

PULSE *120 – SG-1A

ELECTRONIC PRIVATE AUTOMATIC BRANCH EXCHANGE

ASSEMBLY OF APPARATUS

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LINE CIRCUIT ARRANGEMENT	61	1.01 This section describes the methods to be used in assembling the PULSE 120 Electronic Private Automatic Branch Exchange (EPABX) to meet particular installation requirements. This section also describes the course of the inspection of the basic unit, the installation and removal of shelves, circuit packs, and console apparatus items, and the connection of cables in the cabinet.	
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- (c) addition of optional features to an operating system,
- (d) removal and replacement of apparatus items.

Caution: Before proceeding with any installation described in this section, the provisions of Section 553-5011-201, *Shipping and Receiving*, must be obeyed.

1.03 The assembly of apparatus must be completed in the sequence given in this section. All the operations described should be completed before referring to other documents for additional information about strapping and connecting.

1.04 **REASON FOR REISSUE:** to add information on the swing gate cabinet, and QSP7L integrated power supply. Marginal arrows are included to indicate changes.

2. BASIC-UNIT INSPECTION

2.01 The assembly, inspection, and connection instructions provided in this section ensure that the items comprising the cabinet assembly (cabinet, shelves, circuit packs, and interconnecting cables) are properly installed without being damaged. Any apparatus item missing from the

basic-unit assembly must be reported to the supplier.

2.02 The installation of additional shelves in a preinspected cabinet is described in Part 3.

2.03 The front and side panels must be removed from the cabinet as described in Chart 1.

SLIDE NO. 1

2.04 When the front panel of the cabinet is removed, the end of slide no. 1 is exposed on the left side of the cabinet (Fig. 1). Removal of the left-side panel of the cabinet reveals the front of the slide.

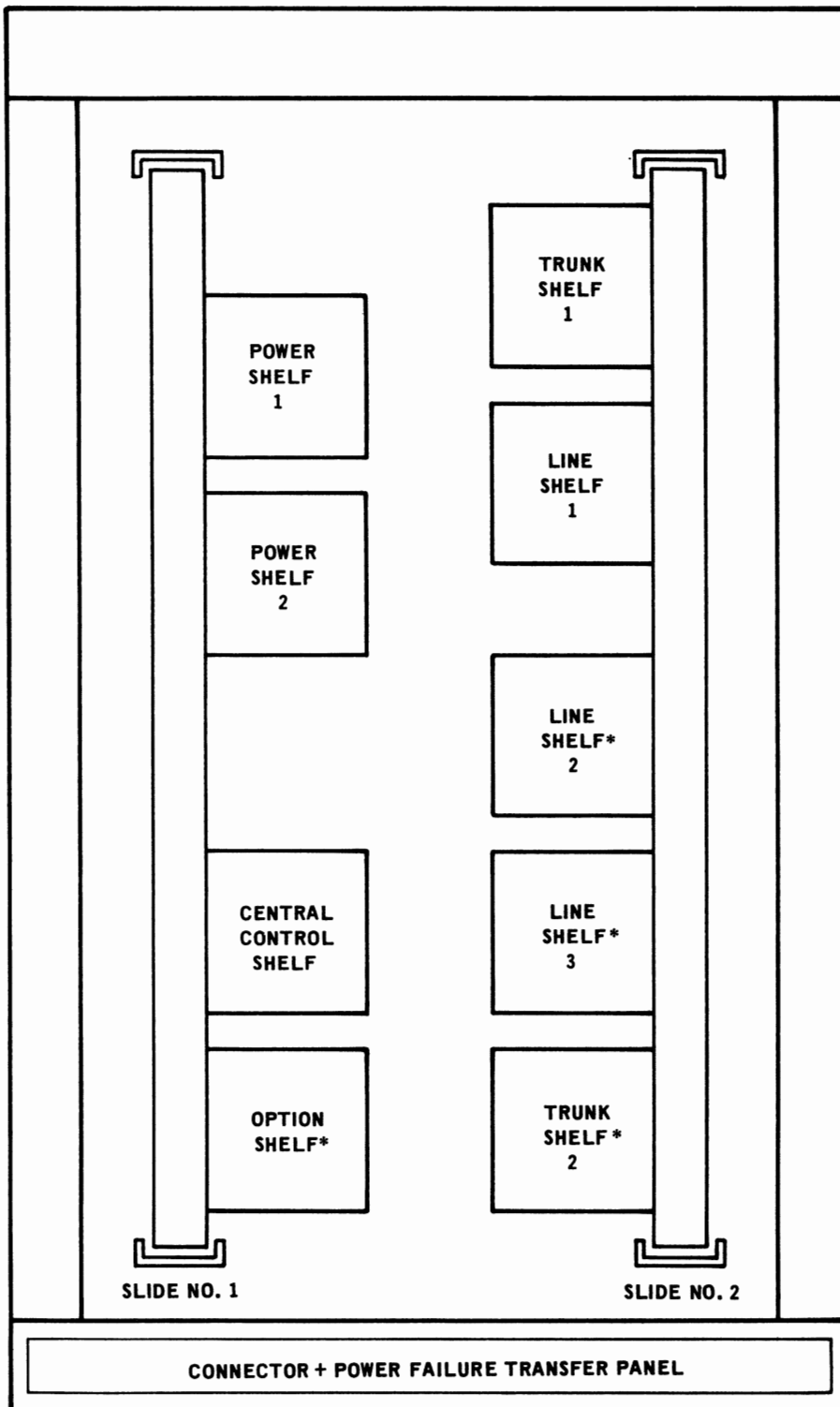
2.05 Slide no. 2 (Fig. 1) must be in the fully closed position before slide no. 1 is pulled out. The procedure for inspection of slide no. 1 is described in Chart 2.

SLIDE NO. 2

2.06 When the front panel of the cabinet is removed, the end of slide no. 2 is exposed on the right side of the cabinet. Removal of the right-side panel of the cabinet reveals the front of the slide.

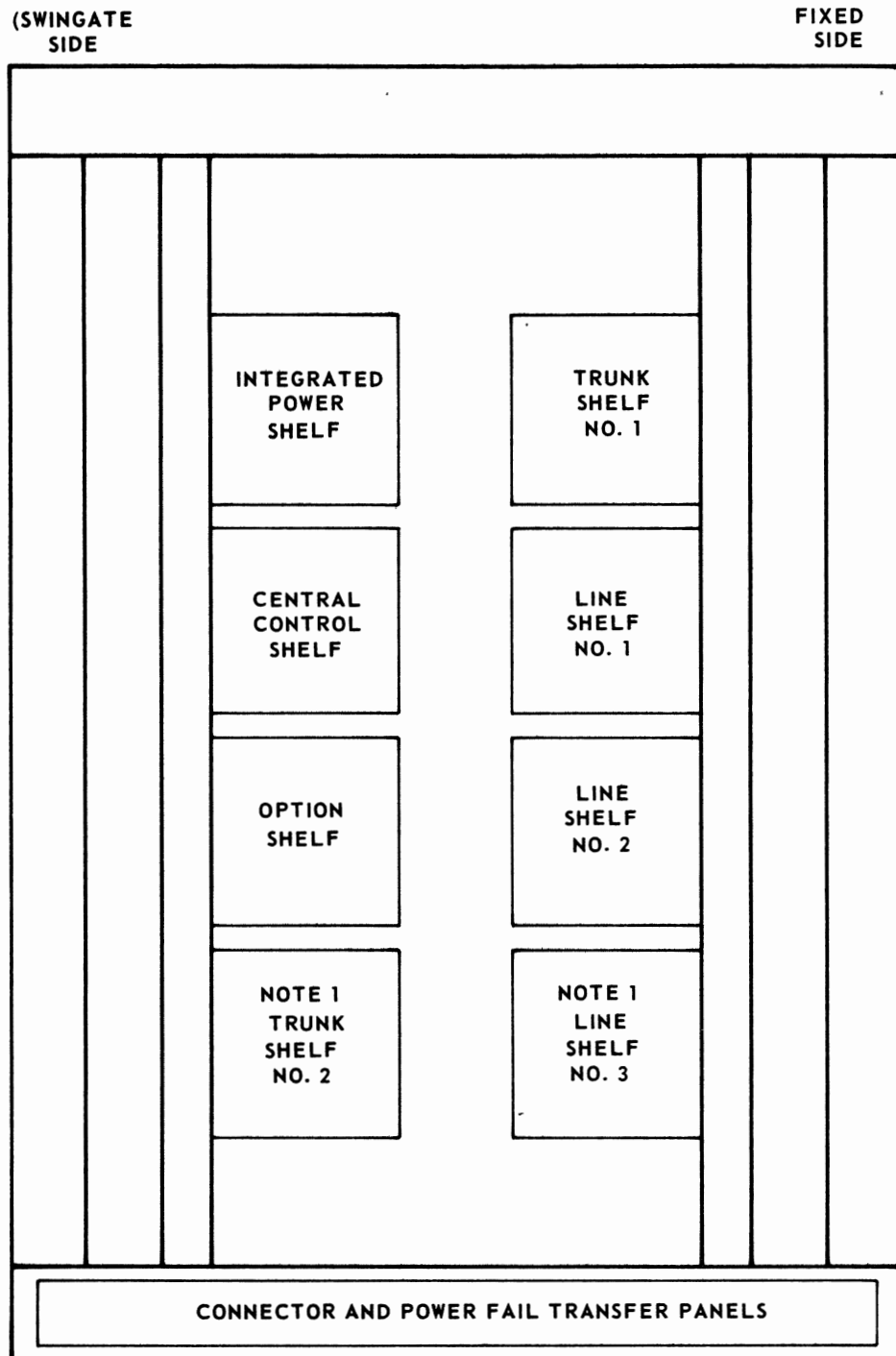
2.07 Slide no. 1 must be in the fully closed position before slide no. 2 is pulled out. The procedure for inspection of slide no. 2 is described in Chart 3.

CHART 1 – REMOVAL OF CABINET PANELS	
Remove front and side panels as required. The removal procedure applies to all panels.	
APPARATUS REQUIRED: Phillips No. 2 Screwdriver	
STEP	PROCEDURE
1	Remove the two screws (Fig. 2) at the top of the panel by turning the screws counterclockwise until the screw and washer can be removed from the panel. Support the panel against the cabinet during this operation.
2	Grasp the panel by the edge trim, tilt slightly away from the cabinet, and lift vertically until the adjustable studs clear the holes in the lower horizontal support of the cabinet.
3	To avoid damage to the panel, stand it securely against a wall or some other suitable support.



* THESE SHELVES ARE NOT INCLUDED IN THE BASIC UNIT.

Fig. 1 Front View of EPABX Shelf Layout (Slider Cabinet)

**NOTE;**

INSTALL TRUNK SHELF NO. 2 ON THE FIXED SIDE OF THE CABINET WHEN LINE SHELF NO. 3 IS NOT PROVIDED. WHEN LINE SHELF NO. 3 IS PROVIDED, INSTALL TRUNK SHELF NO. 2 ON THE SWINGATE SIDE.

Fig. 1A – Front View of EPABX Shelf Layout (Swinggate Cabinet)

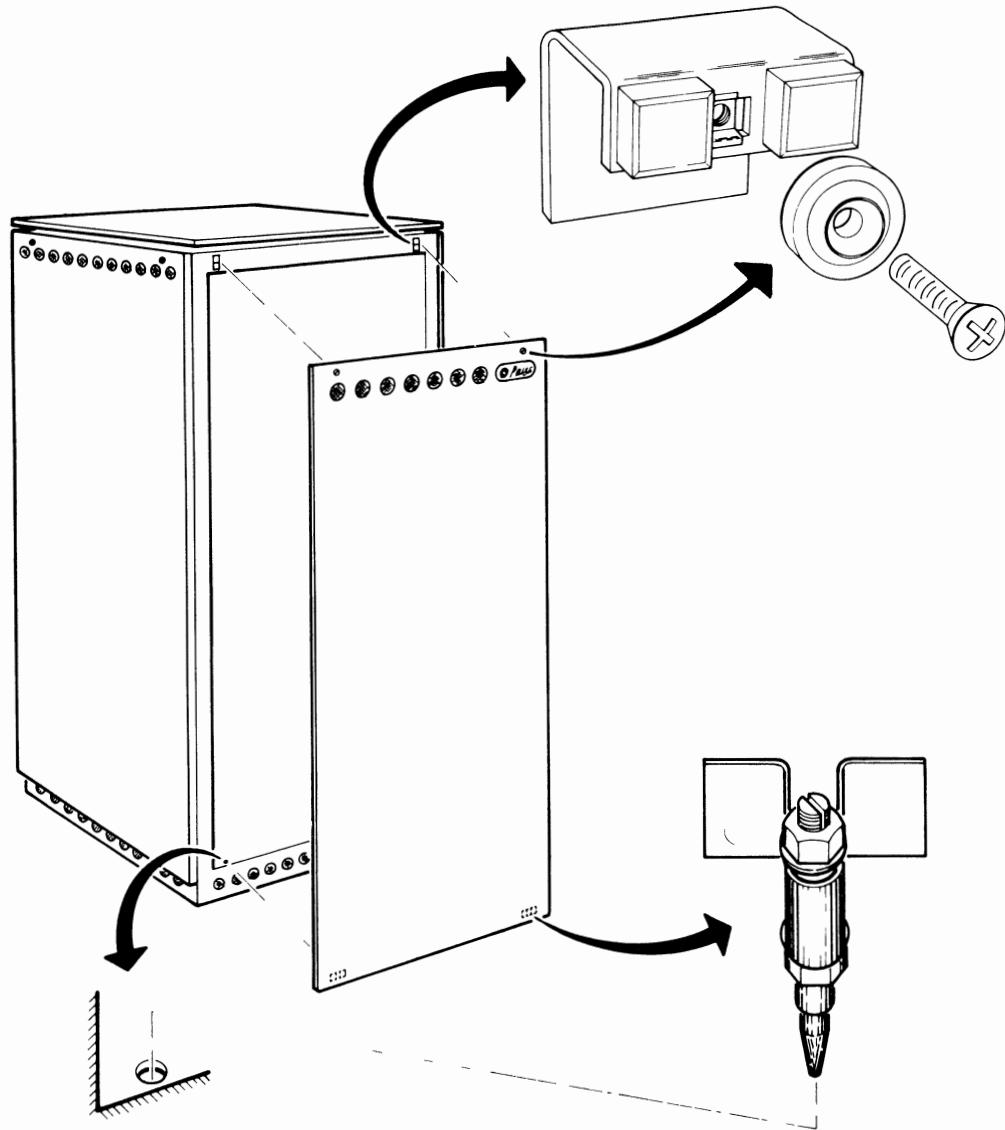


Fig. 2 – Front and Side Panel Removal

CHART 2 –SLIDE NO. 1 ASSEMBLY AND INSPECTION (SLIDER CABINET)	
STEP	PROCEDURE
TO EXTEND SLIDE NO. 1	
1	Disengage the spring latch from the stud at the top of the vertical support of the slide.
2	Pull the slide out to fully opened position until the spring latch engages the rear stud.
POWER SWITCH	
3	Flick the power switch on power shelf no. 2 to the OFF position.

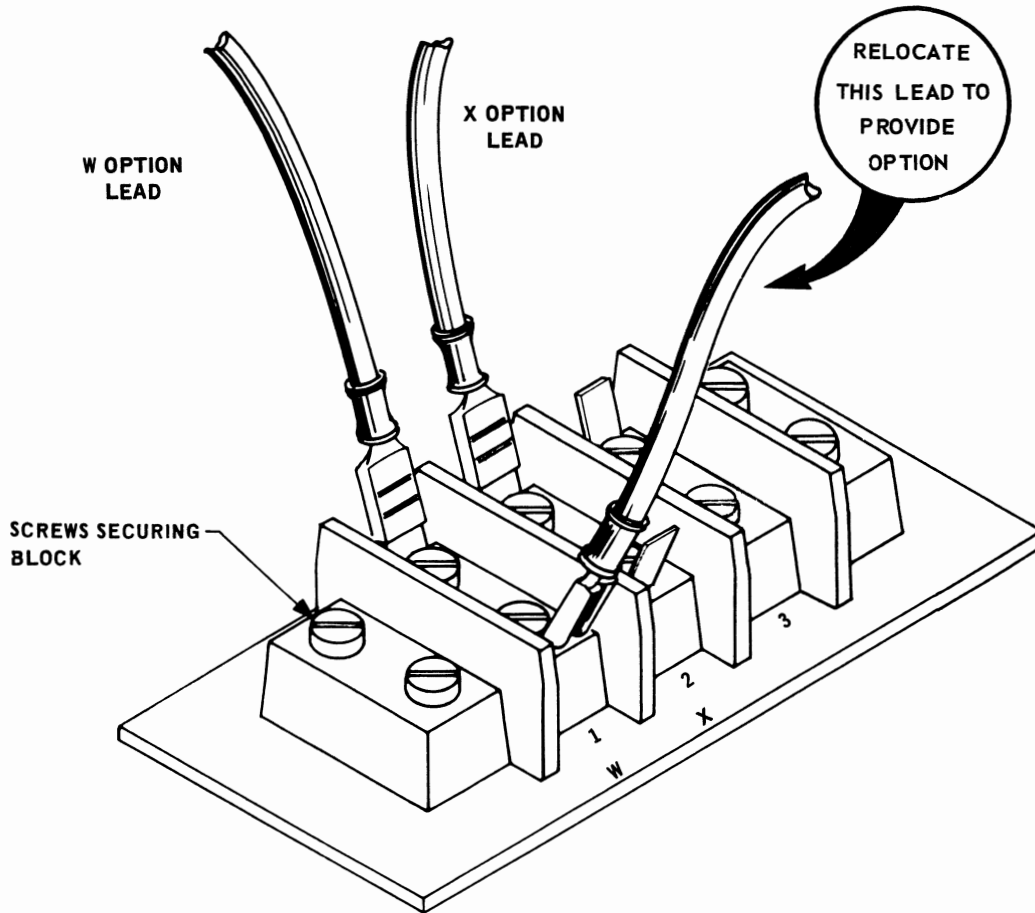


Fig. 3 – W, X Option Block (TB1) on Power Shelf No. 1 (Figure Shows W Option)

CHART 2 (Cont) – SLIDE NO. 1 ASSEMBLY AND INSPECTION	
STEP	PROCEDURE
POWER SHELF NO. 1	
4	Locate the W, X option block (Fig. 3) next to the fuse, and test point panel on power shelf no. 1.
5	Connect the attendant console lamp-power option lead for the W or X option as required. <ul style="list-style-type: none"> • X Option – The attendant console is 100 cable-feet or less from the cabinet. The basic system is shipped wired to the X option. • W Option – The attendant console is more than 100 cable-feet, up to a maximum of 300 cable-feet, from the cabinet.
6	Perform a visual inspection of the back panel wiring to detect physical damage.

CHART 2 (Cont) – SLIDE NO. 1 ASSEMBLY AND INSPECTION

STEP	PROCEDURE
POWER SHELF NO. 2	
7	<p>Inspect the internal cables and tighten the plug connectors (Fig. 5) in place:</p> <p>(a) Hubbell connector P280 (from power shelf no. 1) to J280.</p> <p>(b) Hubbell connector J290 (from connector panel) to P290.</p> <p>(c) J250 (from wiring harness at the front end of power shelf no. 2) to P250.</p> <p>Caution: Do not connect the power plug to the power receptacle.</p>
8	<p>Relocate strap on TB3 (Fig. 4) for +5 V regulator output monitoring provided by X, W, and V strapping options (see Table A). The basic system is shipped wired for X and V options.</p> <p>Note: The asterisk (*) after the base code replaces the suffix letter of the circuit pack in Table A.</p>
9	Tighten the screws on TB2 (if loose) at the rear of the shelf.
10	Perform a visual inspection of the back panel wiring to detect physical damage.

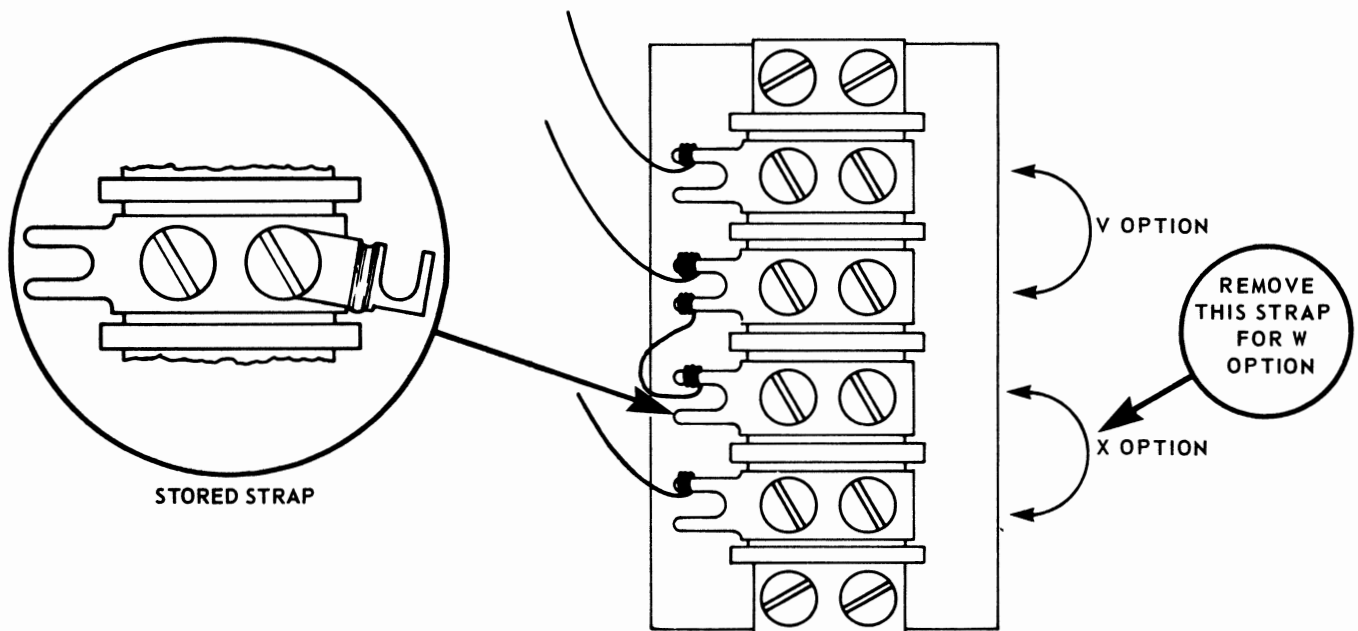
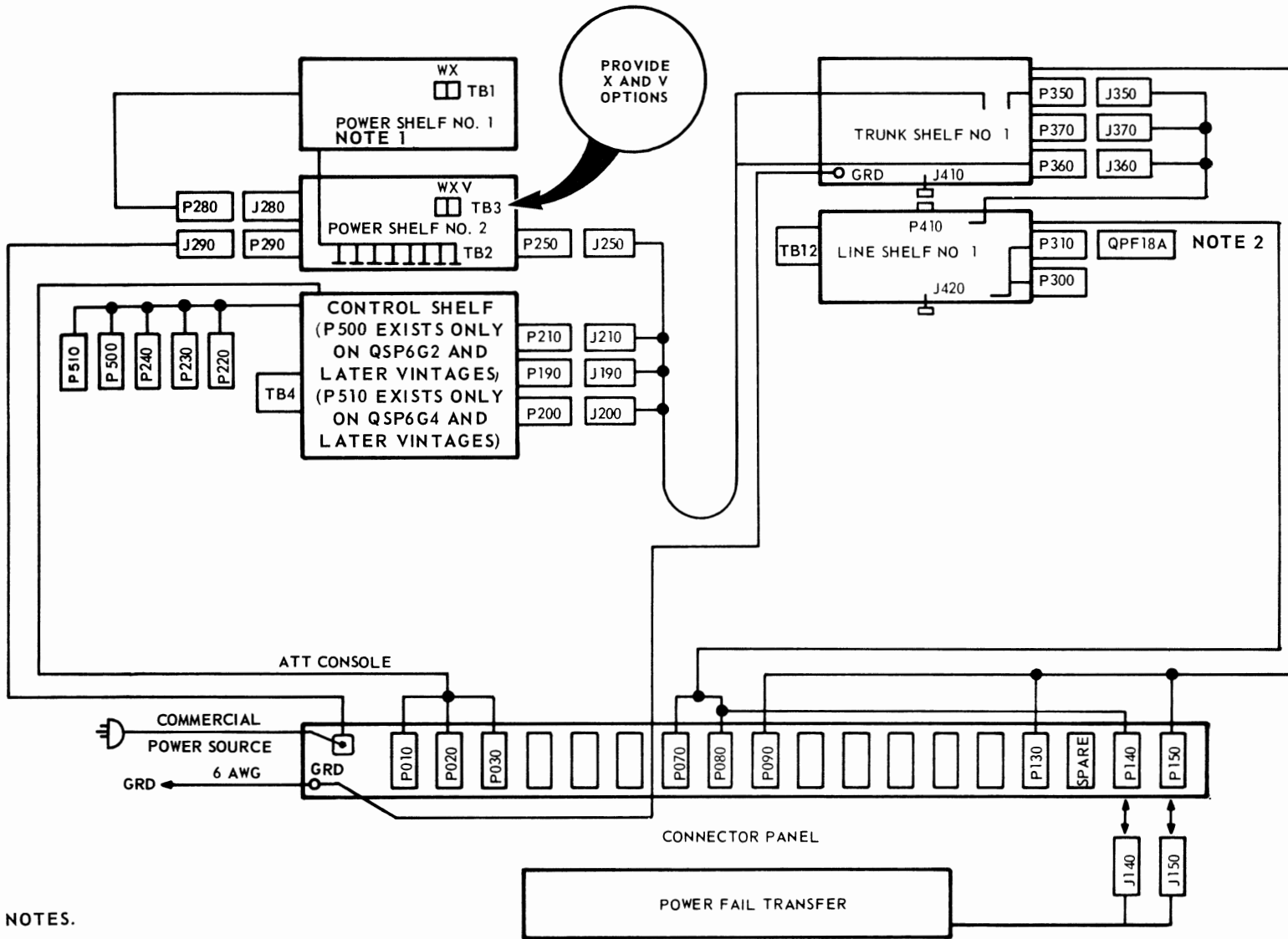


Fig. 4 – TB3 at Rear of Power Shelf No. 2



NOTES.

