# Safety Requirements

The following paragraphs contain general safety information.

For safe operation, observe the following:

- Only authorized personnel should be allowed access to the IPX.
- To ensure safe and proper operation of the IPX (together with peripheral equipment), use only the power cords, cables, and connectors specified for the attached peripheral equipment, and make sure they are in good condition.

## Power and Grounding

1. Ensure that the IPX frame is attached to an isolated ground connection (frame attached directly to ground through an uninterrupted line).
2. As part of the branch circuit that supplies the unit, install a grounding conductor that is identical in size to the ground and ungrounded branch circuit supply conductors. This grounding conductor is green with yellow stripes.
3. Make sure that all attached plug receptacles in the vicinity of the unit or system are of a grounding type, and the grounding conductors serving these receptacles are connected to earth at the service equipment.

## CEPT Requirements

Consider the CEPT requirements prior to connecting a private network to the public switched networks in certain international service areas, as follows:

**Step 1** Only those 48 VDC power sources that comply with EN60950 can connect to the 48 VDC power distribution unit.

**Step 2** The following port types on the IPX are approved to carry public-switched non-voice traffic (OTR001, issue 3, port types 2DN):

- BC-E1 ports (G.703, 2048 Kbits per second).
- SDI-RS-232, LDI-RS-232, BC-SR, SDI-RS-449, FRI-V.35 (approved for direct connection to V.35 leased digital circuit).
- SDI-RS-449 (when connected via StrataCom RS449/X.21 interface cable).

**Step 3** The following port type on the IPX is approved to carry PSTN voice traffic:

- BC-E1 ports (G.703 2048 Kbps, when connected to the CDP and NTC front cards).

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**Note** Each cable must be attached so that its removal requires the use of tools.

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**Step 4** To keep end-to-end delays at 10 ms or less, adhere to the following configuration constraints in relation to the IPX:

- Only d-type connections may be used.
- Routes must not exceed one hop.
- Trunk queue depths must be modified. If an IPX System Administrator cannot do this, contact StrataCom ISC.

## EMI Requirements

Compliance with Emission requirements depends upon adherence to the installation steps in this manual, including installation of faceplates for all slots and the use of shielded cables between systems.

## Parts Checklist

Before proceeding, go through the parts checklists that follow to verify that all ordered parts are present and in good condition. If anything is missing or damaged, report it to your StrataCom Order Administration representative.

### IPX Cabinets

Check the cabinet for the following:

_____ [IPX 16/32] The unit has the correct number of shelves (1 or 2).

_____ The unit has the correct power supply type (AC or DC). For IPX 16/32: open the back door. For IPX 8: look on the back. The words “AC (or DC) PWR DISTRIBUTION” are on the back panel of the Power Distribution Unit.

_____ The unit has the correct number of power supplies (1, 2, 3, or 4).

### Plug-In Cards

Verify that all cards are present for the ordered configuration.

_____ Correct number of NPCs

_____ Correct number of SCCs

_____ Correct number of SCC-Bs

_____ Correct number of CDPs

_____ Correct number of NTCs

_____ Correct number of FRPs

_____ Correct number of FRIs

_____ Correct number of SDPs

_____ Correct number of SDIs

_____ Correct number of LDPs

_____ Blank covers for all unused back slots

_____ Correct number of LDIs

_____ Correct number of BC-T1s

_____ Correct number of BC-E1s

_____ Correct number of BC-SRs

_____ Correct number of BC-J1s

_____ Correct number of BC-Y1s

_____ Correct number of LECs[1]

_____ Correct number of AITS

_____ Correct number of BC-AIT-T3s

_____ Correct number of BC-AIT-E3s

_____

1. Used in IPX 32 nodes only.

**Note** An inventory list of the installed cards is taped to the IPX cabinet. The list includes each card's serial number, revision number, and slot number. Serial and revision numbers are also found on the component side of each card. After accounting for all cards, tape the inventory inside the back cover of this manual for future reference.

