⫴ stride2400

Terminal Station Setup Guide

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SR⫴Telecom

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Preface

About this Manual

This guide describes how to set up the STRIDE™2400 Terminal Station (STS) site equipment which includes the STS, the STS antenna, and the STS Power Pack.

This guide is intended for service personnel responsible for installing the STRIDE2400 equipment.

Contact Us

If you have any comments or suggestions about this or other SR Telecom technical manuals, please send an e-mail to techdoc@srtelecom.com. Include the manual's complete title, issue and document number in your message. We appreciate your comments.

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Table of Contents

Chapter 1   Introduction

This chapter introduces the STRIDE2400 Terminal Station (STS) site equipment and describes its installation phases.

1.1   STRIDE2400 Terminal Station

The STS is an easy-to-install outdoor unit that delivers a variety of voice and data services to a subscriber. Two types of STSs are available: STS-Voice and STS-Voice and Data. For the purposes of this setup guide, both STS types are identical. Figure 1.1 show a typical installation of an STS.

The STS can be easily mounted on a wall, wooden pole or metal pole and is connected to its antenna using a single coaxial cable. The STS Power Pack provides the +24VDC power to the STS and can provide the service drop connection to the subscriber's line termination block.

Figure 1.1   Typical STS Site Installation

1.2 STS Setup Overview

The set up of the STS site equipment consists of six phases as shown in Figure 1.2. Each phase must be conducted in the order provided to ensure the proper installation of the equipment.

The six phases to set up the STS site equipment include:

1. **Preparation:** describes the pre-installation requirements for the STS site.

2. **STS Antenna Installation:** describes the procedures for installing the STS antenna.

3. **STS Installation:** describes the procedures for installing the STS.

4. **STS Power Pack Installation:** describes the procedures for installing the STS Power Pack.

5. **STS Configuration:** describes the procedure for configuring the STS.

6. **STS Antenna Alignment**: describes the procedure for aligning the STS antenna.

Figure 1.2   STS Setup Overview

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Chapter 2   Preparation

This chapter outlines the pre-installation requirements for the STS site.

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, the following guidelines are provided:

- 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   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)

- Each 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

2.1.4   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

The tools required to install the STS and STS Power Pack are shown in Figure 2.1.

#2 Phillips Screwdriver

Small Flat-Blade Screwdriver

Utility Knife

Ratchet Wrench

Crimping Tool

Wire Cutter/Stripper

Drill

Drill Bits

Compass or Binoculars

Vulcanized and Electrical Tape

ESD Wristband

Laptop

RS-232 Console Serial Cable

Digital Voltmeter

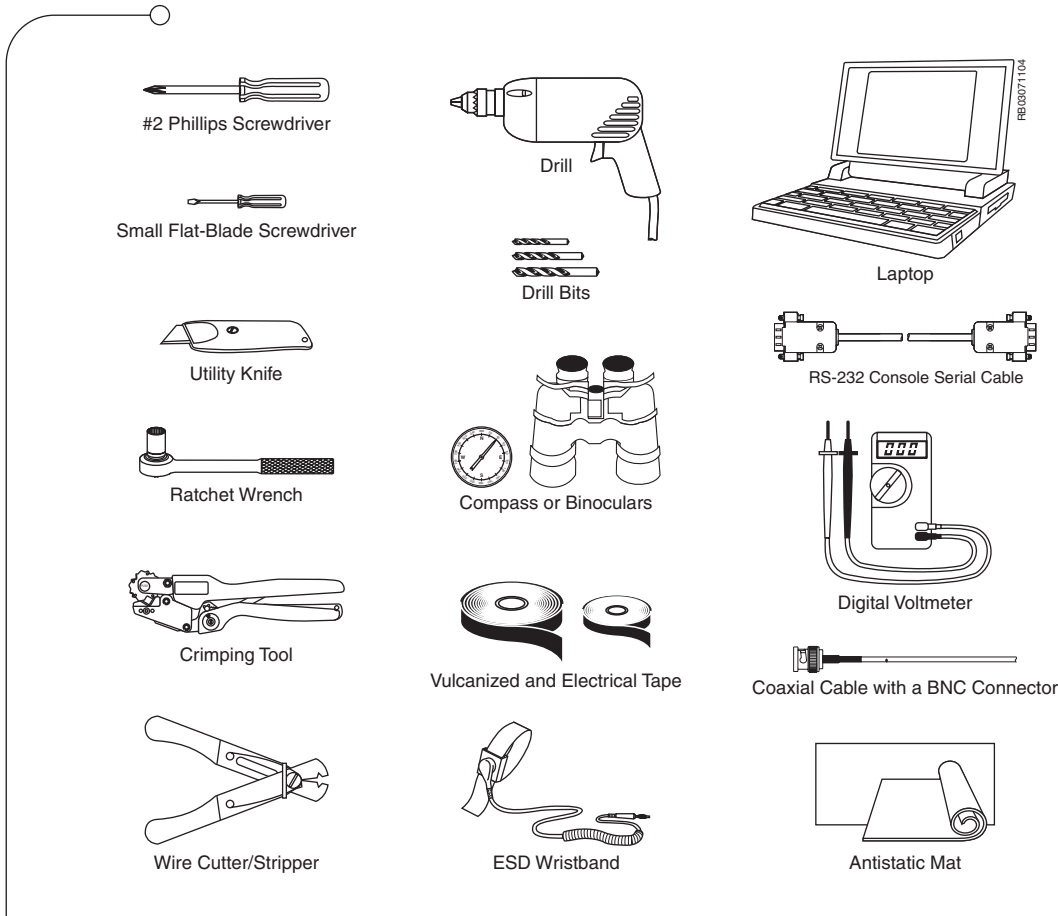Coaxial Cable with a BNC Connector

Antistatic Mat

Figure 2.1   Tools Required

ℹ️ For the drill bit and ratchet wrench socket sizes required, refer to the specific tasks in this document.

2.3   Site Requirements

Before unpacking and installing the STS and the STS Power Pack, it is important to ensure that the site complies with the STRIDE2400 environmental and power requirements. Also, ensure that you have all the necessary cables and wires required to install the 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 VDC nominal (90 VDC to 130 VAC)

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 distance 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

STRIDE2400 Terminal Station Setup Guide

2.4　STS Site Package Contents

Please verify that you have received the following materials for the STS site installation. If any materials are missing or damaged, refer to the *SR Telecom Services*, 033-100367-001 document.

STS Package

STRIDE2400 Terminal Station
RF Lightning Protection
STS Mounting Kit
STRIDE2400 Terminal Station Setup Guide

STS Power Pack Package

STS Power Pack
STS Backup Battery

STS Antenna Cable Package

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

STS Antenna Package

STS Antenna
Antenna Installation Guide

STS Package

STS Power Pack Package

STS Antenna Package

STS Antenna Cable Package

Figure 2.2   STS Site Package Contents

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3
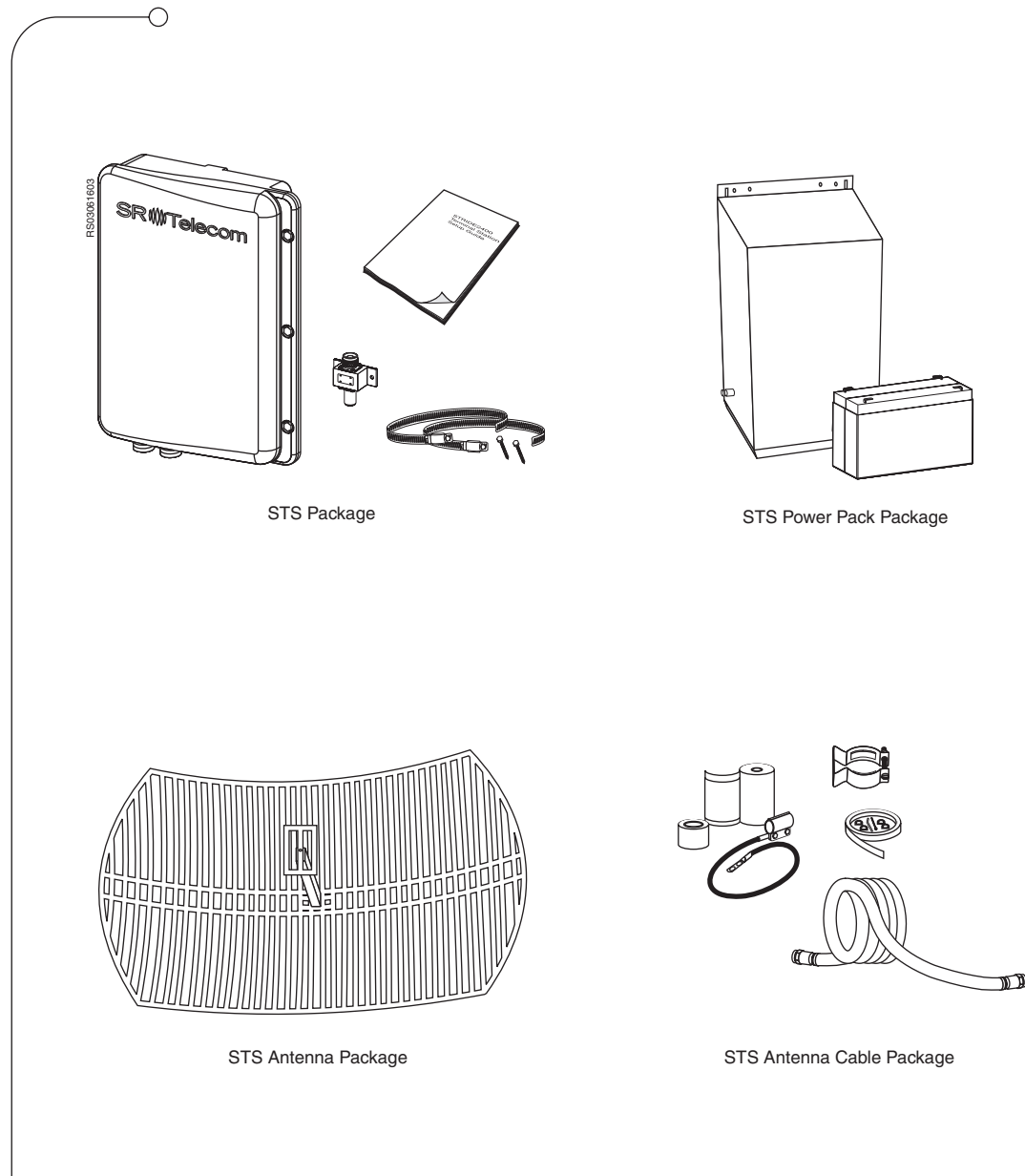
Chapter 3   Installation

This chapter describes the procedures for installing the STS antenna, the STS, and the STS Power Pack. The procedures to configure the STS and to align the STS antenna are also described.

3.1   Installing the STS Antenna

The STS antenna is used to send and receive radio communications between the STRIDE2400 Base Station (SBS) and the STS. The type of antenna used depends on subscriber's site requirements and may vary from site to site. Always use the manufacturer's documentation to mount and install the antenna.

This section provides antenna installation guidelines, including typical mounting, grounding and antenna cable installation procedures.

To install the STS antenna

1.   Ensure compliance with antenna guidelines described in Section 3.1.1 "Antenna Guidelines".

2.   Mount the STS antenna as described Section 3.1.1 on page 24.

3.   Install the STS antenna cable as described in Section 3.1.2 on page 26.

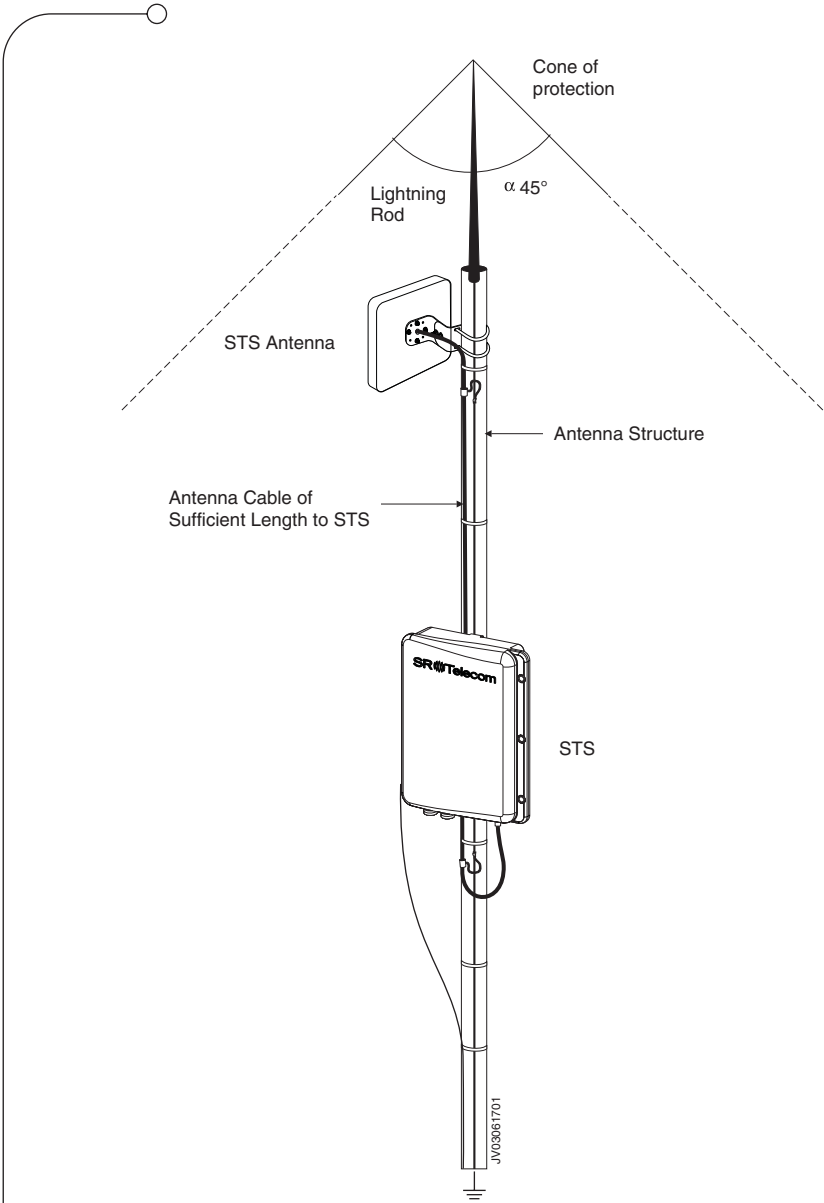4.   Ground the STS antenna as described in Section 3.1.3 on page 28.

