Power Supply	Circuit Breaker
Radio shelf #0 (bottom), left power supply (slots 0–1)	Radio rack PDP, CB 02
Radio shelf #0 (bottom), middle power supply (slots 2–3)	Radio rack PDP, CB 03
Radio shelf #0 (bottom), right power supply (slots 4–5)	Radio rack PDP, CB 04
Radio shelf #1 (middle), left power supply (slots 0–1)	Radio rack PDP, CB 05
Radio shelf #1 (middle), middle power supply (slots 2–3)	Radio rack PDP, CB 06
Radio shelf #1 (middle), right power supply (slots 4–5)	Radio rack PDP, CB 07
Radio shelf #2 (top), left power supply (slots 0–1)	Radio rack PDP, CB 08
Radio shelf #2 (top), middle power supply (slots 2–3)	Radio rack PDP, CB 09
Radio shelf #2 (top), right power supply (slots 4–5)	Radio rack PDP, CB 10
Utility shelf, left power supply (slots 0–1)	Radio rack PDP, CB 11
Utility shelf, middle power supply (slots 2–3)	Radio rack PDP, CB 12
Utility shelf, right power supply (slots 4–5)	Radio rack PDP, CB 13

Table 4.9 Utility and Radio Shelf Power Supply Circuit Breaker Summary

3 Power off all the power supplies in the radio and utility shelves.

4 Power off your main +24V DC power supply.

Insert the Radio and Utility Shelf Cards

See pages 78 to 81 for the location of each card. If the configuration of your NPM basestation does not use a full complement of cards, some slots will be left empty.

WARNING: The cards use components that are sensitive to electrostatic discharges (ESD). Make sure you are wearing an approved and regularly tested grounded wrist strap connected to the grounding point on the PDP. When you handle the cards, hold them by their handles or edges. Do not touch electrical connections, pins, or soldered surfaces.

The pins on the backplane are easily damaged. When inserting cards (especially the hard disk drives), ensure that the connectors are properly aligned before applying sufficient pressure to seat the card. Apply equal pressure to both ejector handles when inserting the card. Failure to do so may result in the pins or connectors being damaged.

Figure 4.15 shows how to properly insert a card into a shelf.

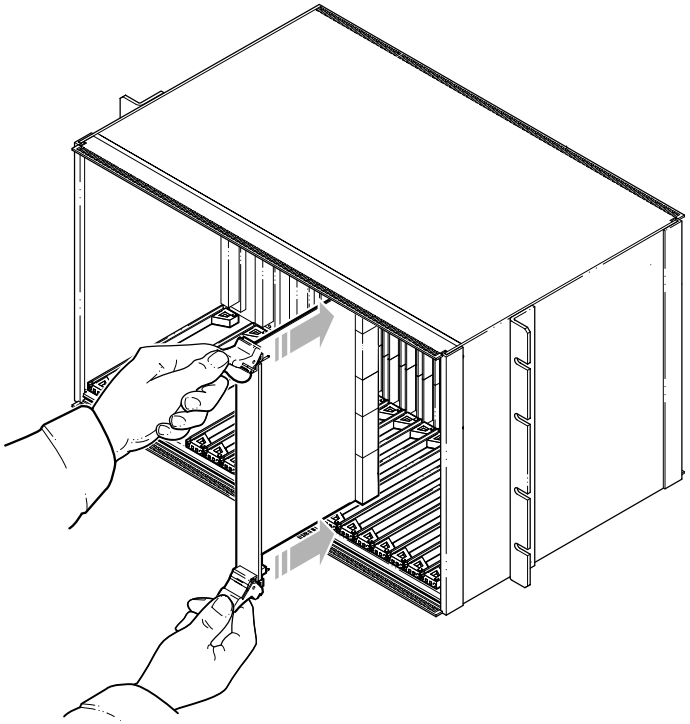

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Figure 4.15 Card Insertion

To insert the cards into the utility and radio shelves

1. Ensure that there are no obstructions in the slot or on the guide rails and check the backplane for bent pins.

   If there are bent pins, the backplane is damaged and requires repair. Report any damaged equipment to your field support coordinator as soon as possible.

2. Remove the card from its antistatic bag.

3. Set the two ejector handles on the card in the open position by turning the handles away from the center of the front panel.

