

WANG

6100

VS LARGE CABLE CONCENTRATOR

Models:

**VS-CC-CBT
VS-CC**

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**Customer Engineering
Product Maintenance Manual**

741-1706

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PREFACE

This document is the Product Maintenance Manual (PMM) for the Wang VS Large Cable Concentrator. The manual is organized in accordance with Customer Engineering Technical Documentation's approved PMM outline. The scope of this manual reflects the type of maintenance philosophy selected for this product.

The purpose of this manual is to provide the Wang-trained Customer Engineer (CE) with sufficient instructions to operate, troubleshoot, and repair the VS Large Cable Concentrator. The manual will be updated on a regular schedule or as necessary. Such updates will be published either as Publication Update Bulletins (PUBs) or as full revisions.

First Edition (January, 1986)

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SECTION 1

INTRODUCTION

1.1 SCOPE AND PURPOSE

This manual contains detailed information for the installation, maintenance, and repair of the Wang VS Large Cable Concentrator. It provides procedures for unpacking and setup, adjustment, and removal/replacement of field-replaceable assemblies. An Illustrated Parts Breakdown (IPB) section provides a list of field-replaceable units (FRUs) by part number for ordering replaceable parts.

The purpose of this manual is to provide the field engineer with the information necessary to install, maintain, and repair the Wang VS Large Cable Concentrator.

1.2 ORGANIZATION AND LAYOUT

The manual is organized into twelve sections based on the Illustrated Manual outline. Some sections may not apply because of the nature of this particular product. In this case, a brief statement of explanation is provided on the section title page. Each section of this manual covers a different topic and attempts to cover the topic as completely as possible based on the information available at the time. Wherever possible, illustrations, consisting of line art with callouts, are used to support and clarify the text.

1.3 ABBREVIATIONS AND SYMBOLS USED IN THIS MANUAL

<u>ABBREVIATION/SYMBOL</u>	<u>DEFINITION</u>
AC	Alternating current
ASSY	Assembly
CBL	Cable
CC	Cable Concentrator
CPU	Central processing unit
DC	Direct current
DIP	Dual in-line package
DVM	Digital voltmeter
EAPA	Electrically active port assembly
FRU	Field-replaceable unit
FWAPA	FiberWay active port assembly
GATC	Gate array telecommunications
I/O	Input/output
IOC	Input output controller
IOP	Input output processor
IPB	Illustrated parts breakdown
LED	Light-emitting diode
MLTC	Multiline telecommunications
P/N	Part number
PCA	Printed circuit assembly

INTRODUCTION

<u>ABBREVIATION/SYMBOL</u>	<u>DEFINITION</u>
PDU	Power distribution unit
PLT	Plate
PNL	Panel
PM	Preventive maintenance
RCS	Remote cluster switch
SCL	Serial communications link
SW	Switch
TC	Telecommunications
V	Volt(s)
VS	Virtual storage
WLI P/N	Wang Laboratories, Inc. part number

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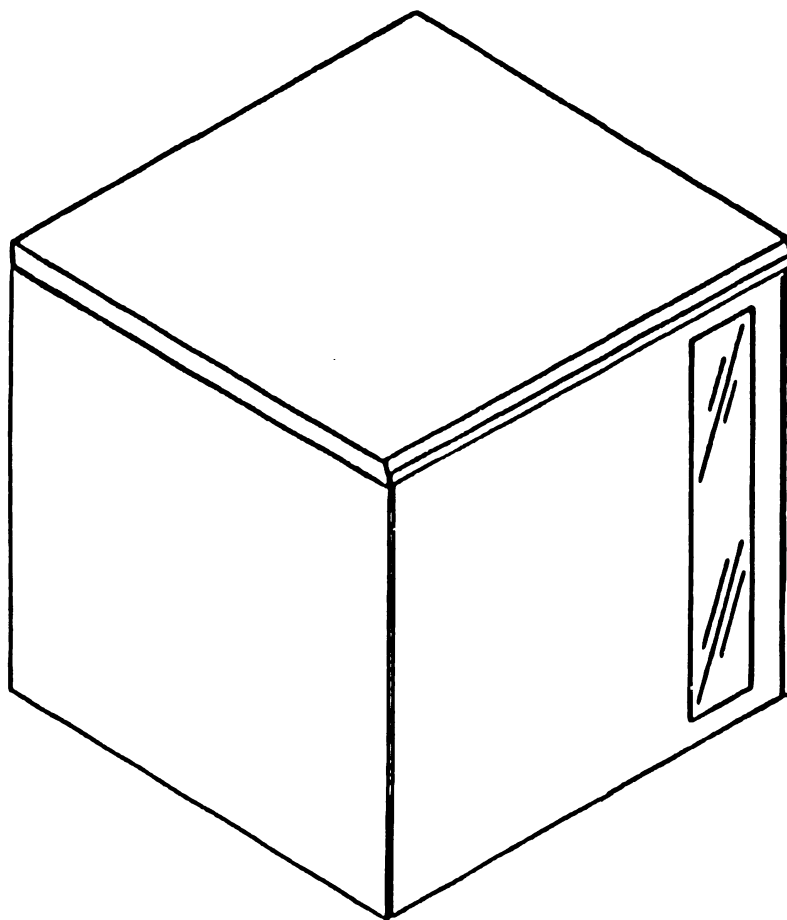
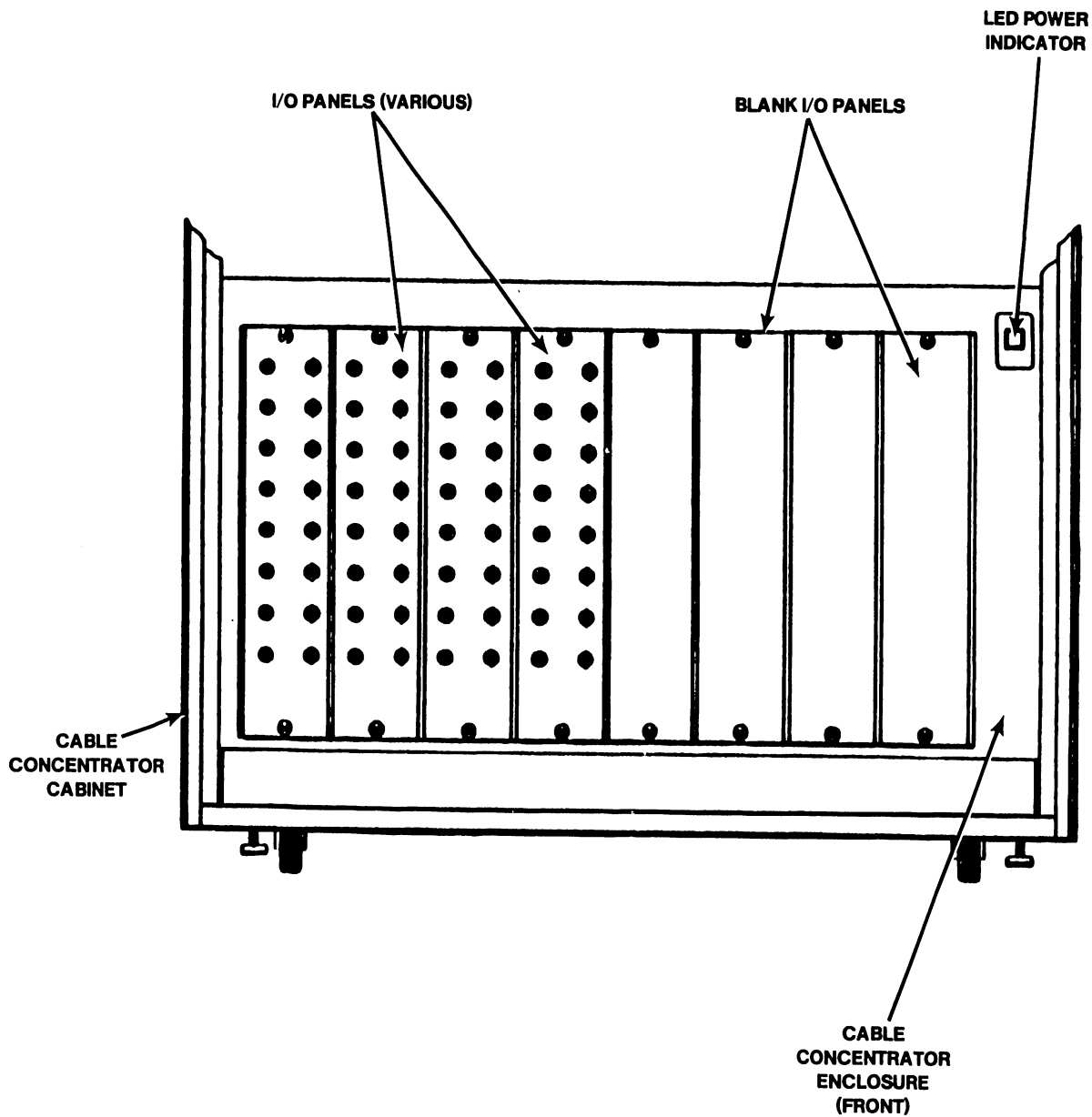


Figure 2-1. VS Large Cable Concentrator

IDENTIFICATION

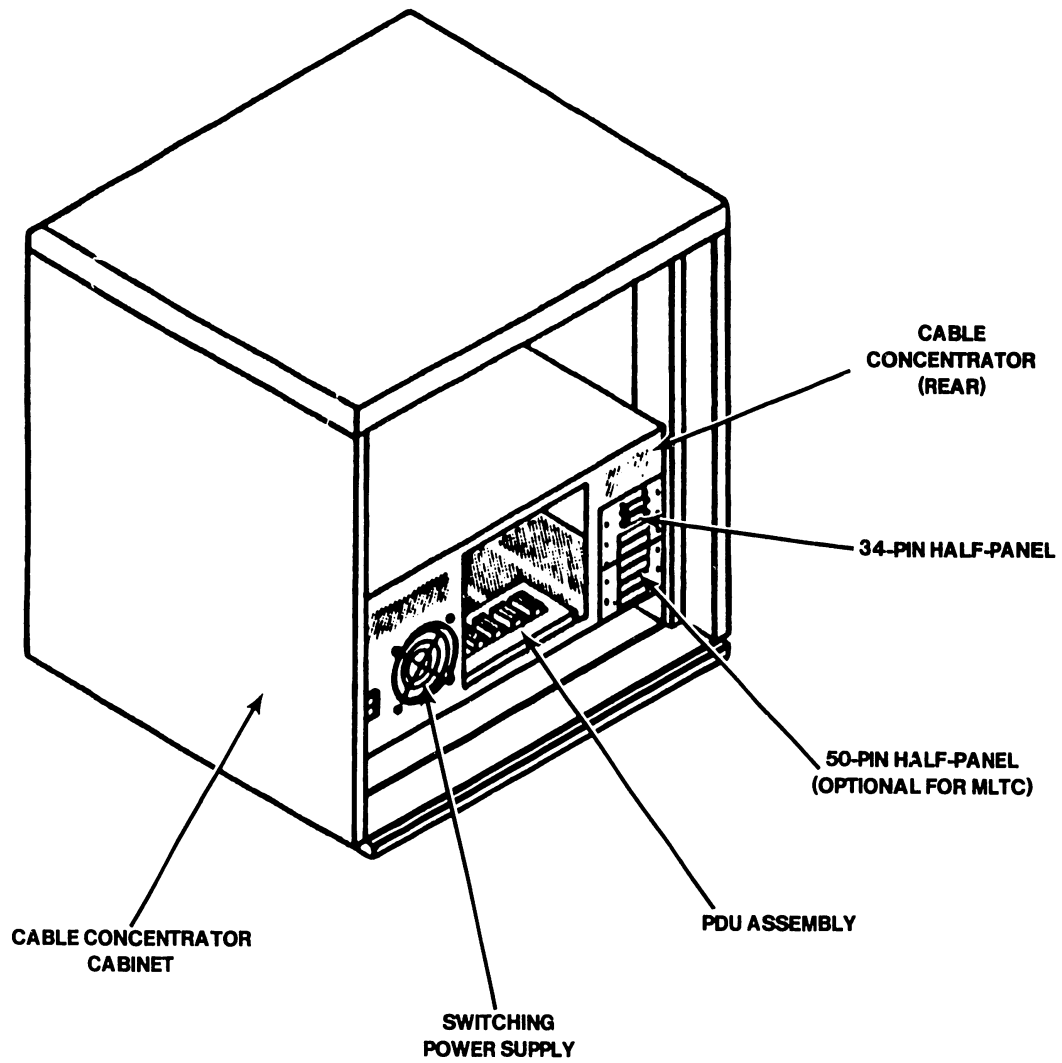
2.2 MAJOR ASSEMBLIES



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Figure 2-2. Large Cable Concentrator Major Assemblies (Front View)

IDENTIFICATION



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Figure 2-3. Large Cable Concentrator Major Assemblies (Rear View)

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SECTION 3

CONTROLS AND INDICATORS

3.1 GENERAL

This section provides information on the controls and indicators used on the VS Large Cable Concentrator. Operator controls and indicators, those accessible to the customer, are covered first, followed by service controls and indicators, those accessible only to the field engineer.

NOTE

For information on the gate array TC and multiline TC APA controls and indicators, refer to the VS-300 Product Maintenance Manual. For information on the FiberWay APA controls and indicators, refer to the Remote Cluster Switch and Fiber Optic Active Port Assembly Product Maintenance Manual.

3.2 OPERATOR CONTROLS AND INDICATORS

Table 3-1 below lists the operator controls and indicators, their location, type, and function.

Table 3-1. Operator Controls and Indicators

NAME	LOCATION	TYPE/FUNCTION
AC Power Switch	Power Supply	Rocker switch; applies ac power to switching power supply.
Power On	Front Panel	LED; indicates dc power is on.

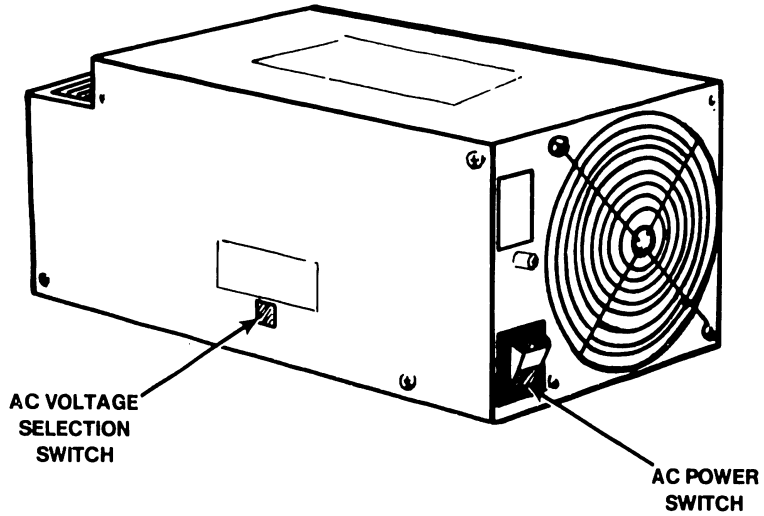
3.3 SERVICE CONTROLS AND INDICATORS

Table 3-2. Service Controls and Indicators

NAME	LOCATION	TYPE/FUNCTION
AC Voltage Selection Switch	Power Supply	Slide switch; selects line voltage of 115V or 230V.

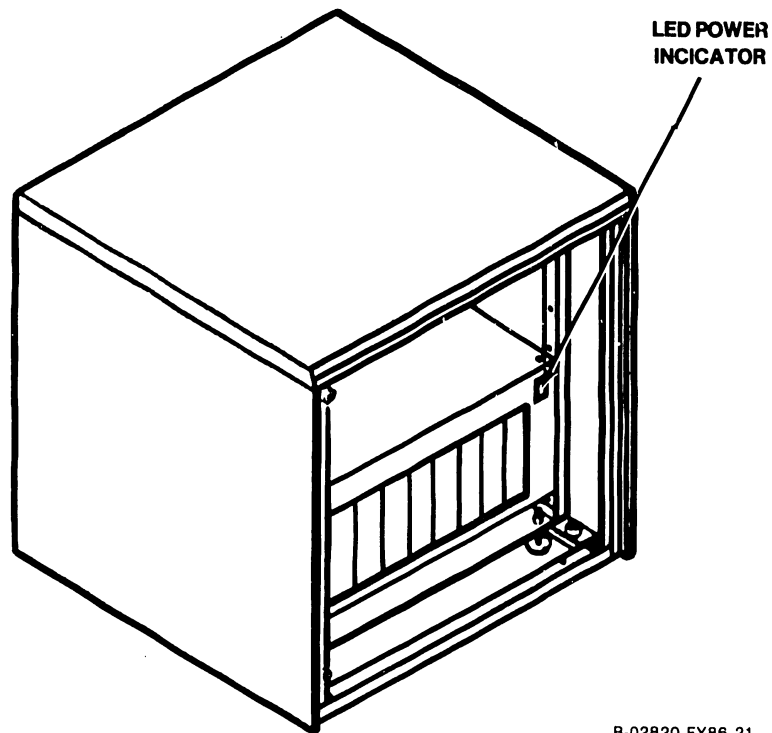
Refer to figures 3-1 and 3-2 below for illustrations of control and indicator locations.

CONTROLS AND INDICATORS



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Figure 3-1. SPS 200 Switching Power Supply



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Figure 3-2. Cable Concentrator Front Panel

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SECTION 4

OPERATION

4.1 GENERAL

This section details the power-up and power-down procedures for the Wang VS Large Cable Concentrator.

4.2 POWER-UP PROCEDURE

The following steps provide the power-up procedure for the VS Large Cable Concentrator:

1. Power up the VS system to which the cable concentrator is attached. Refer to the appropriate VS Product Maintenance Manual.
2. Move the ac power switch on the cable concentrator to the "1" position. Ensure that the power on indicator lights and that the power supply fan is turning.
3. Power up all peripherals attached to the cable concentrator.

4.3 POWER-DOWN PROCEDURE

1. Power down all peripherals attached to the cable concentrator after ensuring that all users have logged off and all background tasks have been completed.
2. Move the ac power switch to the "0" position.
3. Power down the VS system, if desired, according to the procedures in the appropriate VS Product Maintenance Manual.

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SECTION 5

PREVENTIVE MAINTENANCE

5.1 GENERAL

This section contains information on preventive maintenance procedures for the VS Large Cable Concentrator including a PM schedule and tools and equipment required.

5.2 PM SCHEDULE

All PM tasks should be performed every six months.

5.3 TOOLS, EQUIPMENT, AND MATERIALS

No special tools, equipment, or materials are required for Cable Concentrator PM.

5.4 PM PROCEDURES

The following steps detail the preventive maintenance procedures for the VS Large Cable Concentrator:

1. Power down the equipment.
2. Remove the rear cover. Refer to paragraph 7.2.2.
3. Check for loose or missing hardware, including loose connectors. Tighten all loose hardware and reinstall any hardware that may have dropped.
4. Vacuum interior of Cable Concentrator cabinet to remove dust and debris.
5. Power on the Cable Concentrator and ensure that the power supply fan is operating properly.

PREVENTIVE MAINTENANCE

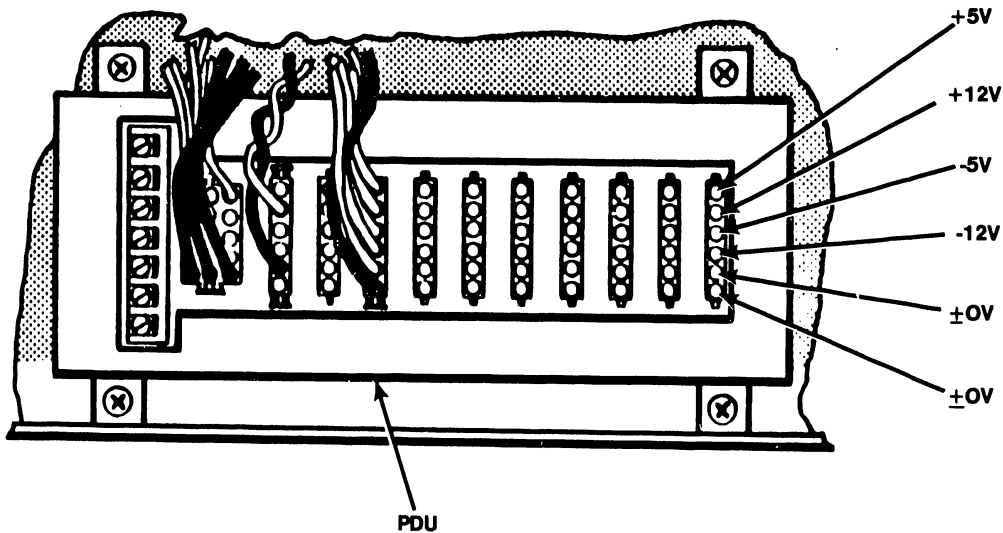
6. Check the dc voltage output of the SPS power supply. Use the pins of one of the unused 6-pin connectors on the power distribution unit (PDU) as test points. Refer to figure 5-1 below. If any of the voltages exceeds the limits in table 5-1 below, the power supply must be replaced. Refer to paragraph 7.2.6 for power supply replacement procedure.

NOTE

The SPS 200 switching power supply is being replaced by the SPS 255 (WLI P/N 270-1033) to provide the proper power levels to drive TC APAs. The 100 mA @ -12V furnished by the SPS 200 provides only marginal support of Multiline, Gate Array, and P-Band TC APAs. If using the SPS 200, limit TC APAs to 3 Gate Arrays, 1 MLTC (23V96-8) only, and 3 P-Band modems. The SPS 255 can support 4 Gate Arrays, 1 MLTC (23V96-16/23V86), and 5 P-Band modems. The SPS 255 is interim and will be replaced with a newly designed supply to provide power @ +12V more adequately.

Table 5-1. DC Voltage Specifications

VOLTS	AMPS	OPERATING LIMITS	AC RIPPLE LIMITS
+5V	2.0	+4.75V to +5.25V	35mV RMS or 50mV Pk to Pk
+12V	7.0	+11.40V to +12.60V	35mV RMS or 50mV Pk to Pk
-5V	0.1	-5.25V to -4.75V	35mV RMS or 50mV Pk to Pk
-12V	0.1	-12.60V to -11.40V	35mV RMS or 50mV Pk to Pk



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Figure 5-1. Cable Concentrator Test Points

PREVENTIVE MAINTENANCE

6. Replace rear cover and power on equipment.
7. Ensure that all peripherals attached to the Cable Concentrator are operating properly.
8. Turn the equipment back over to the customer.

SECTION

6

**TROUBLE-
SHOOTING**

SECTION 6

TROUBLESHOOTING

For troubleshooting and diagnostics procedures, refer to the VS-300 Computer System and the Fiber Optics and Remote Cluster Switch Product Maintenance Manuals.

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REPAIR

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SECTION 7

REPAIR

7.1 TOOLS AND EQUIPMENT

No special tools or equipment are required for the repair of the Wang VS Large Cable Concentrator. A standard tool kit and a digital voltmeter (DVM) are all that is necessary.

7.2 REMOVAL AND REPLACEMENT PROCEDURES

The following paragraphs provide the procedures for the removal and replacement of parts and assemblies of the Cable Concentrator.

7.2.1 FRONT PANEL REMOVAL AND REPLACEMENT

1. Power down the equipment.
2. Rotate the two front panel supports, located underneath the front of the Cable Concentrator cabinet, 90° to release the front panel. Refer to figure 7-1A.
3. Slide front panel down to clear the four button latches on the side supports and lift off panel. Refer to figure 7-1B.
4. To replace the front panel, reverse the removal procedure.

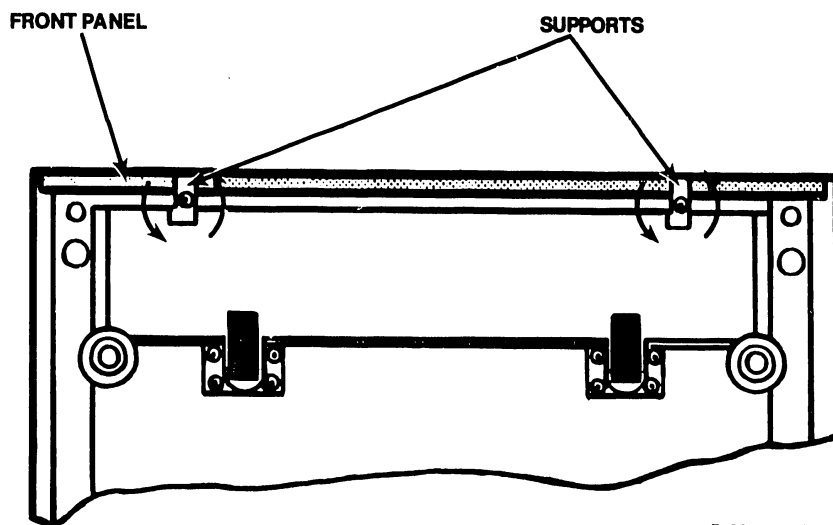


Figure 7-1A. Front Panel Removal (Bottom View)

REPAIR

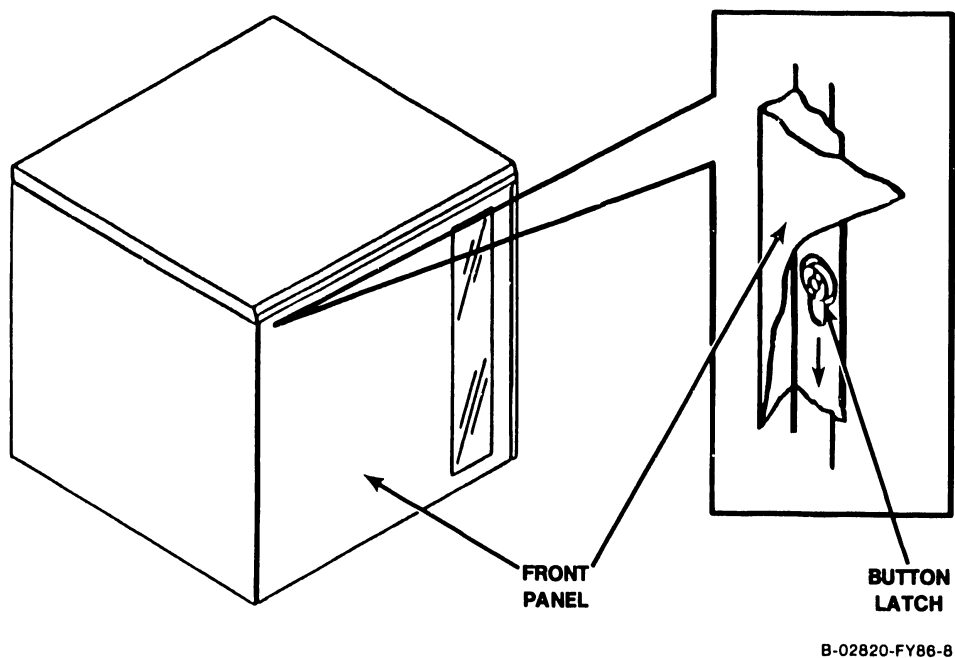


Figure 7-1B. Front Panel Removal

7.2.2 REAR COVER REMOVAL AND REPLACEMENT

1. Power down the equipment.
2. Remove the eight Phillips head screws that secure the rear cover to the back of the Cable Concentrator enclosure and remove cover. Refer to figure 7-2.

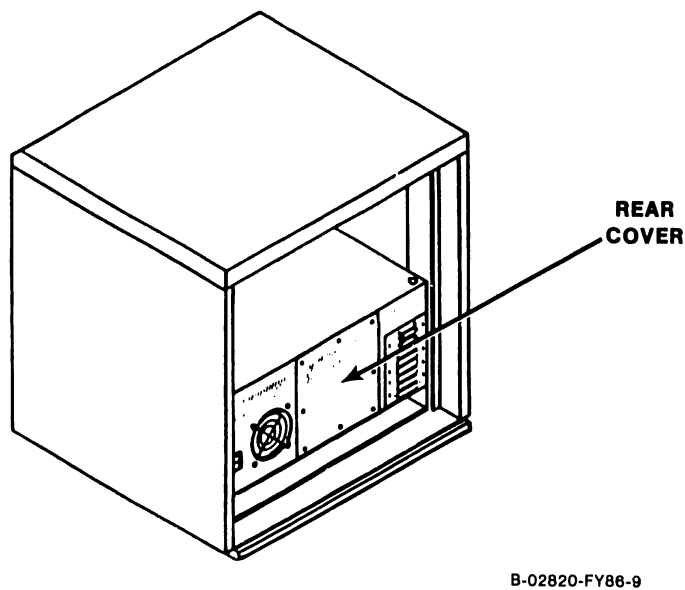
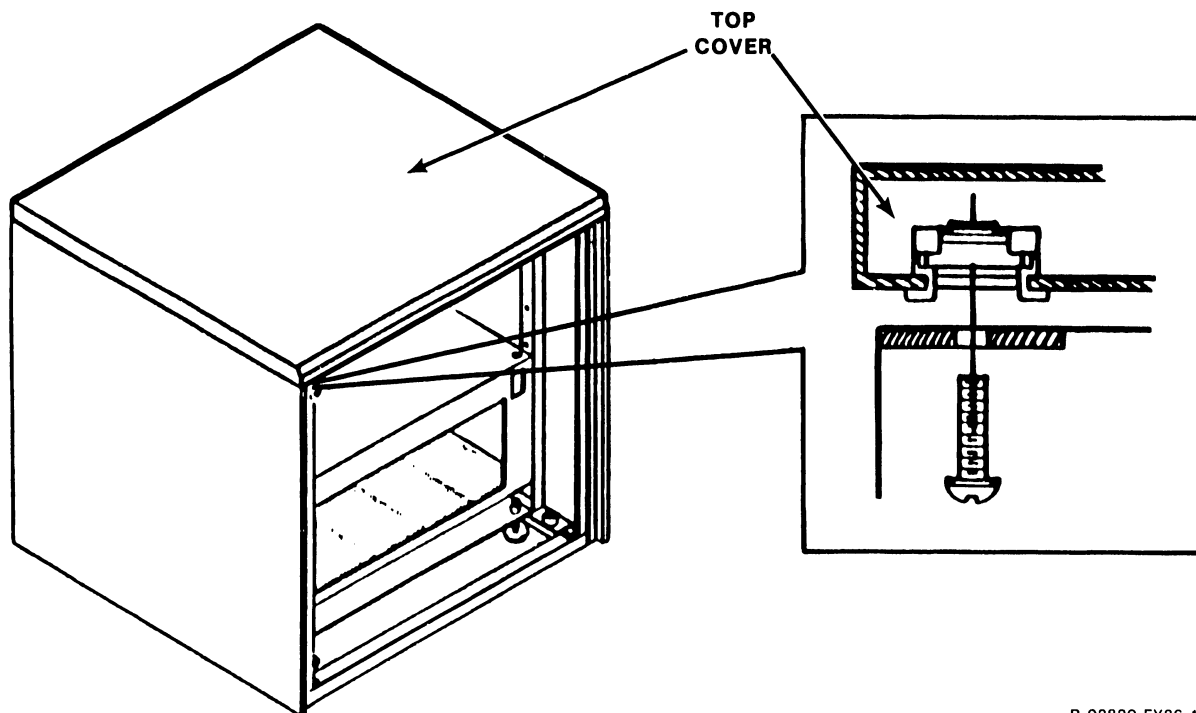


Figure 7-2. Rear Cover Removal

3. To replace the rear cover, reverse the removal procedure.

7.2.3 TOP COVER REMOVAL AND REPLACEMENT

1. Power down the equipment.
2. Remove the front panel. Refer to paragraph 7.2.1.
3. Remove the four Phillips head screws that secure the top cover to the enclosure. Refer to figure 7-3 below.
4. Lift off the top cover.
5. To replace the top cover, reverse the removal procedure.



