
Cabling Overview

Overview

This chapter provides the procedures to prepare the BTS site cabling, but not attach it to the unit. Chapter 6 shows the scope of work for unit cabling.

You will connect cables to the site and route them to the BTS location. You will attach the cables to the unit in Chapter 6.

Repeat cabling installation as necessary for each unit at the BTS.

NOTE

Cabling is one of the most noticeable aspects of workmanship. Straight runs and proper turns are critical for a positive evaluation of the work.

Configurations Supported

This chapter supports cable installation for single carrier omni configurations and multi-carrier omni configurations. This chapter also supports cable installations for sites equipped with the customer-supplied Site I/O Interface. Chapter 5 supports installations for sites equipped with the optional Primary Surge Suppressor.


4


Cabling Installation Order

To install the cables, Motorola recommends that the following procedures be completed in the order shown:

1. Earth ground cabling
2. AC power cabling
3. DC power cabling
4. Battery cabling (optional)
5. Antenna cabling
6. Site I/O interface cabling
7. RGPS/HSO cabling (optional)
8. Span line daisy chain cabling (optional)

Cable Labels

The “Cable Descriptions and Part Numbers” in Table 4-1 provides cable descriptions and part numbers. The labels used to designate the cables (A, B, C, etc.) are used throughout this manual.

Cable Descriptions

Cable Descriptions and Part Numbers

Table 4-1 gives the cable descriptions and part numbers for the cables used to install the BTS. The following cables are necessary for sites equipped with the customer-supplied Site I/O Interface and the Primary Surge Suppressor.

Table 4-1: Cable Descriptions and Part Numbers

Cable	Qty.	Part Number	Description
A	1	3087701C02	Ground cable, 8 -AWG, insulated copper wire. Requires one ring lug connector. Used for Primary Surge Suppressor Installation.
B	1-4	3087701C01	Ground cable. Installed between Site I/O Junction Box and Mounting Bracket.
C	1-8	Customer Supplied	Antenna cable, 50-Ohm coaxial terminated with at least one male, N-type connector.
D	2-6	Customer Supplied	Antenna cable, terminated with 2 male N-type connectors
E	1*	3087707C03	MIB A cable (current, 2m; micro) (part of kit T448H, T448G and T448A)
F	1*	3087707C04	MIB B cable (current, 2m) (part of kit T448AR, T448AY, and T448H)
G	2*	3087707C05	MIB C cable (current, 2m) (part of kit T448H)
I	1*	3087707C07	MIB B cable (long, 5m) (part of kit T448AS, T448AZ, and T448G)
J	2*	3087707C08	MIB C cable (long, 5m) (part of kit T448G)
K	1*	3087707C09	MIB A cable (short, 1m; micro) (part of kit T448B)
L	1-4	3087701C04	Y-Ground cable (for Site I/O and external SU)
M	1	3086039H11	RGPS cable, 125 ft.
		3086039H12	RGPS cable, 250 ft.
		3086039H13	RGPS cable, 500 ft.
		3086039H14	RGPS cable, 1000 ft.
		3086039H15	RGPS cable, 2000 ft.
N	1	Customer Supplied	Span cable. 22-24 AWG solid copper twisted pair.
O	1	Customer Supplied	Customer Input cable. 22-24 AWG solid copper twisted pair.
P	1-4	3088120C03	SU RF cable
Q	1	-	SU Digital Cable

. . . continued on next page

Cable Descriptions – continued

Table 4-1: Cable Descriptions and Part Numbers			
Cable	Qty.	Part Number	Description
S	1–4	3087854C02	AC input power cable. 14 AWG. 5m. Designed for 120–240 VAC power input. Cable has Deutsche connector on both ends.
T	1	Customer Supplied	AC Input power cable. 10–14 AWG, 90°C wire. Designed for 120–240 VAC.
U	1	3087854C04	DC input cable, 14 and 22 AWG, 5 m, is designed for 20 to 30 VDC power input.
V	1	Customer Supplied	Phone (Modem) cable. 22–24 AWG solid copper twisted pair.
W	1–3	Customer Supplied	Span Line Daisy Chain cable.
X	1–11	3086039H18	RGPS Synchronization cable (part of kit SGKN4351A).
		3086039H19	RGPS Synchronization cable (part of kit SGKN4352A).
Y	1	Customer Supplied	Master Ground Cable, 6 -AWG, insulated copper wire. Used for both Primary Surge Suppressor and non-Primary Surge Suppressor installations.
Z	1	3088116C01	Site I/O Cable Extender. Required for use in a BTS not equipped with the Primary Surge Suppressor.
*Quantity of cables depends upon system configuration. Refer to “Motorola Kits for Multi-Unit Installations” for more information.			

Motorola Kits for Multi-Unit Logical BTS Installations

Table 4-2 through Table 4-9 gives the Motorola Kit numbers, cable descriptions and part numbers for the Motorola kits required to perform a multi-unit logical BTS installation. Several kits are available depending upon the carrier installation.

Table 4-2: MicroCell Expansion Kit for Units 1 to 2 Short MIB A (Cubicle) – T448B			
Cable	Qty.	Motorola Part Number	Description
n/a	2	5882106P01	50 Ohm Antenna Terminator
A	1	3087701C02	Ground cable, 8 -AWG, insulated copper wire. Requires one ring lug connector.
K	1	3087707C09	MIB A cable (short, 1m; micro)

Cable Descriptions – continued

Table 4-3: MicroCell Expansion Kit for Units 1 to 2 Long MIB A (Non-Cubicle) – T448A

Cable	Qty.	Motorola Part Number	Description
n/a	2	5882106P01	50 Ohm Antenna Terminator
A	1	3087701C02	Ground cable, 8 -AWG, insulated copper wire. Requires one ring lug connector.
E	1	3087707C03	MIB A cable (current, 2m; micro)

Table 4-4: MicroCell (800 MHz) Expansion Kit for Units 2 to 3 Current 2m MIB B – T448AR

Cable	Qty.	Motorola Part Number	Description
A	1	3087701C02	Ground cable, 8 -AWG, insulated copper wire. Requires one ring lug connector.
F	1	3087707C04	MIB B cable (current, 2m)
n/a	2	8009573X06	Lightning arrestor

Table 4-5: MicroCell (800 MHz) Expansion Kit for Units 2 to 3 Long 5m MIB B – T448AS

Cable	Qty.	Motorola Part Number	Description
A	1	3087701C02	Ground cable, 8 -AWG, insulated copper wire. Requires one ring lug connector.
I	1	3087707C07	MIB B cable (long, 5m)
n/a	2	8009573X06	Lightning arrestor

Table 4-6: MicroCell (1.9 GHz) Expansion Kit for Units 2 to 3 Current 2m MIB B – T448AY

Cable	Qty.	Motorola Part Number	Description
A	1	3087701C02	Ground cable, 8 -AWG, insulated copper wire. Requires one ring lug connector.
F	1	3087707C04	MIB B cable (current, 2m)
n/a	2	8009573X01	Lightning arrestor

Table 4-7: MicroCell (1.9 GHz) Expansion Kit for Units 2 to 3 Long 5m MIB B – T448AZ

Cable	Qty.	Motorola Part Number	Description
A	1	3087701C02	Ground cable, 8 -AWG, insulated copper wire. Requires one ring lug connector.
I	1	3087707C07	MIB B cable (long, 5m)
n/a	2	8009573X01	Lightning arrestor

Cable Descriptions – continued

Table 4-8: MicroCell Expansion Kit for Units 3 to 4 Current 2m MIBs A and C – T448H

Cable	Qty.	Motorola Part Number	Description
A	1	3087701C02	Ground cable, 8 -AWG, insulated copper wire. Requires one ring lug connector.
n/a	2	5882106P01	50 Ohm Antenna Terminator
E	1	3087707C03	MIB A cable (current, 2m; micro)
G	1	3087707C05	MIB C cable (current, 2m)

Table 4-9: MicroCell Expansion Kit for Units 3 to 4 Longer 5M MIBs A and C – T448G

Cable	Qty.	Motorola Part Number	Description
n/a	2	5882106P01	50 Ohm Antenna Terminator
A	1	3087701C02	Ground cable, 8 -AWG, insulated copper wire. Requires one ring lug connector.
E	1	3087707C03	MIB A cable (current, 5m; micro)
J	1	3087707C08	MIB C cable (long, 5m)

Motorola Kits for RGPS Cabling

Table 4-10 and Table 4-11 show the contents of Motorola kits SGKN4351A and SGKN4352A. These kits are necessary for RGPS cabling between multiple logical BTS locations.

Table 4-10: RGPS Synchronization Cable Kit – SGKN4351A

Cable	Qty.	Motorola Part Number	Description
X	1	3086039H18	RGPS Sync Cable, 2000 ft.
n/a	2	5864461A03	Fitting, liquid tight.
n/a	2	0264599A02	Nut, nylon locking

Table 4-11: RGPS Synchronization Cable Kit – SGKN4352A

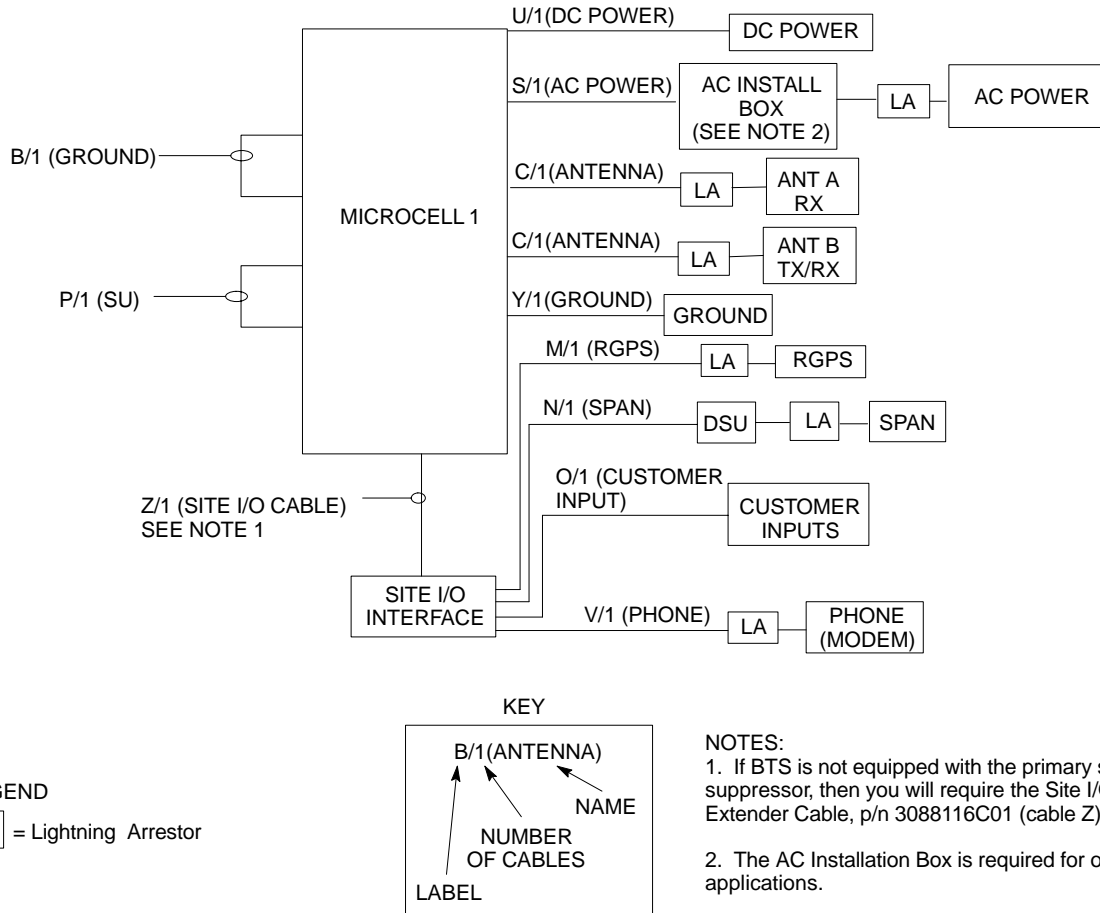
Cable	Qty.	Motorola Part Number	Description
X	1	3086039H19	RGPS Sync Cable, 3280 ft.
n/a	2	5864461A03	Fitting, liquid tight.
n/a	2	0264599A02	Nut, nylon locking

Site Cabling for BTS With Customer–Supplied Site I/O Interface

Preparing Site Cabling Scope of Work

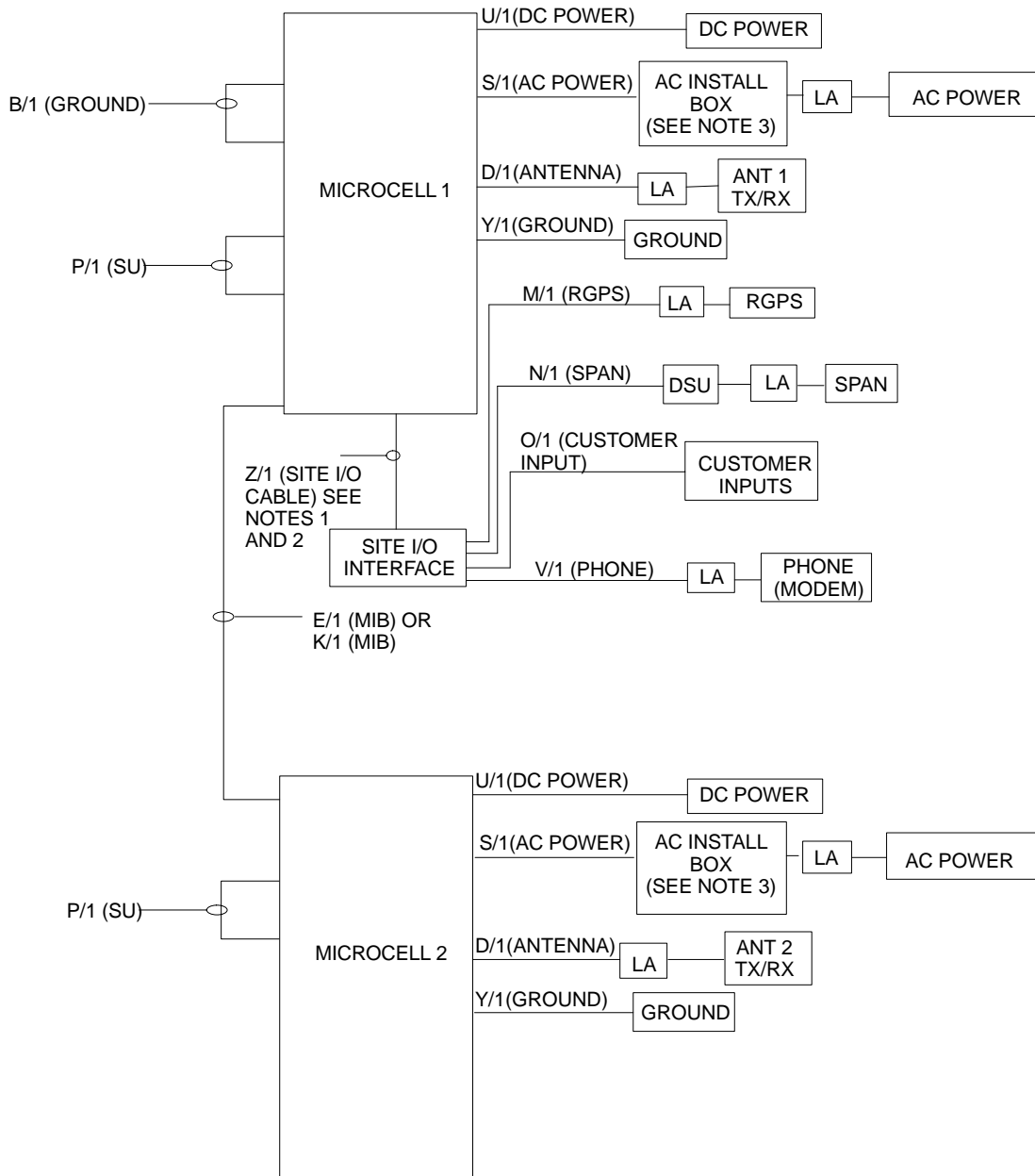
Figure 4-1 through Figure 4-4 shows the scope of work to be performed for preparing the site cabling with the customer–supplied Site I/O Interface. Chapter 6 shows the scope of work for unit cabling.

Figure 4-1: Site Cabling for One MicroCell



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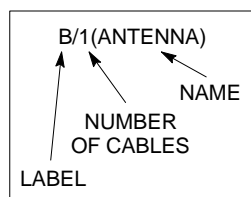
Figure 4-2: Site Cabling for Two MicroCells



LEGEND

LA = Lightning Arrestor

KEY

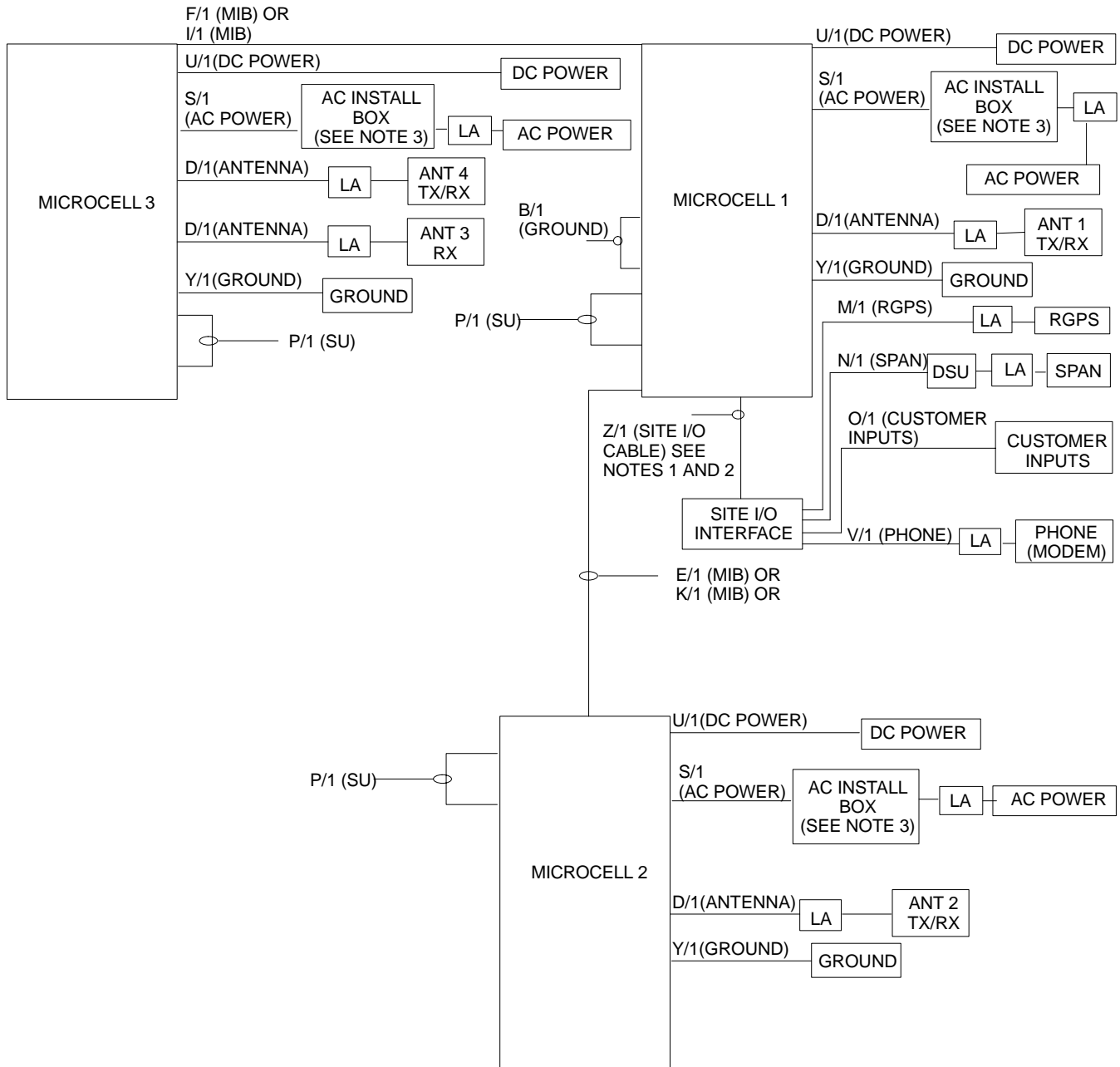


NOTES

- 1: Site I/O junction box and associated cable are present on MicroCell 1 only.
- 2: If BTS is not equipped with the primary surge suppressor, then you will require the Site I/O Cable Extender Cable, p/n 3088116C01 (cable Z).
- 3: The AC Installation Box is required for outdoor applications.

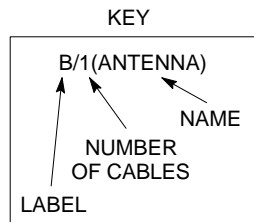
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Figure 4-3: Site Cabling for Three MicroCells



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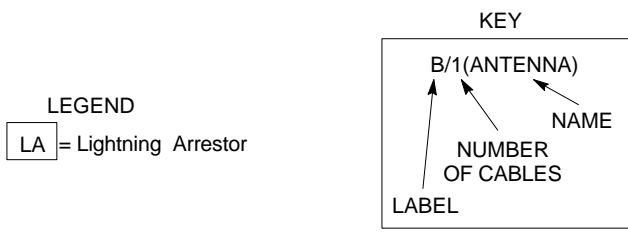
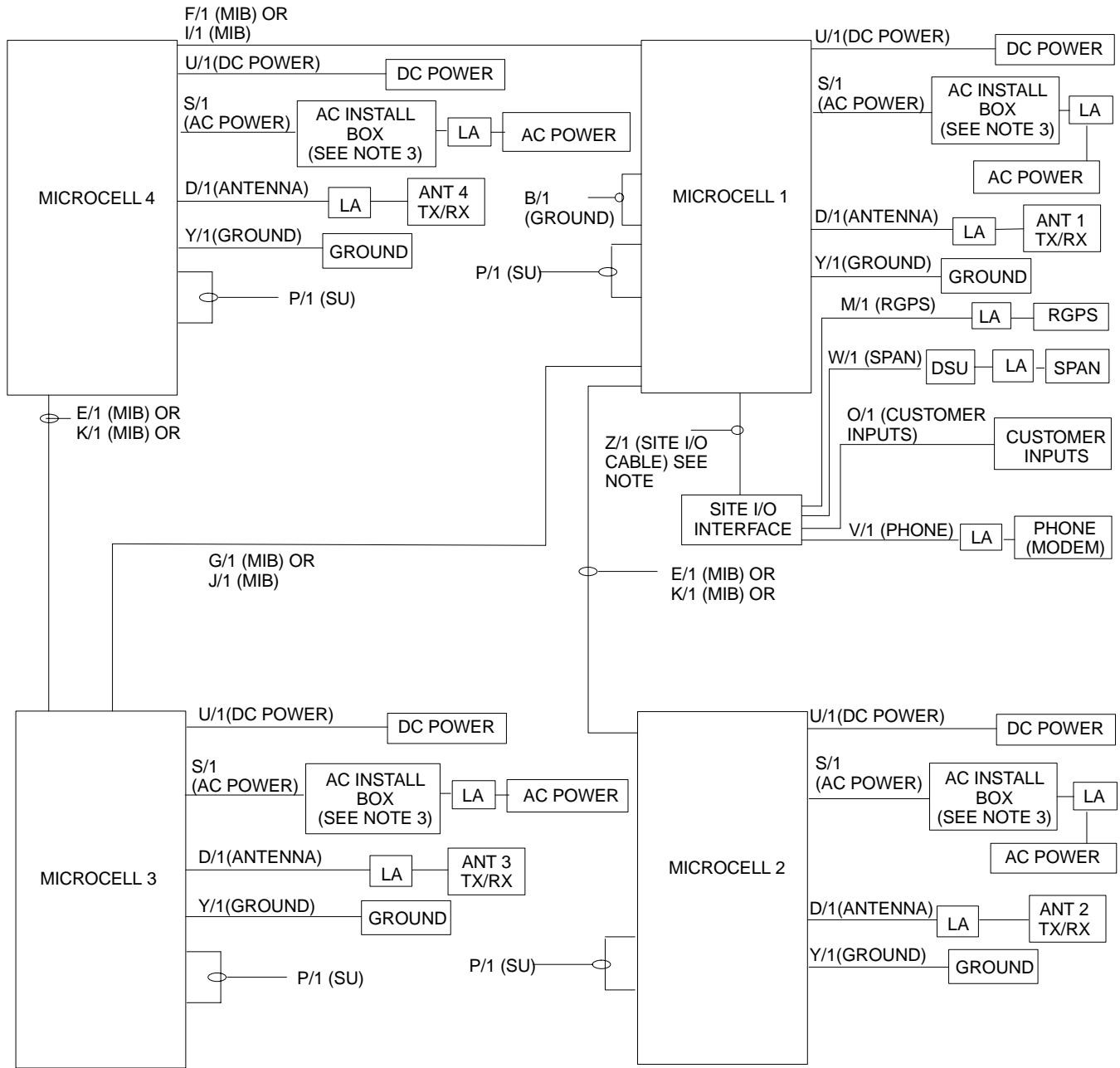
LEGEND
 LA = Lightning Arrestor



NOTES

- 1: Site I/O junction box and associated cable are present on MicroCell 1 only.
- 2: If BTS is not equipped with the primary surge suppressor, then you will require the Site I/O Cable Extender Cable, p/n 3088116C01 (cable Z).
- 3: The AC Installation Box is required for outdoor applications.

Figure 4-4: Site Cabling for Four MicroCells



- NOTES**
- 1: Site I/O junction box and associated cable are present on MicroCell 1 only.
 - 2: If BTS is not equipped with the primary surge suppressor, then you will require the Site I/O Cable Extender Cable, p/n 3088116C01 (cable Z).
 - 3: The AC Installation Box is required for outdoor applications.

Power, Ground, and Battery Cabling for Sites Equipped with Customer–Supplied Site I/O Interface

Objective

The objective of this procedure is to install the power, earth ground, and battery cabling for one or more Microcell units at a site equipped with customer–supplied Site I/O Interface.



WARNING

Dangerous voltages, capable of causing death, are present in this equipment. Use extreme caution when handling and testing this equipment.

NOTE

If you are installing the unit outdoors and are not using the Primary Surge Suppressor, then you must connect AC power with the AC Installation Box. The AC Installation Box is included with the non–surge option.

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Other Grounding Considerations

This procedure covers only the grounding information for the cables that attach to one or more MicroCell units. Grounding considerations beyond the ground cables that attach to the MicroCell are summarized in Appendix A. Refer to Appendix A and the site documentation for other grounding considerations.

NOTE

Motorola recommends that you use an oxide inhibitor such as Burndy PENETROX™ or IlSCO DE–OX™ on all the external ground connections on the unit and on the site I/O interface for all outdoor installations. This includes the ground connections on the mounting bracket, the Site I/O, and the lugs on the customer–supplied site I/O interface.

Power Requirements and Configurations

The power requirements for each unit is: 120–240 VAC (7.5 amps min.) or 20–30 VDC (20 amps min.) power input.

The AC Installation Box is required for all outdoor installations which use the customer–supplied Site I/O interface.

The customer–supplied site I/O interface must be able to pass the 4kV/6kV transient impulse test (Motorola 12M09154A49 Sec. 3.5.3.2.1: Impulse Surge, Test Condition A).

Power, Ground, and Battery Cabling for Sites Equipped with Customer–Supplied Site I/O Interface – continued

The power and battery configurations for the MicroCell units are:

- AC power only (no battery)
- AC power with short duration battery
- DC power

NOTE

Neither the "+" or "-" terminal of the DC Input is connected to the BTS ground. If a negative supply input is provided, the "+" terminal of the DC input must be connected to the Master Ground Plate (MGP). By connecting the "+" terminal of the DC input to the MGP, a negative supply system is created.

Required Cables

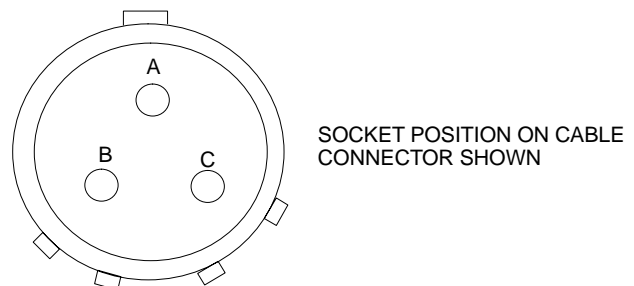
Table 4-12 provides the quantity and description of the required cables.

Cable	Qty.	Part Number	Description
S	1–4	3087854C02	AC input cable, 14 AWG, 5 m, is designed for 88–260 VAC power input.
U	1–4	3087854C04	DC input cable, 14 and 22 AWG, 5 m, is designed for 20 to 30 VDC power input.
Y	1–4	Customer Supplied	Master Ground cable, 6 -AWG, insulated copper wire. Requires one ring lug connector. Used for both Primary Surge Suppressor and non-Primary Surge Suppressor installations.

AC Input Cable Information

The pinout information for the AC input cable(s) (Cable S) is given in Figure 4-5 and Table 4-13.

Figure 4-5: AC Input Cable Connector Information



Power, Ground, and Battery Cabling for Sites Equipped with Customer–Supplied Site I/O Interface – continued

Table 4-13: AC Input Cable Information

Connector	Wire Color	Description
A	Black	Line
B	Green	Ground
C	White	Neutral

DC Input Cable Information

The information for the DC input cable(s) (Cable U) is given in Figure 4-6.

Figure 4-6: DC Input Cable Connector Information

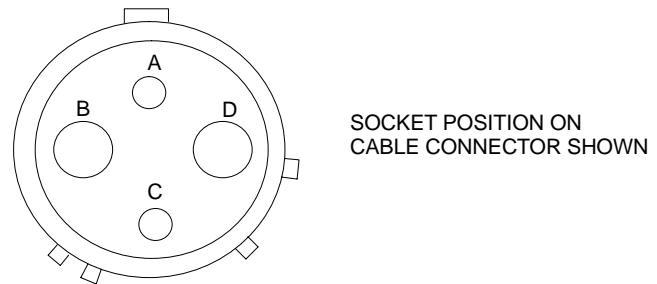


Table 4-14: DC Input Cable Information

Connector	Wire Color	Description	Comments
A	Yellow	Switch A	No connection
B	Red	Positive	Connect to positive terminal of supply.
C	Blue	Switch B	Connect to negative terminal of supply.
D	Black	Negative	Connect to negative terminal of supply.

Procedures to Install Earth Ground, AC/DC Power, and Battery Cabling

The system configuration determines which power cables are installed. The ground cable is always installed. Perform the appropriate procedures from the following tables based on the system configuration.



Power, Ground, and Battery Cabling for Sites Equipped with Customer–Supplied Site I/O Interface – continued

Table 4-15: Procedure to Install Earth Ground Cable

Step	Action
1	Route cable Y (ground cable) from the ground on the mounting bracket to the customer defined grounding location.
2	Connect cable Y to the customer defined master ground plate.

Table 4-16: Procedure to Install AC Input Cable(s) (Indoor Applications)

Step	Action
1	If you will not use the AC Installation box, cut off the male connector (with pins) from the AC input power cable (cable S).
2	Connect the loose wires of cable S (AC input cable) to the customer defined AC power source. Refer to Table 4-13 for wiring information.
3	Verify all connections of cable S with an ohmmeter prior to routing the cable.
4	Route cable S from the AC power supply to the unit location.

Table 4-17: Procedure to Install AC Installation Box (Optional – Required for Outdoor Installations)

Step	Action
1	Route the AC Power Cable (cable T) through 1–in. conduit from the customer–defined AC power source to the AC Installation box. Refer to Figure 4-7 and Table 4-18.
2	Attach the wires of cable T to the AC Installation Box terminal block. Refer to Figure 4-7 and Table 4-18.
3	Place the round, black connector on the AC input cable (cable S) onto the AC power cable connector on the AC installation box. Turn the cable connector to align its key.
4	Route cable S from the AC installation box to the unit location.

Table 4-18: AC Installation Box Cabling

Punchdown Block Connector	AC Power Cable Wire Color	Description
L	Black	Line
N	White	Neutral
GROUND	Green	Ground

Power, Ground, and Battery Cabling for Sites Equipped with Customer-Supplied Site I/O Interface – continued

Figure 4-7: AC Installation Box

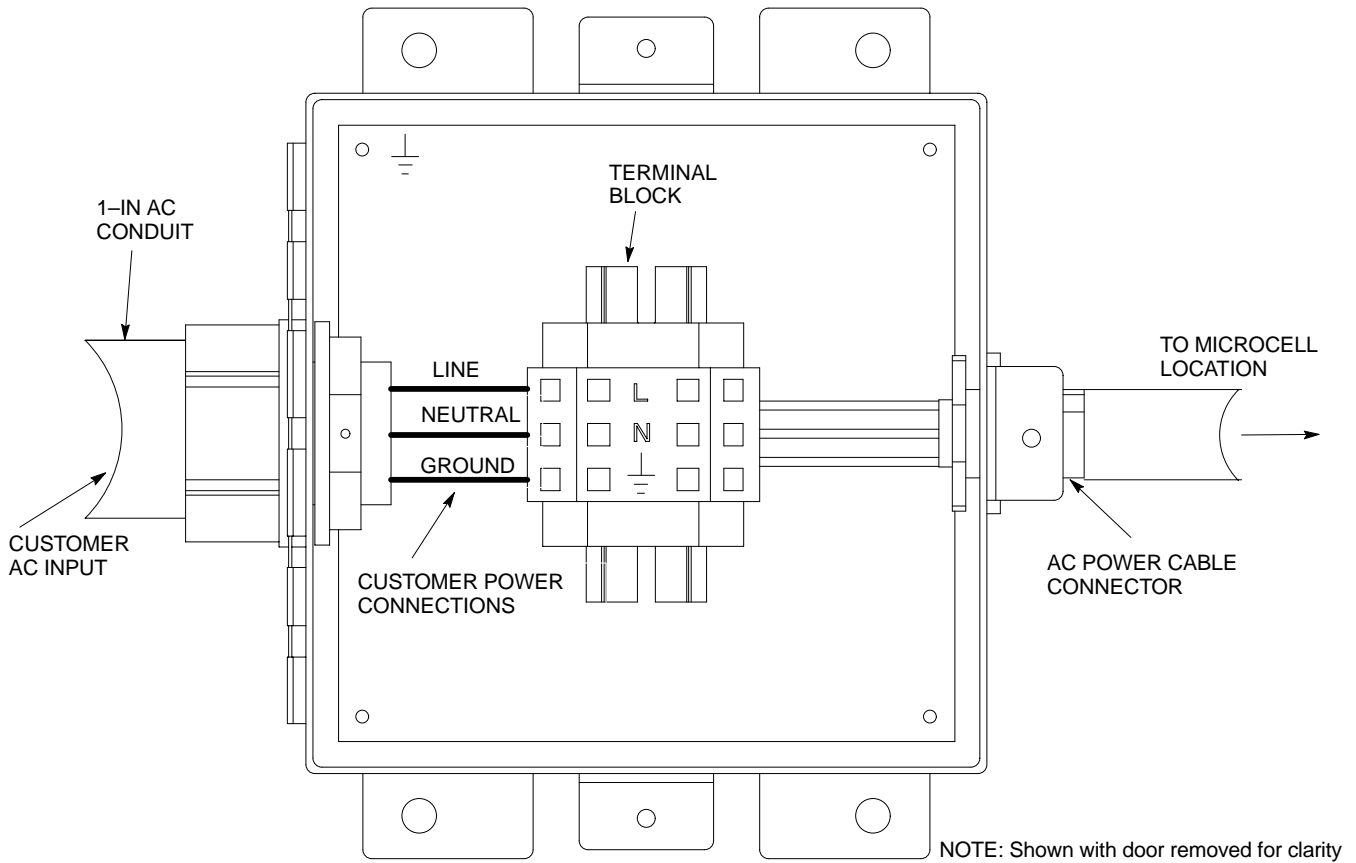


Table 4-19: Procedure to Install DC Input Cable(s)

Step	Action
1	Connect the loose wires of cable U (DC input cable) to the customer defined DC power source. Refer to Table 4-14 for wiring information.
2	Verify all connections of cable U with a multimeter prior to routing the cable.
3	Route cable U from the DC power supply to the unit location.

