Meridian 1

QCA144 1.5 MB/S Remote Peripheral Equipment Cabinet Appendix A

Maintenance and equipment replacement

Document Number: 553-2601-500A
Document Release: Standard 2.0
Date: December 1994

Printed in the United States of America

Revision history

February 2, 1988

Version 1.0. This appendix is reissued to remove references to rectifiers other than the QRF12 –48 rectifier supplied with the cabinets. Changes to the practice are indicated by a vertical bar in the margin next to the affected item.

December 1994

Standard, release 2.0. Updated to new template and editoral changes added.

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General

This appendix describes maintenance and equipment replacement procedures for the QCA144 Remote Peripheral Equipment (RPE) cabinet and related equipment.

Fault clearing for the RPE housed in the QCA144 cabinet is described in *Remote Peripheral Equipment maintenance procedures* (553-2601-500).

Fault detection and locating

Overlay programs

Overlay programs are used to detect most faults in the QCA144 cabinet. These programs are described in *Remote Peripheral Equipment maintenance procedures* (553-2601-500).

Alarm indications

RPE related alarms are described in *Remote Peripheral Equipment maintenance procedures* (553-2601-500). Table 1 of this appendix gives the alarm indications and causes that are unique to the QCA144 cabinet and are not necessarily caused by a fault in the RPE.

Fault locating

Table 2 gives a cross-reference of fault indicators and associated fault type. Some faults may be cleared simply by using Table 1. Others are cleared by using the appropriate procedure for the type of fault indicated in Table 1.

Fault clearing procedures

The following procedures describe how to clear faults in the cabinet.

— CE/PE breaker trips on QUX19 unit—Procedure 1

— AC BRKR breaker trips on –48 V rectifier—Procedure 2

— PE2, PE3, PE4, or PE5 breaker trips—Procedure 3

— FN fuse operates or LN LED is extinguished—Procedure 4

Table 1
Alarm indications (Part 1 of 2)

Type of fault	Trouble indicator										
	CE/PE1 LED OFF	PE 2-5 LED OFF	RECT LED OFF	FN LED OFF	CE LN XFR ON	CAB INP OFF	REM ALARM ON	ATT MJ ALARM ON	TTY MSG	PE1 LN XFR ON	PE 2-5 LN XFR ON
+5 V	→				→		→	→	→	→	→
+12 V	→						→	→	→		
+10 V +6 V PE1	→						→	→	→	→ (Note)	
+15 V –15 V PE1	→						→	→	→		
–12 V	→						→	→	→		
–10 V –6 V PE1	→						→	→	→	→ (Note)	
–48 V PE1	→						→	→	→	→ (Note)	
–52 V (–47 V) AL	→						→	→	→		
–52 V (–42 V) TRIP	→	→	→	→	→	→	→			→	→
86 V RMS	→						→	→	→		
DCON Rectifier	→		→				→	→	→		

Note: Individual shelf transfer if +10, –10, or –48 volts fail on shelf power converter.

Table 1
Alarm indications (Part 2 of 2)

Type of fault	Trouble indicator										
	CE/PE1 LED OFF	PE 2-5 LED OFF	RECT LED OFF	FN LED OFF	CE LN XFR ON	CAB INP OFF	REM ALARM ON	ATT MJ ALARM ON	TTY MSG	PE1 LN XFR ON	PE 2-5 LN XFR ON
PE power from second and third tier PE 2–5		→					→	→	→		→ (Note)
Manual line transfer	→				→		→	→	→	→	→
–150 V	→						→	→	→		
Temp	→	→	→	→	→	→	→			→	→
Fan				→			→	→	→		
Fuse	→						→	→	→		
QBL24			→				→	→	→		

Note: Individual shelf transfer if +10, –10, or –48 volts fail on shelf power converter.

Table 2
Fault indicators and possible causes (Part 1 of 2)

Fault indication	Possible cause
CE/PE LED Extinguished	— Check QUX19 unit for tripped breaker. — Check for a blown fuse on the QUAA3 and QUX19 units. — Check connector PE1 on shelf backplane for a short or defective wiring. — Check for a defective QPC705 (required if bottom PE shelf is equipped with message waiting line card). — Check LN XFR switch on faceplate of QUAA3 unit and ensure that it is set to 0. Wait 2 minutes for fault indication to clear. — Press –48 V CLR button on QUAA3 unit. If fault does not clear, replace the following items until fault clears: • QPC705 (if equipped) • QPC659 in PE shelf in first tier • QUAA3 power unit
RECT/BATT LED Extinguished	— Check for tripped AC BRKR breaker on the –48 V rectifier. — Check for a blown fuse in the QBL15 battery unit (if provided). — Check for a tripped breaker on the QBL24 battery unit (if provided). A tripped breaker on the QBL24 unit indicates defective batteries or a defective QBL24 unit.
PE2-5 LED Extinguished	— Check for tripped PE2, PE3, PE4, or PE5 breaker on QUX20 unit. — Check for extinguished LED on QPC706 or QPC659 circuit pack on the PE shelves. Replace pack with extinguished LED.
FN LED Extinguished	— Check FN fuse on QUX19 unit.
LED Extinguished on QPC705 Power Converter	— Press the –48 V CLR button on the QUAA3 unit. — The QPC705 or the cable connecting it is defective. Replace the following items until the fault is cleared. • Replace the QPC705 • Replace the cable connecting the QPC705

Table 2
Fault indications and possible causes (Part 2 of 2)

Fault indication	Possible cause
LED Extinguished on QPC706 Power Converter	— Check for tripped breaker on QUX20 unit. — Check circuit packs on affected shelf by unseating all packs, resetting the power and reinserting packs one at a time. If all circuit packs are good, replace the following items until fault is cleared: • Affected QPC706 converter ***Caution:*** Corresponding breaker on QUX20 unit (Figure 5) must be set to OFF before removing or inserting a QPC706 converter. • Power distribution cable going to shelf • QUX20 unit
DC ON LED Extinguished	— Check commercial ac power supply. — Check DC BRKR on QBL24 battery box (if equipped). — Check F1 and F2 fuses (if equipped) on 48–4 V rectifier. If blown, replace rectifier.
LED Lit on Power Fail Transfer Unit (PFTU)	— At the local site, load program 35 and enter command CMAJ. — If fault does not clear, check the following at the local site: • Cable on faceplate of PFTU and ensure that it is secure • Check transfer switches on underside of consoles • Check P10 cable connections at cross-connect terminal • Check wiring to consoles • If fault persists, replace PFTU