Cone of
protection

α 45°

Lightning
Rod

STS Antenna

Antenna Structure

Antenna Cable of
Sufficient Length to STS

SR◉Telecom

STS

JV03061701

Figure 3.1   Antenna Installation Scenario

3.1.1 Mounting the STS Antenna

The antenna mounting procedure depends on the antenna purchased. The following is a typical STS antenna mounting procedure.

Requirements:

Included with STS Antenna:	Antenna mounting hardware, antenna mounting instructions

Guidelines:

- Trained personnel must perform the antenna installation

- 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

- The antenna is tuned to the correct frequency, the antenna's label indicates the operating range

- Determine the location of the STS antenna on the pole prior to mounting the unit.

- Ensure that the antenna is pointed in the general direction of the SBS antenna and that the antenna can reach the STS with the antenna cable.

To mount the STS antenna

► Secure the antenna to the pole using the mounting hardware provided, as shown in Figure 3.2 on page 25.
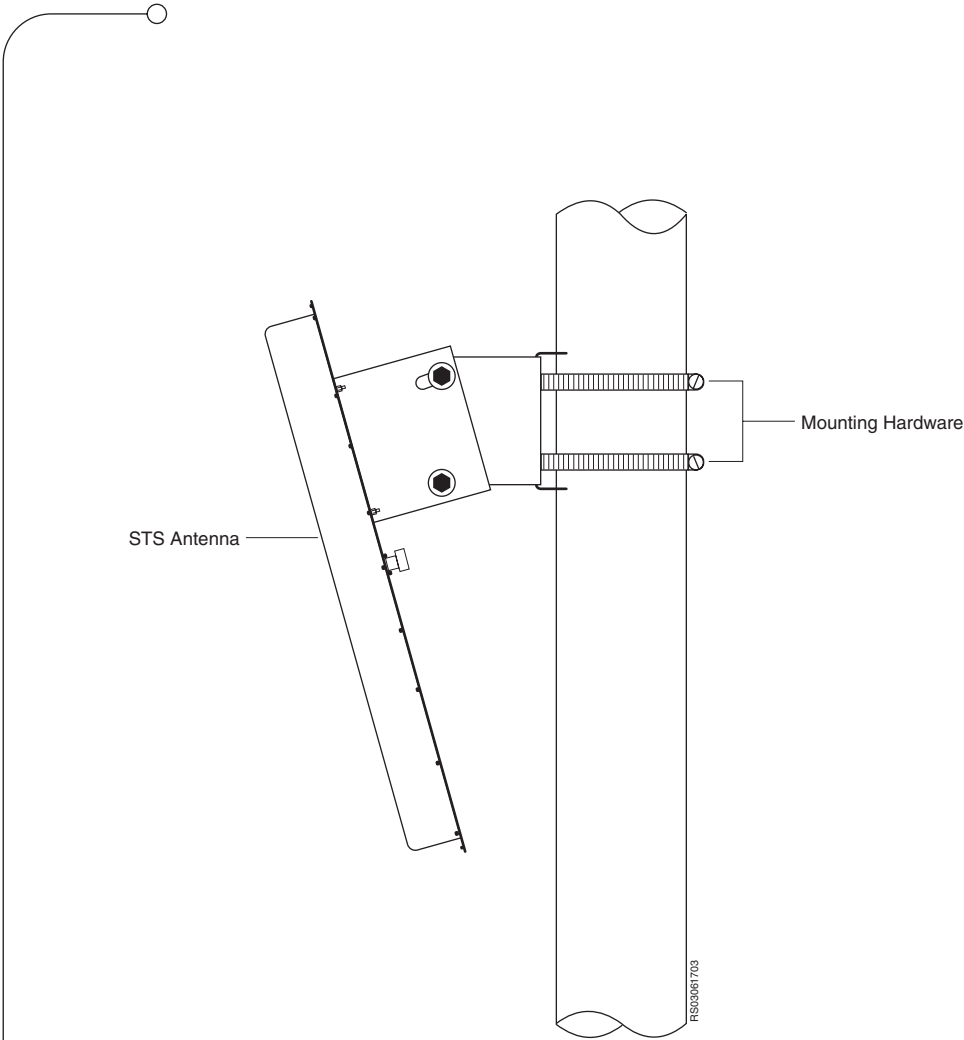
RS03061703

Figure 3.2   Mounting the STS Antenna

3.1.2   Installing the STS Antenna Cable

A 50 Ω coaxial cable with N-type male connectors at both ends is offered by SR Telecom to connect the STS antenna to its STS. This cable is available in lengths of 16 ft. (5 m), 33 ft. (10 m), 49 ft. (15 m) and 66 ft. (20 m).

Requirements:

Included with STS Antenna Cable:	Hanger kits (2), Wrap lock kit

Guidelines:

- Ensure that the antenna cable is of sufficient length to connect to the antenna to the STS

- Install clamps or straps every 3 ft. (1 m) to secure the antenna cable to the pole.

- To prevent water damage, seal all outdoor connectors with vulcanized and electrical tape.
  SR Telecom recommends that this guideline be followed only after the alignment of the antenna.

To install the STS antenna cable

1. Connect the STS antenna cable to the antenna, as shown in Figure 3.3 on page 27.

2. Route the antenna cable down the pole and secure the cable on the pole using the clamps from the hanging kit or the stainless steel straps included in the wrap lock kit.
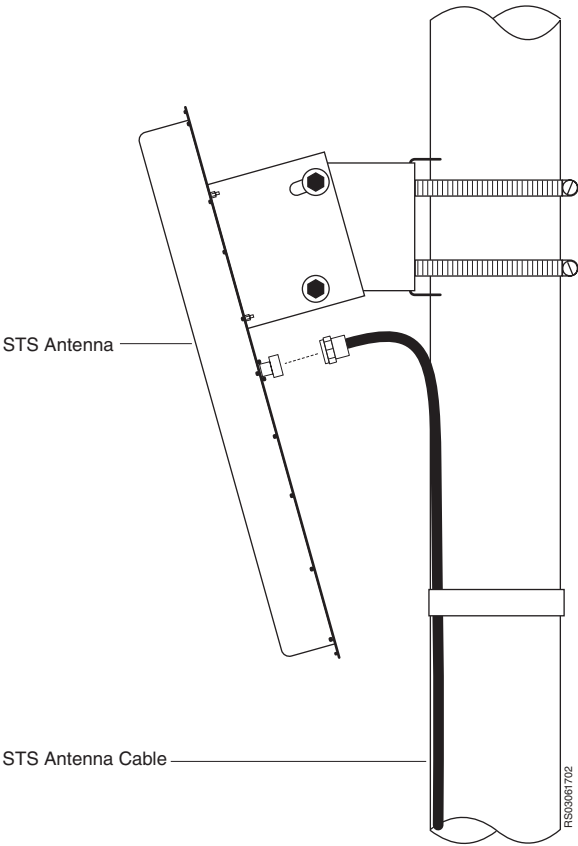
STS Antenna

STS Antenna Cable

RS03061702

Figure 3.3   Installing the STS Antenna

3.1.3   Grounding the STS Antenna

Grounding the STS antenna cable helps protect the STS against lightning transients that can travel down the inner conductor of the antenna cable and can cause damage the STS.

Requirements:

Included with STS Antenna Cable:	Grounding kits (2)

Guidelines:

*   When the STS antenna is supplied with a grounding lug, it must be connected to the lightning rod's ground wire using a mimimum 6 AWG copper wire.

*   Use the grounding kit manufacturer's instructions to attach the grounding kit to the antenna cable. Always weatherproof the connection between the grounding kit and the antenna cable and make a tight connection between the grounding kit and the ground wire.

⚠   SR Telecom strongly recommends that the guidelines provided in Section 2.1.3 "Grounding and Lightning Protection Guidelines" be followed. Failure to comply may void warranty.

To install the grounding kits

1. Install the first ground kit just below the top curve of the antenna cable, as shown in shown in Figure 3.4 on page 29.

2. Install the second ground kit just above the bottom curve of the antenna cable.

Lightning
Rod

STS
Antenna

Grounding Kit
Located just below the
first curve of the antenna cable

SR◉Telecom

STS

Grounding Kit
Located just above the
bottom curve of the antenna cable

RS03061602

Figure 3.4   Installing the Grounding Kits

3.2   Installing the STS

The STS is an outdoor unit that provides the radio link between the SBS and the subscriber's premises. This section provides the procedures for installing the STS.

To install the STS

1.   Mount the STS as described in Section 3.2.1 on page 31.

2.   Ground the STS as described in Section 3.2.2 on page 36.

3.   Connect the STS cables as described in Section 3.2.3 on page 38.

4.   Power-up the STS as described in Section 3.2.4 on page 44.

5.   Verifying the status of the STS LED Indicators in Section 3.2.5 on page 46.

3.2.1   Mounting the STS

The STS can be mounted on a metal pole, wooden pole or on a wall. The procedure to mount an STS on a wall is identical to the wood pole mounting procedure. Since the STS can be mounted on a variety of wall surfaces such as wood, brick, masonry or concrete, no special anchoring hardware is provided to mount the STS on a wall. It is the responsibility of the customer to provide the wall anchoring hardware.

The customer must also ensure that the mounting surface can support the weight of the STS. The dimensions and weight of the STS are listed in Table 3.1.

Table 3.1   STS Dimensions

Dimensions	
Height	15.6 in. (39.6 cm)
Width	11.3 in. (28.7 cm)
Depth	2.5 in. (6.4 cm)
Weight	15 lb (7 kg)

3.2.1.1 Mounting the STS on a Metal Pole

The STS can be mounted on a 2 to 10 in. (5 to 25 cm) diameter metal pole using the metal hose clamps provided with the STS.

Requirements:

Included with STS Mounting Kit:	Hose clamps (2)
Tools:	Ratchet wrench or drill with 5/16" socket

Guidelines:

• Determine the location of the STS on the pole prior to mounting the unit; make sure that the STS mounting position is within reach of its antenna using the provided antenna cable.

• If the STS will be installed on the same pole as the STS Power Pack, make sure that they are installed on opposite sides of the pole to distribute the equipment weight evenly.

• If you are mounting the STS on a metal pole that is less than 5 in. (12.7 cm) in diameter, it is recommended to cut the hose clamps to a more appropriate length.

To mount the STS on a metal pole

1. Insert the hose clamps through the slots at the rear of the STS, as shown in Figure 3.5 on page 33.

2. Secure the hose clamps and the STS to the metal pole and use the ratchet wrench or drill to tighten the hex-head screws on the hose clamps.

Do not overtighten the hex-head screws, over tightening may damage the STS.
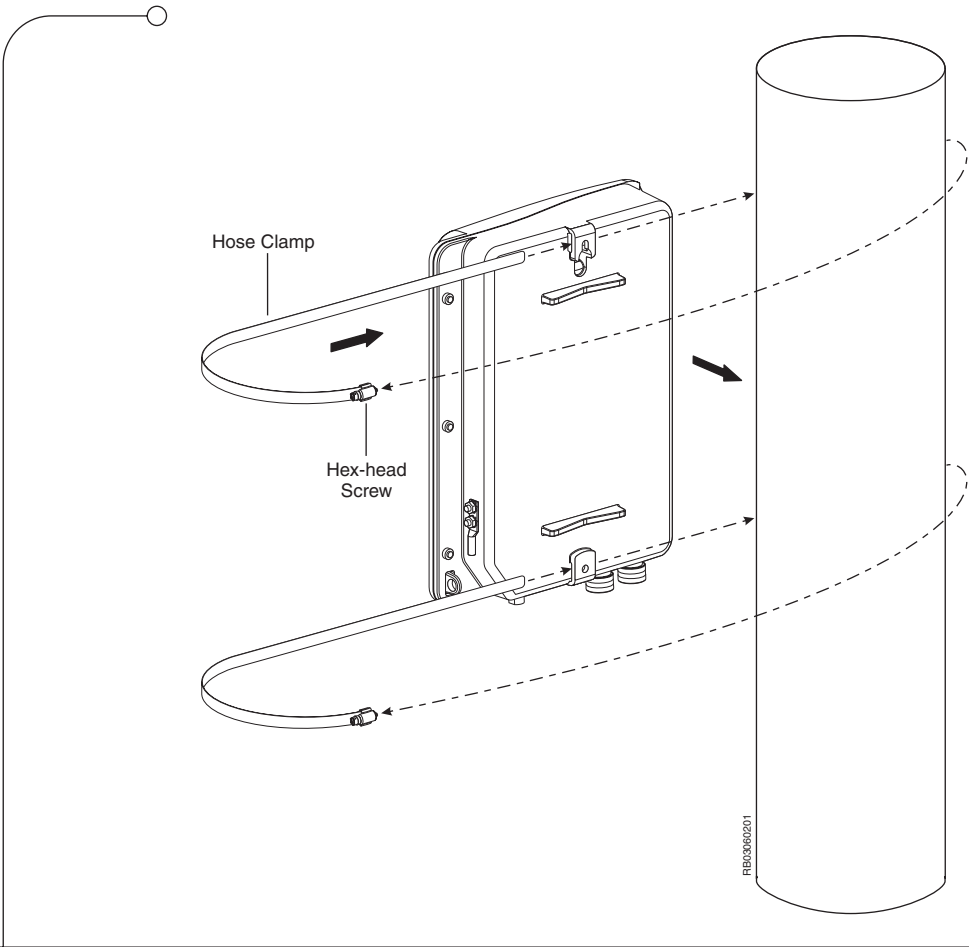
Hose Clamp

Hex-head
Screw

RB03060201

Figure 3.5   Mounting the STS on a Metal Pole

33

3.2.1.2   Mounting the STS on a Wooden Pole or Wall

The STS can be mounted on a wooden pole up to 19.7 in. (50 cm) in diameter using the two 1/4" x 2" lag screws provided with the STS. If you are installing the STS on a wall, make sure that the wall surface can support the STS. Special wall anchoring hardware may be required.

