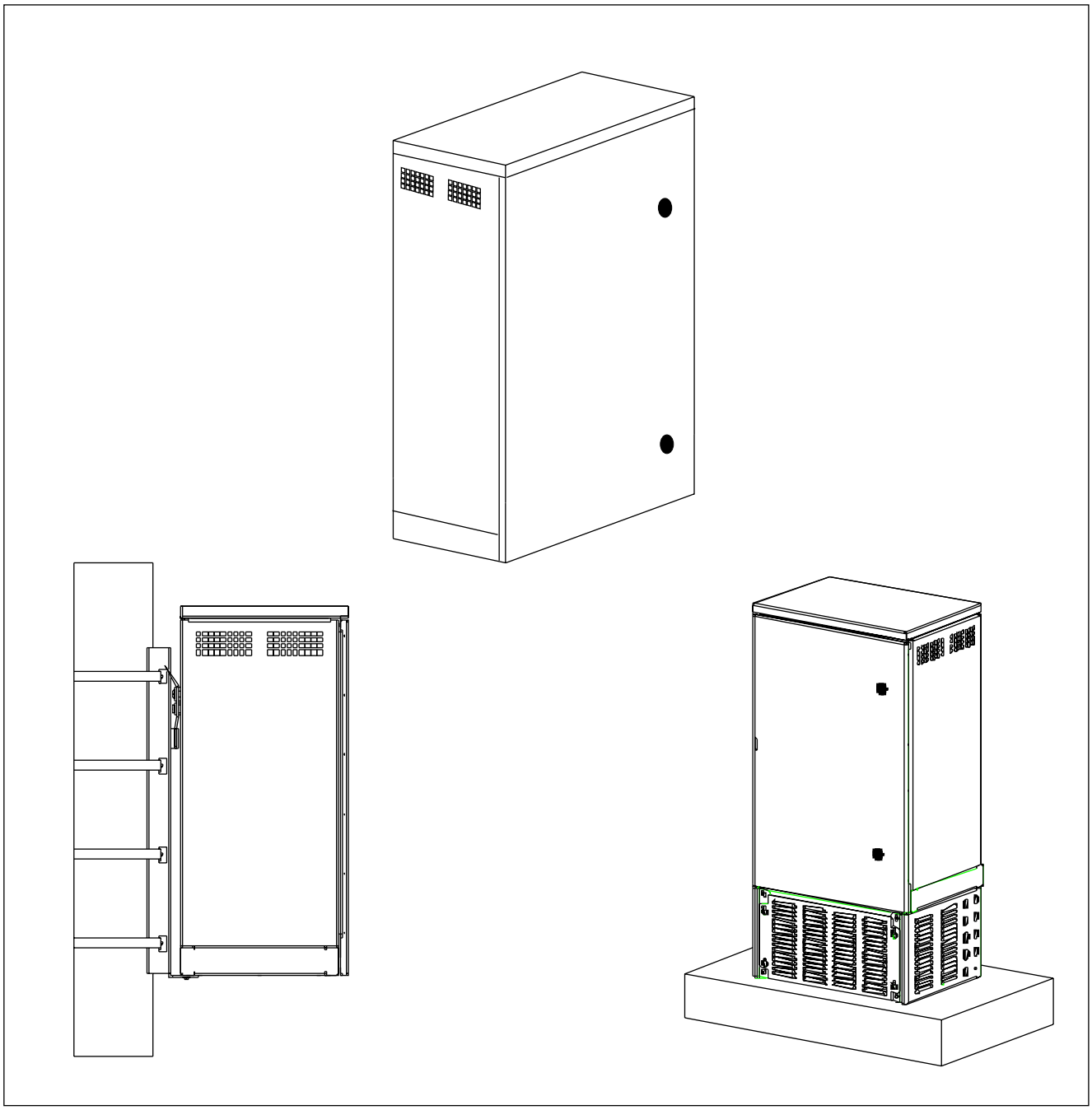
RBS 884 Micro (1900 MHz) Installation and Hardware Replacement Manual



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The contents of this document are subject to revision without notice due to continued progress in methodology, design, and manufacturing.

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This part describes the information contained in the manual and the conventions used in its presentation.

1 Revision Information

This is the first issue of the Installation and Hardware Replacement Manual (IHRM) for Radio Base Station (RBS) 884 Micro (1900 MHz).

2 About This Manual

This manual contains information required to install, troubleshoot, and maintain the RBS 884 Micro (1900 MHz) system.

This manual is intended for RBS site installation and site maintenance personnel.

Before this manual is used to perform any installation or maintenance activities at a radio base station site, the following actions must be completed:

- Telephone transmission facilities must be available and tested.
- AC and DC voltage must be available.
- The antenna system must be installed and tested.
- Grounding system must be available.

When the radio base station equipment is installed and tested using the information in this manual, it will remain powered up and ready for integration into the network by personnel at the Mobile Switching Center (MSC).

This manual is divided into the following parts:

- Part 1, Introduction – provides a description of the contents of the manual and how it can be used.
- Part 2, General Product Information – provides a general description of an unconfigured base station. Specific Radio Base Station (RBS) is provided in Part 3, Suystem Description.

- Part 3, System Description – provides a description of the RBS 884 Micro (1900 MHz) equipment hardware and the available configurations.
- Part 4, Installation – provides procedures for the installation and powering up the RBS 884 Micro (1900 MHz) system.
- Part 5, Hardware Replacement – provides procedures for troubleshooting and replacement procedures for critical components of the RBS 884 Micro (1900 MHz) system.
- Part 6, Glossary of Terms – provides definitions of key terms used in the manual.
- Part 7, Acronyms and Abbreviations – provides expanded versions of all of the acronyms and abbreviations used in the manual.
- Appendix A, Document Overview – provides an overview of the existing customer manuals for RBS 884 products.
- Appendix B, User Feedback – provides information on ordering and trouble reporting for the RBS 884 customer manuals.
- Appendix C, Internal Cables – provides description of the internal, factory installed cables within each RBS cabinet.
- Appendix D, Conversion Table – provides table for translating SI units to American units.

Many of the procedures in this manual require site-specific data from the *Site Installation Documentation* relating to the particular radio base station site. Additional information is available in the *RBS 884 Site Engineering Manual*.

The procedures in the manual are intended to be performed in the order presented.

3 Conventions Used in this Manual

The first time an acronym or abbreviation appears in this manual, the expanded form is shown, followed by the acronym or abbreviation in parentheses, for example, Mobile Switching Center (MSC).

The abbreviated form is shown without parentheses when the expanded form is not used.

A list of acronyms and abbreviations can be found in Part 8.

Names of documents are referred to in italic typeface, for example, *Site Installation Documentation*.

General Product Information

1 Introduction

The *General Product Information* provides general information on unconfigured radio base stations. See *RBS 884 Site Engineering Manual* for descriptions of the available working base station configurations and for information on RBS interfaces (for instance, power, transmission, and antennas).

2 Features

The RBS 884 Series is a series of products in the CMS 8800 family. The products in the RBS 884 Series are fully featured modular radio base stations for both the analog AMPS EIA 553 and the digital D-AMPS EIA IS 136 systems (Advanced Mobile Phone System Electronics Industry Association 553 system and Digital American Mobile Phone System Electronics Industry Association Interim Standard 136 system).

A base station in the RBS 884 Series can support one, two, or three cells. A cell is a defined area covered by one antenna system, and each cell has one control channel for digital or one for analog, or both. There is one cell at an omni site, and one to three cells at a sectorized site.

The RBS 884 Series utilizes multi-mode, multi-functional transceivers (TRXs). The same hardware TRX module can be used for analog and digital voice, control and monitoring purposes.

The hot repair capability allows replacement of defective units when power is still applied.

The RBS 884 Series is designed for remote control monitoring allowing control and fine tuning of all functions and parameters, such as power output, frequencies, and switching of redundant units from the Mobile Switching Center (MSC).

A Radio Frequency Test Loop (RFTL) is an optional feature that enables precise output power settings, Voltage Standing Wave Ratio (VSWR) alarm, and Receive Signal Strength Indicator (RSSI) test measurements.

The device software is stored in non-volatile memory within the RBS, and the control part software is downloaded from the MSC, which ensures a short time to service at power-up.

3 Product Lines

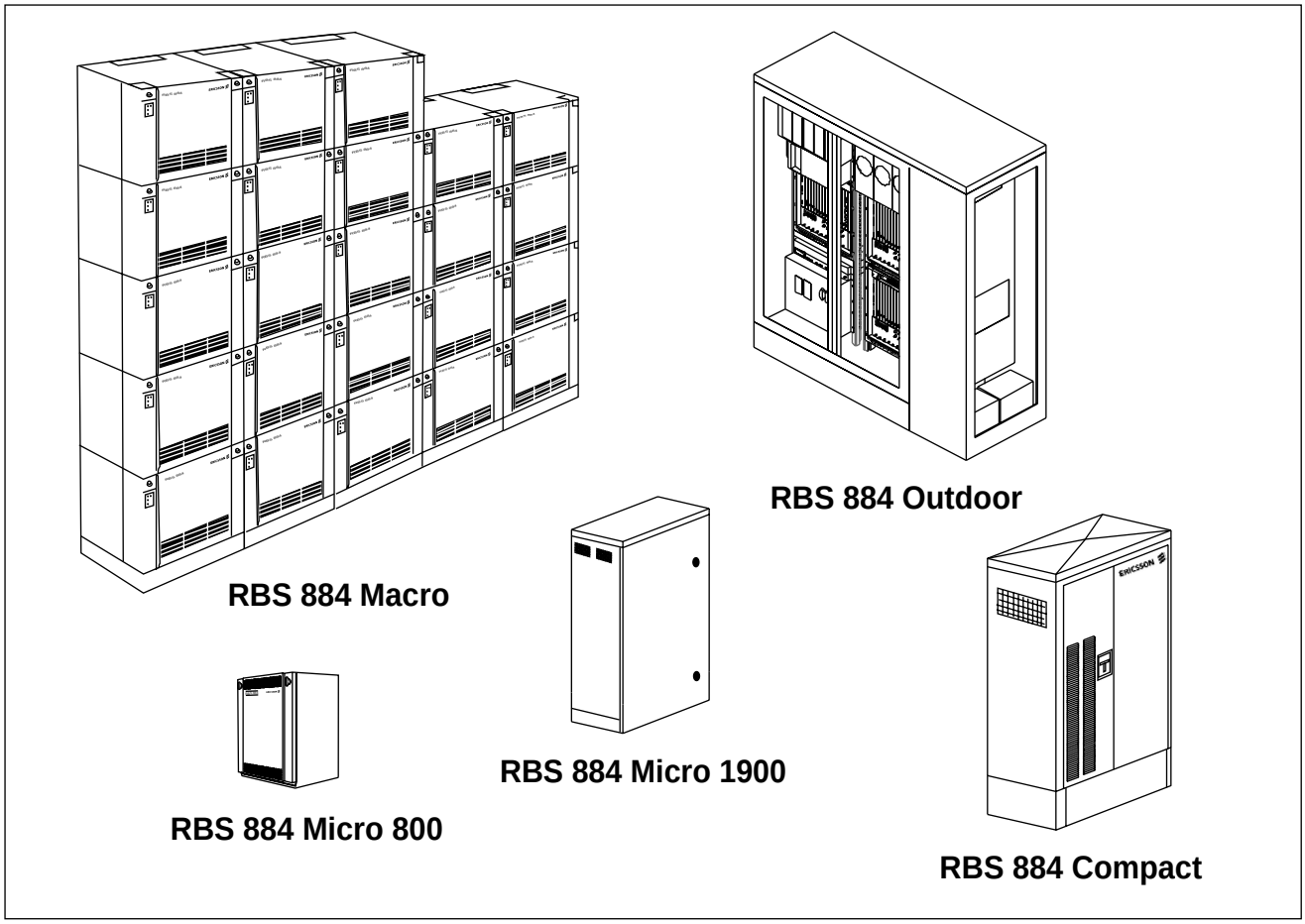


Figure 2-1. Product Lines in the RBS 884 Series

The RBS 884 Series includes product lines for macro and micro cells. See Figure 2-1 on page 2-4.

Note: The maximum number of carriers for each sector stated is the technical limitation for the defined standard configurations. The practical usable sector sizes may be limited by the frequency plan. The capacity of all product lines, with the exception of the RBS 884 Micro (1900 MHz) is calculated for analog systems. The capacity of the RBS 884 Micro (1900 MHz) is calculated for digital systems. See the integration information in the *RBS 884 Operations and Maintenance Manual* for system limitations in digital systems.

3.1 RBS 884 Macro

The macro cell products are intended for normal indoor installations and are built on-site with a number of cabinets of uniform size and design.

The **RBS 884 Macro 800 MHz** supports AMPS and digital D-AMPS. This system operates at 824–894 MHz and provides up to 78 low power or

medium power transceivers (3x24 carriers), or up to 96 high power and 6 low power transceivers (3x32 carriers).

The **RBS 884 Macro 1900 MHz** supports digital D-AMPS and operates at 1850–1990 MHz (A-, B-, or C-band). It provides up to 48 medium power transceivers (3x15 carriers).

A special configuration, Self Contained Cell Site (SCCS), providing up to 8 transceivers in three sectors (3x7 carriers), can be installed in an outdoor container.

The **RBS 884 Macro DBC (Down Banded Cellular)** supports digital D-AMPS and is applicable to frequencies at 806–860 MHz. Up to 39 medium power transceivers (3x12 carriers) can be used in one installation.

3.2 RBS 884 Micro

The RBS 884 Micro products are used wherever local capacity or coverage is required.

The **RBS 884 Micro 800 MHz** is intended for indoor installation, and typical applications include convention centers, office buildings, parking areas and tunnels. The RBS 884 Micro comprises one small main cabinet and two possible expansion cabinets of the same size. It is a completely functional cell, with a drop and insert transmission interface and RF equipment built-in. Up to 10 1.5W transceivers can be used in one cabinet (8 carriers). Up to 30 transceivers can be provided with two auxiliary cabinets (24 carriers). This gives a total capability of up to 23 analog or 68 digital voice channels (71 with E1 PCM links).

The **RBS 884 Micro with Multi Carrier Power Amplifier (MCPA) (800 MHz)** supports analog AMPS EIA 553 and digital D-AMPS EIA IS 136 and operates at 824–894 MHz. It is a standard RBS 884 Micro (800 MHz) equipped with a MCPA for higher output power in one cell. The MCPA is a separate cabinet mounted below the RBS 884 Micro (800 MHz) cabinet. Up to three RBS 884 Micro (800 MHz) cabinets and one MCPA can be mounted in a 19-inch rack cabinet. An RBS 884 Micro with MCPA (800 MHz) can provide up to 23 analog or 68 digital voice channels (71 with E1 PCM links) in one cell.

The **RBS 884 Micro Outdoor (800 MHz)** supports analog AMPS EIA 553 and digital D-AMPS EIA IS 136 and operates at 824–894 MHz. Designed for outdoor use, it is contained in an all-weather steel enclosure with an environmentally-controlled interior and can be installed in a wide variety of locations and climatic zones. The RBS 884 Micro (800 MHz) can be provided with up to 26 transceivers and a total of 24 carriers. This provides a total capacity of up to 23 analog or 68 digital voice channels (71 with E1 PCM links).

The **RBS 884 Micro (1900 MHz)** supports digital D-AMPS EIA IS 136 and operates at 1850–1910 MHz. The RBS 884 Micro (1900 MHz) is a self-contained base station intended primarily for outdoor use. The cabinet

is cooled directly with outdoor air, using a combination of variable speed blowers and a variable power heater to maintain the cabinet air temperature within equipment operating limits. Typical applications include hot spot areas within mature 1900 MHz networks and areas not covered by the RBS 884 Macro. The RBS 884 Micro (1900 MHz) is comprised of one small main cabinet and up to two auxiliary primary cabinets of the same size. The cabinets can be easily mounted on poles, on the sides of buildings, on rooftops, or on concrete pads. The RBS 884 Micro (1900 MHz) is a complete functional cell, with a drop and insert transmission interface and built-in RF equipment. Up to 5 transceivers can be used in one cabinet providing 4 carriers. Up to 15 transceivers can be used in a three-cabinet installation providing 3x4 carriers. The three-cabinet installation allows up to 33 digital traffic channels.

The **RBS 884 Micro with MCPA** is a standard RBS Micro 884 equipped with a Multi Carrier Power Amplifier (MCPA) for 30 W normal output power in one cell. The MCPA is a separate cabinet that is smaller than the RBS 884 Micro cabinet. The cabinets can be wall mounted, and from one to three cabinets and one MCPA can be mounted in a standard 19-inch or Telco rack. An RBS 884 Micro with MCPA can provide up to 23 analog or 68 digital voice channels (71 with E1 PCM links) in one cell.

3.3 RBS 884 Compact

The **RBS 884 Compact** can be compared to the Micro, but is intended for outdoor installations. It is contained in an all-weather steel cabinet with an environmentally-controlled interior and can be installed in a wide variety of locations and climatic zones. The RBS 884 Compact consists of one primary cabinet and two possible expansion cabinets of the same size. It is a completely functional cell with drop and insert transmission interface and RF equipment built-in. Up to 10 low power transceivers can be used in one cabinet (8 carriers). Up to 30 transceivers can be provided with two auxiliary cabinets (24 carriers). This gives a total capability of up to 23 analog or 68 digital voice channels (71 with E1 PCM links).

4 Architecture

The radio base station cabinet contains the equipment needed to control and handle the communication between the MSC and the mobile stations. The configuration of equipment in a specific system depends on the number of sectors, the number of voice channels in each sector, the transmit power, the frequency band, the number and type of antennas, and if the site is all analog, mixed analog and digital, or all digital. Figure 2-2 on page 2-7 shows the main connections to and from an RBS.

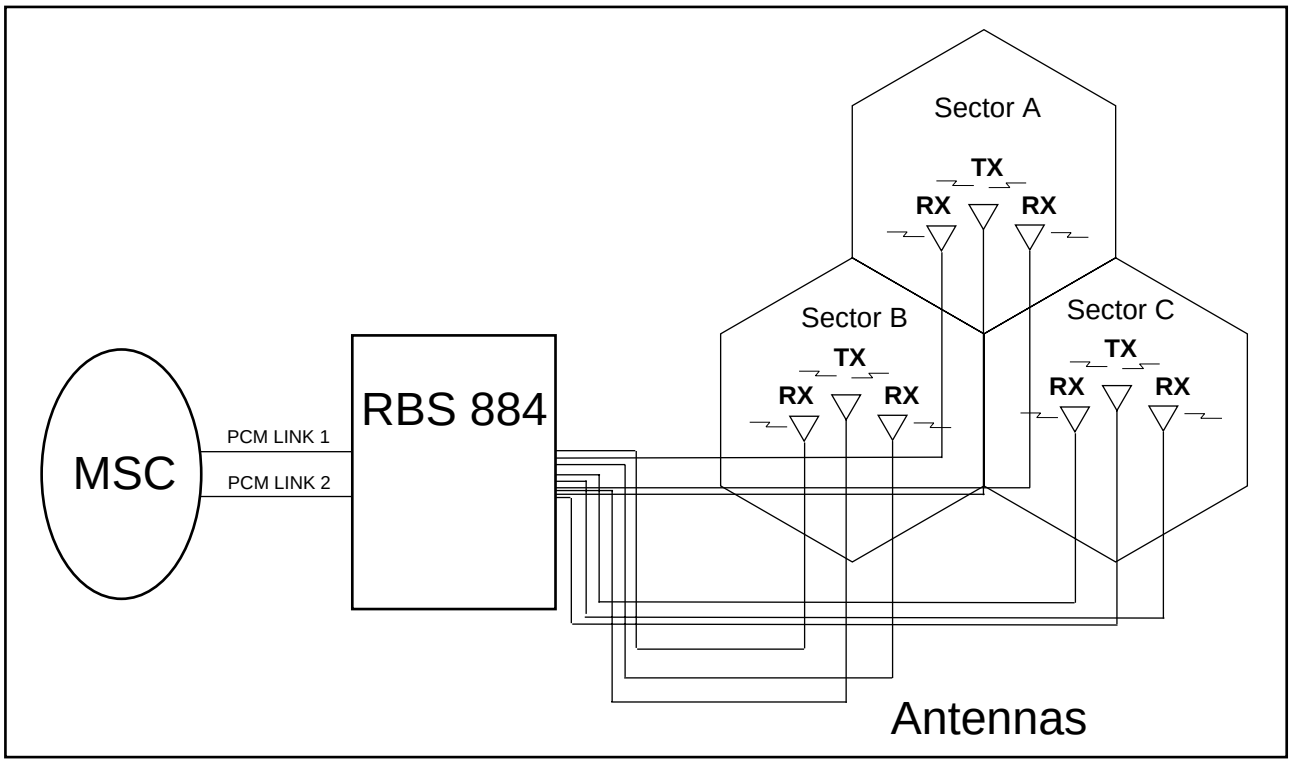


Figure 2-2. General Overview of RBS 884 Configuration

The Group Switch (GS) at the MSC is responsible for switching calls between subscribers. The calls may be between two mobile subscribers or between a mobile subscriber and a subscriber in the public telephone network. In the RBS, there are several regional processors, controlled by and working with the central processor. The regional processors control the switch and the transceivers in the base station. The switch in the base station makes sure that the speech signals from the MSC are connected to the correct transceiver. The transceivers generate radio signals emitted by the base station antenna to the mobile stations. The semipermanent connections are set up in the MSC. Each TRX handles three digital speech channels, but uses only one channel on the PCM link.

Figure 2-3 on page 2-8 shows the logical parts of an RBS.

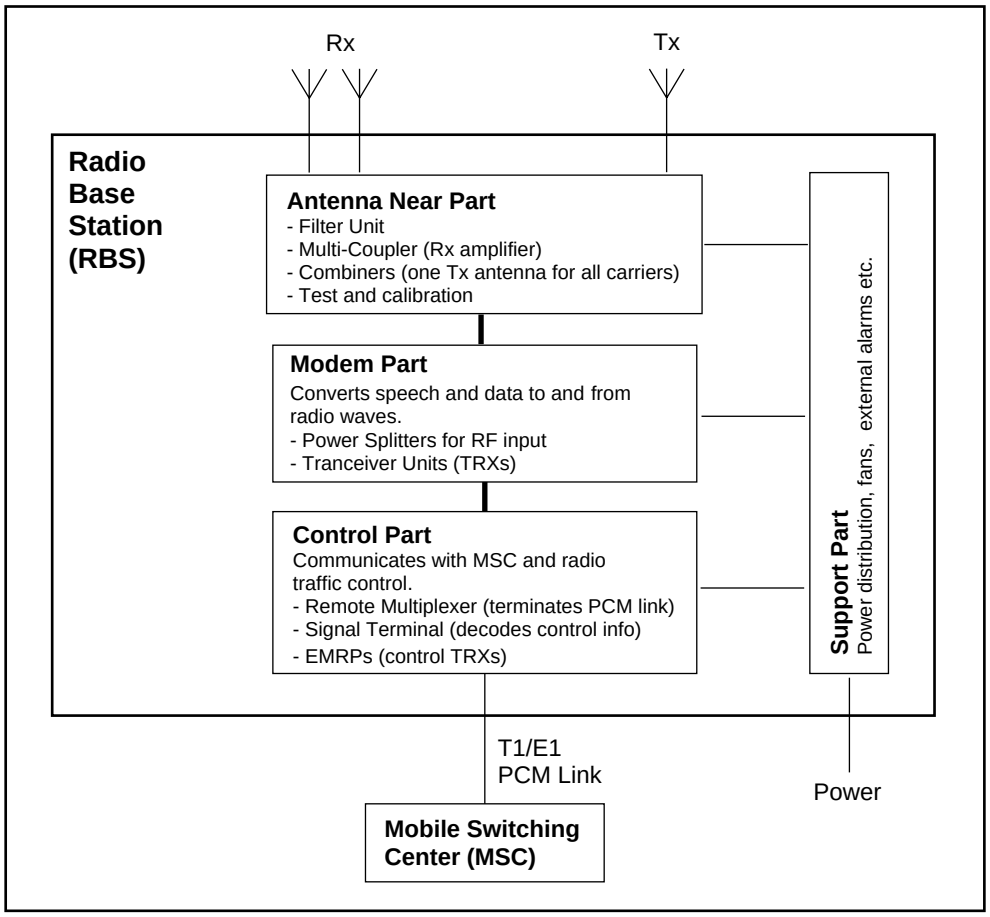


Figure 2-3. Block Diagram of a Radio Base Station

The logical parts of the RBS 884 Micro (1900 MHz) are as follows:

- Control Part (COP) – provides communication between the MSC and the RBS hardware for radio traffic control and statistical data gathering. In the RBS 884 Macro, the COP consists of Control and Radio Interface (CRI) cabinet. In Micro and Compact, the COP consists of the Remote Multiplexer (REMUX), Signaling Terminal Remote, Micro (STRM), Extension Module Regional Processor, Micro (EMRPM), and Connection (CONN) boards.
- Modem Part (MOP) – converts digitized speech and data into radio frequency signals, hosts channel coding and decoding functions, and performs measurements on radio transmission quality. It is comprised of transceiver modules (TRXs) in the RBS and voice coders (TRABs) in the MSC. In the RBS 884 Macro, the MOP consists of the Transceiver cabinet (TCB) and in the RBS 884 Micro and Compact, the MOP consists of TRX boards.

- Antenna Near Part (ANP) – contains components associated with the RF signal paths, such as auto-tuned combiners, power splitters, multicouplers, and bandpass filters. In the RBS 884 Macro the ANP consists of the Antenna Near Part Cabinet (ANPC) and the Auto-tuned Combiner Cabinet (ATCC). In the RBS 884 Micro (800 MHz) and in the RBS 884 Compact, it consists of a number of the RFTL, MC, COMBFILT and CABCOMB boards. In the RBS 884 Micro (1900 MHz), the ANP, bandpath filters, and Radio Frequency Test Loop (RFTL) are integrated into a single hardware unit. The combined ANP/RFTL/Filter unit provides RSSI measurement, output power measurement and calibration, VSWR supervision, and RF path testing. The main functions of the ANP are as follows:
  - Combine multiple TRX output signals to a single Tx antenna
  - Filter TX and RX signals
  - Pre-amplify and distribute RX signals
  - Protect TRXs from reflected power
  - Provide isolation between the TRXs
  - Calibrate and supervise the TRXs and associated RF components
- Support Part (SP) – provides general support, such as power supply and cooling. The components of this part vary significantly between the product lines.

1 Introduction

The *System Description* part of this manual describes the RBS 884 Micro (1900 MHz) equipment hardware and the available configurations.

2 RBS 884 Micro (1900 MHz)

Hardware specifications for the RBS 884 Micro (1900 MHz) are described in the following sections. Figure 3-1 on page 3-3 is an exterior view of the cabinet.

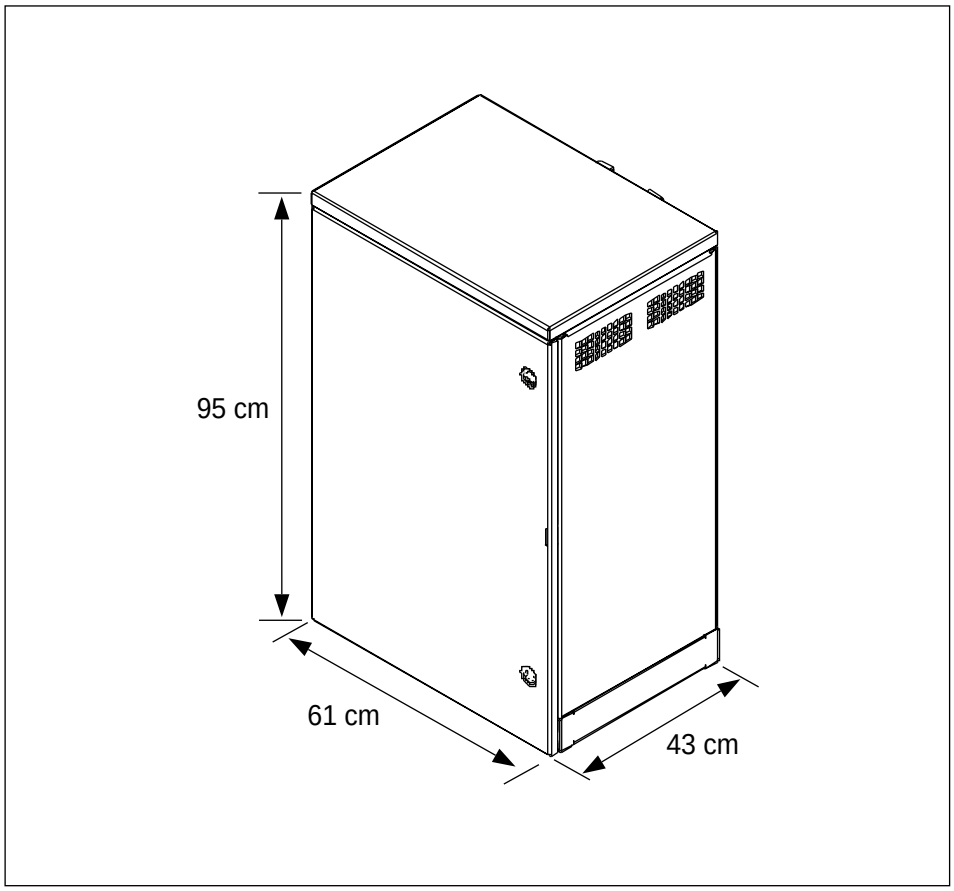


Figure 3-1. RBS 884 Micro (1900 MHz) Exterior View of Cabinet

2.1 Cabinet Layout

The RBS 884 Micro (1900 MHz) base station cabinet provides mechanical support, electrical interconnection, cooling, and environmental protection for the RBS 884 modules and components. All base station equipment wiring and cabling are easily accessible from the front of the unit. The electronic cards and modules plug into the backplanes of the electronics subrack and the subrack is cooled directly with outside air. The RBS equipment is protected from the external climatic variations by use of the environmental control system that supplies the internal modules with 10°C

– 45°C cooling air during normal operation. Figure 3-2 on page 3-4 shows the cooling airflow pattern that is established by the environmental control system. Cabinet siting must allow for adequate airflow space and cable access and routing space to the bottom of the cabinet.

The RBS 884 Micro (1900 MHz) external cabinet shell is constructed of aluminum and finished with a polyester powder paint. The exterior of the cabinet can be refinished by the customer. Refinishing and repainting information is provided in Part 4 – Installation. The corrosion warranty does not apply to refinished cabinets.

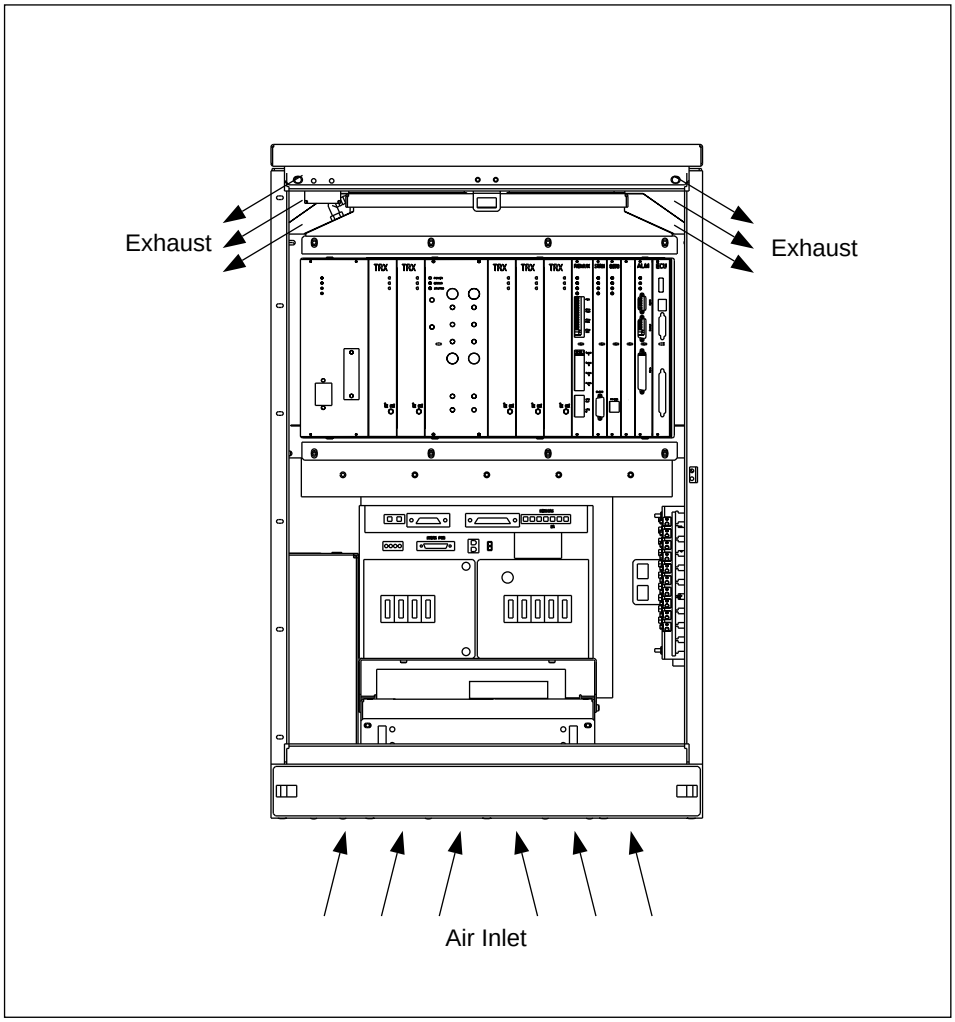


Figure 3-2. RBS 884 Micro (1900 MHz) With Cooling Airflow Pattern

The RBS 884 Micro (1900 MHz) is comprised of one main cabinet and up to two auxiliary primary cabinets, as follows:

- The Main Cabinet is used in all configurations. The Main Cabinet provides up to four digital TRXs and one Digital Verification Module (DVER). The four TRXs offer a total of 11 Digital Traffic Channels (DTCs) and one Dedicated Control Channel (DCCH).
- The Auxiliary Primary Cabinet has a dedicated antenna system and is used to create an additional sector within an omni cell. The Auxiliary Primary Cabinet provides up to four digital TRXs and one DVER device. The four TRXs offer a total of 11 DTCs and one DCCH. The primary cabinet requires an EMRPM transmission link connection to the main cabinet.

The RBS 884 Micro (1900 MHz) Main Cabinet contains the following (see Figure 3-3 on page 3-6):

- Power Distribution Box
- Equipped Microbase Subrack (EMBS)
  - Antenna Near Part (ANP) includes the integrated filter unit and the Radio Frequency Test Loop (RFTL)
  - Power Supply Unit (PSU)
  - Remote Multiplexer (REMUX)
  - Environmental Control Unit (ECU)
  - Transceivers (5) (TRX), including 1 Digital Verification Module (DVER)
  - Extension Module Regional Processor, Micro (EMRPM)
  - Dummy EMRPM or blank module
  - Signaling Terminal Regional, Micro (STRM)
  - Alarm Board (ALM)
- Fans (4)
- Heater
- AC surge suppressor
- Backup batteries
- Heater for backup batteries
- PCM surge suppressor units (primary and secondary)
- Antenna connector plate or I/O plate with integral quarter wave shorting stubs for lightning protection
- Optional air filter

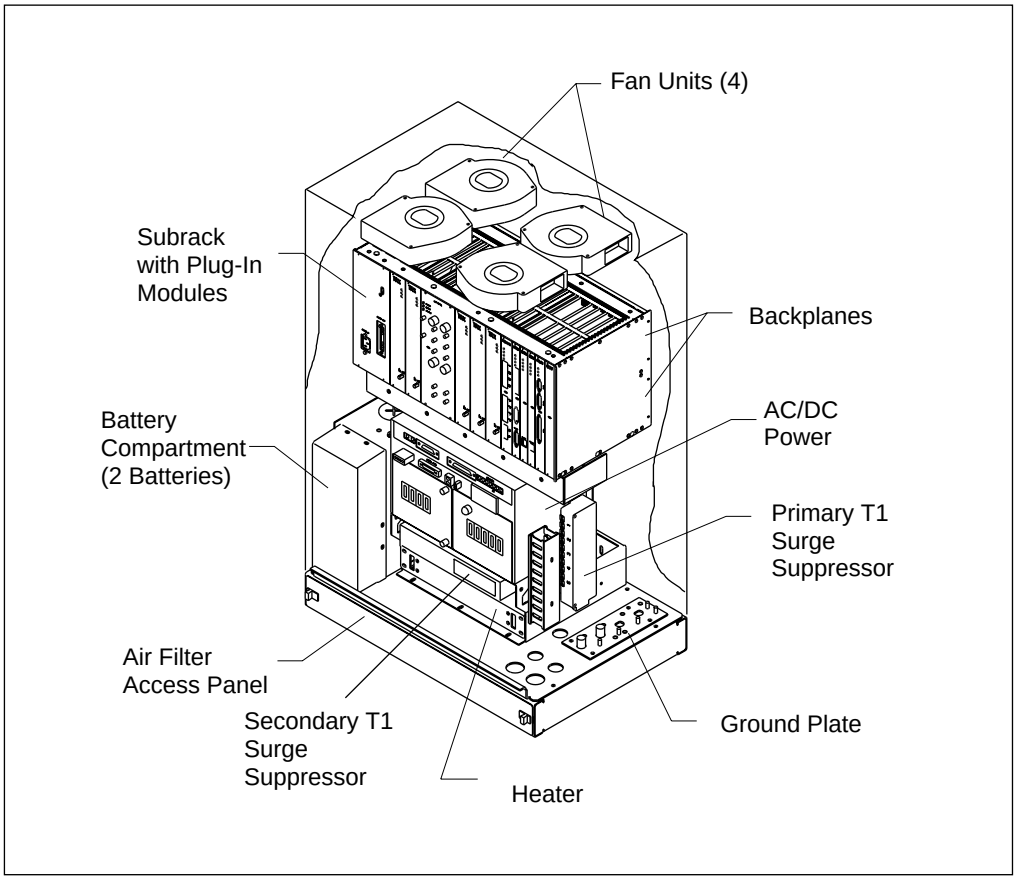


Figure 3-3. RBS 884 Micro (1900 MHz) Fully-Equipped Cabinet

2.2 Power Distribution Box

The power distribution box supplies the RBS equipment with the AC and DC supply voltages. See Figure 3-4 on page 3-7

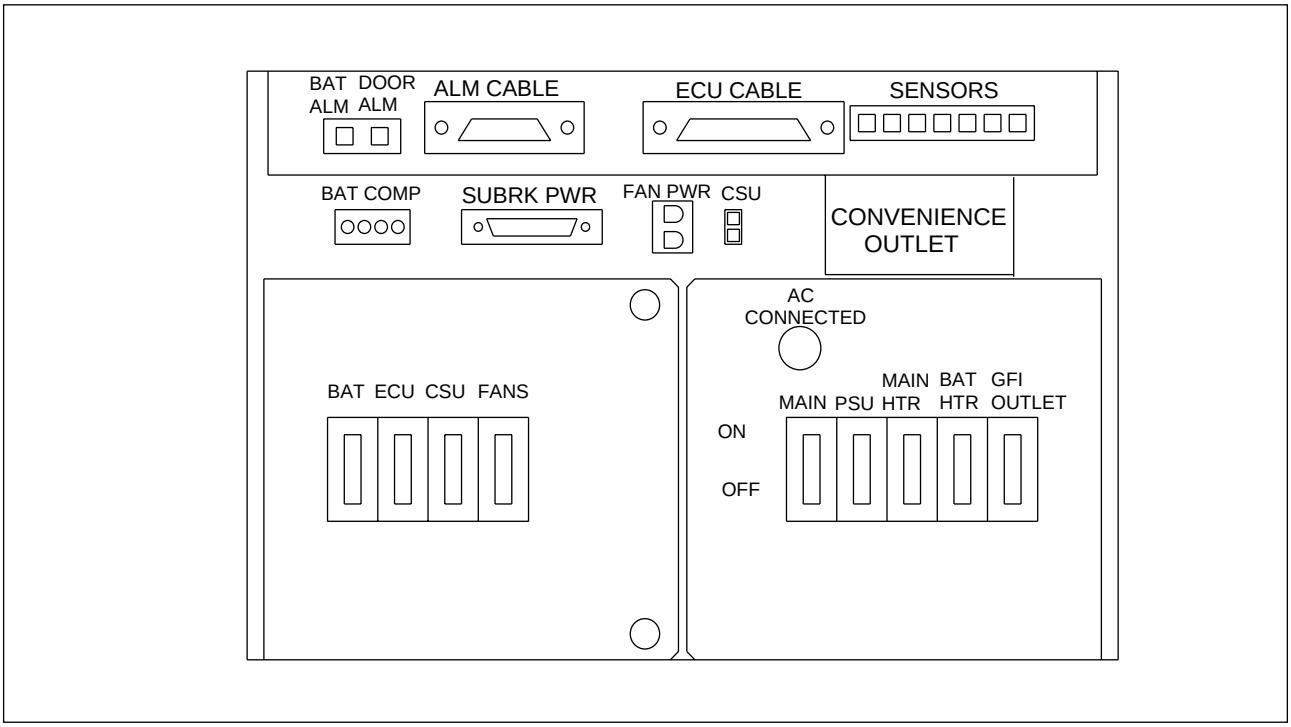


Figure 3-4. RBS 884 Micro (1900 MHz) Power Distribution Box Front Panel

The power distribution box contains the following:

- DC and alarms distribution panel
- DC and AC breakers
- AC mains
- AC surge connection
- Control board with connectors to temperature sensors, alarms, and the Environmental Control Unit (ECU)

The RBS 884 Micro (1900 MHz) is designed with service breakers to allow for replacement of the heaters and batteries while the base station remains powered. The breakers also provide over-current protection. One main breaker removes power from the entire cabinet.

2.3 Equipped Microbase Subrack (EMBS) – Main Cabinet

The EMBS – Main Cabinet contains the RBS 884 Micro (1900 MHz) equipment units described in this section. Figure 3-5 on page 3-8 shows the main cabinet equipment units in their allocated positions. Variable-speed fans are located in the top of the cabinet and the resulting air flow is dimensioned to handle a fully-equipped cabinet. The equipment units and fans are environmentally sealed to protect circuit board traces and components from direct exposure to outside cooling air.

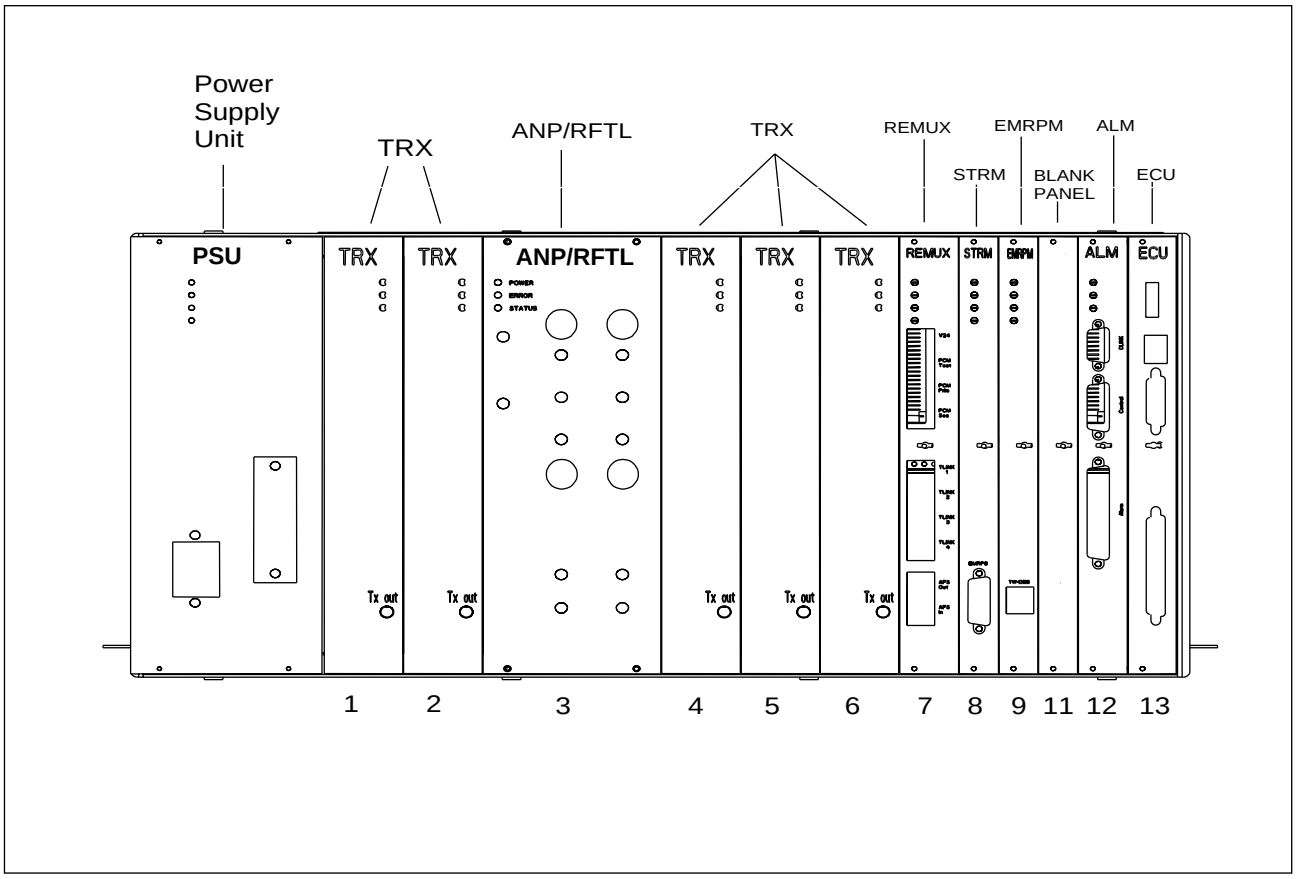


Figure 3-5. RBS 884 Micro (1900 MHz) EMBS Front Panel — Main Cabinet

The equipment units installed in the cabinet are allocated numbered slots, (slot No.1 to slot No. 13) from left to right, and are dimensioned using Building Modules (for example, BM = 1/10 in = 2.54 mm) as the unit of measurement.

The RBS 884 Micro (1900 MHz) EMBS – Main Cabinet contains the following:

- Five Transceivers (TRX), including one Digital Verification Module (DVER) for digital traffic. See Section 2.7 on page 3-15. The five TRXs are installed as follows:
  - Slot 1 (8 BM) – Dedicated Control Channel (DCCH)/Digital Voice Channel (DVC)
  - Slot 2 (8 BM) – DCCH/DVC
  - Slot 4 (8 BM) – DCCH/DVC
  - Slot 5 (8 BM) – DCCH/DVC
  - Slot 6 (8 BM) – DVER
- One Antenna Near Part (ANP) with integrated filter unit and Radio Frequency Test Loop (RFTL). The ANP is installed in slot 3 (10 BM) The function of the ANP is as follows:
  - Supervise the reflected loss of the TX antenna
  - Calibrate Receiver Signal Strength Indicator (RSSI)
  - Calibrate dynamic power and measurement of output power
  - Operate test loop. The measured RF signal from the TX antenna output is converted to the corresponding RX frequency and is fed into the receiver at a fixed RF level.
- One Remote Multiplexer (REMUX) to provide T1/E1 PCM line termination and clock stabilization in the main cabinet. The REMUX is not included in primary cabinets. The REMUX is installed in slot 7 (12 BM).
- One Signaling Terminal Regional (STRM) to decode control information and controls the EMRPM control bus. The STRM is not included in primary cabinets. The STRM is installed in slot 8 (8 BM).
- One Extension Module Regional Processor, Micro (EMRPM) to provide device control, speech interface to transceivers, alarm monitoring and a port for computer interface to the Mobile Switching Center (MSC). The EMRPM is installed in slot 9 (8 BM). Expansion space for a second EMRPM is available in slot 10.
- One EMRPM Dummy Unit to allow for future expansion for a second EMRPM. This equipment unit is the same size as the EMRPM and is used to ensure proper airflow through the unused subrack slot. The EMRPM Dummy Unit is installed in slot 10 (8 BM).

- One Alarm unit (ALM) to provide maximum connection of 32 external alarms. External alarms are alarms for both internal and external equipment that are defined as external alarms on the ALM board. The ALM is installed in slot 11 (10 BM).
- One Environment Control Unit (ECU) to provide temperature regulation inside the cabinet and provides alarms to the TRXs and the ALM board. The ECU is installed in slot 12 (10 BM).

Note: Unused TRX slots must be equipped with dummy TRXs or Radio Matching Units (RMUs). Other unused slots must have an equipment unit (a blank panel along with a dummy board) to assure proper airflow and electromagnetic shielding.

See Table 3-1 on page 3-10 for the complete EMBS Main Cabinet configuration.

Table 3-1. EMBS Configuration for RBS 884 Micro (1900 MHz) Main Cabinet

Slot	Name	Explanation	Comments
1-2	TRX	Transceiver	The TRXs act as digital voice/control channels. Slot 1 is recommended for the control channel TRX.
3	ANP/RFTL	Antenna Near Part/ Radio Frequency Test Loop	The ANP provides transmit (TX) and receive (RX) filtering, low-noise amplifying and RFTL functionality.
4-5	TRX	Transceiver	The TRXs act as digital voice/control channels. Unused TRX slots must contain a dummy TRX or RMU.
6	TRX	Transceiver with mobile verification functionality	The TRX in slot 6 is used as a Personal Communications Services (PCS) or MVER for uplink measurements.
7	REMUX	Remote Multiplexer	The REMUX provides T1/E1 PCM line termination and clock stabilization in the main cabinet.
8	STRM	Signaling Terminal Regional Micro	The STRM decodes control information and controls the EMRPM.
9	EMRPM	Extension Module Regional Processor Micro	The EMRPM controls the TRXs as well as the REMUX, the ANP/RFTL, and the ALM.
10	Blank Module	Dummy EMRPM	The Blank Module or equipment unit allows for future expansion for a second EMRPM. This equipment unit is the same size as the EMRPM and is used to ensure proper airflow through the unused subrack slot.

Table 3-1. EMBS Configuration for RBS 884 Micro (1900 MHz) Main Cabinet (Continued)

Slot	Name	Explanation	Comments
11	ALM	Alarm	The ALM collects internal and external equipment alarms.
12	ECU	Environmental Control Unit	The ECU controls temperature regulation inside the cabinet. The ECU also provides alarms to the TRXs and the ALM board for fan and heater failures.

2.4 Equipped Microbase Subrack (EMBS) – Primary Cabinet

The EMBS – Primary Cabinet contains the RBS equipment units described in this section. Figure 3-6 on page 3-11 shows the primary cabinet units in their allocated positions. Variable-speed fans are located in the top of the cabinet and the resulting air flow is dimensioned to handle a fully-equipped cabinet.

The RBS equipment units and fans are environmentally sealed to protect circuit board traces and components from direct exposure to outside cooling air.

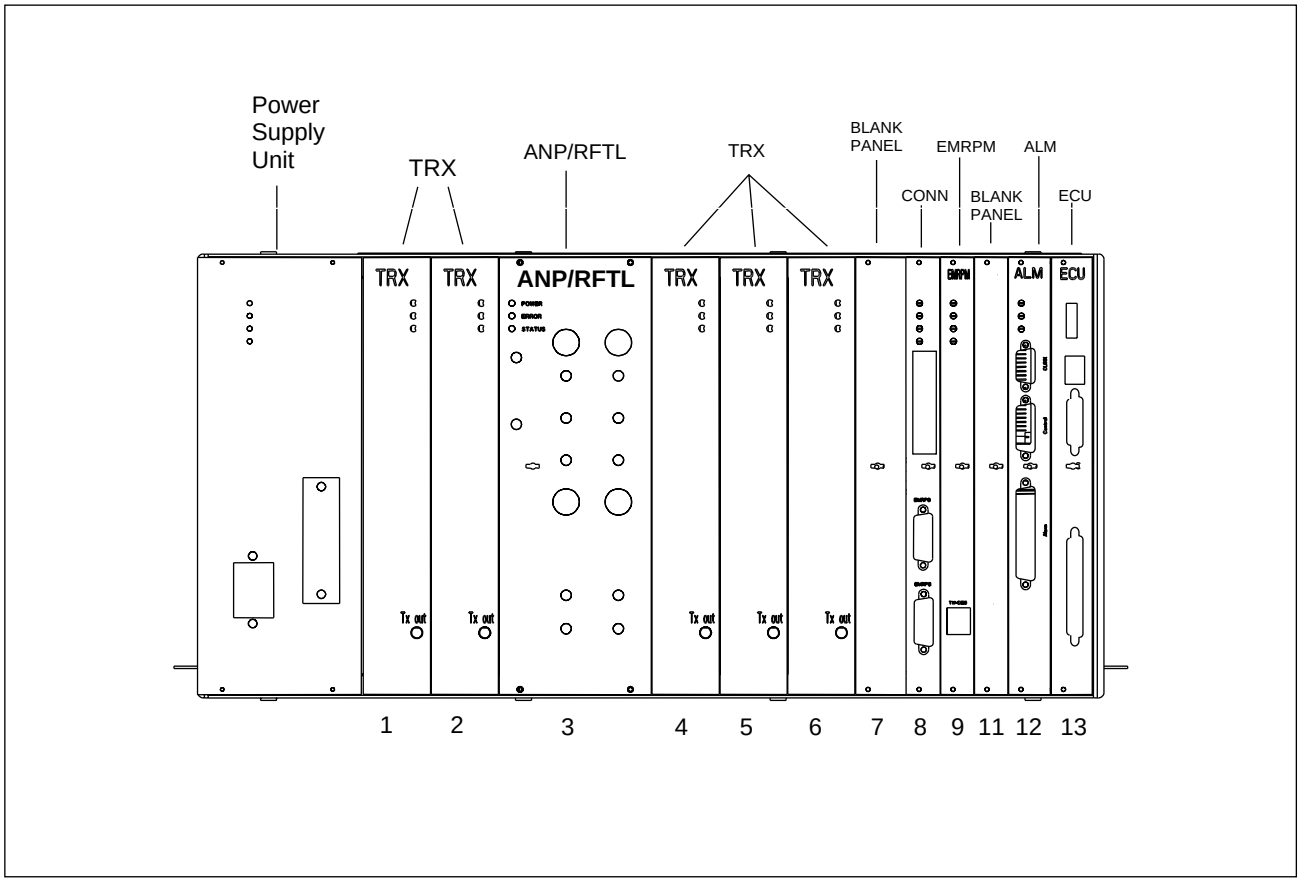


Figure 3-6. RBS 884 Micro (1900 MHz) EMBS Front Panel — Primary Cabinet

The RBS 884 Micro (1900 MHz) EMBS – Primary Cabinet contains the following:

- Five Transceivers (TRX), including one Digital Verification Module (DVER) for digital traffic. See Section 2.7 on page 3-15. The five TRXs are installed as follows:
  - Slot 1 (8 BM) – DCCH/DVC
  - Slot 2 (8 BM) – DCCH/DVC
  - Slot 4 (8 BM) – DCCH/DVC
  - Slot 5 (8 BM) – DCCH/DVC
  - Slot 6 (8 BM) – DVER
- One ANP/RFTL with integrated filter unit. The ANP/RFTL is installed in slot 3 (10 BM).
- One Blank equipment unit or Dummy REMUX installed in slot 7 (8 BM).
- One Connector (CONN) Unit to relay signals from the REMUX and STRM units in the main cabinet to the other units in the primary cabinet. The CONN is installed in slot 8 (8 BM).
- One Extension Module Regional Processor, Micro (EMRPM) to control the TRX slots 1, 2, 4, 5, and 6. The EMRPM is installed in slot 9 (8 BM)
- One EMRPM Dummy Unitto allow for future expansion for a second EMRPM. This equipment unit is the same size as the EMRPM and is used to ensure proper airflow through the unused subrack slot. The EMRPM Dummy Unit is installed in slot No.10 (8 BM).
- One Alarm Unit (ALM) to provide a maximum connection of 32 external alarms. External alarms are alarms for both internal and external equipment that are defined as external alarms on the ALM board. The ALM is installed in slot 11 (10 BM).
- 1 Environment Control Unit (ECU) installed in slot 12 (10 BM).

Note: Unused TRX slots must be equipped with dummy TRXs or Radio Matching Units (RMU). Other unused slots must have an equipment unit (a blank panel along with a dummy board) to assure proper airflow and electromagnetic shielding.

See Table 3-2 on page 3-13 for the complete EMBS – Primary Cabinet configuration.

Table 3-2. EMBS Configuration for RBS 884 Micro (1900 MHz) Primary Cabinet

Slot	Name	Explanation	Comments
1-2	TRX	Transmit TRX	The TRXs act as digital voice/control channels. Slot 1 is recommended for the control channel TRX.
3	ANP/RFTL	Antenna Near Part/Radio Frequency Test Loop	The ANP provides transmit (TX) and receive (RX) filtering, low-noise amplifier and RFTL functionality.
4-5	TRX	Transceiver	The TRXs act as digital voice/control channels. Unused TRX slots must contain a dummy TRX or RMU.
6	TRX	Transceiver with mobile verification functionality	The TRX in slot 6 acts as a Personal Communication Services (PCS) or MVER for uplink measurements.
7	Blank module	Dummy TRX	The dummy TRX or RMU ensures proper airflow through the unused subrack slot.
8	CONN	Connection Board	The CONN board passes TRX signals to the backplane.
9	EMRPM	Extension Module Regional Processor Micro	The EMRPM controls the TRXs as well as the REMUX, the ANP/RFTL, and the ALM units.
10	Blank Module	Dummy EMRPM	The Blank Module or equipment unit allows for future expansion for a second EMRPM. This equipment unit is the same size as the EMRPM and is used to ensure proper airflow through the unused subrack slot.
11	ALM	Alarm	The ALM collects internal and external equipment alarms.
12	ECU	Environmental Control Unit	The ECU controls temperature regulation inside the cabinet. The ECU also provides alarms to the TRXs and the ALM board for fan and heater failures.

2.5 Remote Multiplexer (REMUX)

The RBS 884 Micro (1900 MHz) contains a REMUX transmission unit for a 24 channel (T1) or 32 channel (E1) PCM link with the MSC. The incoming PCM is connected to the PCM Primary (Prim) connector on the REMUX.

One REMUX unit is installed in slot No. 8 in the main cabinet.

For distances of greater than 200 meters, a customer-supplied Channel Service Unit (CSU) can be mounted on the shelf above the main cabinet heater.

Table 3-3 on page 3-14 shows the available REMUX types for T1 and E1 systems.

Table 3-3. PCM System - REMUX

PCM System	Type	Distance to Nearest Active Device (For Instance, CSU or Repeater)	REMUX
T1	Short Haul without external Channel Service Unit (CSU)	<200 m	REMUX 24
T1	Long Haul with external CSU	<1800 m	REMUX 24
E1	Short Haul	<200 m	REMUX 32SH

The REMUX switches are preset at the factory according to the predetermined transmission requirements of the RBS 884 Micro (1900 MHz) site supplied by the site engineer.

The site engineer insures that the installer has access to documented transmission specifications for the RBS 884 Micro (1900 MHz) site. It is vital that the site engineer records all PCM line and switching information in the *RBS 884 Site Engineering Manual* or other applicable site installation documents.

2.6 Extension Module Regional Processor, Micro (EMRPM)

Each RBS 884 Micro (1900 MHz) cabinet contains one EMRPM unit which controls TRX traffic. An extra slot is provided for possible future expansion for a second EMRPM unit to share the traffic load. Ten devices can be connected to each EMRPM unit with TLINK connections. These are numbered TLINK 1 to TLINK 10.

The load capacity of the EMRPM allows up to four of the DVC TLINK connections for TRXs. The EMRPM is assigned to control the REMUX and the RFTL.

The incoming time slots are connected in a fixed pattern, as shown in Table 3-4 on page 3-14.

Table 3-4. RBS 884 Micro (1900 MHz) EMRPM 1

EMRPM TLINK	Cabinet slot	Function
1	1	TRX
2	2	TRX
3	4	TRX
4	5	TRX
6	6	MVER
7	11	ALM
9	3	ANP
10	7	REMUX

The addresses of the EMRPM are set using a Double Inline Pack (DIP) switch on the unit. No address plug is required. The address is dependent upon the configuration of the RBS site and number of cabinets used.

A computer can be connected to the TW/DEB port at the front of the EMRPM unit. The interface has the same function as the V24–B3 unit.

2.7 Transceiver (TRX)

The transceiver (TRX) transmits and receives radio signals to and from mobile stations.

A TRX unit can be remotely configured to support any of the following channel functions:

- Digital Voice Channel (DVC) – transmits and receives
- Digital Control Channel DCCH) – transmits and receives
- Digital Verification (DVER) Channel – receives only

The selection of transceiver channel function is under software control at the Mobile Switching Center (MSC). The first time slot may be used for DCCH and the remaining two time slots for DVCs, or all three time slots may be used for DVCs.