   In the open position, the ejector handles are at an approximately 45° angle from the front panel.

4. Ensure that the mounting screws are withdrawn enough to allow for the insertion of the card.

   Single-slot cards have two mounting screws, one located under each ejector handle. Double-slot cards have four mounting screws, one located under each ejector handle and one located beside each ejector handle.

5. Orient the card so that the text on the front panel is right-side up. The guide pins should be located to the right of the ejector handles.

6. Slide the card into the correct slot. Slot locations are shown on pages 78 to 81. Use the guide rails to ensure the connectors are aligned.

7. Apply sufficient pressure to fully mate the card by pressing on both ejector handles with equal force. If present on the card, the guide pins should slide into the round holes located at the top and the bottom of each slot on the right-hand side.

8. Lock the card in the slot by turning the ejector handles towards the center of the front panel.

   In the lock position, the ejector handles are at a 90° angle from the front panel.

9. Secure the card in the slot by installing the 2.5-mm mounting screws. Torque each screw to 4 inch-pounds.

10. Repeat steps 1 to 9 for the remaining cards.

Cover Unused Card Slots

Any empty slots in the radio and utility shelves should be covered with filler panels. The filler panels ensure airflow to the other cards and protect the cards from dust and electromagnetic interference.

To cover the unused slots with filler panels

1. Remove the filler panel from its protective bag.
2. Set the two ejector handles on the filler panel in the open position by turning the handles away from the center of the front panel.

   In the open position, the ejector handles are at an approximately 45° angle from the front panel.
3. Ensure that the mounting screws are withdrawn enough to allow for the insertion of the filler panel.

   Single-slot filler panels have two mounting screws, one located under each ejector handle. Double-slot filler panels have four mounting screws, one located under each ejector handle and one located beside each ejector handle.
4. Orient the filler panel so that the guide pins are on the right-hand side of the ejector handles.
5. Slide the filler panel into the slot. The guide pins should slide into the round holes located at the top and the bottom of each slot on the right-hand side. Apply sufficient pressure to fully mate the filler panel with the shelf.
6. Lock the filler panel in the slot by turning the handles towards the center of the front panel.

   In the lock position, the ejector handles are at a 90° angle from the front panel.
7. Secure the filler panel in the slot by installing the 2.5-mm mounting screws. Torque each screw to 4 inch-pounds.
8. Ensure that the filler panel is secure by grasping both ejector handles and pulling lightly. The filler panel should not move.

   If the filler panel does move, ensure that the mounting screws are attached to the shelf frame. If necessary, remove the panel and repeat this procedure.
9. Repeat steps 1 to 8 until all the empty slots are covered with filler panels.

CONNECTING THE CABLES

This section describes the cables connecting the different systems in the NPM basestation. Table 4.10 shows the actions described in this section.

Action	Page
Connect the PDP Power Cables	90
Connect the RFSS Signal Cables	94
Connect the Alarm Cables	96
Connect the Ethernet Cables	97
Connect the Clock Cables	99
Connect the RF Cables	101

Table 4.10 Connecting the Cables Procedure Summary

NOTE: The cables are packaged according to their type. Each cable package is labeled with a part number. Use this part number to identify each cable, and refer to the tables provided in this section for its intended origin and termination point.

Depending on the configuration of your basestation, the exact number and layout of the cards may vary. See your field engineering package (FEP) for the specific layout.

Connect the PDP Power Cables

The PDP power cables for each rack are attached to the PDP at the factory. The power cables are already tied to the rack.

The PDP power cables consist of #10, #12, or #16 AWG wire with 3-pin DSUB connectors on each end. The connectors are secured to the racks with 1/8-inch flathead screws.

Component Numbering

When viewed from the back of the NPM basestation, the connectors for the PDP circuit breakers (CB) are labeled from right to left (that is, CB 01 is the right-most breaker and CB 15 is the third breaker from the left).

Each utility and radio shelf has three power supply (PS) connectors: PS2 is the top connector, PS0 is the middle connector, and PS1 is the bottom connector.

The RF shelves are numbered from bottom to top (that is, the bottom shelf is “0” and the top shelf is “2”). When viewed from the front of the basestation, the RFSS modules in each shelf are numbered from left to right (that is, the left module is “0” and the right module is “3”).