Procedure 1
CE/PE1 breaker on QUX19 unit trips

Step	Action	Verification
1	Reset breaker.	If breaker does not trip, fault has cleared. If breaker trips, proceed with next step.
2	Unseat the QPC659 buffer pack in the PE shelf in the first tier (base) of the cabinet. Reset breaker.	If breaker trips, replace power distribution cable at rear of cabinet. If breaker does not trip, proceed with next step.
3	Set breakers to OFF. Unseat all remaining circuit packs from PE shelf. Set breaker to ON.	If breaker trips, replace the shelf backplane.
4	Set breaker to OFF. Inset QPC659 pack. Reset breaker ON.	If breaker trips. replace defective QPC659 pack.
5	Reinsert circuit packs one at a time until circuit breaker trips.	If breaker trips when a pack is inserted, it is defective. Replace pack.

Procedure 2
AC BRKR breaker on –48 V rectifier trips

Step	Action	Verification
1	Reset breaker.	If breaker does not trip, fault has cleared. If fault reoccurs, replace the following items in the order shown until the fault clears: — The –48 V rectifier — The batteries (if equipped) — The QBL24 battery box (if equipped) — The QUAA3 power unit — The QUX19 power unit — The QUX20 power unit (if equipped)
2	Disconnect red and black wires from TB3 at rear of rectifier. Reset breaker.	If breaker trips, replace defective –48 V rectifier.
3	Set breaker to OFF and reconnect wires.	
4	Disconnect red and black wires from TB1 at rear of QUX19 unit. Reset breaker.	If breaker trips and no batteries are provided, the fault is in the red and black wiring between TB3 of the rectifier and TB1 of the QUX19 unit. Repair wiring.
5	Set the DC BRKR breaker on the QBL24 battery unit to OFF. Reset breaker.	If breaker trips, replace the QBL24 battery box. If breaker does not trip, replace the batteries.

Procedure 3
PE2, PE3, PE4, or PE5 breaker trips

Step	Action	Verification
1	Reset breaker.	If breaker does not trip, fault is cleared.
2	Check for extinguished LED on QPC706 pack associated with tripped breaker and replace pack. Reset breaker.	If breaker does not trip, fault is cleared.
3	Unseat all circuit packs on the shelf except the QPC706 pack. Reset breaker.	If breaker trips, replace power cabling to shelf at rear of cabinet. If breaker still trips when reset, replace the QUX20 unit.
4	Insert circuits one at a time until breaker trips.	Last circuit pack inserted is defective. Replace.

Procedure 4
FN fuse operates or FN LED is extinguished

Step	Action	Verification
1	Remove rear EMI shields (if equipped) and check connector J7 at rear of QUAA3 unit. Connection should be secure.	
2	Ensure that FN fuses are not blown or defective.	If fuse blows when replaced, replace fan units one at a time. If fault persists, replace cabling to cooling units at rear of cabinet followed by QUX19 unit.
3	If fuses are good and FN LED is not lit, replace QUAA3 unit.	

Note: When not equipped with cooling units, the cable from the QUX19 unit should be connected to J7 on the QUAA3 unit. When cooling units are equipped, J7 is connected to the cabinet wiring leading to the cooling units.

Equipment replacement

Equipment replacement procedures

The following charts describe equipment replacement procedures used when replacing defective apparatus in QCA144 RPE cabinets.

- Battery replacement—Procedure 5
- Expansion QBL24 Battery Unit replacement—Procedure 6
- Main QBL24 Battery Unit replacement—Procedure 7
- QUAA3 Power Unit replacement—Procedure 8
- QUX19 Power Unit replacement—Procedure 9
- QUX20 Power Unit replacement—Procedure 10
- Power Distribution Cable replacement—Procedure 11
- QUA6 Power Fail Transfer Unit (PFTU) replacement—Procedure 12
- QPC705 Converter replacement—Procedure 13
- QPC706 Power Converter Circuit Pack replacement—Procedure 14
- QUD24 Cooling Unit replacement—Procedure 15
- QRF12 Rectifier replacement—Procedure 16
- Peripheral Equipment Shelf Backplane replacement—Procedure 17

Procedure 5
Battery replacement

> **CAUTION**
> Service in the cabinet is interrupted when replacing the batteries.

1 Set the AC BRKR breaker on the front of the –48 V rectifier and the CAB INP breaker on the front of the QUX19 unit to OFF.

2 Set the DC BRKR breaker on the QBL24 battery units serving the cabinet to OFF.

3 Remove the screws securing the cover on the QBL24 battery unit and remove cover.

> **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.