Antenna Cabling for Sites Equipped with Customer–Supplied Site I/O Interface

Objective

The objective of this procedure is to install the cabling for the antenna(s). This cabling is installed between one or more units and the customer–supplied lightning arrestor(s).

Cable Labels

The cable designations are referenced to Table 4-1 in the “Cable Description” area of this chapter.

Required Cables

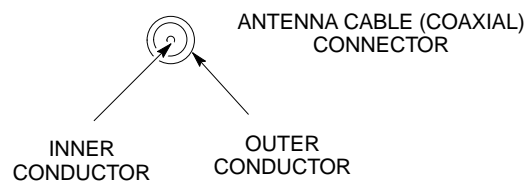
Table 4-20 provides the quantities and descriptions of the required cables.

Cable	Qty.	Part Number	Description
C	1 to 8	Customer Supplied	Antenna cable, 50–Ohm coaxial terminated with at least one male, N–type connector.

Antenna Cable Pin and Signal Information

The antenna cabling uses a 50–Ohm coaxial cable. The inner conductor provides signaling and the outer conductor provides shielding and ground. Refer to Figure 4-8 and Table 4-21.

Figure 4-8: Antenna Cabling Details



Antenna	Inner Conductor	Outer Conductor
B	TX/RX	Ground
A	RX	Ground

Procedure to Install Antenna Cabling for One Microcell



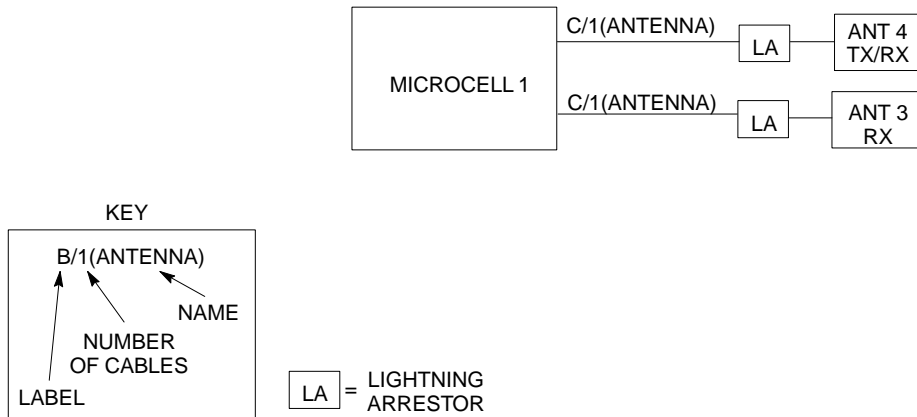
IMPORTANT

You must install lightning arrestors for all outdoor installations.

Antenna Cabling for Sites Equipped with Customer–Supplied Site I/O Interface – continued

Route the antenna cable between the unit and the customer–supplied lightning arrester. Refer to Figure 4-9 and Table 4-21. If a lightning arrester is not required, route the cabling directly to the antenna.

Figure 4-9: Antenna Cabling for One MicroCell

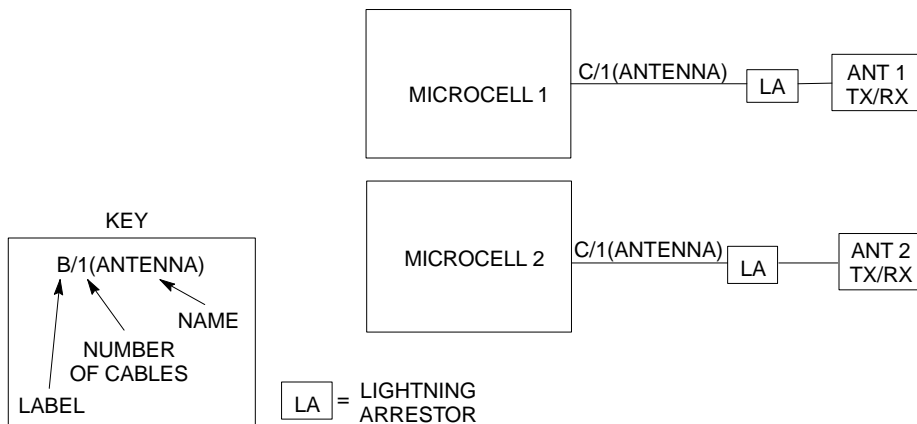


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Procedure to Install Antenna Cabling for Multi–Unit Logical BTS Sites

If your site has more than one MicroCell unit, refer to Figure 4-10 through Figure 4-12 for site cabling information. Route the antenna cables between the units and the customer–supplied lightning arrestors. If lightning arrestors are not required, route the cabling directly to the antennas.

Figure 4-10: Antenna Cabling for Two MicroCells



Antenna Cabling for Sites Equipped with Customer–Supplied Site I/O Interface – continued

Figure 4-11: Antenna Cabling for Three MicroCells

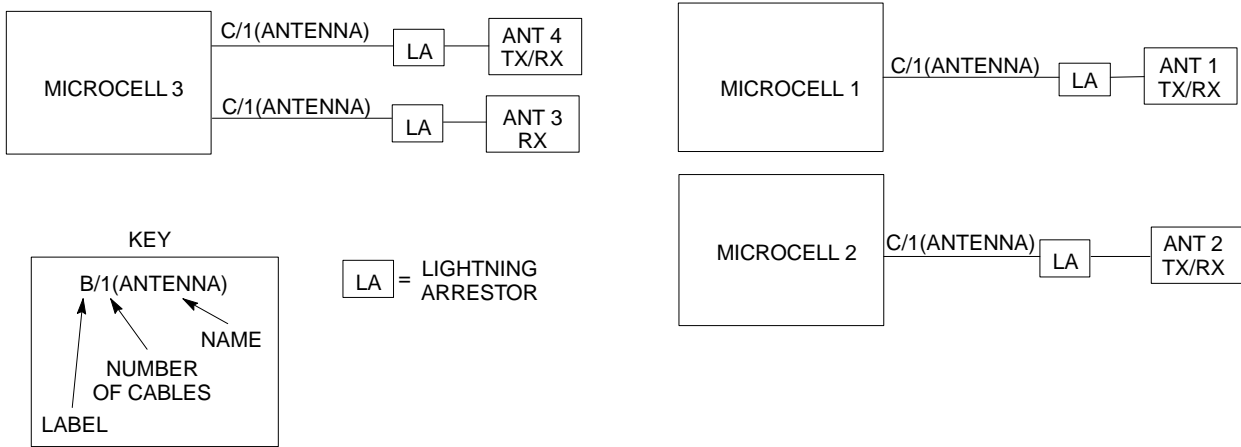
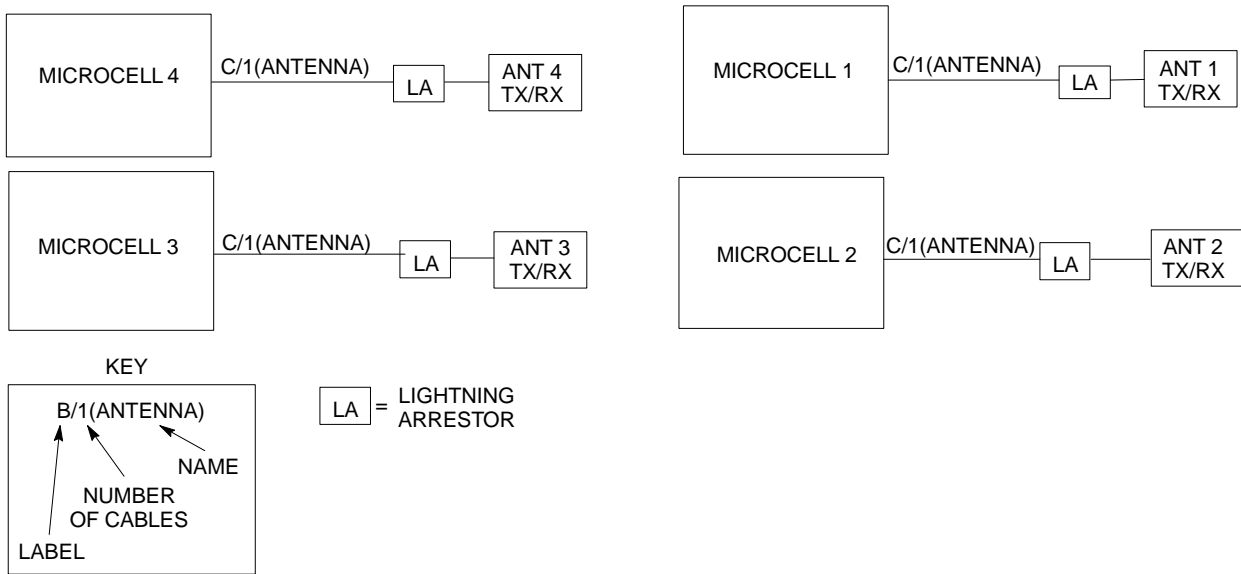


Figure 4-12: Antenna Cabling for Maximum of Four MicroCells



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Site I/O , Span Line, RGPS and Modem Cabling for Sites Equipped with Customer–Supplied Site I/O Interface

Objective

The objective of this procedure is to install the Site I/O cable between the Site I/O junction box and the customer–supplied Site I/O interface. This procedure also covers the installation of the site cabling of the span line, RGPS and modem cabling to the site I/O interface.

If your multi–unit BTS is equipped with the optional Primary Surge Suppressor, refer to the “Primary Surge Suppressor Cabling” procedures in chapter 5.

Cable Labels

The cable designations are referenced to Table 4-1 in the “Cable Description” area of this chapter.

Required Cables

Table 4-22 provides the quantities and descriptions of the required cables.

Cable	Qty.	Part Number	Description
M	1	3086039H11	RGPS cable, 125 ft.
		3086039H12	RGPS cable, 250 ft.
		3086039H13	RGPS cable, 500 ft.
		3086039H14	RGPS cable, 1000 ft.
		3086039H15	RGPS cable, 2000 ft.
N	1	Customer Supplied	Span Cable. 22–24 AWG solid copper twisted pair.
O	1	Customer Supplied	Customer Input Cable. 22–24 AWG solid copper twisted pair.
V	1	Customer Supplied	Phone (Modem) Cable. 22–24 AWG solid copper twisted pair.
Z	1	3088116C01	Site I/O Extender Cable. Required for use in a BTS not equipped with the Primary Surge Suppressor.

Site I/O Cabling

The Site I/O interface and cabling are customer–supplied. The cable between the Site I/O junction box and the Site I/O interface is part of the Site I/O junction box and is supplied by Motorola. If your BTS uses the customer–supplied Site I/O Interface instead of the Primary Surge Suppressor, then you will need to use the Site I/O Extender Cable (Cable Z). The Site I/O Extender cable is included with this option.

The customer determines the Site I/O interface configuration. The end result is the correct signals getting to the correct pins on the Site I/O cable.

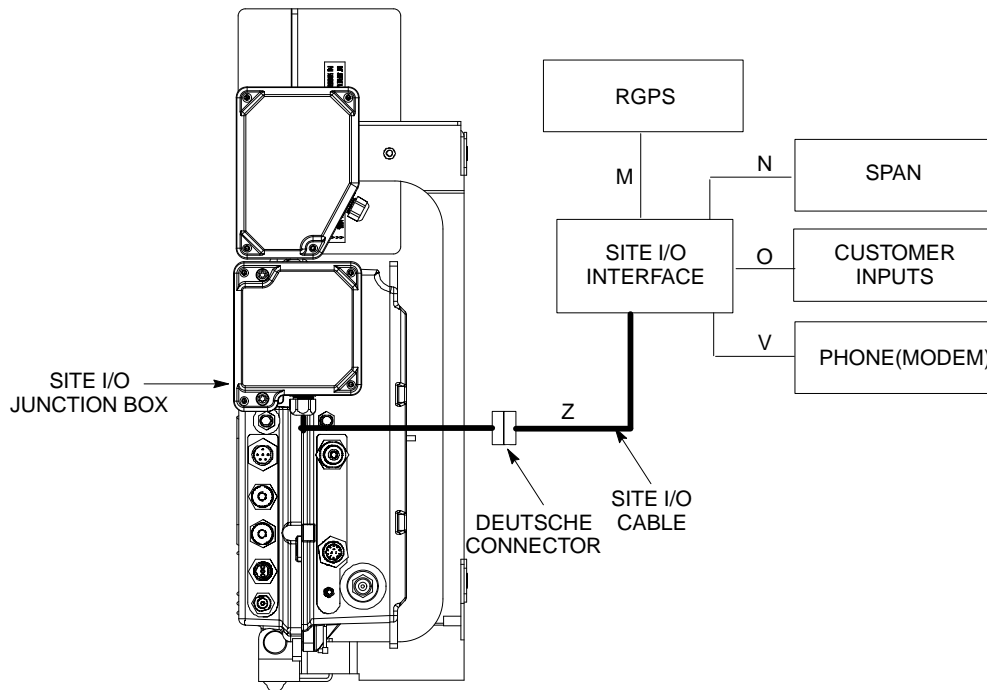
Site I/O , Span Line, RGPS and Modem Cabling for Sites Equipped with Customer–Supplied Site I/O Interface – continued

Procedure to Install Site I/O Cable Between Site I/O Junction Box and Site I/O Interface

Route the Site I/O junction box cable from the unit location(s) to the Site I/O Extender Cable (cable Z). Route cable Z to the Site I/O interface. Connect the appropriate connectors within the Site I/O interface. Refer to Figure 4-13 and Table 4-23.

If lightning arrestors are required, they must be customer–supplied. Lightning arrestors are not necessary for sites equipped with optional Primary Surge Suppressor.

Figure 4-13: Site I/O Cabling Details



Site I/O , Span Line, RGPS and Modem Cabling for Sites Equipped with Customer–Supplied Site I/O Interface – continued

Pin and Signal Information for Site I/O Cabling

Table 4-23 gives the pin and signal information for the Site I/O cable.

Table 4-23: Pin/Signal Information for Site I/O Cable		
BTS Interface	Wire/Stripe Color	Description
Customer Input	Black	Customer Input 1 Signal
	Brown	Customer Input 1 Ground
	Red	Customer Input 2 Signal
	Orange	Customer Input 2 Ground
	Yellow	Customer Input 3 Signal
	Green	Customer Input 3 Ground
	Blue	Customer Input 4 Signal
	Purple	Customer Input 4 Ground
	Grey	Customer Input 5 Signal
	White	Customer Input 5 Ground
	Black/Brown	Customer Input 6 Signal
	Black/Red	Customer Input 6 Ground
	Black/Orange	Customer Input 7 Signal
	Black/Yellow	Customer Input 7 Ground
	Black/Green	Customer Input 8 Signal
Black/Blue	Customer Input 8 Ground	
Sync Reverse	Black/Purple	Data to Tail –
	Black/Grey	Data to Tail +
	Black/White	Data from Tail –
	Brown/Black	Data from Tail +
	Brown/Red	1 PPS to Tail –
	Brown/Orange	1 PPS to Tail +
	Brown/Yellow	1 PPS from Tail –
	Brown/Green	1 PPS from Tail +
	Brown/Blue	Downstream BTS Detect +
	Brown/Purple	Downstream BTS Detect –
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Site I/O , Span Line, RGPS and Modem Cabling for Sites Equipped with Customer–Supplied Site I/O Interface – continued

Table 4-23: Pin/Signal Information for Site I/O Cable

BTS Interface	Wire/Stripe Color	Description
Sync Forward	Brown/Grey	Data from Head –
	Brown/White	Data from Head +
	Red/Black	Data to Head –
	Red/Brown	Data to Head +
	Red/Orange	1 PPS from Head –
	Red/Yellow	1 PPS from Head +
	Red/Green	1 PPS to Head –
	Red/Blue	1 PPS to Head +
	Red/Purple	RGPS 28V
	Red/Grey	RGPS Ground
	Red/White	RGPS 28V
	Orange/Black	RGPS Ground
	Orange/Brown	RGPS 28V
	Orange/Red	RGPS Ground
	Orange/Yellow	NO CONNECTION
Orange/Green	NO CONNECTION	
Span (Network)	Orange/Blue	RX TIP Primary (Network)
	Orange/Purple	RX RING Primary (Network)
	Orange/Grey	TX TIP Primary (Network)
	Orange/White	TX RING Primary (Network)
	Yellow/Black	RX TIP Secondary (Network)
	Yellow/Brown	RX RING Secondary (Network)
	Yellow/Red	TX TIP Secondary (Network)
	Yellow/Orange	TX RING Secondary (Network)
. . . continued on next page		



Site I/O , Span Line, RGPS and Modem Cabling for Sites Equipped with Customer–Supplied Site I/O Interface – continued

Table 4-23: Pin/Signal Information for Site I/O Cable

BTS Interface	Wire/Stripe Color	Description
Span (Redundant)	Yellow/Green	RX TIP Primary (Redundant)
	Yellow/Blue	RX RING Primary (Redundant)
	Yellow/Purple	TX TIP Primary (Redundant)
	Yellow/Grey	TX RING Primary (Redundant)
	Yellow/White	RX TIP Secondary (Redundant)
	Green/Black	RX RING Secondary (Redundant)
	Green/Brown	TX TIP Secondary (Redundant)
	Green/Red	TX RING Secondary (Redundant)
Phone (Modem)	Green/Orange	MODEM TIP
	Green/Yellow	MODEM TIP
	Green/Blue	No connection
	Green/Purple	No connection
	Green/Grey	MODEM RING
	Green/White	MODEM RING

Connecting Customer–Defined Inputs to the Site I/O Interface

The unit provides eight customer–defined inputs for connection to external contacts. Each input (a signal/ground pair) is monitored for an “OPEN” (>50 k Ohms) or “CLOSED” (<3 Ohms) condition.

Site I/O , Span Line, RGPS and Modem Cabling for Sites Equipped with Customer–Supplied Site I/O Interface – continued

Connecting the RGPS Cable to the Site I/O Interface

The RGPS (cable M) is connected to the Site I/O interface (Sync Forward) of the BTS. Table 4-24 provides the Sync Forward to RGPS connections.

Site I/O Cable		RGPS (Cable M)	
Sync Forward Descriptions	Sync Forward Color Code (wire/stripe)	RGPS Description	RGPS Color Code (wire/stripe)
Data from Head –	Brown/Grey	Transmit Port –	Green/Black
Data from Head +	Brown/White	Transmit Port +	Green
Data to Head –	Red/Black	Receive Port –	White/Black
Data to Head +	Red/Brown	Receive Port +	White
1 pps from Head –	Red/Orange	1 PPS Timing –	Brown/Black
1 pps from Head +	Red/Yellow	1 PPS Timing +	Brown
RGPS 28 V	Red/Purple	Power 1	Blue
	Red/White		
RGPS Ground	Red/Grey	DC Ground 1	Blue/Black
	Orange/Black		
RGPS 28 V	Orange/Brown	Power 2	Yellow
RGPS Ground	Orange/Red	DC Ground 2	Yellow/Black
No connect	N/A	No connect	Red
No connect	N/A	No connect	Red/Black

NOTE: The Orange/Yellow and Orange/Green wires should be trimmed back to the grey outer jacket of the Site I/O cable.

Connecting the Span Line Cable to the Site I/O Interface

The unit provides two, four–wire T1/E1 interfaces for backhaul support. Each interface is made up of Transmit Tip/Ring and Receive Tip/Ring connections.

The Transmit and Receive data flow is given from the perspective of the unit. Only a single span line (Primary) is required for BTS operation.

Connecting a Phone Line to the Site I/O Interface (Modem Support)

The unit provides a two–wire analog phone line interface for modem support. The unit Tip and Ring signals are connected to the external phone line Tip and Ring.

RGPS Cabling for Multiple BTS Sites

Objective

This procedure gives information to connect multiple BTS sites for both RGPS (synchronous) and HSO (non-synchronous) configurations in both indoor and outdoor applications.

Background

The RGPS only connects to the first unit of a multi-unit logical BTS. This first unit sends timing signals to all other units. You only need to connect the site I/O interfaces of each multi-unit logical BTS to each other. This allows “sharing” of a single RGPS antenna between several single or multi-unit logical BTSs.

This also applies to systems using HSO instead of RGPS. The HSO timing is “shared” in the same way.

Required Tools and Equipment

Cables

The RGPS Synchronization Cable is contained in the Motorola kits listed in Table 4-25:

Table 4-25: Required Cables for RGPS Cabling for Multiple BTS Sites			
Cable	Qty.	Part Number	Description
X	1-11	3086039H18	RGPS Synchronization cable (part of kit SGKN4351A).
		3086039H19	RGPS Synchronization cable (part of kit SGKN4352A).

Motorola kits

Table 4-26 and Table 4-27 show the contents of Motorola kits SGKN4351A and SGKN4352A. These kits are necessary for RGPS cabling between multiple BTS locations.

Table 4-26: RGPS Synchronization Cable Kit – SGKN4351A			
Cable	Qty.	Motorola Part Number	Description
X	1	3086039H18	RGPS Sync Cable, 2000 ft.
n/a	2	5864461A03	Fitting, liquid tight.
n/a	2	0264599A02	Nut, nylon locking

Table 4-27: RGPS Synchronization Cable Kit – SGKN4352A			
Cable	Qty.	Motorola Part Number	Description
X	1	3086039H19	RGPS Sync Cable, 3280 ft.
n/a	2	5864461A03	Fitting, liquid tight.
n/a	2	0264599A02	Nut, nylon locking

Surge suppressors

Surge suppressors (Polyphaser 097–1017A–A.1) are required for certain installations.

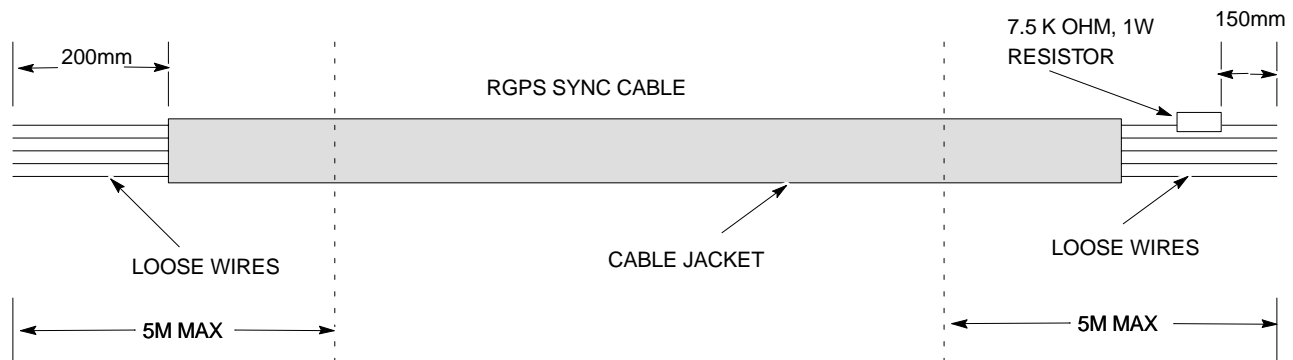
Cable Diagrams and Description

Figure 4-18 shows the RGPS cabling for a multi-BTS configuration for an RGPS (synchronous) configuration. Figure 4-19 shows the RGPS cabling for a multi-BTS HSO (non-synchronous) configuration.

Figure 4-14 shows the general construction of the RGPS Sync Cable (cable X). Cable X is supplied by Motorola with a 7.5 k Ohm, 1W resistor already installed 150 mm from the end of the cable on the blue/black wire. There is 200 mm on each end of the cable where the jacketing has been cut back.

If necessary, the jacketing of cable X may be cut back further for proper strain relief. For installations that require surge protection, you may cut cable X at the dashed lines and insert the surge protection devices. Refer to Table 4-29 for instructions to install the RGPS with surge protection.

Figure 4-14: RGPS Sync Cable Diagram



Procedure to Install RGPS Cabling for an Indoor Installation

Use the procedure in Table 4-28 to connect the RGPS Sync cable for an indoor installation. Refer to the cable run list in Table 4-31, Figure 4-18, and Figure 4-19.

Table 4-28: Procedure to Install RGPS Cabling for an Indoor Installation

Step	Action
1	Connect the resistor end of the RGPS Sync Cable (cable X) to the sync reverse lines on the Site I/O interface of BTS N. Refer to Figure 4-15. Refer to Table 4-31 for the cable X pinouts .
2	Connect the drain wire of cable X to a lug terminal tied directly to the master ground (earth ground) of BTS N.
3	Route cable X from BTS N to BTS N+1.

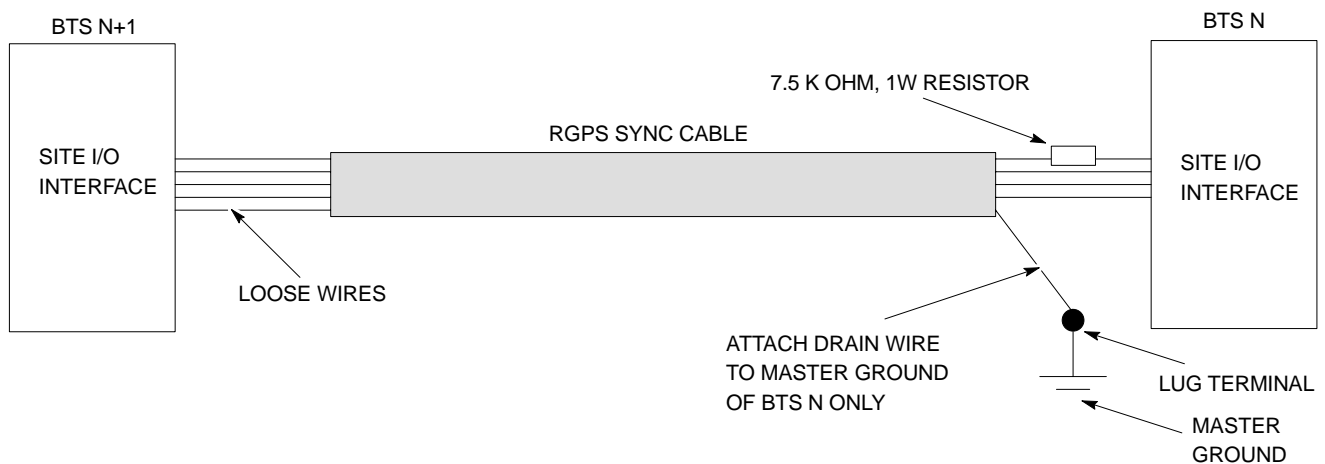
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RGPS Cabling for Multiple BTS Sites – continued

Table 4-28: Procedure to Install RGPS Cabling for an Indoor Installation

Step	Action
4	Remove excess cable length from cable X and terminate to the sync forward lines on the Site I/O interface of BTS N+1. Refer to Table 4-31 for the cable X pinouts. Do not terminate the drain wire to the ground at the Site I/O interface at BTS N+1. NOTE If necessary for proper strain relief, the jacketing of cable X may be cut back further.

Figure 4-15: RGPS Sync Cable for Indoor Installation



Procedure to Install RGPS Cabling for an Outdoor Installation

Use the procedure in Table 4-29 to install the RGPS cabling for any installation that may be susceptible to surges or where any portion of the RGPS cable is routed outside. In these cases, you must reduce the length of the RGPS cable by (still to be determined length) to accommodate for the additional timing error incurred by adding surge protection.

Table 4-29: Procedure to Install RGPS Cabling for an Outdoor Installation

Step	Action
1	Follow all of the procedures in the “Connect RGPS Cables for Indoor Installation” procedure in Table 4-28.
2	Cut cable X to a maximum distance of 5m from BTS N.
3	Install the surge protection device at this point, with the protected side towards BTS N.
4	Ground the surge protection device to the master ground of BTS N.

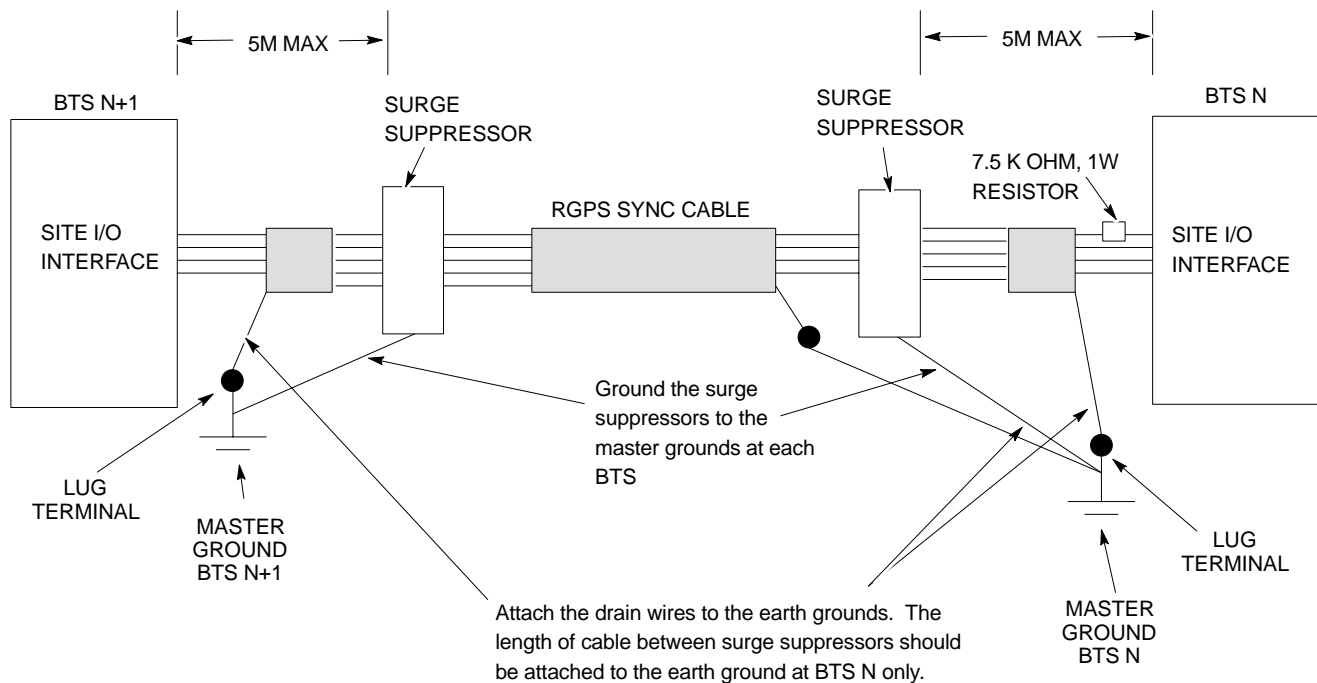
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RGPS Cabling for Multiple BTS Sites – continued

Table 4-29: Procedure to Install RGPS Cabling for an Outdoor Installation

Step	Action
5	When you cut the cable in step 2, the jacketing for the portion of cable X on the unprotected side of the surge suppressor is not grounded. To ground this portion of cable X, connect the drain wire to a lug terminal tied directly to the master ground of BTS N. NOTE Only ground the end of the cable jacket at BTS N. Do not ground the jacket at BTS N+1. Refer to Figure 4-16.
6	Cut cable X to a maximum distance of 5m from BTS N+1.
7	Ground the surge protection device to the master ground of BTS N+1.
8	When you cut cable X in step 6, the jacketing for the portion of cable X between BTS N+1 and the newly-inserted surge protector is ungrounded. To ground this portion of cable X, connect the drain wire from one end of the jacket of the cable to a lug terminal tied directly to the master ground of BTS N+1. Refer to Figure 4-16.

Figure 4-16: RGPS Sync Cable for Outdoor Installations

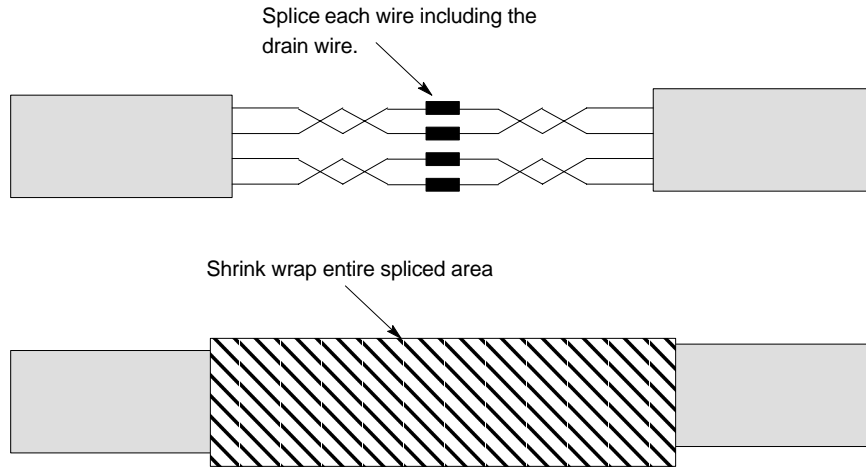


Outdoor installation exceptions

In cases where it is impossible or impractical to route cable X in a continuous stretch from BTS N to BTS N+1, you may cut and rejoin the cable using an inline splice (solder or crimp). Both types of connections are acceptable as long as each wire remains electrically isolated from every other wire. The twisted pairs must be kept together. Refer to Table 4-30 for the pairing of the twisted pairs.

You must splice the drain wire as well. Apply a weatherproof heat shrink tubing or another weatherproof covering over the cable bundle in the spliced section. Refer to Figure 4-17.

Figure 4-17: Cutting and Splicing RGPS Sync Cable



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Table 4-30: Twisted Pairs for RGPS Sync Cable (Cable X)

Pair	Color
1	Red/Black
	Red
2	White/Black
	White
3	Green/Black
	Green
4	Blue/Black
	Blue
5	Yellow/Black
	Yellow
6	Brown/Black
	Brown

RGPS Cabling for Multiple BTS Sites – continued

Cable Connections

For a full signal description of the Site I/O cable, refer to Table 4-23 in the “Site I/O, Span Line, RGPS and Modem Cabling” procedure.

NOTE

The wire colors are based on the Site I/O cable.