# Installing the IPX Cards

**Caution** Ground yourself before handling IPX cards by placing a wrist strap on your wrist and clipping the strap lead to the cabinet, or use the wrist strap that is connected to the cabinet.

The IPX 16 has one (upper) card shelf. Its card slot numbers are 1 through 16 (left to right when viewed from the front of the cabinet). In addition to an upper card shelf, the IPX 32 contains a bottom shelf with card slots numbered 17 through 32. A front view of the IPX 16 and the IPX 32 appear in Figure 2-9 and Figure 2-10, respectively.

The locations of the system cards in an IPX depend on the configuration. The only cards that are always in the same locations are the NPCs, the SCC, and the LEC. The locations of these cards for an IPX 16 and an IPX 32 are as follows:

- IPX 16 (Non-Redundant)
  - NPC: front slot number 1
  - SCC: back slot number 1 behind PCC in front slot number 1
- IPX 16 (Redundant)
  - NPCs: front slot numbers 1 and 2
  - SCC: back slot number 1 behind PCC in front slot number 1
- IPX 32 (Non-Redundant)
  - NPC: front slot number 1
  - SCC: back slot number 1 behind NPC front slot number 1
  - LEC: back slot number 17
- IPX 32 (Redundant)
  - NPC: front slot number 1
  - SCC: back slot number 1 behind NPC front slot number 1
  - NPC: always in front slot number 17
  - LEC: back slot number 17 behind NPC front slot number 17