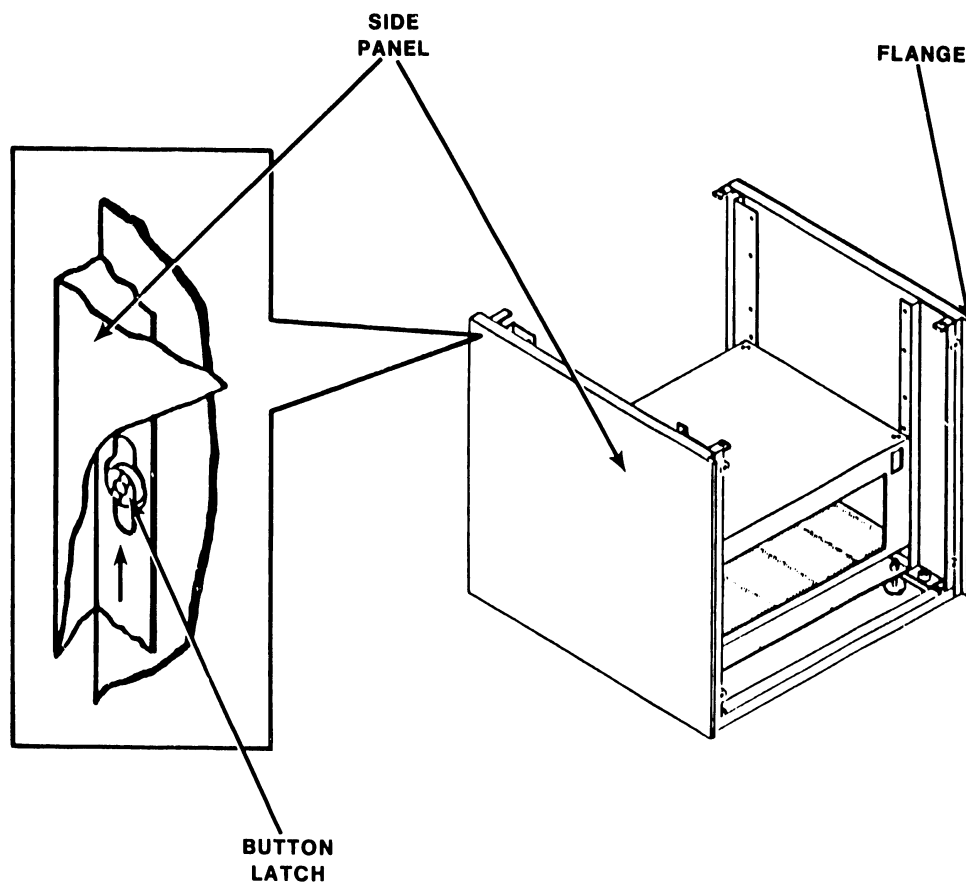
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Figure 7-3. Top Cover Removal

REPAIR

7.2.4 SIDE PANEL REMOVAL AND REPLACEMENT

1. Remove the front cover. Refer to paragraph 7.2.1.
2. Remove the top cover. Refer to paragraph 7.2.3.
3. Slide the side panel up to clear the button latches and lift off the panel. Refer to figure 7-4.
4. To replace the side panel, reverse the removal procedure. Ensure that the flange on the side panel faces toward the front of the unit.



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Figure 7-4. Side Panel Removal

7.2.5 SWITCHING POWER SUPPLY REMOVAL AND REPLACEMENT

WARNING

DO NOT OPEN THE SWITCHING POWER SUPPLY UNDER ANY CIRCUMSTANCE. EXTREMELY DANGEROUS VOLTAGE AND CURRENT LEVELS (IN EXCESS OF 300 VOLTS DC AND UNLIMITED CURRENT) ARE PRESENT WITHIN THE POWER SUPPLY. DO NOT ATTEMPT TO REPAIR THE SWITCHING POWER SUPPLY; IT IS FIELD REPLACEABLE ONLY. AFTER POWERING THE UNIT DOWN AND DISCONNECTING THE AC POWER CONNECTOR FROM THE POWER SOURCE RECEPTACLE, ALLOW ONE MINUTE BEFORE REMOVING THE POWER SUPPLY TO PROVIDE ADEQUATE TIME FOR ANY RESIDUAL VOLTAGE TO DRAIN THROUGH THE BLEEDER RESISTORS.

1. Power down the switching power supply.
2. Disconnect the ac power cable from the ac power source.
3. Remove the two screws that secure the power cable to the power supply and remove cable. Refer to figure 7-5A.
4. Remove the two Phillips head taptite screws that secure the power supply to the rear of the enclosure.

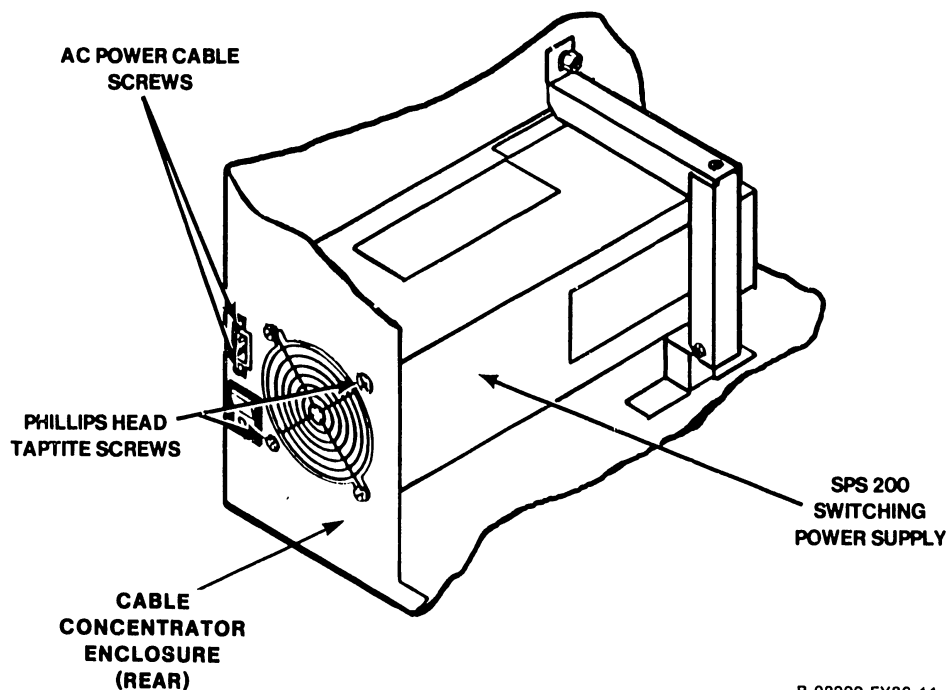
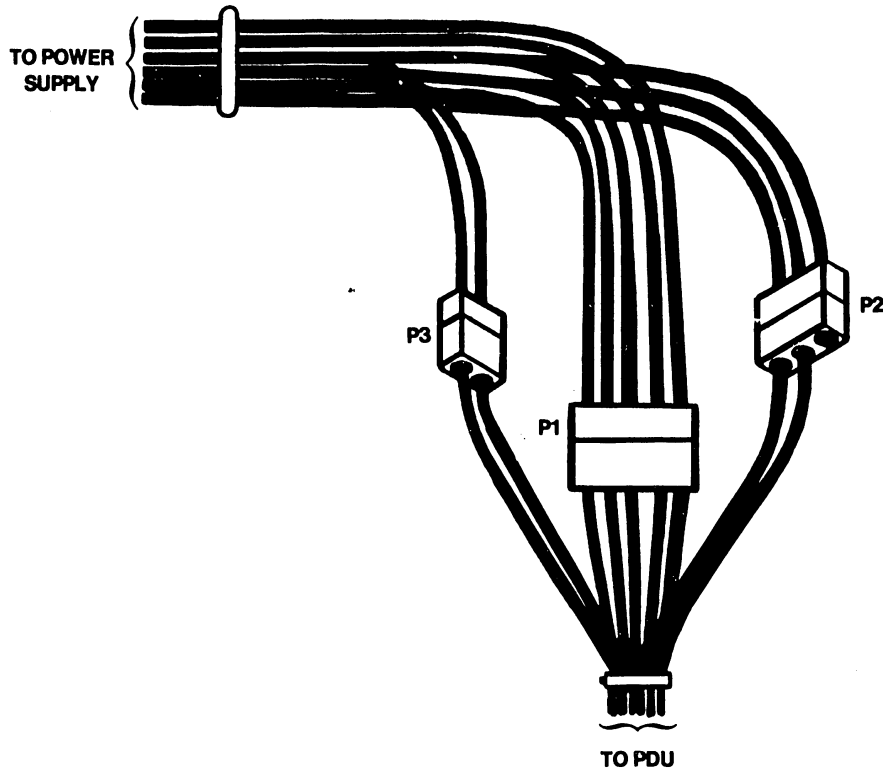


Figure 7-5A. Switching Power Supply Removal

REPAIR

5. Remove the eight Phillips head screws that secure the rear cover to the rear of the enclosure and remove the rear cover. Refer to figure 7-2.
6. Disconnect the dc power harness at P1, P2, and P3 between the power supply and the power distribution unit (PDU). Refer to figure 7-5B.



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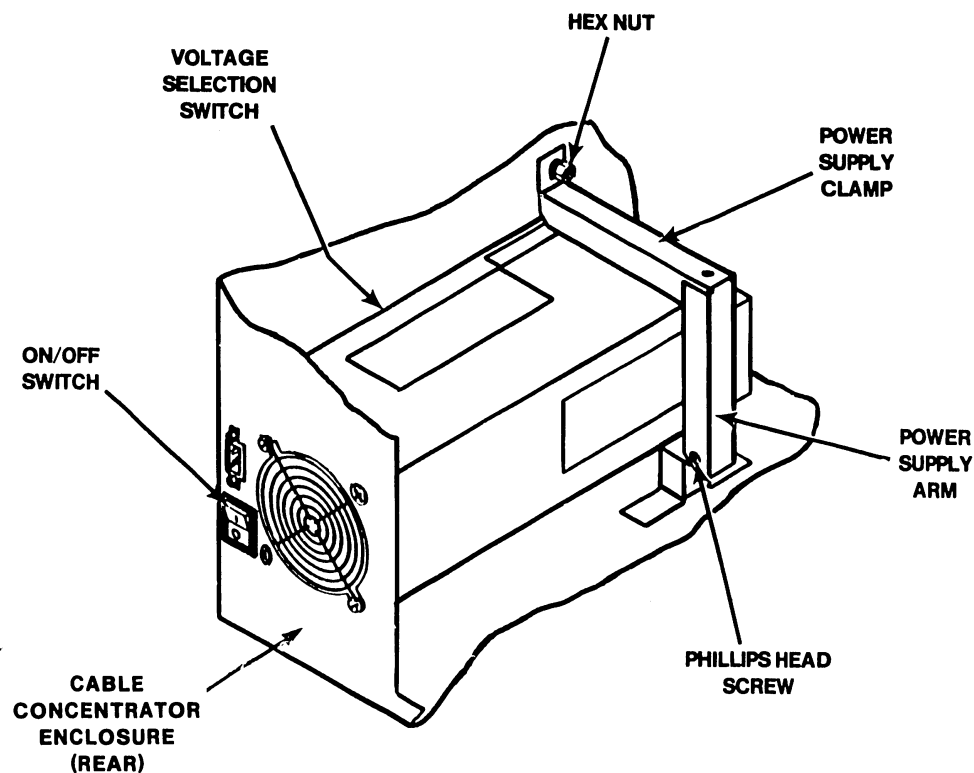
Figure 7-5B. Switching Power Supply Removal

7. Remove the Phillips head screw from the power supply arm (vertical) clamp. Refer to figure 7-5C.
8. Remove the hex nut from the power supply (horizontal) clamp.
9. Remove the power supply clamp assembly.
10. Slide the power supply toward the front of the enclosure slightly to clear the ac on/off switch. Carefully remove the power supply through the rear cover opening.
11. To replace the switching power supply, reverse the removal procedure.

CAUTION

Ensure that the voltage selection switch (located on the left side of the power supply as viewed from the fan end) is in the correct position (115V or 230V) for the available line voltage before installing the power supply in the Cable Concentrator.

12. Ensure that the power supply is secure and that all connectors are reconnected properly.



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Figure 7-5C. Switching Power Supply Removal

REPAIR

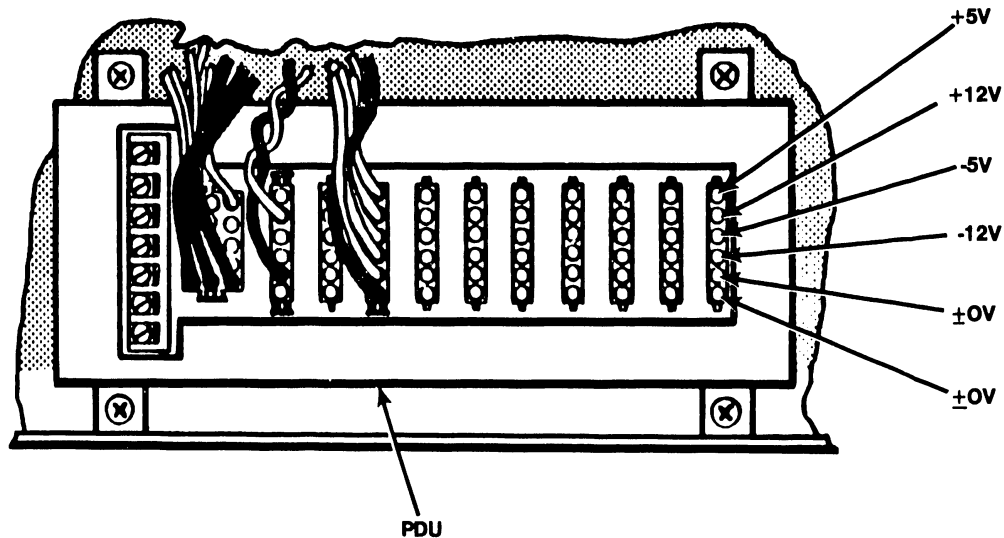
13. Power up the Cable Concentrator and check the voltage outputs listed in the table below, using a 6-pin connector on the PDU for test points. Refer to figure 7-6.

NOTE

The SPS 200 switching power supply is being replaced by the SPS 255 (WLI P/N 270-1033) to provide the proper power levels to drive TC APAs. The 100 mA @ -12V furnished by the SPS 200 provides only marginal support of Multiline, Gate Array, and P-Band TC APAs. If using the SPS 200, limit TC APAs to 3 Gate Arrays, 1 MLTC (23V96-8) only, and 3 P-Band modems. The SPS 255 can support 4 Gate Arrays, 1 MLTC (23V96-16/23V86), and 5 P-Band modems. The SPS 255 is interim and will be replaced with a newly designed supply to provide power @ +12V more adequately.

Table 7-1. DC Voltage Specifications

VOLTS	AMPS	OPERATING LIMITS	AC RIPPLE LIMITS
+5V	20.0	+4.75V to +5.25V	35mV RMS or 50mV Pk to Pk
+12V	7.0	+11.40V to +12.60V	35mV RMS or 50mV Pk to Pk
-5V	0.1	-5.25V to -4.75V	35mV RMS or 50mV Pk to Pk
-12V	0.1	-12.60V to -11.40V	35mV RMS or 50mV Pk to Pk



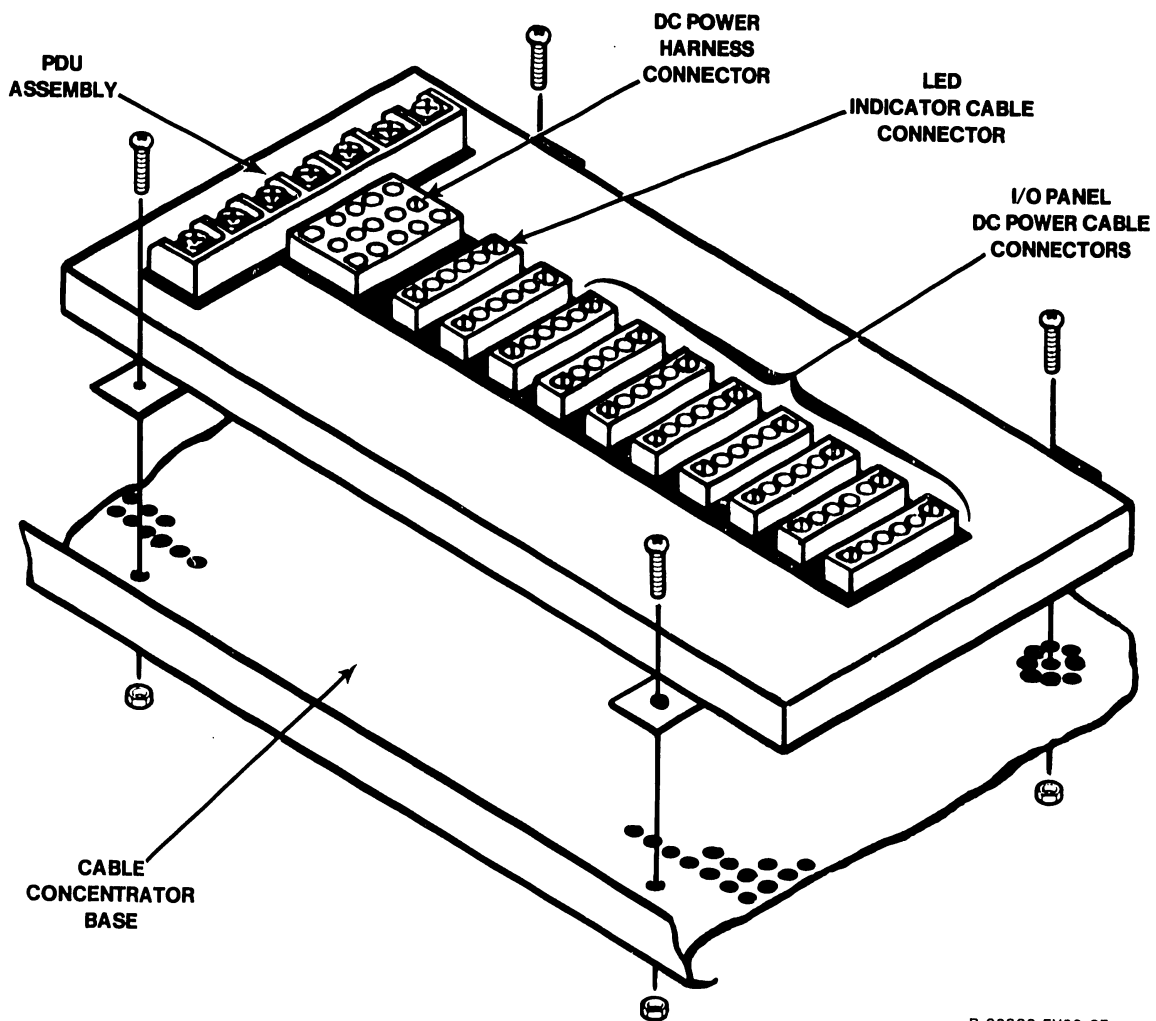
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Figure 7-6. Cable Concentrator Test Points

7.2.6 DC POWER DISTRIBUTION UNIT (PDU) REMOVAL AND REPLACEMENT

The dc power distribution unit (PDU) used in the Cable Concentrator is the same as that used in the VS-300 CPU.

1. Power down the Cable Concentrator
2. Disconnect the ac power cable from the ac power source.
2. Remove the eight Phillips head screws that secure the rear cover to the rear of the enclosure and remove the rear cover.
3. Disconnect the dc power harness (220-2315) from the PDU. Refer to figure 7-7.
4. Disconnect the LED indicator cable (220-2380) from the PDU.
5. Disconnect the I/O panel power cable(s) from the PDU.
6. Remove the four Phillips head screws and hex nuts that secure the PDU to the enclosure base.



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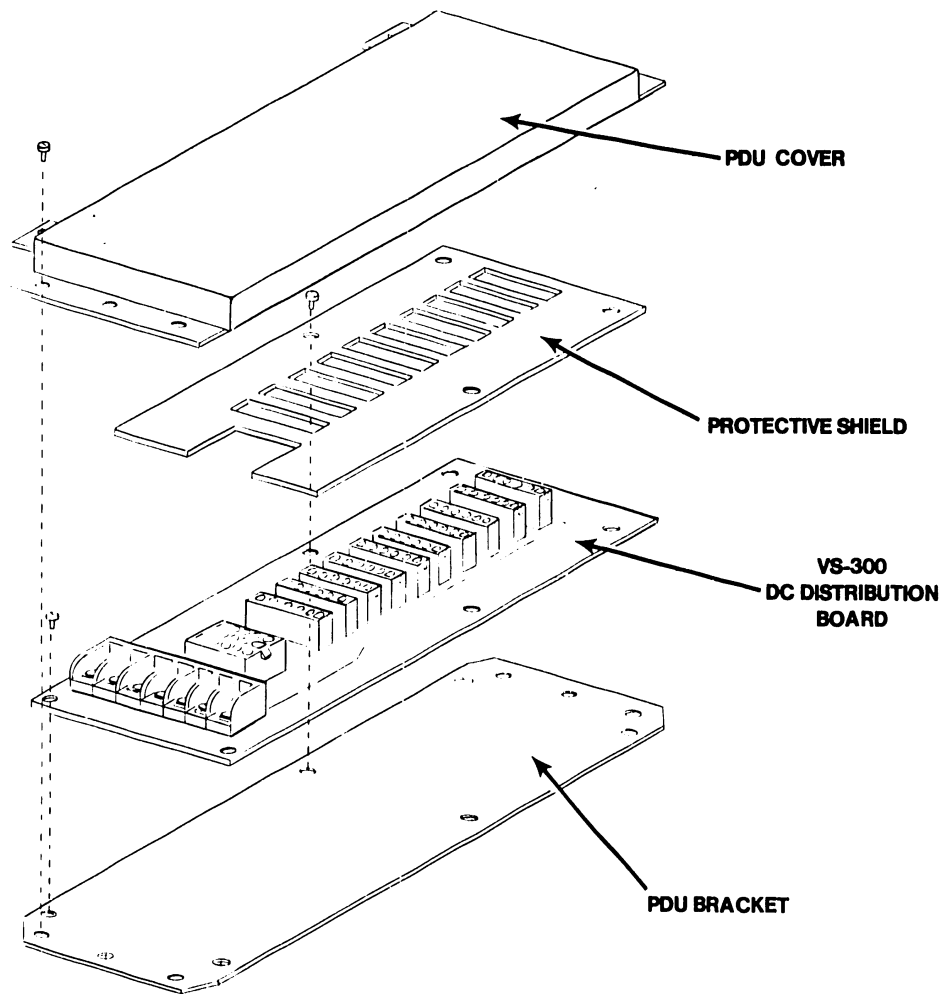
Figure 7-7. DC Power Distribution Unit (PDU) Removal

REPAIR

7. Remove the PDU through the rear cover opening.
8. To replace the PDU, reverse the removal procedure.

7.2.7 DC DISTRIBUTION BOARD REMOVAL AND REPLACEMENT

1. Power down the Cable Concentrator.
2. Remove the PDU. Refer to paragraph 7.2.6.
3. Remove the screws that secure the dc distribution board to the PDU assembly and remove the dc distribution board. Refer to figure 7-8.
4. To replace the dc distribution board, reverse the removal procedure.

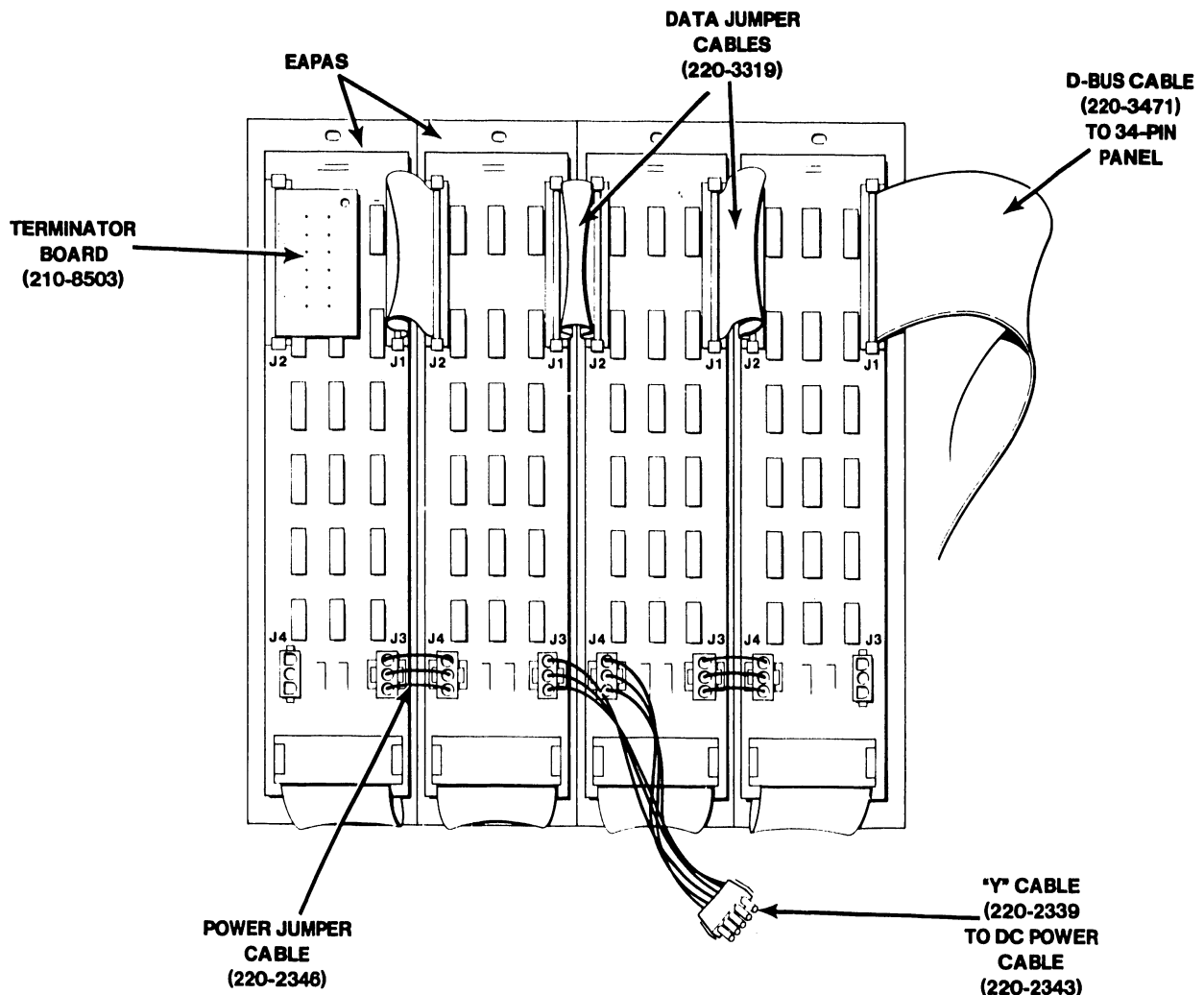


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Figure 7-8. DC Distribution Board Removal

7.2.8 ELECTRICALLY ACTIVE PORT ASSEMBLY (EAPA) REMOVAL AND REPLACEMENT

1. Power down the Cable Concentrator.
2. Remove the front panel. Refer to paragraph 7.2.1.
3. Remove the eight Phillips head screws that secure the rear cover to the rear of the enclosure and remove the rear cover.
4. Disconnect the 220-2346 power cable from J3 and/or J4 or the 220-2339 power cable from J3 or J4 of the EAPA, depending upon which EAPA is to be removed. Refer to figure 7-9A for clarification.
5. Disconnect the 220-3319 data ribbon cable from J1 and J2 or the 220-3471 data ribbon cable, coming from the 34-pin panel assembly, from J1 of the EAPA, depending upon which EAPA is to be removed.

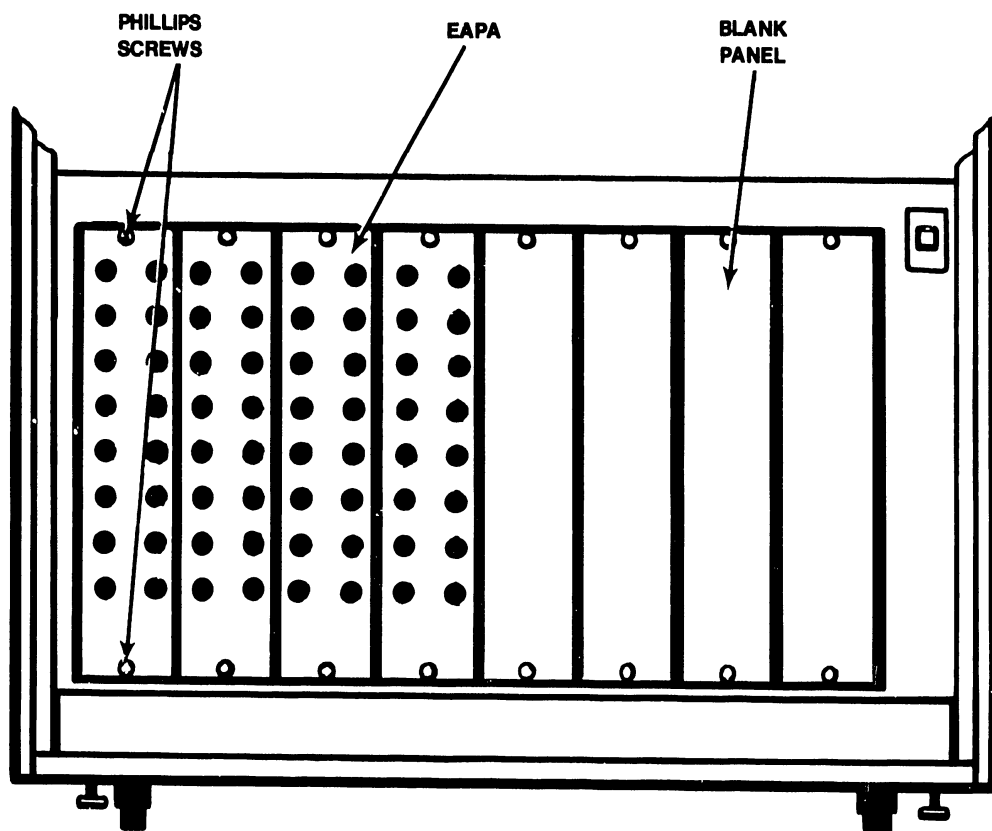


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Figure 7-9A. Electrically Active Port Assembly Removal

REPAIR

6. Disconnect the coax cables from the front of the EAPA panel assembly.
7. Remove the two Phillips head screws that secure the EAPA to the front of the enclosure. Refer to figure 7-9B.
8. Remove the EAPA.
9. To replace the EAPA, reverse the removal procedure.
10. Ensure that a terminator board (210-8503) is installed in J2 of the last EAPA in the group.