Requirements:

Included with STS Mounting Kit:	Two 1/4" x 2" hex head lag screws
Tools:	Ratchet wrench with 7/16" socket, 3/16" drill bit and drill

Guidelines:

- Determine the location of the STS on the pole or wall prior to mounting the unit, make sure that the STS mounting position is within reach of its antenna using provided antenna cable.

- If the STS will be installed on the same pole as the STS Power Pack, make sure that they are installed on opposite sides of the pole to distribute the equipment weight evenly.

To mount the STS on a wooden pole or wall

1. Drill a hole in the pole using a 3/16" drill bit for the top lag screw of the STS, as shown in Figure 3.6 on page 35. If you are installing the STS on a wall, follow the installation instructions included with the wall anchoring hardware.

2. Install the lag screw 1 1/2 inches into the pole.

3. Mount the STS onto the top lag screw.

4. Making sure that the STS is level, mark the location of the STS's bottom mounting hole.

5. Drill a hole for the bottom lag screw, then install and tighten the bottom lag screw.

6. Tighten the top lag screw.

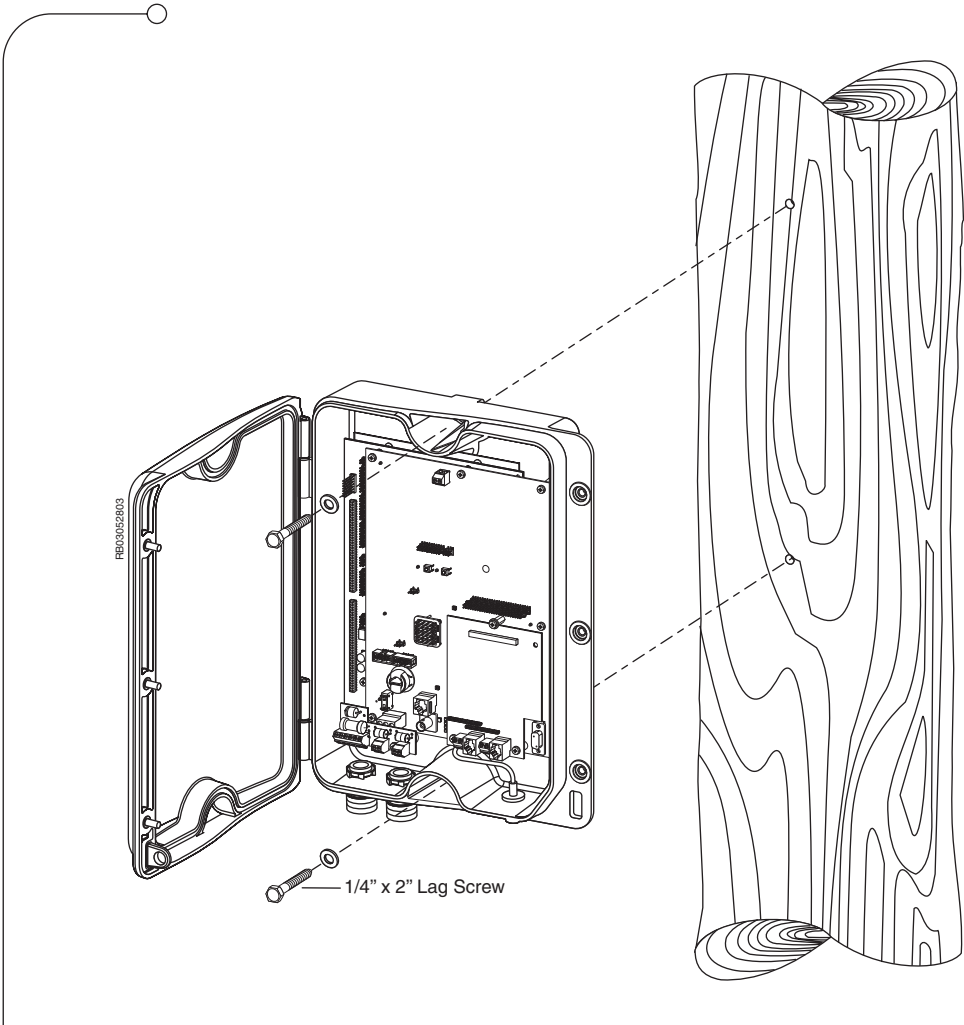> Do not overtighten the lag screws, over tightening may damage the STS.

RB03052803

1/4" x 2" Lag Screw

Figure 3.6   Mounting the STS on a Wooden Pole (or Wall)

3.2.2 Grounding the STS

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

Requirements:

Supplied by Customer:	Ground wire (6 AWG)
Tools:	Ratchet wrench with 7/16" socket, crimping tool, wire cutter/stripper

Guideline

• It is recommended that the ground wire be cut to length.

To ground the STS

1. Remove the ground lug from the STS, as shown in Figure 3.7 on page 37.

2. Crimp the ground wire to the ground lug.

3. Re-install the ground lug on the on the STS and secure the ground lug to the STS.

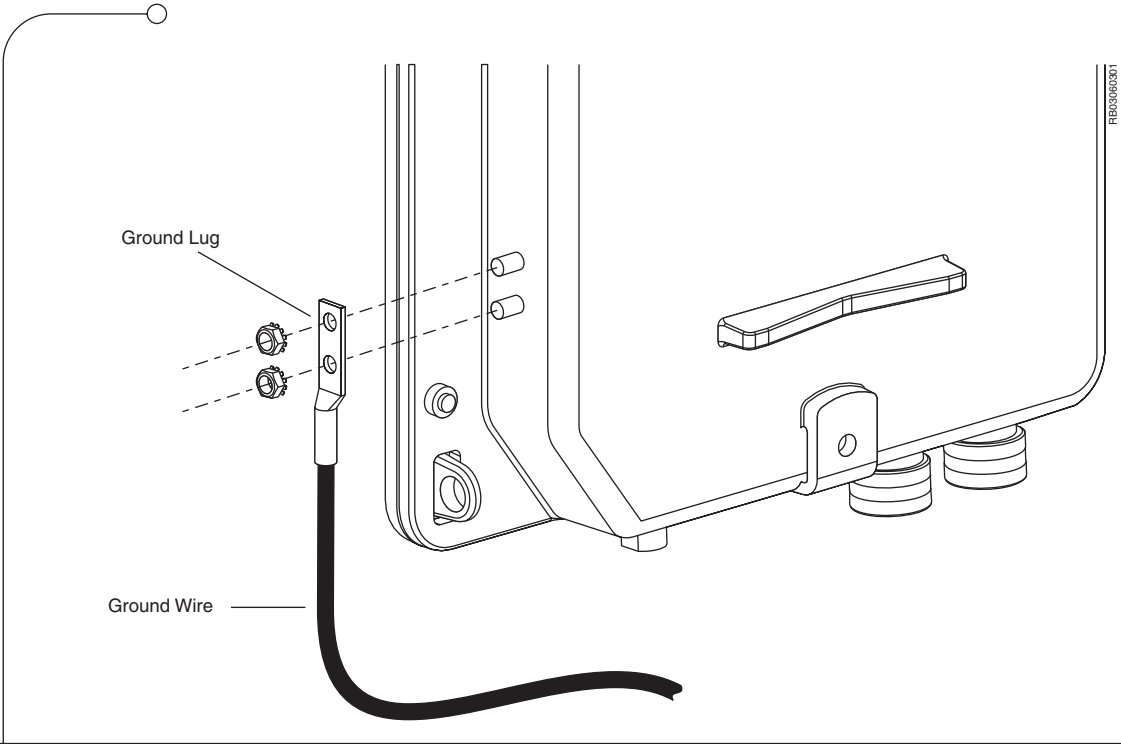4. Strip the other end of the ground wire and connect to the single point ground.

RB03060301

Ground Lug

Ground Wire

Figure 3.7   STS Grounding Connection

3.2.3   Connecting the STS Cables

The subscriber lines and DC power connections to the STS are made on the terminal blocks located inside the STS. Two cable entry glands located at the bottom of the STS provide the cable access to the terminal blocks. If the service drop cable includes both the subscriber line wires and the DC power wires, use the larger cable entry gland (left side) to pass the cable inside the STS. If the subscriber line wires, and the DC wires are on separate cables, use the larger cable entry gland to pass the subscriber line wires and the smaller cable entry gland (right side) to pass the DC power wires

After passing all cables through the glands, make sure the glands are fully tightened to lock the cables in place and protect the STS from the environment. If only one of the cable entry glands is used to pass the service drop cable, the second entry gland must be sealed to weatherproof the STS.

3.2.3.1   Connecting DC Power to the STS

The STS requires an input voltage of +24VDC. The DC power wires may be located on the drop cable that includes the service wires or the DC power wires may be on a separate cable.

Requirements:

Customer Provided:	Drop cable
Tools:	Ratchet wrench with 7/16" socket, small flat -blade screwdriver, wirecutter/stipper

To connect DC power to the STS

1. Use the ratchet wrench to loosen the three hex bolts on the STS and open the STS cabinet door.

2. Remove the STS fuse before making any wire connections to the STS.

3. Insert the drop cable through one of the glands located at the bottom of the STS. Use the gland that is most appropriate for the size of the cable.

4. Connect the positive and negative wires to the STS, as shown in Figure 3.8 on page 39. Ensure that correct polarity is observed when making power connections to the STS.
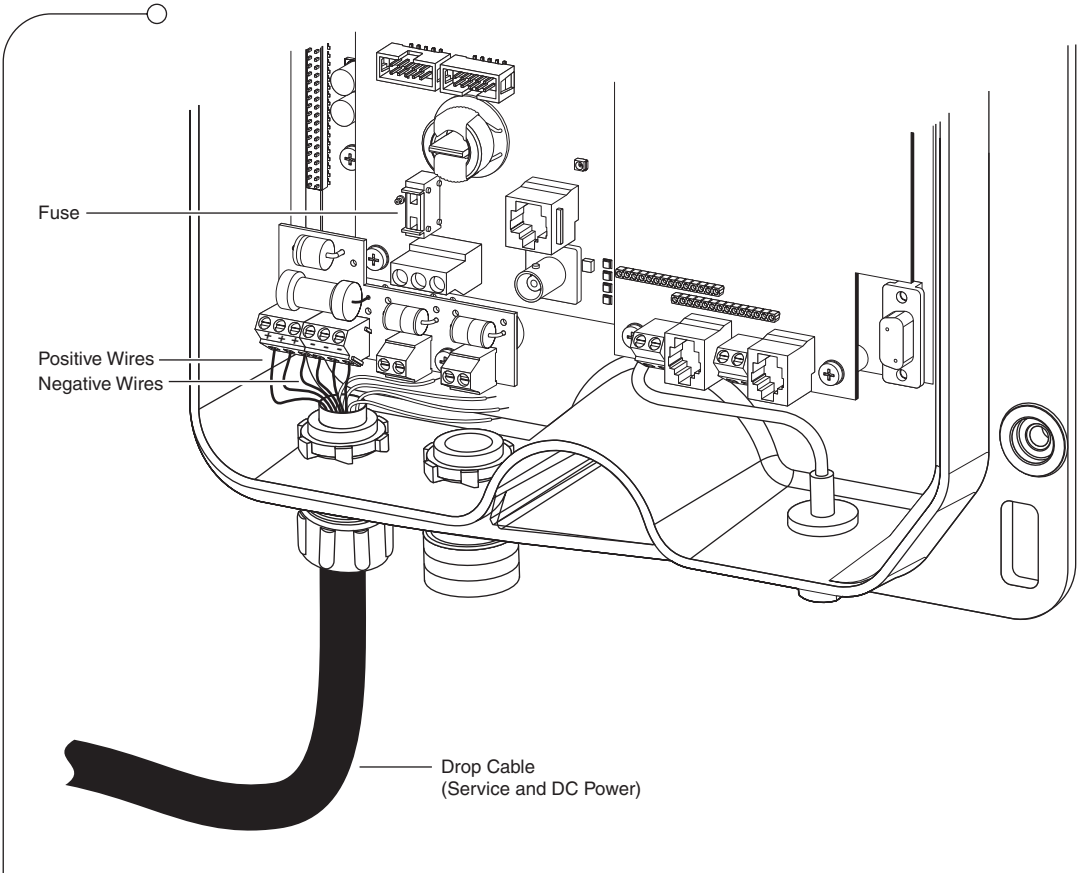
RB03060401

Fuse

Positive Wires
Negative Wires

Drop Cable
(Service and DC Power)

Figure 3.8   +24VDC Power Connection to the STS

3.2.3.2   Connecting the Subscriber Lines to the STS

The STS supports two, 2-wire subscriber lines. Each subscriber line consists of a Tip wire and a Ring wire. The subscriber line wires may be located on the drop cable that includes the DC power wires or on a separate cable.

Requirements:

Customer Provided:	Drop cable
Tools:	Small flat-blade screwdriver, wire cutter/stripper, utility knife, vulcanized tape and electrical tape

⚠ Ensure that the STS fuse has been removed before making any wire connections to the STS.

To connect the subscriber lines to the STS

1. Connect the subscriber lines to the STS, as shown in Figure 3.9 on page 41.

2. Tighten the cable entry gland to lock the drop cable in place.

3. Wrap the drop cable connection first with vulcanized tape, then with electrical tape, to weatherproof the connection. Make sure to wrap the connector in the clockwise direction to tighten the connection.