Figure 4.16 shows the location of the power connectors on the radio rack. Figure 4.17 shows the location of the power connectors on the RF rack.

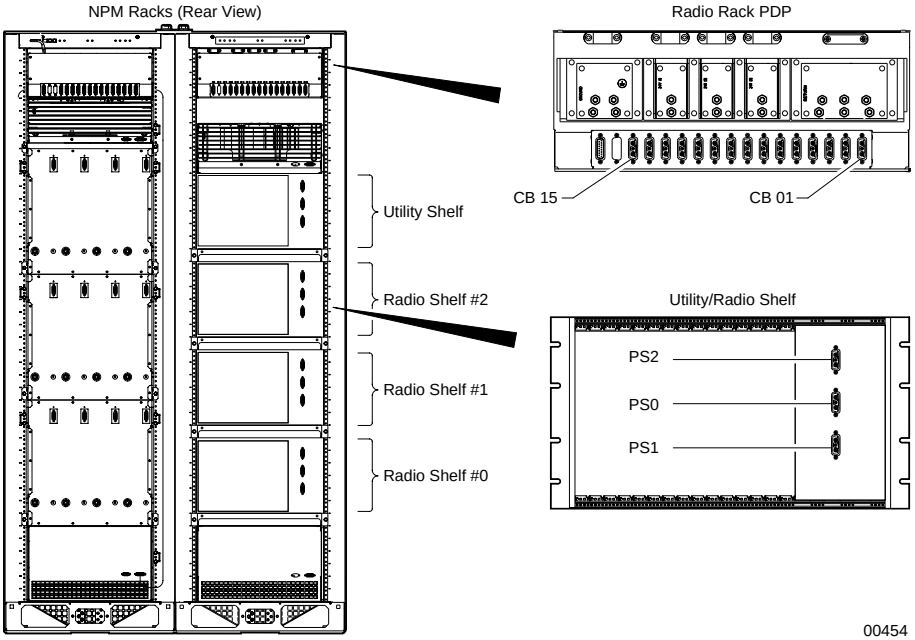

Figure 4.16 Radio Rack Connector Layout

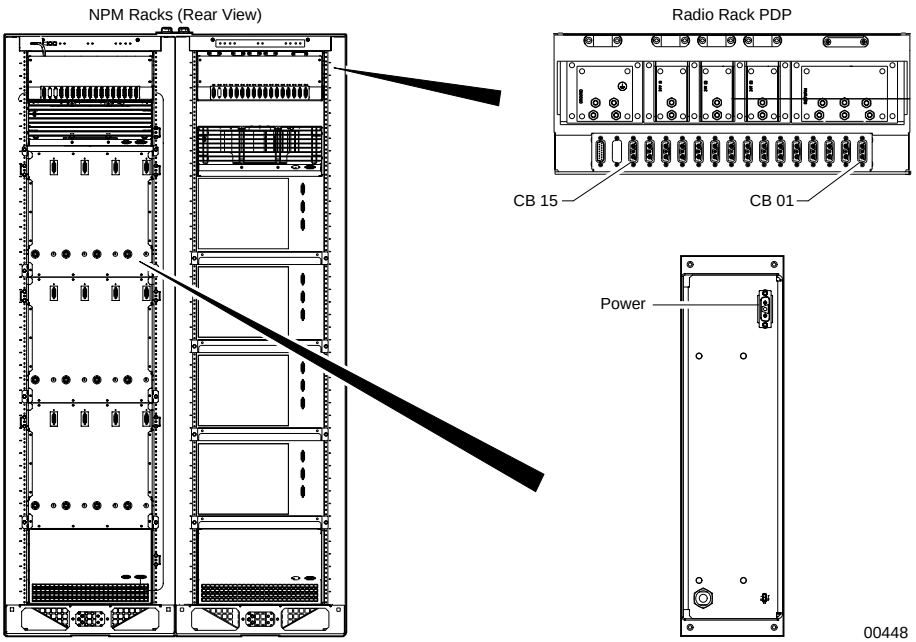

Figure 4.17 RF Rack Connector Layout

To connect the PDP power cables

1 Ensure that each PDP circuit breaker in the radio and RF rack is in the OFF (down) position.

2 Connect each PDP power cable in the radio rack. Table 4.11 shows the origin and termination point of each cable.

Origin	Termination
Radio rack PDP, CB 01	Lower cooling unit
Radio rack PDP, CB 02	Radio shelf 0 (bottom), PS0
Radio rack PDP, CB 03	Radio shelf 0 (bottom), PS1
Radio rack PDP, CB 04	Radio shelf 0 (bottom), PS2
Radio rack PDP, CB 05	Radio shelf 1 (middle), PS0
Radio rack PDP, CB 06	Radio shelf 1 (middle), PS1
Radio rack PDP, CB 07	Radio shelf 1 (middle), PS2
Radio rack PDP, CB 08	Radio shelf 2 (top), PS0
Radio rack PDP, CB 09	Radio shelf 2 (top), PS1
Radio rack PDP, CB 10	Radio shelf 2 (top), PS2
Radio rack PDP, CB 11	Utility shelf, PS0
Radio rack PDP, CB 12	Utility shelf, PS1
Radio rack PDP, CB 13	Utility shelf, PS2
Radio rack PDP, CB 14	Upper cooling unit
Radio rack PDP, CB 15	GPS clock module

Table 4.11 Radio Rack Power Cable Summary

3 Connect each PDP power cable in the RF rack. The power connectors for the RFSS module are located at the back of the rack. Table 4.12 shows the origin and termination point of each cable.

