stride2400

Access Network Setup Guide

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PRELIMINARY AND UNRELEASED

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Preface

About this Manual

This guide provides information on how to set up the STRIDE™ 2400 access network. It describes how to mount, install, connect and power up the STRIDE2400 equipment. If you require additional installation options, you can refer to the *STRIDE2400 Terminal Station Setup Guide* or the *STRIDE2400 Procedures Guide,* for further details.

This setup guide is intended for service personnel responsible for installing the STRIDE2400 access network.

Contact Us

If you have comments about this guide or any other SR Telecom™ technical documentation, please send an e-mail to techdoc@srtelecom.com. Include the complete title of the document, the issue number and the document number. We appreciate your comments.

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Chapter 1 Introduction

This chapter introduces the STRIDE2400 access network and describes the installation phases for setting up the STRIDE2400 equipment.

1.1 STRIDE2400 Access Network

STRIDE2400 is a point-to-multipoint fixed access network that operates in the 2.4 GHz Industrial Scientific Medical (ISM) unlicensed band providing voice and broadband data services to subscribers within a 11 mile (18 km) radius.

With a STRIDE2400 FWA network, service providers can quickly and reliably deliver:

- Voice service at 32 Kbps ADPCM (ITU G.726)
- Voiceband data service at 64 Kbps PCM (ITU G.711)
- Broadband data service at 384 Kbps downstream and 224 Kbps upstream using a ADSL/G.Lite interface

A STRIDE2400 FWA network consists of the following:

STRIDE2400 Base Station (SBS)

The SBS aggregates the voice and data traffic from the STRIDE2400 Terminal Stations (STSs) over the 2.4 GHz airlink and interfaces to backhaul equipment using T1 links.

STRIDE2400 Terminal Station (STS)

The STS performs the conversion between the 2.4 GHz air interface and the subscriber interfaces to deliver voice and data services directly to subscriber premises.

2.4 GHz Airlinks

The outbound (OB) and inbound (IB) antennas complete the wireless radio communication link in the 2.4 GHz frequency band between the SBS and multiple STSs.

Network Management System

Insight NMS™ allows service providers to configure and manage their STRIDE2400 FWA network from either local or remote locations.

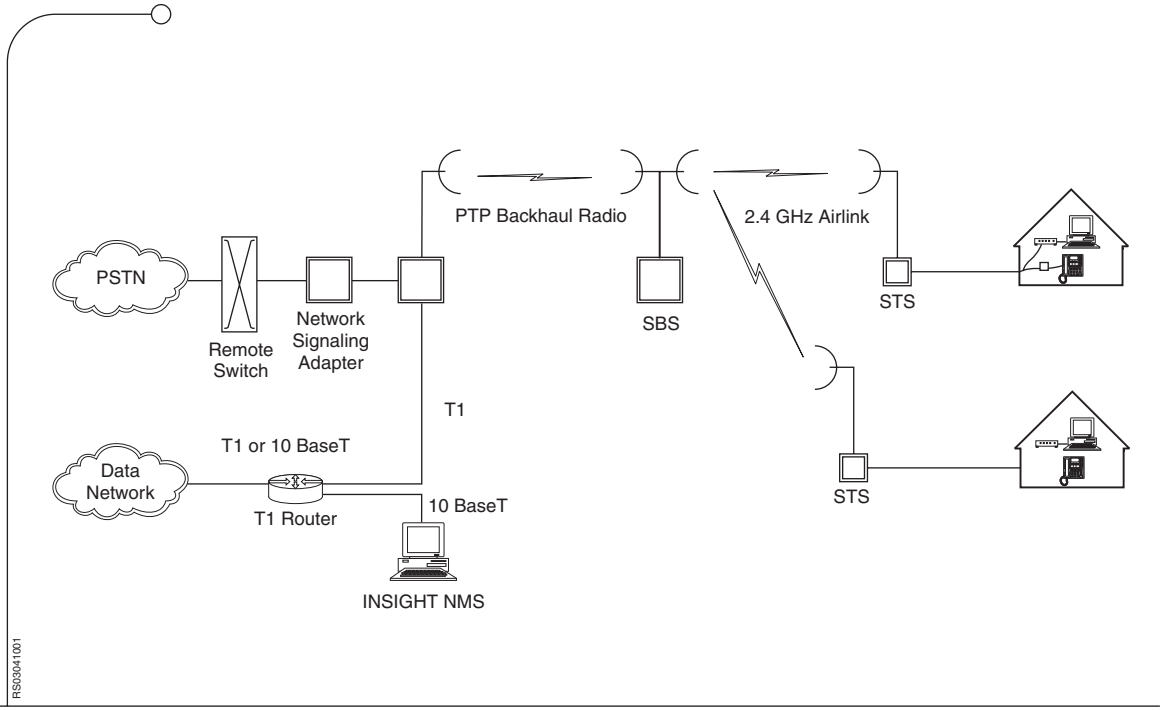

Figure 1.1 Typical STRIDE2400 Access Network Configuration

1.2 STRIDE2400 Access Network Setup Overview

The setup of the STRIDE2400 access network consists of three phases. Each phase must be conducted in the order provided to ensure the optimum performance of the access network equipment.

The three phases to deploy the STRIDE2400 access network include:

1. **Preparation:** describes the pre-installation requirements for the SBS and STS sites.

2. **SBS Installation:** describes the procedures for mounting, grounding, connecting and powering up the SBS equipment.

3. **STS Installation:** describes the procedures for mounting, grounding, connecting, and powering up the STS equipment.

After you have completed the installation phases, Chapter 5, “Your Next Step”, will guide you to the next phase in the setup of your STRIDE2400 access network.

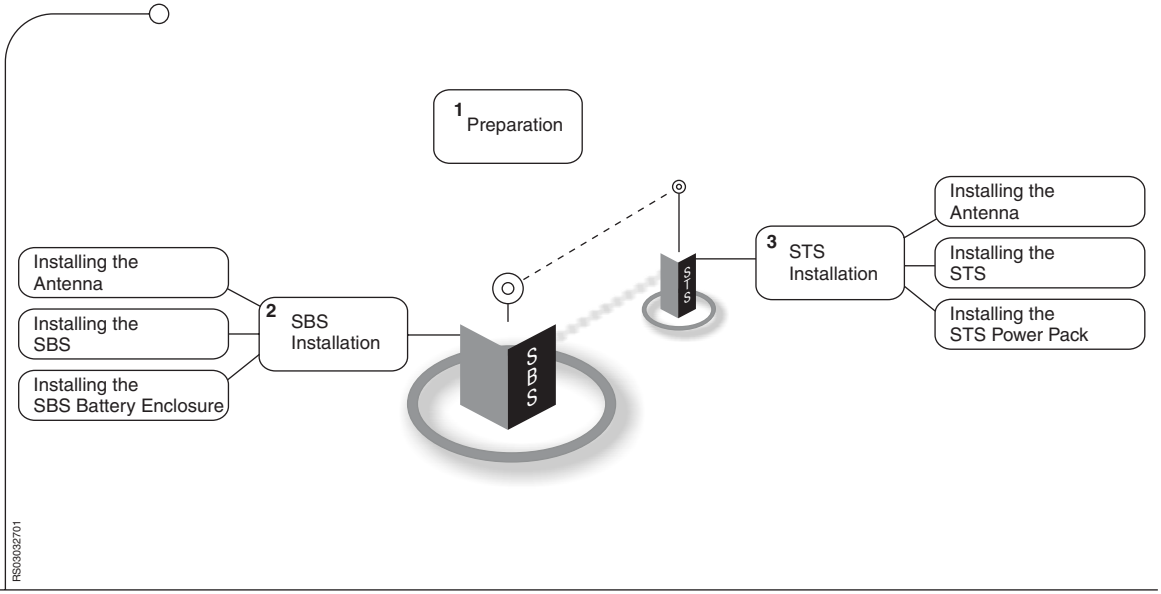

Figure 1.2 STRIDE2400 Access Network Setup Overview

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Chapter 2 Preparation

This chapter outlines the pre-installation requirements for the SBS and STS sites to ensure proper operation of the STRIDE2400 equipment.

2.1 Safety Guidelines

To ensure the proper handling of all equipment and the safety of service personnel, it is important to comply with the precautions outlined in this section. Failure to comply with the following guidelines may void your warranty.

2.1.1 Installation Precautions

SR Telecom equipment must be installed by qualified service personnel who are trained in the correct procedures for handling and installing the equipment. To ensure that SR Telecom equipment is not damaged during the installation of any components, the following guidelines are provided.

Outdoor Installation Guidelines

The following guidelines are provided for outdoor installations:

- Avoid installing or working on equipment in adverse weather conditions
- If you must work in adverse weather conditions, use a plastic sheet or tarpaulin to prevent rain, snow, sand or other debris from seeping into the equipment
- Before opening a cabinet, remove any water, sand, snow or ice particles surrounding the door and use a dry cloth to wipe water that may have seeped into the cabinet
- SR Telecom recommends that the outdoor components of the antenna systems be grounded in accordance with local and national codes
- Do not locate antennas near overhead power lines or other electric light or power circuits, or where antennas can fall into such power lines or circuits

2.1.2 Electrostatic Discharge (ESD) Precautions 

To avoid damage to the equipment, service personnel must be at the same electrical potential as the equipment.

Before handling the equipment, it is important to safely discharge any static electricity. Follow these guidelines:

- Discharge your body and any metal objects, including tools, cable connectors and computer connectors, of static electricity by touching any unpainted metal part of grounded equipment
- Always wear a grounded ESD wristband
- Before removing equipment from their antistatic packaging, make sure you are properly grounded
- Avoid contact with printed circuit tracks or components on the equipment
- Return ESD-sensitive components to their antistatic bags when not in use

This ESD symbol appears in the document whenever a procedure involves the handling of ESD-sensitive equipment.

2.1.3 Battery Precautions

To avoid the danger of an explosion of an incorrectly installed or replaced battery, follow these guidelines.

- Remove all jewelry before handling the battery
- Replace a faulty battery with the same or equivalent type recommended by the manufacturer
- Discard used batteries according to local laws and manufacturer's instructions

For more information on batteries, see Section 3.5.5.1 "Checking and Charging the SBS Backup Batteries" on page 76.

2.1.4 Grounding and Lightning Protection Guidelines

A well-constructed grounding system helps protect SR Telecom equipment from lightning strikes. To properly ground the SR Telecom equipment, lightning rods, transmission lines, poles, and towers, ensure that these guidelines are followed:

- A suitable grounding point is available where the electrical potential at the remote station and the subscriber site is identical, and never exceeds a ground resistance of 10 Ω year round
- The lightning rods, antennas, and transmission lines are properly installed and grounded
- The transmission lines are installed as far as possible from the grounding wires
- The grounding wires are as straight as possible (no loops or sharp bends) and are routed toward the nearest common ground connection
- The lightning rods provide approximately a 45° cone of protection, which will protect all equipment under their field of coverage from direct lightning strikes
- All ground connections are tightly secured and made below the equipment being grounded
- All grounding wires are stripped and secured to bare metal using compression lugs at every 3 to 6 ft. (1 to 2 m)
- The transmission lines are grounded after the top curve and before the bottom curve
- The transmission lines are grounded to the common ground of the structure (tower, pole, building)
- Every piece of equipment must have a separate grounding wire that is grounded to a common point
- For towers and poles that are higher than 246 ft. (75 m), the transmission line must be grounded every 98 ft. (30 m)

2.1.5 Antenna Guidelines

To properly mount the external antennas, ensure that these guidelines are followed:

- Trained SR Telecom service personnel perform the antenna installations
- Antenna structures are securely anchored and vertical
- Galvanizing on the antenna structures is not damaged and there are no signs of rust
- Antennas are correctly oriented and polarized, and clear of transmission lines
- RF Transmission cables are long enough to connect to the SBS and STS

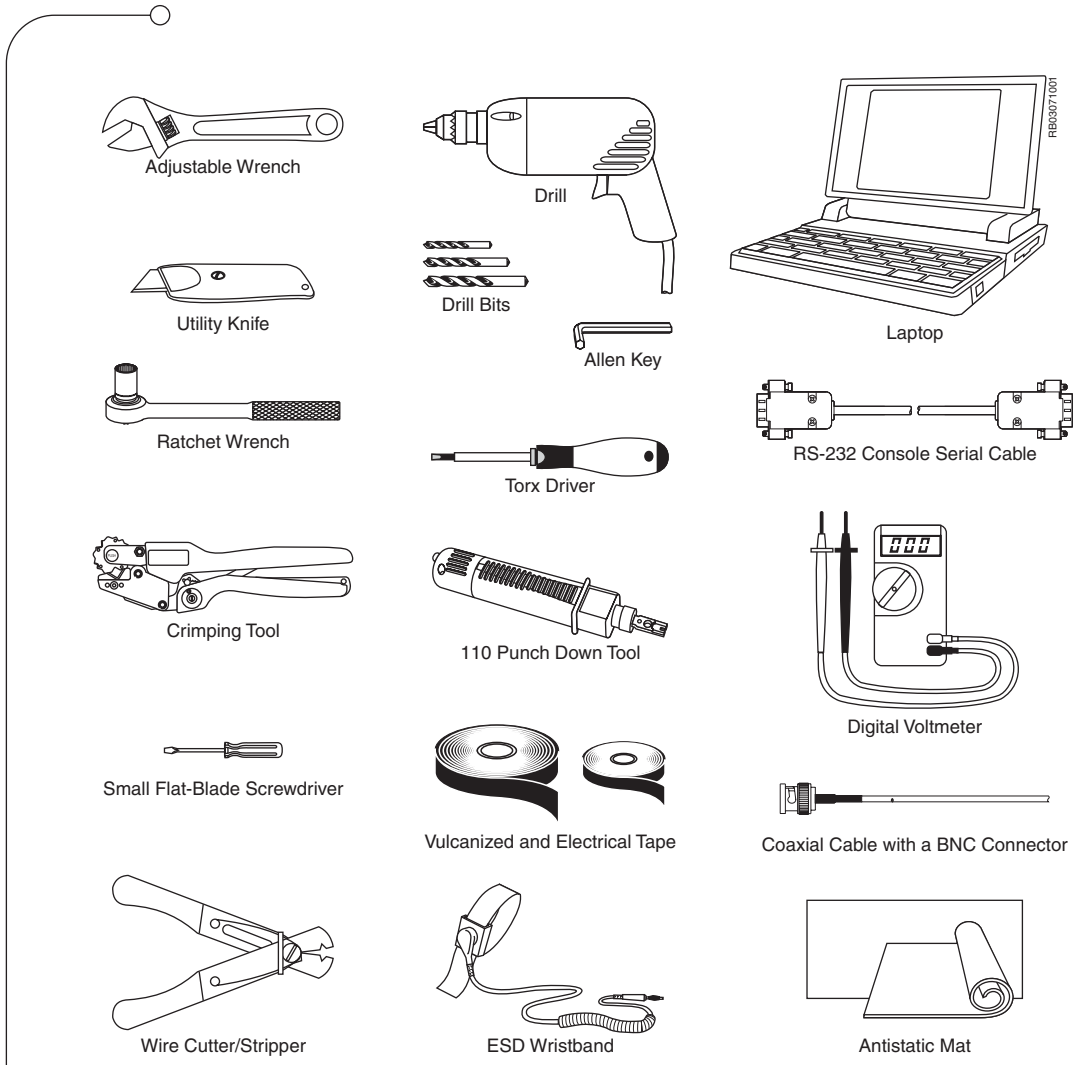
2.1.6 Connection Guidelines

To connect SR Telecom equipment, ensure that these guidelines are followed:

- Check cables for damage
- Secure and neatly arrange wiring
- Tightly secure all connections
- Weatherproof all outdoor connections by wrapping two coats of vulcanized tape and electrical tape
- Weatherproof all grounding cable connections to prevent corrosion by wrapping two coats of sealant tape and electrical tape to all exposed nuts, bolts and junctions between dissimilar metals
- Affix cables and wires to walls, poles, or towers, and secure with tie wraps

2.2 Tool Requirements

When installing the STRIDE2400 equipment, the following tools are required.