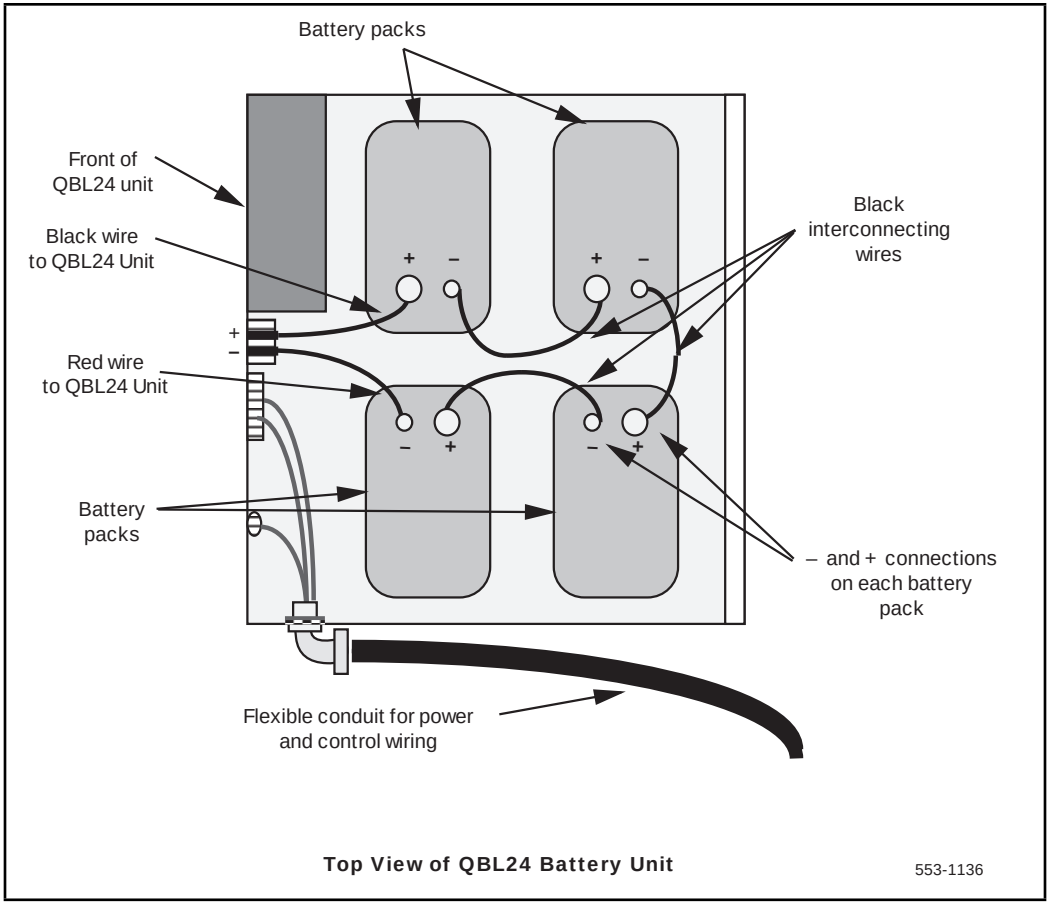
4 Disconnect the red and black wires from the + and – terminals to the battery unit (Figure 1).

5 With caution, disconnect one at a time the black jumper wires interconnecting the battery packs (Figure 1).

6 Remove batteries from QBL24 battery unit.

7 Place replacement batteries in QBL24 battery unit.

Figure 1
Battery cell connections



8 With three black jumper wires, connect the four battery packs in series (Figure 1). Connect the large lug on the black wire to the terminal of the first battery pack. Connect the small lug on the wire to the negative (–) terminal on the second battery pack. Install the remaining wires between the second and third, and the third and fourth battery packs. Ensure that connections to the battery terminals are secure but do not over-tighten (maximum torque not to exceed 3.95 N.m (35 in./lb.)).

9 Connect the black wire inside the QBL24 battery unit to the remaining positive (+) battery terminal, and the red wire to the remaining negative (–) battery terminal.

10 Reinstall cover on QBL24 battery unit.

11 Set the AC BRKR breaker located on the front –48 V rectifier to ON.

12 Set the DC BRKR breaker on the front of the QBL24 battery units to ON.

13 Set the CAB INP breaker on the front of the QUX19 or QUX21 unit to ON.

Procedure 6
Expansion QBL24 Battery Unit replacement

CAUTION
Service in the cabinet is interrupted when replacing the expansion QBL24 battery unit.

1 Set the AC BRKR breaker on the front of the –48 V rectifier to OFF in the cabinet connected to QBL24 battery unit being replaced.

2 Set the DC BRKR breaker on both QBL24 battery units serving the cabinet to OFF.

3 Remove the screws securing the cover on the main QBL24 battery unit and remove cover (Figure 2).

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.

4 Disconnect the red and black wires from the expansion QBL24 battery unit to the front of the main QBL24 unit (Figure 2).

