FORE Kiosk and Accessory Installation Manual

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Legal Notices

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Preface

This manual provides the technical information needed to install and configure the FORE kiosk, a closed, multi-unit rack assembly designed to accommodate any two of the MSC-900, TNX-1100, or ASX-1000. This document also provides safety instructions and suggested uses for the kiosk and its optional accessories.

This document was created for users with various levels of experience. If you have any questions or problems with the installation, please contact FORE Systems' Technical Support.

Chapter Summaries

Chapter 1 - The FORE Kiosk - Provides a brief overview of the kiosk, it's physical specifications, the Power Interface, and a list of terms used in the installation instructions.

Chapter 2 - Kiosk Setup - Provides information about installing the FORE Kiosk, the equipment it holds, and its optional accessories.

Chapter 3 - Suggested Cable Routing - Provides information about cable management and a sample of a cable routing scheme to be used with the Kiosk (or other rack) and cable management tray.

Technical Support

In the U.S.A., you can contact FORE Systems' Technical Support using any one of the following methods:

1. If you have access to the Internet, you may contact FORE Systems' Technical Support via e-mail at:

   support@fore.com

2. You may FAX your questions to "support" at:

   412-742-7900

3. You may send questions, via U.S. Mail, to:

   FORE Systems, Inc.
   1000 FORE Drive
   Warrendale, PA 15086-7502

4. You may telephone your questions to "support" at:

   800-671-FORE (3673) or 412-635-3700

Technical support for non-U.S.A. customers should be handled through your local distributor.

No matter which method is used for support, please be prepared to provide your support contract ID number, the serial number(s) of the product(s), and as much information as possible describing your problem / question.

Important Information Indicators

To call your attention to safety and otherwise important information that must be reviewed to ensure correct and complete installation, as well as to avoid damage to the FORE Systems product or to your system, FORE Systems utilizes the following *WARNING/CAUTION/NOTE* indicators.

WARNING statements contain information that is critical to the safety of the operator and/or the system. Do not proceed beyond a **WARNING** statement until the indicated conditions are fully understood or met. This information could prevent serious injury to the operator, damage to the FORE Systems product, the system, or currently loaded software, and is indicated as follows:

WARNING!

Hazardous voltages are present. To reduce the risk of electrical shock and danger to personal health, follow the instructions carefully.

CAUTION statements contain information that is important for proper installation/operation. Compliance with **CAUTION** statements can prevent possible equipment damage and/or loss of data and are indicated as follows:

CAUTION

You risk damaging your equipment and/or software if you do not follow these instructions.

NOTE statements contain information that has been found important enough to be called to the special attention of the operator and is set off from the text as follows:

If you change the value of the LECS control parameters while the LECS process is running, the new values do not take effect until the LECS process is stopped, and then restarted.

Safety Precautions

For your protection, observe the following safety precautions when setting up equipment:

- Follow all warnings and instructions marked on the equipment.
- Ensure that the voltage and frequency of your power source matches the voltage and frequency inscribed on the equipment's electrical rating label.
- Never push objects of any kind through openings in the equipment. Dangerous voltages may be present. Conductive foreign objects could produce a short circuit that could cause fire, electric shock, or damage to your equipment.

Modifications to Equipment

Do not make mechanical or electrical modifications to the equipment. FORE Systems, Inc., is not responsible for regulatory compliance of a modified FORE product.

Placement of a FORE Systems Product

CAUTION

To ensure reliable operation of your FORE Systems product and to protect it from overheating, openings in the equipment must not be blocked or covered. A FORE Systems product should never be placed near a radiator or heat register.

CHAPTER 1 The FORE Kiosk

1.1 Introduction

The FORE kiosk is a closed, multi-unit equipment rack designed to hold up to two of any combination of the MSC-900, ASX-1000, and TNX-1100. The kiosk is available in three different configurations, described in Section 2.2.1. A view of the kiosk, showing the location and relative position of each hardware option, is shown in Figure 1.1.

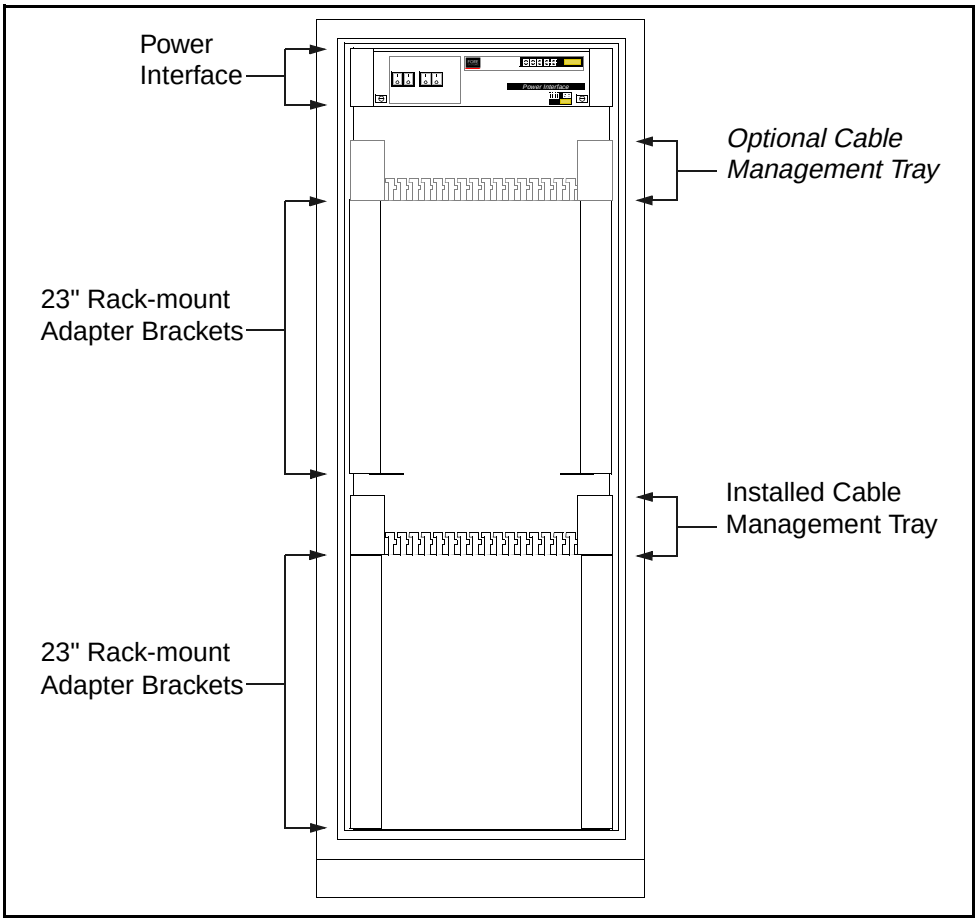

Figure 1.1 - Front View of FORE Kiosk (door not shown)

1.1.1 Kiosk Specifications

The physical specifications of the FORE kiosk are listed in Table 1.1.

Table 1.1 - Kiosk Specifications

Description	Specification
Dimensions	Height: 78.9" (200.4 cm) Width: 29.1" (73.9 cm) Depth: 29.1" (73.9 cm)
Door Opening Height	70.1" (178.1 cm)
Door Opening Width	24.1" (61.2 cm)

1.1.2 Terms and Abbreviations

The following acronyms are used throughout this manual; the list below provides the definition of these acronyms.

ABS Alarm Battery Supply

ACO Alarm Cut Off

ARLB Automatic Recovery from Low Battery

AWG American Wire Gauge

BCD Binary Coded Decimal

BDFB Battery Distribution Fuse Board

BP Branch Panel

BR Battery Return

CBN Common Bonding Network

C.O. Central Office

CSA Canadian Standards Association

DMS	Digital Multiplex Switching
EMI	Electromagnetic Interference
ESD	Electrostatic Discharge
FCC	Federal Communications Commission
FG	Frame Ground
FSP	Frame Supervisory Panel
IBN	Isolated Bonding Network
IEC	International Electrotechnical Commission
LCE	Line Concentrating Equipment
MSP	Modular Supervisory Panel
MTBF	Mean Time Before Failure
MTM	Maintenance Trunk Module
N/A	Not Applicable
N/C	No Connection
OAU	Office Alarm Unit
O/C	Open Circuit
PI	Power Interface
SPG	Single Point Ground
TBD	To Be Determined
UL	Underwriter Laboratories

1.2 Power Interface (PI)

The PI terminates four #6AWG 30A branch panel (BP) feeds, designated A1, A2, B1, B2, and distributes those feeds to the four power supply positions in the FORE kiosk. Each BP input is filtered by a replaceable battery filter module that provides capacitive filtering and low frequency stability. The principal features of the PI are listed below:

- BP feed termination
- 4 independent power switches
- 4 independent battery filter circuits
  - Current-limiting start-up circuit
  - Input monitoring
- Central Office (CO) alarm outputs and indicators
- Modular design
  - Replaceable battery filters
  - Replaceable alarm unit

The Power Interface, shown in Figure 1.2, is installed in the very top portion of the FORE kiosk (see Figure 1.1).