⚠ If only one cable entry gland is used to connect the DC power and service wires, ensure that the second gland is sealed to weatherproof the STS. Failure to seal the second gland will void the warranty.
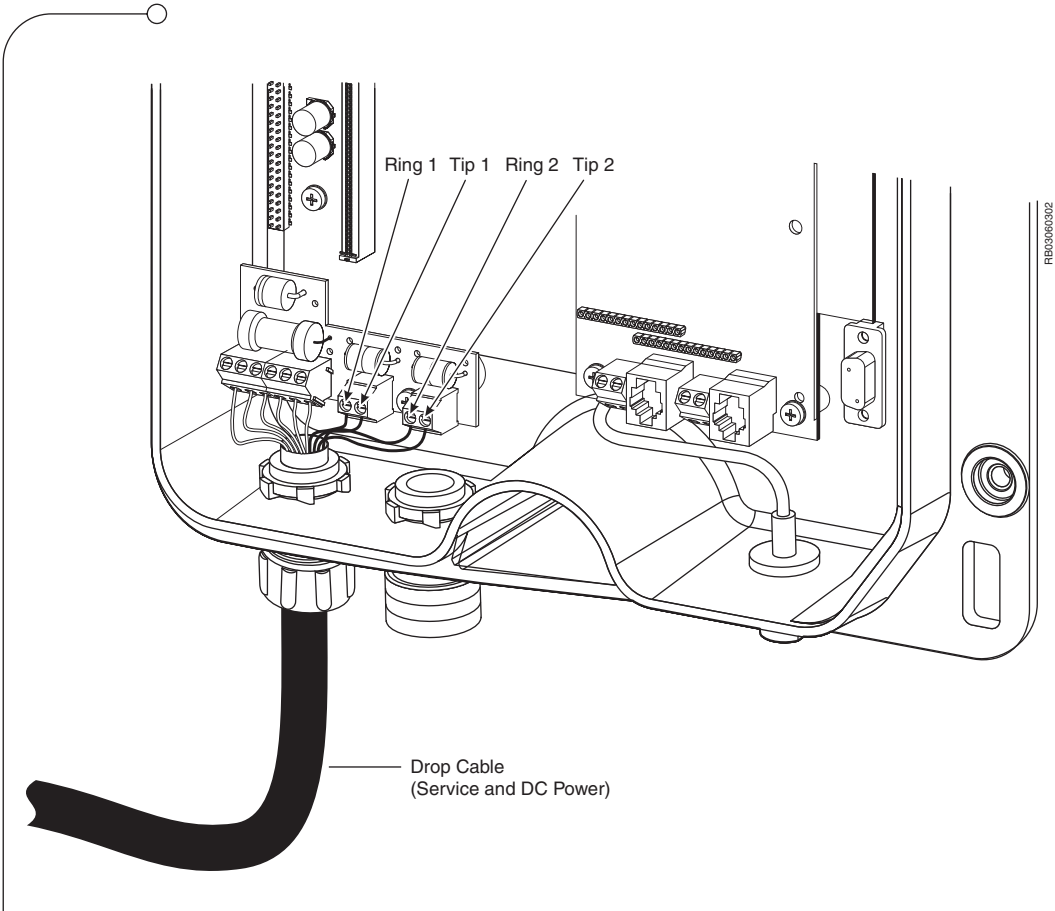
Figure 3.9   Subscriber Line Connections to the STS

3.2.3.3 Connecting the STS Antenna Cable

Before connecting the antenna cable to the STS, the RF Lightning Protection device must be installed on the STS. The RF Lightning Protection device protects the STS against surges of current that may occur due to lightning strikes.

Requirements:

Included with STS:	RF Lightning Protection
Ordered from SR Telecom:	N-Type Connectorized Coaxial Cable
Tools:	Utility knife, vulcanized tape and electrical tape

To connect the STS antenna cable

1. Connect the female N-type connector of the RF Lightning Protection device to the N-type connector located at the bottom of the STS, as shown in Figure 3.10 on page 43.

2. Connect the STS antenna cable to the RF Lightning Protection device.

3. Wrap the N-type connector first with vulcanized tape, then with electrical tape, to weatherproof the connection. Wrap the connector in the clockwise direction to tighten the connection
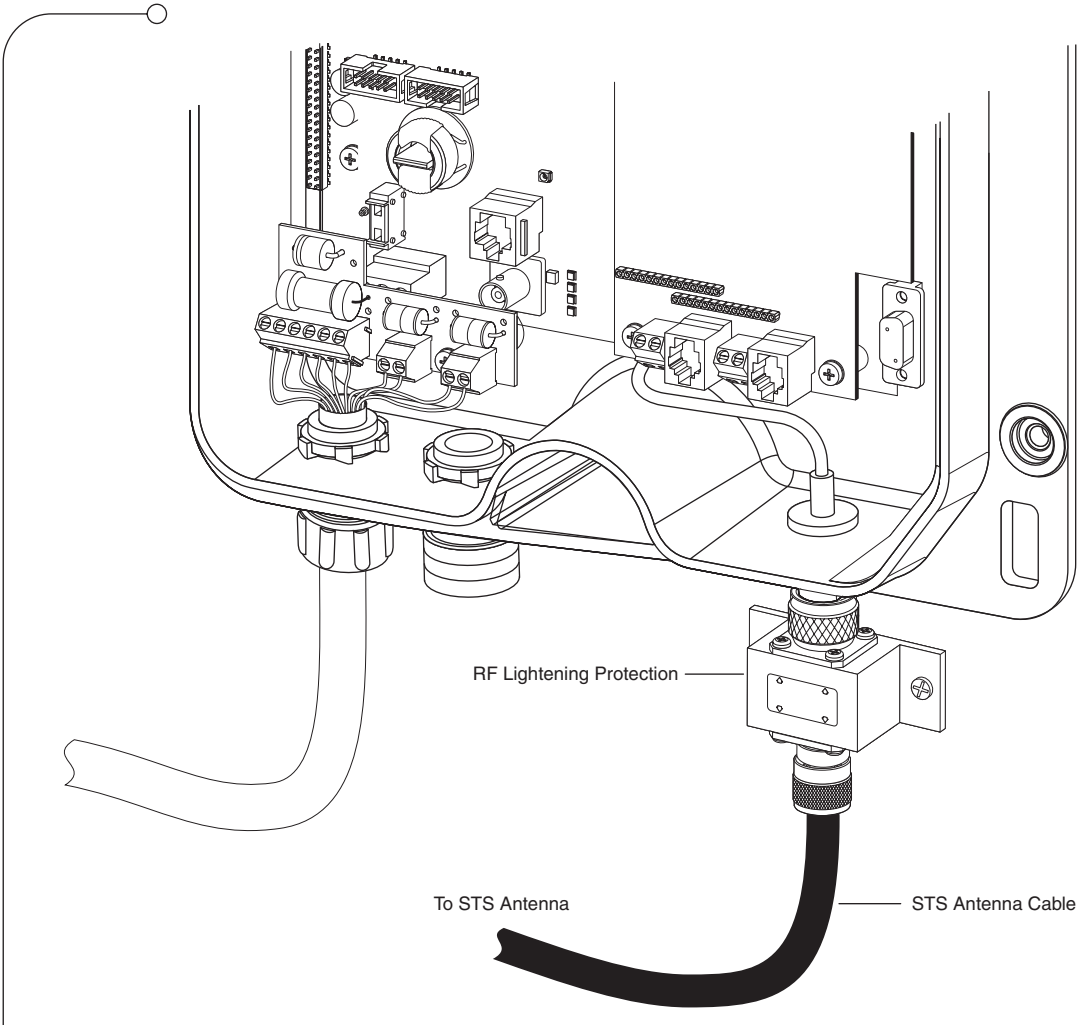
RB03060303

RF Lightening Protection

To STS Antenna   STS Antenna Cable

Figure 3.10   STS Antenna Cable Connection

3.2.4   Powering Up the STS

Make sure that all connections to the STS are correct and secure before powering up the STS.

Guidelines:

- Ensure that the power source meets the input voltage of the STS as listed in Section 2.3 "Site Requirements" on page 17.

To power on the STS

1. Install the STS fuse as shown in Figure 3.11 on page 45.

2. Power up the STS power source.

   ➤ To power up the STS Power Pack, refer to Section 3.3 "Installing the STS Power Pack" on page 48.

Fuse

PWR
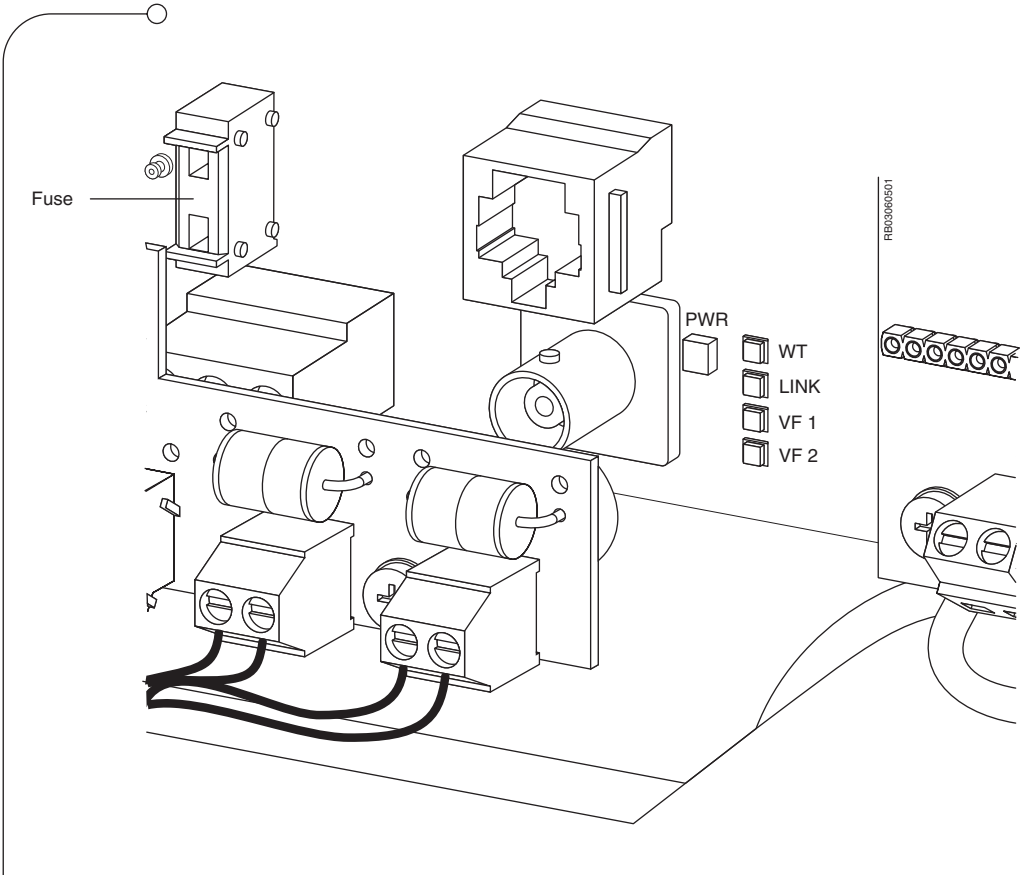WT
LINK
VF 1
VF 2

RB03060501

Figure 3.11   STS Fuse Location

3.2.5 Verifying the Status of the STS LED Indicators

After powering up the STS, verify that the STS LEDs indicate that the STS is operating normally.

To verify the status of the STS LEDs

▶ The STS LEDs are shown in Figure 3.12 on page 47 and their statuses are listed in Table 3.2.

Table 3.2   STS LED Status

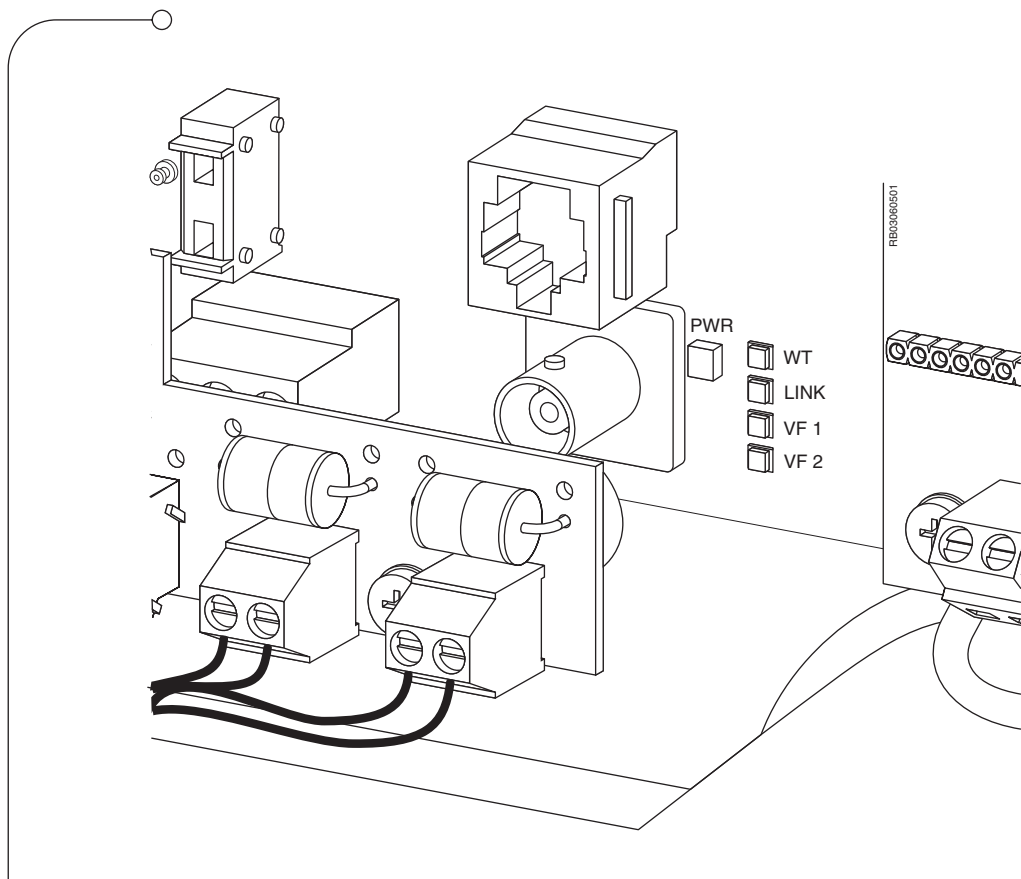| LED	State	Interpretation
PWR	Solid red[*]	STS is powered
	Off	STS is not powered or fuse is not installed
WT	Solid green[*]	STS is operating properly
	Flashing green	STS is starting-up (booting)
	Solid yellow	STS is in maintenance mode
	Off	STS is not powered
	Solid red	STS is experiencing an internal board failure
	Flashing Red	STS is experiencing an external failure or is in sleep mode
LINK	Solid red[*]	STS is not configured to link with the SBS
	Solid green	STS has established link with the SBS
	Flashing green	STS is attempting to established a link with the SBS
	Solid yellow	STS is in maintenance mode
	Off	STS is not powered or LED is defective
VF 1 and VF 2	Solid yellow[*]	Voice frequency (VF) line is in maintenance mode or channel is busy
	Off	VF line is on-hook
	Solid green	VF line is off-hook
	Solid red	VF line is in alarm
[*]Status on power up		

Figure 3.12   STS LEDs

3.3   Installing the STS Power Pack

The STS Power Pack converts 110 VAC to +24VDC and houses the batteries to provide backup power to the STS. This section describes the procedures for installing the STS Power Pack.