5 From the main QBL24 unit, remove the flexible conduit and wiring going to the expansion QBL24 unit (Figure 2).

6 Remove batteries from old unit and install in new QBL24 unit as described in Procedure 5 (or install new batteries).

7 Install cover on expansion QBL24 unit.

8 Install flexible conduit and wiring from expansion QBL24 unit to main QBL24 unit (Figure 2).

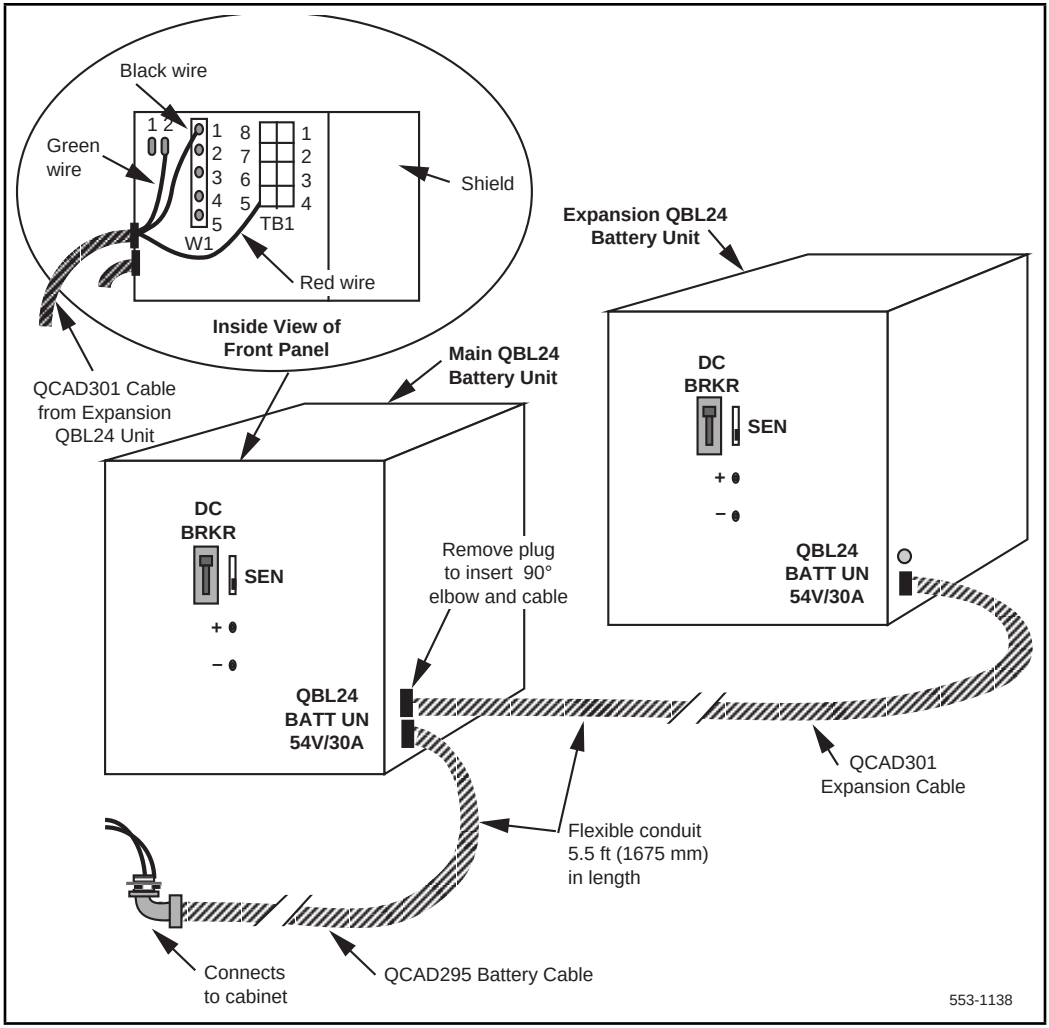
9 Connect green wire to lug 2, black wire to terminal 1 of W1 and red wire to terminal 5 of TB1 on front panel of main QBL24 unit (Figure 2).

10 Install cover on main QBL24 unit.

11 Set the AC BRKR breaker located on the front –48 V rectifier to ON in the cabinet connected to the replacement QBL24 battery unit.

12 Set the DC BRKR breaker on the front of the QBL24 battery units to ON.

Figure 2
Expansion battery unit connections



Procedure 7
Main QBL24 Battery Unit replacement

> **CAUTION**
> Service in the cabinet is interrupted when replacing the main QBL24 battery unit.

1 Set the AC BRKR breaker on the front of the –48 V rectifier to OFF in the cabinet connected to the QBL24 battery unit being replaced.

2 Disconnect the cabinet power line cord from the commercial ac power supply.

3 Set the DC BRKR breaker on main and expansion (if equipped) QBL24 battery units serving the cabinet to OFF.

4 If cabinet is equipped with EMI shields, remove the bottom shield.

5 Disconnect wiring from rear of –48 V rectifier, QUX19 unit and from terminal GRD1A on ground bus to main QBL24 unit (Figure 3). Remove wiring and flexible conduit from cabinet.

6 Install flexible conduit and wiring from replacement QBL24 unit and to –48 V rectifier, QUX19 unit and to GRD1 ground bus terminal as shown in Figure 3.

7 Reinstall EMI shield (if required).

8 If an expansion QBL24 unit is equipped, disconnect from old main QBL24 unit and connect to new main unit as described in Procedure 6.

9 Remove batteries from old main QBL24 and install in new main QBL24 unit as described in Procedure 5 (or install new batteries).

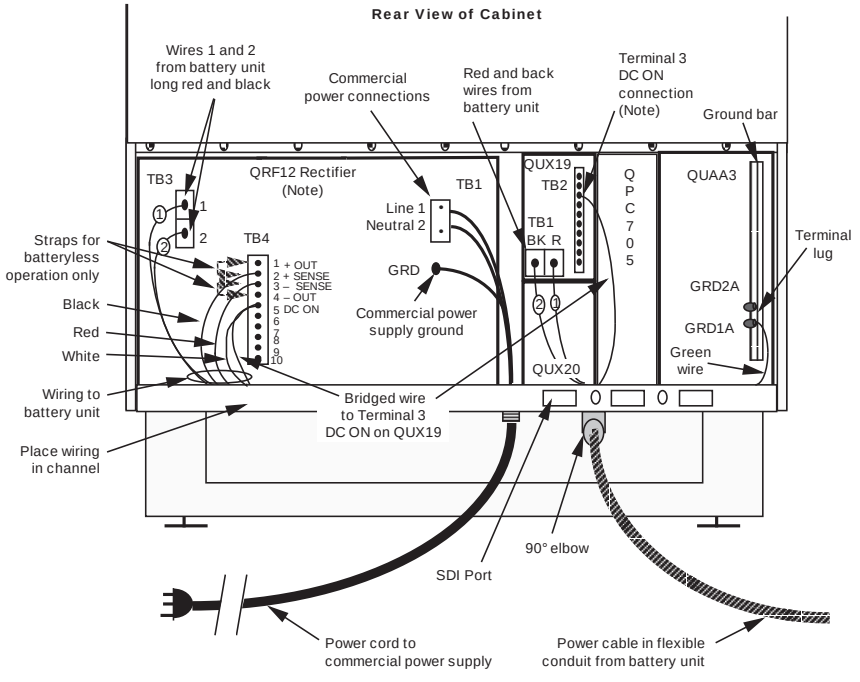
10 Install cover on main QBL24 unit.

11 Reconnect power line cord to commercial ac power supply.

12 Set the AC BRKR breaker located on the front –48 V rectifier to ON.

13 Set the DC BRKR breaker on the front of the QBL24 battery units to ON.

Figure 3
Connections at rear of cabinet



Note: These terminals are located on the QUX21 unit in PE expansion cabinets. PE expansion cabinets are not equipped with QUX19, QUX20 or QPC units.