The TRX provides 33.3 dBm (2.1 W) per carrier at the ANP for the two-antenna configuration and 36.8 dBm (4.8 W) per carrier at the ANP for the four-antenna configuration. The dynamic range is 20 dB with 0.2–dB resolution.

The TRX includes all functionality needed for one RF channel, such as:

- Channel coding and decoding
- Modulation and demodulation
- Power amplification
- Power regulation
- Synchronization
- Diversity combining
- Measurements on received radio signal
- Verification processing (when configured as DVER)

The maximum output power for each TRX is 13.5 W. Note that digital speech coding takes place in the voice coder units in the MSC and not in the TRXs. There are 4 TRXs (carriers) for each antenna system that provide 11 digital voice paths per sector.

Table 3-5 on page 3-16 shows the allocation slots for TRX units in cabinets that are not fully equipped. In the following table, TRX positions

marked with an asterisk (*), represent factory installed units. All empty slots must contain an RMU.

Note: The term transceiver or TRX is used in this document to refer to the hardware unit itself and does not reflect the functionality of the unit. Subrack position 6 must be equipped with a TRX that functions as a receiver or Digital Verification Module (DVER).

Table 3-5. RBS 884 Micro (1900 MHz) TRX Unit Installation – Cabinet Not Fully Equipped

No. of TRX	TRX slot position in cabinet				
	1	2	4	5	6 (MVER)
3	X*	X*			X*
			X	X	X*
4	X*	X*	X*		X*
	X	X		X	X*
		X	X	X	X*
5	X*	X*	X*	X*	X*
* Indicates factory installed unit.					

The maximum speech traffic capacity for a three cabinet configuration is 33 digital voice channels for both the American standard (T1 environment) and the International standard (E1 environment).

In cascaded configurations, one PCM time slot for speech is lost for each additional signaling link.

2.8 Antenna Near Part (ANP)/Radio Frequency Test Loop (RFTL)

The combined Antenna Near Part (ANP), Radio Frequency Test Loop (RFTL), and integrated filter unit provides combining and splitting of RF signals to each antenna.

The main functions of the ANP/RFTL are as follows:

- Combine the output signal of the TRXs
- Filter TX and RX signals
- Protect the TRXs from high reflected power
- Pre-amplify and distribute RX signals
- Provide isolation between the TRXs

- Calibrate TRX transmitter and receivers
- Antenna supervision

The ANP, RFTL, and integrated filters are combined in a single ANP/RFTL assembly and reside in the subrack. The backplane of the subrack contains a five–way power splitter for each receiver diversity branch. The ANP/RFTL assembly provides a single signal for each diversity branch with all splitting performed in the backplane. This design allows all five TRXs to receive the same signal at the same level.

2.9 Environmental Control Unit

The Environmental Control Unit (ECU) runs a control loop that monitors the internal cabinet temperature at several different locations. Using these readings, the ECU maintains the cabinet at an acceptable temperature by controlling the speed of the fans and the power to the heater. When the ECU is unable to maintain the cabinet at an acceptable temperature, the ECU provides alarms to the switch through the EMRPM and ALM boards and can ultimately remove power from the subrack and shut down the base station.

2.10 Fans

The RBS 884 Micro (1900 MHz) uses four variable speed-controlled fans to regulate the temperature of the circuit cards and modules in the cabinet. The fan control is driven by an open thermal control loop that references the outside ambient air temperature. The temperature sensor for the fan control is located in an area that is not affected by solar exposure nor by power dissipation from the cabinet. The amount of air flow through the cabinet is limited to that required to maintain the components within their temperature specifications.

The fans are controlled by the ECU. The ECU is capable of varying the speed of the fans and can turn off one or more of the fans during low temperature extremes and during cold temperature start-up. To insure fail-safe operation, the fans operate at full speed when the thermal sensor signal is lost.

The fans are modular units and can be easily accessed from the top door of the RBS 884 Micro (1900 MHz) cabinet. Fan replacement is done with the fan breaker in the ON position. Base station personnel cycle the fan breaker off and on to reset the fan alarm after they complete the fan replacement procedure. Refer to the “Hardware Replacement” part of the *Installation and Hardware Replacement Manual* for further information on the fan replacement procedure.

2.11 Air Filter

The RBS 884 Micro (1900 MHz) cabinet is equipped with a cooling air intake filter. The lower front panel of the cabinet is removable to gain access for periodic filter replacement.

3 Installation Configurations

3.1 Limitations

One RBS cabinet can contain up to five TRXs, four of which can be used for handling speech traffic.

3.2 Standard Configurations RBS 884 Micro (1900 MHz)

The RBS 884 Micro (1900 MHz) cabinets are configured and assembled at the factory before delivery to the RBS site. It is the responsibility of the site engineer to dimension the required configuration.

When considering which configuration to choose, dimension the TRX units. The RBS 884 Micro (1900 MHz) can contain as few as three TRX units per cabinet. Additional capacity can be added later.

The RBS 884 Micro (1900 MHz) product contains a number of cabinet configurations depending on the following:

- AC power voltage: 110V 60 Hz or 230V 50 Hz
- Type of transmission: E1 or T1
- Antenna configuration: 2 or 4 antennas
  - Two antenna mounting: cabinet-mounted or external
  - Four antenna mounting: external
- Frequency band: AD, DBE, or EFC
- Number of TRXs: 3, 4, or 5 (including 1 Digital Verification [DVER] unit)

The number of cabinets required at the RBS site can be one, two, or three, depending on the number of TRX units and sectors determined for that specific RBS site. The 1900 MHz base station cabinet can be configured to perform as a main or as a primary cabinet by installing the appropriate equipment units.

The configuration diagrams in this section show cabinets (main, and primary), PCM input, AC power input, antenna configurations, and interconnections between cabinets. The cabinets are shown with maximum equipment installed. The PCM/TLINK/EMRPM, control, and

synchronization interconnections between cabinets are shown as **DATA** in the following six configuration diagrams.

Each cabinet requires a separate electrical AC power input supply.

Table 3-6 on page 3-19 provides a list of the antenna and PCM cable connection points that appear on the underside of the Mounting Base Connector Plate.

Table 3-6. Mounting Base Connector Plate – External Cables

External Cable Connector	Connector Plate Connection
RX/TX ANT A	ANT 1
RX/TX ANT B	ANT 2
TX ANT C	ANT 3
TX ANT D	ANT 4
PCM	PCM P

The PCM transmission connection from the RBS to the MSC connects through the PCM lightning protection box that is located below the subrack in the main cabinet.

Refer to the *RF Guidelines* for information on reverse isolation and the output power levels for each configuration.

3.2.1 One-Sector Site

The following cabinet configurations are available for the RBS 884 Micro (1900 MHz) one-sector site.

3.2.1.1 Single Cabinet - 2 Duplex Filters, 2 TX/RX Antennas

Figure 3-7 on page 3-20 and Figure 3-8 on page 3-20 show one-sector site configurations. Both of these configurations have a two-antenna ANP with hybrid combiners and duplex filters connected to an antenna array of two TX/RX antennas.

The ANP for both the cabinet-mounted antenna and the external antenna is offered in the following frequency bands:

- AD
- DBE
- EFC

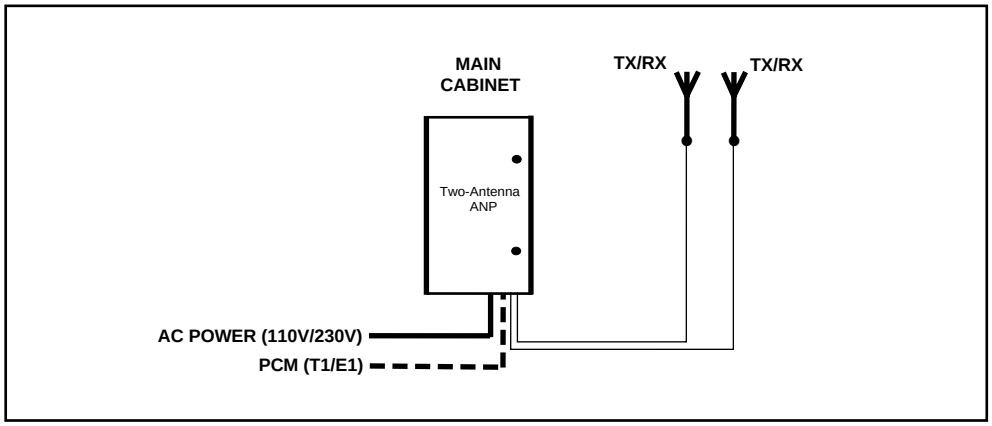


Figure 3-7. One-Sector Site – One Cabinet with Two External TX/RX Antennas

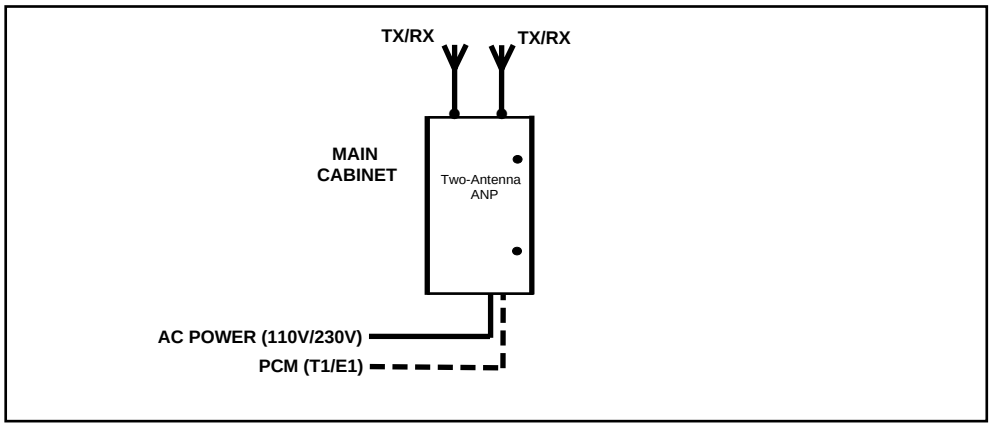


Figure 3-8. One-Sector Site – One Cabinet with Two Cabinet–Mounted Antennas

The Cabinet-Mounted Antenna Kit can be used to mount two fixed antennas directly on the cabinet for a totally self-contained base station.

Note: Single sector site expansion is possible with the use of shared antennas and cell overlays, although RF performance may be compromised.

3.2.1.2 Single Cabinet — 4 Antennas (2 TX/RX Antennas and 2 TX-Only Antennas)

Figure 3-9 on page 3-21 shows a one-sector site configuration with a four-antenna ANP connected to an antenna array of two TX-only antennas and two TX/RX antennas with duplex filters.

The four-antenna ANP is offered in the following frequency bands:

- AD
- DBE
- EFC

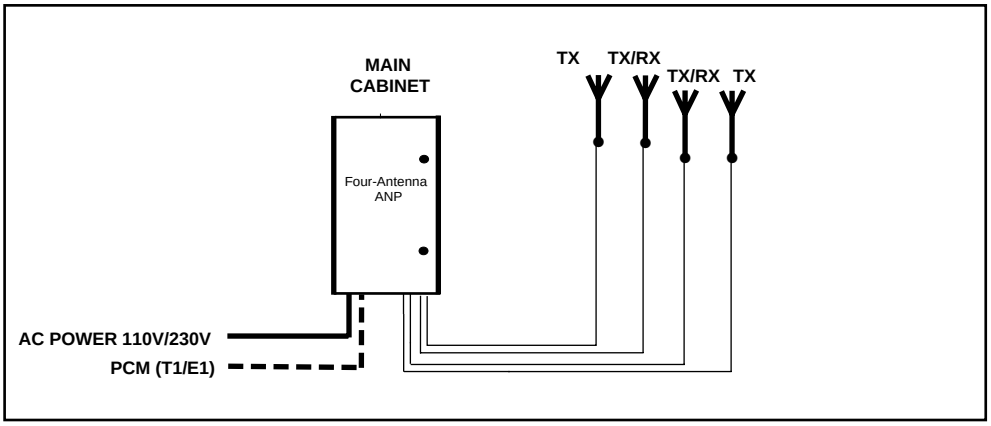


Figure 3-9. One-Sector Site – One Cabinet with Four External Antennas

Note: Single sector site expansion is possible with the use of shared antennas and cell overlays, although RF performance may be compromised.

3.2.2 Two-Sector Site

The following cabinet configurations are available for the RBS 884 Micro (1900 MHz) two-sector site.

3.2.2.1 Dual Cabinets — 2 TX/RX Antennas

Figure 3-10 on page 3-22 and Figure 3-11 on page 3-22 show two-sector site configurations with a main and a primary cabinet. Each cabinet has a two-antenna ANP with hybrid combiner filters and duplex filters connected to an antenna array of two TX/RX antennas.

The two-antenna ANP for both the cabinet-mounted antenna and the external antenna is offered in the following frequency bands:

- AD
- DBE
- EFC

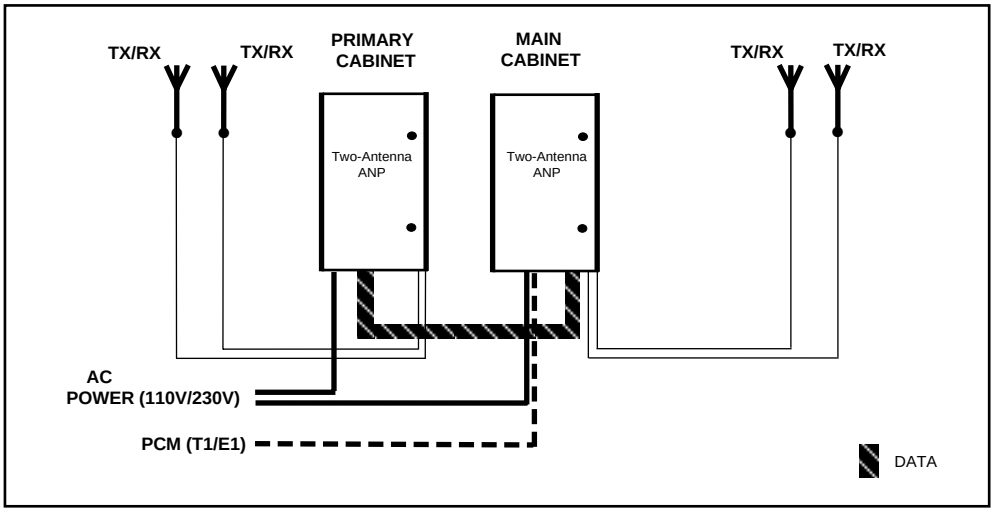


Figure 3-10. Two-Sector Site – Each Cabinet with Two External TX/RX Antennas

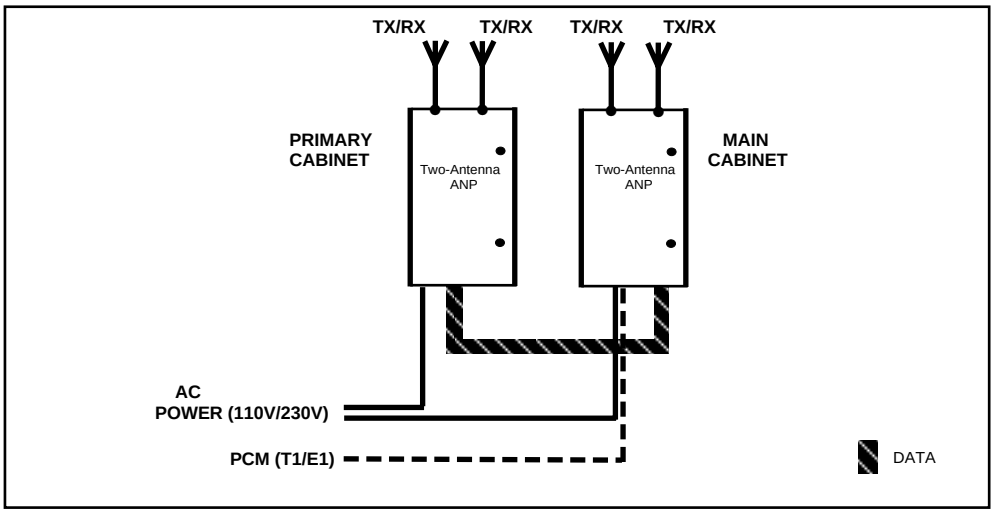


Figure 3-11. Two-Sector Site – Each Cabinet with Two Cabinet-Mounted Antennas

The Cabinet-Mounted Antenna Kit can be used to mount two fixed antennas on each cabinet for a totally self-contained base station site.

3.2.2.2 Dual Cabinets — 4 Antennas (2 TX/RX Antennas and 2 TX-Only Antennas)

Figure 3-12 on page 3-23 shows a two-sector site configuration with a main and a primary cabinet. Each cabinet has a four-antenna ANP connected to an antenna array of two TX-only antennas and two TX/RX antennas with duplex filters.

The four-antenna ANP is offered in the following frequency bands:

- AD
- DBE
- EFC

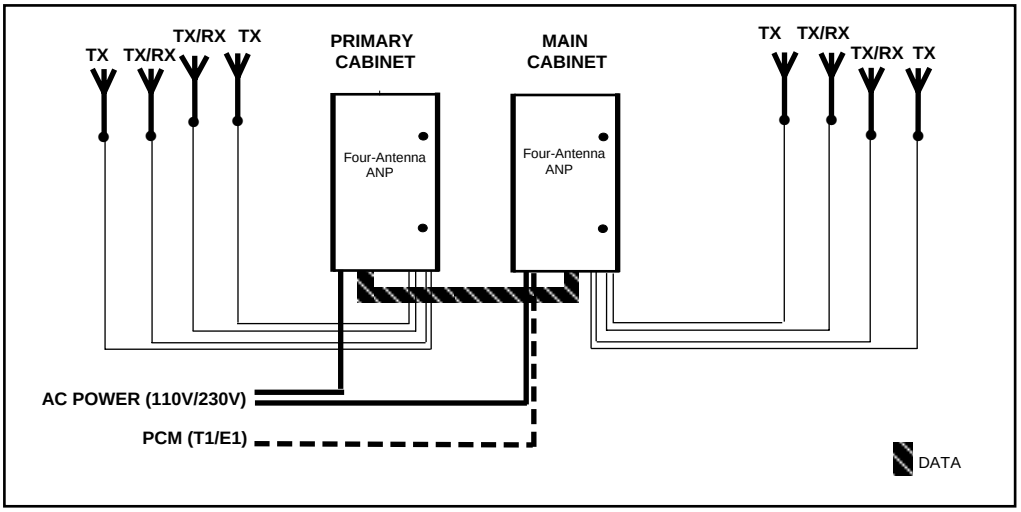


Figure 3-12. Two-Sector Site – Each Cabinet with Four External Antennas

3.2.3 Three-Sector Site

The following cabinet configurations are available for the RBS 884 Micro (1900 MHz) in a three-sector site.

3.2.3.1 Triple Cabinets — 2 TX/RX Antennas

Figure 3-13 on page 3-24 and Figure 3-14 on page 3-24 show three-sector site configurations with a main and two primary cabinets. Each cabinet has a two-antenna ANP with hybrid combiner filters and duplex filters connected to an antenna array of two TX/RX antennas. The primary cabinets are used to provide additional sectors.

The two-antenna ANP for both the cabinet-mounted antenna and the external antenna is offered in the following frequency bands:

- AD
- DBE
- EFC

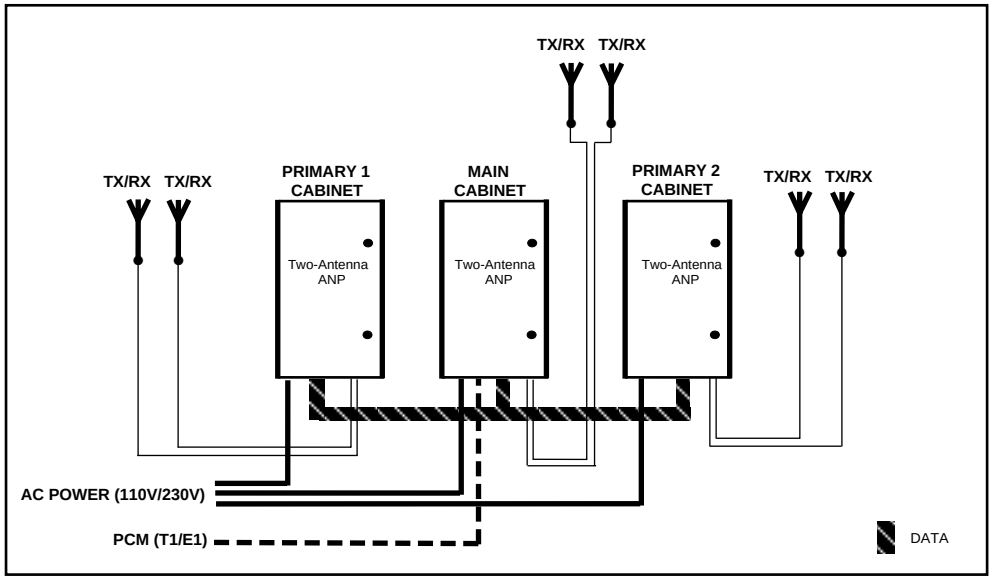


Figure 3-13. Three-Sector Site – Each Cabinets with Two External TX/RX Antennas

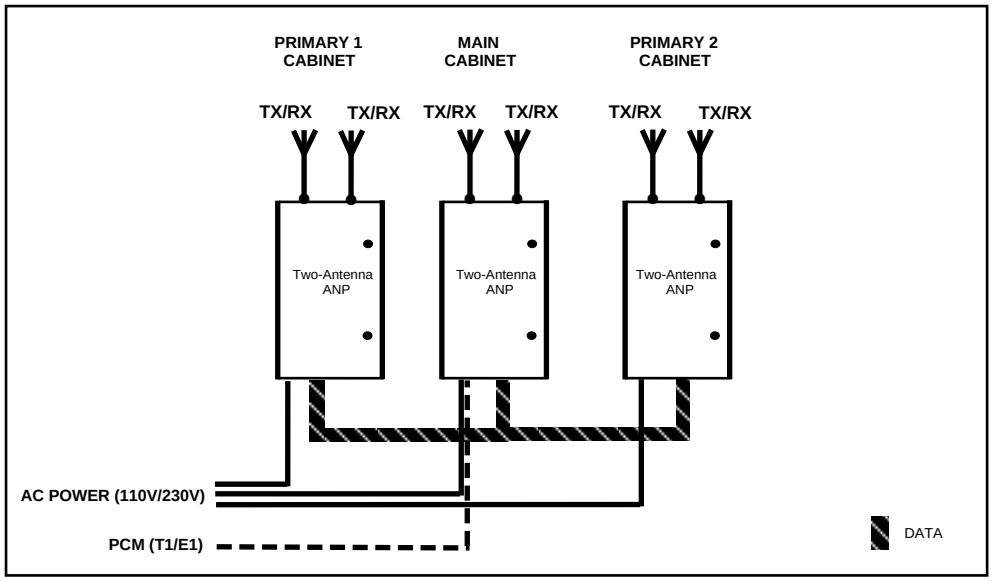


Figure 3-14. Three-Sector Site – Each Cabinet with Two Cabinet-Mounted Antennas

The Cabinet-Mounted Antenna Kit can be used to mount two fixed antennas to each cabinet for a totally self-contained base station site.

3.2.3.2 Triple Cabinets — 4 Antennas (2 TX/RX Antennas, 2 TX-Only Antennas)

Figure 3-15 on page 3-25 shows a three-sector site configuration with one main and two primary cabinets. Each cabinet has a four-antenna ANP connected to an antenna array of two TX-only antennas and two TX/RX antennas with duplex filters.

The four-antenna ANP is offered in the following frequency bands:

- AD
- DBE
- EFC

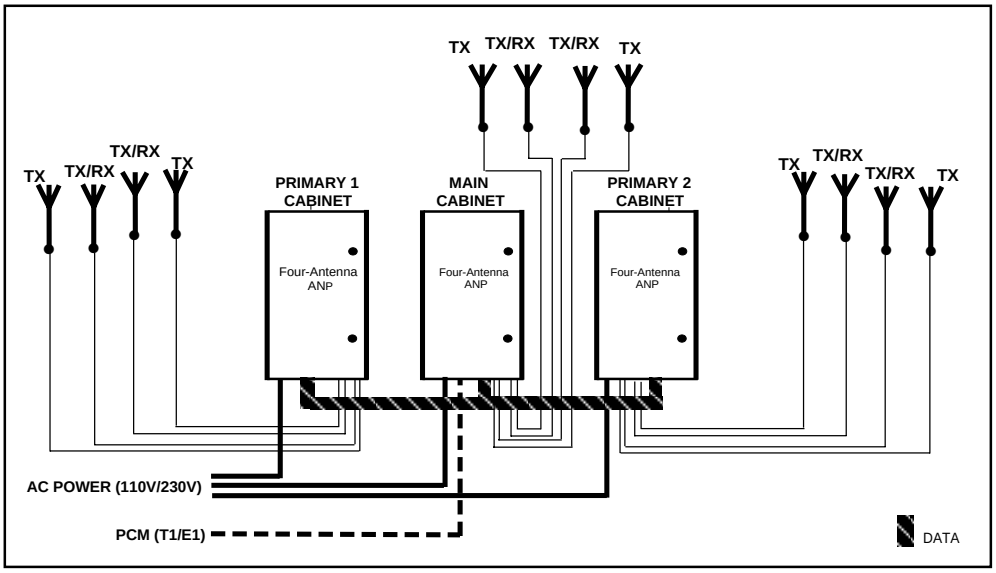


Figure 3-15. Three-Sector Site – Each Cabinet with Four External Antennas

3.2.3.3 Cascade Configurations — RBS 884 Micro (1900 MHz)

RBS 884 Micro (1900 MHz) systems can be connected in a cascading arrangement (see Figure 3-16 on page 3-26) with a single T1/E1 line in order to reduce transmission costs. Cascading is used to expand a site and to create different Radio Cabinet Groups (RCGs) at the same site.

Drop and insert considerations become important when planning the cascading of an RBS site.

Each Micro (1900 MHz) base station becomes a separate Extension Module Group (EMG) and has its own control channel (DS0 - 64 kbit/s channel) on the PCM (T1/E1) transmission cable interconnections.

Additional Control Signaling Link (CLC) extraction timeslots are required for each additional REMUX introduced to support cascading. This allocation is determined by the operator or network provider. Each REMUX will require all switch settings to be checked and reset as necessary (see the *Processes and Procedures* part of the *RBS 884 Site Engineering Manual*.

To maintain transmission quality, it is recommended that no more than four RBS 884 Micro (1900 MHz) base stations be cascaded.

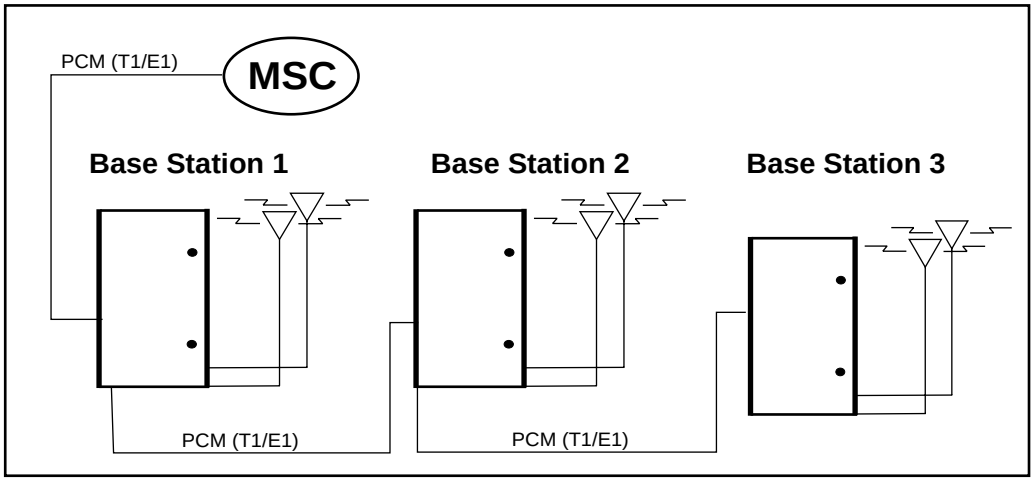


Figure 3-16. Cascade Configuration

1 Introduction

This part of the manual contains procedures for unpacking and installing the RBS 884 Micro (1900 MHz) equipment. Additional procedures are provided for switch configuration, cable installation, power up, and site expansion.

The RBS 884 Micro (1900 MHz) cabinet can be installed on a wall, a pole, or pedestal. The cabinet can also be repainted (refer to Section 18.3 on page 4-82).

2 Safety Considerations

2.1 Cabinet Grounding

This product is Safety Class 1 equipment.

The RBS 884 Micro (1900 MHz) cabinet wiring is based on a single-point ground system. The cabinet has an external earth-ground stud connection on the bottom surface of the cabinet shell.

DANGER!

Any interruption of the protective (grounding) conductor or disconnection of the protective ground terminal will cause a potential shock hazard that could result in personal injury.

2.2 Voltage Hazards

DANGER!

Voltage in excess of 100V is used in the RBS 884 Micro (1900 MHz). Observe safety precautions. Contact with voltage as low as 50V can result in death.

Observe the following safety precautions:

- Do not touch high voltage connections when working on energized equipment.
- Do not energize equipment before the Power Up procedure in this manual is performed.

- Never connect the power cable to the power unit when the unit is removed from the cabinet.
- Perform all installation and repair procedures in the order presented.

2.3 Radio Frequency Radiation

DANGER!

Radio frequency radiation from an antenna may be a danger to health, causing severe burns to skin and clothing.

Turn off the transmitters at the MSC prior to working with or near antennas.

2.4 Beryllium Oxide

Some equipment contains beryllium oxide in ceramic form.

Warning!

Beryllium oxide is poisonous and constitutes a health hazard if present in finely dispersed form, such as dust or smoke, which can be inhaled. Read local hazardous chemical regulations before working with beryllium oxide.

Units with components containing beryllium oxide are marked with a warning label. For detailed information on properties, health and environmental hazards, refer to the regulations issued by the local authorities.

The following rules must be obeyed by all persons handling beryllium oxide:

- Ceramics containing beryllium oxide must not be scraped, filed, ground, treated with acid, or machined in any other way.
- Compressed air must **not** be used to clean units containing beryllium oxide.
- You must always wear protective gloves when handling beryllium oxide.
- Use wet rags to collect dust and particles from damaged beryllium oxide components. After use, place the rags in plastic bags and seal the bags completely.

Scrapped beryllium oxide must be treated as environmentally hazardous waste. Local authorities enforce regulations, regarding the treatment and

disposal of environmentally hazardous waste. Investigate the local regulations that are applicable to you and comply with them.

2.5 Heavy Loads

Warning!

Incorrectly lifting heavy loads can result in severe injury to persons and damage to the equipment.

A fully equipped RBS 884 Micro (1900 MHz) cabinet weighs 105 kg (230 lbs). Ericsson recommends two persons be present during the maintenance activities where heavy lifting is required.

3 Electrostatic Discharge (ESD)

The human body acquires static charge in all situations involving movement. The body rubs against clothes and against a chair when sitting down, and shoes rub against the floor. The same effect is achieved when handling ordinary plastic materials.

If the body comes into contact with a grounded integrated circuit (IC) component, this static charge may cause an electrostatic discharge (ESD) to take place resulting in damage to the component.

To avoid component damage from ESD, always follow the instructions for handling sensitive electronic components and circuit boards. Always use ESD protection equipment when working with such components and boards.

3.1 Storage and Transport

Store and transport components and circuit boards in their original packaging.

Alternatively, use a conductive material or special IC carrier that either short-circuits all contacts and pins, or insulates them from external contact.

3.2 ESD Wrist Strap

When working with circuit boards and cables, an ESD Wrist Strap must be used to avoid ESD damage. When the strap cable is supplied with an alligator connector, it can be connected to an unpainted metal part of the cabinet chassis as shown in Figure 4-1 on page 4-6.

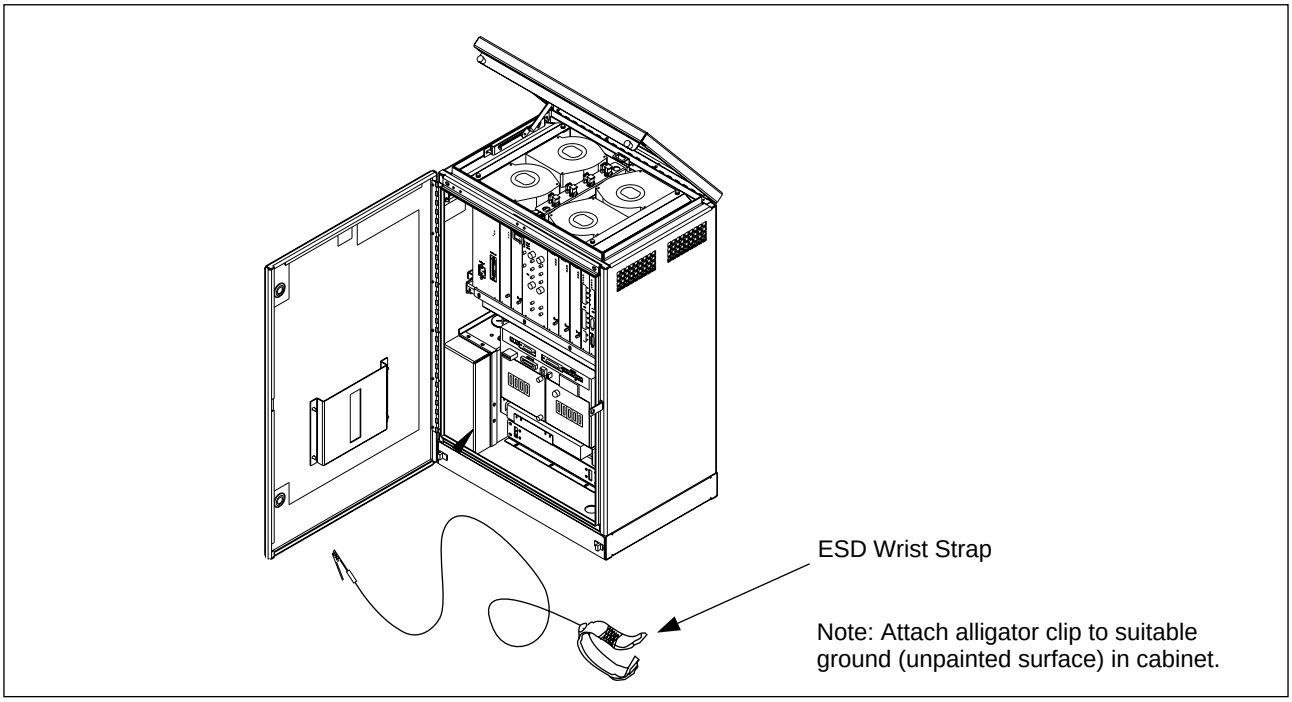


Figure 4-1. ESD Wrist Strap connected to the RBS 884 Micro (1900 MHz) Cabinet

4 Tools

All the tools needed to unpack and install the cabinets, to connect the grounding cables and braids, to set the switches, to install the cables, and to perform power up, are shown in Table 4-1 on page 4-7.

Table 4-1. Tools List

Product Number	Description
N/A	Metric Tape Measure[1]
N/A	Horizontal/Vertical Level[1] (for wall mounting)
N/A	Pen
N/A	Drill[1]
N/A	Drill Bit[1] (appropriate size for use in wall mounting procedure)
LYB 250 01/14	ESD Wrist Strap and Cable[2]
LTT 601 82	Torque Wrench set, including: - Torque Wrench set to torque 0.6 Nm (to use with the SMA tool or the Torx bit TX10 - Torx bit TX10 (for cabinet unit screws) - SMA tool (for the coaxial cables)
LTD 117 02 and LTD 117 14	Unit Extractor Tool (Handle + Button)
N/A	AC Voltmeter[1] (for checking the line voltage)
N/A	Tools for connecting the AC Power Cable to a Line Power Access Point (if this is the local procedure)
[1] Included in Tool Kit LTT 601 044/1 [2] Included in Tool Case LTT 601 84	

5 Site Selection

5.1 Right-of-Way

The installing company should acquire the right-of-way from landowners and obtain permits or other approvals from public authorities before starting construction.

The RBS 884 Micro (1900 MHz) cabinet should be placed in servitudes, on dedicated (recorded) easements, or on property owned by the company. Avoid unrecorded easements.

Rooftop locations require additional considerations and approvals.

5.2 Public Safety

Public safety and street right-of-way should be used only when there is adequate space to place the cabinet and provide safe working conditions.

The cabinet should be placed so that it will not obstruct automobile or pedestrian traffic.

5.3 Vulnerability

Installation locations should be protected against accidents or vandalism. Use protective posts when installing cabinets near automobile traffic and parking areas.

Do not place the cabinets below grade or in flood-prone areas. The cabinet should always be located on a site above the 100-year flood plain. The site should not be subject to water runoff or flash flooding during heavy rains.

If an area is subject to frost, the site must be free of heaving.

For pole-mounted cabinets, ensure the pole can support the cabinet weight (approximately 230 lbs (105 kg).

5.4 Accessibility

For safety, the cabinet should be easily accessible with adequate parking.

Do not install the cabinet within 42.0 inches (1067 mm) of any obstruction, such as a fence, hedge, or tree.

6 Transportation and Storage

Caution!

Follow all appropriate local transportation, handling, and safety practices when transporting and storing the cabinet to a staging area or installation site.

The cabinet is shipped in a wood box on a wood pallet.

Warning!

To avoid possible damage to the cabinet, do not remove the packaging or pallet from the cabinet until it is at the staging area or installation site.

If the cabinet packaging appears damaged, do not accept the unit or component from the shipper. Damaged packaging could indicate cabinet or equipment damage.

Always use proper lifting equipment, such as a forklift, to raise the cabinet and pallet.

Always store the cabinet and battery components in the upright position to avoid possible damage.

Caution!

Do not stack units for transportation or during storage.

7 Unpacking

The RBS 884 Micro (1900 MHz) cabinet is shipped in a wooden box on a wood pallet.

7.1 Required Tools

The tools required to unpack the cabinet are shown in Table 4-2 on page 4-9.

Table 4-2. Tools Required to Unpack cabinet

Product Number	Description
N/A	Tamper resistant wrench (supplied with cabinet)
N/A	Socket or adjustable wrench (for pallet bolts)
N/A	Hammer
N/A	Large flat-blade screwdriver
N/A	Small flat pry bar or crow bar

7.2 Unpacking Procedure

7.2.1 Receiving Materials

Warning!

To avoid damaging the cabinet, do not remove the pallet or wooden box from the cabinet until the cabinet is transported to a staging or installation site.

1. After delivery of materials, check the packing slip to verify that all boxes and crates are received.
2. Inspect all boxes and crates for any visible damage.
3. Report any material shortages or damages to your local logistics coordinator.

7.2.2 Unpacking

1. Remove all packaging material from around the cabinet and the pallet.

   Note: Do not remove the pallet until the cabinet is ready to be lifted into the mounting position.

2. Remove the tamper-resistant wrench from the plastic bag taped to the outside of the Main Cabinet.
3. Use the tamper-resistant wrench to open the doors. Insert the wrench into a security bolt and turn it 1/4–turn counterclockwise. Repeat for the other bolt. Open the door.
4. As the door is opened, secure the wind latch at the top of the door. Open the door until the shoulder slides into the slot at the end of the bar. To release the wind latch, lift up on the bar.
5. Inspect moving parts, mounting hardware, connectors, and electronic equipment. If the cabinet or any equipment appears to be damaged, follow the local procedures or contact the logistics coordinator.
6. Check the packing slip and verify all parts ordered are received.
7. Remove all packaging and dispose of it according to local practices.

7.2.3 Lifting the Cabinet

DANGER!

To avoid injury or equipment damage, follow all local safety practices while lifting the cabinet. Wear all locally recommended safety equipment. Manual cabinet lifting is not recommended. To avoid injury, use proper lifting equipment, such as a forklift or crane. Attach any lifting equipment to lifting ears located on rear of cabinet. Check that there are no obstructions around cabinet.

Warning!

The RBS 884 Micro (1900 MHz) cabinet will tilt forward when raised by the lifting ears located on the rear of the cabinet.

Observe the following procedures when lifting the RBS 884 Micro (1900 MHz) cabinet from the pallet:

- Keep bystanders away from work operations at all times.
- Do not lift the cabinet over people. Do not let anyone work, stand, or pass under a cabinet being lifted.
- All persons working with lifting equipment must wear standard safety headgear and (when required) gloves.
- When lifting the cabinet and pallet with a forklift, do not damage cabinet with forks. Lift from the open ends of the pallet.
- For installations where the cabinet will be mounted at higher locations on a wall or pole, a crane or similar lifting equipment is recommended. Do not attempt to manually lift cabinet. Follow all local safety practices.

7.2.4 Removing Cabinet from Pallet

Perform the following steps to remove the cabinet from the pallet:

1. Locate the four pallet mounting bolts. There are four bolts (one in each corner) in the bottom of the cabinet. Using a socket wrench or adjustable wrench, remove the four pallet mounting bolts.
2. Secure the cabinet door before moving the cabinet.

8 Cabinet Installation

This section describes procedures for installing the RBS 884 Micro (1900 MHz) cabinet on a pad, pole, wall, or roof. Manual cabinet lifting is not recommended. The RBS 884 Micro (1900 MHz) cabinet requires mechanical lift assistance for wall or pole mounting. Attach any lift devices to lifting ears on rear of cabinet. If required, a temporary support structure can be installed prior to installing the cabinet. Position the cabinet on the support structure during installation. Do not stand under cabinet at any time. Follow all safety precautions described in Section 7.2.3 on page 4-11.

8.1 Required Materials and Tools

8.1.1 Materials

Refer to the *CMS 8800 Site Materials Catalog* for general materials to install the RBS 884 Micro (1900 MHz) antennas and cables. Cabinet mounting materials are specified in the individual installation procedures.

8.1.2 Tools

The tools required to mount RBS 884 Micro (1900 MHz) cabinets are shown in Table 4-3 on page 4-12.

Table 4-3. Tools for Cabinet Installation

Product Number	Description
N/A	Mechanical lifting equipment capable of supporting cabinet weight (refer to local safety procedures)
N/A	Metric Tape Measure
N/A	Horizontal/Vertical Spirit Level
N/A	Pen
N/A	Drill
N/A	Appropriate Size Drill Bit
N/A	Socket Wrench
N/A	Ratcheting Box Wrench

8.2 Installation on a Pad

The pedestal base mounting kit is used for pad mounting RBS 884 Micro (1900 MHz) cabinets. The pedestal base mounts on a concrete pad and is used as the base for the cabinet. A removable front panel allows easy access for installation of the pedestal, cabinet, and any cables.

Knock-outs are provided at both ends for routing the cables through the side walls of the pedestal base to the underside of the cabinet floor. The knock-outs are not used if the cables enter the pedestal through conduits from beneath the pad.

Perform the following to install the RBS 884 Micro (1900 MHz) on a pad:

1. Clean all litter from the foundation pad surface.

2. Dress the cable or conduit to avoid interference with the pedestal base installation.

3. Remove any bolts and washers installed in the concrete anchors. Set the hardware aside to attach the pedestal base to the pad.

4. Locate the Pedestal Mounting Kit.

5. Place the pedestal base on the concrete pad. Figure 4-2 on page 4-13 illustrates the pedestal base. Align the pedestal base with the screw anchors that were installed when the concrete pad was poured. If the screw anchors were not installed at that time, use the pedestal base to mark the mounting holes for the anchors and drill. See Figure 4-3 on page 4-14 for the location of the mounting holes on the pedestal base.

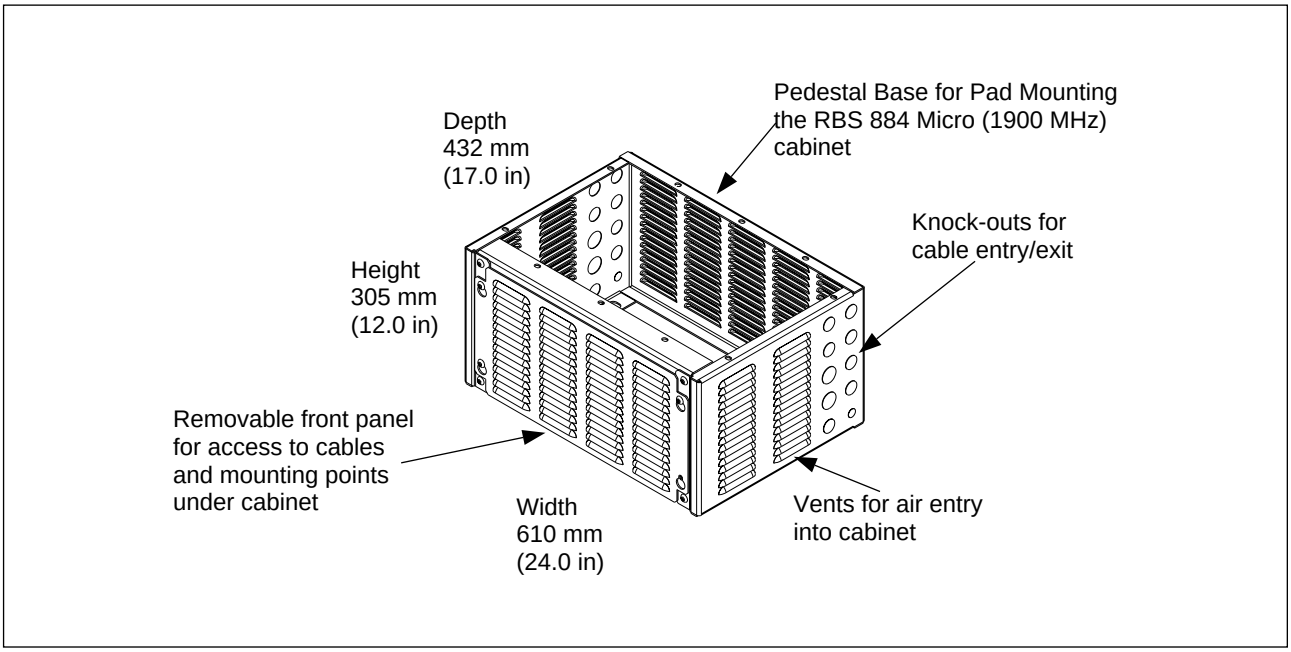


Figure 4-2. Pedestal Base

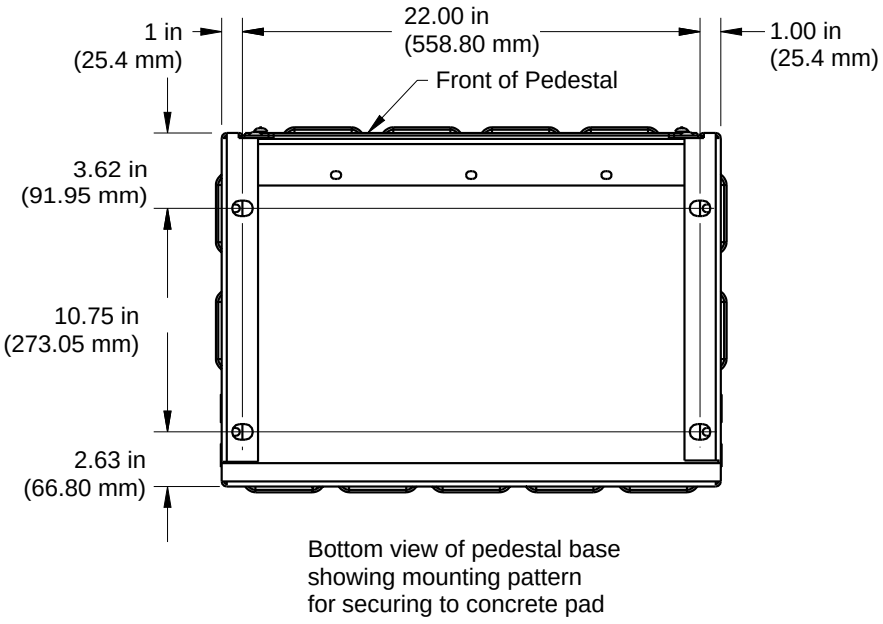


Figure 4-3. Bottom View of Pedestal Mount

6. Attach the pedestal base to the concrete pad and secure with the appropriate size bolts.

7.

DANGER!

To avoid injury or equipment damage, follow all local safety practices while lifting the cabinet. Wear all applicable locally approved safety equipment. Manual cabinet lifting is not recommended. Use proper lifting equipment. Attach any lifting devices to lifting ears on rear of cabinet. Keep bystanders away from work operations at all times.

Warning!

The RBS 884 Micro (1900 MHz) cabinet will tilt forward when raised by the lifting ears located on the rear of the cabinet.

Place the cabinet onto the pedestal pad mount. Check that the cabinet is aligned with the pedestal.

8.

Warning!

Until the mounting hardware secures the cabinet to the pedestal base, the cabinet is unstable and could fall off the base causing injury or equipment damage. Make sure the cabinet is safely supported until it is secured to the pedestal base.

Using the tamper-resistant wrench, remove the front panel on the pedestal base. Secure the cabinet to the pedestal base using the ten 1/2”-13 bolts, flat washers, and lock washers. Tighten all bolts securely.

9. If not using cabinet mounted antennas, remove lifting ears from the cabinet (optional).

10. Install any cabinet mounted antennas.

8.3 Installation on a Pole

Perform the following to install the RBS 884 Micro (1900 MHz) on a pole:

Warning!

For installations where the RBS 884 Micro (1900 MHz) cabinet will be pole mounted, a crane or similar lifting equipment is required. Ensure the cabinet is supported by the lifting equipment at all times during the installation. The cabinet will tilt forward when raised by the lifting ears located on the rear of the cabinet. Keep bystanders away from the work area at all times.

1. Locate the Pole-Mount Kit.

2. Identify the mounting bracket, straps, strap tension brackets, and mounting hardware. A fully assembled Pole Mount is shown in Figure 4-4 on page 4-16.

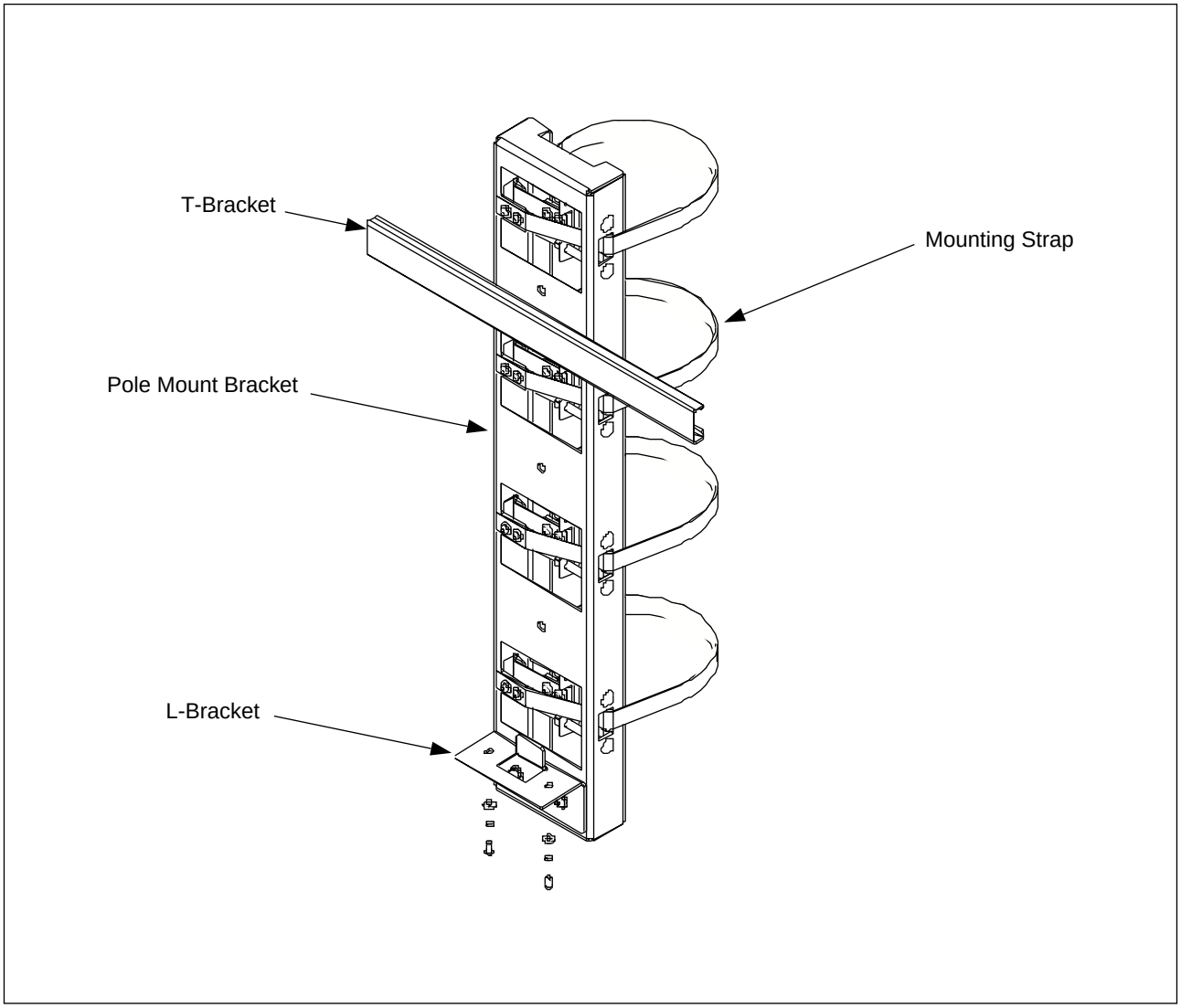


Figure 4-4. Pole-Mount Assembly

3. Attach the mounting straps to the strap tension brackets using two screws, two lock washers, and two flat washers. See Figure 4-5 on page 4-17 for a close-up of the bracket assembly.

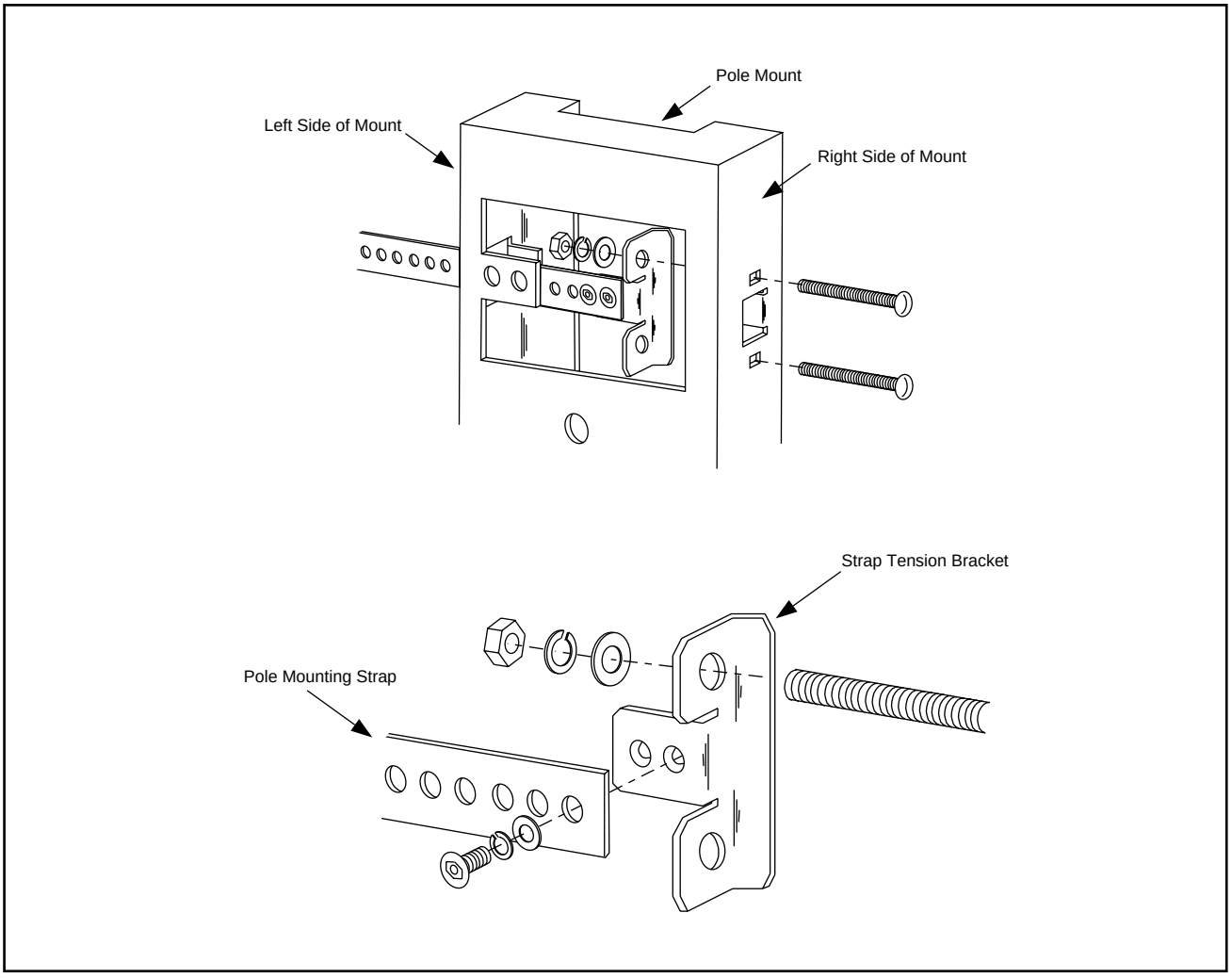


Figure 4-5. Pole-Mount Bracket Assembly

4. Slide the assembled straps through the rear of the bracket and out the left side holes. Ensure the tension bracket holes are facing the right side of the bracket. See Figure 4-5 on page 4-17.

5. For each tension bracket, install two carriage bolts through the right side of the pole-mount bracket and through the strap tension bracket.

6. Slip a washer, a lock washer, and a nut on the ends of the carriage bolts. Do not tighten nuts on carriage bolts.

7. Place the pole-mount bracket on the pole at the desired height and wrap mounting straps around the pole.

8. Insert loose end of strap through strap hole on right side of bracket. Pull strap tight and attach to front strap mounting tab. See Figure 4-6 on page 4-18.

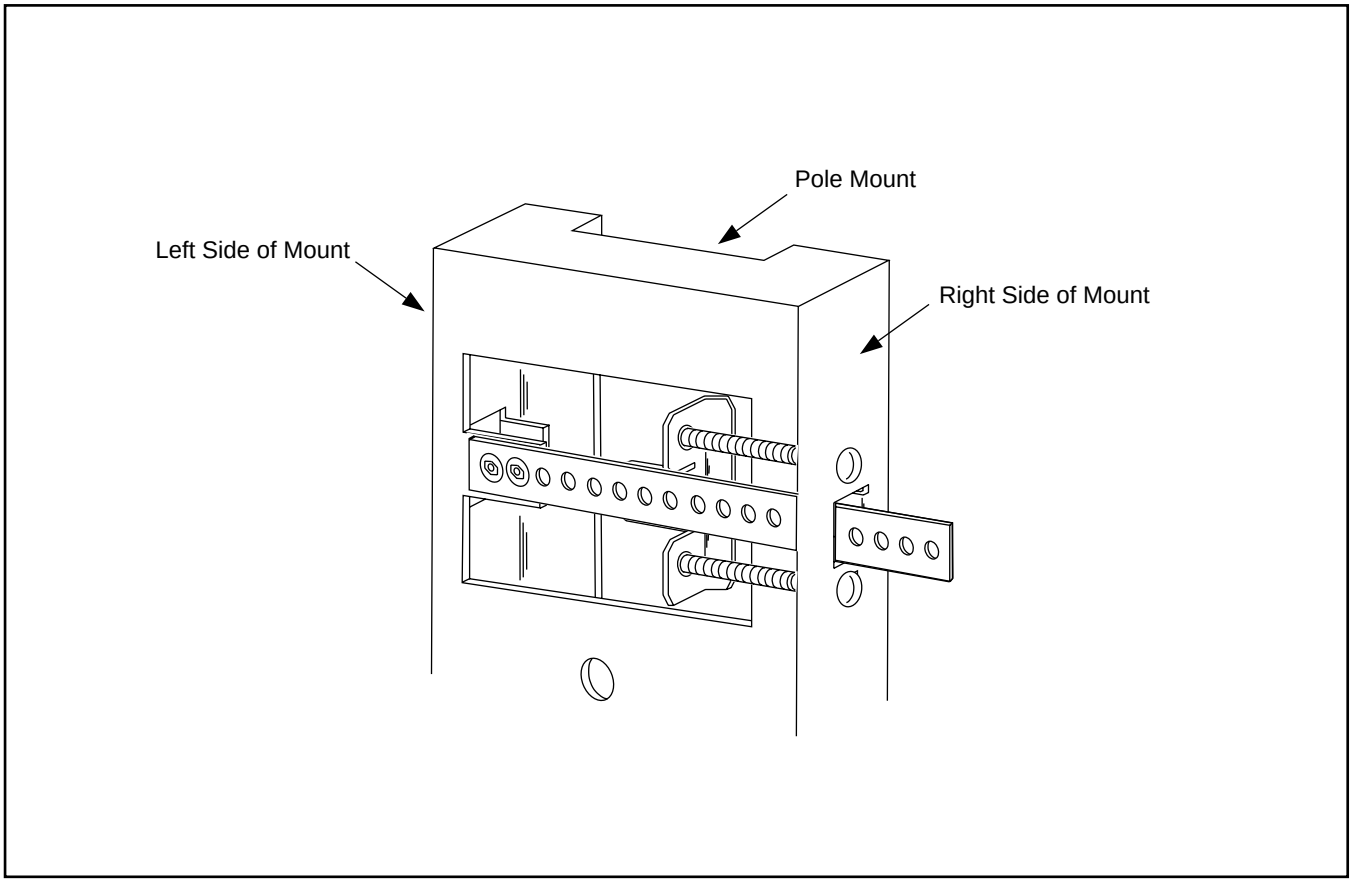


Figure 4-6. Pole-Mount Strap Attachment

9. Ensure the bracket is level and tighten the nuts on the carriage bolts using a ratcheting box wrench. See Figure 4-7 on page 4-19.