To install the STS Power Pack

1. Mount the STS Power Pack, as described in Section 3.3.1 on page 49.

2. Ground the STS Power Pack, as described in Section 3.3.2 on page 54.

3. Connect the STS power cables, as described in Section 3.3.3 on page 56.

4. Install the STS Backup Battery as described in Section 3.3.4 on page 64.

5. Power-up the STS Power Pack, as described in Section 3.3.5 on page 68.

6. Power-up the STS Power Pack, as described in Section 3.3.5 on page 68.

7. Verfying the status of the STS Power Pack LED Indicators, as described in Section 3.3.6 on page 70.

3.3.1 Mounting the STS Power Pack

The STS can be mounted on a metal pole, wooden pole or on a wall. The procedure to mount an STS Power Pack on a wall is identical to the wood pole mounting procedure. Since the STS Power Pack can be mounted on a variety of wall surfaces such as wood, brick, masonry or concrete, no special anchoring hardware is provided to mount the STS Power Pack on a wall. It is the responsibility of the customer to provide wall anchoring hardware.

The customer must also ensure that the mounting surface can support the weight of the STS Power Pack. The dimensions and weight of the STS Power Pack are listed in Table 3.3.

Table 3.3   STS Power Pack Dimensions

Dimensions	
Height	12 in. (30.5 cm)
Width	10 in. (25.4 cm)
Depth	8 in. (20.3 cm)
Weight	30 lb (15 kg)

3.3.1.1   Mounting the STS Power Pack on a Metal Pole

The STS Power Pack can be mounted on a 2 to 6 in. (5 to 15 cm) diameter metal pole using the U-Bolts provided with the STS Power Pack.

Requirements:

Included with STS Power Pack	U-Bolts including lock nuts and washers
Tools:	Ratchet wrench with 7/16" socket

Guidelines:

• Determine the location of the STS on the pole prior to mounting the unit, make sure that the STS Power Pack is within cable reach of the STS and its power source.

• If the STS Power Pack will be installed on the same pole as the STS; make sure that they are installed on opposite sides of pole to distribute the equipment weight evenly.

• Determine the type of U-Bolts required for your installation. The small U-Bolts are used for poles 2 to 3 in. (5 to 7.6 cm) in diameter and the larger U-Bolts are used tor poles 3 to 6 in. (7.6 to 15 cm) in diameter.

To mount the STS Power Pack on a metal pole

1. Insert the appropriate U-Bolts through the metal pole and the STS Power Pack, as shown in Figure 3.13 on page 51.

2. Secure the washers and lock nuts to the U-Bolts and tighten the lock nuts.

> Do not overtighten the lock nuts, over tightening may damage the STS Power Pack.
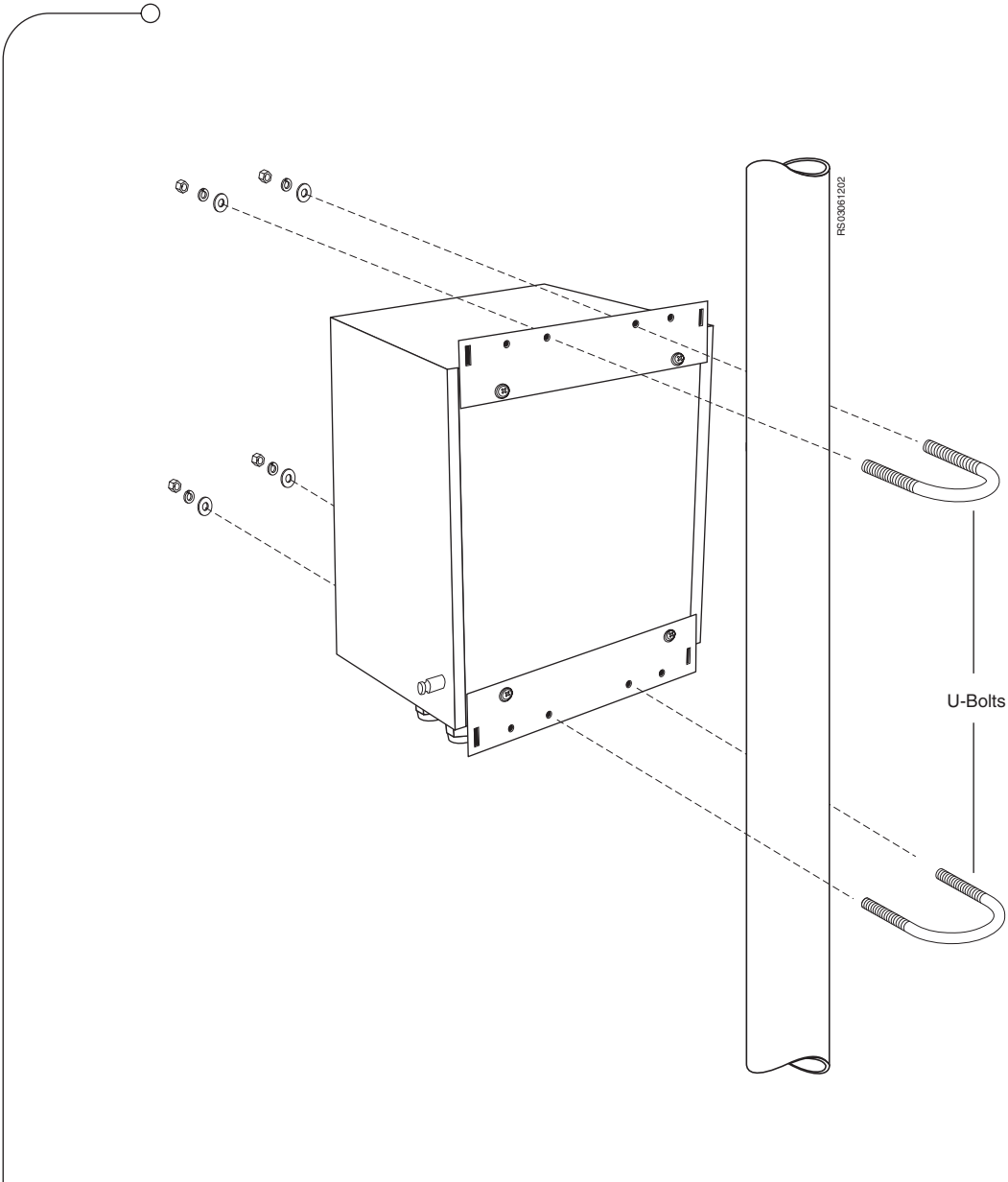
RS03061202

U-Bolts

Figure 3.13   Mounting the STS Power Pack on a Metal Pole

3.3.1.2 Mounting the STS Power Pack on a Wooden Pole or Wall

The STS Power Pack can be mounted on a wooden pole or wall using the four, 1/4" x 2" lag screws provided with the STS Power Pack. If you are installing the STS Power Pack on a wall, make sure that the wall surface can support the STS Power Pack. Special wall-anchoring hardware may be required.

Requirements:

Included with STS Power Pack:	Four, 1/4" x 2" lag screws, including flat washers
Tools:	Ratchet wrench with 7/16" socket, 3/16" drill bit and drill

Guidelines:

- Determine the location of the STS Power Pack on the pole prior to mounting the unit; make sure that the STS Power Pack mounting position is within cable reach of the STS and its power source.

- If the STS will be installed on the same pole as the STS Power Pack, make sure that they are installed on opposite sides of pole to distribute the equipment weight evenly.

To mount the STS Power Pack on a wooden pole or wall

1. Using the STS Power Pack as a template, mark the location of the mounting holes. Use the outer holes for poles greater than 3 in. (7.6 cm) in diameter.

2. Drill holes (top and bottom) using a 3/16" drill bit. If you are installing the STS Power Pack on a wall, follow the installation instructions included with the wall anchoring hardware.

3. Install the STS Power Pack on the pole or wall and secure it in place using the four lag screws, as shown in Figure 3.14 on page 53.

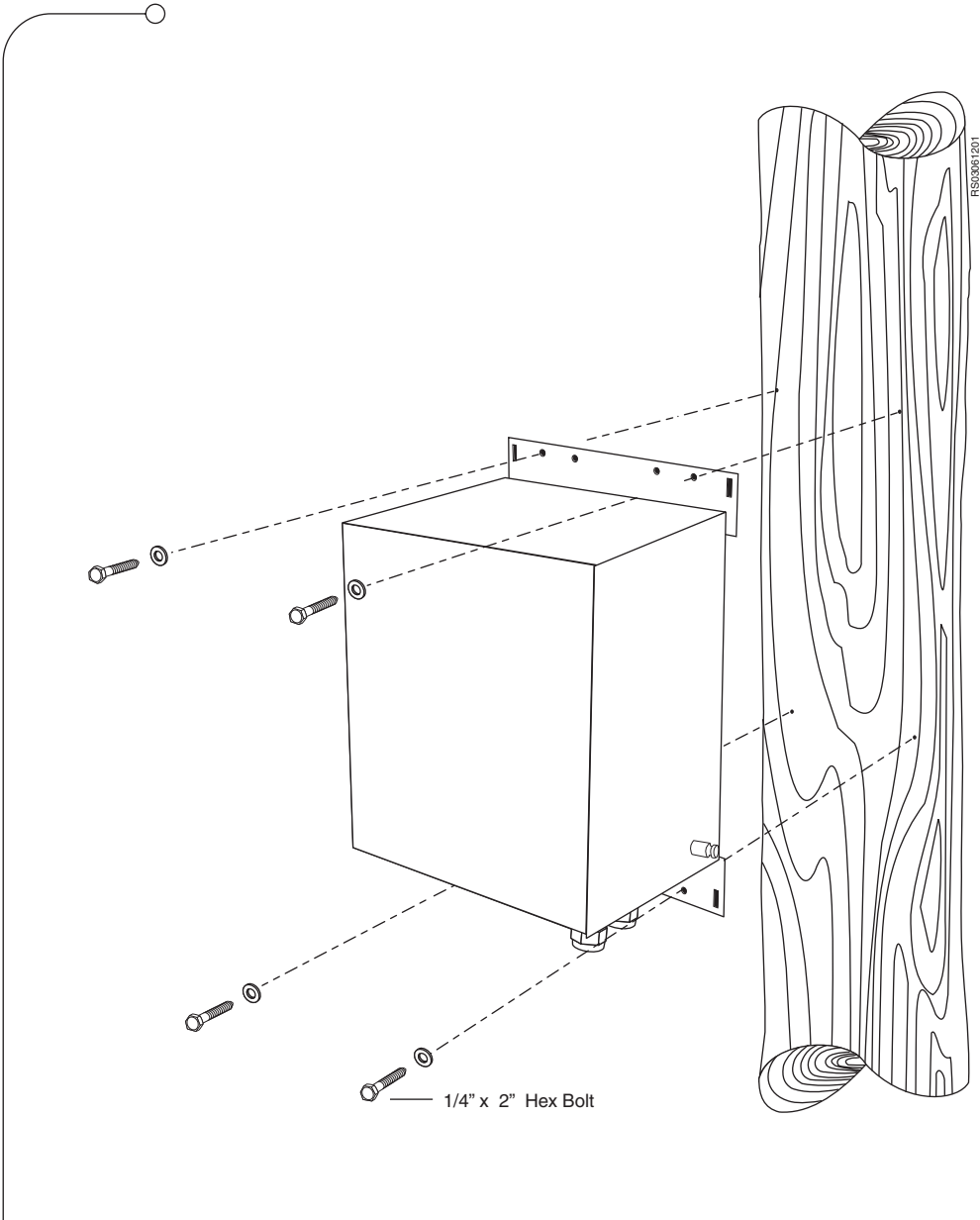Do not overtighten the lag screws, over tightening may damage the STS Power Pack.

RS03061201

1/4" x 2" Hex Bolt

Figure 3.14   Mounting the STS Power Pack on a Wooden Pole (or Wall)

3.3.2   Grounding the STS Power Pack

Grounding the STS Power Pack helps prevent serious injury to service personnel and avoids damage to the equipment. The STS Power Pack ground stud is located inside the unit.

Requirements:

Included with STS Power Pack	AC power cord (10 ft. or 3 m)
Tools:	#2 Phillips screwdriver, ratchet wrench with 3/8" socket

Make sure that the power switch on the STS Power Pack is set to off (down position), before making any wire connections.

To ground the STS Power Pack

1. Remove the cover of the STS Power Pack by loosening the two screws on the left and right sides of the cabinet and lifting the cover straight up.