1. THE INTEGRATED POWER SHELF REPLACES POWER SHELF NO. 1 AND NO. 2.
2. QPF18A IS A TERMINATING JACK

Fig. 5 – Internal Cabling of Basic Unit

TABLE A
QPJ43* CIRCUIT PACK MONITORING
ON POWER SHELF NO. 2

OPTION	PLACE STRAP WHEN QPJ43* IS NOT PRESENT	REMOVE STRAP WHEN QPJ43* IS PRESENT	QPJ43* LOCATION		REMARKS
			SHELF	CONN	
X	1 – 2	—	Power Shelf No. 2	3	If line shelf no. 2 and/or line shelf no. 3 and/or trunk shelf no. 2 are not connected.
V	3 – 4		Option Shelf QSP6M	26	If neither dial pulse sender nor code restriction features are pro- vided.
			Option Shelf QSP6U	29	If neither above options nor call- pickup/call- forward are pro- vided.
W	—	1 – 2	Power Shelf No. 2	3	If line shelf no. 2 and/or line shelf no. 3 and/or trunk shelf no. 2 are connected.

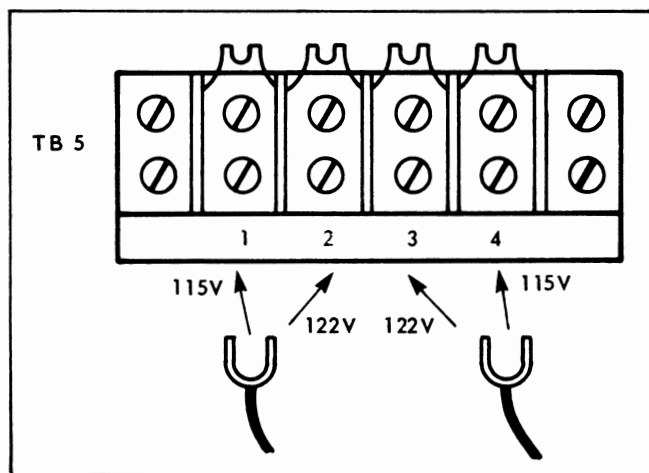
Note: In Hotel/Motel service (option shelf QSP6R) ensure that strap 3-4 on Power Shelf 2 is removed.

CHART 2 (Cont) – SLIDE NO. 1 ASSEMBLY AND INSPECTION

STEP	PROCEDURE
CONTROL SHELF	
11	<p>Inspect the cable from the rear end of the control shelf to P010, P020, and P030 at the connector panel in the base of the cabinet. Inspect the cables and tighten the plug connectors in place as follows:</p> <p>(a) J210 (from wiring harness at front end of control shelf) to P210.</p> <p>(b) J190 (from wiring harness at front end of control shelf) to P190.</p> <p>(c) J200 (from wiring harness at front end of control shelf) to P200.</p>

CHART 2 (Cont) – SLIDE NO. 1 ASSEMBLY AND INSPECTION

STEP	PROCEDURE
12	Perform a visual inspection of the back shelf wiring to detect physical damage.
+5 V POWER AND GROUND BUS CONNECTIONS	
13	Ensure that the connections at the rear of power shelf no. 2 and the control shelf conform with Fig. 6, and that all connections are tight.
14	Connect cabinet-ground wire as described in paragraph 5.09.
CIRCUIT-PACK COMPLEMENT	
15	In some of the connectors in Fig. 7 two circuit pack codes are shown; only one is applicable for each system and depends on the feature provided.
16	Check that the circuit packs are properly inserted in the correct locations as shown in Fig. 7.
TO RETURN SLIDE NO. 1 TO CLOSED POSITION	
17	Disengage the spring latch from the stud at the top of the vertical support of the slide.
18	Push the slide back into the cabinet until the spring latch engages the front stud.



NOTE: If the nominal voltage of the commercial power source is above 115 V ac, the lugs connected to TB5 on power shelf 2 (QSP7K or later vintage) must be relocated for 122 V operation as shown above.

CHART 2B - SWING GATE ASSEMBLY AND INSPECTION

STEP	PROCEDURE
TO OPEN THE SWING GATE	
1	Disengage the spring latch from the stud at the top left area of the swing gate and pull open.
POWER SWITCH	
2	Flick the power switch on the power shelf to OFF.
3	Locate TB1 on the power shelf and convert option leads as follows: Z Option 115V 50/60 Hz –strap 2 to 3 on TB1. Y Option 230V 50/60 Hz –strap 1 to 2 on TB1.
4	Inspect wiring for damage.
5	Inspect the external cables. (a) Hubbell connector J290 to P290 (b) J250 to P250.
CONTROL SHELF	
6	Inspect the cable from the rear end of the control shelf to P010, P020 and P030 at the connector panel in the base of the cabinet. Inspect cables, and tighten plug connectors as follows. (a) J210 (from wiring harness at front end of control shelf) to P210. (b) J190 (from wiring harness at front end of control shelf) to P190. (c) J200 (from wiring harness at front end of control shelf) to P200.
7	Inspect the back shelf wiring for damage.
+5V POWER AND GROUND BUS CONNECTIONS	
8	Ensure that the connections at the rear of the power shelf and control shelf conform to Fig. 6, and all connectors are tight.
9	Connect cabinet-ground wire as described in 5.09.

CHART 2B (Cont) SWING GATE ASSEMBLY AND INSPECTION

STEP	PROCEDURE
CIRCUIT PACK COMPLEMENT	
10	In some of the connectors in Fig. 7 two circuit pack codes are shown, only one is applicable for each system and depends upon the feature provided.
11	Check that the circuit packs are properly inserted in the correct locations as shown in Fig. 7.
TO RETURN SWING GATE TO CLOSED POSITION	
12	If fully opened in 180 ° position disengage the spring latch from the stud near the top of the vertical support.
13	Push the gate back into the cabinet until the spring latch has engaged.

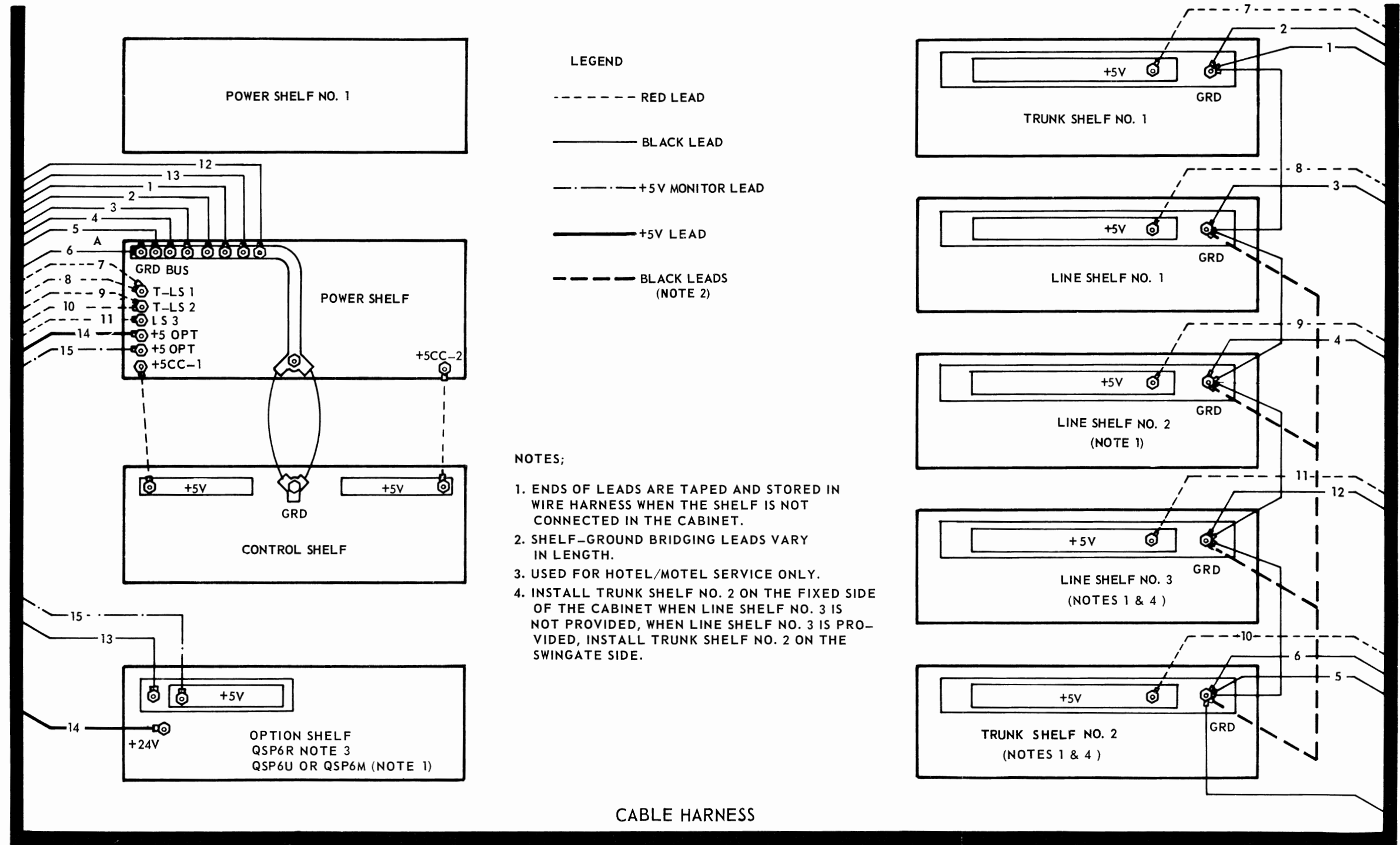


Fig. 6 — Power and Ground Bus Connections at Rear of Slide No. 1 and No. 2

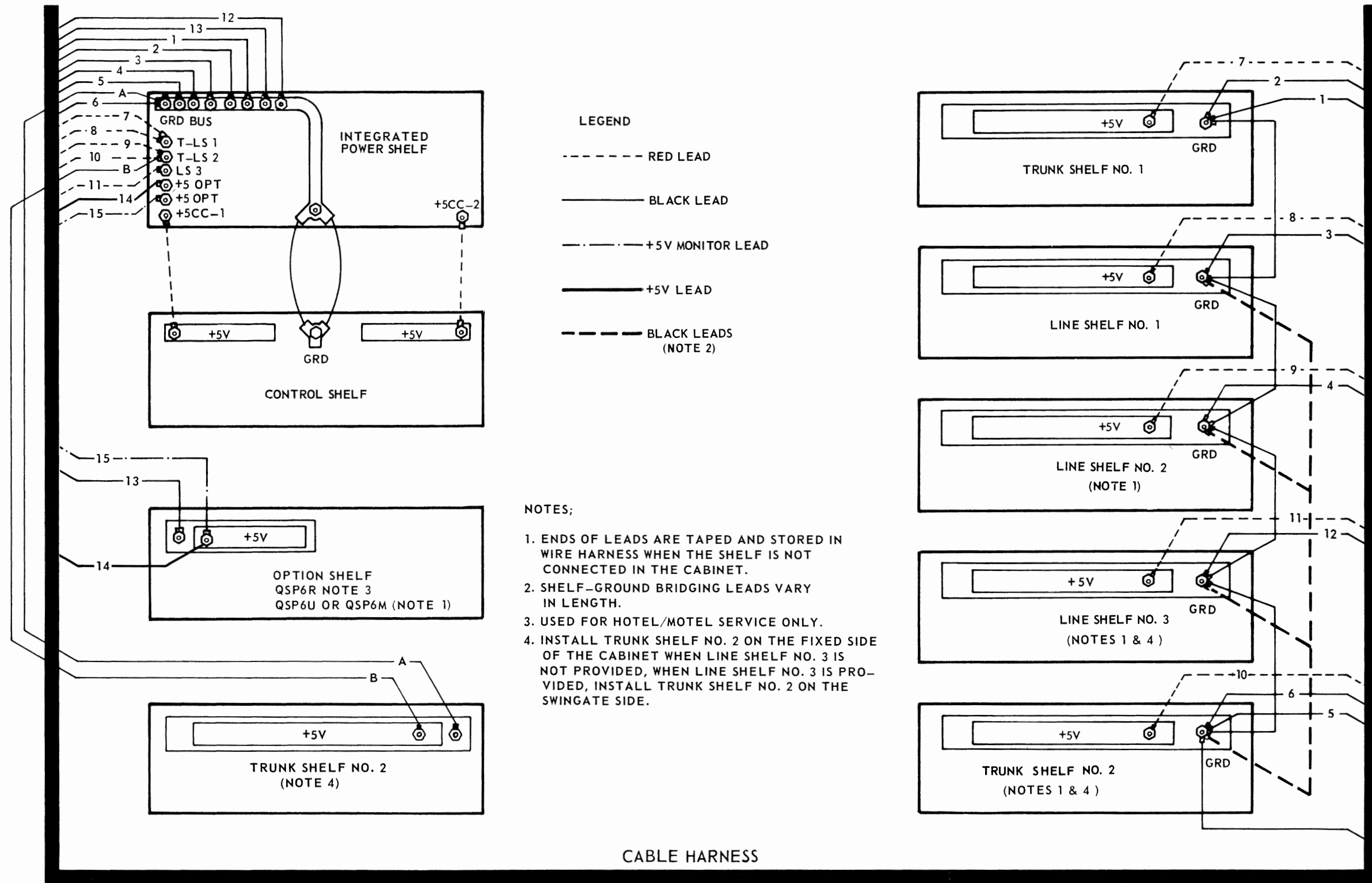
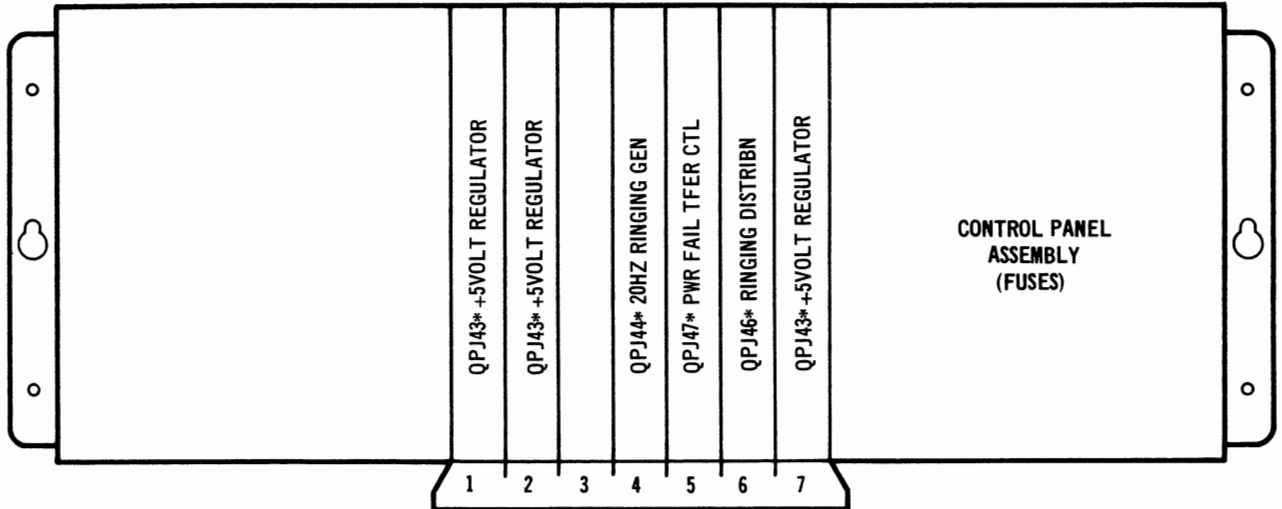
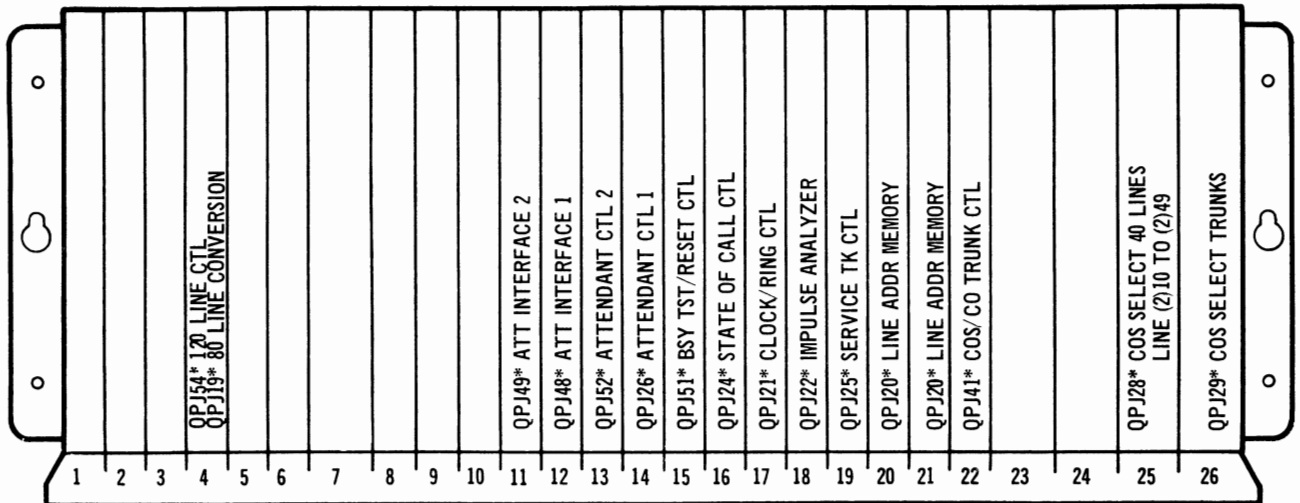


Fig. 6(a) Power and Ground Bus Connections at Rear of Swing Gate and Fixed Side



(a) Power Shelf No. 2

NOTE. FOR INTEGRATED POWER SHELF REFER TO 553-5021-208 AND 553-5021-516.



(b) Control Shelf

NOTE; THE ASTERISK (*) AFTER THE BASE CODE REPLACES THE SUFFIX LETTER OF THE CIRCUIT PACK

Fig. 7 — Circuit Packs Contained in Slide No. 1 of Basic Unit

**CHART 3 SLIDE NO. 2 OR FIXED SIDE ON SWING GATE CABINET
ASSEMBLY AND INSPECTION**

STEP	PROCEDURE
TO EXTEND SLIDE NO. 2 (SLIDER CABINET)	
1	Disengage the spring latch from the stud at the top of the vertical support of the slide.
2	Pull the slide out to the fully opened position until the spring latch engages the rear stud.
Power Switch	
3	Ensure that the power switch on power shelf no. 2 is in the OFF position.
TRUNK SHELF NO. 1	
4	<p>Inspect the internal cables and tighten the plug connectors (Fig. 5) in place as follows:</p> <p>(a) J350 (from wiring harness at rear of shelf) to P350.</p> <p>(b) J370 (from wiring harness at rear of shelf) to P370.</p> <p>(c) J360 (from wiring harness at rear of shelf) to P360.</p> <p>(d) Check that the shelf ground connection terminated below P360 on trunk shelf no. 1 is secure.</p> <p>(e) Inspect the cable from trunk shelf no. 1 to P090, P130, and P150 on the connector panel.</p> <p>(f) Check that power connections (Fig. 6) from power shelf no. 2 are secure.</p> <p>(g) P410 from line shelf no. 1 speech highway is well seated in J410 on trunk shelf no. 1.</p>
LINE SHELF NO. 1	
5	Inspect the cables from line shelf no. 1 to plugs P070, P080, and P140 at the connector panel.
6	Check that the protective cap is in place over plug P300 at the rear of line shelf no. 1.
7	Check that the terminating jack (QPF18A) is installed on P310 at the rear of line shelf no. 1.
8	Check that power connections (Fig. 6) from power shelf no. 2 are secure.

CHART 3 (Cont) – SLIDE NO. 2 ASSEMBLY AND INSPECTION

STEP	PROCEDURE
9	<p>Check strapping on TB12 at rear of line shelf no. 1 for station line numbering arrangement:</p> <p>2-digit numbering; place strap between: 1 – 2 4 – 5 7 – 8 10 – 11</p> <p>3-digit numbering; place strap between: 2 – 3 5 – 6 8 – 9 11 – 12</p> <p style="text-align: right;"><i>Note:</i> 3-digit numbering must be used with hotel/motel service.</p>
CIRCUIT PACK COMPLEMENT	
10	<p>Check that the circuit packs shown in Fig. 8 are all present and properly inserted in their connectors. The QPJ40* circuit pack may be stored in any spare trunk or line connectors in either the trunk or line shelves but preferably in a spare trunk connector.</p>
TO RETURN SLIDE NO. 2 TO CLOSE POSITION (SLIDER CABINET)	
11	<p>Disengage the spring latch from the stud at the top of the vertical support of the slide.</p>
12	<p>Push the slide back into the cabinet until the spring latch engages the front stud.</p>

3. SHELF ASSEMBLY

3.01 Shelf and subshelf assemblies may be installed or removed during:

- (a) initial installation,
- (b) addition of features or additional capacity to an installed system, and
- (c) maintenance procedures.

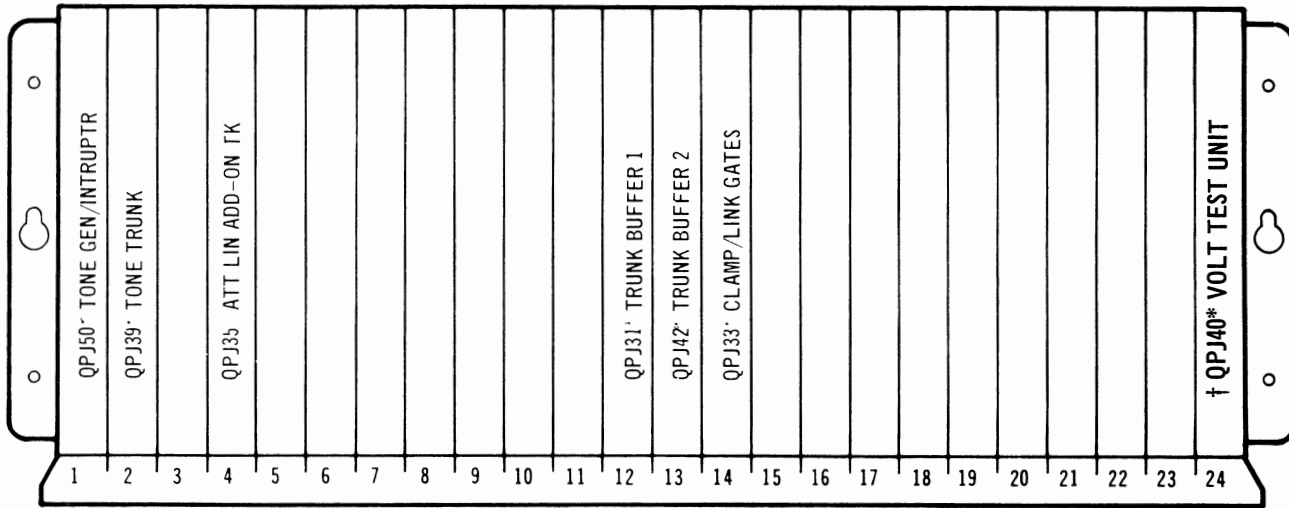
3.02 Care must be taken not to damage back panel wiring and terminal connections while

installing or removing shelves. Plug-ended cables must be coiled and tied securely to avoid damage to the shelf during the installation/removal procedure.