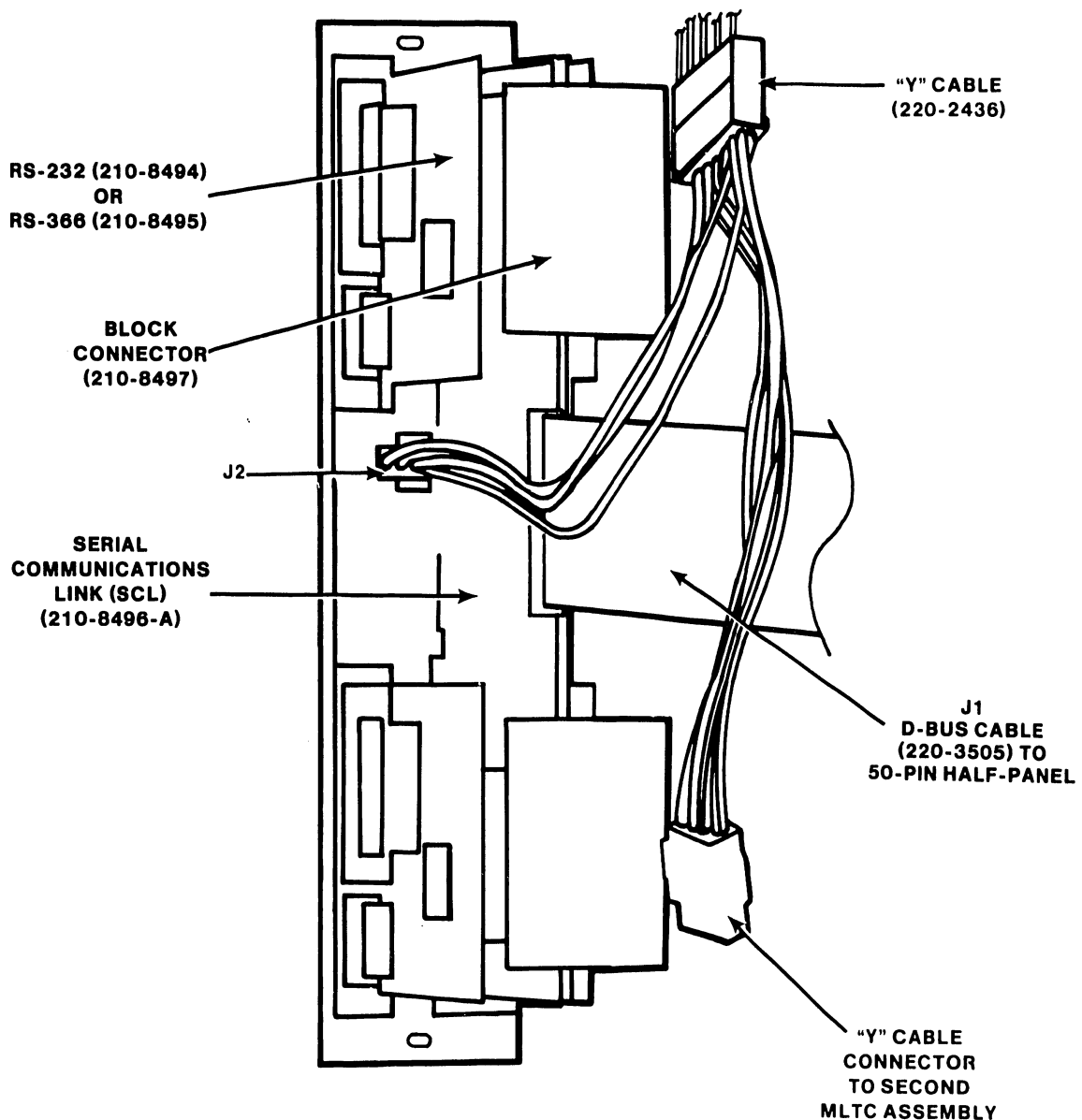


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Figure 7-9B. Electrically Active Port Assembly Removal

7.2.9 MULTILINE TC (MLTC) PANEL ASSEMBLY REMOVAL AND REPLACEMENT

1. Power down the Cable Concentrator.
2. Remove the front panel. Refer to paragraph 7.2.1.
3. Remove the eight Phillips head screws that secure the rear cover to the rear of the Cable Concentrator and remove the rear cover.
4. Disconnect the 220-2436 "Y" cable from J2 on the MLTC assembly to be removed. Refer to figure 7-10 below.
5. Disconnect the 220-3505 D-bus cable from J1.

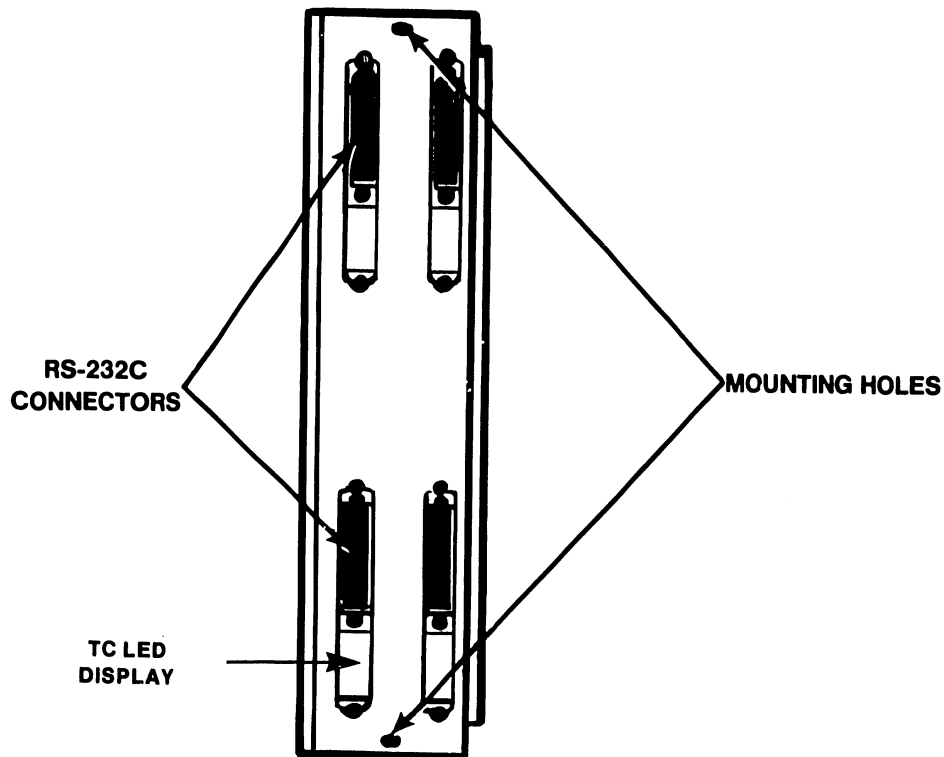


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Figure 7-10A. MLTC Panel Assembly Removal

REPAIR

6. Disconnect the cables from the front of the MLTC panel assembly.
7. Remove the two Phillips head screws that secure the MLTC panel assembly to the front panel. Remove the assembly. Refer to figure 7-10B below.
8. Do NOT replace the entire assembly; only the defective board(s). Remove the screws and/or clamp (SCL) that secure the defective board and remove the board. The block connectors pull off. Refer to figure 7-10A.
9. To reinstall the MLTC panel assembly, reverse the removal procedure.

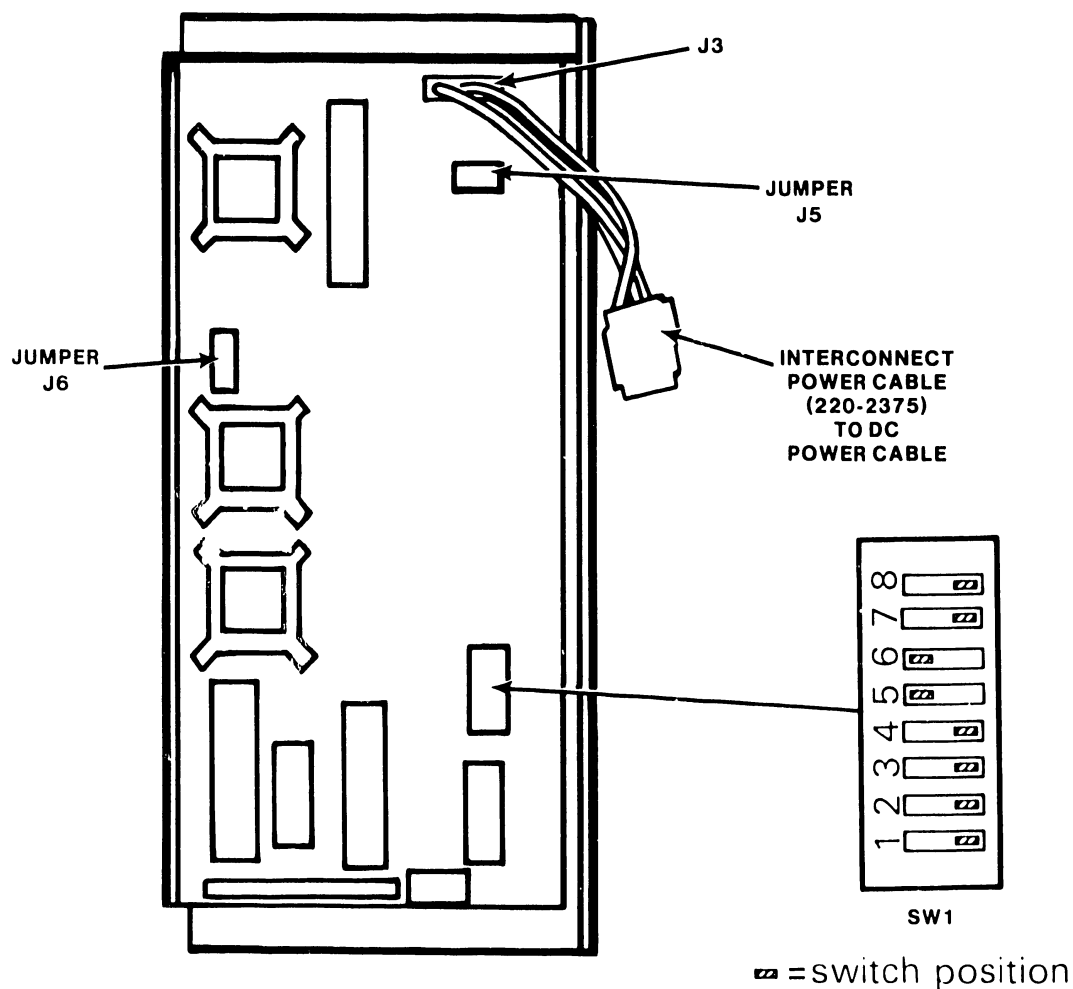


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Figure 7-10B. MLTC Panel Assembly Removal

7.2.10 GATE ARRAY TELECOMMUNICATIONS (GATC) PANEL ASSEMBLY REMOVAL AND REPLACEMENT

1. Power down the Cable Concentrator.
2. Remove the front panel.
3. Remove the eight Phillips head screws that secure the rear cover to the rear of the Cable Concentrator and remove the rear cover.
4. Disconnect the GATC power cable (220-2375) from J3 on the GATC panel assembly to be removed. Refer to figure 7-11A.

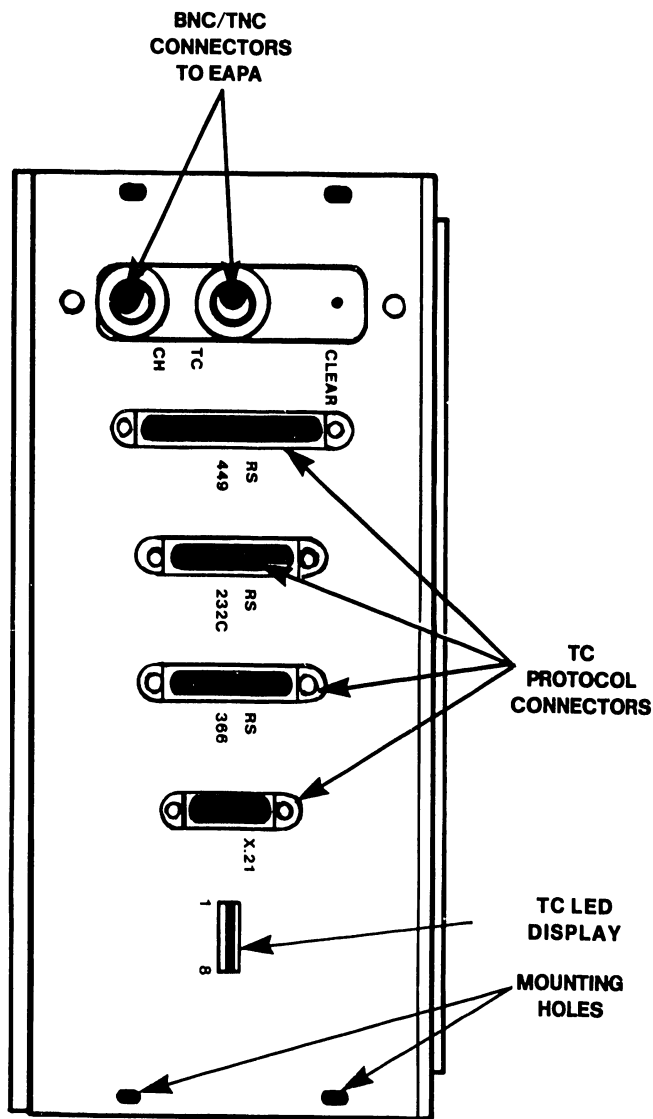


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Figure 7-11A. GATC Panel Assembly Removal

REPAIR

5. Disconnect the coax cable (220-0148) from the BNC/TNC connectors on the front of the GATC panel assembly. Refer to figure 7-11B below.
6. Disconnect the modem RS-232C TC cable (220-0332) and/or the X.21 TC cable (220-0274) from the D-connectors on the front of the GATC panel assembly.
7. Remove the four Phillips head screws that secure the GATC panel assembly to the front panel of the Cable Concentrator.
8. To replace the GATC panel assembly, reverse the removal procedure.
9. Ensure that the 8-position DIP switch at SW1 is set as shown in figure 7-11A. Ensure that the jumpers at J5 and J6 are in place.



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Figure 7-11B. GATC Panel Assembly Removal

7.2.11 WANGNET P-BAND MODEM PANEL ASSEMBLY REMOVAL AND REPLACEMENT

1. Power down the Cable Concentrator.
2. Remove the front panel. Refer to paragraph 7.2.1.
3. Remove the eight Phillips head screws that secure the rear cover to the rear of the Cable Concentrator and remove the rear cover.
4. Disconnect the power cable (220-2402) from P2 on the p-band modem panel assembly. Refer to figure 7-12A.
5. Disconnect the D-bus cable (220-3471) from P1 on the p-band modem panel assembly.

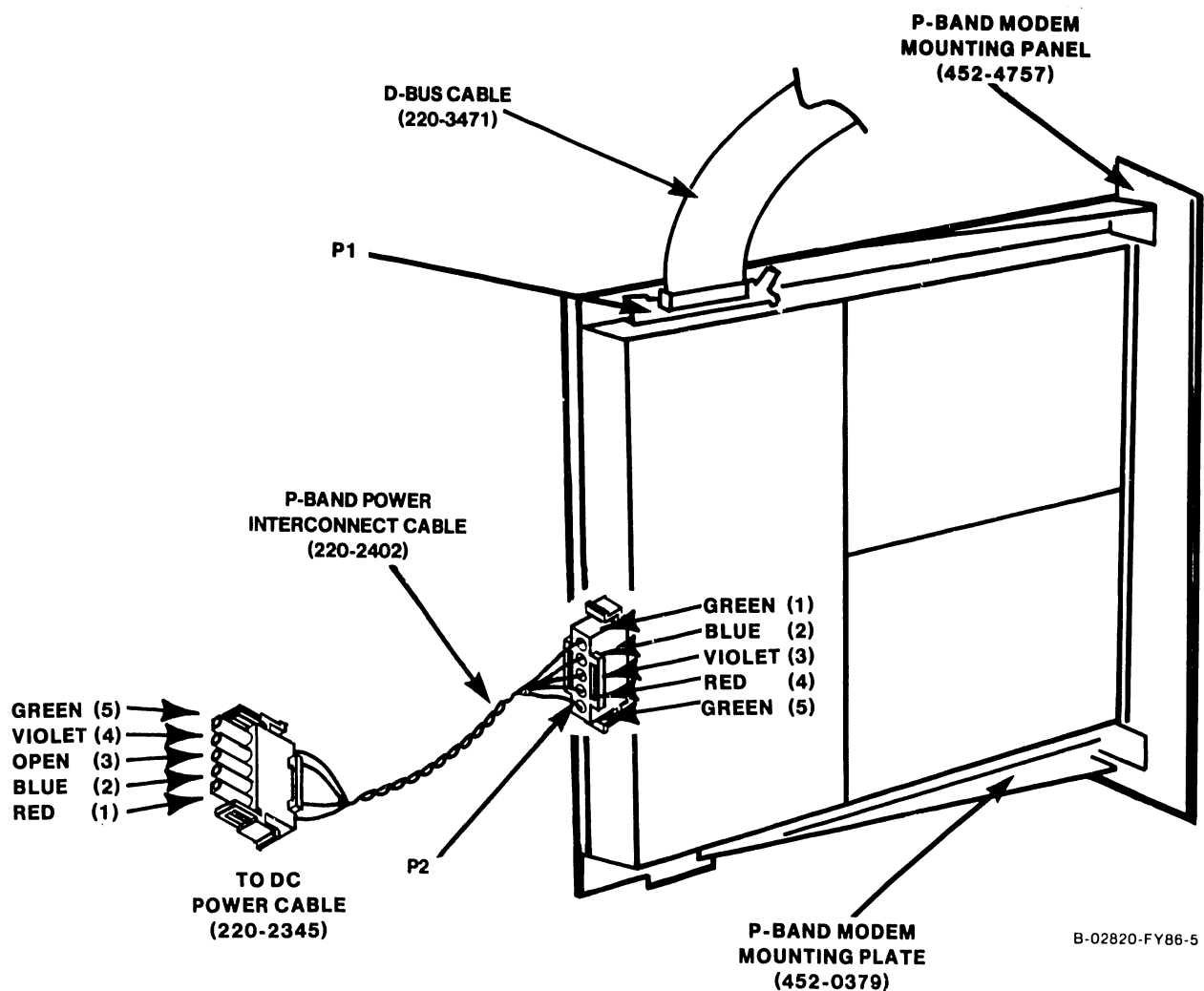
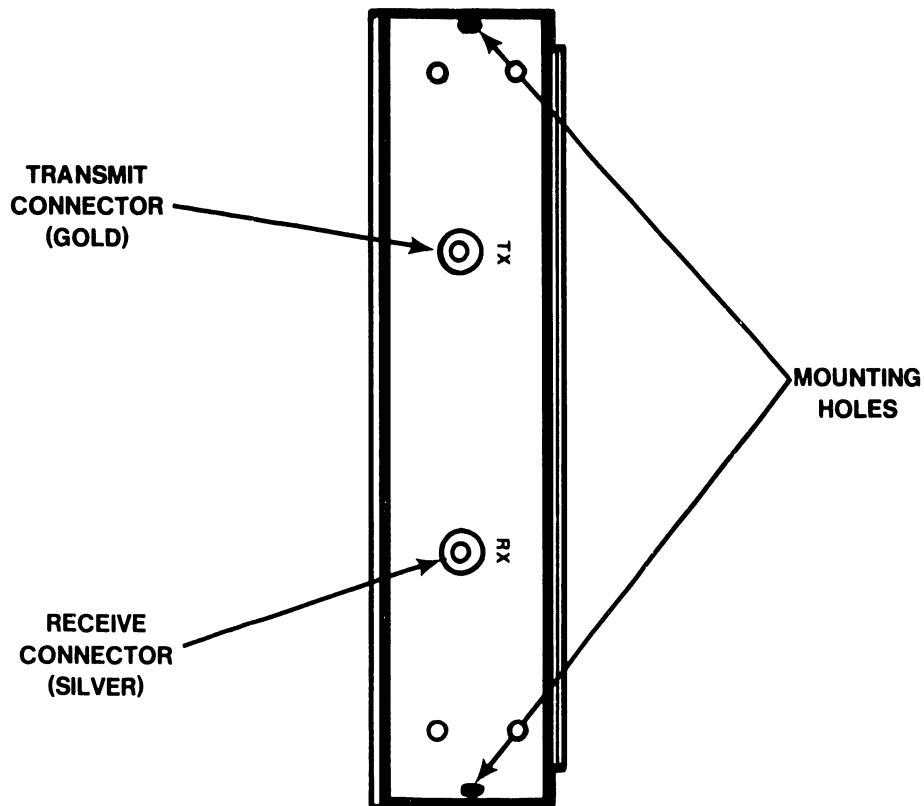


Figure 7-12A. Wangnet P-Band Modem Panel Assembly Removal

REPAIR

6. Disconnect the cables from the transmit (gold) and the receive (silver) connectors on the front of the p-band modem panel assembly.
7. Remove the two Phillips head screws that secure the p-band modem to the front panel of the Cable Concentrator. Refer to figure 7-12B.
8. Do NOT replace the entire assembly; only the modem. Remove the six screws that secure the modem to the mounting plate and remove the plate. Remove the four screws that secure the modem to the mounting panel and remove the panel. Refer to figure 7-12A.
9. To reinstall the Wangnet P-Band Modem panel assembly, reverse the removal procedure.

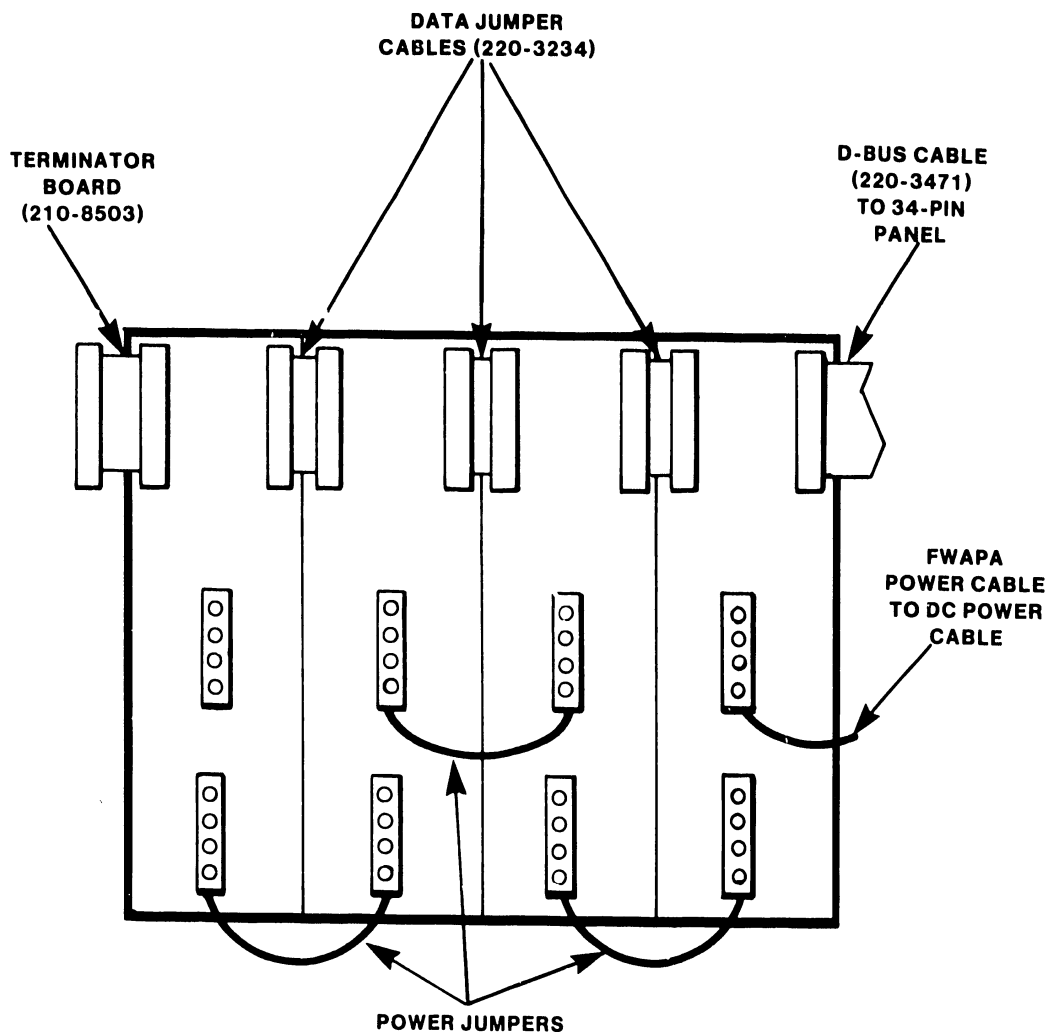


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Figure 7-12B. Wangnet P-Band Modem Panel Assembly Removal

7.2.12 FIBERWAY ACTIVE PORT ASSEMBLY (FWAPA) REMOVAL AND REPLACEMENT

1. Power down the Cable Concentrator.
2. Remove the front panel. Refer to paragraph 7.2.1.
3. Remove the eight Phillips head screws that secure the rear cover to the rear of the enclosure and remove the rear cover.
4. Disconnect the 220-XXXX power jumper cables and/or the 220-XXXX FWAPA power cable from the FiberWay active port assembly (FWAPA) to be removed. Refer to figure 7-13A for clarification.
5. Disconnect the 220-3234 data jumper cables and/or the 220-3471 data ribbon cable, coming from the 34-pin panel assembly, from the FWAPA to be removed.



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Figure 7-13A. FiberWay Active Port Assembly Removal

REPAIR

6. Disconnect the fiber-optic cables from the front of the FWAPA panel assembly.
7. Remove the two Phillips head screws that secure the FWAPA to the front of the enclosure. Refer to figure 7-9B.
8. Remove the FWAPA.
9. To replace the FWAPA, reverse the removal procedure.
10. Ensure that a terminator board (210-8503) is installed in the last FWAPA in the group.

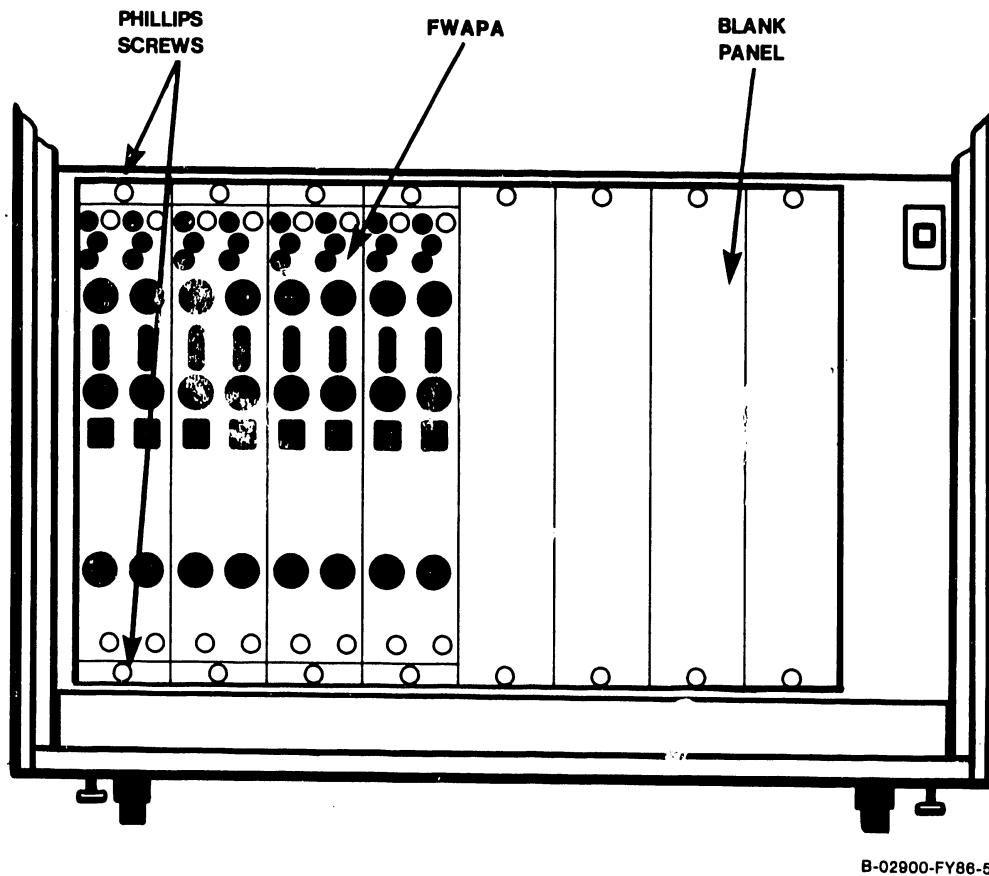


Figure 7-13B. FiberWay Active Port Assembly Removal

SECTION

8

ADJUST-

MENTS

SECTION 8

ADJUSTMENTS

There are no adjustment procedures for the Wang VS Large Cable Concentrator.

SECTION

9

UNPACK-

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SECTION 9

UNPACKING AND SETUP

9.1 TOOLS AND EQUIPMENT

There are no special tools or equipment necessary for the installation of the Wang VS Large Cable Concentrator. A standard tool kit and a digital voltmeter (DVM) are all that is necessary.

9.2 UNPACKING

Before unpacking the Cable Concentrator, check the packing slip to ensure that the proper equipment has been delivered. Check shipping containers for obvious signs of damage such as crushed corners, punctures, etc.