2.3 Site Requirements

Before unpacking and installing STRIDE2400 equipment, it is important to ensure that the site complies with STRIDE2400 environmental and power requirements.

SBS and SBS Battery Enclosure

Environmental Requirements	
Operating Temperature	-40°F to +115°F (-40°C to +46°C) plus solar load
Humidity	Outdoor conditions; wind, rain, and snow

Power Requirements	
SBS Input Voltage	-48 VDC nominal (-40.5 VDC to -60 VDC)
SBS Battery Enclosure Input Voltage	110 VAC, 50/60 Hz nominal (85 VAC to 135 VAC)
SBS Input Current	3 A max.[a]
SBS Battery Enclosure Input Current	7.4 A

a. Does not include optional PTP Radio Backhaul equipment

Cable Requirements	
Ground Wire	6 AWG stranded copper wire
DC Power Wire	10 AWG (distances up to 8 ft.)
External Alarm Wire	22 AWG
T1 Cables	22 - 26 AWG twisted pair and shielded

.

STS and STS Power Pack

Environmental Requirements	
Operating Temperature	-40°F to +115°F (-40°C to +46°C) plus solar load
Humidity	Outdoor conditions; wind, rain, and snow

Power Requirements	
STS Input Voltage	+24 VDC nominal (15 VDC to 28 VDC)
STS Power Pack Input Voltage	110 VAC, 50/60 Hz nominal (90 VAC to 130 VAC)
STS Input Current	2.2 A
STS Power Pack Input Current	1.4 A max.

Cable Requirements	
Ground Wire	6 AWG stranded copper wire
Drop Cable	For distances up to 500 ft. (150 m), one cable consisting of six 19 AWG twisted pair wires is required. This drop cable will support both the DC power and service wires. For distances greater than 500 ft. (150 m), refer to the *STRIDE2400 System Planning Guide* for the drop cable requirements.
Service Drop Jumper Cable	One or two 19 AWG twisted pair wires

Chapter 3 STRIDE2400 Base Station Installation

This chapter describes the procedures for installing, connecting and powering up the SBS equipment.

3.1 Installing the SBS Antenna

The antenna provides the wireless radio communication link between the SBS and STSs. The antenna is an outdoor unit that is typically installed on a tower or pole. This section describes the procedures for installing the SBS antenna.

To install the SBS Antenna

1. Unpack the SBS Antenna package contents and verify that all components are delivered as described in Section 3.1.1 “Verifying the SBS Antenna Package Contents” on page 23.

2. Mount the SBS antenna as described in Section 3.1.2 “Mounting the SBS Antenna” on page 24.

3. Install the SBS Antenna Cable as described in Section 3.1.3 “Installing the SBS Antenna Cable” on page 26.

4. Ground the SBS Antenna as described in Section 3.1.4 “Grounding the SBS Antenna” on page 28.

3.1.1 Verifying the SBS Antenna Package Contents

Verify that you have received the following materials with your SBS antenna package. If any materials are missing or damaged, please contact SR Telecom technical services.

SBS Antenna and mounting hardware
SBS Antenna Installation instructions

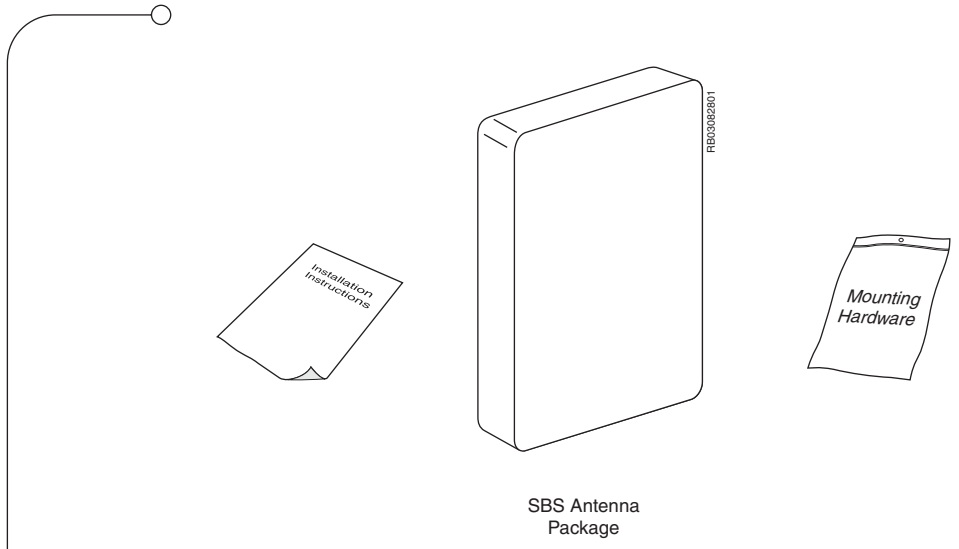


Figure 3.1 SBS Antenna Package Contents Example

3.1.2 Mounting the SBS Antenna

The SBS requires a single sectoral or omnidirectional antenna to provide the wireless communication link to the STS sites. Depending on the antenna purchased, different mounting methods may apply.

Requirements:

Included with SBS Antenna:	SBS antenna mounting hardware, SBS antenna installation instructions

Guidelines:

- Ensure that the antenna is tuned to the correct frequency, the antenna's label indicates the operating range
- Refer to your path profile study to determine the location of the SBS Antenna on the tower or pole

To mount the SBS antenna

➤ Secure the antenna to the pole using the mounting hardware provided, as shown in Figure 3.2 on page 25.

For mounting instructions refer to the documentation supplied with the SBS antenna.

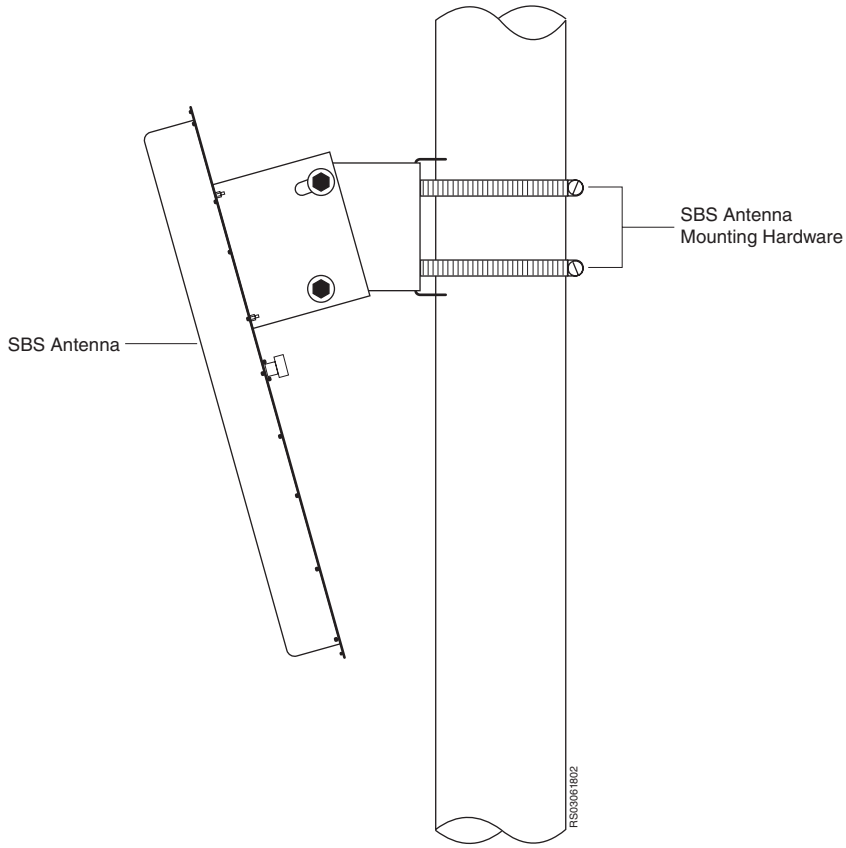


Figure 3.2 SBS Antenna Mount Example

3.1.3 Installing the SBS Antenna Cable

The SBS Antenna Cable is used to connect the SBS antenna to the SBS equipment. The SBS Antenna Cable carries the -48 VDC power that is required to operate the antenna, as well as to transmit and receive data. Included with the SBS antenna cable package are the following:

Connectorized Coaxial Cable (N-Type)
Grounding Kits (2)
Hanger Kits (2)
Wrap Lock

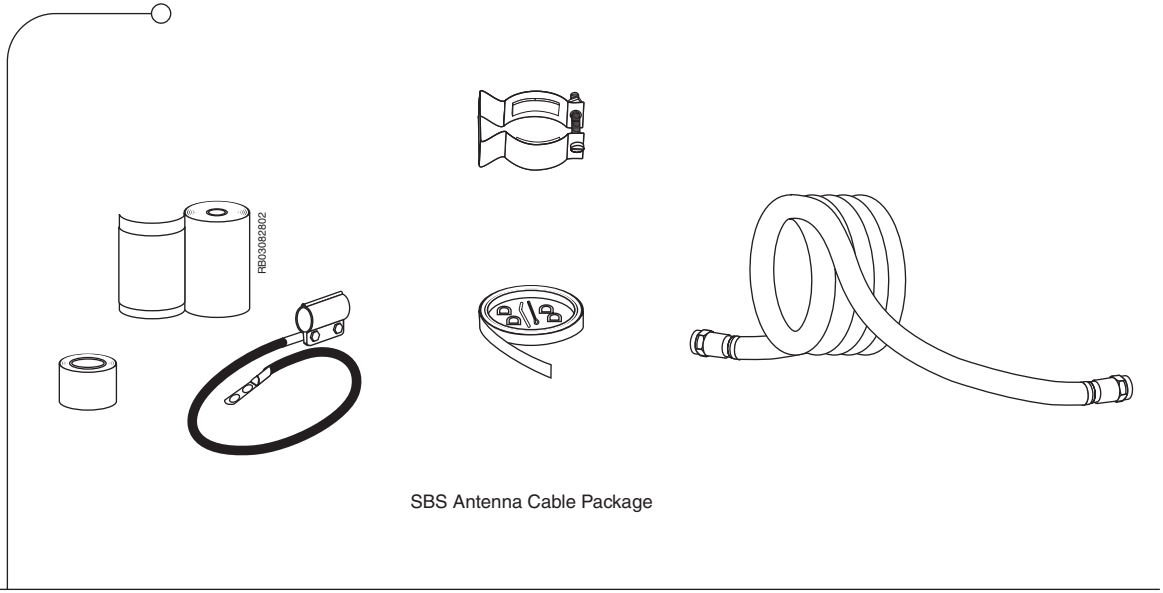


Figure 3.3 SBS Antenna Cable Package Contents

Requirements:

Included with SBS Antenna Cable:	N-type Connectorized Coaxial Cable, Hanger Kits, Wrap Lock
Tools:	Vulcanized and electrical tape

Guidelines:

- To prevent water damage, seal all outdoor connectors with vulcanized and electrical tape
- Install clamps every 3 feet (1 m)

To connect the SBS Antenna Cable to the SBS antenna

1. Connect the SBS Antenna Cable to the SBS antenna and tighten with wrench, as shown in Figure 3.4.

2. Route the SBS Antenna Cable down the pole and secure cable on the pole with clamps.

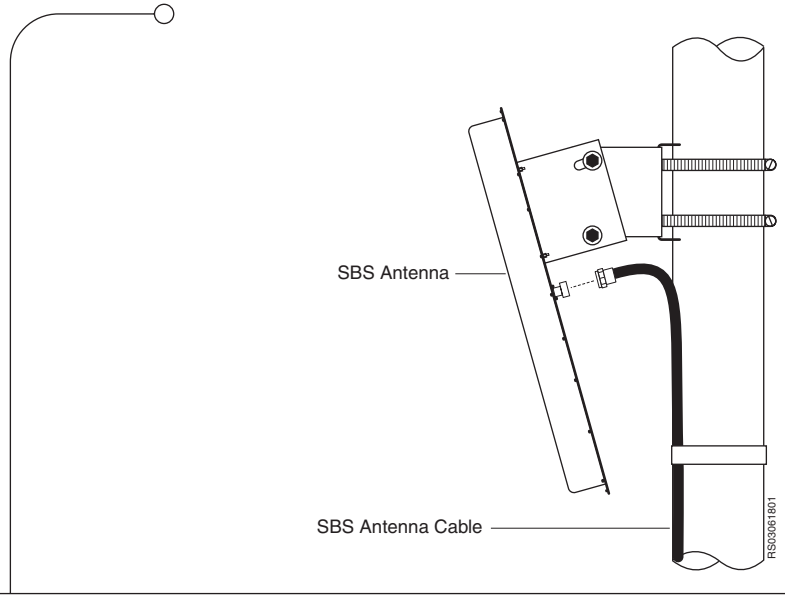


Figure 3.4 SBS Antenna Cable Connection Example

3.1.4 Grounding the SBS Antenna

Grounding ensures that the SBS antenna equipment is protected against lightning strikes or improper handling that can damage the antenna. Depending on the antenna purchased, different grounding methods may apply.

Requirements:

Included with SBS Antenna Cable:	Grounding kits (2)

Guidelines:

- Ensure that the ground lug is connected to the lightning rod's ground wire
- Wrap two coats of sealant tape and electrical tape to all exposed nuts, bolts, and junctions between dissimilar metals to prevent corrosion

To install the SBS Grounding Kits

1. Install a Grounding Kit below the top curve of the antenna cable, as shown in Figure 3.5 on page 29.
2. Install the second Grounding Kit above the bottom curve of the antenna cable.

For installation instructions refer to the documentation supplied with the Grounding Kits.

Please note that not all antennas provide grounding procedures. For SR Telecom grounding guidelines refer to Section 2.1.4 "Grounding and Lightning Protection Guidelines" on page 16.

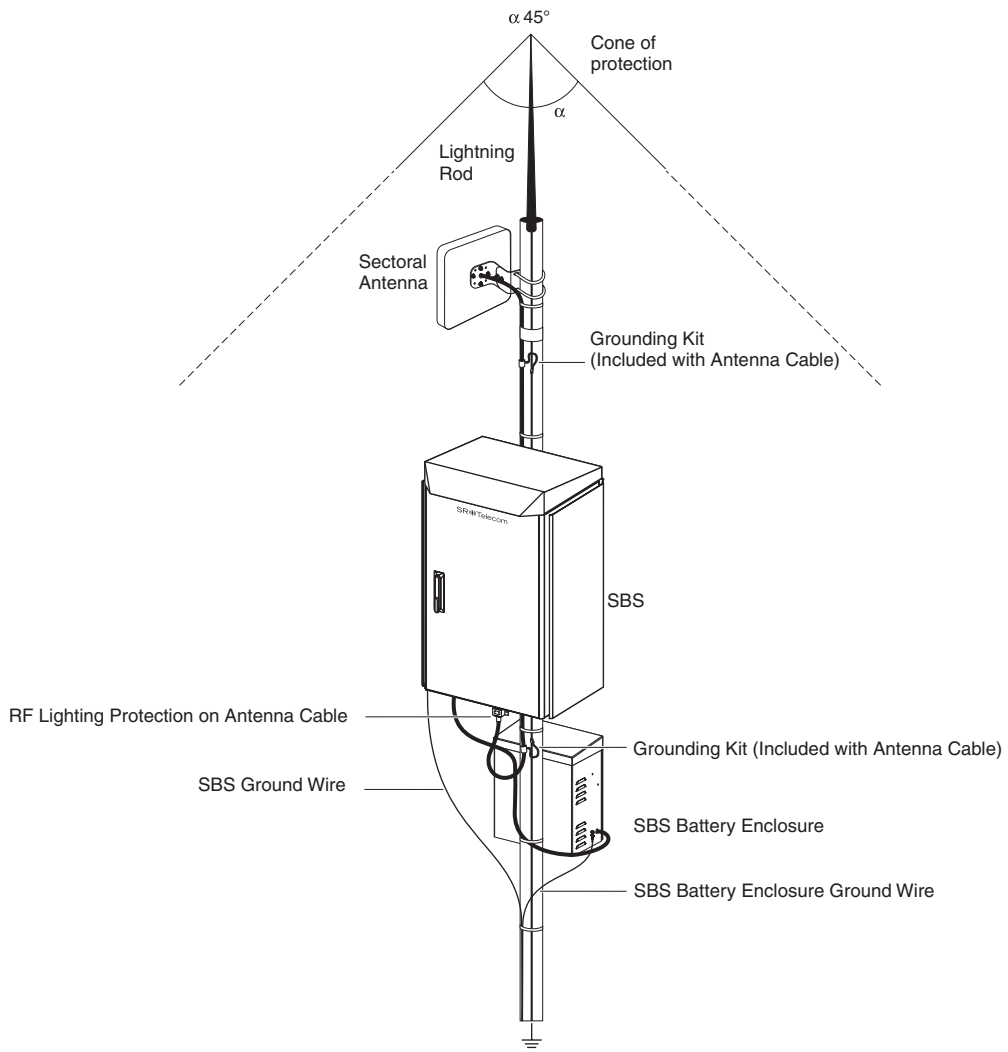


Figure 3.5 SBS Grounding Example Change

3.2 Installing the SBS

The SBS is an outdoor unit that aggregates the voice and data traffic from the STSs over the 2.4 GHz airlink and interfaces to backhaul equipment using T1 links. This section provides the procedures for installing the SBS equipment.