**Figure 2-9 IPX 16 Card Shelf, Front View**

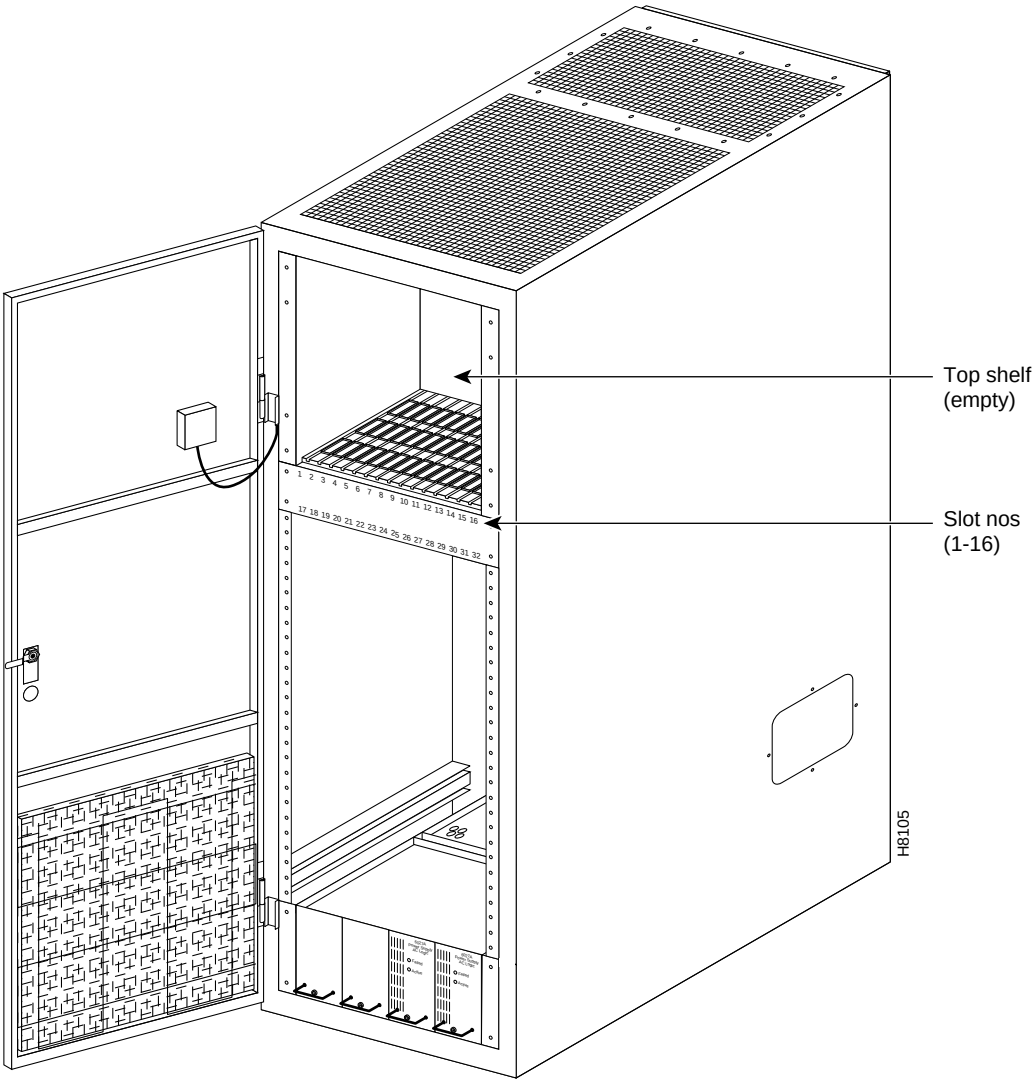