9.2.1 CLAIMS INFORMATION

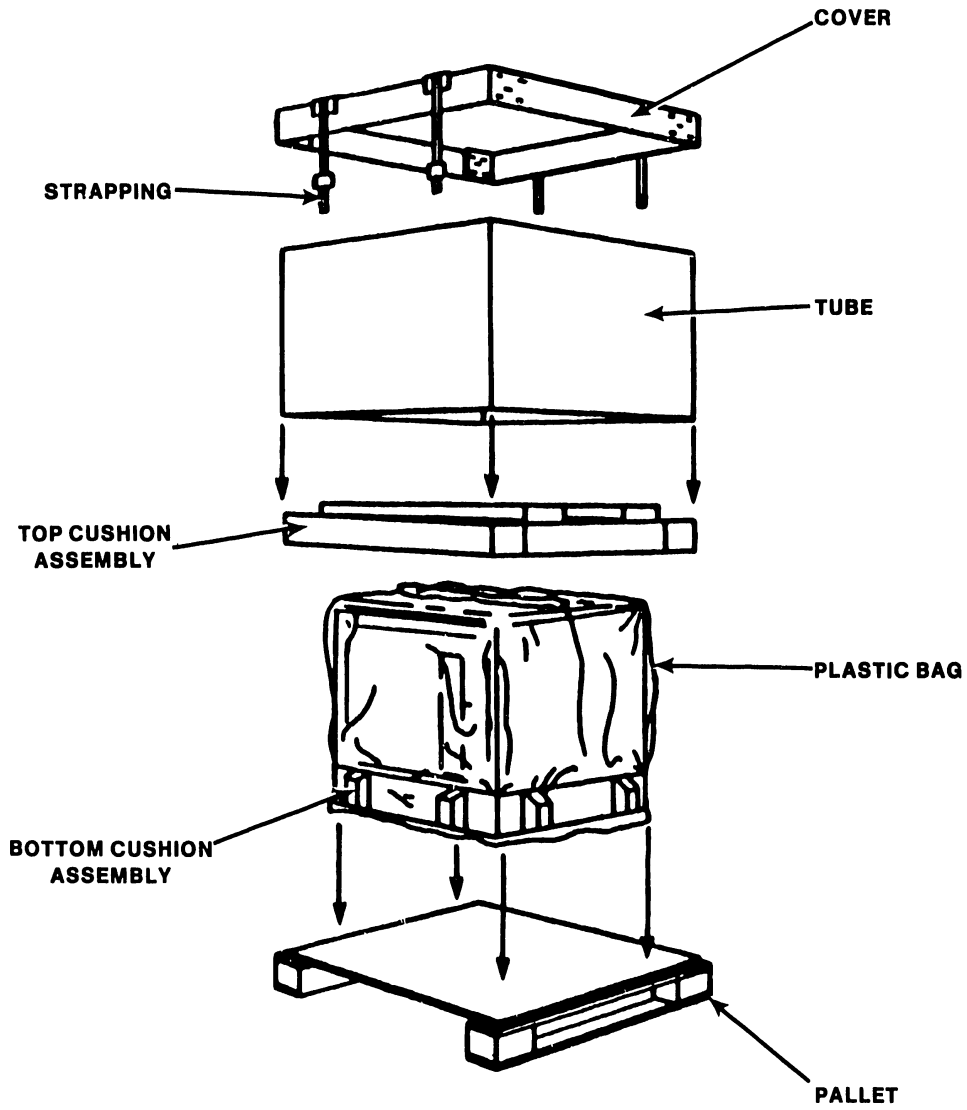
If damage is discovered during inspection, file an appropriate claim promptly with the carrier involved and notify Wang Laboratories, Inc. State the nature and extent of the damage and make arrangements for replacement equipment, if necessary. Be sure to include the following information:

- Work order number
- Customer name
- Customer number
- Model number
- Serial number

9.2.2 CABLE CONCENTRATOR UNPACKING PROCEDURE

1. Cut the straps that secure the cover and tube to the pallet. Refer to figure 9-1.
2. Remove the cover, top cushion assembly, and tube.
3. Remove the bottom cushion assembly.
4. Remove the plastic bag that surrounds the equipment.
5. Carefully roll one end of the cable concentrator off the pallet and then the other end.
6. Move the equipment to the its designated location (may placed up to 50 feet from VS CPU using optional 50-foot muxbus cable), observing the service clearances listed below in table 9-1.

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Figure 9-1. Unpacking The VS Large Cable Concentrator

Table 9-1. Cable Concentrator Service Clearances

CLEARANCES	INCHES	CENTIMETERS
Front	36	91.4
Rear	36	91.4
Left	0	0
Right	0	0
Top	36	91.4

9.2.3 EQUIPMENT INSPECTION

1. Visually inspect the Cable Concentrator for exterior damage.
2. Remove the rear cover by removing the eight Phillips head screws that secure it to the rear of the Cable Concentrator enclosure.
3. Visually inspect the interior of the Cable Concentrator enclosure for loose hardware and broken connectors. Tighten all loose hardware.
4. Ensure that all cable connections are tight.
5. Inspect the power supply for damage and loose connections.
6. If necessary, vacuum the interior to remove dust and debris.
7. If damage is found, file an appropriate claim promptly with the carrier involved and notify your service manager.

9.2.4 POWER SOURCE CHECK

Before proceeding with the Cable Concentrator installation, check the mainframe power source receptacle for proper wiring and service as shown in figure 9-2 and table 9-2 below.

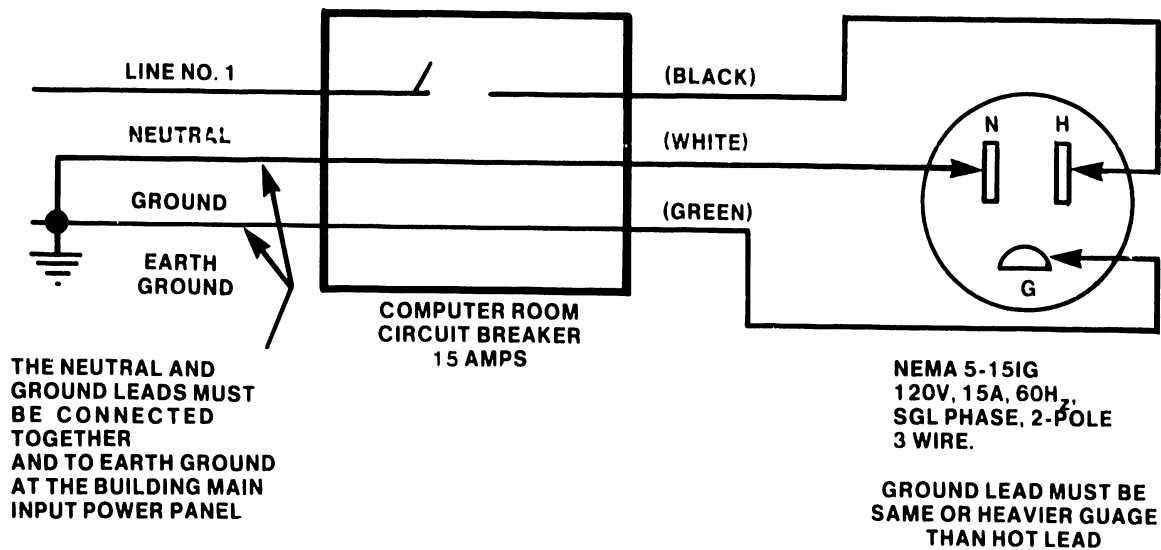
CAUTION

Failure to perform the following power source voltage and wiring checks may result in damage to the Cable Concentrator and connected peripherals.

Table 9-2. Power Source Receptacle Voltage Measurements

TEST POINTS	NORMAL VOLTAGE	MINIMUM	MAXIMUM
H to N	115V ac	90V ac	132V ac
H to G	115V ac	90V ac	132V ac
G to N	+0V ac	+0V ac	+0V ac

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NEMA Configuration: Receptacle Body Matching Connector
5-15IG 5-15IP

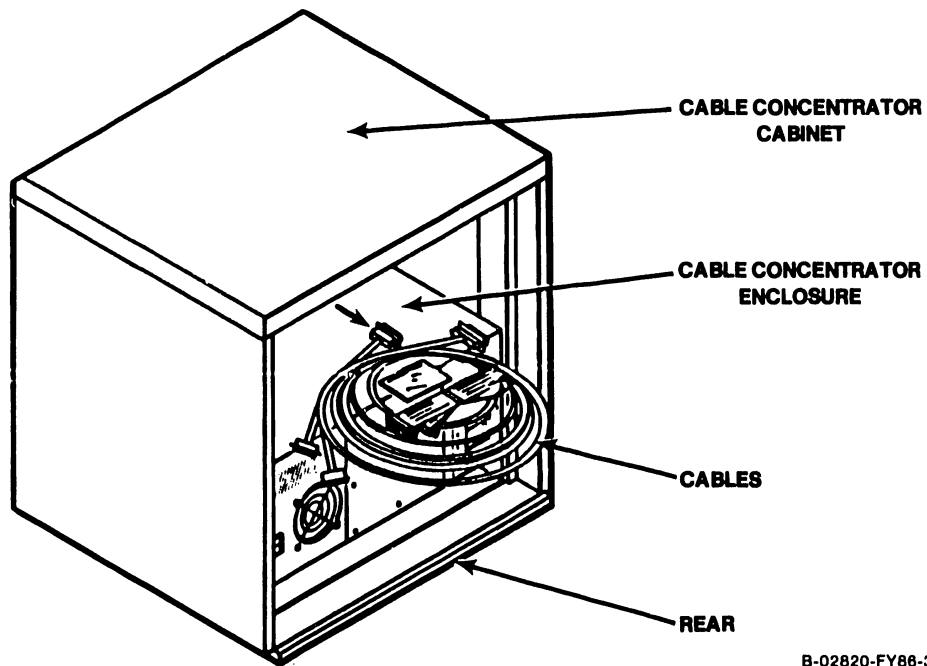
Figure 9-2. VS Large Cable Concentrator Power Service Requirements

9.2.4 CONNECTIONS

The Cable Concentrator can be ordered in two basic configurations: model VS-CC-CBT (WLI P/N 191-0359-20), which consists of a Cable Concentrator enclosure in a Cable Concentrator cabinet, and model VS-CC (WLI P/N 191-0359-21), which consists of a standalone Cable Concentrator enclosure that can be added to the Cable Concentrator cabinet in a stacked configuration or mounted in a 24-inch electronics rack.

For instructions on mounting a second enclosure in a stacked configuration and mounting an enclosure in an electronics rack, refer to paragraphs 9.2.5 and 9.2.6, respectively.

Remove the cables and installation hardware from the top of the Cable Concentrator through the rear of the cabinet. Refer to figure 9-3.

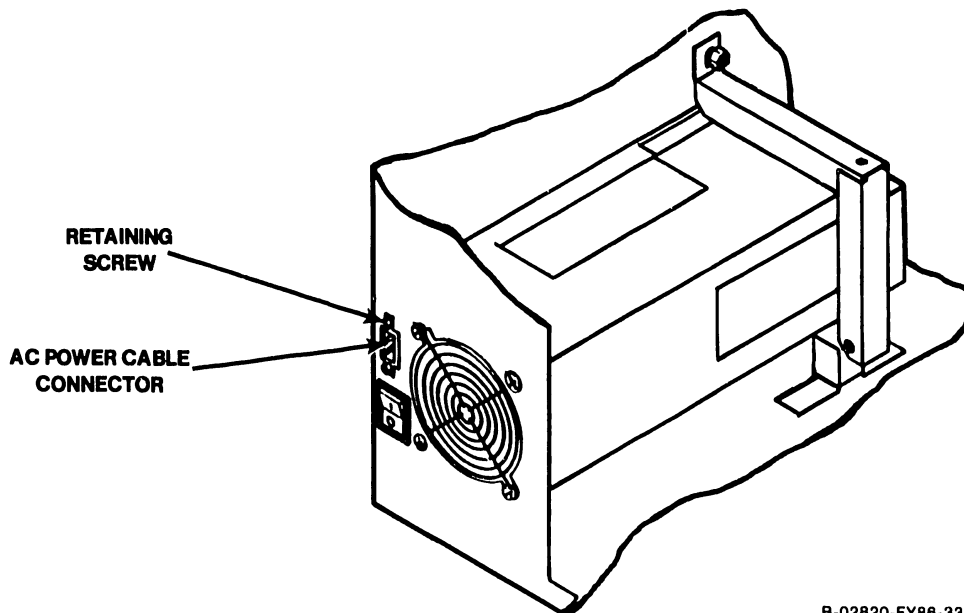


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Figure 9-3. Cable Shipping Location

9.2.4.1 AC Power Cable Connection

1. Ensure that the power on/off switch is in the "0" (off) position.
2. Plug the ac power cable into the power supply.
3. Secure the cable with the screws provided. Refer to figure 9-4 below.



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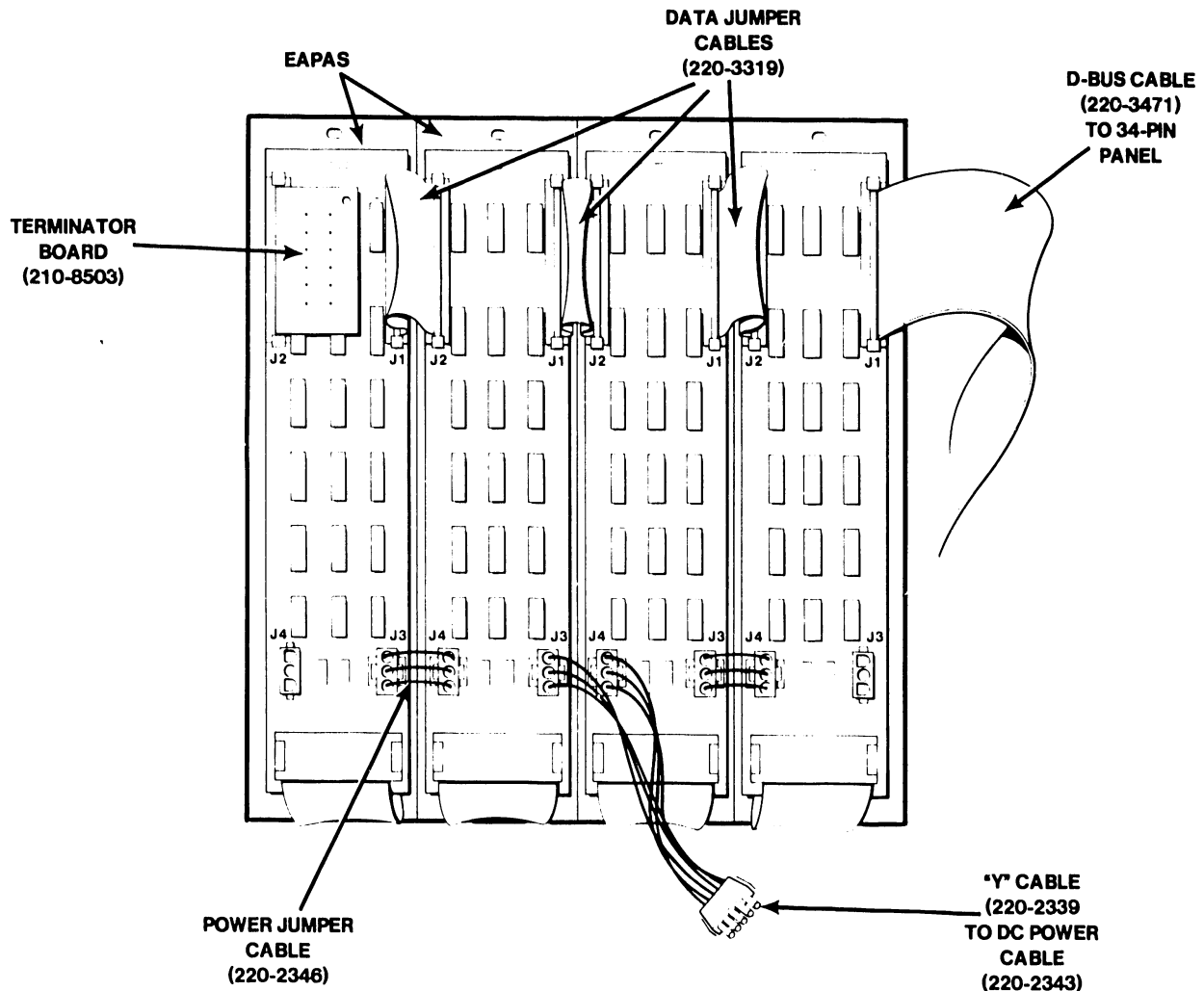
Figure 9-4. AC Power Cable Connection

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9.2.4.2 Electrically Active Port Assembly (EAPA) Cable Connections

Electrically active port assemblies (EAPAs) are used in both the VS-85/100 and the VS-300 Cable Concentrators. As many as eight EAPAs (half panels) can be installed in each cable concentrator enclosure. A set of four or less EAPAs uses one D-bus input cable and one power input cable. If five or more EAPAs are to be installed, a second D-bus cable and a second power cable are required. Data and power are daisy chained to the other EAPAs in the set. Refer to the EAPA Interconnection Diagram (figure 12-10) in Section 12.

1. Connect a D-bus cable (220-3471) to J1 of the first (rightmost as viewed from the rear) EAPA in a set of four or less. Refer to figure 9-5A below.

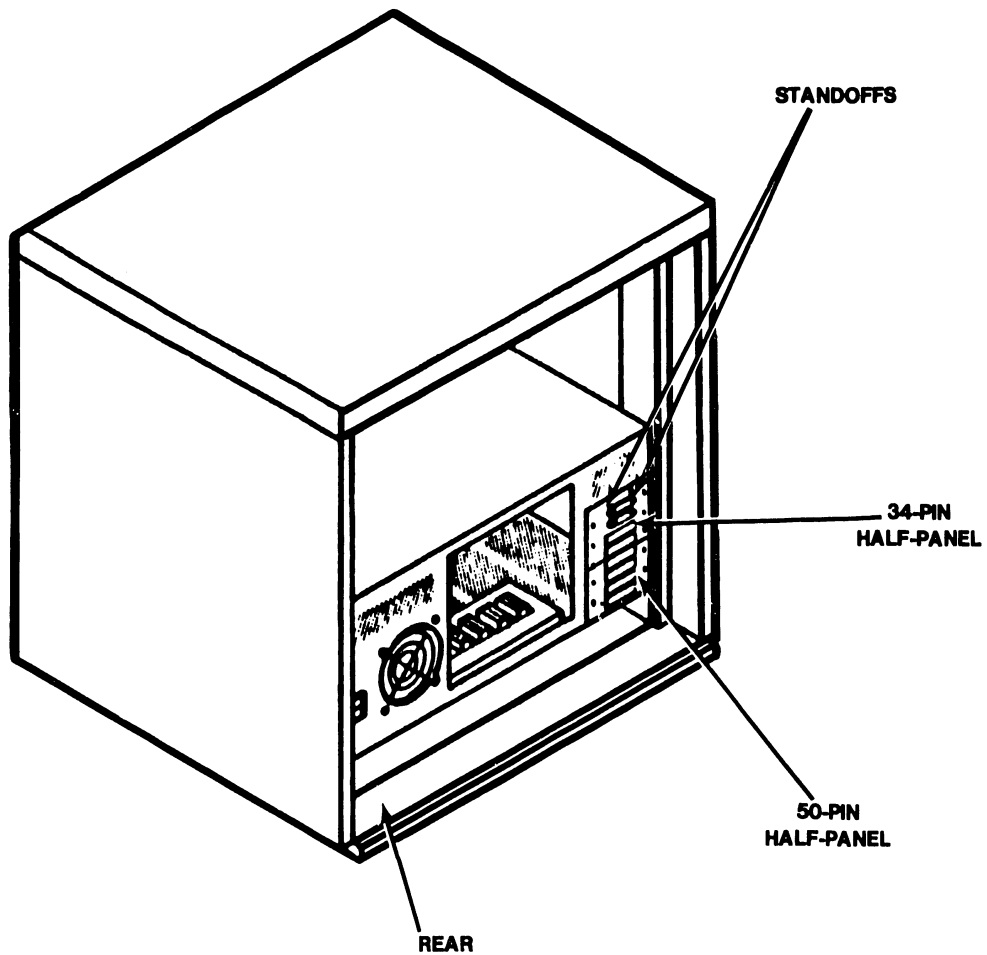


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Figure 9-5A. EAPA Cable Connections

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2. Attach the other end of the D-bus cable to the next blank 34-pin panel slot at the rear of the Cable Concentrator with the standoffs and nuts supplied. Refer to figure 9-5B below.

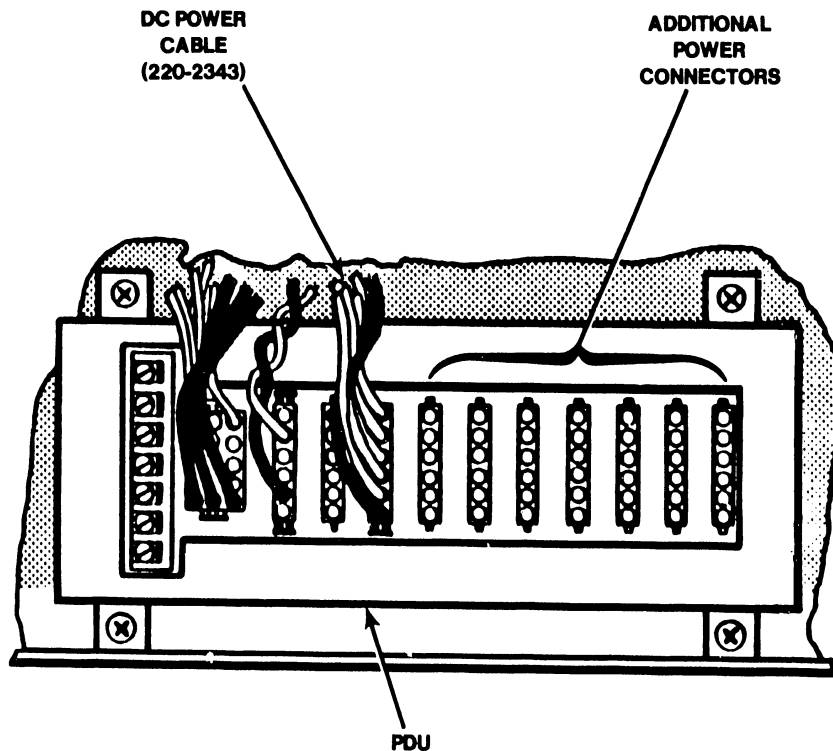


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Figure 9-5B. EAPA Cable Connections

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3. Connect the 6-pin end of the dc power cable (220-2343) to the next available connector on the dc distribution board (figure 9-5C).



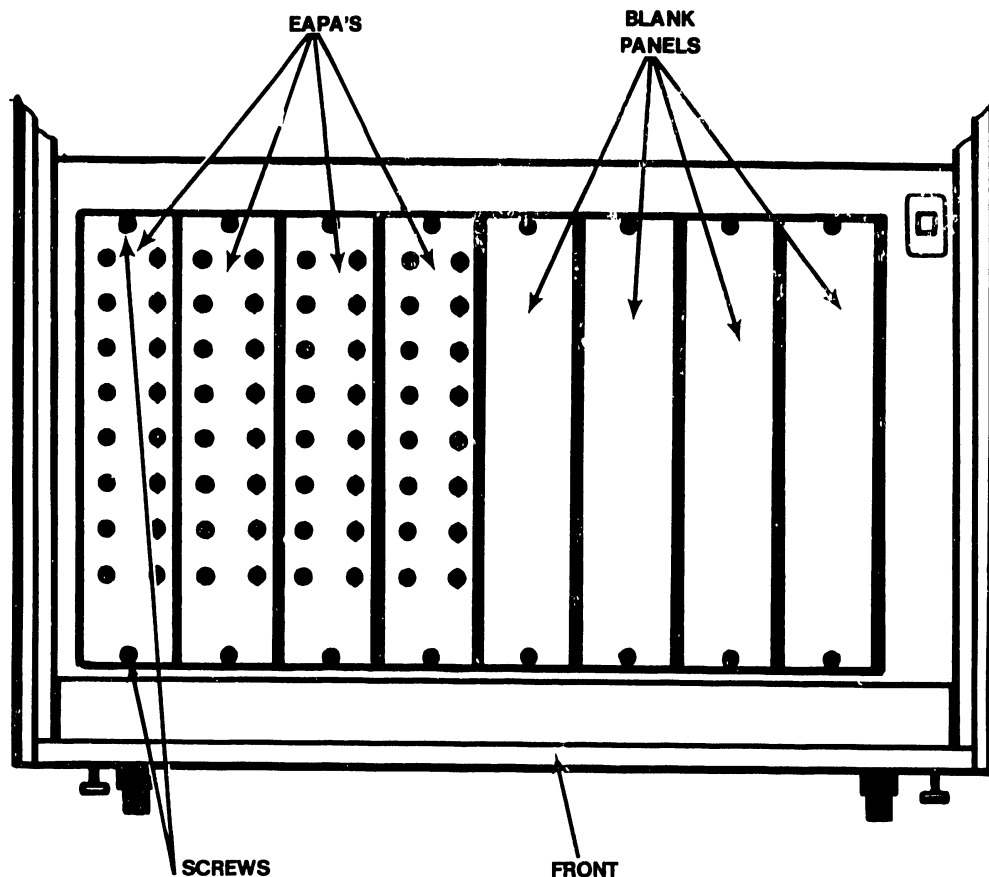
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Figure 9-5C. EAPA Cable Connections

4. Connect the 5-pin end of the dc power cable to the 220-2339 "Y" cable. The two 3-pin connectors of the "Y" cable connect to J3 and J4 of the two middle EAPAs in a set of four. Power is daisy chained to the other panels with cable 220-2346, while data is daisy chained to the other panels with cable 220-3319. Refer to figure 9-5A above.
5. Connect one end of the external muxbus cable (220-0510) to the internal D-bus cable (220-3471) at the 34-pin panel connector at the rear of the Cable Concentrator with the screws provided. Refer to figure 9-5B above.
6. Install the 212-3109 22V47 32-port serial IOP in the VS-85/100 CPU or the 210-8609-A 23V97 32-port serial IOC in the VS-300 as detailed in the appropriate VS CPU Product Maintenance Manual.
7. Connect the CPU D-bus cable (220-3470) to J2 of the 32-port serial IOP/IOC.

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8. Install the other end of the CPU D-bus cable (220-3470) in the Cable Concentrator I/O panel at the top of the rear panel of the VS CPU with the standoffs and nuts provided.
9. Connect the other end of the muxbus cable (220-0510) to the CPU D-bus connector in the Cable Concentrator I/O panel at the top of the VS CPU rear panel with the screws provided.
10. Secure the EAPAs (270-0975) to the front of the Cable Concentrator with the screws provided. Refer to figure 9-6 below.
11. Blank panels (478-1275) must be installed in all unused panel slots.
12. Connect peripherals to the BNC/TNC connectors of the EAPAs with coaxial cable, starting with port 0 of the leftmost EAPA as viewed from the front of the Cable Concentrator.



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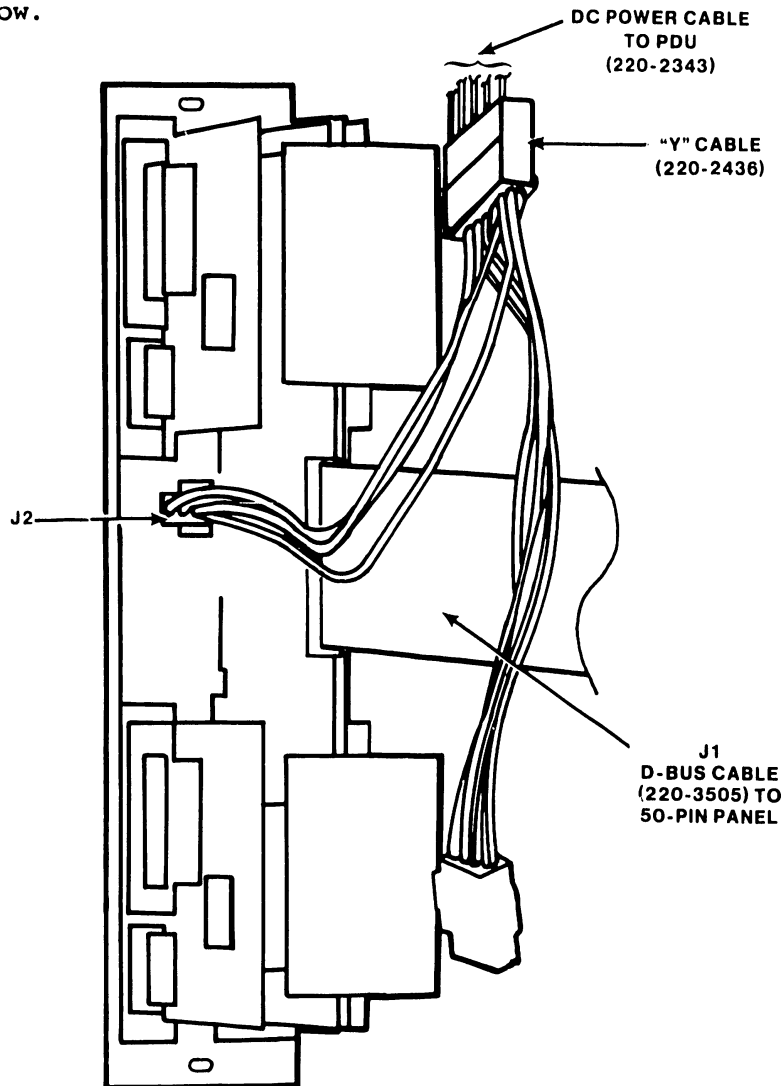
Figure 9-6. EAPA Panel Installation

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9.2.4.3 Multiline Telecommunications (MLTC) Cable Connections

Presently, only the VS-300 Cable Concentrator supports multiline telecommunications (MLTC). In addition, MLTC supports from one to 16 single protocol channels. Currently, only RS-232-C derived protocols with ACU support is available. When ACU support is needed, an RS-366 interface (WLI P/N 210-8495) is required. Installation of MLTC in the VS-300 Cable Concentrator assumes that the customer already has a 210-8491-A 23V96 MLTC IOC installed in the CPU. To install MLTC in the Cable Concentrator, an upgrade kit consisting of a 50-pin VS-300 CPU D-bus cable (220-3484), a 25-foot 50-pin muxbus cable (220-0535), and a cable concentrator 50-pin D-bus cable (220-3505), must be ordered. Up to eight MLTC panels (half-panels) can be installed in each VS-300 Cable Concentrator enclosure. (Refer to note in paragraph 9.2.7.1.) However, unlike the EAPAs, each MLTC panel requires its own D-bus cable. Power is "Y"-cabled to two MLTC panels at a time. Refer to the MLTC Interconnection Diagram (figure 12-12) in Section 12.

1. Connect a D-bus cable (220-3505) to J1 of the 210-8496 Serial Communications Link (SCL) board on the MLTC panel. Refer to figure 9-7A below.

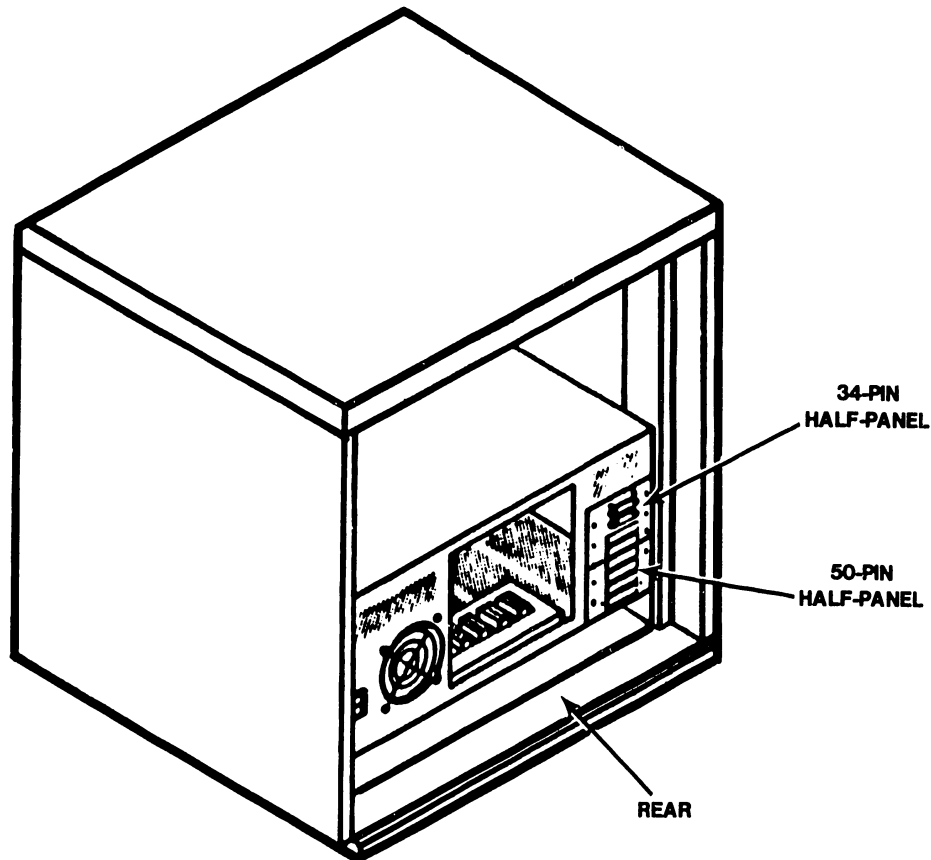


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Figure 9-7A. MLTC Cable Connections

UNPACKING AND SETUP

2. Attach the other end of the D-bus cable to the next blank 50-pin panel slot (if previously installed) at the rear of the Cable Concentrator with the standoffs and nuts supplied. If the 50-pin panel has not been previously installed, remove all D-bus cables from the existing 8-slot 34-pin panel. Install the 34-pin half-panel and the 50-pin half-panel supplied with the MLTC panel assembly. Reinstall all 34-pin D-bus connectors and install the 50-pin MLTC D-bus connectors. Refer to figure 9-7B below.