To install the SBS

1. Unpack the SBS package contents and verify that all components are delivered as described in Section 3.2.1 “Verifying the SBS Package Contents” on page 31.
2. Mount the SBS as described in Section 3.2.2 “Mounting the SBS” on page 32.
3. Ground the SBS as described in Section 3.2.3 “Grounding the SBS” on page 42.
4. Connect the SBS cables as described in Section 3.2.4 “Connecting the SBS Cables” on page 44.
5. Power-up the SBS as described in Section 3.3 “Powering Up the SBS” on page 56.

3.2.1 Verifying the SBS Package Contents

Verify that you have received the following materials with your SBS main package. If any materials are missing or damaged, please contact SR Telecom technical services.

SBS-Main Package (includes RF Lightning Protection and STRIDE2400 Documentation Suite)
SBS Installation Kit (not shown)

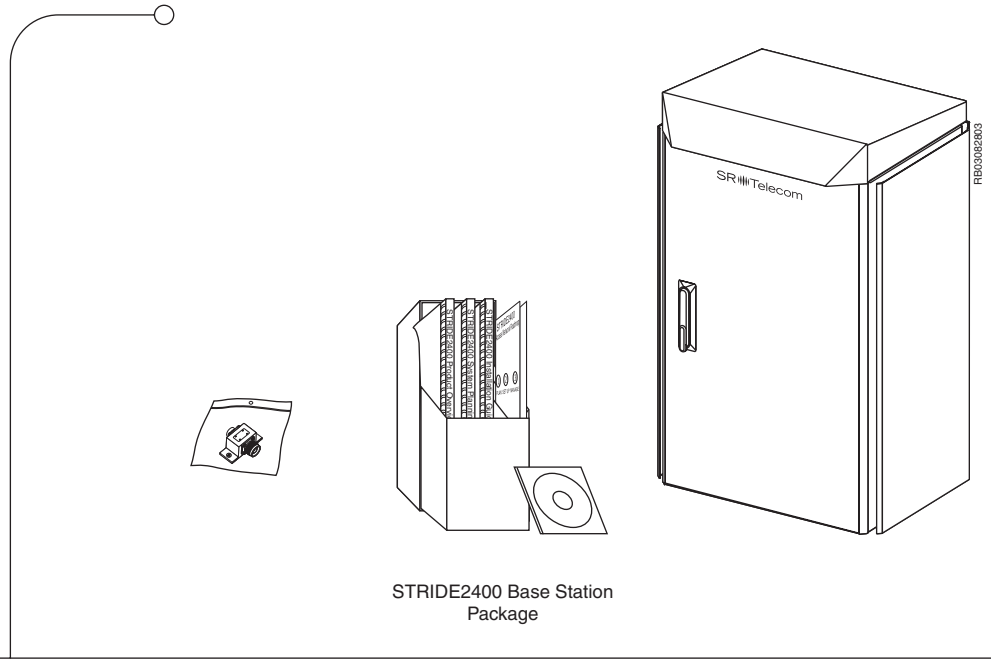


Figure 3.6 SBS Main Package Contents

3.2.2 Mounting the SBS

To ensure that sufficient space is allocated for the installation of the SBS cables, SR Telecom recommends that you first estimate the amount of space required prior to mounting the equipment.

A minimum clearance of 6 in. (15 cm) below the SBS cabinet is required for cable connections, as shown in Figure 3.7.

The SBS comes fully-installed in an outdoor cabinet. The cabinet can be mounted in the following ways:

- Wood Pole-mounted
- Metal Pole-mounted
- Concrete Base-mounted
- Wall-mounted

Type	Height	Width	Depth	Weight
SBS	44.0 in. (111.8 cm)	25.2 in. (64.0 cm)	18.7 in. (47.5 cm)	180 lb. (81.6 kg)

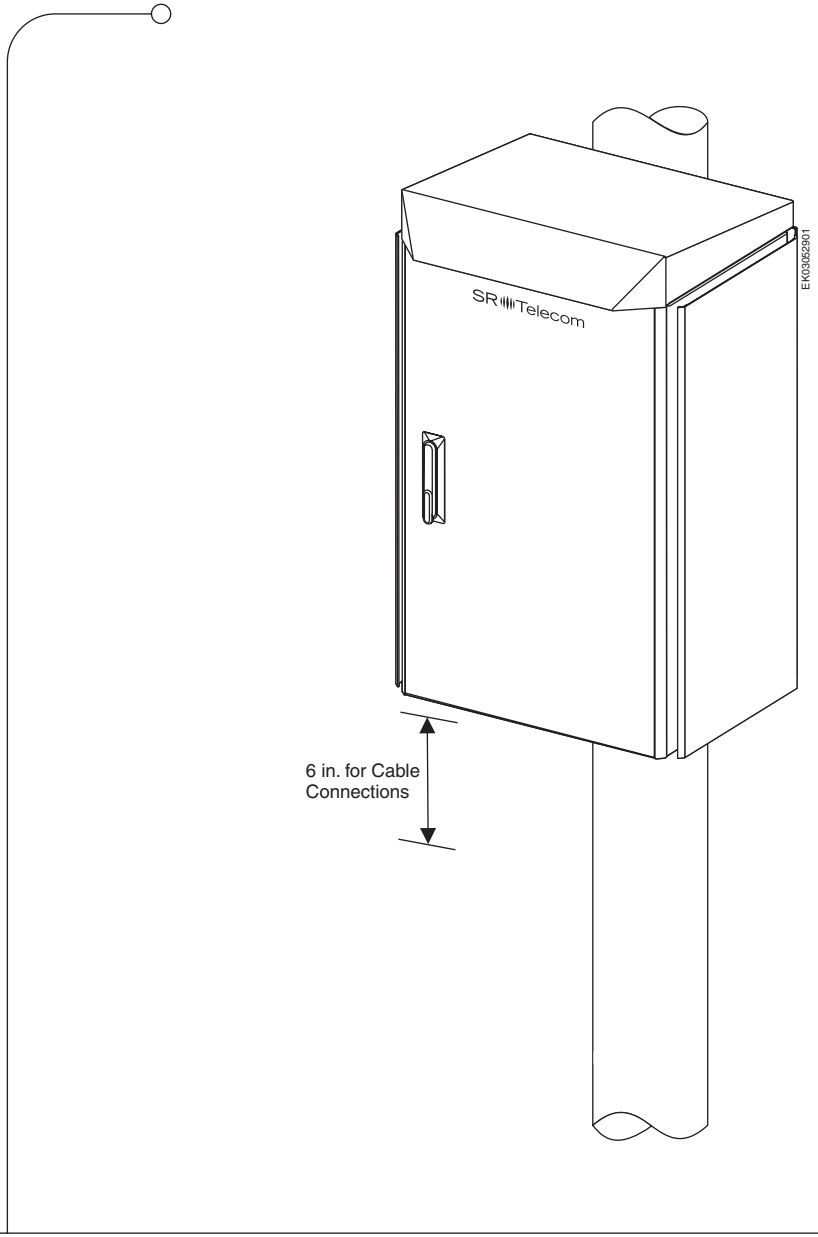


Figure 3.7 STRIDE2400 Base Station Space Requirements

3.2.2.1 Mounting the SBS on a Wooden Pole

The SBS must be mounted on a wooden pole of sufficient diameter (at least 4.7 in.) to withstand environmental conditions such as wind, vibrations and eathquakes.

Requirements:

Included with SBS:	SBS Wood Pole Mount Installation Kit
Tools:	Drill, Torx screwdriver, adjustable wrench

Guidelines:

- Determine the location of the SBS prior to moving the equipment to its final location
- Drilling wood may cause flying chips. Wear safety goggles at all times
- Pole must be at least 4.7 in. (11.9 cm) in diameter to a maximum of 20 in. (50.8 cm)

To mount the SBS on a wooden pole

1. On a pole, mark the location of each hole for the Mounting Rod. Drill the holes 1/2 in. (1.27 cm) in diameter. Distance between the two holes must be 30 in. (76.4 cm).
2. Pass a Pole Bracket through the upper Mounting Rod and attach five washers and a nut to the front of the Mounting Rod. Insert the back end through the drilled hole.
3. Attach the Adjustment Brackets to the upper Pole Bracket. Adjust the width between the two adjustment brackets to the pole diameter. Tighten the bolt, washer and nut.
4. Secure the back end of the upper Mounting Rod to the pole using the large washer, lock washer and nut.
5. Repeat steps 2 - 4 for the second Mounting Rod, Adjustment Bracket and Pole Bracket.
6. Remove the four Torx screws from the back panel of the SBS cabinet. Detach the panel and install onto the upper pole bracket. Attach a bolt, washer and nut. Do not tighten.
7. Slide the SBS cabinet onto the upper and lower bolts attached to the Pole brackets. Tighten all four bolts.

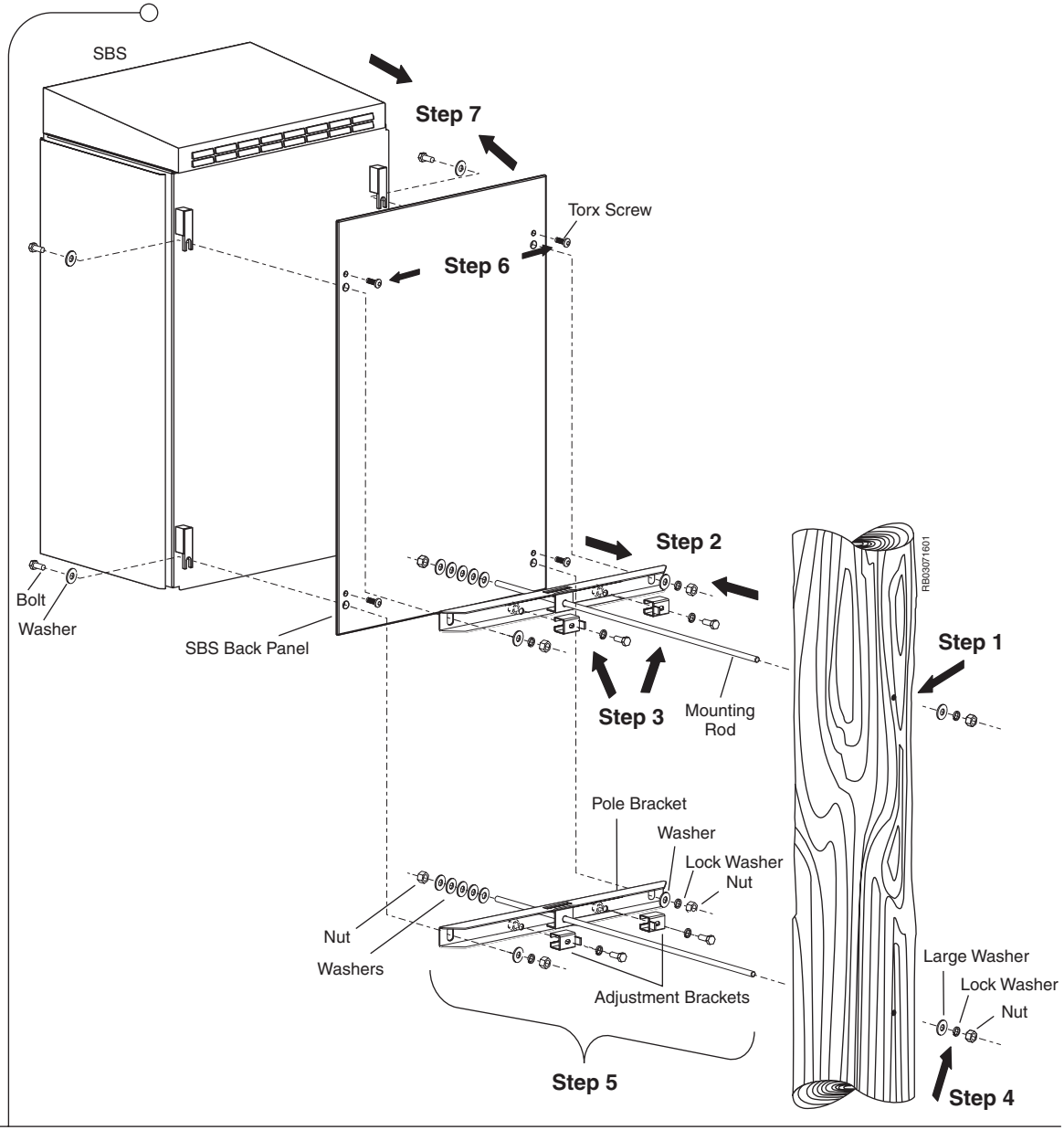


Figure 3.8 Wood Pole-Mounted SBS

3.2.2.2 Mounting the SBS on a Metal Pole

The SBS must be mounted on a metal pole of sufficient diameter (at least 3 in.) to withstand environmental conditions such as wind, vibrations and eathquakes.

Requirements:

Included with SBS:	SBS Metal Pole Mount Installation Kit
Tools:	Torx screwdriver, adjustable wrench

Guidelines:

- Determine the location of the SBS prior to moving the equipment to its final location
- Pole must be at least 3 in. (7.6 cm) in diameter to a maximum of 4.7 in. (11.9 cm)
- Distance between the two brackets must be 30 in. (76.4 cm)

To mount the SBS on a wooden pole

1. Pass the mounting rods through the upper Pole Bracket and attach a nut to the back of each rod.
2. Secure the back end of the Pole Bracket to the pole using the Adjustment Bracket and washer, lock washer and nut.
3. Repeat steps 1 and 2 for the second Pole Bracket.
4. Remove the four Torx screws from the back panel of the SBS cabinet. Detach the panel and install onto the upper pole bracket. Attach a bolt, washer and nut. Do not tighten.
5. Slide the SBS cabinet onto the upper and lower bolts attached to the Pole brackets. Tighten all four bolts.