Note: If the pole-mount bracket is to be bolted to a pole, mark and drill holes in the pole prior to lifting bracket into location. If two or more cabinets are to be installed, a minimum of 12 inches (305 mm) clearance must be maintained between cabinets.

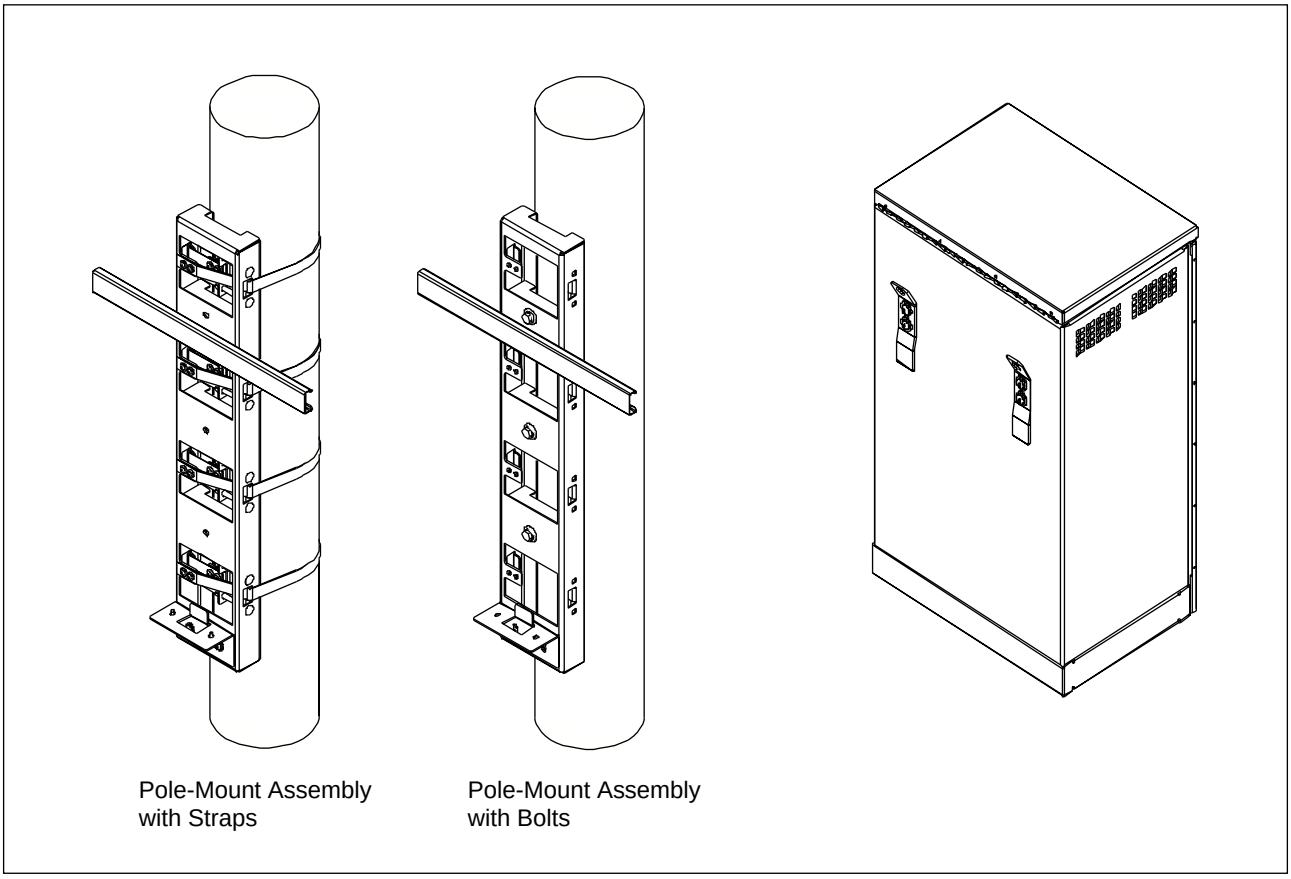


Figure 4-7. Pole-Mount Assembly Installations

10. Using metal cutting shears or a saw, remove the excess strap.

11. Loosely attach the L-bracket to the pole mount assembly using two screws, two lock washers, and two flat washers. See Figure 4-4 on page 4-16 for the position of the L-bracket on the pole mount assembly.

12. If required, attach the cabinet mounted antenna bracket to the cabinet. The bracket is installed behind the lifting ears on the rear of the cabinet.

13. Locate the four mounting bolts (one in each corner) in the base of the cabinet. Remove the four pallet mounting bolts. Remove the pallet and dispose in accordance with local practices.

14. Secure the cabinet door before lifting the cabinet.

15.

Warning!

Ensure the cabinet is supported by the lifting equipment at all times during the installation. The RBS 884 Micro (1900 MHz) cabinet will tilt forward when raised by the lifting ears located on the rear of the cabinet. Do not lift the cabinet over people. Do not let anyone work, stand, or pass under a cabinet while it is being lifted.

Attach the lifting cables or sling to the lifting ears on the mounting bracket. Carefully lift the cabinet and install the cabinet on the mounting bracket. See Figure 4-8 on page 4-20.

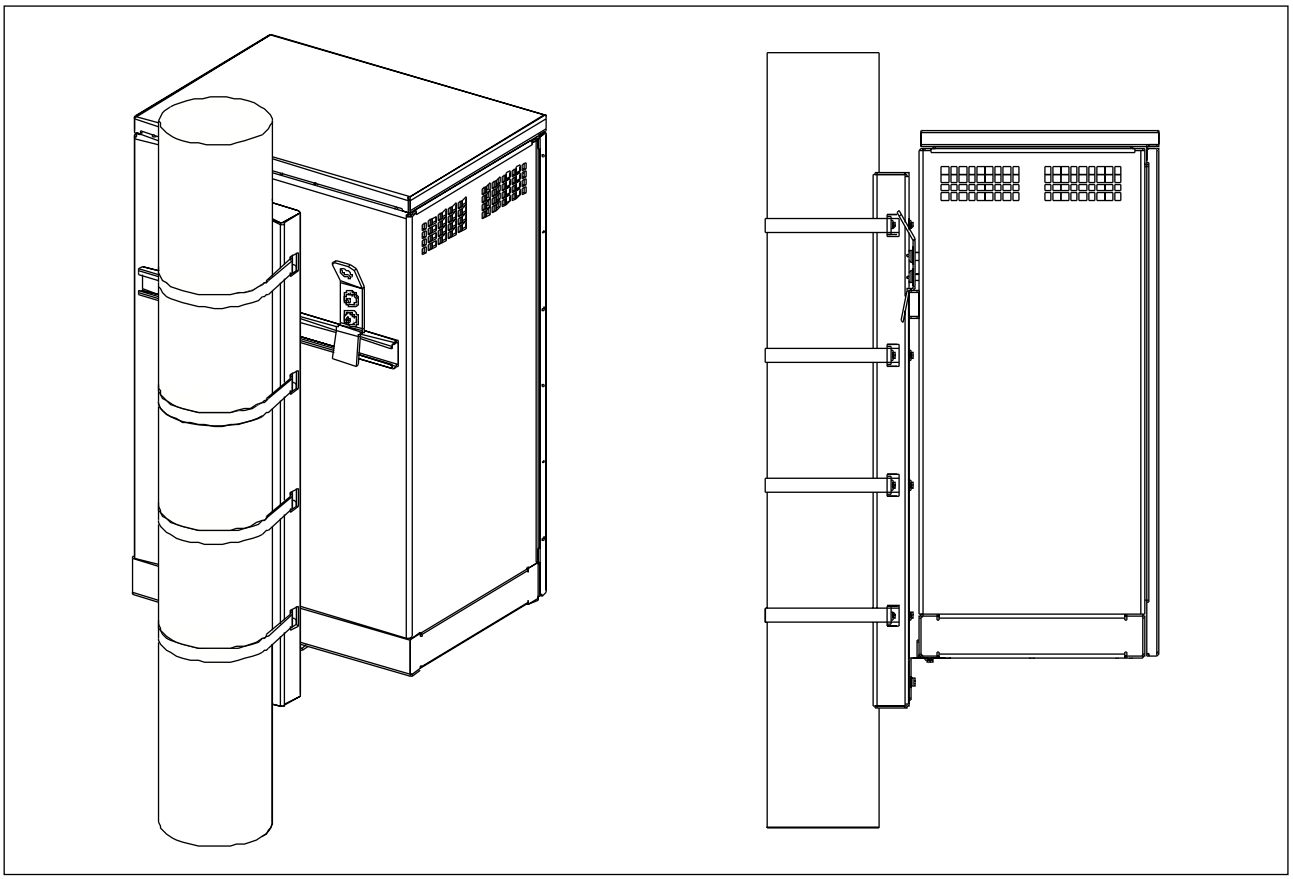


Figure 4-8. Cabinet Installed on Pole-Mount Assembly

16. If required, adjust cabinet horizontally to align with L-bracket.

17. Attach the L-bracket to the bottom of the cabinet using two screws, two lock washers, and two flat washers. Tighten all L-Bracket screws with the tamper-resistant wrench.

18. Install any cabinet mounted antennas to the antenna bracket.

8.4 Installation on a Wall

Perform the following to install the RBS 884 Micro (1900 MHz) on a wall:

Warning!

Ensure the cabinet is supported by the lifting equipment at all times during the installation. The RBS 884 Micro (1900 MHz) cabinet will tilt forward when raised by the lifting ears located on the rear of the cabinet. A fully configured cabinet weighs over 105 kg (230 lbs). Ensure the wall can support the cabinet. Reinforce the wall structure if necessary.

1. Ensure the cabinet is upright
2. Locate the Wall-Mount Kit.

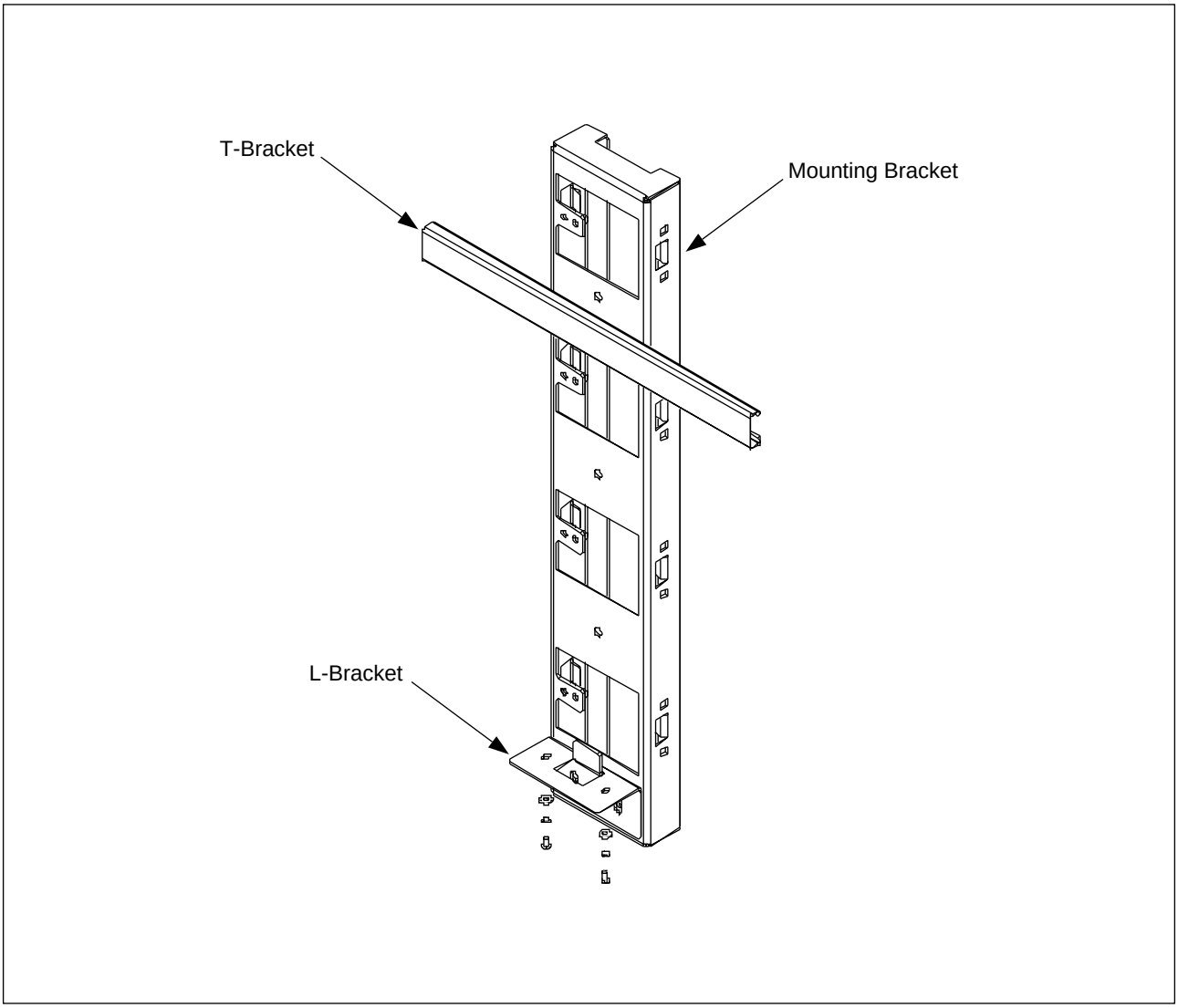


Figure 4-9. Wall-Mount Assembly

3. Identify the mounting bracket, and mounting hardware. A fully assembled Wall Mount Assembly is shown in Figure 4-9 on page 4-21.

4. Locate the place on the wall where the bracket will be mounted and drill holes appropriate for the length of the anchor to be used. Table 4-4 on page 4-22 is a list of the suggested anchoring hardware.

Table 4-4. Wall Anchors

Type of Wall	Recommended Anchor
Masonry	4-1/4-in. x 1-1/4-in. hammer drive anchors
Wood	4-1/2-in. No. 14 RH galvanized wood screws
Hollow	Hollow wall mounting not recommended

5. Secure the bracket to the wall using an appropriate anchor. See Figure 4-10 on page 4-22. Level the bracket before tightening the bolts.

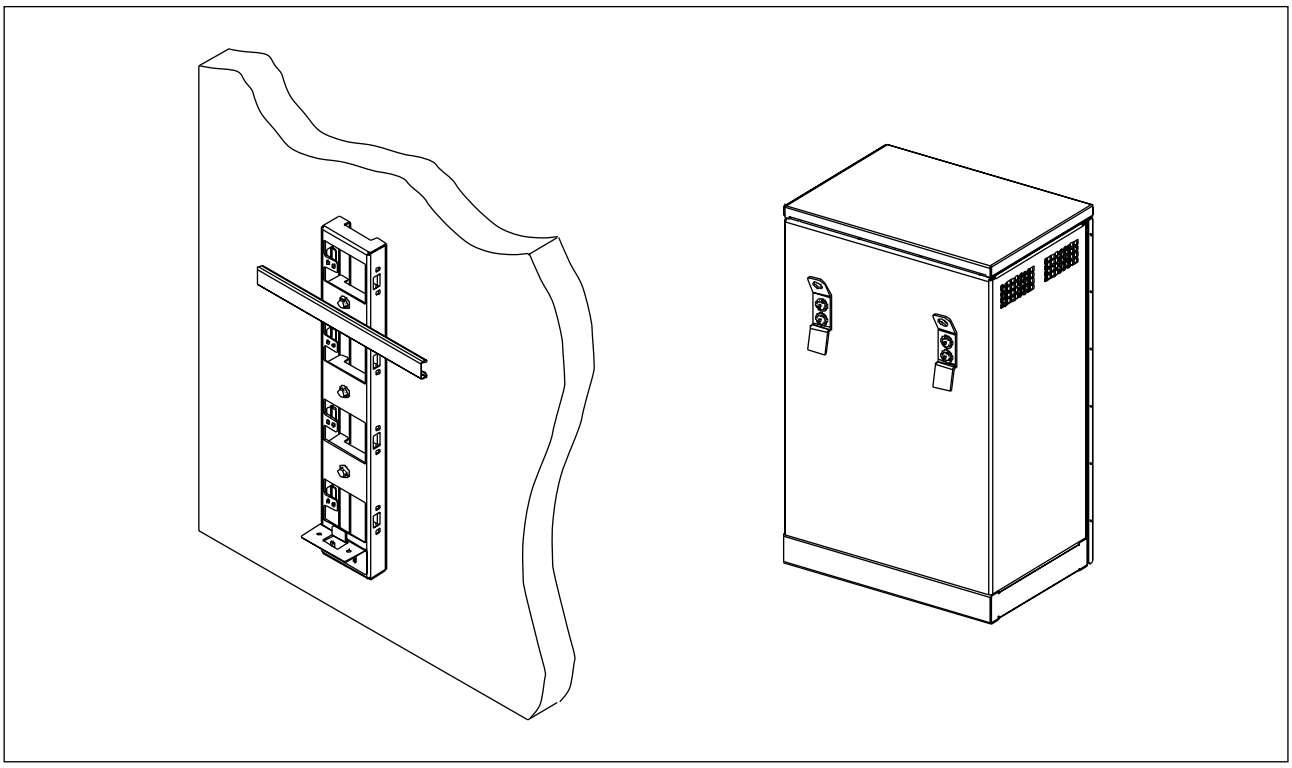


Figure 4-10. Wall-Mount Assembly Installed on Wall

6. Loosely attach the L-bracket to the wall mount assembly using two screws, two lock washers, and two flat washers. See Figure 4-9 on page 4-21 for the position of the L-bracket on the wall mount assembly.

7. If required, attach the cabinet mounted antenna bracket to the cabinet. The bracket is installed behind the lifting ears on the rear of the cabinet.

8. Locate the four mounting bolts (one in each corner) in the base of the cabinet. Remove the four pallet mounting bolts. Remove the pallet and dispose of it in accordance with local practices.

9. Secure the cabinet door before lifting the cabinet.

10.

Warning!

A fully configured cabinet weighs 105 kg (230 lbs). Mechanical lifting equipment is required to lift cabinet into position. Manual lifting is not recommended.

Lift the cabinet and place it on the cross arm bracket.

11. If required, adjust cabinet horizontally to align with L-bracket.

12. Attach the L-bracket to the bottom of the cabinet using two screws, two lock washers, and two flat washers. See Figure 4-11 on page 4-23. Tighten all L-Bracket screws with the tamper-resistant wrench.

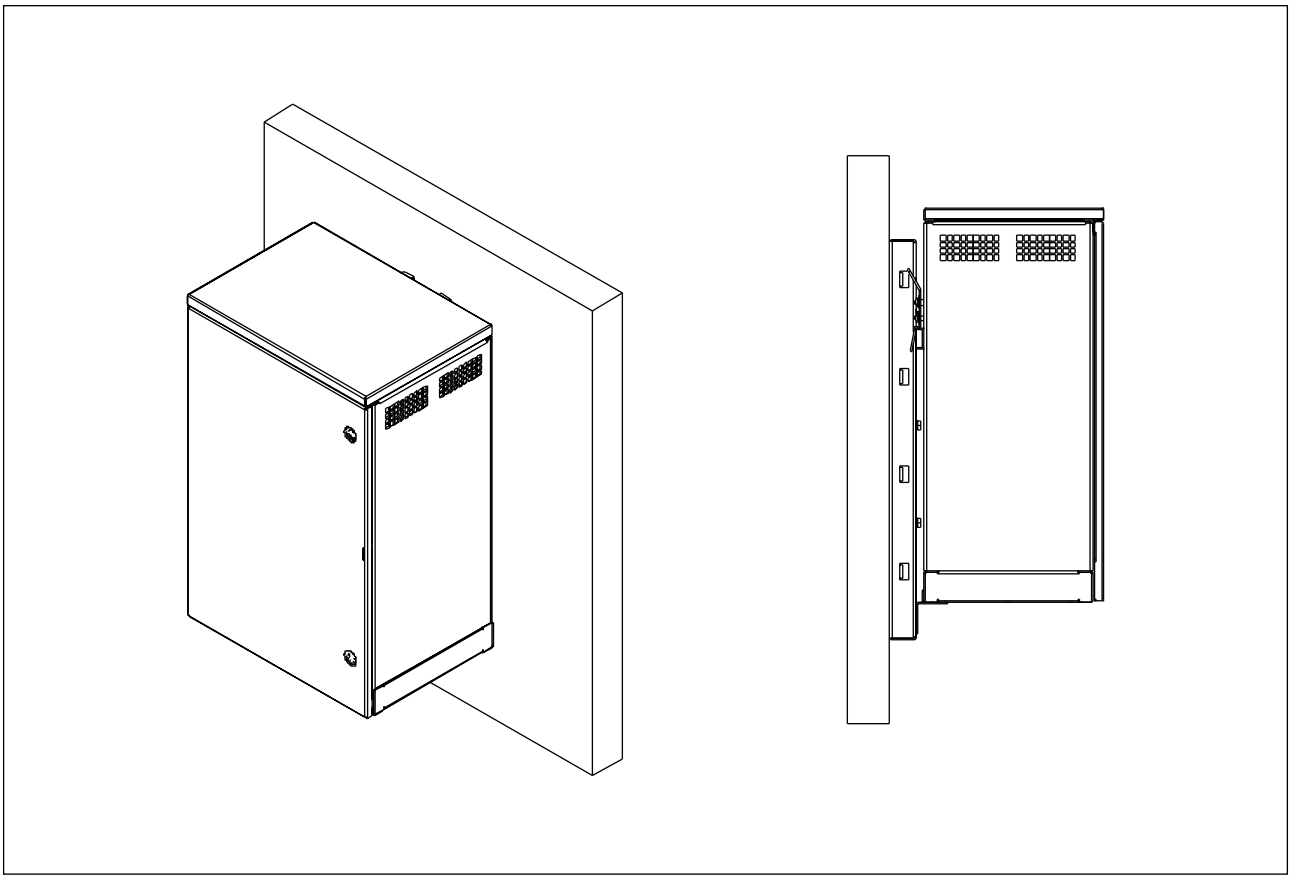


Figure 4-11. Wall Mounted cabinet

13. Install any cabinet mounted antennas to the antenna bracket.

8.5 Installation on a Roof

Perform the following to install the RBS 884 Micro (1900 MHz) on a roof:

1. Locate the four base mounting bolts (one in each corner) in the bottom of the cabinets.

2. Remove the four pallet mounting bolts. Remove the pallet and dispose of in accordance with local practices.

3. Secure the cabinet door before lifting the cabinet.

4. Roof mounted cabinet installations vary depending on the site configuration and type of roof. Refer to the *RBS 884 Site Engineering Manual* for further information on a roof mounted cabinet.

9 Cable and Power Connections

9.1 Grounding

Warning!

Follow all local safety practices, observe all general safety precautions, and wear all appropriate locally approved safety equipment when performing any grounding procedures. Perform all required testing before and after cabinet installation. Only qualified personnel or electricians should install the ground connections.

Caution!

Ensure all local building codes and National Electrical Code® (NEC) are met when installing grounding.

Note: Ensure all ground connections are clean and free of oxidation or rust. Clean all contact surfaces as required.

9.1.1 Perimeter Ground (Pad-Mount only)

1. Before installing cabinet, ensure the ground ring is installed and all antennas are grounded as described in the *RBS 884 Site Engineering Manual*.
2. Install coaxial transmission cable to the RBS 884 Micro (1900 MHz). The 50 ohm cable connects to the lightning surge suppressors on the earthing plate.
3. Use an ammeter and check to ensure there is no AC or DC current on cables already terminated to the earth ground point. If current is present, take steps to isolate circuit and remove current from cables.

9.1.2 Cabinet Ground Cabling

The RBS 884 Micro (1900 MHz) earth ground is connected to an external grounding lug located on the bottom shell of the cabinet.

9.2 Installing Batteries

DANGER!

Equipment temperatures can reach up to 60°C (140°F). Use extreme caution when working around the battery enclosure or other internal components.

Warning!

To avoid injury or equipment damage, follow all locally approved safety practices and wear appropriate safety equipment when working with batteries. Turn off power to the MAIN circuit breaker (40A) to ensure no power is supplied to the cabinet.

A +24Vdc battery system is standard with the cabinet for two minutes of battery reserve. Two 12V batteries are installed in the battery tray in the lower left area of the cabinet. The batteries are connected in series by a copper strap.

All batteries are configured with steel cases for applications where temperatures can reach up to 60°C (140°F).

Perform the following steps to install the batteries into the tray and connect the batteries to the system:

Note: The DC power supply float voltage is calibrated for +27.0 to +27.6 Vdc at the batteries. The float is set at the factory and is not adjusted by the user.

1. Position the **BAT** circuit breaker on the left side of the AC/DC Distribution Box to OFF. See Figure 4-12 on page 4-27.
2. Remove the four screws from the battery cover and remove the cover from the battery compartment.
3. If installed, remove the battery hold-down bracket(s) from left wall of battery compartment.
4. Remove the battery tray from the battery compartment. Ensure battery heater remains in position in bottom of compartment.
5. Install the batteries into the battery tray as illustrated in Figure 4-13 on page 4-28. Attach the hold-down bracket to the battery tray.

   Note: Torque battery bolts to 50 in-lbs maximum.
6. Connect the center terminals (positive terminal of battery one to negative terminal of battery two) with the copper strap. Do not tighten the negative terminal of battery two at this time. See Figure 4-13 on page 4-28
7. Connect the battery cable assembly to the batteries as follows:
   - Connect the 8-gauge red cable to the positive terminal (+) of battery two. See Figure 4-13 on page 4-28.

     Note: Ensure that the battery connections will not contact wall of battery compartment or cover. Reposition connectors as necessary to provide clearance.
   - Connect the 8-gauge black cable to the negative terminal (-) of battery one.
   - Connect one of the 18-gauge white wires labeled POST to the negative terminal of battery one. Connect the other 18–gauge white wire to the negative terminal of battery two.
8. Tighten all remaining battery connections.
9. Install the battery tray assembly in the battery compartment. Ensure the battery cable assembly is not pinched against the battery compartment. Ensure the battery heater is in proper location under battery tray.
10. Place the hold-down bracket over the screw on the side wall of the battery compartment. Secure with a hex nut.
11. Connect the power connector of the battery cable assembly to the connector at the top of the battery compartment.
12. Connect the Failed Battery Sensor connector.
13. Install the battery cover on the battery compartment with the four screws.

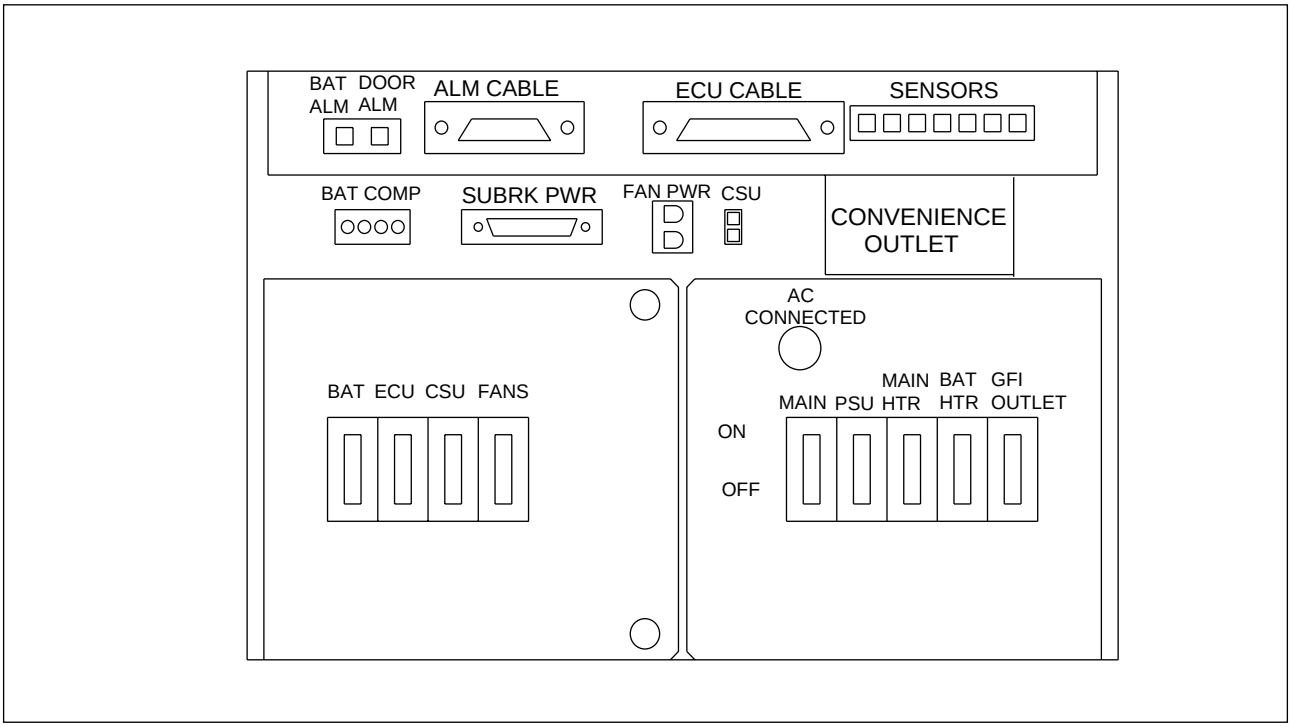


Figure 4-12. AC/DC Distribution Box

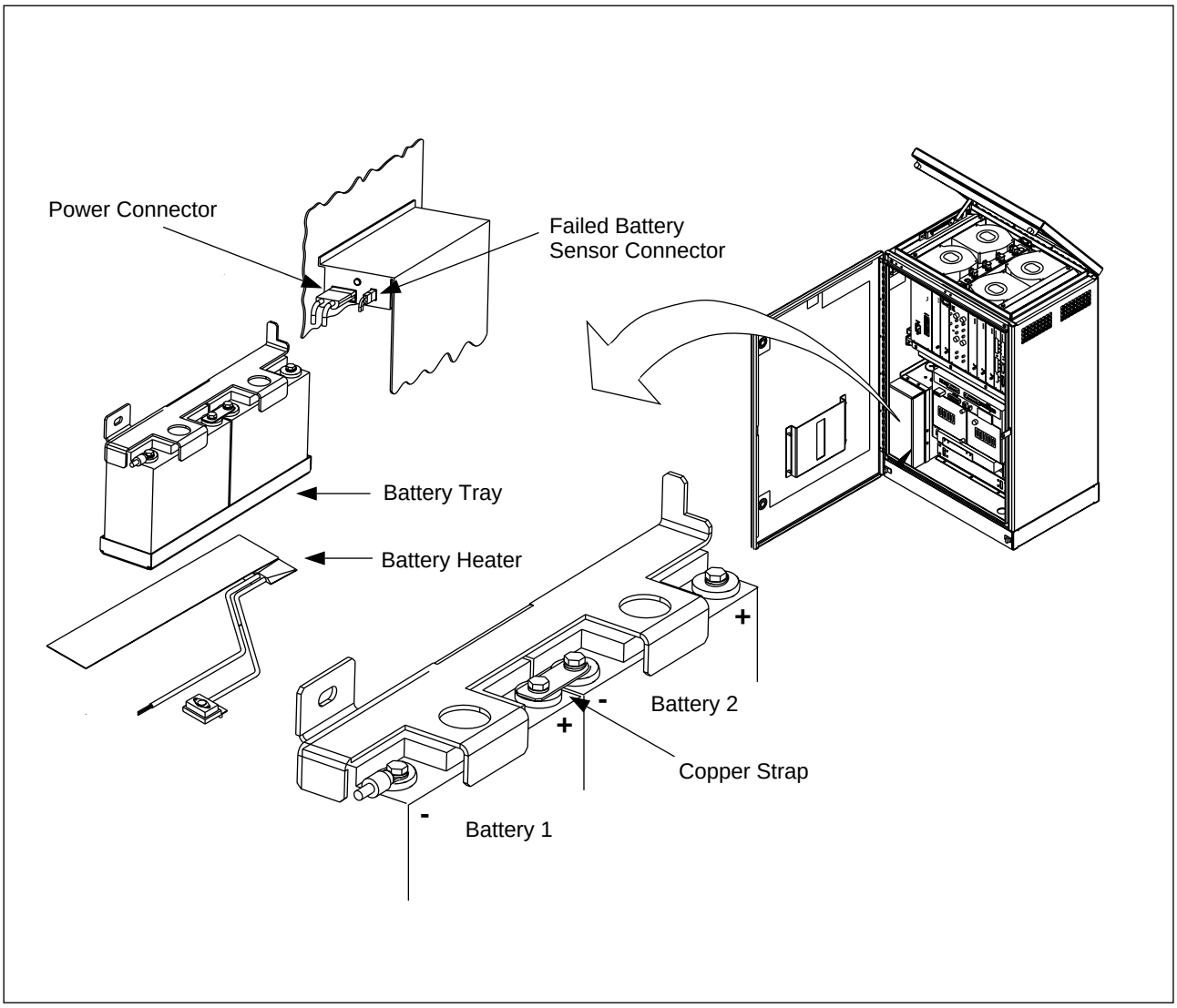


Figure 4-13. Battery Installation in Cabinet

9.3 Installing AC Power

DANGER!

AC power can result in death, injury, or equipment damage. Observe all safety precautions as specified by local building codes and the National Electrical Code® (NEC). All procedures should only be performed by qualified personnel.

DANGER!

Note: The cabinet requires 110V, 60 Hz or 230V, 50 Hz two-wire plus ground commercial power. All AC equipment from the service drop to the pad is provided locally. Consult the NEC and local codes for the correct wire size. Figure 4-14 on page 4-29 shows the location of the AC/DC Distribution Box in the cabinet.

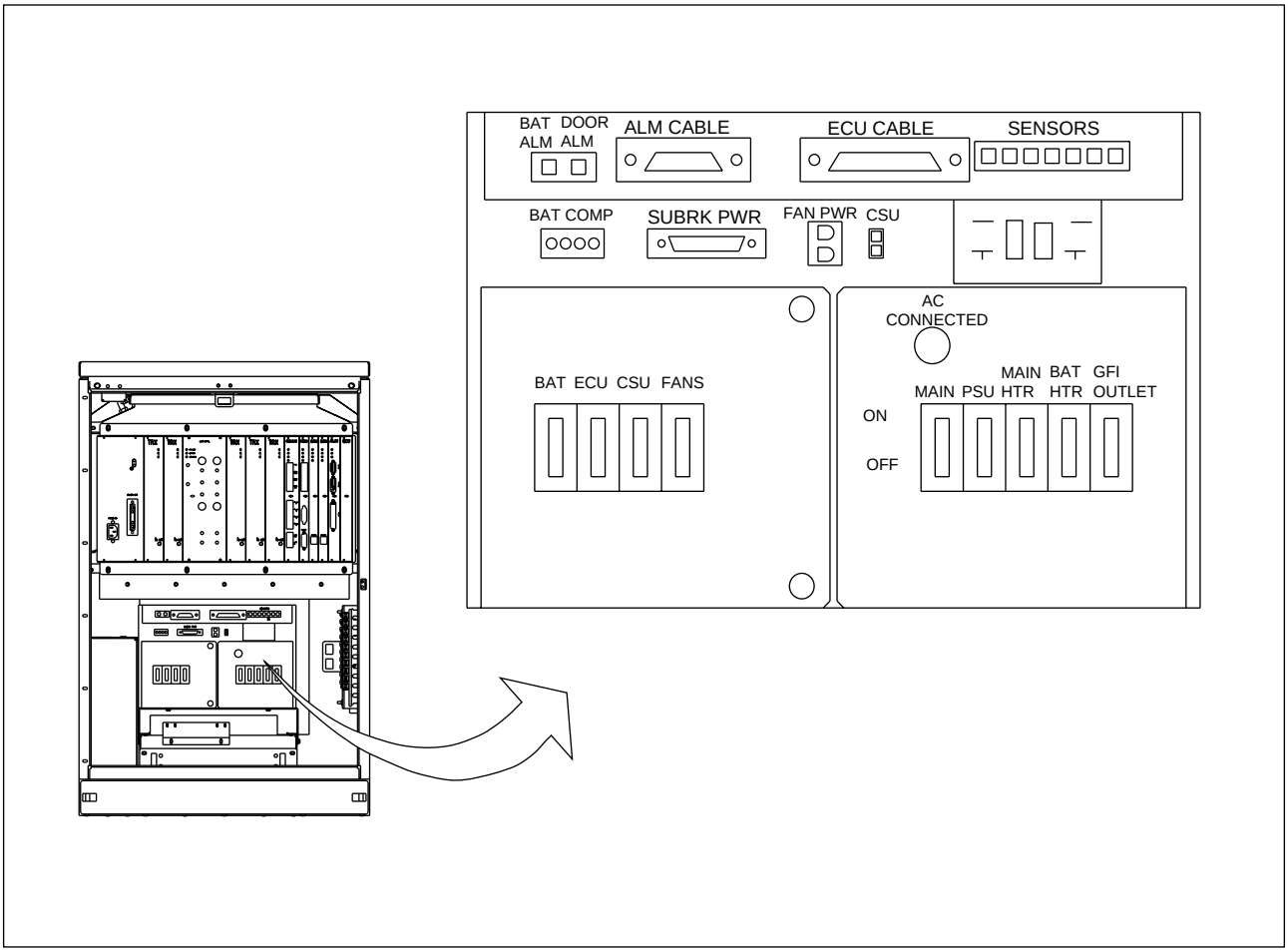


Figure 4-14. AC/DC Distribution Box

Before installation, ensure that the AC ground system is installed. The ground system must be in compliance with local practices and building codes. Refer to the *RBS 884 Site Engineering Manual* for more information.

To install AC power, Perform the following:

1. Open the cabinet and open the AC/DC Distribution Box.
2. The opening in the bottom of the cabinet is sealed with a conduit fitting to prevent air and water leakage into the cabinet. The conduit fitting has threads that extend through the bottom of the cabinet.
3. Pull AC and ground wires through conduit into the AC/DC Distribution Box.
4. Connect ground wire to ground bus inside AC/DC Distribution Box.
5. Connect neutral wire to neutral bus inside AC/DC Distribution Box.
6. Remove clear cover from rear of circuit breakers.
7. Connect the L1 (Line 1) wire to AC main breaker bus (line bus) inside AC/DC Distribution Box. The minimum recommended wire size is 8 AWG (type THHN or equivalent.) Refer to Figure 4-15 on page 4-31.
8. Replace clear cover on rear of circuit breakers and close AC/DC Distribution Box.
9. Bring the external AC conduit up to the bottom of the cabinet and connect it to the threaded internal AC conduit fitting.

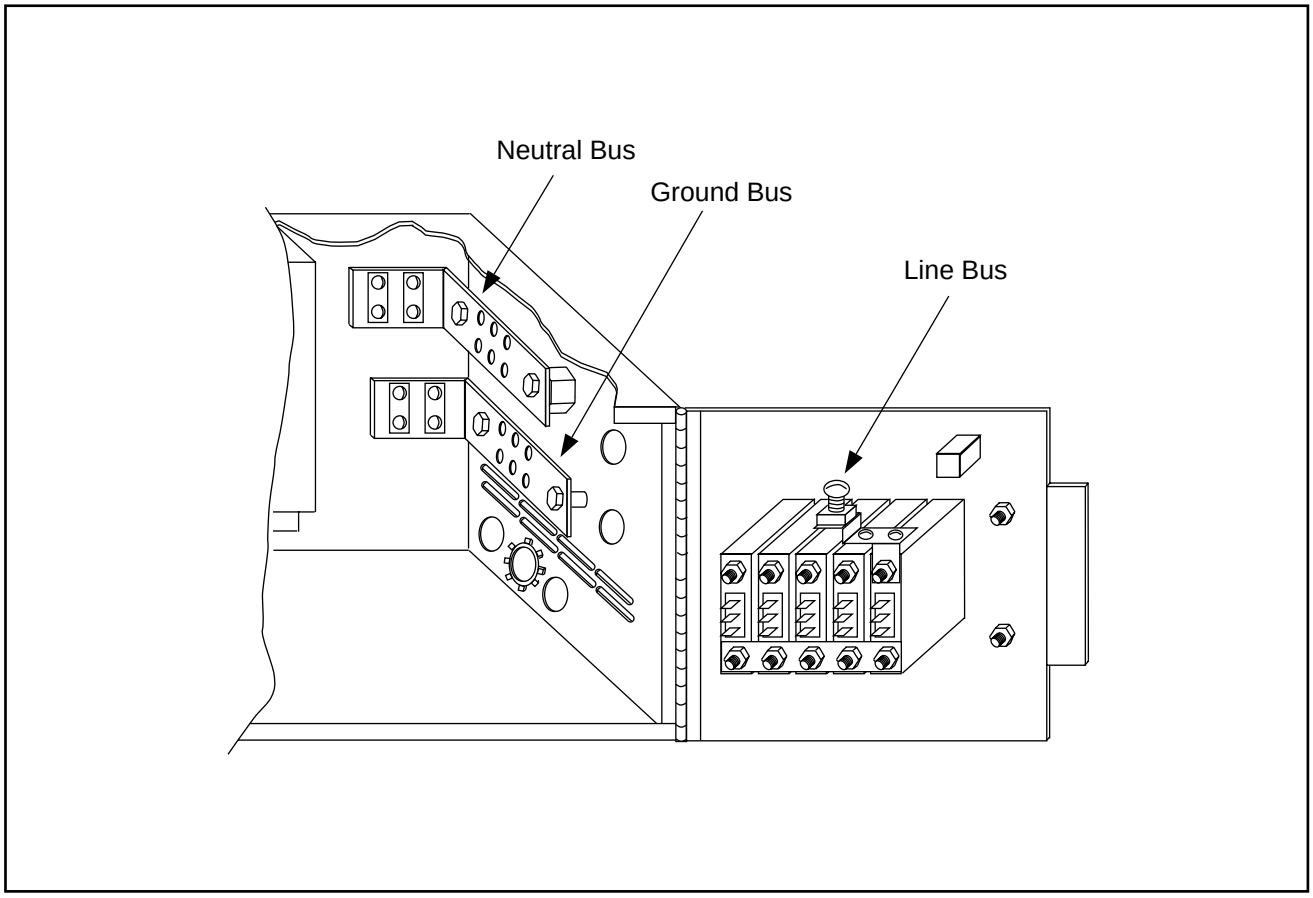


Figure 4-15. AC/DC Distribution Box

9.4 Cable Installation

Each RBS 884 cabinet arrives on site with internal cables pre-installed. These cables are described in the *Internal Cables* appendix in this manual.

This section describes installing external cables in the cabinet. Use the procedure for one of the following types of installation:

- Pedestal (Pad) Mount, Section 9.4.1 on page 4-32
- Pole Mount, Section 9.4.2 on page 4-38
- Wall Mount, Section 9.4.3 on page 4-39
- Roof Mount, Section 9.4.4 on page 4-39
- Site Expansion, Section 17 on page 4-62

Caution!

Ensure all site grounding is installed and functioning before installing cables. Observe all local safety precautions and wear all appropriate locally approved safety equipment during installation procedures.

9.4.1 Pedestal Mount Cable Installation

Caution!

When installing coaxial cable or cable conduit, follow the minimum bending radius requirements for the type of cable being installed.

To install cables in a cabinet with a pedestal mount, perform the following:

1. Using a tamper resistant wrench, remove the front panel from the pedestal base so cables or conduit can be routed to the cabinet. See Figure 4-17 on page 4-36

   Note: This cable installation procedure is for above ground conduit routing. Refer to the *RBS 884 Site Engineering Manual* for information about below ground conduit routing.

2. Route the T1(E1) conduit into the base of the cabinet. See Figure 4-17 on page 4-36 and Figure 4-18 on page 4-37.
3. Route the antenna cables into the base of the cabinet. See Figure 4-17 on page 4-36 and Figure 4-18 on page 4-37.

   Note: When running antenna cables through the pedestal base knockouts, protect the cables with strain relief grommets or other appropriate materials.

4. Verify that the AC power conduit and earth ground have been routed into the base of cabinet. See Figure 4-17 on page 4-36 and Figure 4-18 on page 4-37.
5. Route the antenna jumper cables into the base of the cabinet and connect them to the antenna connectors on the bottom of the earthing plate. See Figure 4-18 on page 4-37.
6. Bond and ground the T1(E1) drop wires according to local practices before installing them into the cabinet.

7. Route the T1(E1) cable through conduit into the base of the cabinet. Connect cable to the T1(E1) Primary Surge Suppressor located on the right-hand side of the cabinet. See Figure 4-16 on page 4-35 for further information on this procedure. See Figure 4-19 on page 4-38 for a close-up view of the T1(E1) Primary Surge Suppressor and Table 4-5 on page 4-33 for information on the input connections. Note that the connector block is grounded to the I/O plate at the factory.

   Note: The hex-nut activators on the T1(E1) Primary Surge Suppressor block are colored white for tip wires and orange for ring. The large ports under the activator clock accommodate 18.5 to 20 AWG wire termination. The small ports accommodate 22 to 24 AWG wire termination. Wire stripping or staggering is not needed when using the T1(E1) Primary Surge Suppressor block. The Primary Surge Suppressor provides straight-through access for wire terminations.

8. Trim the ends of the wire. Split the drop leads approximately two inches. Using a standard 216–type wrench, carefully back off the activator screw until you feel a stop. The wrench will lift up approximately 1/4–inch into the open position.

9. Insert the wire into the large or small port on the side of the activator. Tighten the hex nut on the top of the activator until the tensions stops. Do not overtighten.

10. If testing or if a talk pair is needed, insert test leads into the hex nut on the appropriate activator.

11. To reinstall wires, trim the wire ends and split the drop wire leads approximately two inches and terminate according to the above procedure.

12. After wiring, keep all activators in the down position for good housekeeping.

13. After all cables are installed, turn on the AC power.

14. Watch the Power Light Emitting Diodes (LEDs) on each board and verify the unit is operating properly. Consult the troubleshooting section in the *Hardware Replacement* part of this manual for units that are malfunctioning.

Table 4-5. T1(E1) Input Connections to Primary Surge Suppressor

Terminal No.	REMUX Connector Port	T1(E1) Cable	T1(E1) Pair No.	Wire
1 (white)	PCM/Prim	Transmit to Network	1	Tip
1 (orange)	PCM/Prim	Transmit to Network	1	Ring

Table 4-5. T1(E1) Input Connections to Primary Surge Suppressor (Continued)

2 (white)	PCM/Prim	Receive from Network	2	Tip
2 (orange)	PCM/Prim	Receive from Network	2	Ring
3 (white)	PCM/Sec	Transmit to Network	1	Tip
3 (orange)	PCM/Sec	Transmit to Network	1	Ring
4 (white)	PCM/Sec	Receive from Network	2	Tip
4 (orange)	PCM/Sec	Receive from Network	2	Ring
5 (white)		Not used		
5 (orange)		Not used		

Table 4-6. T1 Output Connections to Primary Surge Suppressor

RJ45 Conn	Pin No.	T1(E1) Cable	T1(E1) Pair No.	Wire
J1	5	Transmit to Network	1	Tip
J1	4	Transmit to Network	1	Ring
J1	1	Receive from Network	2	Ring
J1	2	Receive from Network	2	Tip
J2	5	Transmit to Network	1	Tip
J2	4	Transmit to Network	1	Ring
J2	1	Receive from Network	2	Ring
J2	2	Receive from Network	2	Tip

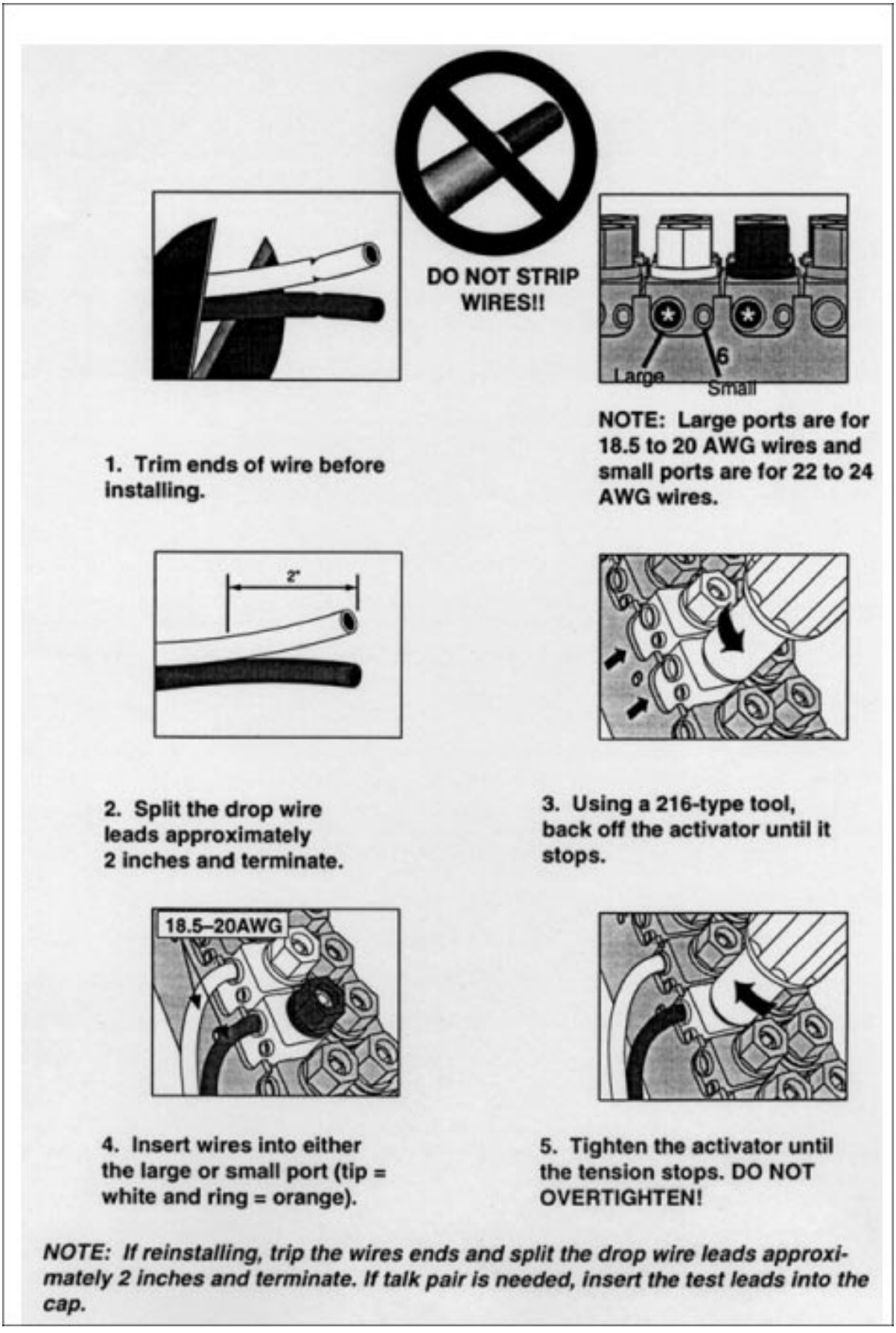
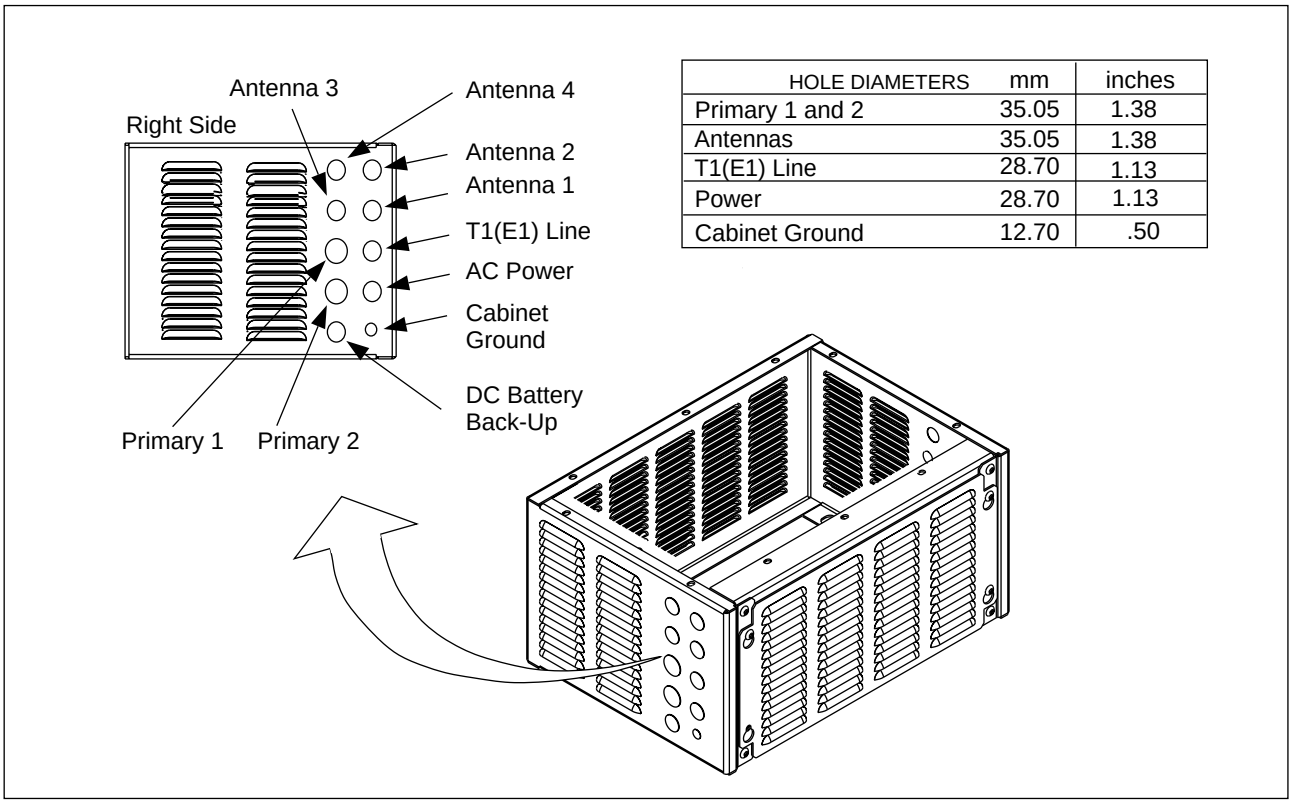


Figure 4-16. Terminating Wires in T1 Surge Protector



HOLE DIAMETERS	mm	inches
Primary 1 and 2	35.05	1.38
Antennas	35.05	1.38
T1(E1) Line	28.70	1.13
Power	28.70	1.13
Cabinet Ground	12.70	.50

Figure 4-17. Pedestal Mount

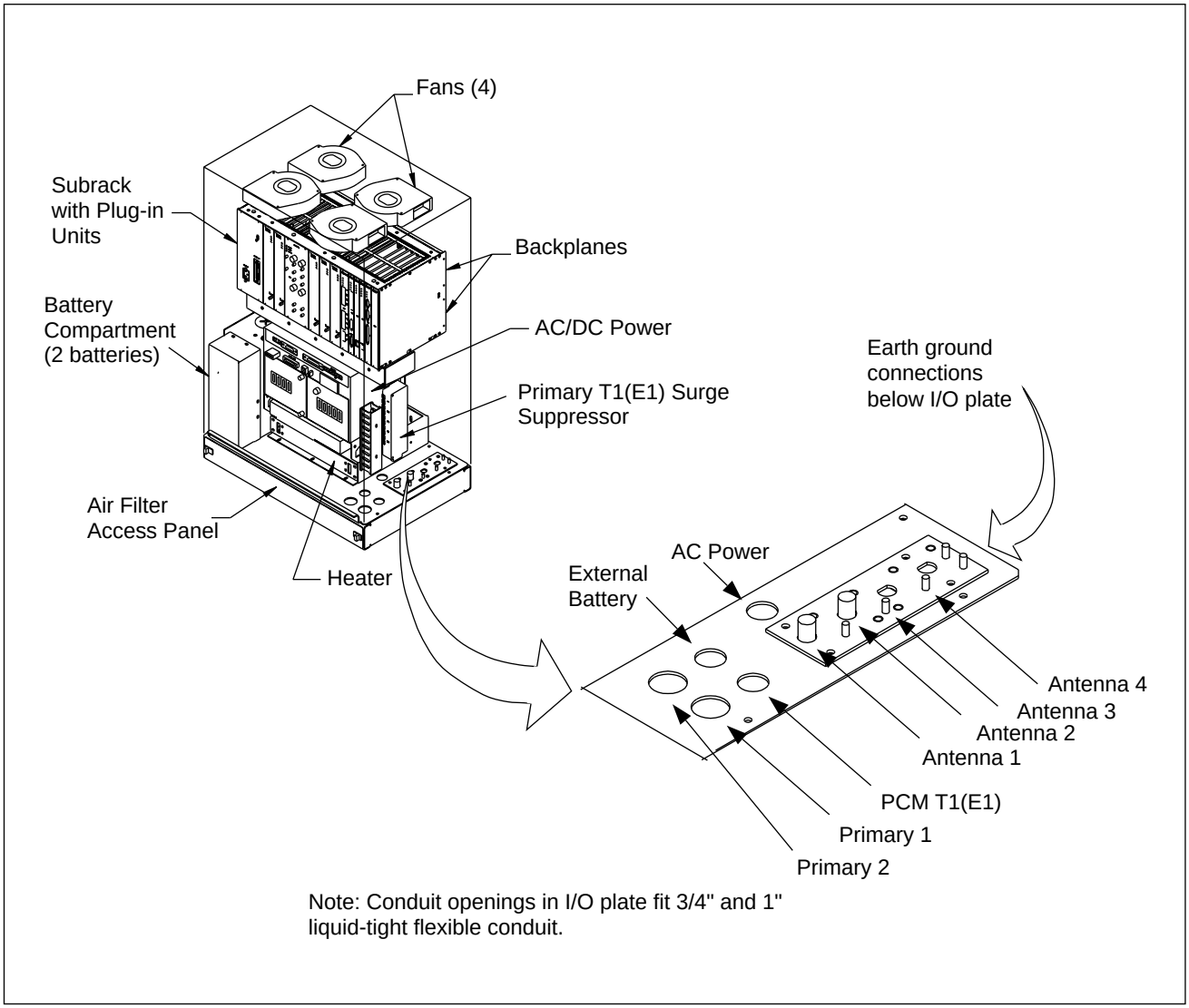


Figure 4-18. Cabinet I/O Plate

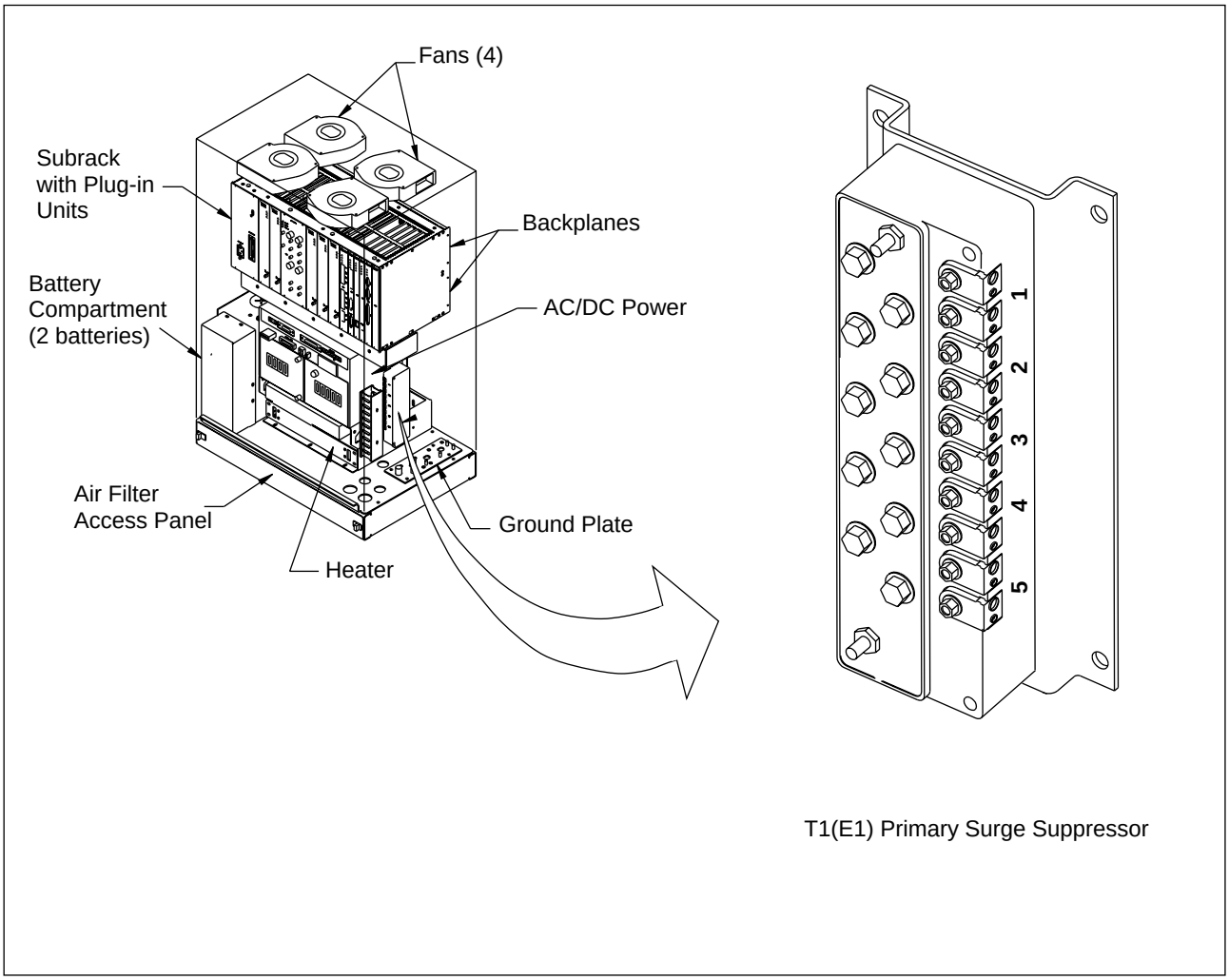


Figure 4-19. T1(E1) Primary Surge Suppressor

9.4.2 Pole Mount Cable Installation

1. Route the antenna cable and T1(E1) conduit into bottom of cabinet. The T1(E1) conduit is terminated at the I/O plate.
2. Slide heat shrink tubing over cable connector and connect the antenna jumpers to the antenna surge suppressors on I/O plate.
3. Apply heat to heat-shrink tubing to seal connector.
4. Route T1(E1) cables through conduit and connect the cables to the surge protector. Refer to Table 4-5 on page 4-33.
5. After all cables are installed, turn on the AC power.
6. Watch the LEDs on each board and verify the unit is operating properly. Consult the Troubleshooting section in the *Hardware Replacement* part of this manual for units that are malfunctioning.