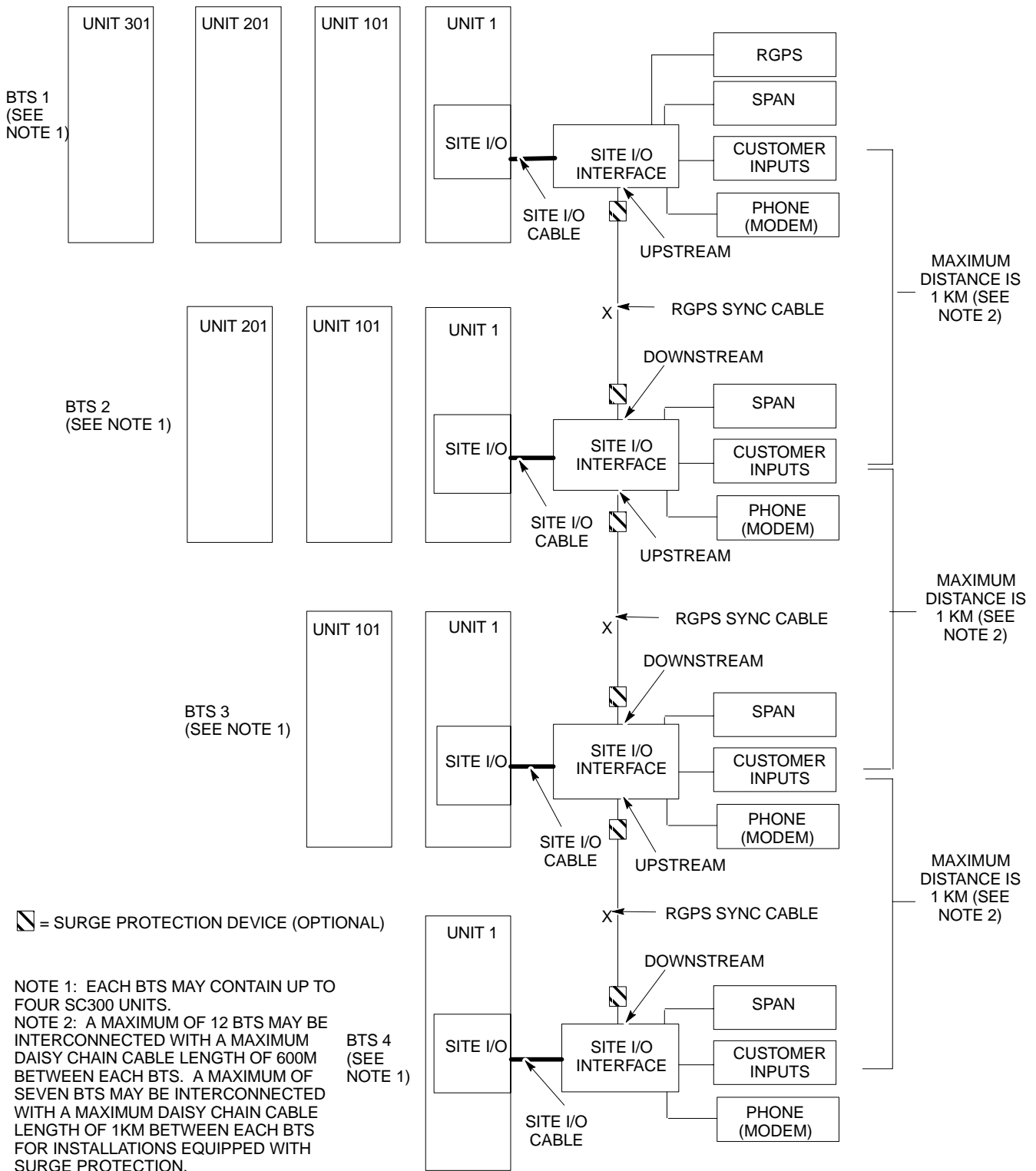
Table 4-31: Multi-BTS Cable Run List

Site I/O Interface of BTS N (Sync Reverse)		Interconnecting Cable (Cable X)	Site I/O Interface of BTS N+1 (Sync Forward)	
Color	Signal	RGPS Cable Color	Color	Signal
Black/Purple	Data to Tail–	Green/Black	Brown/Grey	Data from Head–
Black/Grey	Data to Tail+	Green	Brown/White	Data from Head+
Black/White	Data from Tail–	White/Black	Red/Black	Data to Head–
Brown/Black	Data from Tail+	White	Red/Brown	Data to Head+
Brown/Red	1 PPS to Tail–	Brown/Black	Red/Orange	1 PPS from Head–
Brown/Orange	1 PPS to Tail+	Brown	Red/Yellow	1 PPS from Head+
Brown/Yellow	1 PPS from Tail–	Red/Black	Red/Green	1 PPS to Head–
Brown/Green	1 PPS from Tail+	Red	Red/Blue	1 PPS to Head+
Black/Blue	Ground*	Blue/Black	Black/Blue	Ground*

*The Multi-BTS Synchronization interface must also be referenced to the BTS digital ground through a 7.5K ohm, 1W resistor. This resistor has been integrated into the blue/black wire of Cable X. The end of Cable X with the resistor should be connected to the Sync Reverse locations on the punch block of BTS N. The opposite end of Cable X is connected to the Sync Forward locations on the punch block of BTS N+1 and may be cut to the appropriate length.

RGPS Cabling for Multiple BTS Sites – continued

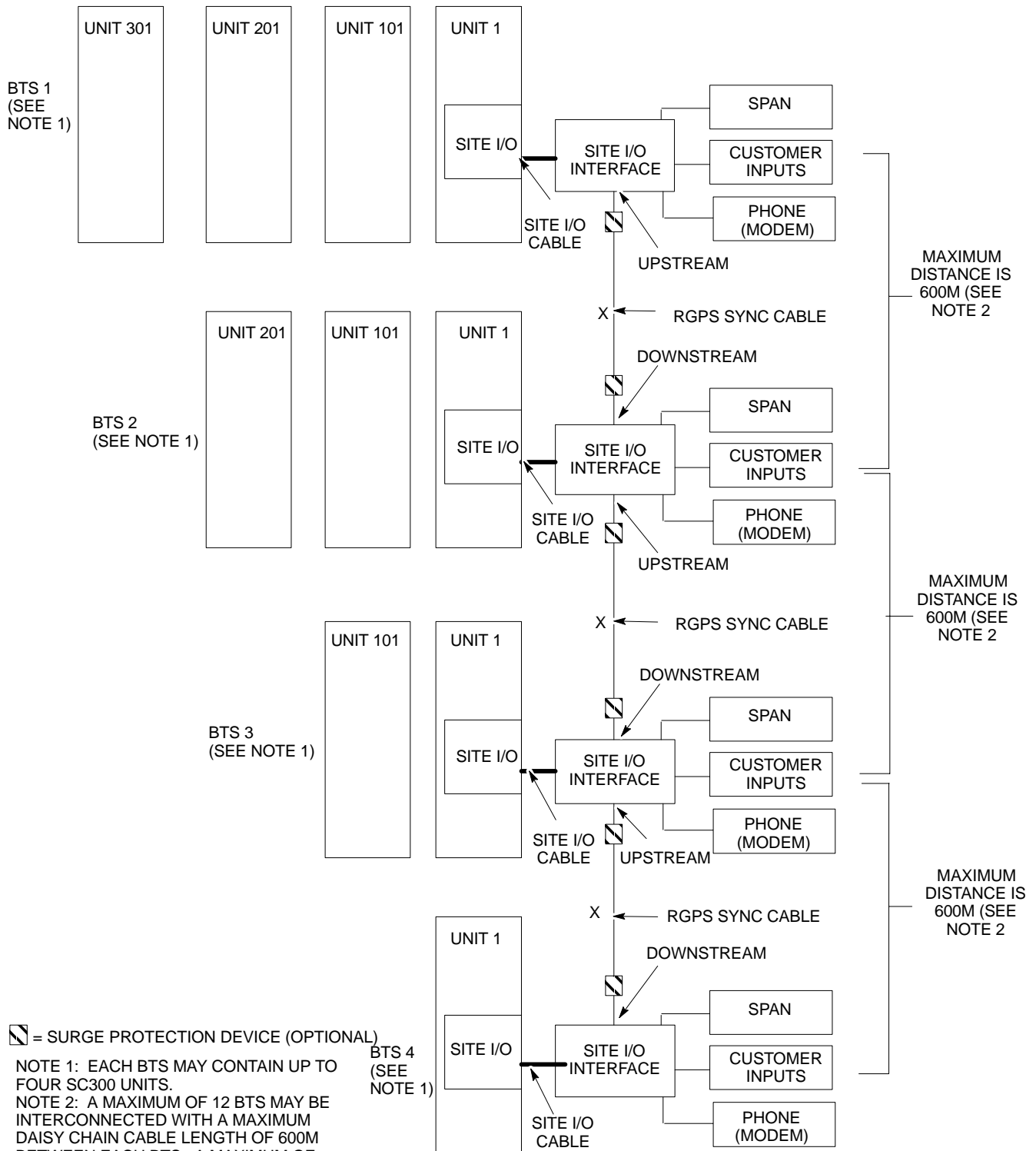
Figure 4-18: Site I/O Interface Cabling for RGPS (Synchronous) Configurations



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RGPS Cabling for Multiple BTS Sites – continued

Figure 4-19: Site I/O Interface Cabling for HSO (Non-Synchronous) Configurations



Span Line Daisy Chain Cabling

Objective

The objective of this procedure is to install span line cabling between multiple BTS sites in an open daisy chain configuration.

Background

This feature allows up to 12 BTS sites to be linked together in an open daisy chain loop using a single T1/E1 span. This will reduce the number of spans necessary to support a CDMA system and minimize unused channels.

Each multi-unit logical BTS may contain up to four units. A maximum of 12 BTS sites may be combined in a single daisy chain.

Required Cables

The following cables in Table 4-32 are necessary to do this procedure.

Cable	Qty.	Part Number	Description
N	1-3	Customer Supplied	Span Line Daisy Chain Cable

Procedure

Attach the span line daisy chain cable (Cable N) to the site I/O interfaces of each BTS. Refer to Figure 4-20 and Table 4-33.

Cable Connections

Table 4-33 shows the cable run information for span line daisy chain cabling.

For a full signal description of the Site I/O cable refer to Table 4-23 in the “Site I/O, Span Line, RGPS and Modem Cabling” procedure.

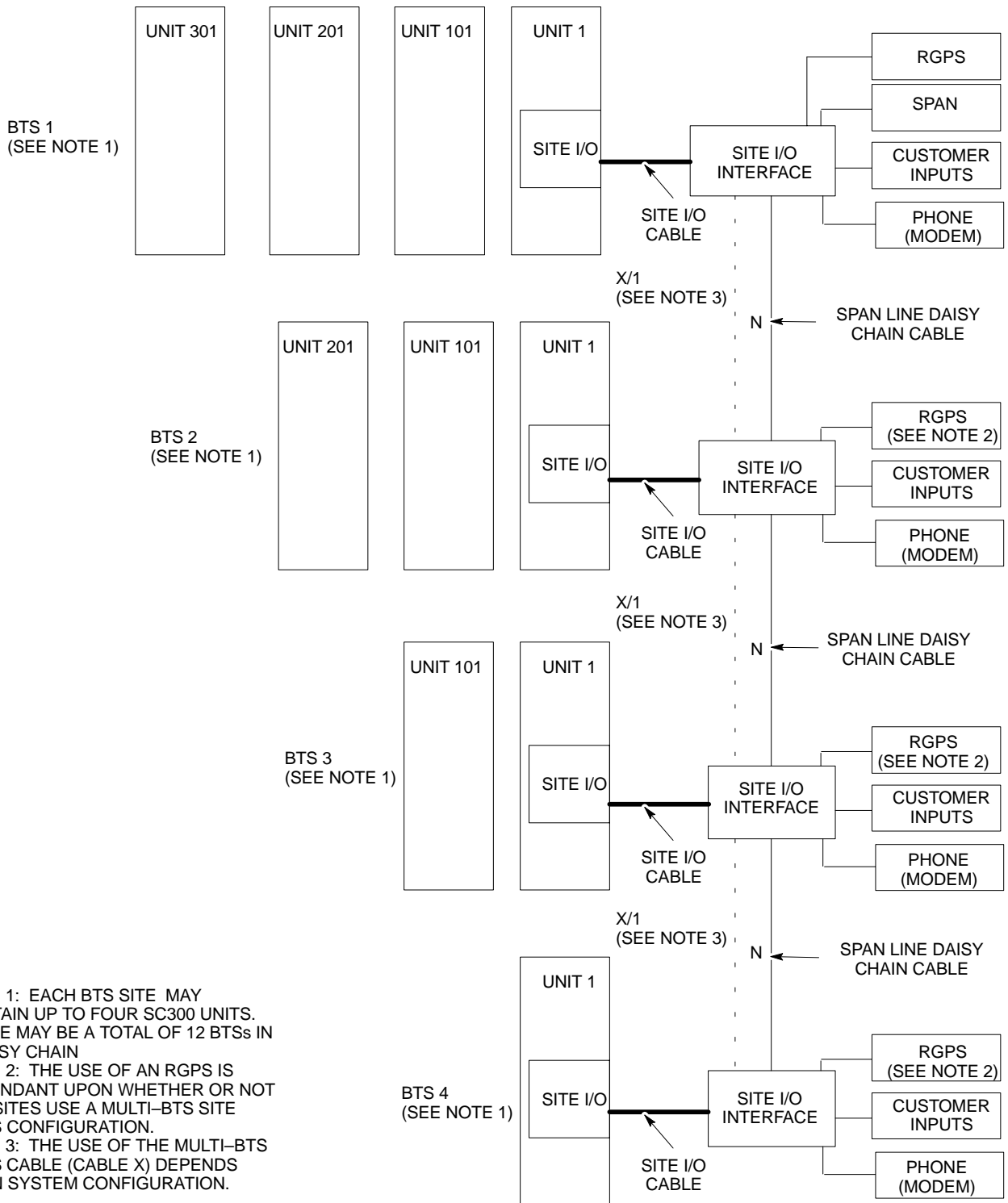
NOTE

The pin number and wire color are based on the Site I/O cable. The pin number corresponds to pins on the Site I/O junction box connectors.

BTS (Secondary Backhaul)		BTS (Primary Backhaul)	
Color	Description	Color	Description
Yellow/Black	RX TIP	Orange/Grey	TX TIP
Yellow/Brown	RX RING	Orange/White	TX RING
Yellow/Red	TX TIP	Orange/Blue	RX TIP
Yellow/Orange	TX RING	Orange/Purple	RX RING

Span Line Daisy Chain Cabling – continued

Figure 4-20: Site I/O Interface Cabling for Span Line Daisy Chain Cabling



NOTE 1: EACH BTS SITE MAY CONTAIN UP TO FOUR SC300 UNITS. THERE MAY BE A TOTAL OF 12 BTSs IN A DAISY CHAIN
 NOTE 2: THE USE OF AN RGPS IS DEPENDANT UPON WHETHER OR NOT THE SITES USE A MULTI-BTS SITE RGPS CONFIGURATION.
 NOTE 3: THE USE OF THE MULTI-BTS RGPS CABLE (CABLE X) DEPENDS UPON SYSTEM CONFIGURATION.

Chapter 5: Preparing Site Cabling for Sites Equipped with Optional Primary Surge Suppressor

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Cabling Overview

Overview

This chapter provides the procedures to prepare the BTS site cabling for sites equipped with the optional Primary Surge Suppressor. Chapter 6 shows the scope of work for unit cabling.

You will connect the cables to the site and route them to the location of the BTS. You will attach the cables to the unit during the unit cabling procedures in Chapter 6.

Repeat cabling installation as necessary for each unit at the BTS.

NOTE

Cabling is one of the most noticeable aspects of workmanship. Straight runs and proper turns are critical for a positive evaluation of the work.

Configurations Supported

This chapter supports cable installation for single carrier omni configurations and multi-carrier omni configurations. This chapter supports cable installations for sites equipped with the optional Primary Surge Suppressor.

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Cabling Installation Order

To install the cables, Motorola recommends that the following procedures be completed in the order shown:

1. Earth ground cabling
2. AC power cabling
3. DC power cabling
4. Battery cabling (optional)
5. Antenna cabling
6. Site I/O interface cabling
7. RGPS/HSO cabling (optional)
8. Span line daisy chain cabling (optional)

Cable Labels

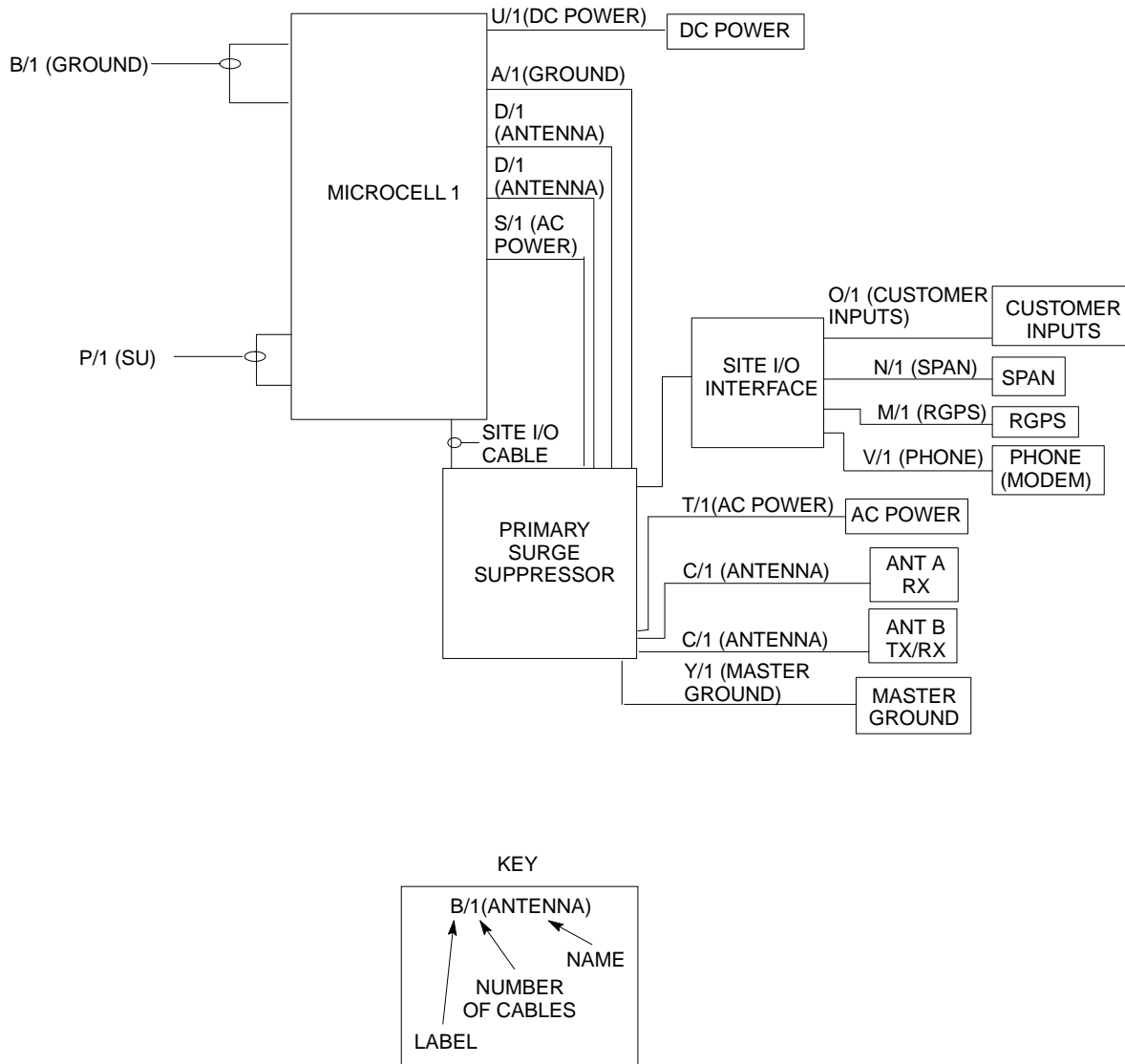
The “Cable Descriptions and Part Numbers” in Table 4-1 provides cable descriptions and part numbers. The labels used to designate the cables (A, B, C, etc.) are used throughout this manual.

Site Cabling for BTS With Optional Primary Surge Suppressor

Preparing Site Cabling Scope of Work

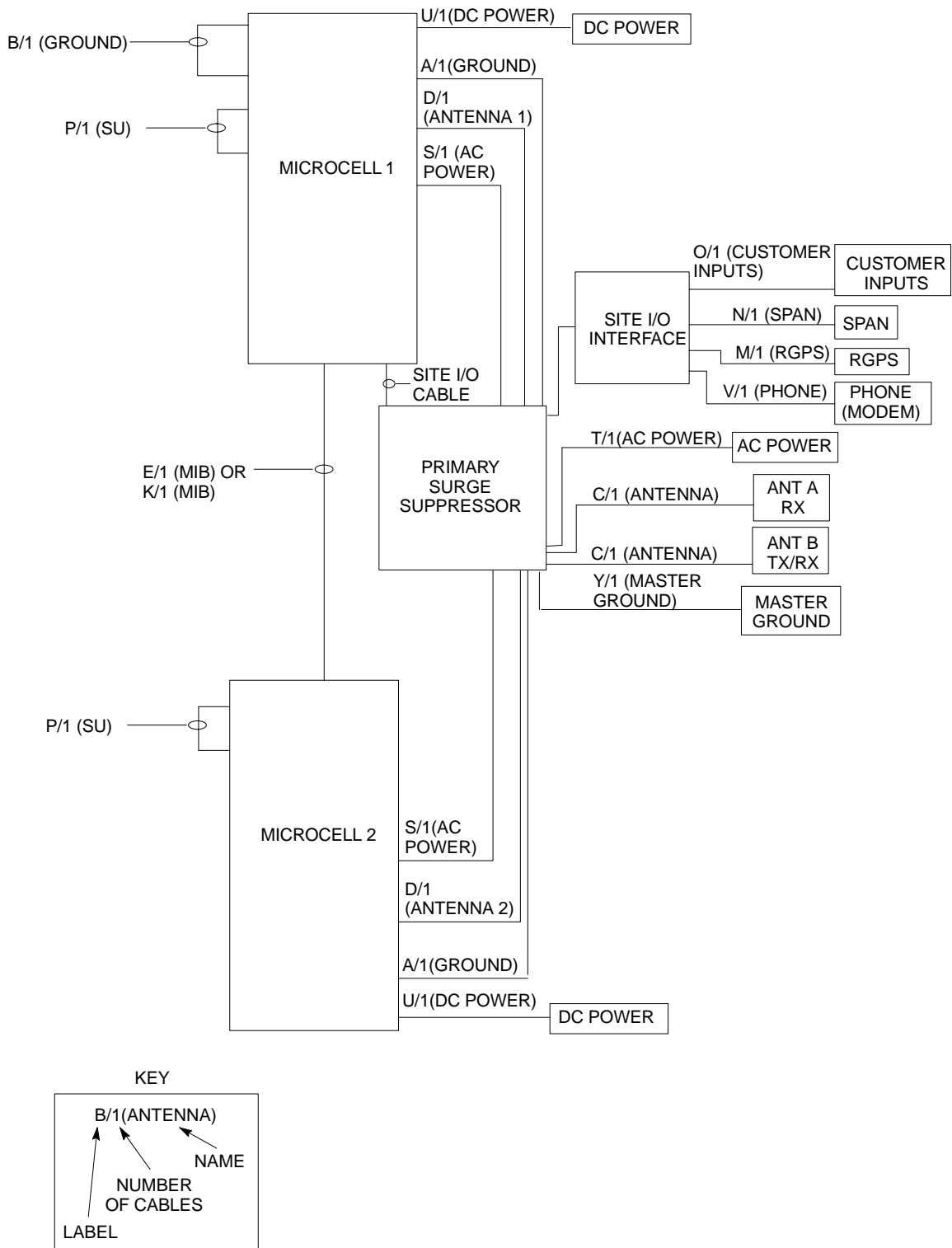
Figure 5-1 through Figure 5-4 shows the scope of work to be performed for preparing the site cabling with the optional Primary Surge Suppressor. Chapter 6 shows the scope of work for unit cabling.

Figure 5-1: Site Cabling for One MicroCell with Primary Surge Suppressor



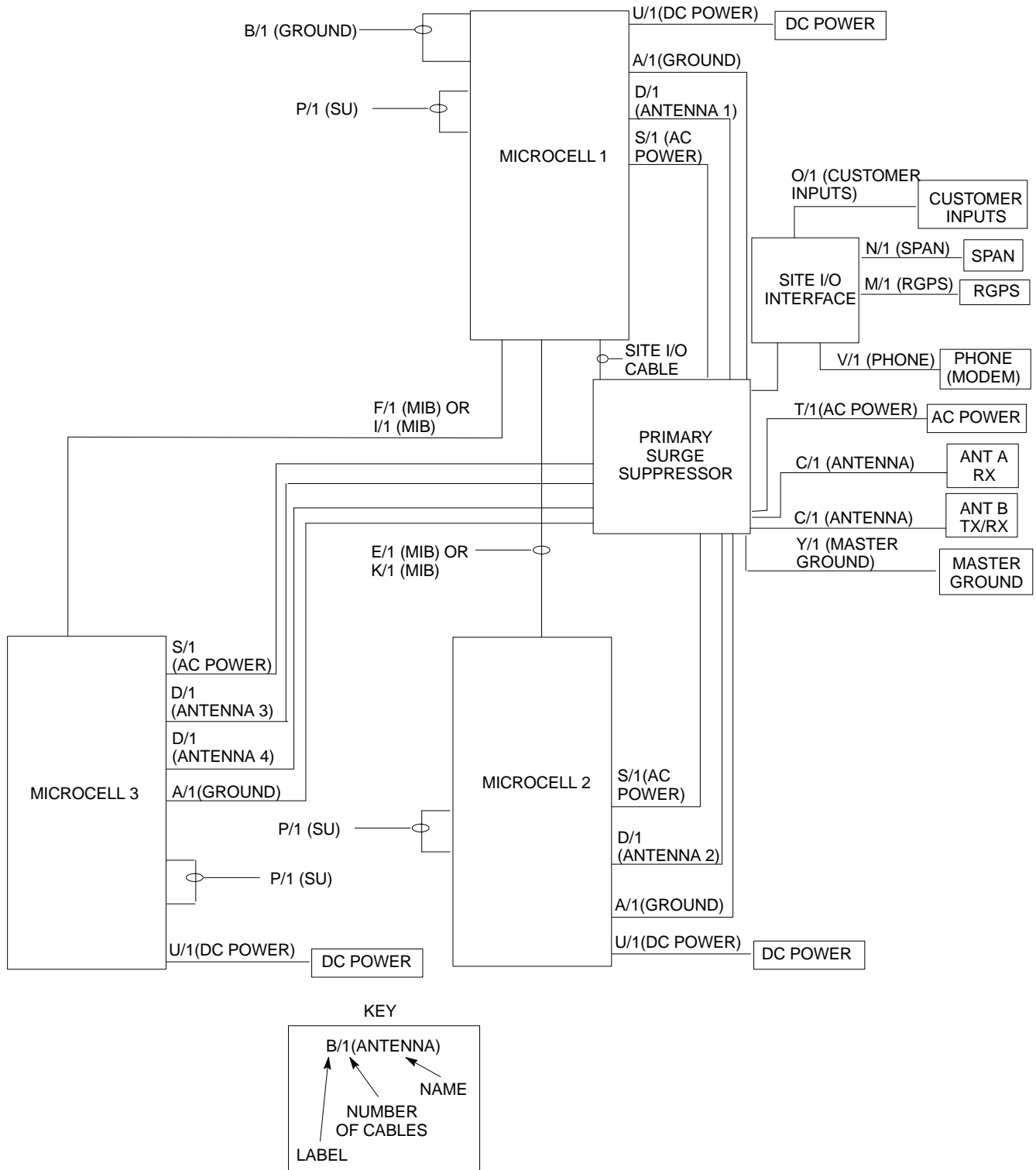
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Figure 5-2: Site Cabling for Two MicroCells with Primary Surge Suppressor



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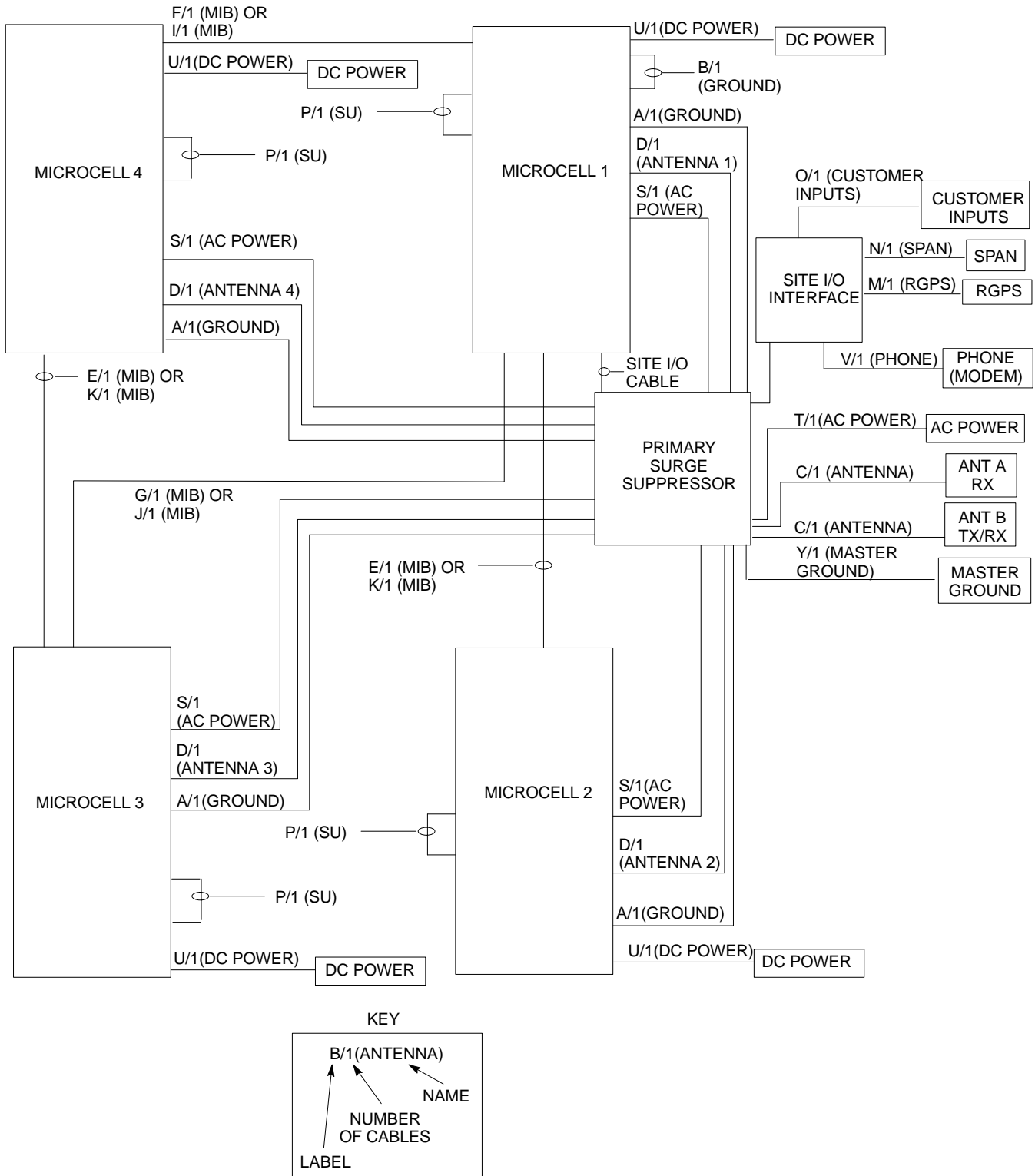
Figure 5-3: Site Cabling for Three MicroCells with Primary Surge Suppressor



5

Site Cabling for BTS With Optional Primary Surge Suppressor – continued

Figure 5-4: Site Cabling for Four MicroCells with Primary Surge Suppressor



5

Attaching the Surge Suppressor to Mounting Bracket

Objective

The objective of this procedure is to attach the optional Primary Surge Suppressor to the mounting bracket. This procedure applies to mounting brackets that are attached to a rack, wall or pole.



IMPORTANT

You must attach the Primary Surge Suppressor to the mounting bracket before you install the unit cabling.

Background

The following procedures should be followed in order to mount the surge suppressor to the mounting bracket. The unit attaches to the mounting bracket with three (3) M6 screws.

Required Tools and Equipment

The following tools and materials are required to attach the unit to the mounting bracket.

- Torque driver wrench, 1/4-in. hex female drive, 0–10 N–M
- T30 Torx tamper bit
- Three M6X19 screws (Motorola Part Number 0387541C03)

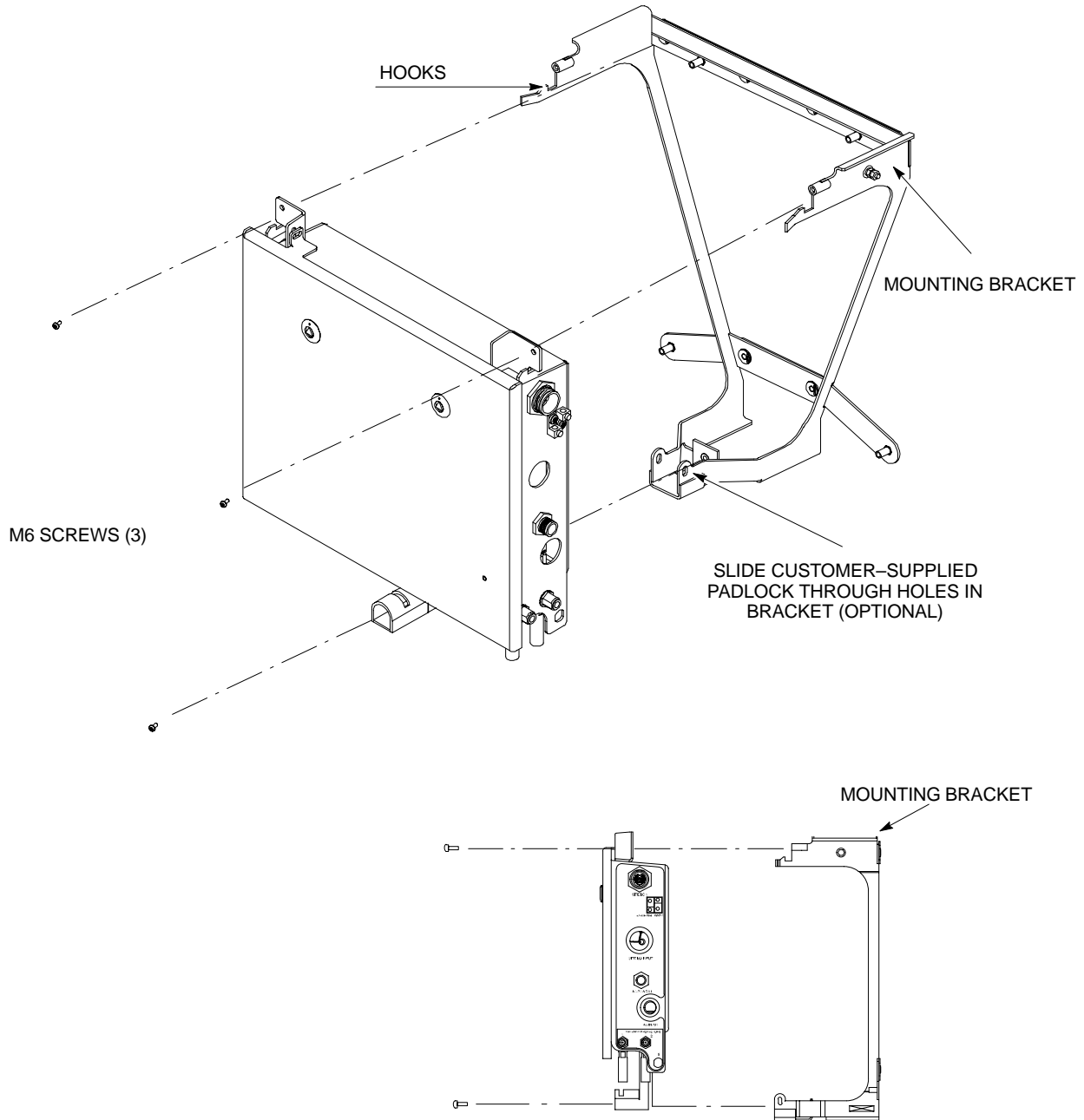
Procedure to Attach the Surge Suppressor to the Mounting Bracket

Use the procedure in Table 5-1 to attach the surge suppressor to the mounting bracket. Refer to Figure 5-5.

Step	Action
1	Lift the unit and place it on the mounting bracket by aligning the bracket's upper arms into the rectangular cutouts in the mounting tabs. The unit may need to be raised up slightly so that the lower bracket flange does not contact the unit's lower surface.
2	Use a T30 Torx tamper bit to start, but not tighten, all three screws in the location shown in Figure 5-5.
3	Use a T30 Torx tamper bit to torque the three mounting screws to 5.0 N–M.

Attaching the Surge Suppressor to Mounting Bracket – continued

Figure 5-5: Attaching the Surge Suppressor to the Mounting Bracket



5

Power, Ground, and Battery Cabling for Sites Equipped with Optional Primary Surge Suppressor

Objective

The objective of this procedure is to install the power, earth ground, and battery cabling for one or more Microcell units at a site equipped with optional Primary Surge Suppressor.



WARNING

Dangerous voltages, capable of causing death, are present in this equipment. Use extreme caution when handling and testing this equipment.

Other Grounding Considerations

This procedure covers only the grounding information for the ground cables that attach to one or more Microcell units. Grounding considerations beyond the ground cables that attach to the Microcell are summarized in Appendix A. Refer to Appendix A and the site documentation for other grounding considerations.

NOTE

Motorola recommends that you use an oxide inhibitor such as Burndy PENETROX™ or IlSCO DE-OX™ on all the external ground connections on the unit and on the primary surge suppressor for all outdoor installations. This includes the ground connections on the mounting bracket, the Site I/O, and the five mechanical lugs on the primary surge suppressor.

