

---

SL-1

## **2-Mb/s Remote Peripheral Equipment**

QCA146 cabinet and QSD74 shelf installation and testing

---

Publication number: Appendix 1 to 553-2741-200

Document release: Group F

Document status: Standard

Date: 90 11 02

-

© 1987 Northern Telecom

All rights reserved.

NT, Meridian 1, Meridian and SL-1 are trademarks of Northern Telecom.

Title to and ownership of SL-1 software shall at all times remain with Northern Telecom. SL-1 software shall not be sold outright and the use thereof by the customer shall be subject to the parties entering into agreement as specified by Northern Telecom.

Information contained in this document is subject to change. Northern Telecom reserves the right, without notice, to make changes in equipment or program components as progress in engineering, manufacturing, or technology may warrant.

## Reason for revision

---

**90 11 02**

Changes have been made to add references to publication 553-2931-200 for Generic X11 Supplementary Features (Phase 6) Remote Peripheral Equipment and include miscellaneous updates.

# Contents

---

<b>General</b>	<b>1-1</b>
<hr/>	
<b>Description</b>	<b>2-1</b>
QCA146 RPE cabinet	2-1
Expansion shelves	2-1
QSD74 RPE shelf	2-1
QSD66 PE expansion shelf	2-1
Loop assignment	2-2
Spare loop	2-2
Bus terminating units	2-2
Network extender	2-2
Other circuit packs	2-3
Power converters	2-3
AC power line cords	2-3
Reserve batteries	2-4
Cooling units	2-4
Environment	2-4
Grounding	2-4
<hr/>	
<b>Installation</b>	<b>3-1</b>
<hr/>	

## General

---

This Appendix describes the installation, connections and testing of Remote Peripheral Equipment (RPE) installed in a QCA146 RPE cabinet and in a QSD74 RPE shelf mounted in a cabinet either at the remote end or the local end.

A description of the use and operation of RPE is given in NTPs 553-2741-100 for Generic X08 and 553-2931-100 for Generic X11 Including Supplementary Features.

---

## Description

---

### QCA146 RPE cabinet

The single-tier base QCA146 RPE cabinet is equipped with an RPE shelf, one PE shelf capable of accommodating ten PE line packs and a peripheral buffer circuit pack, and the required power equipment. The base cabinet can be expanded to a two- or three-tier cabinet by the addition of RPE or PE expansion shelves.

*N* The expansion RPE shelf can only be added as the second  
*tier.* The PE expansion shelf can be the second or third tier.  
*t*  
*e*  
*:*

### Expansion shelves

#### QSD74 RPE shelf

The QSD74 RPE shelf assembly can be mounted in a QCA146 RPE cabinet at the remote location when additional loops are required. The shelf is designed to contain all the RPE related circuit packs required to operate three network loops. Included in the shelf assembly is a PE shelf containing eight slots for lines and trunks. The QSD74 shelf can also be used at the local end when the common equipment is housed in a QCA136 or QCA141 CE cabinet as shown in Figure 1-1.

#### QSD66 PE expansion shelf

The QSD66 PE expansion shelf is used to expand a QCA146 RPE cabinet to a two- or three-tier cabinet. The QSD66 is equipped with two PE shelves each capable of accommodating eight line circuit packs and one peripheral buffer circuit pack.

## 2-2 Description

---

Although the QSD66 PE expansion shelf provides dual-loop capabilities, the shelf can only be used in a single-loop mode when operating with RPE.

*e*  
:

### Loop assignment

Remote loops are defined in groups in software using Overlay Program 52 (refer to 553-2321-310 and 553-2321-311 for Generic X08, and 553-2931-200 and Appendix 1 to 553-2311-311 for Generic X11 with Supplementary Features). Each group can be assigned four members.

Loops are assigned from left to right on the RPE shelf. Circuit packs for each loop are located in the following slots in the RPE shelf:

- slots 2 and 3 for the first loop (LM0 in software)
- slots 5 and 6 for the second loop (LM1 in software)
- slots 10 and 11 for the third loop (LM2 or LM3 in software).

### Spare loop

When a spare loop is assigned to a shelf, it must be connected to the third loop on the shelf and defined as loop member LM3 in software.

The spare loop cannot be defined as LM0, LM1 or LM2 in software.

*t*  
*e*  
:

### Bus terminating units

Each QSD74 RPE shelf requires three Bus Terminating Units (BTUs). When used in a QCA146 cabinet (remote end), three QPC477A23 BTUs are required. When used in a QCA136 or QCA141 CE cabinet (local end), three QPC477A24 BTU are required.

Connectors for inserting the BTU are located between slots 3 and 4, 6 and 7, 9 and 10 at the front of the RPE shelf.

## Network extender

Each RPE shelf (local and remote ends) requires one QPC769 Network Extender circuit pack to connect a maximum of three network loops to the RPE equipment.

## Other circuit packs

Information about other RPE related circuit packs used with the QCA146 RPE cabinet is given in 553-2741-200 (X08) or 553-2931-200 (X11 Supplementary Features).

## Power converters

QPC705 Power Converter. The QPC705 power converter supplies  $\pm 15$  V (for SL-1 and digital telephones) and -150 V (for message waiting) to the PE shelf in the first tier of the cabinet. A QCAD278 cable is required to connect the QPC705 converter.

QPC706 Power Converter. The QPC706 power converter provides all the required power supplies to each PE shelf in the second and third tiers of the cabinet. One converter is required for each PE shelf and is installed in the designated slot on each shelf.

QPC691 and QPC355 Power Converters. One of these power converters is required in slot 13 of the QSD74 shelf when it is mounted in a QCA136 or QCA141 CE cabinet.

## AC power line cords

Three commercial power line cords can be used with the QCA146 RPE cabinet.

- (a) A QCAD273 line cord is used when a 115 V 15A power supply is provided. A NEMA type 5-15R power supply receptacle is required to accommodate the line cord.
- (b) A QCAD274 line cord is used when a 220 V 20A power supply is provided. A NEMA type L6-20R power supply receptacle is required to accommodate the line cord.
- (c) A QCAD275 line cord is used when a 110 V 30A power supply is provided. A NEMA type L5-30R power supply receptacle is required to accommodate the line cord.

## 2-4 Description

---

Power cords are connected to the rear of the -48 V rectifier in the cabinet.

### **Reserve batteries**

One or two QBL24 battery units containing rechargeable dry cells can be connected to the cabinet when service is required during commercial power failures.

The cabinet can also be connected to lead acid batteries through a QBL15 battery distribution box and a QCAD321 junction box assembly.

### **Cooling units**

QUD24 Cooling Units located in the cabinet top assembly are required in cabinet equipped with three tiers.

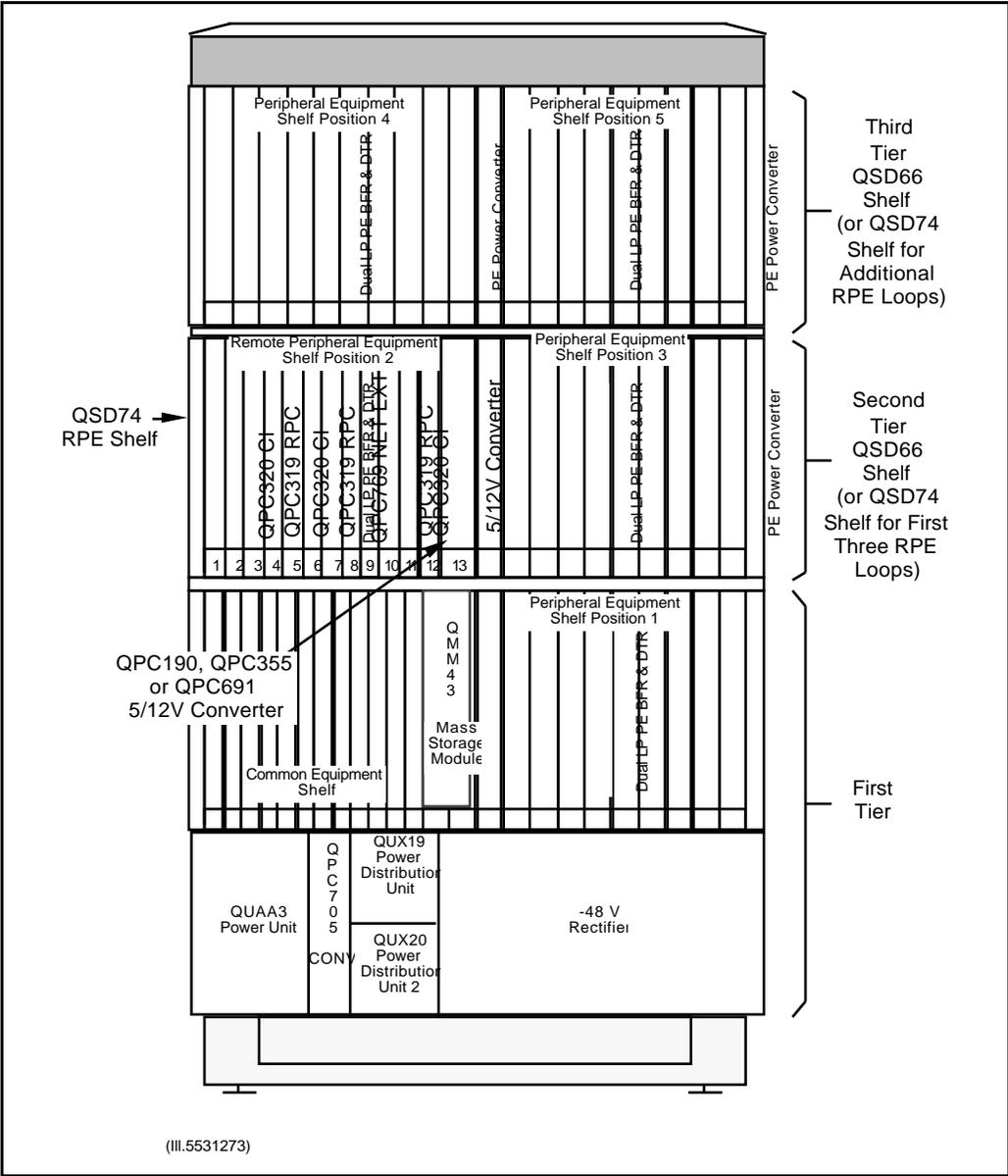
### **Environment**

The QCA146 should be installed in an environment suitable for Meridian SL-1. The location should be clean, dry and protected from extreme heat or cold. The operating environment described in 553-YYY1-200 for the location of the main Meridian SL-1 should be used as a guide when installing the QCA146 RPE cabinet.

### **Grounding**

The QCA146 RPE cabinet must be connected to a suitable building ground to ensure proper operation of the RPE equipment. Refer to 553-YYY1-200 for a description of suitable building grounds.

Figure 2-1  
Front view of typical CE cabinet



---

# Installation

---

## Procedures

Chart 3-1 describes the procedures to follow when installing a QCA146 RPE cabinet.

Chart 3-2 describes the procedures to follow when installing an additional QSD66 PE or QSD74 RPE shelf assembly in an existing QCA146 RPE cabinet.

Chart 3-3 describes the procedures to follow when installing a QBL24 Battery Unit.

Chart 3-4 describes the procedures to follow when installing an expansion QBL24 Battery Unit.

Chart 3-5 describes the procedures to follow when installing a QUA6 Power Fail Transfer Unit (PFTU).

Chart 3-6 describes the procedures to follow when installing alarm and transfer wiring (P10).

Chart 3-7 describes the procedures to follow when installing a QPC705 power converter.

Chart 3-8 describes the procedures to follow when installing QUD24 cooling units.

Chart 3-9 describes the procedures to follow when installing a QCAD321 junction box assembly.

Chart 3-10 describes the procedures to follow when installing QBL15 battery distribution box.

## 3-2 Installation

---

**Chart 3-1**  
**QCA146 RPE cabinet installation**

<b>Step</b>	<b>Procedure</b>
1	Transport the cabinet as close as possible to its final location.
2	Transport the remaining equipment to a convenient safe dry location.
3	Unpack and inspect the cabinet.
4	Remove cabinet from pallet and place on floor.
5	If casters are provided, tilt the cabinet and replace the levellers on the cabinet with four casters.
6	Adjust floor levellers or casters when in final location. When casters are provided, ensure that they are locked in position when the cabinet is in its final location.
7	Remove the front and rear cabinet covers.
8	If required, install additional shelves as described in Chart 2-2.
9	Install but do not connect a 6 AWG wire between the approved building ground and the ground lug identified by a ground symbol (Figure 2-1) at the rear of the cabinet.
10	At the building ground end of the wire, connect the 6 AWG wire to the approved building using at least two fastening devices and insulate the connections with electrical tape. Install a DO NOT DISCONNECT tag on the connection.
11	With an ohm meter, measure the resistance between the ground pin on the ac power cord plug and the ground lug at the rear of the cabinet (Figure 2-1). The resistance should be 0 . If greater than 0 , check power cord connections at rear of cabinet.
12	Ensure that the AC BRKR or the AC POWER breaker on the faceplate of the -48 V rectifier in the cabinet is set to OFF.
13	Connect the power line cord to the commercial ac power supply.

- 14 Measure the resistance between the system ground wire and the ground lug at the rear of the cabinet (Figure 2-1). If the resistance is greater than 5  $\Omega$ , check the building ground and ac panel connections.