2. Insert the power wires (black and white) and the ground wire (green) of the AC power cord through either cable entry gland as shown in Figure 3.15 on page 55.

3. Connect the green ground wire to ground stud of the STS Power Pack.
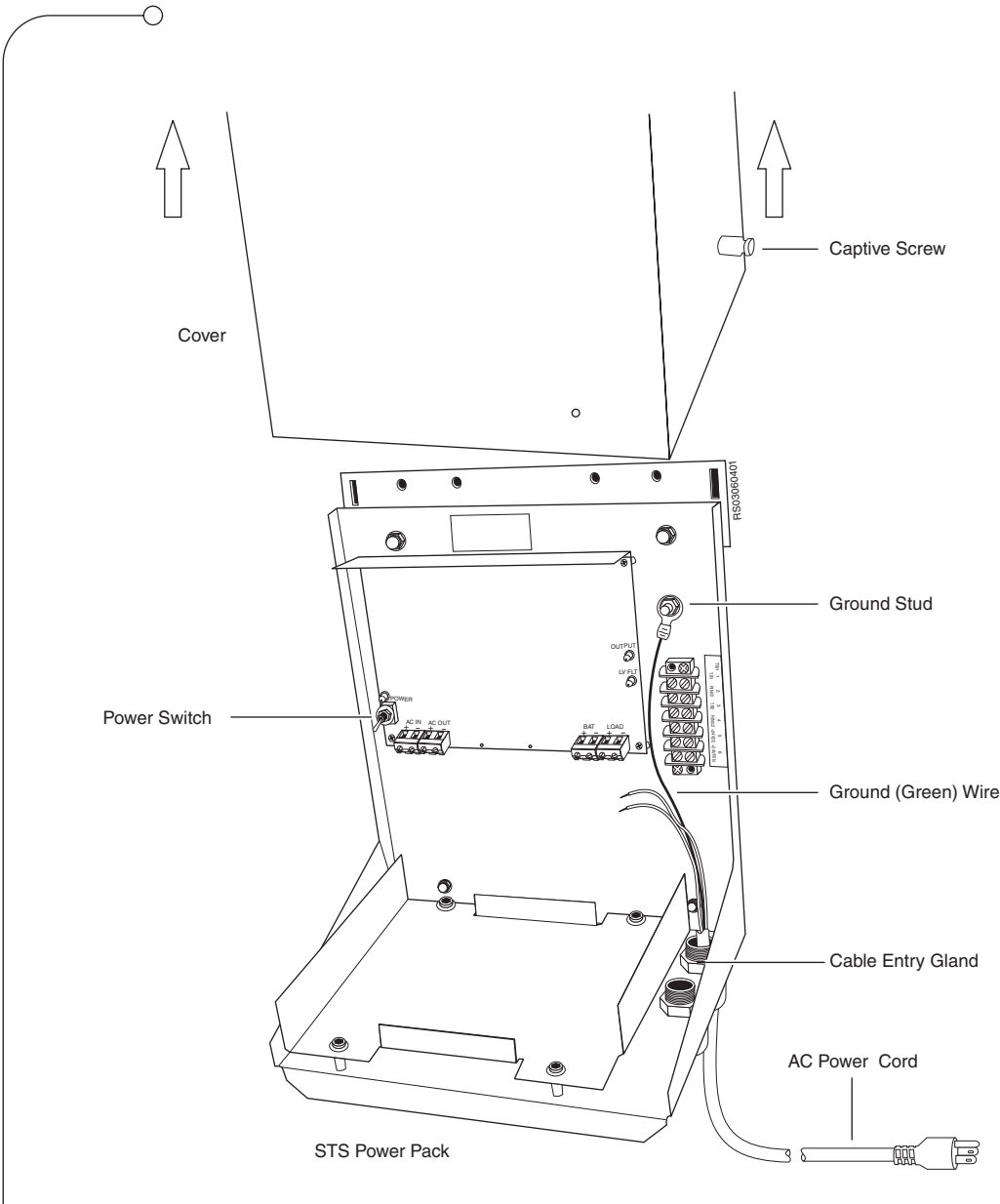
Captive Screw

Cover

Ground Stud

OUTPUT

LV FLT

Power Switch

POWER

AC IN   AC OUT

BAT   LOAD

RS03060401

Ground (Green) Wire

Cable Entry Gland

AC Power Cord

STS Power Pack

Figure 3.15   STS Power Pack Ground Connection

55

3.3.3 Connecting the STS Power Pack Cables

All input and output cable connections are made on the terminal blocks located inside the STS Power Pack. These terminal blocks can accept upto 14 AWG wire.

Cable access to the terminal blocks is through two locking cable entry glands located at the bottom right of the STS Power Pack. After passing all cables through the glands, make sure the glands are tightened fully to lock the cables in place and protect the STS Power Pack from the environment.

3.3.3.1 Connecting AC Power to the STS Power Pack

The AC power cord provided with the STS Power Pack is used to connect the STS Power Pack to an 110 VAC power source.

Requirements:

Included with STS Power Pack:	AC power cord (10 ft. or 3 m)
Tools:	Small flat-blade screwdriver

⚠ Make sure that the power switch on the STS Power Pack is set to off (down position), before making any wire connections.

To connect AC Power to the STS Power Pack

1. Connect the live (black) wire from the AC power cord to TB1-1 on terminal block AC IN.

2. Connect the neutral (white) wire from the AC power cord to TB1-2 on terminal block AC IN.
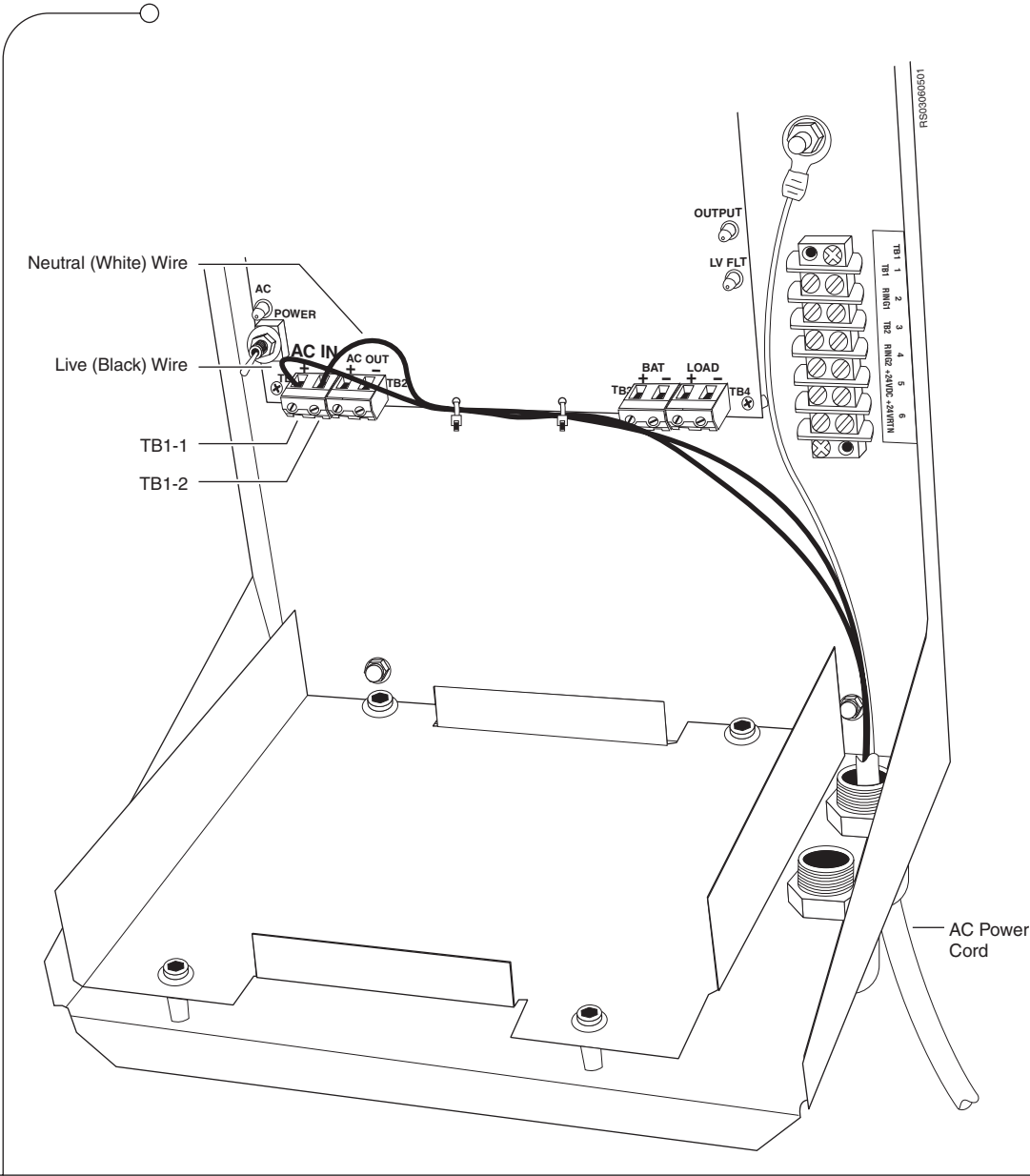
Neutral (White) Wire

Live (Black) Wire

TB1-1

TB1-2

AC
POWER

AC IN   AC OUT

OUTPUT

LV FLT

BAT   LOAD

AC Power
Cord

Figure 3.16   STS Power Pack AC Power Connection

3.3.3.2   Connecting the Power Wires From the STS to STS Power Pack

This connection enables the STS Power Pack to supply +24VDC to the STS. The power wires from the STS may be located on the drop cable that includes the service wires or the power wires may be on a separate cable.

Requirements:

Customer Provided:	Drop cable
Tools:	Small flat-blade screwdriver

⚠ Make sure that the power switch on the STS Power Pack is set to off (down position), before making any wire connections.

To connect power wires from the STS to the STS Power Pack

1. Insert the drop cable through one of the glands located at the bottom of the STS Power Pack as shown in Figure 3.17 on page 59.

2. Connect the positive wires from the STS to TB4-1 on terminal block LOAD.

3. Connect the negative wires from the STS to TB4-2 on terminal block LOAD.

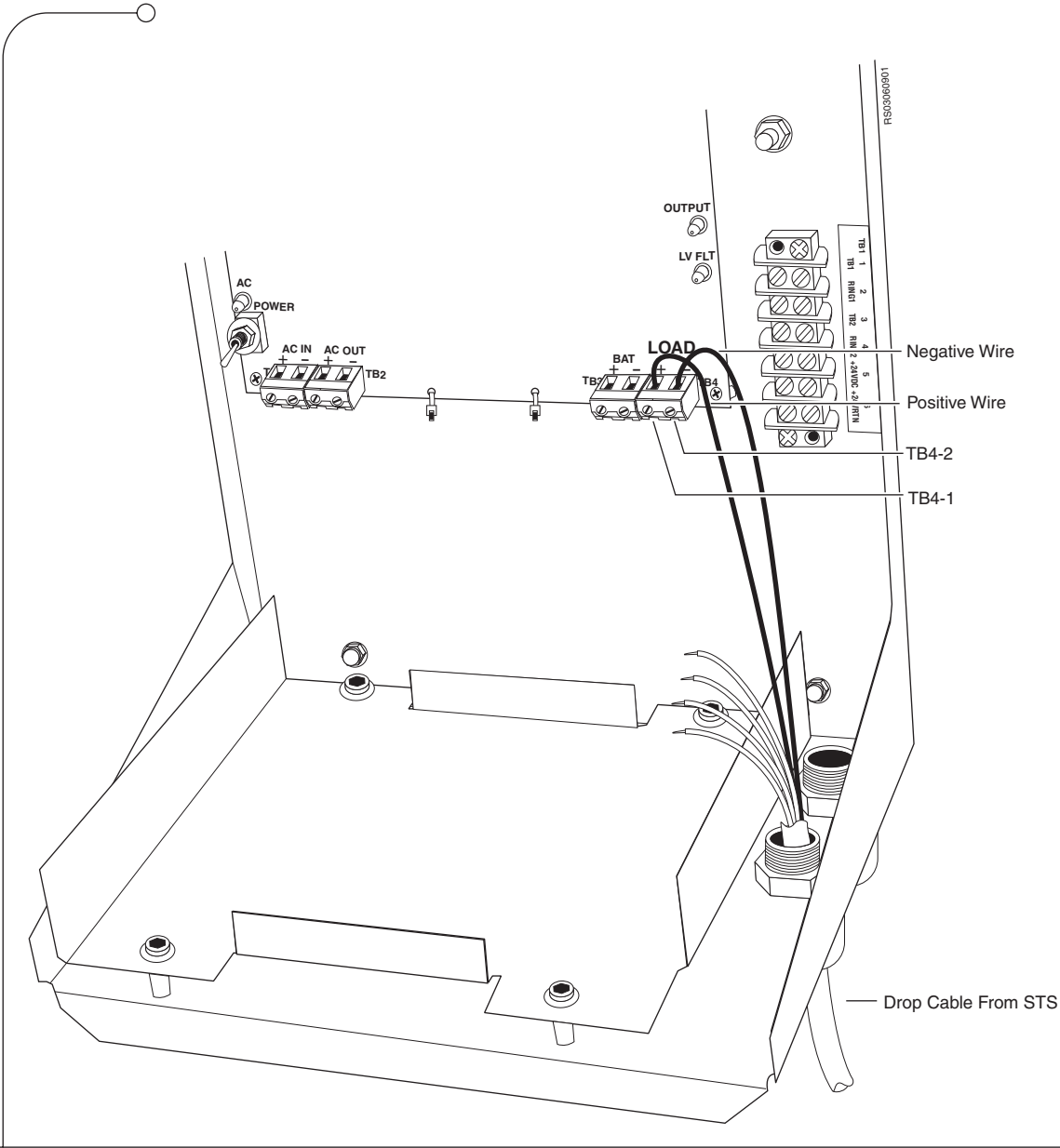⚠ Ensure that correct polarity is observed when making power connection from the STS to the STS Power Pack.