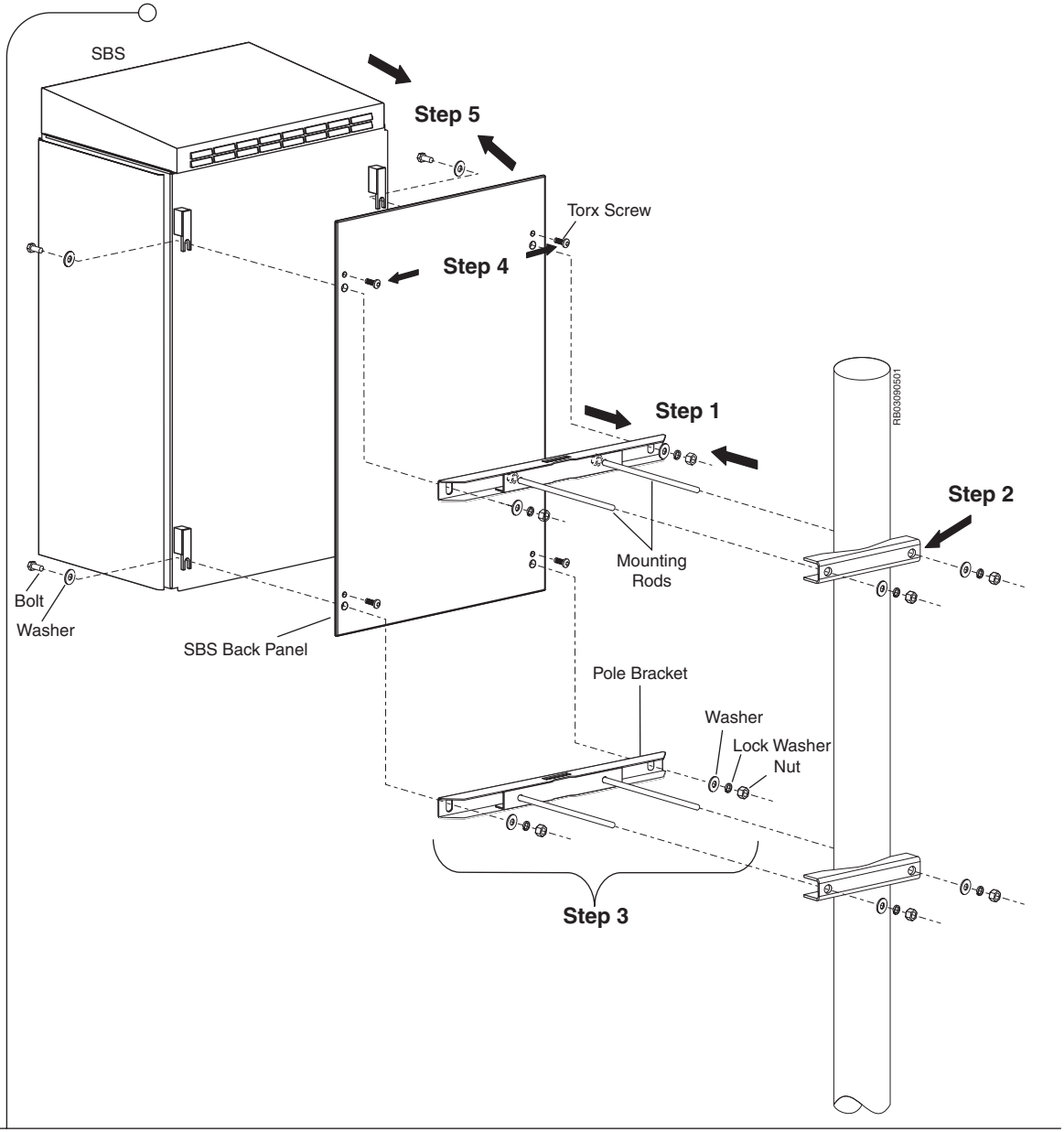


Figure 3.9 Metal Pole-Mounted SBS

3.2.2.3 Mounting the SBS to a Concrete Base

The SBS can be anchored to a cement floor.

Requirements:

Included with SBS:	SBS Concrete Base Installation Kit
Tools:	Allen Key (10 mm), drill, hand setting tool

Guidelines:

- Determine the location of the SBS prior to moving the equipment to its final location
- Drilling concrete may cause flying chips of stone. Wear safety goggles at all times
- When preparing the SBS site, ensure that the cement flooring around the SBS cabinet exceeds by at least 10 cm on each side

To prepare the SBS site

1. Dig 8 in. (20 cm) into the ground. Pour cement and let stand until completely dry. Ensure that wiring is covered by a protective tubing.
2. On the concrete, mark the location of each hole for the anchors. Drill the holes 1/2 in. in diameter and 1-9/16 in. deep.
3. Place the anchors into the drilled holes and push with the hand setting tool until flush with the cement.

To secure the SBS to a cement floor

1. Remove the four bottom feet of the SBS cabinet and place the SBS Concrete Base over the concrete anchors, secure using a bolt and washer, as shown in Figure 3.10 on page 39.
2. Place rubber washers on the four mounting holes of the SBS Concrete Base.
3. Mount the SBS cabinet onto the SBS Concrete Base and secure using a hex bolt, lock washer, and washers. Attach the front panel with a screw.

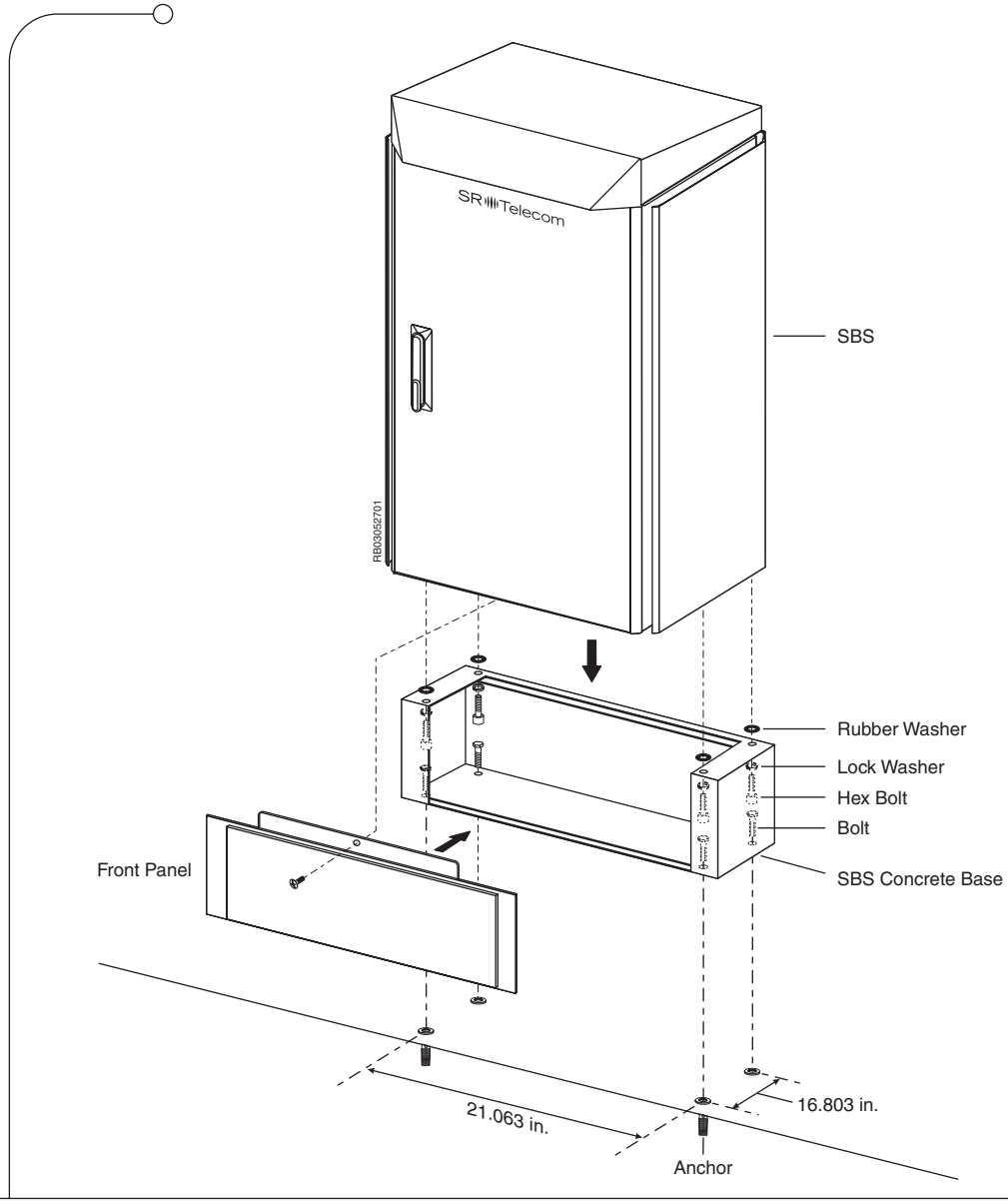


Figure 3.10 Concrete Base-Mounted SBS

3.2.2.4 Mounting the SBS on a Wall

The SBS can be mounted on a variety of wall surfaces such as gypsum, plywood or cement. Prior to mounting the SBS cabinet, ensure that you acquire the appropriate anchoring hardware.

Requirements:

Included with SBS:	SBS Metal Pole Mount Installation Kit
Tools:	Drill, adjustable wrench
Supplied by Customer:	Anchoring hardware

Guidelines:

- Determine the location of the SBS prior to moving the equipment to its final location
- Pole must be at least 3 in. (7.6 cm) in diameter to a maximum of 4.7 in. (11.9 cm)
- Distance between the two brackets must be 30 in. (76.4 cm)

To mount the SBS on a wooden pole

1. Remove the four Torx screws from the back panel of the SBS cabinet. Detach the panel and use the panel as a template to mark the location of the four holes on the wall.
2. Drill the holes and insert appropriate wall anchoring hardware.
3. Attach the SBS cabinet into place using the wall anchoring hardware.

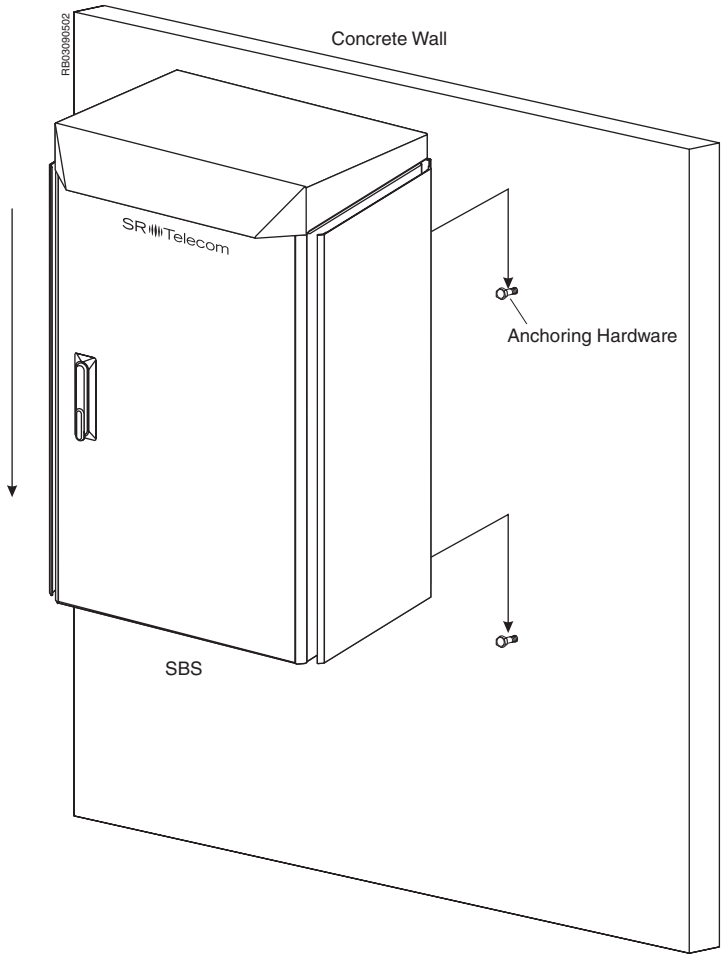


Figure 3.11 Wall Mounted SBS

3.2.3 Grounding the SBS

Grounding the SBS helps prevent serious injury to service personnel and avoids damage to the equipment.

Requirements:

Supplied by Customer:	6 AWG ground wire
Tools:	Flathead screwdriver, wire cutter/stripper or utility knife

Guidelines:

- If the ground wire is insulated, strip the insulation with a utility knife before connecting to the Grounding Bus Bar
- It is strongly recommended that the ground wire be cut to length and that the most direct path be taken when connecting the equipment to ground

To ground the SBS cabinet

1. Remove the ground fitting from the bottom of the of the SBS cabinet.
2. Pass the 6 AWG wire through the ground fitting and connect the ground wire to the ground connector, as shown in Figure 3.12 on page 43.
3. Strip the other end of the ground wire and connect it to the single point ground.

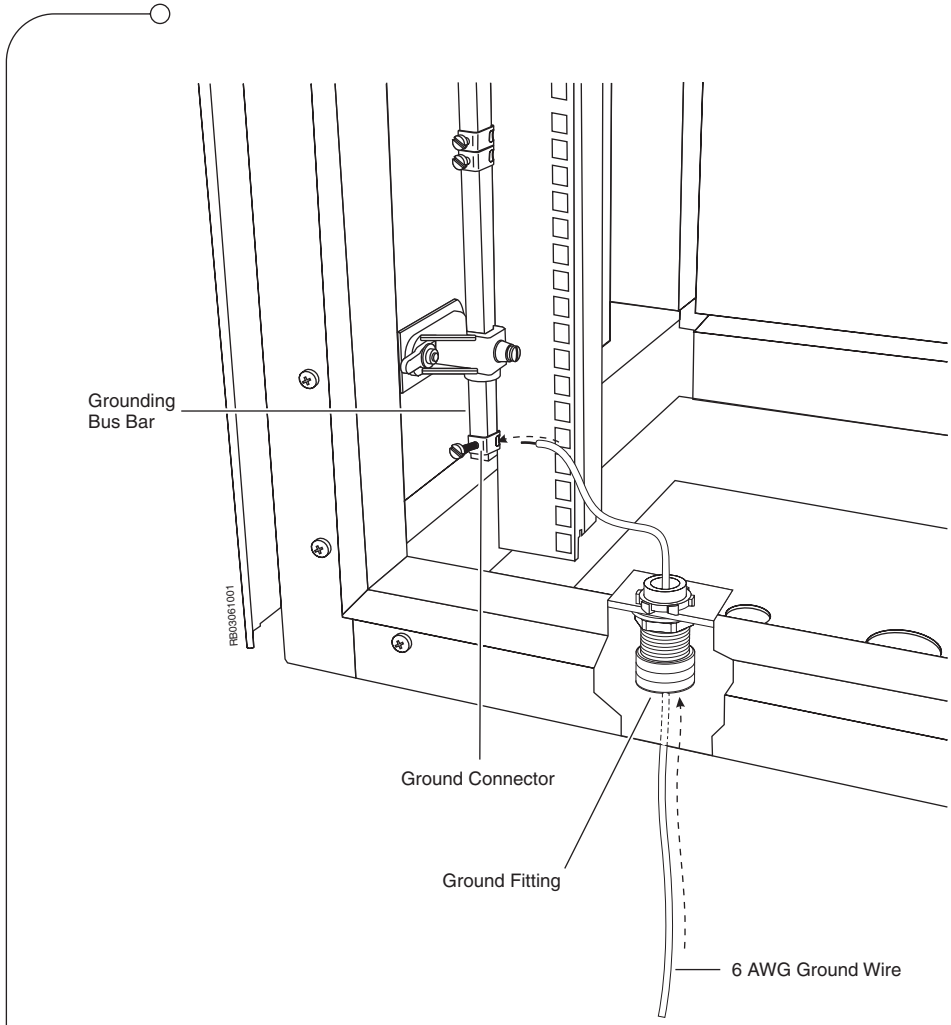


Figure 3.12 Ground Connection

3.2.4 Connecting the SBS Cables

This section provides the procedures for connecting the antenna cables, T1 lines, and power cables to the SBS equipment.

Before connecting any equipment, make sure that you are properly grounded, see section Section 2.1.4 “Grounding and Lightning Protection Guidelines” on page 16.

3.2.4.1 Connecting the PTP Radio Backhaul Antenna Cable

The optional PTP Radio Backhaul provides the wireless network interface functionality to the central office (CO) in order to support data and voice services. Up to eight T1 links can be configured for the wireless T1 connectivity to service provider voice and data networks.

If you have not purchased the PTP Radio Backhaul option, please go to Section 3.2.4.2 “Connecting a T1 Cable to the T1Lightning Protection Module” on page 46.

Requirements:

Purchased from SR Telecom:	RG-6 Coaxial Cable with N-type male connector

Guidelines:

- To prevent water damage, seal all outdoor connectors with vulcanized and electrical tape
- Install clamps every one to two meters (3 ft. to 6 ft.)