**—continued—**

### 3-4 Installation

---

**Chart 3-1 (continued)**  
**QCA146 RPE cabinet installation**

---

<b>Step</b>	<b>Procedure</b>
15	Disconnect the power line cord from the commercial ac power supply.
16	Connect the 6 AWG building ground wire to the ground lug identified by a ground symbol at the rear of the cabinet (Figure 2-1).
17	If required, install reserve battery unit as described in Chart 2-3.
18	Install connecting blocks at cross-connect terminal. A typical wall-mounted terminal block layout is shown in Figure 2-2.
19	If a QUA6 Power Fail Transfer Unit (PFTU) is provided, install unit as described in Chart 2-4.
20	If required, install alarm and transfer (P10) wiring as described in Chart 2-5.
21	Install and terminate Peripheral Equipment (PE) cables from connectors A through G (first tier) and A through F (second and third tiers if equipped) at the rear of each PE shelf to cross-connect terminal (Figure 2-3). Cable terminating sequence is given in Table 2-A.
22	Install and connect two 75-ohm coaxial cables from the connectors at the rear of the RPE shelf (Figure 2-4) to Line Terminal Units (LTUs) for each loop.
23	Install and connect cable for customer defined alarms to alarm cable connector on RPE shelf backplane (Figure 2-4). Refer to 553-2741-200 (X08) or 553-2931-200 (X11 Supplementary Features) for connection information.
24	Ensure that the circuit packs are in their assigned position in the RPE shelf (Figure. 2-5).
<i>N</i>	Three Bus Terminating Units (BTUs) are required in

o the RPE shelf. At the remote end, QPC477A23 BTU are  
t installed from the front of the RPE shelf in the connectors  
e located between positions 3 and 4, 6 and 7, 9 and 10.  
:

**—continued—**

### 3-6 Installation

---

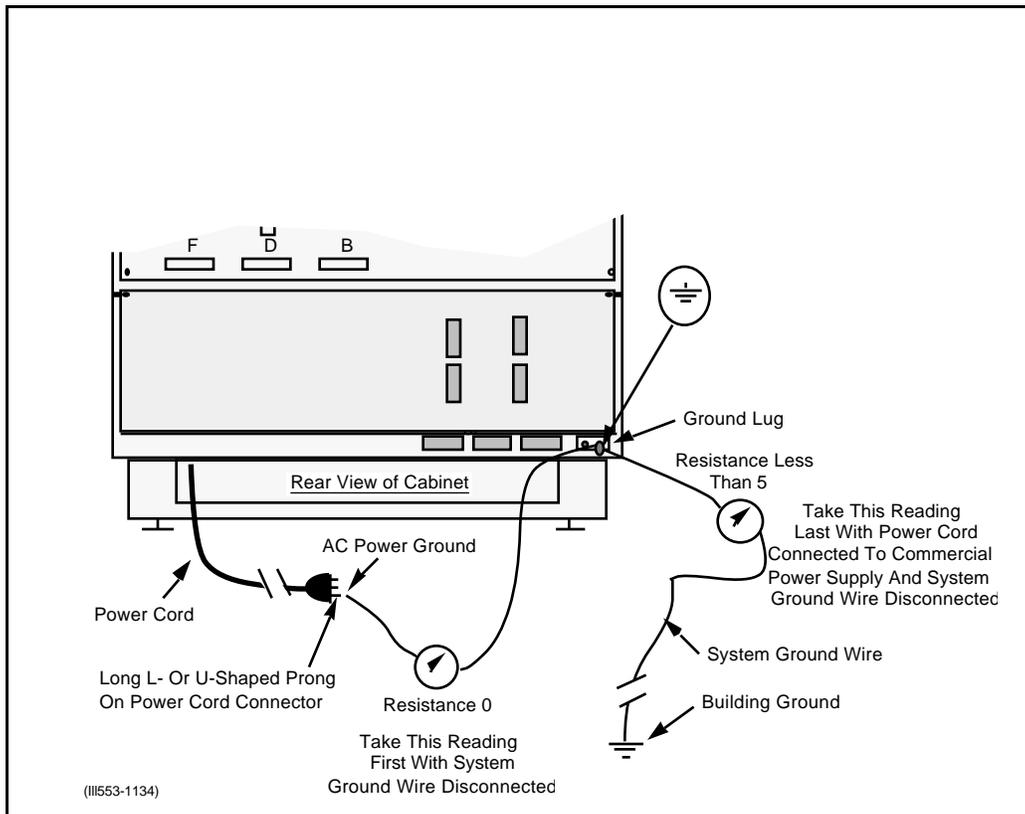
**Chart 3-1 (continued)**  
**QCA146 RPE cabinet installation**

---

<b>Step</b>	<b>Procedure</b>
25	Connect ac power line cord to commercial ac power supply.
26	Set all breakers at the front of the cabinet to ON.
27	Test RPE equipment as described in 553-2741-200 (X08) or 553-2931-200 (X11 Supplementary Features).
28	Install front and rear covers on cabinet.