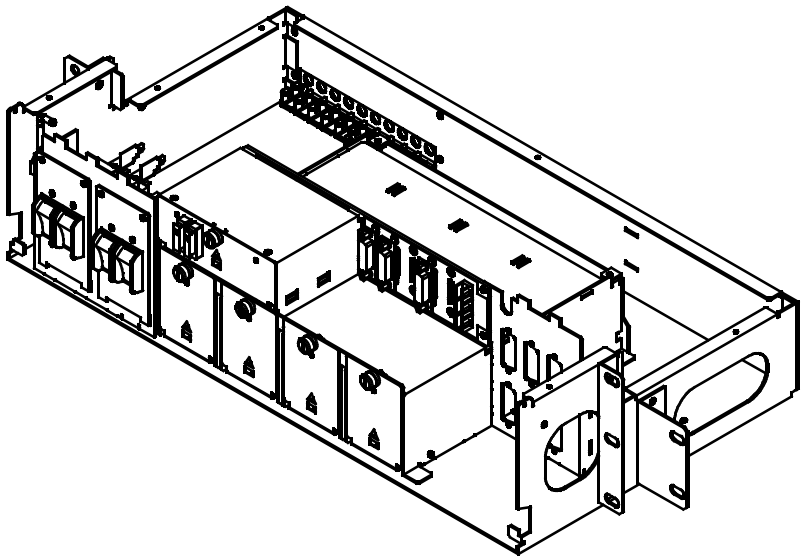

Figure 1.2 - The FORE Systems Power Interface (PI)

1.2.1 Block Diagrams and Partitioning

The block diagram in Figure 1.3 shows the basic subgroups of the PI.

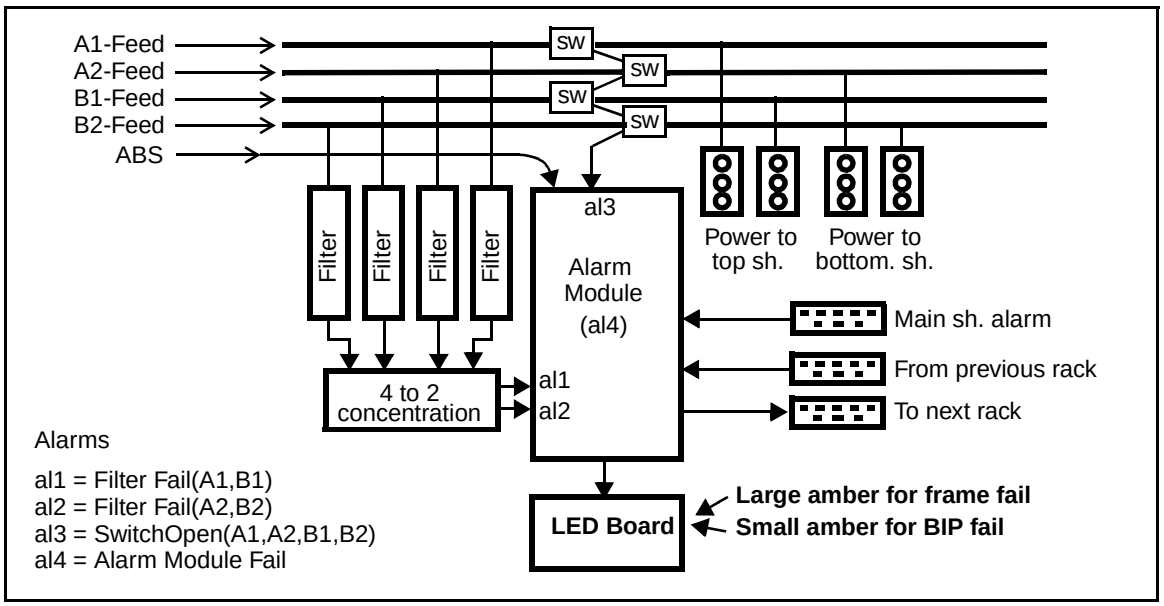

Figure 1.3 - PI Block Diagram and Subgroups

The power inputs and filter modules are connected to 30A BP feeds and are able to provide capacitive filtering for low frequency stability. The module contains a start-up current limiting circuit and has the ability to indicate failures.

The alarm unit receives a contact break signal from the shelf indicating a failure within the shelf. It also provides Frame Identification (Frame ID) signals via 2 BCD switches, switch position signals, and ABS power. In addition to inter-rack (or office) alarm outputs including, alarm level unit hook and TPC communication links, an aisle alarm is generated and routed via two high density 26 pin D-sub connectors. The alarm unit also generates the drive for appropriate “Follow Me” and fail indications. A separate LED PCB mounted to the front cover is utilized for mounting the “Follow Me” and “PI Fail” LEDs.

1.2.2 PI Components

1.2.2.1 Bus Bar/BP Feed Termination

The bus bar assembly, shown in Table 1.4, is designed to terminate one #6AWG two hole lug per bar and one #10AWG two hole lug for ABS. Each bar is designed to terminate a single feed from the BP. Each of these bars also terminates a #10AWG link to the corresponding switch. Connections to the bus bars route directly to the output connectors. The vertical full length bars are for the feeds A1, A2, B1, B2 and the ABS. The half length bars are for the feed returns BR1, BR2, BR3, and BR4 with the ABS sharing a feed return with the BR1 feed. The provision is also made for ETSI grounding, with the option to link all bars to FG.

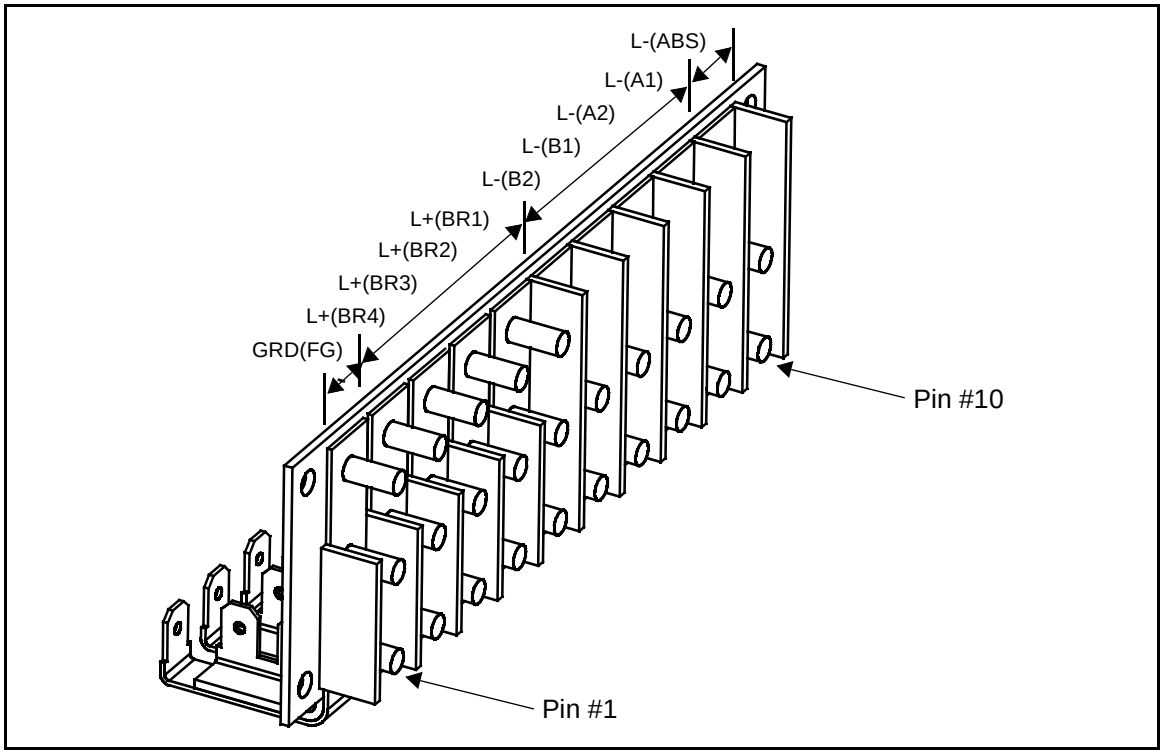

Figure 1.4 - Bus Bar Assembly

1.2.2.2 Switches and Output Connectors

The PI switches are rocker type with a 30 Amp ratings. The switch arrangement on the PI is shown in Figure 1.5. The switches are arranged in this manner for both maintenance and fail-safe purposes. Both feeds to any shelf cannot be switched off simultaneously.

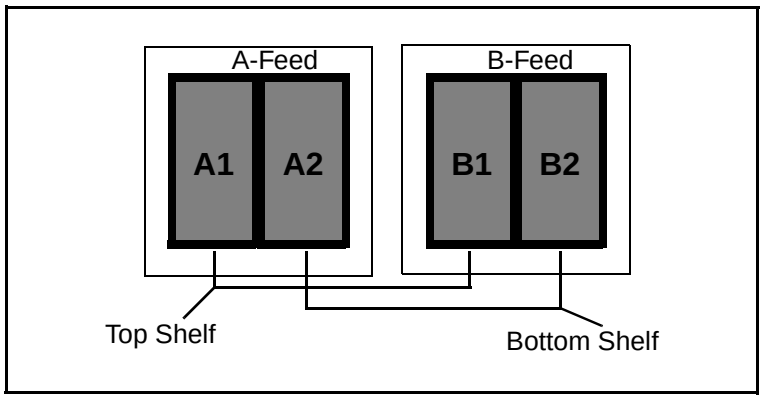

Figure 1.5 - Switch Arrangement

The power outputs are 3 pin Power-D sub connectors that use jackscrews with female contacts. The arrangement of the shelf connectors is shown in Figure 1.6.