Origin	Termination
RF rack PDP, CB 01	Lower cooling unit
RF rack PDP, CB 02	RF shelf 0, RFSS module 0
RF rack PDP, CB 03	RF shelf 0, RFSS module 1
RF rack PDP, CB 04	RF shelf 0, RFSS module 2
RF rack PDP, CB 05	RF shelf 0, RFSS module 3
RF rack PDP, CB 06	RF shelf 1, RFSS module 0
RF rack PDP, CB 07	RF shelf 1, RFSS module 1
RF rack PDP, CB 08	RF shelf 1, RFSS module 2
RF rack PDP, CB 09	RF shelf 1, RFSS module 3
RF rack PDP, CB 10	RF shelf 2, RFSS module 0
RF rack PDP, CB 11	RF shelf 2, RFSS module 1
RF rack PDP, CB 12	RF shelf 2, RFSS module 2
RF rack PDP, CB 13	RF shelf 2, RFSS module 3
RF rack PDP, CB 14	Upper cooling unit

Table 4.12 RF Rack Power Cable Summary

Connect the RFSS Signal Cables

The signal cables are serial cables with 9-pin DSUB connectors on each end. The connectors are secured to their receptacles with 1/8-inch flathead screws.

Component Numbering

The RF shelves are numbered from bottom to top (that is, the bottom shelf is “0” and the top shelf is “2”). When viewed from the front of the NPM basestation, the RFSS modules in each shelf are numbered from left to right (that is, the left module is “0” and the right module is “3”).

The radio shelves are numbered from bottom to top (that is, the bottom shelf is “0” and the top shelf is “2”). Each radio shelf contains two IF/RF cards, one in slots 10–11 and one in slots 15–16.

Figure 4.18 shows the location of the RFSS signal connectors.