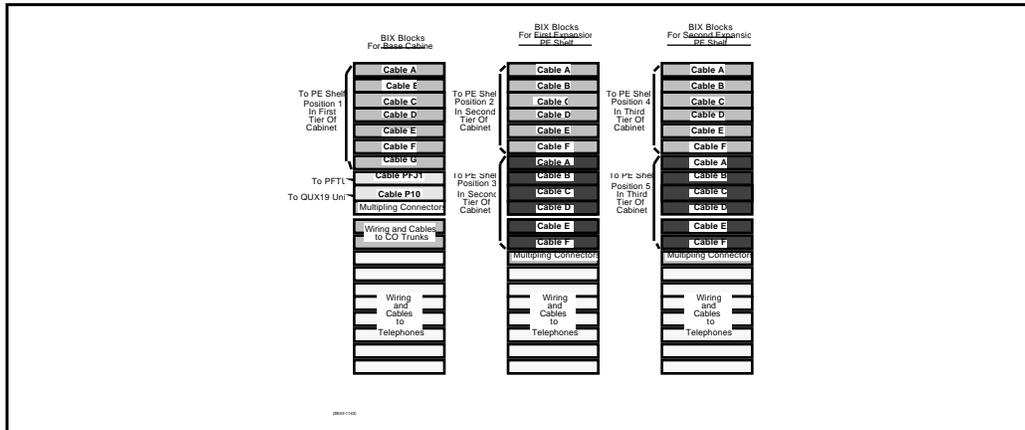
---

**Figure 3-1**  
**Ground connection and tests**



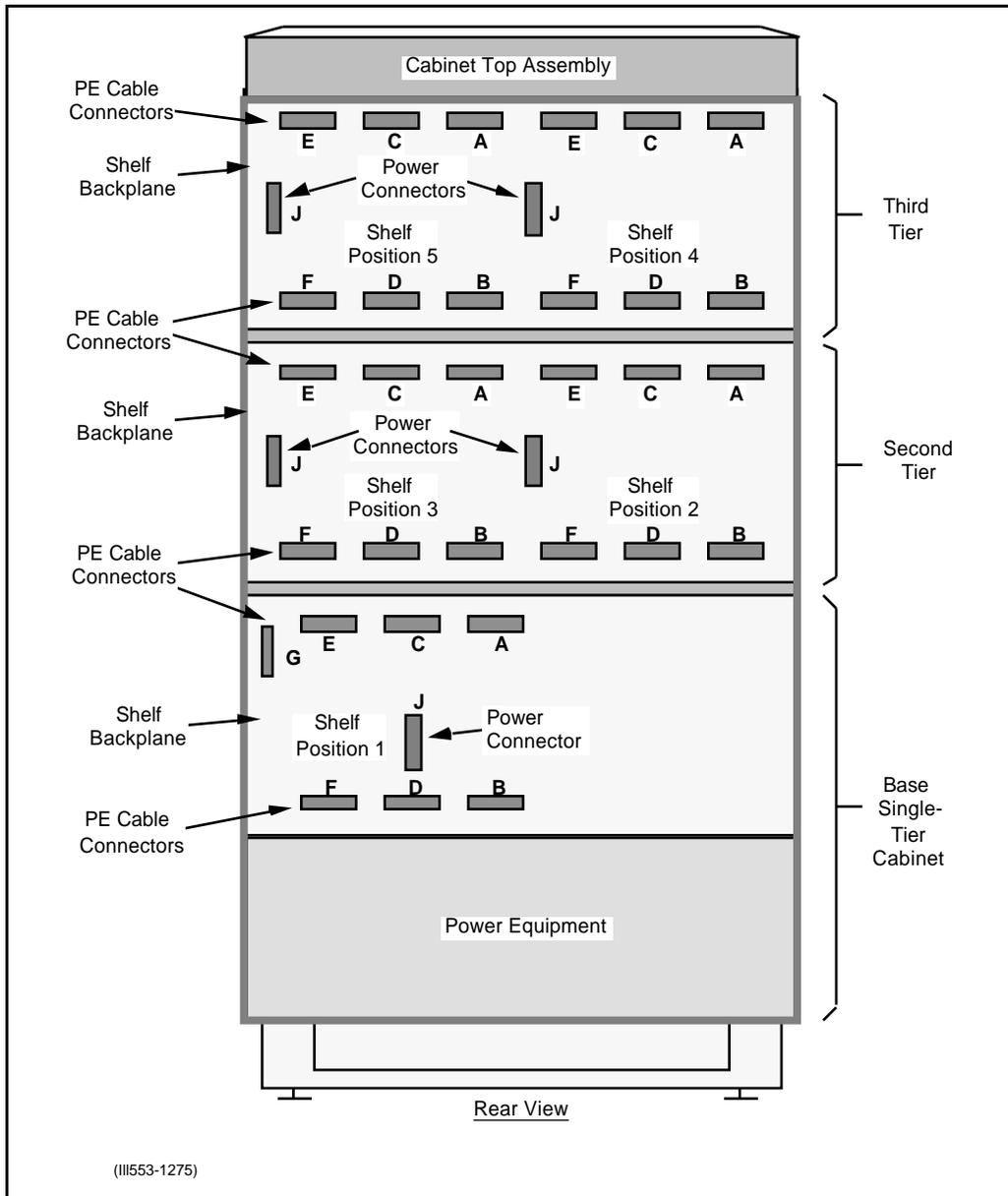
### 3-8 Installation

**Figure 3-2**  
**Typical terminal block layout**

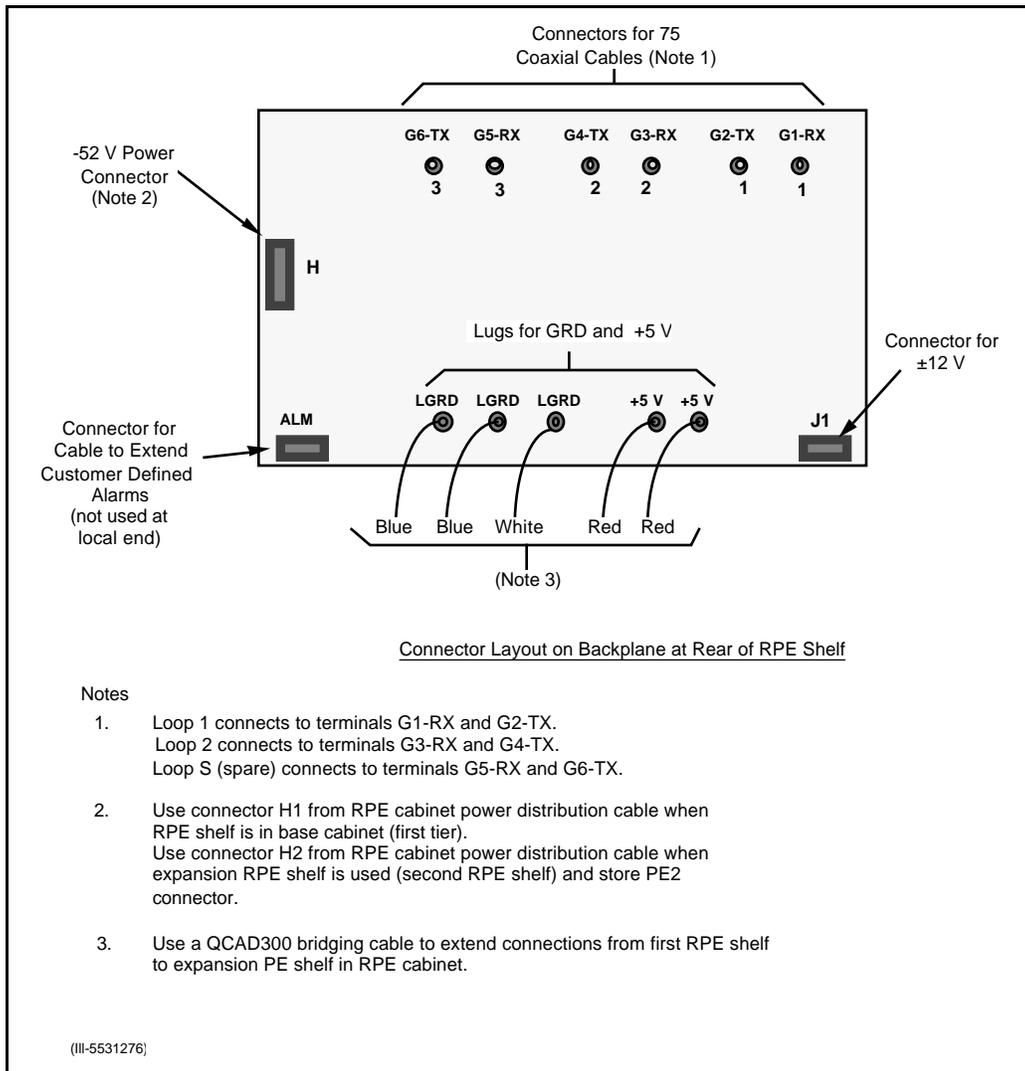


**Figure 3-3**  
**Connector layout rear of cabinet**

### 3-10 Installation

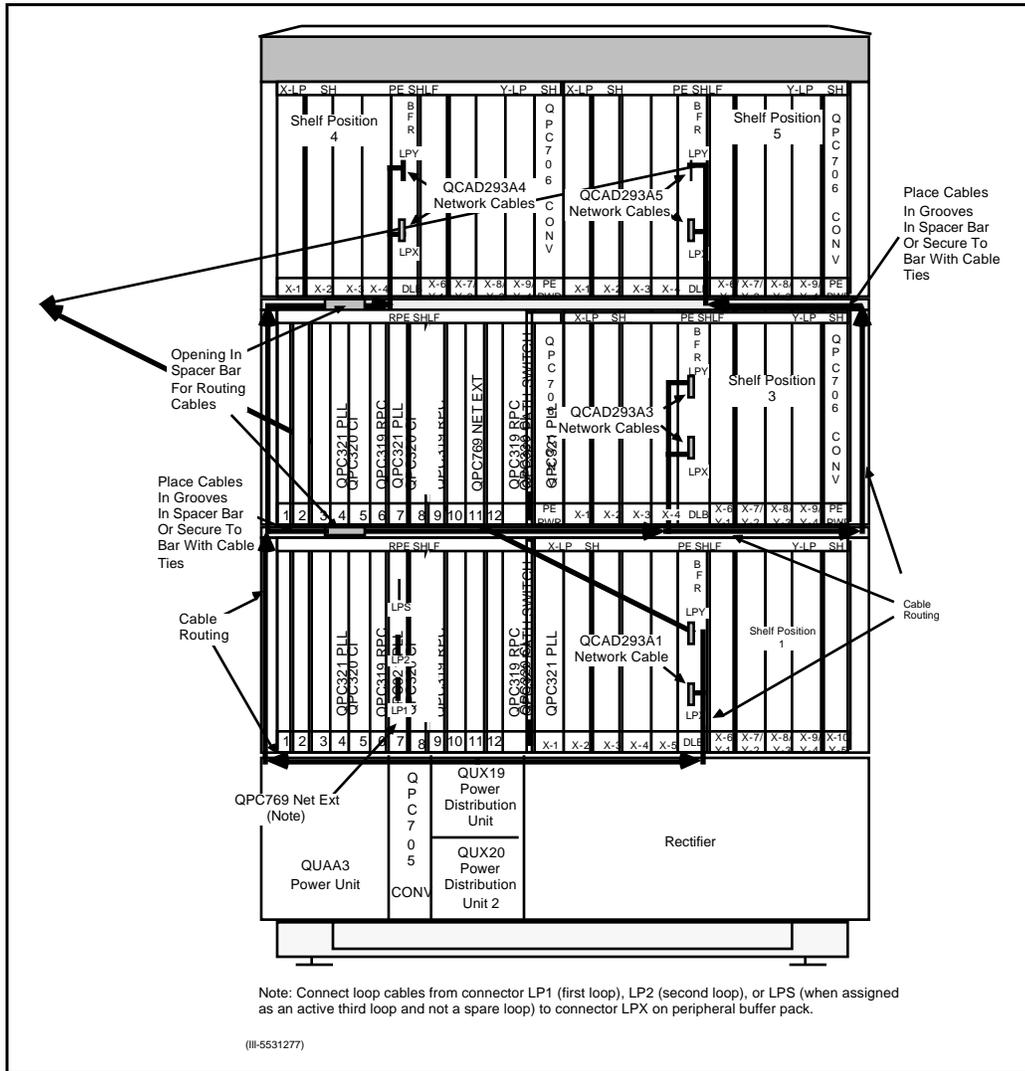


**Figure 3-4**  
**Connections at rear of RPE shelf**



3-12 Installation

Figure 3-5  
Front view of RPE cabinet



**Table 3-A**  
**Peripheral equipment cable terminating sequence**

PE CABLE FROM CONNECTOR A								
TERMINAL NUMBER (TN)								
PAIR	PIN	PAIR COLOR	DUAL LOOP MODE	SINGLE LOOP MODE	16 UNITS PER CARD	8 UNITS PER CARD	4 UNITS PER CARD	2 UNITS PER CARD
1T	26	W-BL	S L O T  C A R D  1	S L O T  C A R D  1	UNIT 0	UNIT 0	UNIT 0	UNIT 0
1R	1	BL-W			UNIT 8	UNIT 1		
2T	27	W-O			UNIT 1			
2R	2	O-W			UNIT 9			
3T	28	W-G			UNIT 2		UNIT 2	
3R	3	G-W			UNIT 10			
4T	29	W-BR			UNIT 3			
4R	4	BR-W			UNIT 11			
5T	30	W-S			UNIT 4	UNIT 4		
5R	5	S-W			UNIT 12			
6T	31	R-BL			UNIT 5			
6R	6	BL-R			UNIT 13			
7T	32	R-O			UNIT 6	UNIT 6		
7R	7	O-R			UNIT 14			
8T	33	R-G			UNIT 7			
8R	8	G-R			UNIT 15			
9T	34	R-BR	UNIT 8	UNIT 7				
9R	9	BR-R	UNIT 6					
10T	35	R-S	UNIT 7					
10R	10	S-R	UNIT 15					
11T	36	BK-BL	UNIT 5	UNIT 5				
11R	11	BL-BK	UNIT 13					
12T	37	BK-O	UNIT 6					
12R	12	O-BK	UNIT 14					
13T	38	BK-G	UNIT 6	UNIT 6				
13R	13	G-BK	UNIT 14					
14T	39	BK-BR	UNIT 7					
14R	14	BR-BK	UNIT 15					
15T	40	BK-S	UNIT 7	UNIT 7				
15R	15	S-BK	UNIT 15					
16T	41	Y-BL	UNIT 6					
16R	16	BL-Y	UNIT 15					
17T	42	Y-O	UNIT 8	UNIT 8				
17R	17	O-Y	UNIT 13					
18T	43	Y-G	UNIT 7					
18R	18	G-Y	UNIT 15					
19T	44	Y-BR	UNIT 8	UNIT 8				
19R	19	BR-Y	UNIT 13					
20T	45	Y-S	UNIT 7					
20R	20	S-Y	UNIT 15					
21T	46	V-BL	UNIT 9	UNIT 9				
21R	21	BL-V	UNIT 13					
22T	47	V-O	UNIT 7					
22R	22	O-V	UNIT 15					
23T	48	V-G	UNIT 9	UNIT 9				
23R	23	G-V	UNIT 13					
24T	49	V-BR	UNIT 7					
24R	24	BR-V	UNIT 15					
25R	50	V-S	SPARE					
25T	25	S-V	SPARE					

(11553-1146a)

—continued—

3-14 Installation

**Table 3-A (continued)**  
**Peripheral equipment cable terminating sequence**

PE CABLE FROM CONNECTOR B										
TERMINAL NUMBER (TN)										
PAIR	PIN	PAIR COLOR	DUAL LOOP MODE	SINGLE LOOP MODE	16 UNITS PER CARD	8 UNITS PER CARD	4 UNITS PER CARD	2 UNITS PER CARD		
1T	26	W-BL	S L O T	S L O T	UNIT 4	UNIT 4	UNIT 2	UNIT 1		
1R	1	BL-W			UNIT 12					
2T	27	W-O			UNIT 5	UNIT 5				
2R	2	O-W			UNIT 13					
3T	28	W-G	X-2	X-2	UNIT 6	UNIT 6	UNIT 3			
3R	3	G-W			UNIT 14					
4T	29	W-BR			UNIT 7				UNIT 7	
4R	4	BR-W			UNIT 15					
5T	30	W-S	C A R D	C A R D	UNIT 0	UNIT 0	UNIT 0			
5R	5	S-W			UNIT 8					
6T	31	R-BL			UNIT 1	UNIT 1				
6R	6	BL-R			UNIT 9					
7T	32	R-O	2	2	UNIT 2	UNIT 2		UNIT 1		
7R	7	O-R			UNIT 10					
8T	33	R-G			UNIT 3				UNIT 3	
8R	8	G-R			UNIT 11					
9T	34	R-BR	S L O T	S L O T	UNIT 4	UNIT 4			UNIT 2	
9R	9	BR-R			UNIT 12					
10T	35	R-S			UNIT 13					UNIT 13
10R	10	S-R			UNIT 14					
11T	36	BK-BL	X-3	X-3	UNIT 5	UNIT 5	UNIT 3			
11R	11	BL-BK			UNIT 15					
12T	37	BK-O			UNIT 11					UNIT 11
12R	12	O-BK			UNIT 12					
13T	38	BK-G	C A R D	C A R D	UNIT 6	UNIT 6		UNIT 1		
13R	13	G-BK			UNIT 13					
14T	39	BK-BR			UNIT 4					UNIT 4
14R	14	BR-BK			UNIT 12					
15T	40	BK-S	3	3	UNIT 3	UNIT 3			UNIT 0	
15R	15	S-BK			UNIT 13					
16T	41	Y-BL			UNIT 5					UNIT 5
16R	16	BL-Y			UNIT 14					
17T	42	Y-O	3	3	UNIT 6	UNIT 6	UNIT 3			
17R	17	O-Y			UNIT 13					
18T	43	Y-G			UNIT 4					UNIT 4
18R	18	G-Y			UNIT 15					
19T	44	Y-BR	3	3	UNIT 5	UNIT 5		UNIT 1		
19R	19	BR-Y			UNIT 13					
20T	45	Y-S			UNIT 6					UNIT 6
20R	20	S-Y			UNIT 14					
21T	46	V-BL	3	3	UNIT 7	UNIT 7			UNIT 3	
21R	21	BL-V			UNIT 15					
22T	47	V-O			UNIT 6					UNIT 6
22R	22	O-V			UNIT 14					
23T	48	V-G	3	3	UNIT 7	UNIT 7	UNIT 3			
23R	23	G-V			UNIT 15					
24T	49	V-BR			UNIT 6					UNIT 6
24R	24	BR-V			UNIT 15					
25R	50	V-S	SPARE							
25T	25	S-V	SPARE							

(11553-1146b)

3-16 Installation

**Table 3-A (continued)**  
**Peripheral equipment cable terminating sequence**

PE CABLE FROM CONNECTOR C			TERMINAL NUMBER (TN)								
PAIR	PIN	PAIR COLOR	DUAL LOOP MODE	SINGLE LOOP MODE	16 UNITS PER CARD	8 UNITS PER CARD	4 UNITS PER CARD	2 UNITS PER CARD			
1T	26	W-BL	S L O T	S L O T	UNIT 0	UNIT 0	UNIT 0	UNIT 0			
1R	1	BL-W			UNIT 0						
2T	27	W-O			UNIT 8						
2R	2	O-W			UNIT 1						
3T	28	W-G			UNIT 9						
3R	3	G-W			UNIT 2						
4T	29	W-BR			UNIT 10						
4R	4	BR-W			UNIT 3						
5T	30	W-S			UNIT 11						
5R	5	S-W			UNIT 4						
6T	31	R-BL			UNIT 12						
6R	6	BL-R			UNIT 5						
7T	32	R-O			UNIT 13						
7R	7	O-R			UNIT 6						
8T	33	R-G			UNIT 14						
8R	8	G-R			UNIT 7						
9T	34	R-BR	C A R D	C A R D	UNIT 15	UNIT 4	UNIT 2	UNIT 1			
9R	9	BR-R			UNIT 4						
10T	35	R-S			UNIT 12						
10R	10	S-R			UNIT 5						
11T	36	BK-BL			UNIT 13						
11R	11	BL-BK			UNIT 6						
12T	37	BK-O			UNIT 14						
12R	12	O-BK			UNIT 7						
13T	38	BK-G			UNIT 15						
13R	13	G-BK			UNIT 8						
14T	39	BK-BR			UNIT 9						
14R	14	BR-BK			UNIT 10						
15T	40	BK-S			UNIT 11						
15R	15	S-BK			UNIT 12						
16T	41	Y-BL			UNIT 13						
16R	16	BL-Y			UNIT 14						
17T	42	Y-O	S L O T	S L O T	UNIT 0	UNIT 0	UNIT 0	UNIT 0			
17R	17	O-Y			UNIT 8						
18T	43	Y-G			UNIT 1						
18R	18	G-Y			UNIT 9						
19T	44	Y-BR			UNIT 2						
19R	19	BR-Y			UNIT 10						
20T	45	Y-S			UNIT 3						
20R	20	S-Y			UNIT 11						
21T	46	V-BL			C A R D	C A R D	UNIT 15		UNIT 1	UNIT 1	UNIT 0
21R	21	BL-V					UNIT 8				
22T	47	V-O					UNIT 9				
22R	22	O-V					UNIT 10				
23T	48	V-G					UNIT 11				
23R	23	G-V					UNIT 12				
24T	49	V-BR					UNIT 13				
24R	24	BR-V					UNIT 14				
25R	50	V-S	SPARE								
25T	25	S-V	SPARE								

Notes:

1. Card number 5 (slot 5 in PE shelf) cannot be assigned on shelves equipped with only eight PE slots.
2. The transfer lead (BR-V) is provided only on PE shelves equipped with a maximum of eight slots and connects to the PE SHELF TRANSFER lead (W-O) of the QUAE power fail transfer unit serving trunks on this shelf (if equipped).

(Ill553-1146c)

—continued—

**Table 3-A (continued)**  
**Peripheral equipment cable terminating sequence**

PE CABLE FROM CONNECTOR D											
TERMINAL NUMBER (TN)											
PAIR	PIN	PAIR COLOR	DUAL LOOP MODE	SINGLE LOOP MODE	16 UNITS PER CARD	8 UNITS PER CARD	4 UNITS PER CARD	2 UNITS PER CARD			
1T	26	W-BL	S L O T	S L O T	UNIT 4	UNIT 4	UNIT 2	UNIT 1			
1R	1	BL-W			UNIT 12						
2T	27	W-O			UNIT 5						
2R	2	O-W			UNIT 13						
3T	28	W-G			X-5	X-5	UNIT 6		UNIT 5	UNIT 3	
3R	3	G-W					UNIT 14				
4T	29	W-BR					UNIT 7				
4R	4	BR-W					UNIT 15				
5T	30	W-S	C A R D	C A R D	UNIT 0	UNIT 0	UNIT 0				
5R	5	S-W			UNIT 1						
6T	31	R-BL			UNIT 2						
6R	6	BL-R			UNIT 3						
7T	32	R-O			5	5	UNIT 4	UNIT 1	UNIT 1		
7R	7	O-R					UNIT 5				
8T	33	R-G					UNIT 6				
8R	8	G-R					UNIT 7				
9T	34	R-BR	S L O T	S L O T	UNIT 8	UNIT 0	UNIT 0				
9R	9	BR-R			UNIT 9						
10T	35	R-S			UNIT 10						
10R	10	S-R			UNIT 11						
11T	36	BK-BL			Y-1	X-6	UNIT 12	UNIT 1	UNIT 1		
11R	11	BL-BK					UNIT 13				
12T	37	BK-O					UNIT 14				
12R	12	O-BK					UNIT 15				
13T	38	BK-G			1	6	UNIT 16	UNIT 2	UNIT 2		
13R	13	G-BK					UNIT 17				
14T	39	BK-BR					UNIT 18				
14R	14	BR-BK					UNIT 19				
15T	40	BK-S					Y-1	X-6	UNIT 20	UNIT 3	UNIT 2
15R	15	S-BK							UNIT 21		
16T	41	Y-BL							UNIT 22		
16R	16	BL-Y							UNIT 23		
17T	42	Y-O	C A R D	C A R D	UNIT 24	UNIT 4	UNIT 3				
17R	17	O-Y			UNIT 25						
18T	43	Y-G			UNIT 26						
18R	18	G-Y			UNIT 27						
19T	44	Y-BR	1	6	UNIT 28	UNIT 5	UNIT 1				
19R	19	BR-Y			UNIT 29						
20T	45	Y-S			UNIT 30						
20R	20	S-Y			UNIT 31						
21T	46	V-BL	Y-1	X-6	UNIT 32	UNIT 6	UNIT 3				
21R	21	BL-V			UNIT 33						
22T	47	V-O			UNIT 34						
22R	22	O-V			UNIT 35						
23T	48	V-G	C A R D	C A R D	UNIT 36	UNIT 7	UNIT 1				
23R	23	G-V			UNIT 37						
24T	49	V-BR			UNIT 38						
24R	24	BR-V			UNIT 39						
25R	50	V-S	SPARE								
25T	25	S-V	SPARE								

Note: Card number 5 (slot 5 in PE shelf) cannot be assigned on shelves equip with only eight PE slots.  
 (111553-1146d)