Power Considerations and Configurations

The Primary Surge Suppressor is designed for 120/240 VAC 3-wire plus ground single phase 30 amp min. service.

The power and battery configurations for the MicroCell unit is:

- AC power only (no battery)
- AC power with short duration battery
- DC power

NOTE

Neither the "+" or "-" terminal of the DC Input is connected to the BTS ground. If a negative supply input is provided, the "+" terminal of the DC input must be connected to the Master Ground Plate (MGP). By connecting the "+" terminal of the DC input to the MGP, a negative supply system is created.

Power, Ground, and Battery Cabling for Sites Equipped with Optional Primary Surge Suppressor – continued

Required Cables

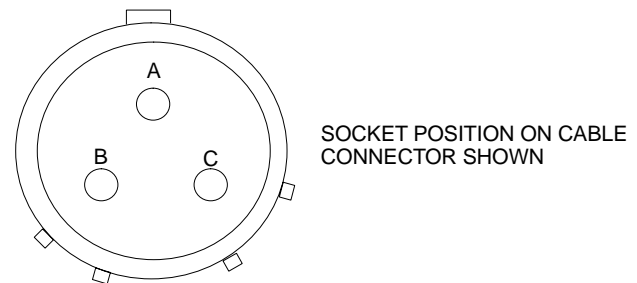
Table 5-2 provides the quantity and description of the required cables.

Cable	Qty.	Part Number	Description
A	1–4	3087701C02	Ground cable, 8 -AWG, insulated copper wire. Requires one ring lug connector.
S	1–4	3087854C02	AC input cable, 14 AWG, 5 m, is designed for 88–260 VAC power input. Cable has Deutsche connector on both ends.
T	1	Customer Supplied	AC Input power cable. 10–14 AWG, 90°C wire. Designed for 120–240 VAC.
U	1–4	3087854C04	DC input cable, 14 and 22 AWG, 5 m, is designed for 20 to 30 VDC power input.
Y	1	Customer Supplied	Master Ground Cable, 6 -AWG, insulated copper wire.

AC Input Cable Information

The information for the AC input cable(s) (Cable S) is given in Figure 5-6 and Table 5-3.

Figure 5-6: AC Input Cable Connector Information



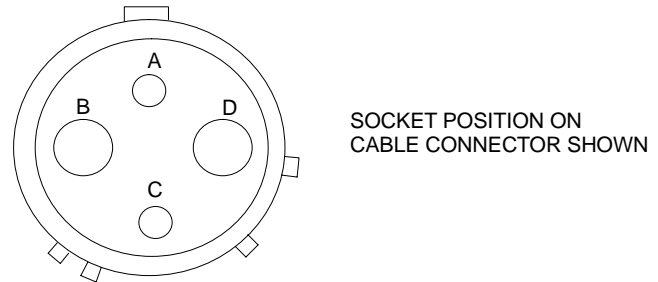
Connector	Wire Color	Description
A	Black	Line
B	Green	Ground
C	White	Neutral

Power, Ground, and Battery Cabling for Sites Equipped with Optional Primary Surge Suppressor – continued

DC Input Cable Information

The information for the DC input cable(s) (Cable U) is given in Figure 5-7 and Table 5-4.

Figure 5-7: DC Input Cable Connector Information



Connector	Wire Color	Description	Comments
A	Yellow	Switch A	No connection
B	Red	Positive	Connect to positive terminal of supply.
C	Blue	Switch B	Connect to negative terminal of supply.
D	Black	Negative	Connect to negative terminal of supply.

Procedures to Install the Ground and Power Cabling

The system configuration determines which power cables are installed. The ground cable is always installed. Based on the system configuration perform the appropriate procedures from the following tables.

Step	Action
1	Connect the Master Ground cable (cable Y) to the EARTH GND connector on the Primary Surge Suppressor.
2	Connect the other end of cable Y to the customer-defined master ground plate.



Power, Ground, and Battery Cabling for Sites Equipped with Optional Primary Surge Suppressor – continued

Table 5-6: Procedure to Install the Earth Ground Cable on a BTS Equipped with Optional Primary Surge Suppressor

Step	Action
1	Route cable A (ground cable) from the ground lug on the unit mounting bracket to the Primary Surge Suppressor location.
2	Connect cable A to the GND connector 1–4 on the Primary Surge Suppressor.

Table 5-7: Procedure to Install the AC Input Cable(s) on a BTS Equipped with Optional Primary Surge Suppressor

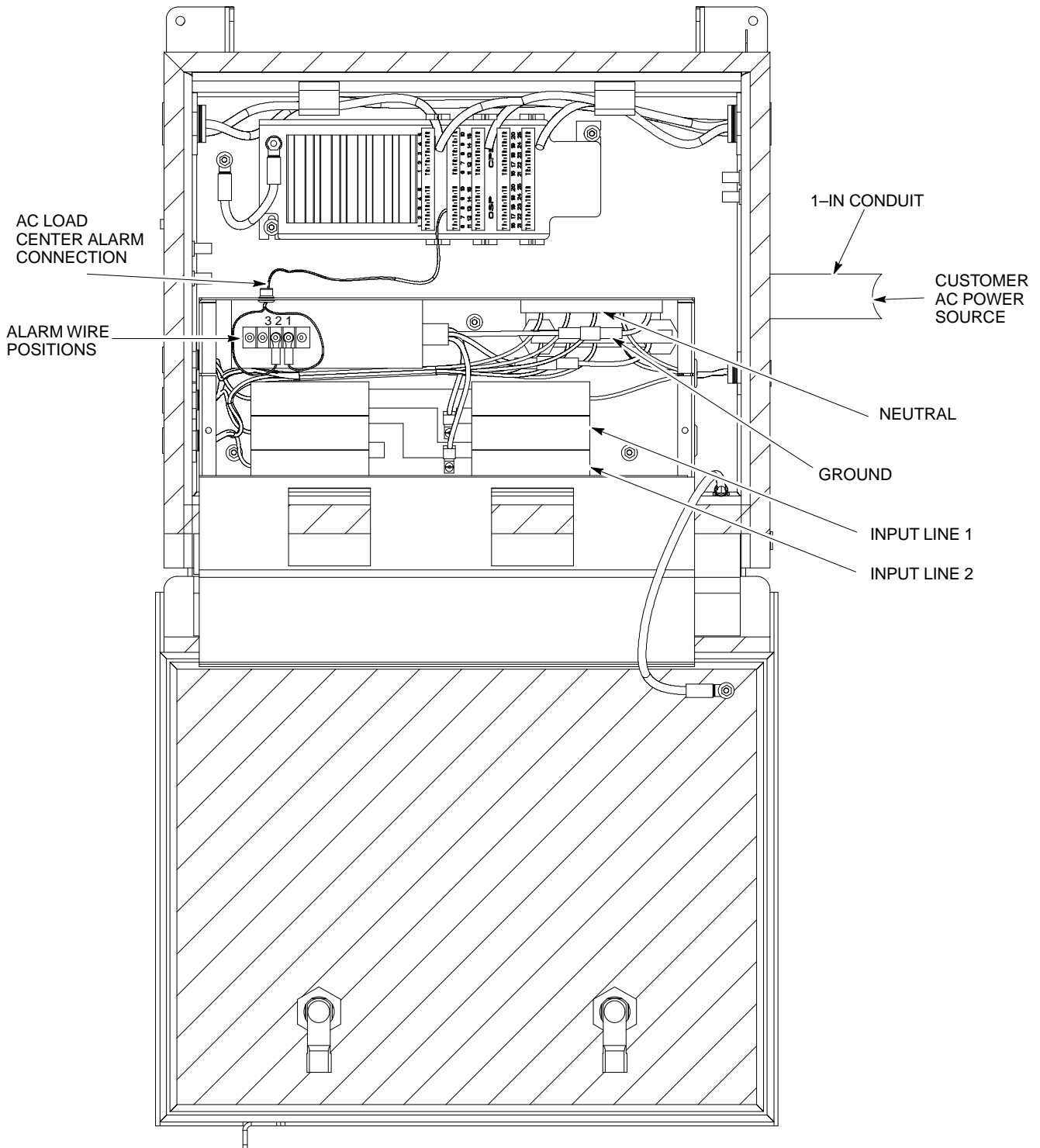
Step	Action
1	Connect the customer-supplied AC input power cable (cable T) to the customer defined AC power source. Refer to Table 5-3 for wiring information.
2	Verify all connections of cable T with an ohmmeter prior to routing the cable.
3	Route cable T via 1-in. conduit from the customer defined AC power source to the breaker terminals inside the Primary Surge Suppressor. Refer to Figure 5-8.
4	Place the round, black connector on the AC input power cable (cable S) onto the appropriate Carrier 1–4 AC Output connector on the Primary Surge Suppressor.
5	Route the AC input power cable (cable S – Motorola part number 3087854C02) from the Primary Surge Suppressor to the unit location(s).

Table 5-8: Procedure to Install the DC Input Cable(s) on a BTS Equipped with Optional Primary Surge Suppressor

Step	Action
1	Connect the loose wires of the DC Input Cable (cable U) to the customer defined DC power source. Refer to Table 5-4 for wiring information.
2	Verify all connections of cable U with an ohmmeter prior to routing the cable.
3	Route cable U from the DC power supply to the unit location.

Power, Ground, and Battery Cabling for Sites Equipped with Optional Primary Surge Suppressor – continued

Figure 5-8: Primary Surge Suppressor AC Input Power Connection Locations



5

Antenna Cabling for Sites Equipped With Optional Primary Surge Suppressor

Objective

The objective of this procedure is to install the cabling for the antenna(s).

The antenna cabling is installed between one or more units and the Primary Surge Suppressor. No lightning arrestors are used.

Cable Labels

The cable designations are referenced to Table 4-1 in the “Cable Description” area of this chapter.

Required Cables

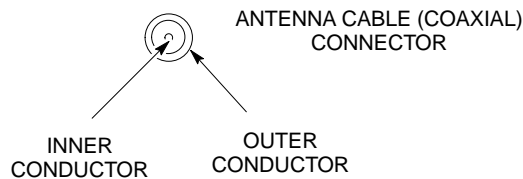
Table 5-9 provides the quantities and descriptions of the required cables.

Cable	Qty.	Part Number	Description
C	1 to 8	Customer Supplied	Antenna cable, 50-Ohm coaxial terminated with at least one male, N-type connector.
D	2-6	Customer Supplied	Antenna cable, terminated with 2 N-type connectors

Antenna Cable Pin and Signal Information

The antenna cabling uses a 50-Ohm coaxial cable. The inner conductor provides signaling and the outer conductor provides shielding and ground.

Figure 5-9: Antenna Cabling Details



Antenna	Inner Conductor	Outer Conductor
B (Microcell only)	TX/RX	Ground
A	RX (Microcell)	Ground

Antenna Cabling for Sites Equipped With Optional Primary Surge Suppressor – continued

Procedure to Install Antenna Cabling for Sites Equipped with Primary Surge Suppressor

Do the procedure in Table 5-11 to install the antenna cabling.



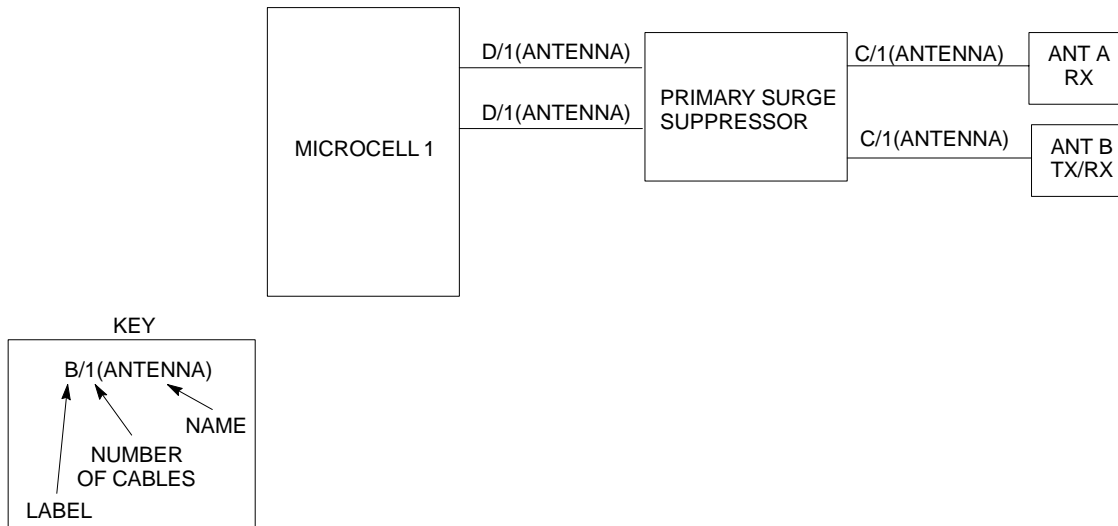
IMPORTANT

Lightning arrestors are installed on the Primary Surge Suppressor for two units. You must add additional lightning arrestors when you expand from one to two units; two to three units and from three to four units.

Table 5-11: Procedure to Install Antenna Cabling for Sites Equipped with Primary Surge Suppressor

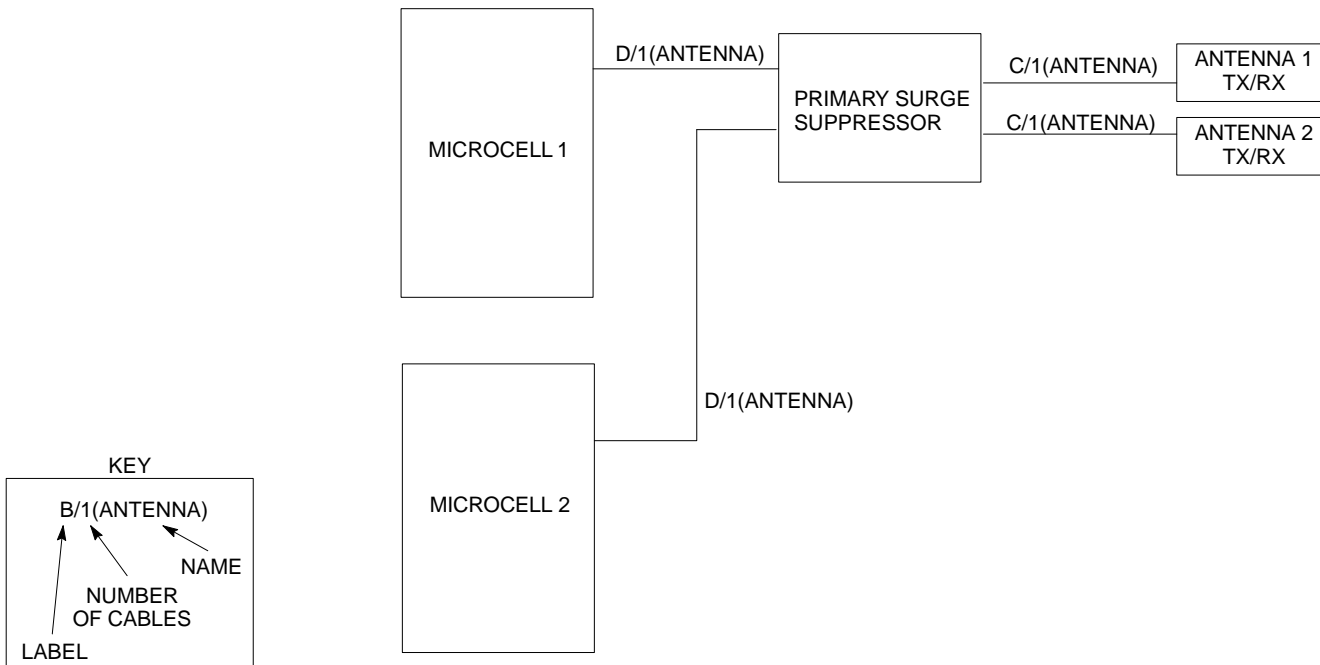
Step	Action
1	Route cable D (antenna cable) between the unit(s) and the Primary Surge Suppressor.
2	Route cable C (antenna cable) from the Primary Surge Suppressor directly to the antenna(s).
3	Torque connectors to 4.3 N-m.

Figure 5-10: Antenna Cabling for One Microcell with Primary Surge Suppressor



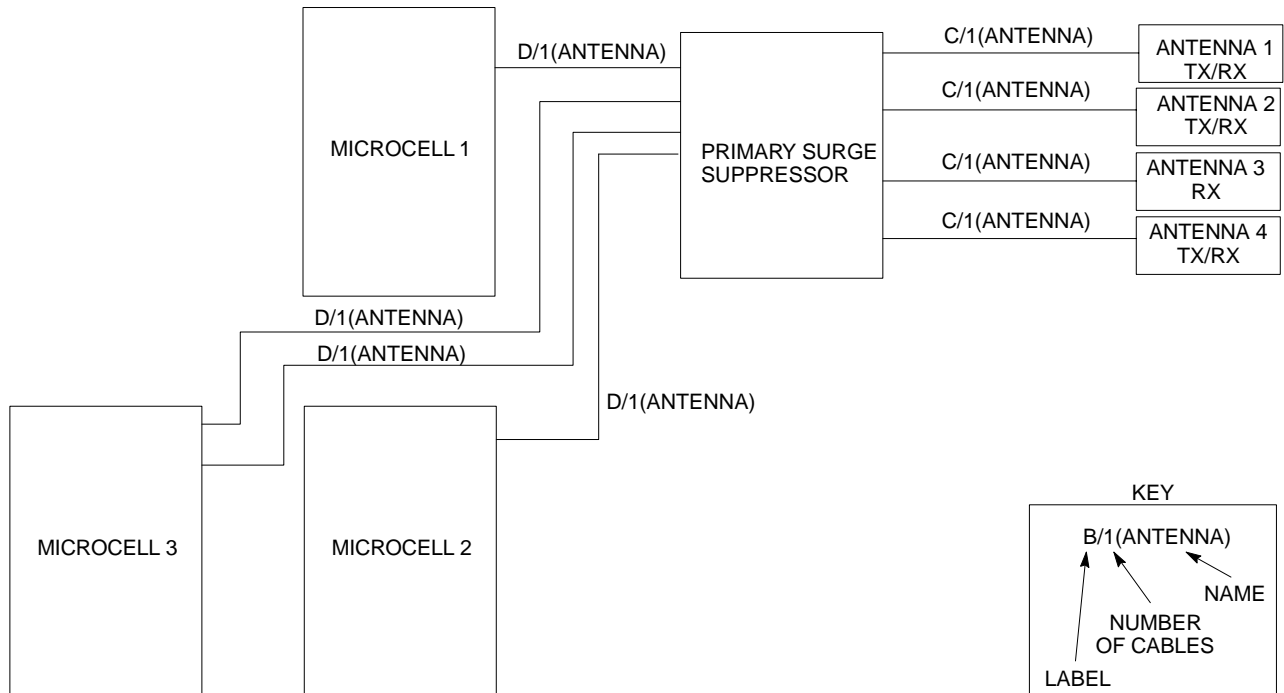
Antenna Cabling for Sites Equipped With Optional Primary Surge Suppressor – continued

Figure 5-11: Antenna Cabling for Two Microcells with Primary Surge Suppressor



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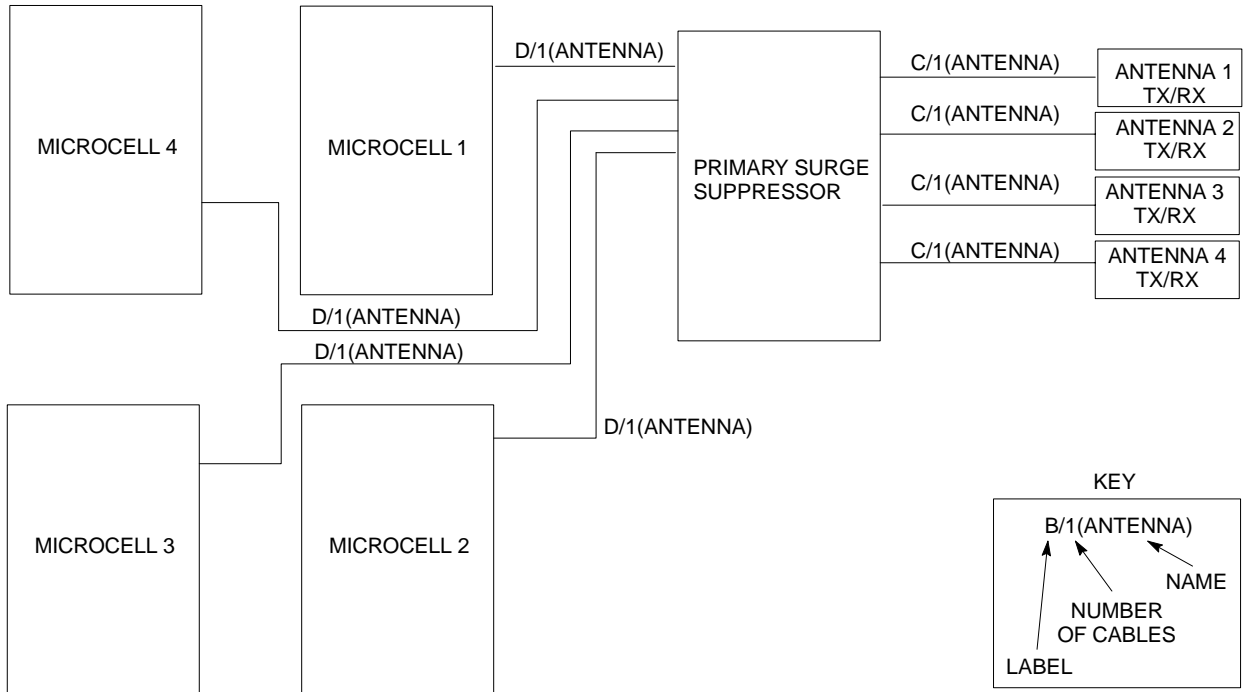
Figure 5-12: Antenna Cabling for Three Microcells with Primary Surge Suppressor



Antenna Cabling for Sites Equipped With Optional Primary Surge Suppressor

– continued

Figure 5-13: Antenna Cabling for Four Microcells with Primary Surge Suppressor



5

Site I/O, Span Line, RGPS, and Modem Cabling for Sites Equipped With Primary Surge Suppressor

Objective

The objective of this procedure is to install the cabling between the Site I/O junction box to the Primary Surge Suppressor. This procedure also shows the punchblock cabling for the Site I/O cable.

Cable Labels

The cable designations are referenced to Table 4-1 in the “Cable Description” area of this chapter.

Required Cables

Table 5-12 provides the quantities and descriptions of the required cables.

Cable	Qty.	Part Number	Description
C	1–8	Customer Supplied	Antenna cable, 50–Ohm coaxial terminated with at least one male, N–type connector.
D	2–6	Customer Supplied	Antenna cable, terminated with 2 N–type connectors
M	1	3086039H11	RGPS cable, 125 ft.
		3086039H12	RGPS cable, 250 ft.
		3086039H13	RGPS cable, 500 ft.
		3086039H14	RGPS cable, 1000 ft.
		3086039H15	RGPS cable, 2000 ft.
N	1	Customer Supplied	Span Cable. 22–24 AWG solid copper twisted pair.
O	1	Customer Supplied	Customer Input Cable. 22–24 AWG solid copper twisted pair.
T	1	Customer Supplied	AC Input Power Cable. 14 AWG. Designed for 120–240 VAC. Terminated by at least 1 Deutsche connector.
V	1	Customer Supplied	Phone (Modem) Cable. 22–24 AWG solid copper twisted pair.

Site I/O Cabling

The Primary Surge Suppressor is optional and is supplied by Motorola. The Site I/O cable between the Primary Surge Suppressor and units 1 and 2 is part of the Site I/O Junction box and is supplied by Motorola.

The customer determines the Primary Surge Suppressor configuration. The end result is the correct signals getting to the correct punchblock location on the punchdown block.

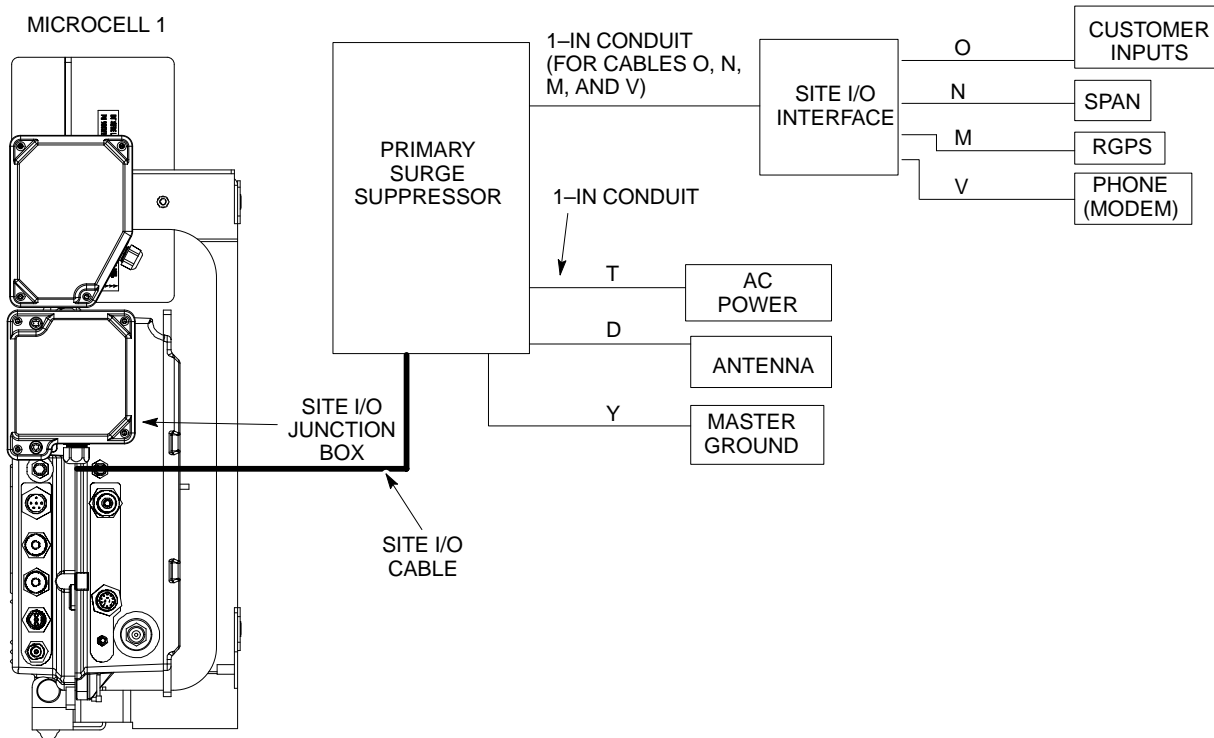
Site I/O, Span Line, RGPS, and Modem Cabling for Sites Equipped With Primary Surge Suppressor – continued

Procedure to Install Site I/O Cable Between Site I/O Junction Box and Optional Primary Surge Suppressor

Do the procedure in Table 5-13 to connect the Site I/O cable. Refer to Figure 5-14, Figure 5-15 and Figure 5-16.

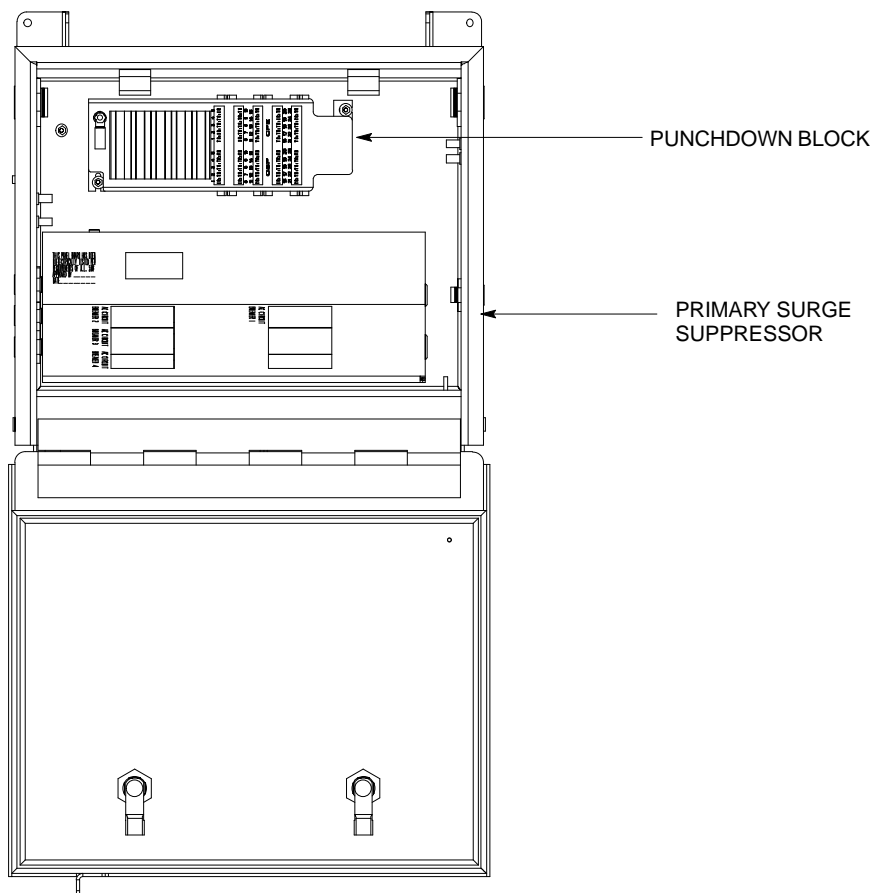
Table 5-13: Procedure to Install Site I/O Cable Between Site I/O Junction Box and Optional Primary Surge Suppressor	
Step	Action
1	Route the Site I/O cable(s) from the unit location to the Primary Surge Suppressor.
2	Connect the Site I/O cable from unit 1 to the connector labeled SITE I/O 1 on the right side of the Surge Suppressor.
3	Connect the appropriate conductors or wires to the Primary Surge Suppressor Punchdown block.

Figure 5-14: Site I/O Cabling Details with Primary Surge Suppressor



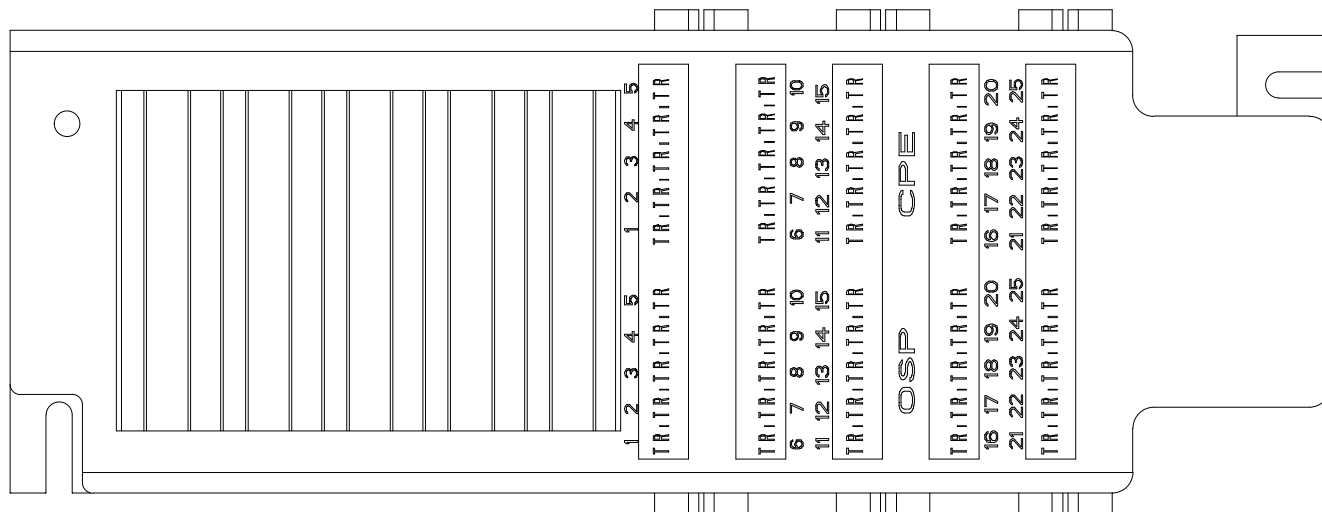
Site I/O, Span Line, RGPS, and Modem Cabling for Sites Equipped With Primary Surge Suppressor – continued

Figure 5-15: Punchdown Block Location



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Figure 5-16: Punchdown Block



Site I/O, Span Line, RGPS, and Modem Cabling for Sites Equipped With Primary Surge Suppressor – continued

Pin and Signal Information for Surge Suppressor Punchdown Block Cabling

Table 5-14 gives the pin and signal information for connecting the loose wires to the customer locations on the Punchdown Block.

NOTE

The “CPE” half of the punchdown block connectors comes shipped pre-wired and complete. The user only needs to wire the “OSP” half of the punchdown block connectors.

Table 5-14: Pin/Signal Information for Site I/O Cable and Punchdown Block

BTS Interface	Punchblock Location	Description
Customer Input	OSP 1T	Customer Input 1 Signal
	OSP 1R	Customer Input 1 Ground
	OSP 2T	Customer Input 2 Signal
	OSP 2R	Customer Input 2 Ground
	OSP 3T	Customer Input 3 Signal
	OSP 3R	Customer Input 3 Ground
	OSP 4T	Customer Input 4 Signal
	OSP 4R	Customer Input 4 Ground
	OSP 5T	Customer Input 5 Signal
	OSP 5R	Customer Input 5 Ground
	OSP 6T	Customer Input 6 Signal
	OSP 6R	Customer Input 6 Ground
	OSP 7T	Customer Input 7 Signal
	OSP 7R	Customer Input 7 Ground
	OSP 8T	Customer Input 8 Signal*
	OSP 8R	Customer Input 8 Ground*
Sync Reverse	OSP 9T	Data to Tail –
	OSP 9R	Data to Tail +
	OSP 10T	Data from Tail –
	OSP 10R	Data from Tail +

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Site I/O, Span Line, RGPS, and Modem Cabling for Sites Equipped With Primary Surge Suppressor – continued

Table 5-14: Pin/Signal Information for Site I/O Cable and Punchdown Block

BTS Interface	Punchblock Location	Description
Sync Reverse	OSP 11T	1 PPS to Tail –
Sync Reverse	OSP 11R	1 PPS to Tail +
	OSP 12T	1 PPS from Tail –
	OSP 12R	1 PPS from Tail +
	OSP 13T	Downstream BTS Detect +
	OSP 13R	Downstream BTS Detect –
Sync Forward	OSP 14T	Data from Head –
	OSP 14R	Data from Head +
	OSP 15T	Data to Head –
	OSP 15R	Data to Head +
	OSP 16T	1 PPS from Head –
	OSP 16R	1 PPS from Head +
	OSP 17T	1 PPS to Head –
	OSP 17R	1 PPS to Head +
	OSP 18T	RGPS 28V
	OSP 18R	RGPS Ground
	OSP 19T	RGPS 28V
	OSP 19R	RGPS Ground
Unused	OSP20T	Unused
	OSP20R	Unused
Span (Network)	OSP 21T	RX TIP Primary (Network/Span A)
	OSP 21R	RX RING Primary (Network/Span A)
	OSP 22T	TX TIP Primary (Network/Span A)
	OSP 22R	TX RING Primary (Network/Span A)
	OSP 23T	RX TIP Secondary (Network/Span B)
	OSP 23R	RX RING Secondary (Network/Span B)
Span (Network)	OSP 24T	TX TIP Secondary (Network/Span B)
	OSP 24R	TX RING Secondary (Network/Span B)

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Site I/O, Span Line, RGPS, and Modem Cabling for Sites Equipped With Primary Surge Suppressor – continued

Table 5-14: Pin/Signal Information for Site I/O Cable and Punchdown Block

BTS Interface	Punchblock Location	Description
Phone (Modem)	OSP 25T	MODEM TIP
	OSP 25R	MODEM RING

*Motorola recommends that you use the Customer Input 8 Signal and Ground for load center alarms.

Connecting Customer-Defined Inputs to the Primary Surge Suppressor

The unit provides eight customer-defined inputs for connection to external contacts. Each input (a signal/ground pair) is monitored for an “OPEN” (>50 k Ohms) or “CLOSED” (<3 Ohms) condition.