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Procedure 8
QUAA3 Power Unit replacement

> **CAUTION**
> Service in the cabinet is interrupted when replacing the QUAA3 power unit.

1 Set the AC BRKR breaker on the front of the –48 V rectifier to OFF.

2 Set the DC BRKR breaker on the QBL24 battery units (if equipped) serving the cabinet to OFF.

3 If cabinet is equipped with EMI shields remove the bottom shield. Remove the two screws at the top corners of the shield and lower shield to disengage from cabinet.

4 Tag and disconnect connectors J1, J2, J3, J4, J5, J6, and J7 at rear of QUAA3 unit.

5 Tag and disconnect wires from terminals 1, 2, 3, 4, 5, and 6 of TB4 at rear of QUAA3 unit.

6 Perform this step only if a QPC705 converter is installed beside the QUAA3 unit. From the front of the cabinet, remove screws securing the QPC705 converter to the cabinet. Slide the QPC705 out of the cabinet and set aside.

7 From the front of the cabinet, remove the two bolts securing the right bottom of the QUAA3 unit to the cabinet.

8 Remove the two screws securing the left side of the QUAA3 unit to the cabinet and remove unit from cabinet.

9 Position the replacement QUAA3 unit in the cabinet and secure to cabinet with mounting screws and bolts.

10 If previously removed, reinstall the QPC705 converter and secure to cabinet with mounting screws.

11 At the rear of the QUAA3 unit, reconnect connectors J1, J2, J3, J4, J5, J6, and J7.

12 On TB4 at rear of QUAA3 unit, reconnect wires to terminals 1, 2, 3, 4, 5, and 6.

13 If previously removed, reinstall EMI shield at rear of cabinet and secure with mounting screws.

14 Ensure that the 24Hz/20Hz and the LN XFR switches on the front of the QUAA3 unit are correctly set (usually set the same as on the removed QUAA3 unit).

15 Set the AC BRKR breaker located on the front –48 V rectifier to ON.

16 If cabinet is equipped with QBL24 battery units, set the DC BRKR breaker on the units to ON.

Procedure 9
QUX19 Power Unit replacement

> **CAUTION**
> Service in the cabinet is interrupted when replacing the main QUX19 power unit.

1 Set the AC BRKR breaker on the front of the –48 V rectifier to OFF.

2 Set the DC BRKR breaker on the QBL24 battery units (if equipped) serving the cabinet to OFF.

3 If cabinet is equipped with EMI shields, tag and disconnect cables from all connectors A, B, C, D, E, F, and G at the rear of the cabinet and remove shields.

4 Remove screws securing cabinet top assembly (Figure 4).

5 With a soldering iron, disconnect wiring from thermostat under cabinet top assembly (Figure 4).

6 At the rear of the QUAA3 unit, disconnect cable connectors P1, P5, P6, and P7 and wiring from terminals 1, 2, 3, 4, 5, and 6 of TB4.

7 At the rear of the QUX19 unit, tag and disconnect power wiring from TB1 and P10 wiring from TB2.

8 From the ground bus at the right rear of the cabinet, disconnect wiring from lugs GRD2A, GRD2G, and GRD1C.

9 From the front of the cabinet, remove the screws securing the QUX19 unit to cabinet and remove unit and attached wiring from cabinet.

10 Install replacement QUX19 unit and wiring in cabinet and secure with mounting screws.

11 From the rear of the cabinet, position the long black and white wires for the thermostat. Connect and solder connections to thermostat (Figure 4).

12 Install cabinet top assembly and secure with mounting screws (Figure 4).

13 Reconnect power wiring to TB1 and P10 wiring to TB2 at rear of QUX19 unit.

14 Connect connectors P1, P5, P6, and P7 from QUX19 unit to connectors J1, J5, J6, and J7 at rear of QUAA3 unit.

15 Connect connector PE to connector J on backplanes.

16 Connect power wiring harness containing three red wires, two blue wires, and a black wire to TB4 at the rear of the QUAA3 unit as follows:

— The two 10 AWG red wires to terminals 1 and 2.

— The two 10 AWG blue wires to terminals 3 and 4.

— The 14 AWG black wire to terminal 5.

— The 14 AWG black wire to terminal 6.

17 At the cabinet ground bus, connect the remaining wires from the QUX19 unit as follows:

— Black and yellow wires to terminal GRD2A on one lug.

— Blue wire to the second lug on terminal GRD2A.

— One black wire on each lug of terminal GRD2G.

— One white wire on each lug of terminal GRD1C.