Figure 3.17   Power Connection from the STS Power Pack to the STS

3.3.3.3   Connecting the Subscriber Lines to the STS Power Pack

The STS Power Pack supports two, 2-wire subscriber lines. Each subscriber line consists of a Tip wire and a Ring wire. The subscriber line wires may be located on the drop cable that includes the DC power wires or on a separate cable.

Requirements:

Customer Provided:	Drop cable
Tools:	Small flat-blade screwdriver, wire cutter/stripper

> ⚠ Make sure that the power switch on the STS Power Pack is set to off (down position), before making any wire connections.

⚡ **To connect the subscriber lines to the STS Power Pack**

1. Connect the first subscriber line on the drop cable to the Tip 1 and Ring 1 connectors on TB1 as shown in Figure 3.15 on page 55.

2. Connect the second subscriber line on the drop cable to the Tip 2 and Ring 2 connectors on TB1 (if required).
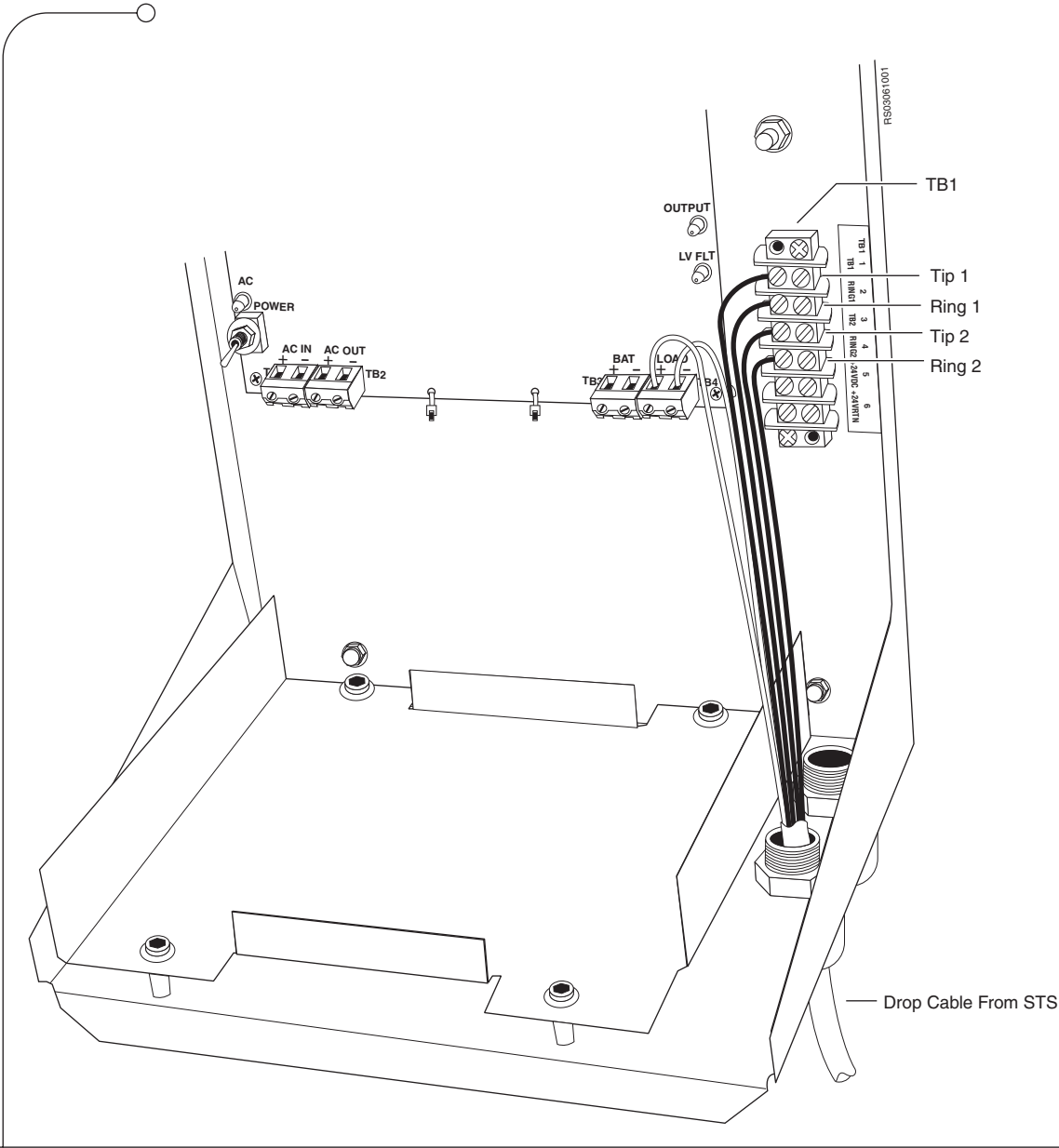
TB1

OUTPUT

LV FLT

Tip 1

Ring 1

Tip 2

Ring 2

AC

POWER

AC IN   AC OUT

TB2

BAT

LOAD

TB3

TB4

Drop Cable From STS

Figure 3.18   Subscriber Line Connections to the STS Power Pack

3.3.3.4   Connecting the Subscriber Lines to the Line Termination Block

After the subscriber lines are connected to the STS Power Pack, they must be connected to the subscriber's line termination block (LTB).

Requirements:

Customer Provided:	Service drop jumper cable
Tools:	Small flat-blade screwdriver, wire cutter/stripper

> ⚠ Make sure that the power switch on the STS Power Pack is set to off (down position), before making any wire connections.

To connect the subscriber lines to the LTB

1. Insert the service drop jumper cable through either cable entry glands of the STS Power Pack as shown in Figure 3.17 on page 59.

2. Connect Tip 1 and Ring 1 on TB1 to line 1 on the subscriber's LTB as shown in Figure 3.19 on page 63.

3. Connect Tip 2 and Ring 2 on TB1 to line 2 on the subscriber's LTB (if required).

4. Tighten the two cable entry glands to lock the cables in place.

5. Wrap the cable entry glands first with vulcanized tape, then with electrical tape, to weatherproof the connection. Make sure to wrap the cable entry glands in the clockwise direction to tighten the connection.
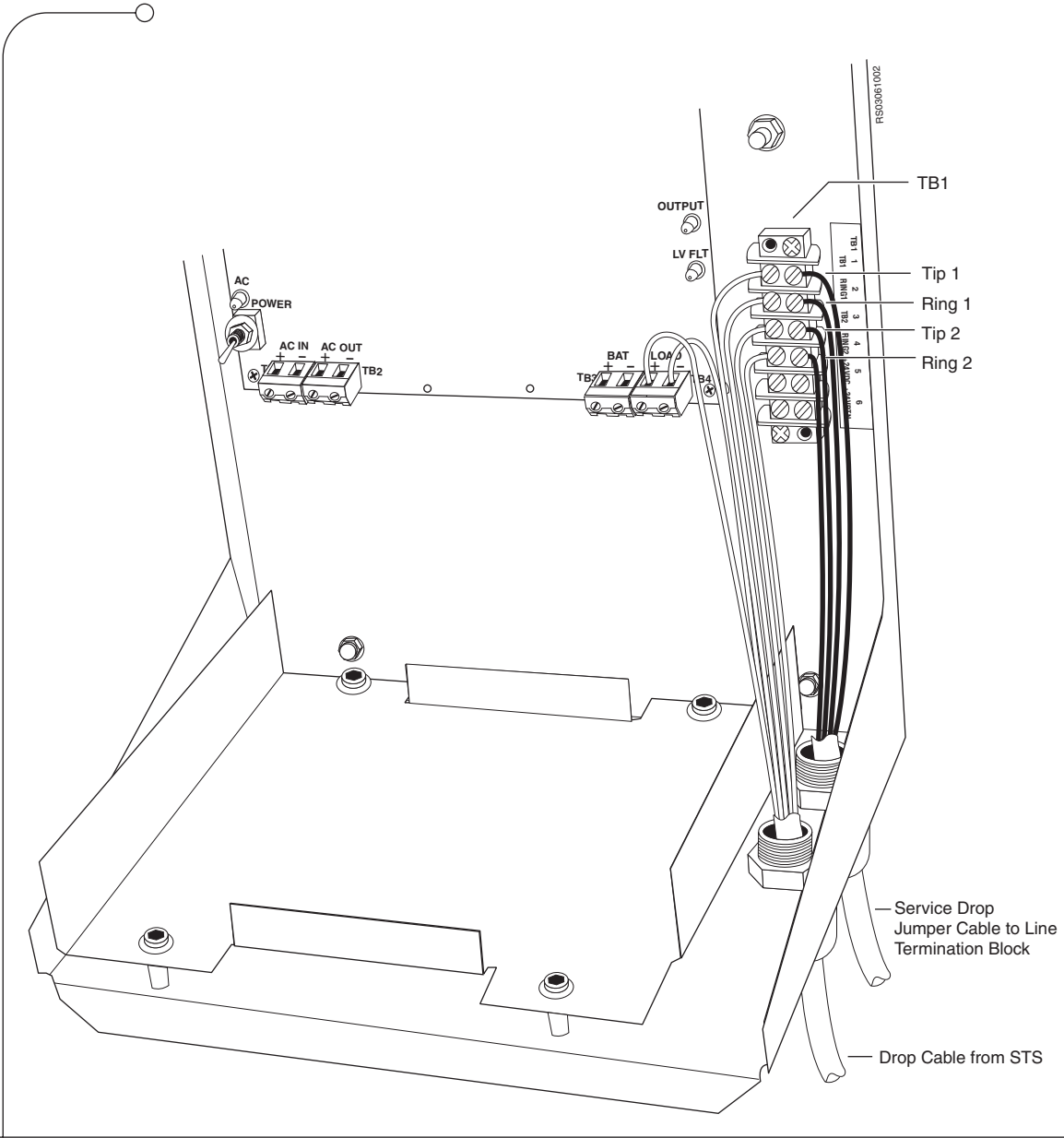
Figure 3.19   Subscriber Lines Connections to the Line Termination Block

3.3.4 Installing the STS Backup Battery

Before installing the STS Backup Battery make sure that the battery has been charged within its typical storage life time period as specified in Table 3.4. If it has not been charged, check the battery's voltage and, if required, top charge the battery.

Table 3.4   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 marketing notice, *Maintaining SR Telecom Supplied Batteries*, 033-100331-001.

3.3.4.1 Checking and Charging the STS Backup Battery

Verify the voltage of the battery with no load connected across the terminals. If the battery's voltage is 12 VDC or less, discard the battery. If the battery's voltage is greater than 12 VDC, top charge the battery using the following instructions.

Requirements:

Tools:	Digital voltmeter and adjustable power supply

Guidelines:

- Always use an adjustable power supply to top charge the battery; SR Telecom equipment must not be used to top charge the battery

- 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 discarded battery with the same or equivalent type

To charge the STS Backup Battery

1. Top charge one battery at a time according to Table 3.5.

> If the battery's casing becomes too hot to touch while the battery is being charged, reduce the current and 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. Check the battery's voltage. It should be at least 12.9 VDC, if it is less than 12.9 VDC discard the battery.

4. Update the battery's maintenance log.

Table 3.5   Top Charging Guidelines

Date Since Last Top Charge	Top Charging Recommendations
Within the first half of storage life	4 to 6 hours at constant current of 0.1 CA (current rate in amperes) • Set charge rate to 1.2 A (12 Ah X 0.1 CA = 1.2 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 1.2 A (12 Ah X 0.1 CA = 1.2 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

3.3.4.2   Connecting the STS Backup Battery to the STS Power Pack

STS Power Pack is offered with an optional battery warmer. If your STS Power Pack is equipped with a battery warmer, you will need to wrap the battery warmer around the battery and connect it to the STS Power Pack.

Requirements:

Purchased from SR Telecom:	STS Backup Battery
Tools:	Small flat-blade screwdriver

⚠ Make sure that the power switch on the STS Power Pack is set to off (down position), before making any wire connections.

After connecting the STS Backup Battery make sure to power up the STS Power Pack, refer to Section 3.2.4 on page 44. Failure to power up the STS Power Pack may drain the battery.