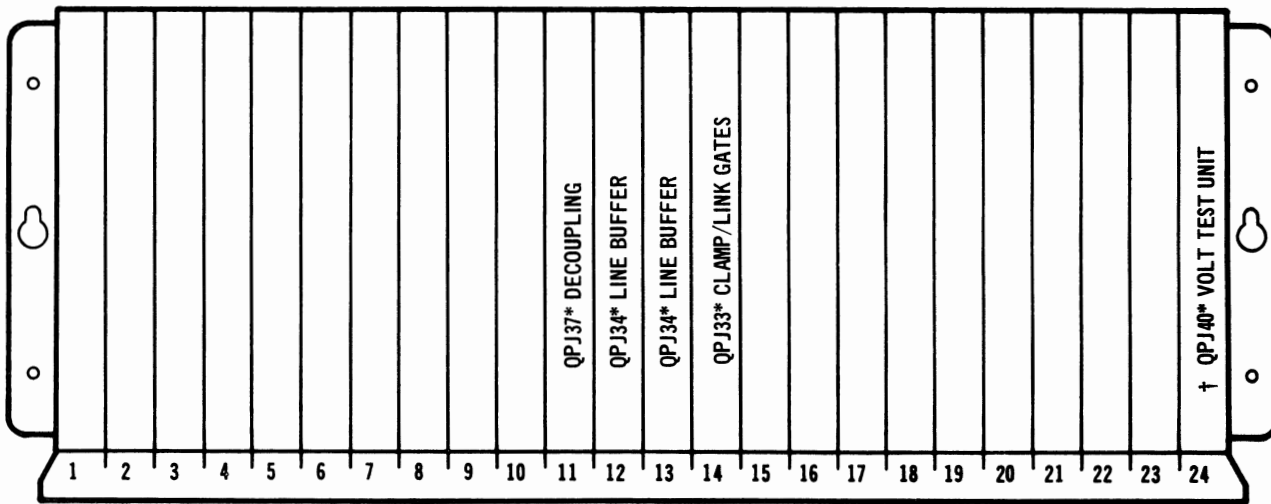
SHELF INSTALLATION AND REMOVAL

3.03 General and individual shelf installation and removal procedures are described in Charts 4 through 16.

3.04 For cabinet panel removal procedures to gain access to shelves, refer to Chart 1.



(a) Trunk Shelf No. 1



† QPJ40* MAY BE LOCATED IN ANY SPARE CONNECTOR ON LINE OR TRUNK SHELF, BUT PREFERABLY IN A SPARE TRUNK SHELF CONNECTOR.

(b) Line Shelf No. 1

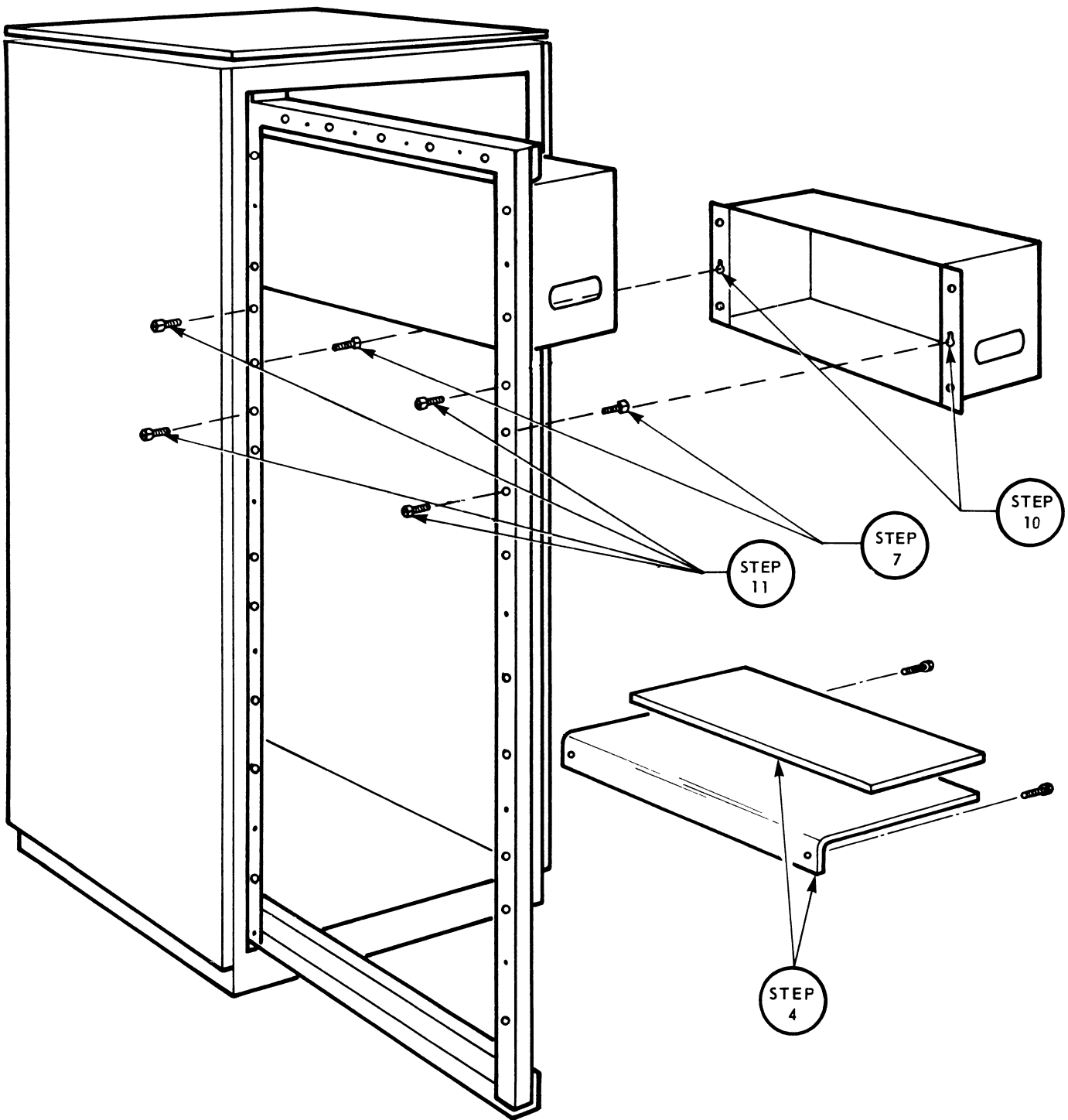
Fig. 8 — Circuit Packs Contained in Slide No. 2 of Basic Unit

CHART 4 – GENERAL SHELF INSTALLATION**APPARATUS REQUIRED:**

Tool NE-NSQ2000 L1

Screwdriver

STEP	PROCEDURE
1	Remove panels. (Chart 1)
2	Flick the power switch on power shelf no. 2 to the OFF position. This releases the Power-Fail Transfer (PFT) relays to provide emergency service only.
3	Release the slide on which the shelf is to be installed, and pull it out to the fully open position. Open the gate fully on the swing gate cabinet.
4	Remove the supporting bracket (P0519682) and pad (P0519681), when present (see Fig. 9).
5	Remove the shelf from the shipping box, and place the shelf (still in its polyethylene bag) near the cabinet.
6	Remove two of the six self-tapping screws from the paper envelope in the shelf container.
7	Identify the appropriate shelf location (Fig. 1) on the slide. Insert (from behind) the two self-tapping screws in the center holes in both slide vertical members in the appropriate shelf location (see Fig. 9).
8	Turn the screws until they protrude one thread beyond the front of the slide vertical member.
9	Remove the shelf from the polyethylene bag.
10	Holding the shelf by the handholes in the end plates, and engage the keyhole slots (Fig. 9) in the shelf flanges over the screws. If necessary, the shelf may be allowed to rest on the shelf below during part of this operation.
11	Adjust the shelf so the remaining four self-tapping screws can be inserted from the front of the slide vertical members (Fig. 9). Tighten these screws.
12	Connect the connectors and wires as instructed in the appropriate shelf installation chart.
13	Refer to Part 4 for applicable circuit pack installation.



→

Fig. 9 – Shelf Installation Keyed to Steps in Chart 4 (Slider Cabinet)

CHART 5 – GENERAL SHELF REMOVAL

STEP	PROCEDURE
1	Flick the power switch on power shelf no. 2 to the OFF position. This releases the PFT relays to provide emergency service only.
2	Release the spring clip at the top of the desired slide and extend the slide to the fully opened position. On the swing gate cabinet, open the gate. ←
3	Disconnect all connectors associated with the shelf to be removed, as instructed in the appropriate chart.
4	Disconnect all +5V and GRD bus straps associated with the shelf to be removed as instructed in the appropriate chart.
5	If a line or trunk shelf is removed from service, the terminating jack (QPF18A) must be relocated as described in the appropriate chart.
6	Remove the two lower and two upper screws which secure the shelf to the vertical members of the slide. <i>Do not remove the two center screws.</i>
7	Loosen the two center screws <i>two turns only</i> if necessary. To support the shelf, each of these two center screws must remain screwed in its vertical member of the slide and project beyond the front of the member by one complete thread.
8	Standing in front of the slide, hold the shelf by the handholes, and raise the shelf a short distance vertically until the keyhole slots can be disengaged from the center screws. Lower the shelf squarely onto the shelf below. Then remove the shelf from the back of the slide. If no shelf is present below the shelf to be removed, disengage the shelf from the center screws and lower it to the floor. Then remove the shelf from the back of the slide.
9	Place the shelf on a flat surface and remove the circuit packs for reinstallation in the replacement shelf, or for repacking and returning to storage.

CHART 6 – OPTION SHELF INSTALLATION/REMOVAL

Note: To remove subshelves and option shelves, follow the installation sequence in reverse order.

STEP	PROCEDURE
QSP6P OPTION SHELF AND SUBSHELF INSTALLATION	
1	Install the option shelf in slide no. 1 as described in Chart 4, Steps 3 through 11.
2	Remove the subshelf from the shipping container.
3	Identify the opening allotted to the subshelf (Fig. 10).
4	Position the subshelf in the opening at the back of the option shelf so that the wiring harness is towards the upper edge of the option shelf and the connectors are facing into the shelf.
5	Line up the screw holes in the subshelf flanges with the holes in the option shelf (Fig. 10).
6	Insert four self-tapping screws, and secure the subshelf to the option shelf.
7	<p>Inspect the internal cables, and connect the plug connectors in place (Fig. 11) as follows:</p> <p>(a) <i>For Toll-Denial Subshelf (QSP8C):</i> Remove the protection cap from P220 (on control shelf, and connect J220 to P220.</p> <p>(b) <i>For Busy-Lamp-Field and COS Select 40 Line Subshelf (QSP8E):</i> Remove the protection cap from P230 (on control shelf) and connect J230 to P230. Mount P040, P050, and P060 on the connector panel in the predesignated openings. Place the cabling from the subshelf to the connector panel behind the cable retaining bar at the rear of the cabinet and tie the cabling to the wire harness from the control shelf.</p> <p>(c) <i>For DIGITONE* Subshelf (QSP8A):</i> Remove the protection cap from P240 (on control shelf) and connect J240 to P240.</p>
8	See Fig. 12(c) which shows a front view of the option shelf equipped with all subshelves.
9	Fasten the clamp fitted over the jacks J220, J230 and J240.
10	Refer to Part 4 for applicable circuit pack installation.

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CHART 6 (Cont) – OPTION SHELF INSTALLATION/REMOVAL

STEP	PROCEDURE
QSP6M, QSP6R OR QSP6U OPTION SHELF INSTALLATION	
11	Install the option shelf in slide no. 1 as described in Chart 4, Steps 3 through 11.
12	<p>Inspect the internal cables, and connect the plug connectors in place (Fig. 13) as follows:</p> <p>(a) J220, J230, J240 (and J500 for QSP6R) from the option shelf wire harness to P220, P230, P240 (and P500 on QSP6R) on the end panel of the control shelf. If option shelf is a QSP6U, connect J510 to P510 and J500 to P500.</p> <p>(b) Rotate clamp-bar over the connectors and tighten screw.</p> <p>(c) Place the wire harness from the plugs behind the cable retaining bars.</p> <p>(d) Mount P040, P050, P060 (and P131 for QSP6R) from the option shelf wire harness, in the predesignated opening on the connector panel at the base of the cabinet.</p>
13	Connect one end of the +5V monitoring lead designated as 15 to the +5 OPT lug at the rear of power shelf 2 and the other end of lead 15 to the +5V bus bar at the rear of the option shelf. See Fig. 6.
14	Connect one end of the +24V lead designated as 14 to the +24V lug at the rear of power shelf 2 and the other end of lead 14 to the +24V lug at the rear of option shelf. See Fig. 6 and note 1.
15	Connect one end of the GRD lead designated as 13 to the GRD lug on the bus bar at the rear of the power shelf 2 and the other end of lead 13 to the GRD bus bar at the rear of the option shelf.
16	Remove strap from terminals 3 and 4 on TB3 at rear of power shelf no. 2 only if a QPJ43-type circuit pack is to be inserted in option shelf.
17	Dress the cables and wire harness. The cables from the rear of the shelves to the retaining bars must be laced together or tied with a cable tie. Note 2.
18	For strapping instructions on the TB4 strapping block, refer to Section 553-5011-204.
19	<p>Refer to Part 4 for applicable circuit pack installation.</p> <p>Note: 1. When the integrated power shelf is provided, one end of the lead designated 14 connects to the +5V bus bar on the option shelf, and the other end connects to +5V option on the integrated power shelf.</p> <p>Note: 2. When the swing gate cabinet is provided, the cables from the shelf to the receptacle panel follow the same path, and lace to the central control cables. This path is along the cable trough at the bottom of the cabinet and around the cable loop.</p>

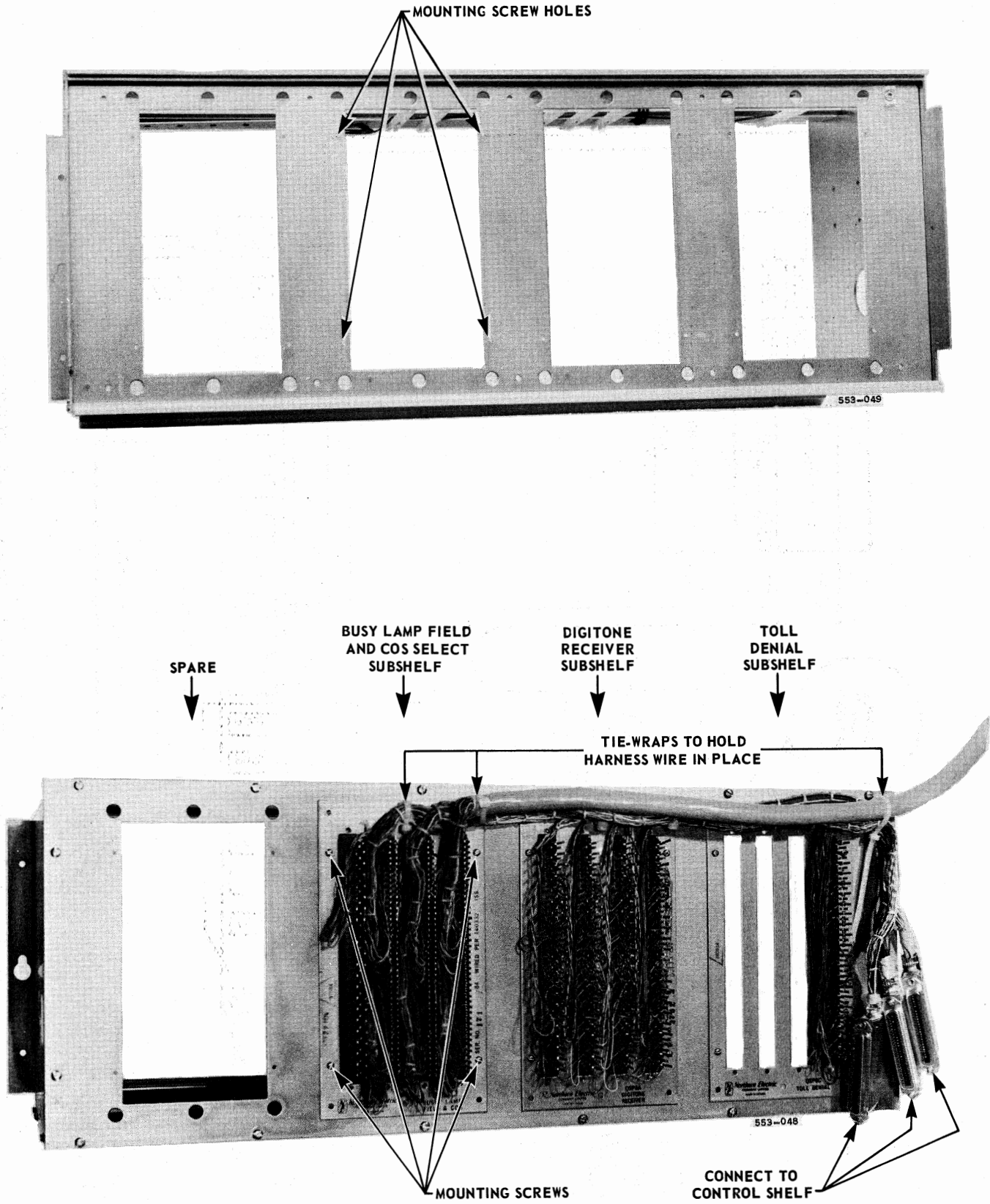
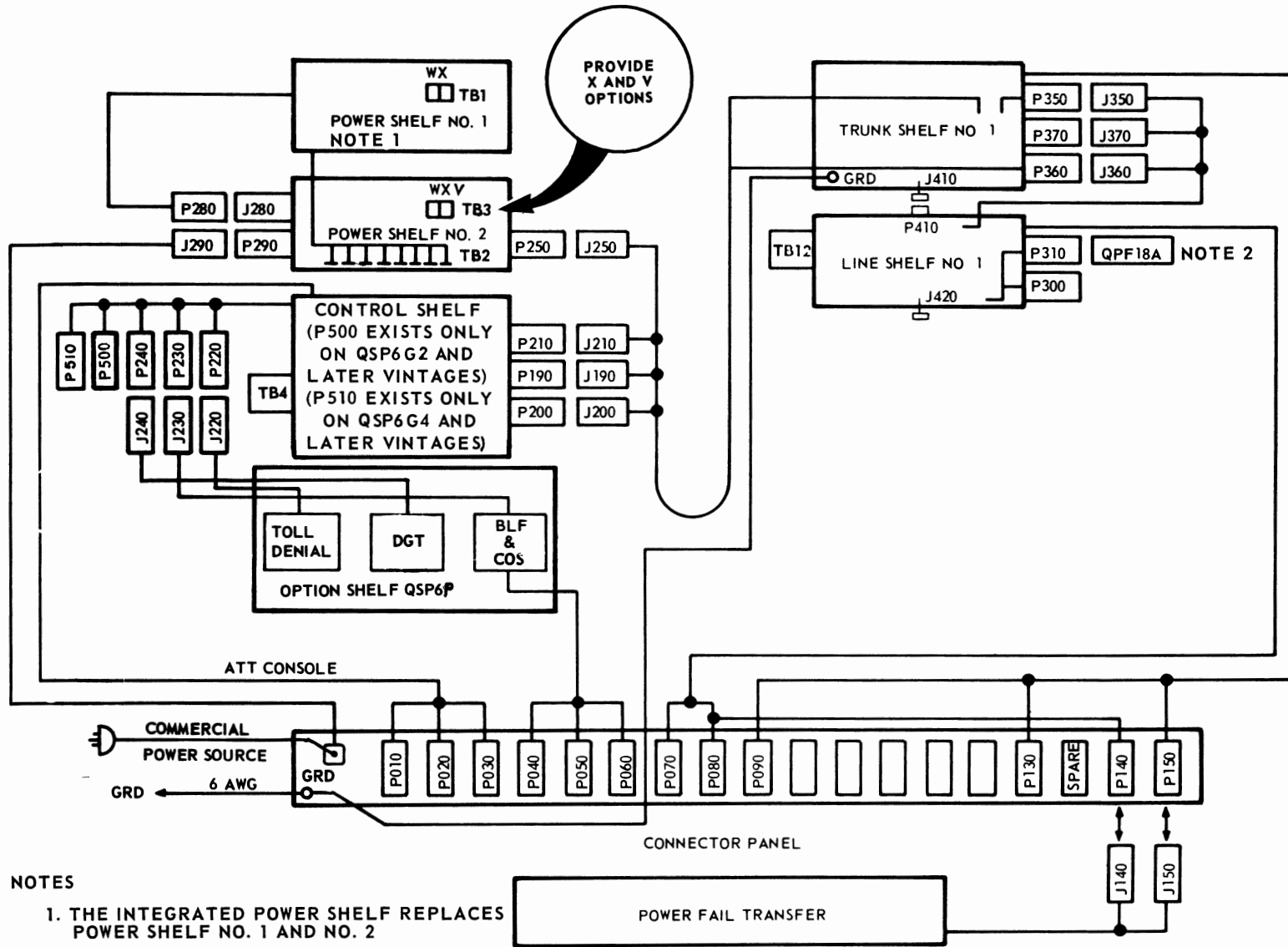


Fig. 10 - Rear Views of Option Shelf Showing Subshelf Installation



- NOTES
1. THE INTEGRATED POWER SHELF REPLACES POWER SHELF NO. 1 AND NO. 2
 2. QPF18A IS A TERMINATING JACK

Fig. 11 – Internal Cabling of Basic Unit Plus Option Shelf QPS6P

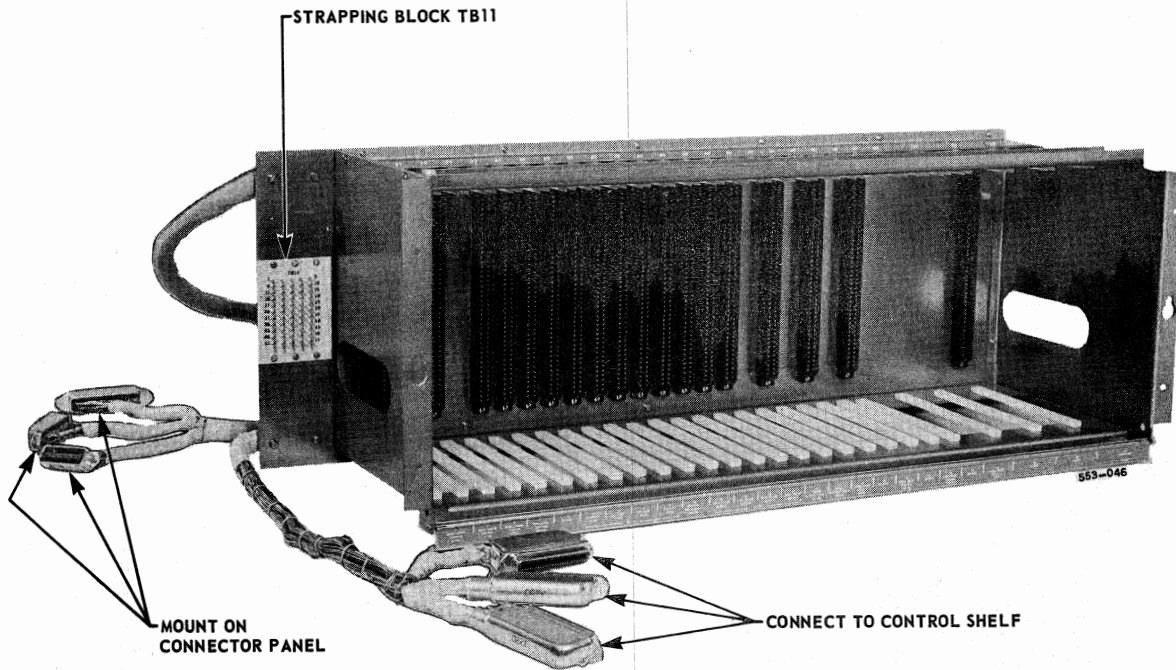


Fig. 12(a) – Front View of QSP6M Option Shelf

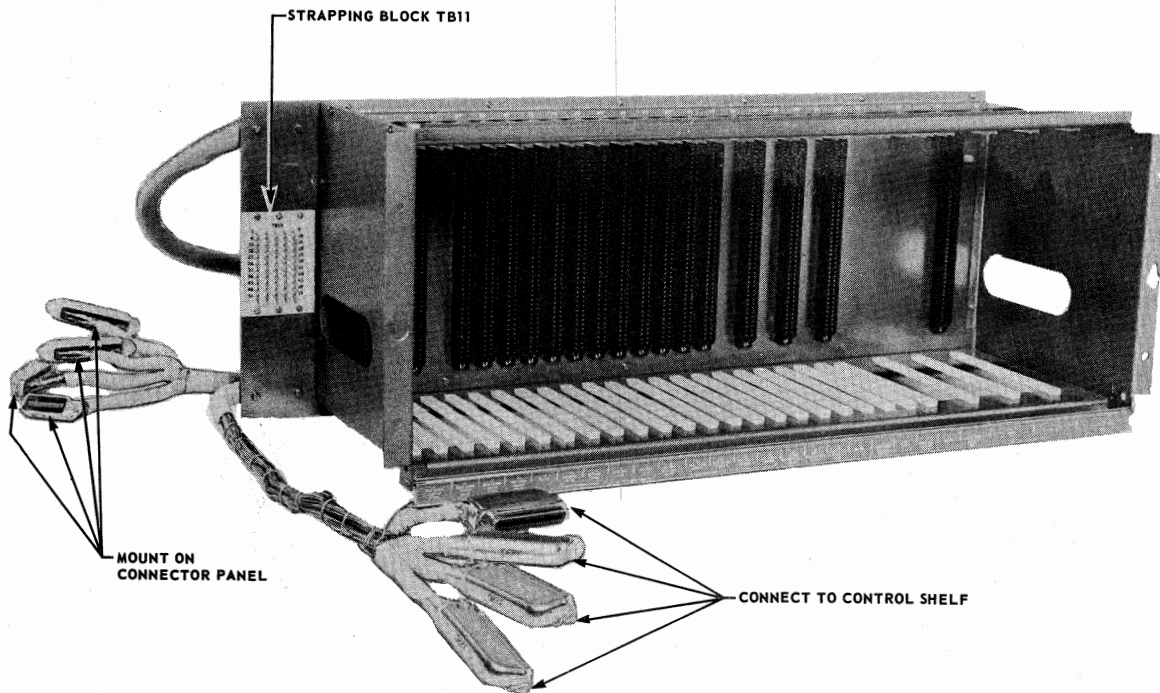


Fig. 12(b) – Front View of QSP6R Option Shelf
used with Hotel/Motel

NOTE: QSP6U OPTION SHELF NOT SHOWN.