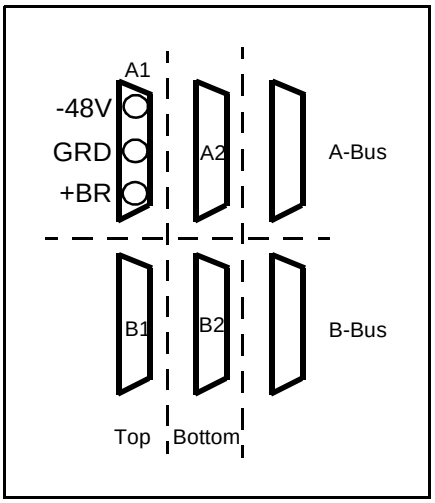

Figure 1.6 - 3W3 Connector Arrangement

1.2.2.3 Battery Filter Module

The battery filter module is designed to prevent oscillation in the feeds supplying the FORE kiosk with power. A slow charge circuit is included to prevent high currents to the alarm capacitors during start-up. The filter is designed to interface with the PI via a blind mate power D-Sub connector. Once the filter is disconnected from its mating connector, a discharge begins. The discharge has an RC time constant of no more than 10 seconds.

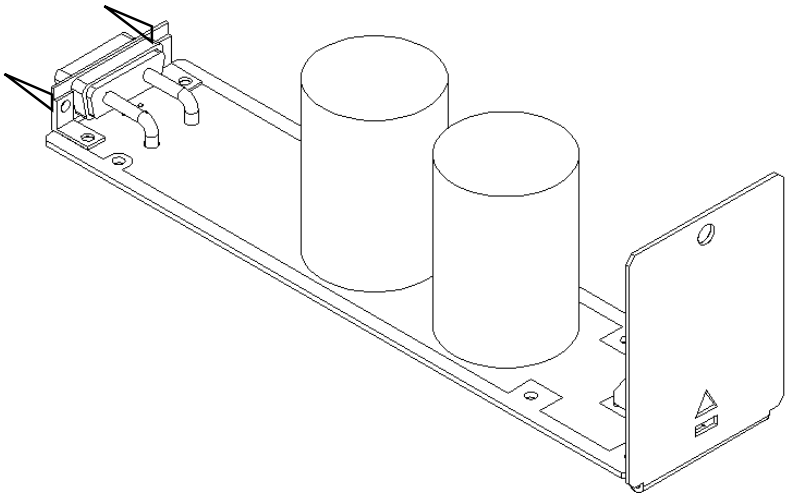

Figure 1.7 - Battery Filter Module

The primary functions of the battery filter module are to provide the following:

- Fully connectorized interface
- Current limiting start-up circuit
- Fail / power loss alarm
- Input voltage range
- Input transient protection
- LED test capability
- 30A capability

1.2.2.4 Alarm Module

The alarm module is designed for quick and simple replacement. This design helps to minimize service interruption should the module ever require replacement. The alarm circuit is comprised principally of transistor logic which is triggered by three different input types: Filter Fail, Switch Open, and Alarm Module Fail.

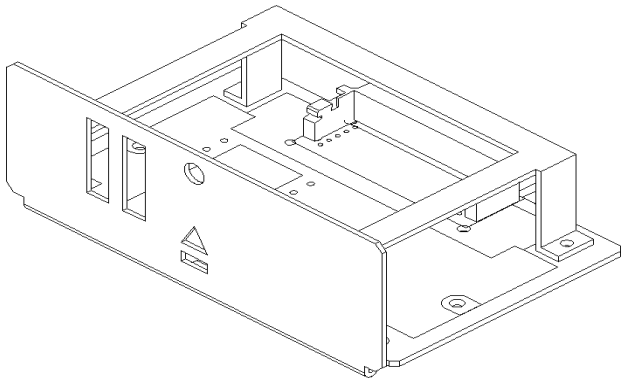

Figure 1.8 - Alarm Module

The primary functions of the Alarm Module are to monitor and indicate the following:

- Switch / breaker status
- Filter status
- ABS fuse failures
- PI failure
- Conditions to trigger external alarms

1.2.2.5 Alarm Backplane

The alarm backplane routes signals to and from the alarm module and all necessary interface connectors. It allows the alarm module to be blind mated and to minimize internal PI wiring. The left-most connector (Figure 1.9) accepts ABS power which is then routed to the alarm module for fusing.

The pin header to the right is for the alarm module. The first (left-most) two high-density D-sub connectors are for inter-PI and office alarms. The next connector is for PI / shelf alarm communication.

The top right 2x4 pin header is routed to the switches (for switch position) and to the LED board (for indicator drive). The middle and bottom right 2x4 pin headers are routed to the four filters (for alarms, LED test, etc.)

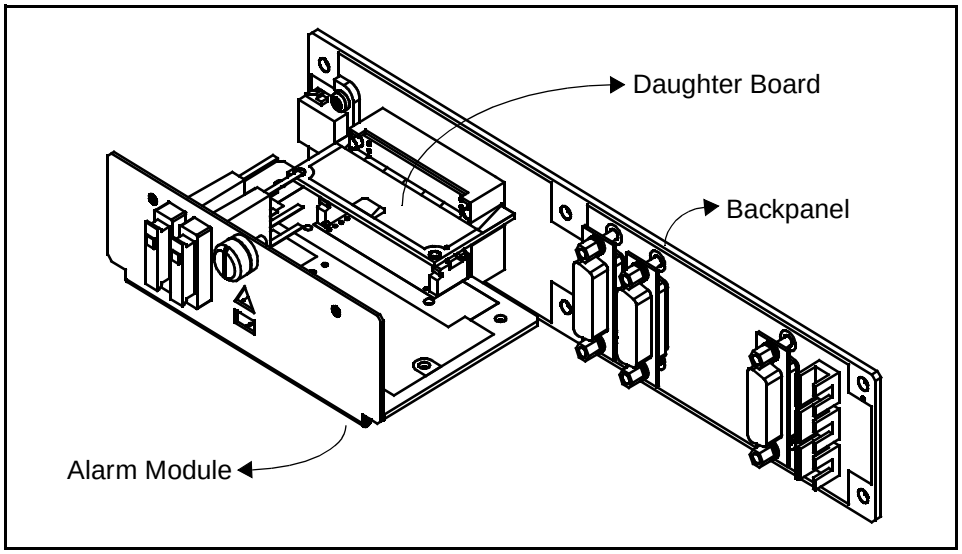

Figure 1.9 - Alarm Backplane Assembly

Additionally, the backplane hosts a small daughter board for the purpose of 4-to-2 concentration of the filter fail alarms. The two feed alarms to a given shelf are combined into one alarm signal. All the electronic components are surface mounted and fully connectorized. The daughter board is powered and monitored by the alarm module.

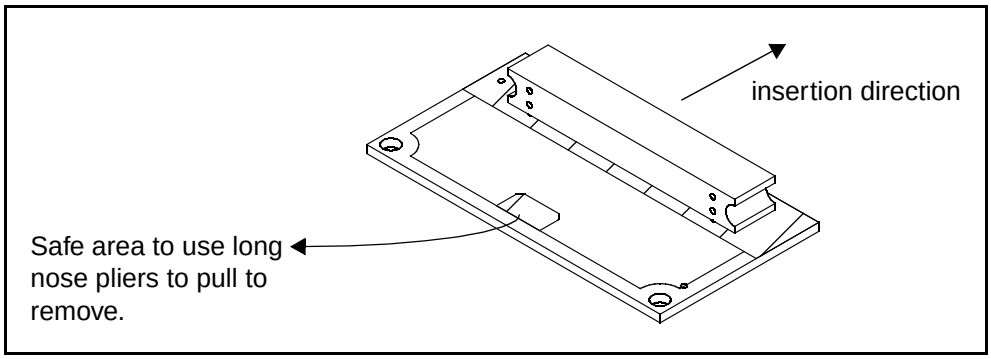

Figure 1.10 - Backpanel Daughter Board

1.2.2.6 LED Board

The LED board is a replaceable unit, driven by the alarm module (via the alarm backplane). It is mounted to the rear of the front cover, and dispersal of its illumination is provided by lenses mounted on the face of the front cover.

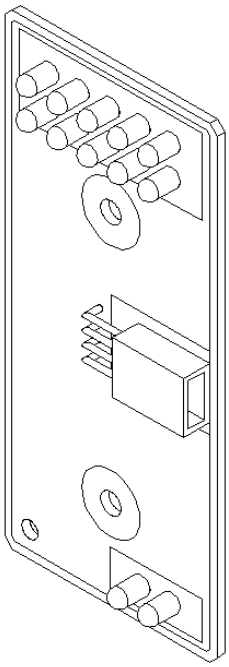

Figure 1.11 - LED Board

The primary functions of the LED board are to provide:

- Rack fail indication.
- PI fail indication.
- A fully connectorized interface

1.2.2.7 Front Cover

The front cover is an aluminum investment casting which can be unlocked and hinged upward to allow access to the output switches and breaker door. The front cover is also used to mount the LED board.

A detailed drawing of the front cover is shown in Figure 1.12.