Motorola recommends using Customer Input 8 Signal and Ground for AC load center alarms. The Primary Surge Suppressor is shipped with the AC load center alarms already connected to positions 1 and 2 (OSP8T and OSP8R). Refer to Figure 5-8 and Table 5-15.

Table 5-15: Customer Alarm Wiring Positions in AC Load Center on MOVs

Alarm Wire Positions		Circuit	Alarm	Reason for Alarm
1	2	Normally open	Normally closed	Damaged MOVs. Power interruption to surge box
2	3	Normally closed	Normally open	Damaged MOVs. Power interruption to surge box Alarm interruption

Site I/O, Span Line, RGPS, and Modem Cabling for Sites Equipped With Primary Surge Suppressor – continued

Connecting the RGPS Cable to the Primary Surge Suppressor

The RGPS cable (cable M) is connected to the Primary Surge Suppressor punchdown block (Sync Forward). Table 5-16 provides the punchdown block to RGPS connections.

Punchdown Block		RGPS (Cable M)	
Sync Forward Descriptions	Punchdown Block Location	RGPS Description	RGPS Color Code (wire/stripe)
Data from Head –	OSP14T	Transmit Port –	Green/Black
Data from Head +	OSP14R	Transmit Port +	Green
Data to Head –	OSP15T	Receive Port –	White/Black
Data to Head +	OSP15R	Receive Port +	White
1 pps from Head –	OSP16T	1 PPS Timing –	Brown/Black
1 pps from Head +	OSP16R	1 PPS Timing +	Brown
RGPS 28V	OSP18T	Power 1	Blue
RGPS Ground	OSP18R	DC Ground 1	Blue/Black
RGPS 28V	OSP19T	Power 2	Yellow
RGPS Ground	OSP19R	DC Ground 2	Yellow/Black
N/A	N/A	No connect	Red
N/A	N/A	No connect	Red/Black

Connecting the Span Line Cable to the Primary Surge Suppressor

The unit provides two, four-wire T1/E1 interfaces for backhaul support. Each interface is made up of Transmit Tip/Ring and Receive Tip/Ring connections.

The Transmit and Receive data flow is given from the perspective of the unit. Only a single span line (Primary) is required for BTS operation.

The second span is used to support the Span Line Daisy Chain cabling option.

Connecting a Phone Line to the Primary Surge Suppressor (Modem Support)

The unit provides a two-wire analog phone line interface for modem support. The unit Tip and Ring signals are connected to the external phone line Tip and Ring.

RGPS Cabling for Multiple BTS Sites Equipped with Optional Primary Surge Suppressor

Objective

This procedure gives information to connect multiple BTS sites for both RGPS (synchronous) and HSO (non-synchronous) configurations in both indoor and outdoor applications.

Background

The RGPS connects to the site I/O interface of a multi-unit logical BTS. This first unit sends timing signals to all other units in a multi-unit logical BTS. You only need to connect the site I/O interfaces of each BTS to each other. This allows “sharing” of a single RGPS antenna between several single or multi-unit logical BTSs.

This also applies to systems using HSO instead of RGPS. The HSO timing is “shared” in the same way.

Required Cables and Kits

Cables

The RGPS Synchronization Cable is contained in the Motorola kits listed in Table 5-17:

Table 5-17: Required Cables for Multi-BTS RGPS Cabling			
Cable	Qty.	Part Number	Description
X	1-11	3086039H18	RGPS Synchronization cable (part of kit SGKN4351A).
		3086039H19	RGPS Synchronization cable (part of kit SGKN4352A).

Motorola kits

Table 5-18 and Table 5-19 show the contents of Motorola kits SGKN4351A and SGKN4352A. These kits are necessary for RGPS cabling between multiple BTS sites.

Table 5-18: RGPS Synchronization Cable Kit – SGKN4351A			
Cable	Qty.	Motorola Part Number	Description
X	1	3086039H18	RGPS Sync Cable, 2000 ft.
n/a	2	5864461A03	Fitting, liquid tight.
n/a	2	0264599A02	Nut, nylon locking

Table 5-19: RGPS Synchronization Cable Kit – SGKN4352A			
Cable	Qty.	Motorola Part Number	Description
X	1	3086039H19	RGPS Sync Cable, 3280 ft.
n/a	2	5864461A03	Fitting, liquid tight.
n/a	2	0264599A02	Nut, nylon locking

RGPS Cabling for Multiple BTS Sites Equipped with Optional Primary Surge Suppressor – continued

Surge suppressors

Surge suppressors (Polyphaser 097–1017A–A.1) are required for certain installations.

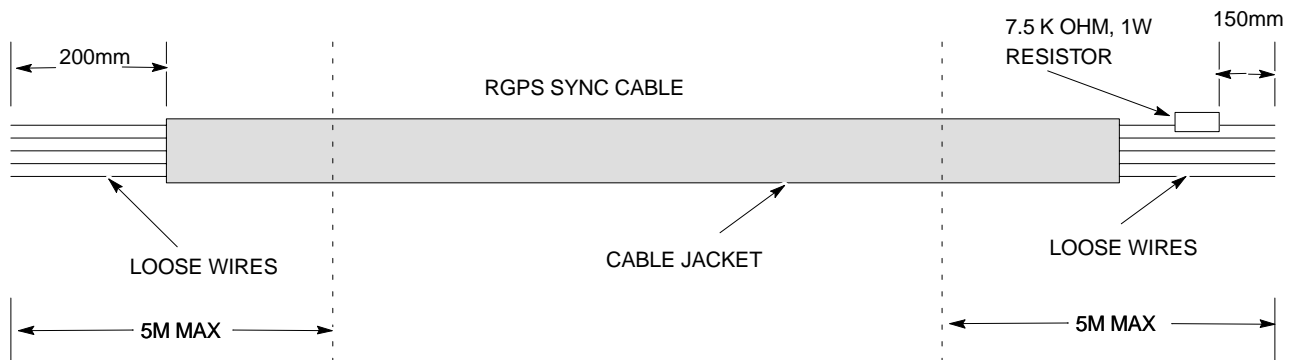
Cable Diagrams and Description

Figure 5-21 shows the RGPS cabling for a multi-BTS configuration for an RGPS (synchronous) configuration. Figure 5-22 shows the RGPS cabling for a multi-BTS HSO (non-synchronous) configuration.

Figure 5-17 shows the general construction of the RGPS Sync Cable (cable X). Cable X is supplied by Motorola with a 7.5 k Ohm, 1W resistor already installed 150 mm from the end of the cable on the blue/black wire. There is 200 mm on each end of the cable where the jacketing has been cut back.

If necessary, the jacketing of cable X may be cut back further for proper strain relief. For installations that require surge protection, you may cut cable X at the dashed lines and insert the surge protection devices. Refer to Table 5-21 for instructions to install the RGPS with surge protection.

Figure 5-17: RGPS Sync Cable Diagram



Procedure to Install RGPS Cabling for an Indoor Installation

Use the procedure in Table 5-20 to connect the RGPS Sync cable for an indoor installation. Refer to the cable run list in Table 5-23, Figure 5-21, and Figure 5-22.

Table 5-20: Procedure to Install RGPS Cabling for an Indoor Installation

Step	Action
1	Connect the resistor end of the RGPS Sync Cable (cable X) to the sync reverse lines on the Site I/O interface of BTS N. Refer to Figure 5-18. Refer to Table 5-23 for the cable X pinouts .
2	Connect the drain wire of cable X to a lug terminal tied directly to the master ground (earth ground) of BTS N.
3	Route cable X from BTS N to BTS N+1.

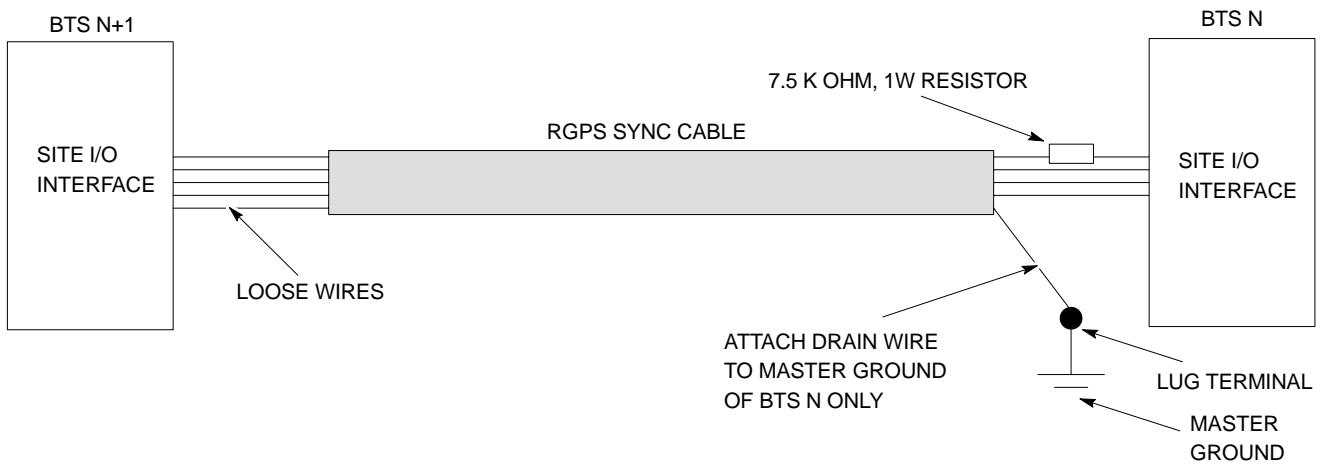
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RGPS Cabling for Multiple BTS Sites Equipped with Optional Primary Surge Suppressor – continued

Table 5-20: Procedure to Install RGPS Cabling for an Indoor Installation

Step	Action
4	Remove excess cable length from cable X and terminate to the sync forward lines on the Site I/O interface of BTS N+1. Refer to Table 5-23 for the cable X pinouts. Do not terminate the drain wire to the ground at the Site I/O interface at BTS N+1. NOTE If necessary for proper strain relief, the jacketing of cable X may be cut back further.

Figure 5-18: RGPS Sync Cable for Indoor Installation



Procedure to Install RGPS Cabling for an Outdoor Installation

Use the procedure in Table 5-21 to install the RGPS cabling for any installation that may be susceptible to surges or where any portion of the RGPS cable is routed outside. In these cases, you must reduce the length of the RGPS cable by (still to be determined length) to accommodate for the additional timing error incurred by adding surge protection.

Table 5-21: Procedure to Install RGPS Cabling for an Outdoor Installation

Step	Action
1	Follow all of the procedures in the “Connect RGPS Cables for Indoor Installation” procedure in Table 5-20.
2	Cut cable X to a maximum distance of 5m from BTS N.
3	Install the surge protection device at this point, with the protected side towards BTS N.
4	Ground the surge protection device to the master ground of BTS N.

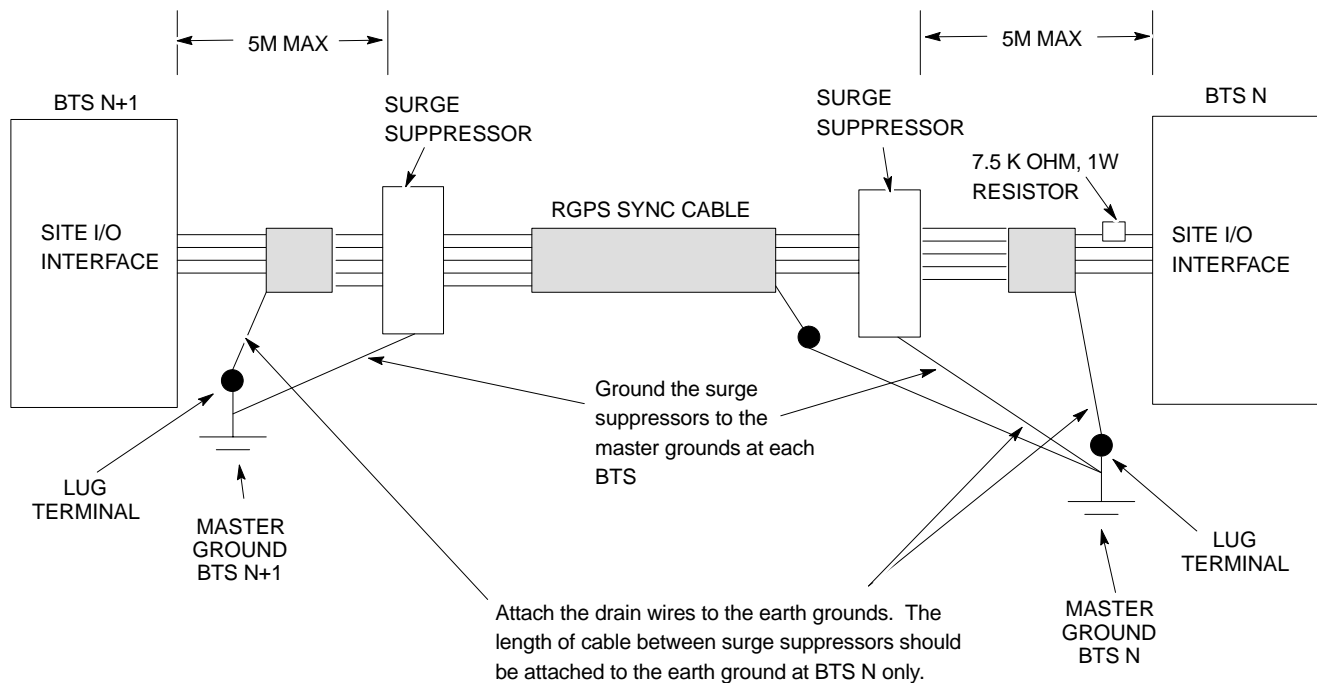
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RGPS Cabling for Multiple BTS Sites Equipped with Optional Primary Surge Suppressor – continued

Table 5-21: Procedure to Install RGPS Cabling for an Outdoor Installation	
Step	Action
5	When you cut the cable in step 2, the jacketing for the portion of cable X on the unprotected side of the surge suppressor is not grounded. To ground this portion of cable X, connect the drain wire to a lug terminal tied directly to the master ground of BTS N. NOTE Only ground the end of the cable jacket at BTS N. Do not ground the jacket at BTS N+1. Refer to Figure 5-19.
6	Cut cable X to a maximum distance of 5m from BTS N+1.
7	Ground the surge protection device to the master ground of BTS N+1.
8	When you cut cable X in step 6, the jacketing for the portion of cable X between BTS N+1 and the newly-inserted surge protector is ungrounded. To ground this portion of cable X, connect the drain wire from one end of the jacket of the cable to a lug terminal tied directly to the master ground of BTS N+1. Refer to Figure 5-19.

Figure 5-19: RGPS Sync Cable for Outdoor Installations



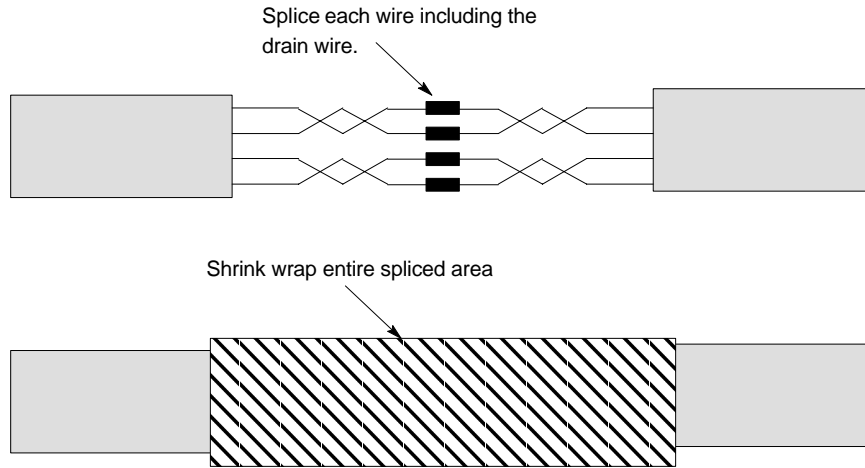
Outdoor installation exceptions

In cases where it is impossible or impractical to route cable X in a continuous stretch from BTS N to BTS N+1, you may cut and rejoin the cable using an inline splice (solder or crimp). Both types of connections are acceptable as long as each wire remains electrically isolated from every other wire. The twisted pairs must be kept together. Refer to Table 5-22 for the pairing of the twisted pairs.

RGPS Cabling for Multiple BTS Sites Equipped with Optional Primary Surge Suppressor – continued

You must splice the drain wire as well. Apply a weatherproof heat shrink tubing or another weatherproof covering over the cable bundle in the spliced section. Refer to Figure 5-20.

Figure 5-20: Cutting and Splicing RGPS Sync Cable



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Table 5-22: Twisted Pairs for RGPS Sync Cable (Cable X)

Pair	Color
1	Red/Black
	Red
2	White/Black
	White
3	Green/Black
	Green
4	Blue/Black
	Blue
5	Yellow/Black
	Yellow
6	Brown/Black
	Brown

RGPS Cabling for Multiple BTS Sites Equipped with Optional Primary Surge Suppressor – continued

Cable Connections

For a full signal description of the Site I/O cable, refer to Table 5-14 in the “Site I/O, Span Line, RGPS and Modem Cabling For Sites Equipped With Primary Surge Suppressor” procedure.

NOTE

The pin number and wire color are based on the Site I/O cable. The pin number corresponds to pins on the Site I/O junction box connectors.

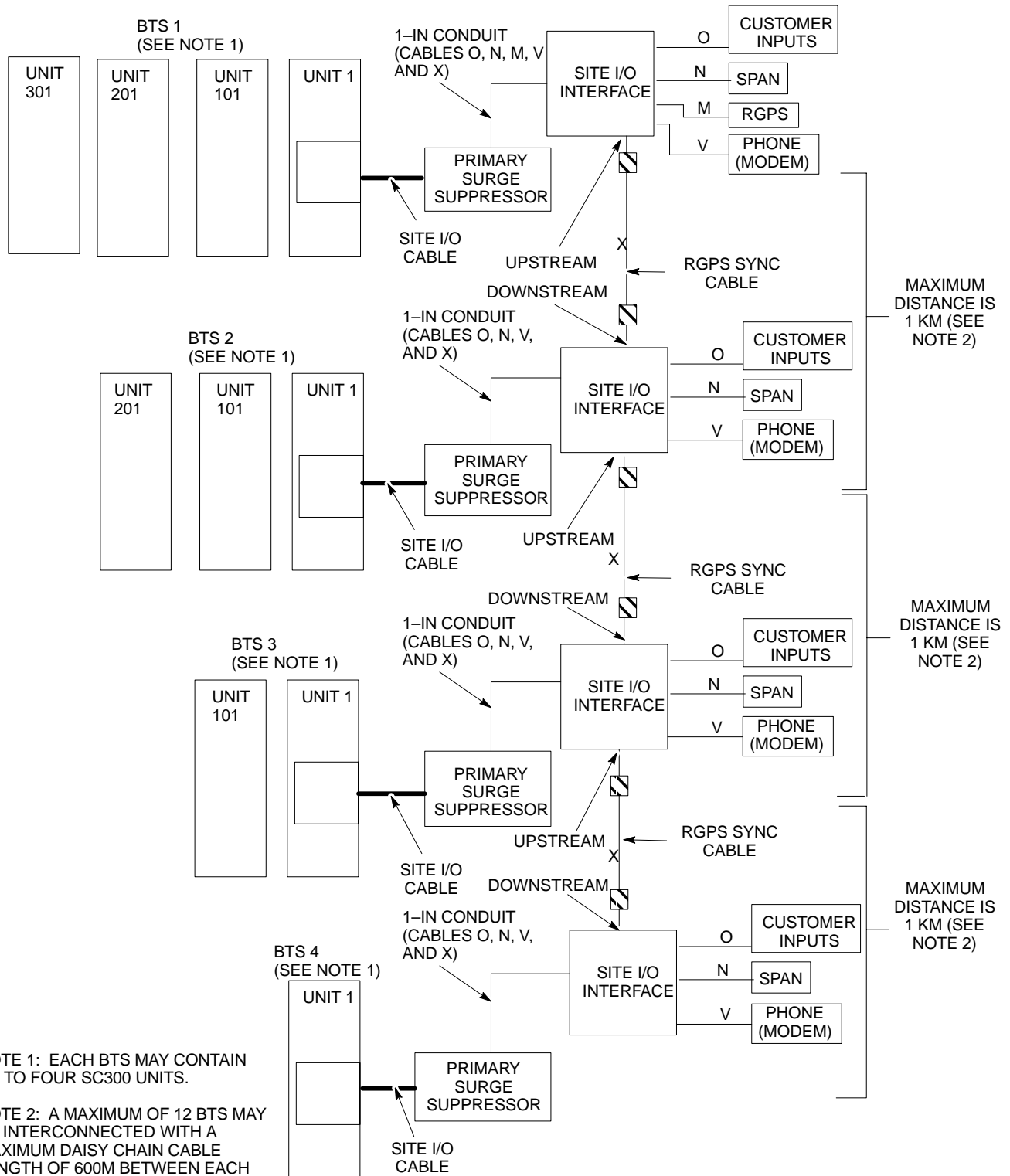
Table 5-23: Multi-BTS RGPS Cable Run List for Primary Surge Suppressor

Sync Reverse – From BTS N		Interconnecting RGPS Cable (Cable X)	Sync Forward – To BTS N+1	
Punchblock Location	Signal		Punchblock Location	Signal
OSP 9T	Data to Tail–	Green/Black	OSP 14T	Data from Head–
OSP 9R	Data to Tail+	Green	OSP 14R	Data from Head+
OSP 10T	Data from Tail–	White/Black	OSP 15T	Data to Head–
OSP 10R	Data from Tail+	White	OSP 15R	Data to Head+
OSP 11T	1 PPS to Tail–	Brown/Black	OSP 16T	1 PPS from Head–
OSP 11R	1 PPS to Tail+	Brown	OSP 16R	1 PPS from Head+
OSP 12T	1 PPS from Tail–	Red/Black	OSP 17T	1 PPS to Head–
OSP 12R	1 PPS from Tail+	Red	OSP 17R	1 PPS to Head+
OSP 20T	Ground*	Blue/Black	OSP 20R	Ground*

*The Multi-BTS Synchronization interface must also be referenced to the BTS digital ground through a 7.5K ohm, 1W resistor. This resistor has been integrated into the blue/black wire of Cable X. The end of Cable X with the resistor should be connected to the Sync Reverse locations on the punch block of BTS N. The opposite end of Cable X is connected to the Sync Forward locations on the punch block of BTS N+1 and may be cut to the appropriate length.

RGPS Cabling for Multiple BTS Sites Equipped with Optional Primary Surge Suppressor – continued

Figure 5-21: Site I/O Interface Cabling for RGPS (Synchronous) Configurations



NOTE 1: EACH BTS MAY CONTAIN UP TO FOUR SC300 UNITS.

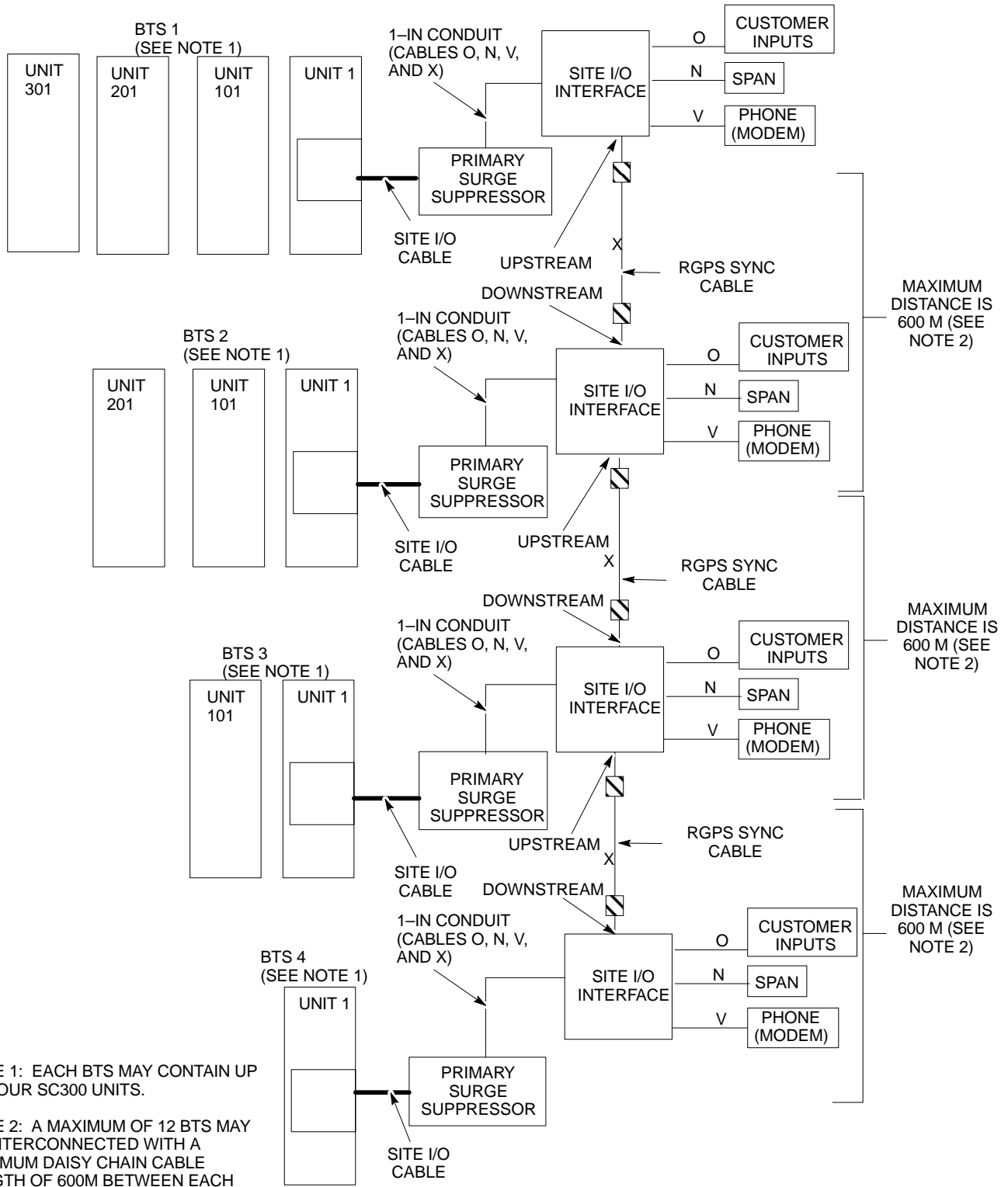
NOTE 2: A MAXIMUM OF 12 BTS MAY BE INTERCONNECTED WITH A MAXIMUM DAISY CHAIN CABLE LENGTH OF 600M BETWEEN EACH BTS. A MAXIMUM OF SEVEN BTS MAY BE INTERCONNECTED WITH A MAXIMUM DAISY CHAIN CABLE LENGTH OF 1KM BETWEEN EACH BTS.

☐ = SURGE PROTECTION DEVICE (OPTIONAL)

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RGPS Cabling for Multiple BTS Sites Equipped with Optional Primary Surge Suppressor – continued

Figure 5-22: Site I/O Interface Cabling for HSO (Non-Synchronous) Configurations



NOTE 1: EACH BTS MAY CONTAIN UP TO FOUR SC300 UNITS.

NOTE 2: A MAXIMUM OF 12 BTS MAY BE INTERCONNECTED WITH A MAXIMUM DAISY CHAIN CABLE LENGTH OF 600M BETWEEN EACH BTS. A MAXIMUM OF SEVEN BTS MAY BE INTERCONNECTED WITH A MAXIMUM DAISY CHAIN CABLE LENGTH OF 1 KM BETWEEN EACH BTS.

☐ = SURGE PROTECTION DEVICE (OPTIONAL)

Span Line Daisy Chain Cabling for Multiple BTS Sites Equipped with Optional Primary Surge Suppressor

Objective

The objective of this procedure is to install span line cabling between multiple BTS sites equipped with Primary Surge Suppressor in an open daisy chain configuration.

Background

This feature allows multiple BTS sites to be linked together in an open daisy chain loop using a single T1/E1 span. This will reduce the number of spans necessary to support a CDMA system and minimize unused channels.

Each BTS site may contain up to four units. A maximum of 12 BTS sites may be combined in a single daisy chain.

Required Cables

The following cables are necessary to do this procedure.

Table 5-24: Required Cables for Span Line Daisy Chain Cabling			
Cable	Qty.	Part Number	Description
W	1-3	Customer Supplied	Span Line Daisy Chain Cable

Procedure

Attach the span line daisy chain cable (Cable W) to the site I/O interface of each BTS site. Refer to Figure 5-23 and Table 5-25.

Cable Connections

Table 5-25 shows the cable run information for span line daisy chain cabling for BTS sites equipped with the Primary Surge Suppressor.

For a full signal description of the Site I/O cable refer to Table 5-14 in the “Site I/O, Span Line, RGPS and Modem Cabling for Sites Equipped with Optional Primary Surge Suppressor” procedure.

NOTE

The pin number and wire color are based on the Site I/O cable. The pin number corresponds to pins on the Site I/O junction box connectors.

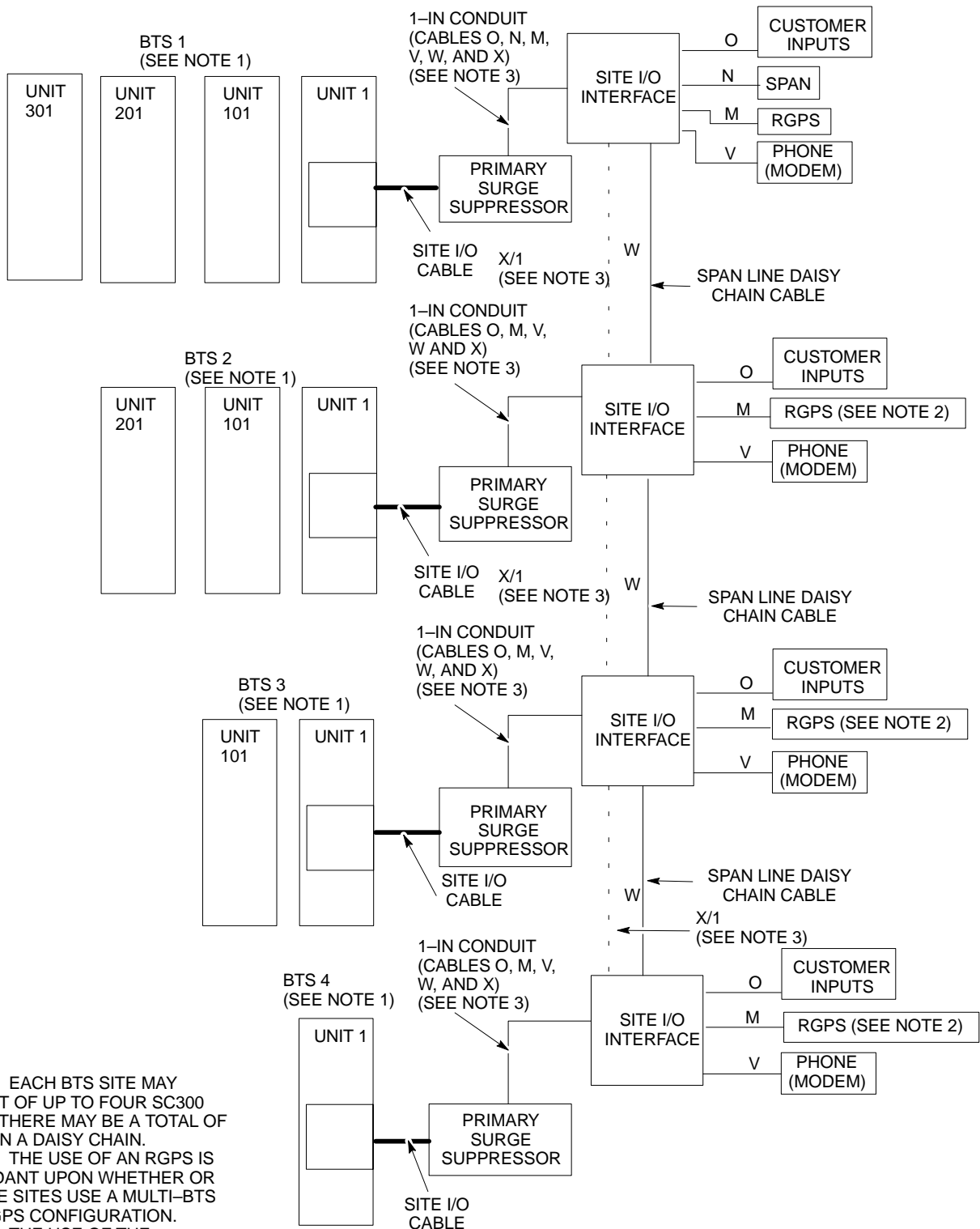
Span Line Daisy Chain Cabling for Multiple BTS Sites Equipped with Optional Primary Surge Suppressor – continued

Table 5-25: Cable Run List for Span Line Daisy Chain Cabling

BTS 1 (Secondary Backhaul – Span B Downstream)		BTS 2 (Primary Backhaul – Span A Upstream)	
Punchdown Block Location	Desc.	Punchdown Block Location	Desc.
OSP 23T	RX TIP	OSP 22T	TX TIP
OSP 23R	RX RING	OSP 22R	TX RING
OSP 24T	TX TIP	OSP 21T	RX TIP
OSP 24R	TX RING	OSP 21R	RX RING

Span Line Daisy Chain Cabling for Multiple BTS Sites Equipped with Optional Primary Surge Suppressor – continued

Figure 5-23: Site I/O Interface Cabling for Span Line Daisy Chain Cabling



NOTE 1: EACH BTS SITE MAY CONSIST OF UP TO FOUR SC300 UNITS. THERE MAY BE A TOTAL OF 12 BTS IN A DAISY CHAIN.
 NOTE 2: THE USE OF AN RGPS IS DEPENDANT UPON WHETHER OR NOT THE SITES USE A MULTI-BTS SITE RGPS CONFIGURATION.
 NOTE 3: THE USE OF THE MULTI-BTS RGPS CABLE (CABLE X) DEPENDS UPON SYSTEM CONFIGURATION.

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Unit Installation Overview

Overview

This chapter provides the procedures for unit installation and cabling.

The site cabling has been installed and routed to the location of the BTS. In this chapter, the cables will be attached to the unit(s). Cabling installation will be repeated as necessary for each unit at the BTS.