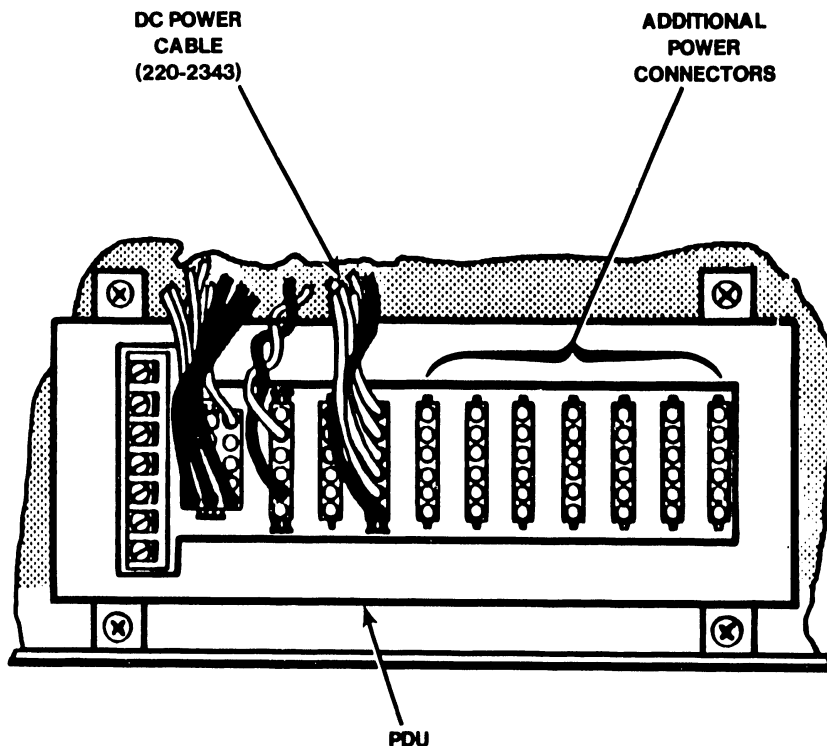


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Figure 9-7B. MLTC Cable Connections

UNPACKING AND SETUP

3. Connect the 6-pin end of the 220-2343 dc power cable to the next available connector on the dc distribution board of the PDU. Refer to figure 9-7C below.



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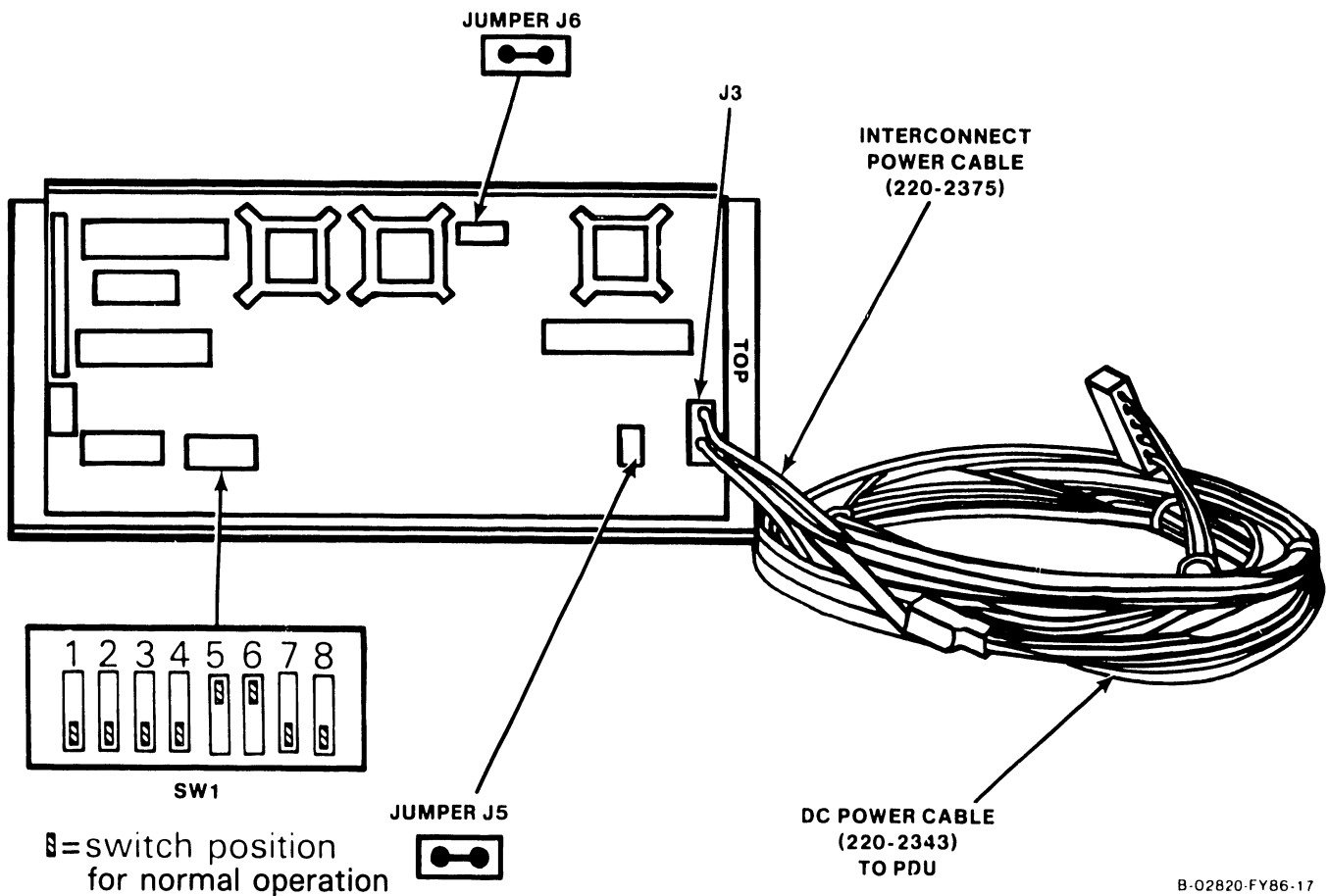
Figure 9-7C. MLTC Cable Connections

4. Connect the 5-pin end of the dc power cable to the MLTC "Y" cable (220-2336). The two-connector end of the "Y" cable connects to J2 on either of a pair of MLTC panels. Refer to figure 9-7A above.
5. Connect one end of an external muxbus cable (220-0535) to the D-bus cable connector at the 50-pin panel at the rear of the Cable Concentrator with the screws provided for each MLTC panel to be installed. Refer to figure 9-7B above.
6. Connect one end of a CPU D-bus cable (220-3484), provided, to an available connector on the MLTC IOC in the VS-300 CPU. Attach the other end of the cable to the Cable Concentrator I/O panel at the top of the rear panel of the CPU with the standoffs and nuts supplied. Do this for each MLTC panel assembly to be installed.
7. Connect the other end of the muxbus cable (220-0535) to the CPU D-bus cable connector in the Cable Concentrator I/O panel at the top of the CPU rear panel with the screws provided.
8. Secure the MLTC panels (270-1003) to the front of the Cable Concentrator with the screws provided.
9. Connect the RS-232C modems to the MLTC panel with the modem TC cable (220-0332) supplied.

9.2.4.4 Gate Array Telecommunications (GATC) Cable Connections

Currently, only the VS-300 Cable Concentrator supports the gate array telecommunications (GATC) assembly. In addition, GATC presently supports RS-232-C, RS-449, X.21, and ACU support via RS-366 derived protocols. Up to four GATC panels (full panels) can be installed in each Cable Concentrator enclosure. (Refer to note in paragraph 9.2.7.1.) Gate Array panels are connected to an EAPA in the VS-300 rear panel via coaxial cable. Each gate array panel assembly requires its own power and signal cables. Refer to the GATC Interconnection Diagram (figure 12-14) in Section 12.

1. Ensure that the jumpers at J5 and J6 are installed and that the 8-position DIP switch at SW1 (all on the 210-8714 CPU/Gate Array board) is set according to the switch settings shown in figure 9-8A below for each GATC assembly to be installed.
2. Connect the GATC power interconnect cable (220-2375) to J3. The other end of the cable connects to the dc power cable (220-2343) coming from the PDU.

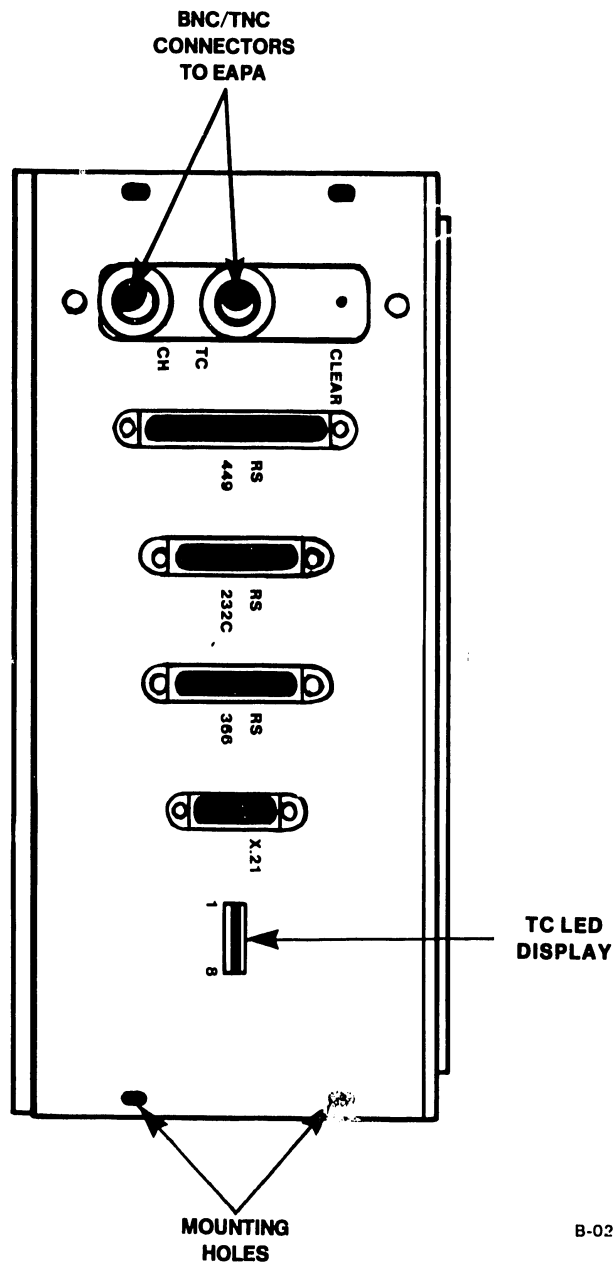


B-02820-FY86-17

Figure 9-8A. GATC Cable Connections

UNPACKING AND SETUP

3. Install the GATC panel(s) (270-1016) in the front of the Cable Concentrator with the four Phillips head screws provided. Refer to figure 9-8B.
4. Connect the GATC panel BNC/TNC connectors to an APA in the CPU rear panel with the dual coax cable (220-0148) supplied.
5. Connect an RS-232C modem with the modem TC cable (220-0332) and an X.21 modem with the TC X.21 cable (220-0274) to the GATC assembly.



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Figure 9-8B. GATC Installation

9.2.4.5 Wangnet P-Band Modem Cable Connections

Presently, only the VS-300 Cable Concentrator supports the Wangnet P-Band Modem. Because of the depth of the Wangnet P-Band Modem panel assembly and the location of the Cable Concentrator power supply, only five P-Band Modem panel assemblies can be installed in each Cable Concentrator enclosure. (Refer to note in paragraph 9.2.7.1.) If the P-Band Modem is to be installed in the Cable Concentrator and the 210-8609-A 23V97 Serial IOC has not been previously installed, the customer should request model 23V67W-19 (WLI P/N 289-0449). If, however, the serial IOC is already in place, the P-Band Modem can be installed either in the CPU or the Cable Concentrator by ordering upgrade model VS-WN-19B. Each P-Band Modem panel assembly requires its own IOC, D-bus cable, and power cable.

1. Connect a D-bus cable (220-3471) to P1 on the P-Band Modem panel assembly. Refer to figure 9-9A below.

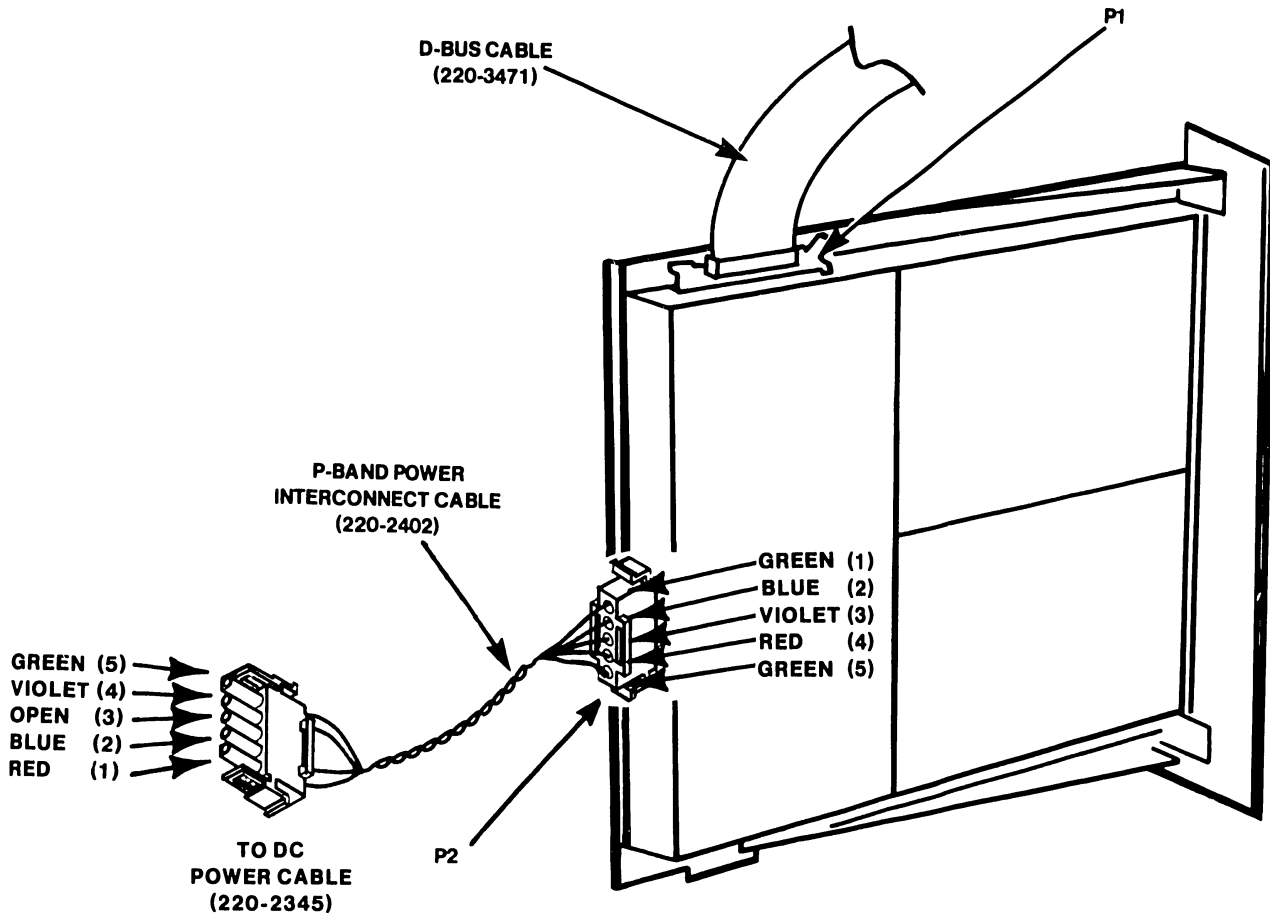


Figure 9-9A. P-Band Modem Panel Cable Connections

UNPACKING AND SETUP

2. Attach the other end of the D-bus cable to the next blank 34-pin panel slot at the rear of the Cable Concentrator with the standoffs and nuts provided. Refer to figure 9-9B.

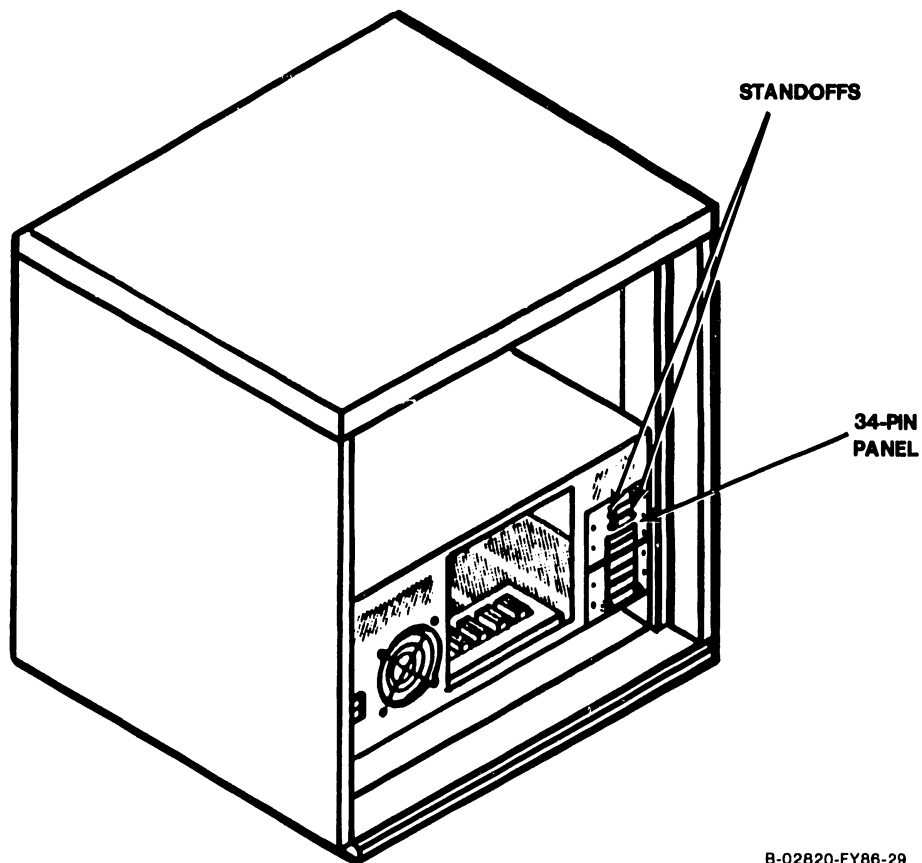
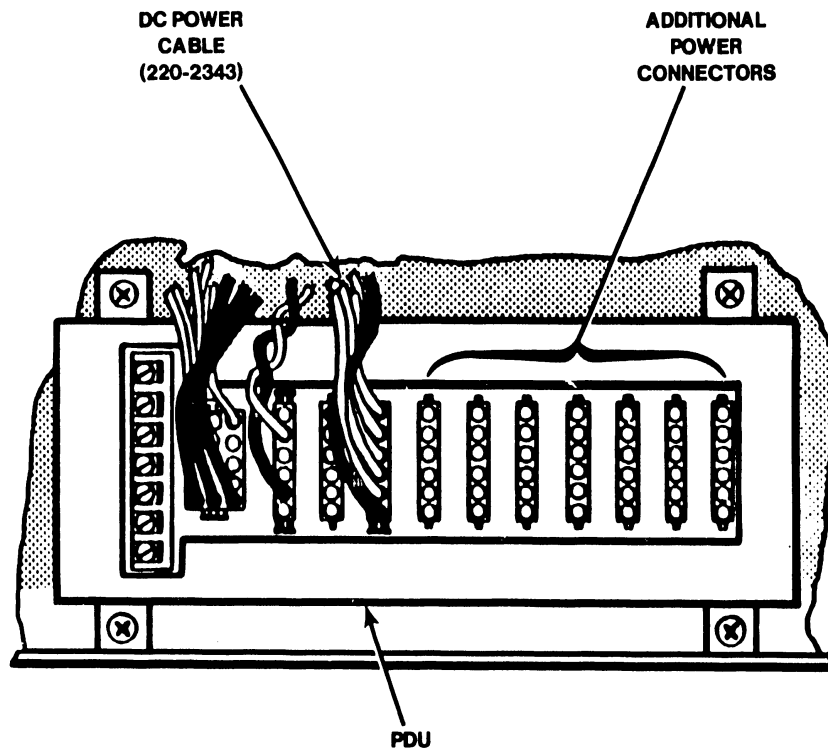


Figure 9-9B. P-Band Modem Panel Cable Connections

UNPACKING AND SETUP

3. Connect the dc power cable (220-2345 or 220-2343 depending upon when upgrade was shipped) to the next available connector on the dc distribution board of the PDU. Refer to figure 9-C below.



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Figure 9-9C. P-Band Modem Cable Connections

CAUTION

The 220-2402 power interconnect cable has an open pin 3 on one end. This end MUST be connected to the dc power cable! Failure to connect cable properly will short -5 Vdc to ground and crowbar power supply. Refer to figure 9-9A above.

4. Connect the other end of the dc power cable (220-2345 or 220-2343) to the P-Band power interconnect cable (220-2402) which in turn connects to P2 on the P-Band Modem panel. Refer to figure 9-9A above.
5. Connect one end of the external muxbus cable (220-0510) to the D-bus cable connector at the 34-pin panel at the rear of the Cable Concentrator with the screws provided. Refer to figure 9-9B above.
6. Install, if necessary, the 210-8609-A 23V97 32-port serial IOC in the VS-300 CPU as detailed in the VS-300 Product Maintenance Manual.
7. Connect the CPU D-bus cable (220-3470) to J1 of the 32-port serial IOC.

UNPACKING AND SETUP

8. Install the other end of the CPU D-bus cable (220-3470) in the Cable Concentrator I/O panel at the rear of the VS-300 CPU with the stand-offs and screws provided.
9. Connect the other end of the muxbus cable (220-0510) to the CPU D-bus connector in the VS-300 Cable Concentrator I/O panel at the top of the VS 300 CPU rear panel with the screws supplied.
10. Secure the P-Band Modem panel to the front of the Cable Concentrator with the screws provided.
11. Connect the modem to a Wangnet outlet using RG59A/U coax cable (220-0294). Ensure that the transmit (gold) connector and the receive (silver) connector of the Wangnet outlet are linked to the corresponding connectors on the modem. Refer to figure 9-9D.

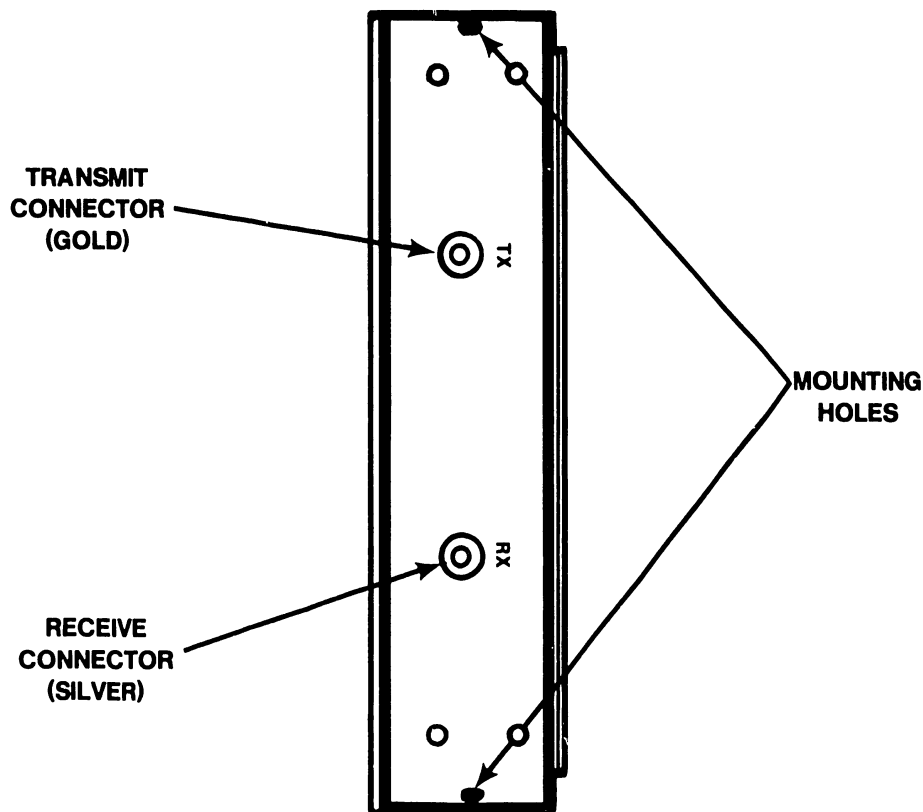


Figure 9-9D. P-Band Modem Panel Cable Connections

9.2.4.6 FiberWay Active Port Assembly (FWAPA) Cable Connections

FiberWay active port assemblies (FWAPAs) are used in both the VS-85/100 and the VS-300 Cable Concentrators. One to four FWAPAs can be installed in a cable concentrator enclosure. A set of four or less FWAPAs uses one D-bus input cable and one power input cable. Data and power are daisy chained to the other FWAPAs in the set. Refer to the FWAPA Interconnection Diagram (figure 12-18) in Section 12. It is important to note that FiberWay does not increase the total number of peripherals that the CPU can support. Even though the total number of physical (BNC/TNC) connections may exceed the capacity of the CPU, not all ports can be configured into the system.

1. Connect a D-bus cable (220-3471) to J1 of the first (rightmost as viewed from the rear) FWAPA in a set of four or less. Refer to figure 9-10A below.

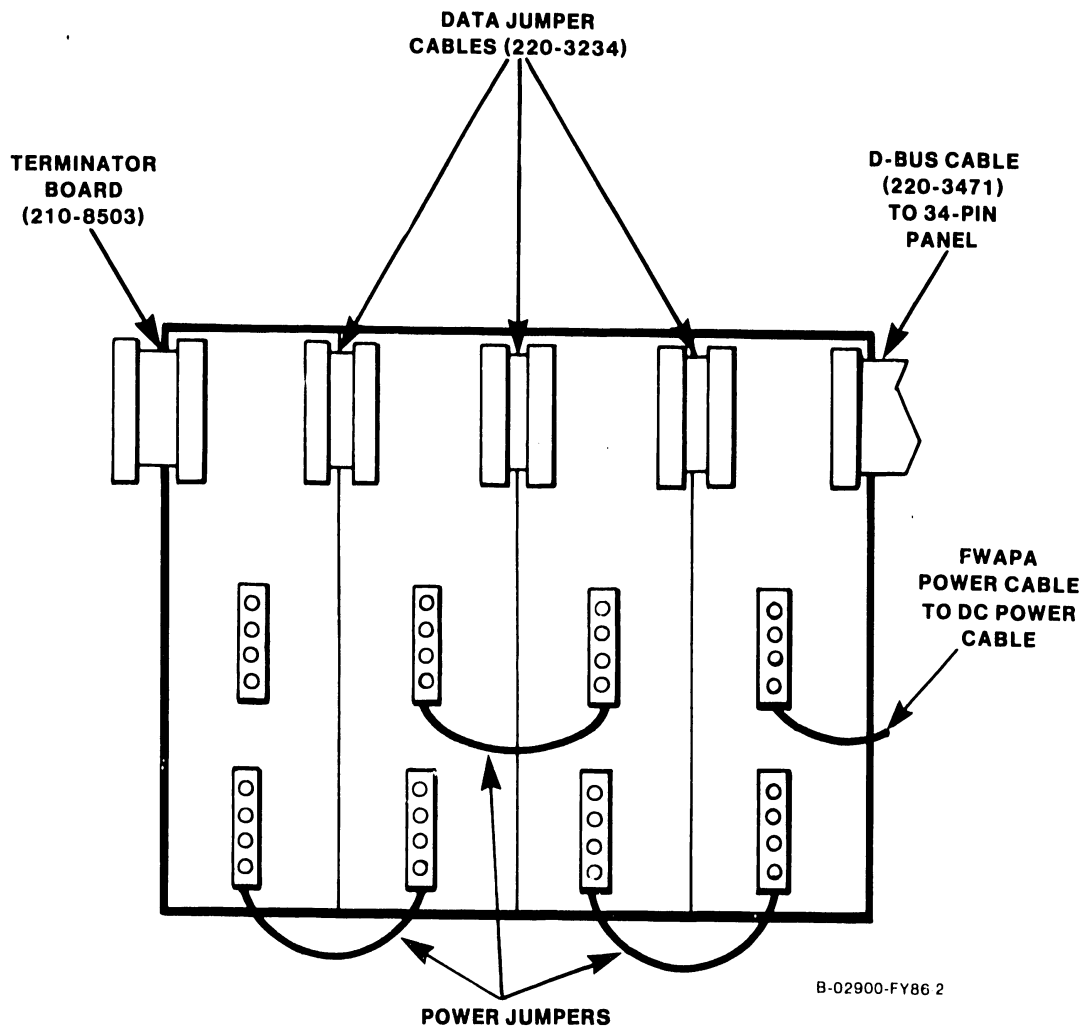
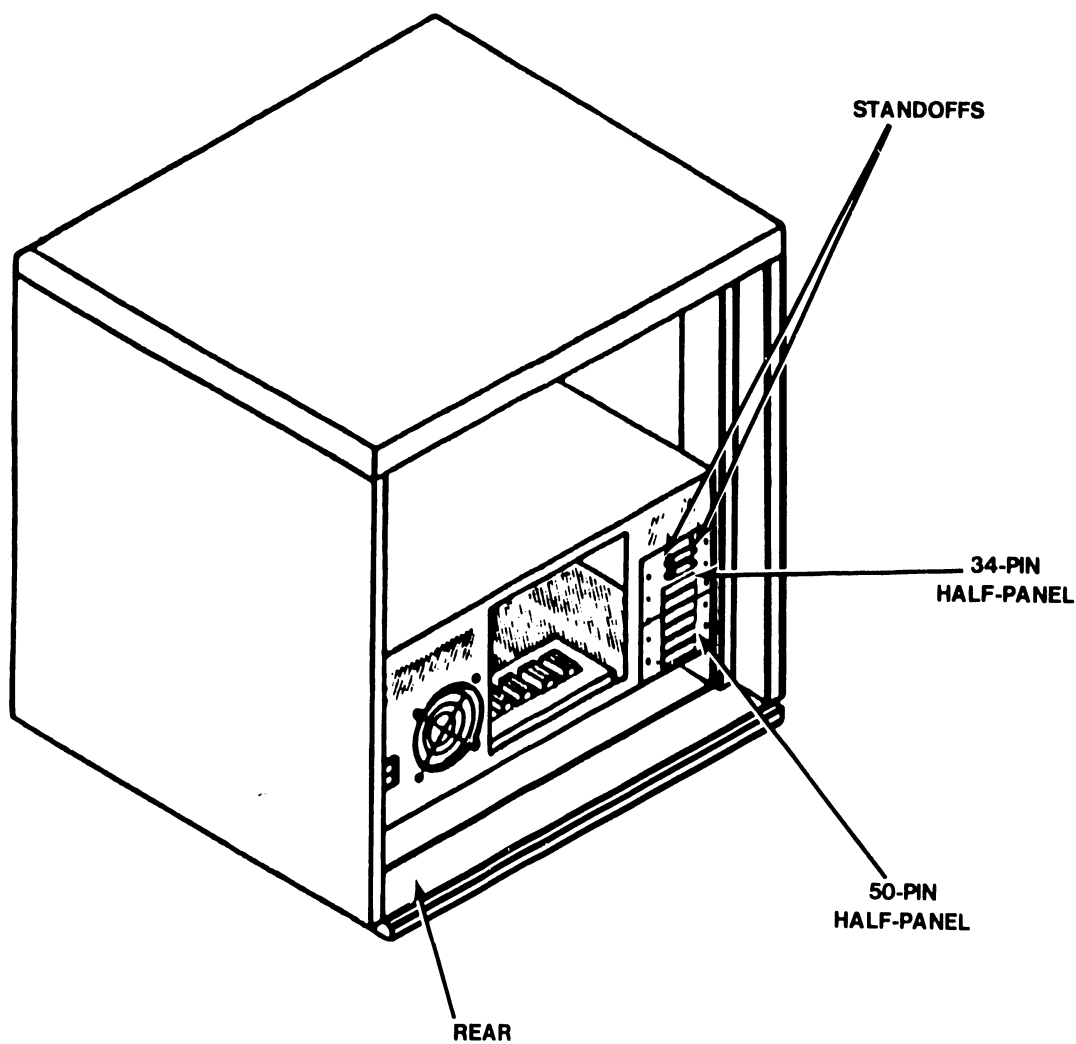


Figure 9-10A. FWAPA Cable Connections

UNPACKING AND SETUP

2. Attach the other end of the D-bus cable to the next blank 34-pin panel slot at the rear of the Cable Concentrator with the standoffs and nuts supplied. Refer to figure 9-10B below.