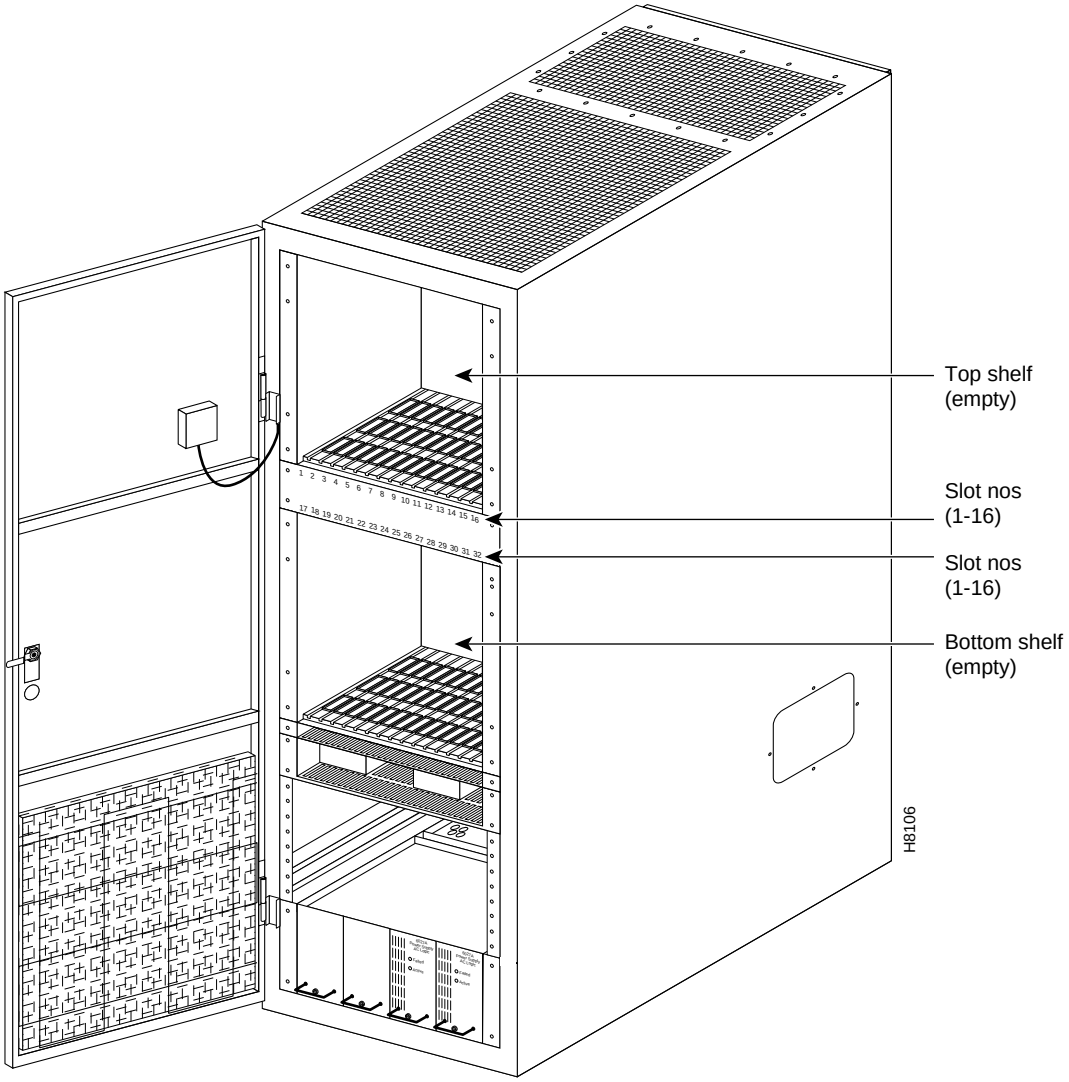
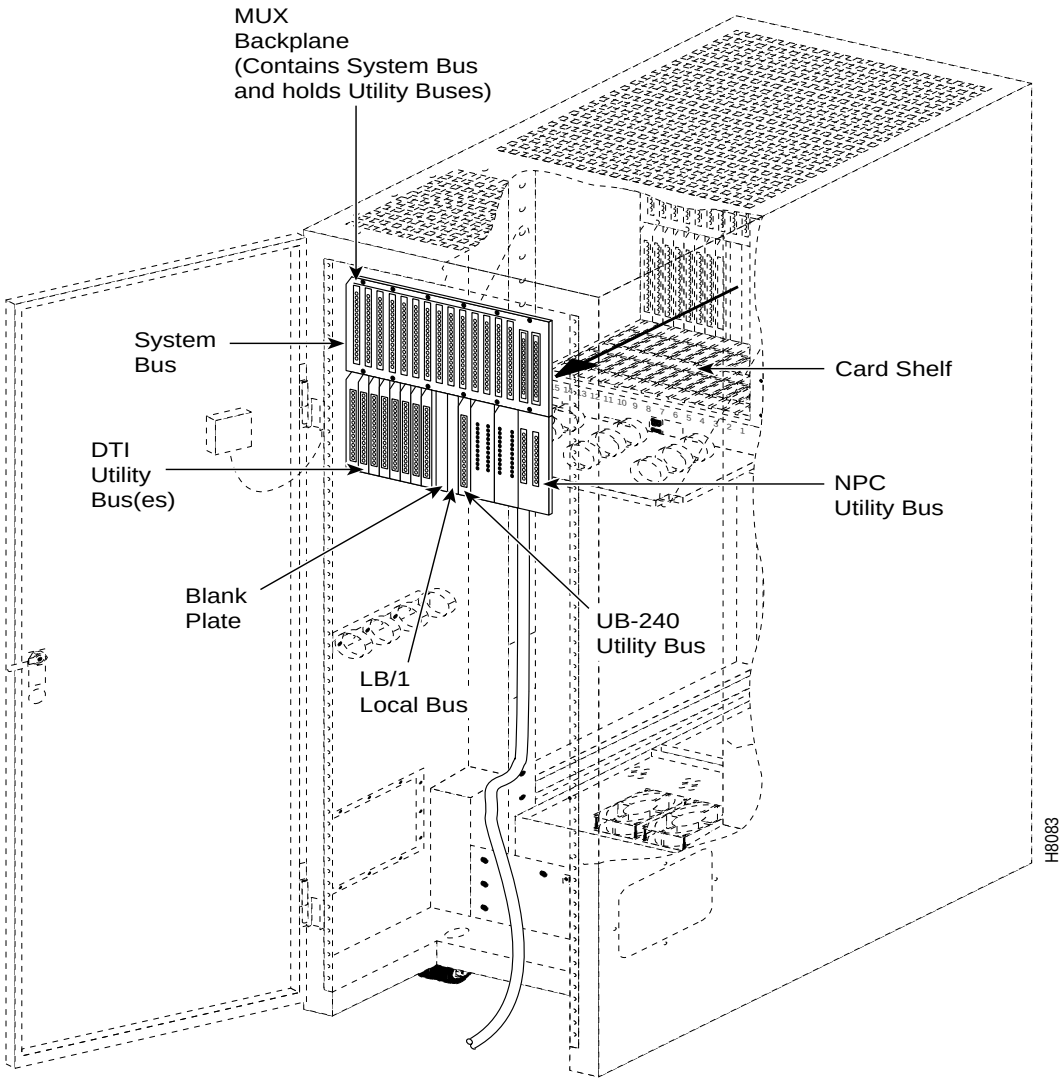