**Table 3-A (continued)**  
**Peripheral equipment cable terminating sequence**

PE CABLE FROM CONNECTOR E									
TERMINAL NUMBER (TN)									
PAIR	PIN	PAIR COLOR	DUAL LOOP MODE	SINGLE LOOP MODE	16 UNITS PER CARD	8 UNITS PER CARD	4 UNITS PER CARD	2 UNITS PER CARD	
1T	26	W-BL	S L O T  Y-2  C A R D  2	S L O T  X-7  C A R D  7	UNIT 0	UNIT 0	UNIT 0	UNIT 0	
1R	1	BL-W			UNIT 8	UNIT 1			
2T	27	W-O			UNIT 1	UNIT 2			
2R	2	O-W			UNIT 9	UNIT 10			
3T	28	W-G			UNIT 2	UNIT 3	UNIT 1		UNIT 1
3R	3	G-W			UNIT 3	UNIT 4			
4T	29	W-BR			UNIT 4	UNIT 5	UNIT 2		UNIT 2
4R	4	BR-W			UNIT 11	UNIT 12			
5T	30	W-S			UNIT 12	UNIT 13	UNIT 3		UNIT 3
5R	5	S-W			UNIT 13	UNIT 14			
6T	31	R-BL			UNIT 14	UNIT 15	UNIT 4		UNIT 4
6R	6	BL-R			UNIT 6	UNIT 7			
7T	32	R-O			UNIT 7	UNIT 8	UNIT 5		UNIT 5
7R	7	O-R			UNIT 8	UNIT 9			
8T	33	R-G			UNIT 9	UNIT 10	UNIT 6		UNIT 6
8R	8	G-R			UNIT 10	UNIT 11			
9T	34	R-BR	UNIT 11	UNIT 12	UNIT 7	UNIT 7			
9R	9	BR-R	UNIT 12	UNIT 13					
10T	35	R-S	UNIT 13	UNIT 14	UNIT 3	UNIT 3			
10R	10	S-R	UNIT 14	UNIT 15					
11T	36	BK-BL	UNIT 15	UNIT 16	UNIT 4	UNIT 4			
11R	11	BL-BK	UNIT 16	UNIT 17					
12T	37	BK-O	UNIT 17	UNIT 18	UNIT 5	UNIT 5			
12R	12	O-BK	UNIT 18	UNIT 19					
13T	38	BK-G	UNIT 19	UNIT 20	UNIT 6	UNIT 6			
13R	13	G-BK	UNIT 20	UNIT 21					
14T	39	BK-BR	UNIT 21	UNIT 22	UNIT 7	UNIT 7			
14R	14	BR-BK	UNIT 22	UNIT 23					
15T	40	BK-S	UNIT 23	UNIT 24	UNIT 8	UNIT 8			
15R	15	S-BK	UNIT 24	UNIT 25					
16T	41	Y-BL	UNIT 25	UNIT 26	UNIT 9	UNIT 9			
16R	16	BL-Y	UNIT 26	UNIT 27					
17T	42	Y-O	S L O T  Y-3  C A R D  3	S L O T  X-8  C A R D  8	UNIT 0	UNIT 0	UNIT 0	UNIT 0	
17R	17	O-Y			UNIT 8	UNIT 1			
18T	43	Y-G			UNIT 1	UNIT 2			
18R	18	G-Y			UNIT 9	UNIT 10			
19T	44	Y-BR			UNIT 2	UNIT 3	UNIT 1		UNIT 1
19R	19	BR-Y			UNIT 3	UNIT 4			
20T	45	Y-S			UNIT 4	UNIT 5	UNIT 2		UNIT 2
20R	20	S-Y			UNIT 10	UNIT 11			
21T	46	V-BL			UNIT 5	UNIT 6	UNIT 3		UNIT 3
21R	21	BL-V			UNIT 6	UNIT 7			
22T	47	V-O			UNIT 7	UNIT 8	UNIT 4		UNIT 4
22R	22	O-V			UNIT 8	UNIT 9			
23T	48	V-G			UNIT 9	UNIT 10	UNIT 5		UNIT 5
23R	23	G-V			UNIT 10	UNIT 11			
24T	49	V-BR			UNIT 10	UNIT 11	UNIT 6		UNIT 6
24R	24	BR-V			UNIT 11	UNIT 12			
25R	50	V-S	SPARE						
25T	25	S-V	SPARE						

(III553-1146e)

—continued—

3-20 Installation

**Table 3-A (continued)**  
**Peripheral equipment cable terminating sequence**

PE CABLE FROM CONNECTOR F								
			TERMINAL NUMBER (TN)					
PAIR	PIN	PAIR COLOR	DUAL LOOP MODE	SINGLE LOOP MODE	16 UNITS PER CARD	8 UNITS PER CARD	4 UNITS PER CARD	2 UNITS PER CARD
1T	26	W-BL	S L O T	S L O T	UNIT 4	UNIT 4	UNIT 2	
1R	1	BL-W			UNIT 12			
2T	27	W-O			UNIT 5			
2R	2	O-W			UNIT 13			
3T	28	W-G	Y-3	X-8	UNIT 6	UNIT 5	UNIT 3	
3R	3	G-W			UNIT 14			
4T	29	W-BR			UNIT 7			
4R	4	BR-W			UNIT 15			
5T	30	W-S	C A R D	C A R D	UNIT 0	UNIT 0	UNIT 0	UNIT 0
5R	5	S-W			UNIT 8			
6T	31	R-BL			UNIT 1			
6R	6	BL-R			UNIT 9			
7T	32	R-O	3	8	UNIT 2	UNIT 1	UNIT 1	
7R	7	O-R			UNIT 10			
8T	33	R-G			UNIT 3			
8R	8	G-R			UNIT 11			
9T	34	R-BR			UNIT 4	UNIT 2	UNIT 2	
9R	9	BR-R			UNIT 12			
10T	35	R-S			UNIT 5			
10R	10	S-R			UNIT 13			
11T	36	BK-BL	S L O T	S L O T	UNIT 6	UNIT 1	UNIT 1	
11R	11	BL-BK			UNIT 14			
12T	37	BK-O			UNIT 3			
12R	12	O-BK			UNIT 15			
13T	38	BK-G	Y-4	X-9	UNIT 4	UNIT 3	UNIT 3	
13R	13	G-BK			UNIT 12			
14T	39	BK-BR			UNIT 5			
14R	14	BR-BK			UNIT 13			
15T	40	BK-S	C A R D	C A R D	UNIT 6	UNIT 4	UNIT 2	
15R	15	S-BK			UNIT 14			
16T	41	Y-BL			UNIT 5			
16R	16	BL-Y			UNIT 15			
17T	42	Y-O	4	9	UNIT 6	UNIT 5	UNIT 3	
17R	17	O-Y			UNIT 14			
18T	43	Y-G			UNIT 5			
18R	18	G-Y			UNIT 15			
19T	44	Y-BR			UNIT 6	UNIT 6	UNIT 3	
19R	19	BR-Y			UNIT 14			
20T	45	Y-S			UNIT 7			
20R	20	S-Y			UNIT 15			
21T	46	V-BL			UNIT 6	UNIT 6	UNIT 3	
21R	21	BL-V			UNIT 14			
22T	47	V-O			UNIT 7			
22R	22	O-V			UNIT 15			
23T	48	V-G			UNIT 7	UNIT 7	UNIT 3	
23R	23	G-V			UNIT 15			
24T	49	V-BR						
24R	24	BR-V						
25R	50	V-S	SPARE					
25T	25	S-V	SPARE					

(III553-1146f)

—continued—



### 3-22 Installation

---

**Chart 3-2**  
**QSD66 or QSD74 expansion in a QCA146 RPE cabinet**

<b>Step</b>	<b>Procedure</b>
1	Remove screws securing front and rear cabinet covers.
2	Set the input breakers on the QUX20 unit (if equipped) for the new shelf to OFF.  <i>N</i> The designations on the breakers located on the <i>o</i> QUX20 unit correspond to connectors PE2 through PE5 on the <i>t</i> QCAD276 and QCAD277 power cables. <i>e</i> <i>:</i>
3	If not previously installed, install a QUX20 power unit as follows: <ul style="list-style-type: none"><li>• Insert the QUX20 unit in its position in front of cabinet (Figure 2-5) and secure with two mounting screws.</li><li>• From the rear of the cabinet, connect lead equipped with a spade connector from the QUX20 unit to the terminal at TB3 at rear of the QUX19 unit.</li></ul>
4	Remove the louvered top assembly from the cabinet by removing the six screws through the top assembly.
5	Remove the side panels from each end of the existing top shelf of the cabinet by sliding panels upward (Figure 2-6).
6	Remove the four hex screws at each end of the top shelf securing the top panel to the cabinet (Figure 2-6).
7	Remove top panel and place towards rear of cabinet. Do not damage wiring to the thermostat in top panel.
8	With self-tapping screws supplied, secure a joiner plate (two screws each) to each end of the existing top shelf of the cabinet.
9	Ensure that the spacers installed in the top of each of the two front corner uprights of the cabinet are in place (Figure 2-6).

- 10 Reinstall the two cabinet side panels by sliding them down in the grooves located in the uprights at each end of the cabinet. The flange on the side panels should be positioned at the top facing towards the inside of the cabinet.

—continued—

**Chart 3-2 (continued)**  
**QSD66 or QSD74 expansion in a QCA146 RPE cabinet**

---

<b>Step</b>	<b>Procedure</b>
11	Set the new shelf on top of the existing shelf with both ends overlapping the joiner plates.
12	Install a spacer bar between the bottom front rail of the new shelf and the top front rail of the existing top shelf as follows (Figure 2-6): <ul style="list-style-type: none"><li>• Tilt the new shelf slightly backwards.</li><li>• Position the spacer bar with the cut-out on the left and facing outward (Figure 2-6) in the groove along the top front of the existing shelf.</li><li>• Lower the new shelf onto the spacer bar with the top rail of the bar in the groove in the bottom of the new shelf.</li></ul>
13	Align the new shelf with the existing shelf and secure the joiner plates with two screws each.
14	If shelf being installed is a QSD74 RPE shelf, use a QCAD300 bridging cable and connect the LGRD and +5V connections at the rear of the RPE shelf backplane to the corresponding LGRD and +5V connections at the rear of the existing RPE shelf backplane. (Figure 2-4)

### 3-24 Installation

---

15 Connect power connector from QCAD276 or QCAD277 power cable to connector J on the shelf backplane according to shelf position in the cabinet (Figure 2-3).

- Connector PE2 from QCAD276 cable connects to backplane in position 2.

*Note* Connector PE2 is not used if a QSD74 RPE shelf is being installed.

*Table*  
:

- Connector PE3 from QCAD276 cable connects to backplane in position 3.
- Connector PE4 from QCAD277 cable connects to backplane position 4.
- Connector PE5 from QCAD277 cable connects to backplane in position 5.

—continued—

**Chart 3-2 (continued)**  
**QSD66 or QSD74 expansion in a QCA146 RPE cabinet**

---

**Step Procedure**

---

- 16 If not previously connected, connect the other end of the power cable as follows:
- a) QCAD276 power cable.
    - Connector P3 to J3 at the rear of the QUAA3 power unit.
    - Black leads equipped with ring connections to the GRD2 lug on the ground bus near the rear of the QUAA3 unit.
    - White leads equipped with ring connections to the GRD1 lug on the ground bus.
    - The red lead designated 2 equipped with a spade connector to TB5 terminal 2 at the rear of the QUX20 unit.
    - The blue lead designated 3 equipped with spade connector to TB5 terminal 3 at the rear of the QUX20 unit.
  - b) QCAD277 power cable
    - Connector P4 to J4 at the rear of the QUAA3 power unit
    - Black leads equipped with ring connections to the GRD2 lug on the ground bus near the rear of the QUAA3 unit.
    - White leads equipped with ring connections to the GRD1 lug on the ground bus.
    - The red lead designated 4 equipped with spade connector to TB5 terminal 4 at the rear of the QUX20 unit.
    - The blue lead designated 5 equipped with spade connector to TB5 terminal 5 at the rear of the QUX20 unit.
- 17 Reinstall top panel and secure to top shelf with four hex screws at each end.
- 18 Install the two shelf side panels by sliding them down the grooves located in the uprights at each end of the new shelf.

*N* The flange on the side panels should be positioned at the top facing towards the inside of the new cabinet.

*t*  
*e*  
:

—continued—

**Chart 3-2 (continued)**  
**QSD66 or QSD74 expansion in a QCA146 RPE cabinet**

Step	Procedure
19	If QUD24 cooling units are required, install as described in Chart 2-6. If cooling units are not required, reinstall the louvered top assembly on top of the new shelf and secure with six screws through the top.
20	If shelf being installed is a QSD74 shelf, install and connect two 75-ohm coaxial cables from the connectors at the rear of the RPE shelf (Figure 2-4) to Line Terminal Units (LTUs) for each loop.
21	If shelf being installed is a QSD74 shelf, install and connect cable for customer defined alarms to alarm cable connector on RPE shelf backplane (Figure 2-4). Refer to 553-2741-200 (X08) or 553-2931-200 (X11 Supplementary Features) for connection information.
22	If shelf being installed is a QSD74 shelf, ensure that the circuit packs are in their assigned position in the RPE shelf (Figure 2-5).  <i>N</i> Three Bus Terminating Units (BTUs) are required in <i>o</i> the RPE shelf. At the remote end, QPC477A23 BTU are <i>t</i> installed from the front of the RPE shelf in the connectors <i>e</i> located between positions 3 and 4, 6 and 7, 9 and 10. :
23	If this is an operating cabinet, set the CAB INP breaker on the QUX19 unit to ON to restore service to the cabinet.
24	Install circuit packs in assigned positions in new shelf (Figure 2-5).

25 Install NE-A25B-type cables from connectors A, B, C, D, E, and F on the shelf backplane to the cross-connect terminal. Cable terminating sequence is shown in Table 2-A.

26 Set the input breakers for the new shelf to ON.

*N* The designations on the QUX20 power unit correspond  
*o* to connectors PE2 through PE5 on the QCAD276 and QCAD277  
*t* power cables.

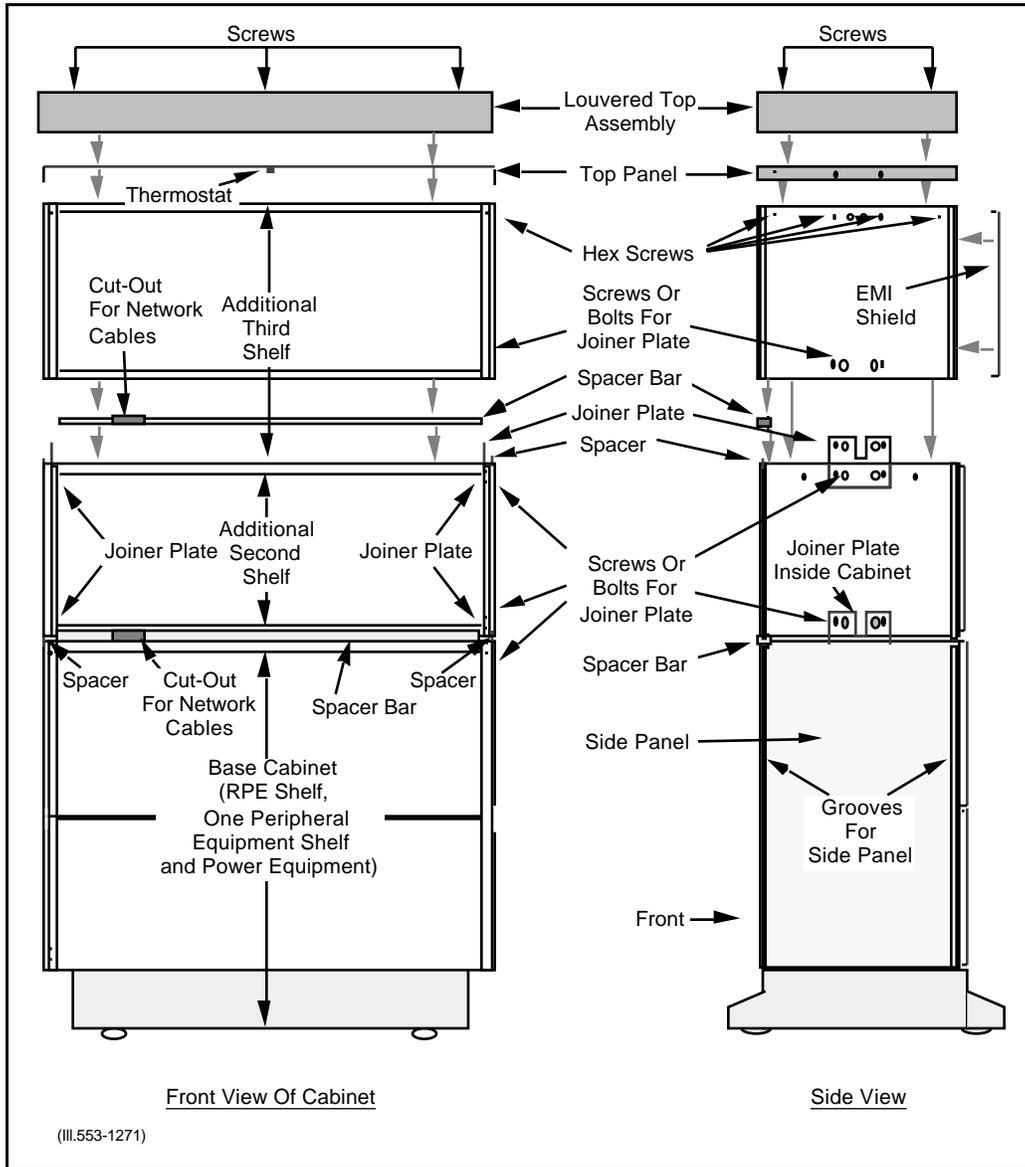
*e*

*:*

---

3-28 Installation

Figure 3-6  
Shelf assembly



**Chart 3-3**  
**QBL24 battery unit installation (main unit)**

When adding batteries to a cabinet ensure that the cabinet is connected to a 220 V 20A or 110 V 30A ac power supply. Service is interrupted when adding batteries to an opening cabinet.