To connect the PTP Radio Backhaul Antenna Cable

➤ Connect the Antenna Cable to the PTP Radio Backhaul Antenna Port on the bottom of the SBS cabinet, as shown in Figure 3.13 on page 45.

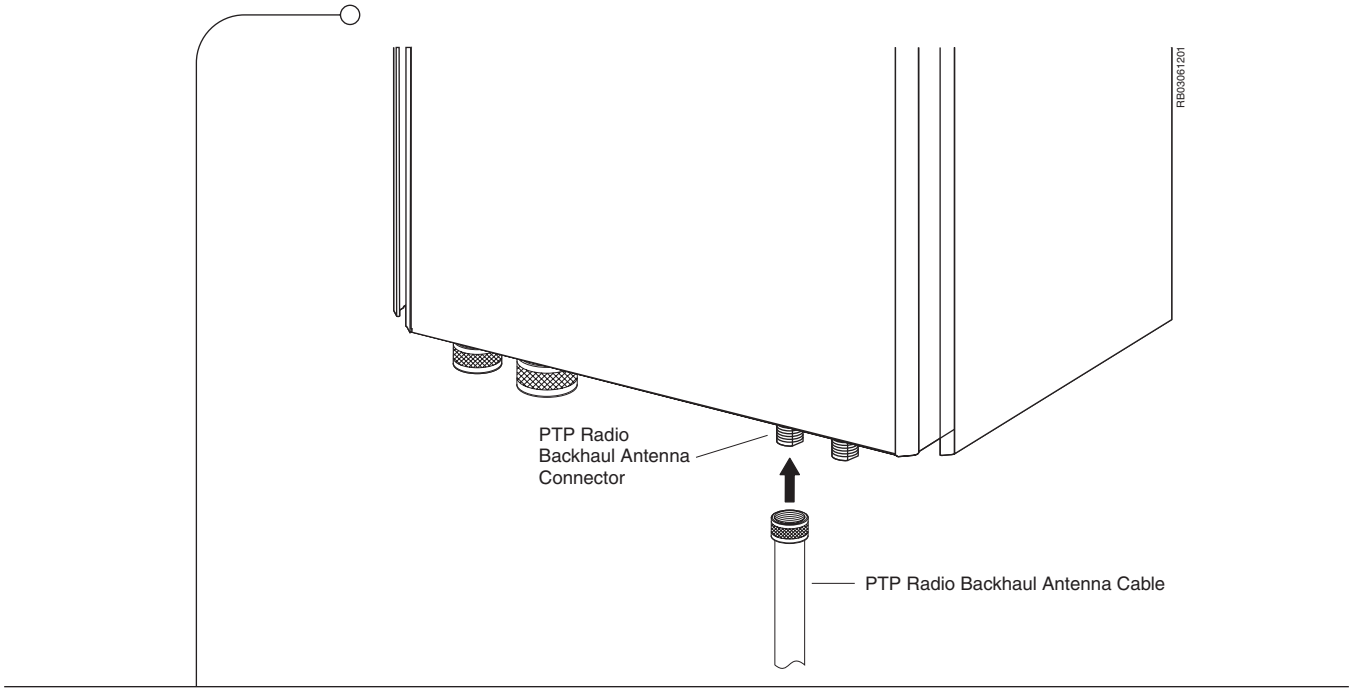


Figure 3.13 Antenna Cable Connection

3.2.4.2 Connecting a T1 Cable to the T1Lightning Protection Module

The optional T1 Lightning Protection Panel provides up to eight T1 lines that protect the Octal T1 module network interfaces from lightning surges.

Requirements:

Supplied by Customer:	T1 Cables
Tools:	Phillips screwdriver

Guideline:

- Ensure that the SBS power is turned off

To connect a T1 line to the Lightning Protection Module

1. Remove the four Phillips screws from the T1 Lighting Protection Panel. Gently pull the panel out.
2. Remove the cover of the T1 Lightning Protection Module.
3. Remove a rubber stopper from the T1 rubber bushing using a utility knife and pass the T1 line through the opening.
4. Connect the T1 cable, as shown in Figure 3.14 on page 47.

T1 Line	Color	Description
Module 1	Brown	TXRING_1 TXTIP_1
	Green	RXRING_1 RXTIP_1

Refer to the SBS's door panel for the required T1 configurations.

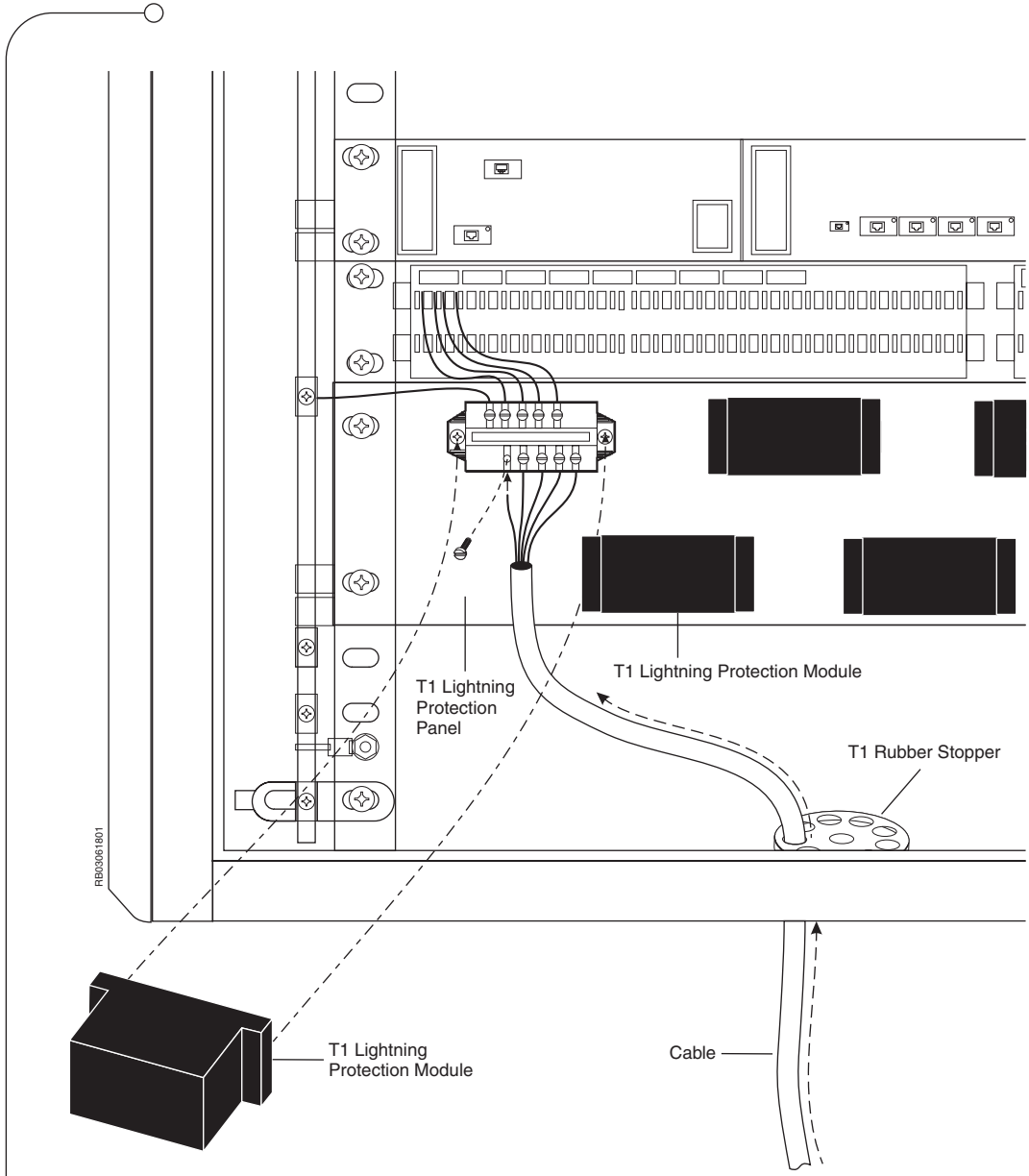


Figure 3.14 T1 Port Connection

3.2.4.3 Connecting DC Power to the SBS

The SBS is powered from a DC power source and requires -48 VDC (-40.5 to -57) input voltage.

If you are not providing -48 VDC and have purchased the AC/DC Converter option, please go to Section 3.2.4.4 “Connecting AC Power to the SBS” on page 50.

Requirements:

Provided by Customer:	DC power input cable
Tools:	wire cutter/stripper or utility knife, flathead screwdriver

Guideline:

- Ensure that the power source is off

To provide -48 VDC to the SBS

1. Remove the Power Input fitting from the bottom of the SBS cabinet.
2. Pass the DC power input cable through the fitting and connect to the Power Connector.
3. Connect the power wires (red +, black -) to the corresponding DC output terminal on the SBS Bottom Plate, as shown in Figure 3.15 on page 49.
4. Secure the Power Input fitting using the wrench.

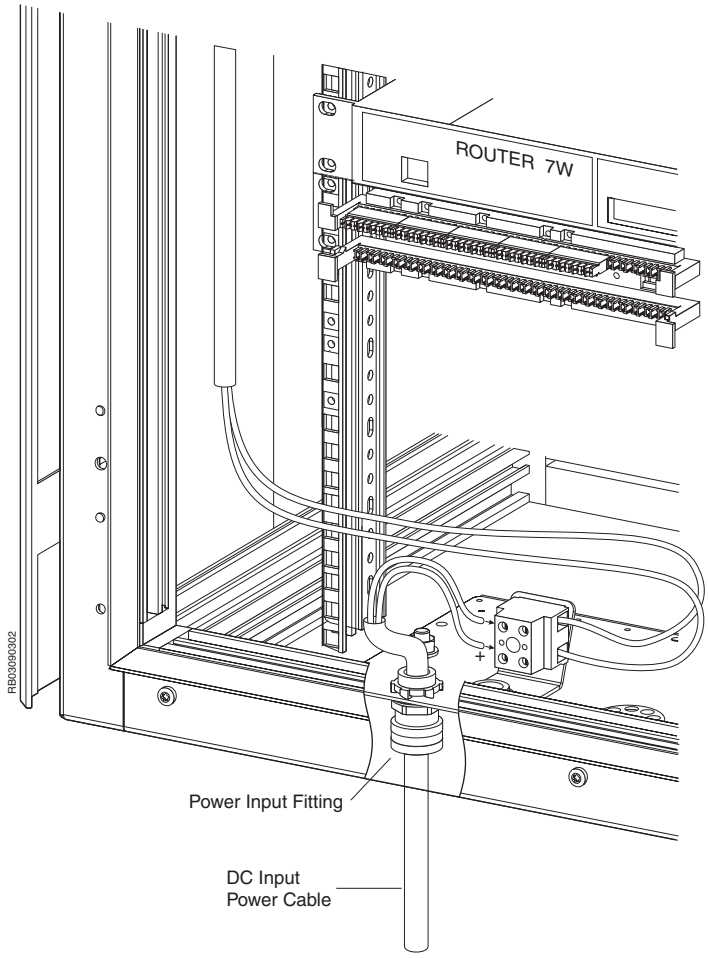


Figure 3.15 DC Power Connection

3.2.4.4 Connecting AC Power to the SBS

SBS's powered from an AC power source require the AC to DC Converter. The AC to DC Converter generates 110 VAC to -48 VDC and supports nominal input voltage of 85 VAC to 135 VAC (50/60 Hz). The AC to DC Converter works in conjunction with the SBS Battery Enclosure.

Requirements:

Provided by Customer:	AC input cable
Tools:	wire cutter/stripper or utility knife, flathead screwdriver

Guidelines:

- Ensure that the power source is off
- Ensure that the power switch located on the power converter is in the off position

To connect to AC Input Panel

1. Remove the Power Input fitting from the bottom of the SBS cabinet.
2. Pass the AC Power Cable through the fitting and connect to the Power Connector.
3. Connect the power wires (red +, black -) to the corresponding DC output terminal on the AC Input Panel, as shown in Figure 3.15 on page 49.
4. Secure the Power Input fitting using the wrench.

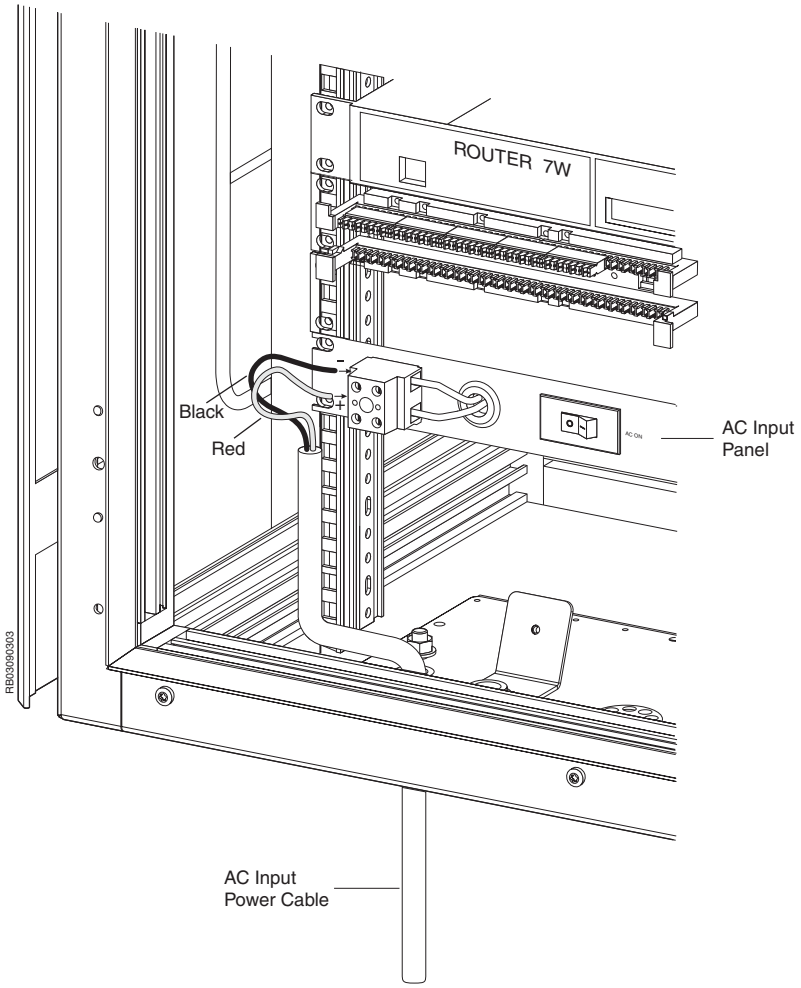


Figure 3.16 AC Power Connection

3.2.4.5 Connecting the SBS Battery Enclosure Cable Harness to the SBS

The SBS Battery Enclosure backup battery provides eight-hour standby power and one-hour-talk backup time during power interruptions. The SBS Battery Enclosure connects to the SBS's AC to DC Converter.

Requirements:

Included with SBS Battery Enclosure:	SBS Battery Enclosure Cable Harness
Tools:	Wrench

Guidelines:

- Ensure that the power source is off
- Ensure that the power switch located on the power converter is in the off position

To connect the SBS Battery Enclosure Cable Harness to the SBS

1. Remove the Battery fitting from the bottom of the SBS cabinet.
2. Pass the SBS Battery Enclosure Cable Harness through the fitting and connect to the AC/DC Converter, as shown in Figure 3.17 on page 53.
3. Secure the Battery fitting using a wrench.