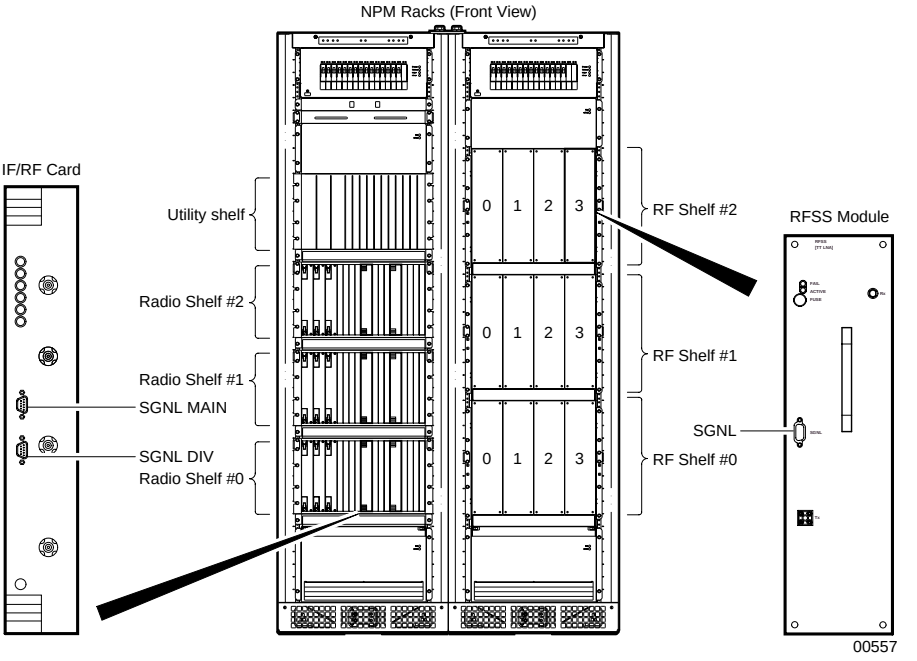

Figure 4.18 RFSS Signal Connector Layout

To connect the RFSS signal cables

1 Connect each RFSS signal cable. Table 4.13 shows the origin and termination point of each cable.

Origin	Termination
RF shelf 0, RFSS module 0, SGNL connector	Radio shelf 0, left IF/RF card (slots 10–11), SGNL MAIN connector
RF shelf 0, RFSS module 1, SGNL connector	Radio shelf 0, left IF/RF card (slots 10–11), SGNL DIV connector
RF shelf 0, RFSS module 2, SGNL connector	Radio shelf 0, right IF/RF card (slots 15–16), SGNL MAIN connector
RF shelf 0, RFSS module 3, SGNL connector	Radio shelf 0, right IF/RF card (slots 15–16), SGNL DIV connector
RF shelf 1, RFSS module 0, SGNL connector	Radio shelf 1, left IF/RF card (slots 10–11), SGNL MAIN connector
RF shelf 1, RFSS module 1, SGNL connector	Radio shelf 1, left IF/RF card (slots 10–11), SGNL DIV connector
RF shelf 1, RFSS module 2, SGNL connector	Radio shelf 1, right IF/RF card (slots 15–16), SGNL MAIN connector
RF shelf 1, RFSS module 3, SGNL connector	Radio shelf 1, right IF/RF card (slots 15–16), SGNL DIV connector
RF shelf 2, RFSS module 0, SGNL connector	Radio shelf 2, left IF/RF card (slots 10–11), SGNL MAIN connector
RF shelf 2, RFSS module 1, SGNL connector	Radio shelf 2, left IF/RF card (slots 10–11), SGNL DIV connector
RF shelf 2, RFSS module 2, SGNL connector	Radio shelf 2, right IF/RF card (slots 15–16), SGNL MAIN connector
RF shelf 2, RFSS module 3, SGNL connector	Radio shelf 2, right IF/RF card (slots 15–16), SGNL DIV connector

Table 4.13 RFSS Signal Cable Summary

Connect the Alarm Cables

The alarm cables are serial cables with DSUB connectors on each end. The DSUB connectors are secured to their receptacles with 1/8-inch flathead screws.

WARNING: Ensure that the main +24V DC power supply for the NPM basestation is powered off before connecting the alarm cables. The PDP alarm cables are hot at all times and are not hot-swappable, even when the circuit breakers in the PDP are powered OFF (down). Failure to power off the main +24V DC power supply may result in damage to the cables and basestation.

The PDP alarm cables are not hot-swappable. Do not disconnect a PDP alarm cable (labeled “RADIO PDP” or “RF PDP”) from the alarm wiring card if the basestation is receiving +24V DC or if the fuses in the PDP have not been temporarily removed.