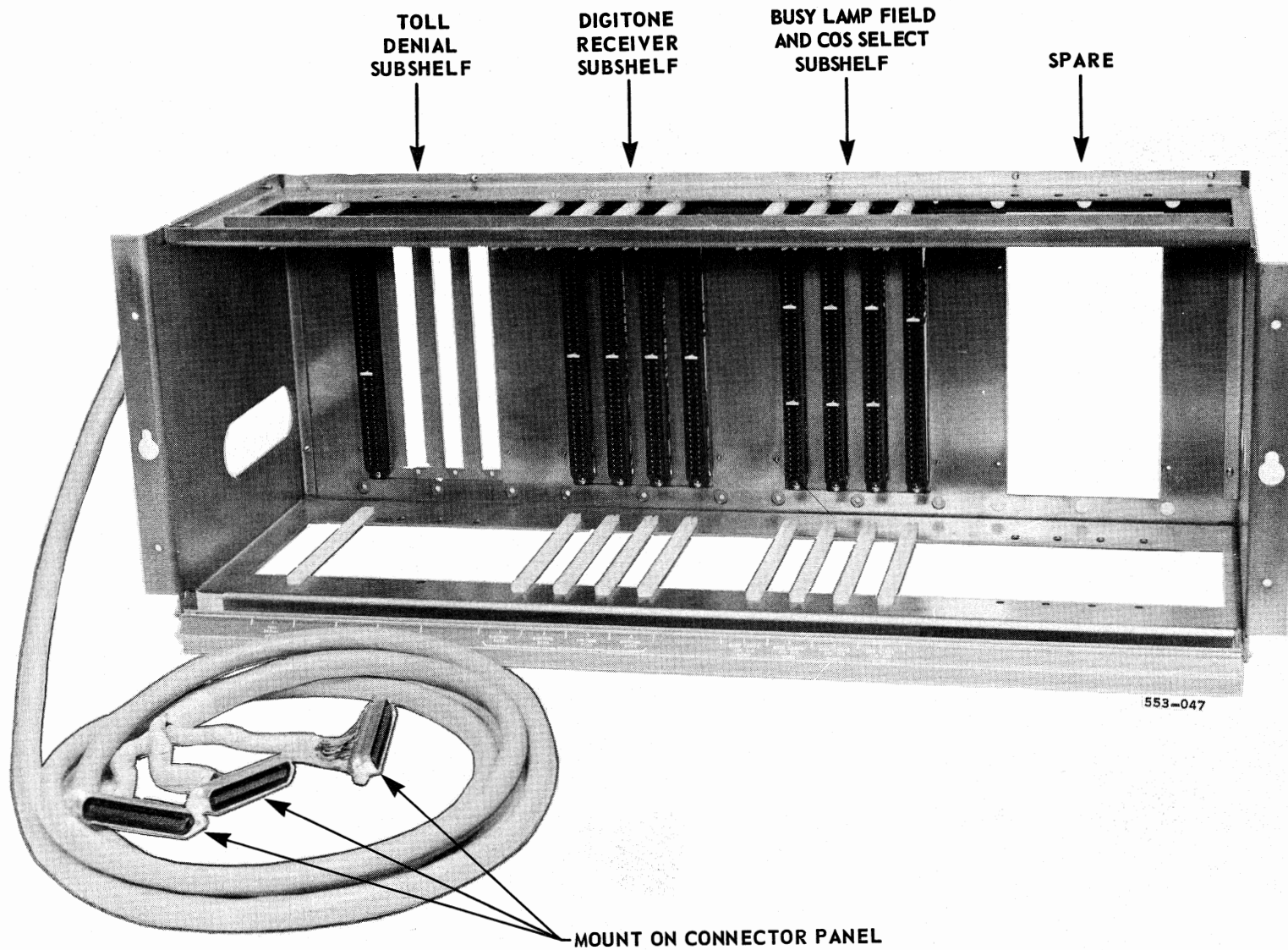


Fig. 12(c) – Front View of QSP6P Option Shelf Equipped with All Subshelves

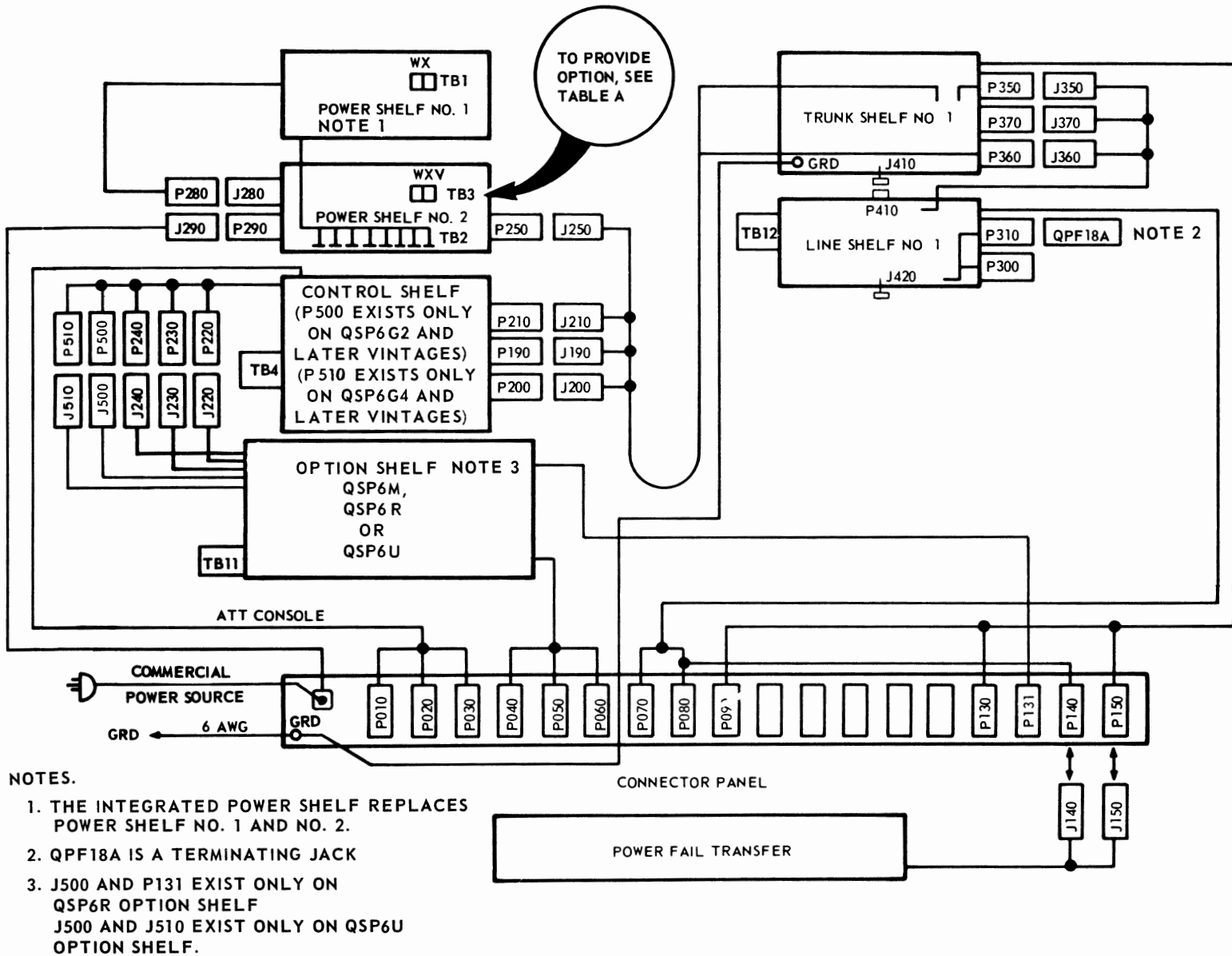


Fig. 13 Internal Cabling of Basic Unit With Option Shelf QSP6M, QSP6R or QSP6U

CHART 7 – LINE SHELF NO. 2 INSTALLATION (TRUNK SHELF NO.2 NOT INSTALLED)

STEP	PROCEDURE
1	Mount line shelf no. 2 in slide no. 2 as described in Chart 4, Steps 3 through 11.
2	Remove terminating jack (QPF18A) from P310 on line shelf no. 1, and connect to P330 on line shelf no. 2.
3	<p>Inspect internal cables, and connect plug connectors in place (Fig. 14) as follows:</p> <p>(a) J300 from wiring harness to P300 on line shelf no. 1.</p> <p>(b) J310 from wiring harness to P310 on line shelf no. 1.</p>
4	Flick the power switch on power shelf no. 2 to the OFF position.
5	Insert the QPJ43-type circuit pack in connector location 3 in power shelf no. 2 if a integrated power shelf is not provided.
6	Remove strap for W option between terminal 1 and 2 on TB3 at rear of power shelf no. 2 (Fig. 4) if a integrated power shelf is not provided.
7	Connect the red +5V lead (no. 9) to the +5V bus bar on line shelf no. 2 (Fig. 15). Power leads are already provided in wire harness to power shelf no. 2.
8	Connect black GRD lead (no. 4) and the strap from line shelf no. 1 (Fig. 6) to the ground bus bar (Fig. 15) on line shelf no. 2. Connect the black GRD lead between line shelves no. 1 and no. 2.
9	Connect the black GRD lead (no. 4) to the ground bus bar and the red lead (no. 9) to the +5 V bus bar at the rear of power shelf no. 2 (Fig. 6).
10	Connect the speech-highway connector J420 to P420 (Fig. 16) at the rear center of the line shelf. Dress the connector plug J440 and attached wire into the wire harness at the back of the shelf, to prevent damage to the wire and connector.
11	If the system was previously in service, flick the power switch on power shelf no. 2 to the ON position.
12	Place the wire harness connected to P100 and P110 behind the cable retaining bars on the back panel. When a swing gate cabinet is provided, run the cable up by trunk shelf no. 1 and down to the receptacle panel. Support the cable with cable ties.

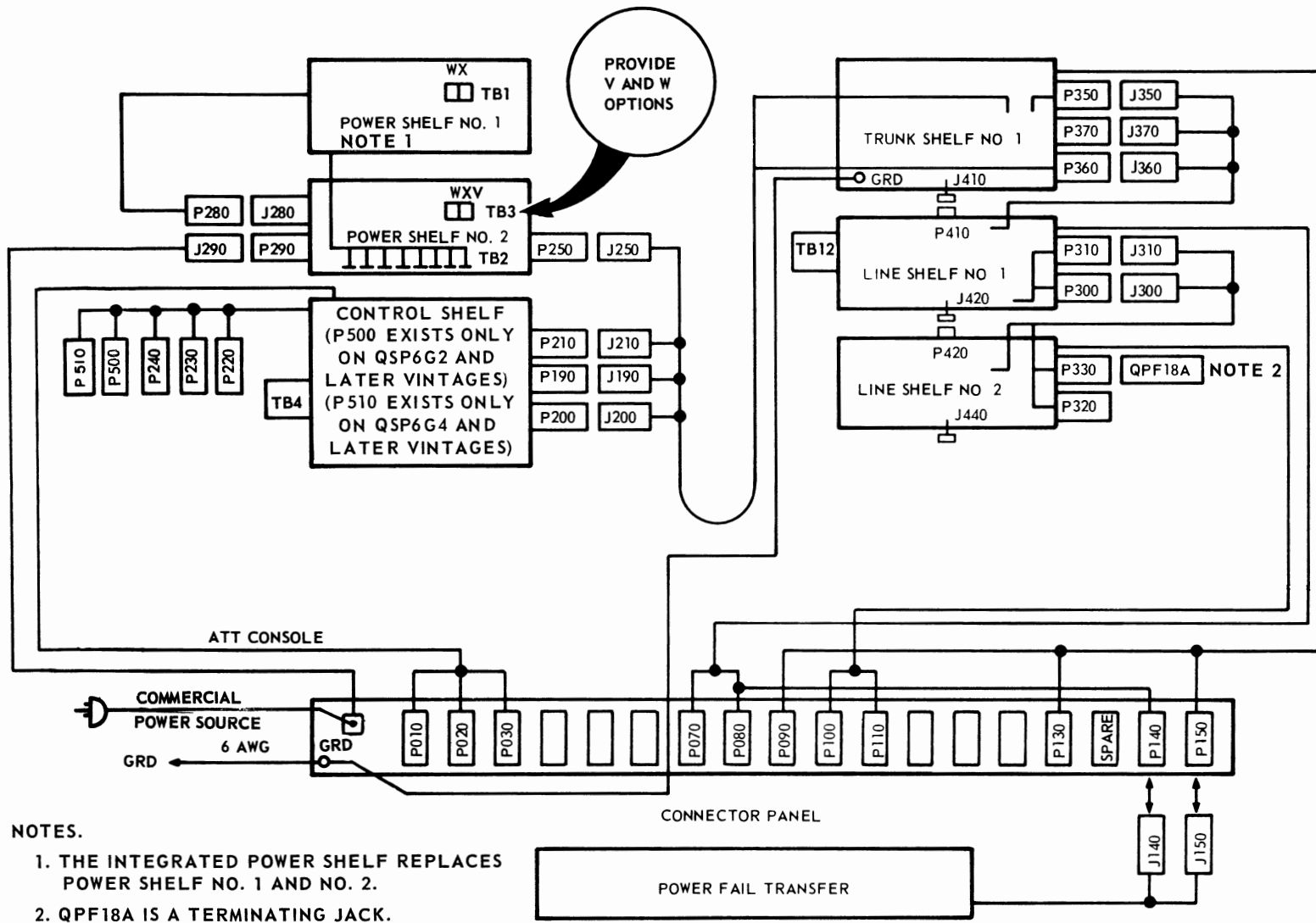


Fig. 14 – Internal Cabling of Basic Unit With Line Shelf No. 2

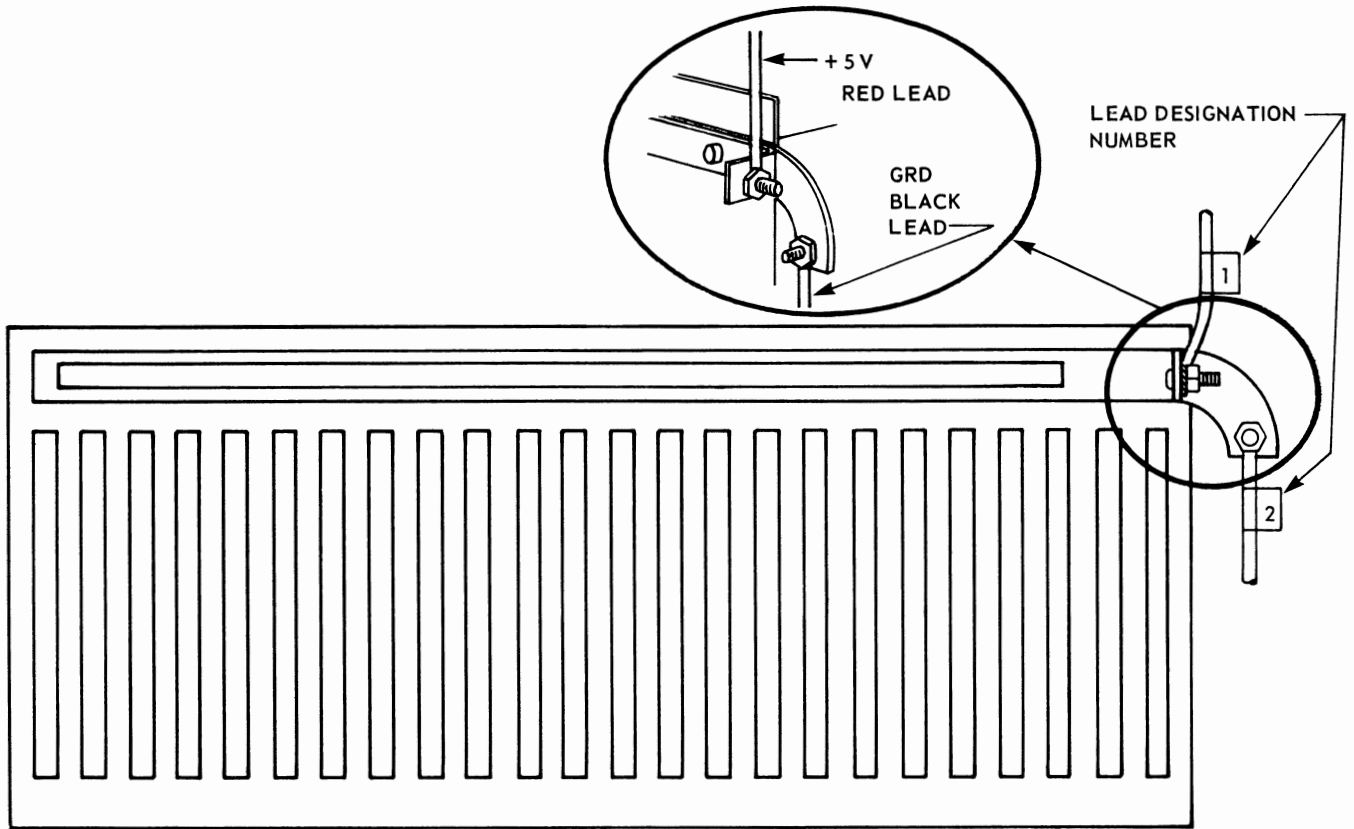


Fig. 15 - +5 V and Grd Lug Connections on Trunk and Line Shelves

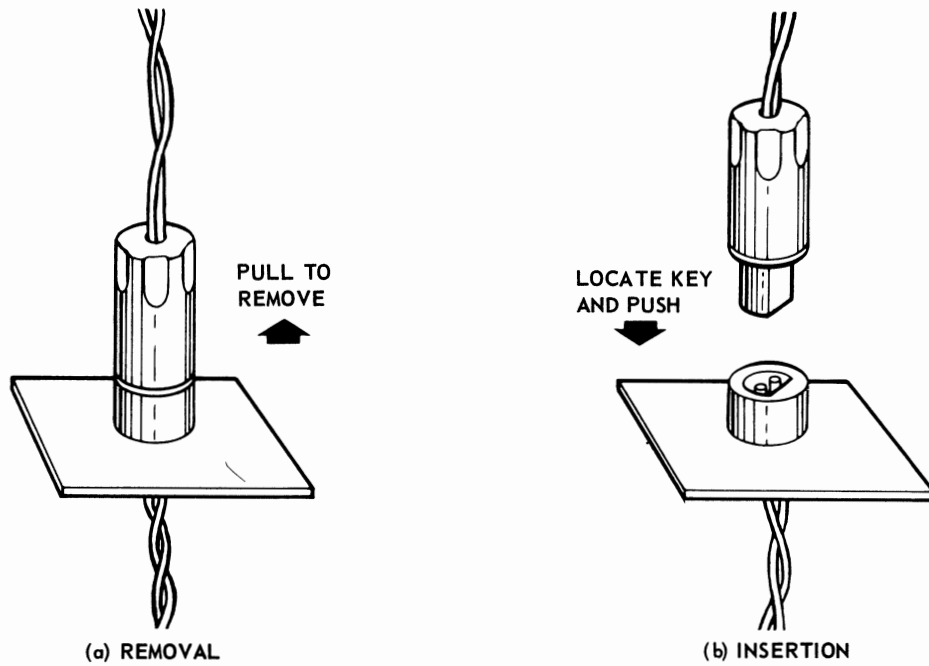


Fig. 16 - Speech-Highway Connectors

**CHART 7 (Cont) – LINE SHELF NO. 2 INSTALLATION (TRUNK SHELF
NO. 2 NOT INSTALLED)**

STEP	PROCEDURE
13	Mount P100 and P110 on the connector panel in the opening stenciled P100 and P110.
14	Dress the cables and wire harness. The cables from the rear of the shelves to the retaining bars must be laced together or tied with a cable tie.
15	Refer to Part 4 for applicable circuit-pack installation.
16	Refer to Part 6 for connector-cable connections.

CHART 8 – LINE SHELF NO. 2 INSTALLATION (TRUNK SHELF NO. 2 INSTALLED)

STEP	PROCEDURE
1	Remove the speech highway strap from J420 and ground straps connecting line shelf no. 1 and trunk shelf no. 2 from the rear of the shelves.
2	Mount line shelf no. 2 in slide no. 2 as described in Chart 4, Steps 3 through 11.
3	Remove J380 and J390 from P300 and P310 on line shelf no. 1, and connect J380 to P320 and J390 to P330 on line shelf no. 2.
4	Leave terminating jack (QPF18A) in P340 on trunk shelf no. 2.
5	Using speech highway strap, connect J420 to P420 at the rear of the line shelves and J440 to P430 at the rear of trunk shelf no. 2. When a swing gate cabinet is provided, the speech highway strap is not required. Connect J440 to P430 direct.
6	Inspect cables, and connect each of the following plug connectors (Fig. 17) from the wiring harness to its particular line shelf: (a) J300 to P300 on line shelf no. 1. (b) J310 to P310 on line shelf no. 1. (c) J380 to P320 on line shelf no. 2. (d) J390 to P330 on line shelf no. 2.
7	Flick the power switch on power shelf no. 2 to the OFF position.
8	Connect the red +5V lead (no. 9) to the +5V bus bar on line shelf no. 2 (Fig. 15). Power leads are already provided in wire harness to power shelf no. 2.
9	Connect the black ground lead (no. 4) and the strap from line shelf no. 1 to the ground bus bar on line shelf no. 2 (Fig. 15). Connect the black ground lead between the GRD bus bars of line shelf no. 2 and trunk shelf no. 2.
10	Connect the black lead (no. 4) to the ground bus bar and the red lead (no. 9) to the +5V bus bar at the rear of power shelf no. 2 (Fig. 6).
11	If the system was previously in service, flick the power switch on power shelf no. 2 to the ON position.
12	Place the wire harness connected to P100 and P110 behind the cable brackets on the back panel. When a swing gate cabinet is provided, run the cable up by trunk shelf no. 1 and down to the receptacle panel. Support the cable with cable ties.