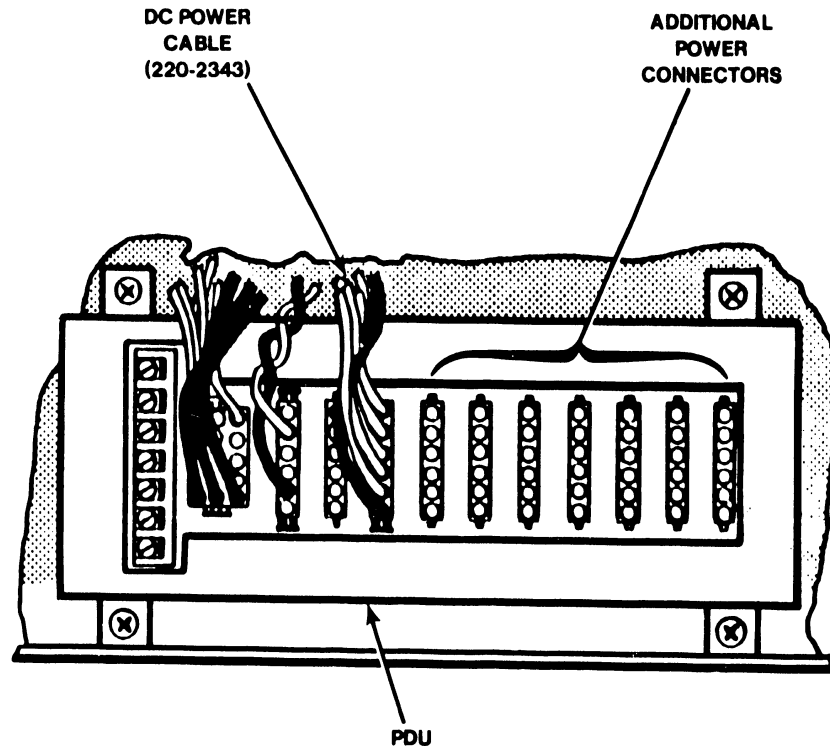


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Figure 9-10B. FWAPA Cable Connections

UNPACKING AND SETUP

3. Connect the 6-pin end of the dc power cable (220-2343) to the next available connector on the dc distribution board (figure 9-10C).



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Figure 9-10C. FWAPA Cable Connections

4. Connect the 5-pin end of the dc power cable to the FWAPA power cable. The 4-pin connector of the FWAPA power cable connects to the rightmost FWAPA (as viewed from the rear). Power is daisy chained to the other panels with a power jumper cable, while data is daisy chained to the other panels with cable 220-3234. Refer to figure 9-10A above.
5. Connect one end of the external muxbus cable (220-0510) to the internal D-bus cable (220-3471) at the 34-pin panel connector at the rear of the Cable Concentrator with the screws provided. Refer to figure 9-10B above.
6. Install the 212-3109 22V47 32-port serial IOP in the VS-85/100 CPU or the 210-8609-A 23V97 32-port serial IOC in the VS-300 as detailed in the appropriate VS CPU Product Maintenance Manual.
7. Connect the CPU D-bus cable (220-3470) to J2 of the 32-port serial IOP/IOC.

UNPACKING AND SETUP

8. Install the other end of the CPU D-bus cable (220-3470) in the Cable Concentrator I/O panel at the top of the rear panel of the VS CPU with the standoffs and nuts provided.
9. Connect the other end of the muxbus cable (220-0510) to the CPU D-bus connector in the Cable Concentrator I/O panel at the top of the VS CPU rear panel with the screws provided.
10. Secure the FWAPAs to the front of the Cable Concentrator with the screws provided.
11. Blank panels (478-1275) must be installed in all unused panel slots.
12. The customer has the responsibility of maintaining the recommended operating environment and procedural safeguards described in Wang product documentation. The customer also has the responsibility for connecting, installing, and maintaining fiber optic cable between locations, along with the wall-mounted connector plates (if applicable). Only the standard 25-foot "plug and play" fiber optic cable will be maintained by the customer engineer.

Fiber optic hardware items (splice bushings, connectors, cables, etc.) are sold to customers through the Wang Supplies Division. The duplex cable used is terminated with identical connectors at each end. To reduce confusion when installing and connecting the cable, one or more of the following identifying features may be helpful:

- Wang part number (420-0500)
- Manufacturer's code designation
- Vendor identification number
- Other appropriate markings (UL, CSA, IEC, etc.)

The cable is further identified as follows:

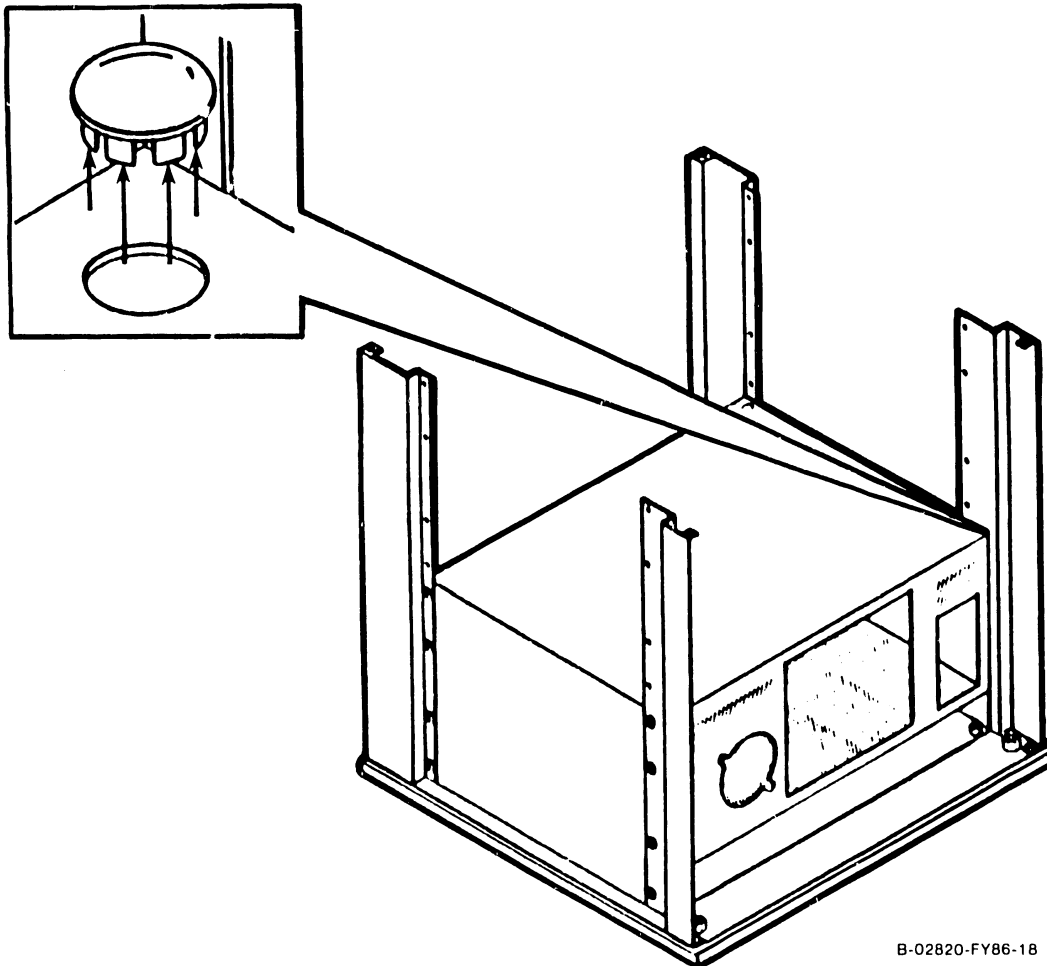
- One cable of the twin-pair fiber-optic cable contains no markings but has a raised ridge discernable to both sight and touch.
- The other cable of the twin-pair has consecutive numbers stamped every foot along its entire length.
- To determine the length of a particular cable run, simply note the number stamped at (or near) the start of a run and the number stamped at the other end of the same run. Unless spliced, the difference between these two numbers is the distance of the fiber optic cable run in feet.

Refer to the appropriate fiber optic and remote cluster switch (RCS) manual for complete installation and test procedures.

9.2.5 CABLE CONCENTRATOR STACKED CONFIGURATION INSTALLATION

To increase the port capacity of the CPU even further, a second Cable Concentrator enclosure (VS-CC) may be installed in a stacked configuration in the Cable Concentrator cabinet. The following procedure details the installation.

1. Remove the front cover, top cover, and side panels of the existing Cable Concentrator cabinet. Refer to paragraphs 9.2.1, 9.2.3, and 9.2.4.
2. Remove the hole plugs from the top of the existing Cable Concentrator enclosure. Refer to figure 9-11A.



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Figure 9-11A. Cable Concentrator Stacked Configuration Installation

UNPACKING AND SETUP

3. Place the second enclosure on top of the first, ensuring that the holes in the base of the upper enclosure align with the holes in the top of lower enclosure.
4. Using the hardware provided with the upgrade kit, place a plain washer on a 3/8-16 bolt and thread bolt through the hole at the top of the lower enclosure and the hole at the bottom of the top enclosure from below. Secure the bolt with a plain washer, a lock ext. washer, and a 3/8-16 nut. Repeat for the other three bolts. Refer to figure 9-11B.

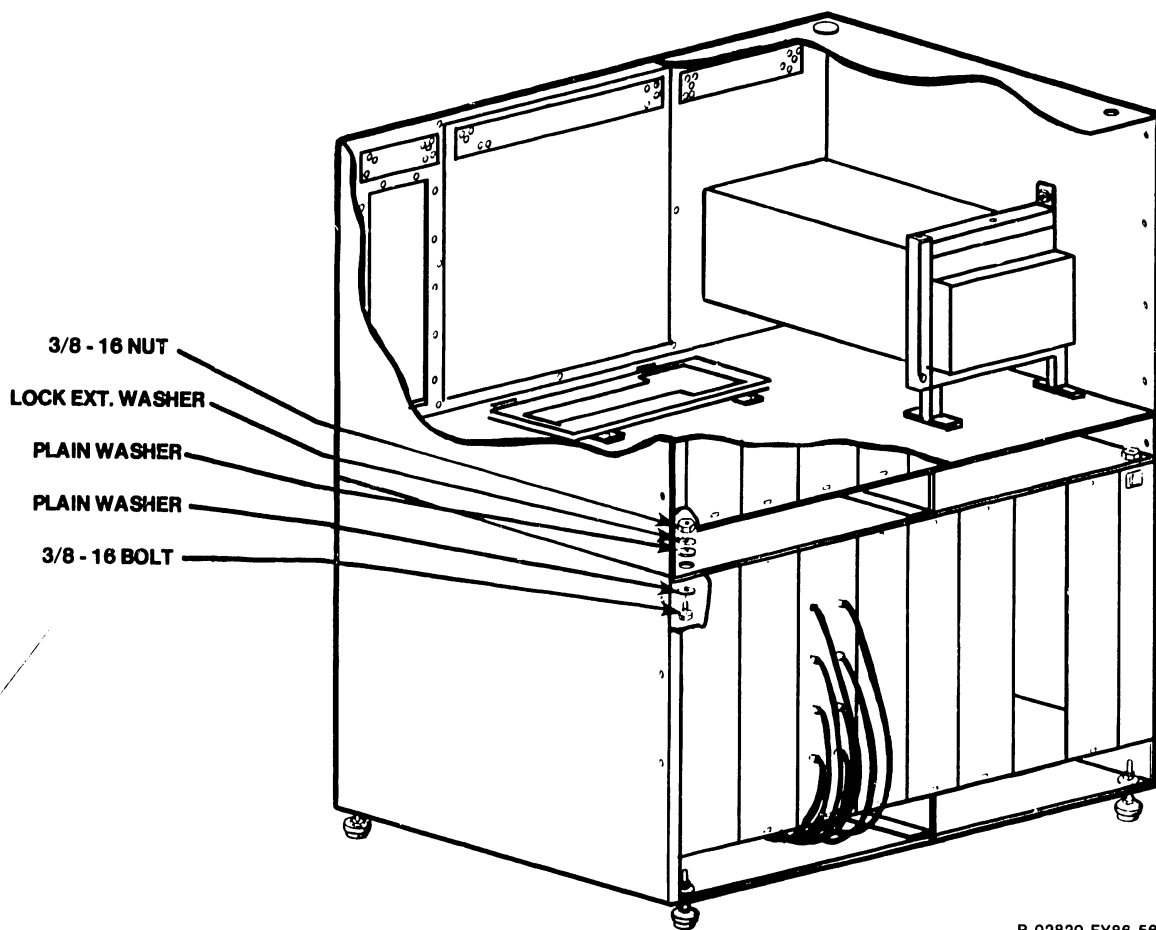
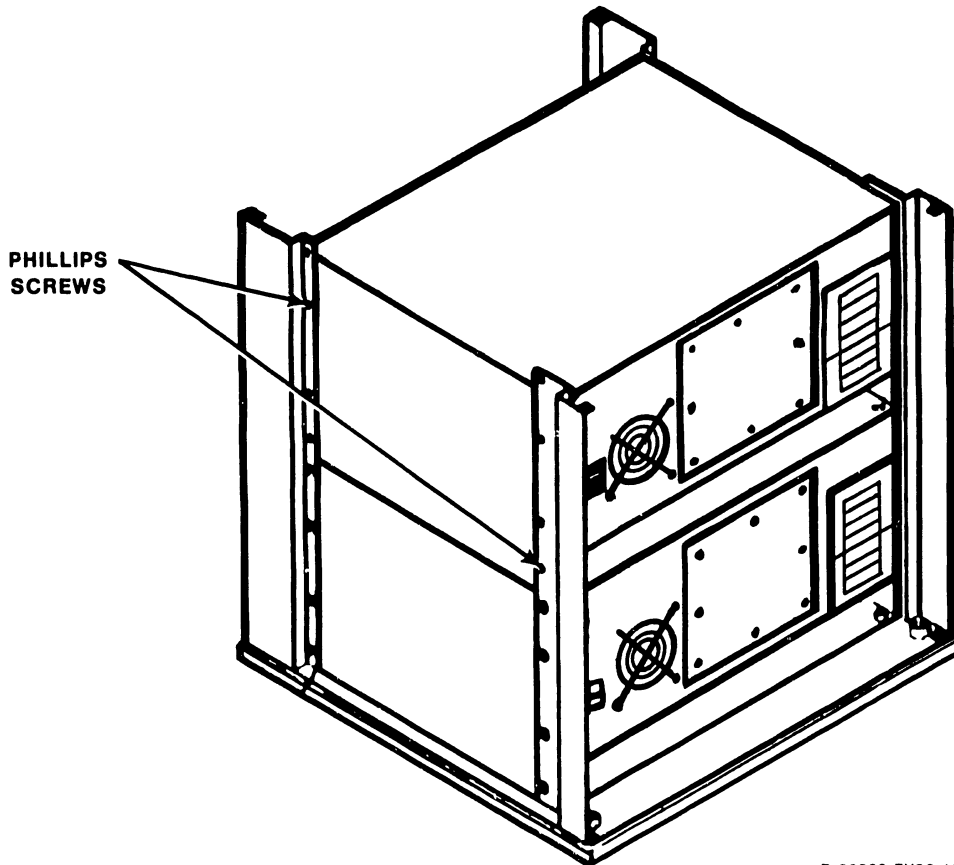


Figure 9-11B. Cable Concentrator Stacked Configuration Installation

UNPACKING AND SETUP

5. Secure the top enclosure to the side supports with the sixteen 8-32 x 3/8" pan head Phillips screws provided. Refer to figure 9-11C.
6. Replace the side panels and the top cover.
7. Install the power cable and I/O panel assemblies according to the procedures in paragraphs 9.2.4.1 through 9.2.4.5.



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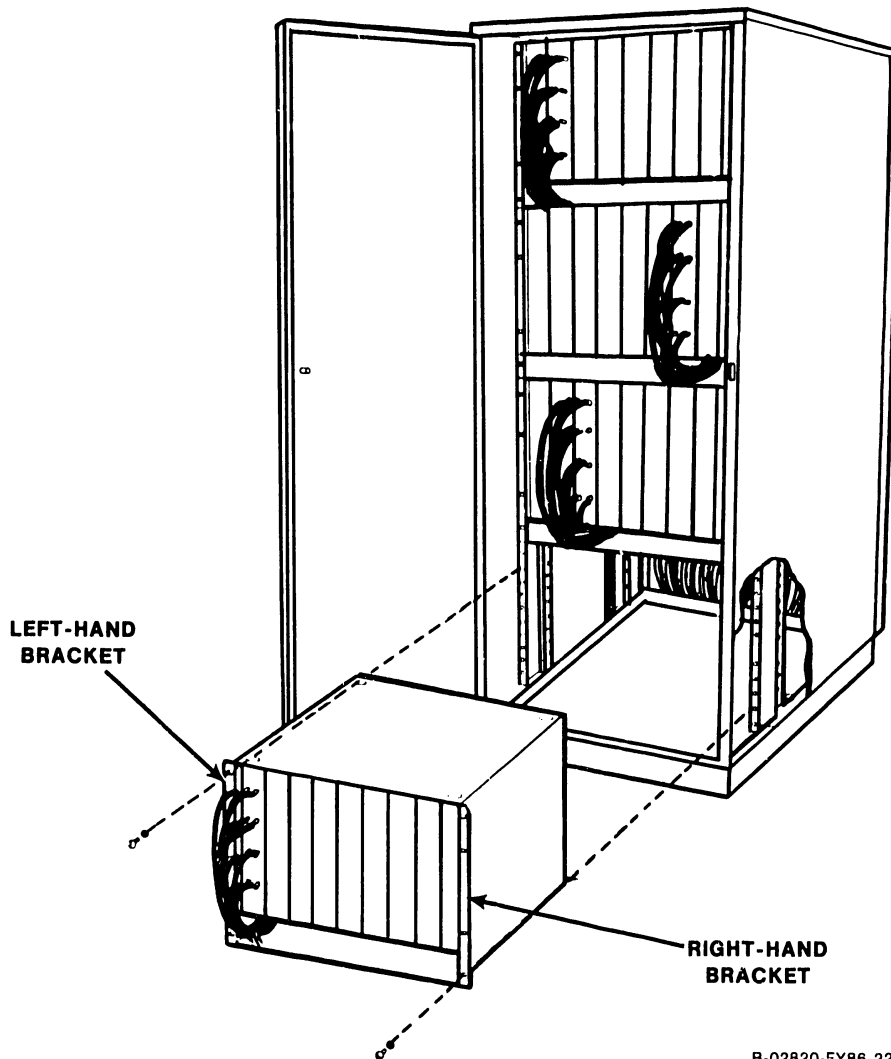
Figure 9-11C. Cable Concentrator Stacked Configuration Installation

UNPACKING AND SETUP

9.2.6 24-INCH ELECTRONICS RACK INSTALLATION

The following procedure explains the installation of the Cable Concentrator in a 24-inch electronics rack.

1. Attach a left-hand bracket (451-5426) and a right-hand bracket (451-5427) to the front of the corresponding sides of the Cable Concentrator enclosure with the screws provided.
2. Open the door of the electronics rack and slide the Cable Concentrator enclosure into the rack.
3. Secure the Cable Concentrator enclosure by attaching the brackets installed above to the front of the side supports of the electronics rack. Refer to figure 9-12.
4. Install the power cable and I/O panels according to the procedures in paragraphs 9.2.4.1 through 9.2.4.5.



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Figure 9-12. Electronics Rack Installation

9.2.7 INITIAL CHECKS

The following checks must be made prior to using the Cable Concentrator to ensure proper operation.

9.2.7.1 Switching Power Supply Checks

The following power supply checks must be made prior to operating the Cable Concentrator.

1. Remove the right side panel of the Cable Concentrator cabinet. Refer to page 7-4.
2. Looking through the cutout in the right side of the Cable Concentrator enclosure, ensure that the power supply voltage selection switch is in the correct position (115V or 230V) for the available line voltage. Correct if necessary.
3. With the rear cover still off, locate an unused connector on the dc distribution board of the power distribution unit (PDU). If all connectors are in use, remove the power cable from the last connector on the right (as viewed from the rear of the Cable Concentrator). Use the pins of this connector as test points. Refer to figure 9-13 below.
4. Plug the power cable into the ac source.
5. Power on the Cable Concentrator by moving the ac power switch at the rear of the Cable Concentrator to the "1" position.
6. Ensure that the power supply fan is turning and that the LED indicator on the front panel is lighted.
7. Check the dc output voltages listed in table 9-3 below. If any of the voltages exceeds the limits in table 9-3, replace the power supply. Refer to paragraph 7.2.6 for power supply replacement procedure. DO NOT attempt to adjust or repair the switching power supply! It is field-replaceable only.

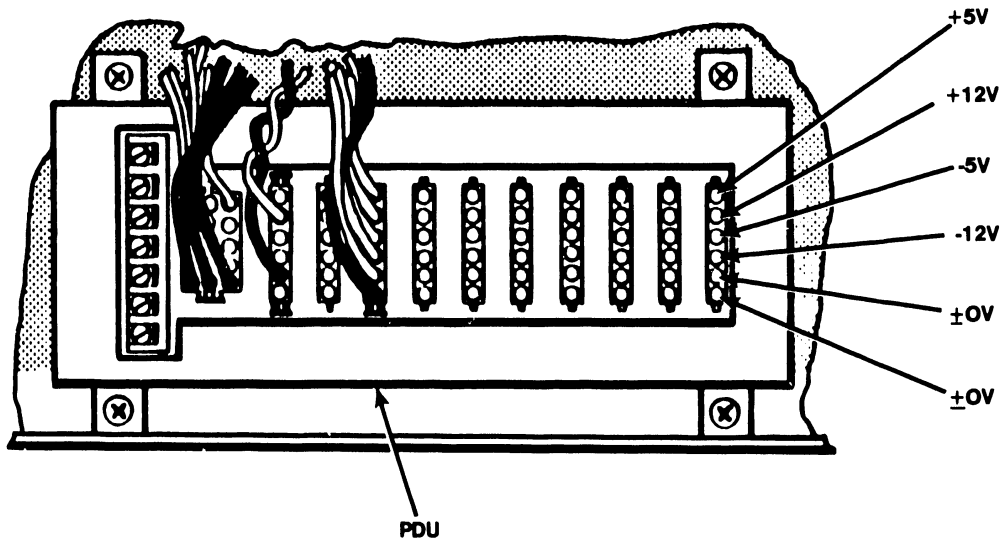
NOTE

The SPS 200 switching power supply is being replaced by the SPS 255 (WLI P/N 270-1033) to provide the proper power levels to drive TC APAs. The 100 mA @ -12V furnished by the SPS 200 provides only marginal support of Multiline, Gate Array, and P-Band TC APAs. If using the SPS 200, limit TC APAs to 3 Gate Arrays, 1 MLTC (23V96-8) only, and 3 P-Band modems. The SPS 255 can support 4 Gate Arrays, 1 MLTC (23V96-16/23V86), and 5 P-Band modems. The SPS 255 is interim and will be replaced with a newly designed supply to provide power @ +12V more adequately.

UNPACKING AND SETUP

Table 9-3. SPS 200 DC Output Voltage Specifications

VOLTS	AMPS	OPERATING LIMITS	AC RIPPLE LIMITS
+5V	20.0	+4.75V to +5.25V	35mV RMS or 50mV Pk to Pk
+12V	7.0	+11.40V to +12.60V	35mV RMS or 50mV Pk to Pk
-5V	0.1	-5.25V to -4.75V	35mV RMS or 50mV Pk to Pk
-12V	0.1	-12.60V to -11.40V	35mV RMS or 50mV Pk to Pk



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Figure 9-13. Cable Concentrator Test Points

8. Power off the Cable Concentrator.

9.2.8 SYSTEM CHECKOUT

Before turning the Cable Concentrator over to the customer, check the following:

1. Ensure that the Cable Concentrator is configured with the proper I/O panels. Blank panels (478-1275) should be installed in unused front panel slots.
2. Check all cables to ensure that connections are correct and tight.
3. Install all covers and panels.
4. Power on VS CPU.
5. Power on Cable Concentrator and peripherals.
6. Ensure that all peripherals configured through the Cable Concentrator are operating properly.
7. Turn the system over to the customer.

**SECTION
10
FUNC-
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SECTION 10

FUNCTIONAL DESCRIPTION

No functional description is provided for the Wang VS Large Cable Concentrator because of the maintenance philosophy associated with this product and because of the relatively simple nature of this product. All electrical components of the VS Large Cable Concentrator are field-replaceable only and do not require a functional description.

SECTION

11

**SPECIFI-
CATIONS**

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SECTION 11

SPECIFICATIONS

11.1 HARDWARE

Table 11-1. Hardware Specifications

<u>DIMENSIONS</u>	<u>MODEL</u>		<u>INCHES</u>	<u>CENTIMETERS</u>	
	VS-CC-CBT	Depth	25.45	64.64	
		Width	24.88	63.19	
		Height	36.00	91.44	
	VS-CC	Depth	16.50	41.91	
		Width	22.31	56.67	
		Height	15.72	39.93	
<u>WEIGHT</u>	<u>MODEL</u>		<u>POUNDS</u>	<u>KILOGRAMS</u>	
	VS-CC-CBT + VS-CC		150	68.18	
<u>SERVICE CLEARANCES</u>			<u>INCHES</u>	<u>CENTIMETERS</u>	
		Front	36	91.4	
		Rear	36	91.4	
		Left	0	0	
		Right	0	0	
		Top	36	91.4	
<u>POWER REQUIREMENTS</u>			<u>VOLTS</u>	<u>AMPS</u>	<u>FREQUENCY</u>
	Domestic		115 (90-132)	4.0	60 Hz (47-63)
	International		230 (180-264)	2.0	50 Hz (47-63)
<u>ENVIRONMENTAL REQUIREMENTS</u>			<u>MINIMUM</u>	<u>MAXIMUM</u>	
	Temperature (°F)		60	90	
	Temperature (°C)		15.5	32.2	
	% Humidity (Non-condensing)		20	80	

11.2 SOFTWARE

For software specifications, refer to the appropriate VS CPU Product Maintenance Manual.

SPECIFICATIONS

11.3 OPTIONS AVAILABLE

Table 11-2. VS Large Cable Concentrator Options

MODEL #/PART #	DESCRIPTION	VS-85/100	VS-300
VS-CC*	VS Large Cable Concentrator Upgrade	X	X
23V97**	32-Port Serial IOC (EAPA)		X
23V96***	16-Port Multiline TC IOC		X
VS6550	Gate Array TC Processor		X
23V67W-19	Wangnet P-Band (includes serial IOC)		X
VS-WN-19B	Wangnet P-Band Upgrade		X
	(assumes 210-8609-A Serial IOC PCA already installed)		
22V47****	32-Port Serial IOP (EAPA)	X	
VS-CC-CPA	CPU Connector Plate Assembly	X	
	Cable Concentrator EAPA Upgrade	X	
FW-APA-2S	FiberWay APA	X	X
220-0510-50	50-ft External Muxbus Cable	X	X

*Stand-alone Cable Concentrator for inclusion in Cable Concentrator cabinet in stacked configuration or for mounting in 24-inch electronics rack.
**For VS-300, EAPAs may be upgraded in banks of four only; maximum of four per serial IOC.
***Requires an upgrade kit for installation in Cable Concentrator.
****For VS-85/100, two EAPAs (16 ports) shipped initially; EAPAs may be upgraded one at a time for a maximum of four per serial IOP.

11.4 RELATED DOCUMENTATION

For further information related to the VS Large Cable Concentrator, refer to the Technical Documentation Catalog/Index (WLI P/N 741-0000). This document contains a listing of all current technical documentation manuals in print. Manuals may be obtained from Wang Supplies Division.

11.5 SIGNAL MNEMONICS

For a listing of relevant signal mnemonics, refer to the appropriate CPU Product Maintenance Manual.

SECTION

12

**ILLUS-
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SECTION 12

ILLUSTRATED PARTS

12.1 GENERAL

This section contains the illustrated parts breakdown for the VS Large Cable Concentrator. In addition, Table 12-1 provides a listing of all field-replaceable units (FRUs) in the Cable Concentrator by part number. Use the part numbers in this table when ordering replacement parts.

NOTE

An interconnection diagram immediately follows each illustration of the cable concentrator I/O panel assemblies.