9.4.3 Wall Mount Cable Installation

1. Route the antenna cable and T1(E1) conduit into bottom of cabinet. The T1(E1) conduit is terminated at the I/O plate.
2. Slide heat shrink tubing over cable connector and connect the antenna jumpers to the antenna surge suppressors on I/O plate.
3. Apply heat to heat-shrink tubing to seal connector.
4. Route T1(E1) cables through conduit and connect the cables to the surge protector. Refer to Table 4-5 on page 4-33.
5. After all cables are installed, turn on the AC power.
6. Watch the LEDs on each board and verify the unit is operating properly. Consult the Troubleshooting part in the *Hardware Replacement* part of this manual that are malfunctioning.

9.4.4 Roof Mount Cable Installation

Cabling of the roof mounted cabinet depends on the type of mounting kit being used. Any of the three mounting kits, pedestal, pole, or wall, may be used for the roof mount. Refer to the specific cable installation instructions in this section for pedestal, pole, or wall mountings.

10 Setting the Unit Switches

Before the RBS 884 Micro (1900 MHz) is powered up, the REMUX and EMRPM switches must be set. This section describes the procedure for setting the REMUX and EMRPM switches.

Prior to starting, review electrostatic discharge instructions in Section 3 on page 4-5.

For information on removing the REMUX or EMRPM, refer to the *Hardware Replacement* part of this manual.

The units are shown in Figure 4-20 on page 4-40.

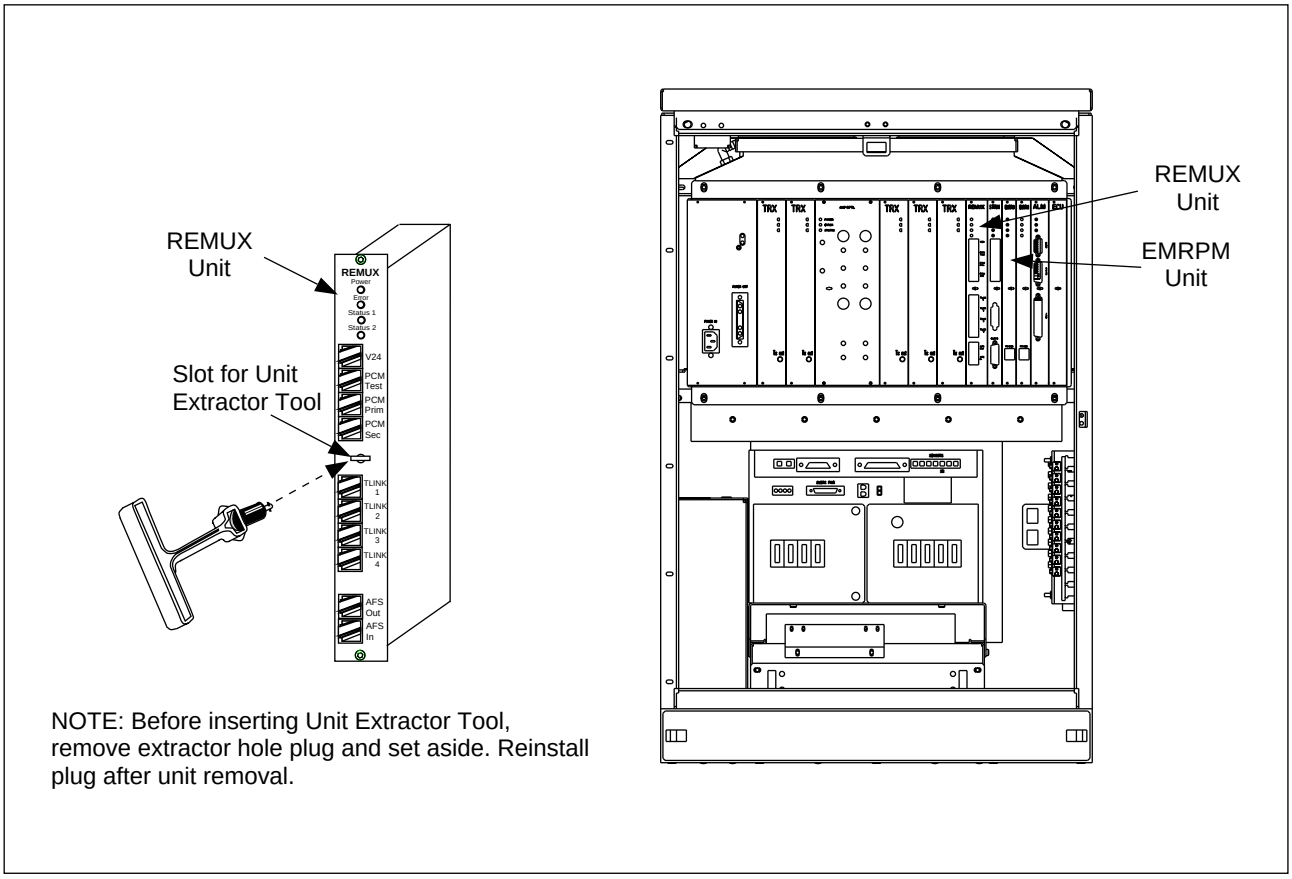


Figure 4-20. Cabinet Units for Switch Settings (Example with a Main Cabinet)

10.1 Prerequisites and Tools

10.1.1 Prerequisites

The following site specific data for setting the switches on the units must be available in the *Configuration Data* in the *Site Installation Documentation*:

- PCM line impedance
- PCM primary line specification (length or attenuation)
- PCM secondary line specification (length or attenuation)
- PCM primary line code and frame mode
- PCM secondary line cascading
- Control Signaling Link (CLC) extraction time slot
- PCM jitter and wander limit
- Frequency

10.1.2 Tools

The tools shown in Table 4-7 on page 4-41 are required for setting unit switches.

Table 4-7. Tools for Setting the Unit Switches

Product Number	Description
LYB 250 01/14	ESD Wrist Strap and Cable
LTT 601 82	From Torque Wrench set: -Torque Wrench for torque 0.6 Nm (to use with the Torx bit TX10) -Torx bit TX10 (for the unit screws)
LTD 117 02 and LTD 117 12	Unit Extractor Tool (Handle + Button)
	Small screwdriver, pen, or simular tool to set switches

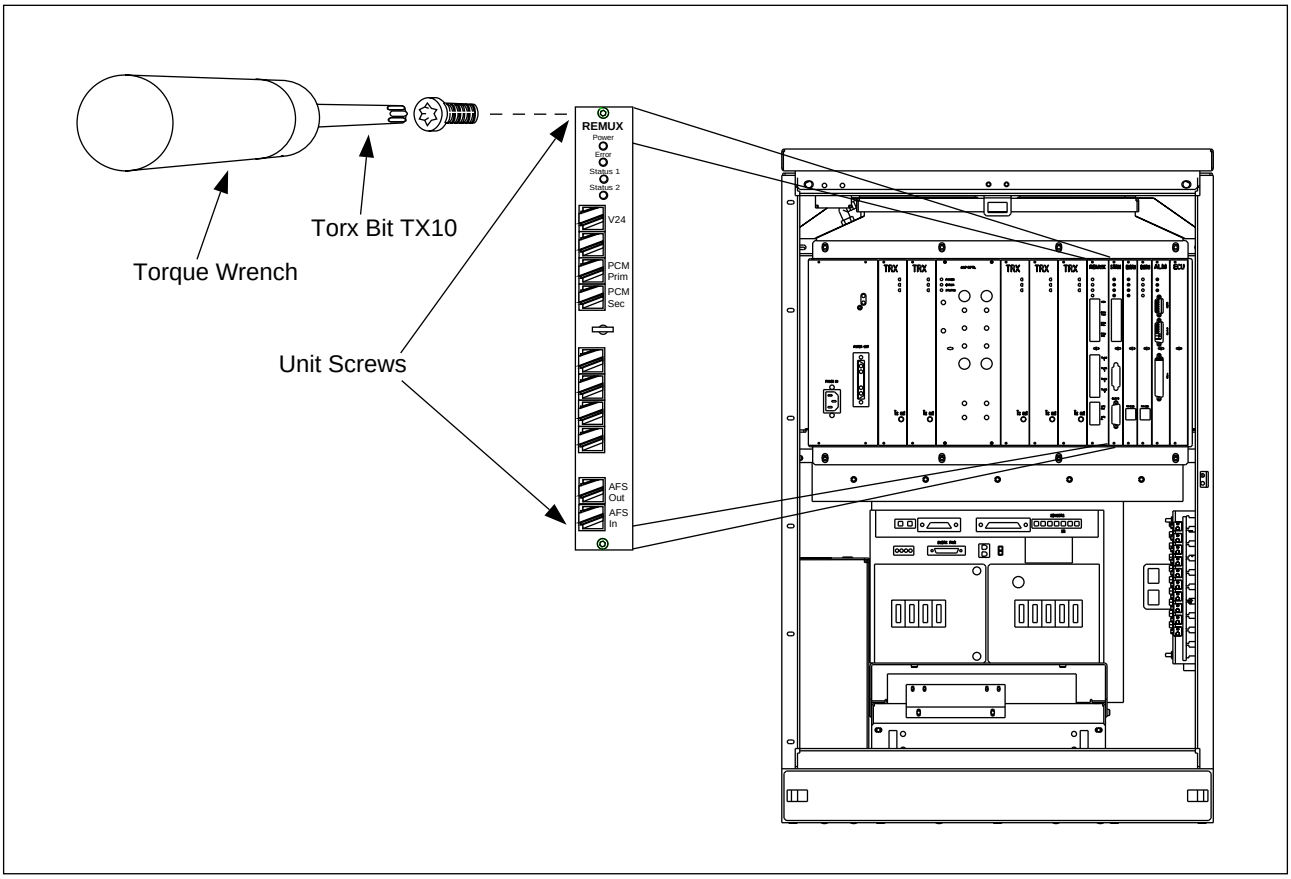


Figure 4-21. Torque Wrench with Torx TX10 Bit

10.2 REMUX Switch Settings

1. Attach the ESD strap to your wrist and connect the free end of the strap cable to an appropriate ground conductor in the cabinet.

2. Use the torque wrench with the Torx TX10 to loosen the top and bottom screws on the front of the REMUX unit.

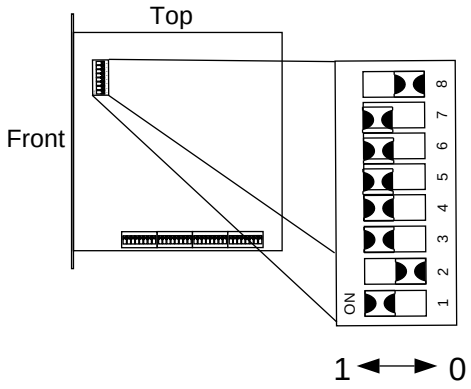
   Note: Do not touch any components or connector pins on a circuit board.

3. Remove the REMUX unit from the cabinet using the extractor tool as shown in Figure 4-20 on page 4-40. Save the extractor hole plug and replace plug after installing the REMUX unit.

4. Locate the eight-pole DIP switch at the top front of the REMUX unit.

5. Set the unit to the PCM line impedance by setting the switches as shown in Figure 4-22 on page 4-42. The line impedance can be found in the *Configuration Data* in the *Site Installation Documentation.*

PCM Line Impedance



Line Impedance	Switch Settings (1-8)	REMUX Boards
75 ohm (E1)	0111 1101	ROF 367 211/3
100 ohm (T1)	1011 1110	ROF 367 211/1
120 ohm (E1)	0000 0000	ROF 367 211/3

Note: This example shows the REMUX set for 100 ohm line impedance (T1)

Figure 4-22. Setting the PCM Line Impedance

6. Locate the 32-pole DIP switch at the bottom of the REMUX unit.

   Note: When a DIP switch is in its lower position (with the REMUX board oriented as shown in Figure 4-22 on page 4-42), the value is 0 (zero).

7. Check with the *Configuration Data* in the *Site Installation Documentation* to determine whether the settings for the PCM Primary line are decided by the length, attenuation, or impedance of the line. Set the switches for the appropriate use as follows:

   - If line length is used (T1 Short Haul), see Figure 4-23 on page 4-43.
   - If impedance is used (for E1 transmission, and T1 Federal Communications Commission [FCC] Part 68, Option A), see Figure 4-24 on page 4-43.

   Note: For distances exceeding 40 meters, customer supplied CSU should be used.

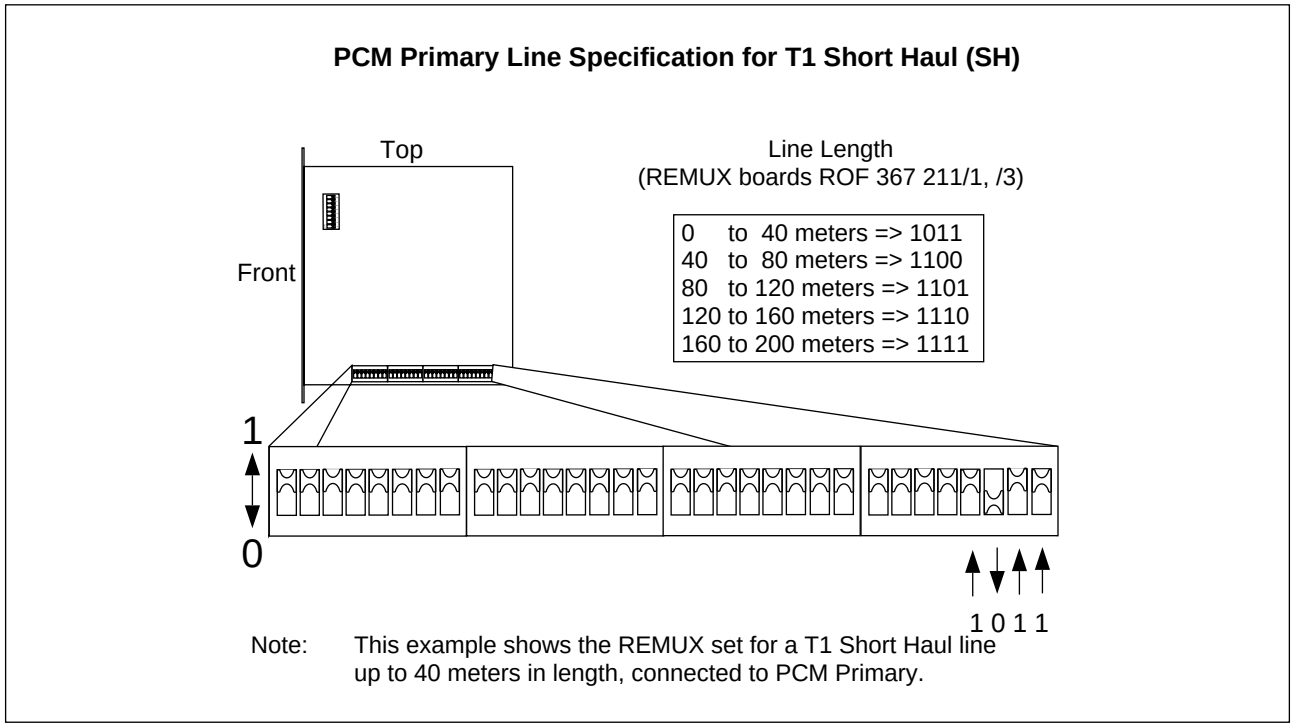


Figure 4-23. Settings for the PCM Primary Line Specification, T1 Short Haul

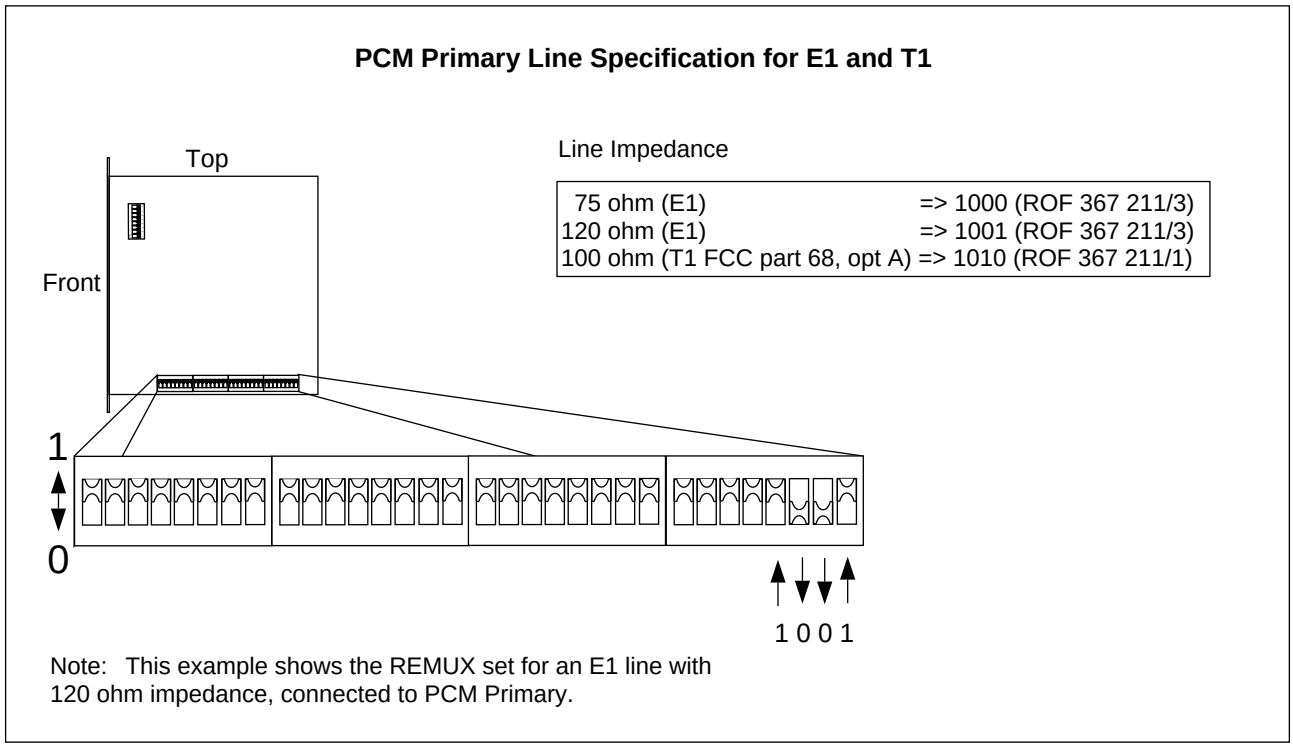


Figure 4-24. Settings for the PCM Primary Line Specification, E1 and T1

8. Check with the *Configuration Data* in the *Site Installation Documentation* to determine whether the settings for the PCM

Secondary line are decided by the length, attenuation, or impedance of the line. Set the switches for the appropriate use as follows:

- If line length is used (T1 Short Haul), see Figure 4-25 on page 4-44.
- If impedance is used (for E1 transmission, and T1 FCC Part 68, Option A), see Figure 4-26 on page 4-45.

Note: For distances exceeding 40 meters, customer supplied CSUs should be used.

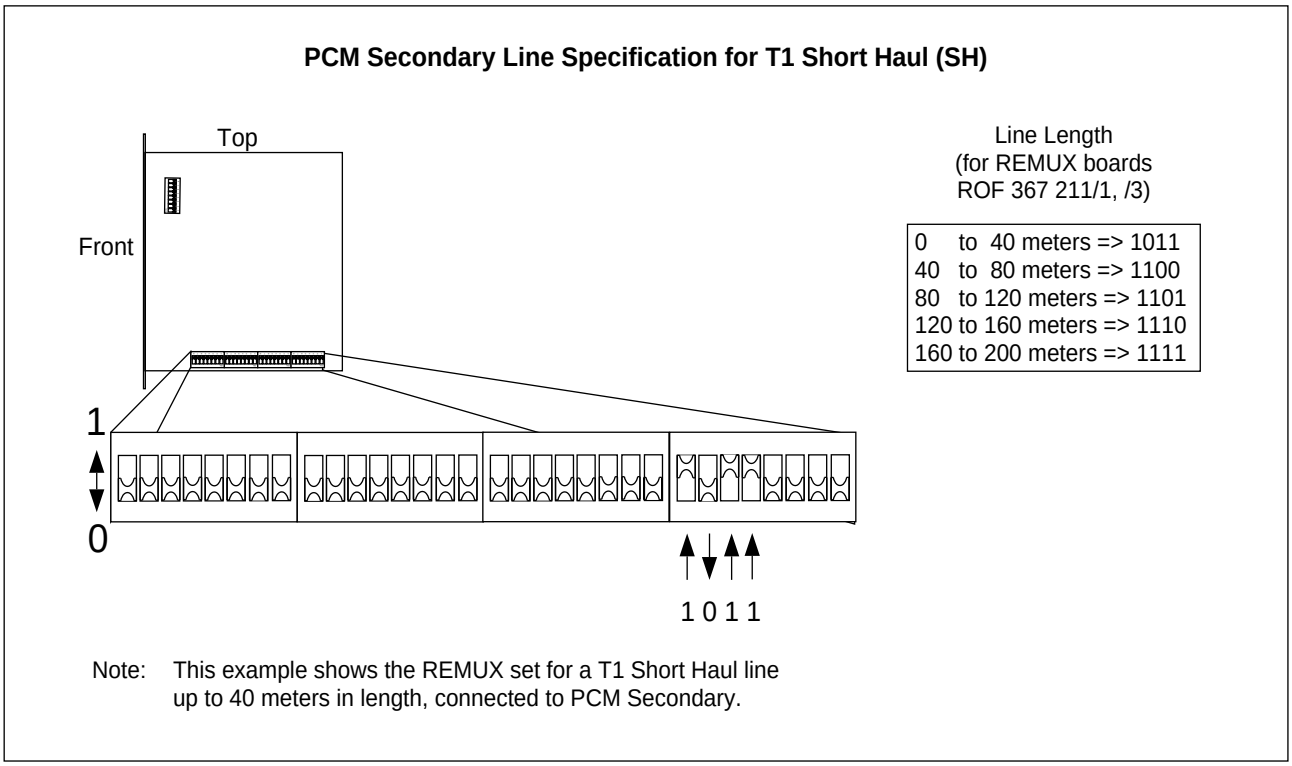


Figure 4-25. Settings for the PCM Secondary Line Specification, T1 Short Haul

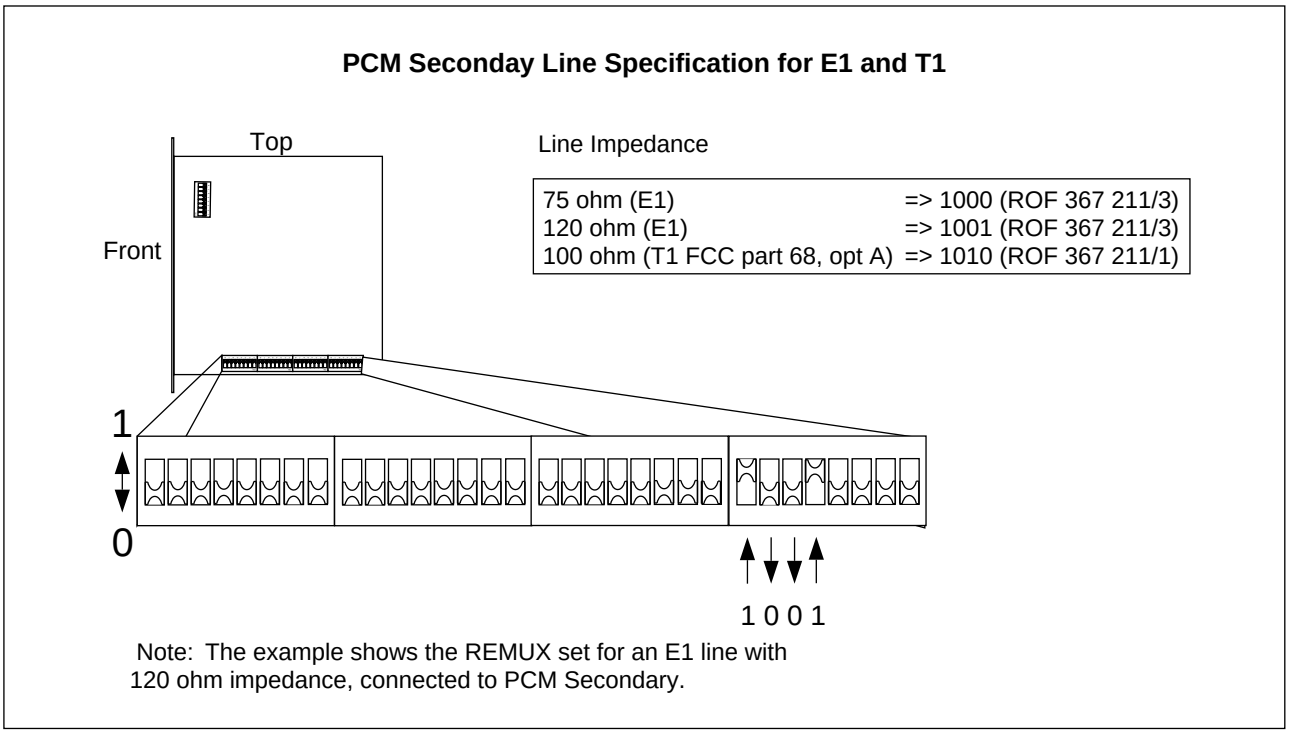


Figure 4-26. Settings for the PCM Secondary Line Specification, E1 and T1

9. Set the PCM primary line code and frame mode, as shown in Figure 4-27 on page 4-45, in accordance with the *Configuration Data* in the *Site Installation Documentation*.

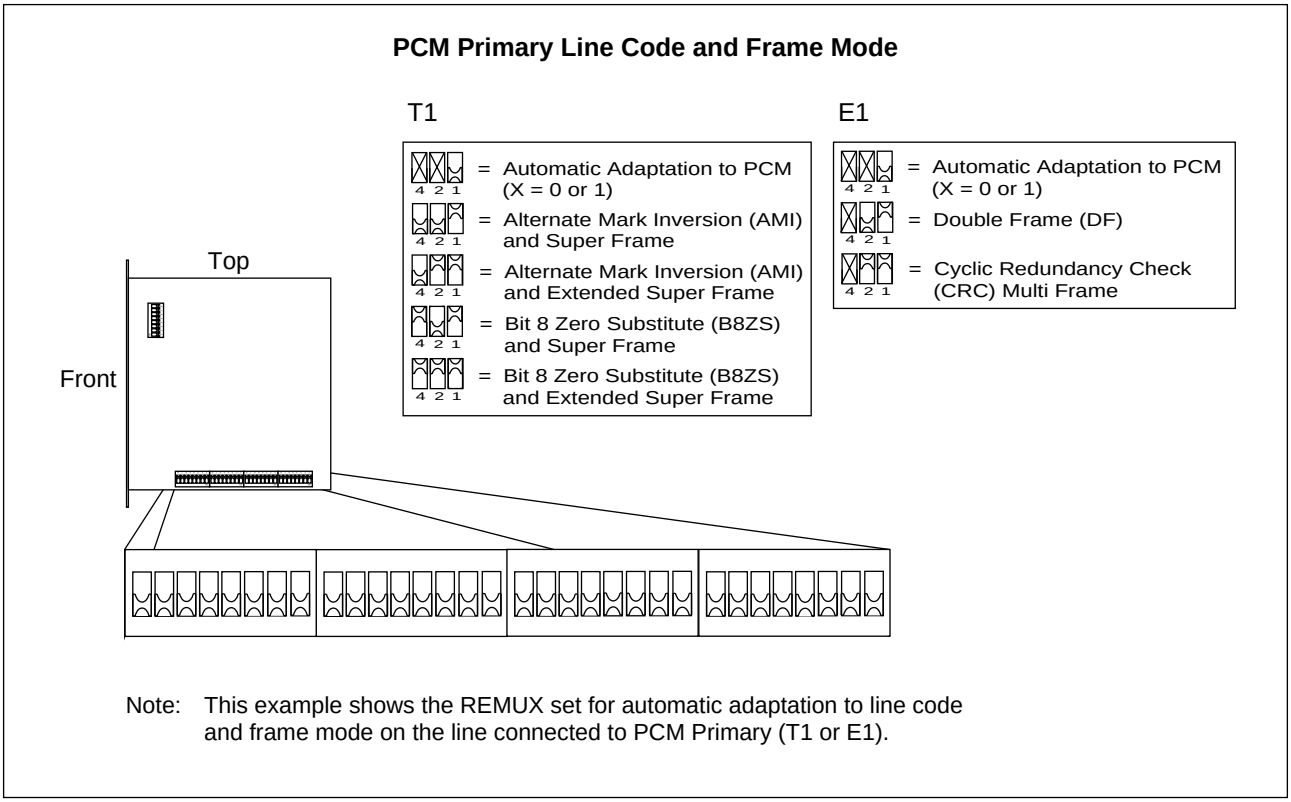


Figure 4-27. Setting for PCM Primary Line Code and Frame Mode

10. Set the switch to enable or disable the PCM secondary line for cascading, as shown in Figure 4-28 on page 4-46 in accordance with the *Configuration Data* in the *Site Installation Documentation*.

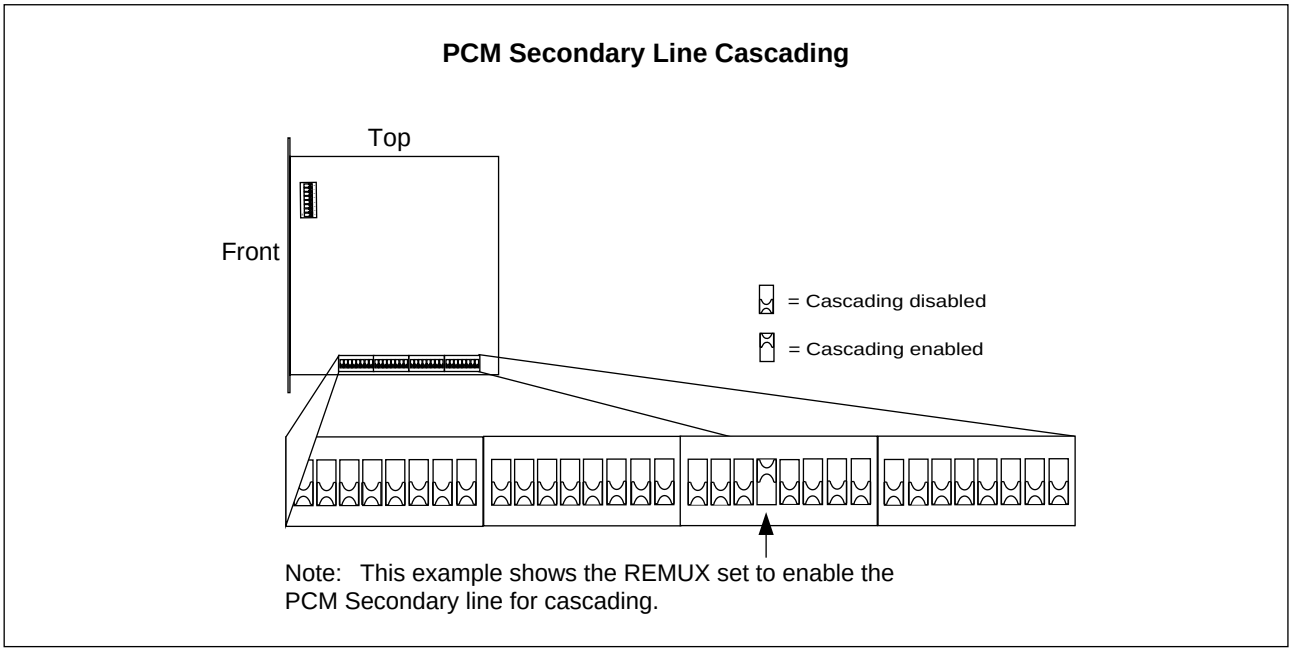


Figure 4-28. Enabling/Disabling the PCM Secondary Line for Cascading

11. For an E1 PCM line, select the timeslot (TS) for Control signaling Link (CLC) extraction, as shown in Figure 4-29 on page 4-47 in accordance with the *Configuration Data* in the *Site Installation Documentation*.

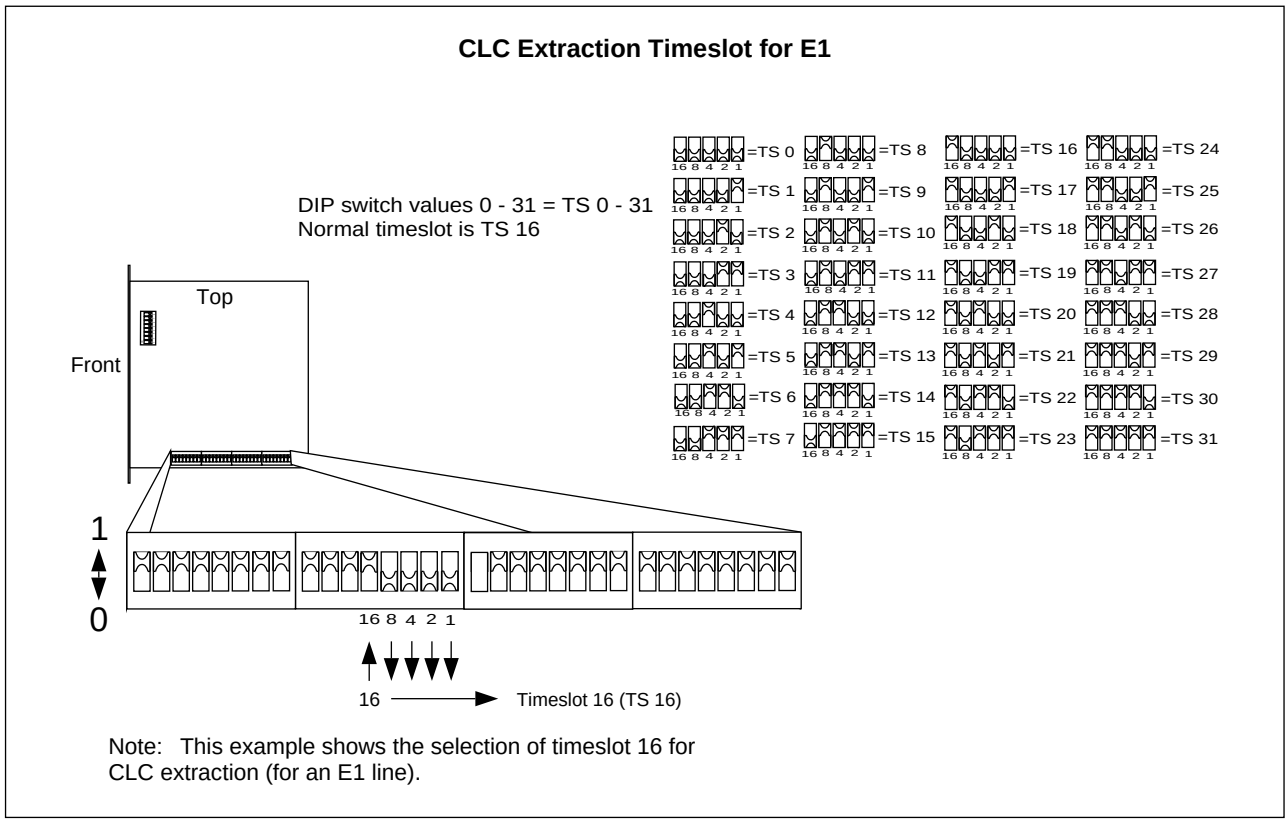


Figure 4-29. Setting the CLC Extraction Timeslot for E1

12. For a T1 PCM line, select the timeslot (TS) for Control signaling Link (CLC) extraction, as shown in Figure 4-30 on page 4-48, in accordance with the *Configuration Data* in the *Site Installation Documentation*.

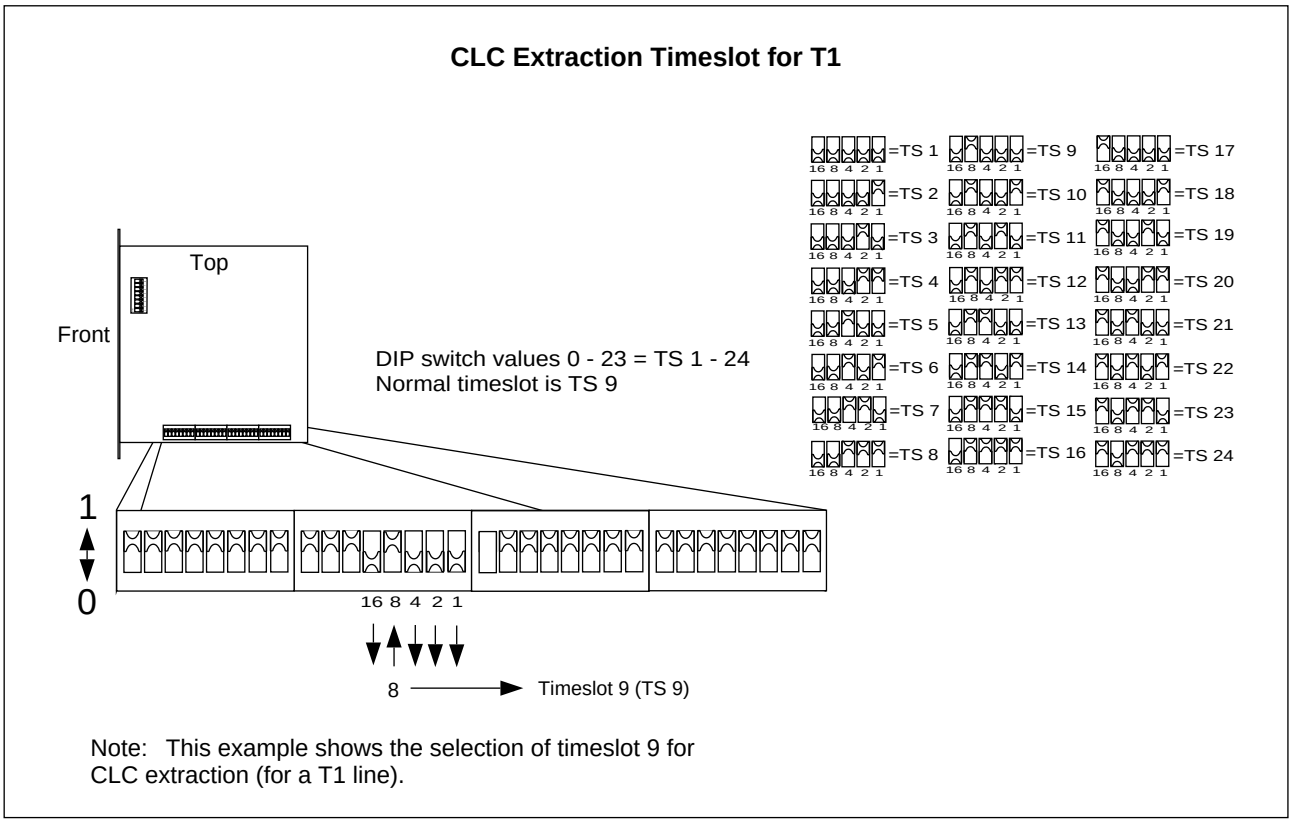


Figure 4-30. Setting the CLC Extraction Timeslot for T1

13. Set the jitter and wander limit for the PCM line for 138 Unit Intervals (UI), as shown in Figure 4-31 on page 4-48 in accordance with the *Configuration Data* in the *Site Installation Documentation*.

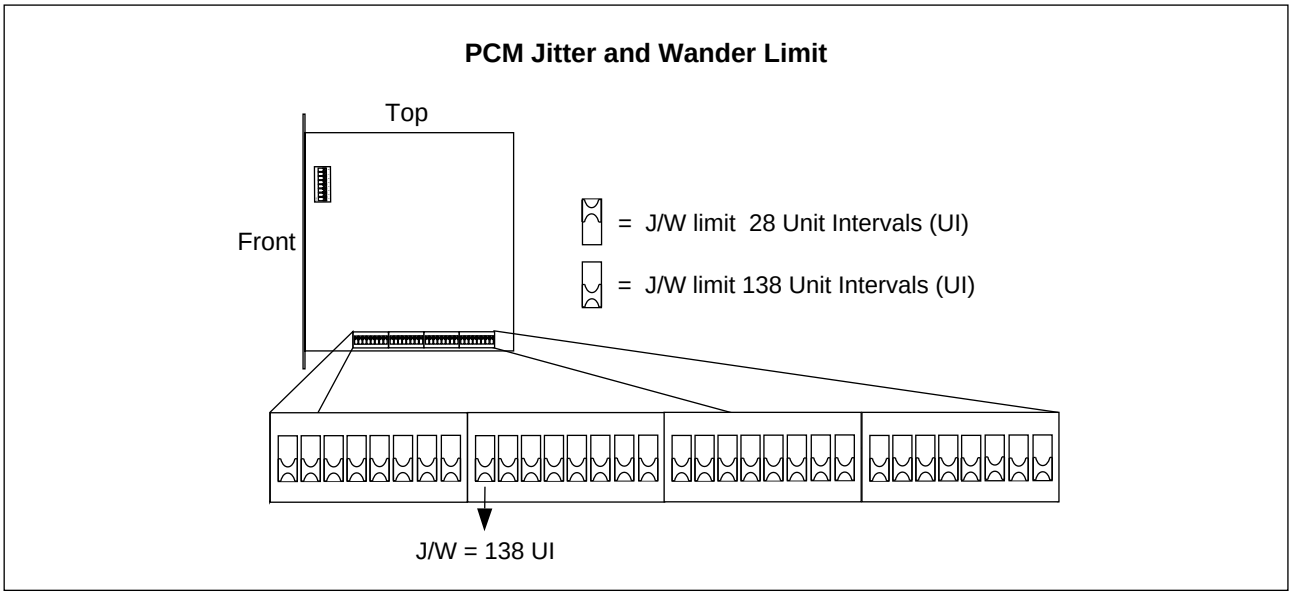


Figure 4-31. Setting the PCM Line Jitter and Wander Limit

14. Set the frequency of operation for 1900 MHz as shown in Figure 4-32 on page 4-49.

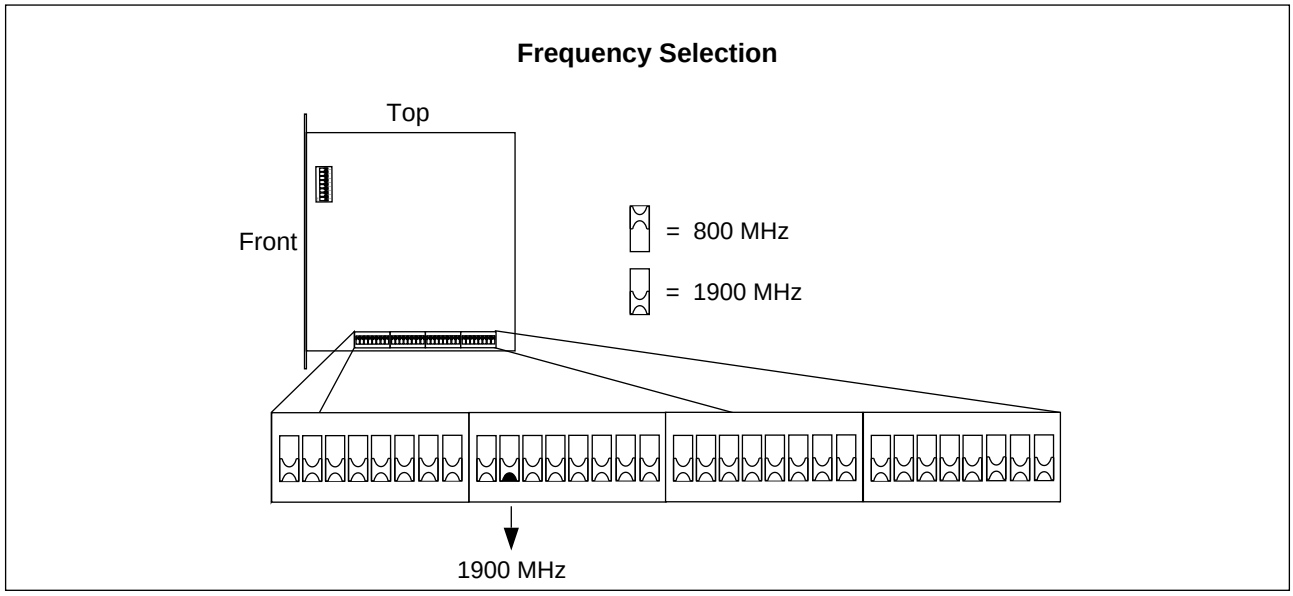


Figure 4-32. Setting the Frequency of Operation

15. Carefully slide the REMUX unit back into the cabinet following the guides, and push the unit firmly into the backplane connector.

16. Use the torque wrench with the Torx bit TX10 to tighten the top and bottom screws on the front to 0.6 Nm.

10.3 EMRPM Switch Settings

1. Keep the ESD strap attached.

2. Use the torque wrench with the Torx bit TX10 to loosen the top and bottom screws on the front of one of the EMRPM units.

   Note: Do not touch any components or connector pins on a circuit board.

3. Remove the EMRPM unit from the cabinet using the extractor tool. Save the extractor hole plug and replace plug after installing the EMRPM unit.

4. Locate the DIP switch and set the EMRPM address, as shown in Figure 4-33 on page 4-50, depending on which cabinet is being configured. Set the address as follows:

   - Main Cabinet, set the EMRPM unit address to 1.
   - Primary Cabinet 1, set the address to 3.
   - Primary Cabinet 2, set the address to 5.

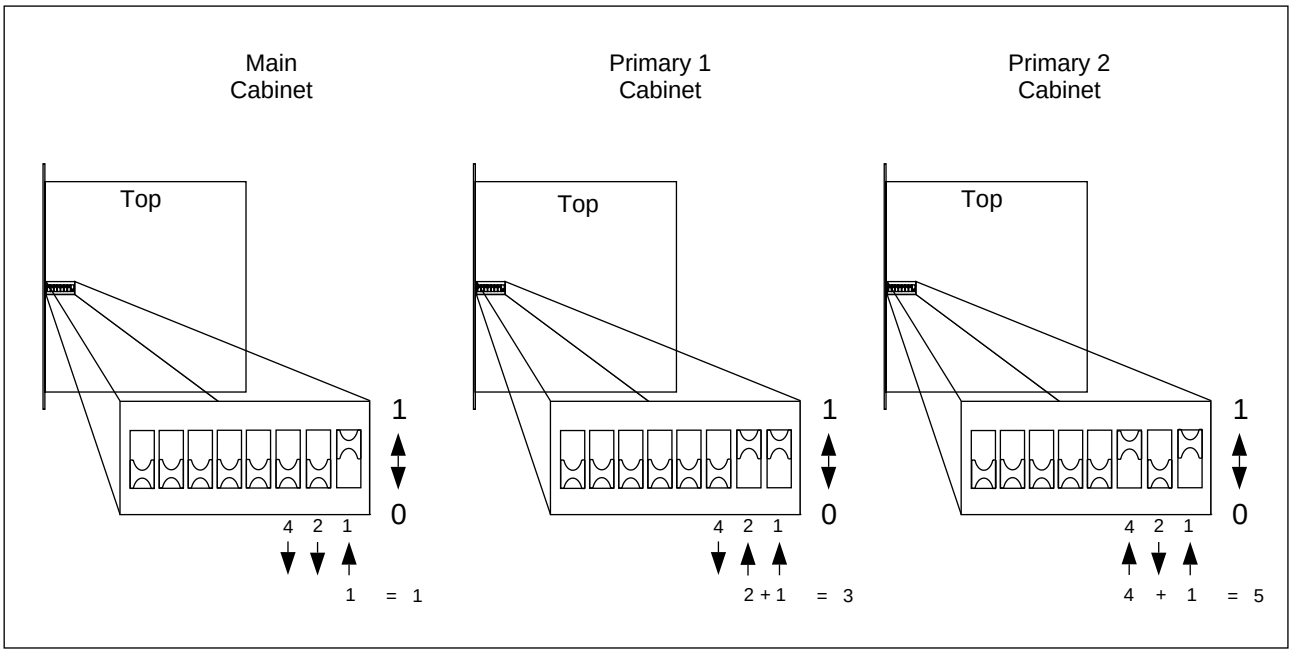


Figure 4-33. EMRPM Address Setting

5. Carefully slide the EMRPM unit back into the cabinet following the guides, and push the unit firmly into the backplane connector.

6. Use the torque wrench with the Torx bit TX10 to tighten the top and bottom screws on the front.

7. Repeat the same steps for the other EMRPM unit.

11 External Alarm Connections

The RBS 884 Micro (1900 MHz) provides four customer defined external alarm connections. These connections are available on a terminal block located on the lower right wall inside the cabinet and connect to the ALM board. Each alarm is activated by a dry contact closure (either normally open or normally closed). See Figure 4-34 on page 4-51.

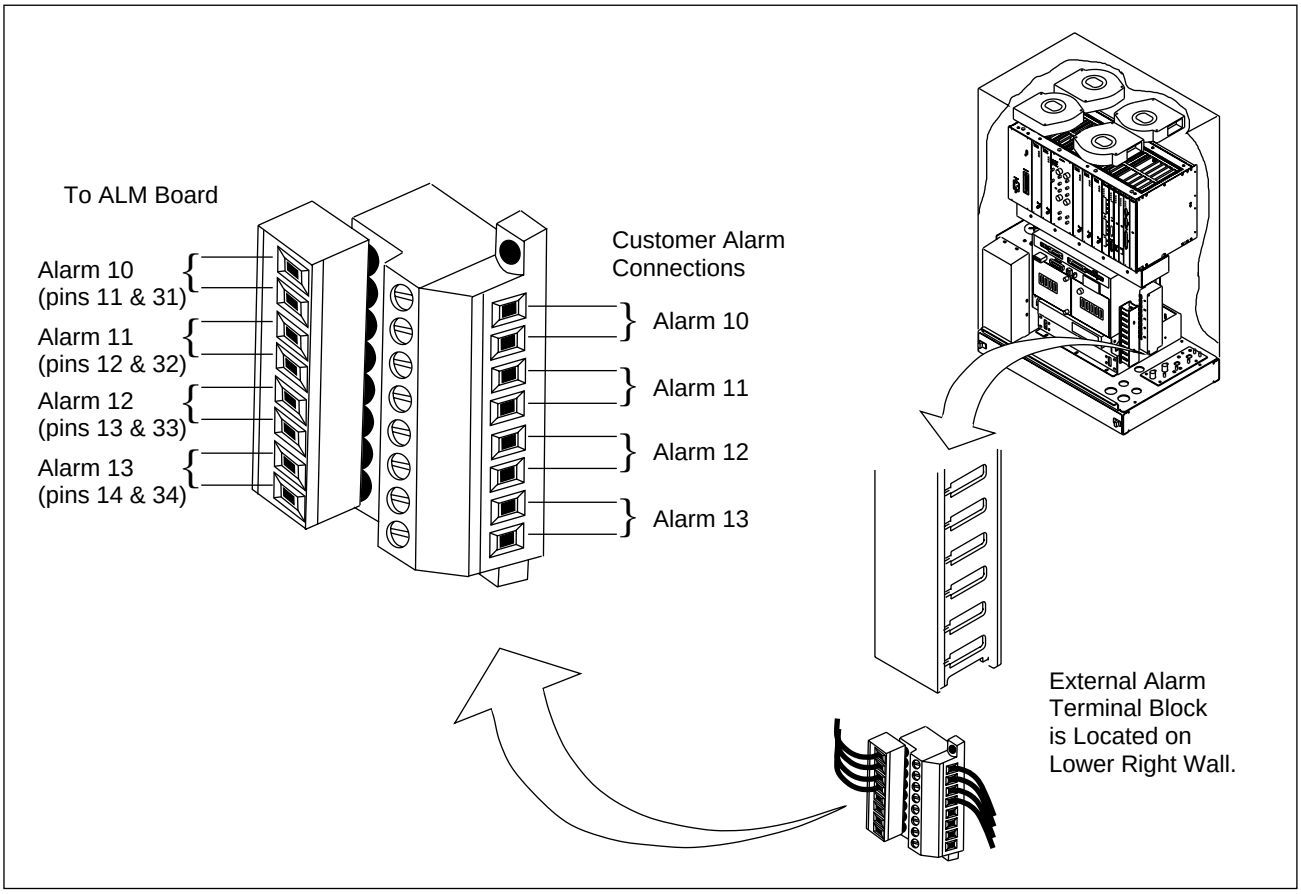


Figure 4-34. Customer Defined External Alarm Connection Terminal Block

12 Site Inventory

To facilitate equipment replacement in the RBS cabinets, perform a site inventory to identify all units delivered, including revision states. This information is recorded in the *Plant Specification* found in the *Site Installation Documentation*.

12.1 Prerequisites

12.1.1 Prerequisites

Complete the following activities before the site inventory is performed:

- Cabinet mounting, Section 8 on page 4-12
- Grounding, Section 9.1 on page 4-24
- Setting of switches, Section 10 on page 4-39
- Cable installation, Section 9.4 on page 4-31

12.2 Site Inventory Procedure

Site Information

1. Record the name of the site, date, and other relevant information for each cabinet in the *Site Installation Documentation, Plant Specification*, or follow your local procedure.

RBS Cabinet Units

2. Locate the product labels on all of the units in the cabinets. Each unit has a product label located on its front panel, as shown in Figure 4-35 on page 4-52, indicating its product number and revision state.

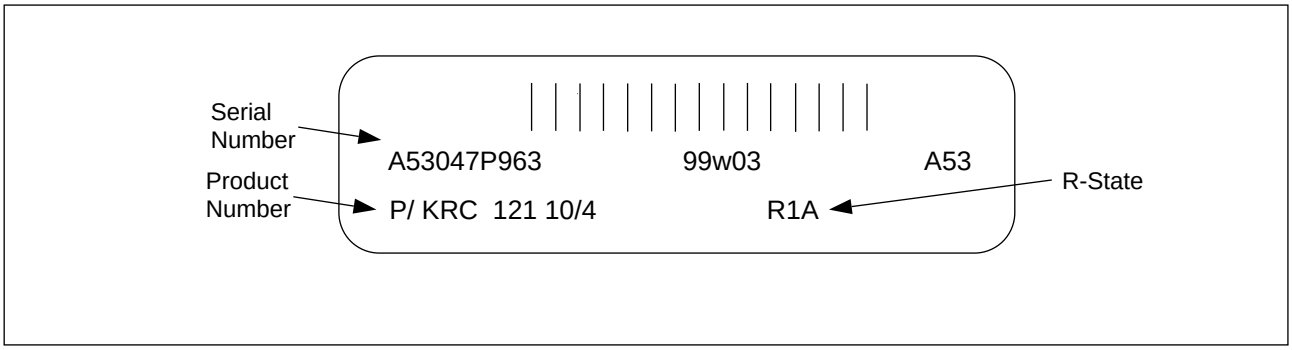


Figure 4-35. Unit Product Label

3. Record the product number, serial number, and R-state for each unit in each of the cabinets in the *Plant Specification* (or any other site inventory list). See Table 4-8 on page 4-52.

Table 4-8. RBS 884 Micro (1900 MHz) Units

Product Number	Unit
HRB 102 13	1900 Micro Radio Base Station
ROF 137 2775	ECU Unit
ROA 119 3157/7	ALM
ROF 367 211/1	REMUX - (T1) 24 Channel
ROF 367 211/3	REMUX - (E1) 32 Channel
ROF 367 212/1	CONN
ROF 367 207/1	STRM
ROF 367 210/1	EMRPM
KRC 121 106/1	TRX
KRF 102 115/1	ANP/RFTL (2) Two Antenna (A+D)
KRF 102 115/2	ANP/RFTL (4) Four Antenna (A+D)
KRF 102 115/3	ANP/RFTL (2) Two Antenna (D+B+E)
KRF 102 115/4	ANP/RFTL (4) Four Antenna (D+B+E)
KRF 102 115/5	ANP/RFTL (2) Two Antenna (E+F+C)

Table 4-8. RBS 884 Micro (1900 MHz) Units (Continued)

Product Number	Unit
KRF 102 115/6	ANP/RFTL (4) Four Antenna (E+F+C)
ROF 367 213/1	Dummy EMRPM
ROF 367 216/1	Dummy REMUX
ROF 367 217	Dummy TRX
BKV 301 457	Fan

13 Equipment Power Up

This section describes the procedure for applying AC power to each of the RBS 884 Micro (1900 MHz) cabinets.

Note: Read the Safety Considerations (Section 2 on page 4-3) before starting the power up procedure.

13.1 Prerequisites and Test Equipment

13.1.1 Prerequisites

The following activities must be completed for each cabinet before power can be applied:

- Mounting, Section 8 on page 4-12
- Grounding, Section 9.1 on page 4-24
- Setting of switches, Section 10 on page 4-39
- Cabling, Section 9.4 on page 4-31
- Connecting AC voltage, Section 9.3 on page 4-29

13.1.2 Tools and Test Equipment

The following equipment is required for completing the electrical power installation and for power-up testing:

- Tools for connecting the AC power cable to a line power access point, if this is the local procedure
- Multimeter for checking supplied line voltage and polarity for DC power.

13.2 Power-Up Procedure

AC Power Connection

1. Verify the AC CONNECTED lamp on the front panel of the AC/DC distribution box is ON.

2. Position the following circuit breakers on the front panel of the AC/DC distribution box to ON in the following sequence (see Figure 4-36 on page 4-54 for the location of the circuit breakers).