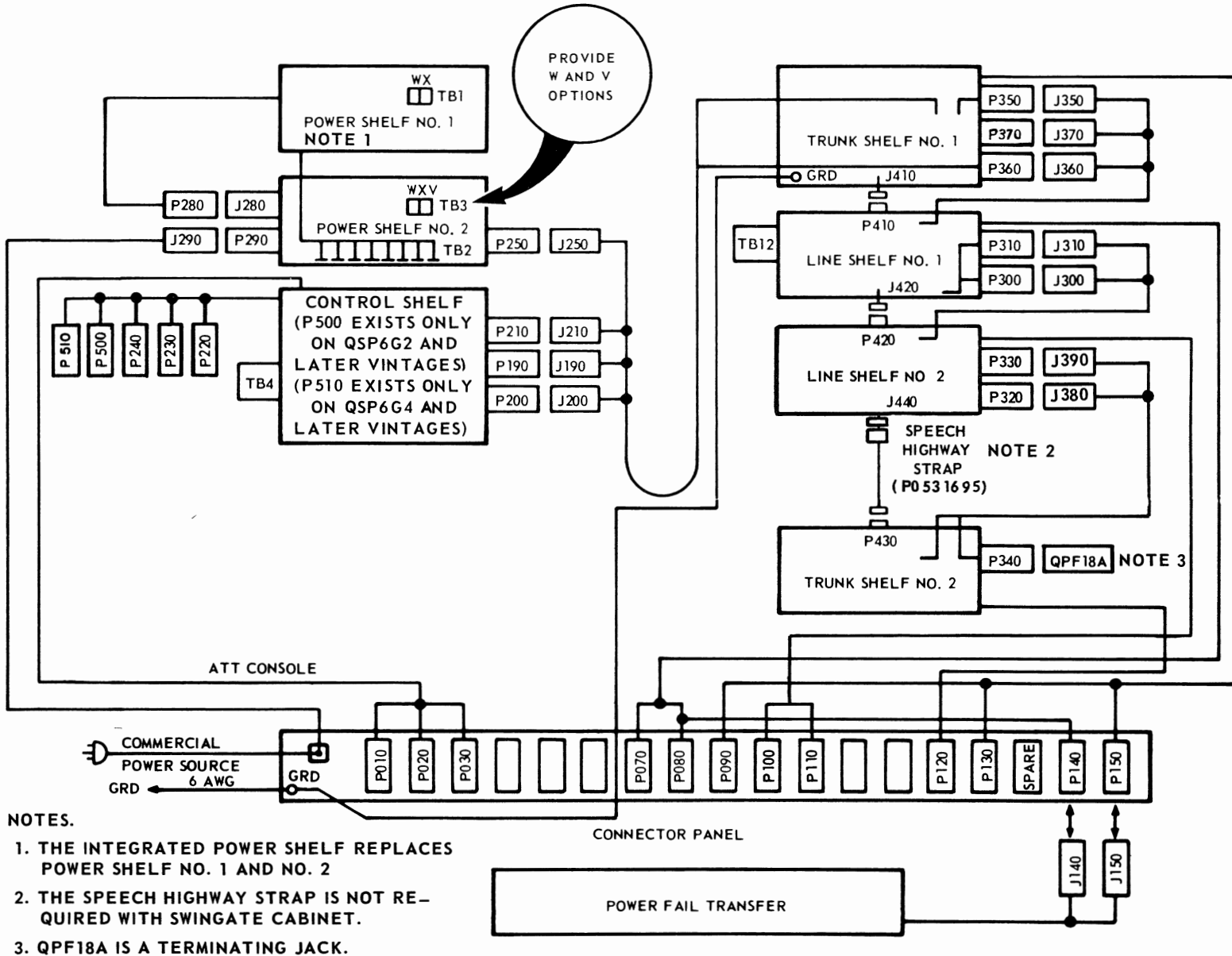


Fig. 17 - Internal Cabling of Basic Unit with Line Shelf No. 2 and Trunk Shelf No. 2

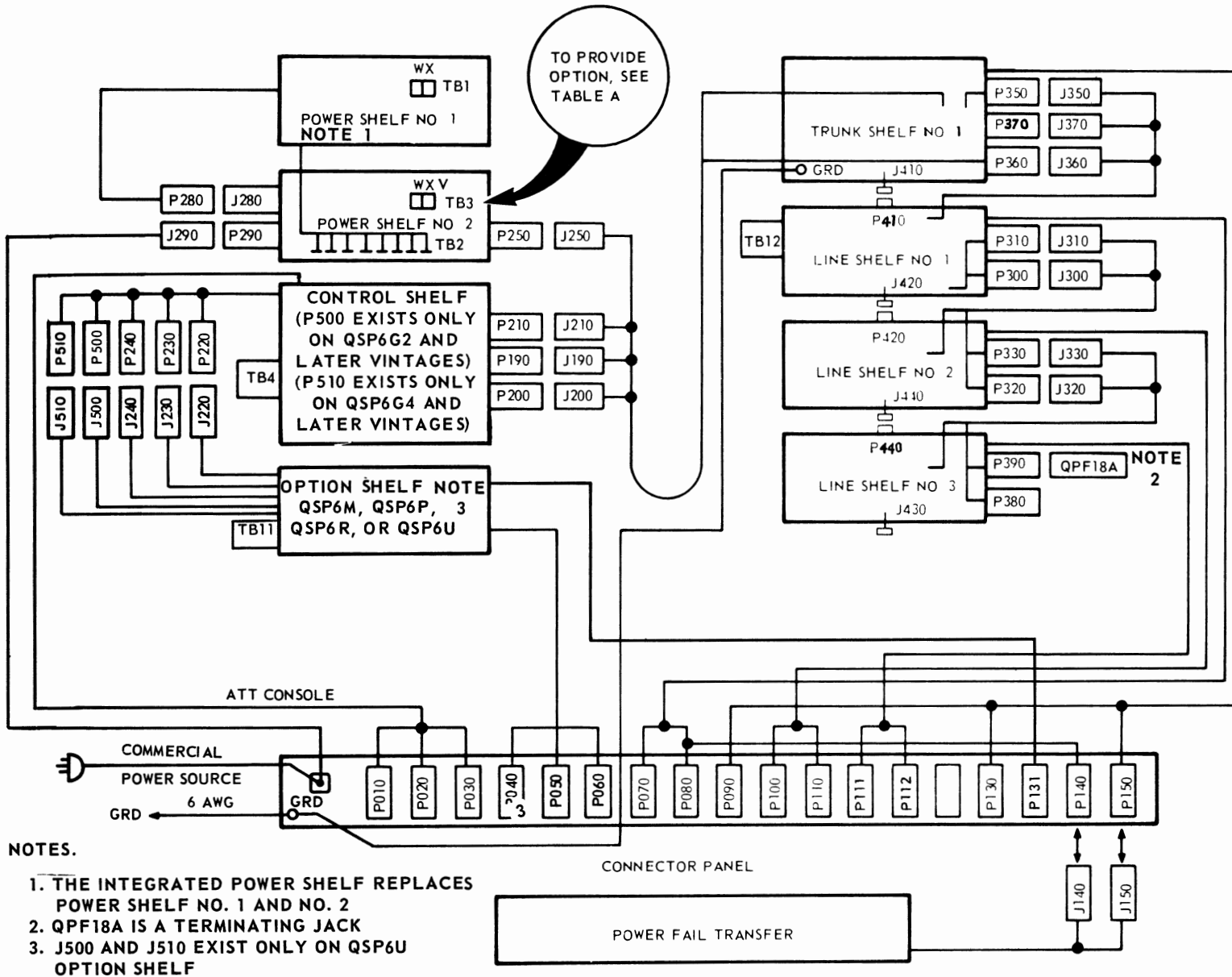
CHART 8 (Cont) – LINE SHELF NO. 2 INSTALLATION (TRUNK SHELF NO. 2 INSTALLED)

STEP	PROCEDURE
13	Mount P100 and P110 on the connector panel in the opening stenciled P100 and P110.
14	Dress the cables and wire harness. The cables from the rear of the shelves to the cable bracket must be laced together or tied with a cable tie.
15	Refer to Part 4 for applicable circuit-pack installation.
16	Refer to Part 6 for connector-cable connections.

CHART 9 – LINE SHELF NO. 3 INSTALLATION (TRUNK SHELF NO. 2 NOT INSTALLED)

Option Shelf QSP6M, QSP6U, or QSP6P with subshelf QSP6E must be installed to provide system options to line shelf no. 3 stations. In hotel/motel service, option shelf QSP6R must be installed.

STEP	PROCEDURE
1	Mount line shelf no. 3 in slide no. 2 as described in Chart 4, Steps 3 through 11.
2	Remove terminating jack (QPF18A) from P330 on line shelf no. 2, and connect to P390 on line shelf no. 3.
3	<p>Inspect internal cables, and connect plug connectors in place (Fig. 18) as follows:</p> <p>(a) J320 from wiring harness to P320 on line shelf no. 2.</p> <p>(b) J330 from wiring harness to P330 on line shelf no. 2.</p>
4	Flick the power switch of power shelf no. 2 to the OFF position.
5	Insert QPJ43-type circuit pack in connector location no. 3 on power shelf no. 2, if a integrated power shelf is not provided.
6	Remove strap for W option between terminals 1 and 2 on TB3 at the rear of power shelf no. 2 (Fig. 4). If a integrated power shelf is not provided.
7	Connect the red +5V lead (no. 11) to the +5V bus bar on line shelf no. 3 (Fig. 15). Power leads are already in wire harness to power shelf no. 2.



NOTES.

1. THE INTEGRATED POWER SHELF REPLACES POWER SHELF NO. 1 AND NO. 2
2. QPF18A IS A TERMINATING JACK
3. J500 AND J510 EXIST ONLY ON QSP6U OPTION SHELF

Fig. 18 - Internal Cabling of Basic Unit With Line Shelf No. 2 and Line Shelf No. 3

**CHART 9 (Cont) – LINE SHELF NO. 3 INSTALLATION (TRUNK SHELF
NO. 2 NOT INSTALLED)**

STEP	PROCEDURE
8	Connect the black ground lead (no. 12) to the ground bus bar (Fig. 15) on line shelf no. 3. Connect the black ground lead between the ground bus bars of line shelf no. 3 and line shelf no. 2.
9	Connect the black ground lead (no. 12) to the ground bus bar and the red lead (no. 11) to the +5 V bus bar at the rear of power shelf no. 2 (Fig. 6).
10	Connect the speech-highway connector J440 to P440 (Fig. 16) at the center rear of the line shelf. Dress the connector plug J430 and attached wire into the wire harness at the back of the shelf to prevent damage to the wire and connector.
11	If system was previously in service, flick the power switch of power shelf no. 2 to the ON position.
12	Place the wire harness connected to P111 and P112 behind the cable brackets on the back panel. When a swing gate cabinet is provided, loop the cable up beside trunk shelf no. 1 and back down.
13	Mount P111 and P112 on the connector panel in the opening stenciled P111 and P112.
14	Dress the cables and wire harness. The cables from the rear of the shelves to the cable brackets must be laced together or tied with a cable tie.
15	Refer to Part 4 for applicable circuit-pack installation.
16	Refer to Part 6 for connector-cable connections.

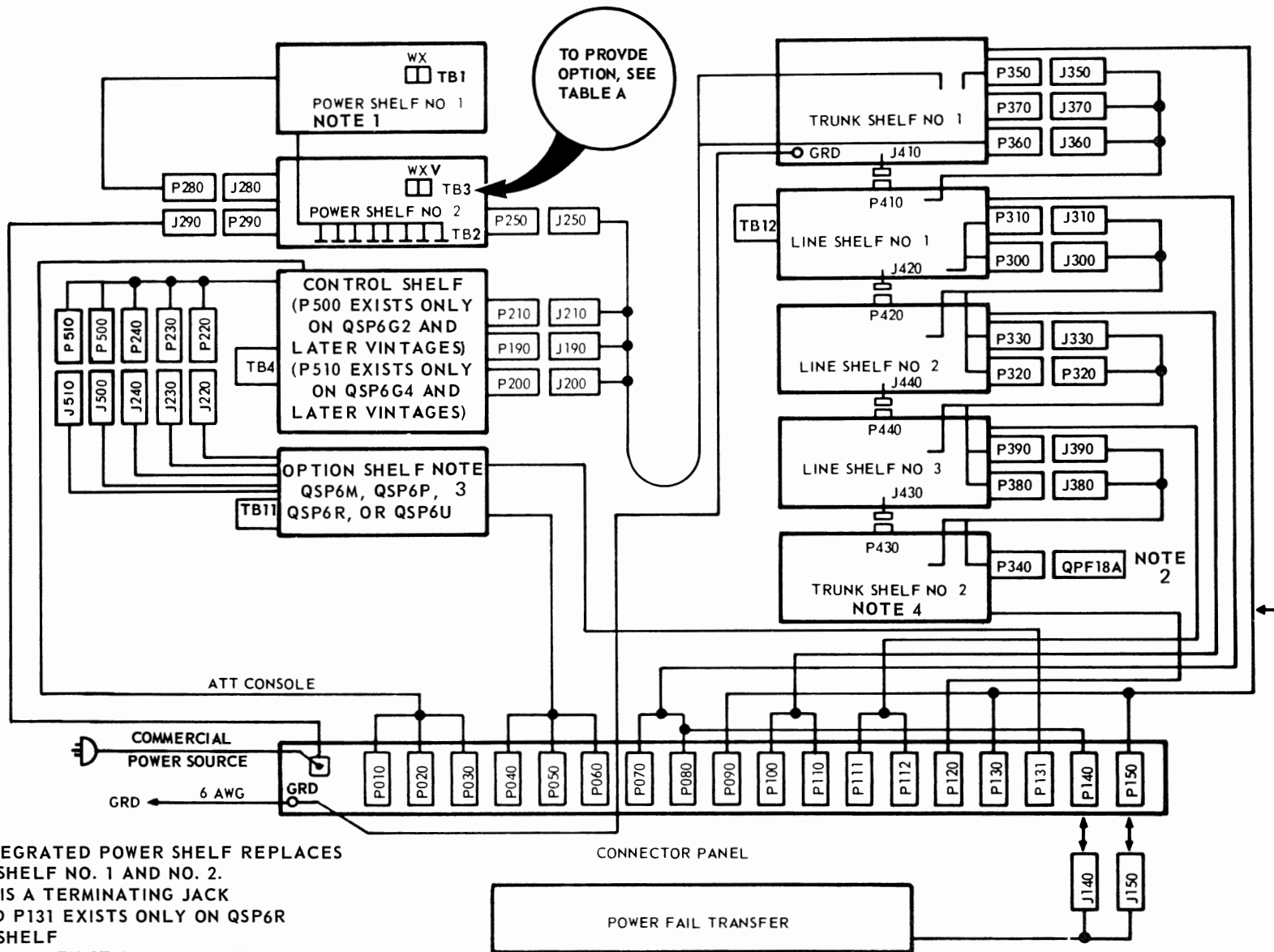
**CHART 10A - LINE SHELF NO. 3 INSTALLATION (TRUNK SHELF NO. 2 INSTALLED)
SLIDER CABINET**

Option Shelf QSP6M, QSP6U, or QSP6P with subshelf QSP6E must be installed to provide system options to line shelf no. 3 stations. In hotel/motel service, option shelf QSP6R must be installed.

STEP	PROCEDURE
1	Remove the speech highway from J440 and the ground straps connecting line shelf no. 2 and trunk shelf no. 2 from the rear of the shelves.
2	Mount line shelf no. 3 in slide no. 2 as described in Chart 4, Steps 3 through 11.

→ CHART 10A (Cont) –LINE SHELF NO. 3 INSTALLATION (TRUNK SHELF NO. 2 INSTALLED)

STEP	PROCEDURE
3	Remove J390 and J380 from P320 and P330, respectively, on line shelf no. 2, and connect J390 to P390 and J380 to P380 on line shelf no. 3 (Fig. 19).
4	Leave terminating jack (QPF18A) in P340 on trunk shelf no. 2.
5	Connect speech-highway connector J440 to P440 at the rear of the line shelves and J430 to P430 at the rear of trunk shelf no. 2.
6	<p>Inspect cables and connect each of the following plug connectors (Fig. 19) from the wiring harness to its particular line shelf.</p> <p>(a) J330 to P330 on line shelf no. 2.</p> <p>(b) J320 to P320 on line shelf no. 2.</p> <p>(c) J390 to P390 on line shelf no. 3.</p> <p>(d) J380 to P380 on line shelf no. 3.</p>
7	Flick the power switch of power shelf no. 2 to the OFF position.
8	Connect the red +5 V lead (no. 11) to the +5 V bus bar on line shelf no. 3 (Fig. 15). Power leads are already provided in wire harness to power shelf no. 2.
9	Connect the black ground lead (no.12) and the strap from line shelf no. 2 to the ground bus bar on line shelf no. 3 (Fig. 15). Connect the black ground lead between the ground bus bars of line shelf no. 3 and both line shelf no. 2 and trunk shelf no. 2.
10	Connect the black ground lead (no.12) to the ground bus bar, and the red lead(no.11) to the +5 V bus bar at the rear of power shelf no. 2 (Fig. 6).
11	If the system was previously in service, flick the power switch of power shelf no. 2 to the ON position.
12	Place the wire harness connected to P111 and P112 behind the cable brackets on the back panel of the cabinet.
13	Mount P111 and P112 on the connector panel in the opening stenciled P111 and P112.



NOTES.

1. THE INTEGRATED POWER SHELF REPLACES POWER SHELF NO. 1 AND NO. 2.
2. QPF18A IS A TERMINATING JACK
3. J500 NAD P131 EXISTS ONLY ON QSP6R OPTION SHELF
J500 AND J510 EXIST ONLY ON QSP6U OPTION SHELF
4. INSTALL TRUNK SHELF NO. 2 ON THE SWINGATE WHEN LINE SHELF NO. 3 IS PROVIDED

Fig. 19 — Internal Cabling of Basic Unit With Line Shelf No. 2, No. 3 and Trunk Shelf No. 2

**CHART 10B. –LINE SHELF NO. 3 INSTALLATION (TRUNK SHELF NO. 2 INSTALLED)
SWING GATE CABINET.**

Option shelves QSP6M, QSP60, QSP6P and subshelf QSP6E are required to provide system options to stations associated with line shelf No. 3. Option shelf QSP6R is required in hotel/motel service.

STEP	PROCEDURE
1	Remove trunk shelf no. 2 from the fixed side of the cabinet, following Step 1 through 8 in Chart 5.
2	Install line shelf no. 3 on the fixed side following Steps 3 through 11 in Chart 3.
3	Leave the terminating jack (QPF18A) in P340 on trunk shelf no. 2.
4	Connect a speech highway connector J440 to P440 at the rear of line shelves.
5	<p>Inspect cables, and connect each of the following plug connectors (Fig. 19) from the wiring harness to its particular line shelf.</p> <p>(a) J330 to P330 on line shelf no. 2.</p> <p>(b) J320 to P320 on line shelf no. 2.</p>
6	Connect the red lead designated 1 to the +5 V on the bus bar on line shelf no. 3 (Fig. 15).
7	Connect the black lead designated 2 from line shelf no. 2, to the ground bus bar on line shelf no. 3 (Fig. 15).
8	Connect the black ground lead designated 12 to the ground bus bar, and the red lead designated 11 to the + 5 V bus bar at the rear of the power shelf. (Fig. 6).
9	Run the wire harness connected to P111 and P112 up by trunk shelf no. 1 and down to the receptacle panel. Support the cable with cable ties.
10	Mount P111 and P112 on the connector panel in the opening stenciled P111 and P112.
11	Install the applicable circuit packs following steps 1 through 9 in chart 21.
12	Install trunk shelf no. 2 on swing gate following Steps 1 through 12 in Chart 13B.
13	Refer to Part 5 for connector cable connections.

→ **CHART 10B (Cont) –LINE SHELF NO. 3 INSTALLATION (TRUNK SHELF NO. 2 INSTALLED)**

STEP	PROCEDURE
14	Dress the cables and wire harness. The cable from the rear of the shelves to the cable brackets must be laced together or tied with a cable tie.
15	Refer to Part 4 for applicable circuit pack installation.
16	Refer to Part 6 for connector-cable connections.

CHART 11 – TRUNK SHELF NO. 2 INSTALLATION (LINE SHELF NO. 2, AND NO. 3 NOT INSTALLED)

STEP	PROCEDURE
1	Mount trunk shelf no. 2 into slide no. 2 as described in Chart 4, Steps 3 through 11.
2	Remove terminating jack QPF18A from P310 on line shelf no. 1, and connect to P340 on trunk shelf no. 2.
3	Install the speech-highway strap (PO531694) between J420 on line shelf no. 1 and P430 on trunk shelf no. 2. When a swing gate cabinet is provided install a PO531695 speech-highway strap.
4	Inspect the internal cables, and connect the plug connectors in place (Fig. 20) as follows: (a) J380 from wiring harness to P300 on line shelf no. 1. (b) J390 from wiring harness to P310 on line shelf no. 1.
5	Flick the power switch on power shelf no. 2 to the OFF position.
6	Insert the QPJ43-type circuit pack in connector 3 in power shelf no. 2, if integrated power shelf is not provided.
7	Remove strap for W option between terminals 1 and 2 on TB3 at the rear of power shelf no. 2 (Fig. 4), if integrated power shelf is not provided.
8	Connect the red +5V lead (no. 10) to the +5V bus bar at the rear of trunk shelf no. 2(Fig. 15). Power leads are already provided in wire harness to power shelf no. 2.

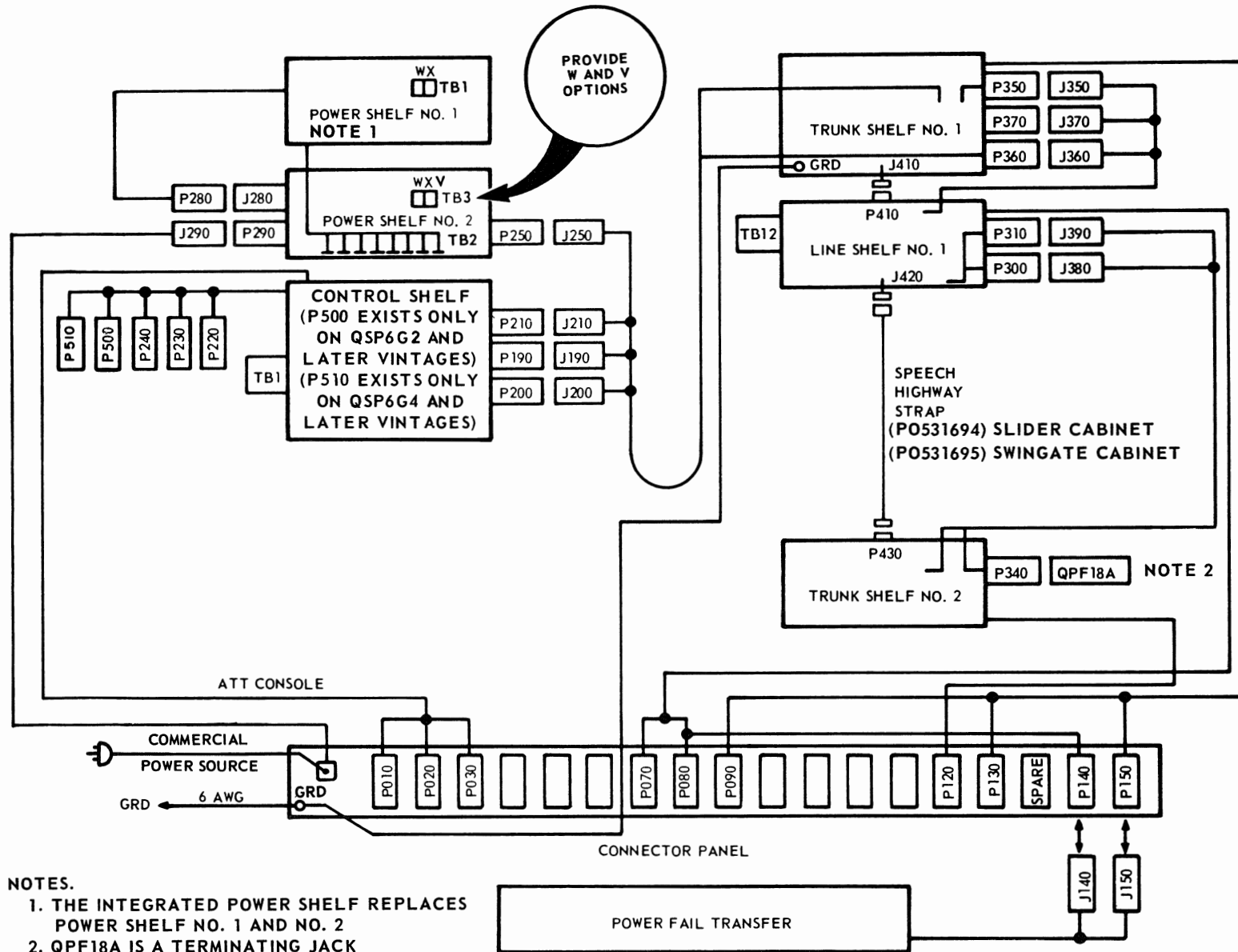


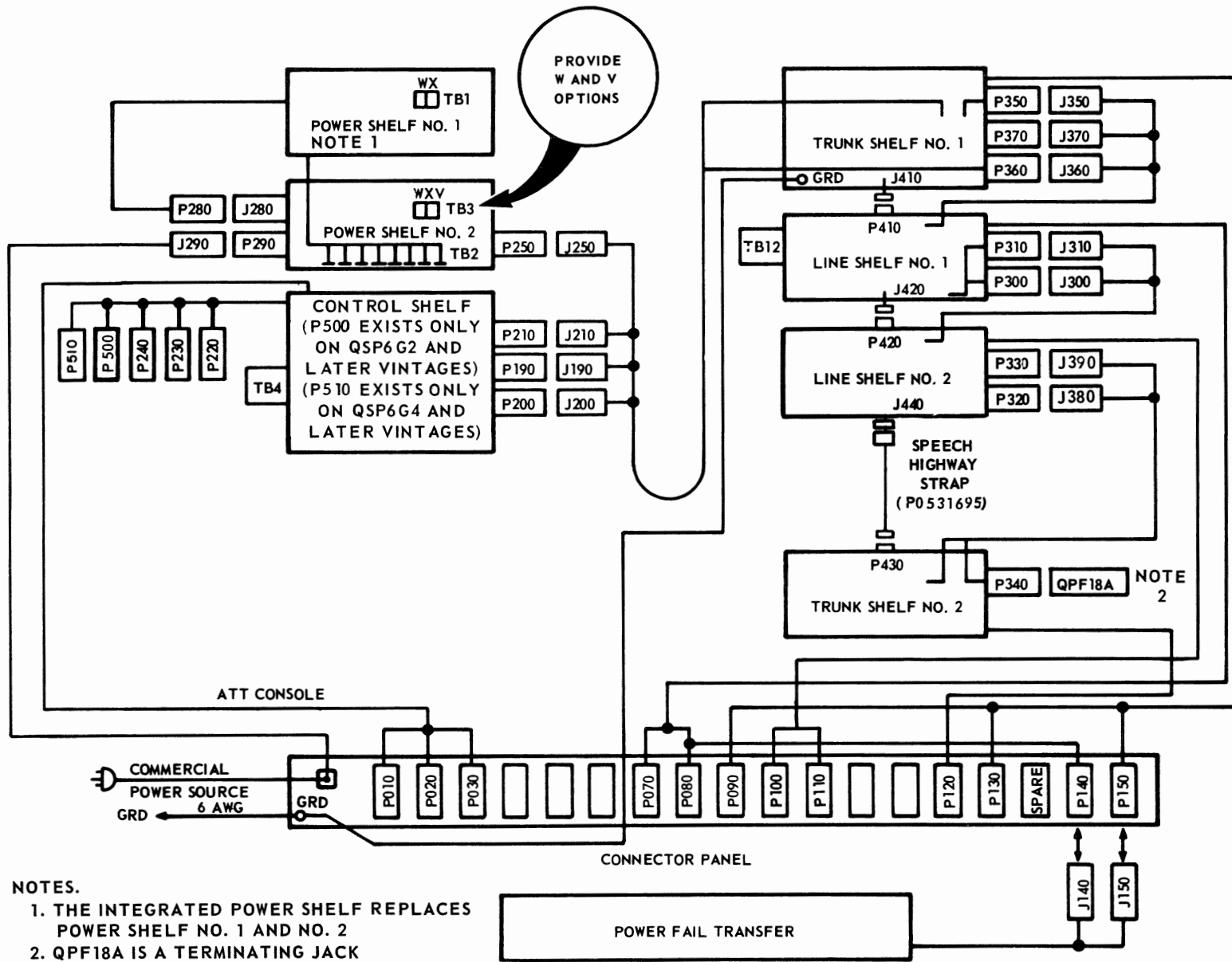
Fig. 20 — Internal Cabling of Basic Unit With Trunk Shelf No. 2

**CHART 11 (Cont) – TRUNK SHELF NO. 2 INSTALLATION (LINE SHELF NO. 2,
AND NO. 3 NOT INSTALLED)**

STEP	PROCEDURE
9	Connect the black leads (no. 5 and 6) and the ground strap from line shelf no. 1 to the ground bus bar at the rear of trunk shelf no. 2 (Fig. 15).
10	Install the ground strap (P0531694) between the ground bus bars on line shelf no. 1 and trunk shelf no. 2 (Fig. 15).
11	Connect the black leads (no. 5 and 6) to the ground bus bar and the red lead (no. 10) to the +5 V bus bar at the rear of power shelf no. 2 (Fig. 6).
12	If the system was previously in service, flick the power switch on power shelf no. 2 to the ON position.
13	Place the wiring harness connected to P120 behind the cable brackets on the back panel. When a swing gate cabinet is provided run the cable up by trunk shelf no. 1 and down to the receptacle panel. Support the cable with cable ties.
14	Mount P120 on the connector panel in the opening stenciled P120.
15	Dress the cables and wiring harness. The cables from the rear of the shelves to the cable brackets must be laced together or tied with a cable tie.
16	Refer to Part 4 for applicable circuit-pack installation.
17	Refer to Part 6 for connector-cable connections.