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12.2 EQUIPMENT

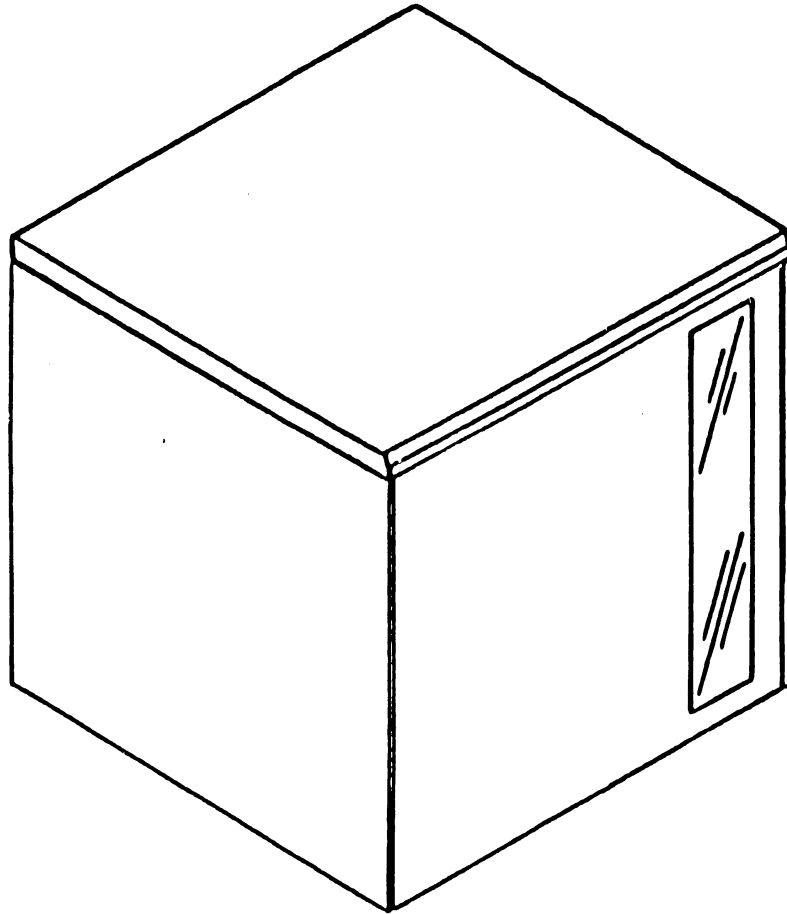
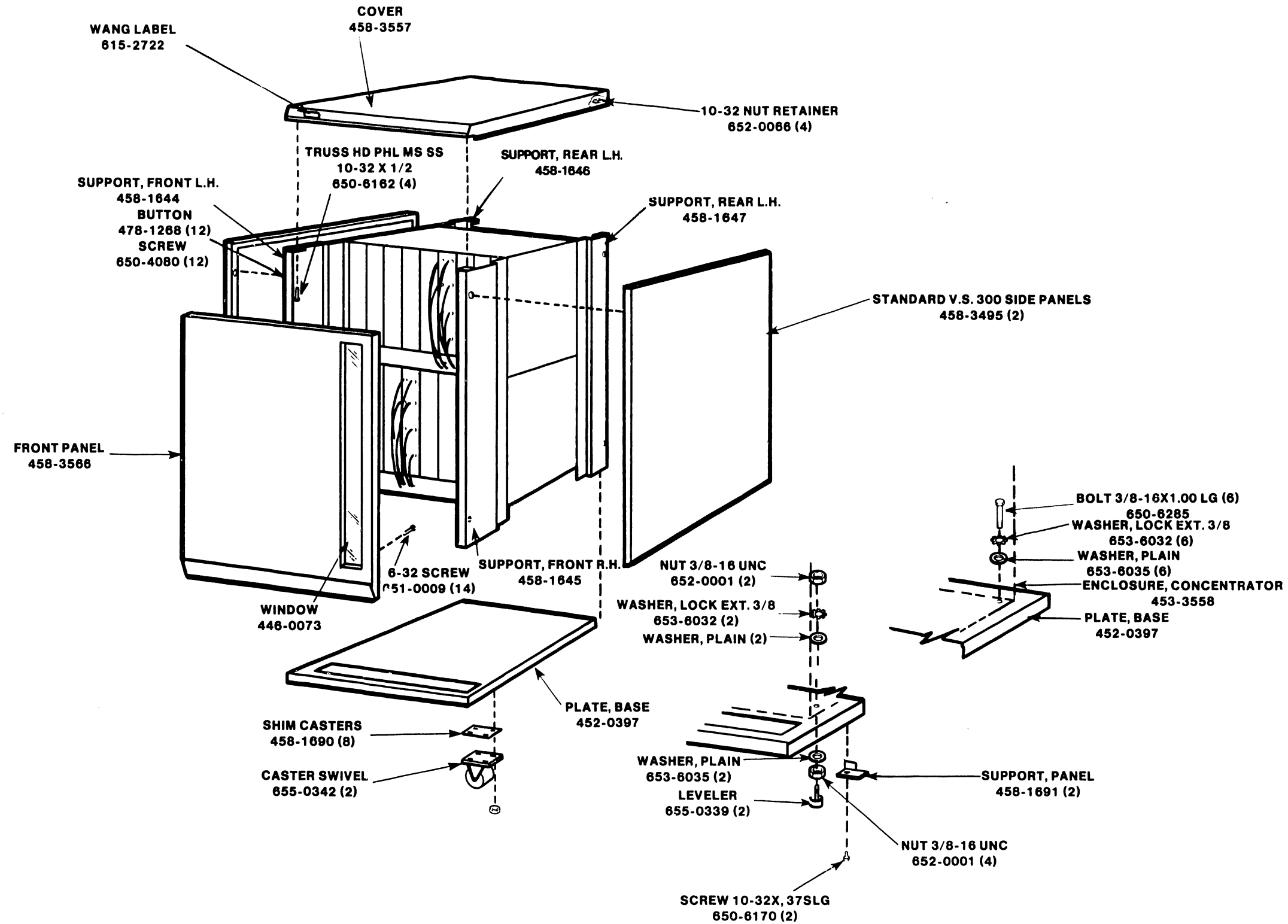


Figure 12-1. VS Large Cable Concentrator

ILLUSTRATED PARTS

12.3 MAJOR ASSEMBLIES



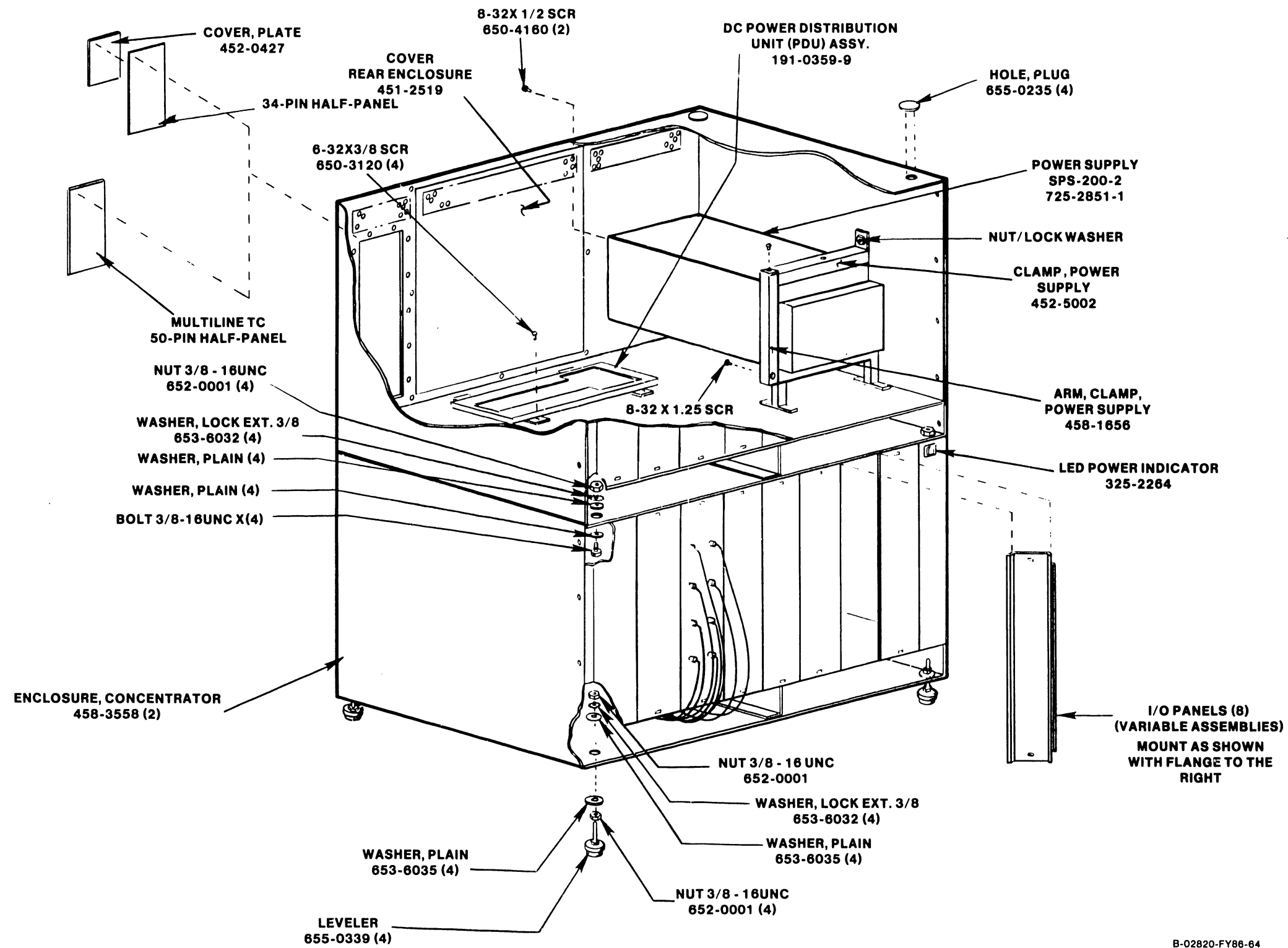
B-02820-FY86-20

Figure 12-2. Large Cable Concentrator Cabinet Assembly

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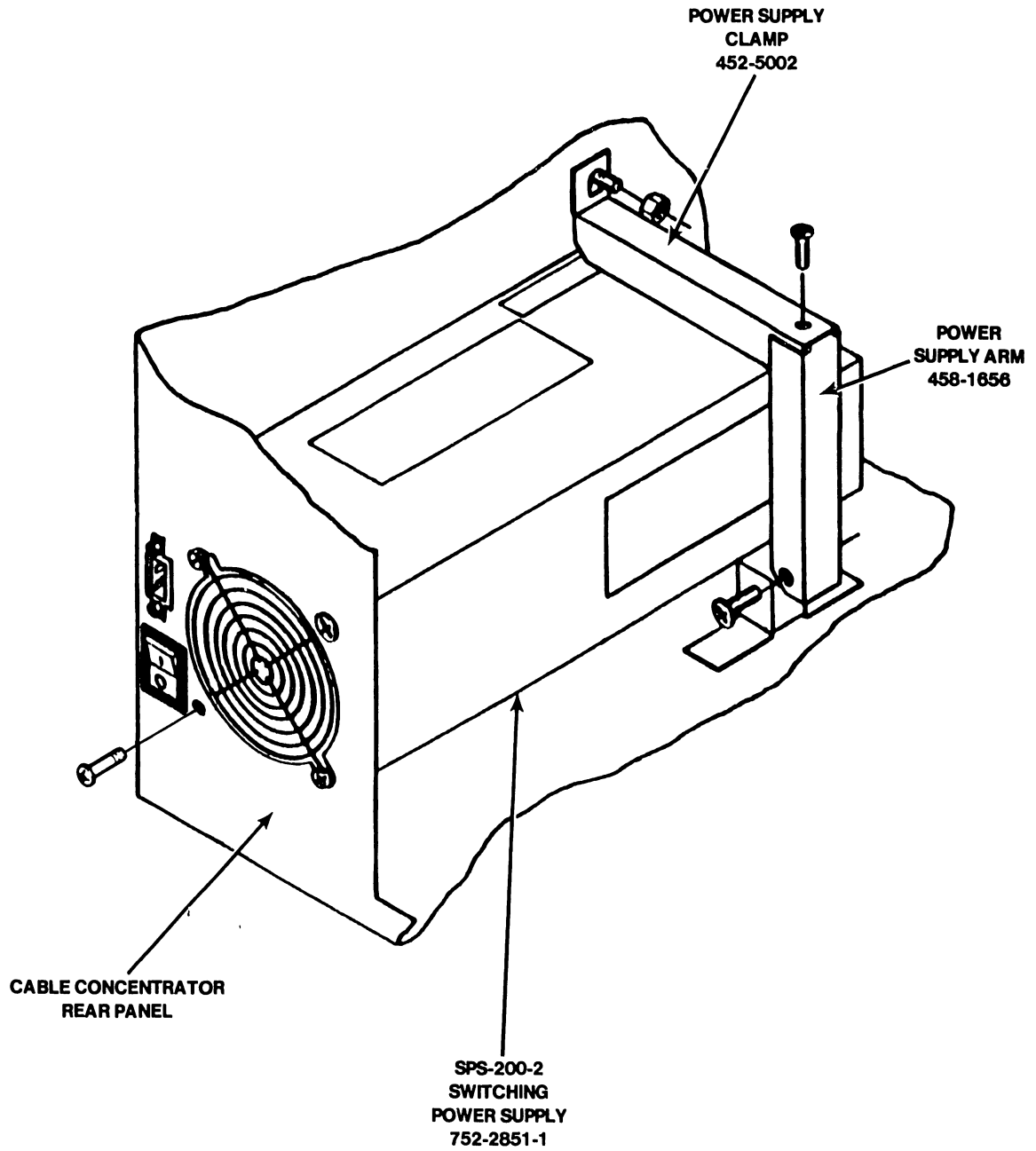
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Figure 12-3. Large Cable Concentrator Major Assemblies

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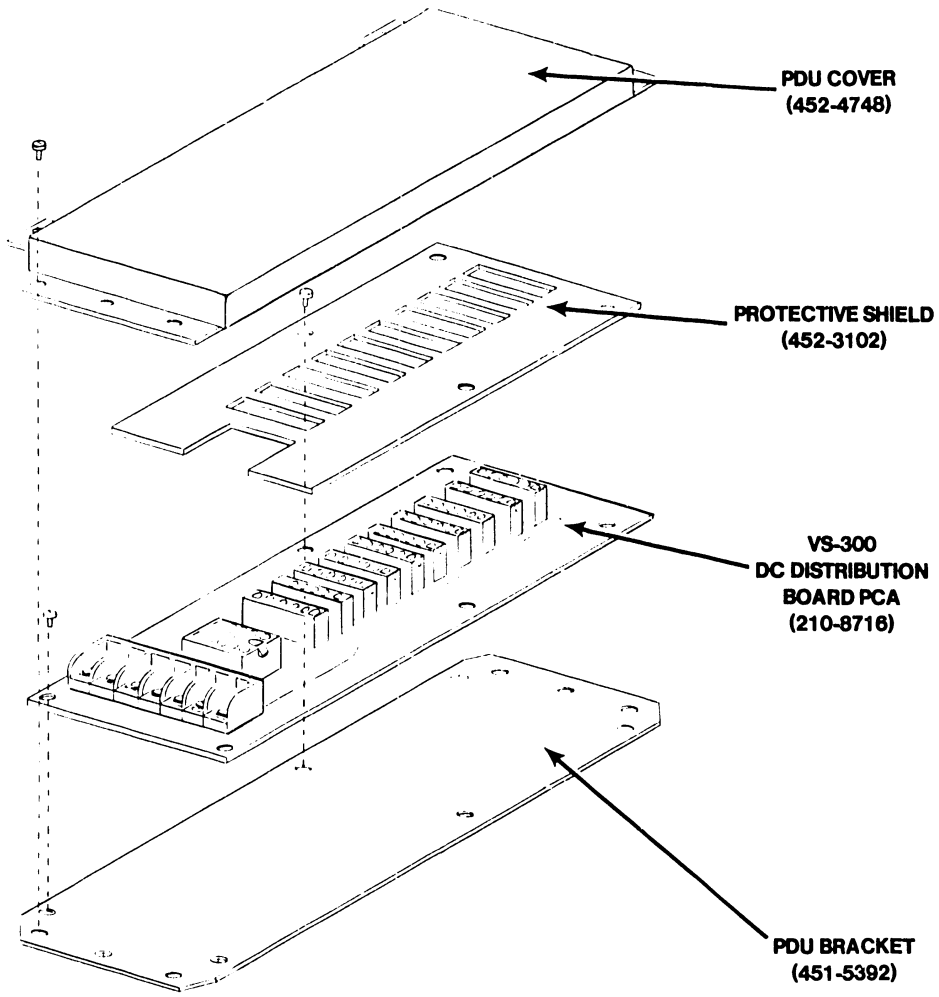
12.4 SUBASSEMBLIES



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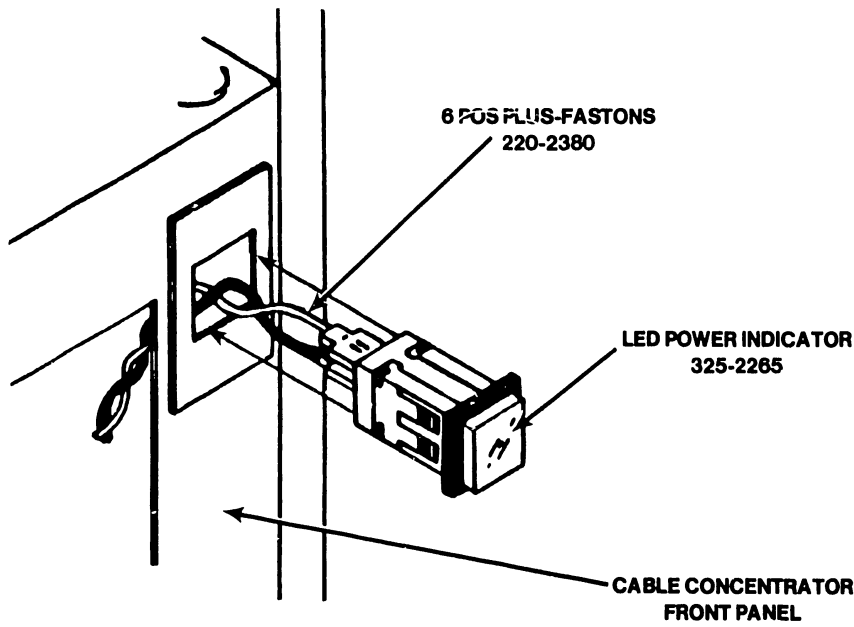
Figure 12-4. Switching Power Supply

ILLUSTRATED PARTS



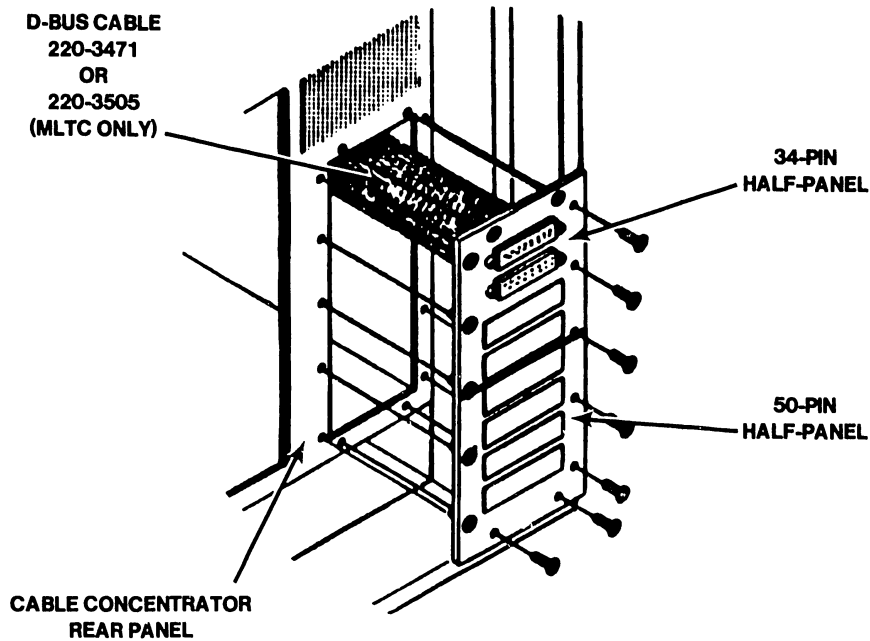
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Figure 12-5. VS-300 DC Power Distribution Unit (PDU)



B-02820-FY86-40

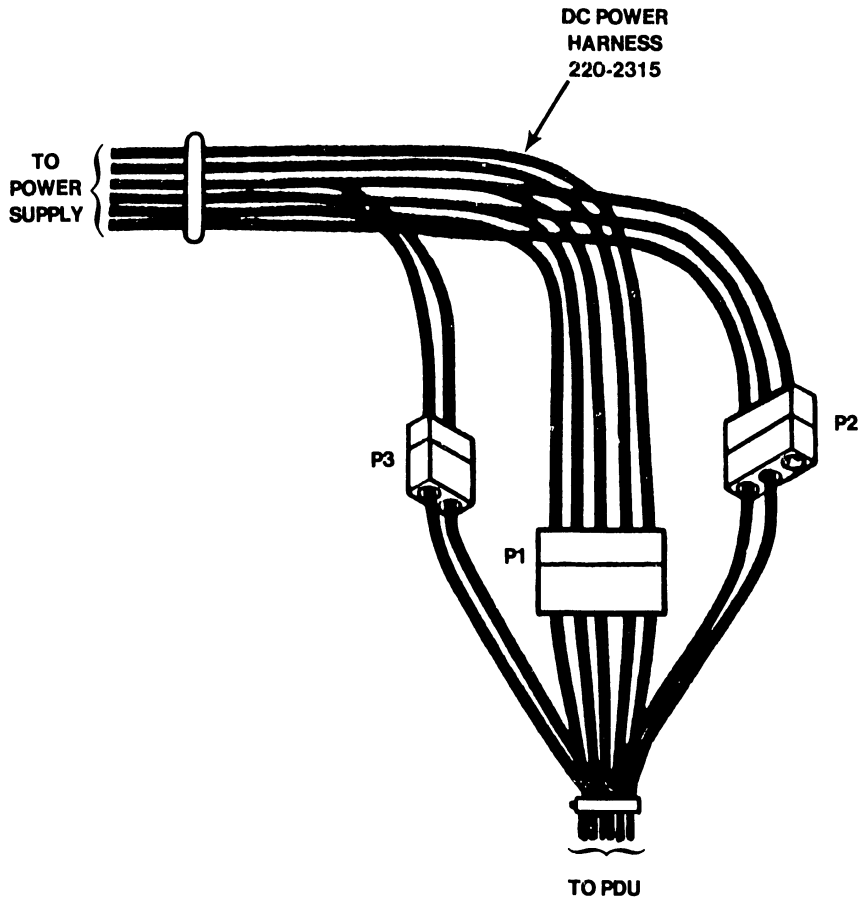
Figure 12-6. LED Power Indicator



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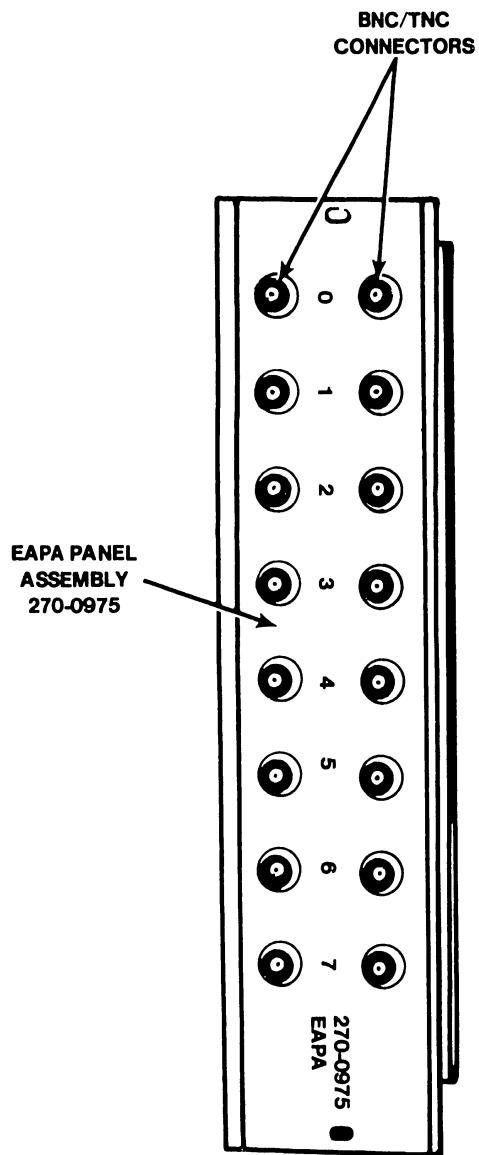
Figure 12-7. 34-/50-Pin Panel

ILLUSTRATED PARTS



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Figure 12-8. DC Power Harness

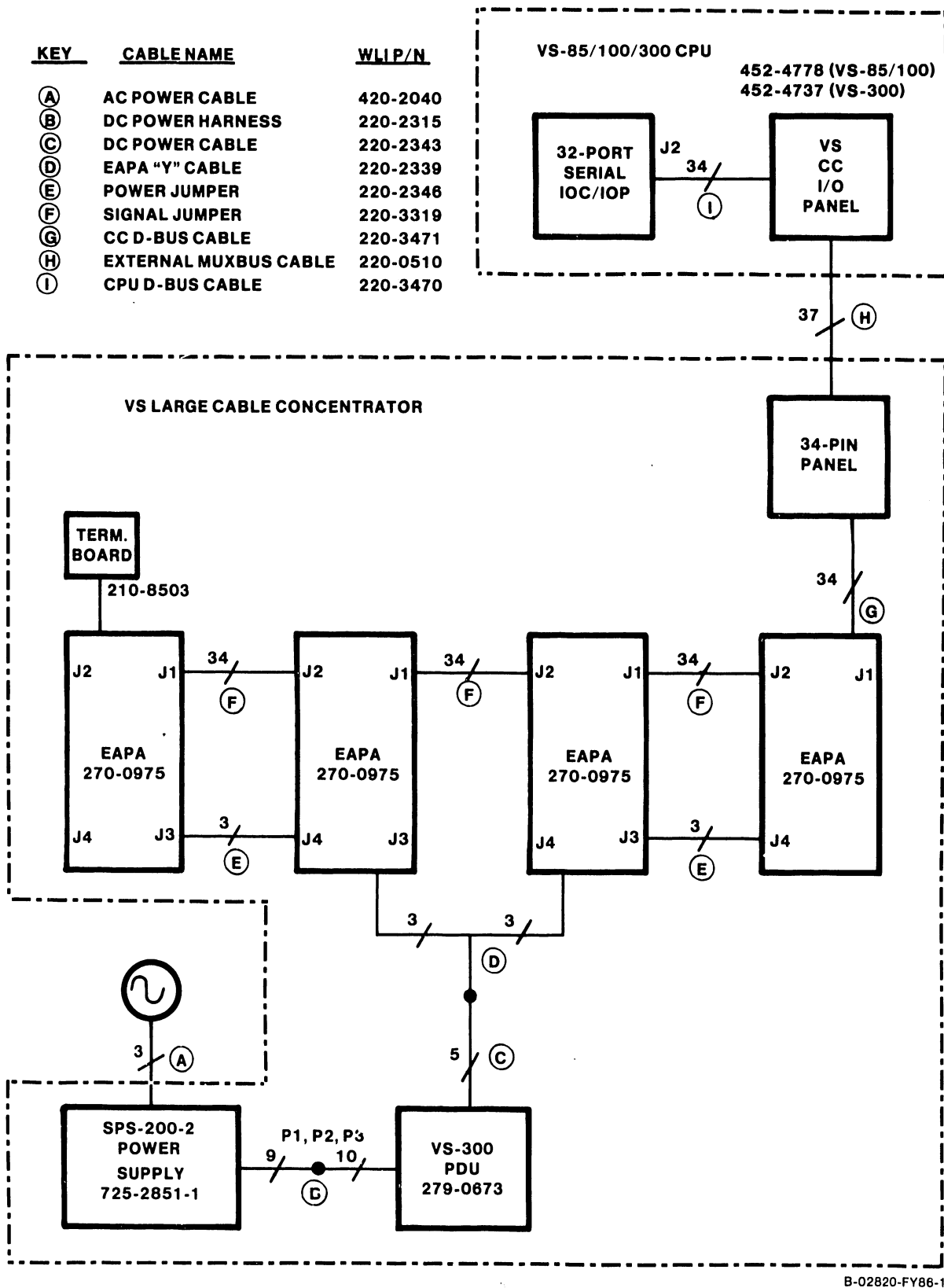


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Figure 12-9. Electrically Active Port Assembly (EAPA)

ILLUSTRATED PARTS

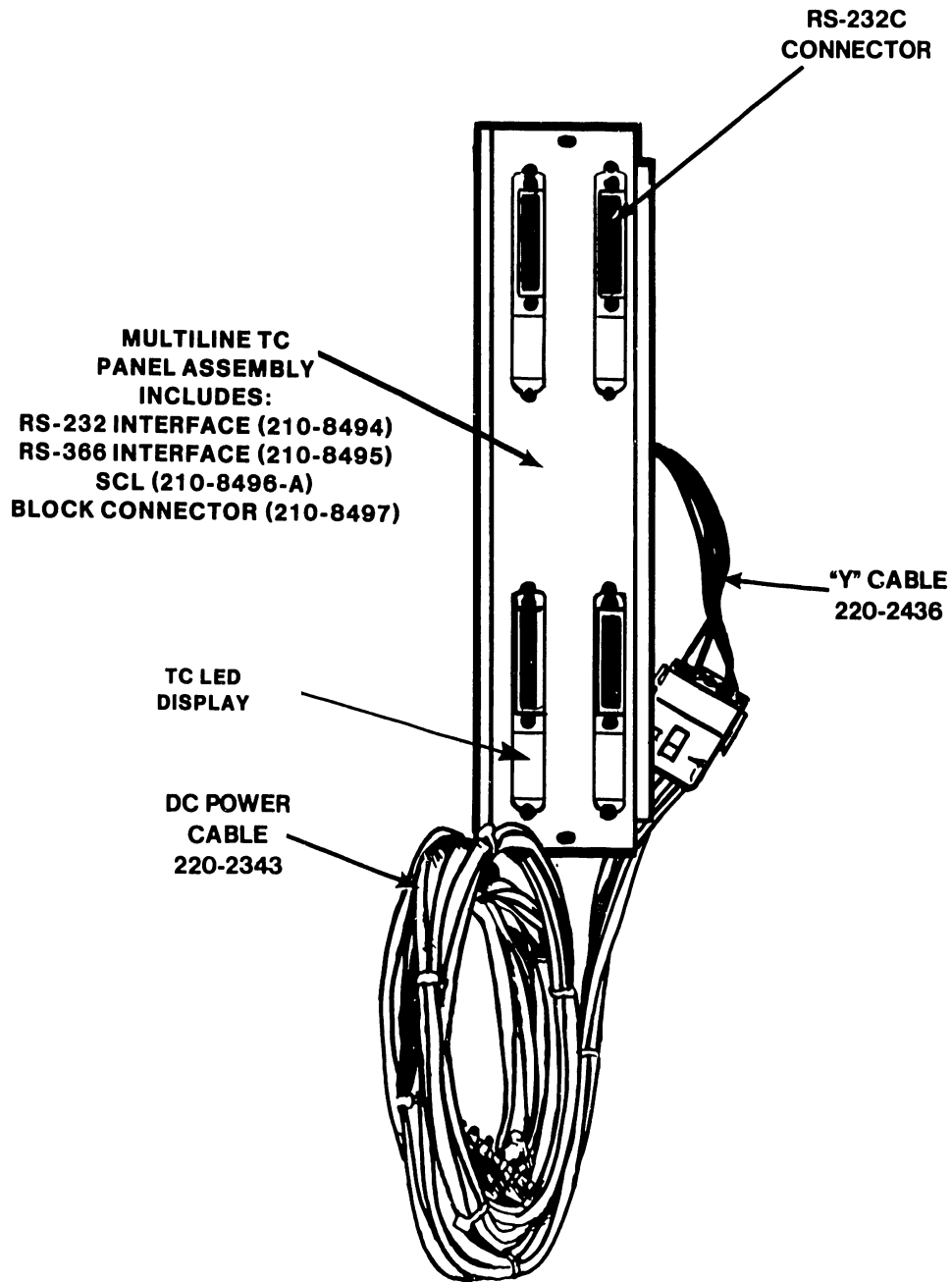
KEY	CABLE NAME	WL/P/N
(A)	AC POWER CABLE	420-2040
(B)	DC POWER HARNESS	220-2315
(C)	DC POWER CABLE	220-2343
(D)	EAPA "Y" CABLE	220-2339
(E)	POWER JUMPER	220-2346
(F)	SIGNAL JUMPER	220-3319
(G)	CC D-BUS CABLE	220-3471
(H)	EXTERNAL MUXBUS CABLE	220-0510
(I)	CPU D-BUS CABLE	220-3470