   - Main
   - PSU
   - ECU
   - FANS

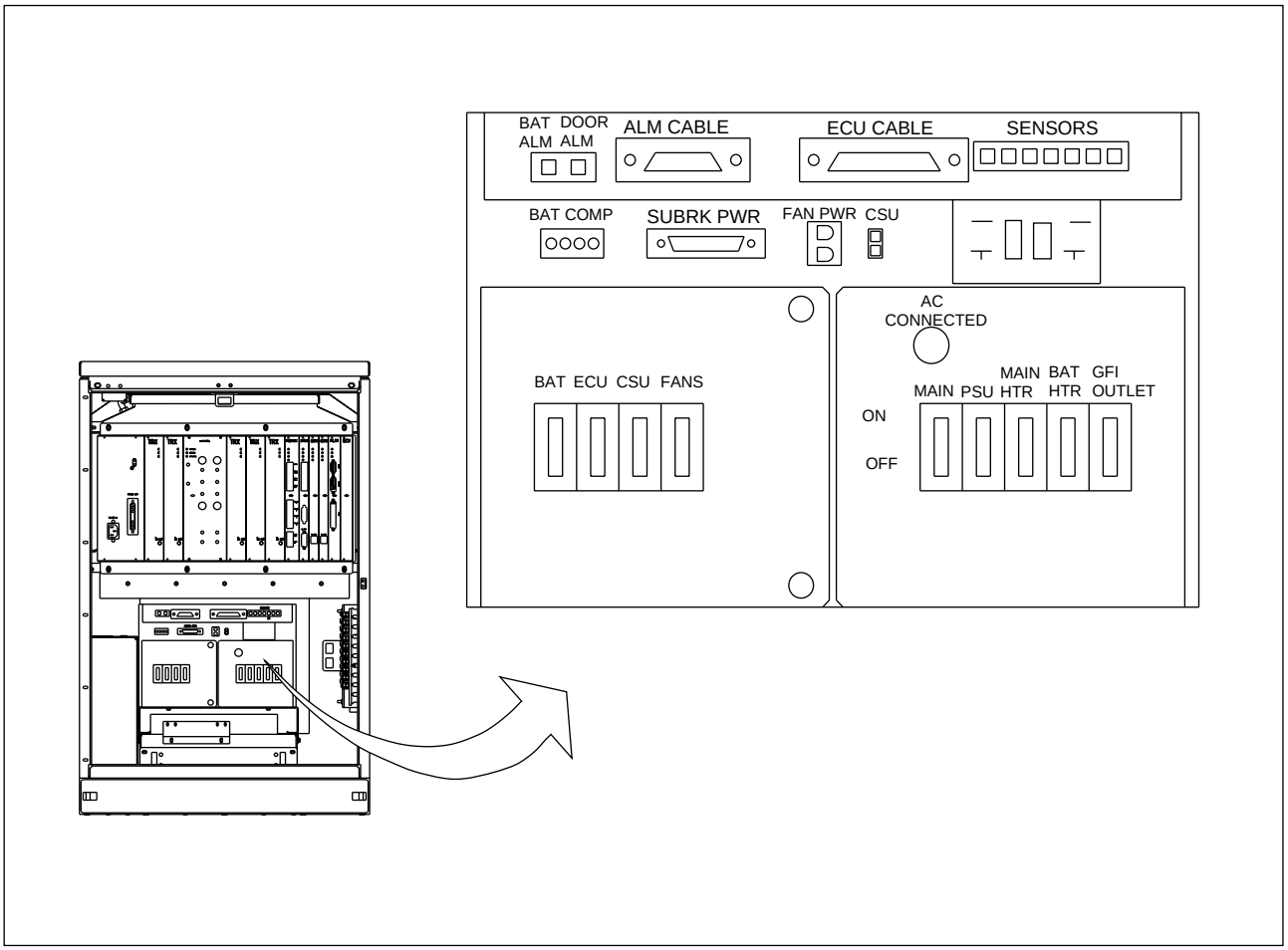


Figure 4-36. Cabinet Circuit Breakers on AC/DC Distribution Box

3. After the above circuit breakers are on, the fans will start up fast and drop back to a normal operating speed. Observe that for about 20 seconds after power-up, the red Error LEDs on all units in the subrack flash at 3 Hz as the units perform internal self-tests.

4. Position the remainder of the circuit breakers to ON as follows:

   - BAT
   - MAIN HTR
   - BAT HTR
   - CSU (if customer-supplied CSU equipment is installed)

   Note: Do not turn on the GFI OUTLET circuit breaker unless performing maintenance on the equipment.

Power-Up Test

5. After 20 seconds, verify that all fans at the top of the cabinet are running. If not, refer to the "Troubleshooting" section in the *Installation and Hardware Replacement Manual* for information on detecting faulty units.

6. Check that the green LED on each of the units in the cabinet is on (see Figure 4-37 on page 4-55).

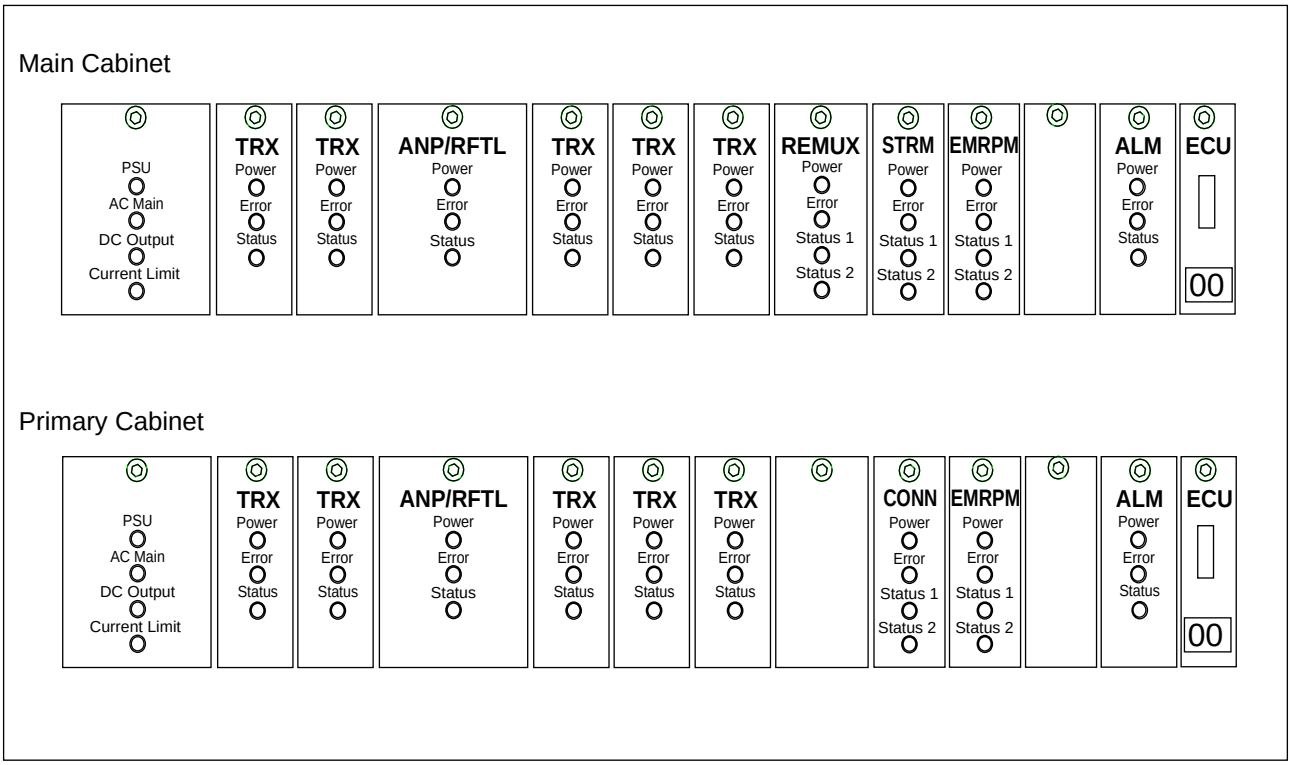


Figure 4-37. The Green Power LEDs and Red Error LEDs

7. If any of the green Power LEDs are off, replace the unit in accordance with the “Hardware Replacement” part of the *Installation and Hardware Replacement Manual*.

8. Check that none of the red Error LEDs is on (see Figure 4-37 on page 4-55).

9. If any of the red Error LEDs are on or flashing continuously, replace the unit in accordance with the “Hardware Replacement” part of the *Installation and Hardware Replacement Manual*.

10. Repeat Step 1 on page 4-54 to Step 9 on page 4-56 for each cabinet.

11. Inform the MSC operator that the unit has been replaced and is ready to be tested.

14 Cold Start-up

During an AC power-on event, the ECU checks the temperature of the equipment before allowing DC power to be distributed to the rest of the equipment. The ECU prohibits the equipment from operating when its temperature is outside the safe function limits (-5°C to +50°C). The cold-start mode is used when AC is first applied and the subrack thermal mass temperature is below the subrack inlet temperature limit of 10°C.

If a cold start-up condition exists, heaters are activated to warm the cabinet temperature. The heater is controlled by a variable voltage from the ECU (5Vdc to 12Vdc) to provide 80 to 1600 watts of variable heat.

During the warm-up period, the fans operate at 20% of full flow circulating the heated air trough the cabinet. When the subrack thermal mass reaches 10°C, the ECU applies power to the Subrack Power Bus.

The warm-up time from AC power-on until the equipment reaches operational temperature varies with the initial equipment temperature. At an initial equipment temperature of -35°C, the warm-up can take approximately 55 minutes.

The ECU does not generate any alarms to the MSC during a cold start-up. The ECU Cold Start error code (C0) does appear on the ECU LED display.

15 Completing the Installation

This section describes the general housekeeping duties required to complete the installation.

15.1 Prerequisites and Tools

15.1.1 Prerequisites

The Installation Completion Procedure can be completed only after the equipment has been successfully powered up in accordance with Section 13 on page 4-53.

15.1.2 Tools

A tie-wrap tool is required to complete the “Installation Completion Procedure.”

15.2 Installation Completion Procedure

This procedure describes the general housekeeping duties required to complete the base station installation.

General housekeeping

1. Verify that all cables, except antenna and ground, enter the cabinet through conduit. The conduit must be terminated at the bottom of the cabinet at the locations shown in Figure 4-18 on page 4-37.
2. Secure internal cables in cable trays.
3. Trim any tie-wrap ends to within 1/8” of the wrap.
4. Verify that all activators on the Primary T1/E1 Surge Protector are in the down position.
5. Recycle the packing materials in accordance with the local regulations.

16 LED Indications

Active devices are equipped with Light Emitting Diodes (LEDs) to indicate the status of the device. Refer to Figure 4-38 on page 4-58 for the location of LEDs on a TRX unit.

In general:

- Green LEDs indicate the power is on.
- Red LEDs indicate an error has occurred (a red LED that is on, indicates that an unspecified error has occurred in that unit).
- Yellow LEDs show operational status.

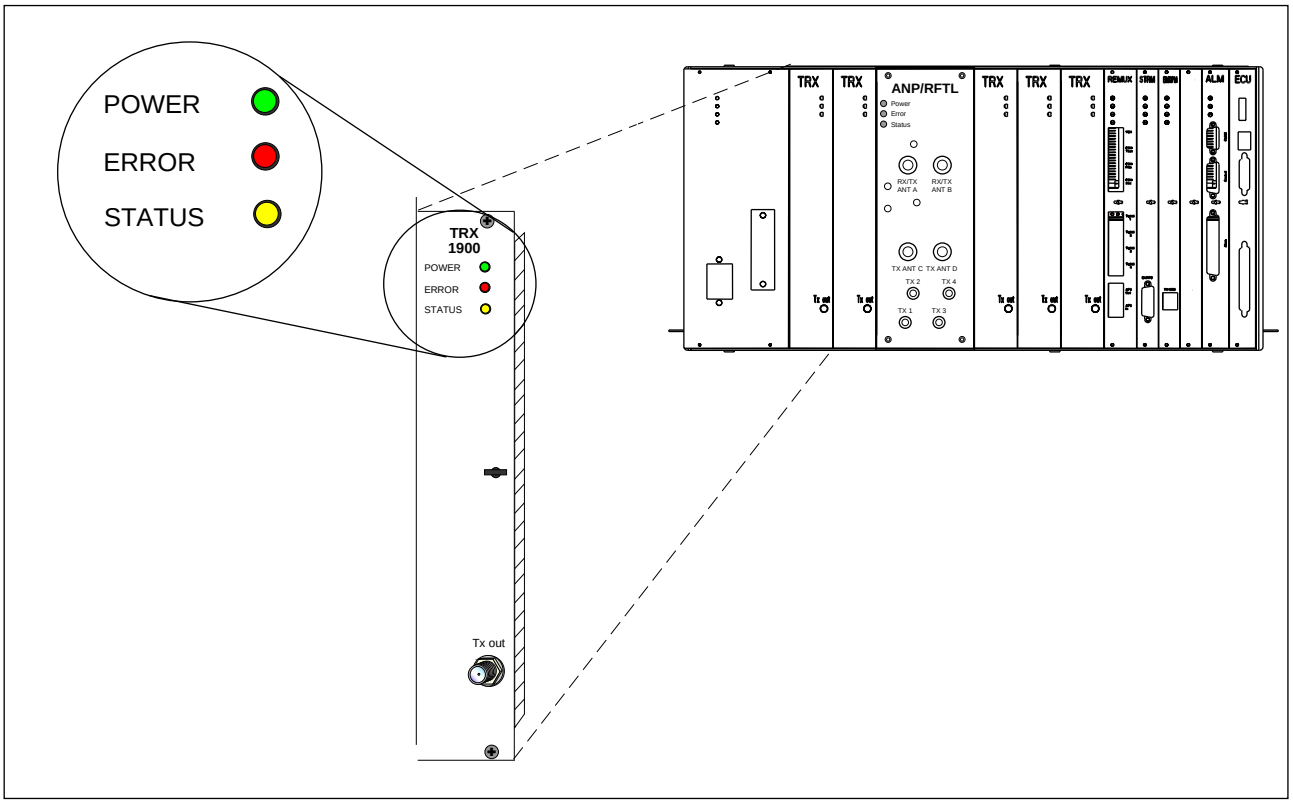


Figure 4-38. LED on a TRX

16.1 PSU LEDs

In the RBS 884 Micro (1900 MHz) PSU unit, four LED indicators are provided for the following:

- PSU
- AC Mains
- DC Output
- Current Limit

Note: During battery charging, the Current Limit LED will be on. This is a normal indication.

16.2 TRX LEDs

In the RBS 884 Micro (1900 MHz) TRX units, three LED indicators are provided for the following:

- Red Error LED

  ON: Indicates an error or fault with the TRX

  FLASH 3 Hz: Power-up test

  FLASH: Communication with EMRPM is lost

- Yellow Status LED

  OFF: No PCM signal is present on the primary interface

  FLASHING: Indicates TRX(s) are on (33% duty cycle =1 timeslot, 66% duty cycle=2 timeslot, 99% duty cycle=3 timeslot)

- Green Power LED

  ON: Indicates the TRX is powered on

16.3 REMUX LEDs

In the RBS 884 Micro 1900 REMUX unit, four LED indicators are provided for the following:

- Red Error LED

  ON: Indicates an error or fault with the TRX

  FLASH 3 Hz: Power-up test

  FLASH: Communication with EMRPM/S is lost

- Yellow Status LEDs (2)

  OFF: No PCM signal is present on the primary interface

  FLASH 3 Hz: Primary PCM interface is not operable

  FLASH 15 Hz: Primary PCM interface is operable

- Green Power LED

  ON: Indicates the REMUX is powered on

16.4 ANP (RFTL) LEDs

In the RBS 884 Micro (1900 MHz) ANP (RFTL) unit, three LED indicators are provided for the following:

- Red Error LED

  ON: Indicates an error or fault with the ANP (RFTL)

- Yellow Status LED

  OFF: No PCM signal is present on the primary interface

- Green Power LED

  ON: Indicates the ANP (RFTL) is powered

16.5 STRM LEDs

In the RBS 884 Micro (1900 MHz) STRM unit, two LED indicators are provided for the following:

- Yellow Status LED

  FLASHING 8 Hz: Blocked

  FLASHING 1 Hz: Deblocked

  FLASHING Two blinks-pause-two blinks: Signaling Terminal Central (STC) communication not working

- Green Power LED

  ON: Indicates the STRM is powered on

16.6 ALM LEDs

In the RBS 884 Micro (1900 MHz) ALM unit, three LED indicators are provided for the following:

- Red Error LED

  ON: Indicates an error or fault with the TRX

  FLASH 3 Hz: Power-up test

  FLASH: Communication with EMRPM/S is lost

- Yellow Status LED

  OFF: No PCM signal present on the primary interface

- Green Power LED

  ON: Indicates the TRX is powered on

16.7 EMRPM LEDs

In the RBS 884 Micro (1900 MHz) EMRPM unit, four LED indicators are provided for the following:

- Red Error LED

  ON: Indicates an error or fault with the EMRPM

- Yellow Status 1 LED

  OFF: Turned off by APZ at EMRPM reset

  ON: Turned on when EMRPM is started

  FLASHING: Starts to blink when traffic is pending and is set to ON when there is no traffic

- Yellow Status 2 LED

  OFF: Turned off by APZ at EMRPM reset, at restart, and when all devices are blocked

  ON: Turned on when at least one device is deblocked but all individuals are blocked

  FLASHING: Indicates at least one deblocked individual

- Green Power LED

  ON: Indicates the EMRPM is powered on

16.8 ECU LEDs

The ECU in the RBS 884 Micro (1900 MHz) provides interfaces to the following cabinet equipment:

- Main DC Power Bus Disconnect Relay
- Temperature Sensors
- PSU
- Main Heater
- ALM

Two seven-segment displays on the front of the ECU provide error codes to indicate equipment failure alarms and ALM status (see Table 4-9 on page 4-61).

Table 4-9. ECU Error Codes

Error Code	Description
A0	Temperature shutdown alarm
A1	Single fan alarm
A2	Multiple fan alarm
A3	Main heater alarm
A4	PSU failure alarm
A5	Battery temperature alarm
F1	Fan #1 failure
F2	Fan #2 failure
F3	Fan #3 failure
F4	Fan #4 failure
FF	Fan test
S1	Ambient Temperature Sensor failure
S2	Inlet Temperature Sensor failure
S3	Subrack Temperature Sensor failure

Table 4-9. ECU Error Codes (Continued)

S4	Exhaust Temperature Sensor failure
S5	Battery Compartment Temperature Sensor failure
S6	Inlet 2 (backup) Temperature Sensor failure
C0	Cold start
C1	Cold start timeout > 30 minutes

17 Site Expansion

An RBS 884 Micro (1900 MHz) can be expanded by adding the following:

- TRXs to one or more of the cabinets (see Section 17.1 on page 4-62).
- One or two Primary Cabinets (see Section 17.2 on page 4-67).

After completing the site expansion, fill in the Site Inventory list in the *Site Installation Documentation*. Note the date and the R-state of the new units.

This section also provides additional cabling information for the following configurations:

- One-sector sites, one cabinet with two antennas
- One-sector sites, one cabinet with four antennas
- Two-sector sites, two cabinets with two antennas per cabinet
- Two-sector sites, two cabinets with four antennas per cabinet
- Three-sector sites, three cabinets with two antennas per cabinet
- Three-sector sites, three cabinets with four antennas per cabinet

17.1 Adding TRX Boards

To increase call handling capacity within a sector, replace the base station's RMUs with TRXs.

Note: Other options for single-sector site expansion are not supported by the RBS 884 Micro (1900 MHz).

17.1.1 Tools

The tools required for adding TRXs to a cabinet are shown in Table 4-10 on page 4-63, Figure 4-39 on page 4-63, Figure 4-40 on page 4-64, and Figure 4-41 on page 4-64.

Table 4-10. Tools for Adding TRXs

Description	Product Number
ESD Wrist Strap and Cable	LYB 250 01/14
Torque Wrench set including: - Torque Wrench for torque 0.6 Nm (to use with the SMA tool and the torx bit TX10 - Torx bit TX10 (for circuit board screws) - SMA tool (for the coaxial cables)	LTT 601 82
Unit Extractor Tool (Handle and Button)	LTD 117 02 and LTD 117 14

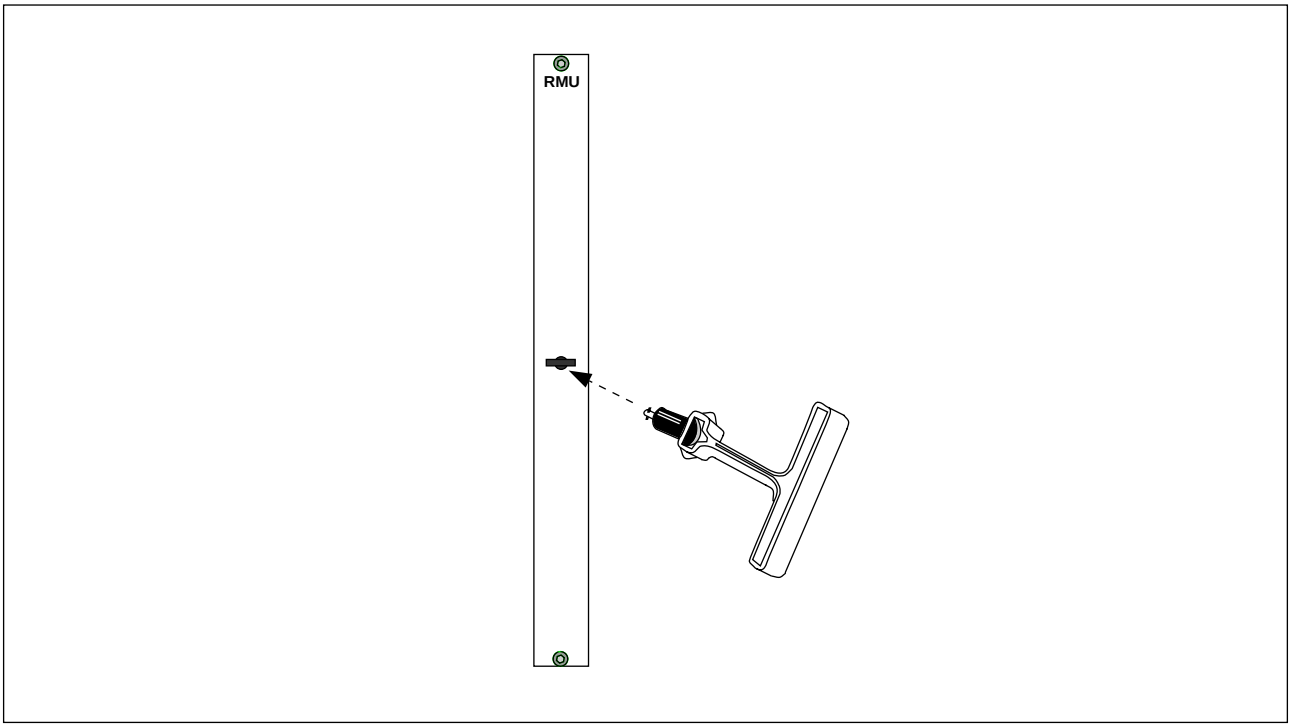


Figure 4-39. Unit Extractor Tool (extracting an RMU)

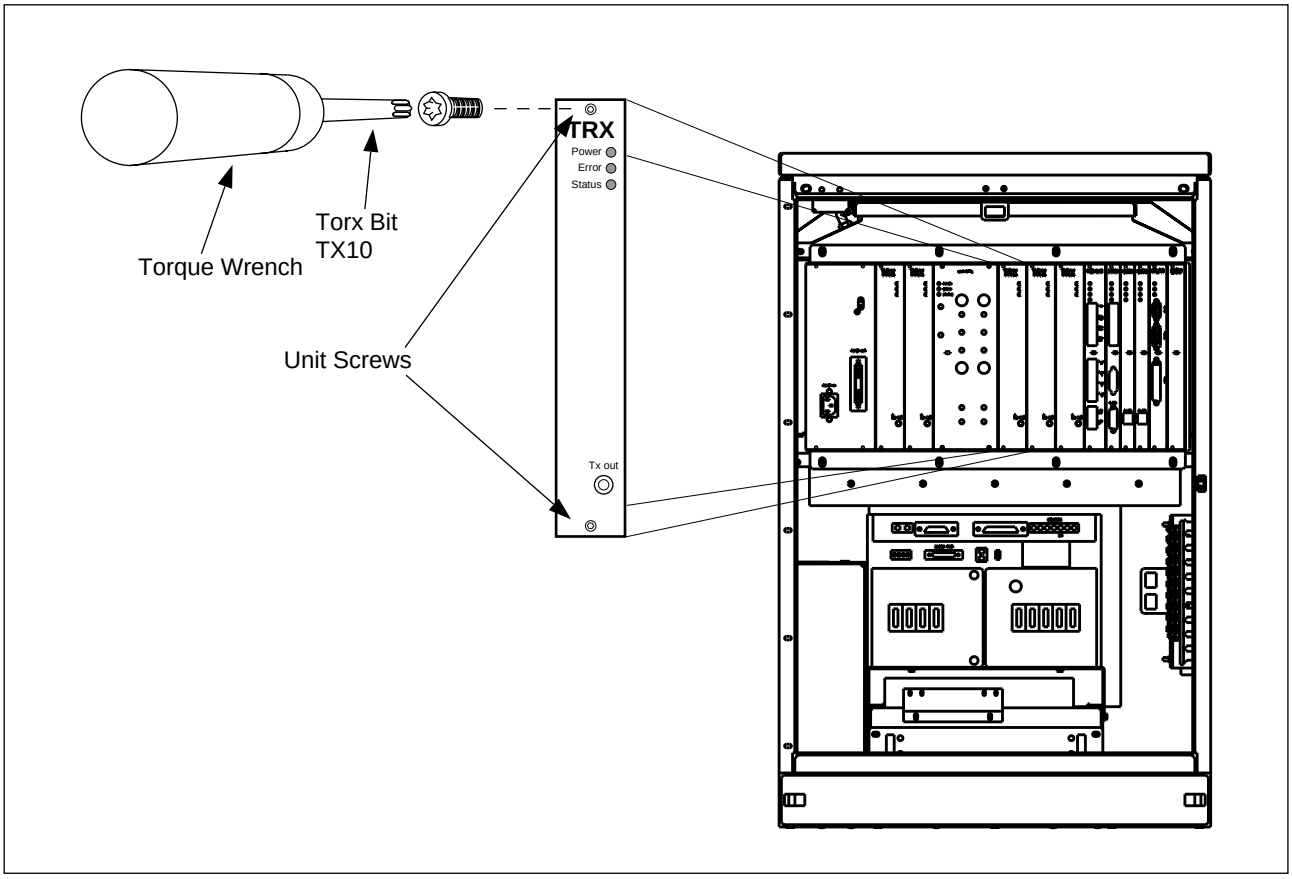


Figure 4-40. Torque Wrench with Torx TX10

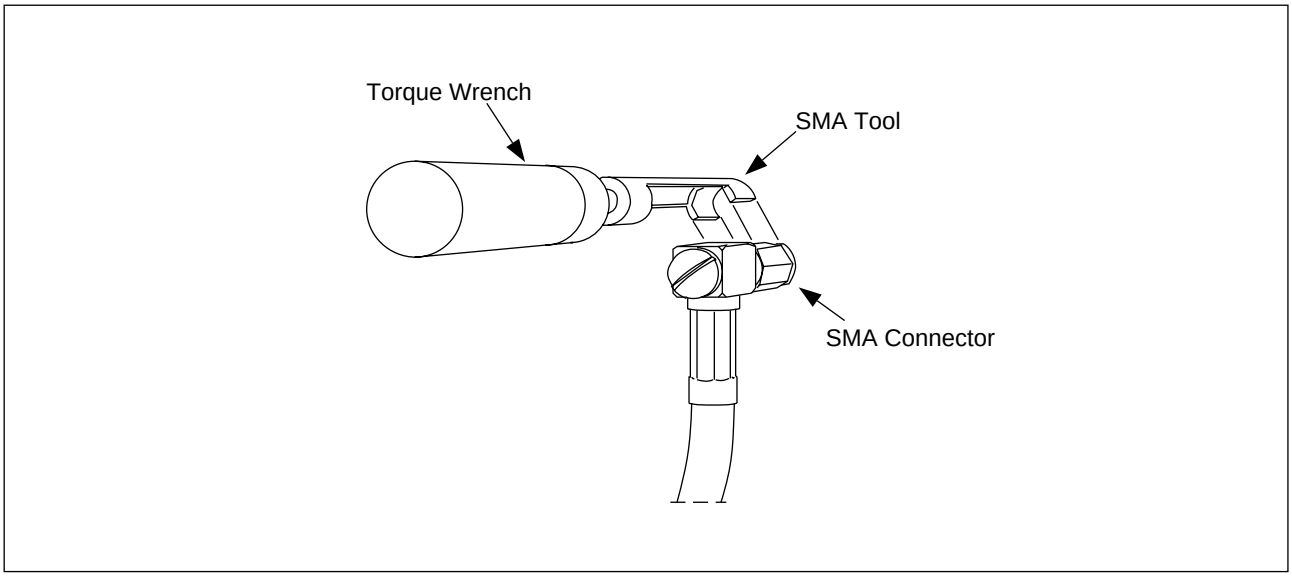


Figure 4-41. Torque Wrench with SMA Tool

17.1.2 TRX Positions

See Figure 4-42 on page 4-65 for TRX positions. TRXs are added to the cabinet in the following positions.

- Third TRX in slot 4
- Fourth TRX in slot 5

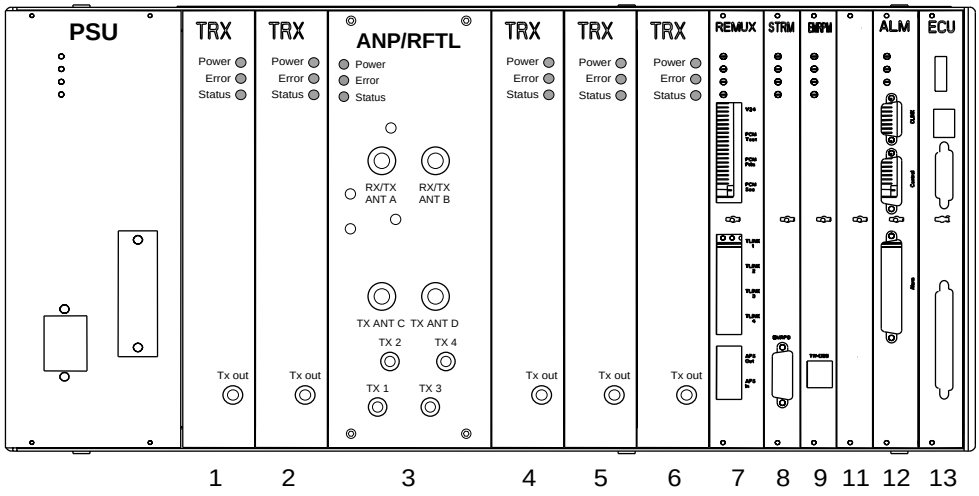


Figure 4-42. Unit Positions

17.1.3 Installation Procedure

Perform the following procedure to install a TRX unit.

1. Attach the ESD strap to your wrist and connect the free end of the strap cable to an appropriate ground conductor in the cabinet.

   See Section 3 on page 4-5 for more information about ESD.

2. Remove the first RMU (dummy TRX).

   Use the torque wrench with the Torx bit TX10 to loosen the screws, and the unit extractor tool to pull the blank panel out.

3. Carefully slide the TRX into the cabinet following the guides. Push it firmly into the backplane connector.

4. Use the torque wrench with the Torx bit TX10 to tighten the screws on the front.

   Turn the torque wrench until it slides to tighten screws to 0.6 Nm.

5. Check that the green power LED on the unit is on and the red error LED is off. If this is not the case, refer to the "Troubleshooting" section in the *Installation and Hardware Replacement Manual* for information on detecting faulty units.

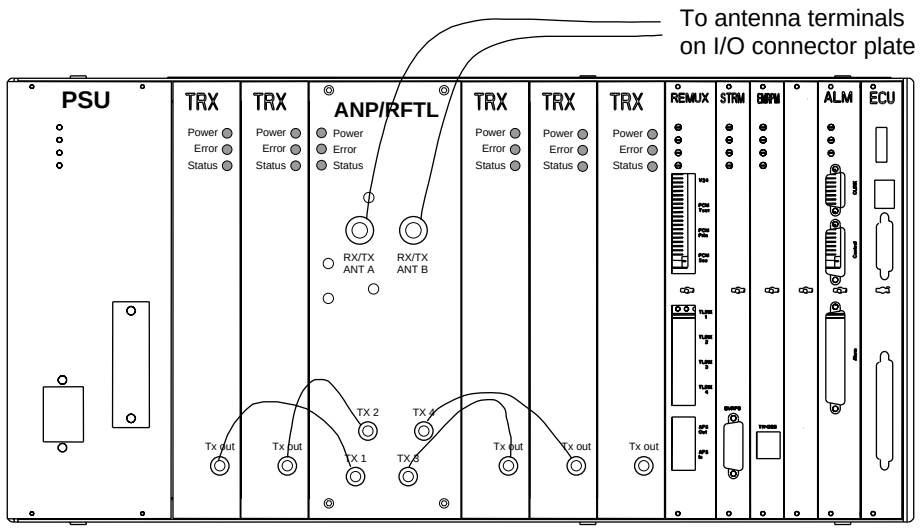
6. The cables are installed as shown in Figure 4-43 on page 4-67. Choose the appropriate example in the figure (depending on the number of antennas connected to the cabinet).

   When attaching the cable connector to the connector on the unit, hand-tighten as much as possible. Thereafter, fully tighten using the torque wrench with the SMA tool.

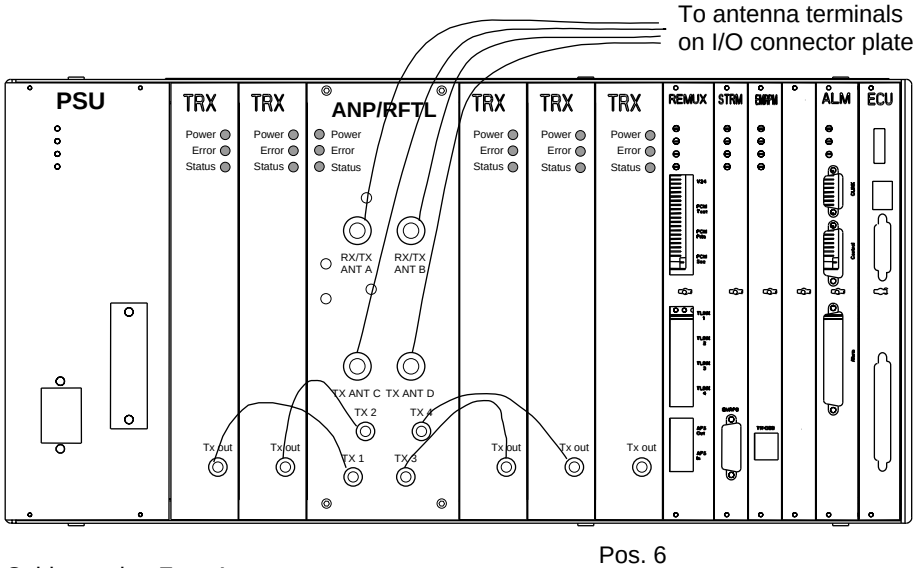
   Turn the torque wrench until it slides to tighten connector to 0.6 Nm.

7. Follow the same procedure for all other TRXs to be installed.

8. Inform the MSC operator that the installation is complete.



Cabinet using Two Antennas



Cabinet using Four Antennas

Note: The TRX board in position 6 is used as a Digital Verification Module (DVER)
Cabinets illustrated are Main Cabinets, although the cabling is the same for Primary Cabinets.

Figure 4-43. TRX Cable Connections for Cabinets with Antennas

17.2 Adding Cabinets

A radio base station is expanded to a two-sector site by adding a Primary cabinet to the Main cabinet. The radio base station is expanded to a three-sector site by adding an additional Primary cabinet. Two or three cabinets that occupy the same site location and serve separate sectors are referred to

as collocated cabinets. Collocated cabinets are connected together with the following cables:

- EMRPM Bus (EMRPB). The EMRPB cables are daisy chained from the Main cabinet to the Primary 1 cabinet and then to the Primary 2 cabinet.
- TLINKS. Two TLINKS are run directly from the Main cabinet to each of the Primary cabinets.
- Air Frame Synchronization (AFS). The AFS cable is daisy chained from the Main cabinet to the Primary 1 cabinet and then to the Primary 2 cabinet.

These cables are run in liquid tight flexible conduit from the floor of one cabinet to the floor of the next cabinet. The Main and Primary cabinets have two 1 3/8 inch (33 mm) diameter knockouts for 1 inch (25 mm) diameter conduit. Both cabinet cable entries are located on the bottom surface of the cabinet in the front right corner.

Note: All cables routed into and through the pedestal mounting base should be encased in liquid tight flexible conduit. Do not terminate the liquid tight flexible conduit at the pedestal base knockouts.

A diagram of cable routing for collocated cabinets is shown in Figure 4-44 on page 4-69.

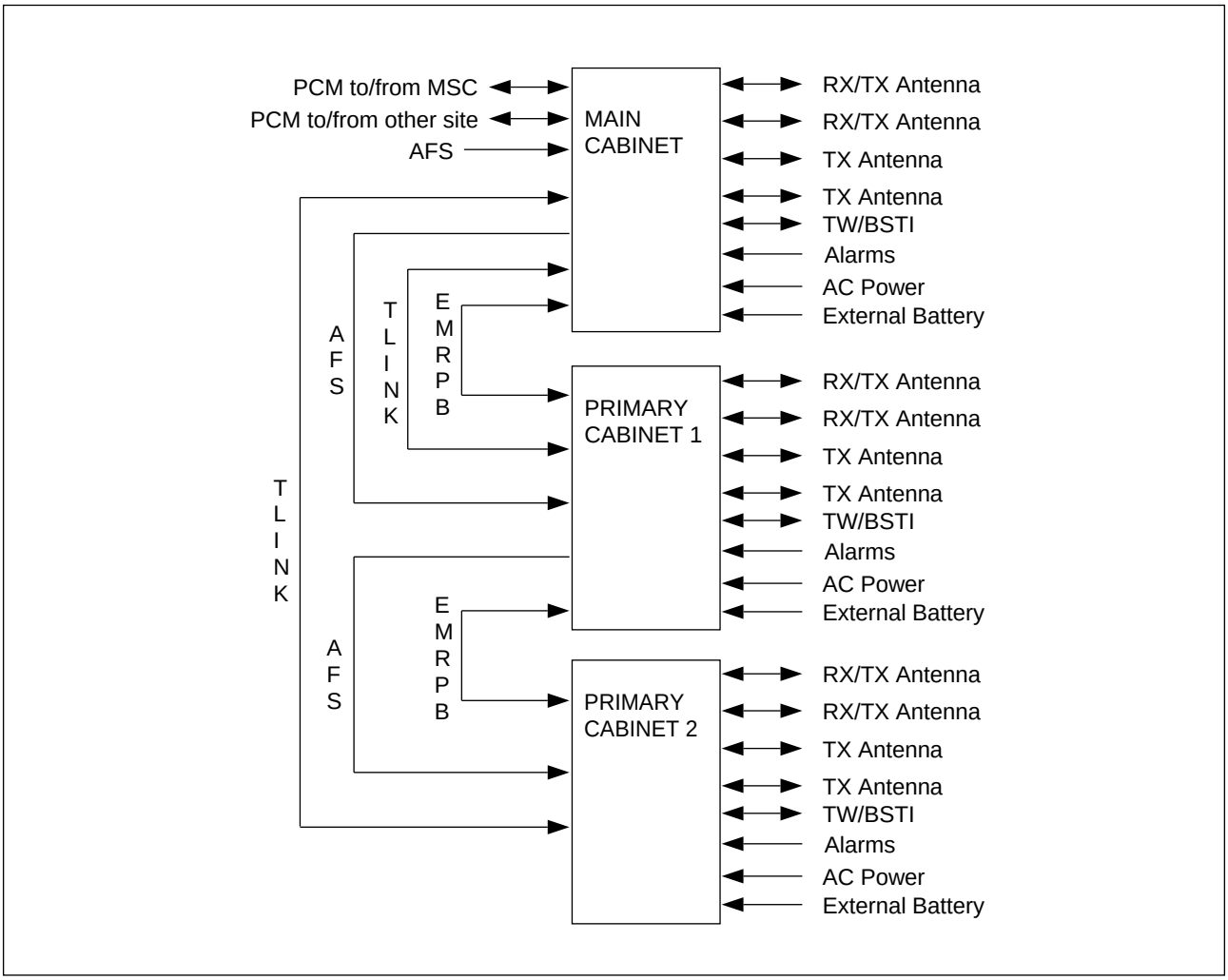


Figure 4-44. RBS 884 Micro (1900 MHz) Cable Routing for Collocated Cabinets

Use the Extension Cable Set (NTM 201 1807) for each collocated cabinet.

The Extension Cable Set is customer assembled. The cable set contains the following:

- AFS Cable (six meters) with RJ45 connectors
- TLINK Cable (six meters) with RJ45 connectors
- EMRPB Cable (six meters)
- Two Insulation Displacement Connection (IDC) connectors
- Two IDC connector backshells
- T-Handle Connector Tool (for seating wires) See Section 17.2.2 on page 4-70 for information on how to use the T-Handle Connector tool.

The EMRPB cable transfers control data between the STRM in the Main cabinet and the CONN in the Primary cabinet. See Table 4-11 on page 4-70 and Figure 4-45 on page 4-71 for cable connector assembly.

Table 4-11. Extension Cable Connector Signals and Pin Connections

Connector A (Pin No.)	Signal	Connector B (Pin No.)
1	CLKM+ (Transmit clock from STRM)	1
2	DATAM+ (Transmit data from STRM)	2
3	DATAM+ (Transmit data from STRM)BLO+ (Blocking Signal from STRM)	3
4	BSB+ (Bus standby signal from STRM)	4
5	CLKS+ (Receive clock to STRM)	5
6	DATAS+ (Receive Data to STRM)	6
7	Not Connected	7
8	GND	8
9	CLKM- (Transmit clock from STRM)	9
10	DATAM- (Transmit data from STRM)	10
11	DATAM- (Transmit data from STRM)	11
12	BSB- (Bus standby signal from STRM)	12
13	CLKS- (Receive clock to STRM)	13
14	DATAS- (Receive Data to STRM)	14
15	Not Connected	15
NOTE: To ensure adequate shielding, clamp the cable braid and shield between backshell halves during assembly.		

17.2.1 Required Materials and Tools

17.2.1.1 Materials

The Extension Cabinet Cable Set — NTM 201 1807 is used to connect collocated cabinets.

Install the cables in the order they appear in the table enclosed with each cable kit.

17.2.1.2 Tools

The T-Handle connector tool that is supplied with the Extension Cabinet Cable Set is the only tool required for intercabinet cabling. Refer to Section 17.2.2 on page 4-70 for information on the T-Handle connector tool

17.2.2 Using the T-Handle Connector Tool

The following procedure explains how to use the T-Handle connector tool to insert individual, unstripped wires into the IDC connectors. The T-

Handle connector tool features a blade that is used to push the wire squarely into the contact and to crimp the wire insulation area, thus providing a reliable connection.

1. Support the wire termination side of the IDC connector on a block or other suitable flat surface and position the IDC connector so that the wire termination area of the contacts face upward.
2. Position the unstripped wire over the desired contact with the wire butting against the plastic shoulder and not extending past it.
3. Place the tool on the wire as shown in Figure 4-45 on page 4-71. Make sure that the arrow on the tool handle points toward the wire termination side of the IDC connector.
4. Press straight down on the tool handle to insert the wire.

   Note: To avoid damage to the tool, the wire, or the contact, do not apply pressure at an angle, and do not use excessive pressure.
5. Remove the tool and inspect the contact for proper wire insertion. Repeat the procedure if necessary.

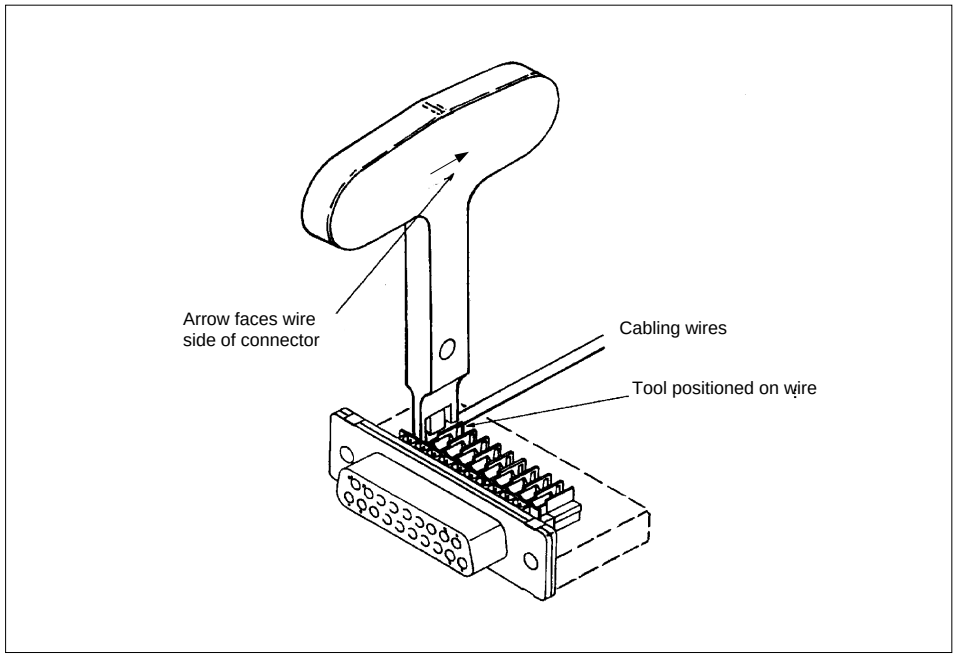


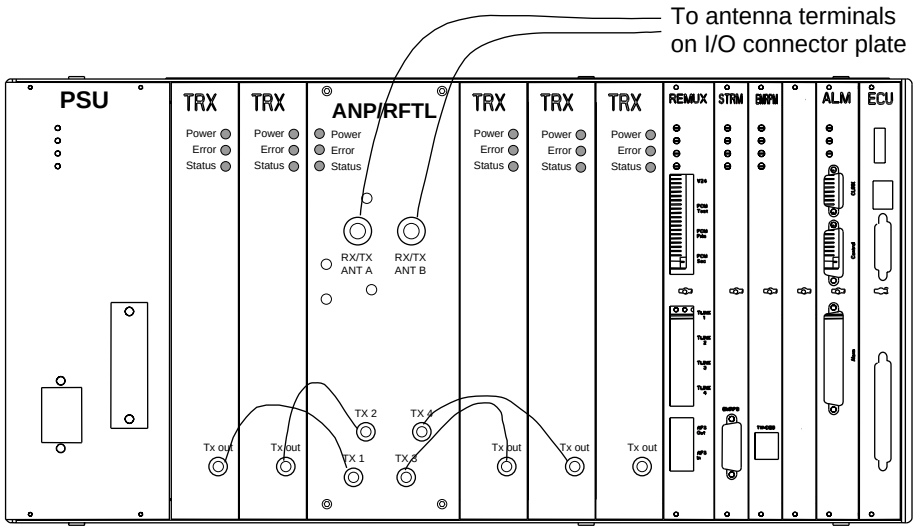
Figure 4-45. Cable Assembly with Cable Connector Tool

17.3 One-Sector Sites

Before beginning the installation, attach the ESD strap to your wrist and connect the free end of the strap cable to an appropriate ground conductor in the cabinet.

The following cabinet configurations are examples of fully configured sites.

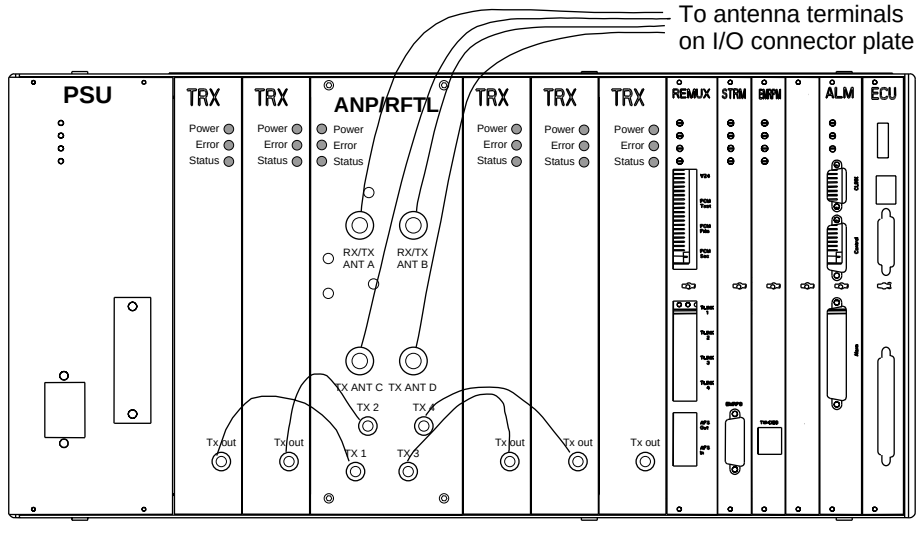
17.3.1 One-Sector Sites, One Cabinet with Two Antennas



Note: The TRX board in position 6 is used for DVER

Figure 4-46. One-Sector Site, One Cabinet with Two Antennas

17.3.2 One-Sector Sites, One Cabinet with Four Antennas



Note: The TRX board in position 6 is used for DVER

Figure 4-47. One-Sector Site, One Cabinet with Four Antennas

17.4 Two-Sector Sites

Before beginning the installation, attach the ESD strap to your wrist and connect the free end of the strap cable to an appropriate ground conductor in the cabinet.

EMRPB, TLINK, and AFS Cables are routed between cabinets using 1" liquid-tight, flexible conduit. Conduit is run from the floor of the Main cabinet to the floor of the Primary cabinet.

Note: Route the EMRPB cable through the conduit and use the connector tool (see Figure 4-45 on page 4-71) to terminate to an IDC connector. The signal and pin connections for the IDC connector are shown in Table 4-11 on page 4-70.

17.4.1 Two-Sector Site, Each Cabinet with Two Antennas

Use the following steps to cable the Main and Primary cabinets in a two-sector site using two antennas. Use the cables in the Extension Cabinet Cable Set (NTM 201 1807). See Figure 4-48 on page 4-74 for placement of cables.

1. Connect a cable from the AFS OUT connector on the REMUX board in the Main cabinet to the External AFS IN connector on the CONN board in the Primary cabinet.
2. Connect a cable from the TLINK 1 Interface connector on the REMUX board in the Main cabinet to the TLINK 1 Interface connector on the CONN board in the Primary cabinet.
3. Connect a cable from the EMRPB interface connector on the STRM board in the Main cabinet to the top EMRPB interface connector on the CONN board in the Primary cabinet.
4. Insert a termination plug (RVN991200012) in the bottom EMRPB interface connector on the CONN board.

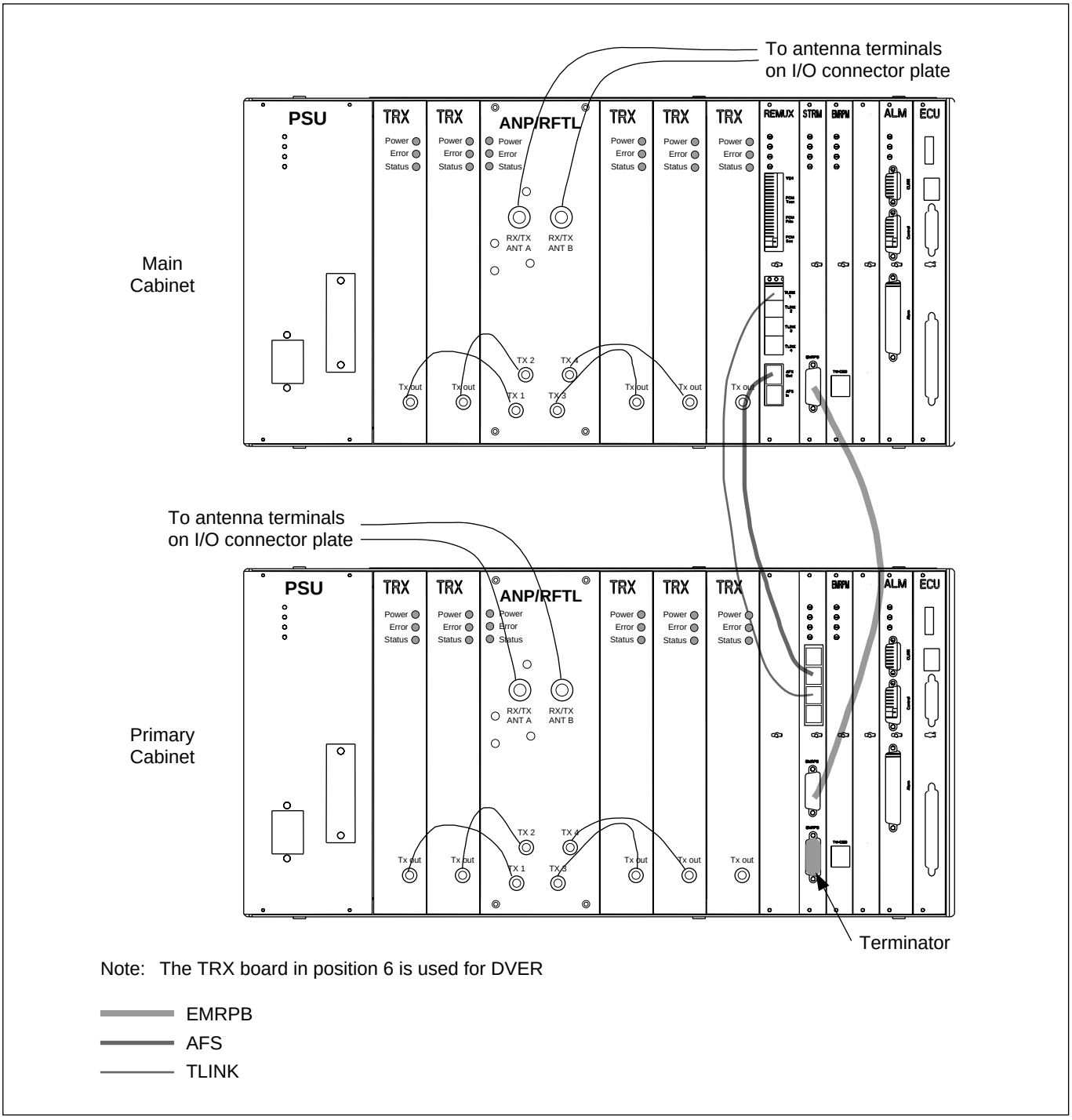


Figure 4-48. Two-Sector Site, Each Cabinet with Two Antennas

17.4.2 Two-Sector Site, Each Cabinet with Four Antennas

Use the following steps to cable the Main and Primary cabinets in a two-sector site using four antennas. Use the cables in the Extension Cable Set (NTM 201 1807). See Figure 4-49 on page 4-76 for placement of cables.

1. Connect a cable from the TLINK 1 Interface connector on the REMUX board in the Main cabinet to the TLINK 1 Interface connector on the CONN board in the Primary cabinet.
2. Connect a cable from the External AFS OUT connector on the REMUX board in the Main cabinet to the External AFS IN connector on the CONN board in the Primary cabinet.
3. Connect a cable from the EMRPB interface connector on the STRM board in the Main cabinet to the top EMRPB interface connector on the CONN board in the Primary cabinet.
4. Insert a termination plug (RVN991200012) in the bottom EMRPB interface connector on the CONN board.

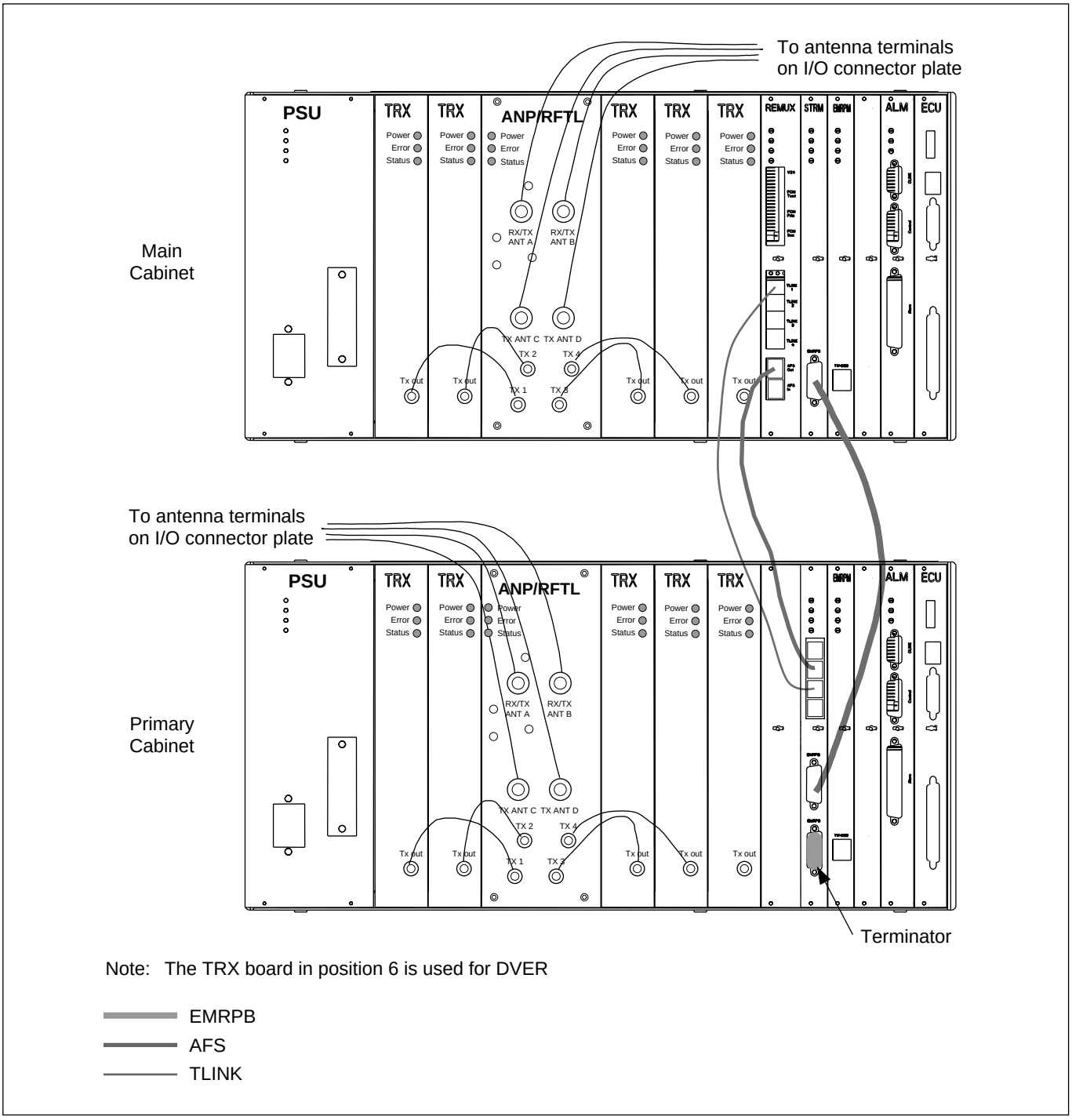


Figure 4-49. Two-Sector Site, Each Cabinet with Four Antennas

17.5 Three Sector Sites

Before you begin the installation, attach the ESD strap to your wrist and connect the free end of the strap cable to an appropriate ground conductor in the cabinet.

EMRPB, TLINK, and AFS Cables are routed between cabinets using 1” liquid-tight, flexible conduit. Conduit is run from the floor of the Main cabinet to the floor of the Primary cabinet.

Note: Route the EMRPB cable through the conduit and use the connector tool (see Figure 4-45 on page 4-71) to terminate to an IDC connector per Table 4-11 on page 4-70.

17.5.1 Three-Sector Site, Each Cabinet with Two Antennas

Use the following steps to cable the Main, Primary 1, and Primary 2 cabinets in a three-sector site using two antennas. Use the cables in the Extension Cable Set (NTM 201 1807). See Figure 4-50 on page 4-78 for placement of cables.

1. Connect a cable from the TLINK 1 Interface connector on the REMUX board in the Main cabinet to the TLINK 1 Interface connector on the CONN board in the Primary 1 cabinet.
2. Connect a cable from the TLINK 3 Interface connector on the REMUX board in the Main cabinet to the TLINK 1 Interface connector on the CONN board in the Primary 2 cabinet.
3. Connect a cable from the External AFS OUT connector on the REMUX board in the Main cabinet to the External AFS IN connector on the CONN board in the Primary 1 cabinet.
4. Connect a cable from the External AFS OUT connector on the CONN board in the Primary 1 cabinet to the External AFS IN connector on the CONN board in the Primary 2 cabinet.
5. Connect a cable from the EMRPB interface connector on the STRM board in the Main cabinet to the top EMRPB interface connector on the CONN board in the Primary 1 cabinet.
6. Connect a cable from the bottom EMRPB interface connector on the CONN board in the Primary 1 cabinet to the top EMRPB interface connector on the CONN board in the Primary 2 cabinet.
7. Insert a termination plug (RVN991200012) in the bottom EMRPB interface connector on the CONN board in the Primary 2 cabinet.