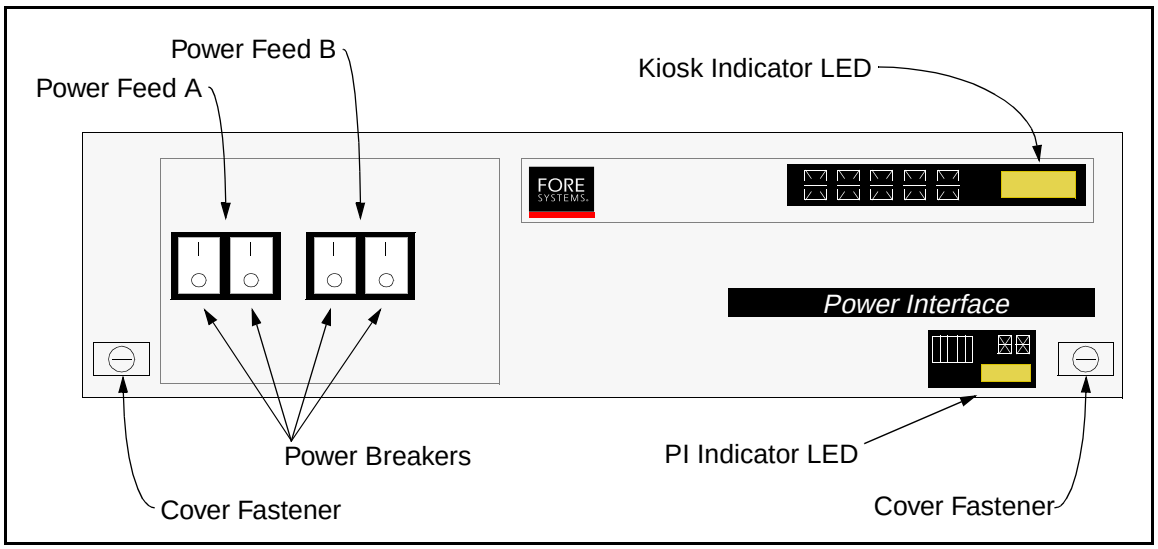

Figure 1.12 - The FORE Power Interface

1.2.3 Electrical Specifications

1.2.3.1 Input Characteristics

Table 1.2 - PI Input Characteristics

Busbar Terminal	Signal	Limits
9	A1	30A Max at -75VDC
8	A2	30A Max at -75VDC
7	B1	30A Max at -75VDC
6	B2	30A Max at -75VDC
5	BR1	30A Max at BR
4	BR2	30A Max at BR
3	BR3	30A Max at BR
2	BR4	30A Max at BR
10	L+(ABS)	5A Max at -75VDC
1	FG	Required for ETSI compatibility

1.2.3.2 Output Characteristics

Table 1.3 - Switch Output Characteristics

Connector	Pin Number	Signal	Limits
A1	A1	A1	30A Max at -75VDC
	A2	FG	Required for ETSI compatibility
	A3	BR1	30A Max at BR
A2	A1	A2	30A Max at -75VDC
	A2	FG	Required for ETSI compatibility
	A3	BR2	30A Max at BR
B1	A1	B1	30A Max at -75VDC
	A2	FG	Required for ETSI compatibility
	A3	BR3	30A Max at BR
B2	A1	B2	30A Max at -75VDC
	A2	FG	Required for ETSI compatibility
	A3	BR4	30A Max at BR
C1	A1	A2	30A Max at -75VDC
	A2	FG	Required for ETSI compatibility
	A3	BR2	30A Max at BR
C2	A1	B2	30A Max at -75VDC
	A2	FG	Required for ETSI compatibility
	A3	BR4	30A Max at BR

CHAPTER 2 Kiosk Setup

The FORE kiosk is a closed, multi-unit equipment rack designed to hold up to two of any combination of FORE Systems' ASX-1000, MSC-900, and TNX-1100 ATM switches and multiservice concentrators.

Over and above standard rack equipment, the kiosk provides the option of using both 19" and 23" devices, fiber and cable management hardware, and self-contained power conditioning for DC-powered installations.

This chapter contains the following information about setting up the FORE Systems kiosk:

- **Section 2.1 -** Introduction
- **Section 2.2 -** Unpacking
- **Section 2.3 -** Placing the Kiosk
- **Section 2.4 -** Connecting DC Power and Ground Cabling
- **Section 2.5 -** Installing an MSC-900, TNX-1100, or ASX-1000

2.1 Introduction

The FORE kiosk is available in three different configurations. These configurations, described further in Section 2.2.1, are listed below:

- **KIOSK-23** - 23" System Kiosk
- **KIOSKPKG-23/AC** - 23" System Kiosk Package (for AC-powered units)
- **KIOSKPKG-23/DC** - 23" System Kiosk Package (for DC-powered units)

Before installing the FORE kiosk, there are several important factors that must be taken into consideration, depending on the type of installation site. The following sections discuss in detail how to install the kiosk and any prerequisites to the installation.

It is important to read through the ENTIRE installation procedure before attempting to turn on the power to the unit.

2.2 Unpacking

Upon receipt of, and before opening your kiosk, inspect the package for any damage that may have occurred during shipping. If the package shows any signs of external damage or rough handling, notify your carrier's representative.

When unpacking the kiosk, be sure to keep all original packing materials. They may be needed for storing, transporting, or returning the product.

CAUTION

All products returned to FORE Systems, under warranty, must be packed in their original packing materials.

2.2.1 Inventorying the Unit

An inventory of the kiosk package should be performed before setting it up. Each kiosk package is different. The following subsections detail the contents of each package.

If any of the items listed for your package are missing or damaged, please contact FORE Systems' Technical Support immediately.

2.2.1.1 KIOSK-23 Contents

The KIOSK-23 kit should contain the following:

Quantity	Item
1	FORE Kiosk
2	Rack Mount Adapter Bracket Assemblies (pre-installed)
1	FORE Kiosk and Accessory Installation Manual (this manual)

2.2.1.2 KIOSKPKG-23/AC Contents

The KIOSKPKG-23/AC kit should contain the following:

Quantity	Item
1	FORE Kiosk
1	23" Cable Management Tray (pre-installed)
2	Rack Mount Adapter Bracket Assemblies (pre-installed)
4	Extended Length (10') AC Power Cords
1	FORE Kiosk and Accessory Installation Manual (this manual)

2.2.1.3 KIOSKPKG-23/DC Contents

The KIOSKPKG-23/DC kit should contain the following:

Quantity	Item
1	FORE Kiosk
1	Power Interface (PI) (pre-installed)
1	23" Cable Management Tray (pre-installed)
2	Rack Mount Adapter Bracket Assemblies (pre-installed)
4	DC Power Cables (w/ 3-pin D-subminiature connectors)
2	Alarm Cables
1	FORE Kiosk and Accessory Installation Manual (this manual)

2.3 Placing the Kiosk

The kiosk should only be installed in restricted access areas, such as dedicated equipment rooms or equipment closets, in accordance with local electrical codes. To ensure that the installed system operates at its maximum efficiency, it is important that the kiosk be positioned correctly. The following list provides a few guidelines that should be followed when determining where to place the kiosk:

- the kiosk should be in a stable area, free of excess movement and jarring
- the kiosk should be located where it can be easily serviced
- the kiosk should be safely installed; cables and cords should not be in the way of site personnel
- there should be space for proper air flow to allow the system to cool
- the area should be free of excess heat, dust, smoke, and electrostatic discharge

The kiosk is shown in Figure 2.1.

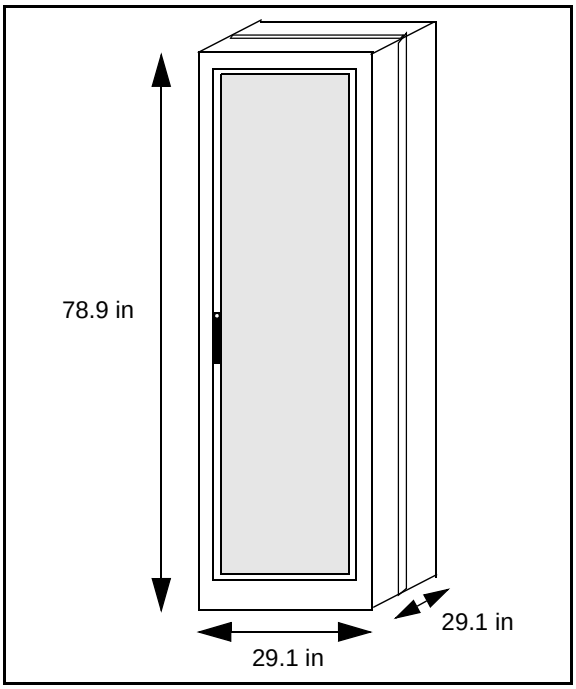

Figure 2.1 - FORE Kiosk

2.4 Connecting DC Power and Ground Cabling

This section provides procedures to install DC power and ground cables from a central office power supply to a FORE kiosk system. The kiosk has the versatility to use either top or bottom cable routing for the power feeds and frame ground.

2.4.1 Electrical Considerations

The following items should be considered when setting up the kiosk:

CAUTION

Consideration should be given to the connection of the equipment to the supply circuit and the effect that the overloading of circuits could have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

CAUTION

Reliable grounding of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch (i.e., use of power strips).

2.4.2 Power and Ground Overview

Three types of grounding topologies are discussed in this section. Common Bonding Network (CBN) (Figure 2.2) and Isolated Bonding Network (IBN) (Figure 2.3) are typically found in North America. These are similar topologies, the major difference being that the IBN topology is isolated from the floor. ETSI (Mesh-BN) Bonding Network (Figure 2.4) topologies are commonly used elsewhere. For all topologies, the -48V source must be reliably connected to earth and must be electrically isolated from any AC source.