This chapter provides the information and procedures to:

- Attach the unit to the mounting bracket
- Attach cables to the unit
- Power on the unit
- Mount the solar covers
- Complete the installation completion checklist

Unit Installation Procedure Order

The process of installing the unit requires that the following procedures be completed in the order shown:

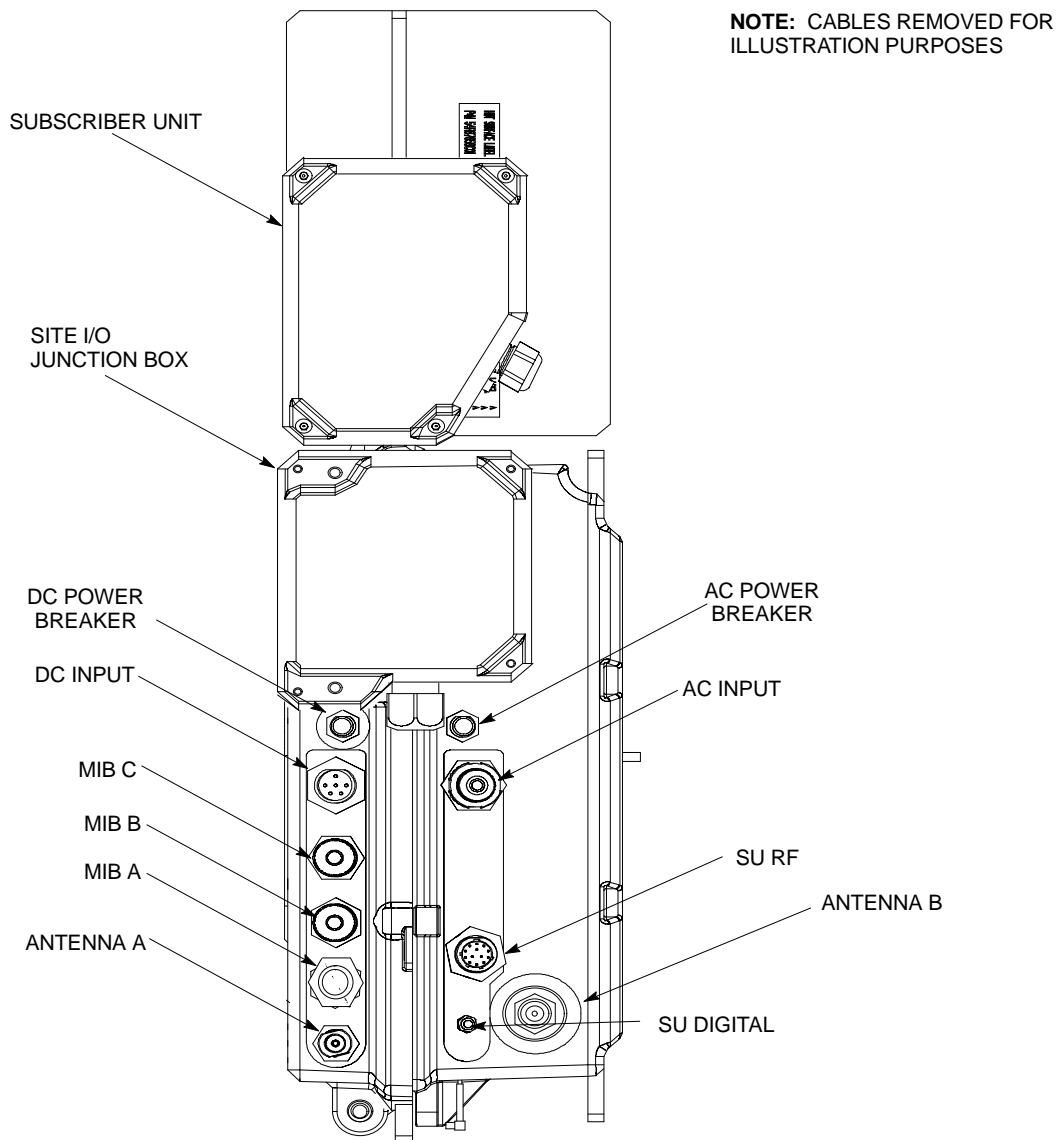
1. Install back fin cover to unit (required for indoor applications if solar covers will not be used).
2. Attaching the installation handles to the unit (optional).
3. Attaching the unit to the mounting bracket.
4. Remove the installation handles (optional).
5. Attach earth ground cable and optional master ground cable.
6. Attach the Site I/O junction box to the unit.
7. Attach Subscriber Unit (SU) to unit.
8. Attach front fin cover (required for indoor applications if solar covers will not be used).
9. Attach the short duration battery (optional).
10. Attach the AC input power or DC input power cable.
11. Attach antenna cable(s).
12. Attach the MIB cables (optional).
13. Attach the SU cables (optional).
14. Terminating unused connectors.
15. Powering on the unit.
16. Attach front solar cover (required for outdoor installations and optional for indoor applications if fin covers will not be used).
17. Cleaning up site.
18. Filling out the installation completion checklist.

Connector Locations

Connector Locations for MicroCell and Primary Surge Suppressor

Figure 6-1 through Figure 6-3 show the location of the cable connectors on the Microcell and Primary Surge Suppressor. The system configuration determines which connectors are used.

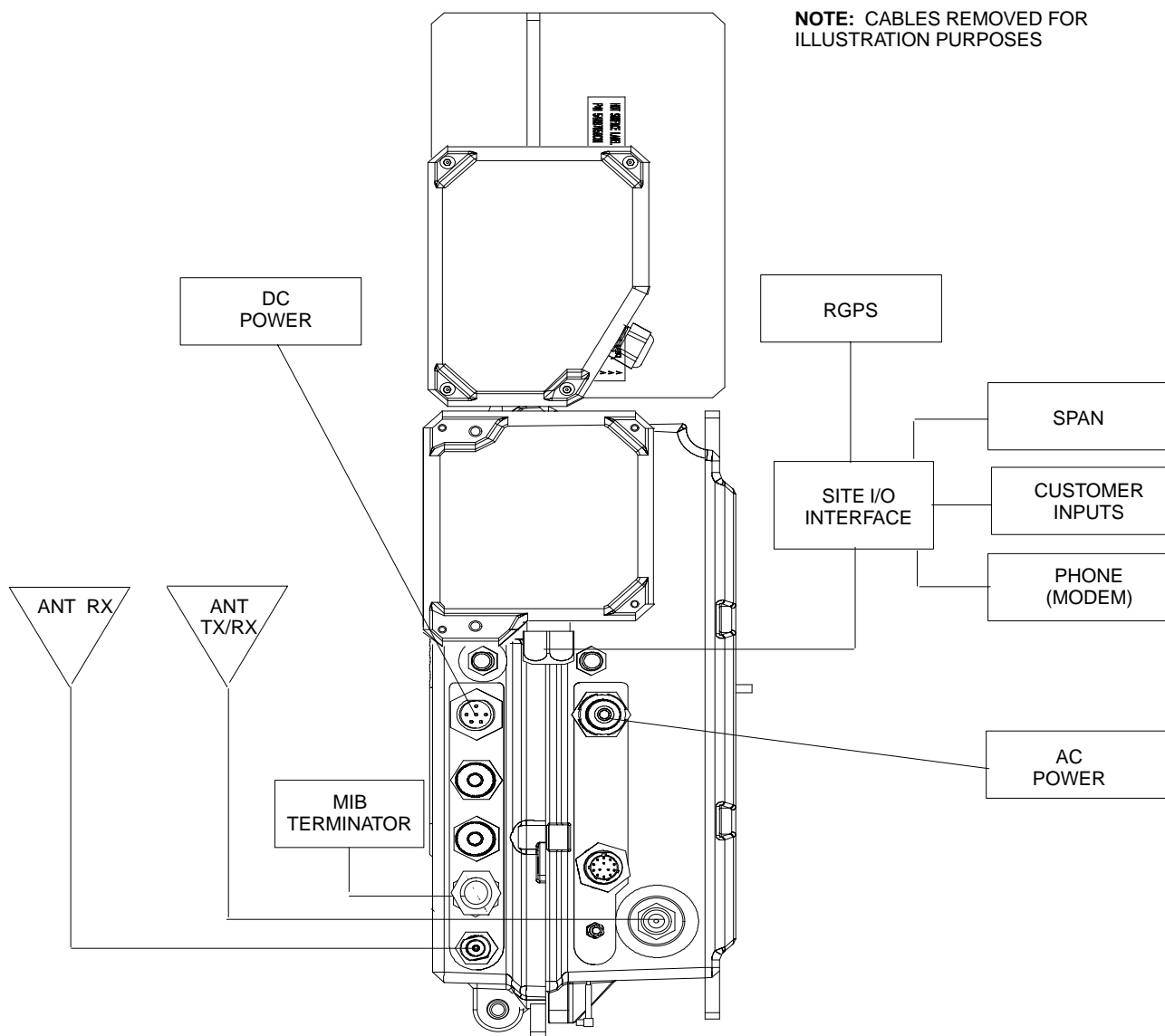
Figure 6-1: General Block Diagram Showing the Port Names



6

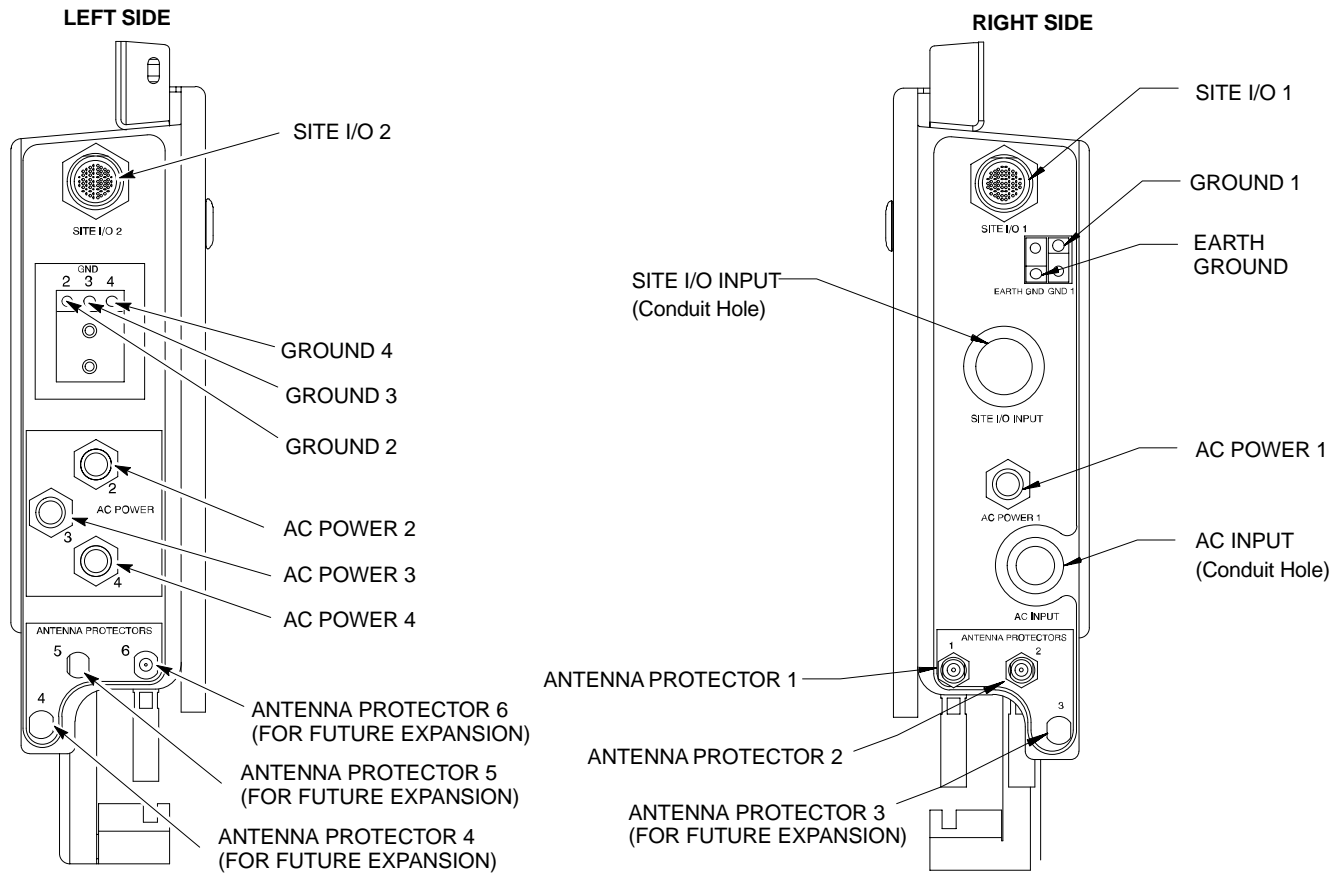
Connector Locations – continued

Figure 6-2: General Block Diagram Showing the Unit, Site I/O Interface, and External Items



Connector Locations – continued

Figure 6-3: Location of Primary Surge Suppressor Connectors



6

Attaching Back Fin Cover to Unit

Objective

The objective of this procedure is to attach the back fin cover to the MicroCell unit. The front fin cover is mounted to the unit after the unit is mounted to the mounting bracket.

When to Use the Fin Covers

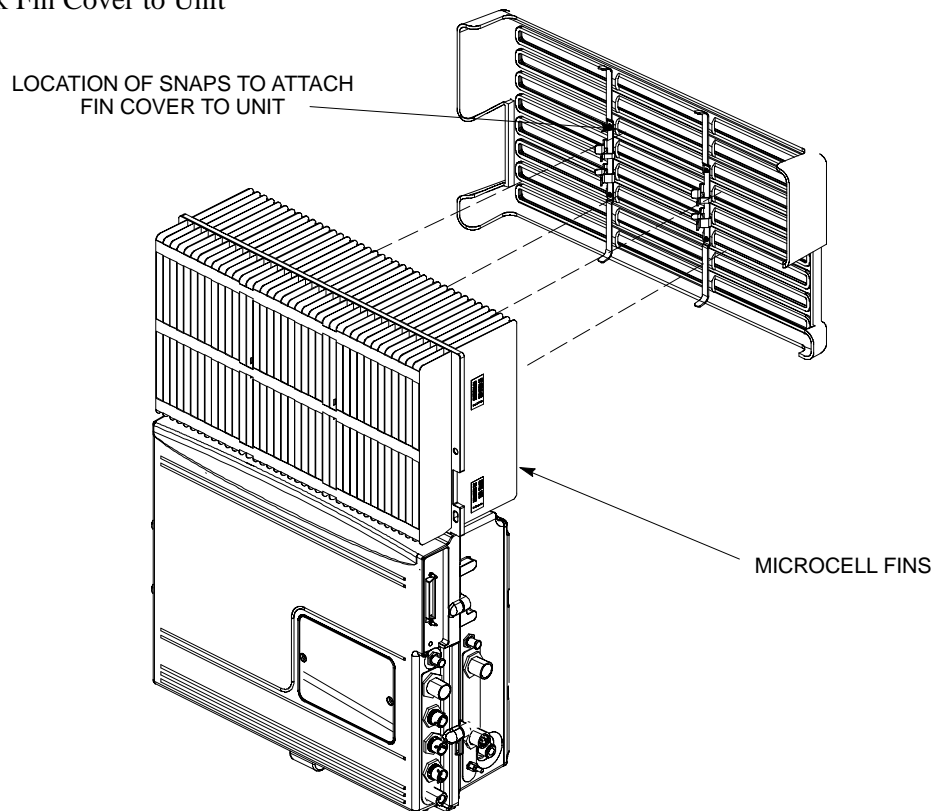
You must always use fin covers in an indoor application.

Procedure to Install Back Fin Cover to Unit

Attach the back fin cover to the unit by following the procedures in Table 6-1 and the information in Figure 6-4.

Table 6-1: Procedure to Install Back Fin Cover to Unit	
Step	Action
1	Install back fin cover prior to placing unit on the mounting bracket.
2	Center fin cover on the fins of the unit. See Figure 6-4 for snap locations.
3	Align snap with center tab on fins.
4	Push fin cover into place.

Figure 6-4: Attaching Back Fin Cover to Unit



Attaching Optional Installation Handles to the Unit

Objective

The objective of this procedure is to attach the installation handles to the unit. The location for the handles is shown in Figure 6-5. The handles should be used when lifting or carrying the unit.

NOTE

Installation handles are available with installation kit #SGLN5754

Required Tools and Materials

Tools

Attaching the installation handles to the unit requires:

- T30 Torx tamper bit
- Torque driver wrench, 1/4-in. hex female drive, 0–10 N–M

Motorola parts

Table 6-2 lists the parts necessary to do this procedure.

Quantity	Part Number	Description
2	0387541C08	Screws M6x25
2	0387541C09	Screws M6x35
2	5588425C01	Handle

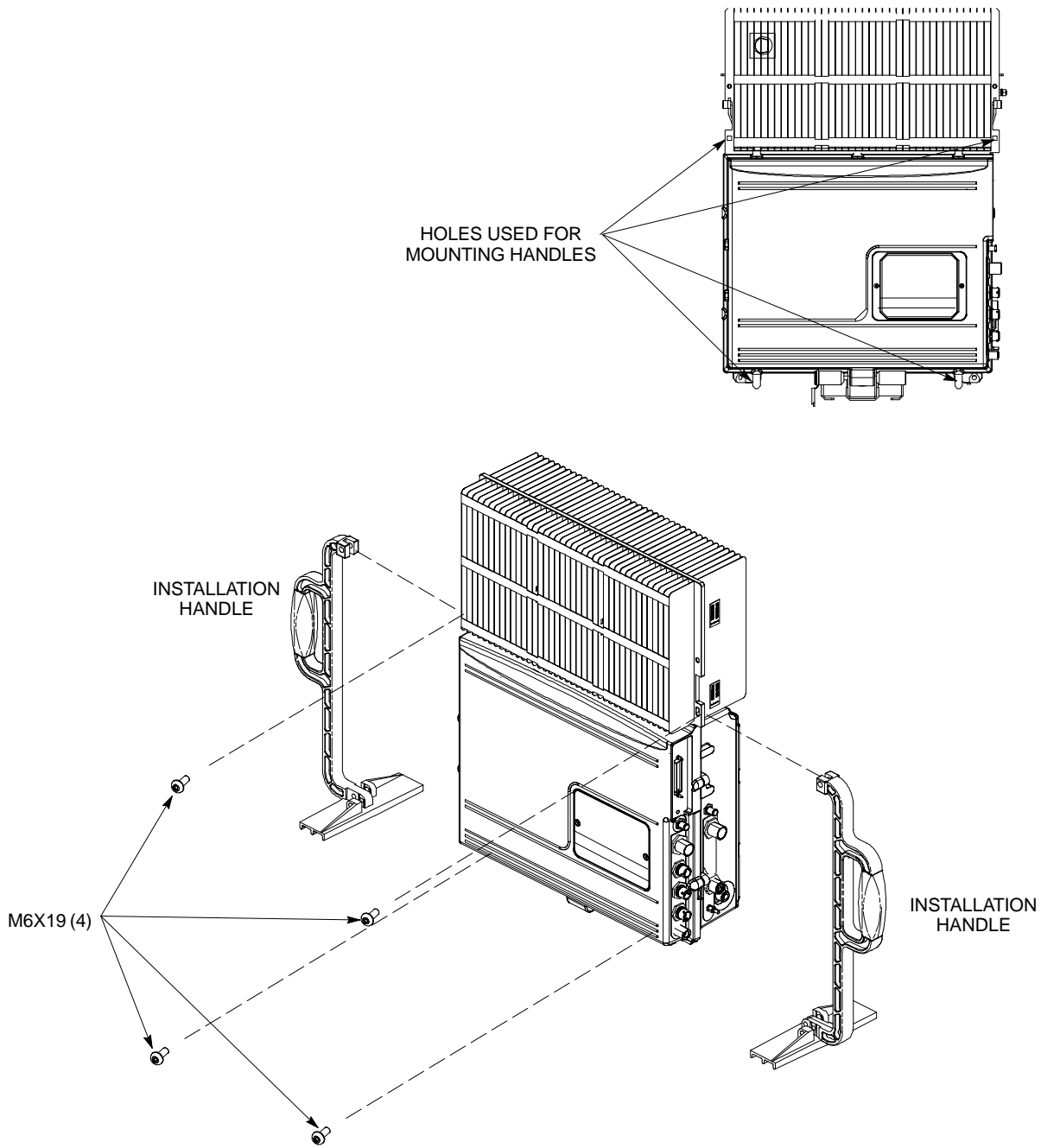
Procedure to Attach the Handles to the Unit

Attach the installation handles to the unit by following the procedures in Table 6-3 and the information in Figure 6-5.

Step	Action
1	Hold one handle in position and start the upper screw. See Figure 6-5.
2	Start the lower screw.
3	Use a T30 Torx tamper bit to torque the two M6 screws to 5.0 N–m.
4	Repeat steps 1–3 for the other handle.

Attaching Installation Handles to the Unit – continued

Figure 6-5: Attaching the Installation Handles to the Unit



Attaching Unit to Mounting Bracket

Objective

The objective of this procedure is to attach the unit to the mounting bracket. This procedure applies to mounting brackets that are attached to a rack, wall, or pole.

Background

The unit attaches to the mounting bracket with two (2) M6 screws and the provided pin or a customer-supplied padlock.

NOTE

The handles should be mounted to the unit before mounting the unit to the bracket. The handles should be used to lift the unit onto the bracket. If the solar cover is to be used, the back cover must be attached prior to mounting the unit. Remove the handles once the unit has been secured to the mounting bracket.

Required Tools and Equipment

The following tools and equipment are required to attach the unit to the mounting bracket:

- Torque driver wrench, 1/4-in. hex female drive, 0–10 N–M
- T30 Torx tamper bit
- Two M6X19 screws (Motorola Part Number 0387541C03)

Procedure to Attach the Unit to the Mounting Bracket

Follow the procedure in Table 6-4 to attach the unit to the mounting bracket. Refer to Figure 6-6.



CAUTION

Use caution when resting the MicroCell unit on the hooks of the mounting bracket. Do not leave unit supported by hooks only.

Table 6-4: Procedure to Attach the Unit to the Mounting Bracket

Step	Action
1	Lift the unit using the installation handles and place it on the mounting bracket by aligning the bracket's upper arms into the rectangular cutouts in the heatsink. The unit will need to be raised up slightly so that the lower bracket flange does not contact the unit's lower surface.
2	Use a T30 Torx tamper bit to start, but not tighten, both screws in the location shown in Figure 6-6.

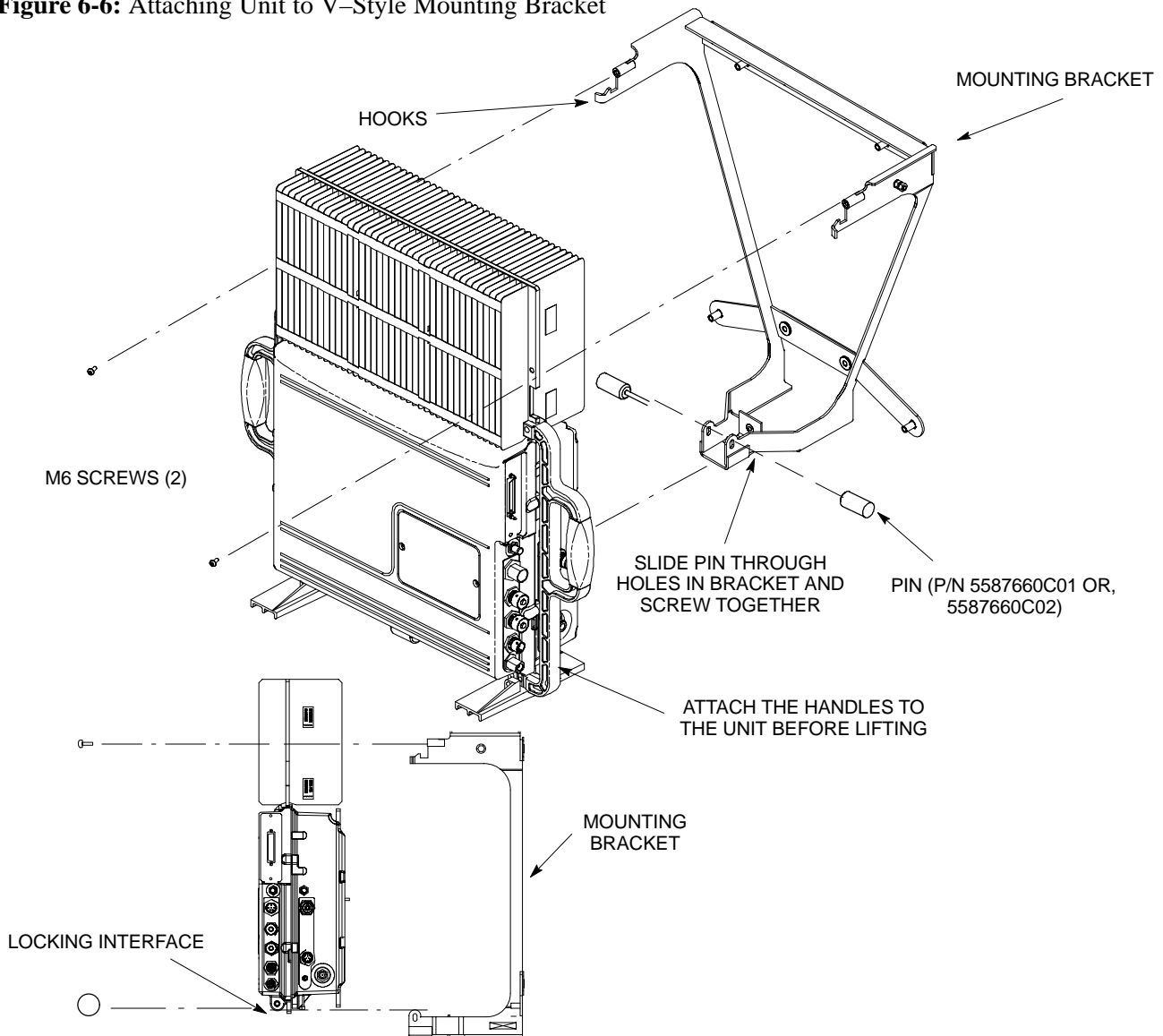
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Attaching Unit to Mounting Bracket – continued

Table 6-4: Procedure to Attach the Unit to the Mounting Bracket

Step	Action
3	At the bottom of the unit, align the hole in the mounting bracket with the hole in the unit. Place the pin or customer-supplied padlock through this hole. Screw pin together and tighten firmly.
4	Use a T30 Torx tamper bit to torque the two mounting screws to 5.0 N-M.
5	Use a T30 Torx tamper bit to remove the installation handles.

Figure 6-6: Attaching Unit to V-Style Mounting Bracket



Earth Ground Cabling

Objective

The objective of this procedure is to attach the earth ground cabling to one or more MicroCell units. This procedure covers just the grounding cables that attach to the MicroCell.

Other Grounding Considerations

Grounding considerations beyond the ground cables that attach to the MicroCell are summarized in Appendix A. Refer to Appendix A and the site documentation for other grounding considerations.

If your site is equipped with the optional Primary Surge Suppressor, refer to the “Power, Earth Ground, and Battery Cabling” Procedure in chapter 4 for information about installing the Master Ground cable.

Required Cables

The following cables in Table 6-5 are necessary to do this procedure.

Cable	Qty.	Part Number	Description
A	1–4	3087701C02	Ground cable, 8 -AWG, insulated copper wire. Requires one ring lug connector. Used for Primary Surge Suppressor Installation.
B	1–4	3087701C01	Ground cable, Site I/O Junction Box to Bracket (for installations without external Subscriber Unit).
L	1–4	3087701C04	Y–Ground Cable (for external SU and Site I/O).
Y	1	Customer Supplied	Master Ground Cable, 6 -AWG, insulated copper wire. Used for both Primary Surge Suppressor and non–Primary Surge Suppressor installations.

Required Tools and Materials

The following tools are required to attach ground cabling to the MicroCell unit.

- 13 mm torque wrench set to 5.0 N–M
- Flathead screwdriver bit
- T30 TORX bit

Procedure to Attach the Earth Ground Cables

Use the following procedure to attach the ground cables. Refer to Table 6-6 and Figure 6-7.

Step	Action
1	Remove the hex nuts and lock washers from the ground stud on the mounting bracket. Refer to Figure 6-8.

. . . continued on next page

Earth Ground Cabling – continued

Table 6-6: Procedure to Attach the Earth Ground Cables

Step	Action
2	Attach the master ground cable (cable A or cable Y) to the ground stud on the mounting bracket.
3	Replace one lock washer and nut on the ground stud and tighten to 5 N–m.
4	Attach the single end of the Y–ground cable (cable L) to the ground stud on the mounting bracket. If the unit is not equipped with a Site I/O, attach one end of the Site I/O ground cable (cable B) to the ground stud on the mounting bracket.
5	Replace the second lockwasher and hex nut to the ground stud on the mounting bracket. Use a torque wrench and a 13mm socket to tighten to 5.0 N–m.

Figure 6-7: Detail Location of Ground Stud

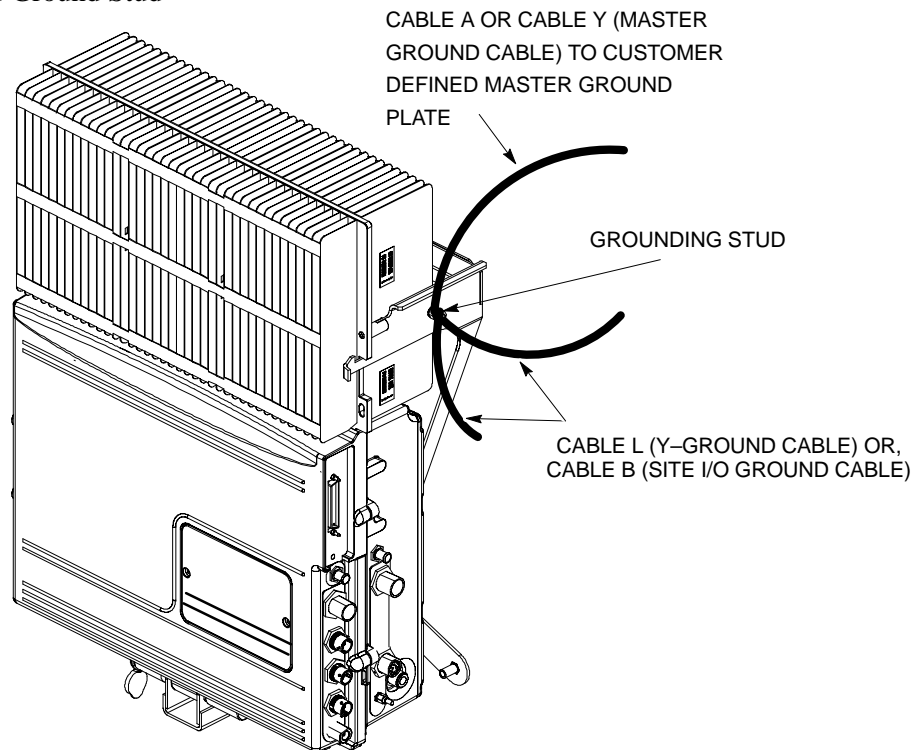
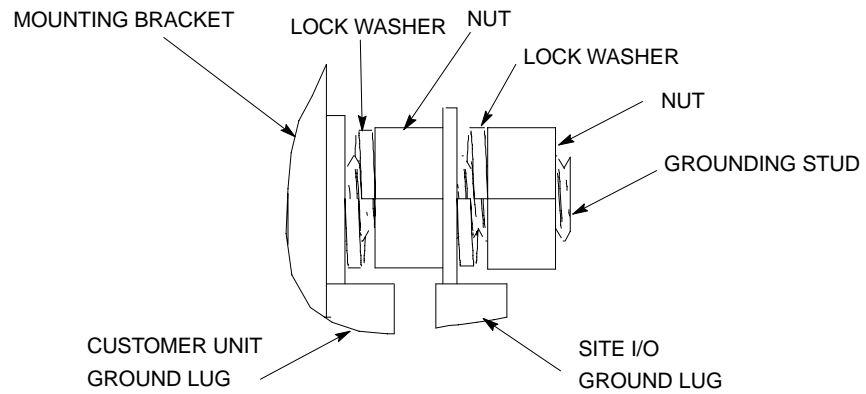


Figure 6-8: Grounding Stud on Mounting Bracket



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Attaching the Site I/O Junction Box to the Unit

Objective

The objective of this procedure is to attach the Site I/O junction box to the unit. The location for the Site I/O junction box is shown in Figure 6-9.

If you do not mount a Site I/O Junction box to a unit, leave the installed Site I/O caps on the Site I/O Junction box connectors.

Required Tools and Materials

The following tools and materials are necessary to do this procedure:

- Torque driver wrench, 1/4-in. hex female drive, 0–10 N–M
- T30 Torx tamper bit
- Site I/O Junction box

Procedure to Attach the Site I/O Junction Box to the Unit

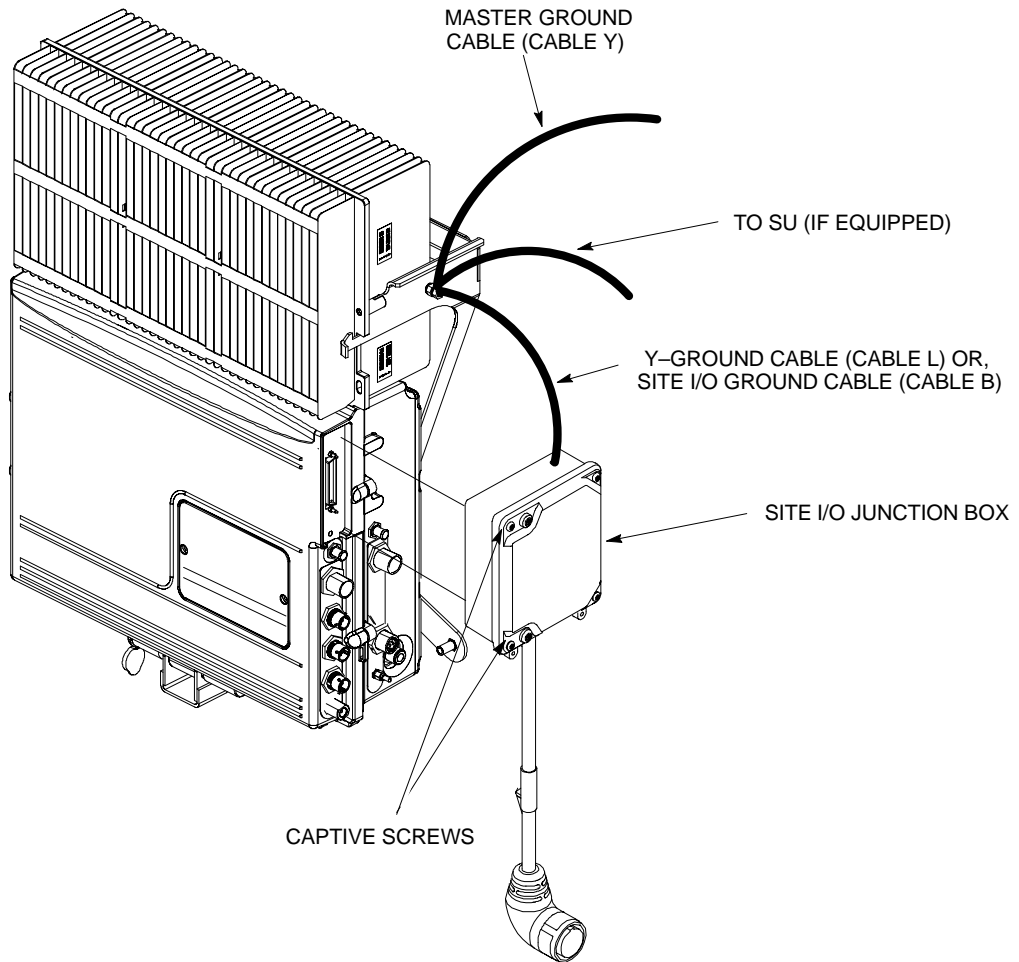
Follow the procedure below to attach the site I/O junction box to the unit.

Table 6-7: Procedure to Attach the Site I/O Junction Box to the Unit

Step	Action
1	Use a T30 TORX bit to remove Site I/O Cap from the Site I/O connector. NOTE Save Site I/O Cap for future use.
2	Remove the Site I/O Plate from the Site I/O Junction Box.
3	Attach the straight end of the Y-ground cable (cable L) or the Site I/O ground cable (cable B) to the site I/O junction box. Use one M6x19 tamper-resistant screw. Torque to 5.0 N-m. NOTE The free end of the Site I/O junction box cable should be connected to the customer-supplied Site I/O interface.
4	The free end of the Site I/O junction box cable should be connected to the customer-supplied Site I/O interface or to the Primary Surge Suppressor.
5	Position the Site I/O junction box as shown in Figure 6-9.
6	Insert the Site I/O junction box on to the housing, using the alignment feature on the housing.
7	Use a T30 Torx tamper bit to tighten (but do not torque) the upper tamper resistant screw.
8	Tighten but do not torque the lower tamper resistant screw.
9	Use a T30 Torx tamper bit to torque the upper and lower screw to 5 N-m.

Attaching the Site I/O Junction Box to the Unit – continued

Figure 6-9: Attaching the Site I/O Junction Box to the Unit



6

Procedure to Attach a Site I/O Cap to the Unit (optional)

Use the following procedure in Table 6-8 to attach a Site I/O Cap to the unit.

Table 6-8: Procedure to Attach a Site I/O Cap to the Unit (optional)

Step	Action
1	Position the Site I/O cap, Motorola Part Number 1587667C06, over the Site I/O socket.
2	Use a T30 Torx tamper bit to tighten (but do not torque) the upper tamper resistant screw.
3	Tighten but do not torque the lower tamper resistant screw.
4	Use a T30 Torx tamper bit to torque the upper and lower screw to 5 N-m.