**CAUTION**

Do not add batteries to a cabinet connected to a 110 V 15A power supply. Ensure batteries are installed in a well ventilated area.

---

**Step Procedure**

---

- 1 If more than one QBL24 battery unit is being connected to this cabinet, refer to Chart 2-4 and connect the expansion QBL24 unit.  
  
*N* The expansion QBL24 unit is equipped with a  
*o* QCAD301 expansion cable.  
*t*  
*e*  
*:*
- 2 Set the breaker on the front of the QBL24 unit to OFF.
- 3 Remove cover from the QBL24 unit by loosening the captive screws on top of the unit.
- 4 Unpack batteries and place in unit as shown in Figure 2-7. Ensure that the date indicated on the battery packs is the same on all packs.

**3-30 Installation**

**WARNING:**

The battery cells are capable of delivering high currents when externally short-circuited. Caution must be used when working near the open terminals of the batteries to ensure that the terminals are not inadvertently short-circuited.

—continued—

---

**Chart 3-3 (continued)**  
**QBL24 battery unit installation (main unit)**

---

<b>Step</b>	<b>Procedure</b>
5	With the three black jumper wires supplied with batteries, connect the four battery packs in series as shown in Figure 2-7. Connect the large lug of the black to the large terminal (+) on the first battery pack. Connect the small lug of the wire to the small terminal (-) on the second battery pack and so on until all packs are interconnected. Ensure that connections to the battery terminals are secure but do not over-tighten (maximum torque not to exceed 35 in/lb 93.95 N.m).
6	Connect the black wire inside the battery unit to the remaining positive (+) battery terminal and the red wire to the remaining negative (-) battery terminal.
7	If not removed, remove the front and rear covers from the cabinet.
8	Service will be interrupted on operating cabinet when performing this step. Set the AC BRKR or AC POWER breaker on the faceplate of the -48 V rectifier at the front of the cabinet to OFF.
9	If not previously disconnected, disconnect the power line cord from the commercial power supply.
10	Remove the lock nut from the 90° elbow on the end of the flexible conduit containing wiring from the QBL24 unit.
11	Insert the wires and the 90° elbow in the hole at the rear of the cabinet to the right of the cabinet power cord.
12	Insert the wires through the lock nut and secure elbow to cabinet.
13	At the rear of the -48 V rectifier, disconnect and remove red and black wires going from TB3 to TB1 at the rear of the QUX19 unit (Figure 2-8).

—continued—

### 3-32 Installation

---

**Chart 3-3 (continued)**  
**QBL24 battery unit installation (main unit)**

<b>Step</b>	<b>Procedure</b>
14	<p>Connect the power and control wiring from the QBL24 unit as follows (Figure 2-8):</p> <ul style="list-style-type: none"><li>• Connect the long black wires (designated 1 and 2) to terminals 1 and 2 of TB3 at the rear of the rectifier.</li><li>• Remove straps from terminals 1 and 2, and 3 and 4 of TB4 at rear of rectifier (Figure 2-8).</li><li>• Connect the black wire equipped with a spade tip connector to terminal 2 (+SENSE) on TB4 (Figure 2-8).</li><li>• Connect the red wire equipped with a spade tip connector to terminal 3 (-SENSE) on TB4 (Figure 2-8).</li><li>• Connect red and black wires not equipped with connectors (bare-ended) to the R(1) and BK (2) terminals of TB1 at the rear of the QUX19 unit (Figure 2-8).</li><li>• Connect the white wire equipped with two spade tip connectors (designated DCON) to the terminal designated DCON (terminal 5) on TB4 at rear of rectifier. Connect the second connector on the wire to terminal 3 on TB2 at the rear of the QUX19 unit.</li><li>• Connect the remaining green wire to the GRD1A lug on the ground bar at the rear of the cabinet.</li></ul>
15	<p>Install cover on QBL24 battery unit and secure with locking screws.</p>
16	<p>Set all breakers on the front of the QUX19 and QUX20 power distribution units to the OFF position.</p>
17	<p>Connect the power line cord to the commercial power supply.</p>
18	<p>Set the AC BRKR or AC POWER breaker on the front of the -48 V rectifier to ON.</p>

- 19 With a volt meter, measure the voltage at the test points located on the front of the QBL24 battery unit. If required, adjust the voltage by turning the VOLT ADJ screw on the rectifier until a reading of -53.60 V is attained.

**—continued—**

### 3-34 Installation

---

#### Chart 3-3 (continued) QBL24 battery unit installation (main unit)

---

Step	Procedure
20	Set breakers to ON in the following order: <ul style="list-style-type: none"><li>i DCBRKR breaker on the front of the QBL24 unit (and expansion unit if equipped).</li><li>ii CAB INP breaker on the QUX19 unit.</li></ul> <p><i>N</i> Check power and battery connections if DC BRKR or <i>o</i> CAB INP breaker trips. <i>t</i> <i>e</i> <i>:</i></p>
21	<ul style="list-style-type: none"><li>iii CE/PE1 breaker on QUX19 unit.</li><li>iv PE2 through PE5 breakers on QUX20 unit (if equipped).</li></ul> <p><i>N</i> Breakers PE2 through PE5 supply power to the <i>o</i> corresponding shelf positions in the cabinet. Breakers for <i>t</i> unused positions should be set to OFF. <i>e</i> <i>:</i></p>
22	If required, install cabinet covers.

---

---

**Chart 3-4**  
**Expansion QBL24 battery unit installation**

---

**Step Procedure**

---

- 1 Set the breaker on the front of the QBL24 unit to OFF.
- 2 Remove cover from the QBL24 unit by loosening the captive screws on top of the unit.
- 3 Unpack batteries and place in unit as shown in Figure 2-7. Ensure that the date indicated on the battery packs is the same on all packs.

*N* The battery cells are capable of delivering high  
*o* currents when externally short-circuited. Caution must be used  
*t* when working near the open terminals of the batteries to ensure  
*e* that the terminals are not inadvertently short-circuited.  
:

- 4 With the three black jumper wires supplied with the batteries, connect the four battery packs in series as shown in Figure 2-7. Connect the large lug of the black to the large terminal (+) on the first battery pack and so on until all packs are interconnected. Ensure that connections to the battery terminals are secure but do not over-tighten (maximum torque not to exceed 35 in/lb (3.95 N.m)).
- 5 Connect the black wire inside the battery unit to the remaining positive (+) battery terminal and the red wire to the remaining negative terminal.
- 6 If expansion QBL24 battery unit is being added to a main QBL24 unit previously connected to an operating cabinet, remove the front covers from the cabinet.

Set the following breakers to OFF:

- the AC BRKR or AC POWER breaker on front of -48 rectifier
- the DCBRKR on front of main QBL24 battery unit
- the CAB INP breaker on the QUX19 unit

### **3-36 Installation**

---

- 7 Remove cover from top of the main QBL24 battery unit.

**—continued—**

**Chart 3-4 (continued)**  
**Expansion QBL24 battery unit installation**

Step	Procedure
8	Remove plug from top hole on the right side of the main QBL24 battery unit (Figure 2-9)
9	Remove lock nut from the 90° elbow on the end of the flexible conduit containing wiring from the expansion QBL24 unit.
10	Insert the wires and the 90° elbow in the top hole on the right of the existing QBL24 battery unit (Figure 2-9).
11	Insert the wires through the lock nut and secure elbow to cabinet.
12	Connect wiring from expansion QBL24 battery unit to the main QBL24 unit as follows (Figure 2-9): <ul style="list-style-type: none"> <li>• Connect the green to lug 2 at the front of the unit.</li> <li>• Connect the black wire to terminal 1 of terminal strip W1.</li> <li>• Connect the red wire to terminal 5 of TB1.</li> </ul>
13	Install covers on both QBL24 battery units. <i>N</i> Do not install cover on main QBL24 if battery cells <i>o</i> have not been installed in that unit. <i>t</i> <i>e</i> <i>:</i>
14	Perform this step only if the expansion QBL24 battery unit is added to a main QBL24 unit previously connected to an operating cabinet. <ol style="list-style-type: none"> <li>a) Set the AC BRKR or the AC POWER breaker on the -48 V rectifier to ON.</li> <li>b) Set the DC BRKR breaker on the main QBL24 battery unit to ON.</li> <li>c) Set the DC BRKR breaker on the expansion QBL24 unit to ON.</li> </ol>

### 3-38 Installation

---

*N* Check wiring and polarity of batteries if DC BRKR  
*o* breaker on the QBL24 battery unit trips.

*t*

*e*

:

d) Set the CAB INP breaker on the QUX19 unit to ON.

—continued—

**Chart 3-4 (continued)**  
**Expansion QBL24 battery unit installation**

Step	Procedure
15	If required, install cabinet covers.
16	<p>Connect wiring from expansion QBL24 battery unit to the main QBL24 unit as follows (Figure 2-9):</p> <ul style="list-style-type: none"> <li>• Connect the green to lug 2 at the front of the unit.</li> <li>• Connect the black wire to terminal 1 of terminal strip W1.</li> <li>• Connect the red wire to terminal 5 of TB1.</li> </ul>
17	<p>Install covers on both QBL24 battery units.</p> <p><i>N</i> Do not install cover on main QBL24 if battery cells have not been installed in that unit.</p> <p><i>t</i></p> <p><i>e</i></p> <p><i>:</i></p>
18	<p>Perform this step only if the expansion QBL24 battery unit is added to a main QBL24 unit previously connected to an operating cabinet.</p> <ol style="list-style-type: none"> <li>a) Set the AC BRKR or the AC POWER breaker on the -48 rectifier to ON.</li> <li>b) Set the DC BRKR breaker on the main QBL24 battery unit to ON.</li> <li>c) Set the DC BRKR breaker on the expansion QBL24 battery unit to ON.</li> </ol> <p><i>N</i> Check wiring and polarity of batteries if DC BRKR breaker on the QBL24 battery unit trips.</p> <p><i>t</i></p> <p><i>e</i></p> <p><i>:</i></p> <ol style="list-style-type: none"> <li>d) Set the CAB INP breaker on the QUX19 unit to ON.</li> </ol>