The topics covered in this section include:

- Top ground cabling (all three topologies) - Section 2.4.3 to Section 2.4.5
- Top power cabling - Section 2.4.6
- Bottom ground cabling (all three topologies) - Section 2.4.7 to Section 2.4.9
- Bottom power cabling - Section 2.4.10

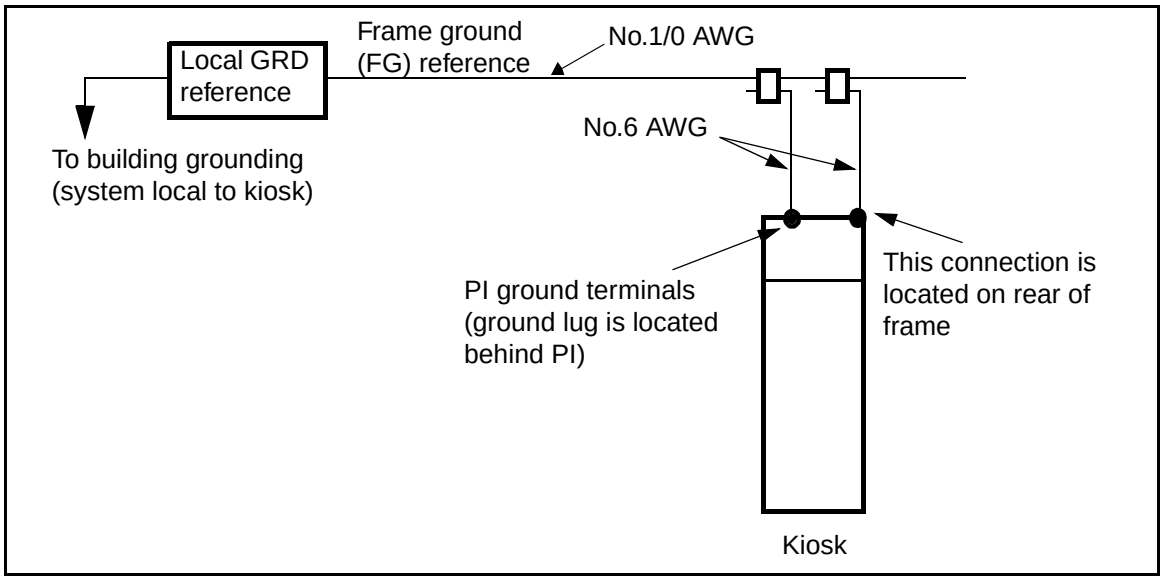

Figure 2.2 - Typical Common Bonding Network (CBN)

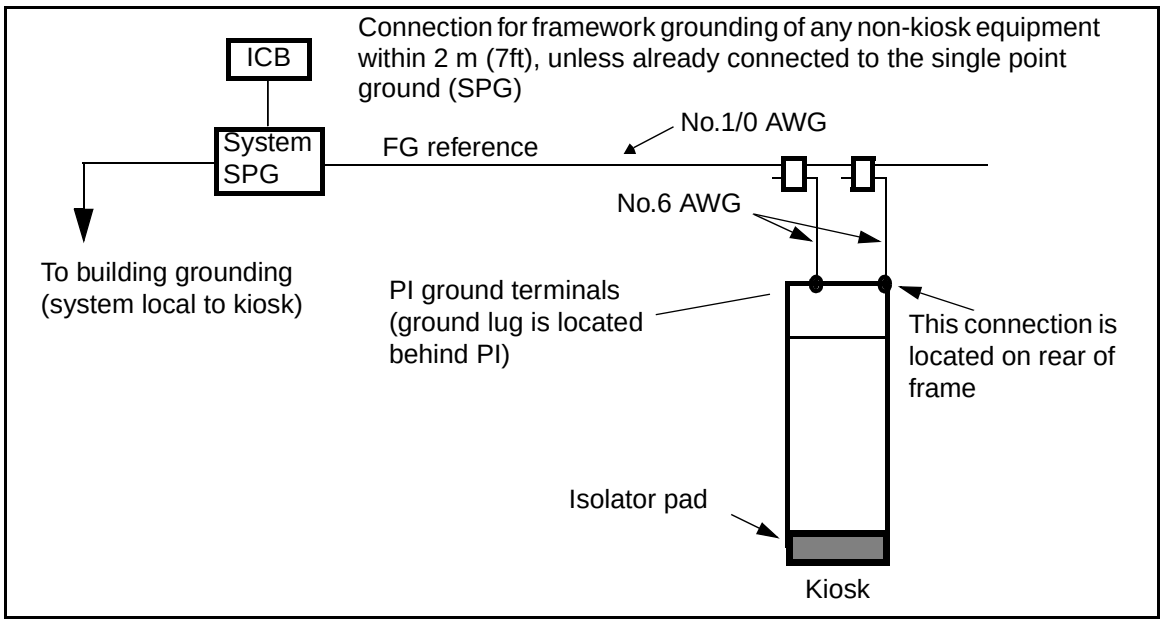

Figure 2.3 - Typical Grounding Topology Isolated Bonding Network (IBN)

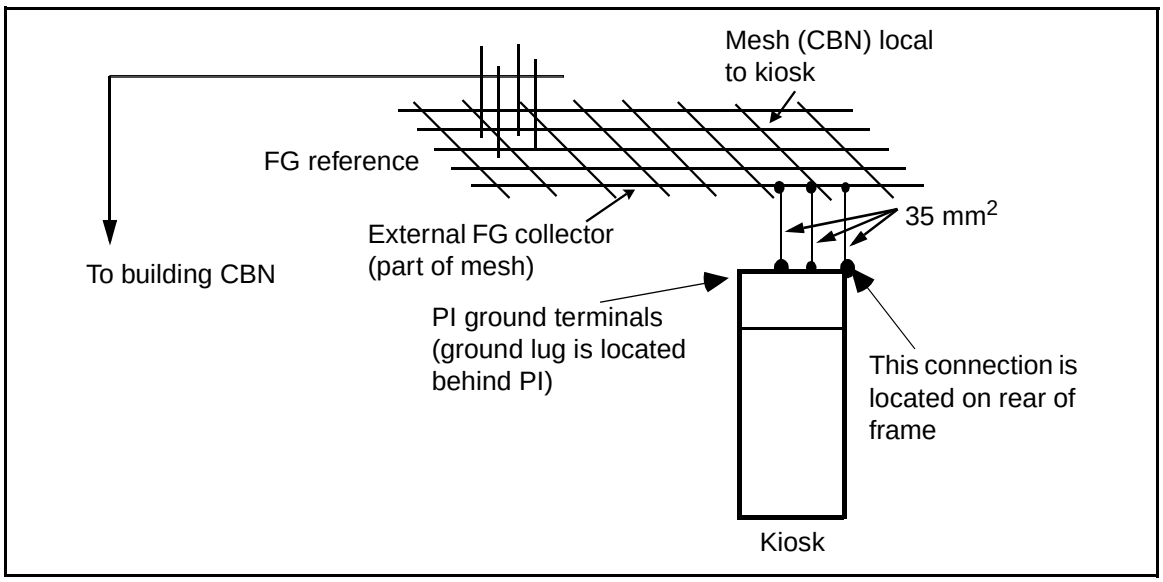

Figure 2.4 - ETSI (Mesh-BN) Bonding Network

NOTE

For installation in a Common Bonding Network (CBN), go to Section 2.4.3 and Section 2.4.7.

For installation in an Isolated Bonding Network (IBN), go to Section 2.4.4 and Section 2.4.8.

For installation in an ETSI Mesh Bonding Network (Mesh-BN), go to Section 2.4.5 and Section 2.4.9.

2.4.3 Top Ground Cabling for Common Bonding Network

1. If not already in place, route a No.1/0 AWG (50mm^2) cable from local ground reference to ground L bracket on overhead racking.
2. C-tap No.6 AWG (13mm^2) frame ground cable from each of the kiosks to the No.1/0 AWG (50mm^2) frame ground which goes to the local ground reference, ensuring there are no sharp bends in the cable, and connect the end to the No.1/0 AWG (50mm^2). Refer to Figure 2.2 on page 2 - 6.
3. Strip the No.6 AWG (13mm^2) cable 0.5 in.(13 mm) and crimp a grounding lug to the end of the cable.
4. Remove the screws mounted on the frame ground stud behind PI.
5. Attach the grounding cable to the double hole lug.
6. Tighten the screws fastening the lugs to the frame ground stud. Go to Section 2.4.6.

2.4.4 Top Ground Cabling for Isolated Bonding Network

1. If not already in place, route a No.1/0 AWG (50mm^2) cable from single point ground (SPG) to ground L bracket on overhead racking.

With IBN bonding topologies, it is recommended that the power plant feeding the equipment feed only IBN equipment. General rules are:

- There shall be only one SPG for all equipment fed from the power plant.

All communication equipment shall be within one floor of the system SPG.

The battery return (BR) bar of the power plant shall be insulated from the Framework and connected to the SPG by a Battery Return Reference conductor.

- The framework of the power plant shall be bonded to the FGB of the floor on which the power plant is located.
- Grounding conductors shall not carry current under normal operating conditions.

If feeding both IBN and CBN equipment from a common power plant cannot be avoided, the following rules apply. This configuration should be restricted to applications such as small CBN entities co-located with an IBN switch:

- There shall be only one SPG for all IBN equipment fed from the power plant, namely a non-current carrying section of the insulated BR bar of the power plant.
- All IBN equipment shall be within one floor of the power plant.
- The BR bar of the power plant shall be insulated from the framework and bonded to the FGB.
- The framework of the power plant shall be bonded to the FGB.

2. C-tap No.6 AWG (13mm^2) frame ground cable from each of the kiosks to the No.1/0 AWG (50mm^2) frame ground which goes to the single point ground, ensuring there are no sharp bends in the cable, and connect the end to the No.1/0 AWG (50mm^2). Refer to Figure 2.3 on page 2 - 6.
3. Strip the No.6 AWG (13mm^2) cable 0.5 in.(13 mm) and crimp a grounding lug to the end of the cable.
4. Remove the screws mounted on the frame ground stud behind the PI.
5. Attach the grounding cable to the double hole lug.
6. Tighten the screws fastening the lugs to the frame ground stud. Go to Section 2.4.6.