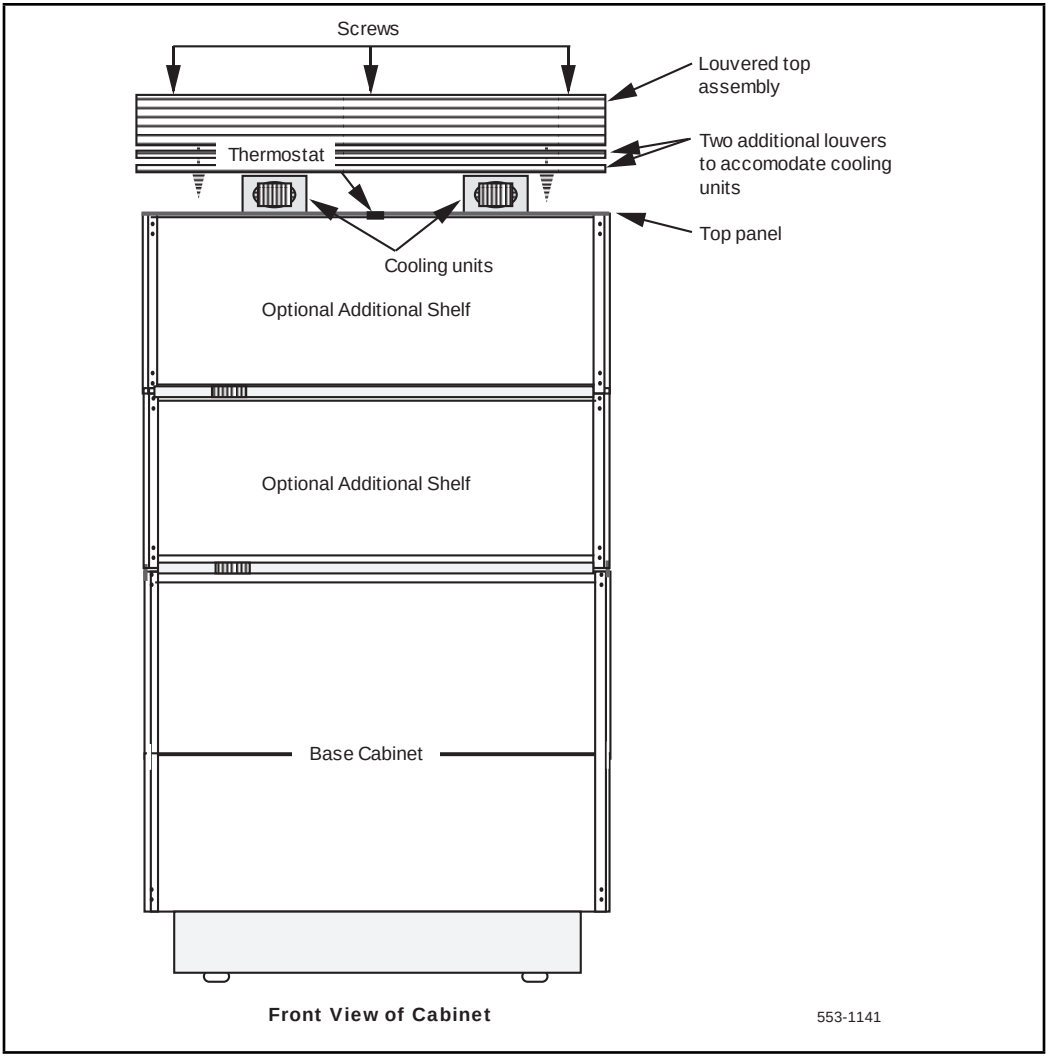
18 If previously removed, reinstall EMI shields and reconnect cables at rear of cabinet.

19 Set the CAB INP breaker on the front of the QUX19 unit to ON.

20 Set the AC BRKR breaker on the front of the –48 V rectifier to ON.

21 Set the DC BRKR breaker on the QBL24 battery units (if equipped) serving the cabinet to ON.

Figure 4
Cabinet top assembly



Procedure 10
QUX20 Power Unit replacement

CAUTION
Service in the cabinet is interrupted when replacing the main QUX20 power unit.

1 Set the breakers on the faceplate of the QUX20 unit to OFF.

2 Set the CAB INP breaker on the QUX19 unit to OFF.

3 If equipped, remove the lower EMI shield from the rear of the cabinet.

4 From the rear of the cabinet, disconnect the lead equipped with a spade connector from the QUX20 unit to TB3 at rear of the QUX19 unit.

5 Tag and disconnect red and blue wires from terminals 2, 3, 4, and 5 (4 and 5 may be spare) of TB5 at rear of QUX20 unit.

6 From the front of the cabinet, remove the screws securing the QUX20 unit to the cabinet and remove unit.

7 Position replacement QUX20 unit and secure to cabinet with mounting screws.

8 From the rear of the cabinet, connect the lead equipped with a spade connector to the terminal at TB3 at the rear of the QUX19 unit.

9 Reconnect red and blue wires to terminals 2, 3, 4, and 5 (4 and 5 may be spare) of TB5 at rear of QUX20 unit.

10 If required, reinstall EMI shields.

11 Set the required breakers on the front of the QUX20 unit to ON.

12 Set the CAB INP breaker on the QUX19 unit to ON.

Procedure 11
Power Distribution Cable replacement

> **CAUTION**
> Service in the cabinet is interrupted when replacing a power distribution cable.

1 Set the CAB INP breaker on the QUX19 unit to OFF.

2 Perform this step only if EMI shields are equipped.

— Remove screws securing bottom shield and remove shield.

— Tag and disconnect cables from connectors at rear of the first PE shelf. Remove EMI shield.

— Tag and disconnect cables from connectors A, B, C, D, E, and F at rear of PE shelf on second tier. Remove EMI shield.

— If power cable being replaced is connected to the third tier, tag and disconnect cables from connectors A, B, C, D, E, and F of third tier. Remove EMI shield.

3 Perform this step only if the power cable serving the first tier is being replaced.

— Disconnect connector P3 from the rear of the QUAA3 unit.

— Disconnect red and blue wires from terminals 2 and 3 of TB5 at the rear of the QUX20 unit.

— Disconnect the black and white wires from the distribution cable to the GRD2 and GRD1 connections on the ground bus at the rear of the cabinet.

— Disconnect connectors PE2 and PE3 from the PE shelf backplane.

— Connect connectors PE2 and PE3 of the replacement distribution cable to the PE shelf backplane J connectors and connector P3 and J3 at the rear of the QUAA3 unit.

— Connect the white and black wires equipped with ring connectors to GRD1 and GRD2 terminals on the ground bus.

— Connect the red and blue wires to terminals 2 and 3 of TB5 at the rear of the QUX20 unit.

4 Perform this step only if the power distribution cable for the third tier is being replaced.

- — Disconnect connector P4 and P7 from the rear of the QUAA3 unit.
- — Disconnect red and blue wires from terminals 4 and 5 of TB5 at the rear of the QUX20 unit.
- — Disconnect the black and white wires from the distribution cable to the GRD2 and GRD1 connections on the ground bus at the rear of the cabinet.
- — Disconnect connectors PE4 and PE5 from the PE shelf backplane.
- — Connect connectors PE4 and PE5 of the replacement distribution cable to the PE shelf backplane J connector and connectors P4 and P7 to J4 and J7 at the rear of the QUAA3 unit.
- — Connect the white and black wires equipped with ring connectors to GRD1 and GRD2 terminals on the ground bus.
- — Connect the red and blue wires to terminals 4 and 5 of TB5 at the rear of the QUX20 unit.