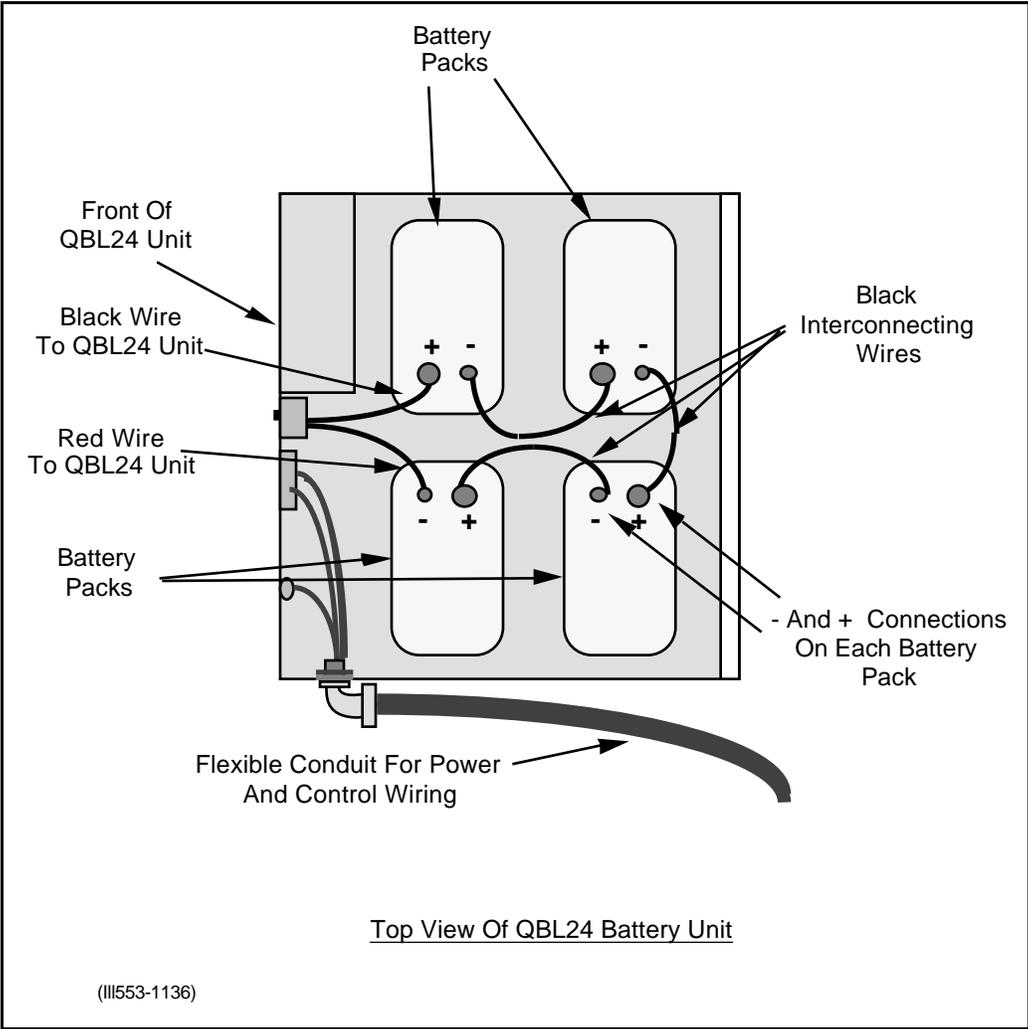
**3-40 Installation**

---

19 If required, install cabinet covers.

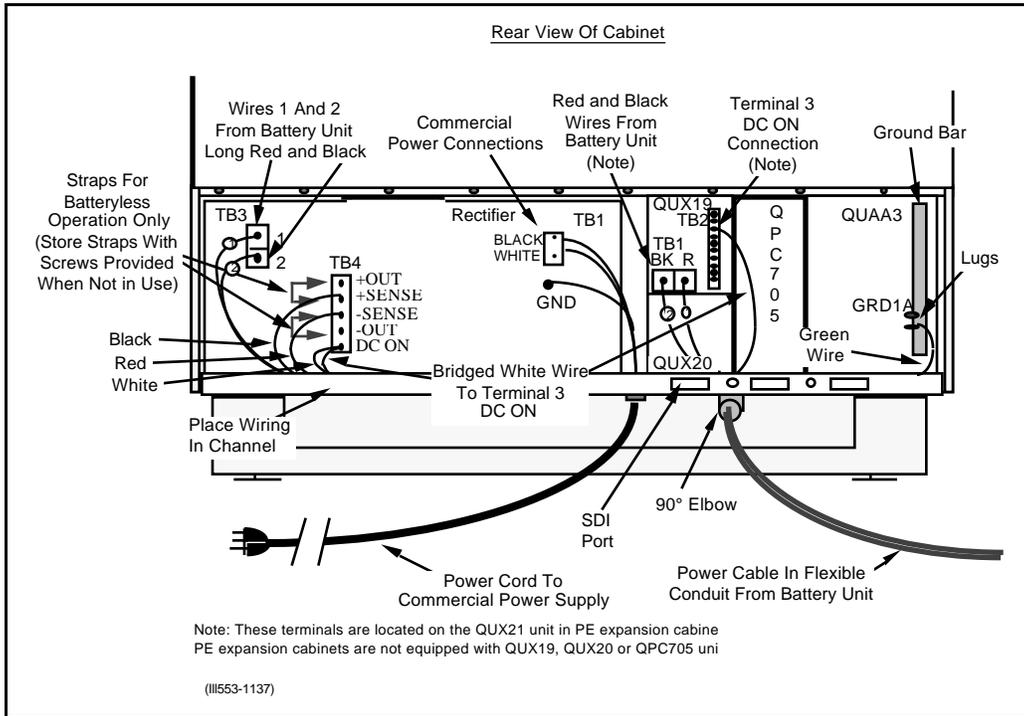
---

**Figure 3-7**  
**Battery cell connections**

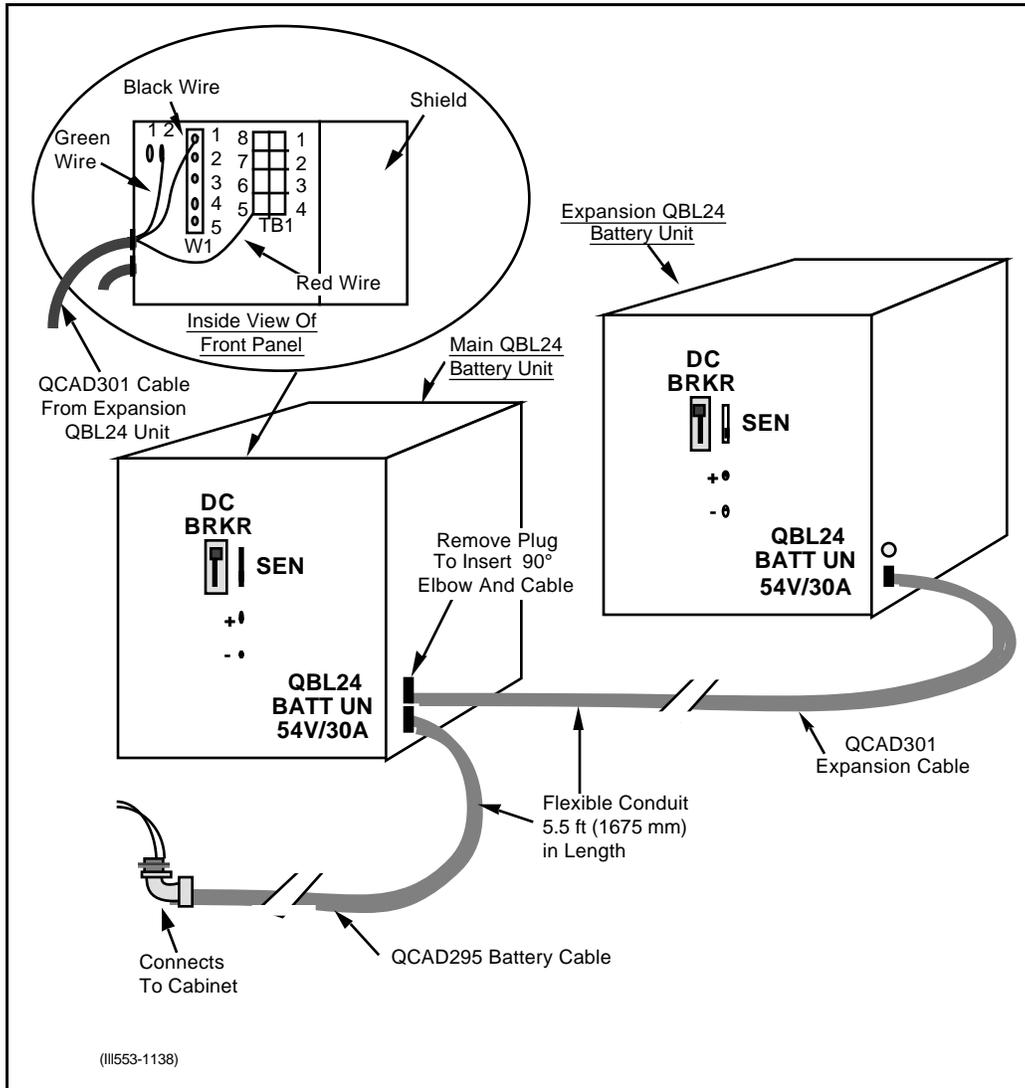


3-42 Installation

Figure 3-8  
Reserve power supply connections



**Figure 3-9**  
**Expansion battery unit connections**



### 3-44 Installation

---

#### **Chart 3-5 QUA6 Power Fail Transfer Unit (PFTU) installation**

---

<b>Step</b>	<b>Procedure</b>
-------------	------------------

---

- |   |  |
|---|--|
| 1 | Remove the QUA6 unit from its container.   |
| 2 | Mount the unit (preferably on a wall if cabinet is not equipped with a built-in cross-connect terminal) near the Meridian SL-1 cross-connect terminal and secure with four screws. |
| 3 | Install an NE-A25B-type cable from connector J1 on the QUA6 unit to a connecting block reserved for PFJ1 cables at the cross-connect terminal.                                     |
| 4 | Cross-connect the PFJ1 cable to the P10 cable and to the telephones and trunks assigned to emergency transfer. See Table 2-B.  |
- 

#### **Chart 3-6 Alarm and transfer wiring (P10) installation**

---

The P10 wiring is extended from the rear of the QUX19 unit in the cabinet to the cross-connect terminal using a QCAD294-type cable available in the following lengths:

- 25 ft (7600 mm) - QCAD294B1
- 50 ft (15200 mm) - QCAD294B2
- 100 ft (30400) - QCAD294B3

One QCAD294 cable is required when the cabinet is served by one or more QUA6 Power Fail Transfer Units (PFTU). This cable should be designated as cable 1.

A second QCAD294 cable is used to extend the major (MJ) alarm connections to attendant consoles and to extend remote (REM) alarm connections. This cable should be designated as cable 2.

—continued—

**Chart 3-6 (continued)**  
**Alarm and transfer wiring (P10) installation**

Step	Procedure
1	If not previously removed, remove the lower rear cover from the cabinet.
2	Tag and install one or two (as required) QCAD294 cables through a round access hole at the rear of the cabinet.  <i>N</i> The end of the wires equipped with spade tip connectors <i>o</i> will be connected to TB2 at the rear of the QUX19 power unit. <i>t</i> Leave enough wire to reach the connections. <i>e</i> :
3	Install the cables in to the area reserved for P10 cables at the cross-connect terminal.  <i>N</i> The cables each contain two black wires, one paired <i>o</i> with a white wire and one with a red wire. Care must be taken <i>t</i> not to interchange the black wires. <i>e</i> :
4	Terminate and designate cable 1 (if provided) as follows: <ul style="list-style-type: none"> <li data-bbox="609 1360 1136 1381">• Terminate the red wire and designate as AUX.</li> <li data-bbox="609 1409 1153 1430">• Terminate the white wire and designate as GRD.</li> <li data-bbox="609 1457 1274 1518">• Terminate the black wire associated with the white wire and designate as XPE</li> <li data-bbox="609 1545 1258 1606">• Terminate the black wire associated with the red wire and designate as CPE.</li> <li data-bbox="609 1619 1226 1640">• Store the braided wire (connected only in the cabinet).</li> </ul>

---

**Chart 3-6 (continued)**  
**Alarm and transfer wiring (P10) installation**

---

<b>Step</b>	<b>Procedure</b>
5	Terminate and designate cable 2 (if provided) at the cross-connect terminal as follows (Figure 2-10): <ul style="list-style-type: none"><li>• Terminate the black wire associated with the red wire and designate as REM A.</li><li>• Terminate the black wire associated with the white wire and designate as REM B.</li><li>• Terminate the red wire and designate as MJ.</li><li>• Store the remaining white wire (not used) and the braided wire (connected only in the cabinet).</li></ul>
6	Connect cable 1 (if provided) to the terminals on TB2 at the rear of the QUX19 unit in the cabinet as follows: <ul style="list-style-type: none"><li>• red wire to terminal 5 (AUX) on TB2</li><li>• white wire to terminal 4</li><li>• black wire associated with the white wire to terminal 8 (XPE)</li><li>• black wire associated with the red wire to terminal 9 (XCE)</li><li>• braided bare wire to terminal 4</li></ul>
7	Connect cable 2 (if provided) to terminals on TB2 at the rear of the QUX19 as follows: <ul style="list-style-type: none"><li>• black wire associated with the red wire to terminal 6 (REMA)</li><li>• black wire associated with the white wire to terminal 7 (REMB)</li><li>• red wire to terminal 10 (MJ)</li><li>• braided bare wire to terminal 4</li><li>• store the white wire (not used)</li></ul>
8	If required, reinstall cabinet cover

---

3-48 Installation

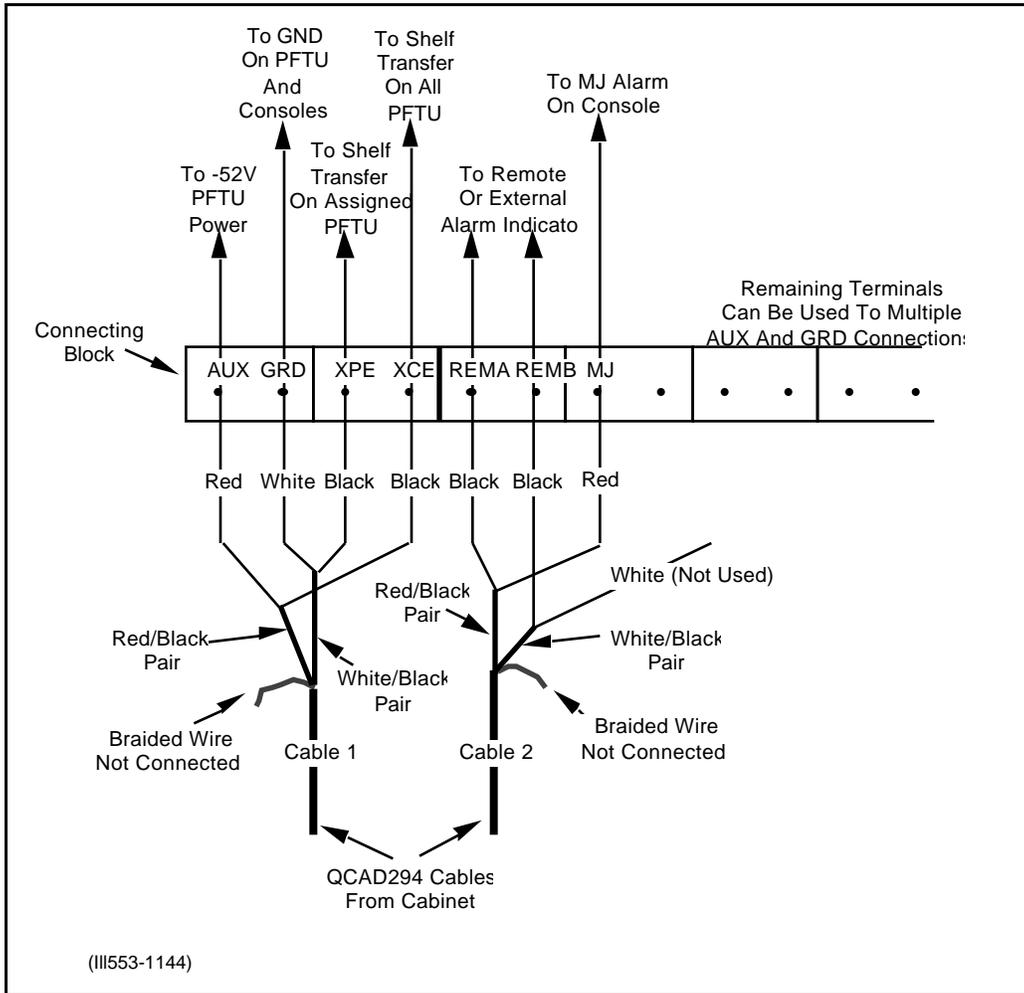
**Table 3-B**  
**PFJ1 emergency transfer cable cross-connections**

FUNCTION	PAIR NUMBER	PAIR COLOR	CONNECTS TO	COMMENTS
C O N T R O L	1T 1R	W-BL BL-W	(ALM) CONSOLE ALARM LEC (GND) ON P10, CONSOLE	See 553-2201-215 for connections to attendant console.
	2T 2R	W-O O-W	(SLT) SHLF TRANSFER (XPE/XCE) (GND) ON P10	See Note.
	3T 3R	W-G G-W	(TC) CONSOLE TRANSFER SWITCH	See 553-2201-215 for connections to attendant console
	4T 4R	W-BR BR-W		This pair is not used
	P F T 1	5T 5R	W-S S-W	500-TYPE TELEPHONE
6T 6R		R-BL BL-R	500-LINE CARD	Connect to TN assigned to telephone
7T 7R		R-O O-R	CENTRAL OFFICE TRUNK	Connect to Central Office trunk.
8T 8R		R-G G-R	CO LINE CARD	Connect to TN assigned to CO trunk
P F T 2	9T 9R	R-BR BR-R	500-TYPE TELEPHONE	Connect to 500-type telephone.
	10T 10R	R-S S-R	500-LINE CARD	Connect to TN assigned to telephone
	11T 11R	BK-BL BL-BK	CENTRAL OFFICE TRUNK	Connect to Central Office trunk.
	12T 12R	BK-O O-BK	CO LINE CARD	Connect to TN assigned to CO trunk
P F T 3	13T 13R	BK-G G-BK	500-TYPE TELEPHONE	Connect to 500-type telephone.
	14T 14R	BK-BR BR-BK	500-LINE CARD	Connect to TN assigned to telephone
	15T 15R	BK-S S-BK	CENTRAL OFFICE TRUNK	Connect to Central Office trunk.
	16T 16R	Y-BL BL-Y	CO LINE CARD	Connect to TN assigned to CO trunk
P F T 4	17T 17R	Y-O O-Y	500-TYPE TELEPHONE	Connect to 500-type telephone.
	18T 18R	G-Y Y-G	500-LINE CARD	Connect to TN assigned to telephone
	19T 19R	Y-BR BR-Y	CENTRAL OFFICE TRUNK	Connect to Central Office trunk.
	20T 20R	Y-S S-Y	CO LINE CARD	Connect to TN assigned to CO trunk
P F T 5	21T 21R	V-BL BL-V	500-TYPE TELEPHONE	Connect to 500-type telephone.
	22T 22R	V-O O-V	500-LINE CARD	Connect to TN assigned to telephone
	23T 23R	V-G G-V	CENTRAL OFFICE TRUNK	Connect to Central Office trunk.
	24T 24R	Y-BR BR-V	CO LINE CARD	Connect to TN assigned to CO trunk
PFTU POWER	25T 25R	V-S S-V	-52V -52V	Connect to AUX on P10 cabl

Note: The SLT (W-O) connects to 24R (BR-V) of cable C from each PE shelf in positions 2 to 5 in a CE cabinet (all PE shelves in RPE and PE cabinets) and to XCE/XPE on the P10 cable served by this PFTU.