**CHART 12 – TRUNK SHELF NO. 2 INSTALLATION (LINE SHELF NO. 2 INSTALLED
LINE SHELF NO. 3 NOT INSTALLED)**

STEP	PROCEDURE
1	Mount trunk shelf no. 2 in slide no. 2 as described in Chart 4, Steps 3 through 11. When a swing gate cabinet is provided, mount P120 prior to mounting trunk shelf no. 2.
2	Remove terminating jack QPF18A from P330 on line shelf no. 2, and connect to P340 on trunk shelf no. 2.
3	Connect the speech highway strap (PO531694) to J440 at the rear of line shelf no. 2 to P430 at the rear of trunk shelf no. 2.
4	Inspect the cables, and connect the plug connectors in place (Fig. 21) as follows: (a) J380 from wiring harness to P320 on line shelf no. 2. (b) J390 from wiring harness to P330 on line shelf no. 2.
5	Flick the power switch on power shelf no. 2 to the OFF position.
6	Connect the red +5V lead (no. 10) to the +5 bus bar at the rear of trunk shelf no. 2 (Fig. 14). Power leads are already provided in wire harness to power shelf no. 2.
7	Connect the black leads (no. 5 and 6) and the ground strap from line shelf no. 2 to the ground bus bar on trunk shelf no. 2 (Fig. 15).
8	Connect the black leads (no. 5 and 6) to the ground bus bar and the red lead (no. 10) to the +5V bus bar at the rear of power shelf no. 2 (Fig. 6).
9	If the system was previously in service, flick the power switch on power shelf no. 2 to the ON position.
10	Place the wiring harness connected to P120 behind the retaining bars on the back panel. When a swing gate cabinet is provided run the cable up by trunk shelf no. 1 and down to the receptacle panel. Support the cable with cable ties.
11	Mount P120 on the connector panel in the opening stenciled P120.
12	Dress the cables and wiring harness. The cables from the rear of the shelves to the cable bracket must be laced together or tied with a cable tie.
13	Refer to Part 4 for applicable circuit pack installation.
14	Refer to Part 6 for connector-cable connections.



NOTES.

1. THE INTEGRATED POWER SHELF REPLACES POWER SHELF NO. 1 AND NO. 2
2. QPF18A IS A TERMINATING JACK

Fig. 21 — Internal Cabling of Basic Unit With Line Shelf No. 2 and Trunk Shelf No. 2

**CHART 13A –TRUNK SHELF NO. 2 INSTALLATION (LINE SHELF NO. 2
AND NO. 3 INSTALLED) SLIDER CABINET**

STEP	PROCEDURE
1	Mount trunk shelf no. 2 in slide no. 2 as described in Chart 4, Steps 3 through 11.
2	Remove terminating jack (QPF18A) from P390 on line shelf no. 3 and connect to P340 at the rear of trunk shelf no. 2.
3	Connect the speech-highway connector J430 at the rear of line shelf no. 3 to P430 at the rear of trunk shelf no. 2.
4	<p>Inspect the cables and connect the plug connectors in place (Fig. 22) as follows:</p> <p>(a) J380 from wiring harness to P380 on line shelf no. 3.</p> <p>(b) J390 from wiring harness to P390 on line shelf no. 3.</p>
5	Flick the power switch on power shelf no. 2 to the OFF position.
6	Connect the red +5 V lead (no. 10) to the +5 bus bar at the rear of trunk shelf no. 2 (Fig. 15). Power leads are already provided in wire harness to power shelf no. 2.
7	Connect the black leads (no. 5 and 6) and the ground strap from line shelf no. 3 to the ground bus bar on trunk shelf no. 2 (Fig. 15).
8	Connect the black leads (no. 5 and 6) to the ground bus bar and the red lead (no. 10) to the +5 V bus bar at the rear of power shelf no. 2 (Fig. 6).
9	If the system was previously in service, flick the power switch on power shelf no. 2 to the ON position.
10	Place the wiring harness connected to P120 behind the cable brackets on the back panel.
11	Mount P120 on the connector panel in the opening stenciled P120.
12	Dress the cables and wiring harness. The cables from the rear of the shelves to the cable brackets must be laced together or tied with a cable tie.
13	Refer to Part 4 for applicable circuit-pack installation.
14	Refer to Part 6 for connector-cable connections.

CHART 13B TRUNK SHELF NO. 2 INSTALLATION (LINE SHELF NO. 2 AND NO. 3 INSTALLED) SWING GATE CABINET

STEP	PROCEDURE
1	Install trunk shelf no. 2 on swing gate following Steps 3 through 11 in Chart 4.
2	Remove the terminating jack (QPF18A) from P390 on line shelf no. 3 and connect to P340 at the rear of trunk shelf no. 2.
3	Flick the power switch OFF.
4	Connect black GRD lead from ground connection on bus bar to ground bus bar on power shelf.
5	Connect red +5V lead from +5V connection on trunk shelf bus bar to +5V TK2 connection on power shelf.
6	Take tip and ring cable, and follow the loop that the control shelf cables follow. Install in P120 location on receptacle panel.
7	Connect a highway extension to trunk shelf no. 2 highway connector, then follow the loop that the control shelf cables follow. Connect the other end to line shelf no. 3 highway.
8	Support the highway and tip and ring cables to the loop with large cable ties. Tie the +5V and GRD leads together between trunk shelf no. 2 and the power shelf with small cable ties.
9	Tape both ends of highway-extension to prevent highway from coming apart.
10	Connect J380 and J390 to P380 and P390 respectively. (Fig. 22).
11	Install the applicable circuit packs following Steps 1 through 9 in Chart 21.
12	Refer to Part 5 for connector cable connections.

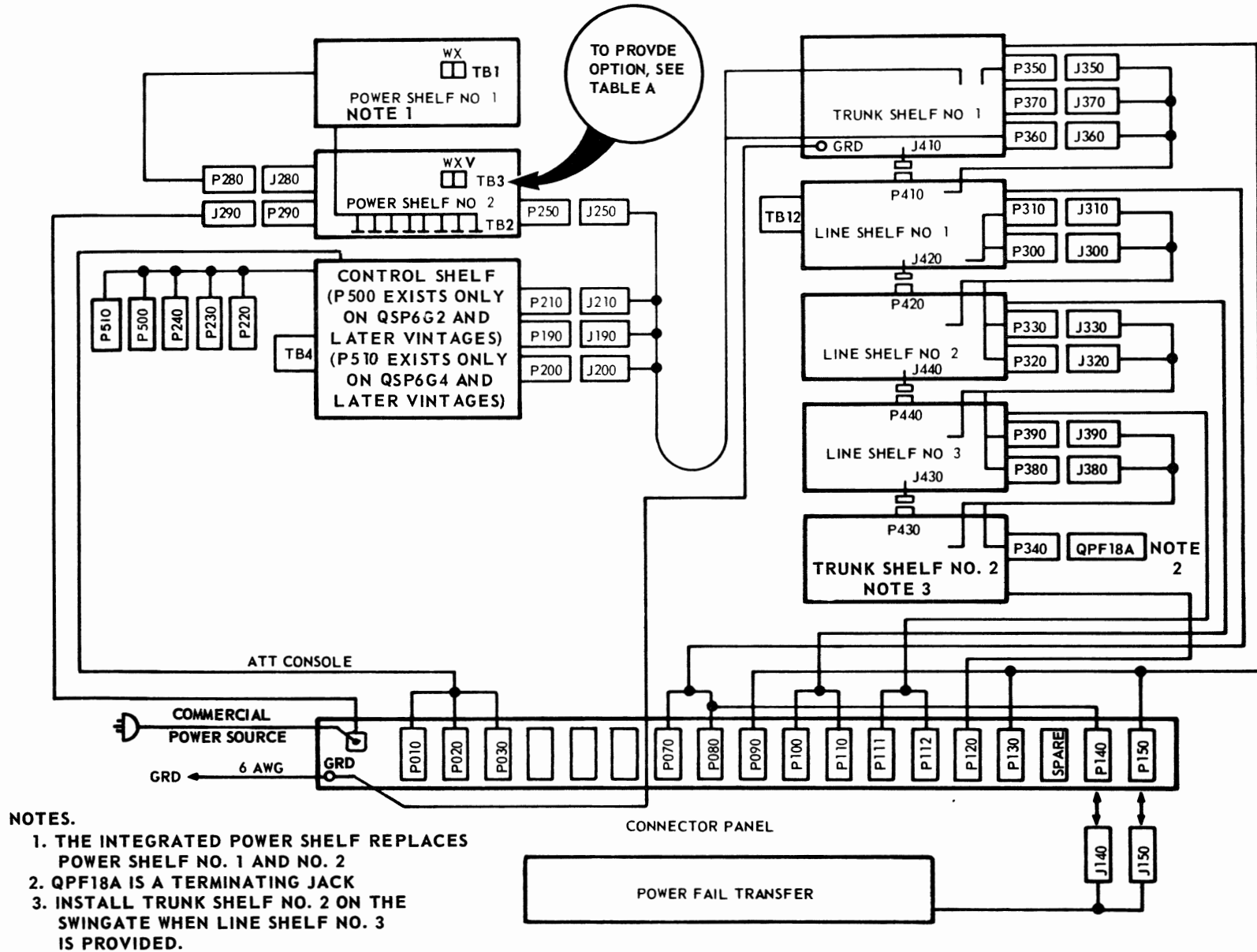
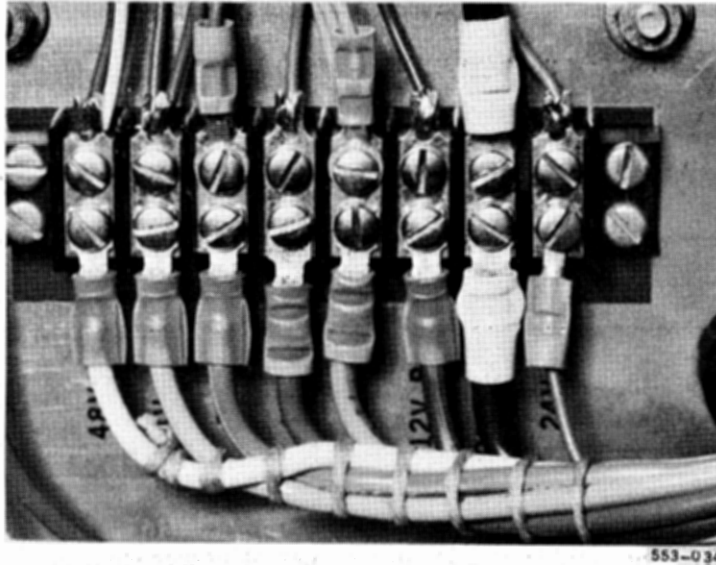


Fig. 22 — Internal Cabling of Basic Unit with Line Shelf No. 2 and No. 3 and Trunk Shelf No. 2

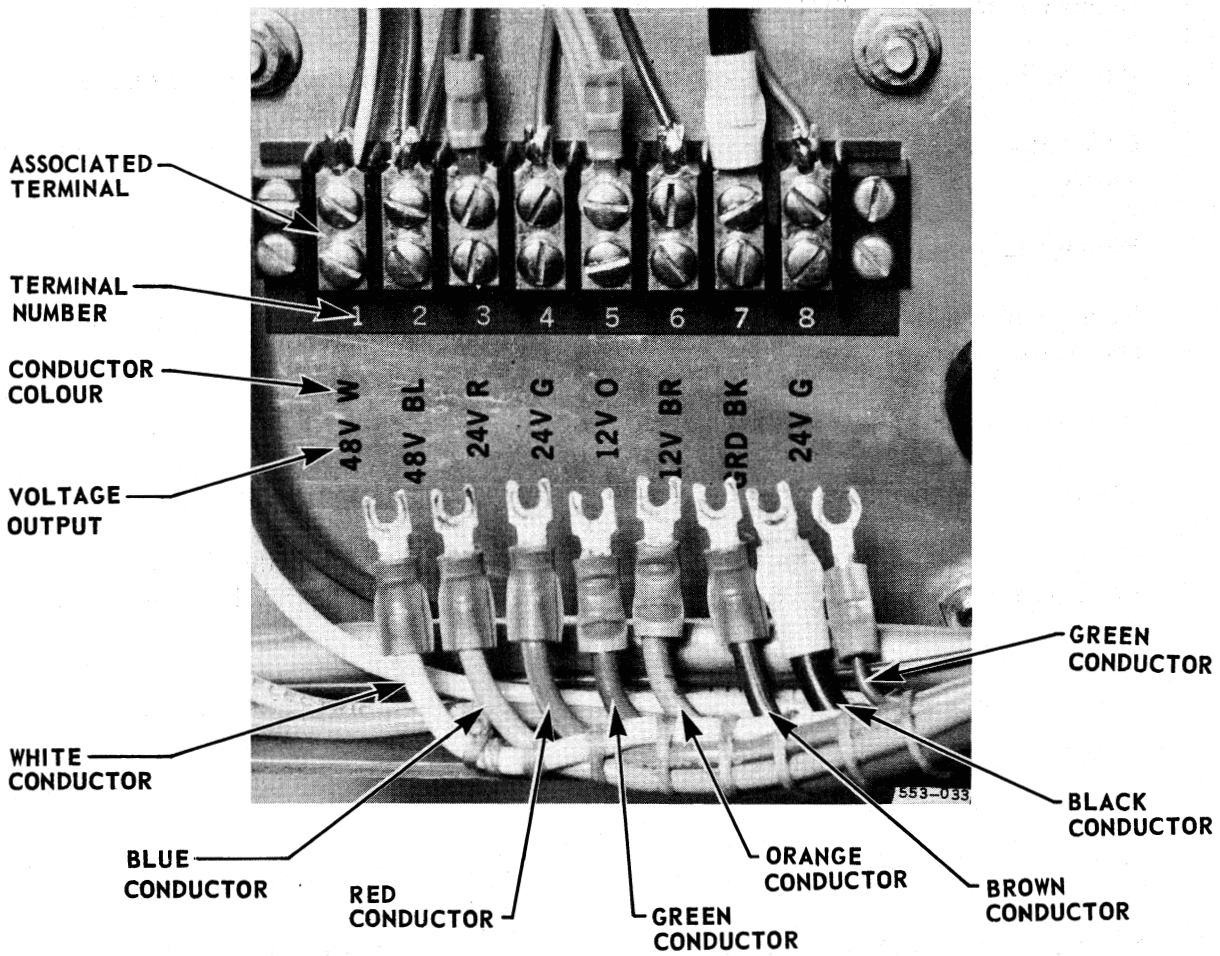
CHART 14 – SUBSTITUTION OF POWER SHELF NO.1

Power shelf no. 1 weighs approximately 60 pounds.

STEP	PROCEDURE
1	Extend slide no. 1 to the fully open position.
2	Flick the power switch on power shelf no. 2 to the OFF position. This releases the PFT relays to provide emergency service only.
3	Loosen all screws on TB2 (Fig. 23) at the rear of the power shelf no. 2. <i>Do not remove the screws.</i> Remove the spade connectors.
4	Remove P280 from J280 (twist-lock connection) at the rear end of power shelf no. 2.
5	Check whether the W or the X option on the terminal block in power shelf no. 1 is recorded on the record sheet.
6	Remove power shelf no. 1, following the procedure described in Chart 5.
7	Install the substituting shelf, as described in Chart 4.
8	Connect the lead for the W or X option on the block in power shelf no. 1 as indicated on the record sheet.
9	Connect P280 to J280 (twist-lock connection) at the rear end of power shelf no. 2.
10	Connect the spade connectors to TB2 (Fig. 23) at the rear of power shelf no. 2 and tighten the screws.
11	Ensure that all Bussman fuses are present in each of the fuse holder and are not faulty.
12	Flick the power switch on power shelf no. 2 to the ON position. Press the RESET button to restore normal service to the system.



(a) Connected



(b) Disconnected

Fig. 23 – View of TB2 at the Rear of Power Shelf No. 2

CHART 15 – SUBSTITUTION OF POWER SHELF NO. 2

Power shelf no. 2 weighs approximately 75 pounds.

STEP	PROCEDURE
1	Extend slide no. 1 to the fully opened position.
2	Flick the power switch on power shelf no. 2 to the OFF position. This releases the PFT relays to provide emergency service only.
3	Loosen all screws on TB2 (Fig. 23) at the rear of power shelf no. 2. <i>Do not remove the screws.</i> Remove the spade connectors.
4	Remove P280 from J280 (twist-lock connection) at the rear of power shelf no. 2.
5	Remove P290 from J290 (twist-lock connection) at the rear end of power shelf no. 2.
6	Check that the options on TB3 at the rear of power shelf no. 2 coincide with the record sheets.
7	Remove J250 from P250 at the front end of power shelf no. 2.
8	Remove all the red +5 V leads and black ground leads (Fig. 6) to the control, option line, and trunk shelves from power shelf no. 2.
9	Remove power shelf no. 2, following the procedures described in Chart 5.
10	Install the substituting shelf, as described in Chart 4.
11	Connect and tighten the +5 V and ground leads on the bus bars at the rear of power shelf no. 2. The numbered +5 V leads <i>must</i> be connected to the correct +5 V bus bars as shown in Fig. 6.
12	Connect J250 to P250 at the front end of power shelf no. 2, and tighten the screws.
13	From the information noted on the record sheet, strap for the W, V, or X option on TB3 at the rear of power shelf no. 2 (Table A, Page 48).
14	Connect P290 to J290 (twist-lock connection) at the rear end of power shelf no. 2.
15	Connect P280 to J280 (twist-lock connection) at the rear end of power shelf no. 2.

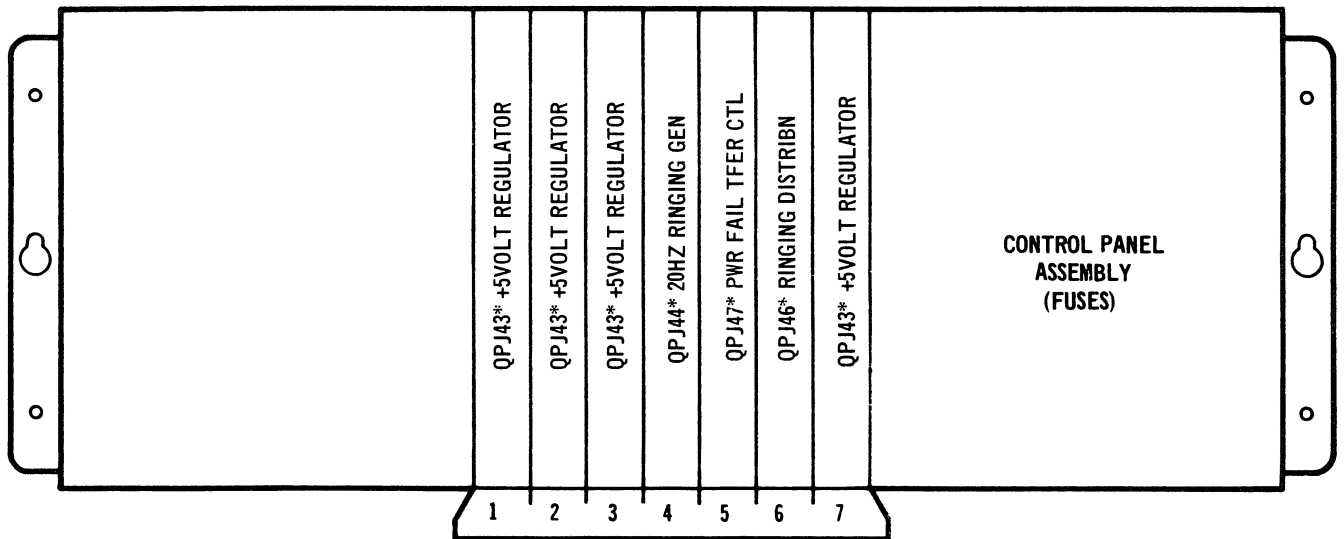
CHART 15 (Cont) – SUBSTITUTION OF POWER SHELF NO. 2

STEP	PROCEDURE
16	Insert the spade connectors under the screws on TB2 (Fig. 23) at the rear of power shelf no. 2. Tighten all screws on TB2.
17	Transfer all the circuit packs from the faulty shelf to their appropriate connector locations (Fig. 24) on the new shelf.
18	Check that all fuses listed in Table B are present and are not faulty.
19	Flick the power switch on power shelf no. 2 to the ON position. Press the RESET button on power shelf no. 2 to restore normal service to the system.

TABLE A
QPJ43* CIRCUIT PACK MONITORING
OF POWER SHELF NO. 2

OPTION	PLACE STRAP WHEN QPJ43* IS NOT PRESENT	REMOVE STRAP WHEN QPJ43* IS PRESENT	QPJ43* LOCATION		REMARKS
			SHELF	CONN	
X	1 – 2		Power Shelf No. 2	3	If line shelf no. 2 and/or line shelf no. 3 and/or trunk shelf no. 2 are not connected.
V	3 – 4		Option Shelf QSP6M	26	If either dial pulse sender nor code restriction features are pro- vided.
			Option Shelf QSP6U	29	If neither above options nor call- pickup/call- forward are pro- vided.
W		1 – 2	Power Shelf No. 2	3	If line shelf no. 2 and/or line shelf no. 3 and/or trunk shelf no. 2 are connected.

Note: In hotel/motel service (option shelf QSP6R) ensure that strap 3-4 on Power Shelf 2 is removed.