5 Reinstall EMI shields and secure with mounting screws.

6 Reconnect all cables previously disconnected.

7 Set the CAB INP breaker on the QUX19 unit to ON.

Procedure 12
QUA6 Power Fail Transfer Unit (PFTU) replacement

1 Place temporary jumpers at cross-connect terminal to maintain service on telephones involved with the QUA6 unit.

2 Remove and tag cable from connector J1 on the faceplate of the QUA6 unit.

3 Remove screws securing QUA6 unit to wall (if mounted on wall) and remove unit.

4 With mounting screws, mount replacement QUA6 unit.

5 Reconnect cable to connector J1 on the faceplate of the QUA6 unit.

6 Remove temporary jumpers at cross-connect terminal.

Procedure 13
QPC705 Converter replacement

> **CAUTION**
> Service in the cabinet is interrupted when performing step 1.

1 Set the CAB INP breaker on the QUX19 power distribution unit to OFF.

2 Remove the screws securing the QPC705 converter to the cabinet.

3 Slide the QPC705 converter out of its position and disconnect the QCAD278 power cable from the connector at the rear of the converter.

4 Perform this step only if the QCAD278 cable is being replaced.

— Remove the screws securing the lower EMI shield (if equipped) at the rear of the cabinet and remove shield.

— Disconnect the QCAD278 cable from terminal 2 of TB2 on the QUX19 unit, connector P2 at the rear of the QUAA3 unit and from the lug on the ground bus.

— Remove cable.

5 If QPC705 is being replaced, connect existing QCAD278 cable to connector on rear of new QPC705 converter.

If the QCAD278 cable is being replaced, connect connector 705 of new cable to connector at rear of existing QPC705 converter.

6 Install the QPC705 in its assigned position with the QCAD278 cable towards the rear of the cabinet. Secure the QPC705 converter to the cabinet with mounting screws.

7 Perform this step only if the QCAD278 power cable is being replaced.

— Connect connector P2 of the QCAD278 cable to connector P2 at the rear of the QUAA3 unit.

— Connect the red wire equipped with a spade connector to terminal 2 of TB2 at the rear of the QUX19 unit.

— Connect the black wire equipped with a ring connector to GRD2 terminal on the ground bus at the rear of the cabinet.

— Reinstall the EMI shield at rear of cabinet and secure with mounting screws.

Procedure 14
QPC706 Power Converter Circuit Pack replacement

CAUTION
The appropriate breaker must be OFF before attempting to replace a QPC706 converter pack. See Figure 5 for breaker assignments.

1 See 553-2301-511 and load overlay 32 and disable loops on shelf containing the QPC706 converter.

2 Set the ENB/DIS switch on the QPC659 circuit pack on the PE shelf containing the QPC706 converter to DIS.

3 Set the PE breaker corresponding to the PE shelf on the QUX20 unit to OFF (Figure 5).

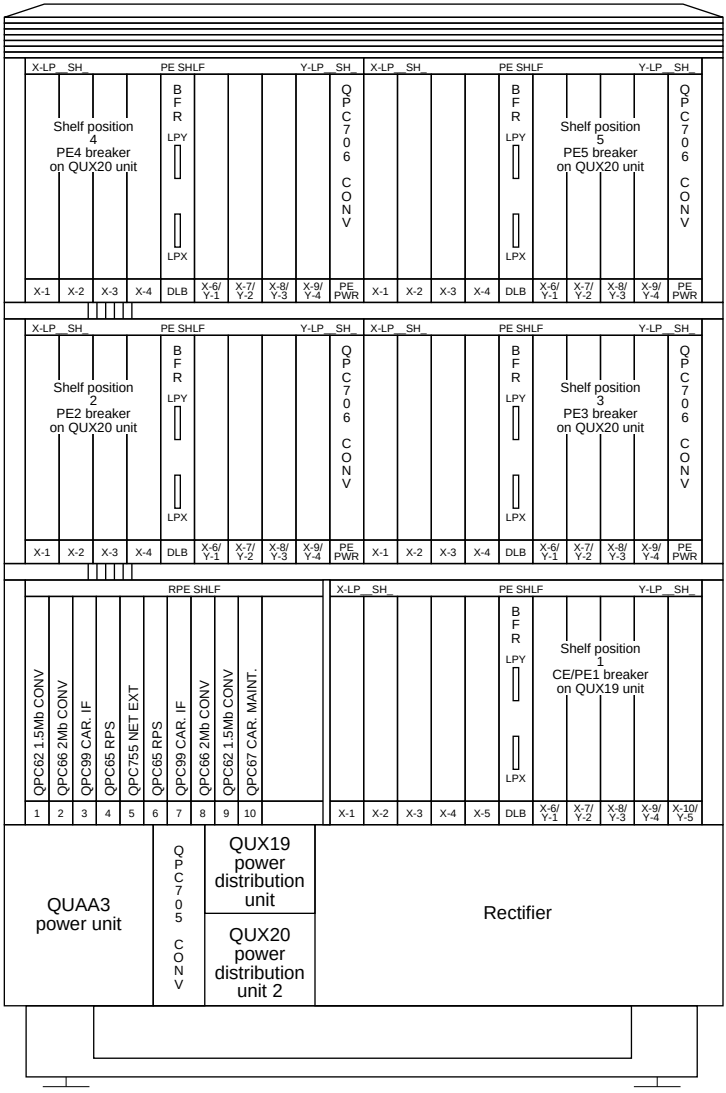
4 Remove the QPC706 converter and install replacement.

5 Set the corresponding PE breaker on the QUX20 unit to ON.

6 Set the ENB/DIS switch on the QPC659 circuit pack on the PE shelf to ENB.

7 Using overlay program 32, enable loops previously disabled.

Figure 5
Shelf assignments



Procedure 15
QUD24 Cooling Unit replacement

Note: QUD24 cooling units are located in the cabinet top panel assembly. Connections given in this chart are typical and may vary from one installation to another. Cooling units are connected in series.