To connect the alarm cables

1 Ensure that the main +24V DC power supply is powered off.

2 Connect the alarm cables to the alarm wiring card. Table 4.14 shows the origin and termination point of each cable.

Origin	Termination
Alarm wiring card (slots 12–13), UPPER COOLING RF connector	RF rack, upper cooling unit, SIGNAL connector
Alarm wiring card (slots 12–13), UPPER COOLING RADIO connector	Radio rack, upper cooling unit, SIGNAL connector
Alarm wiring card (slots 12–13), LOWER COOLING RF connector	RF rack, lower cooling unit, SIGNAL connector
Alarm wiring card (slots 12–13), LOWER COOLING RADIO connector	Radio rack, lower cooling unit, SIGNAL connector
Alarm wiring card (slots 12–13), RF PDP connector	RF rack, PDP SGNL connector (left-most connector)
Alarm wiring card (slots 12–13), RADIO PDP connector	Radio rack, PDP SGNL connector (left-most connector)

Table 4.14 Alarm Cable Summary

Connect the Ethernet Cables

The Ethernet cables are CAT5 cables with RJ-45 connectors on each end. The cables connect radio sector controllers (RSC), utility bus controllers (UBC), Ethernet switches (ES), application hosts (AH), and edge routers. The two Ethernet switches are connected together with a cross-over cable; the other cards use straight-through cables.

The Ethernet cabling is done via rear I/O cards. The Ethernet ports on the front-facing cards are used only for debug purposes.

Table 4.15 shows the Ethernet cabling for a fully populated 6-sector NPM

ES1 Rear I/O Card (Slots 19–20)		ES0 Rear I/O Card (Slots 6–7)	
1 – Edge router	2 – NC	1 – Edge router	2 – NC
3 – UBC0 Eth B (utility shelf, slot 10)	4 – UBC1 Eth A (utility shelf, slot 14)	3 – UBC0 Eth A (utility shelf, slot 10)	4 – UBC1 Eth B (utility shelf, slot 14)
5 – NC	6 – NC	5 – NC	6 – NC
7 – NC	8 – NC	7 – NC	8 – NC
9 – RSC4 Eth B (radio shelf 2, slot 12)	10 – RSC5 Eth A (radio shelf 2, slot 14)	9 – RSC4 Eth A (radio shelf 2, slot 12)	10 – RSC5 Eth B (radio shelf 2, slot 14)
11 – RSC2 Eth B (radio shelf 1, slot 12)	12 – RSC3 Eth A (radio shelf 1, slot 14)	11 – RSC2 Eth A (radio shelf 1, slot 12)	12 – RSC3 Eth B (radio shelf 1, slot 14)
13 – RSC0 Eth B (radio shelf 0, slot 12)	14 – RSC1 Eth A (radio shelf 0, slot 14)	13 – RSC0 Eth A (radio shelf 0, slot 12)	14 – RSC1 Eth B (radio shelf 0, slot 14)
15 – AH0 Eth B (utility shelf, slot 9)	16 – AH1 Eth B (utility shelf, slot 18)	15 – AH0 Eth A (utility shelf, slot 9)	16 – AH1 Eth A (utility shelf, slot 18)
17 – AH2 Eth A (utility shelf, slot 11)	18 – AH3 Eth A (utility shelf, slot 17)	17 – AH2 Eth B (utility shelf, slot 11)	18 – AH3 Eth B (utility shelf, slot 17)
19 – NC	20 – NC	19 – NC	20 – NC
21 – NC	22 – NC	21 – NC	22 – NC
23 – Ethernet patch panel, port B	24 – ES0, port 24 (cross-over cable)	23 – Ethernet patch panel, port A	24 – ES1, port 24 (cross-over cable)

Table 4.15 Ethernet Cable Summary

basestation.

NOTE: See your field engineering package (FEP) for cabling information specific to your basestation.

To connect the Ethernet cables

1 Connect the Ethernet cables to the Ethernet switches. Table 4.15 shows the origin and termination point of each cable.

- If you are using an edge router configuration without redundancy, connect Ethernet switch 0 to the edge router by connecting port 1 on the right ES rear I/O card (slots 19–20) to the edge router. Use a straight-through Ethernet cable.
- If you are using an edge router configuration with redundancy:

  i Connect Ethernet switch 0 to the edge router by connecting port 1 on the right ES rear I/O card (slots 6–7) to port 0 on the edge router.

  ii Connect Ethernet switch 1 to the edge router by connecting port 1 of the left ES rear I/O card (slots 19–20) to port 1 on the edge router.

Connect the Clock Cables

The GPS clock module receives its timing signals from the GPS antennas via two coaxial cables with male TNC connectors on each end. The clock cables use 0.195-inch coaxial cables with male SMA connectors to distribute the timing signals to the clock wiring cards.