To connect the STS Backup Battery to the STS Power Pack

1. Connect the positive (red) wire from the battery to TB3-1 on terminal block BAT as shown in Figure 3.20 on page 67.

2. Connect the negative (black) wire from the battery to TB3-2 on terminal block BAT.

To connect the battery warmer

1. Connect the positive wire from the battery warmer to TB2-1 on terminal block AC OUT.

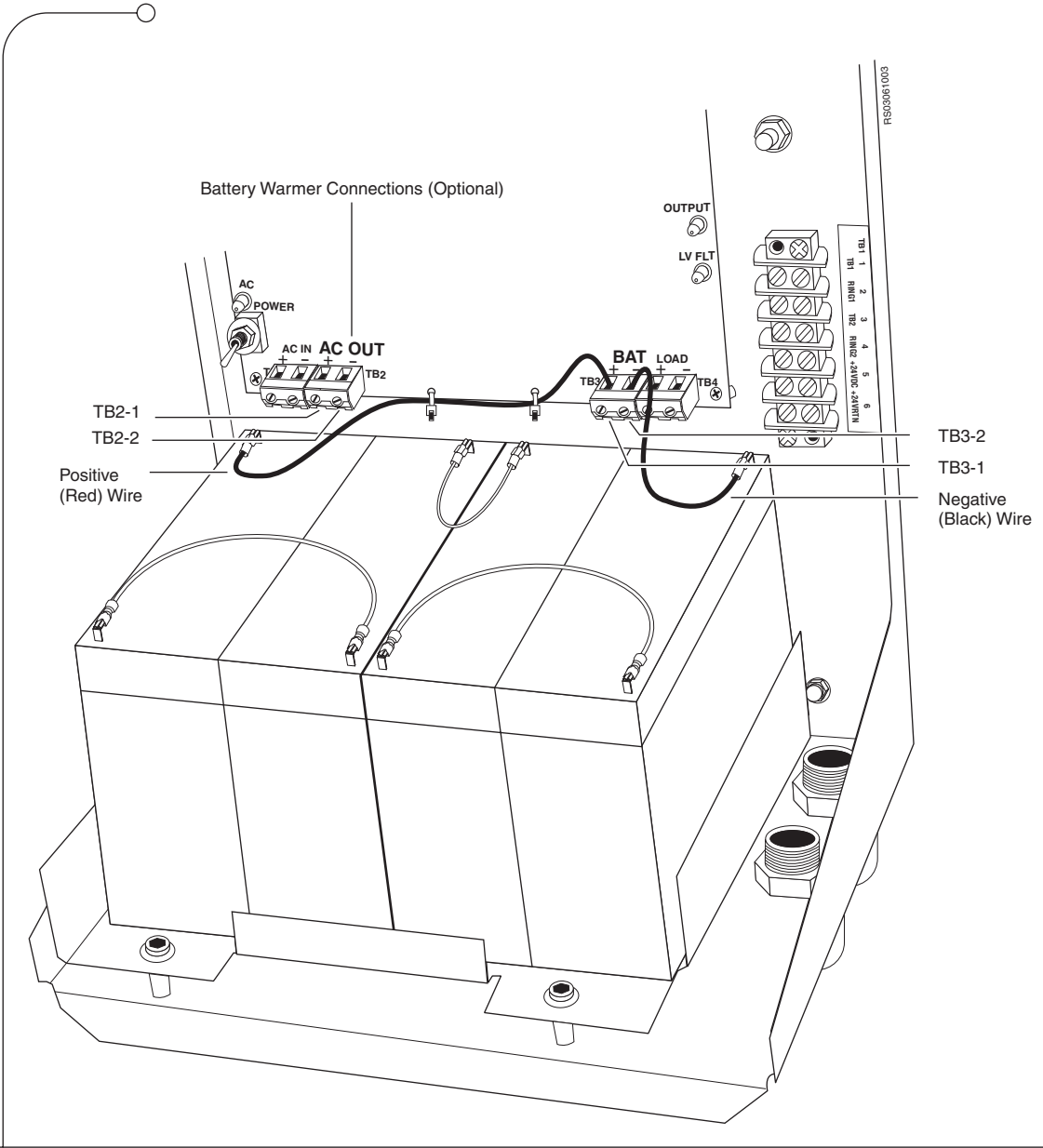2. Connect the negative wire from the battery warmer to TB2-2 on terminal block AC OUT.

Figure 3.20   STS Power Pack Battery Connection

3.3.5 Powering Up the STS Power Pack

Make sure that all connections are correct and secure before powering up the STS Power Pack.

Guideline:

- Ensure that the power source meets the input voltage of the STS Power Pack, refer to Section 2.3 "Site Requirements" on page 17.

To power up the STS Power Pack

1. Connect the STS Power Pack AC power cord to a 110 VAC grounded AC outlet. as shown in Figure 3.21 on page 69.

2. Set the STS Power Pack power switch to the up position.

Power LED

Power Switch

OUTPUT LED

LV FLT LED

110 VAC Outlet

AC Power Cord

Figure 3.21   STS Power Pack AC Power Cord Connection

3.3.6   Verifying the Status of the STS Power Pack LED Indicators

After powering up the STS Power Pack, verify that the STS Power Pack LEDs indicate that the STS Power Pack is operating normally.

To verify the STS Power Pack LEDs

➤ The STS Power Pack LEDs are shown in Figure 3.22 on page 71 and the LED states are listed in Table 3.6.

Table 3.6   STS Power Pack LEDs

LED	State	Interpretation
AC	On* (green)	The STS Power Pack is receiving the correct input voltage.
	Off	The STS Power Pack is not receiving the correct input voltage.
OUTPUT	On* (green)	The STS Power is outputting the required voltage.
	Off	The STS Power Pack is not outputting the required voltage.
LV FLT	On* (red)	The battery is discharged and its voltage is too low (below 22 VDC), or the STS has been disconnected from the battery.
	Off	The low voltage disconnect is not active .
*Status on power up		

OUTPUT LED

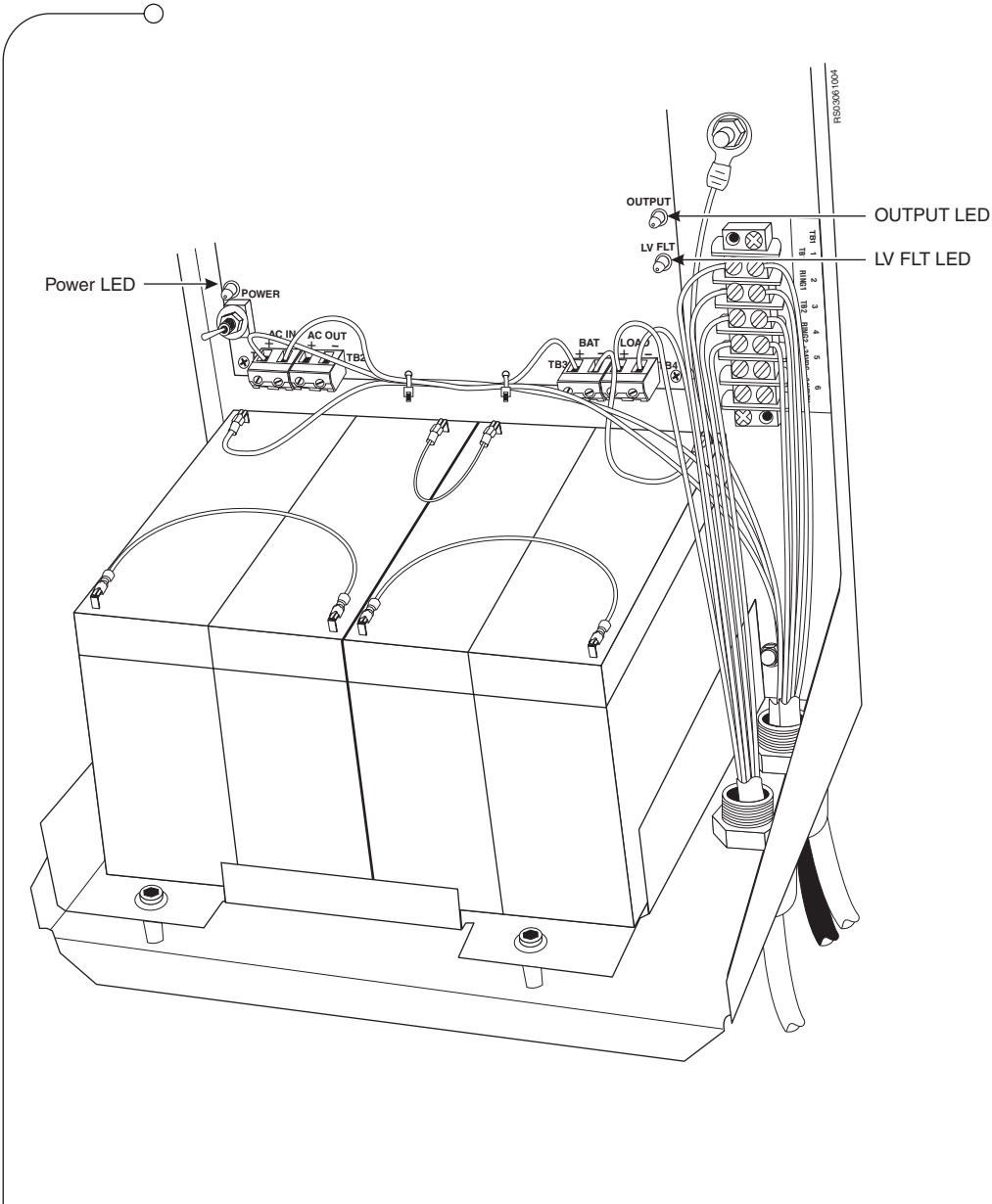LV FLT LED

Power LED

Figure 3.22   STS Power Pack LEDs

3.4   Configuring the STS

Before the STS can establish a radio link to the SBS, the following parameters must be configured:
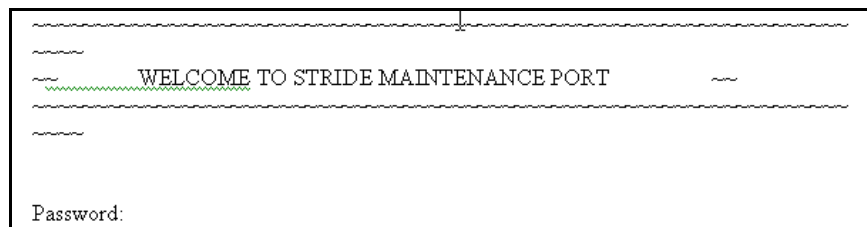
- Frequency channel that the STS will use to communicate with the SBS

- Distance that the STS is from the SBS

- IP address that was assigned to the STS

Requirements:

Customer provided	Laptop computer running HyperTerminal or similar terminal emulation software, RS-232-C serial cable with a male DB9 connector

To initially configure the STS

1. Connect the serial cable between the laptop and the DB9 connector on the STS as shown in Figure 3.23 on page 75.

2. Start a HyperTerminal session using the following communication settings:

    - Bits per second: 9600

    - Data bits: 8

    - Parity: None

    - Stop bit: 1

    - Flow control: None

3. Enter the password **SRT**, to access the Stride Maintenance Port software.

```
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
~~~~
~~         WELCOME TO STRIDE MAINTENANCE PORT              ~~
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
~~~~

Password:
```

4. Wait ten seconds for the Station Management Menu to appear, then type **getprov** to list the default initial STS configuration.

```
Station Management Menu >
getprov
Station Management Menu >
     Guard Symbols = 11
     PN Code = 7
     RF Channel = 12
     Pilot RW Code = 2
     Distance = 0.8km
     IP Address = 172.17.16.1
     IP Subnet Mask = 255.255.0.0
```

5. Use the **setprov** command to change the values of the RF Channel and the Distance parameters to reflect the STS's requirements. It may also be necessary to change the IP address of the STS.

    ► Type **setprov rfchannel x**, where x is the code assigned to the frequency channel as list in Table 3.7 on page 74.

    ► Type **setprov wtdist y**, where y is the distance (in 100 meters) between the STS and SBS. For example, y= 8 means 800 m (0.8 km).

```
setprov rfchannel 12
Station Management Menu >Rf Channel successfully set to 12

setprov wtdist 8
Station Management Menu >WT Distance successfully set to 0.8km
```

6. Use the reset command to save the new configuration.

    ► Type **reset**.

```
reset
Station Management Menu > Orderly Shutdown Mode
```

Table 3.7   RF Channel Frequency Codes

Channel	Frequency		Channel	Frequency
0	2.4030		12	2.4450
1	2.4065		13	2.4485
2	2.4100		14	2.4520
3	2.4135		15	2.4555
4	2.4170		16	2.4590
5	2.4205		17	2.4625
6	2.4240		18	2.4660
7	2.4275		19	2.4695
8	2.4310		20	2.4730
9	2.4345		21	2.4765
10	2.4380		22	2.4800
11	2.4415			

RS03070301

DB9 Connector

Figure 3.23   Labtop to STS Connection

3.5   Aligning the STS Antenna

Aligning the STS antenna toward the SBS antenna enables the STS to receive a strong signal from the SBS.

Requirements:

Customer provided	Laptop computer running HyperTerminal or similar terminal emulation software, serial cable with a male DB9 connector, digital voltmeter, coaxial cable with a BNC connector, compass or binoculars

Guidelines:

- The alignment of the antenna is a two-person task. One person is required to aim the antenna and the second person will monitor the voltmeter connected to the STS to determine the maximum receive level signal.

To align the STS Antenna

1. Connect the coaxial cable between the voltmeter and the BNC connector on the STS.

2. Connect the serial cable between the laptop and the DB9 connector on the STS.

3. Start a HyperTerminal session using the following communication settings:

   - Bits per second: 9600
   - Data bits: 8
   - Parity: None
   - Stop bit: 1
   - Flow control: None

4. Enter the password **SRT**, to access the Stride Maintenance Port software.

5. Type **manual** within the 10 seconds time limit to access the Manual Test Mode.

6. Type **airlink** to access the Air Link submenu.

```
Main Menu >airlink
Air Link Menu >
```

7. Start the antenna alignment configuration process using the RF channel and distance specified in the initial configuration of the STS, refer to Section 3.4 "Configuring the STS" on page 72.

    ▶ Type **alignantenna x y**, where x is the RF channel entered in the initial configuration and y is the distance.

```
Air Link Menu >alignantenna 15 10
Air Link Menu >H?/;H?/;H?/;H?/;
```

8. Use binoculars or a compass to determine the line-off-sight direction to the SBS antenna, then point the STS antenna in this direction.

9. Pan the antenna horizontally and vertically until you receive the highest voltage reading on the digital voltmeter

10. Return to the Main menu to save the new settings.

    ▶ Type **main** to access to the Main Menu.

    ▶ At the Main Menu prompt, type **stationmgmt**.

    ▶ Type **reset** to save the new antenna alignment process values.

```
Main Menu >stationmgmt
Station Management Menu >Station Management menu:
reset      |
        Exit Maintenance Mode and Reset the Wireless Terminal
```

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Chapter 4   Your Next Step

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

STRIDE2400 Access Network Roadmap

① **PLAN**

PRODUCT OVERVIEW
033-100567-001

SYSTEM PLANNING
033-100568-001

② **SET UP**

ACCESS NETWORK SETUP GUIDE
033-100566-001

TERMINAL STATION SETUP GUIDE
033-100569-001

PROCEDURES GUIDE
033-100570-001

③ **MANAGE**

OPERATIONS GUIDE
033-100571-001

MIB REFERENCE
033-100572-001

R00303032702

You have just completed this phase

SR⦀Telecom

STRIDE2400 Terminal Station Setup Guide

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