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Figure 12-10. EAPA Interconnection Diagram

ILLUSTRATED PARTS

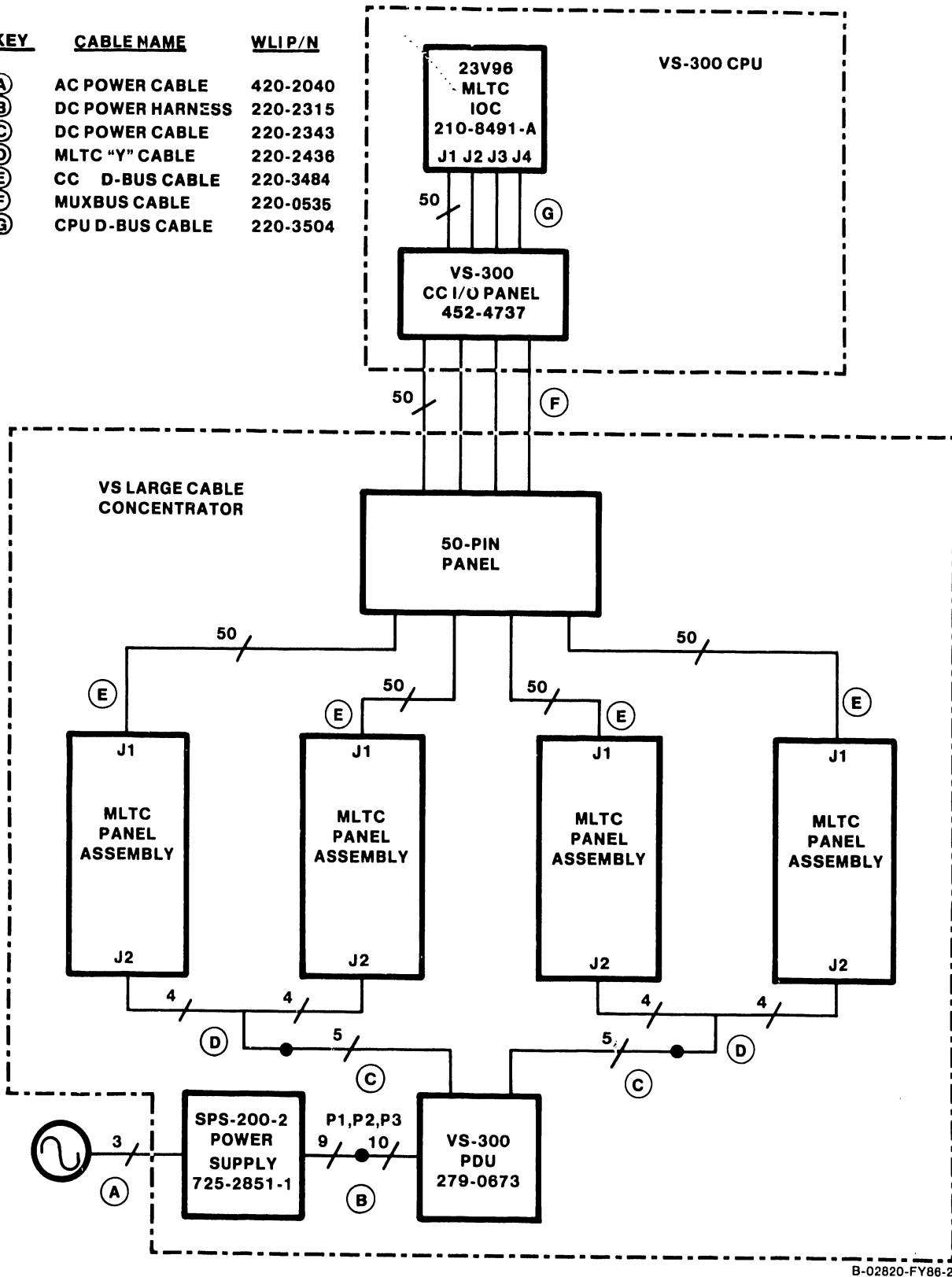


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Figure 12-11. Multiline Telecommunications (MLTC) Panel Assembly

ILLUSTRATED PARTS

KEY	CABLENAME	WLIP/N
(A)	AC POWER CABLE	420-2040
(B)	DC POWER HARNESS	220-2315
(C)	DC POWER CABLE	220-2343
(D)	MLTC "Y" CABLE	220-2436
(E)	CC D-BUS CABLE	220-3484
(F)	MUXBUS CABLE	220-0535
(G)	CPU D-BUS CABLE	220-3504



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Figure 12-12. MLTC Interconnection Diagram

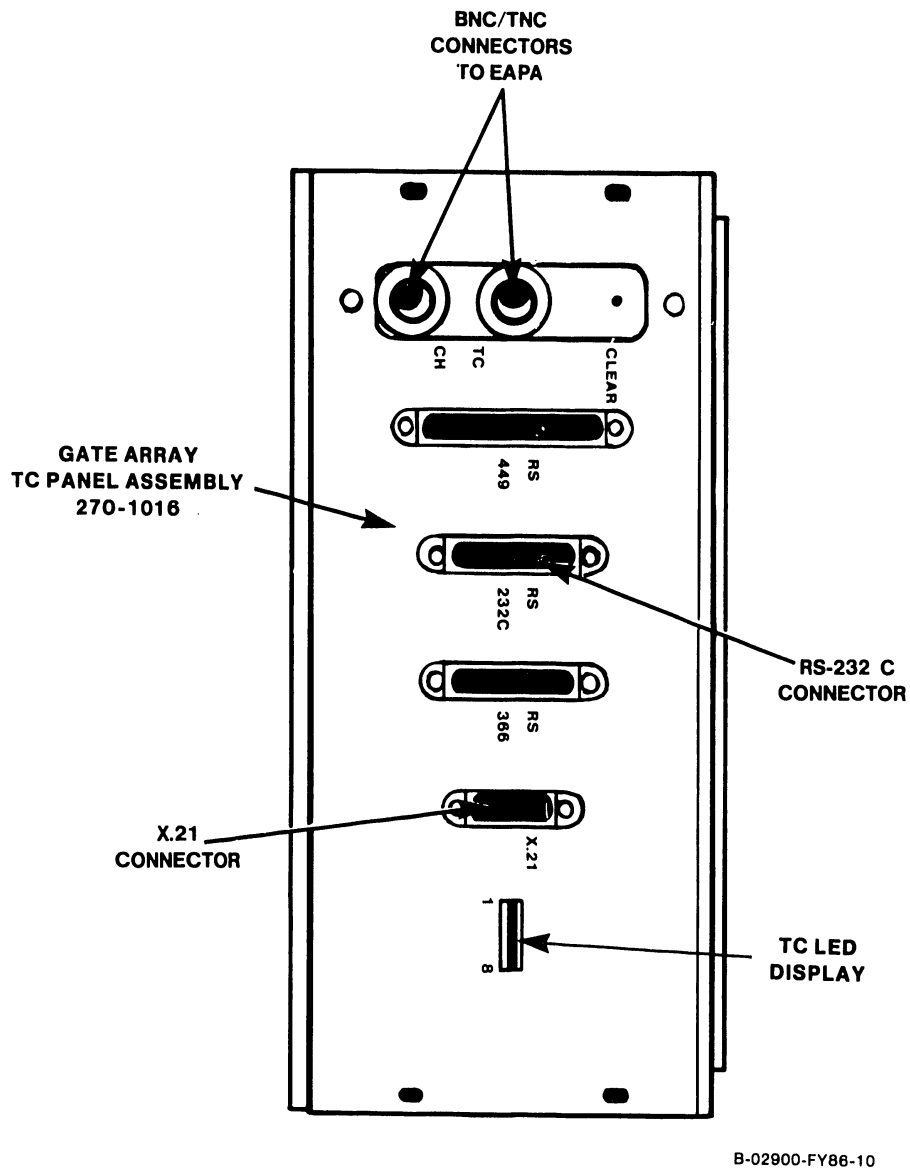
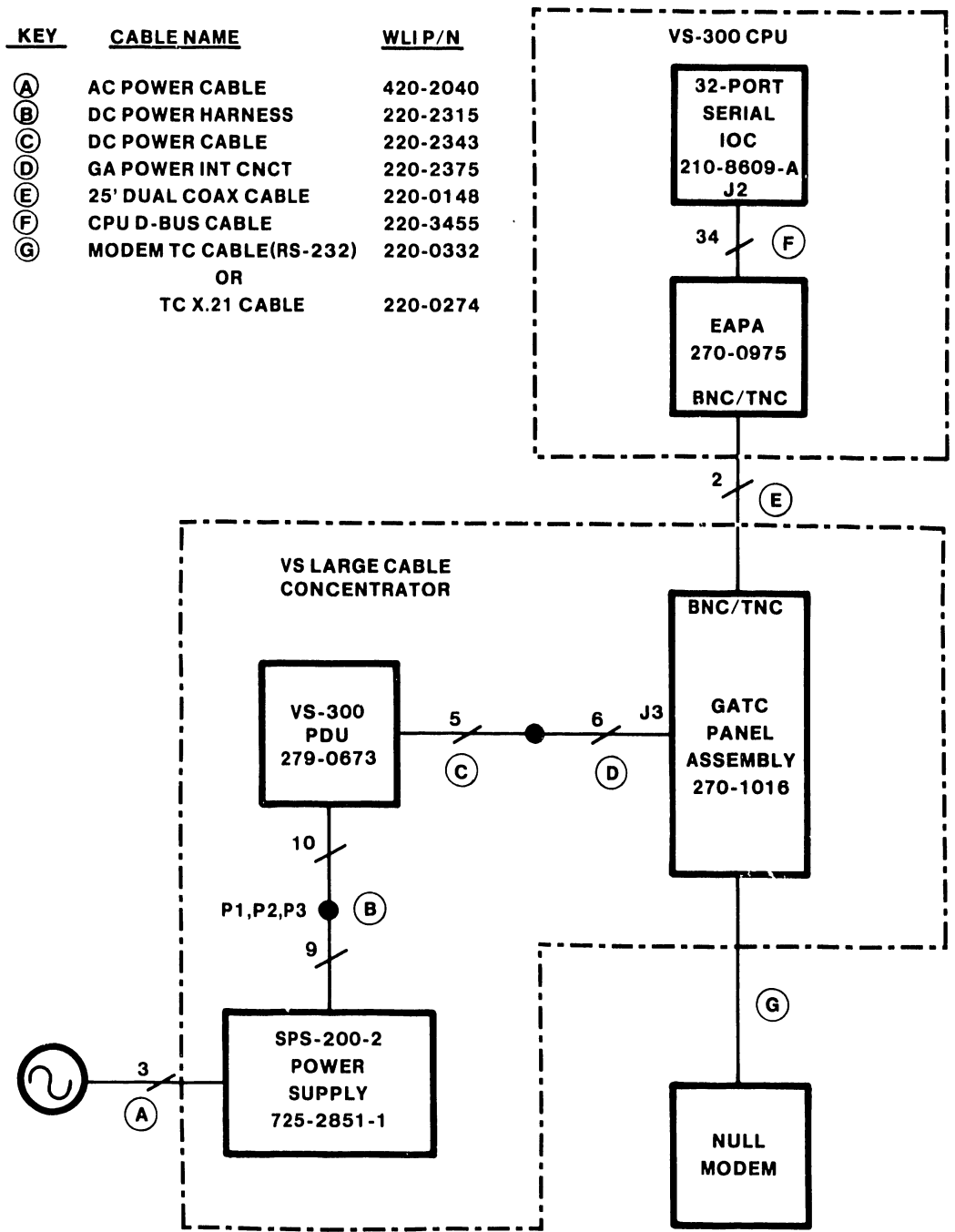


Figure 12-13. Gate Array Telecommunications (GATC) Panel Assembly

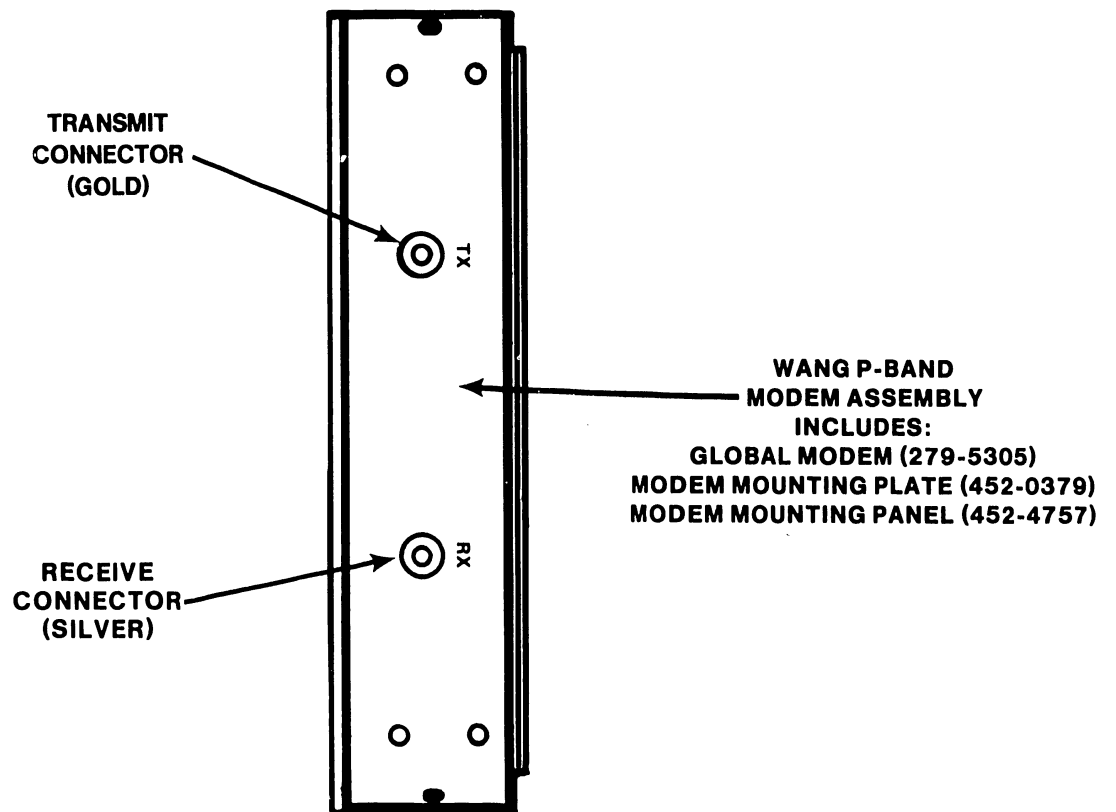
ILLUSTRATED PARTS



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Figure 12-14. GATC Interconnection Diagram

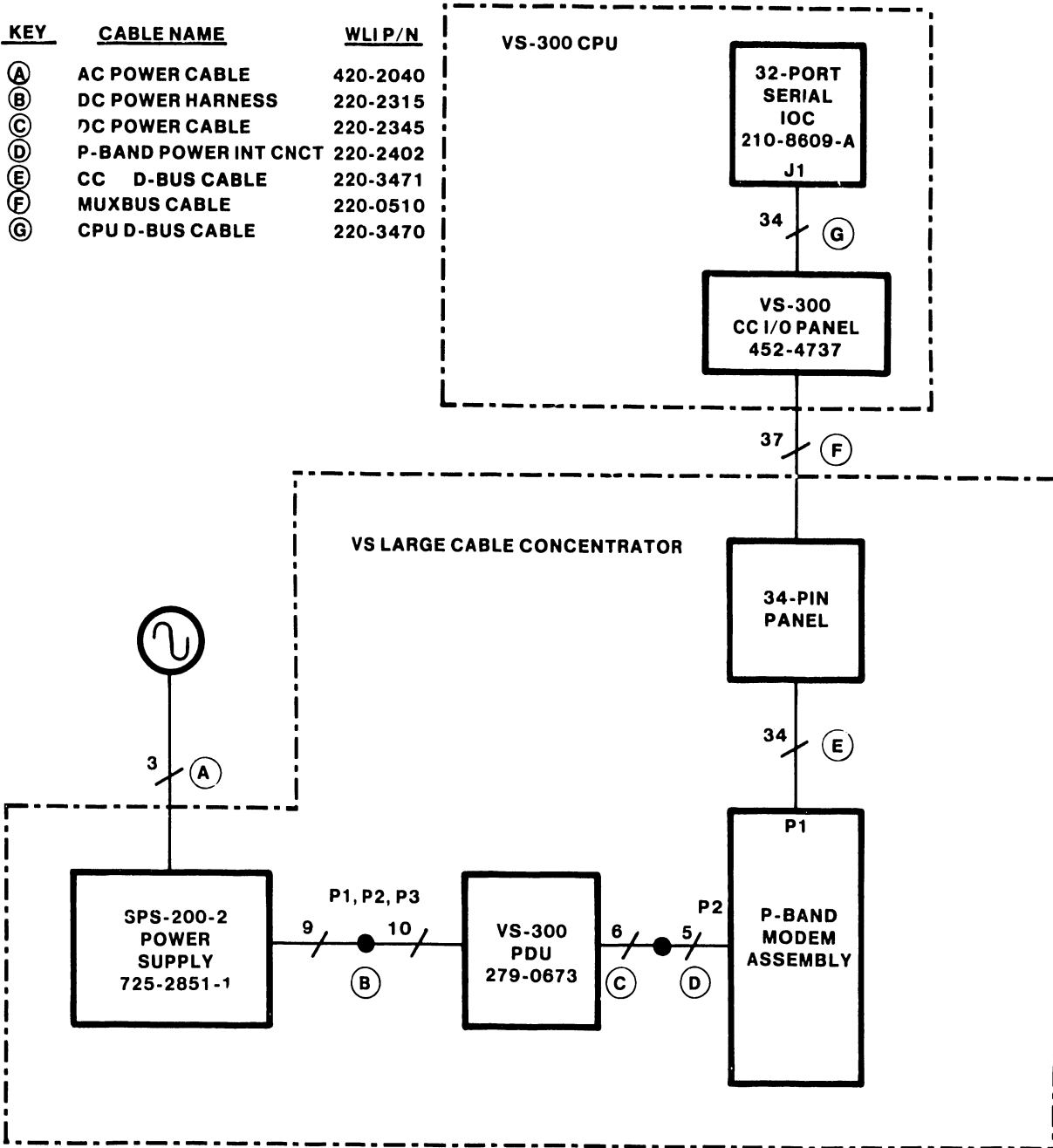
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Figure 12-15. Wangnet P-Band Modem Panel Assembly

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Figure 12-16. Wangnet P-Band Modem Interconnection Diagram

ILLUSTRATED PARTS

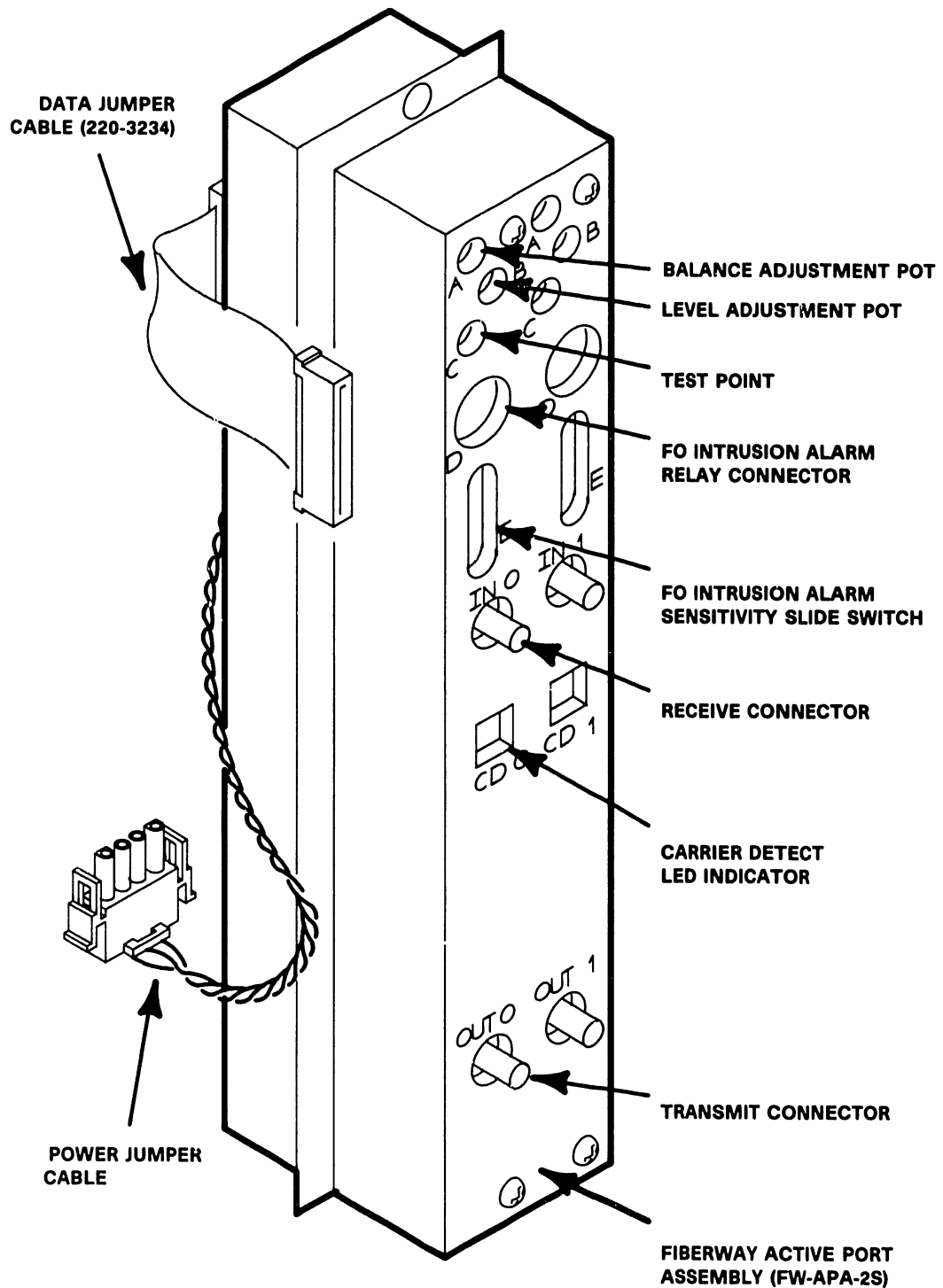
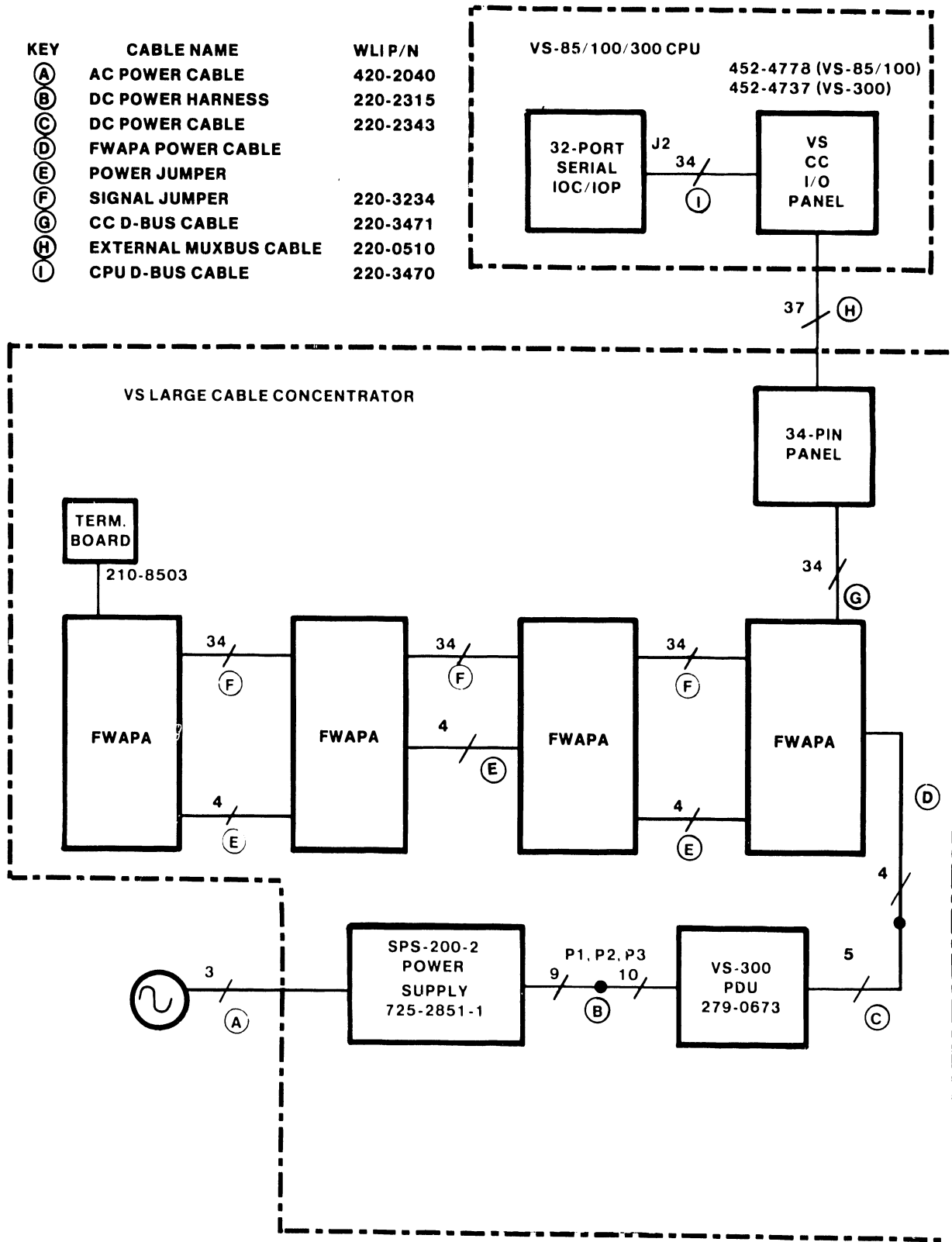


Figure 12-17. FiberWay Active Port Assembly (FWAPA)

ILLUSTRATED PARTS

KEY	CABLE NAME	WLIP/N
(A)	AC POWER CABLE	420-2040
(B)	DC POWER HARNESS	220-2315
(C)	DC POWER CABLE	220-2343
(D)	FWAPA POWER CABLE	
(E)	POWER JUMPER	
(F)	SIGNAL JUMPER	220-3234
(G)	CC D-BUS CABLE	220-3471
(H)	EXTERNAL MUXBUS CABLE	220-0510
(I)	CPU D-BUS CABLE	220-3470



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Figure 12-18. FWAPA Interconnection Diagram

12.5 FIELD-REPLACEABLE UNITS

The following table lists the field-replaceable units (FRUs) in the VS Large Cable Concentrator by part number, along with a description of the part, and the FRU type.

Table 12-1. Cable Concentrator Field-Replaceable Units

WLI P/N	DESCRIPTION	FRU TYPE
210-8494	MLTC RS-232-C Interface	PCA
210-8495	MLTC RS-366 Interface	PCA
210-8496-A	MLTC Serial Communications Link	PCA
210-8497	MLTC Block Connector	PCA
210-8503	928MC Muxbus Terminator Board	PCA
210-8716	VS-300 PDU DC Distribution Board	PCA
220-0148	25-ft Dual Coaxial Cable	CBL
220-0274	12-ft TC X.21 Cable	CBL
220-0332	12-ft Modem TC Cable (RS-232C)	CBL
220-0510	25-ft External Muxbus Cable	CBL
220-0510-50	50-ft External Muxbus Cable	CBL
220-0535	MLTC External Muxbus Cable	CBL
220-2315	DC Power Harness	CBL
220-2339	APA "Y" Power Cable	CBL
220-2343	DC Power Cable (Options)	CBL
220-2345	DC Power Cable	CBL
220-2346	APA Power Jumper Cable (3 Pos Plug-Plug 4")	CBL
220-2375	Gate Array Power Interconnect Cable	CBL
220-2380	6 Pos Plug-Fastons	CBL
220-2402	Wangnet P-Band Power Interconnect Cable	CBL
220-2436	MLTC "Y" Power Cable	CBL
220-3319	EAPA Signal Jumper Cable (34 Pos Soc-Soc 3 1/8")	CBL
220-3470	CPU D-Bus Cable (37 Pos D-Bus-34 Pos Soc)	CBL
220-3471	CC D-Bus Cable (37 Pos D-Bus-34 Pos Soc)	CBL
220-3484	MLTC CPU D-Bus Cable	CBL
220-3505	MLTC CC D-Bus Cable	CBL
270-0975	Electrically Active Port Assembly (EAPA)	ASSY
270-1016	Gate Array Telecommunications (GATC) Panel Assembly	ASSY
270-1033	SPS 255 Switching Power Supply	ASSY
270-XXXX	FW-APA-2S FiberWay Active Port Assembly	ASSY
270-XXXX	34-Pin Panel Assembly	ASSY
270-XXXX	50-Pin Panel Assembly	ASSY
279-0673	VS-300 DC Power Distribution Unit (PDU) Assembly	ASSY
279-5305	Wangnet P-Band Global Modem Assembly	ASSY
325-2265	LED Power Indicator	LED
420-2040	AC Power Cable	CBL
452-0379	P-Band Modem Mounting Plate	PLT
452-4757	P-Band Modem Mounting Panel	PNL
725-2851-1	SPS 200 Switching Power Supply	ASSY



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