Component Numbering

The radio shelves are numbered from bottom to top (that is, the bottom shelf is "0" and the top shelf is "2"). Each radio shelf contains two rear-facing clock wiring cards, one in slot 11 and one in slot 16.

The GPS clock module outputs are numbered from left to right when viewed from the back of the NPM basestation.

To connect the clock cables

1. Connect the two GPS antenna cables to the Antenna 1 and Antenna 2 ports located on the rear of the GPS clock module.
2. Connect the GPS clock module to the clock wiring cards using the clock cables. Table 4.16 shows the origin and termination point of each cable.

> **NOTE:** The minimum bend radius for clock cables is 2.54 cm (1.0 inch).

Origin	Termination
GPS clock module, FREQUENCY OUT 1	Radio shelf 0 (bottom), right clock wiring card (slot 11), FREQUENCY (bottom) connector
GPS clock module, FREQUENCY OUT 2	Radio shelf 0 (bottom), left clock wiring card (slot 16), FREQUENCY (bottom) connector
GPS clock module, FREQUENCY OUT 3	Radio shelf 1 (middle), right clock wiring card (slot 11), FREQUENCY (bottom) connector
GPS clock module, FREQUENCY OUT 4	Radio shelf 1 (middle), left clock wiring card (slot 16), FREQUENCY (bottom) connector
GPS clock module, FREQUENCY OUT 5	Radio shelf 2 (top), right clock wiring card (slot 11), FREQUENCY (bottom) connector
GPS clock module, FREQUENCY OUT 6	Radio shelf 2 (top), left clock wiring card (slot 16), FREQUENCY (bottom) connector

Table 4.16 Clock Cable Summary

Connect the RF Cables

The RF cables are 0.195-inch coaxial cables with male SMA connectors on each end.

Component Numbering

The RF shelves are numbered from bottom to top (that is, the bottom shelf is “0” and the top shelf is “2”). When viewed from the front of the NPM basestation, the RFSS modules in each shelf are numbered from left to right (that is, the left module is “0” and the right module is “3”).

The radio shelves are numbered from bottom to top (that is, the bottom shelf is “0” and the top shelf is “2”). Each radio shelf contains two IF/RF cards, one in slots 10–11 and one in slots 15–16.

Figure 4.19 shows the layout of the RFSS modules and IF/RF cards.

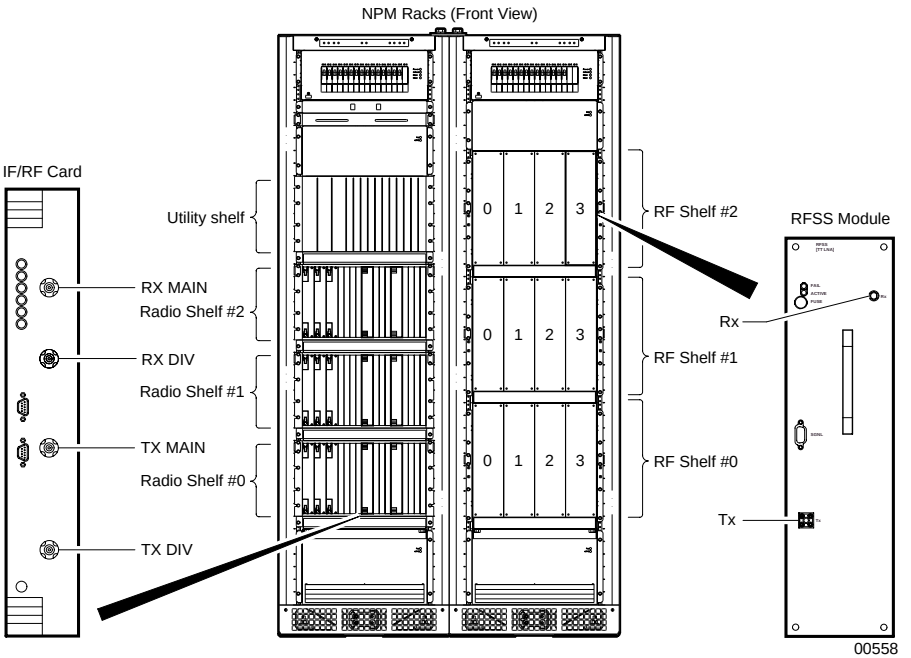

Figure 4.19 RF Connector Locations

To connect the RF cables

1 Connect each RF cable. Table 4.17 shows the origin and termination point of each cable.

NOTE: The minimum bend radius for RF cables is 2.54 cm (1.0 inch).