1 Remove the six screws securing the cabinet top panel assembly and remove top (Figure 4).

2 Disconnect cable from P1 connector of QUD24 unit (Figure 6).

3 Disconnect the cable or terminating plug (whichever is equipped) from connector P2 of the QUD24 unit (Figure 6).

4 Remove mounting screws securing QUD24 unit to cabinet top panel (Figure 6) and remove QUD24 unit.

5 Unpack and inspect the replacement QUD24 cooling unit.

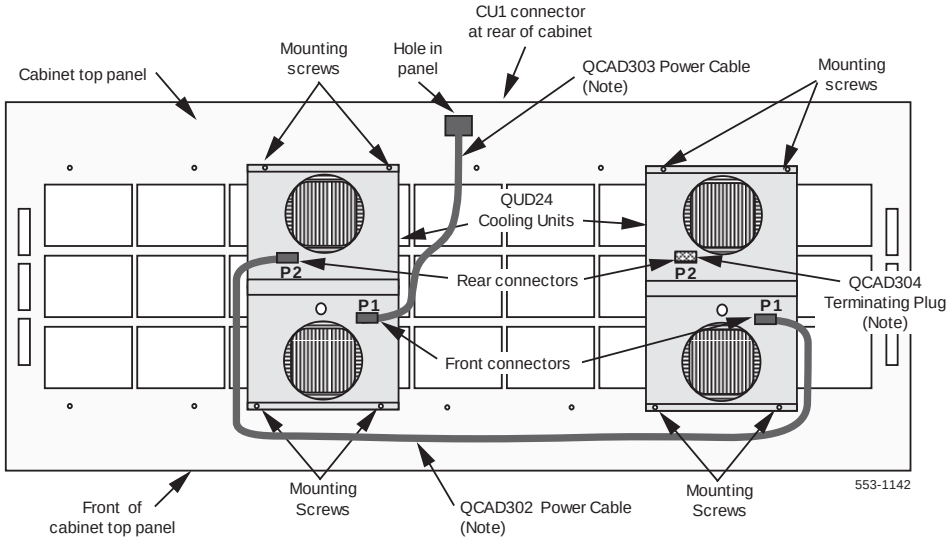
6 Install replacement QUD24 unit and secure to cabinet top panel with mounting screws (Figure 6).

7 Reconnect cable to connector P1 of the QUD24 cooling unit (Figure 6).

8 Reconnect cable or terminating plug (removed from previous QUD24 unit) to connector P2 of the QUD24 unit (Figure 4).

9 Reinstall cabinet top assembly and secure with mounting screws (Figure 4).

Figure 6
Cooling unit connections



Note Cooling units are wired in series. Connections to and between cooling units may not always be as shown.

Procedure 16
QRF12 Rectifier replacement

CAUTION
Service in the cabinet is interrupted when replacing the rectifier unless battery backup is provided.

1 Set AC BRKR breaker on the front of the rectifier to OFF.

2 Disconnect rectifier commercial power line cord from its receptacle.

3 If equipped, remove the bottom EMI shield.

4 Tag and disconnect the commercial power line cord, sense leads, DCON lead and battery leads from the rear of the rectifier (Figure 3).

5 Remove the mounting screws at the front of the rectifier and remove the rectifier from cabinet.

6 Position the new rectifier in the cabinet and secure with mounting screws.

7 Set the ac breaker on the new rectifier to OFF.

8 Reconnect all previously disconnected wiring (Figure 3).

9 Ensure that the 110V/220V switch on the front of the new rectifier is set to the correct voltage.

10 Connect the rectifier commercial power line cord to its receptacle.

11 Set the rectifier AC BRKR breaker on the front rectifier to ON.

Procedure 17
Peripheral Equipment Shelf Backplane replacement

1 Log in to the system and load overlay program 32 as described in 553-2301-511.

2 Disable the PE shelf being replaced using command DISS 1 s, where 1 is the loop number and s is the shelf number.

Note: If the loop is extended to a second PE shelf, that shelf must also be disabled.

3 If the backplane being replaced is located on the same level as the RPE shelf in the first tier (base) of the cabinet, remove the PE1 fuse from the QUX19 power unit.

If the backplane being replaced is located in shelf positions 2 through 5, set the corresponding PE breaker (PE2, PE3, PE4, or PE5).

4 If the backplane being replaced is in positions 2 through 5 and the cabinet is equipped with EMI shields, tag and disconnect cables from connectors A, B, C, D, E, and F on the back of the shelf next to the backplane being replaced.

5 If the cabinet is equipped with EMI shields, remove the screws securing the shield behind the backplane being replaced.

6 Disconnect power cable from connector J on the backplane being replaced.

7 Unseat all circuit packs from backplane being replaced.

8 Remove the hex screws securing the top and bottom of the backplane to the cabinet and remove backplane.

9 Position the new backplane and secure to cabinet with hex screws.

10 Reconnect power cable to connector J on backplane.

11 If previously removed, reinstall EMI shield and secure to cabinet with mounting screws.

12 Reconnect all cables previously disconnected from connectors on shelf backplanes.

13 Reinsert all circuit packs previously unseated.

14 Reinsert PE1 fuse (if removed) on QUX19 unit or set PE breaker on QUX 20 unit for replaced backplane to ON.

15 With overlay program 32 (see 553-2301-511) enable the previously disabled shelves by entering command ENLS 1 s, where 1 is the loop and s is the shelf number.

16 Enter **** to abort overlay program 32.

17 To test replacement PE shelf, load overlay program 30 (NWS).

18 Enter command LOOP 1, where 1 is the loop number on which the shelf was replaced.

19 If the system response is other than OK, refer to the trouble indicators documented in this practice.

Meridian 1

QCA144 1.5 MB/S Remote Peripheral Equipment Cabinet Appendix A

Maintenance and equipment replacement

Publication number: 553-2601-500A
Document release: Standard 2.0
Date: December 1994
Printed in the United States of America

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