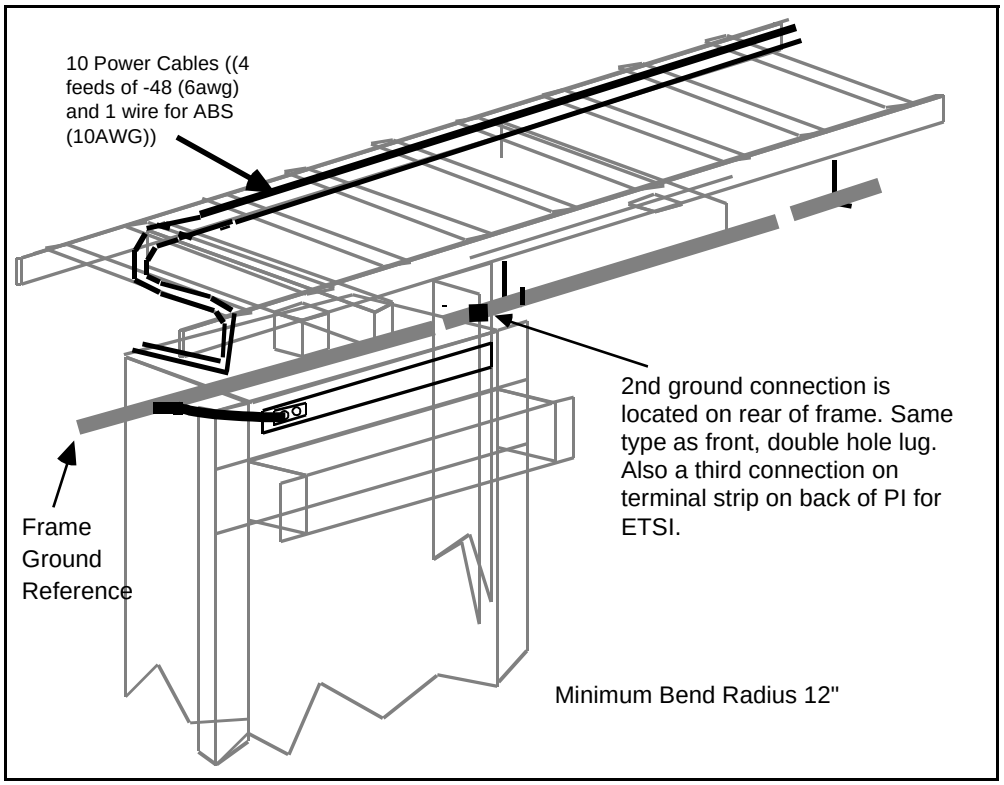

Figure 2.5 - Power and Ground Wire Run

2.4.5 Top Ground Cabling for ETSI Mesh Bonding Network

1. Connect 35mm^2 frame ground cable from each of the kiosks to the local mesh which is connected to the building common bonding network also connect ground cable to terminal strip on rear of PI labeled frame ground, ensuring there are no sharp bends in the cable, and connect the end to the local Mesh. See Figure 2.4 on page 2 - 7.
2. Strip the 35mm^2 cable 13 mm (0.5 in.) and crimp a ground lug to cable.
3. Remove the screws mounted on the frame ground stud behind the PI.
4. Attach L-bracket to BR lugs and FG strap as shown in Figure 2.6 on PI unit.
5. Attach the grounding cable to the double hole lug.
6. Tighten the screws fastening the lugs to the frame ground stud. Go to Section 2.4.6.

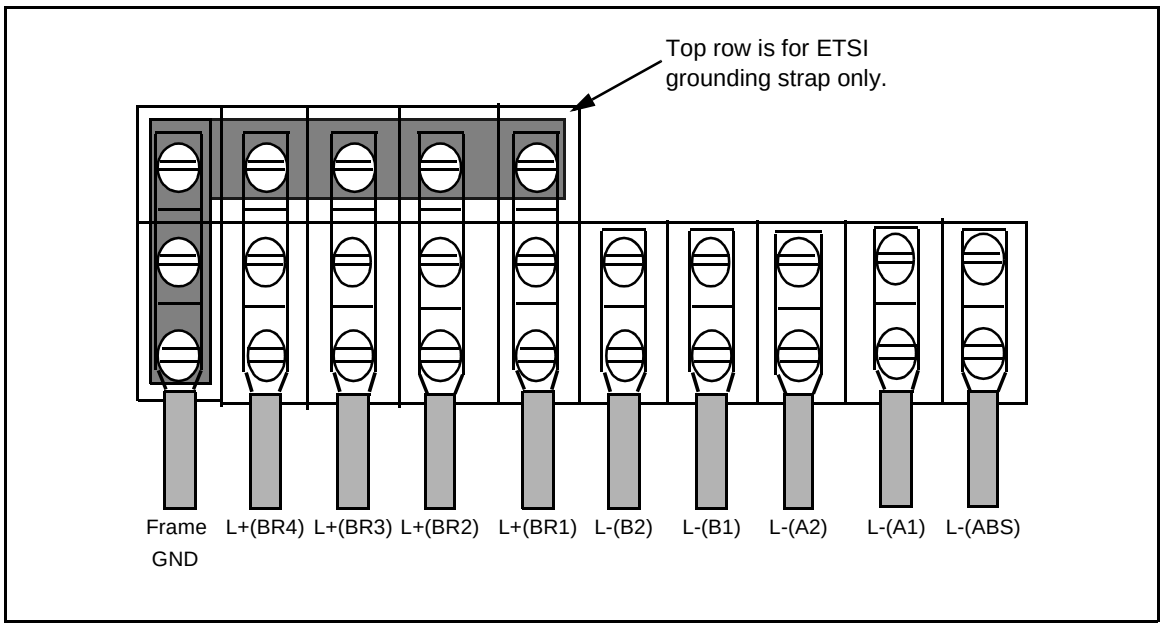

Figure 2.6 - Battery Return to Frame Ground Bonding L-Bracket

2.4.6 Top Power Cabling

1. Turn off all main circuit breakers on the equipment in the kiosk.

NOTE

For non-ETSI Mesh Bonding offices, the L-bracket on the terminal strip of the PI rear must be removed. That is the bracket that is connecting the four battery returns and the frame ground lug.

2. Route eight, No.6 AWG (13mm^2) power cables from the kiosk to the office Battery Distribution Fuse Board (BDFB), 30 amp breaker, ensuring no sharp bends in the cable, and connect one end to the BDFB. Also, one No.10 AWG (5.26mm^2) cable for Alarm Battery Supply (ABS) should be run from BDFB to rear of PI ABS lug connection. A 5 amp breaker is required for ABS.

NOTE

Heatshrink tubing must be used over all power cables to prevent shorts. Slide a 4" (100mm) length of heatshrink tubing over each of the power cables. Make sure the heatshrink tubing covers beyond the tip of the wire.

3. Route the power cables from the overhead rack to the top of the kiosk PI left side rear.

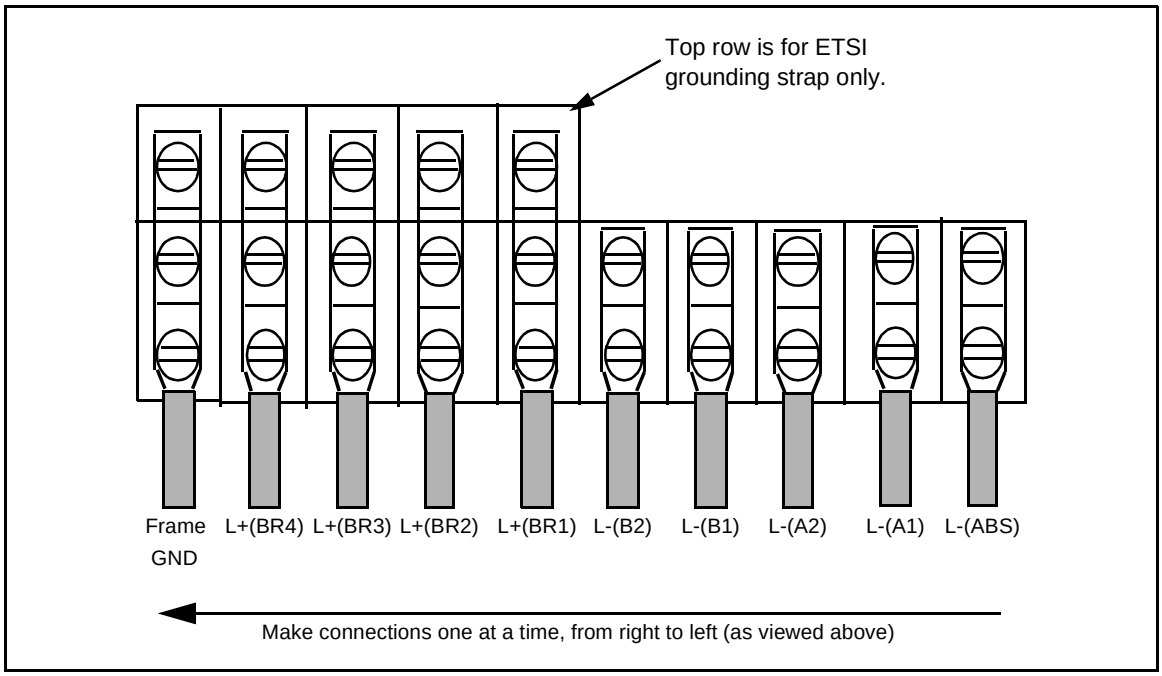

Figure 2.7 - Power Interface Terminal Block Connections

4. Strip the No.6 AWG ($13mm^2$) cables, 13 mm (0.5 in.), and crimp power lugs to the end of the cables.
5. Connect the office battery cables to PI terminal block as shown in Figure 2.7. A 7mm (9/32") socket or nut driver is required. Secure the cables to the kiosk using ty-raps.