Origin	Termination
RF shelf 0, RFSS module 0, RX connector	Radio shelf 0, left IF/RF card (slots 10–11), RX MAIN connector
RF shelf 0, RFSS module 0, TX connector	Radio shelf 0, left IF/RF card (slots 10–11), TX MAIN connector
RF shelf 0, RFSS module 1, RX connector	Radio shelf 0, left IF/RF card (slots 10–11), RX DIV connector
RF shelf 0, RFSS module 1, TX connector	Radio shelf 0, left IF/RF card (slots 10–11), TX DIV connector
RF shelf 0, RFSS module 2, RX connector	Radio shelf 0, right IF/RF card (slots 15–16), RX MAIN connector
RF shelf 0, RFSS module 2, TX connector	Radio shelf 0, right IF/RF card (slots 15–16), TX MAIN connector
RF shelf 0, RFSS module 3, RX connector	Radio shelf 0, right IF/RF card (slots 15–16), RX DIV connector
RF shelf 0, RFSS module 3, TX connector	Radio shelf 0, right IF/RF card (slots 15–16), TX DIV connector
RF shelf 1, RFSS module 0, RX connector	Radio shelf 1, left IF/RF card (slots 10–11), RX MAIN connector
RF shelf 1, RFSS module 0, TX connector	Radio shelf 1, left IF/RF card (slots 10–11), TX MAIN connector
RF shelf 1, RFSS module 1, RX connector	Radio shelf 1, left IF/RF card (slots 10–11), RX DIV connector

Table 4.17 RF Cable Summary (1 of 2)

Origin	Termination
RF shelf 1, RFSS module 1, TX connector	Radio shelf 1, left IF/RF card (slots 10–11), TX DIV connector
RF shelf 1, RFSS module 2, RX connector	Radio shelf 1, right IF/RF card (slots 15–16), RX MAIN connector
RF shelf 1, RFSS module 2, TX connector	Radio shelf 1, right IF/RF card (slots 15–16), TX MAIN connector
RF shelf 1, RFSS module 3, RX connector	Radio shelf 1, right IF/RF card (slots 15–16), RX DIV connector
RF shelf 1, RFSS module 3, TX connector	Radio shelf 1, right IF/RF card (slots 15–16), TX DIV connector
RF shelf 2, RFSS module 0, RX connector	Radio shelf 2, left IF/RF card (slots 10–11), RX MAIN connector
RF shelf 2, RFSS module 0, TX connector	Radio shelf 2, left IF/RF card (slots 10–11), TX MAIN connector
RF shelf 2, RFSS module 1, RX connector	Radio shelf 2, left IF/RF card (slots 10–11), RX DIV connector
RF shelf 2, RFSS module 1, TX connector	Radio shelf 2, left IF/RF card (slots 10–11), TX DIV connector
RF shelf 2, RFSS module 2, RX connector	Radio shelf 2, right IF/RF card (slots 15–16), RX MAIN connector
RF shelf 2, RFSS module 2, TX connector	Radio shelf 2, right IF/RF card (slots 15–16), TX MAIN connector
RF shelf 2, RFSS module 3, RX connector	Radio shelf 2, right IF/RF card (slots 15–16), RX DIV connector
RF shelf 2, RFSS module 3, TX connector	Radio shelf 2, right IF/RF card (slots 15–16), TX DIV connector

Table 4.17 RF Cable Summary (2 of 2)

INSTALLING THE ANTENNAS

These procedures describe how to install the main, diversity, and GPS antennas for use with the NPM basestation.

Table 4.18 shows the actions described in this section.

Action	Page
Install the GPS Antennas	106
Install the Main and Diversity Antennas	108
Measuring VSWR and Return Loss	111
Measuring the Distance to a Fault	114

Table 4.18 Installing the Antennas Procedure Summary