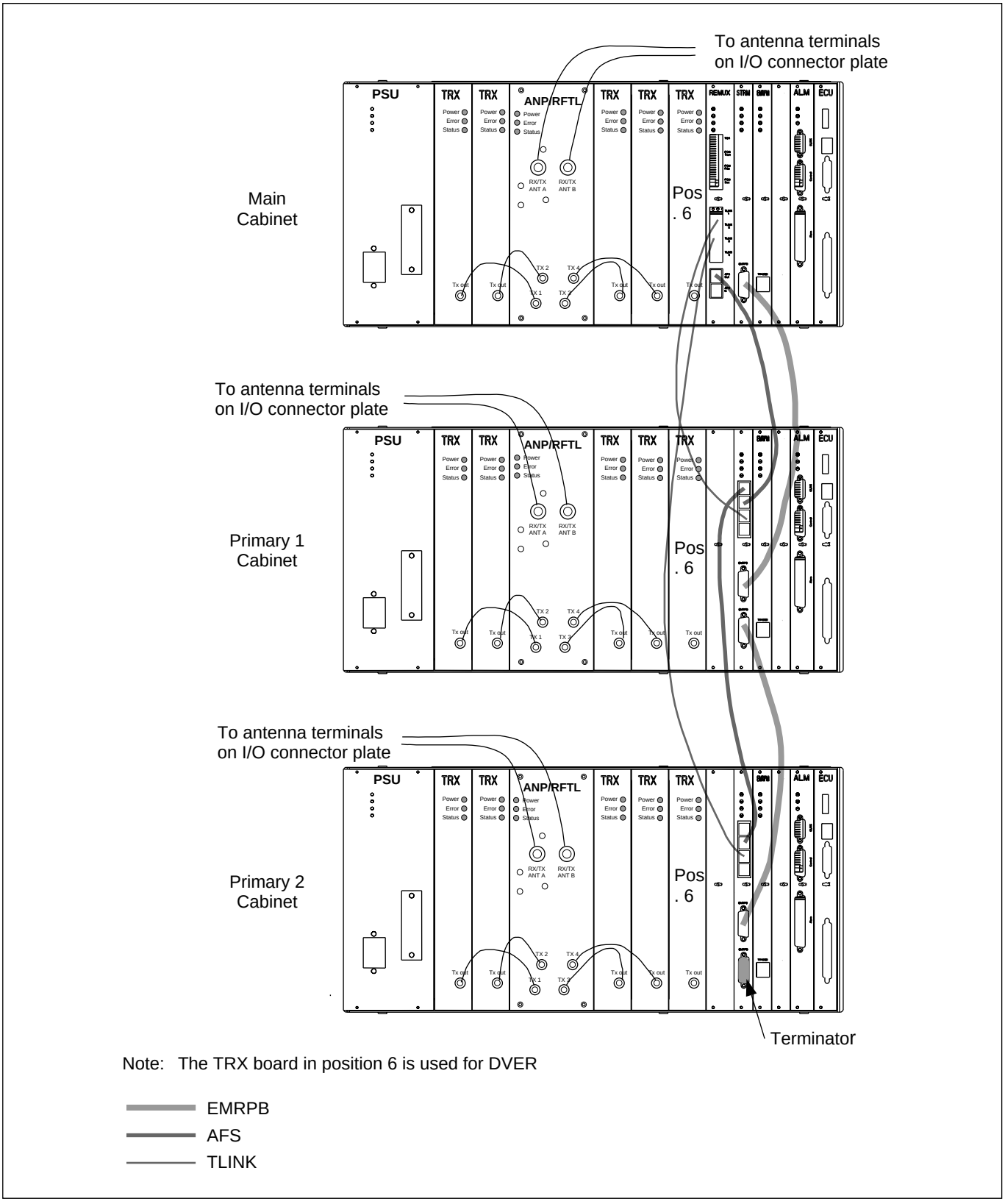


Figure 4-50. Three-Sector Site, Each Cabinet with Two Antennas

17.5.2 Three-Sector Site, Each Cabinet with Four Antennas

Use the following steps to cable the Main, Primary 1, and Primary 2 cabinets in a three-sector site using four antennas. Use the cables in the Extension Cable Set (NTM 201 1807). See Figure 4-51 on page 4-80 for placement of cables.

1. Connect a cable from the TLINK 1 Interface connector on the REMUX board in the Main cabinet to the TLINK 1 Interface connector on the CONN board in the Primary 1 cabinet.
2. Connect a cable from the TLINK 3 Interface connector on the REMUX board in the Main cabinet to the TLINK 1 Interface connector on the CONN board in the Primary 2 cabinet.
3. Connect a cable from the External AFS OUT connector on the REMUX board in the Main cabinet to the External AFS IN connector on the CONN board in the Primary 1 cabinet.
4. Connect a cable from the External AFS OUT connector on the CONN board in the Primary 1 cabinet to the External AFS IN connector on the CONN board in the Primary 2 cabinet.
5. Connect a cable from the EMRPB interface connector on the STRM board in the Main cabinet to the top EMRPB interface connector on the CONN board in the Primary 1 cabinet.
6. Connect a cable from the bottom EMRPB interface connector on the CONN board in the Primary 1 cabinet to the top EMRPB interface connector on the CONN board in the Primary 2 cabinet.
7. Insert a termination plug (RVN991200012) in the bottom EMRPB interface connector on the CONN board in the Primary 2 cabinet.

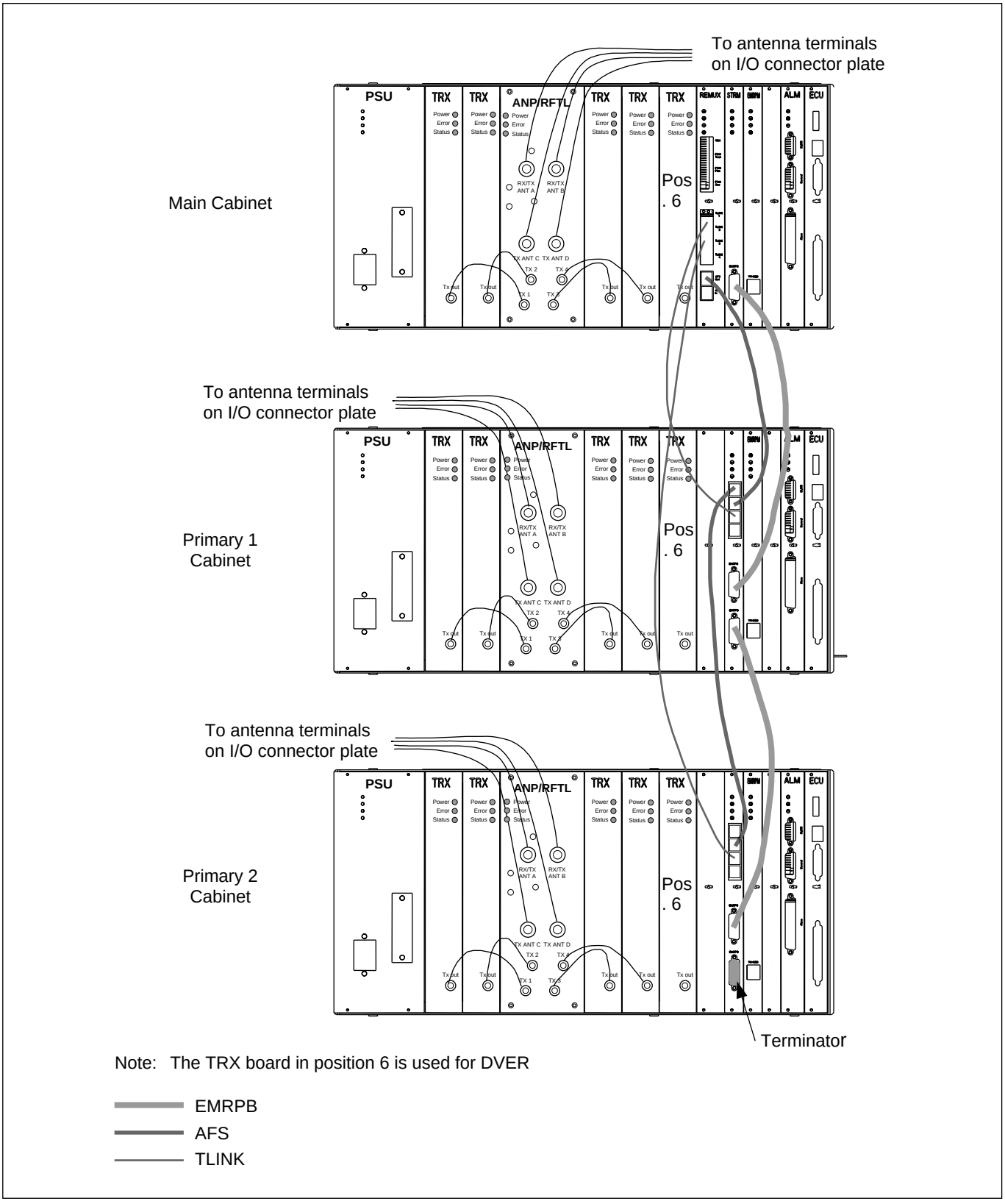


Figure 4-51. Three-Sector Site, Each Cabinet with Four Antennas

18 RBS 884 Micro (1900 MHz) Cabinet Repainting

This section provides instructions for repainting RBS 884 Micro (1900 MHz) cabinets. The instructions are intended as general recommendations only and may not be suitable in all applications.

18.1 Required Materials and Tools

18.1.1 Materials

Prior to repainting the cabinet, obtain all materials listed in Table 4-12 on page 4-81

Table 4-12. Cabinet Repainting Materials

Part Number	Description
Refer to Paint Manufacturer	Two-component polyurethane coating (paint chip required for color matching)
N/A	80 grit (or finer) Sandpaper (for orbital sander)
N/A	120 grit (or finer) Sandpaper (for finish sanding)
N/A	Tack Cloth
N/A	Masking Tape

18.1.2 Tools

Prior to repainting the cabinet, obtain all tools listed in Table 4-13 on page 4-81

Table 4-13. Cabinet Repainting Tools

Part Number	Description
N/A	Orbital Sander
N/A	Paint Spraying Equipment
N/A	Sanding Blocks (as required)

18.2 Cabinet Surface Preparation

Prior to repainting the RBS 884 Micro (1900 MHz) cabinet, prepare the cabinet surface as outlined in the following steps:

DANGER!

Paint, paint dust, and paint refinishing chemicals can be hazardous to your health and result in injury or damage to equipment. Do not breathe paint fumes or paint dust. Wear protective breathing equipment and work only in well ventilated areas. Follow all local safety practices.

Caution!

Sanding the surface of the RBS 884 Micro (1900 MHz) cabinet may result in reduced corrosion resistance. Also, use of a darker paint color will degrade the thermal performance of the cabinet.

1. Using an orbital sander with 80 grit or finer sandpaper, lightly sand all surfaces to be painted.
2. Blow off any excess sanding dust with compressed air.
3. Using a tack cloth, wipe down all surfaces.
4. If scratches or imperfections are visible in the surface, lightly sand surfaces again using 120 grit or finer sandpaper.
5. **Caution!**

   To ensure proper paint adhesion, all paint dust and any other loose material must be removed from the cabinet surface.

   Using a tack cloth, wipe down all surfaces.
6. Mask all areas that are not to be painted, including hinges and door hardware.

18.3 Cabinet Painting

To apply the primer and finish paint to the cabinet, perform the following steps:

Applying Primer Paint to Cabinet

1. Using appropriate paint spraying equipment, apply primer to all areas to be painted.

2. Allow primer to dry for a minimum of 30 minutes.

   Note: Paint drying times vary according to environmental conditions such as temperature and humidity. Refer to the paint manufacturer's specifications for drying times.

3. When primer is dry, feather sand the edges of the primed areas.

4. Wipe all surfaces clean with a tack cloth. Ensure surface is free of all dust and debris.

Applying Finish Paint to Cabinet

5. Prepare finish paint as specified by the paint manufacturer.

   Note: The finish paint is a two-part polyurethane coating (paint and catalyst) that hardens with age. Painting time is limited after mixing. Refer to the paint manufacturer's specifications for working life of the mixed paint.

6. Using appropriate paint spraying equipment, apply the finish paint to all areas to be painted.

7. Allow paint to dry and apply one or more additional coats.

8. Allow painted cabinet to dry for a minimum of 24 hours (48 hours recommended) before handling or removing any masking.

9. After 24 to 48 hours, carefully remove masking from hinges and door hardware.

   Note: Two-component polyurethane paint includes a catalyst that causes the paint to harden and become more durable with age. Within the first 48 hours after application, the paint is soft and scuffs easily. Use care to not scuff or mar the surface.

1 Introduction

This part of the manual lists procedures for basic troubleshooting and hardware replacement of faulty items of equipment, such as cabinet units or cables.

The use of the procedures by a site maintenance technician may depend on instructions from the MSC personnel who are able to determine the status of the RBS site equipment from the MSC.

The site maintenance technician may be asked to replace a particular unit using the procedure in Section 6 on page 5-14, or to follow the troubleshooting procedure in Section 4 on page 5-6 for determining a faulty unit. The troubleshooting procedure is also used if failures occur during the power-up procedure.

2 Safety Considerations

2.1 Grounding of the RBS Cabinets

This product is Safety Class 1 equipment.

The RBS cabinets must be connected to the AC power through a grounded power cable, with the ground wire firmly connected to an electrical ground (safety ground) at the power outlet.

DANGER!

Any interruption of the protective (grounding) conductor, or disconnection of the protective ground terminal will cause a potential shock hazard that could result in personal injury.

2.2 Voltage Hazards

DANGER!

Voltage in excess of 100V is used in the RBS 884 Micro (1900 MHz). Observe safety precautions. Contact with voltage as low as 50V can result in death.

Observe the following safety precautions:

- Do not touch high voltage connections when working on energized equipment.
- Do not energize equipment before the Power Up procedure in this manual is performed.
- Never connect the power cable to the power unit when the unit is removed from the cabinet.
- Perform all installation and repair procedures in the order presented.
- Keep one hand away from the equipment, if the nature of the maintenance permits, to reduce the possibility of current flowing through vital body organs.

Note: The power cable serves as the only power disconnection device for the cabinet.

2.3 Radio Frequency Radiation

DANGER!

Radio frequency radiation from an antenna may be a danger to health, causing severe burns to skin and clothing.

All transmitters must be disabled prior to working with or near antennas.

2.4 Beryllium Oxide

Some equipment contains beryllium oxide in ceramic form.

DANGER!

Beryllium oxide is poisonous and constitutes a health hazard if present in finely dispersed form, such as dust or smoke, which can be inhaled. Read local hazardous chemical regulations before working with beryllium oxide.

Units with components containing beryllium oxide are marked with a warning label. For detailed information on properties, health and environmental hazards, refer to the regulations issued by the local authorities.

The following rules must be obeyed by all persons handling beryllium oxide:

- Ceramics containing beryllium oxide must not be scraped, filed, ground, treated with acid, or machined in any other way.
- Compressed air must **not** be used to clean units containing beryllium oxide.
- Always wear protective gloves when handling beryllium oxide.
- Use wet rags to collect dust and particles from damaged beryllium oxide components. After use, place the rags in plastic bags and seal the bags completely.

Scrapped beryllium oxide must be treated as environmentally hazardous waste. Local authorities enforce regulations regarding the treatment and disposal of environmentally hazardous waste. Comply with all applicable local regulations.

2.5 Heavy Loads

Warning!

Incorrectly lifting heavy loads can result in severe injury to persons and damage to the equipment.

A fully equipped RBS 884 Micro (1900 MHz) cabinet weighs 105 kg (230 lbs). Ericsson recommends two persons be present during the maintenance activities where heavy lifting is required.

3 Product Handling and Inspection

Components may be damaged because of ESD. Read the “Electrostatic Discharge” section in the *Installation and Hardware Replacement Manual* for information and directions.

A hardware replacement unit must always be kept in its original packaging until it is installed on a site.

The unit must not be exposed to wide variations in temperature, to direct sunshine, or to high levels of humidity, such as may occur if the unit is left in a closed vehicle.

When handling circuits boards, do not touch any components or connector pins.

If the packing material is damaged, inspect the unit immediately. If the unit appears to be damaged, follow local procedures or return it to the local service center for repair or hardware replacement.

A faulty unit must always be accompanied by a completed Repair Traveler Note, with written information concerning the circumstances of the suspected fault. A Repair Traveler Note is a tie-on tag, which can be attached to the unit.

4 General Troubleshooting

Operational status of the RBS equipment is indicated by LEDs mounted on the front of the units plugged into the cabinets.

In general, green LEDs are used for power status, red LEDs are used for error status, and yellow LEDs are used to indicate other types of operational status.

The procedure in this section is used to determine faulty units by visual inspection of the LEDs and other means. If the procedure does not result in the detection of a faulty unit, the MSC must be informed in order to determine if a problem at the site is still indicated at the MSC.

4.1 Prerequisites and Tools

4.1.1 Prerequisites

The troubleshooting procedure in this section is intended to be followed if an RBS unit fault is detected during the power-up procedure, or at the request of the MSC as a result of an RBS site equipment error indication at the MSC.

4.1.2 Tools

Tools required to troubleshoot the RBS 884 Micro (1900 MHz) are shown in Table 5-1 on page 5-7.

Table 5-1. Tools List

Product Number	Description
	Pen
LYB 250 01/14	ESD Wrist Strap and Cable[2]
LTD 117 02 and LTD 117 14	Unit Extractor Tool (Handle + Button)
N/A	AC or AC/DC Voltmeter[1] (for checking the line voltage)
[1] Included in Tool Kit LTT 601 044/1 [2] Included in Tool Case LTT 601 84	

4.2 Troubleshooting Procedure for RBS 884 Micro (1900 MHz) Cabinets

To troubleshoot the RBS 884 Micro (1900 MHz), perform the following:

Cabinet Access

1. Unlock the door latches as shown in Figure 5-1 on page 5-7

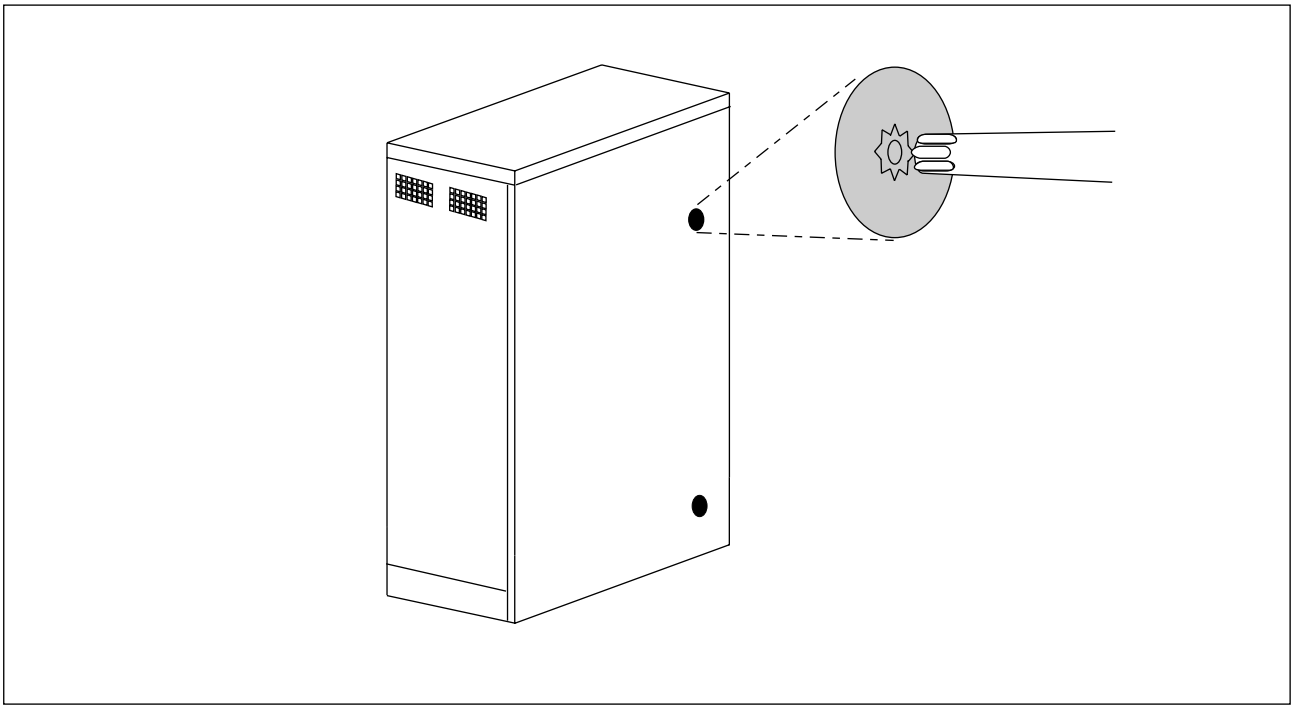


Figure 5-1. Unlocking the RBS Cabinet Door

2. Open the cabinet door and secure the wind latch at the top of the door. Open the door until the shoulder slides into the slot at the end of the bar.

3. Disable the intrusion alarm by pulling out the black pin at the top of the door frame.

4. To release the wind latch, lift up on the bar and close the door.

5. Attach the ESD strap and connect the alligator clip to a suitable ground on the cabinet chassis. Do not attach to a painted or coated surface. See Figure 5-2 on page 5-8.

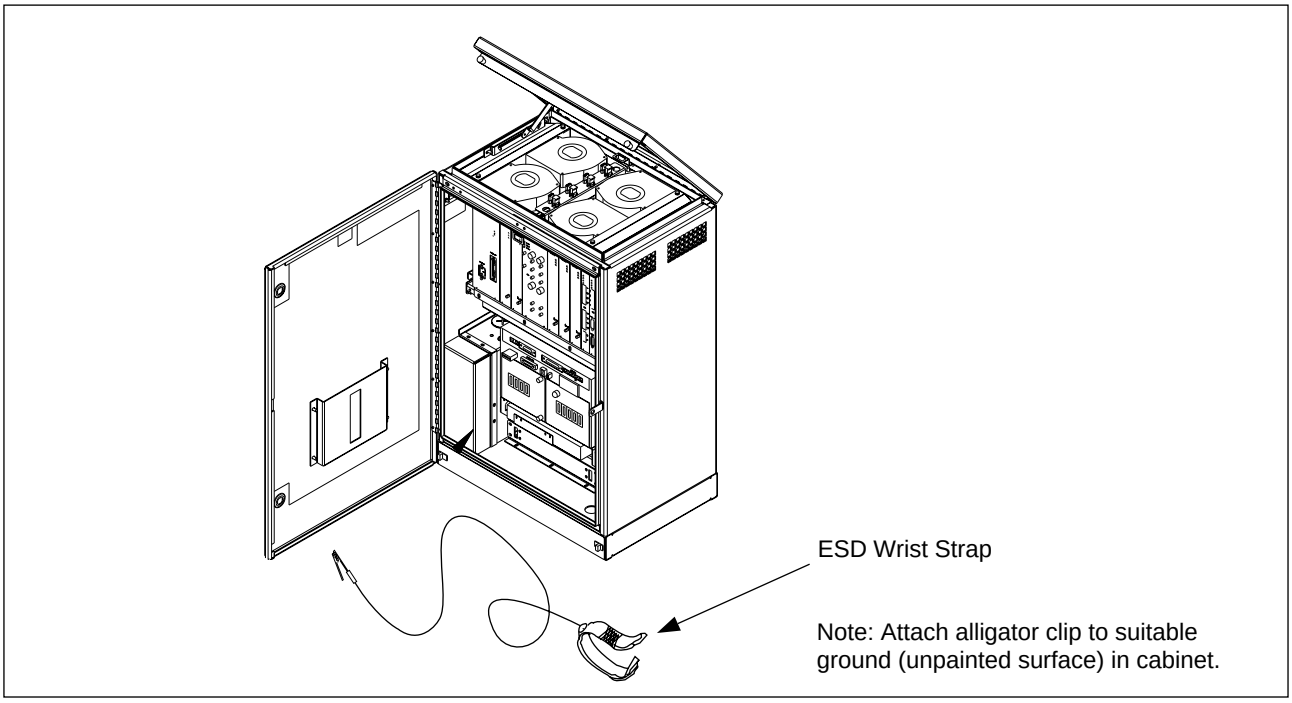


Figure 5-2. Opening the RBS Cabinet and Attaching the ESD Strap

Troubleshooting Flowchart

6. Follow the flowchart shown in Figure 5-3 on page 5-9 or Figure 5-4 on page 5-10 to identify a unit suspected to be faulty.

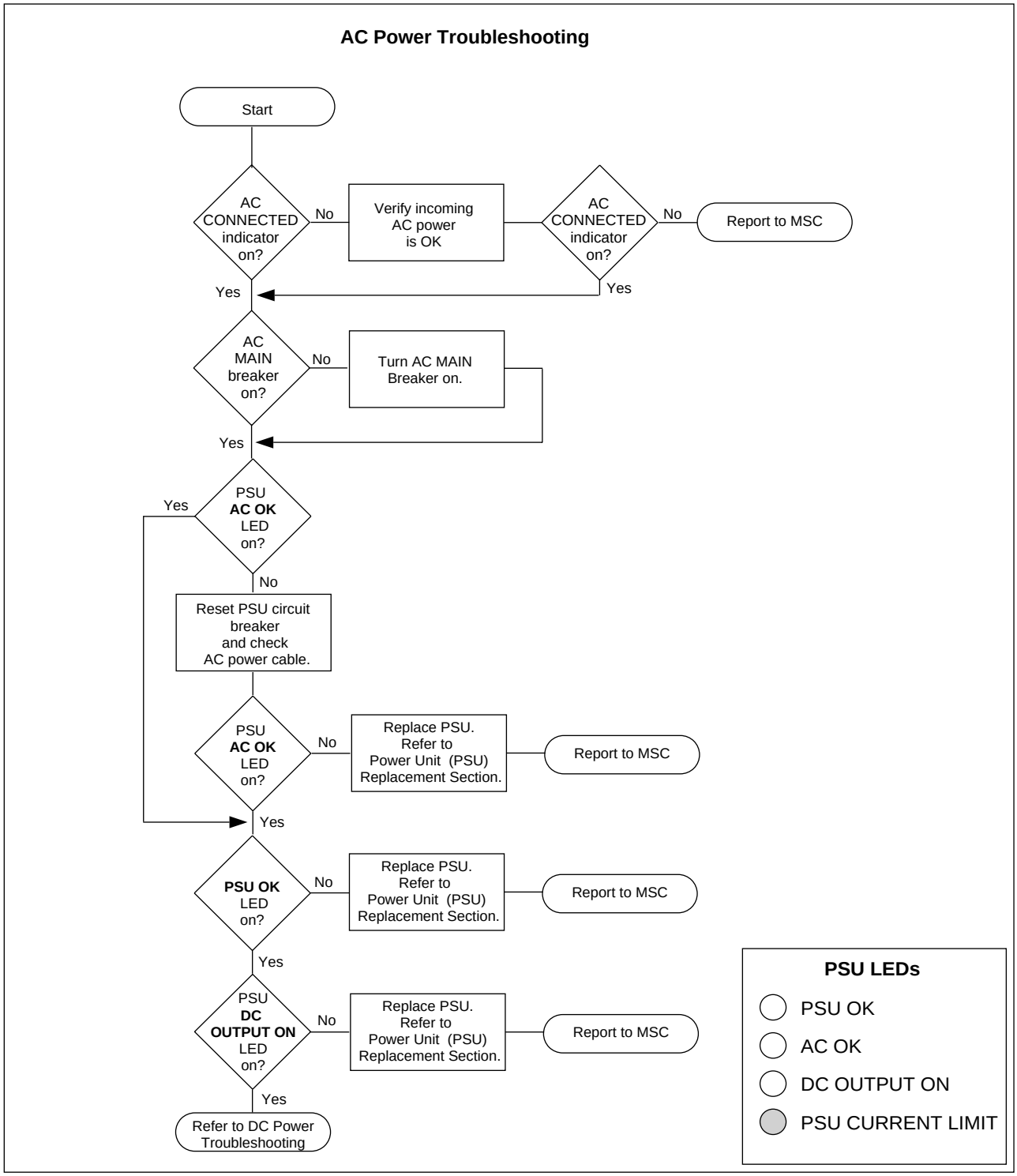


Figure 5-3. Troubleshooting Flowchart for AC Power Connection

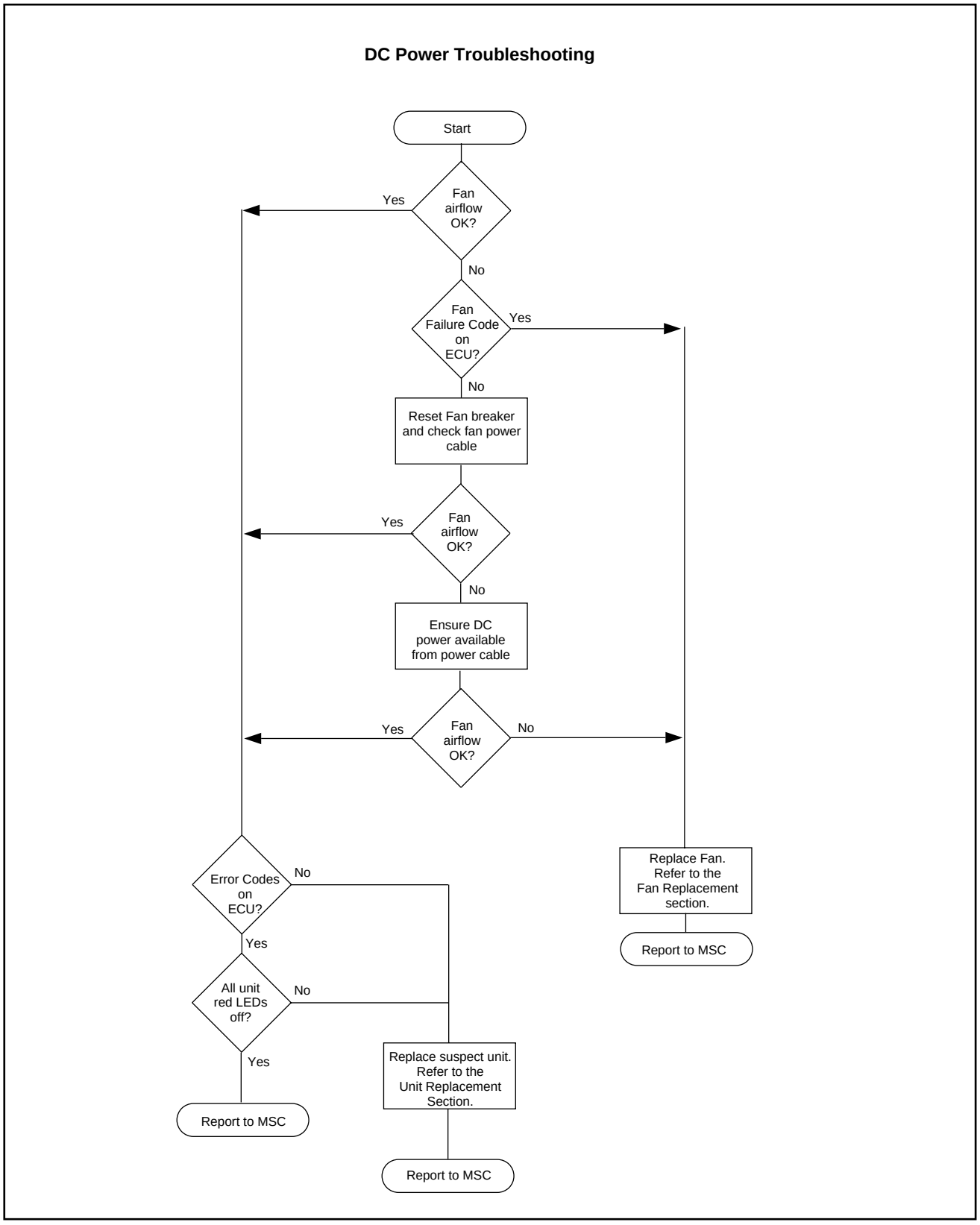


Figure 5-4. Troubleshooting Flowchart for DC Power Connection

7. If Troubleshooting procedures have been performed as part of a power-up procedure, return to the appropriate section and complete the power-up procedure.

5 Alarm Troubleshooting

Refer to Table 5-2 on page 5-11 for RBS 884 Micro (1900 MHz) alarm conditions and corrective actions. For alarm routing, refer to both Table 5-2 on page 5-11 and Figure 5-5 on page 5-14.

Table 5-2. Alarm Troubleshooting

Alarm Name	Condition	Corrective Action/ Alarm Clearing
	Alarm Source/Routing	
Single Fan Alarm	Fan not within ±25% of set speed (checked once per second)	Reset fan breaker
	From ECU/TRXs by way of backplane	
Multi-Fan Alarm	Two or more fans not within ±25% of set speed (checked once per second)	Reset fan breaker
	From ECU/TRXs by way of backplane	
AC Mains Failure Alarm	AC Mains ≤ minimum PSU voltage requirement	Self clears when AC Mains voltage is adequate to power PSU
	From PSU by way of AC/ DC Distribution Box by way of cable to ECU by way of cable to EMRPM by way of backplane	
PSU Failure Alarm	AC Mains > 100 Vac and DC Out < 24 Vdc and Output Current < 1A	Self clears (trigger conditions not valid) after PSU power is within specification
	From PSU by way of AC/ DC Distribution Box by way of cable to ECU by way of cable to EMRPM through backplane	

Table 5-2. Alarm Troubleshooting (Continued)

	Condition	
Low Voltage Disconnect Alarm	DCBus Voltage < 22.9 VDC; disconnects Battery when < 20.9 VDC	Self Clears
	From AC/DC Distribution Box to ALM through cable	
Battery Thermal Alarm	Temperature of Battery Terminal > 70°C	Self clears
	From AC/DC Distribution Box to ALM through cable	
Temperature Sensor Failure Alarm	One or more temperature sensors shorted or open (checked once per second)	Self clears
	From ECU to AC/DC Distribution Box through cable to ALM through cable	
Temperature Shutdown Alarm	Subrack Inlet ≤ -6°C or Subrack Inlet ≥ +51°C or Exhaust ≥ +62°C. After alarm generation, there is a six-second delay before subrack is disconnected (checked once per second).	Self clears if Subrack Inlet ≥ -4°C and Subrack Inlet ≤ +49°C and Exhaust ≤ +60°C
	From ECU to AC/DC Distribution Box through cable to ALM through cable	
Main Heater Failure Alarm	Ten-minute delay (warning) if ambient temp ≤ 0°C and Subrack Inlet < ambient + 5°C for ten minutes	Reset Main Heater breaker
	From ECU to AC/DC Distribution Box through cable to ALM through cable	

Table 5-2. Alarm Troubleshooting (Continued)

	Condition	
Battery Compartment Temperature Alarm	Ambient temp > +15°C and Battery Compartment > ambient + 10°C or Ambient temp < -5°C and Battery Compartment < ambient + 5°C	Self clears when temperature returns to within specifications
	From ECU to AC/DC Distribution Box through cable to ALM through cable	
AC Surge Suppressor Alarm	AC Surge No AC Power = alarm	Self clears if AC Surge Suppressor is not damaged
	From AC Surge Suppressor through cable to AC/DC Distribution Box through cable to ALM	
Door Alarm	Top or Front Door is Open	Self clears when both doors closed
	From Switches through cable to AC/DC Distribution Box through cable to ALM	

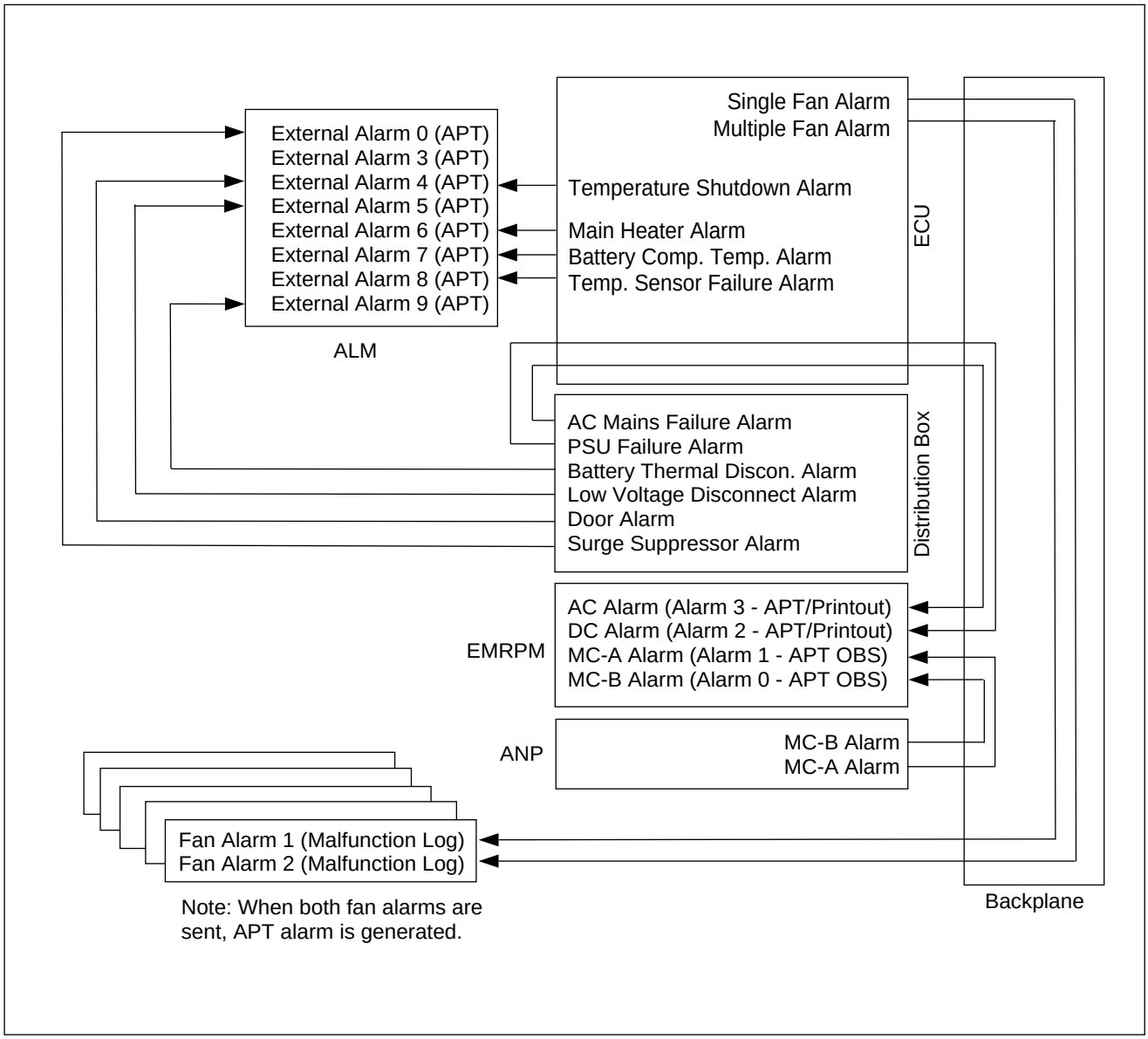


Figure 5-5. RBS 884 Micro (1900 MHz) Alarm Routing

6 RBS Unit Hardware Replacement

When a suspected faulty unit is identified either by indications at the MSC or by the troubleshooting procedures in Section 4 on page 5-6, follow the appropriate procedure in this section to replace the unit.

Hardware replacement procedures are provided for the following devices:

- Power Supply Unit (PSU)
- Remote Multiplexer (REMUX) Unit
- Signal Terminal Receiver, Micro (STRM) Unit

- Connector (CONN) Unit
- Extension Module Regional Processor, micro (EMRPM) Unit
- Transceiver (TRX) Unit
- Antenna Near Part (ANP)/Radio Frequency Test Loop (RFTL) Unit
- Alarm (ALM) Unit
- Environmental Control Unit (ECU)
- Fans
- Main Heater
- Battery Heater
- Batteries
- AC Surge Suppressor
- Pulse Code Modulation (PCM) (T1/E1) Primary Surge Suppressor
- Pulse Code Modulation (PCM) (T1/E1) Secondary Surge Suppressor
- Air Filter

6.1 Prerequisites and Tools

6.1.1 Prerequisites

Before a faulty unit is replaced, the hardware replacement unit must be available and must have the same or higher R-state number (R-state letters do not matter).

When units other than the PSU are replaced, suitable blank panels (8M, 10M, or 12M) or dummy TRXs (RMUs) must be available in case the hardware replacement takes an extended amount of time. The blank panels ensure proper cooling and EMC shielding.

6.1.2 Tools

The tools required for unit hardware replacement are shown in Table 5-3 on page 5-16, Figure 5-6 on page 5-16, Figure 5-7 on page 5-17 and Figure 5-8 on page 5-17. Additionally, an ESD bag is required for the unit suspected to be faulty (other type of bag can be used for fan and power units).

Table 5-3. Tools for RBS Unit Hardware Replacement

Product Number	Description
LYB 250 01/14	ESD Wrist Strap and Cable
LTT 601 82	Torque Wrench set including: - Torque Wrench 0.6 Nm - Torx bit T10 for circuit board screws - SMA tool for the coaxial cables
LSA 126 11/10	Torx driver TX10
LTD 117 02 and LTD 117 14	Unit Extractor Tool (Handle and Button)
N/A	Small Screwdriver or Pen (to set switches)
N/A	Repair Traveler Note

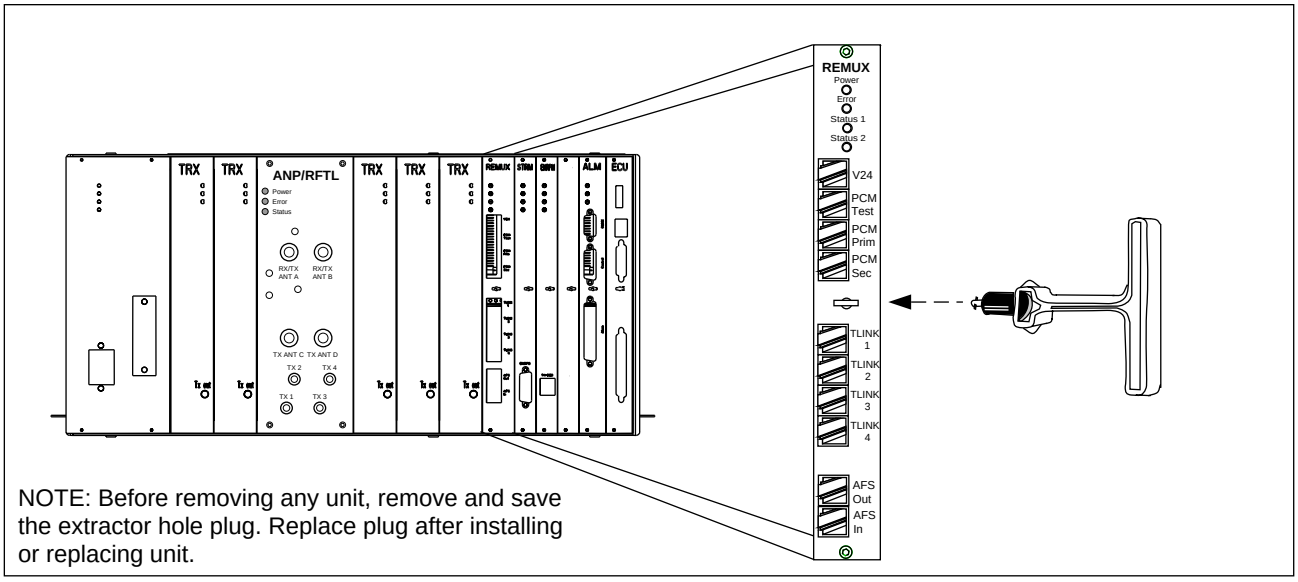


Figure 5-6. Unit Extractor Tool (Example with the REMUX Unit)

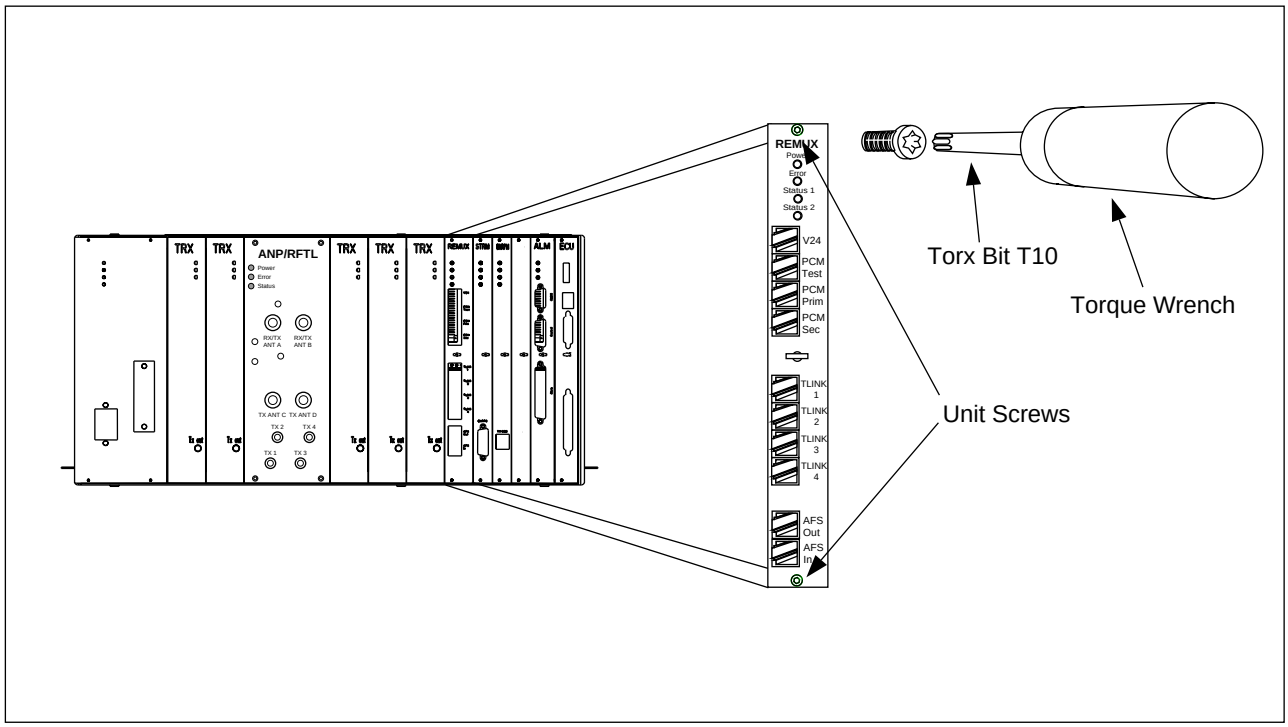


Figure 5-7. Torque Wrench with Torx Bit TX10 (Example with the REMUX Unit)

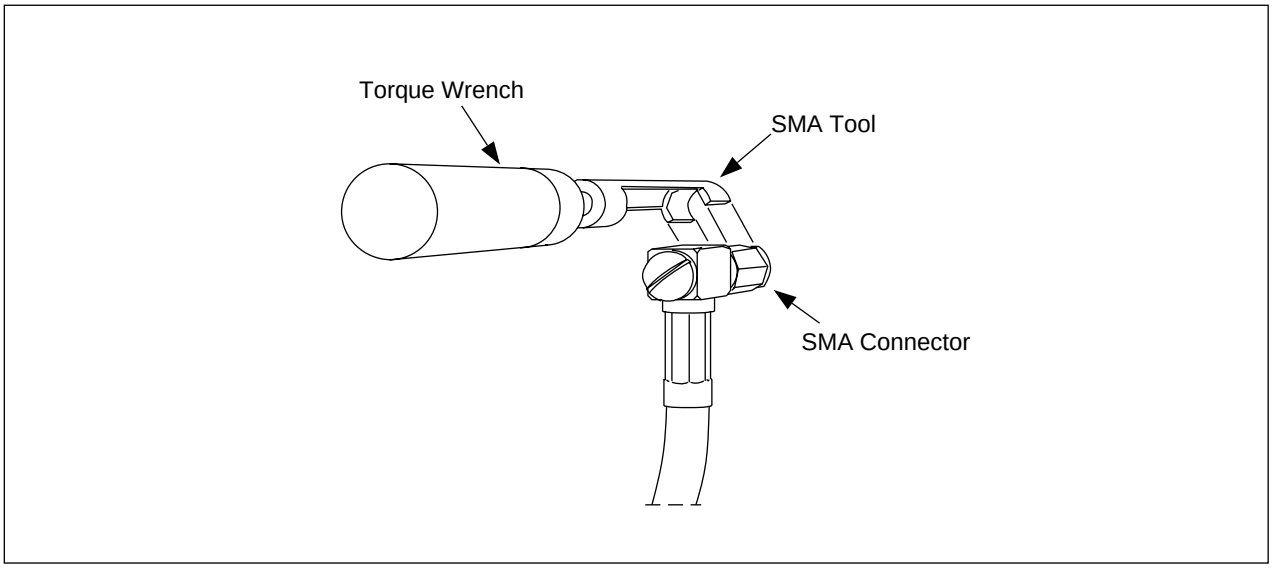


Figure 5-8. Torque Wrench with SMA Tool

6.2 Power Supply Unit (PSU) Replacement

Unit Removal

Warning!

The following procedure will disable the RBS 884 Micro (1900 MHz). The unit will be out of service during the procedure. Contact the MSC before performing the following procedure.

1. Obtain permission from the MSC operator to replace the unit. RBS units must be blocked at the MSC before replacement.

2. Open the cabinet door and secure the wind latch at the top of the door. Open the door until the shoulder slides into the slot at the end of the bar.

3. **Warning!**

   A unit must never be replaced by another unit with a lower R-state number.

   Ensure the PSU is the same type as the unit to be replaced, and that it has the same or higher R-state number.

4. **Warning!**

   Verify all TRX status LEDs (see Figure 5-9 on page 5-19) in the cabinet are off. If the main cabinet power unit is to be changed, all TRX status LEDs in all cabinets have to be checked.

   If any TRX status LEDs are on or flashing, contact the MSC operator.

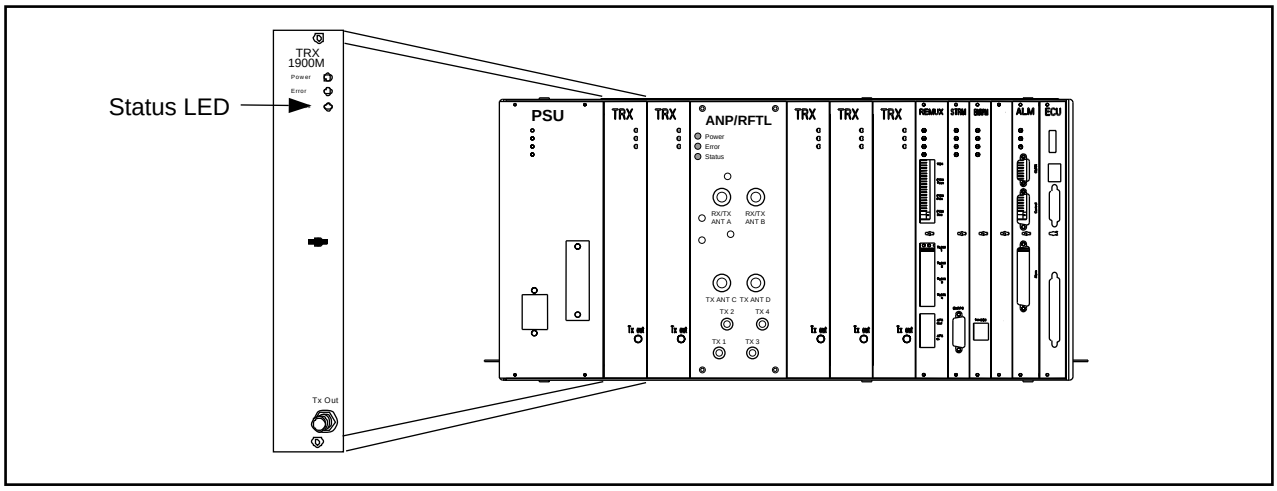


Figure 5-9. A TRX Unit

5. Attach the ESD strap to your wrist and connect the free end of the strap cable to an appropriate ground conductor in the cabinet.

6. Locate the PSU shown in Figure 5-10 on page 5-19.

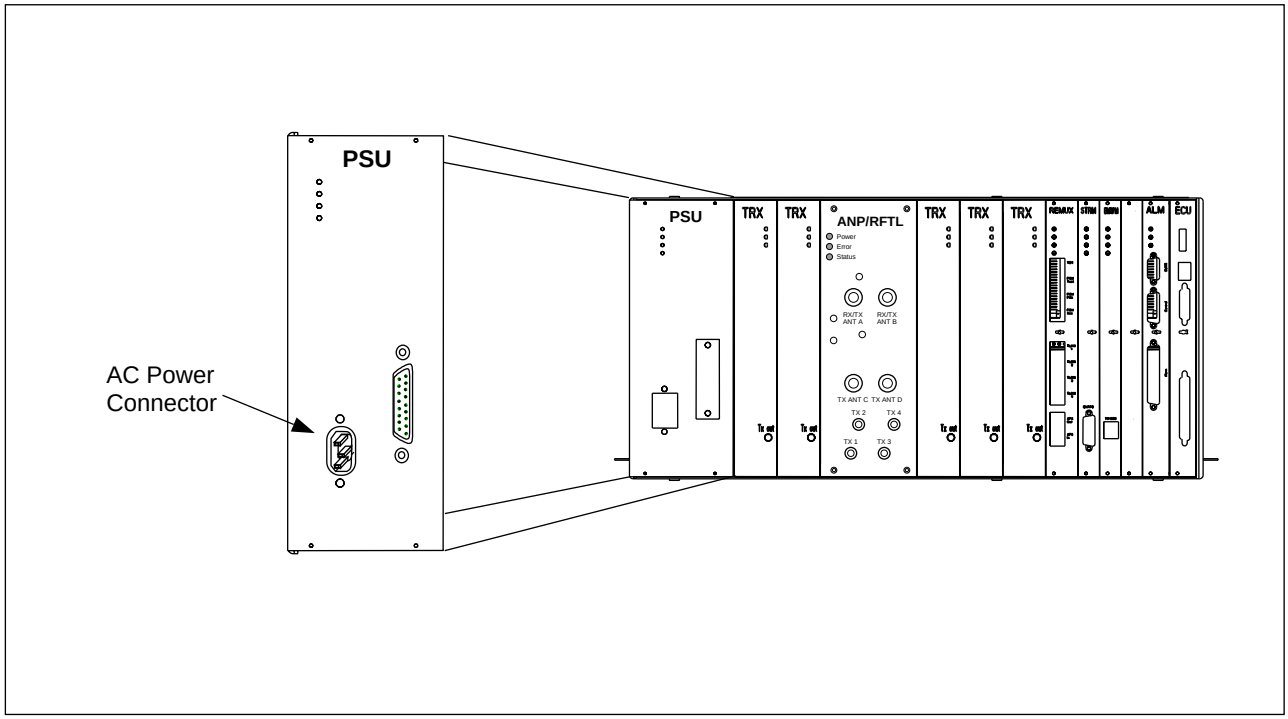


Figure 5-10. The Power Unit

7. Power down the RBS cabinet by turning the PSU and AC Mains circuit breakers OFF.

8. Disconnect the AC Power connector.

9. Disconnect the DC Power connector.

10. Use the torque wrench with the Torx bit TX10 to loosen the screws on the front of the unit.

11. Pull the unit out, and place it in a bag.

Unit Hardware Replacement

12. Remove the replacement PSU from its packaging and carefully slide the unit into the cabinet in place of the old unit.

13. Use the torque wrench with a Torx bit TX10 to tighten the screws on the front to 0.6 Nm.

14. Reconnect the AC and DC Power connectors.

15. Follow the procedure for powering up the cabinet in the “Equipment Power Up” section in the *Installation and Hardware Replacement Manual*.

16. Inform the MSC operator that the unit has been replaced and is ready to be tested.

17. Remove the ESD strap cable from the cabinet, and detach it from your wrist.

18. Update the *Plant Specification* in the *Site Installation Documentation* concerning the new PSU. Use the comments field to note the date of hardware replacement and the new R-state number.

19. Close the cabinet door.

Unit Repair

20. Complete the Repair Traveler Note and attach it to the PSU suspected to be faulty.

21. Pack the PSU in the packing material from the new unit and return it to your local service center.

6.3 Remote Multiplexer (REMUX) Unit Replacement

Unit Removal

Warning!

The following procedure will disable the RBS 884 Micro (1900 MHz). The unit will be out of service during the procedure. Contact the MSC before performing the following procedure. This procedure will also disable any additional sectors and cascaded RBS systems.

1. Obtain permission from the MSC operator to replace the REMUX.
2. Open the cabinet door and secure the wind latch at the top of the door. Open the door until the shoulder slides into the slot at the end of the bar.
3. **Warning!**

   A unit must never be replaced by another unit with a lower R-state number.

   Check that the REMUX is the same type as the unit to be replaced, and that it has the same or higher R-state.
4. **Warning!**

   Check that the REMUX status LEDs (see Figure 5-11 on page 5-22) and all TRX status LEDs (see Figure 5-9 on page 5-19) in all cabinets are OFF.

   If any of the mentioned status LEDs are on or flashing, contact MSC operator.

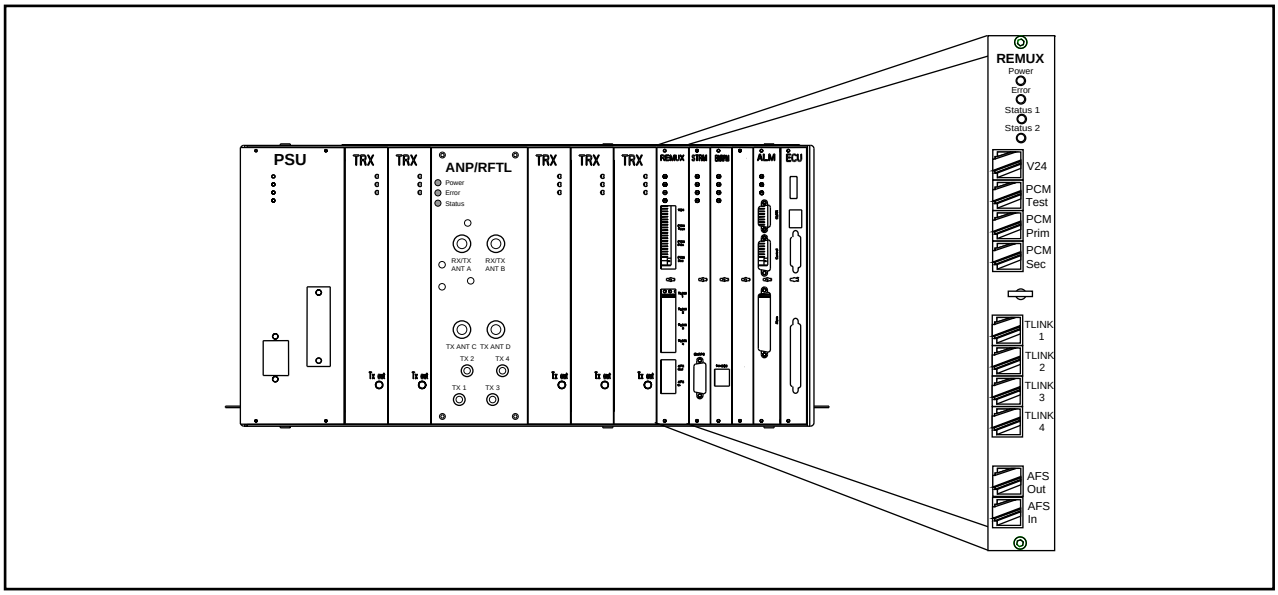


Figure 5-11. The REMUX Unit

5. Attach the ESD strap to your wrist and connect the free end of the strap cable to an appropriate ground conductor in the cabinet.

6. Make a note of the cables connected to the REMUX.

7. Disconnect the cables from the REMUX.

8. Use the torque wrench with the Torx bit TX10 to loosen the screws on the front of the unit.

9.

Warning!

The slot in the cabinet must not be left empty for an extended period of time. If there is any delay in installing the REMUX, then a blank panel (Blank 12M) must be screwed into the slot position (or the old unit left in position).

Pull out the REMUX, using the extractor tool, and place it in an ESD bag. Save the extractor hole plug. Replace the plug after installing or replacing the unit.

Unit Hardware Replacement

10. Remove the replacement REMUX from its ESD bag and set its switches to match those on the old unit. The switch settings are described in the “Setting the Unit Switches” section in the *Installation and Hardware Replacement Manual*.

11. Carefully slide the replacement unit into the cabinet. Push the unit firmly into the backplane connector.

12. Use the torque wrench with the Torx bit TX10 to tighten the screws on the front to 0.6 Nm.

13. Check that the green power LED on the unit is on and the red error LED is off. If this is not the case, refer to the troubleshooting procedures in Section 4 on page 5-6 for detection of units suspected to be faulty.

14. Connect the cables that were disconnected in Step 7 on page 5-22 to the unit. For cable connections, refer to the External Cable Installation section in the "Installation" part of the *Installation and Hardware Replacement Manual*. Additional information can be found in "Appendix C" of the *Installation and Hardware Replacement Manual*.