Subscriber Unit (SU) Installation and Cabling

Objective

The objective of this procedure is to install the Subscriber Unit (SU) to the unit and to install the necessary cables.

Cable Labels

The cable designations are referenced to Table 4-1 in the “Cable Description” area of this chapter.

Required Tools and Materials

Required tools

- Torque driver wrench
- T30 TORX tamper bit
- 5/16-in. SMA 9 in-lb. break-away torque wrench

Motorola kits

The Motorola Kit described in Table 6-9 is required to do this procedure.

Table 6-9: External Subscriber Unit Kit – T529AA			
Cable	Qty.	Part Number	Description
n/a	1–4	SGLN5976A	Subscriber Unit
P	1–4	3088120C03	SU RF cable
L	1–4	3087701C04	Y–Ground Cable (for external SU and Site I/O).

Motorola terminators

The following Motorola terminators in Table 6-10 are required to do this procedure. The number of SU Terminators depends upon system configuration.

Table 6-10: Terminations of Unused Connectors		
Connector	Motorola Part #	Description
SU Digital	5887659C02	Terminator, Power SC340 AC
SU Distribution	0187683C03	Terminator, SMA (Microcell)

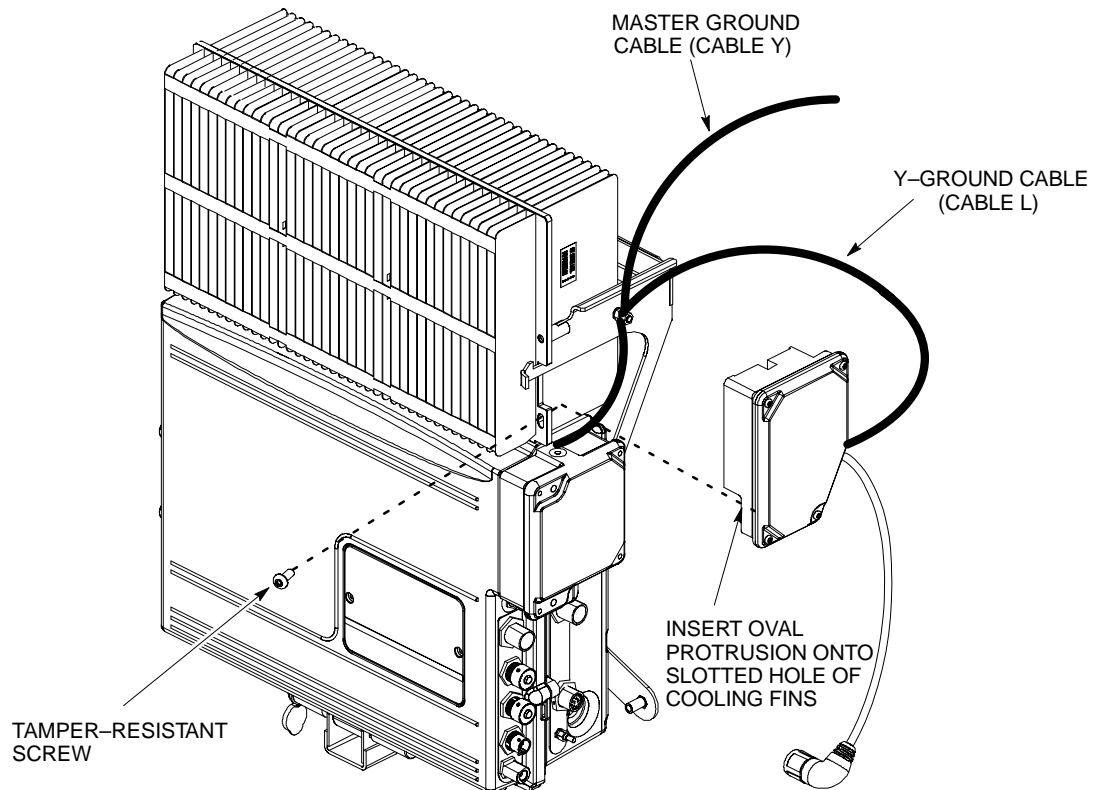
Subscriber Unit (SU) Installation and Cabling – continued

Procedure to Install SU Box

Table 6-11 gives the procedure to install the SU box on a MicroCell unit. You must install one SU on each unit at the BTS.

Table 6-11: Procedure to Install the SU Box	
Step	Action
1	Attach one end of the Y-Ground cable (cable L) to the SU. Use one M6x19 tamper-resistant screw. Torque to 5.0 N-m. NOTE If unit is not equipped with a Site I/O, then one end of the Y-ground cable will hang loose.
2	Position the SU as shown in Figure 6-10.
3	Insert the oval protrusion of the SU onto the slotted hole on the cooling fins.
4	Use a torque driver and a T30 TORX bit to tighten the tamper-resistant screw. Tighten to 5.0 N-m.

Figure 6-10: Attaching Subscriber Unit (SU) to Unit



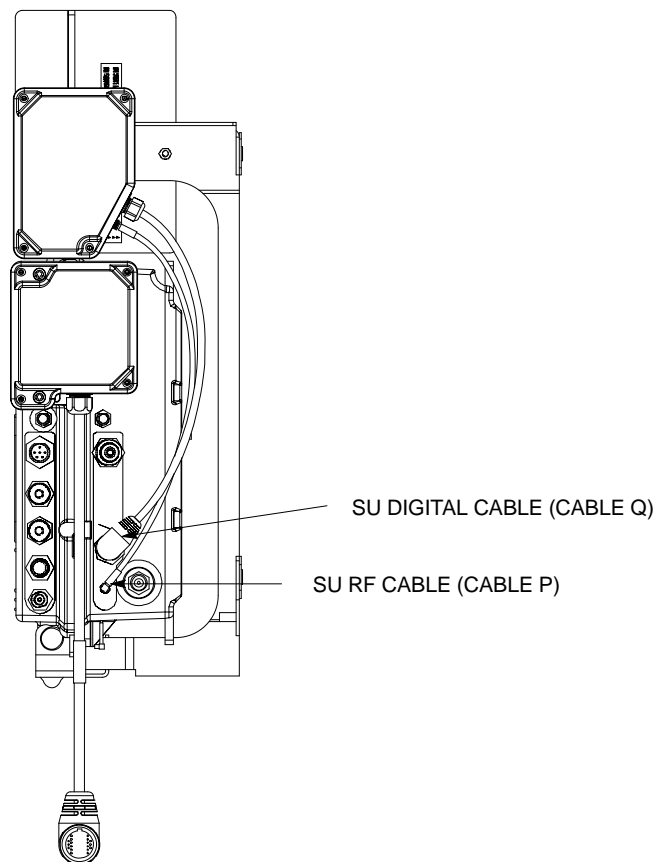
Subscriber Unit (SU) Installation and Cabling – continued

Procedure to Install SU Cabling

Table 6-11 gives the procedure to install the SU cabling on a MicroCell unit.

Table 6-12: Procedure to Install the SU Cabling	
Step	Action
1	Attach one end of the SU RF cable (cable P) to the SU 1 connector on the SU. Attach the other end of cable P to the SU RF connector on the unit. Refer to Figure 6-11.
2	Use the 5/16-in. SMA breakaway wrench to tighten the SMA connectors on the SU RF cable.
3	Attach the free end of the SU Digital cable (cable Q) to the SU DIGITAL connector on the unit. Refer to Figure 6-11. Hand tighten the SU Digital connector (you will hear soft clicks, this is normal). When the red line on the connector on the unit is covered, the connection is complete.

Figure 6-11: Attaching SU Cables to Unit



Attaching Front Fin Cover to Unit

Objective

The objective of this procedure is to attach the front fin cover to the MicroCell unit.

When to Use the Fin Covers

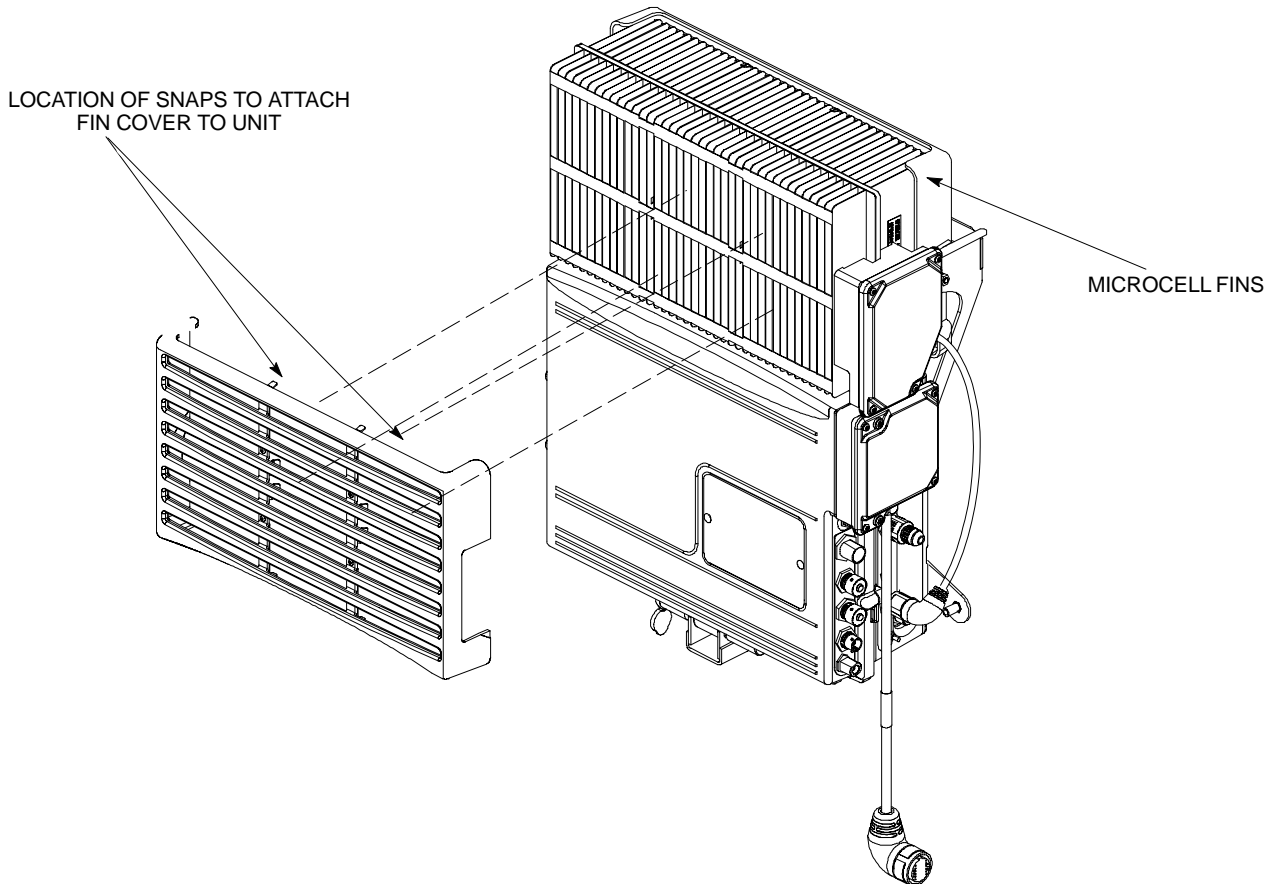
Always use fin covers for an indoor application.

Procedure to Attach the Front Fin Cover to Unit

Follow the procedure in Table 6-13 to attach the front fin cover to the unit. Refer to Figure 6-12.

Table 6-13: Procedure to Attach the Front Fin Cover to Unit	
Step	Action
1	Center fin cover on the fins of the unit. See Figure 6-12 for snap locations.
2	Align snap with center tab on fins.
3	Push fin cover into place.

Figure 6-12: Attaching Front Fin Cover to Unit



Attaching the Short Duration Battery to the Unit (optional)

Objective

The objective of this procedure is to attach the short duration battery to the unit.

Required Tools and Materials

Attaching the battery to the unit requires:

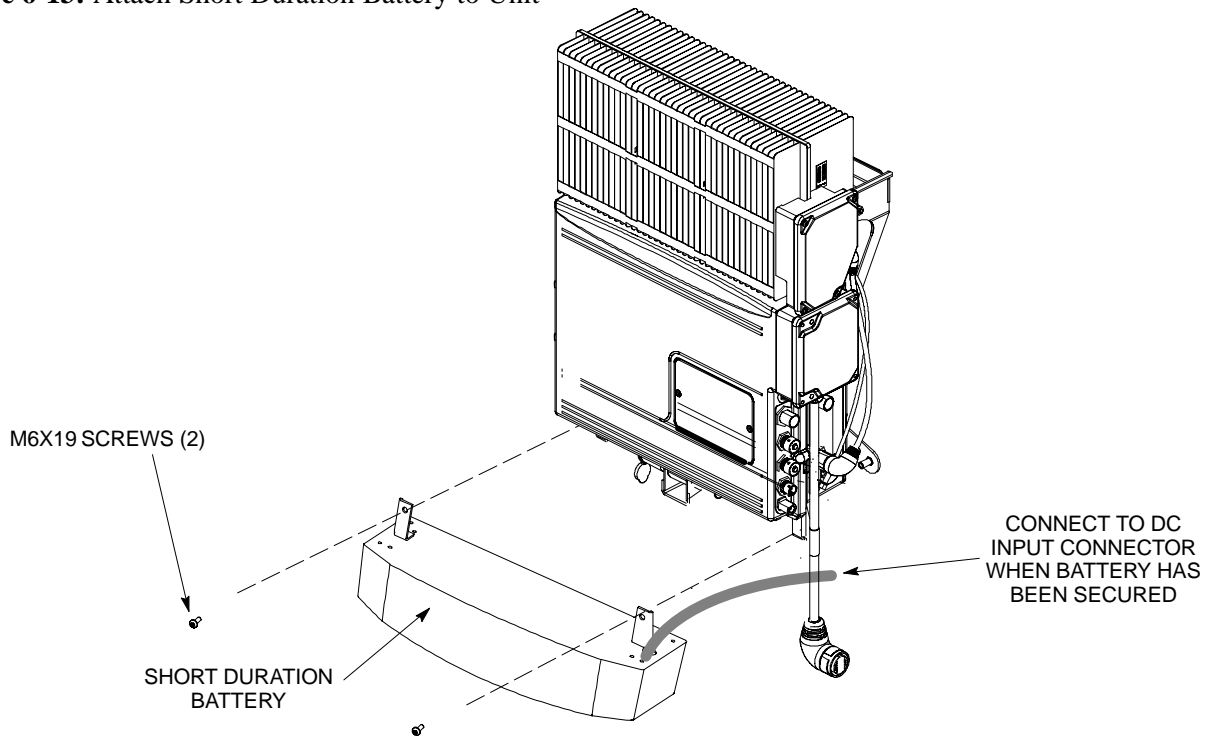
- T30 Torx tamper bit, 1/4-in. hex
- Torque driver wrench, 1/4-in. hex female drive, 0–10 N–M
- Two (2) Screws M6x19 (Motorola Part Number 0387541C03)

Procedure to Attach the Short Duration Battery to the Unit

Follow the procedure in Table 6-14 to attach the short duration battery to the unit. Refer to Figure 6-13.

Step	Action
1	Hold the battery in the position shown in Figure 6-13.
2	The two holes at the end of the battery should align with the mounting holes on the unit. See Figure 6-13.
3	Start but do not tighten the M6x19 screws.
4	Use a T30 Torx tamper bit wrench, 1/4-in. hex female drive, 0–10 N–M, to torque the screws to 5 N–M.

Figure 6-13: Attach Short Duration Battery to Unit



Short Duration Battery Cabling

Objective

The objective of this procedure is to attach the short duration battery cable.

Battery Cable

The battery cable is part of the battery assembly. The same type connector is used for the short duration battery and DC input cables.

Procedure to Install Short Duration Battery Cable to the Unit

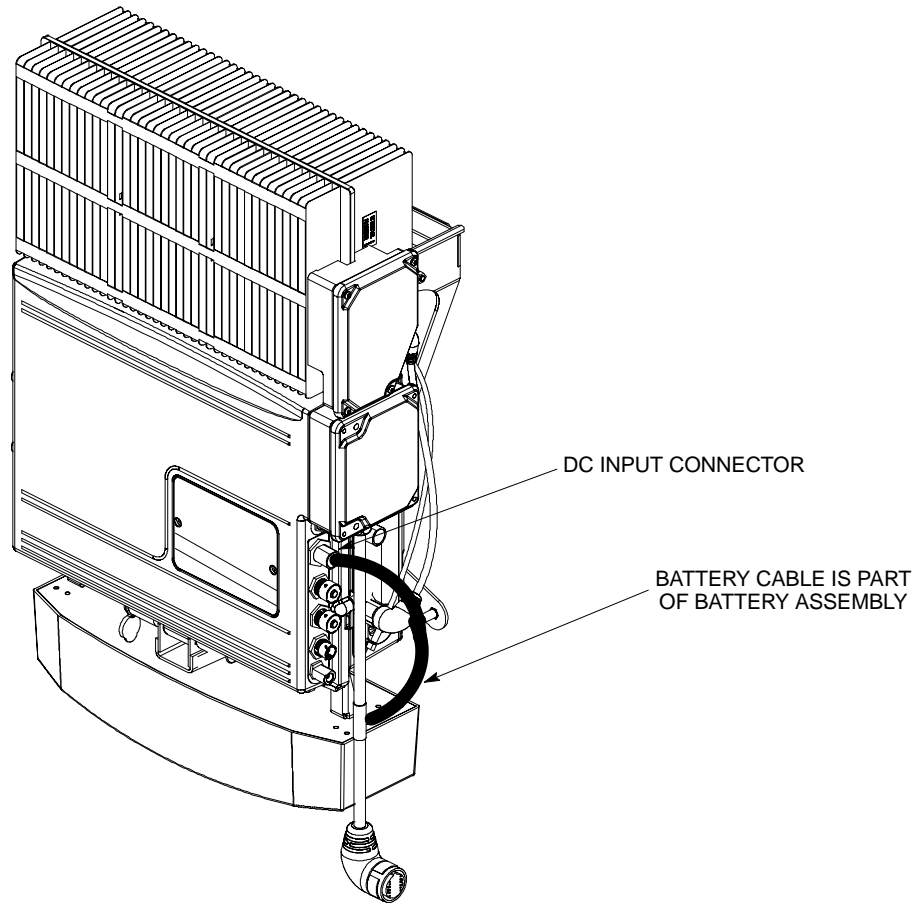
Use the following procedure in Table 6-15 to attach the short duration battery (DC input) cable to the DC input connector. Refer to Figure 6-14. The cable should be connected before the solar cover is attached.

The short duration battery should not be opened under any circumstances. No wire termination is required by the user except connection to the BTS, with the provided connector.

Table 6-15: Procedure to Install Short Duration Battery Cable to Unit

Step	Action
1	Ensure that the ground wire has a connection to unit and the Master Ground Bus (also called Master Ground Plate).
2	Verify that the DC power breaker is open. The white collar on the breaker is visible when it is open.
3	Place the round, black connector of the DC input cable onto the DC input connector on the BTS. Refer to Figure 6-14. Turn the cable connector to align its key.
4	Hand tighten the connector (a clicking sound is heard, this is normal). When the red line on the connector on the unit is covered, connection is complete.

Figure 6-14: Battery Cable Installation



6

AC Power Cabling

Objective

The objective of this procedure is to attach the AC input power cable to the unit. Use this procedure only when AC power is used to power the unit.

If the Primary Surge Suppressor is not used, the AC Installation Box is required for all outdoor mounting applications.



WARNING

This equipment uses dangerous voltages and is capable of causing death. Use extreme caution when handling and testing this equipment.

Required Cables

The following cables in Table 4-1 are necessary to do this procedure:

Cable	Qty.	Part Number	Description
S	1–4	3087854C02	AC input cable, 18 AWG, 5 m, is designed for 120–240 VAC power input. Cable has Deutsche connector on both ends.

Power Cable and Connector Signal Information

The AC input connector is located on the side of the unit as shown in Figure 6-15. The unit is designed for 88–260 VAC power input.

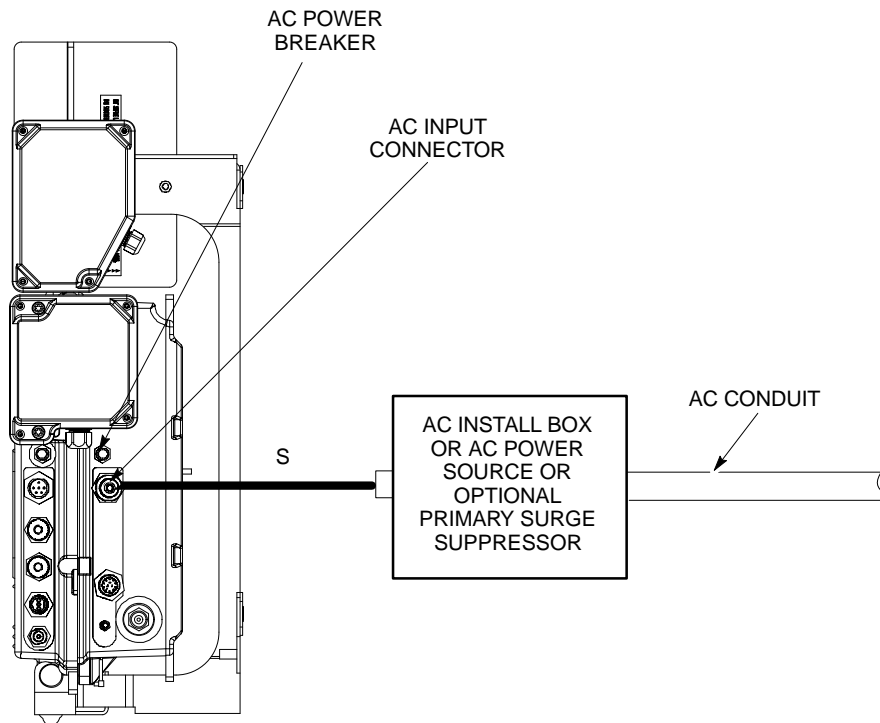
Procedure to Connect AC Input Power Cable to the Unit

Use the following procedure in Table 6-17 to connect the AC input cable to the unit. The AC input cable should be connected before the solar cover is attached.

Step	Action
1	Ensure that the ground wire has a connection to the Master Ground Bus (also called Master Ground Plate).
2	Verify that the AC power breaker is open. The white collar on the breaker is visible when it is open.
3	Place the round, black connector on the AC input cable (cable S) onto the AC input connector. See Figure 6-15. Turn the cable connector to align its key.
4	Hand tighten the connector (a clicking sound is heard, this is normal). When the red line on the connector on the unit is covered, connection is complete.

AC Power Cabling – continued

Figure 6-15: AC Power Cabling Details



DC Power Cabling

Objective

The objective of this procedure is to attach the DC input cable to the unit. Use this procedure only when DC power is used to power the unit.



WARNING

This equipment uses dangerous voltages and is capable of causing death. Use extreme caution when handling and testing this equipment.

Required Cables

The following cables in Table 6-18 are necessary to do this procedure.

Cable	Qty.	Part Number	Description
U	1	3087854C04	DC input cable, 18 AWG, 5 m, is designed for 20 to 30 VDC power input.

Power Cable and Connector Signal Information

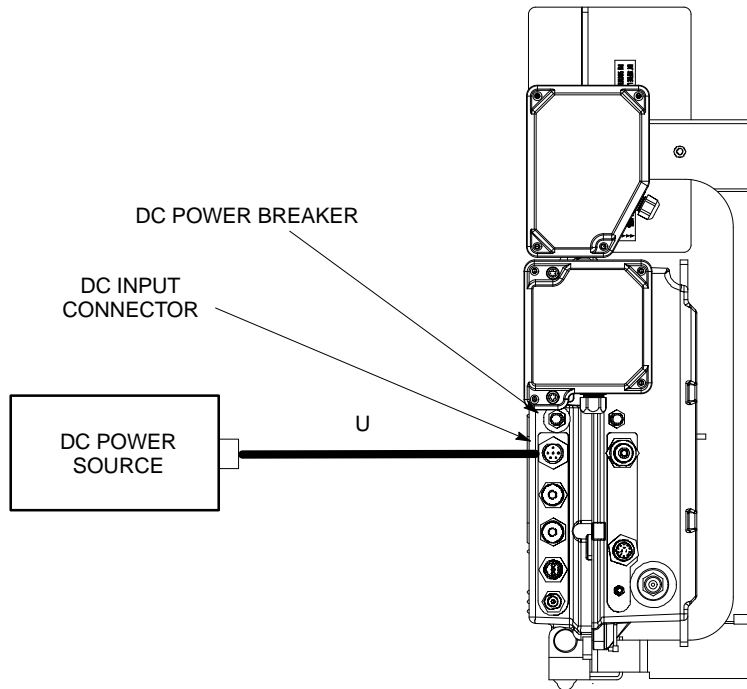
The DC input connector is located on the side of the unit. The unit is designed for 20 to 30 VDC.

Procedure to Connect DC Input Power Cabling to the Unit

Use the following procedure in Table 6-19 to connect the DC input cable to the unit. Refer to Figure 6-16. The DC input cable should be connected before the solar cover is attached.

Step	Action
1	Ensure that the ground wire has a connection to the Master Ground Bus (also called Master Ground Plate).
2	Verify that the DC power breaker is open. The white collar on the breaker is visible when it is open.
3	Place the round, black connector of the DC input cable onto the DC input connector. See Figure 6-16. Turn the cable connector to align its key.
4	Hand tighten the connector (a clicking sound is heard, this is normal). When the red line on the connector on the unit is covered, connection is complete.

Figure 6-16: DC Power Cabling Details



6

Antenna Cabling for Sites Equipped with Customer–Supplied Site I/O Interface

Objective

The objective of this procedure is to attach the antenna cabling for one or more units.

If your BTS is equipped with the optional Primary Surge Suppressor, then proceed to the “Antenna Cabling for Sites Equipped with the Optional Primary Surge Suppressor” procedure in Chapter 6.

Required Cables

The following cables in Table 6-20 are necessary to do this procedure.

Table 6-20: Required Cables for Antenna Cabling			
Cable	Qty.	Part Number	Description
C	1–8	Customer Supplied	Antenna cable, 50–Ohm coaxial terminated with at least one male, N–type connector.

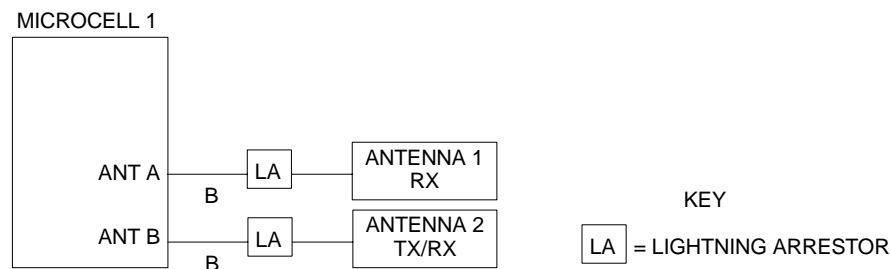
Procedure to Install Antenna Cabling

The cabling is installed between the unit(s) and the external lightning arrestors. If lightning arrestors are not present, it connects to the antenna.

If your BTS has one unit, cable the unit as shown in Figure 6-17. Torque the connectors to 4.3 N–M.

If your BTS has more than one unit (logical BTS), cable the unit as shown in Figure 6-18, Figure 6-19, or Figure 6-20.

Figure 6-17: Antenna Cabling Details for One MicroCell Unit



Antenna Cabling for Sites Equipped with Customer–Supplied Site I/O Interface – continued

Figure 6-18: Antenna Cabling for Two MicroCells

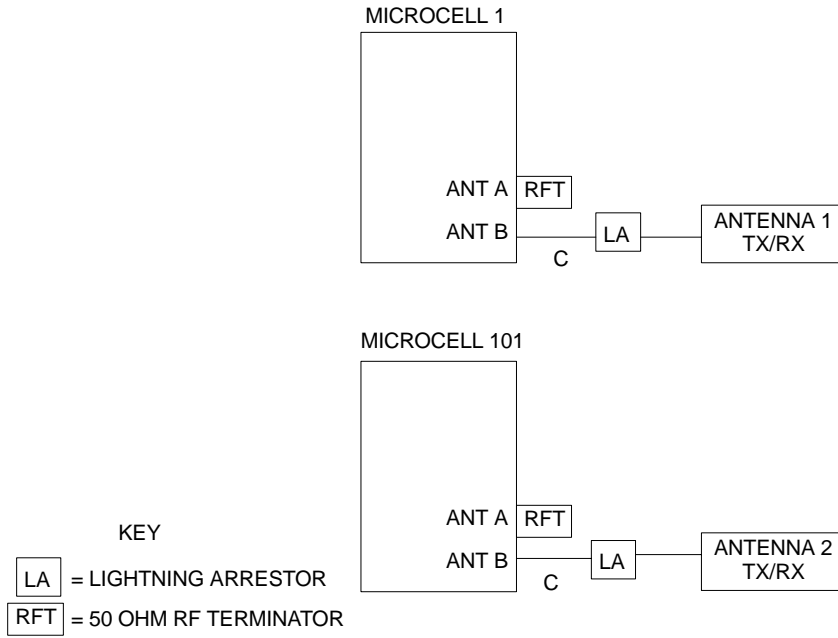
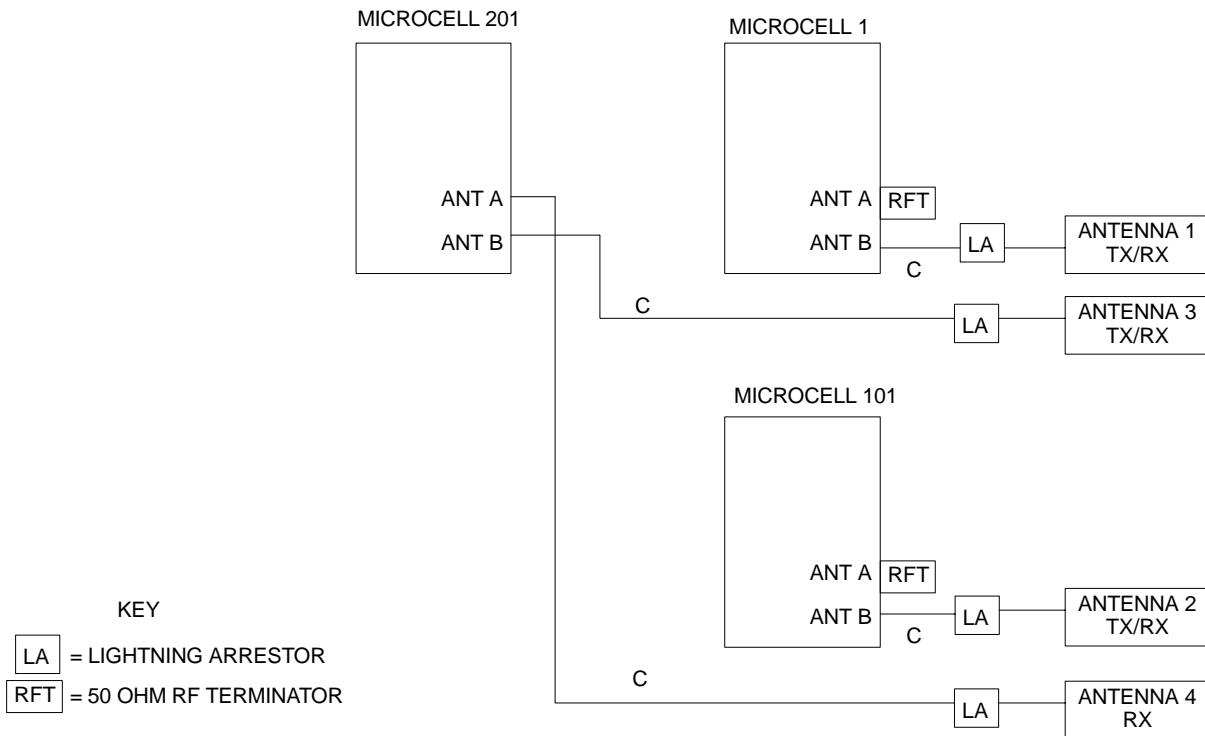


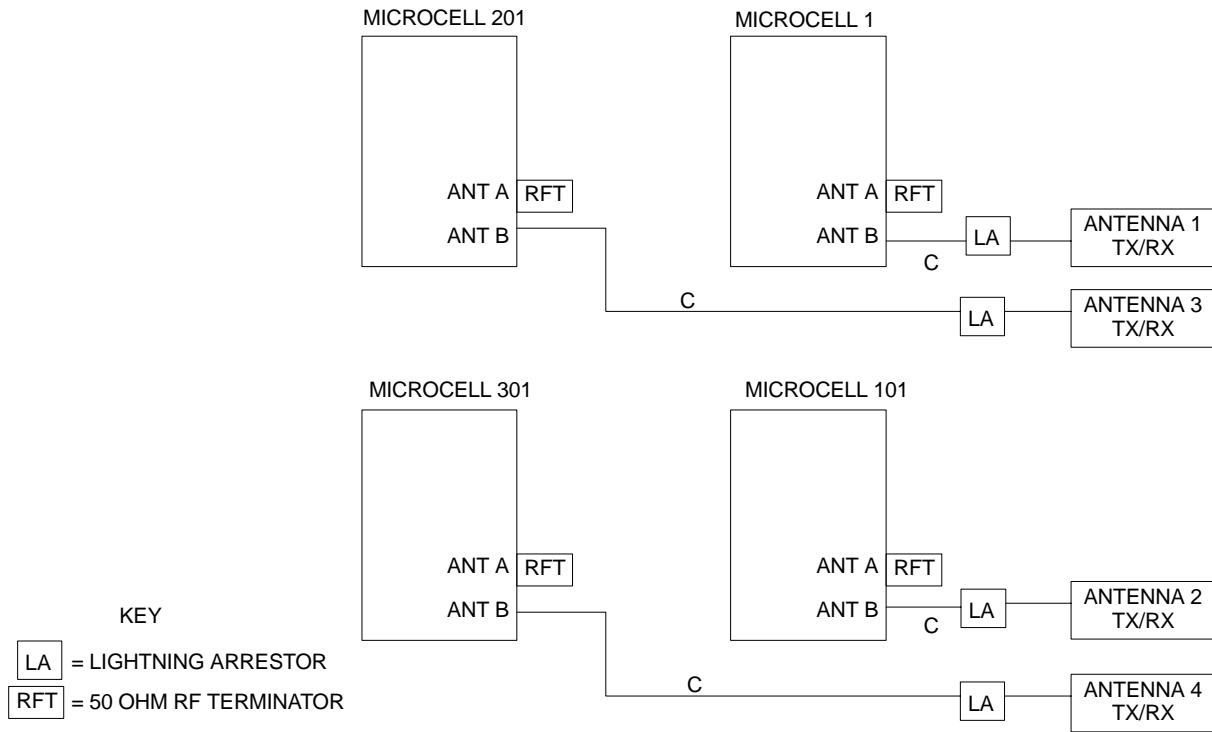
Figure 6-19: Antenna Cabling for Three MicroCells



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Antenna Cabling for Sites Equipped with Customer–Supplied Site I/O Interface – continued

Figure 6-20: Antenna Cabling for Four MicroCells



Antenna Cabling for Sites Equipped with Optional Primary Surge Suppressor

Objective

The objective of this procedure is to attach the antenna cabling for one or more units at a site equipped with the optional Primary Surge Suppressor.

Cable Labels

The cable designations are referenced to Table 4-1 in the “Cable Description” area of Chapter 4.

Required Cables

The following cables in Table 6-21 are necessary to do this procedure.

Table 6-21: Required Cables for Antenna Cabling			
Cable	Qty.	Part Number	Description
C	1–8	Customer Supplied	Antenna cable, 50–Ohm coaxial terminated with at least one male, N–type connector.
D	2–6	Customer Supplied	Antenna cable, terminated with 2 male N–type connectors

Procedure to Install Antenna Lightning Arrestors and Antenna Cabling

Lightning arrestors are shipped/installed in the Primary Surge Suppressor for one or two unit configurations. If you are expanding from two to three or from three to four units, then you must install lightning arrestors for units three and four. Refer to the procedure in Table 6-22 to install antenna lightning arrestors.