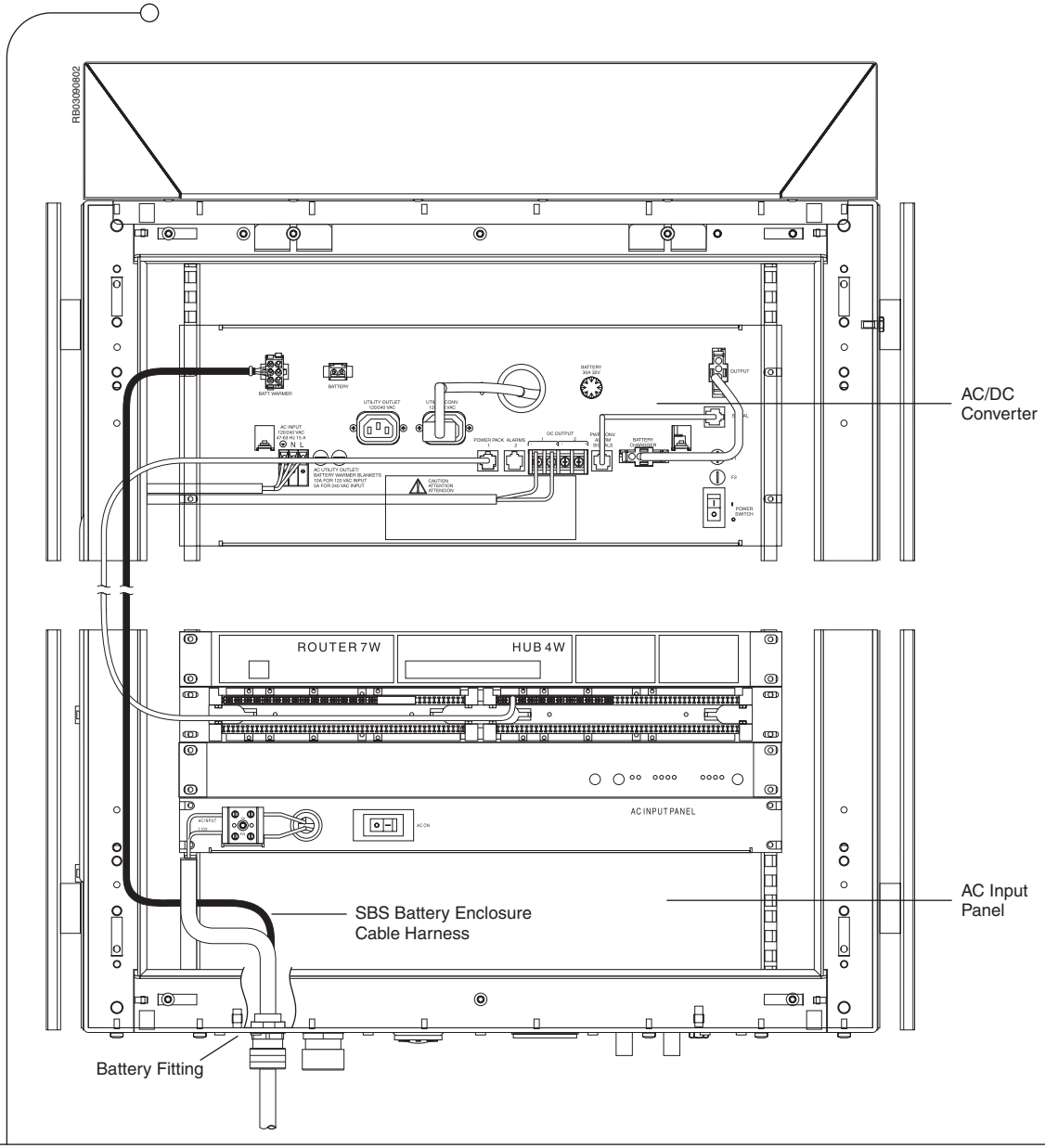


Figure 3.17 SBS Battery Enclosure Cable Harness Connection

3.2.4.6 Connecting the SBS Antenna Cable to the SBS

The SBS Antenna Cable connects the SBS antenna to the SBS equipment to provide the radio communication in the STRIDE2400 access network.

Requirements:

Included with SBS:	RF Lightning Protection
Purchased from SR Telecom:	SBS Antenna Cable
Tools:	Vulcanized and electrical tape, utility knife

Guideline:

- Ensure that equipment is not powered prior to making any connections
- To prevent water damage seal all outdoor connectors with vulcanized or electrical tape

To connect the SBS Antenna

1. Attach the RF Lightning Protection to the Antenna Connector on the bottom plate of the SBS cabinet.
2. Connect the SBS Antenna Cable to the RF Lightning Protection, as shown in Figure 3.18 on page 55.

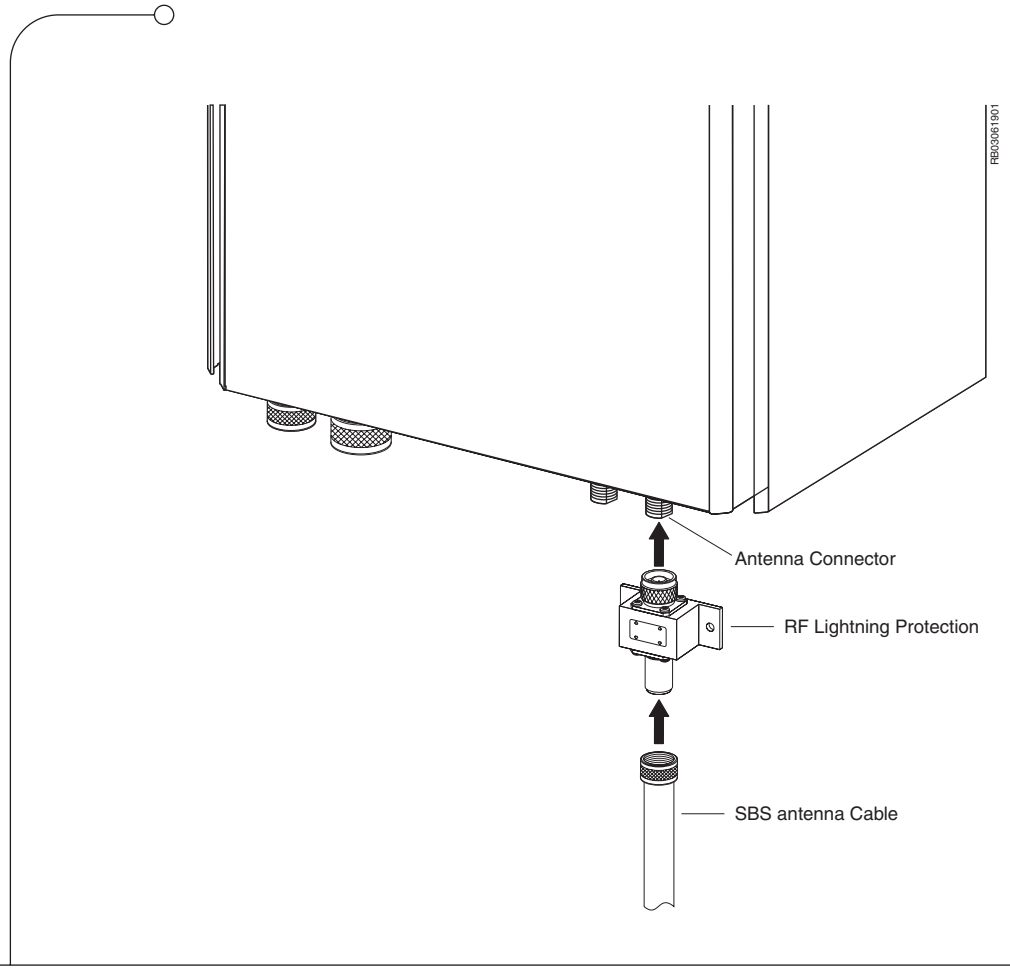


Figure 3.18 SBS Antenna Connection

3.3 Powering Up the SBS

Powering up the SBS should only be conducted after the installation and connection of the SBS, SBS Battery Enclosure, and SBS Antenna has been completed.

After installing and connecting the SBS, SBS Battery Enclosure and SBS Antenna, the power up procedure must then be conducted.

Guidelines:

- Ensure that the SBS Antenna has been installed and that all connections to the SBS are secure
- Ensure that the SBS Battery Enclosure has been installed and that all connections to the SBS are secure
- Ensure that the AC power cord is connected to the grounded 110 VAC AC outlet
- If you are using the PTP Radio Backhaul option, ensure that the connection to the cable harness is made prior to powering up any equipment

To power up the SBS equipment

1. Turn the power source on.
2. From the SBS, turn on the SBS Power Supply and the SBS Router/Hub Assembly.

If you have purchased the AC/DC Converter option, turn on the AC Input Panel and the Power Supply on the AC/DC Converter.

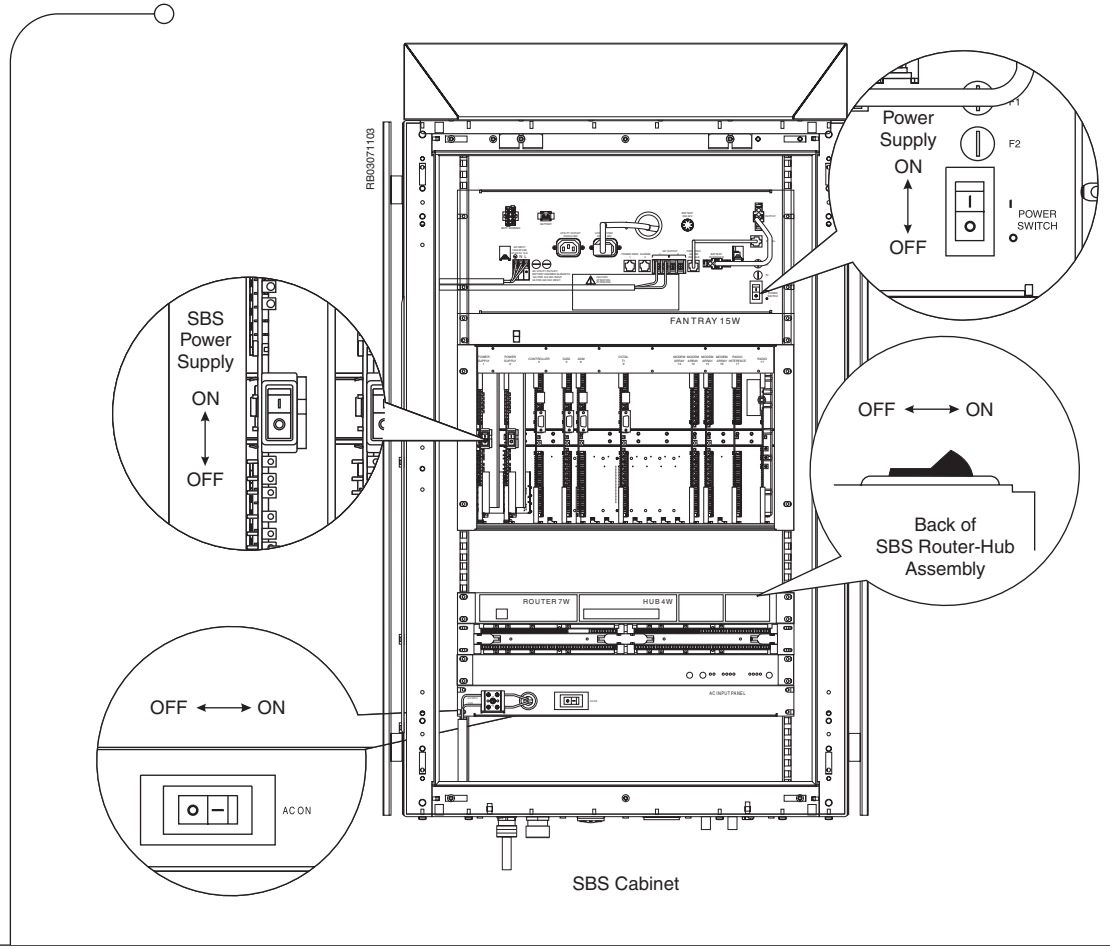


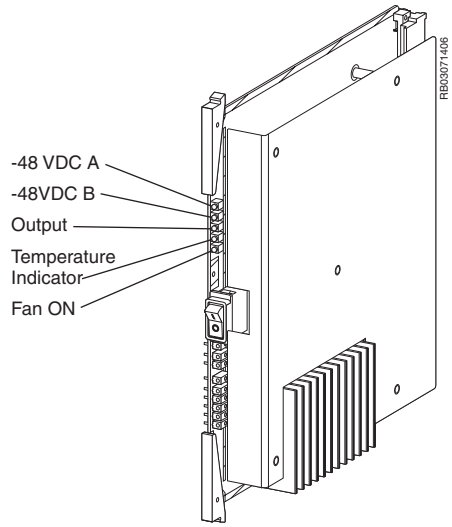
Figure 3.19 SBS Power Up

3.4 Verifying the SBS LED Status Indicators

To ensure that the SBS is functioning properly, verify the SBS LED indicators.

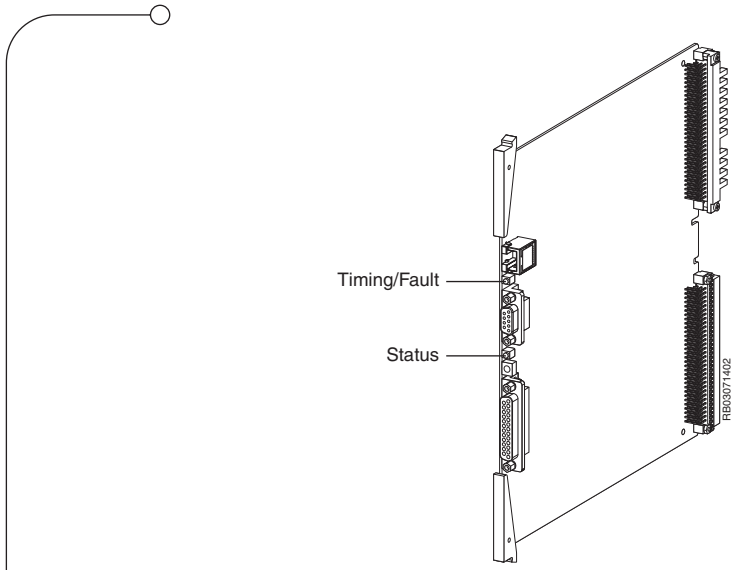
SBS Power Supply Module

LED	State	Interpretation
-48 VDC A	On (Green)	- 48 VDC input voltage is present
	Off	-48 VDC input voltage is not present
-48 VDC B	Green	- 48 VDC input voltage is present
	Red	-48 VDC input voltage is not present
Output	Green	Output voltage is present
	Red	Output voltage is not present
	Off	No input voltage
Temperature Indicator	Green	Temperature of SBS is within normal limits
	Red	Temperature rise within SBS cabinet
	Off	No input voltage
Fan On	Green	Fan is active
	Off	Fan is not active


-48 VDC A
-48VDC B
Output
Temperature
Indicator
Fan ON
RB03071406

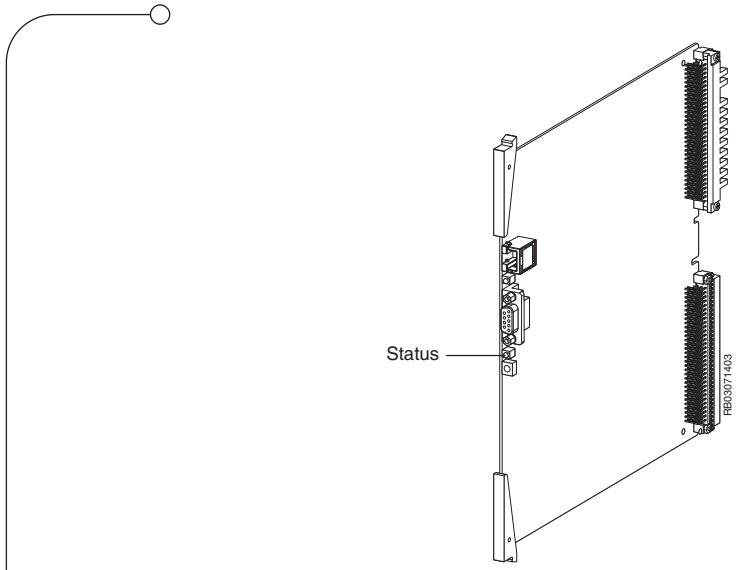
Controller Module

LED	State	Interpretation
Timing/Fault	Green (flashing slow)	Timing on internal clock
	Green (flashing fast)	Timing on T1 source
	Red	Status on power up
Status	Green	Module is active
	Red	Module is not active
	Yellow	Status on power up