NOTE Connect the cables to the PI terminal block from right to left.

6. At PI terminal block, verify there is no potential on either the “A” or “B” battery leads.
7. At PI terminal block, short circuit the -48V A-leads.
8. At the BDFB, measure the resistance at the equipment side of the A-fuse. It should measure 0 ohm towards the associated battery return lead. This indicates correct polarity.

NOTE

If the ohmmeter reads "×" (open circuit), measure also the resistance between the equipment side of the B-fuse and its associated battery return cable, while maintaining the short circuit across the A-leads. In this case, 0 ohm reading means that the battery leads are reversed. Reverse battery -48V A and -48V B leads as well as associated RTN A and RTN B leads.

9. Repeat steps 7 and 8; reading should now be 0 ohm for both battery A and B leads.

NOTE

An ohmmeter reading of "×" in a pair of battery leads, irrespective of their reversal, indicates a discontinuity in that pair; repair and repeat steps 7 and 8 for that pair.

10. Remove the short circuit across the leads on the PI terminal block.
11. Apply office battery power at BDFB and verify that the voltage (at the PI terminal block) between -48V A and RTN A is -48 Volts.
12. Repeat steps 7 through 11 for -48V B and RTN B.
13. Repeat steps 6 through 12 for A2 and B2 power feed.
14. Turn OFF office battery power at BDFB and ensure all circuit breakers on the equipment in the kiosk remain OFF until testing is performed.

Continue to Section 2.5, "Installing an MSC-900, TNX-1100, or ASX-1000," on page 2 - 18.

2.4.7 Bottom Ground Cabling for Common Bonding Network

1. If not already in place, route a No.1/0 AWG (50mm^2) cable from local ground reference to location defined by site under floor.
2. C-tap No.6 AWG (13mm^2) frame ground cable from each of the kiosks to the No.1/0 AWG (50mm^2) frame ground which goes to the local ground reference, ensuring there are no sharp bends in the cable, and connect the end to the No.1/0 AWG (50mm^2). See the figure Figure 2.2 on page 2 - 6.
3. Strip the No.6 AWG (13mm^2) cable 0.5 in.(13 mm) and crimp a grounding lug to the end of the cable.
4. Remove the screws mounted on the frame ground stud behind the PI.
5. Attach the grounding cable to the double hole lug.
6. Tighten the screws fastening the lugs to the frame ground stud. Go to Section 2.4.10.

2.4.8 Bottom Ground Cabling for Isolated Bonding Network

1. If not already in place, route a No.1/0 AWG (50mm^2) cable from local ground reference to location defined by site under floor.

With IBN bonding topologies, it is recommended that the power plant feeding the equipment feed only IBN equipment. General rules are:

- There shall be only one SPG for all equipment fed from the power plant.

All communication equipment shall be within one floor of the system SPG.

The BR bar of the power plant shall be insulated from the Framework and connected to the SPG by a Battery Return Reference conductor.

- The framework of the power plant shall be bonded to the FGB of the floor on which the power plant is located.
- Grounding conductors shall not carry current under normal operating conditions.

If feeding both IBN and CBN equipment from a common power plant cannot be avoided, the following rules apply. This configuration should be restricted to applications such as small CBN entities co-located with an IBN switch.

- There shall be only one SPG for all IBN equipment fed from the power plant, namely a non-current carrying section of the insulated BR bar of the power plant.
- All IBN equipment shall be within one floor of the power plant.
- The BR bar of the power plant shall be insulated from the framework and bonded to the FGB.

- The framework of the power plant shall be bonded to the FGB.

2. C-tap No.6 AWG (13mm^2) frame ground cable from each of the kiosks to the No.1/0 AWG (50mm^2) frame ground which goes to the single point ground (SPG), ensuring there are no sharp bends in the cable, and connect the end to the No.1/0 AWG (50mm^2). Refer to Figure 2.3 on page 2 - 6.
3. Strip the No.6 AWG (13mm^2) cable 0.5 in.(13 mm) and crimp a grounding lug to the end of the cable.
4. Remove the screws mounted on the frame ground stud behind the PI.
5. Attach the grounding cable to the double hole lug.
6. Tighten the screws fastening the lugs to the frame ground stud. Go to Section 2.4.10.

2.4.9 Bottom Ground Cabling for ETSI Mesh Bonding Network

1. Connect 35mm^2 frame ground cable from each of the kiosks to the local mesh which is connected to the building common bonding network (CBN) also connect ground cable to terminal strip on rear of PI marked frame ground, ensuring there are no sharp bends in the cable, and connect the end to the local Mesh. See figure Figure 2.4 on page 2 - 7.
2. Strip the 35mm^2 cable 13 mm (0.5 in.) and crimp a grounding lug to the end of the cable.
3. Remove the screws mounted on the frame ground stud behind the PI.
4. Attach L-bracket to BR lugs and FG strap as shown in Figure 2.6 on PI unit.
5. Attach the grounding cable to the double hole lug.
6. Tighten the screws fastening the lugs to the frame ground stud. Go to Section 2.4.10.

2.4.10 Bottom Power Cabling

1. Turn OFF all main circuit breakers on the equipment in the kiosk.

NOTE

For non-ETSI Mesh Bonding offices the L-bracket on terminal strip of PI rear must be removed. That is the bracket that is connecting the four battery returns and the frame ground lug.

2. Route eight, No.6 AWG (13mm^2) power cables from the kiosk to the office Battery Distribution Fuse Board (BDFB), 30 amp breaker, ensuring no sharp bends in the cable, and connect one end to the BDFB. Also one No.10 AWG (5.26mm^2) cable for Alarm Battery Supply will be run from BDFB to rear of PI ABS lug connection. A 5 amp breaker is required for ABS.

NOTE

Heatshrink tubing must be used over all power cables to prevent shorts. Slide a 4" (100mm) length of heatshrink tubing over each of the power cables. Make sure the heatshrink tubing covers beyond the tip of the wire.

3. Route the power cables from the floor to the top of the kiosk PI left side rear. Run cables on left side view from front.
4. Strip the No.6 AWG (13mm^2) cables, 13 mm (0.5 in.), and crimp power lugs to the end of the cables.
5. Connect the office battery cables to PI terminal block as shown in Figure 2.7. A 7mm (9/32") socket or nut driver is required.
6. Secure the power cables and frame ground to the kiosk using ty-raps.
7. At PI terminal block, verify there is no potential on either the “A” or “B” battery leads.
8. At PI terminal block, short circuit the -48V A-leads.
9. At the BDFB, measure the resistance at the equipment side of the A-fuse. It should measure 0 ohm towards the associated battery return lead. This indicates correct polarity.

NOTE

If the ohmmeter reads "×" (open circuit), measure also the resistance between the equipment side of the B-fuse and its associated battery return cable, while maintaining the short circuit across the A-leads. In this case, 0 ohm reading means that the battery leads are reversed. Reverse battery -48V A and -48V B leads as well as associated RTN A and RTN B leads.

10. Repeat steps 8 and 9; reading should now be 0 ohm for both battery A and B leads.

NOTE

An ohmmeter reading of "×" in a pair of battery leads, irrespective of their reversal, indicates a discontinuity in that pair; repair and repeat steps 8 and 9 for that pair.

11. Remove the short circuit across the leads on the PI terminal block.
12. Apply office battery power at BDFB and verify that the voltage (at the PI terminal block) between -48V A and RTN A is -48 Volts.
13. Repeat steps 8 through 12 for -48V B and RTN B.
14. Repeat steps 7 through 13 for A2 and B2 power feed.
15. Turn OFF office battery power at BDFB and ensure all circuit breakers on the equipment in the kiosk remain OFF until testing is performed.

Continue to Section 2.5, "Installing an MSC-900, TNX-1100, or ASX-1000," on page 2 - 18.

2.5 Installing an MSC-900, TNX-1100, or ASX-1000

Once the kiosk has been placed, the equipment should be installed inside. The following precautions should be addressed when installing equipment in the kiosk:

WARNING!

When rack-mounting equipment, start from the bottom of the kiosk and move up. This ensures that a hazardous condition is not created due to uneven weight distribution (i.e., the unit is not top-heavy).

CAUTION

FORE Systems recommends that the maximum operating temperature not exceed 35°C when using equipment in the kiosk.

CAUTION

Take care not to block the air vents of the equipment in the kiosk, as this would compromise the amount of air flow required for proper cooling.

CAUTION

Ensure that any unpopulated slots on the installed equipment are covered with a blank panel before supplying power. Operating a device with any of these slots left open can cause a significant temperature rise in a very short time.

2.5.1 Mounting the Equipment

The kiosk comes with two, pre-installed, 23" rack mount brackets for mounting up to two of any combination of MSC-900s, ASX-1000s, or TNX-1100s. To install a device in the kiosk, follow the steps listed below:

1. Choose a position (top or bottom) for the device.

WARNING!

Because of the unit's weight, two people should lift the unit to place it in the kiosk.