If your BTS has one unit and is equipped with the Primary Surge Suppressor, cable the unit as shown in Figure 6-22.

If your BTS has more than one unit and is equipped with the Primary Surge Suppressor, cable the units as shown in Figure 6-23 through Figure 6-25.

Table 6-22: Procedure to Install Antenna Lightning Arrestors	
Step	Action
1	Remove the 3/4–in. nut and lock washer from N–type connector on antenna lightning arrestor. Refer to Figure 6-21.
2	Insert the antenna lightning arrestor through hole in mounting flange. NOTE Antenna cable connectors may be connected to either side of the antenna protectors on the Primary Surge Suppressor.
3	Install the lockwasher and 3/4–in. nut on the N–type connector.
4	Use a 3/4–in. wrench to tighten to 20 N–m.

Antenna Cabling for Sites Equipped with Optional Primary Surge Suppressor – continued

Figure 6-21: Installation of Third and Fourth Antenna Lightning Arrestors

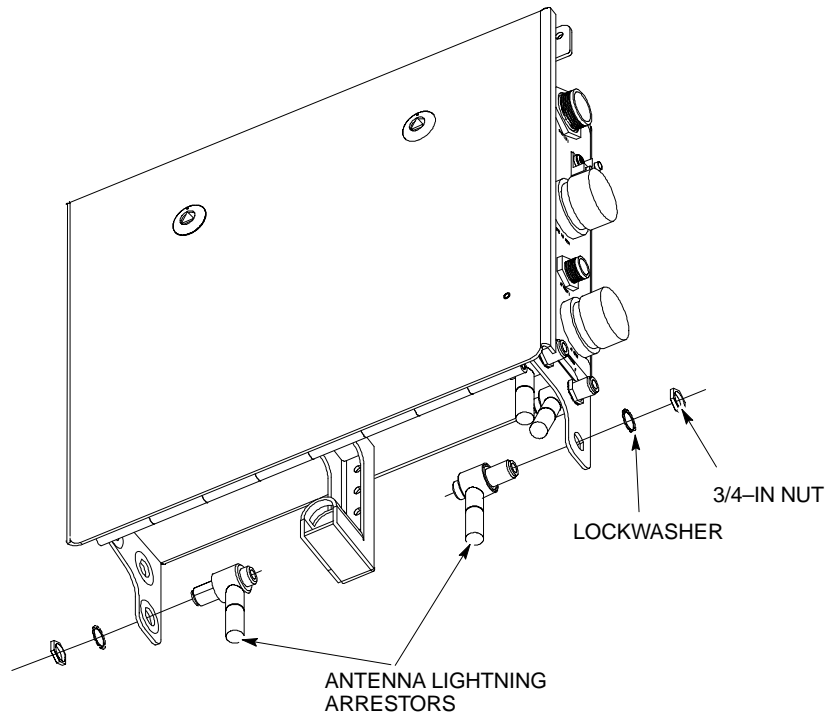
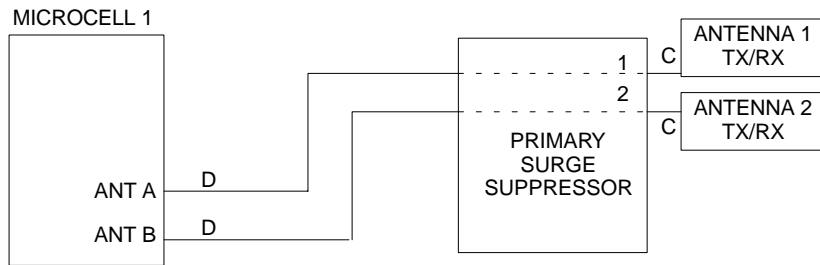
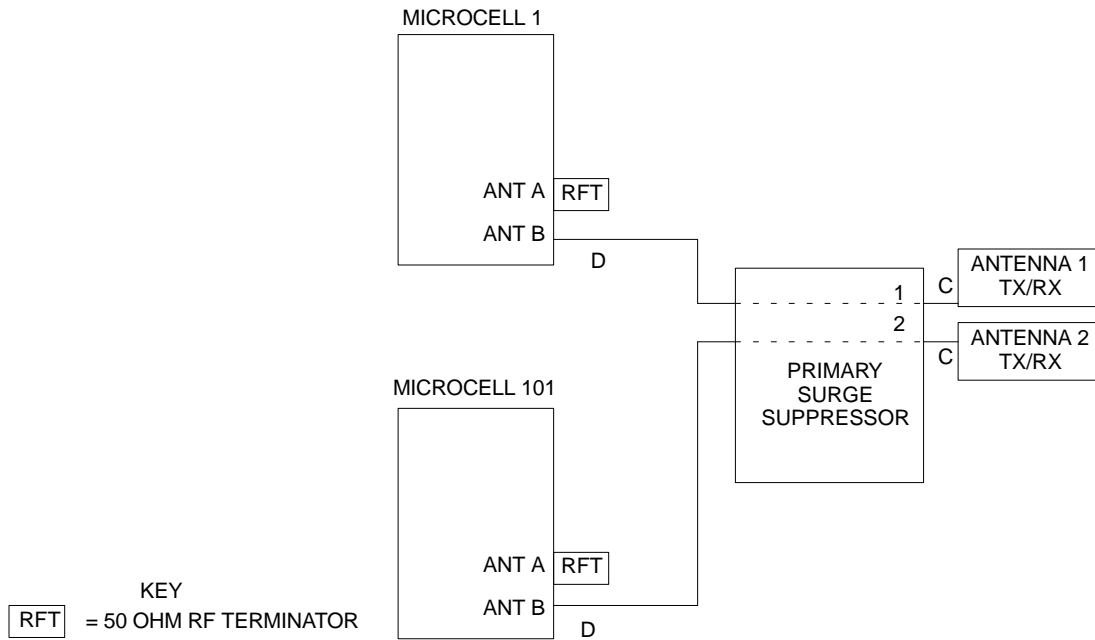


Figure 6-22: Antenna Cabling Details for MicroCell Equipped with Primary Surge Suppressor



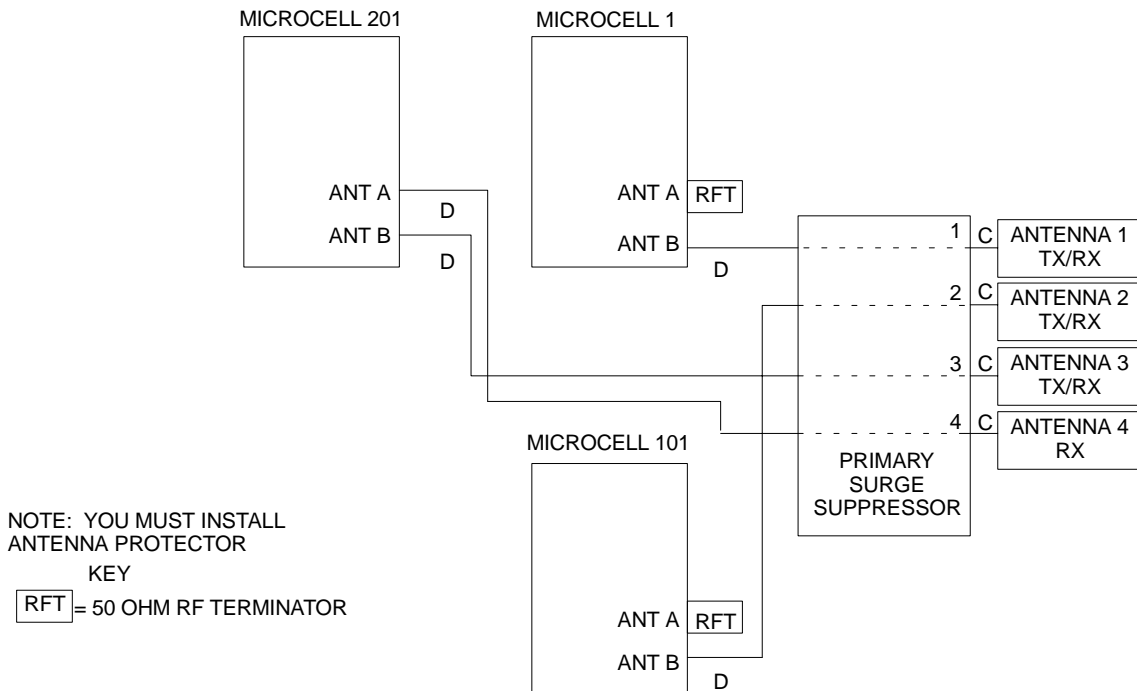
Antenna Cabling for Sites Equipped with Optional Primary Surge Suppressor – continued

Figure 6-23: Antenna Cabling for Two MicroCells Equipped with Primary Surge Suppressor



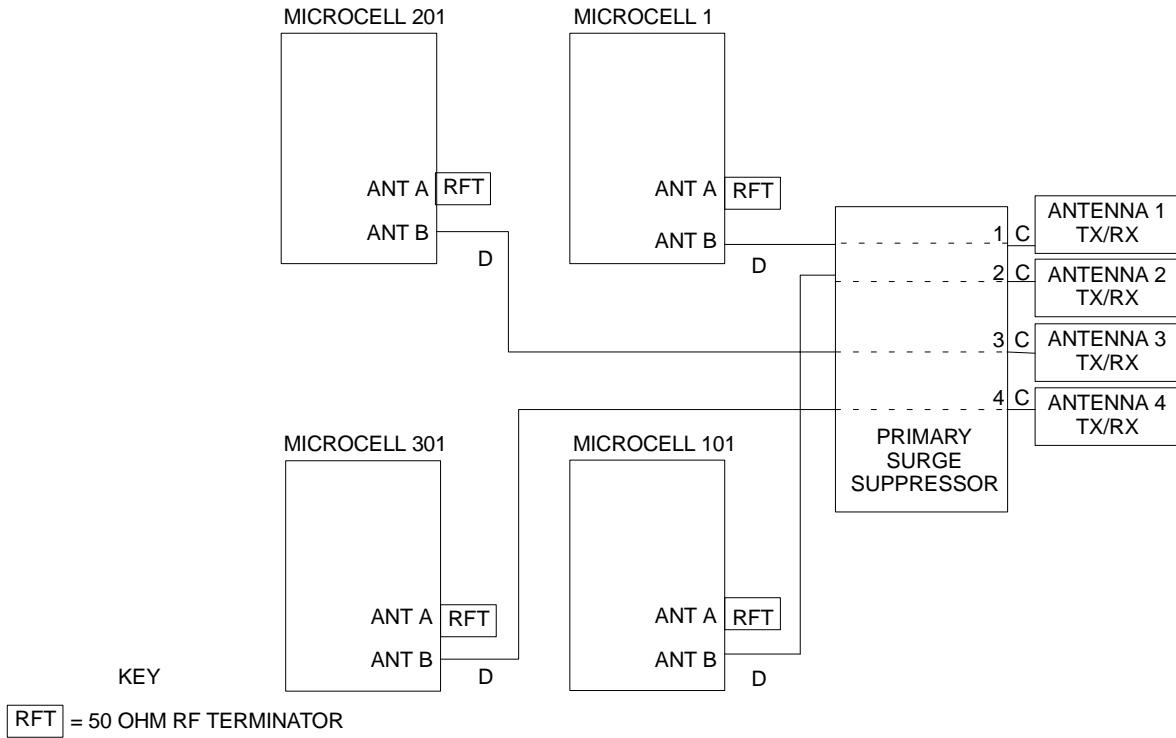
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Figure 6-24: Antenna Cabling for Three MicroCells Equipped with Primary Surge Suppressor



Antenna Cabling for Sites Equipped with Optional Primary Surge Suppressor – continued

Figure 6-25: Antenna Cabling for Four MicroCells Equipped with Primary Surge Suppressor



MIB Cabling for Multi-Unit Logical BTS Configurations

Overview

The objective of this procedure is to attach the MIB cabling for a multi-unit logical BTS configuration.

Cable Labels

The cable designations are referenced in Table 4-1 in the “Cable Descriptions” procedure in Chapter 4.

Required Tools and Equipment

Motorola parts

The following terminators in Table 6-23 are necessary to do this procedure for a single-unit installation and are shipped with the unit:

Table 6-23: MIB Terminators		
Quantity	Part Number	Description
3	3009865S04	Dust cap
1	3009865S02	Terminator, MIB (Microcell)

Motorola kits for multi-unit installations

Table 6-24 through Table 6-31 give the Motorola kit numbers, cable descriptions and part numbers for the Motorola kits required to perform a multi-unit installation. Several kits are available depending upon the carrier installation.

Table 6-24: MicroCell Expansion Kit for Units 1 to 2 Short MIB A (Cubicle) – T448B			
Cable	Qty.	Motorola Part Number	Description
n/a	2	5882106P01	50 Ohm Antenna Terminator
A	1	3087701C02	Ground cable, 8 -AWG, insulated copper wire. Requires one ring lug connector.
K	1	3087707C09	MIB A cable (short, 1m; micro)

Table 6-25: Microcell Expansion Kit for Units 1 to 2 Long MIB A (Non-Cubicle) – T448A			
Cable	Qty.	Motorola Part Number	Description
n/a	2	5882106P01	50 Ohm Antenna Terminator
A	1	3087701C02	Ground cable, 8 -AWG, insulated copper wire. Requires one ring lug connector.
E	1	3087707C03	MIB A cable (current, 2m; micro)

MIB Cabling for Multi-Unit Logical BTS Configurations – continued

Table 6-26: Microcell (800 MHz) Expansion Kit for Units 2 to 3 Current 2m MIB B – T448AR

Cable	Qty.	Motorola Part Number	Description
A	1	3087701C02	Ground cable, 8 -AWG, insulated copper wire. Requires one ring lug connector.
F	1	3087707C04	MIB B cable (current, 2m)
n/a	2	8009573X06	Lightning arrestor

Table 6-27: Microcell (800 MHz) Expansion Kit for Units 2 to 3 Long 5m MIB B – T448AS

Cable	Qty.	Motorola Part Number	Description
A	1	3087701C02	Ground cable, 8 -AWG, insulated copper wire. Requires one ring lug connector.
I	1	3087707C07	MIB B cable (long, 5m)
n/a	2	8009573X06	Lightning arrestor

Table 6-28: Microcell (1.9 GHz) Expansion Kit for Units 2 to 3 Current 2m MIB B – T448AY

Cable	Qty.	Motorola Part Number	Description
A	1	3087701C02	Ground cable, 8 -AWG, insulated copper wire. Requires one ring lug connector.
F	1	3087707C04	MIB B cable (current, 2m)
n/a	2	8009573X01	Lightning arrestor

Table 6-29: Microcell (1.9 GHz) Expansion Kit for Units 2 to 3 Long 5m MIB B – T448AZ

Cable	Qty.	Motorola Part Number	Description
A	1	3087701C02	Ground cable, 8 -AWG, insulated copper wire. Requires one ring lug connector.
I	1	3087707C07	MIB B cable (long, 5m)
n/a	2	8009573X01	Lightning arrestor

Table 6-30: Microcell Expansion Kit for Units 3 to 4 Current 2m MIBs A and C – T448H

Cable	Qty.	Motorola Part Number	Description
A	1	3087701C02	Ground cable, 8 -AWG, insulated copper wire. Requires one ring lug connector.
n/a	2	5882106P01	50 Ohm Antenna Terminator
E	1	3087707C03	MIB A cable (current, 2m; micro)
G	1	3087707C05	MIB C cable (current, 2m)

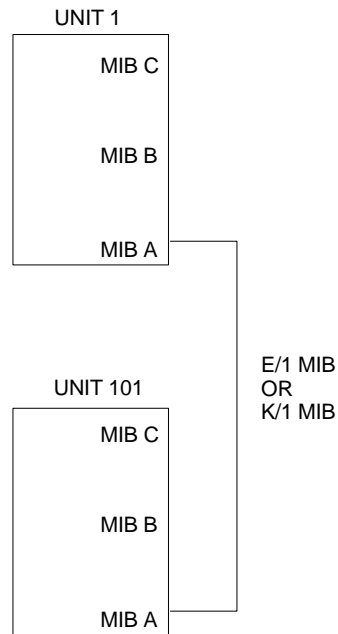
MIB Cabling for Multi-Unit Logical BTS Configurations – continued

Table 6-31: Microcell Expansion Kit for Units 3 to 4 Longer 5M MIBs A and C – T448G			
Cable	Qty.	Motorola Part Number	Description
n/a	2	5882106P01	50 Ohm Antenna Terminator
A	1	3087701C02	Ground cable, 8 -AWG, insulated copper wire. Requires one ring lug connector.
E	1	3087707C03	MIB A cable (current, 5m; micro)
J	1	3087707C08	MIB C cable (long, 5m)

Procedure to Install MIB Cabling

Cable the units as shown in Figure 6-28, Figure 6-27 or Figure 6-26. Refer to the “Connector Locations” procedure in this chapter. Make sure to terminate any unused connectors.

Figure 6-26: MIB Cabling for Two Units



MIB Cabling for Multi-Unit Logical BTS Configurations – continued

Figure 6-27: MIB Cabling for Three Units

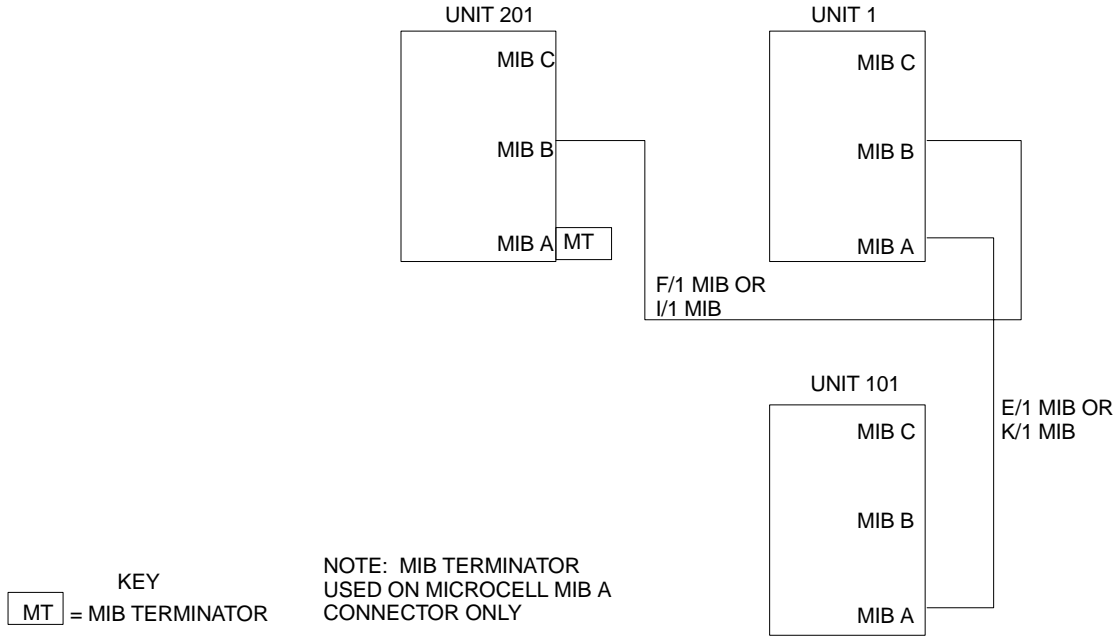
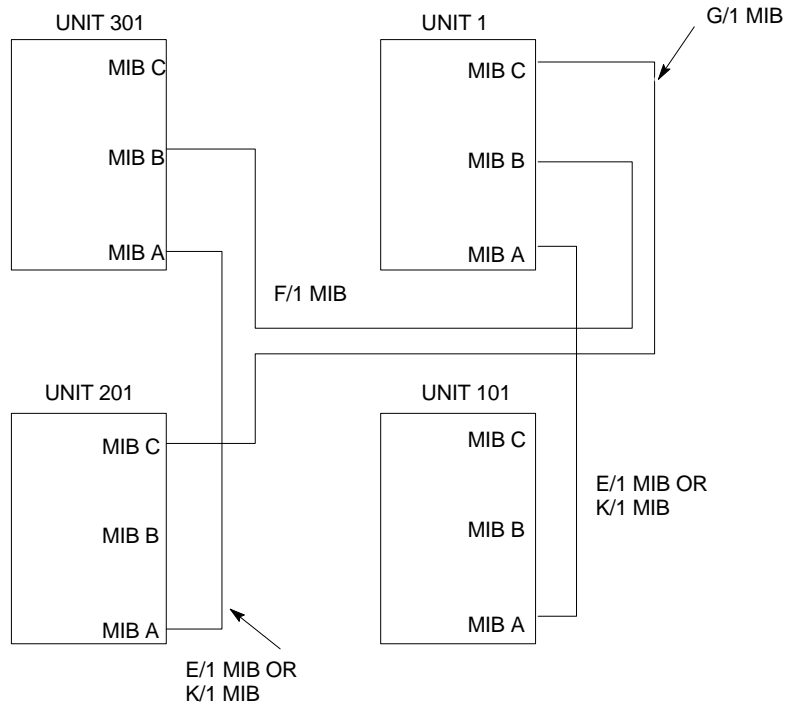


Figure 6-28: MIB Cabling for Four Units



Terminating Unused Connections

Objective

The objective of this procedure is to terminate any unused connections.



IMPORTANT

Terminate all unused connections.

List of Terminators for Unused Connections

Table 6-32: List of Terminators for Unused Connections		
Connector	Motorola Part #	Description
AC Input	5887659C02	Terminator, AC
DC Input	5887659C04	Terminator, DC
MIB A	3009865S02	Terminator, MIB
MIB B, C	3009865S04	Cap, MIB
SU Distribution	0187683C02	Terminator, SMA
SU Digital	5887659C02	Terminator, Power SC300 AC

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Procedure

The unit is shipped with the above terminators. Verify that a terminator is on each unused connector. Tighten the SMA terminators using a 5/16 Breakaway 9 in. lb. Hand tighten all other terminators.

Powering on the Unit and Mounting the Solar Cover

Objective

The objective of this procedure is to power on the unit and mount the solar cover on the chassis.

You May Want to Wait

Do not mount the front solar cover on the unit if you wish to perform the Acceptance Test Procedures (ATP). Otherwise, mount the front solar cover until you perform the ATP.

Required Tools and Materials

The following tamper-resistant keys are required to do this procedure.

- Key for tamper-resistant stud (provided) for the solar cover.
- Key for tamper-resistant locks (provided) for the Primary Surge Suppressor.

Procedure to Power On the Unit and Mount Solar Cover

Refer to the procedure in Table 6-33 to power on the unit and mount the solar cover.

Table 6-33: Procedure to Power on the Unit and Mount the Solar Cover	
Step	Action
1	<p>△ WARNING</p> <p>Make sure the unit is properly grounded and that all connections are connected before powering on unit.</p> <p>If not applying AC power, go to step 2. If applying AC power, push down on the AC power breaker until it clicks and remains down. The white collar on the breaker is not visible when the breaker is closed.</p>
2	<p>If not applying DC power or providing for battery backup, go to step 3. If applying DC power or have short or long duration batteries present, push down on the DC power breaker until it clicks and remains down. The white collar on the breaker is not visible when the breaker is closed.</p>
3	<p>Position the solar cover so the cooling vents are at the top and place the solar cover on the unit. Use the key to tighten the four tamper-resistant studs (two on each side). Refer to Figure 6-29.</p>

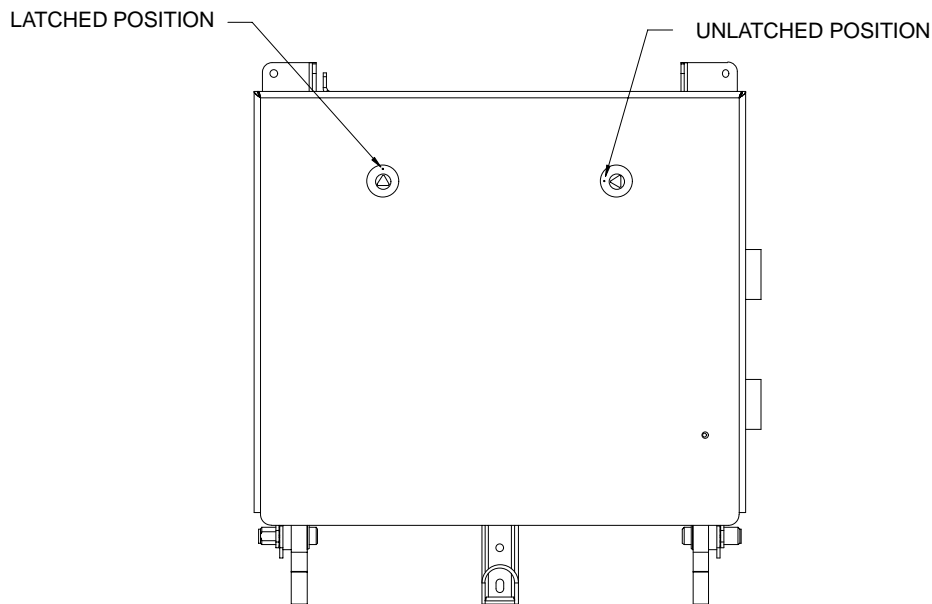
Procedure to Power On the Surge Suppressor, the Unit, and Mount the Solar Cover

If your BTS is equipped with the Primary Surge Suppressor, refer to the procedure in Table 6-34 to power on the unit and mount the solar cover.

Table 6-34: Procedure to Power on the Surge Suppressor, the Unit, and Mount the Solar Cover	
Step	Action
1	<p>If closed, open the front cover of the Primary Surge Suppressor. Use the tamper-resistant key and turn both the locks counter-clockwise. Refer to Figure 6-29.</p>
. . . continued on next page	

Table 6-34: Procedure to Power on the Surge Suppressor, the Unit, and Mount the Solar Cover	
Step	Action
2	If not applying AC power, go to step 6. If applying AC power, push the main AC power breaker on the Surge Suppressor to the “On” position. Refer to Figure 6-30.
3	Push the AC power breakers for each individual carrier to the “On” position. All unused power breakers must be in the “Off” position.
4	Close the Primary Surge Suppressor door. Use the tamper-resistant key to turn the locks clockwise to the “Locked” position.
5	Push down on the AC power breaker on the unit until it clicks and remains down. The white collar on the breaker is not visible when the breaker is closed.
6	If not applying DC power or providing for battery backup, go to step 7. If applying DC power or have short or long duration batteries present, push down on the DC power breaker until it clicks and remains down. The white collar on the breaker is not visible when the breaker is closed.
7	Position the solar cover so the cooling vents are at the top and place the solar cover on the unit. Use the tamper-resistant key to tighten the four screws (two on each side) to 2.2 N–M. Refer to Figure 6-31.

Figure 6-29: Lock Positions on Primary Surge Suppressor



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Figure 6-30: Location of AC Power Breakers on Primary Surge Suppressor

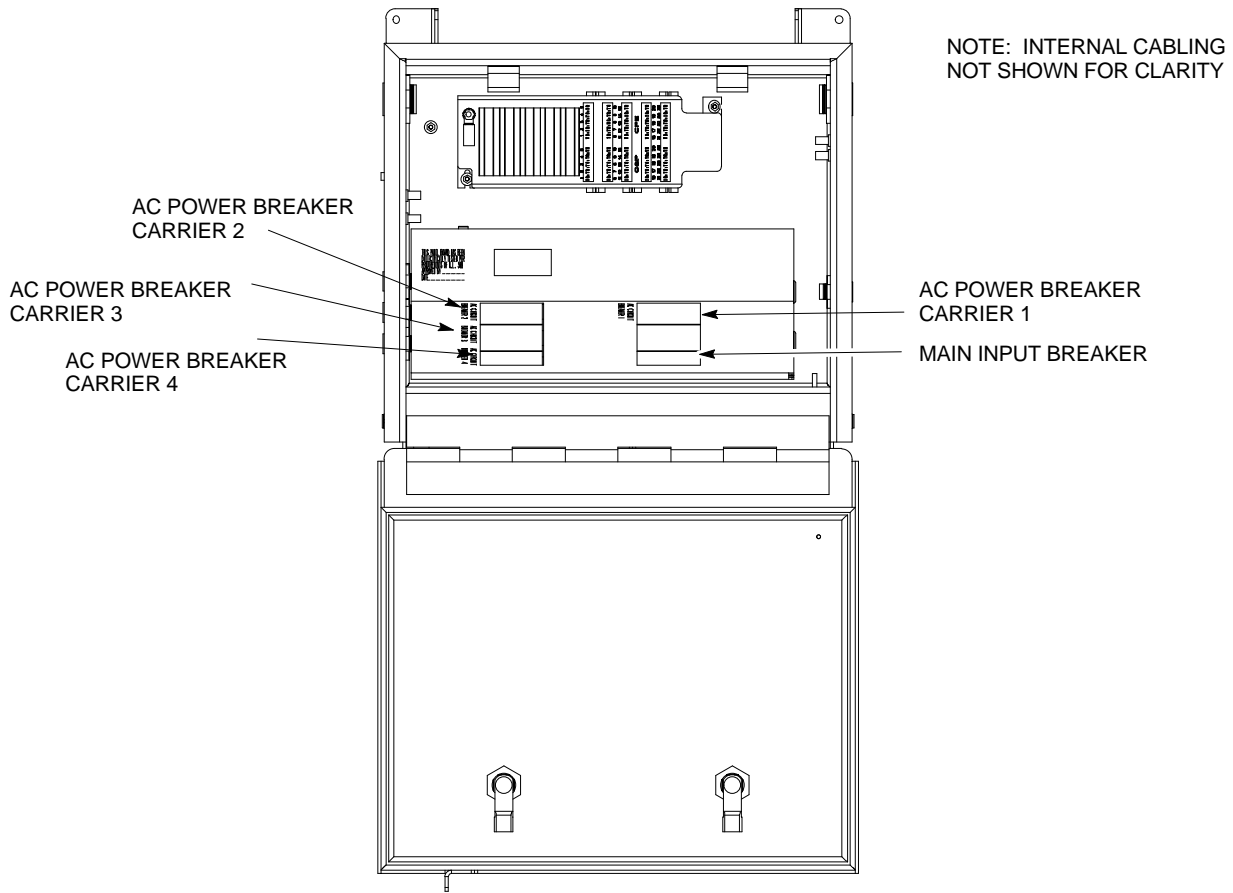
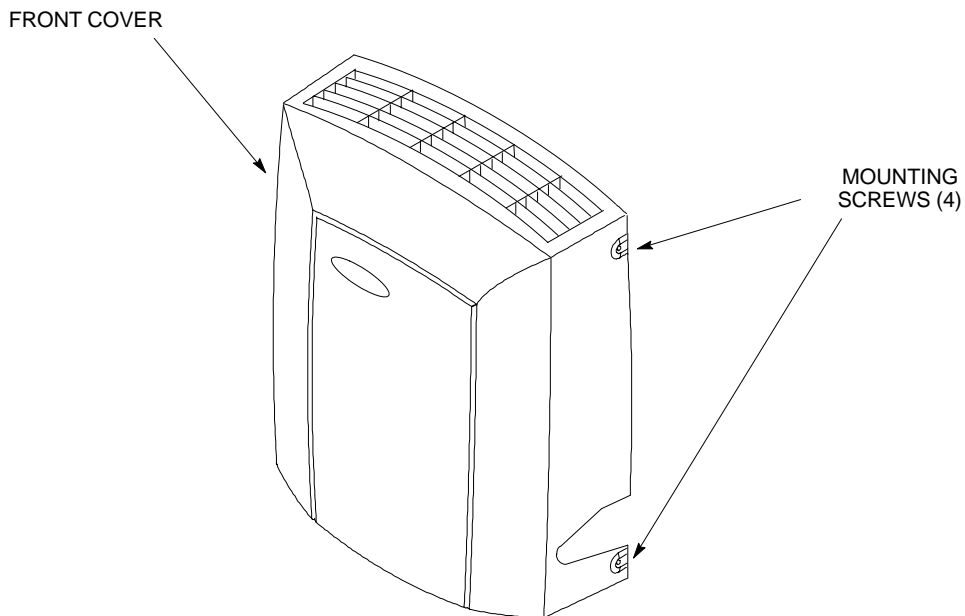


Figure 6-31: Front Solar Cover



Site Cleanup

Remove Protective Covering

Remove any antistatic plastic or cloth sheeting that was used to cover the equipment.

Lighting Fixtures

Remove the masking tape from the fluorescent light fixtures.

Tools

Place all hand and power tools in the installation tool kit or other appropriate place. Note any tools that need replacement, cleaning, or adjustment.

Materials

Place any leftover materials in a location specified by the site manager.

Remove Debris

Remove any packing material.

Ensure that all scrap materials have been removed from any tables or stands.

Clean/sweep the floor. Ensure that all alignment marks have been removed.

Environment

Remove any temporary weather protection used for installation.

Check that all covers are in place.

Check that the power connections are tight.

Organize any items (manuals, materials, etc.) left on site and place them in a location specified by the site manager.

Check that the unit lock is secure and key is removed.

Check that solar cover is secure.

Verify that cabling is properly secured between unit and enclosures.

Installation Completion Checklist

Directions

Fill out the installation completion checklist and make any necessary copies. You may copy this check sheet as needed.

Installation Completion Checklist

Date Hardware Installation Completed: _____

Site: _____

Serial Number(s): _____

Checklist Completed By: _____

Checklist Reviewed By: _____

Table 6-35: Installation Completion Checklist

Status	No.	Item	Notes
	1	Air flow clearance requirements are met.	
	2	Equipment is not damaged.	
	3	Mounting bracket is level and secure.	
	4	Back solar cover (if applicable) is securely attached to the mounting bracket.	
	5	RGPS head and mast are secure.	
	6	RGPS head has a clear view of the sky and is not in a location which accumulates debris. Make sure the RGPS is located away from the BTS transmit antenna.	
	7	Mounting bracket is connected to the Master ground.	
	8	The connection to the AC source is secure (if applicable).	
	9	The AC source is protected by a lightning arrester (if applicable).	
	10	The connection to the DC source is secure (if applicable).	
	11	The connection to the battery is secure (if applicable).	
	12	The connection to the auxiliary device is secure (if applicable).	
	13	The antenna connections are secure.	

. . . continued on next page

Installation Completion Checklist – continued

Table 6-35: Installation Completion Checklist

Status	No.	Item	Notes
	14	The antenna cables are protected by lightning arrestors (if applicable).	
	15	Customer input alarm connections are complete between the Site I/O cable and the Site I/O interface(s).	
	16	RGPS connections are complete between the Site I/O cable and the Site I/O interface(s).	
	17	Phone (modem) connections are complete between the Site I/O cable and the Site I/O interface(s).	
	18	Span connections are complete between the Site I/O cable and the Site I/O interface(s).	
	19	Span, phone, and RGPS connections are protected by lightning arrestors (if applicable).	
	20	The RGPS/HSO cabling for multi-BTS configurations is secure (if applicable).	
	21	The span line daisy chain cabling for multi-BTS configurations is secure.	
	22	The RGPS ground lead is connected to the BTS digital ground reference.	
	23	Fin covers are secure.	
	24	Installation hardware is removed.	
	25	The lock is in place and the key removed.	
	26	The site I/O junction box is secure.	
	27	The short-duration battery is secure (if applicable).	
	28	The short-duration battery cable (DC input cable) is secure (if applicable).	
	29	The earth ground connection is secure between the site I/O junction box and the mounting bracket.	
	30	The AC input cable is securely attached to the AC input connector (if applicable).	
	31	The DC input cable is securely attached to the DC input connector (if applicable).	
			... continued on next page

Installation Completion Checklist – continued

Table 6-35: Installation Completion Checklist

Status	No.	Item	Notes
	32	The DC output cable is securely attached to the DC output connector (if applicable).	
	33	The unit-to-unit SU cabling is secure (if applicable).	
	34	The unit-to-unit MIB cabling is secure (if applicable)	
	35	The antenna N-type connectors are securely attached to the antenna A and B connectors.	
	36	All unused ports are properly terminated.	
	37	All cables are dressed and tied.	
	38	The external power source (AC or DC) is active.	
	39	The AC and/or DC power breakers on the BTS are engaged (pushed in).	
	40	The front solar cover is secure (if applicable).	
	41	The auxiliary device is switched on (if applicable).	
	42	The site is cleaned, swept and trash removed.	
	43	The site specific documentation is present at the site.	