(III553-1145)

**Figure 3-10**  
**P10 cable terminations and designations**



### 3-50 Installation

---

#### **Chart 3-7** **QPC705 power converter installation**

The QPC705 power converter mounts in the slot between the QUAA3 power unit and the QUX19 power distribution unit. A QCAD278 cable is required to connect the QPC705 power converter.

---

<b>Step</b>	<b>Procedure</b>
-------------	------------------

---

- 1 Remove the lower front and rear cabinet panels.
- 2 From the front of the cabinet, remove dummy faceplate covering the slot between the QUAA3 power unit and the QUX19 power distribution unit.
- 3 Unpack the QPC705 power converter.
- 4 Connect connector 705 on the QCAD278 cable to the connector on rear of QPC705 power converter.
- 5 From the front of the cabinet, route the free end of the QCAD278 cable through the slot between the QUAA3 unit and the QUX19 unit to the rear of cabinet.
- 6 Insert the QPC705 power converter in its assigned slot and secure to cabinet with mounting screws.

<p style="text-align: center;"><b>CAUTION</b></p>
---

<p style="text-align: center;">Service in the cabinet is interrupted when performing this step.</p>
---

- 7 Set the CAB INP breaker on the QUX19 unit to OFF.
- 8 From the rear of the cabinet, connect connector P2 of the QCAD278 cable to connector P2 at the rear of the QUX19 unit.
- 9 Connect the red lead (equipped with a spade connector) to terminal 2 of TB2 on the rear of the QUX19 unit.
- 10 Connect the black lead (equipped with a ring connector) to the GRD2 terminal on the ground bus at the rear of the cabinet.

- 11 Set the CAB INP breaker on the QUX19 unit to ON. Service should be restored to the cabinet.
- 12 Reinstall the cabinet cover (if required).

---

**Chart 3-8**  
**QUD24 fan unit installation**

---

Step	Procedure
1	If not previously removed, remove the lower front and top rear covers.
2	Remove screws securing cabinet top assembly and remove assembly and louvers (Figure 2-11).
3	Position QUD24 cooling units in their assigned location on the cabinet top panel and secure with mounting screws (Figure 2-12).
4	Connect a QCAD302 power cable from connector P2 on the first QUD24 unit to connector P1 on the second QUD24 unit (Figure 2-12).
5	Connect the male connector of a QCAD303 power cable to connector P1 on the second QUD24 unit (Figure 2-12).
6	Connect the other end of the QCAD303 power cable to connector CU1 of the QCAD277 power cable at the rear of the cabinet (Figure 2-12).
7	Install a QCAD304 terminating plug in connector P2 on the first QUD24 cooling unit (Figure 2-12).
8	Secure cooling units cables to cabinet top panel with plastic cable ties to avoid interference with fans.
9	Remove and store the six screws from the cabinet top assembly and insert six replacement screws (longer screws supplied with cooling unit assemblies).
<i>N</i>	The six removed screws should be retained for future use.
<i>t</i>	
<i>e</i>	

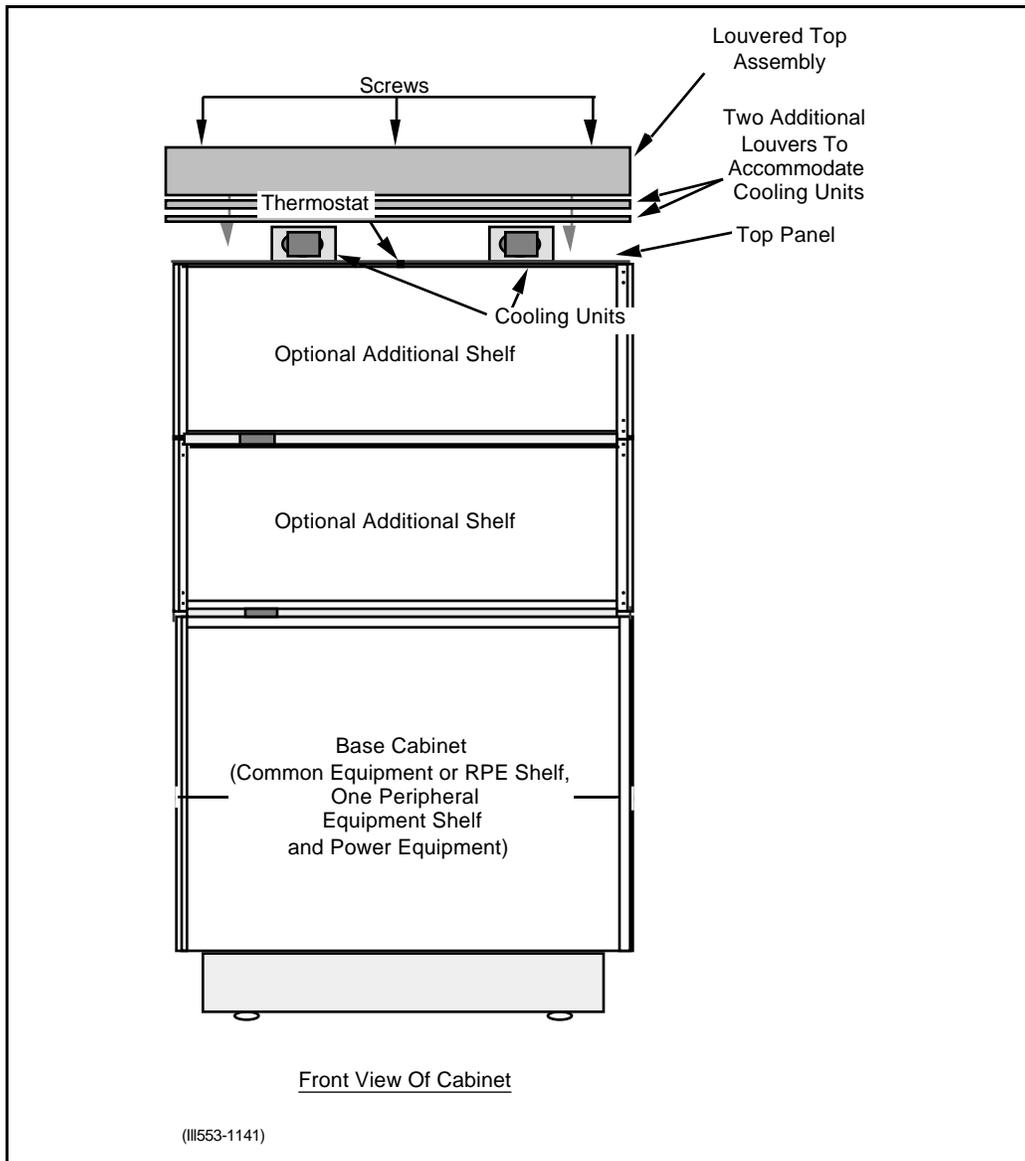
### 3-52 Installation

---

:

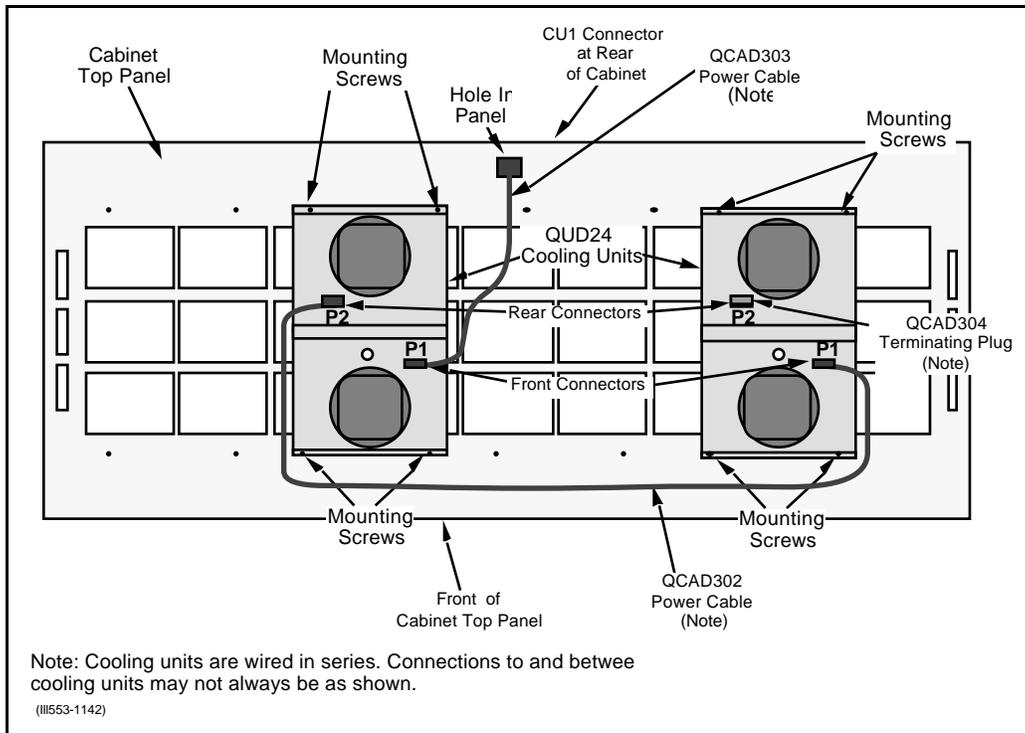
- 10 Install the two extra louvers supplied with the cooling unit assemblies and reinstall the cabinet top assembly (Figure 2-11).
  - 11 Ensure that the QUX19 unit located at the front bottom of the cabinet is equipped with a 3 A fuse in the fuse position designated FN.
  - 12 If required, reinstall cabinet covers.
-

**Figure 3-11**  
**Cabinet top assembly**



### 3-54 Installation

**Figure 3-12**  
**Cooling unit location and connections**



**Chart 3-9**  
**QCAD321 junction box assembly installation**

The QCAD321 junction box assembly is equipped with power and control wiring enclosed in a flexible conduit 5.5 ft (1675 mm) long. The junction box should be installed on the floor or on the wall within 5 ft. (1525 mm) of the cabinet.

The QBL25 battery distribution unit should be installed before attempting to install the QCAD321 junction box assembly.

---

<b>Step</b>	<b>Procedure</b>
1	Unpack the QCAD321 junction box assembly and dispose of the packing material.
2	Mount the junction box on a wall or locate on floor within 5 ft (12525 mm) of the cabinet.
3	Remove screws securing cover to junction box and remove cover.
4	Remove front and rear covers from cabinet.
5	Service in the cabinet will be interrupted when performing this step on an operating cabinet.  Set the AC BRKR or the AC POWER breaker (whichever is equipped) on the faceplate of the -48 V rectifier in the cabinet to OFF.  Set breakers on the faceplates of the power distribution units (QUX19, QUX20, QUX21) to OFF.
6	If not previously disconnected, disconnect the power line cord from the commercial power supply.
7	If the first SDI port is equipped with a connector (Figure 2-8), remove port mounting screws and pull SDI connector away from cabinet.

---

### **3-56 Installation**

---

- 8 Remove the lock nut from the 90° elbow on the end of the flexible conduit containing wiring from the QCAD321 junction box.
- 9 Insert the wires and the 90° elbow in the hole at the rear of the cabinet to the right of the cabinet power cord.

**—continued—**

**Chart 3-9 (continued)**  
**QCAD321 junction box assembly installation**

---

**Step Procedure**

---

- 10 Insert the wires through the lock nut and secure the 90° elbow to the cabinet. Ensure that the locking teeth on the nut are facing downward against the cabinet metal.
  - 11 If previously removed, reinstall the SDI port.
  - 12 Disconnect and remove the red and black wires going from TB3 at the rear of the -48 V rectifier to TB1 at the rear of the QUX19 unit (Figure 2-8) or QUX21 unit (whichever is equipped).
- N* Do not discard these wires as they are required if the  
*o* batteries are removed at a future date.

*t*  
*e*  
*:*

### 3-58 Installation

---

- 13 Connect the power and control wiring from the QCAD321 junction box as follows (see Figure 2-8):
  - Connect the long black and red wires (designated wires 1 and 2) equipped with ring lugs to terminals 1 and 2 of TB3 at rear of rectifier.
  - Remove straps between +OUT and +SENSE and -OUT and -SENSE terminals of TB4 at rear of rectifier.
  - Connect the black and red wires equipped with spade tip connectors to +SENSE (black wire to terminal 2) and -SENSE (red wire to terminal 3) terminals on TB4 at rear of rectifier.
  - Connect the two black and red wires not equipped with connectors (bare-ended) to the R (1) and BK (2) terminals of TB1 at the rear of the QUX19 or QUX21 power unit (whichever is equipped). Ensure that the connections are secure.
  - Connect the white wire equipped with two spade tip connectors (designated DCON) to the DCON connection of TB4 at rear of rectifier and extend to terminal 3 of TB2 at the rear of the QUX19 or QUX21 power unit (whichever is equipped).
  - Connect the remaining green wire to the GRD 1A lug on the ground bar at the rear of the cabinet.
- 14 Remove assigned DISCHARGE fuse from the QBL15 battery distribution box (Figure 2-13).

—continued—

**Chart 3-9 (continued)**  
**QCAD321 junction box assembly installation**

Step	Procedure
15	<p>Install and connect a 4 AWG red wire between the CHARGE bus in the QBL15 and terminal 1 of terminal block TB1 in the QCAD321 junction box (Figure 2-13 and 2-14).</p> <p><i>N</i> Use one 4 AWG wire for distances up to 100 ft (30 m).  <i>o</i> Use two 4 AWG wires for distances of 100 to a maximum of <i>t</i> 200 ft (20 to 60 m). Terminal 2 of terminal block TB1 in the <i>e</i> junction box is reserved for a second 4 AWG wire.            :</p>
16	<p>Install and connect a 2 pair 24 AWG Z-type station wire between terminal blocks TB1 and TB2 (-SENSE, +SENSE and ALARM) in the QBL15 battery distribution unit and terminal 1 (-SENSE), terminal 2 (+SENSE), and terminal 3 (ALARM) of terminal block TB2 in the QCAD321 junction box (Figure 2-15).</p> <p><i>N</i> The TRIP connection is not used when connecting to a <i>o</i> QCAD321 junction box assembly.  <i>t</i>  <i>e</i>            :</p>
17	<p>Remove the assigned discharge fuses (Figure 2-13) from the QBL15 battery distribution box.</p>
18	<p>Install and connect a 4 AWG red wire from the assigned discharge fuse in the QBL15 battery distribution box to terminal 3 of terminal block TB1 in the QCAD321 junction box (Figure 2-13 and 2-14)</p> <p><i>N</i> Use one 4 AWG wire for distances up to 100 ft (30 m).  <i>o</i> Use two 4 AWG wires for distances of 100 to a maximum of <i>t</i> 200 ft (30 to 60 m). Terminal 4 of terminal block TB1 in the <i>e</i> junction box is reserved for a second 4 AWG wire.            : If the cabinet draws more than 30 A, install and connect additional 4 AWG red wiring between discharge terminal 4 in</p>

**3-60 Installation**

---

the QBL15 battery distribution box and terminal 3 or 4 of terminal block TB1 in the QCAD321 junction box.