NOTE. FOR INTEGRATED POWER SHELF INFORMATION;
REFER TO 553-5021-208 AND 553-5021-516

Fig. 24 – Power Shelf No. 2 Fully Equipped

TABLE B
FUSE DISTRIBUTION ON POWER SHELF NO. 2

FUSE NO.	TYPE OF FUSE	COLOR INDICATOR	FUSE RATING (AMPERES)	VOLTAGE (VOLTS)
F1	Bussman MTH	—	1.5	-48
F2	Bussman MTH	—	1.5	+24
F3	Bussman MTH	—	5	+24
F4	Bussman MTH	—	5	+24
F5	Bussman MTH	—	5	+24
F6	Bussman MTH	—	5	+24
F7	QFF 1C	Blue	3	+12
F8	QFF 1C	Blue	3	+12
F9	Bussman MTH	—	5	+24
F10	(No Fuse Holder)			
F11	QFF 1H	Brown	3/4	+24
F12	QFF 1H	Brown	3/4	+24
F13	QFF 1H	Brown	3/4	+24
F14	QFF 1H	Brown	3/4	+24
F15	QFF 1H	Brown	3/4	+24
F16	QFF 1H	Brown	3/4	+24
F17	QFF 1H	Brown	3/4	+24
F18	QFF 1H	Brown	3/4	+24
F19	QFF 1H	Brown	3/4	+24
F20	QFF 1H	Brown	3/4	+24
F21	QFF 1H	Brown	3/4	+24
F22	QFF 1H	Brown	3/4	+24
F23	QFF 1H	Brown	3/4	+24
F24	QFF 1F	Violet	1/4	+24
F25	QFF 3A	—	Dummy	—
F26	QFF 3A	—	Dummy	—
F27	QFF 1F	Violet	1/4	-24
F28	QFF 1F	Violet	1/4	-24
F29	QFF 3A	—	Dummy	—
F30	QFF 3A	—	Dummy	—
F31	QFF 1F	Violet	1/4	-48
F32	QFF 1A	White	1-1/3	-48
F33	QFF 1G	Red	1/2	-48
F34	QFF 3A	—	Dummy	—
F35	QFF 1F	Violet	1/4	86 V – 20 Hz
F36	QFF 1F	Violet	1/4	86 V – 20 Hz
F37	QFF 1F	Violet	1/4	86 V – 20 Hz
F38	QFF 1F	Violet	1/4	86 V – 20 Hz
F39	QFF 1F	Violet	1/4	86 V – 20 Hz
F40	QFF 1F	Violet	1/4	86 V – 20 Hz
F41	QFF 1F	Violet	1/4	86 V – 20 Hz
F42	QFF 1F	Violet	1/4	86 V – 20 Hz

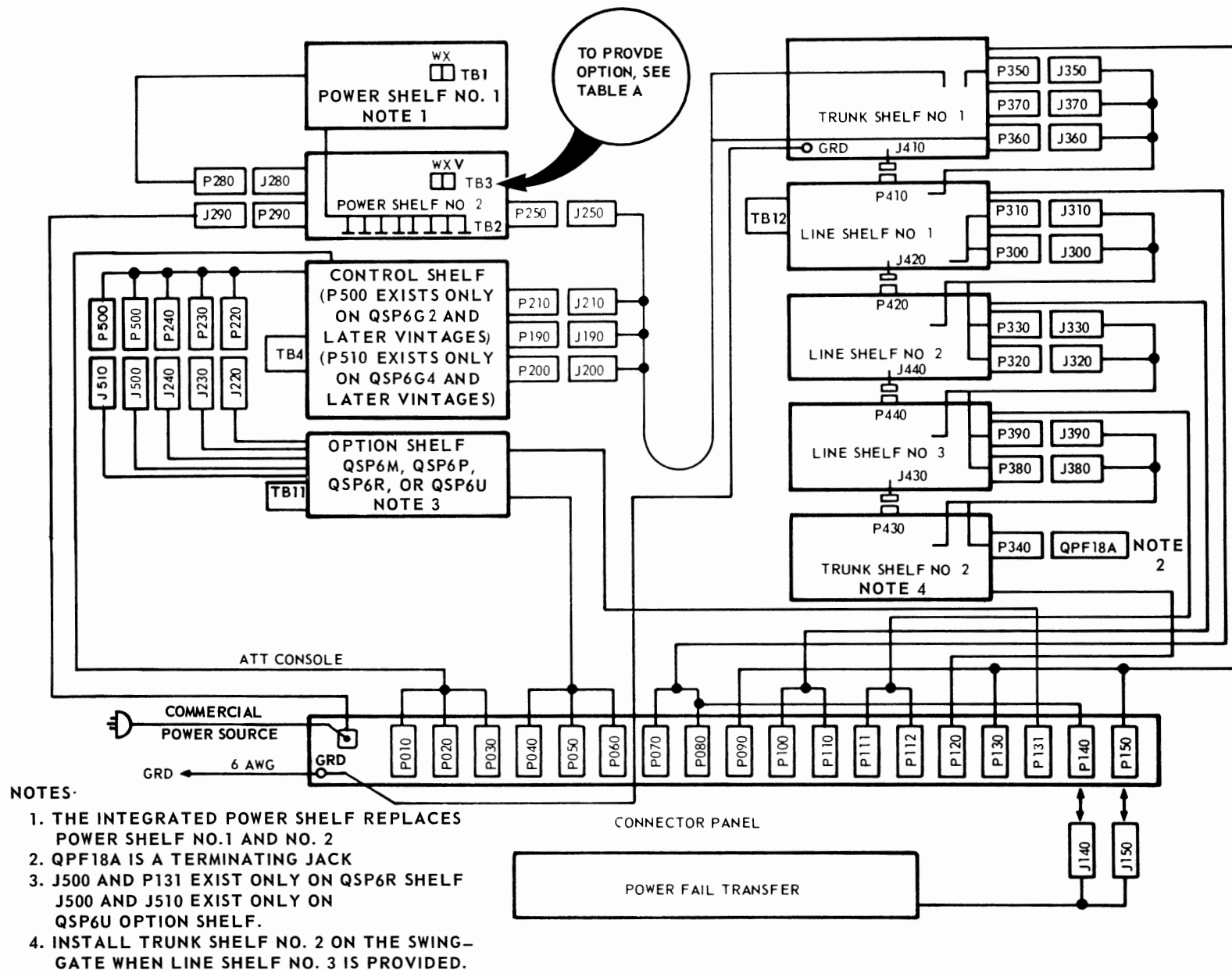
CHART 16A –SUBSTITUTION OF CONTROL SHELF SLIDER CABINET

STEP	PROCEDURE
1	Extend slide no. 1 to the fully opened position.
2	Operate the power switch on power shelf no. 2 to the OFF position. This releases the PFT relays to provide emergency service only.
3	Remove J240 from P240, J230 from P230, J220 from P220 (and J500 from P500 in hotel/motel service) at the rear end of the control shelf (Fig. 25). If the option shelf is not present the jacks will not be present in the plugs. If option shelf is a QSP6U, remove J510 from P510 and J500 from P500.
4	Remove J200 from P200, J210 from P210, and J190 from P190 at the front end of the control shelf.
5	Remove the wire-harness clamp from the front end of the control shelf.
6	Disconnect the red +5 V leads and the black ground leads from the bus bars at the rear of the control shelf.
7	If the traffic measurement circuit packs are installed, mark the connector-cable locations, and remove the connector cables from the circuit packs.
8	Disconnect and remove P010, P020, and P030 from the connector panel at the base of the cabinet. Remove the cable enclosed in the sleeve from the control shelf to the connector panel.
9	Check all classes of service provided by the system on QPJ28, QPJ29, QPJ62-type circuit packs and TB4 with the record sheet, and correct the sheet if necessary.
10	Remove the control shelf by following the procedures in Chart 5.
11	Mount the substituting shelf as described in Chart 4.
12	Place the straps on TB4 on the control shelf as recorded on the record sheet.
13	Place the control shelf cables behind the retaining bars at the rear of the cabinet; mount and connect P010, P020, and P030 on the connector panel.
14	Tie or lace all wires and cables together from slide no. 1 to the cable brackets, and enclose them in the zippered sleeve.
15	Connect the red +5 V leads and the black ground leads from power shelf no. 2 to the bus bars on the control shelf as shown in Fig. 6.

CHART 16A (Cont) --SUBSTITUTION OF CONTROL SHELF SLIDER CABINET

STEP	PROCEDURE
→ 16	Install the wire-harness clamp at the front end of the control shelf.
17	Connect J200 to P200, J210 to P210, and J190 to P190 at the front end of the control shelf (Fig. 25), and tighten the screws.
18	If option shelf is present, connect J240 to P240, J230 to P230, J220 to P220 (and J500 to P500 in hotel/motel service) at the rear end of the control shelf, and tighten the screws. If option shelf is a QSP6U, connect J510 to P510 and J500 to P500.
19	Transfer the QPJ97, QPJ51, QPJ24, QPJ21, QPJ25, QPJ22, QPJ20, QPJ20, QPJ54, or QPJ19 type circuit packs from the faulty shelf to their appropriate connector locations on the new shelf (Fig. 26).
20	Flick the main contact breaker on power shelf no. 2 to the ON position.
21	Perform the Logic Test A described in Section 553-5011-206.
22	If applicable, connect the connector cables to the appropriate traffic measurement circuit packs.
23	Transfer remaining circuit packs from the faulty shelf to their appropriate connector locations on the new shelf (Fig. 26).
24	Perform the Logic Test A described in Section 553-5011-206.
25	Press the RESET button on power shelf no. 2 to restore normal service to the system.

CHART 16B SUBSTITUTION OF CONTROL SHELF SWING GATE CABINET	
STEP	PROCEDURE
1	Open swing gate.
2	Operate the power switch on power shelf to the OFF position. This releases the PFT relays to provide emergency service only.
3	Remove J240 from P240, J230 from P230, J220 from P220 (and J500 from P500 in hotel/motel service) at the rear end of the control shelf (Fig. 25). If the option shelf is not present the jacks will not be present in the plugs. If option shelf is a QSP6U, remove J510 from P510 and J500 from P500.
4	Remove J200 from P200, J210 from P210, and J190 from P190 at the front end of the control shelf.
5	Remove the wire-harness clamp from the front end of the control shelf.
6	Disconnect the red +5 V leads and the black ground leads from the bus bars at the rear of the control shelf.
7	If the traffic measurement circuit packs are installed, mark the connector cable locations, and remove the connector cables from the circuit packs.
8	Disconnect and remove P010, P020, and P030 from the connector panel at the base of the cabinet. Remove the cable ties that form the loop, and hold the cable under the gate.
9	Check all classes of service provided by the system on QPJ28, QPJ29, QPJ62-type circuit packs and TB4 with the record sheet, and correct the sheet if necessary.
10	Remove the control shelf by following the procedures in Chart 5.
11	Mount the substituting shelf as described in Chart 4.
12	Place the straps on TB4 on the control shelf as recorded on the record sheet.
13	Place the control shelf cables under the gate on the ledge, and form a loop similar to the one which existed.
14	Tie or lace all wires and cables together forming a loop. Tie the formed wires and cables to the gate using a hole in the gate. Connect P010, P020, P030 on the connector panel.
15	Connect the red +5V leads and the black ground leads from power shelf no. 2 to the bus bars on the control shelf as shown in Fig. 6.



NOTES:

1. THE INTEGRATED POWER SHELF REPLACES POWER SHELF NO.1 AND NO. 2
2. QPF18A IS A TERMINATING JACK
3. J500 AND P131 EXIST ONLY ON QSP6R SHELF
J500 AND J510 EXIST ONLY ON QSP6U OPTION SHELF.
4. INSTALL TRUNK SHELF NO. 2 ON THE SWING-GATE WHEN LINE SHELF NO. 3 IS PROVIDED.

Fig. 25 – Internal Cabling of a Fully Equipped EPABX

CHART 16B (Cont) –SUBSTITUTION OF CONTROL SHELF	
STEP	PROCEDURE
16	Install the wire-harness clamp at the front end of the control shelf.
17	Connect J200 to P200, J210 to P210, and J190 to P190 at the front end of the control shelf (Fig. 25), and tighten the screws.
18	If option shelf is present, connect J240 to P240, J230 to P230, J220 to P220 (and J500 to P500 in hotel/motel service) at the rear end of the control shelf, and tighten the screws. If option shelf is a QSP6U, connect J510 to P510 and J500 to P500.
19	Transfer the QPJ97, QPJ51, QPJ24, QPJ21, QPJ25, QPJ22, QPJ20, QPJ20, QPJ54, or QPJ19 type circuit packs from the faulty shelf to their appropriate connector locations on the new shelf (Fig. 26).
20	Flick the main contact breaker on the power shelf to the ON position.
21	Perform the Logic Test A described in Section 553-5011-206.
22	If applicable, connect the connector cables to the appropriate traffic measurement circuit packs.
23	Transfer remaining circuit packs from the faulty shelf to their appropriate connector locations on the new shelf (Fig. 26).
24	Perform the Logic Test A described in Section 553-5011-206.
25	Press the RESET button on power shelf no. 2 to restore normal service to the system.

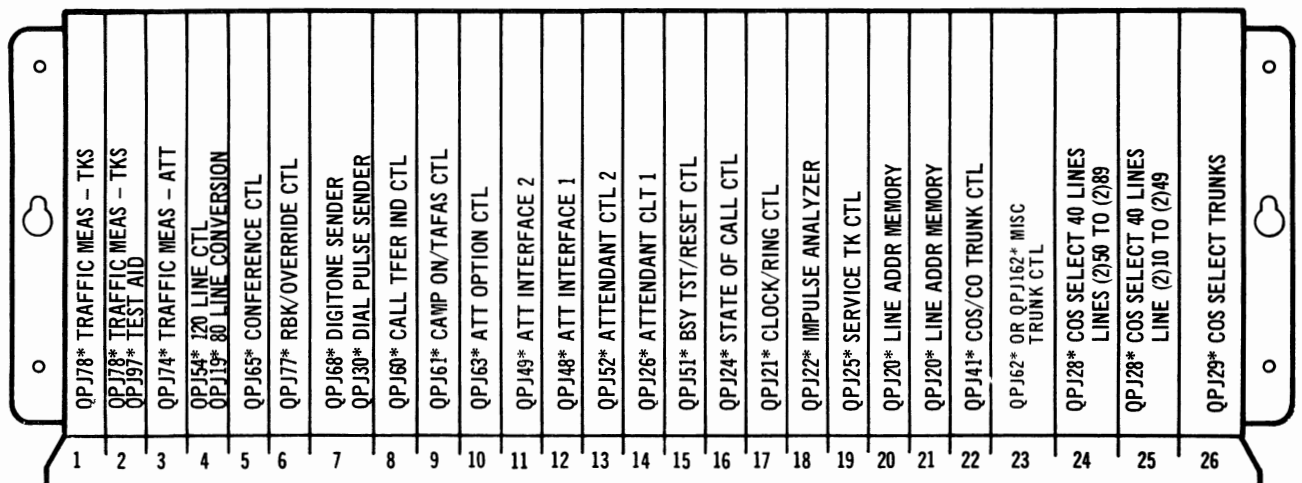


Fig. 26 – Fully Equipped Control Shelf

CHART 17 – SUBSTITUTION OF POWER-FAIL TRANSFER PANEL

STEP	PROCEDURE
→ 1	Extend slide no. 2 to the fully opened position, or open the swing gate.
2	Before removing the PFT panel, emergency service to the EPABX must be provided via a short emergency connector cable bridging station lines (2)10 through (2)19 directly to trunks 1 through 10. See Steps 3 and 4.
3	Remove J070 and J090 from P070 and P090, on the connector panel.
4	Bridge J070 to J090 using the short double-ended (male) emergency connector cable (P0519592). Ensure that the wander-ground start lead attached to the emergency connector cable at the J070 end is connected to the ground terminal on the connector panel. This establishes direct emergency-service connection.
5	Disconnect and remove P140 and P150 from the connector panel. This releases the PFT relays.
6	With a screwdriver remove the two screws on the right end of the PFT panel. The screwdriver in this and subsequent steps should be at least 4 inches long.
→ 7	Return slide no. 2 to the fully closed position (slider cabinet)
→ 8	Extend slide no. 1 to the fully opened position (slider cabinet)
9	With a screwdriver, remove the two screws on the left end of the PFT panel.
10	Remove the PFT panel from the base of the cabinet.
11	Insert the replacement PFT panel.
12	With a screwdriver align the PFT panel, and tighten the screws on the left end of the panel.
13	Return slide no. 1 to the fully closed position.
14	Extend slide no. 2 to the fully opened position.
15	With a screwdriver tighten the two screws on the right end of the PFT panel to secure it to the cabinet.
16	Mount, connect, and tighten P140 to J140, and P150 to J150 on the connector panel.

CHART 17 (Cont) – SUBSTITUTION OF POWER-FAIL TRANSFER PANEL

STEP	PROCEDURE
17	Disconnect the emergency connector cable. Connect and tighten J070 and J090 to P070 and P090 on the connector panel.
18	Perform a transmission test from station lines (2)10 to (2)19 through their corresponding trunks while the PFT relays are still released.
19	Press the RESET button on power shelf no. 2 to restore normal service to the system, and operate the PFT relays.
20	Establish station-to-station calls, and perform a transmission test on station lines (2)10 through (2)19.
21	Establish trunk calls, and perform a transmission test on trunks 1 through 10.

CHART 18 – SUBSTITUTION OF TRUNK SHELF NO. 1

STEP	PROCEDURE
1	Extend slide no. 2 to the fully opened position, or open swing gate.
2	Flick the power switch on power shelf no. 2 to the OFF position.
3	Since the removal of trunk shelf no. 1 interrupts emergency service to the EPABX, a short emergency connector cable must be provided to bridge station lines (2)10 through (2)19 to trunks 1 through 10 during the substitution of the shelf.
4	Remove J070 and J090 from P070 and P090 on the connector panel.
5	Bridge J070 to J090 using the short double-ended (male) emergency connector cable (P0519592). Ensure that the wander ground start-lead attached to the emergency cable at the J070 end is connected to the ground terminal on the connector panel. This establishes direct emergency service connection.
6	Disconnect and remove J350 from P350, J360 from P360, and J370 from P370 at the rear of trunk shelf no. 1.
7	Disconnect and remove J250 from P250 at the front end of power shelf no. 2, J210 from P210, J200 from P200, and J190 from P190 on the front end of the control shelf.

CHART 18 (Cont) – SUBSTITUTION OF TRUNK SHELF NO. 1

STEP	PROCEDURE
8	Remove the wire-harness clamp at the front end of the control shelf.
9	Remove the wire-harness clamp at the front end of line shelf no. 1.
10	Remove all red +5 V leads and black ground leads from the bus bars at the rear of power shelf no. 2 (Fig. 6).
11	Disconnect the speech-highway connector J410 from P410 (Fig. 25) at the rear of line shelf no. 1.
12	Remove all red +5 V leads and black ground leads in wire harness from the bus bars only on line shelf no. 1 and trunk shelf no. 2 and line shelves no. 2 and 3 if installed.
13	Disconnect P090, P130, and P150 from the connector cables, and remove P090, P130, and P150 from the connector panel.
14	Remove the wire harness from trunk shelf no. 1 from the cable brackets at the rear of the cabinet.
15	Remove the ground connection under P360 at the rear end of trunk shelf no. 1. The ground lead extends to the ground connection on the connector panel.
16	Remove trunk shelf no. 1, following the procedure described in Chart 5.
17	Install the replacement shelf as described in Chart 4.
18	Reconnect the ground connection under P360 at the rear end of trunk shelf no. 1. Ensure that the ground lead connections are tightened at both the connector-panel and trunk shelf ends.
19	Place all the cables behind the cable brackets. Lace or tie together all the cables and wires from slide no. 2 with twine, or a cable tie. When swing gate cabinet is provided, loop the cables up by the trunk shelf no. 1 and down to the receptacle panel. ←
20	Disconnect the emergency connector cable from J070 and J090. Mount P090, P130, and P150 on the connector panel in their assigned opening. Connect the appropriate connector cables to P070, P090 and P130, and connect J150 to P150. Tighten all connector screws.
21	Connect all red +5V leads and black ground leads to the bus bars at the rear of the line and trunk shelves. Connect the leads as shown in Fig. 15.
22	Connect the speech-highway connector J410 to P410 at the rear of the line shelf no. 1.

CHART 18(Cont) – SUBSTITUTION OF TRUNK SHELF NO. 1

STEP	PROCEDURE
23	Connect all red +5 V leads and black ground leads to the bus bars at the rear of power shelf no. 2. Connect the leads as shown in Fig. 6.
24	Secure the wire-harness clamp at the front end of line shelf no. 1.
25	Secure the wire-harness clamp at the front end of the control shelf.
26	Connect and tighten the screws on J200 to P200, J210 to P210, and J190 to P190 at the front end of the control shelf.
27	Connect and tighten the screws on J250 to P250 at the front end of power shelf no. 2.
28	Connect and tighten the screws on J350 to P350, J360 to P360, and J370 to P370 at the front end of trunk shelf no. 1.
29	Insert circuit packs as described in Part 4.
30	Flick the power switch on power shelf no. 2 to the ON position. Press the RESET button on power shelf no. 2 to restore normal service to the system.
31	Perform a transmission test on all trunks on trunk shelf no. 1.

CHART 19 – SUBSTITUTION OF LINE SHELF NO. 1

STEP	PROCEDURE
1	Extend slide no. 2 to the fully opened position, or open swing gate. ←
2	Flick the power switch on power shelf no. 2 to the OFF position.
3	Since the removal of line shelf no. 1 interrupts emergency service to the EPABX, a short emergency connector cable must be provided to bridge station lines (2)10 through (2)19 to trunks 1 through 10 during the substitution of the shelf.
4	Remove J070 and J090 from P070 and P090 on the connector panel.
5	Bridge J070 to J090 using the short double-ended (male) emergency connector cable (P0519592). Ensure that the wander ground start-lead attached to the emergency cable at the J070 end is connected to the ground terminal on the connector panel. This establishes direct emergency service connection.

CHART 19 (Cont) – SUBSTITUTION OF LINE SHELF NO. 1

STEP	PROCEDURE
6	Disconnect and remove J350 from P350, J360 from P360, and J370 from P370 at the front end of trunk shelf no. 1.
7	Disconnect and remove any jacks in P300 and P310 at the rear end of line shelf no. 1.
8	Disconnect and remove the speech-highway connector J420 from either P420 at the rear of line shelf no. 2, if installed, or the speech-highway bridge connector to trunk shelf no. 2, if installed.
9	Disconnect and remove the speech-highway connector J410 from P410 at the rear of line shelf no. 1.
10	Remove the wire-harness clamp at the front end panel of line shelf no. 1.
11	Disconnect P080 and P140 from the connector cables, and remove P070, P080, and P140 from the connector panel.
12	Remove all red +5 V leads and black ground leads on the bus bars at the rear of line shelf no. 1. The lead arrangement is shown in Fig. 6.
13	Remove line shelf no. 1, following the procedures described in Chart 5.
14	Install the replacement shelf, as described in Chart 4.
15	Connect all red +5 V leads and black ground leads to the bus bars at the rear of line shelf no. 1. Connect the leads as shown in Fig. 6.
16	Flick the power switch on power shelf no. 2 to the ON position. Press the RESET button on power shelf no. 2 to restore trunk answering service to the attendant console.
17	Place all cables from line shelf no. 1 behind the cable bracket at the rear of the cabinet. Lace or tie together all cables from slide no. 2 with cable ties. When swing gate cabinet is provided, loop cables up by trunk shelf no. 1 and down to the receptacle panel.
18	Disconnect the emergency connector cable from J070 and J090.
19	Mount P070, P080, and P140 on the connector panel in their assigned opening. Connect the appropriate connector cable to P070 and P080 and connect J140 to P140. Tighten all connector screws.
20	Place the wire-harness clamp at the front end panel of line shelf no. 1.

CHART 19 (Cont) – SUBSTITUTION OF LINE SHELF NO. 1	
STEP	PROCEDURE
21	Connect the speech-highway connector J410 to P410 at the rear of line shelf no. 1 (Fig. 25).
22	Perform <i>one</i> of the following operations with speech-highway connector J420. <ul style="list-style-type: none"> (a) If line shelves no. 2 and no. 3, and trunk shelf no. 2 are <i>not</i> present in the system, dress back the speech-highway connector J420 and the attached wire in the shelf back wiring to prevent damage to the connector. (b) If line shelf no. 2 is present in the system, connect J420 to P420 at the rear of line shelf no. 2. (c) If line shelves no. 2 and no. 3 are <i>not</i> present, but trunk shelf no. 2 is present, connect J420 to P430 using the speech-highway bridge connector (P0531694).
23	Perform <i>one</i> of the following operations on line shelf no. 1: <ul style="list-style-type: none"> (a) If line shelves no. 2 and no. 3 and trunk shelf no. 2 are <i>not</i> present in the system, connect the terminating jack QPF18A in P310, and tighten the screws. (b) If line shelf no. 2 is present in the system, connect J300 to P300, and J310 to P310 at the rear end of line shelf no. 1. (c) If line shelves no. 2 and no. 3 are <i>not</i> present, but trunk shelf no. 2 is present in the system, connect J380 to P300 and J390 to P310 at the rear end of line shelf no. 1.
24	Connect J350 to P350, J360 to P360, and J370 to P370 at the rear end of trunk shelf no. 1.
25	Insert circuit packs as described in Part 4.
26	Perform a transmission test on all station lines on line shelf no. 1.

4. CIRCUIT PACKS

4.01 The circuit pack used in the EPABX consists of a fiberglass sheet with components and solid-state logic circuits mounted on one of the sides. A single or double row of precious-metal-coated contacts is provided at the rear, and a handle marked with the code number and color designation of the circuit pack is provided at the front, a detailed description of circuit packs is given in Section 553-5011-200.

WARNING: Do not touch the circuit pack contacts with fingers or abrasives.

4.02 Some circuit packs bearing the same code number and color designation may differ in appearance, e.g., there may be surface wiring on some packs and not others. These differences do not affect the interchangeability of the circuit packs, if their code numbers on the handle are identical.

SECTION 553-5011-202

4.03 The make-up of typical circuit pack assembly code (QPJ60A CALL TFER IND CTL) is:

QPJ – prefix and common to all Pulse EPABX circuit pack assemblies

60 – base code number for identification of individual circuit packs

A – vintage control suffix-letter

CALL TFER

IND CTL – abbreviated name

When replacing circuit packs the base code number of the replacing and existing circuit packs must be identical. The vintage control suffix letter may be identical or a following letter, e.g. A QPJ60A may be replaced by a QPJ60A or QPJ60B.

Note: QPJ60A must not be used to replace a QPJ60B.

INSERTION AND REMOVAL

4.04 To install or remove a circuit pack, remove the front panel of the cabinet as described in Chart 1, then follow the procedure detailed in Chart 20.

CHART 20 – GENERAL CIRCUIT-PACK INSERTION/REMOVAL

STEP	PROCEDURE
→ 1	Extend the desired slide to the fully opened position (slider cabinet).
2	Select the appropriate shelf.
3	Tilt the circuit-pack locking bar forward.
4	Using the handle, pull the circuit pack to be replaced out of the connector.
5	Take the replacement circuit pack from the shipping container. Spray the circuit pack and connector contacts with a freon contact cleaning solvent, and remove dirt or grease residues with a clean soft-hair brush.
6	Insert the fiberglass edges of the replacement circuit pack in the upper and lower plastic aligning guides. Refer to the appropriate chart for connector assignment.
7	Push the circuit pack in until the contacts are fully engaged in the connector.
8	Perform operation tests on the features provided by the circuit pack.
9	Restore the locking bar to its original position.
10	Return the slide to the fully closed position and replace the front panel.
11	Tag the defective circuit pack.
12	Place the removed circuit pack in the empty container for return to the store.

LINE CIRCUIT ARRANGEMENT

4.05 The insertion of the appropriate circuit pack in a connector location for a line circuit provides the connections for two station lines, without any requirement for additional internal system wiring.