**Figure 2-10 IPX 32 Card Shelves, Front View**




Use of the remaining slots depends on the node configuration. The position of the various utility buses installed on the System Bus backplane determines in which slots the cards can be installed. Figure 2-11 shows the six types of utility buses as viewed from the back of the cabinet. These are the NPC-UB, LB/1, and UB 240 utility buses. Except for the NPC bus, the locations of these buses can vary from node to node.

**Figure 2-11 Typical Locations of Utility Buses (Rear View)**



The use of the MUX backplane, system bus, and utility buses is as follows:

- MUXBUS Backplane
  - 16-slot backplane that provides power to all cards contains the system bus and any installed utility buses. Each card shelf has one MUXBUS backplane.
- NPC Utility Bus
  - The IPX uses two different types of NPC utility buses: a one-slot bus and a two-slot bus.
  - In an IPX 16, the two-slot bus is installed in slot 1 and supports two NPC front cards and extends the I/O interface of the NPCs to an SCC installed in back slot 1.
  - In an IPX 32, a one-slot bus is installed in both slot 1 and slot 17 and supports an active and a standby NPC. The SCC installed in back slot 1 is connected by cabling to an LEC installed in back slot 17, thereby extending the system bus to the lower shelf (slots 17 through 32).
- Local Utility Bus (LB/1)
- provides a single-slot bus for the following:
  - CDP in the front slot, with a BC-T1, BC-J1, or BC-E1 in the back slot behind the CDP card.
  - NTC in the front slot, with a BC-T1, BC-Y1, BC-SR, or BC-E1 in the back slot behind the NTC.
  - LDP in the front slot, with a four-port or eight-port LDI in the back slot behind the LDP.
- UB-240 Utility Bus
  - Single-slot bus for an SDP in the front slot, with an SDI in the back slot behind the SDP card.

## IPX 8 Card Shelf Configuration

The IPX 8 cabinet contains one card shelf with front and back slots for card access. Figure 2-12 illustrates the slot numbering.

Front slots 1 and 2 are reserved for the primary and redundant NPC controller cards. The accompanying SCC is factory-installed in rear slot 1. If the system has a redundant PCC/NPC, it resides in front slot 2, and rear slot 2 remains empty.