15. The REMUX requires approximately 20 minutes to synchronize. If the RBS 884 Micro (1900 MHz) does not become operational after 20 minutes, issue a software repair command to the STRM. The command is RECEI.

16. Inform the MSC operator that the REMUX has been replaced and is ready to be tested.

17. Remove the ESD strap cable from the cabinet, and detach it from your wrist.

18. Update the *Plant Specification* in the *Site Installation Documentation* concerning the new unit. Use the comments field to note the date of the hardware replacement and new R-state.

19. Close the cabinet door.

Unit Repair

20. Complete the Repair Traveler Note and attach it to the REMUX suspected to be faulty.

21. Pack the REMUX in the packing material from the new unit and return it to the local service center.

6.4 Signal Terminal Receiver, Micro (STRM) Unit Replacement

Unit Removal

Warning!

The following procedure will disable the RBS 884 Micro (1900 MHz). The unit will be out of service during the procedure. Contact the MSC before performing the following procedure. This procedure will also disable any additional sectors and cascaded RBS systems.

1. Obtain permission from the MSC operator to replace the unit.
2. Open the cabinet door and secure the wind latch at the top of the door. Open the door until the shoulder slides into the slot at the end of the bar.
3. **Warning!**

   A unit must never be replaced by another unit with a lower R-state number.

   Check that the replacement STRM is the same type as the unit to be replaced, and that it has the same or higher R-state number.
4. **Warning!**

   Check that the STRM status LEDs (see Figure 5-12 on page 5-25) and all TRX status LEDs (see Figure 5-9 on page 5-19) in all cabinets are OFF.

   If any of the mentioned status LEDs are on or flashing, contact the MSC operator.

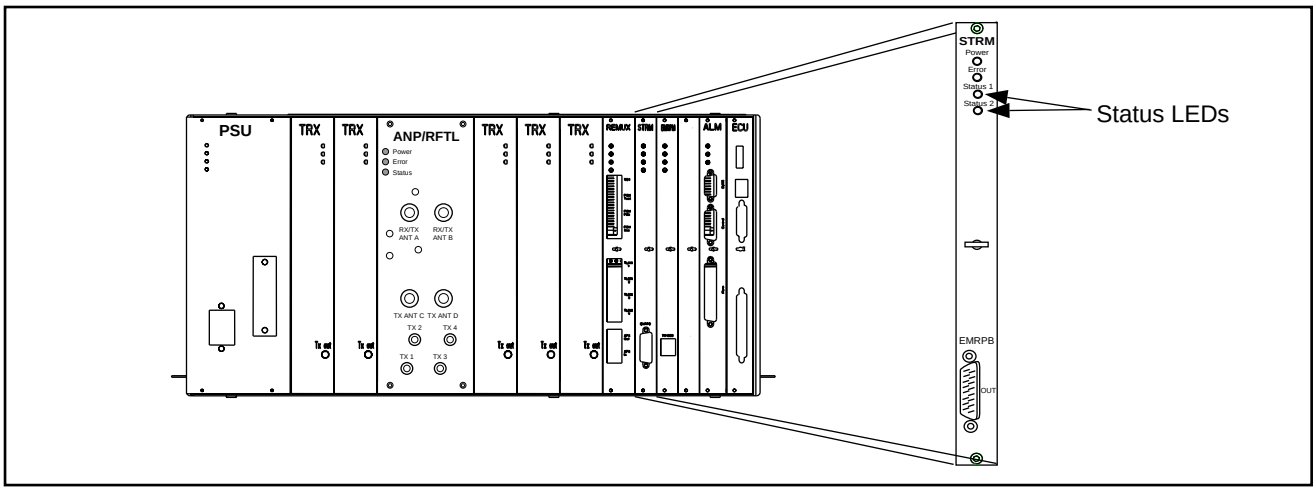


Figure 5-12. The STRM Unit

5. Attach the ESD strap to your wrist and connect the free end of the strap cable to an appropriate ground conductor in the cabinet.

6. Disconnect the cable or terminator from the STRM.

7. Use the torque wrench with the Torx bit TX10 to loosen the screws on the front of the STRM.

8.

Warning!

The slot in the cabinet must not be left empty for an extended period of time. If there is any delay in installing the STRM, a blank panel (Blank 8M) must be screwed into the slot position.

Pull out the unit, using the extractor tool, and place it in an ESD bag. Save the extractor hole plug. Replace the plug after installing or replacing the unit.

Hardware Replacement Unit

9. Remove the replacement STRM from its ESD bag.

10. Carefully slide the replacement unit into the cabinet in place of the old unit. Push the unit firmly into the backplane connector.

11. Use the torque wrench with the Torx bit TX10 to tighten the screws on the front to 0.6 Nm.

12. Check that the green power LED on the unit is on and the red error LED is off. If this is not the case, refer to the troubleshooting procedures in Section 4 on page 5-6 for detection of units suspected to be faulty.

13. Reconnect the STRM cable or terminator.

14. If the RBS 884 Micro (1900 MHz) does not become operational, cycle the power to the cabinet to reload the software.

15. Inform the MSC operator that the STRM has been replaced and is ready to be tested.

16. Remove the ESD strap cable from the cabinet, and detach it from your wrist.

17. Update the *Plant Specification* in the *Site Installation Documentation* concerning the new STRM. Use the comments field to note the date of the hardware replacement and new R-state.

18. Close the cabinet door.

Unit Repair

19. Complete the Repair Traveler Note and attach it to the STRM suspected to be faulty.

20. Pack the STRM in the packing material from the new unit and return it to the local service center.

6.5 Connector (CONN) Unit Replacement

Unit Removal

Warning!

The following procedure will disable the RBS 884 Micro (1900 MHz). The unit will be out of service during the procedure. Contact the MSC before performing the following procedure.

---

1. Obtain permission from the MSC operator to replace the CONN unit.

2. Open the cabinet door and secure the wind latch at the top of the door. Open the door until the shoulder slides into the slot at the end of the bar.

3. ---

Warning!

A unit must never be replaced by another unit with a lower R-state number.

Check that the replacement CONN unit is the same type as the unit to be replaced, and that it has the same or higher R-state number.

4.

Warning!

Check that all TRX status LEDs (see Figure 5-9 on page 5-19) in the relevant cabinet are OFF.

If they are on or flashing, contact the MSC operator.

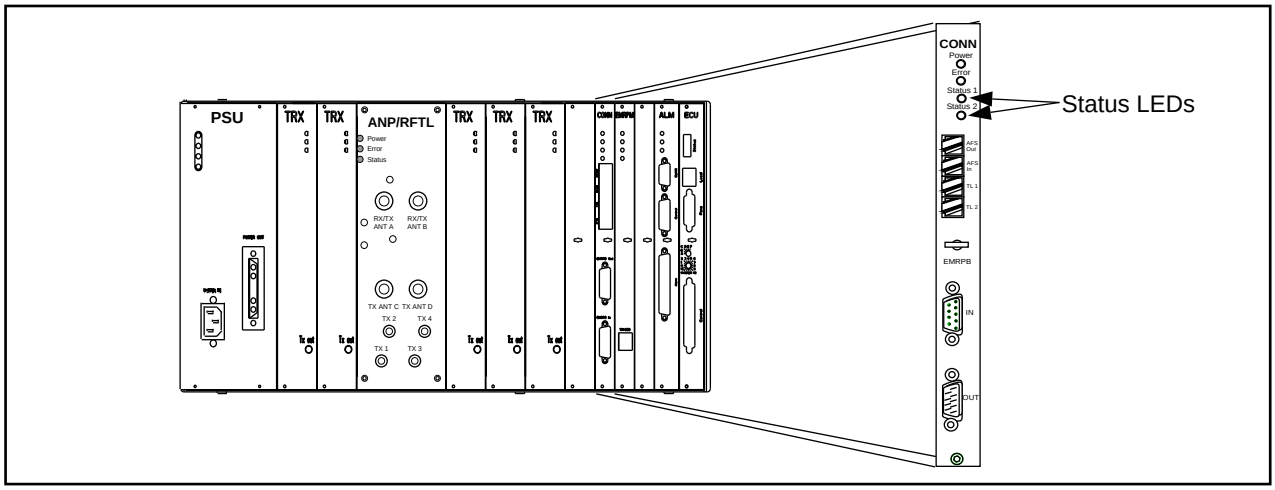


Figure 5-13. The CONN Unit

5. Attach the ESD strap to your wrist and connect the free end of the strap cable to an appropriate ground conductor in the cabinet.

6. Make a note of the cables connected to the CONN unit.

7. Disconnect the cables from the CONN unit.

8. Use the torque wrench with the Torx bit TX10 to loosen the screws on the front of the CONN unit.

9.

Warning!

The slot in the cabinet must not be left empty for an extended period of time. If there is any delay in installing the CONN unit, a blank panel (Blank 8M) must be screwed into the slot position.

Pull out the CONN unit, using the extractor tool, and place it in an ESD bag. Save the extractor hole plug. Replace the plug after installing or replacing the unit.

Hardware Replacement Unit

10. Remove the replacement CONN unit from its ESD bag.

11. Carefully slide the replacement unit into the cabinet. Push the unit firmly into the backplane connector.

12. Use the torque wrench with the Torx bit TX10 to tighten the screws on the front to 0.6 Nm.

13. Check that the green power LED on the unit is on and the red error LED is off. If this is not the case, refer to the troubleshooting procedures in Section 4 on page 5-6 for detection of units suspected to be faulty.

14. Reconnect the CONN unit cables.

15. Inform the MSC operator that the CONN unit has been replaced and is ready to be tested.

16. Remove the ESD strap cable from the cabinet, and detach it from your wrist.

17. Update the *Plant Specification* in the *Site Installation Documentation* concerning the new CONN unit. Use the comments field to note the date of hardware replacement and new R-state.

18. Close the cabinet door.

Unit Repair

19. Complete the Repair Traveler Note and attach it to the CONN unit suspected to be faulty.

20. Pack the unit in the packing material from the new unit and return it to the local service center.

6.6 Extension Module Regional Processor (EMRPM) Unit Replacement

Unit Removal

Warning!

The following procedure will disable the RBS 884 Micro (1900 MHz). The unit will be out of service during the procedure. Contact the MSC before performing the following procedure.

---

1. Obtain permission from the MSC operator to replace the EMRPM unit.

2. Open the cabinet door and secure the wind latch at the top of the door. Open the door until the shoulder slides into the slot at the end of the bar.

3.

Warning!

A unit must never be replaced by another unit with a lower R-state number.

Check that the replacement EMRPM unit is the same type as the unit to be replaced, and that it has the same or higher R-state number.

4.

Warning!

Check that the EMRPM status LEDs (see Figure 5-14 on page 5-29) and all TRX status (see Figure 5-9 on page 5-19) in the relevant cabinet are OFF. If any main cabinet EMRPM is to be changed, all TRX status LEDs in all cabinets have to be checked.

If any of the mentioned status LEDs are on or flashing, contact the MSC operator.

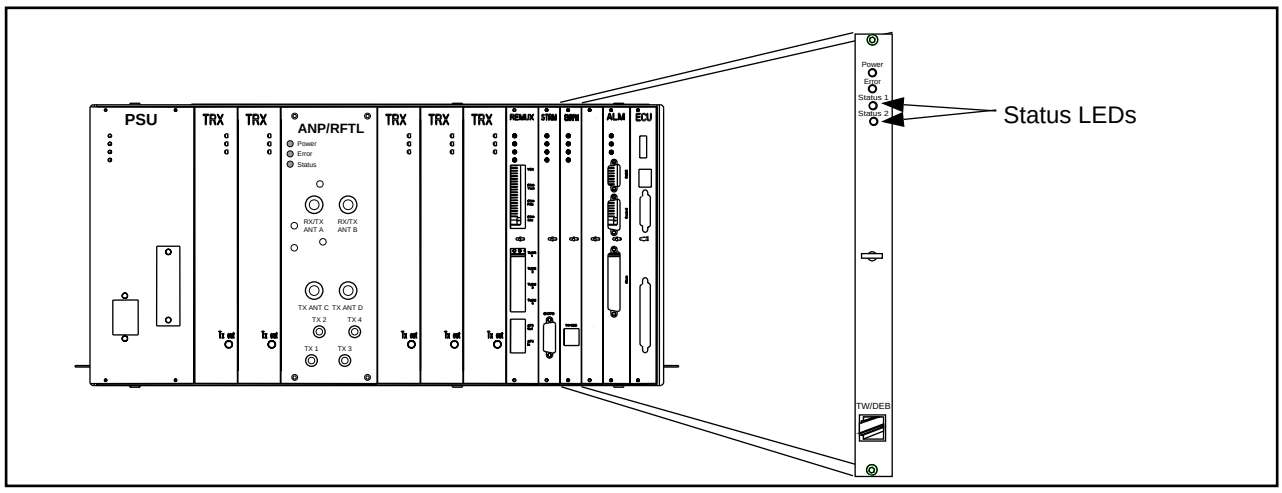


Figure 5-14. An EMRPM Unit

5. Attach the ESD strap to your wrist and connect the free end of the strap cable to an appropriate ground conductor in the cabinet.

6. Disconnect the cables from the unit.

7. Use the torque wrench with the Torx bit TX10 to loosen the screws on the front of the unit.

8.

Warning!

The slot in the cabinet must not be left empty for an extended period of time. If there is any delay in installing the EMRPM unit, a blank panel (Blank 8M) must be screwed into the slot position.

Pull out the unit, using the extractor tool, and place it in an ESD bag. Save the extractor hole plug. Replace the plug after installing or replacing the unit.

Unit hardware replacement

9. Remove the replacement EMRPM unit from its ESD bag and set the address switches to match those on the old unit. EMRPM address switch settings are described in the Setting the Unit Switches section of the "Installation" part of the *Installation and Hardware Replacement Manual*.

10. Carefully slide the replacement EMRPM unit into the cabinet. Push the unit firmly into the backplane connector.

11. Use the torque wrench with the Torx bit TX10 or TX8 to tighten the screws on the front to 0.6 Nm.

12. Check that the green power LED on the unit is on and the red error LED is off. If not, refer to the troubleshooting procedures in Section 4 on page 5-6 for detection of units suspected to be faulty.

13. If the RBS 884 Micro (1900 MHz) does not become operational after five to eight minutes, cycle the power to the cabinet to reload the software.

14. Inform the MSC operator that the EMRPM has been replaced and is ready to be tested.

15. Remove the ESD strap cable from the cabinet, and detach it from your wrist.

16. Update the *Plant Specification* in the *Site Installation Documentation* concerning the new unit. Use the comments field to note the date of the hardware replacement and new R-state.

17. Close the cabinet door.

Unit Repair

18. Complete the Repair Traveler Note and attach it to the unit suspected to be faulty.

19. Pack the unit in the packing material from the new unit and return it to the local service center.

6.7 Transceiver (TRX) Unit Replacement

Unit Removal

1. Obtain permission from the MSC operator to replace the TRX.

2. Open the cabinet door and secure the wind latch at the top of the door. Open the door until the shoulder slides into the slot at the end of the bar.

3.

Warning!

A unit must never be replaced by another unit with a lower R-state number.

Check that the replacement TRX is the same type as the unit to be replaced, and that it has the same or higher R-state number.

4.

Warning!

Check that the status LED on the TRX to be replaced (see Figure 5-15 on page 5-31) is OFF.

If it is on or flashing, contact the MSC operator.

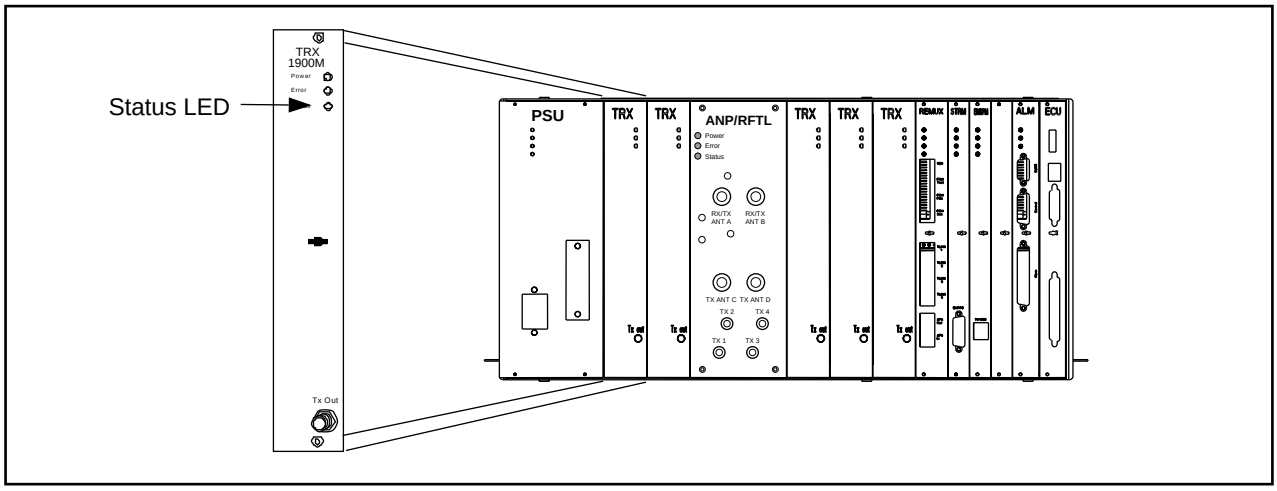


Figure 5-15. A TRX Unit

5. Manually block the TRX to be replaced. This assures that any calls are handed off to another TRX.

6. Attach the ESD strap to your wrist and connect the free end of the strap cable to an appropriate ground conductor in the cabinet.

7. Disconnect the cable from the TRX, using the torque wrench with the SMA tool.

8. Use the torque wrench with the Torx bit TX10 to loosen the screws on the front of the unit.

9.

Warning!

The slot in the cabinet must not be left empty for an extended period of time. If there is any delay in installing the hardware replacement unit, an RMU (dummy TRX) must be installed or the old TRX left in position.

Pull out the TRX, using the extractor tool, and place it in an ESD bag. Save the extractor hole plug. Replace the plug after installing or replacing the TRX.

Unit Hardware Replacement

10. Remove the replacement TRX from its ESD bag.

11. Carefully slide the replacement unit into the cabinet in place of the old unit. Push the unit firmly into the backplane connector.

12. Use the torque wrench with the Torx bit TX10 to tighten the screws on the front to 0.6 Nm.

13. Check that the green power LED on the unit is on and the red error LED is off. If not, refer to the troubleshooting procedures in Section 4 on page 5-6 for detection of units suspected to be faulty.

14. Reconnect the TRX cable. Hand tighten the cable and then use the torque wrench with the SMA tool to tightened to 0.6 Nm.

15. Manually deblock the TRX.

16. Inform the MSC operator that the TRX has been replaced and is ready to be tested.

17. Remove the ESD strap cable from the cabinet, and detach it from your wrist.

18. Update the *Plant Specification* in the *Site Installation Documentation* concerning the new TRX. Use the comments field to note the date of the hardware replacement and new R-state.

19. Close the cabinet door.

Unit Repair

20. Complete the Repair Traveler Note and attach it to the TRX suspected to be faulty.

21. Pack the unit in the packing material from the new unit and return it to your local service center.

    Note: TRX components contain beryllium oxide. Return the TRX to the local service center for proper disposal.

6.8 Antenna Near Part (ANP)/Radio Frequency Test Loop (RFTL) Unit Replacement

Unit Removal

Warning!

The following procedure will disable the RBS 884 Micro (1900 MHz). The unit will be out of service during the procedure. Contact the MSC before performing the following procedure.

---

1. Obtain permission from the MSC operator to replace the ANP/RFTL.

2. Open the cabinet door and secure the wind latch at the top of the door. Open the door until the shoulder slides into the slot at the end of the bar.

3. ---

   Warning!

   A unit must never be replaced by another unit with a lower R-state number.

   Check that the replacement ANP/RFTL unit is the same type as the unit to be replaced, and that it has the same or higher R-state number.

4. ---

   Warning!

   Check that the status LED on the unit to be replaced (see Figure 5-16 on page 5-34) is OFF.

If it is on or flashing, contact the MSC operator.

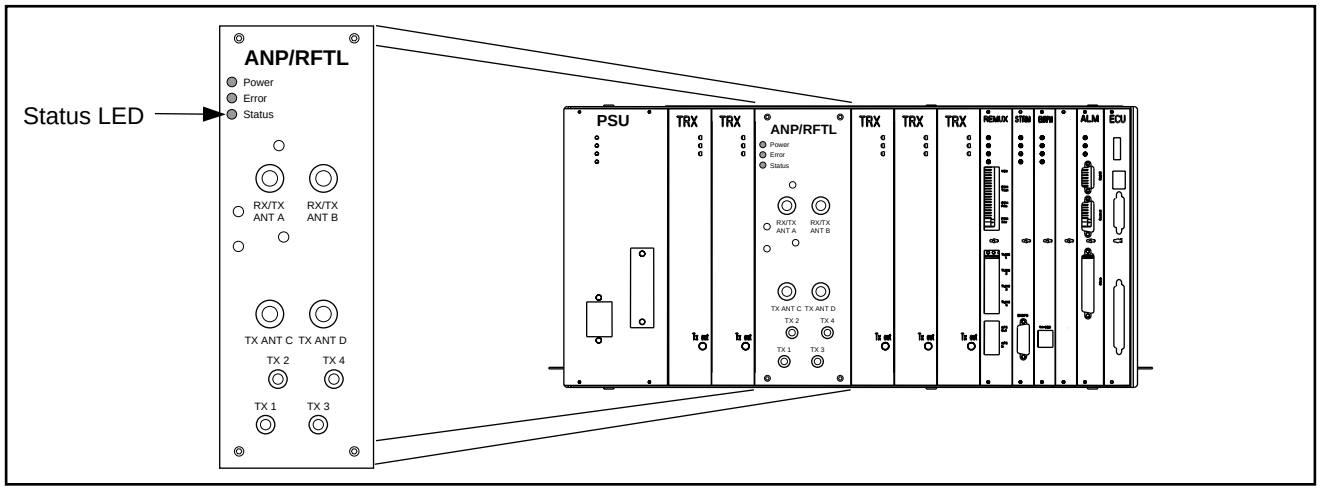


Figure 5-16. The ANP/RFTL Unit

5. Attach the ESD strap to your wrist and connect the free end of the strap cable to an appropriate ground conductor in the cabinet.

6. Make a note of the cables connected to the ANP/RFTL.

7. Disconnect the cables from the ANP/RFTL. Disconnect antenna cables by hand. Use the torque wrench with the SMA tool for other cables.

8. Use the torque wrench with the Torx bit TX10 or TX8 to loosen the screws on the front of the ANP/RFTL.

9.

Warning!

The slot in the cabinet must not be left empty for an extended period of time. If there is any delay in installing the replacement ANP/RFTL unit, leave the old unit in the slot until the replacement unit is available.

Using the extractor tool, remove the ANP/RFTL and place it in an ESD bag. Save the extractor hole plug. Replace the plug after installing or replacing unit.

Unit Hardware Replacement

10. Remove the replacement ANP/RFTL from its ESD bag.

11. Carefully slide the replacement unit into the cabinet. Push the unit firmly into the backplane connectors.

12. Use the torque wrench with the Torx bit TX10 to tighten the screws on the front to 0.6 Nm.

13. Check that the green power LED on the ANP/RFTL is on and the red error LED is off. If not, refer to the troubleshooting procedures in Section 4 on page 5-6 for detection of units suspected to be faulty.

14. Reconnect the ANP/RFTL cables. Hand tighten all cables. Do not use the torque wrench on TNC connectors. On non-TNC connectors, use the torque wrench with the SMA tool to tightened to 0.6 Nm. For cable connections, refer to the "External Cable Installation" section in the *Installation and Hardware Replacement Manual*. Additional information can be found in "Appendix C" of the *Installation and Hardware Replacement Manual*.

15. Inform the MSC operator that the ANP/RFTL has been replaced and is ready to be tested.

16. Remove the ESD strap cable from the cabinet, and detach it from your wrist.

17. Update the *Plant Specification* in the *Site Installation Documentation* concerning the new unit. Use the comments field to note the date of hardware replacement and new R-state.

18. Close the cabinet door.

Unit Repair

19. Complete the Repair Traveler Note and attach it to the unit suspected to be faulty.

20. Pack the unit in the packing material from the new unit and return it to the local service center.

6.9 Alarm (ALM) Unit Replacement

Unit Removal

1. Obtain permission from the MSC operator to replace the ALM unit.

2. Open the cabinet door and secure the wind latch at the top of the door. Open the door until the shoulder slides into the slot at the end of the bar.

3.

Warning!

A unit must never be replaced by another unit with a lower R-state number.

Check that the replacement ALM unit is the same type as the unit to be replaced, and that it has the same or higher R-state number.

4.

Warning!

Check that the status LED on the ALM unit (see Figure 5-17 on page 5-36) is OFF.

If it is on or flashing, contact the MSC operator.

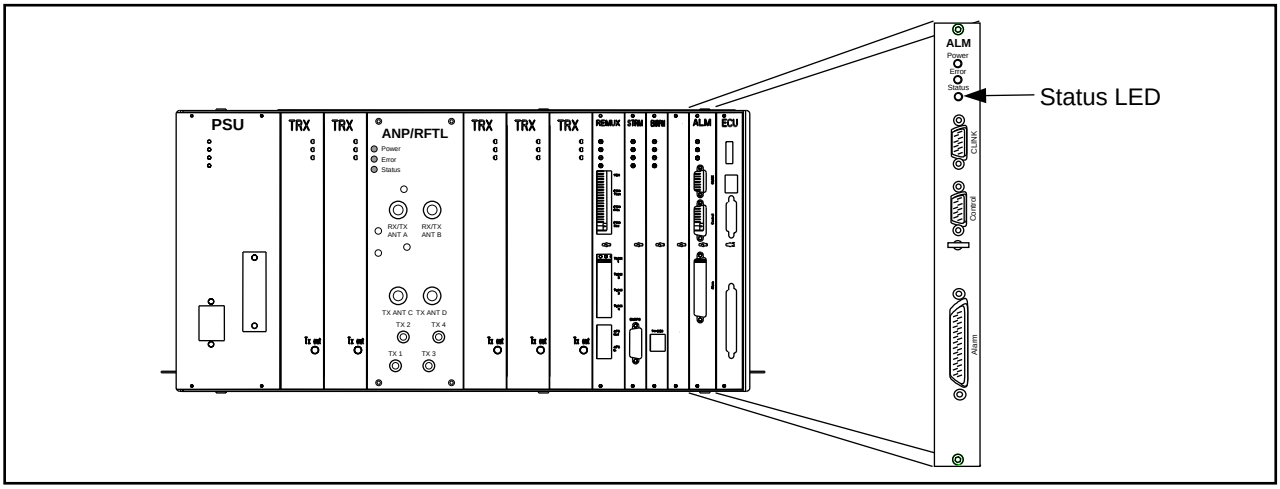


Figure 5-17. The Alarm Unit

5. Attach the ESD strap to your wrist and connect the free end of the strap cable to an appropriate ground conductor in the cabinet.

6. Make a note of the cables connected to the unit.

7. Disconnect the cables from the unit.

8. Use the torque wrench with the Torx bit TX10 to loosen the screws on the front of the unit.

   Note: All external alarms are disabled when the ALM unit is blocked.

9.

Warning!

The slot in the cabinet must not be left empty for an extended period of time. If there is any delay in installing the replacement ALM unit, a blank panel (Blank 10M) must be installed in the slot position.

Using the extractor tool, remove the ALM unit and place it in an ESD bag. Save the extractor hole plug. Replace the plug after installing or replacing unit.

Unit Hardware Replacement

10. Remove the replacement ALM unit from its ESD bag.

11. Carefully slide the replacement ALM unit into the cabinet. Push the unit firmly into the backplane connector.

12. Use the torque wrench with the Torx bit TX10 to tighten the screws on the front to 0.6 Nm.

13. Check that the green power LED on the unit is on and the red error LED is off. If not, refer to the troubleshooting procedures in Section 4 on page 5-6 for detection of units suspected to be faulty.

14. Reconnect the ALM cables.

15. Inform the MSC operator that the ALM has been replaced and is ready to be tested.

16. Remove the ESD strap cable from the cabinet, and detach it from your wrist.

17. Update the *Plant Specification* in the *Site Installation Documentation* concerning the new ALM unit. Use the comments field to note the date of hardware replacement and new R-state.

18. Close the cabinet door.

Unit Repair

19. Complete the Repair Traveler Note and attach it to the ALM unit suspected to be faulty.

20. Pack the ALM unit in the packing material from the new unit and return it to your local service center.

6.10 Environmental Control Unit (ECU) Replacement

Unit Removal

Warning!

The following procedure will disable the RBS 884 Micro (1900 MHz). The base station will be out of service during the procedure. Contact the MSC before performing the following procedure. Inform the MSC operator that the base station will be disabled.

---

1. Obtain permission from the MSC operator to replace the ECU unit.

2. Open the cabinet door and secure the wind latch at the top of the door. Open the door until the shoulder slides into the slot at the end of the bar.

3.

Warning!

A unit must never be replaced by another unit with a lower R-state number.

Check that the replacement ECU unit is the same type as the unit to be replaced, and that it has the same or higher R-state number.

4. Attach the ESD strap to your wrist and connect the free end of the strap cable to an appropriate ground conductor in the cabinet.

5. Turn off the ECU circuit breaker.

6. Make a note of the cables connected to the ECU unit. Refer to Figure 5-18 on page 5-38).

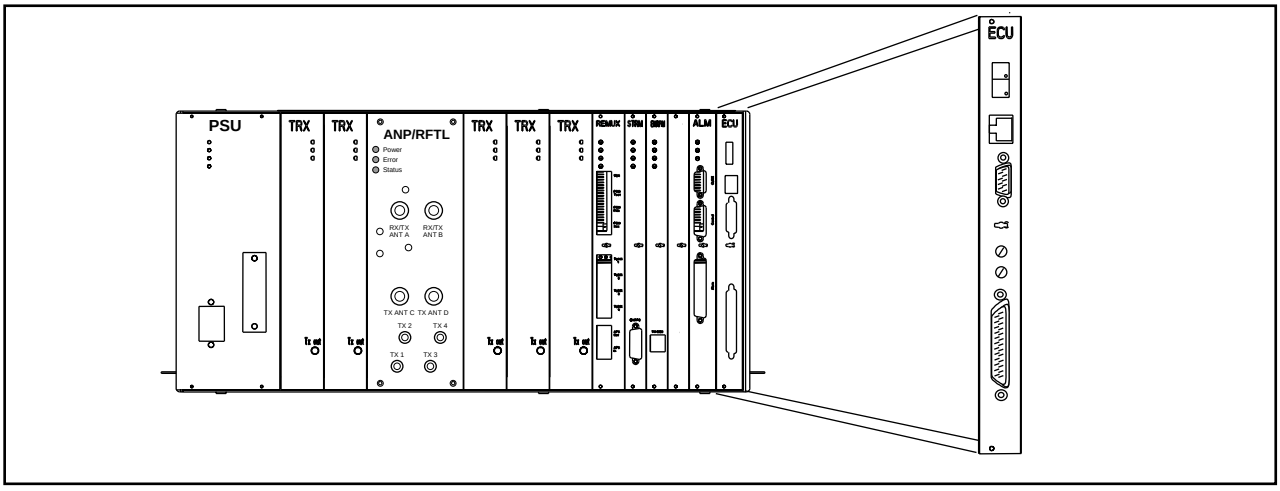


Figure 5-18. Environmental Control Unit (ECU)

7. Disconnect the cables from the ECU unit.

   Note: When cables are disconnected from the ECU, the system assumes the ECU has failed. As a result, all fans will be powered on at full speed. This is normal.

8. Use the torque wrench with the Torx bit TX10 to loosen the screws on the front of the ECU unit.

9. Using the extractor tool, remove the ECU unit and place it in an ESD bag. If required, remove the handle of the extractor tool. Save the extractor hole plug. Replace the plug after installing or replacing unit.

Unit Hardware Replacement

10. Remove the replacement ECU unit from its ESD bag.

11. Carefully slide the replacement ECU unit into the cabinet. Push the unit firmly into the backplane connector.

12. Use the torque wrench with the Torx bit TX10 to tighten the screws on the front. Turn the torque wrench until it slides to tighten to 0.6 Nm.

13. Reconnect the ECU cables.

14. Turn on the ECU circuit breaker.

15. After fan test is complete, verify the decimal points located in the two-digit display are illuminated. If not, refer to the troubleshooting procedures in Section 4 on page 5-6 for detection of units suspected to be faulty.

16. After ECU replacement, block and deblock all units in the RBS 884 Micro (1900 MHz) cabinet.

17. Remove the ESD strap cable from the cabinet, and detach it from your wrist.

18. Update the *Plant Specification* in the *Site Installation Documentation* concerning the new ECU unit. Use the comments field to note the date of hardware replacement, and new R-state.

19. Close the cabinet door.

20. Inform the MSC operator that the ECU unit has been replaced.

Unit Repair

21. Complete the Repair Traveler Note and attach it to the ECU unit suspected to be faulty.

22. Pack the ECU unit in the packing material from the new unit and return it to the local service center.

6.11 Fan Replacement

Unit Removal

1. Obtain permission from the MSC operator to replace the Fan unit.

2. Open the cabinet door and secure the wind latch at the top of the door. Open the door until the shoulder slides into the slot at the end of the bar.

3. Pull out the two plungers in the lid and fully lift lid. Lower lid slightly while pushing the support brace towards the rear of the cabinet. The support brace should engage the mating bracket and lock the lid in position.

4. Identify the failed Fan unit. The code displayed on the front of the ECU indicates which Fan has failed.

5.

Warning!

A unit must never be replaced by another unit with a lower R-state number.

Check that the replacement Fan unit is the same type as the unit to be replaced, and that it has the same or higher R-state number.

6.

Warning!

The remaining steps in this procedure must be performed as quickly as possible in order to avoid overheating the cabinet.

Disconnect the cable from the Fan unit.

7. Disconnect the three-wire connector. See Figure 5-19 on page 5-40.

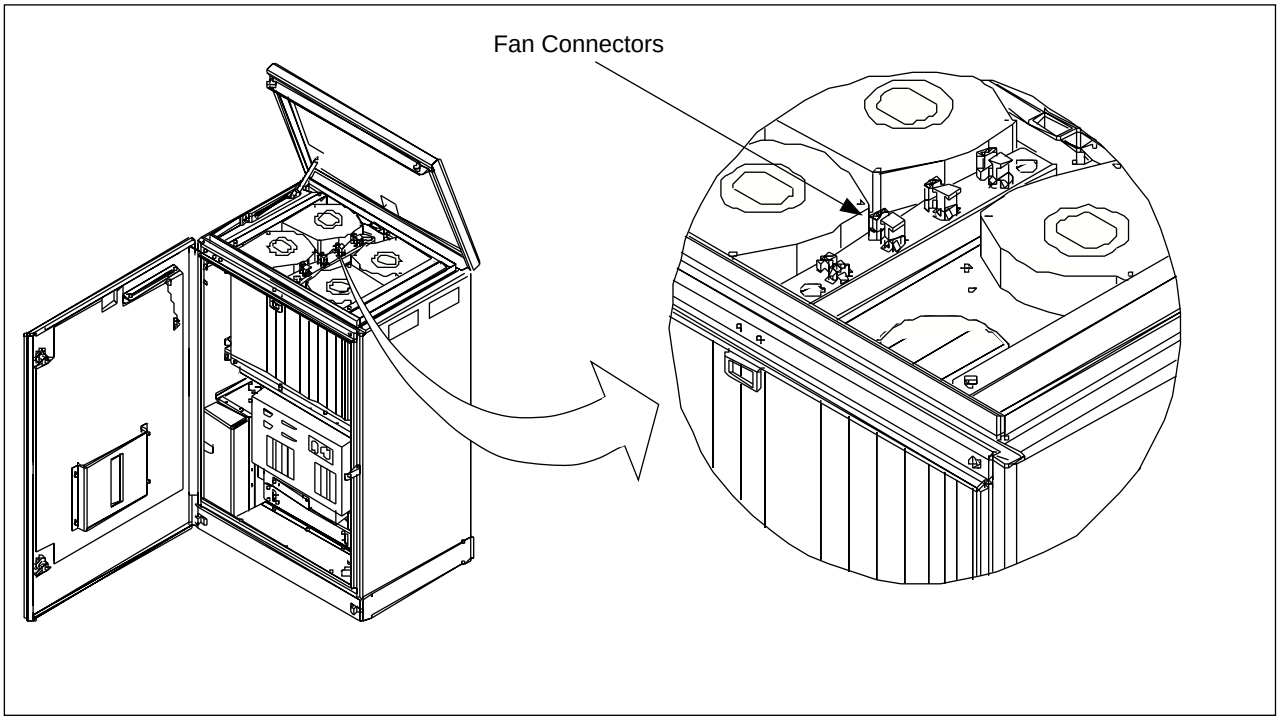


Figure 5-19. The Fan Unit

8. Disconnect the two-wire connector.

9. Remove the tie wraps securing the Fan wiring.

10. Remove the three screws that secure the Fan unit to the cabinet frame.

11. Remove the Fan unit.

Unit Hardware Replacement

12. Remove the replacement Fan unit from any packing material.

13. Install new Fan unit and replace three mounting screws.

14. Replace tie wraps if required.

15. Reconnect the two-wire Fan connector.

16. Reconnect the three-wire Fan connector.

17. Cycle the Fan breaker (turn off and turn on) to reset the Fan alarm. The Fan start-up sequence will be initiated.

18. If the new Fan does not start, refer to the troubleshooting procedures in Section 4 on page 5-6 for detection of units suspected to be faulty.

19. Close the lid by disengaging the support brace. Press down firmly on the lid until the two plungers engage the slots on the cabinet. Press the plungers toward rear of cabinet to lock lid.

20. Update the *Plant Specification* in the *Site Installation Documentation* concerning the new Fan unit. Use the comments field to note the date of hardware replacement and new R-state.

21. Close the cabinet door.

22. Inform the MSC operator that the Fan has been replaced.

Unit Repair

23. Complete the Repair Traveler Note and attach it to the Fan unit suspected to be faulty.

24. Pack the Fan unit in the packing material from the new unit and return it to your local service center.

6.12 Main Heater Assembly Replacement

Warning!

The following procedure will disable the RBS 884 Micro (1900 MHz). The unit will be out of service during the procedure. Contact the MSC operator before performing the following procedure.

Unit Removal

1. Obtain permission from the MSC operator to replace the Main Heater Assembly.

2. Open the cabinet door and secure the wind latch at the top of the door. Open the door until the shoulder slides into the slot at the end of the bar.

3. Place the **MAIN HTR** circuit breaker on the right side of the AC/DC Distribution Box in the OFF position. See Figure 5-20 on page 5-42.

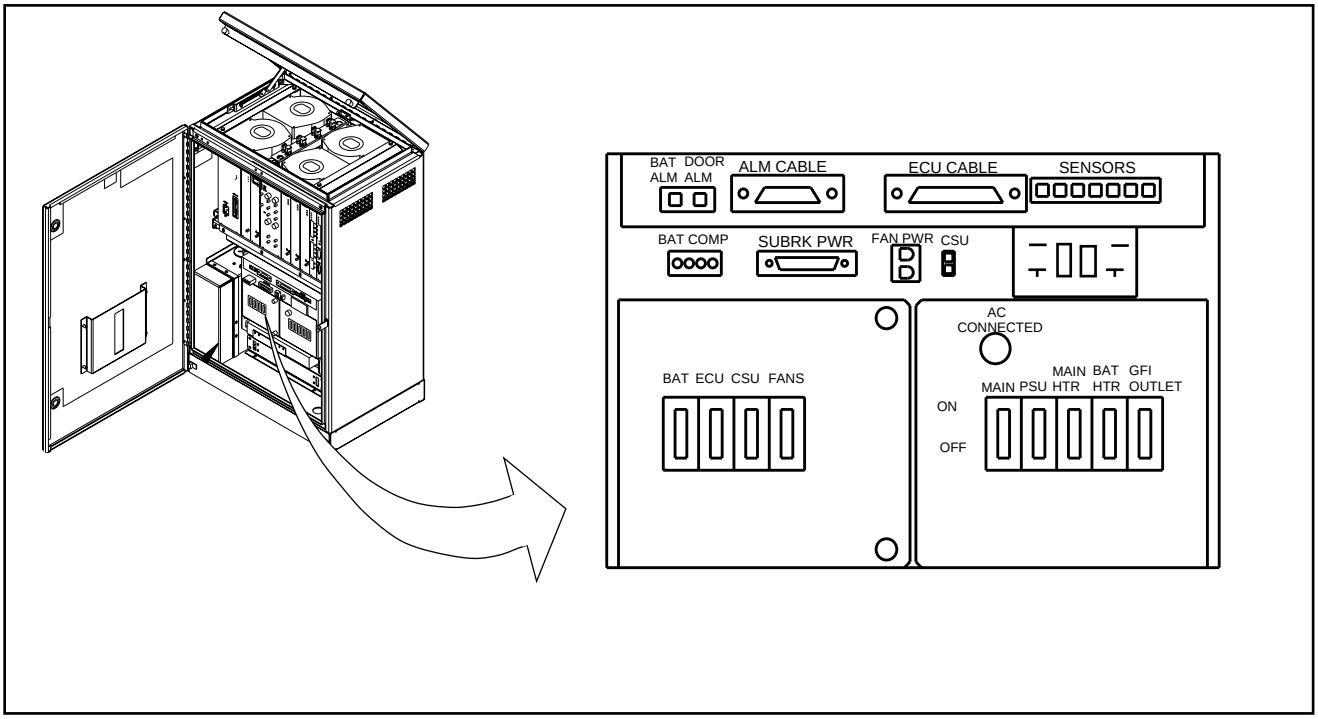


Figure 5-20. AC/DC Distribution Box

4. Locate the Main Heater Assembly. See Figure 5-21 on page 5-43.

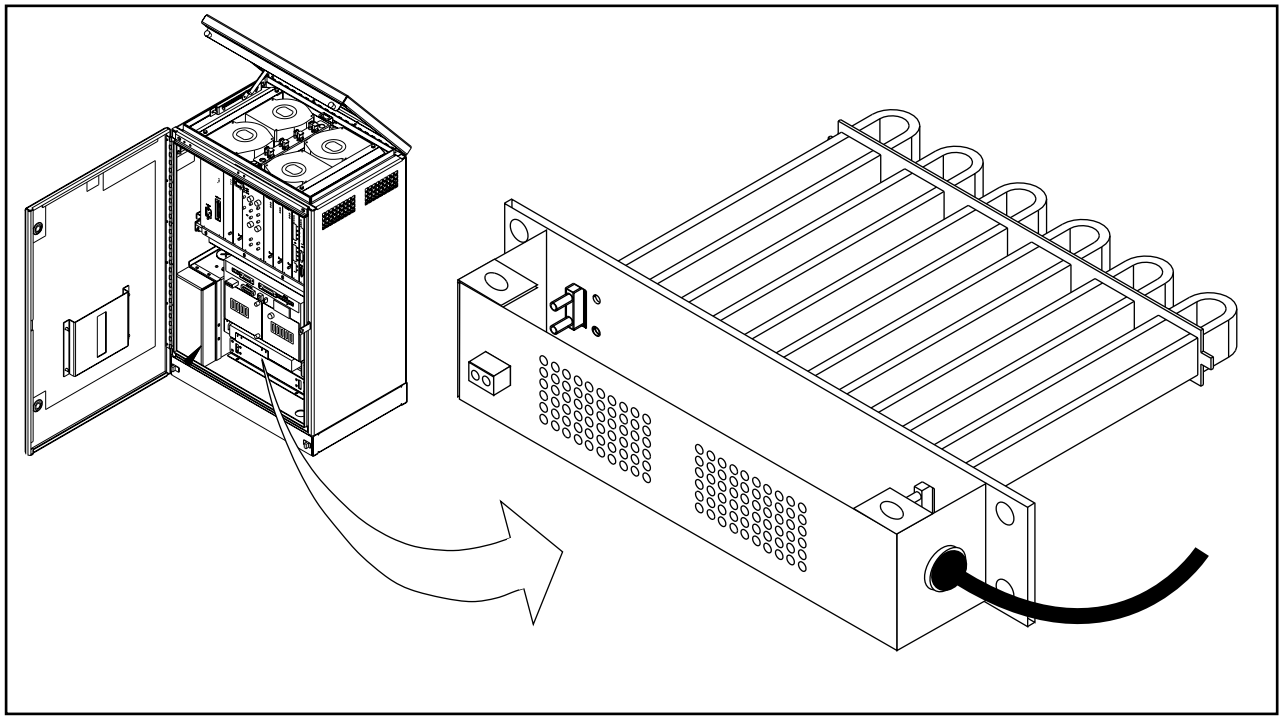


Figure 5-21. Subrack Heater

5. Check that the Main Heater Assembly is the same type as the assembly to be replaced.

6. Unplug the control wires from the front of the Main Heater Assembly.

7. Remove the two screws located on the top of the perforated assembly cover. Remove the cover and retain for installation on replacement assembly.

8. Remove the mounting screws located on each side of the Main Heater Assembly (two per side). Pull the assembly out four to six centimeters.

9.

DANGER!

Use a voltmeter to verify the unit is NOT energized. Do not assume power is OFF.

Locate the heater power cable on the right side of the assembly. Follow cable into the Main Heater Assembly and locate the black, white, and green power wires.

Note: If required, remove any ties or clamps securing power wires.

10. Disconnect the black, white, and green power wires. If needed, record wire position and connections.

11. Remove the strain relief and remove the power cable from the heater assembly. Remove the Main Heater Assembly from the cabinet.

Unit Hardware Replacement

12. Remove the replacement Main Heater Assembly from any packing material.

13. Remove the two screws located on the top of the perforated assembly cover. Remove the cover.

14. Insert the replacement assembly approximately eight to ten centimeters into cabinet opening.

15. Insert power cable through right side of the assembly.

16. Reconnect the black, white, and green power wires. The black wire connects to the solid-state relay terminal (2). The white wire connects to 1L1 and 1L2 with a wire nut. The green wire connects to the heater assembly ground.

17. Replace the top cover and tighten screws.

18. Push the Main Heater Assembly all the way into the cabinet opening and replace the mounting screws (two per side).

19. Reconnect the control wires to the front of the Main Heater Assembly.

20. Place the **MAIN HTR** circuit breaker on the right side of the AC/DC Distribution Box in the ON position.

21. Update the *Plant Specification* in the *Site Installation Documentation* concerning the new assembly. Use the comments field to note the date of the hardware replacement and new R-state.

22. Close the cabinet door.

23. Inform the MSC operator that the Main Heater Assembly has been replaced.

Unit Repair

24. Complete the Repair Traveler Note and attach it to the unit suspected to be faulty.

25. Pack the assembly in the packing material from the new assembly and return it to the local service center.

6.13 Battery Heater Replacement

Unit Removal

1. Obtain permission from the MSC operator to replace the Battery Heater.

2. Open the cabinet door and secure the wind latch at the top of the door. Open the door until the shoulder slides into the slot at the end of the bar.

3. Place the **BAT** circuit breaker on the left side of the AC/DC Distribution Box in the OFF position. See Figure 5-22 on page 5-45.

4. Place the **BAT HTR** circuit breaker on the right side of the AC/DC Distribution Box in the OFF position. See Figure 5-22 on page 5-45.

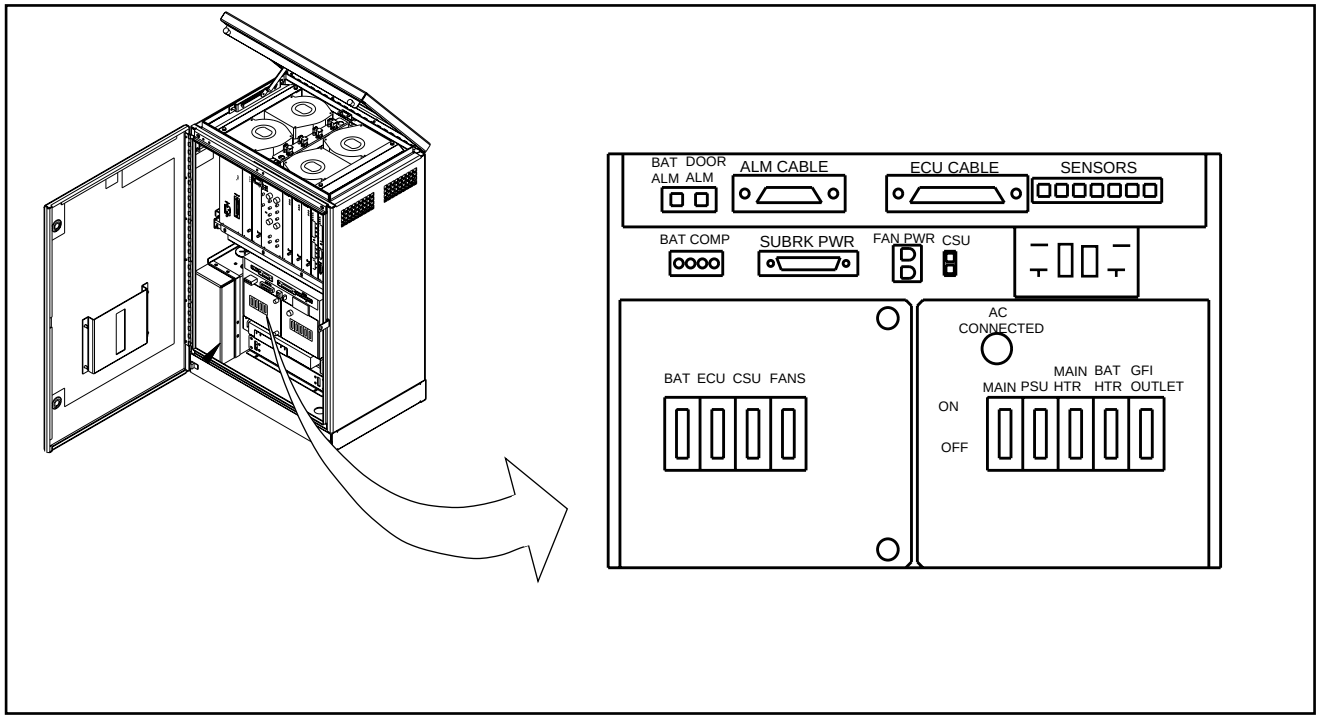


Figure 5-22. AC/DC Distribution Box

5. Locate the battery compartment and Battery Heater under the battery tray. See Figure 5-23 on page 5-46.

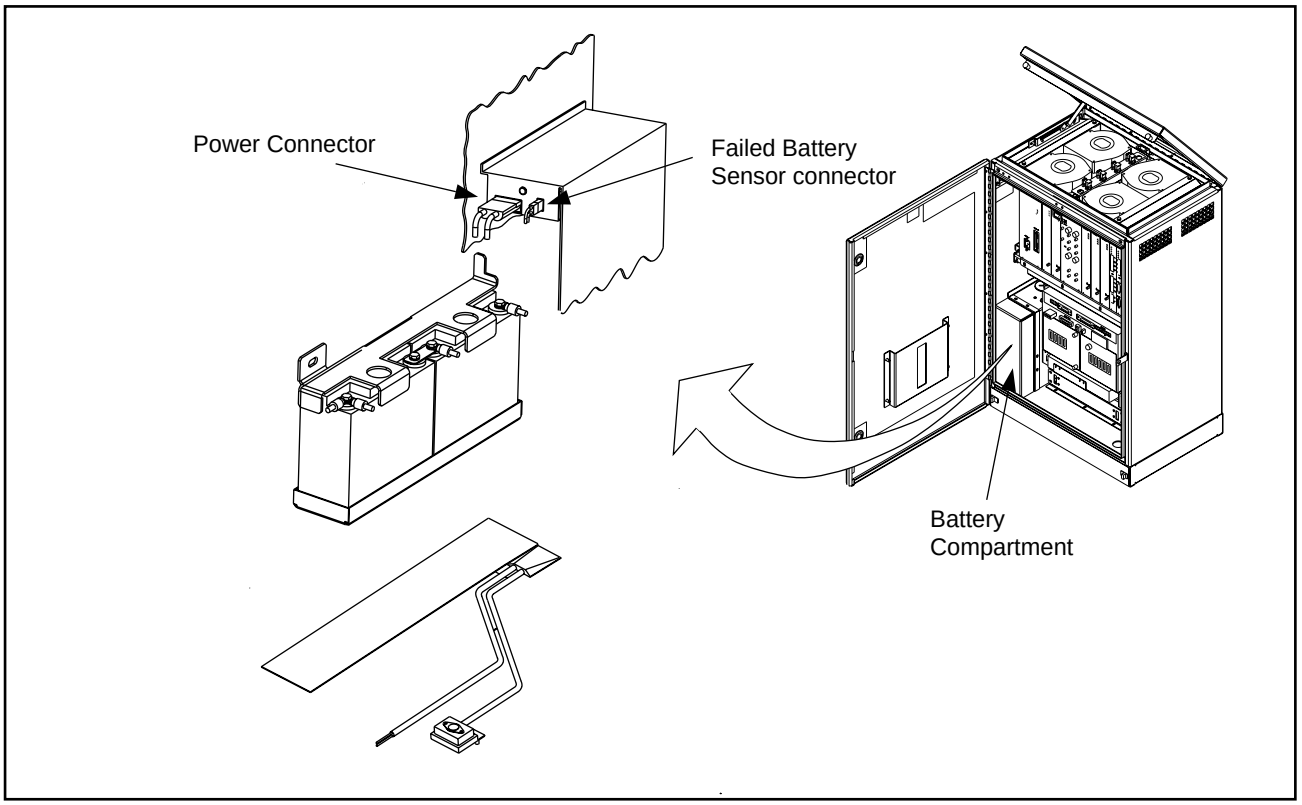


Figure 5-23. Location of Battery Compartment and Battery Heater

6. Remove the four screws from the battery cover and remove the cover from the battery compartment.

7. Disconnect the Failed Battery Sensor connector. See Figure 5-24 on page 5-47.

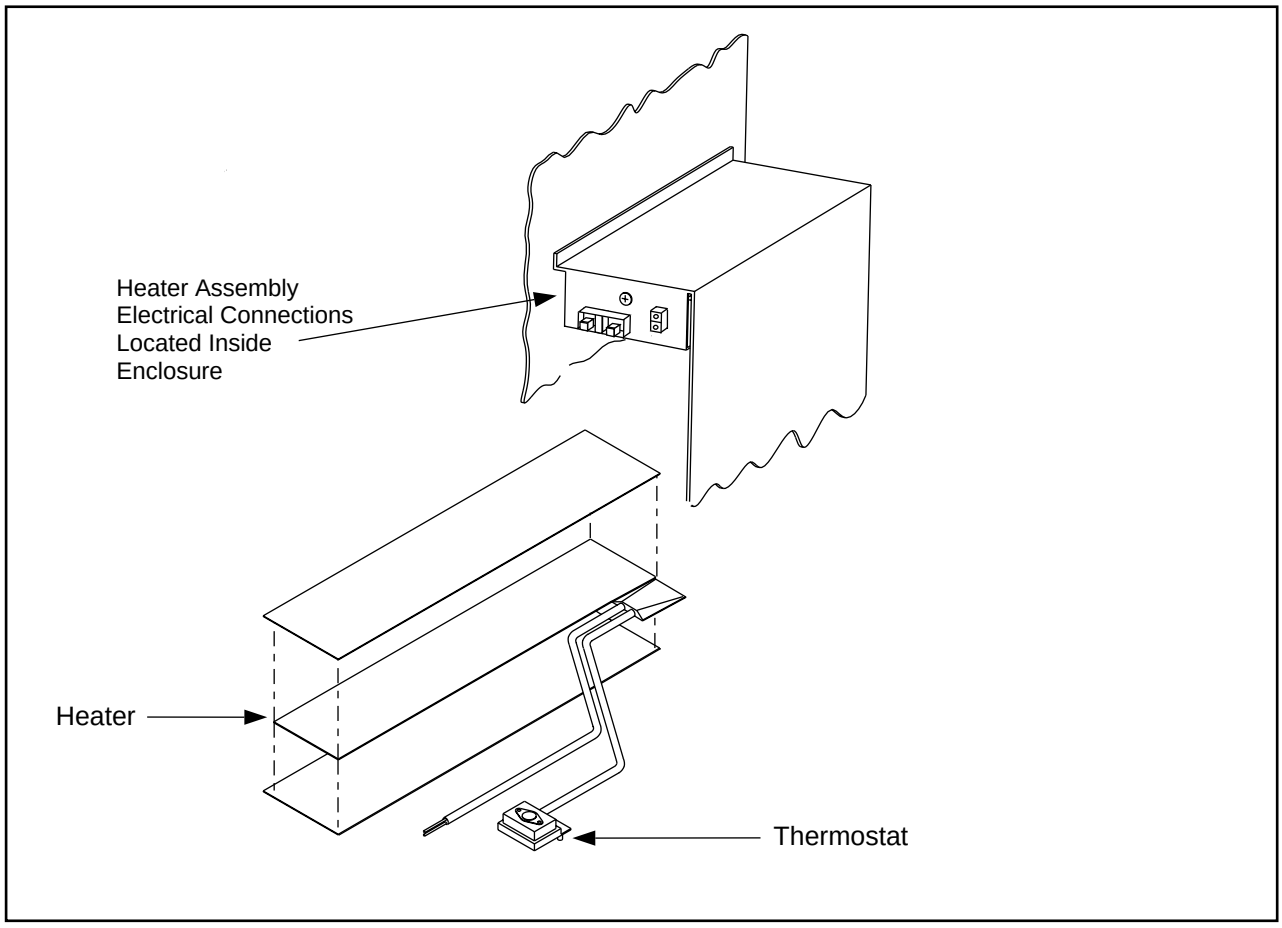


Figure 5-24. Battery Heater Assembly

8. Disconnect the power connector of the battery cable assembly from the connector at the top of the battery compartment.

9. Remove the hex nut on the hold-down bracket on the side wall of the battery compartment. Remove the hold down bracket.

10. Remove the battery tray with the batteries from the battery compartment.

11. Remove the screw on the front of the wiring enclosure located above the battery compartment. Support the enclosure.

12. Pull the enclosure down and locate the two screws securing the battery heater thermostat to the bottom of the enclosure.

13. Remove the thermostat nuts and thermostat.

14. Remove the two heater power wires from the terminal strip inside the enclosure. Remove the strain relief and pull the wires through the bottom of the enclosure.

15. Remove the Battery Heater from the cabinet.

Unit Hardware Replacement

16. Remove any packing material from the replacement Battery Heater.

17. Push the two heater power wires through the strain relief and the bottom of the enclosure. Connect the wires to the terminal strip.

18. Secure the thermostat to the bottom of the enclosure.

19. Raise the enclosure and slide the pins into the holes. Secure the enclosure to the top of the battery compartment.

20. Install the battery tray.

21. Install the hold-down bracket and the hex nut on the side wall of the battery compartment.

22. Reconnect the power connector of the battery cable assembly to the connector at the top of the battery compartment.

23. Reconnect the Failed Battery Sensor connector.

24. Replace the battery compartment cover.

25. Place the **BAT** circuit breaker on the left side of the AC/DC Distribution Box in the ON position.

26. Place the **BAT HTR** circuit breaker on the right side of the AC/DC Distribution Box in the ON position.

27. Update the *Plant Specification* in the *Site Installation Documentation* concerning the new Battery Heater. Use the comments field to note the date of the hardware replacement and new R-state.

28. Close the cabinet door.

29. Inform the MSC operator that the battery heater has been replaced.

Unit Repair

30. Complete the Repair Traveler Note and attach it to the Battery Heater suspected to be faulty.

31. Pack the Battery Heater in the packing material from the new heater and return it to the local service center.

6.14 Battery Replacement

Unit Removal

1. Obtain permission from the MSC operator to replace the Battery.

2. Open the cabinet door as described in the steps beginning with Step 1 on page 5-7.

3. Place the **BAT** circuit breaker on the left side of the AC/DC Distribution Box in the OFF position. See Figure 5-25 on page 5-49.