The first unit installed in the kiosk should be placed in the bottom position.

2. Set the unit on the bottom edge of the 23" rack mount bracket adapter assembly with the front of the unit facing forward.
3. Slide the unit into the kiosk until the unit's mounting flanges meet the mounting bracket.
4. Use the 10 Phillips-head screws that come with the device to attach it to the mounting ears.
5. Ensure that the device is screwed tightly to the ears to ensure that proper grounding is maintained.

2.5.2 Connecting Equipment to a Power Source

After mounting equipment in the kiosk, it must be connected to a power source (AC or DC).

2.5.2.1 Connecting to AC Power

For an AC-powered device, the steps below should be followed when connecting the unit to a power source:

1. Ensure that the power switch on both power supplies is in the OFF position.
2. Connect the female end of one of the supplied power cords to the AC power input connector on each power supply.

If you are using KIOSKPKG-23/AC, make sure you use the included 10' power cord in Step 2.

3. Plug the male end of each power cord into an approved electrical outlet (110 volt), typically through the rear of the kiosk.

2.5.2.2 Connecting to DC Power in KIOSKPKG-23/DC with PI

For a DC-powered device, the steps below should be followed when connecting the unit to the kiosk's PI:

1. Ensure that the circuit breaker on both power supplies is in the OFF (down) position.
2. Remove the protective cover from the power connectors on the front of each power supply.
3. Ensure that all circuit breakers on the PI are in the off position.
4. Connect one end of the supplied three-pin wiring assembly to one of the four output connectors on the PI and connect the other end to the three-pin connector on the power supply.
5. Secure both ends of the three-pin plug with the screws on the top and bottom of the connector.
6. Repeat steps 4 and 5 for each power supply.
7. Once the feed wires have been connected, replace the protective cover on the power connectors.
8. Return DC power to the feed wires coming into the supply.

Return to the documentation that accompanied the equipment in the kiosk for post-installation procedures.

CHAPTER 3 Suggested Cable Routing

This chapter shows suggested cable routing schemes that can be utilized with the cable management tray. Figure 3.1 shows how cables entering the FORE kiosk from above might be routed. This routing scheme can also be used with standard rack equipment.

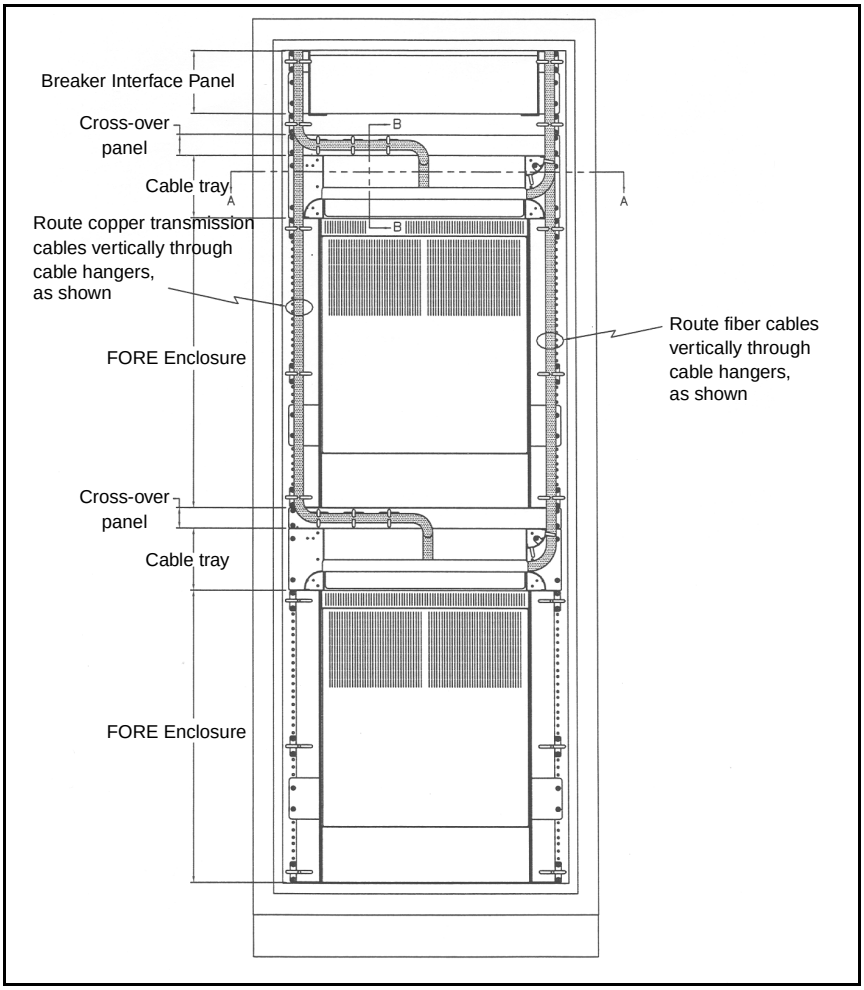

Figure 3.1 - Rear View of FORE Kiosk with Cable Management

Figure 3.2 shows the top view of the cable management tray with the routing scheme shown in Figure 3.1. This view displays how cables can be bundled and secured to the tray.

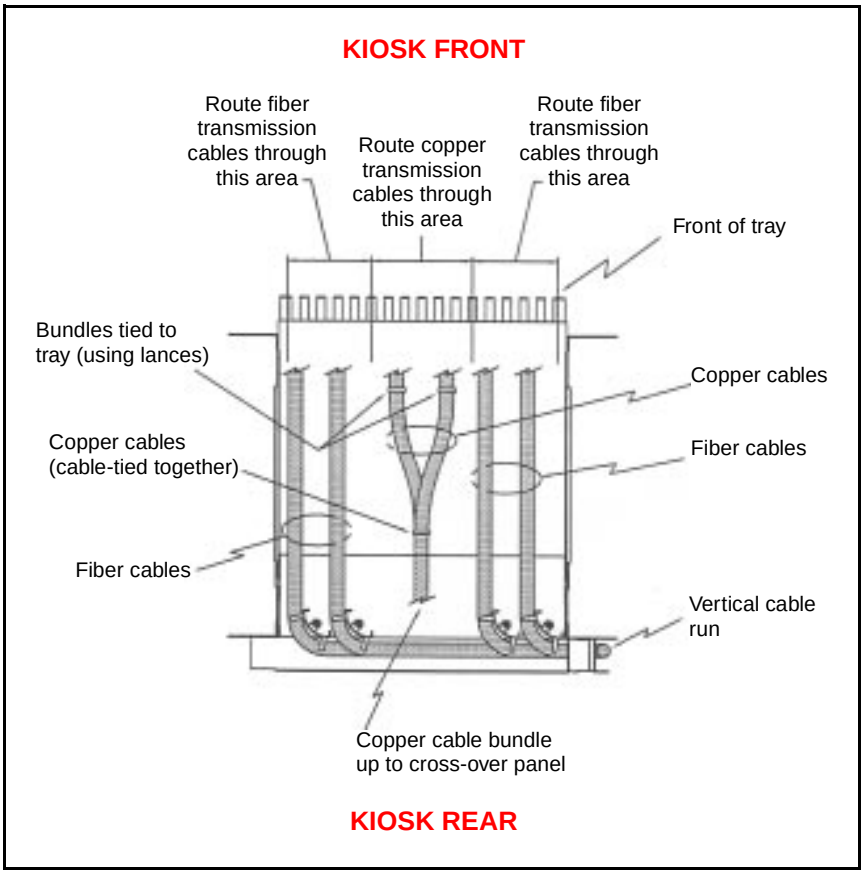

Figure 3.2 - Top View of Cable Management Tray with Suggested Routing Scheme

Figure 3.3 shows a side view of the cable management tray with the routing scheme shown in Figure 3.1, demonstrating how cables and bundles can be routed with the cross-over panel.

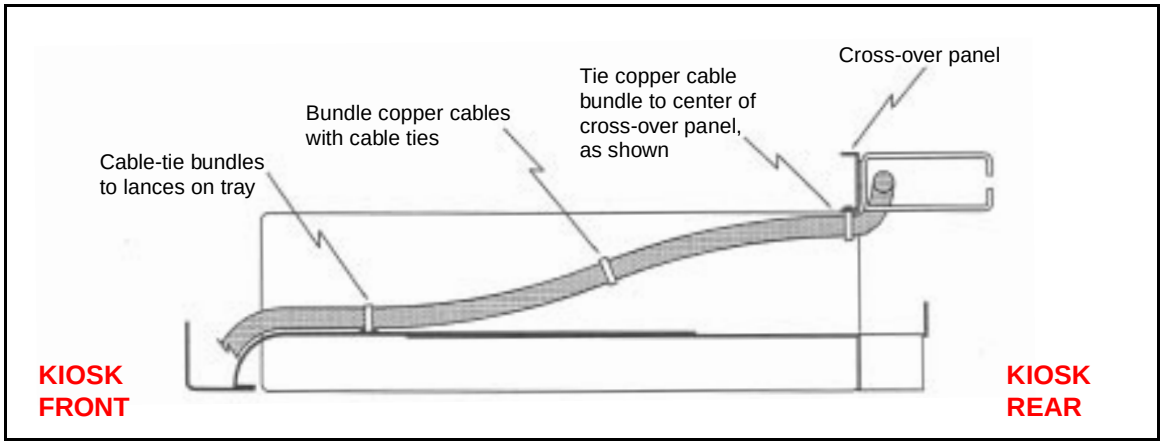

Figure 3.3 - Side View of Cable Management Tray