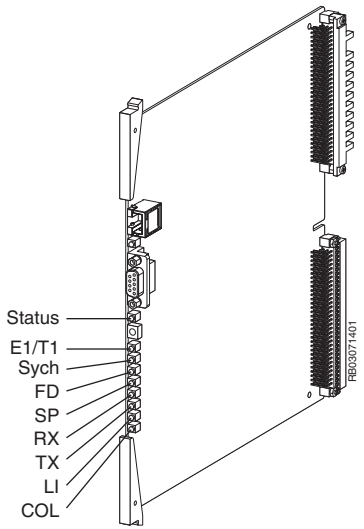
Add/Drop Multiplexer (ADM) Module

Add/Drop Multiplexer (ADM) Module	State	Interpretation
Status	Green	Module is active
	Red	Module is not active
	Yellow	Status on power up



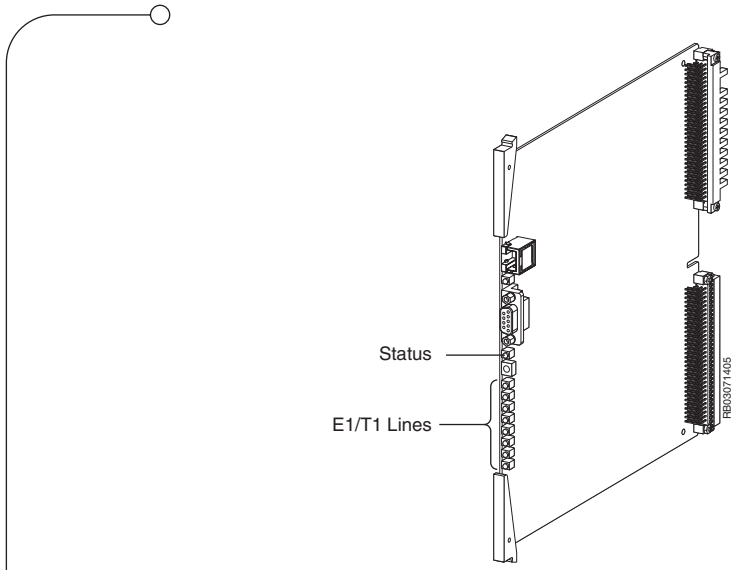
Data Module

LED	State	Interpretation
Status	Green	Module is active
	Red	Module is not active
	Yellow	Status on power up
E1/T1	Not applicable	
Sych	Not applicable	
FD	Yellow	Operating in full-duplex mode
	Off	Not operating in full-duplex mode
SP	Yellow	Connected to a 100Base-T network
	Off	Connected to a 10Base-T network
RX	Green	Receiving
	Off	Not receiving
TX	Green	Transmitting
	Off	not transmitting
LI	Yellow	Ethernet signal detected
	Off	Ethernet signal not detected
COL	Red	Collision detected
	Off	No collision


Status
E1/T1
Sych
FD
SP
RX
TX
LI
COL
RB03071401

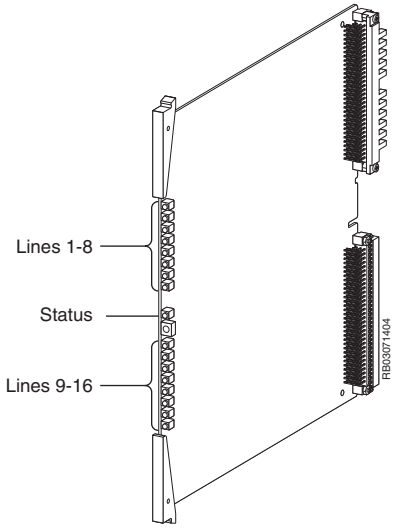
Octal T1 Module

LED	State	Interpretation
Status	Green	Module is active
	Red	Module is not active
	Yellow	Status on power up
E1/T1 Lines 1-8	Green	Active T1 connection
	Orange	No T1 Link
	Off	T1 not configured



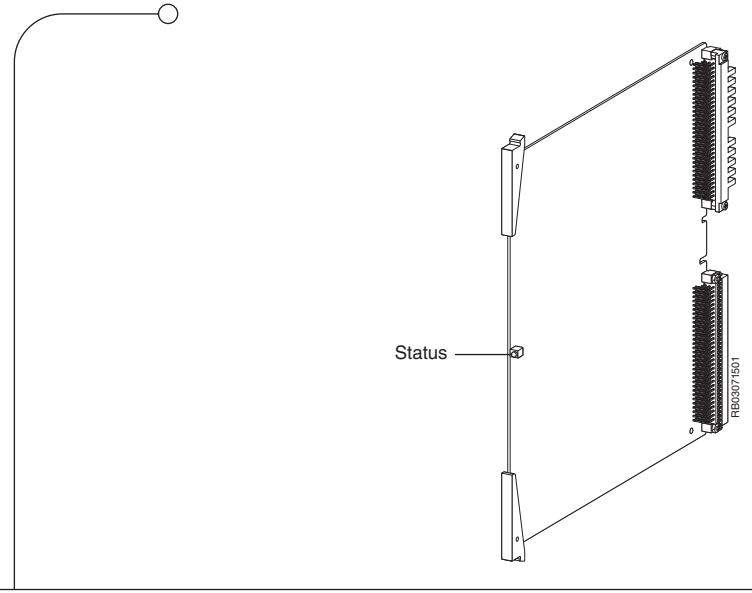
Modem Array Module

LED	State	Interpretation
Status	Green	Module is active
	Red	Module is not active
	Yellow	Status on power up
Channels 1 - 16	Green	Activity on channel
	Orange	No activity on channel
	Red	Channel open but no activity



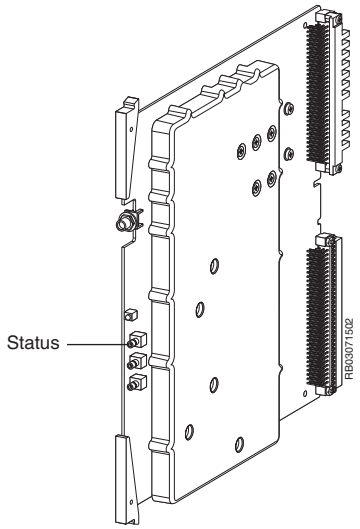
Radio Interface Module

LED	State	Interpretation
Status	Green	Module is active
	Red	Module is not active
	Yellow	Status on power up



SBS Radio Module

LED	State	Interpretation
Power On	Green	Module is active
	Red	Fault



3.5 Installing the SBS Battery Enclosure

The SBS Battery Enclosure houses the batteries to provide eight-hour standby power and one-hour-talk backup time during power interruptions. This section describes the procedures for installing the SBS Battery Enclosure.

To install the SBS Battery Enclosure

1. Unpack the SBS Battery Enclosure and verify that all components are delivered as described in Section 3.5.1 “Verifying the SBS Battery Enclosure Package Contents” on page 69.

2. Mount the SBS Battery Enclosure as described in Section 3.5.2 “Mounting the SBS Battery Enclosure” on page 70.

3. Ground the SBS Battery Enclosure as described in Section 3.5.3 “Grounding the SBS Battery Enclosure” on page 72.

4. Connect the SBS Battery Enclosure Cable as described in Section 3.5.4 “Connecting the SBS Battery Enclosure Cable Harness to the SBS Battery Enclosure” on page 74.

5. Install the SBS Backup Battery as described in Section 3.5.5 “Installing the SBS Backup Battery” on page 76.

3.5.1 Verifying the SBS Battery Enclosure Package Contents

Verify that you have received the following materials with your SBS main package. If any materials are missing or damaged, please contact SR Telecom technical services.

SBS Battery Enclosure
SBS Battery (purchased separately)
SBS Battery Warmer (optional) - not shown

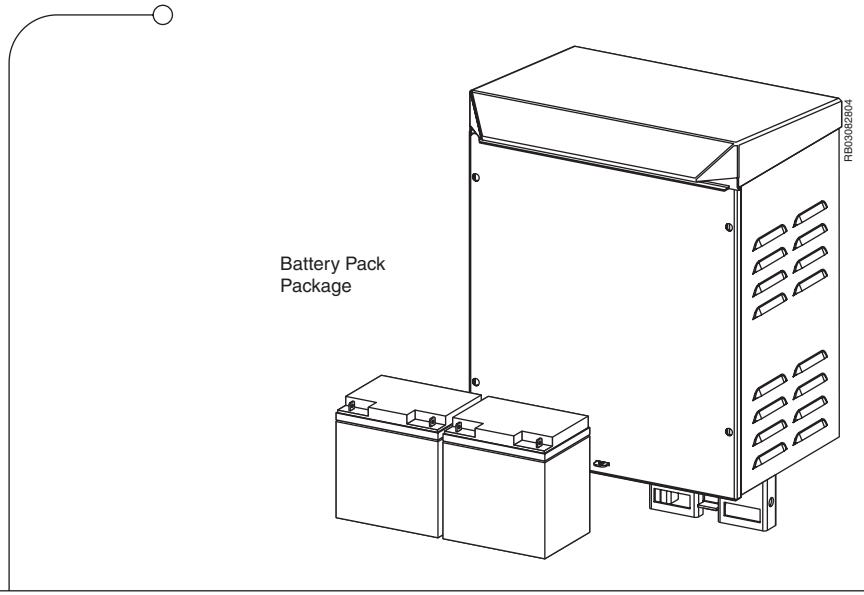


Figure 3.20 SBS Battery Enclosure Package Contents

3.5.2 Mounting the SBS Battery Enclosure

The SBS Battery Enclosure can be mounted on a pole or wall. If you are mounting the SBS Battery Enclosure on a pole, install the SBS Battery Enclosure on the side opposite the station to distribute the equipment weight evenly.

Type	Height	Width	Depth	Weight
SBS Battery Enclosure	21.1 in. (43.2 cm)	17 in. (53.6 cm)	13.3 in. (33.8 cm)	105 lb. (47.6 kg)

Requirements:

Included with SBS Battery Enclosure:	SBS Battery Enclosure Mounting Kit
Tools:	Drill and Ratchet

Guidelines

- Determine the location of the SBS Battery Enclosure prior to moving the equipment to its final location
- Ensure that the Battery Enclosure cable can reach the SBS

To mount the SBS Battery Enclosure

1. Using the bracket as a template, mark the location of each hole. Drill two holes and secure the bracket to the pole.
2. Hook the SBS Battery Enclosure cabinet on the bracket and open the cabinet door.
3. Secure the cabinet to the bracket, as shown in Figure 3.21.

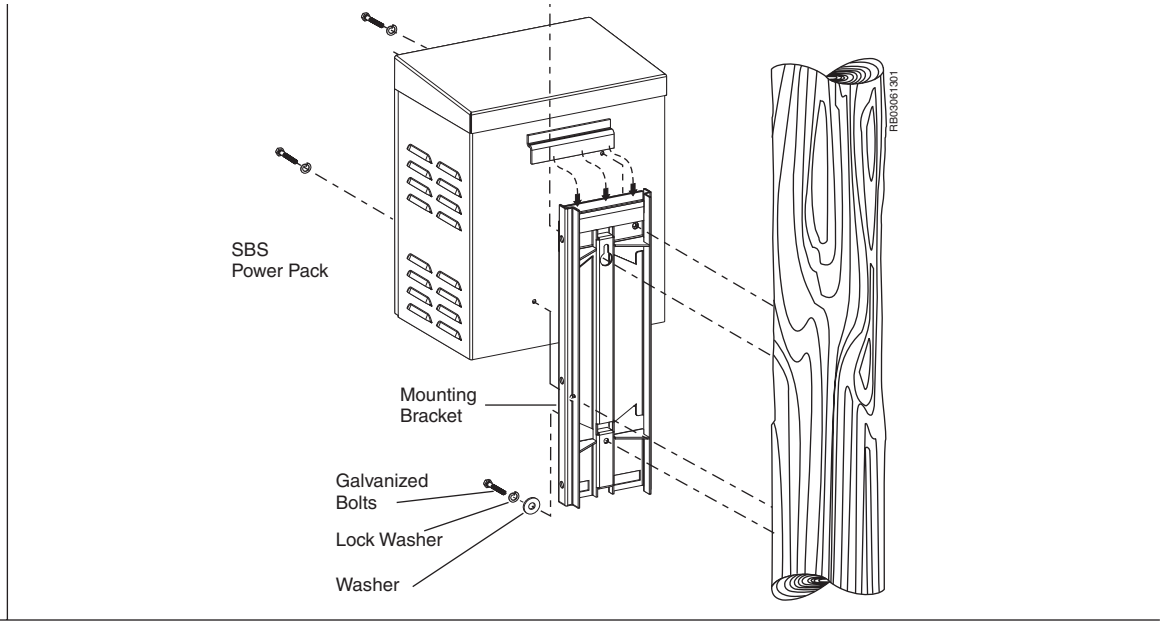


Figure 3.21 Mounting the SBS Battery Enclosure

3.5.3 Grounding the SBS Battery Enclosure

Grounding the SBS Battery Enclosure helps to prevent serious injury to service personnel and avoids damage to the equipment.

Requirements:

Included with SBS Battery Enclosure:	6 AWG ground wire
Tools:	Crimping tool, wire cutter/stripper or utility knife

Guidelines:

- For pole-mount installations, route the ground wire along the side of the pole opposite to the station's SBS Antenna Cable. This will reduce the possibility of equipment damage due to lightning
- It is strongly recommended that the ground wire be cut to length and that the most direct path be taken when connecting the equipment to ground

To ground the SBS Battery Enclosure

1. Remove ground lug from the SBS Battery Enclosure Cabinet.
2. Crimp the ground wire to the ground lug.
3. Secure the ground lug to the ground studs on the SBS Battery Enclosure, as shown in Figure 3.22 on page 73.
4. Strip the end of the ground wire and connect to single point ground.