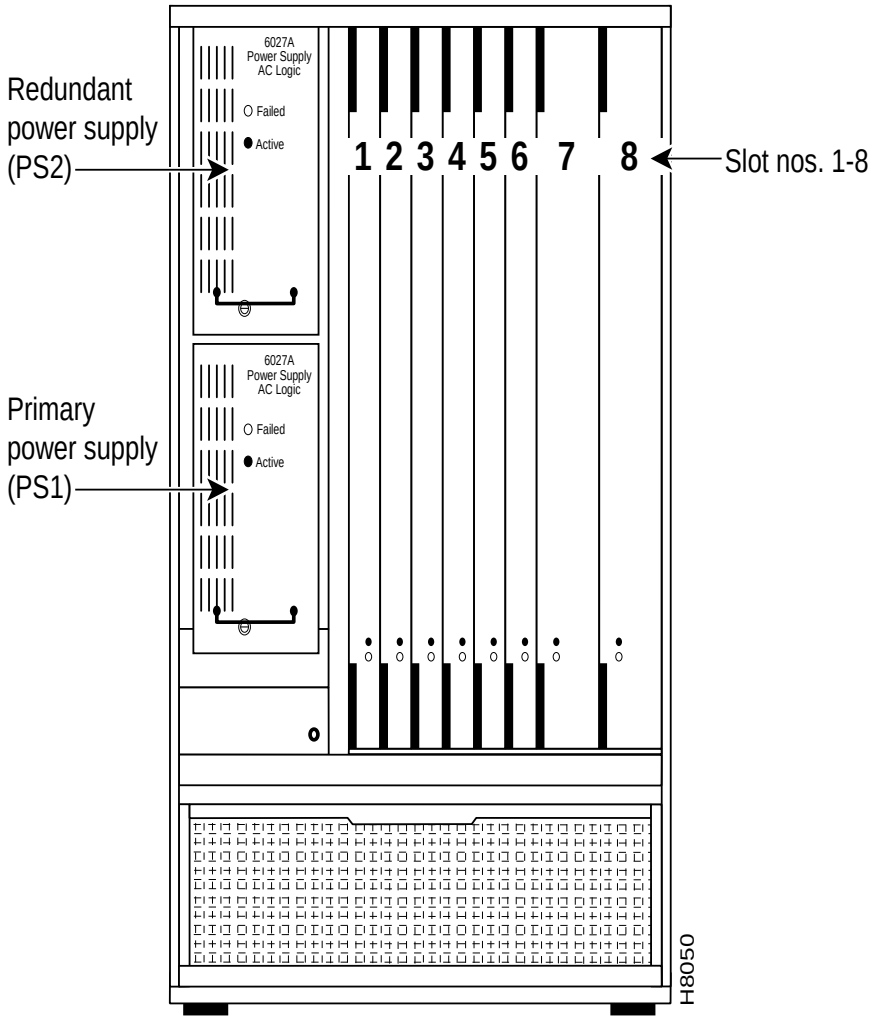
Various cards can reside in card slots other than 1 and 2. These include the NTC, CDP, FRP, SDP, LDP, ARC, and AIT. The cards in the back slots are the network and user interface cards. These include the BC-E1, BC-T1, BC-SR, FRI, SDI, ARI, ATM-T3/E3 and LDI. Most card types can reside anywhere a vacant slot and the appropriate utility bus exists. Only the controller card and power supply have assigned slots for primary and redundant units.

System assemblies indicated as T1 are configured with a BC-T1 as the back card associated with the NTC and CDP. Assemblies indicated as E1 are configured with a BC-E1 as the back card associated with the NTC and CDP. System assemblies indicated as J1 are configured with a BC-J1 as the back card associated with the NTC card and a BC-Y1 as the back card associated with the CDP.

## Installing IPX 8 Plug-In Cards

The IPX 8 has one card shelf. The card slot numbers are 1 through 8 (left to right from the front of the cabinet). Figure 2-12 shows a front view of the card shelf. The locations of the system cards in an IPX depend on the configuration. The NPCs, and SCC occupy reserved card slots.

**Figure 2-12 IPX 8 Card Shelf (Front View)**




The locations for the NPCs, the SCC, and the power supplies are as follows:

- Single NPC configuration:
  - NPC: front slot number 1
  - SCC: back slot number 1
- Redundant NPC configuration:
  - Primary NPC: front slot number 1
  - Redundant NPC: front slot number 2
  - SCC: back slot number 1

- Single Power Supply configuration:
  - Power Supply in lower left power supply slot
- Redundant Power Supply configuration:
  - Primary Power Supply number 1 in lower left power supply slot
  - Redundant Supply number 2 in upper left power supply slot

## Installing a Redundant IPX 8 Power Supply

If a second power supply is later added for redundancy, it is used as a hot backup. Remove the front top blank panel and install it in the upper power supply slot in place of the blank panel (Figure 2-12).

## Expansion into Empty Slots

Use of the remaining empty slots in the cabinet depends on the node configuration. Each slot requires a utility bus to provide an electrical interface between the front card and the back card. You must not randomly install a card in an empty slot because the card may require a specific utility bus that may or may not be installed.

For the IPX 8, the choice of utility buses for the last several slots narrows down to either Local Bus 1 (LB/1) for the CDP, NTC, AIT, and LDP cards or the UB-240 bus for the SDP card.