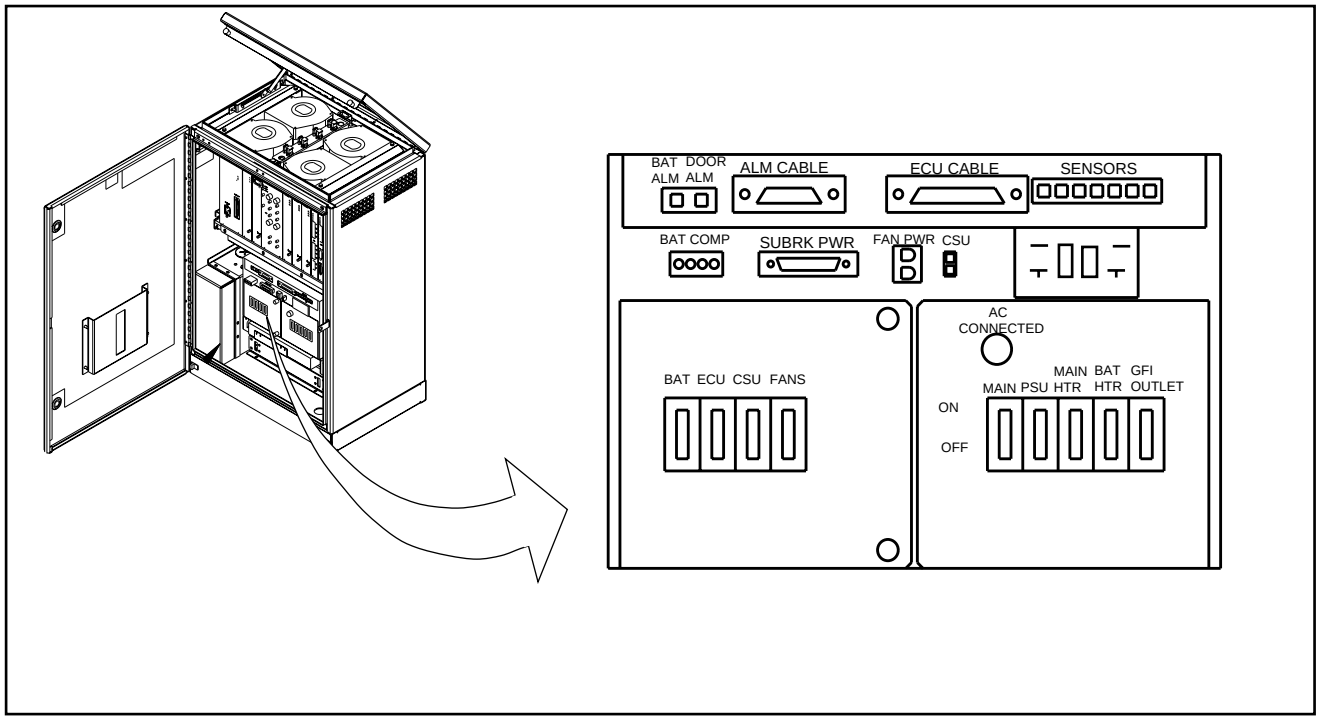


Figure 5-25. AC/DC Distribution Box

4. Locate the battery compartment. See Figure 5-26 on page 5-50.

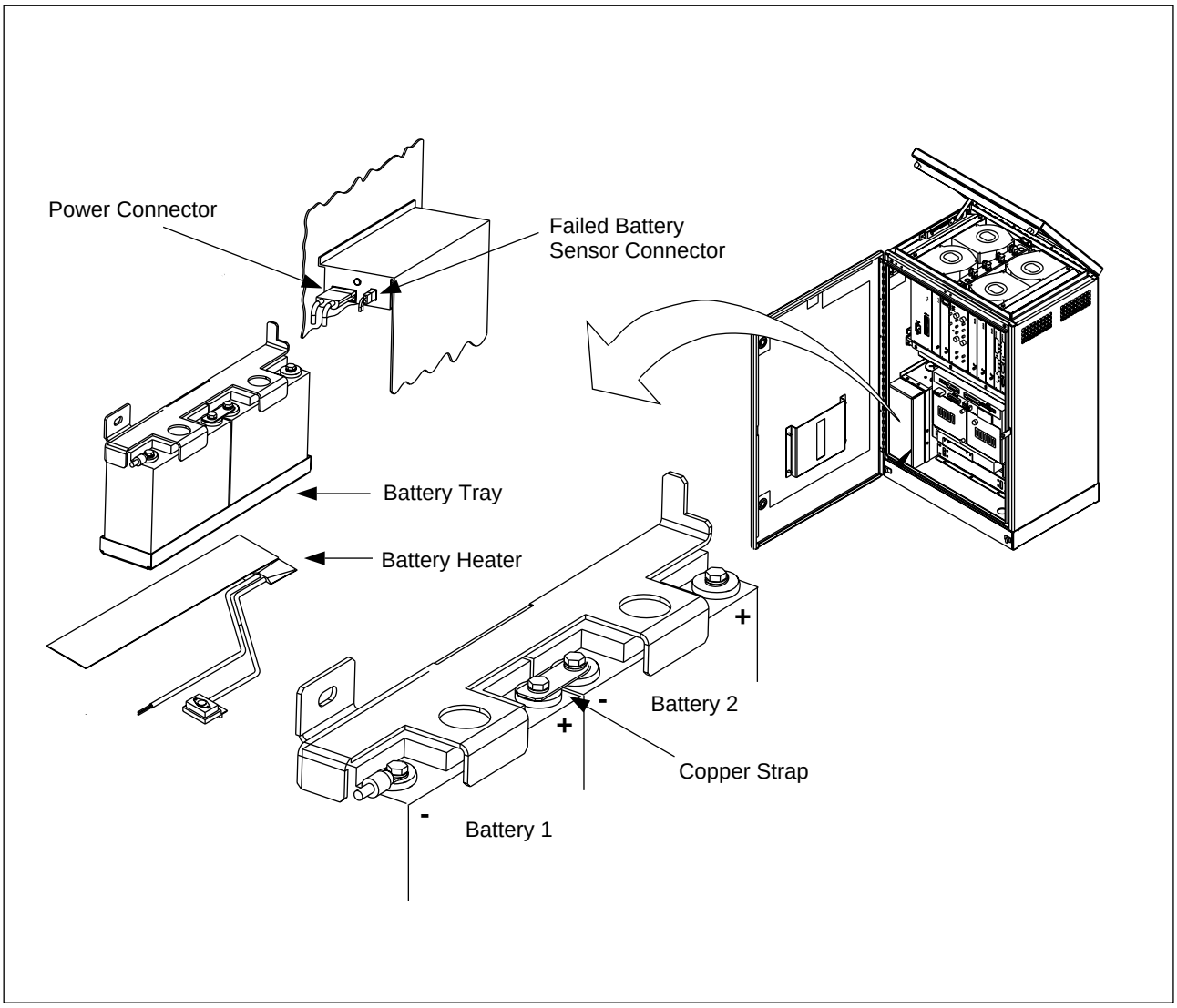


Figure 5-26. aBattery Assembly

5. Remove the four hex head bolts from the battery cover and remove the cover from the battery compartment.

6. Disconnect the Failed Battery Sensor connector. Refer to Figure 5-24 on page 5-47.

7. Disconnect the power connector of the battery cable assembly from the connector at the top of the battery compartment.

8. Remove the hex nut on the hold-down bracket on the side wall of the battery compartment. Remove the hold down bracket.

9. Remove the battery tray with the batteries from the battery compartment.

10. Disconnect the 8-gauge red cable from the positive terminal (+) of battery 2.

11. Disconnect the 8-gauge black cable from the negative terminal (-) of battery 1.

12. Disconnect one of the 18-gauge white wires labeled POST from the negative terminal (-) of battery 1. Disconnect the other 18-gauge white wire from the negative terminal (-) of battery 2.

13. Remove the copper strap connecting the center terminals (positive terminal of battery 1 to negative terminal of battery 2).

14. Remove the batteries from the battery tray.

15. Dispose of old batteries properly.

Unit Hardware Replacement

16. Remove the replacement batteries from the packing material.

17. Install the batteries into the battery tray as illustrated in Figure 5-24 on page 5-47. Place the hold-down bracket on the batteries.

18. Connect the center terminals (positive terminal of battery 1 to negative terminal of battery 2) with the copper strap. Do not tighten the negative terminal of battery 2 at this time.

19. Connect one of the 18-gauge white wires labeled POST to the negative terminal of battery 1. Connect the other 18-gauge white wire to the negative terminal of battery 2.

20. Connect the 8-gauge black cable to the negative terminal (-) of battery 1.

21. Connect the 8-gauge red cable to the positive terminal (+) of battery 2.

    Note: Ensure the terminals are placed inward, toward the back of the battery. Torque all bolts to 50 in-lbs.

22. Install the battery tray with the batteries in the battery compartment. Make sure the battery cable assembly is not pinched against the battery compartment.

23. Place the hold-down bracket over the screw on the side wall of the battery compartment. Secure with a hex nut.

24. Connect the power connector of the battery cable assembly to the connector at the top of the battery compartment.

25. Connect the Failed Battery Sensor connector.

26. Replace the battery cover on the battery compartment.

27. Place the **BATT** circuit breaker on the left side of the AC/DC Distribution Box in the ON position.

28. Update the *Plant Specification* in the *Site Installation Documentation* concerning the new battery. Use the comments field to note the date of the hardware replacement and new R-state.

29. Close the cabinet door.

30. Inform the MSC operator that the internal battery has been replaced.

6.15 AC Surge Suppressor Replacement

Unit Removal

Warning!

The following procedure will disable the RBS 884 Micro (1900 MHz). The unit will be out of service during the procedure. Contact the MSC before performing the following procedure.

---

1. Obtain permission from the MSC operator to replace the AC Surge Suppressor.

2. Open the cabinet door and secure the wind latch at the top of the door. Open the door until the shoulder slides into the slot at the end of the bar.

3. Disconnect all power to the RBS 884 Micro (1900 MHz) cabinet.

4. ---

   Warning!

   Verify all power is removed from the cabinet. Verify the AC CONNECTED indicator light is OFF.

   Place the **MAIN** circuit breaker on the right side of the AC/DC Distribution Box in the OFF position. See Figure 5-27 on page 5-53.

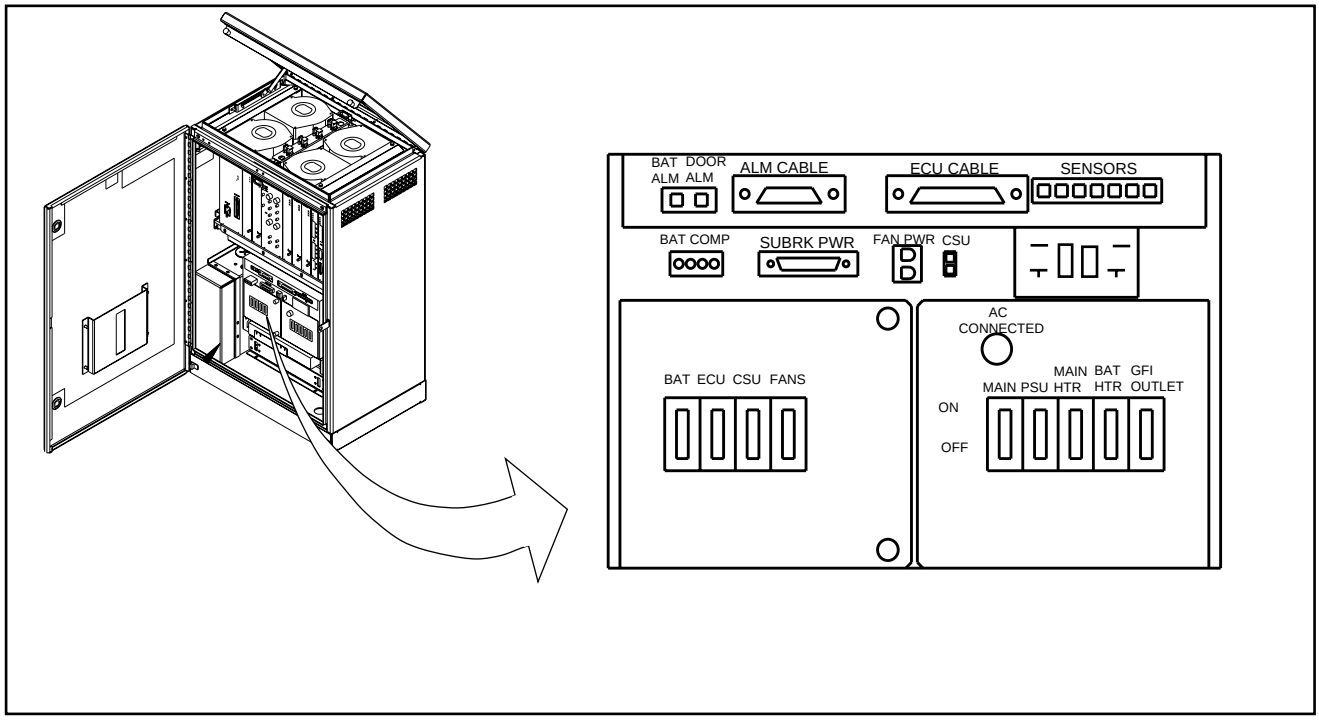


Figure 5-27. AC/DC Distribution Box

5. Open the front of the AC/DC Distribution Box and locate the AC Surge Suppressor on the back wall. See Figure 5-28 on page 5-53.

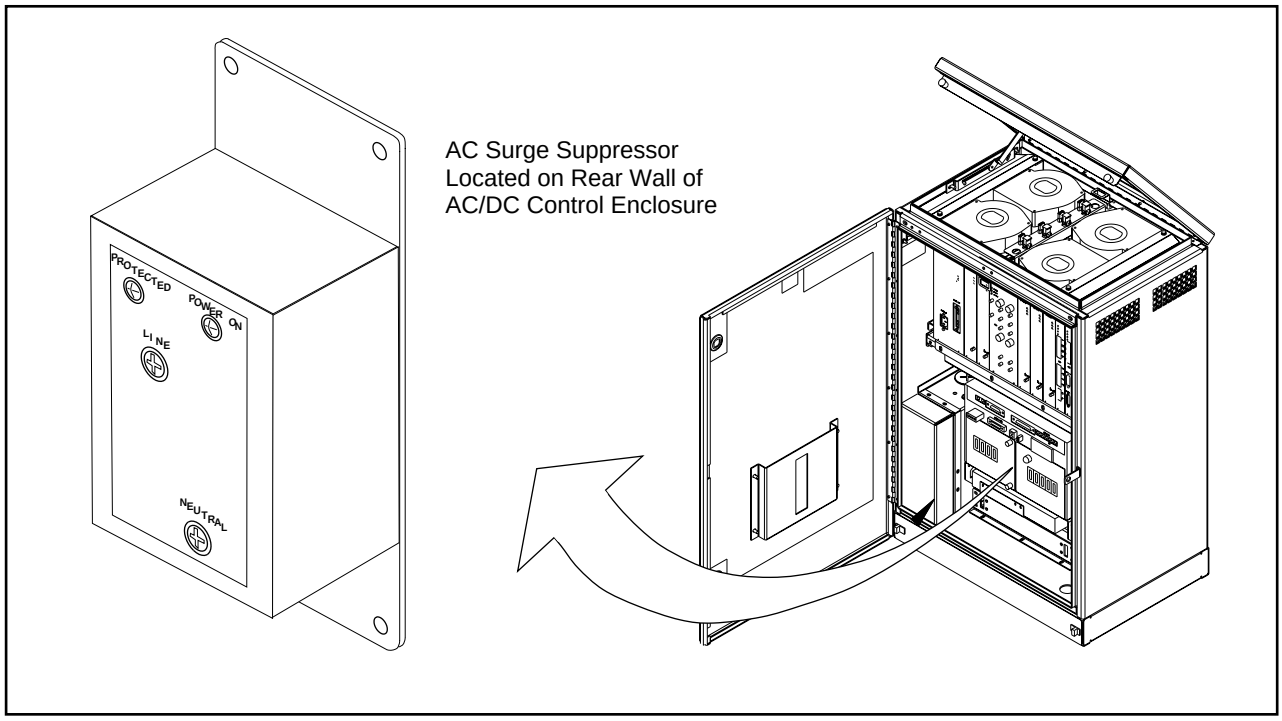


Figure 5-28. AC Surge Suppressor Assembly

6. Verify the LEDs on the front of the AC Surge Suppressor are off.

7. Disconnect the LINE and NEUTRAL wires from the front of the surge suppressor.

8. Remove the nuts securing the AC Surge Suppressor to rear wall. Remove the AC Surge Suppressor.

Unit Hardware Replacement

9. Remove any packing material from the replacement AC Surge Suppressor.

10. Install new AC Surge Suppressor to rear wall of AC/DC Distribution Box.

11. Reconnect the LINE and NEUTRAL wires to the front of the surge suppressor.

12. Place the **MAIN** circuit breaker on the right side of the AC/DC Distribution Box in the ON position.

13. Verify the LEDs on the front of the AC Surge Suppressor are on.

14. Close the AC/DC Distribution Box.

15. Update the *Plant Specification* in the *Site Installation Documentation* concerning the new unit. Use the comments field to note the date of the hardware replacement and new R-state.

16. Close the cabinet door.

17. Inform the MSC operator that the AC Surge Suppressor has been replaced.

Unit Repair

18. Complete the Repair Traveler Note and attach it to the unit suspected to be faulty.

19. Pack the unit in the packing material from the new unit and return it to the local service center.

6.16 Pulse Code Modulation (PCM) (T1/E1) Primary Surge Suppressor Replacement

Unit Removal

Warning!

The following procedure will disable the RBS 884 Micro (1900 MHz). The unit will be out of service during the procedure. Contact the MSC before performing the following procedure.

1. Obtain permission from the MSC operator to replace the PCM Primary Surge Suppressor.

2. Open the cabinet door and secure the wind latch at the top of the door. Open the door until the shoulder slides into the slot at the end of the bar.

3. Locate the PCM Primary Surge Suppressor on the right inside wall of cabinet. See Figure 5-29 on page 5-55.

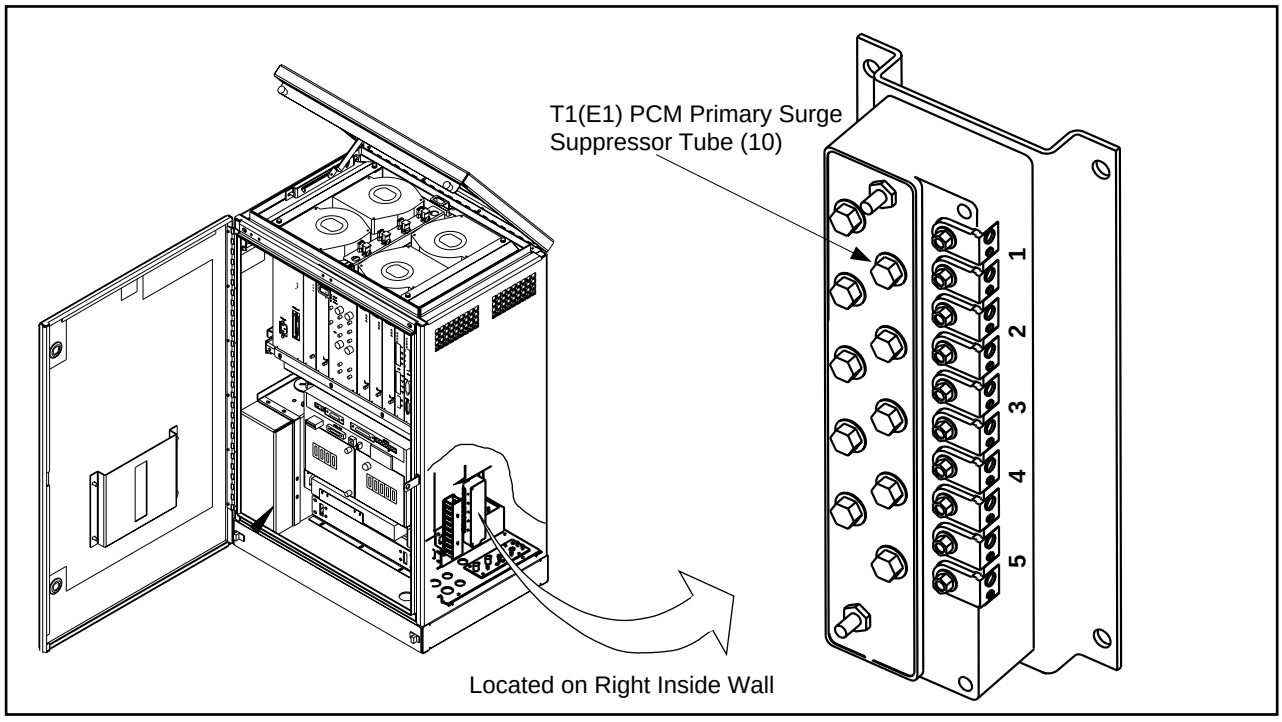


Figure 5-29. T1(E1) Primary Surge Suppressor

4. Remove the T1(E1) cable wires from the PCM Primary Surge Suppressor. Record the position of the wires.

5. Remove the four nuts securing the PCM Primary Surge Suppressor to the cabinet. Remove the unit from the cabinet.

6. Remove the replacement PCM Primary Surge Suppressor.

7. Install the replacement unit in the cabinet.

8. Connect the T1(E1) cable wires into the large and small activator ports (tip=white and ring=orange).

   Note: Large ports are for 18.5 to 20 AWG wires and small ports are for 22 to 24 AWG wires.

9. Using a 216–type tool, tighten the activator until the tension stops. Do Not Overtighten.

10. Update the *Plant Specification* in the *Site Installation Documentation* concerning the new unit. Use the comments field to note the date of the hardware replacement, and new R-state.

11. Close the cabinet door.

12. Inform the MSC operator that the PCM Primary Surge Suppressor has been replaced.

Unit Repair

13. Complete the Repair Traveler Note and attach it to the unit suspected to be faulty.

14. Pack the PCM Primary Surge Suppressor in the packing material from the new unit and return it to your local service center.

6.17 Pulse Code Modulation (PCM) T1(E1) Secondary Surge Suppressor Replacement

Unit Removal

Warning!

The following procedure will disable the RBS 884 Micro (1900 MHz). The unit will be out of service during the procedure. Contact the MSC before performing the following procedure.

1. Obtain permission from the MSC operator to replace the unit.

2. Open the cabinet door and secure the wind latch at the top of the door. Open the door until the shoulder slides into the slot at the end of the bar.

3. Locate the PCM Secondary Surge Suppressor. See Figure 5-30 on page 5-57.

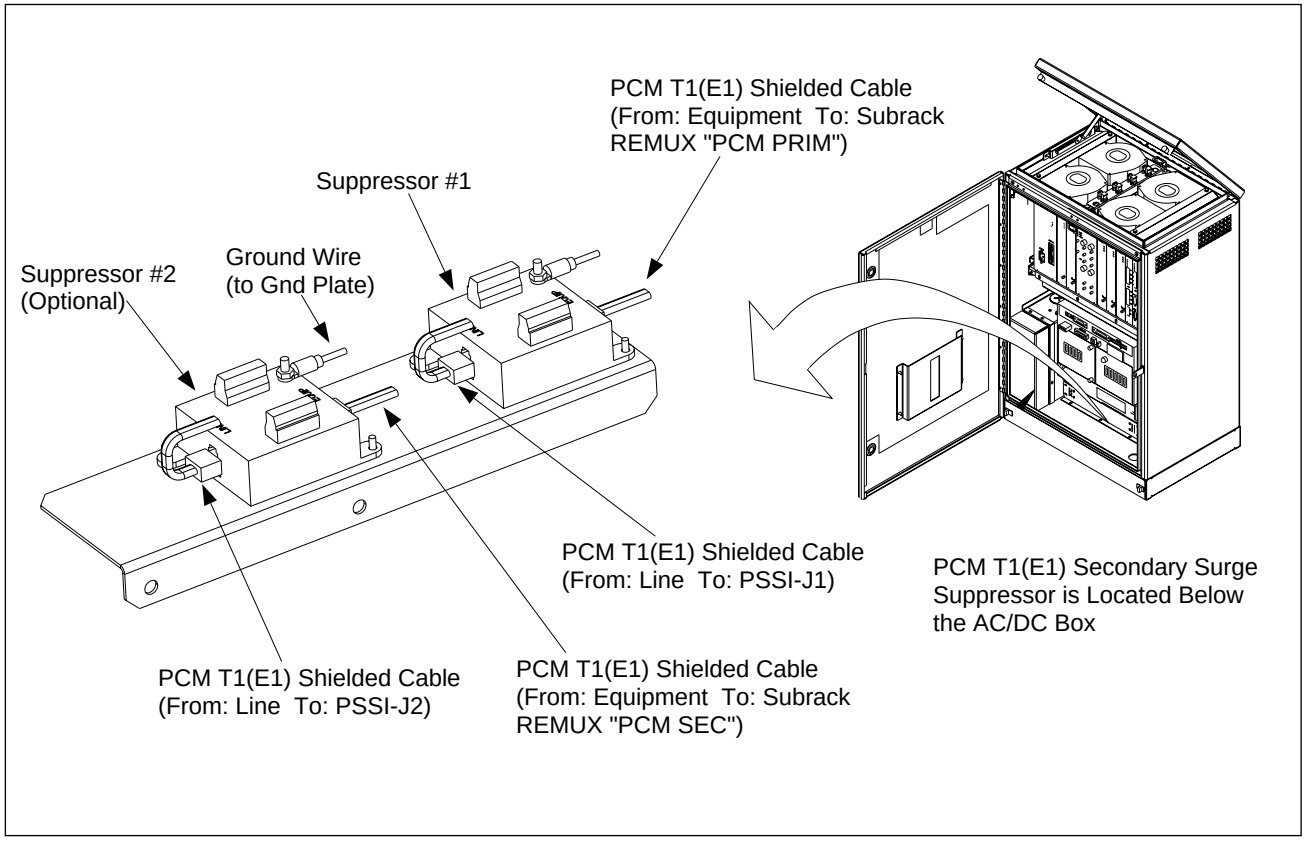


Figure 5-30. PCM T1(E1) Secondary Surge Suppressor Assembly

4. Remove the T1(E1) cables from the PCM Secondary Surge Suppressor. Record position of cables if required.

5. Remove the ground wire.

6. Remove the two mounting screws (or nuts) and remove the PCM Secondary Surge Suppressor from the cabinet.

Unit Hardware Replacement

7. Install the replacement PCM Secondary Surge Suppressor in cabinet and replace two mounting screws.

8. Connect T1(E1) cables and ground wire.

9. Update the *Plant Specification* in the *Site Installation Documentation* concerning the new unit. Use the comments field to note the date of the hardware replacement and new R-state.

10. Close the cabinet door.

11. Inform the MSC operator that the PCM Secondary Surge Suppressor has been replaced.

Unit Repair

12. Complete the Repair Traveler Note and attach it to the unit suspected to be faulty.

13. Pack the PCM Secondary Surge Suppressor in the packing material from the new unit and return it to the local service center.

6.18 Air Filter Replacement

Unit Removal

1. Obtain permission from the MSC operator to replace the Air Filter.

2. Open the cabinet door and secure the wind latch at the top of the door. Open the door until the shoulder slides into the slot at the end of the bar.

3. Locate the lower air filter cover. See Figure 5-31 on page 5-58.

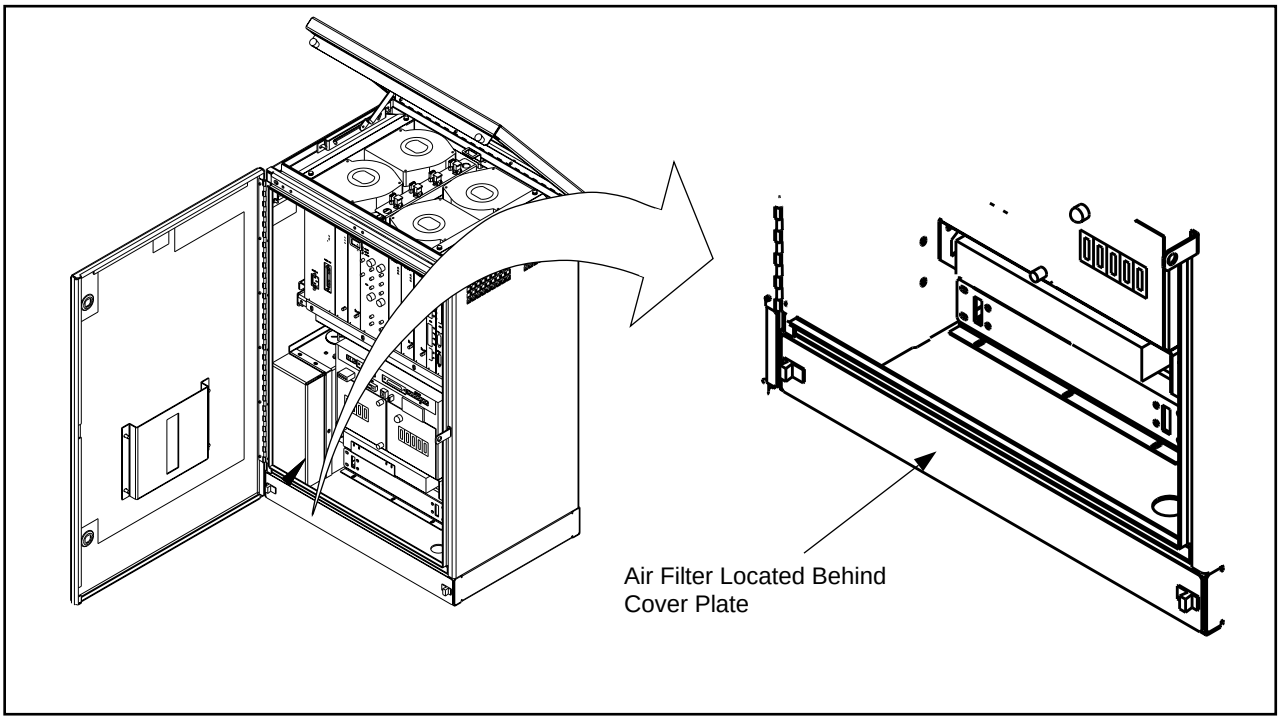


Figure 5-31. Air Filter Location

4. If equipped with slide latches, grasp the slide latches and move outward. If equipped with screws, remove the screws. Remove the cover and set aside.

5. Locate the Air Filter and slide outward.

   Note: Use care when removing Air Filter. Ensure that no dust or debris from the Air Filter enters the cabinet.

6. Dispose of the old Air Filter properly.

Unit Hardware Replacement

7. Remove the replacement Air Filter and note air flow directional arrows on side of the filter.

8. Install the new Air Filter with directional air flow arrows pointed up.

9. Replace the front cover and slide the latches inward to secure the cover.

10. Update the *Plant Specification* in the *Site Installation Documentation* concerning the new unit: use the comments field to note the date of hardware replacement, and new R-state.

11. Close the cabinet door.

12. Inform the MSC operator that the Air Filter has been replaced.

Glossary of Terms

Auxiliary Cabinet	Any extra RBS cabinet besides the main RBS cabinet. It is connected to the main cabinet (no direct connection with the MSC).
Cascading	Connecting another radio base station to a first one, thus using a common PCM line to the MSC.
Dummy TRX	A blank panel with an empty box behind, to be placed in unused TRX positions to ensure proper cooling and EMC shielding.
E1 Connection	The European standard for 2.048 Mbit/s PCM connections, carrying 32 independent 64 kbit/s channels (DS0s) numbered 0–31.
Main Cabinet	The Main Cabinet is directly connected to an MSC by a PCM link. The cabinet always has an antenna system.
Mobile Switching Center	The Mobile Switching Center handles all connections and disconnections of calls to a mobile station (MS) and serves as the interface between the mobile network and the Public Switched Telephone Network (PSTN).
Primary Cabinet	The Primary Cabinet is used to create an additional sector within an omni cell.
T1 Connection	The American standard for 1.544 Mbit/s PCM connections carrying 24 independent 64 kbit/s channels (DS0s) numbered 1–24.

Acronyms and Abbreviations

AC	Alternating Current
ALM	Alarm (Module for RBS)
AMPS	Advanced Mobile Phone Service
ANP	Antenna Near Part
ATC	Autotuned Combiner
ATCC	Autotuned Combiner Cabinet
B8ZS	Bit 8 Zero Substitute
CABCOMB	Cabinet Combiner
CLC	Control Signaling Link
COMBFILT	Combiner Filter
CONN	Connection Board
COP	Control Part
CRC	Cyclic Redundancy Check
CRI	Control and Radio Interface
CSU	Channel Service Unit
D-AMPS	Digital Advanced Mobile Phone Service
DBC	Down Banded Cellular
DC	Directional Coupler
DCCH	Digital Control Channel
DS0	Digital Signal Level 0
DTC	Digital Traffic Channel
DVER	Digital Verification Module
ECU	Environmental Control Unit
EMBS	Equipped Micro base Subrack
EMC	Electromagnetic Compatibility
EMRP	Extension Module Regional Processor
EMRPM	EMRP for Micro Base
ESD	Electrostatic Discharge
FCC	Federal Communications Commission
GS	Group Switch
IC	Integrated Circuit
IHRM	Installation and Hardware Replacement Manual
LED	Light Emitting Diode
MC	MultiCoupler
MCPA	MultiCarrier Power Amplifier

MOP	Modem Part
MSC	Mobile Switching Center
MVER	Mobile Verification Module
PCB	Printed Circuit Board
PCM	Pulse Code Modulation
PSU	Power Supply
RBS	Radio Base Station
RCG	Radio Cabinet Group
REMUX	Remote Multiplexor: Interfacing Board for the RBS
RF	Radio Frequency
RFTL	Radio Frequency Test Loop
RMU	Radio Matching Unit
RSSI	Received Signal Strength Indicator
RX	Receiver
SCCS	Self-Contained Cell Site
SP	Signalling Point (SS7)
SP	Support Processor (MSC)
STC	Signaling Terminal Central
STR	Signaling Terminal Regional
STRM	Signal Terminal Remote
TCB	Transceiver Cabinet
TLINK	Transmission Link
TRAB	Transcode Rate Adapter Board
TRX	Transceiverm (Module for RBS)
TS	Time slot
TX	Transmitter
VSWR	Voltage Standing Wave Radio

Appendix A

Documentation Overview

1 Introduction

This appendix provides an overview of the existing customer manuals for RBS 884, the work procedures covered by the manuals, and the recommended use of the manuals.

2 RBS 884 Customer Manuals

The customer manuals for RBS 884 cover the work procedures for Radio Network Design, Radio Site Engineering, Data Transcript, Installation and Test, Customer System Test, and Maintenance (see Figure A-1 on page A-3).

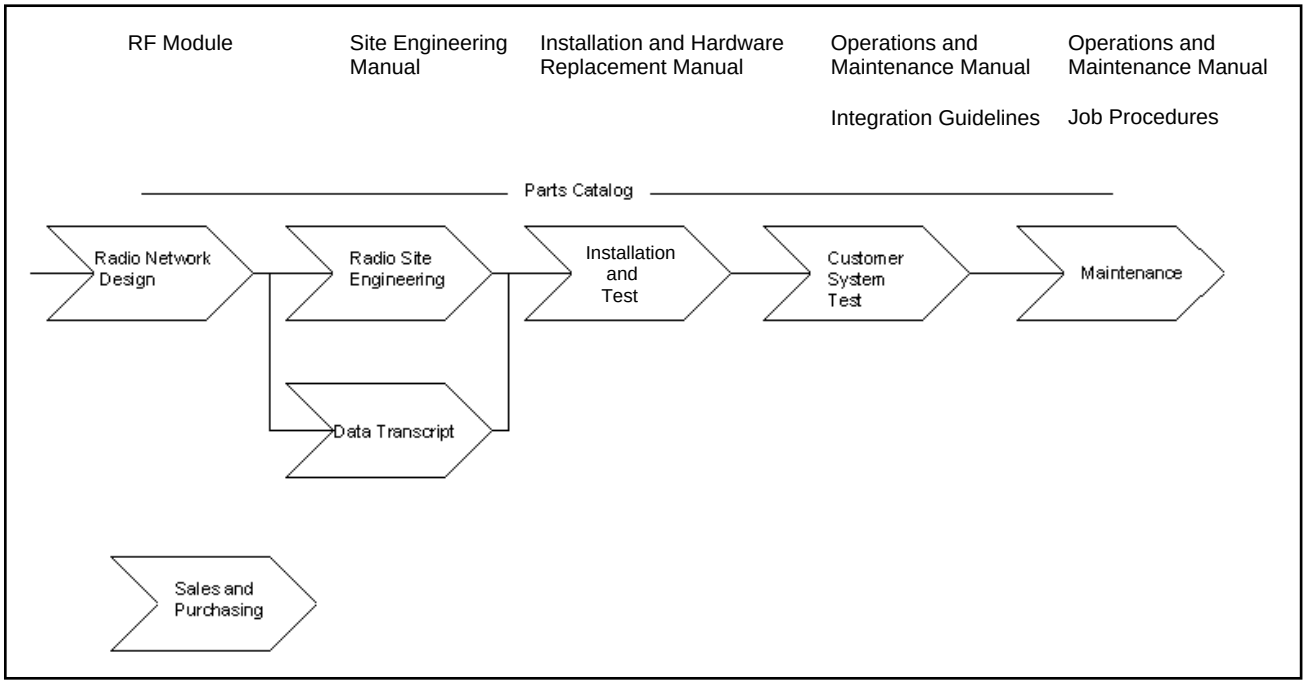


Figure A-1. RBS 884 Customer Manuals Related to Work Procedures

Use the *RF Modules* to plan and dimension a cellular network based on the Ericsson Cellular Telephone System. Engineer the sites using the *RBS 884 Site Engineering Manual*, and create a data transcript using the *RBS Integration Guidelines*.

Install and test the sites using the *General Installation Instructions* and the *Installation and Hardware Replacement Manual*. These manuals cover

installation of new base stations, replacement of hardware, and extension of existing base stations. There is one manual for each type of RBS:

- *RBS 884 Macro Installation and Hardware Replacement Manual* (one manual for each frequency band)
- *RBS 884 Micro Installation and Hardware Replacement Manual* (one manual for each frequency band)
- *RBS 884 Compact Installation and Maintenance Manual*

Test the sites using the *Installation and Hardware Replacement Manual* and the *Job Procedures*. Commission the sites and test the cellular network using the *Job Procedures* and the *RBS Integration Guidelines*.

Use the *Job Procedures* during operation and maintenance from the Mobile Switching Center (MSC). Use the *Parts Catalog* to identify replaceable RBS parts, and use the *Installation and Hardware Replacement Manual* for RBS hardware replacement and hardware extensions.

Table A-1. RBS 884 Customer Manuals

Manual Type	Customer Manual	Product Number
RF Engineering	RF Module - CMS 8800	EN/LZB 119 3278
	RF Module - DBC	EN/LZB 119 2888
	RF Module - Fixed Cellular Telephony	EN/LZB 119 3277
Site Engineering	RBS 884 Series Site Engineering Manual	EN/LZB 119 2855
Installation	General Installation Instructions	EN/LZB 119 3342
	RBS 884 Macro 800 MHz Installation and Hardware Replacement Manual	EN/LZB 119 3307
	RBS 884 Macro 1900 MHz Installation and Hardware Replacement Manual	EN/LZB 119 3308
	RBS 884 DBC Installation and Hardware Replacement Manual	EN/LZB 119 3309
	RBS 884 Micro (800 MHz) Installation and Hardware Replacement Manual	EN/LZB 119 3311
	RBS 884 Micro (1900 MHz) Installation and Hardware Replacement Manual	EN/LZB 119 3312
	RBS 884 Compact Installation and Maintenance Manual	EN/LZB 119 2224

Table A-1. RBS 884 Customer Manuals (Continued)

Manual Type	Customer Manual	Product Number
Parts Catalog	RBS 884 Macro 800 MHz Parts Catalog	EN/LZB 119 2453
	RBS 884 Macro 1900 MHz Parts Catalog	EN/LZB 119 2784
	RBS 884 DBC Parts Catalog	EN/LZB 119 2857
	RBS 884 Micro (800 MHz) Parts Catalog	EN/LZB 119 2454
	RBS 884 Micro (1900 MHz) Parts Catalog	EN/LZB 119 3320
	RBS 884 Compact Parts Catalog	EN/LZB 119 2455
Operation and Maintenance	RBS 884 Series Operations and Maintenance Manual CMS 8800 Version 4.0 [1]	LZY 213 1045
[1] Available on CD-ROM only		

The *Job Procedures* and the *Integration Guidelines* are available as part of the *RBS 884 Operations and Maintenance Manual*.

User Feedback

1 Introduction

This appendix provides information on ordering and trouble reporting for the RBS 884 customer manuals.

2 Ordering of Customer Manuals

For ordering of RBS 884 customer manuals, please contact your Ericsson account manager.

3 Problem Solving

If you have any problems with a radio base station in the RBS 884 series that can not be solved by reading the manuals, please contact your nearest Ericsson Technical Assistance Center (TAC).

4 Trouble Reporting

Please report any errors found in this manual to:

Ericsson Radio Systems, AR/SO

S-164 80 Stockholm

Sweden

or

e-mail: era.erarimpl@memo.ericsson.se

send e-mail as “Mime Compliant” (7–bits)

Appendix C

Internal Cables

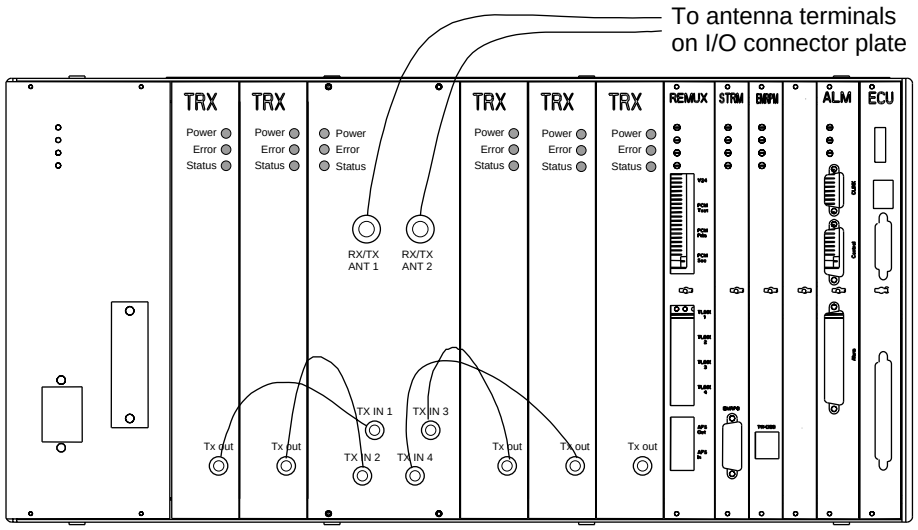
1 Introduction

This appendix describes the internal cabling within each RBS cabinet.

All internal cables are installed at the factory.

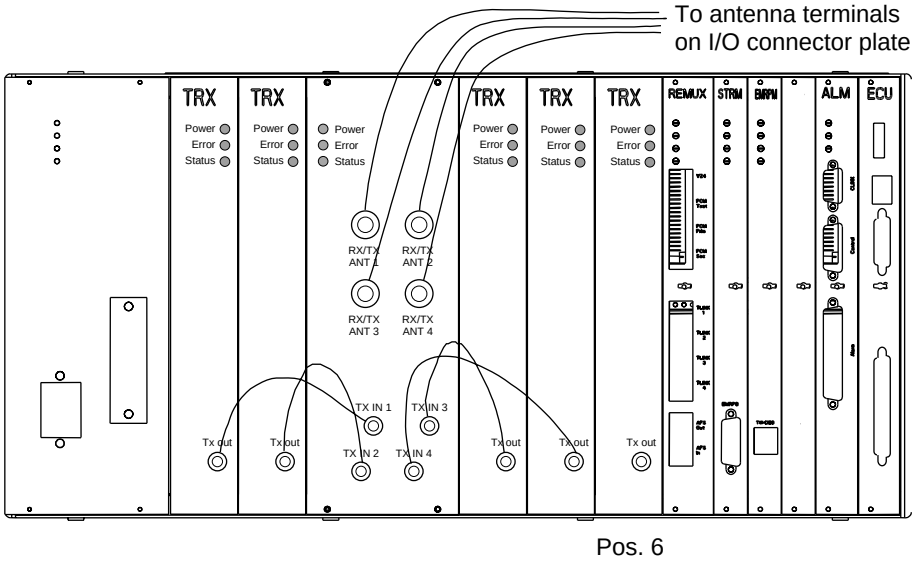
The configuration diagrams in this section show cabinets (Main and Primary), antenna configurations, and interconnections between cabinets. The cabinets are shown with maximum equipment installed.

2 One-Sector Sites



Note: The TRX board in position 6 is used as DVER

Figure C-1. One-Sector Site, One Cabinet with Two Antennas



Note: The TRX board in position 6 is used for DVER

Figure C-2. One-Sector Site, One Cabinet with Four Antennas

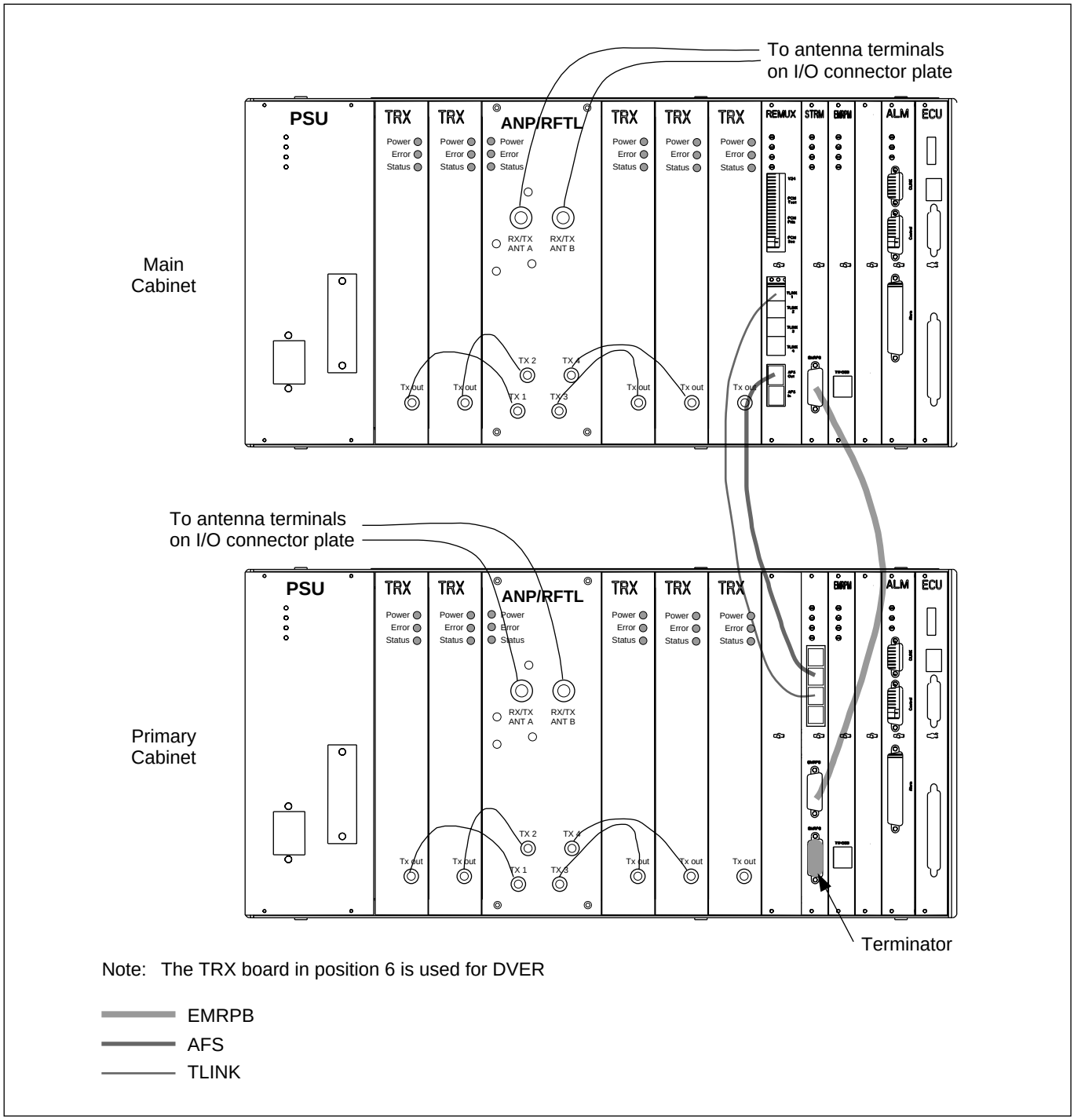


Figure C-3. Two-Sector Site, Two Cabinets, Each Cabinet with two Antennas

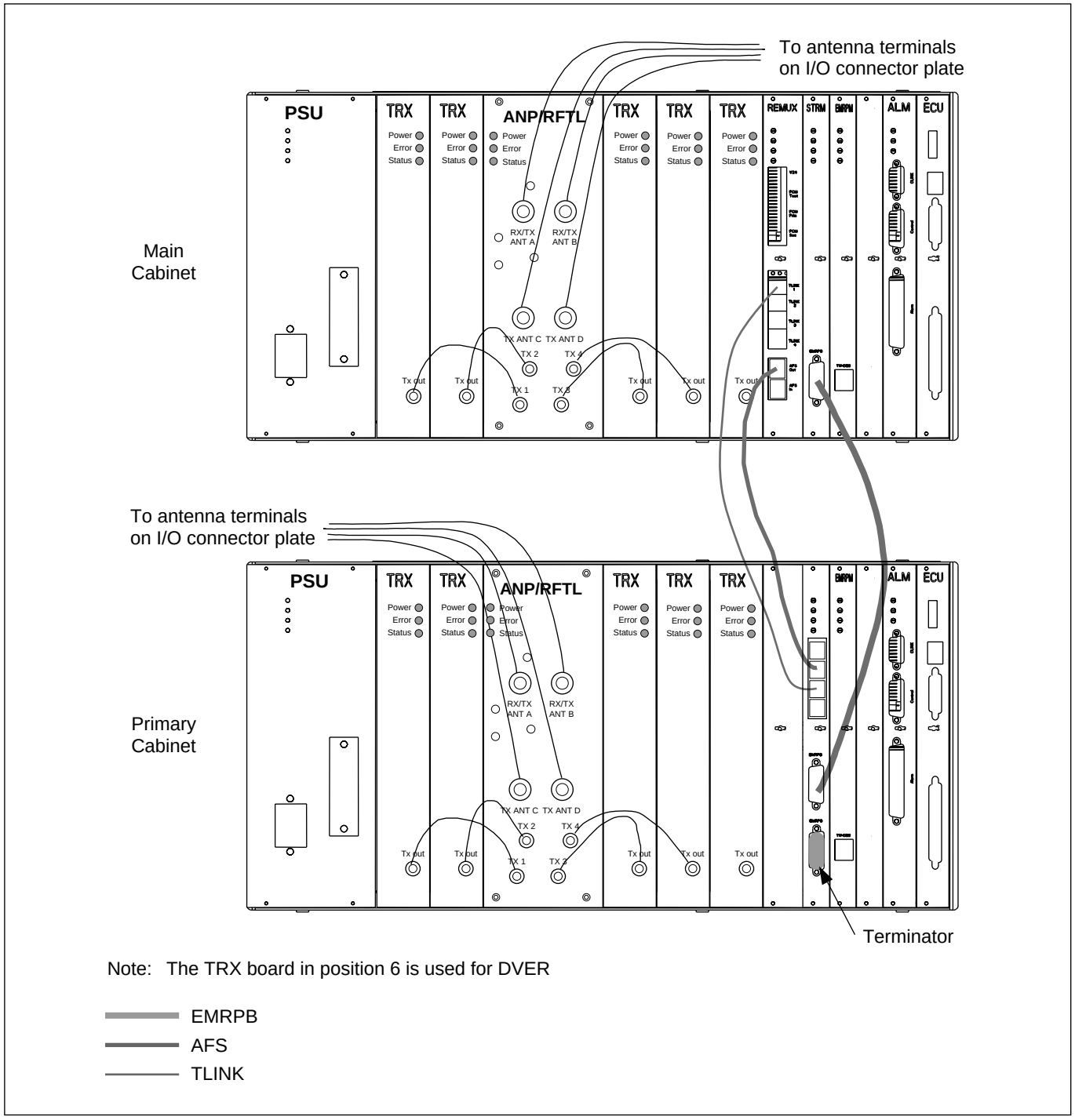


Figure C-4. Two-Sector Site, Two Cabinets, Each Cabinet with Four Antennas

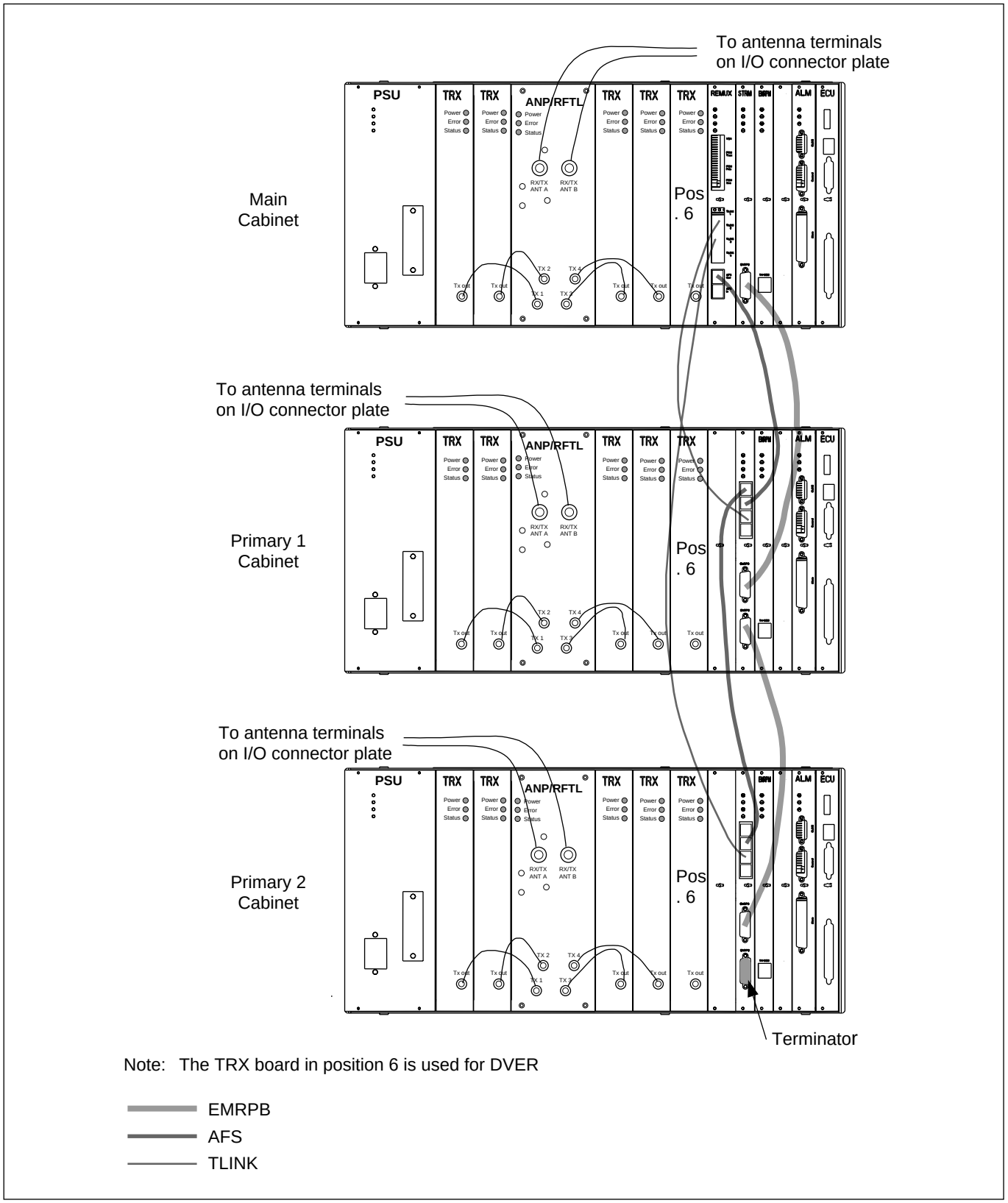


Figure C-5. Three-Sector Site, Each Cabinet with Two Antennas

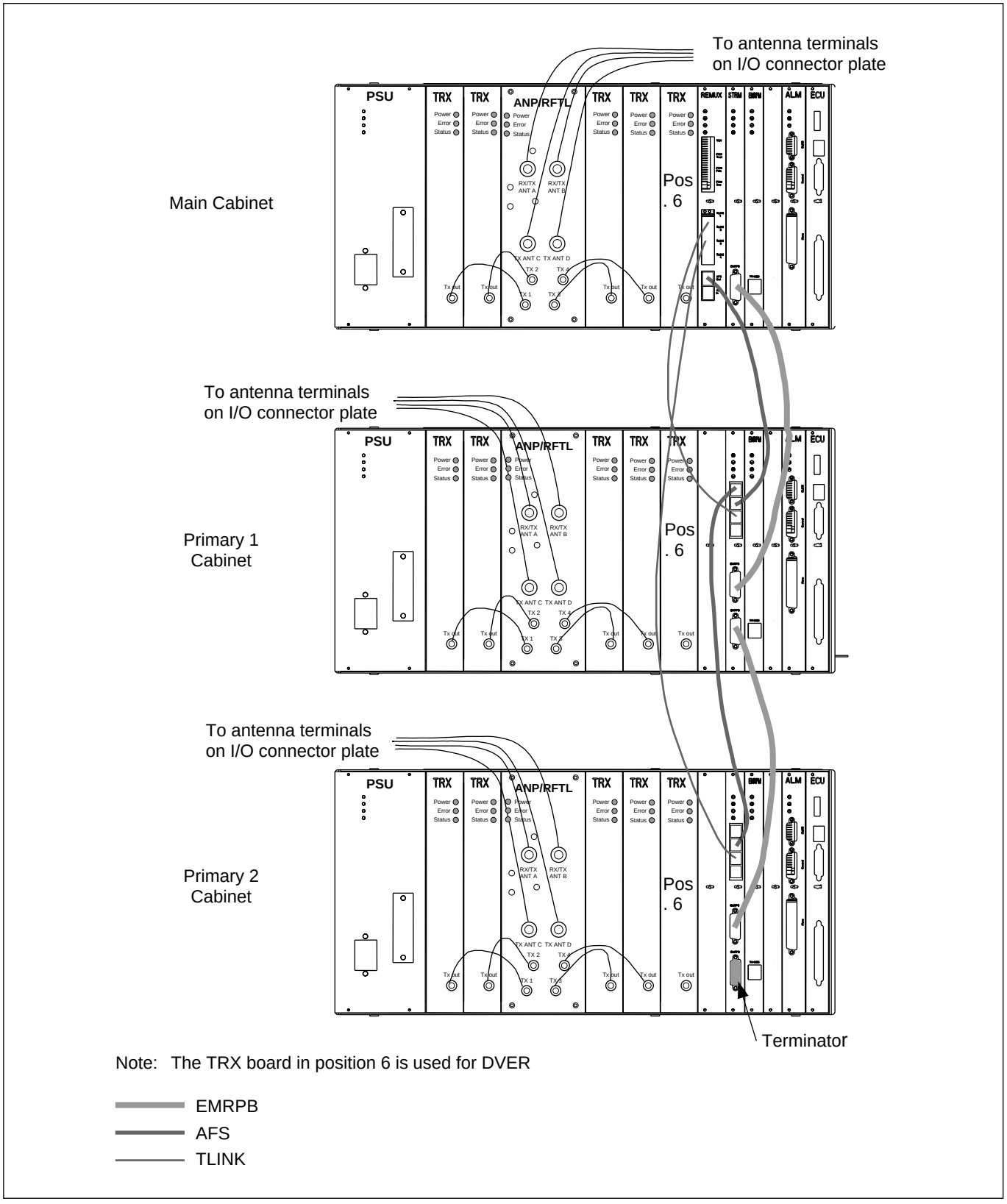
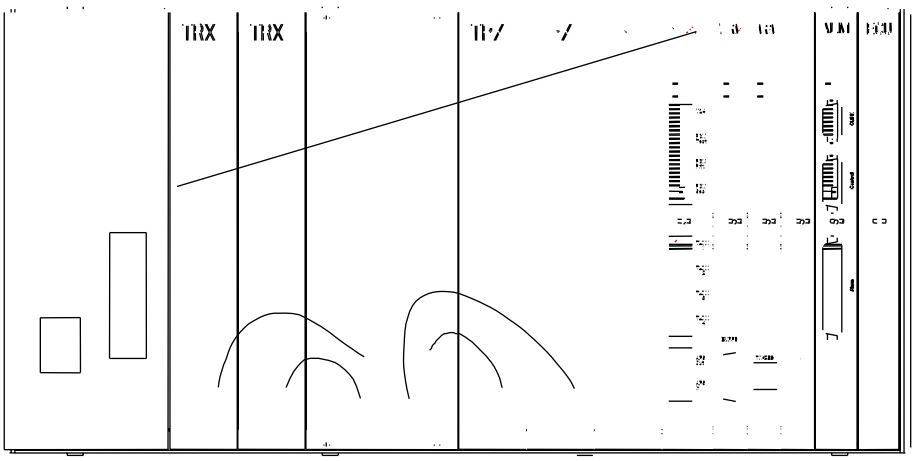


Figure C-6. Three-Sector Site, Each Cabinet with Four Antennas

5 Transceivers (TRXs)

The transceiver cables (RPM 513 977/00185) are installed as shown in Figure C-7 on page C-9.



Pos. 6

Cabinet using Four Antennas

Note: The TRX board in position 6 is used for MVER
Cabinets illustrated are Main Cabinets, but the cabling is the same for Primary Cabinets.