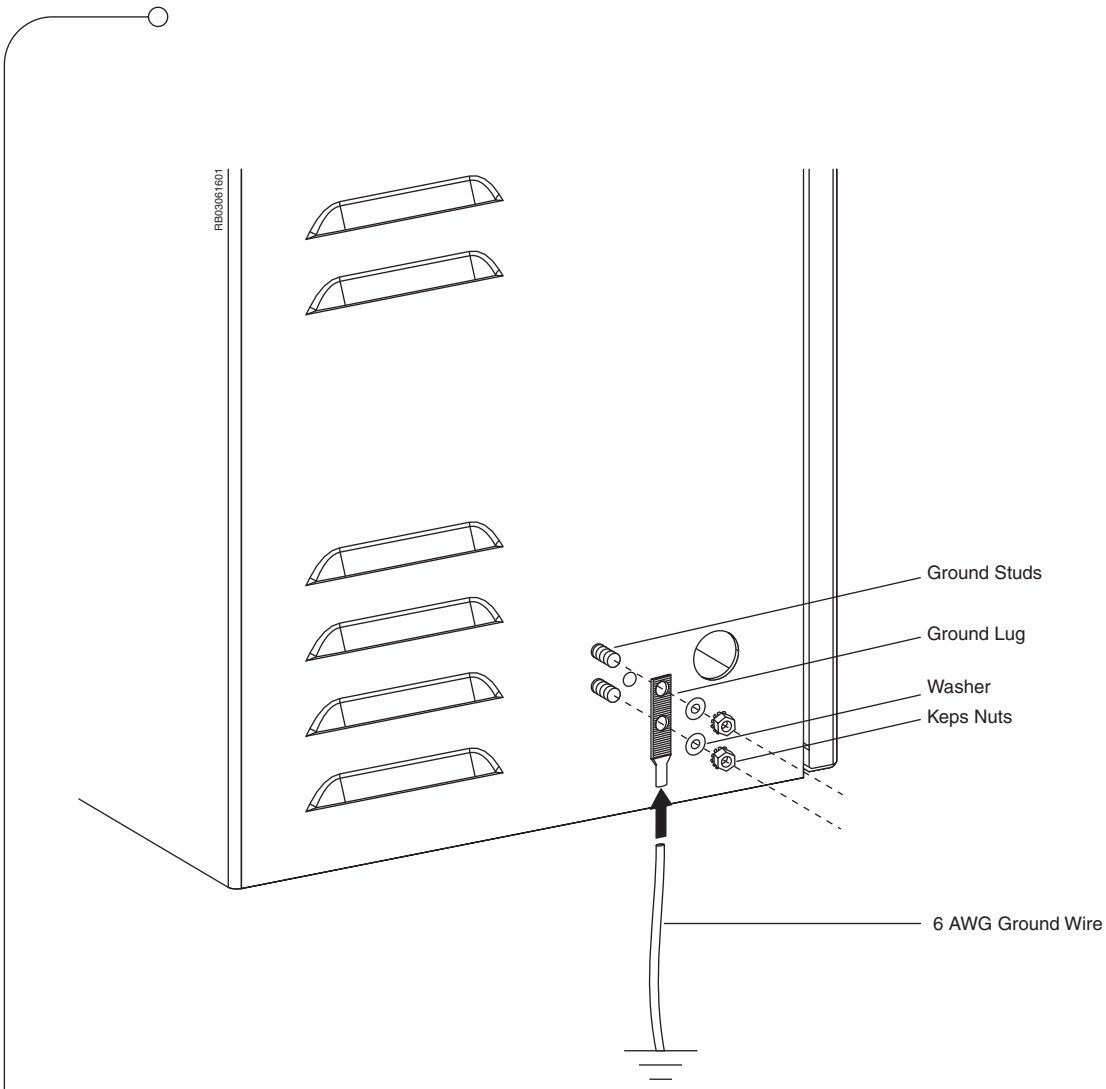


Figure 3.22 Ground Connection

3.5.4 Connecting the SBS Battery Enclosure Cable Harness to the SBS Battery Enclosure

The SBS Battery Enclosure Cable Harness connects to the SBS Battery Enclosure to provide backup power during power interruptions.

Requirements:

Included with SBS Battery Enclosure:	SBS Battery Enclosure Cable Harness
Tools:	Wrench

Guidelines:

- Ensure that the power source is off
- Ensure that the power switch located on the AC/DC power converter is in the off position

To connect the SBS Battery Enclosure Cable Harness to the SBS Battery Enclosure

1. Remove the Cable fitting from the side panel of the SBS Battery Enclosure.
2. Pass the SBS Battery Enclosure Cable Harness through the fitting and connect to the connector of the Battery Cable, as shown in Figure 3.23 on page 75.
3. Secure the Cable fitting using a wrench.

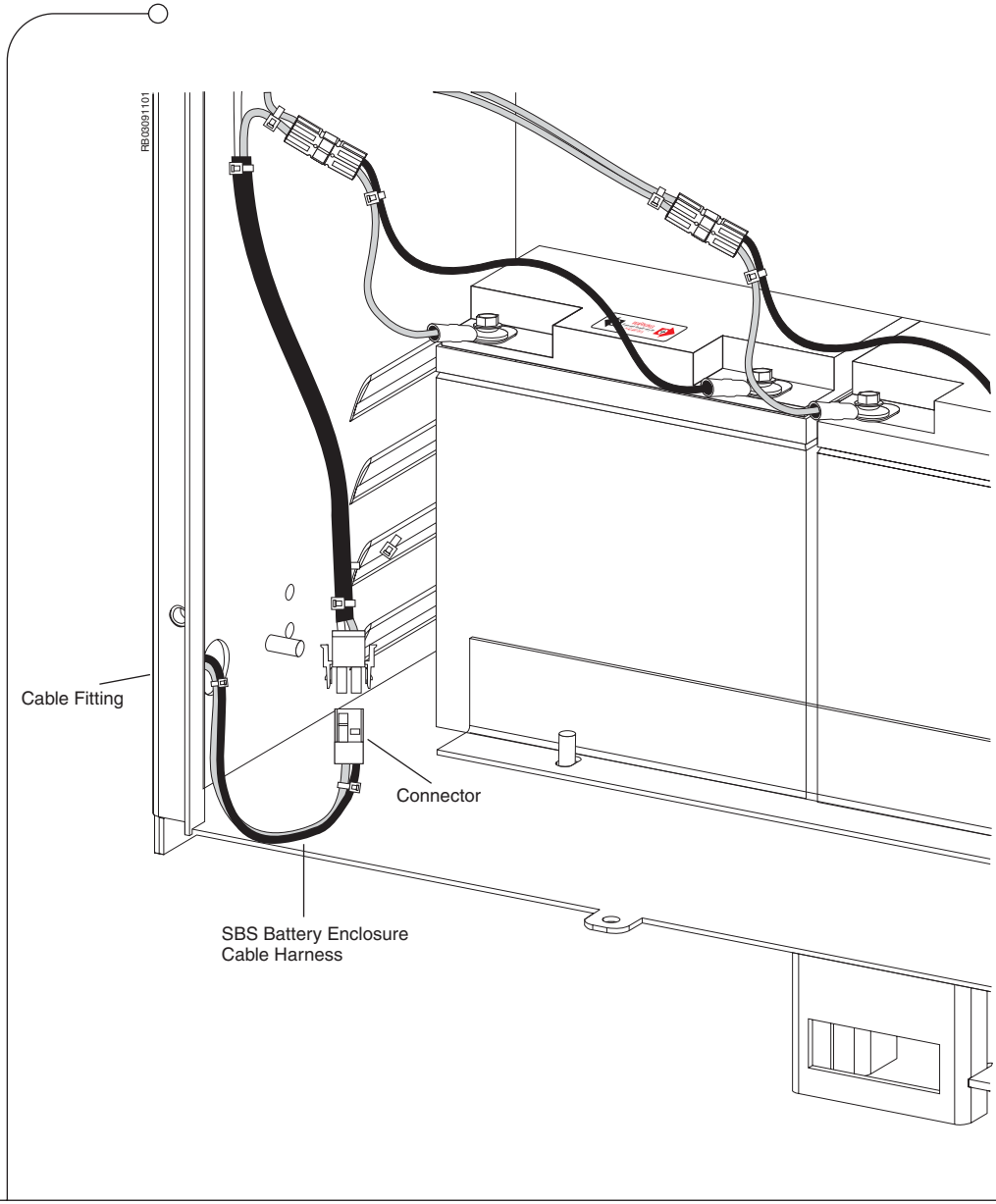


Figure 3.23 SBS Battery Enclosure Cable Harness Connection

3.5.5 Installing the SBS Backup Battery

The SBS Battery Enclosure batteries must be charged within its typical storage lifetime period prior to installation; refer to Table 3.1.

Table 3.1 Battery Storage Period

Average Ambient Temperature	Typical Storage Life
0°C (32° F) to 20°C (68°F)	12 months
21°C (70° F) to 30°C (86°F)	9 months
31°C (88° F) to 40°C (104°F)	5 months
41°C (106° F) to 50°C (122°F)	2.5 months

For more information on battery maintenance and storage, please consult your battery manufacturer's maintenance and storage guide or SR Telecom's Supplied Batteries marketing notice.

3.5.5.1 Checking and Charging the SBS Backup Batteries

Prior to installing any batteries in the SBS Battery Enclosure ensure that the batteries are charged.

Requirements:

Tools:	Digital voltmeter and adjustable

Guidelines:

- Use an adjustable power supply to top charge the battery, SR Telecom equipment must not be used
- Do not top charge the battery more than three times during its storage life
- Discard the battery according to the manufacturer's instructions and local laws; always replace the battery with the same or equivalent type

To charge the SBS Backup Battery

1. Top charge one battery at a time according to Table 3.2.

   If the battery's casing becomes too hot to touch while the battery is being charged, reduce the current an charge at a lower rate. The battery may take longer to charge.

2. After the battery has been charged, disconnect the battery and let it sit for 24 hours.
3. Using a voltmeter, check the voltage of the battery. Battery voltage should be at least 12.9 volts. If less than 12.9 VDC discard the battery.
4. Update the battery's maintenance log.

Table 3.2 Top Charging Recommendations

Date Since Last Top Charge	Top Charging Recommendations
Within the first half of storage life	6 to 8 hours at constant current of 0.1 CA (current rate in amperes) • Set charge rate to 2.8 A (28 Ah x 0.1 CA = 2.8 A) • Set voltage to 14.4 V; voltage is limited to 2.4 V per cell (6 cells x 2.4 V = 14.4 V) for a 12 V battery
Beyond the first half of storage life	8 to 10 hours at constant current of 0.1 CA (current rate in amperes) • Set charge rate to 2.8 A (28 Ah x 0.1 CA = 2.8 A) • Set voltage to 14.4 V; voltage is limited to 2.4 V per cell (6 cells x 2.4 V = 14.4 V) for a 12 V battery

3.5.5.2 Connecting the Battery to the SBS Battery Enclosure

The SBS Backup Batteries provide backup power and also serve to filter out voltage spikes that may be present in the AC network. To ensure maximum equipment performance, operate the Battery Enclosure only when its batteries are installed.

Requirements:

Included with SBS Battery Enclosure:	Battery Cable
Purchased from SR Telecom:	SBS Backup Battery
Tools:	Flathead screwdriver

Guidelines:

- Batteries must only be connected after the SBS and AC power have been connected
- Power up the SBS Battery Enclosure only after all battery connections have been made. Failure to comply may drain the battery

To install the backup battery in the SBS Battery Enclosure

1. Place the battery in the battery compartment.
2. Connect the SBS Backup Battery to the Cable Harness by attaching the red and black lug rings to the positive (+) and negative (-) poles on the battery and secure with the appropriate hardware, as shown in Figure 3.24 on page 79.
3. Attach the Battery Cable connectors to the Cable Harness connectors as illustrated.

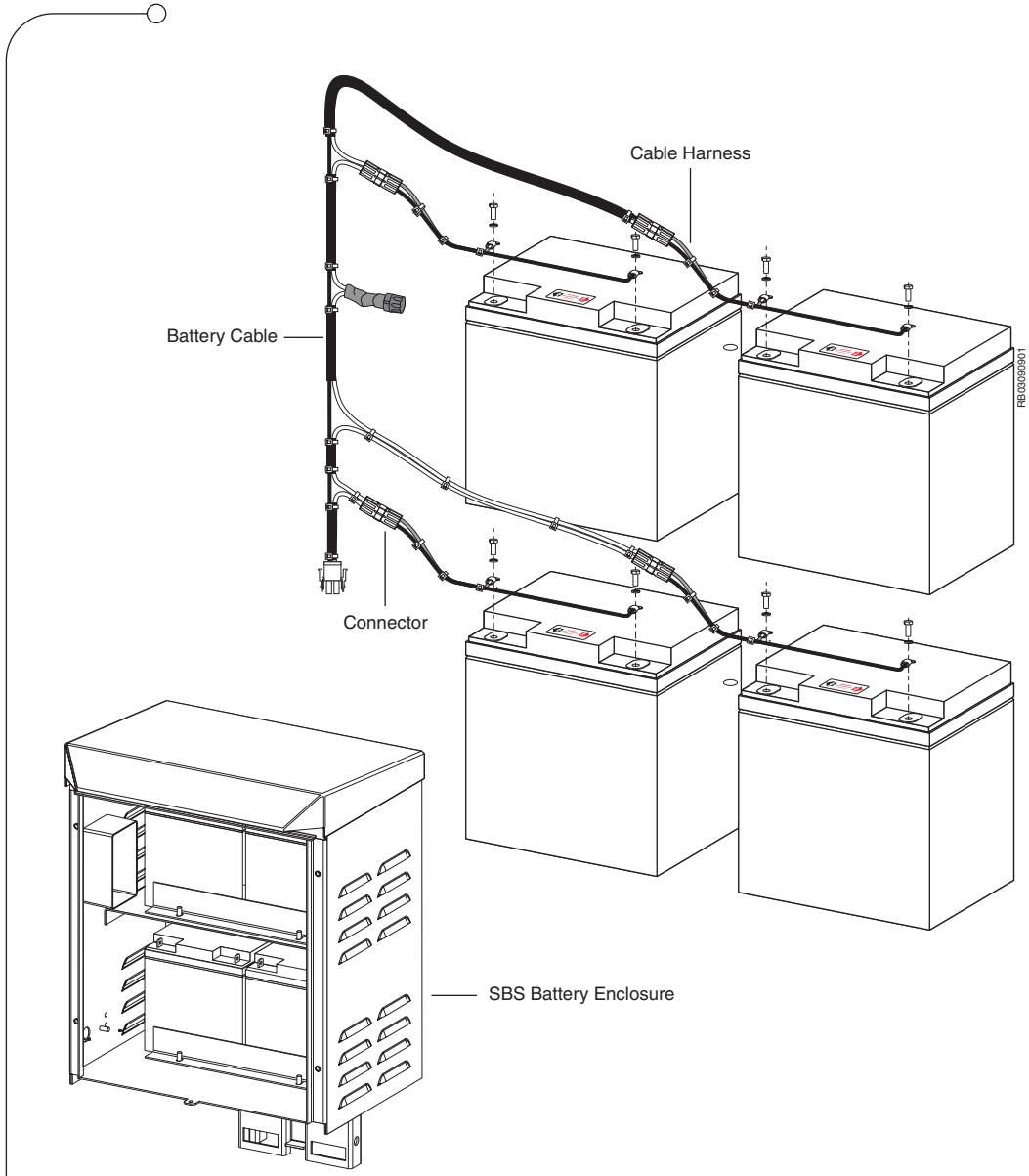


Figure 3.24 Battery Cable Connection

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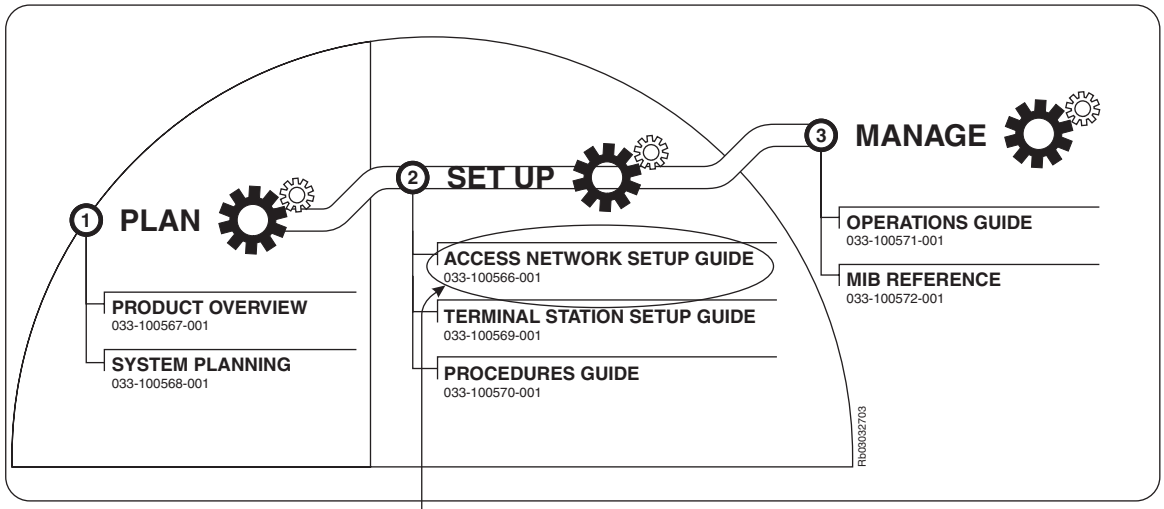
Chapter 4 STRIDE2400 Terminal Station Installation

This chapter has been intensionally left out for this review. For information on the STRIDE2400 Terminal Station, refer to the STRIDE2400 Terminal Station Setup Guide, 033-100569-001.

Chapter 5 Your Next Step

Return to your STRIDE2400 Access Network Roadmap to continue with the next phase of planning, setting up or managing your STRIDE2400 access network.

STRIDE2400 Access Network Roadmap



You have just completed this phase

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