**—continued—**

---

**Chart 3-9 (continued)**  
**QCAD321 junction box assembly installation**

---

**Step Procedure**

---

- 19 Install and connect a AWG black wire from the positive (+ve) bus in the QBL15 battery distribution box to terminal 5 of terminal block TB1 in the QCAD321 junction box (Figure 2-13 and 2-14)

*N* Use one 4 AWG wire for distances up to 100 ft (30 m).

*o* Use two 4 AWG wires for distances of 100 to a maximum of 200 ft (30 to 60 m). Terminal 6 of terminal block TB1 in the junction box is reserved for a second AWG wire.

*e*  
:

- 20 Ensure that all connections and conduit (if required) are secured. If conduit is not used, grommets should be installed in the entrance holes of the QCAD321 junction box to protect the wiring

- 21 Install cover on QCAD321 junction box and secure with four screws.

- 22 Insert the previously removed DISCHARGE fuse in the QBL15 battery distribution box (Figure 2-13).

- 23 Connect the power line cord to the commercial ac power supply.

- 24 Set breakers to ON in the cabinet in the following order:

- a) CAB INP breaker on the QUX19 or QUX21 power distribution unit (whichever is equipped).
- b) CE/PE1 breaker on the QUX19 unit (if equipped).
- c) Remaining PE breakers on the power distribution units (QUX20, QUX21).

*N* The numbers assigned to the PE breakers correspond to the shelf positions in the cabinet. Breakers for unused shelf positions should be set to OFF.

*e*  
:

**Chart 3-9 (continued)**  
**QCAD321 junction box assembly installation**

Step	Procedure
25	<p>Connect the positive test probe of a volt meter to a ground source and test the following terminals:</p> <ul style="list-style-type: none"> <li>a) Terminal 1 of terminal block TB3 at rear of rectifier. The meter should indicate a minimum reading of 52.08 V.</li> <li>b) Negative input (CHARGE) terminal in the QBL15 battery distribution box. The meter should indicate a minimum reading of 52.08 V.</li> </ul>
	<p>Any voltage variations from the batteries should be investigated.</p>
26	<p>Insert the discharge fuses in the QBL15 battery distribution box.</p>
27	<p>Set the AC BRKR or AC POWER breaker on the faceplate of the -48 V rectifier in the cabinet to ON.</p>
28	<p>If required, install cabinet covers.</p>
29	<p>Install and secure the front panel on the QBL15 battery distribution unit.</p>
30	<p>Ensure that the EQUALIZE switch on the front of the QBL15 battery distribution box is set to OFF for normal operation.</p>
	<p><i>N</i> When the equalize switch is set to ON, the RECT LED on the QUAA3 unit in the cabinet extinguishes giving an alarm indication.</p> <p><i>e</i></p> <p>:</p>

### 3-64 Installation

---

#### Chart 3-10 QBL15 battery distribution box installation

The QBL15 battery box should be located on the wall near the Meridian SL-1 cabinet to readily enable viewing of meters and LED indicators on the front of the unit.

---

Step	Procedure
------	-----------

---

- |   |  |
|---|--|
| 1 | Unpack the QBL15 battery distribution box and dispose of the packing material. |
|---|--|

<p style="text-align: center;"><b>CAUTION</b></p>
---

<p>The QBL15 battery distribution box weights approximately 50 lbs (23 kg).</p>
---

- |   |  |
|---|--|
| 2 | Inspect the unit for damage, paying particular attention to the meters. Report any damage to supplier.   |
| 3 | Using screws or bolts, mount the unit on the wall within 6 ft (1830 mm) of the batteries. The bottom of the unit should be approximately 4 ft (1220 mm) above the floor.<br><i>N</i> A wooden backboard may be required to support the<br><i>o</i> unit on the wall.<br><i>t</i><br><i>e</i><br><i>:</i> |
| 4 | Remove the screws securing the front panel of the battery distribution box.  |
| 5 | Remove the main fuse (CRS200) from the QBL15 battery distribution box (Figure 2-13).   |

- 6 Install and connect a red 1/0 AWG wire between the negative terminal of the battery string and the negative input (-VE BUS) in the QBL15 battery distribution box (Figure 2-15).

**—continued—**

### 3-66 Installation

---

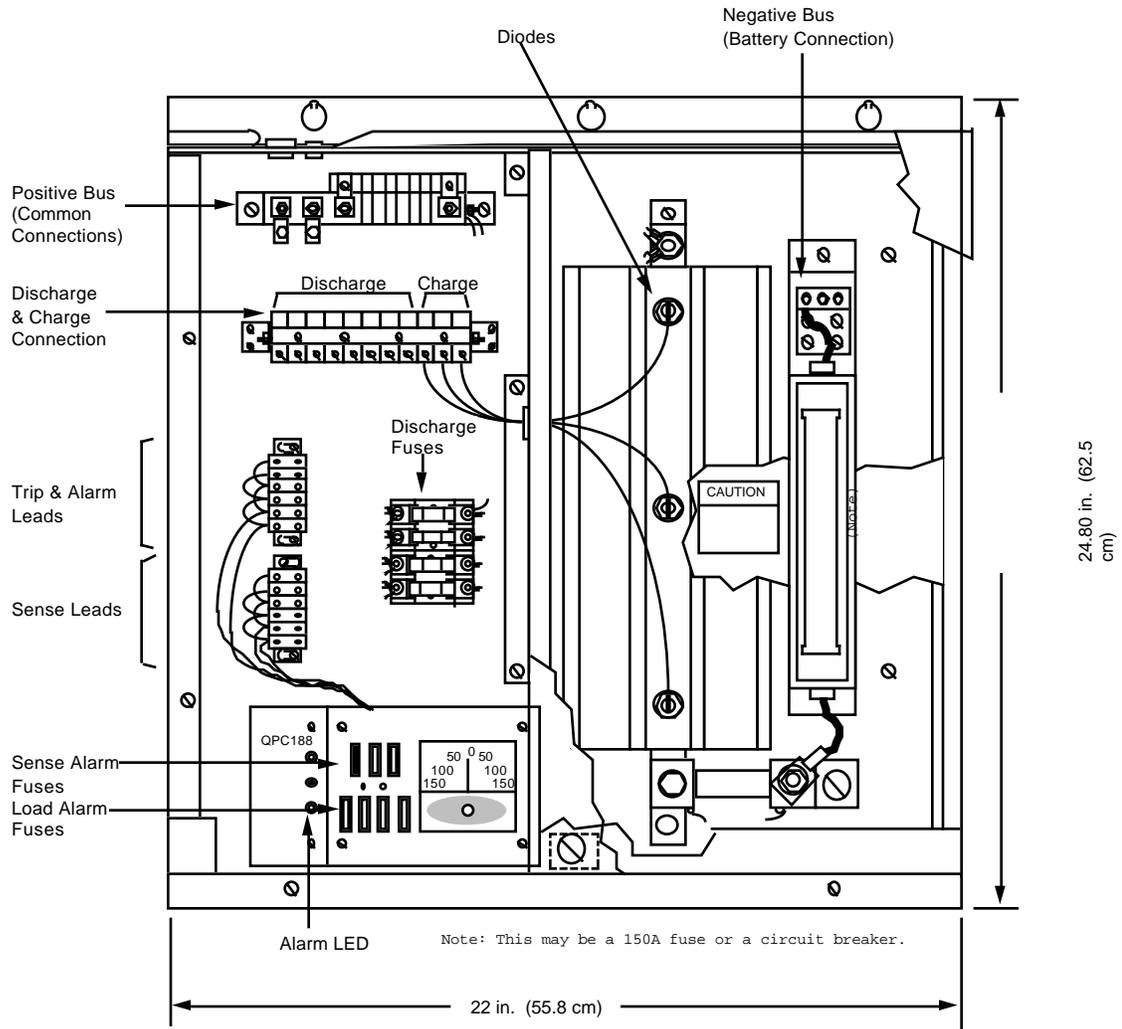
#### Chart 3-10 (continued) QBL15 battery distribution box installation

---

Step	Procedure
7	Install and connect a black 1/0 AWG wire between the positive terminal of the battery string and the negative bus ( $\pm$ BUS) in the QBL15 battery distribution box (Figure 2-15).
8	Insert the main fuse (CRS200) in the QBL15 battery distribution box (Figure 2-13).
9	If required, install cover.

---

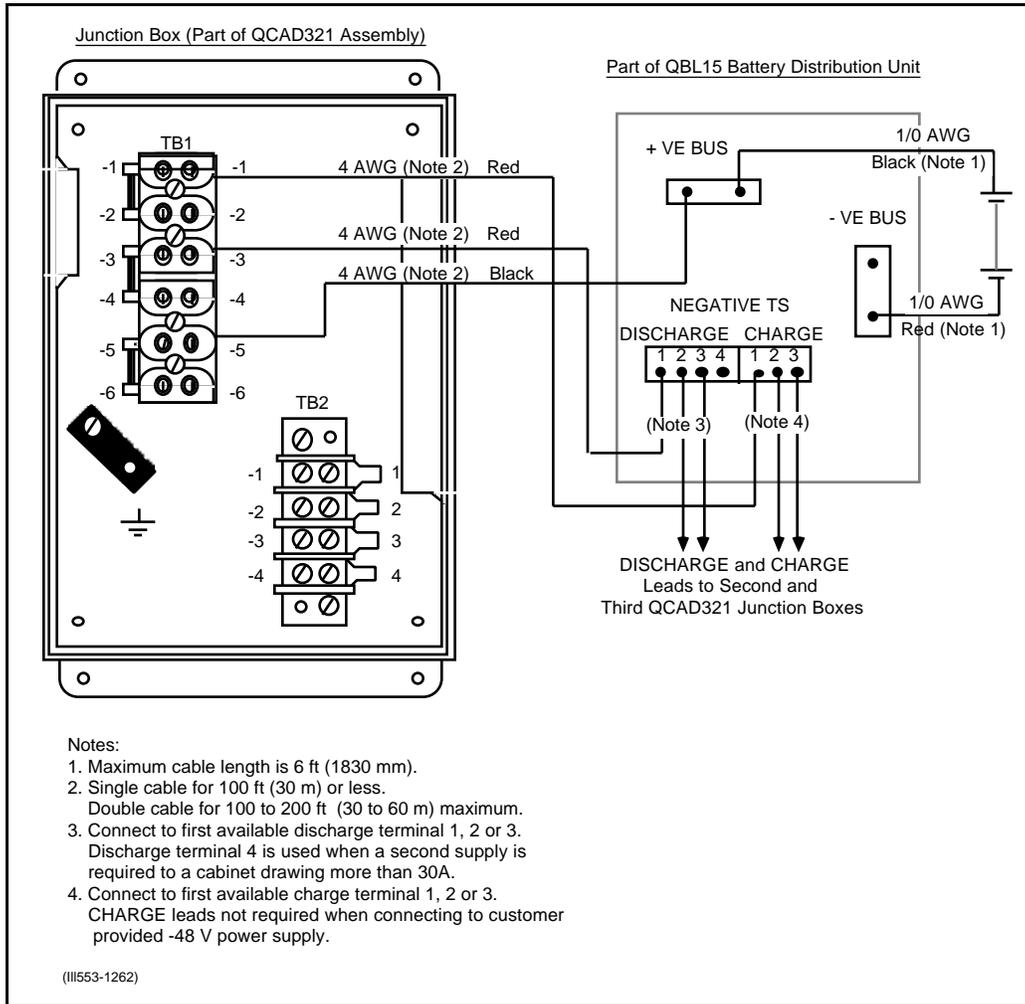
**Figure 3-13**  
**QBL15 battery distribution box**



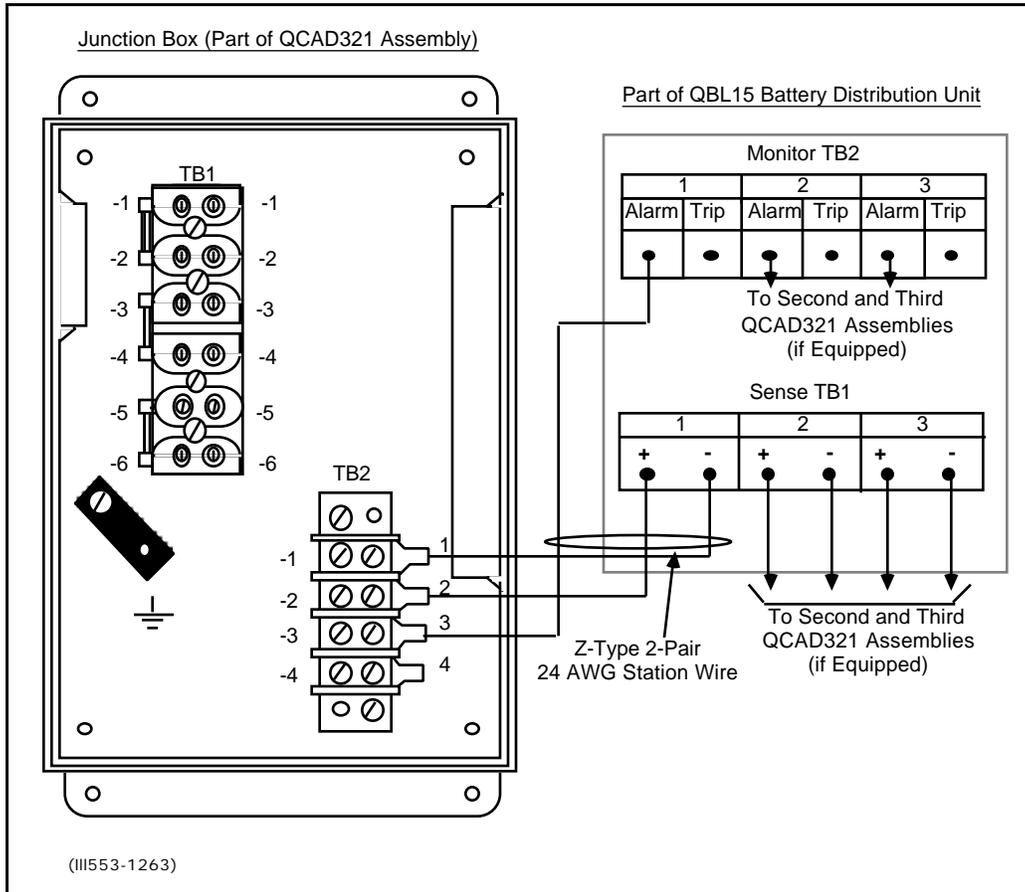
555-013A

### 3-68 Installation

**Figure 3-14**  
**Reserve power connections outside cabinet**



**Figure 3-15**  
**Battery sensing and monitoring connections**



SL-1

## **2-Mb/s Remote Peripheral Equipment**

QCA146 cabinet and QSD74 shelf installation and testing

© 1987 Northern Telecom

All rights reserved.

Information subject to change without notice.

Group F

Standard

90 11 02

Printed in Canada