4.06 The station line class-of-service selection and feature strapping are described in Section 553-5011-204.

4.07 The emergency service enables station lines (2)10 to (2)19, connected to trunks 1 to 10 by the release of the power-fail transfer relays, to receive and place outgoing trunk calls while the system is in power-fail transfer mode. The station

line set must be equipped with a start key, e.g., 551A key or telephone set 510-type, or equivalent, to apply a ground on the ring side of the line to energize the CO equipment. One side of the start key must be grounded and the other side connected to the tip conductor of the station line so that grounding of the trunk is completed only when the receiver is off-hook.

4.08 To provide service to the desired station lines on shelves no. 1 and/or no. 2 and/or no. 3 follow the procedure in Chart 21.

4.09 The QPJ40-type circuit pack may be stored in any spare station line and trunk connectors.

CHART 21 – CIRCUIT-PACK INSERTION IN LINE SHELVES NO. 1, NO. 2, AND NO. 3

STEP	PROCEDURE
1	Extend slide no. 2 to the fully opened position. (slider cabinet).
2	Place all the yellow color-coded circuit packs next to the extended slide. Do not remove the circuit packs from the container.
3	All installation operations for line shelf no. 1 (Chart 3 or 16), line shelf no. 2 (Chart 7 or 8), and line shelf no. 3 (Chart 9 or 10) <i>must</i> be completed prior to inserting line circuit packs.
4	Check that the basic complement of four circuit packs shown in Fig. 27 is present in each line shelf. The four common circuits <i>must</i> be present in a line shelf to provide service.
5	Select the appropriate connector for the desired station lines from Fig. 28 (a), (b), or (c).
6	Insert the QPJ36-type circuit packs in the assigned station line connectors as described in Chart 20. QPJ40-type circuit pack may be relocated to a spare station line or trunk connector.
7	If line shelf no. 2 is installed for class-of-service selection on stations lines (2)50 through (2)89, insert a QPJ28-type circuit pack in connector location 24 on the control shelf.
8	If line shelf no. 3 is installed for class-of-service selection on station lines (3)10 through (3)49, insert QPJ28-type circuit pack in connector location 4 on the option shelf.
9	For information on class-of-service selection and feature strapping, refer to Section 553-5011-204.

TRUNK ARRANGEMENT

4.09 Although the basic circuit-pack complement for trunk shelf no. 1 differs from that of trunk shelf no. 2, the following three types of circuit packs are common to each shelf (Fig. 29):

QPJ33* Clamp/Link Gates

QPJ31* Trunk Buffer 1

QPJ42* Trunk Buffer 2

4.10 To ensure that the circuit packs for trunk services are inserted in the correct connector locations on the trunk shelves, follow the procedures given in Chart 22.

CHART 22 – CIRCUIT-PACK INSERTION IN TRUNK SHELVES NO. 1 AND NO. 2	
STEP	PROCEDURE
1	Extend slide no. 2 to the fully opened position. (slider cabinet)
2	Place all the brown color-coded circuit packs next to the extended slide. Do not remove the circuit pack from its container.

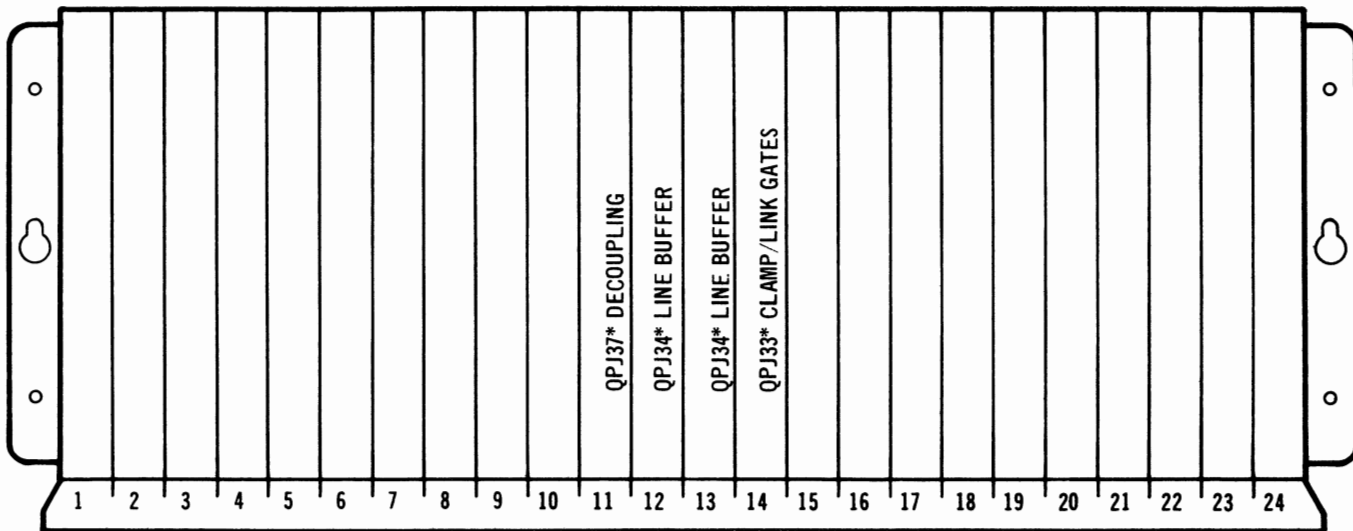


Fig. 27 – Basic Complement of Circuit Packs in Line Shelves

1	QPJ36* LINE CIRCUIT	(2)10 (2)11
2	QPJ36* LINE CIRCUIT	(2)12 (2)13
3	QPJ36* LINE CIRCUIT	(2)14 (2)15
4	QPJ36* LINE CIRCUIT	(2)16 (2)17
5	QPJ36* LINE CIRCUIT	(2)18 (2)19
6	QPJ36* LINE CIRCUIT	(2)20 (2)21
7	QPJ36* LINE CIRCUIT	(2)22 (2)23
8	QPJ36* LINE CIRCUIT	(2)24 (2)25
9	QPJ36* LINE CIRCUIT	(2)26 (2)27
10	QPJ36* LINE CIRCUIT	(2)28 (2)29
11	QPJ37* DECOUPLING & MAINT	
12	QPJ34* T-LINE BUFFER	
13	QPJ34* C-LINE BUFFER	
14	QPJ33* CLAMP & LINK GATE	
15	QPJ36* LINE CIRCUIT	(2)30 (2)31
16	QPJ36* LINE CIRCUIT	(2)32 (2)33
17	QPJ36* LINE CIRCUIT	(2)34 (2)35
18	QPJ36* LINE CIRCUIT	(2)36 (2)37
19	QPJ36* LINE CIRCUIT	(2)38 (2)39
20	QPJ36* LINE CIRCUIT	(2)40 (2)41
21	QPJ36* LINE CIRCUIT	(2)42 (2)43
22	QPJ36* LINE CIRCUIT	(2)44 (2)45
23	QPJ36* LINE CIRCUIT	(2)46 (2)47
24	QPJ36* LINE CIRCUIT	(2)48 (2)49

(a) Line Shelf No. 1

1	QPJ36* LINE CIRCUIT	(2)50 (2)51
2	QPJ36* LINE CIRCUIT	(2)52 (2)53
3	QPJ36* LINE CIRCUIT	(2)54 (2)55
4	QPJ36* LINE CIRCUIT	(2)56 (2)57
5	QPJ36* LINE CIRCUIT	(2)58 (2)59
6	QPJ36* LINE CIRCUIT	(2)60 (2)61
7	QPJ36* LINE CIRCUIT	(2)62 (2)63
8	QPJ36* LINE CIRCUIT	(2)64 (2)65
9	QPJ36* LINE CIRCUIT	(2)66 (2)67
10	QPJ36* LINE CIRCUIT	(2)68 (2)69
11	QPJ37* DECOUPLING & MAINT	
12	QPJ34* T-LINE BUFFER	
13	QPJ34* C-LINE BUFFER	
14	QPJ33* CLAMP & LINK GATE	
15	QPJ36* LINE CIRCUIT	(2)70 (2)71
16	QPJ36* LINE CIRCUIT	(2)72 (2)73
17	QPJ36* LINE CIRCUIT	(2)74 (2)75
18	QPJ36* LINE CIRCUIT	(2)76 (2)77
19	QPJ36* LINE CIRCUIT	(2)78 (2)79
20	QPJ36* LINE CIRCUIT	(2)80 (2)81
21	QPJ36* LINE CIRCUIT	(2)82 (2)83
22	QPJ36* LINE CIRCUIT	(2)84 (2)85
23	QPJ36* LINE CIRCUIT	(2)86 (2)87
24	QPJ36* LINE CIRCUIT	(2)88 (2)89

(b) Line Shelf No. 2

1	QPJ36* LINE CIRCUIT	310 311
2	QPJ36* LINE CIRCUIT	312 313
3	QPJ36* LINE CIRCUIT	314 315
4	QPJ36* LINE CIRCUIT	316 317
5	QPJ36* LINE CIRCUIT	318 319
6	QPJ36* LINE CIRCUIT	320 321
7	QPJ36* LINE CIRCUIT	322 323
8	QPJ36* LINE CIRCUIT	324 325
9	QPJ36* LINE CIRCUIT	326 327
10	QPJ36* LINE CIRCUIT	328 329
11	QPJ37* DECOUPLING & MAINT	
12	QPJ34* T-LINE BUFFER	
13	QPJ34* C-LINE BUFFER	
14	QPJ33* CLAMP & LINK GATE	
15	QPJ36* LINE CIRCUIT	330 331
16	QPJ36* LINE CIRCUIT	332 333
17	QPJ36* LINE CIRCUIT	334 335
18	QPJ36* LINE CIRCUIT	336 337
19	QPJ36* LINE CIRCUIT	338 339
20	QPJ36* LINE CIRCUIT	340 341
21	QPJ36* LINE CIRCUIT	342 343
22	QPJ36* LINE CIRCUIT	344 345
23	QPJ36* LINE CIRCUIT	346 347
24	QPJ36* LINE CIRCUIT	348 349

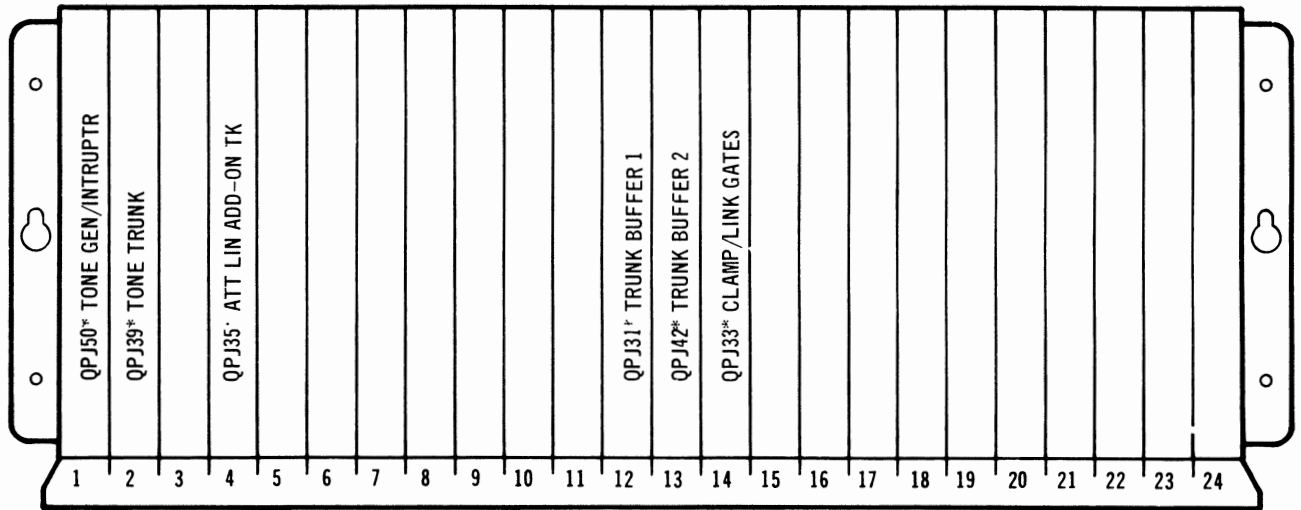
(c) Line Shelf No. 3

NOTE: IN HOTEL/MOTEL SERVICE, THE STATION LINE NUMBERS ARE REFERRED TO AS SYSTEM NUMBERS. THE DIALED NUMBERS (ROOM NUMBERS) ASSOCIATED WITH THE SYSTEM NUMBERS ARE GIVEN IN SECTION 553-5011-207 (LOCATED IN PULSE CABINET)

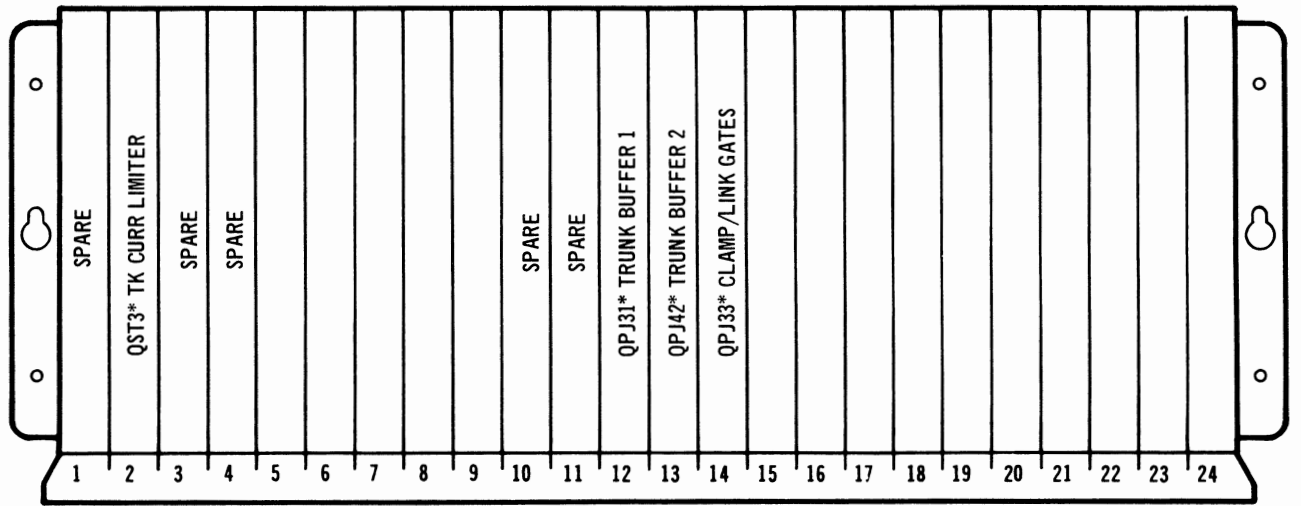
Fig. 28 — Station Line Connector Assignment on Line Shelves

CHART 22 (Cont) – CIRCUIT-PACK INSERTION IN TRUNK SHELVES NO. 1 AND NO. 2

STEP	PROCEDURE
3	All installation procedures for trunk shelf no. 1 (Chart 3 or 18) and trunk shelf no. 2 (Chart 11, 12 or 13) <i>must</i> be completed before the trunk circuit packs are inserted.
4	Check that the basic complement of circuit packs is present in trunk shelf no. 1 and/or trunk shelf no. 2 as shown in Fig. 29. The basic circuit packs <i>must</i> be present in the trunk shelf connector to provide service.
5	Complete trunk shelf no. 1 trunk assignment before proceeding to trunk shelf no. 2 trunk assignment.
6	<p>Consider the following points when assigning trunk-connector locations:</p> <p>(a) Incoming-only trunks should be assigned to trunk number locations 1 through 10. This provides incoming trunk answering for PFT. During PFT, stations (2)10 through (2)19 may complete 2-way calls through the CO trunk bridge provided by the PFT relays. The emergency-station telephones must be equipped with a ground start button if bridged to a trunk strapped for ground start at the CO.</p> <p>(b) Outgoing-only trunks should be assigned to locations <i>other</i> than 1 through 10. Outgoing trunks are then available for access by station lines in the event of attendant-initiated PFT caused by major console operation failure.</p> <p>(c) The outgoing trunk-hunting process starts at the highest trunk number to which a trunk is assigned and continues towards the lowest trunk number.</p> <p>(d) If the Direct-Inward-Dialing (DID) feature is provided and the EPABX is not equipped with reserve power, outgoing trunks should be assigned to trunk number locations 1 through 10. This provides access for outgoing calls during a commercial power failure.</p>
7	<p>For trunk shelf no. 1:</p> <p>(a) Select the appropriate connector from Table C for each of the trunks assigned to trunk shelf no. 1. Read all notes in Table C before selecting the connectors.</p> <p>(b) Complete the trunk COS diode pin installation record sheet as shown in Chart 5, Section 553-5011-204.</p> <p>(c) Insert the trunk circuit packs as described in Chart 20 in the assigned connectors shown in Fig. 30(a).</p>



(a) Trunk Shelf No. 1

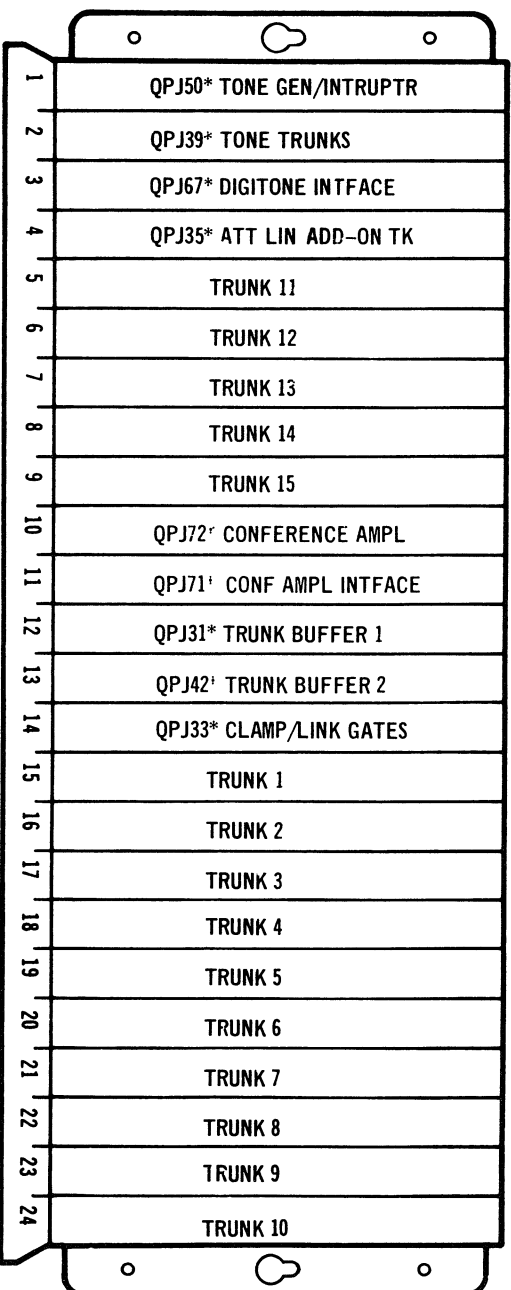


(b) Trunk Shelf No. 2

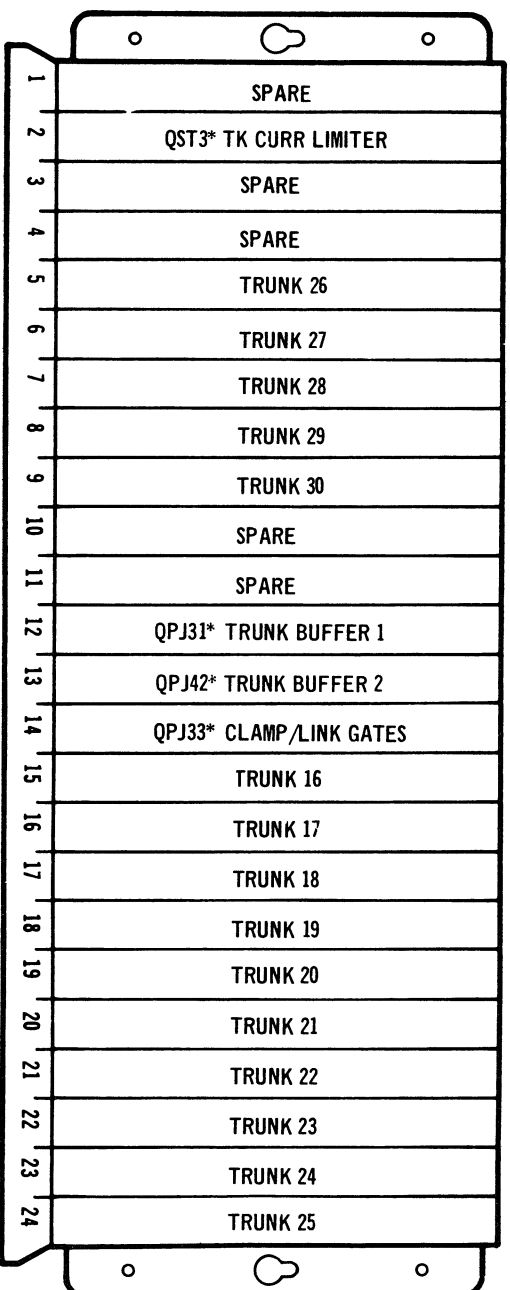
Fig. 29 – Basic Circuit Pack Complement on Trunk Shelves

TABLE C
TRUNKS-CIRCUIT PACK INSTALLATION
(Trunk Shelf No. 1)

TRUNK NO.	CONN LOC	DICT.	PAGING	TIE TK DR OR OAID	TIE TK E&M, OR DX	CCSA	2-WAY FX W/GAIN OR WATS	2-WAY FX NON/GAIN OR WATS	DID	CO OR I/C FX W/GAIN	CO OR I/C FX NON/GAIN
		<p><i>Notes:</i></p> <ol style="list-style-type: none"> The order of circuit-pack installation is from left to right of the table. When special access trunks are installed, ensure that QPJ62* is installed in connector location 23, control shelf and for 2-digit station line numbering system QPJ28* is installed in connector location 24. There is a maximum of five QPJ75* (paging) and two QPJ73* (dictation) circuit packs in any installation. Connector location 5 provides paging attendant preempt facility. The types of trunk in connectors 15 to 24 must permit emergency service stations to receive and place trunk calls when the system is in power-fail transfer mode. If a customer-supplied audio source is connected to the music-on-hold (QPJ181*) trunk(s), one of the circuit packs in connector locations 5 through 9 must not be a QPJ69* or QPJ75*. 									
1	15								QPJ76*	QPJ(1)81*	QPJ38*
2	16								QPJ76*	QPJ(1)81*	QPJ38*
3	17								QPJ76*	QPJ(1)81*	QPJ38*
4	18								QPJ76*	QPJ(1)81*	QPJ38*
5	19								QPJ76*	QPJ(1)81*	QPJ38*
6	20								QPJ76*	QPJ(1)81*	QPJ38*
7	21								QPJ76*	QPJ(1)81*	QPJ38*
8	22								QPJ76*	QPJ(1)81*	QPJ38*
9	23								QPJ76*	QPJ(1)81*	QPJ38*
10	24								QPJ76*	QPJ(1)81*	QPJ38*
11	5	—	QPJ75*	QPJ76*	QPJ69*	QPJ69*	QPJ(1)81*	QPJ38*	QPJ76*	QPJ(1)81*	QPJ38*
12	6	QPJ73*	QPJ75*	QPJ76*	QPJ69*	QPJ69*	QPJ(1)81*	QPJ38*	QPJ76*	QPJ(1)81*	QPJ38*
13	7	QPJ73*	QPJ75*	QPJ76*	QPJ69*	QPJ69*	QPJ(1)81*	QPJ38*	QPJ76*	QPJ(1)81*	QPJ38*
14	8	—	QPJ75*	QPJ76*	QPJ69*	QPJ69*	QPJ(1)81*	QPJ38*	QPJ76*	QPJ(1)81*	QPJ38*
15	9	—	QPJ75*	QPJ76*	QPJ69*	QPJ69*	QPJ(1)81*	QPJ38*	QPJ76*	QPJ(1)81*	QPJ38*



(a) Trunk Shelf No. 1



(b) Trunk Shelf No. 2

Fig. 30 – Assignment of Trunks to Connectors on Trunk Shelves

CHART 22 (Cont) – CIRCUIT-PACK INSERTION IN TRUNK SHELVES NO. 1 AND NO. 2

STEP	PROCEDURE
8	<p>For trunk shelf no. 2:</p> <p>(a) Select the appropriate connector from Table D for each of the trunks assigned to trunk shelf no. 2. Read all notes in Table D before selecting the connectors.</p> <p>(b) Complete the trunk COS diode pin installation record sheet as shown in Chart 5, Section 553-5011-204.</p> <p>(c) Insert the trunk circuit packs as described in Chart 20 in the assigned connectors shown in Fig. 30(b).</p>
9	For information on class-of-service selection and feature strapping, refer to Section 553-5011-204.

OPTIONAL FEATURE ARRANGEMENT

4.11 A list of optional features and the circuit packs is given in Tables E and F. Install the optional circuit packs as required in the location given in Table E or F, as applicable. A fully equipped option shelf is shown in Fig. 31, and a fully equipped control shelf is shown in Fig. 26.

4.12 The dial-pulse sender, QPJ30-type circuit pack, is required to convert the attendant console dc dial signals to dial pulse signals for trunk calls. The DIGITONE sender QPJ68-type circuit pack replaces the QPJ30-type circuit pack, equipping trunks for DIGITONE dialing.

4.13 For information on class-of-service selection and feature strapping requirements, refer to Section 553-5011-204.

5. CABINET CABLE CONNECTIONS

ENTRY INTO CABINET

5.01 Before placing the cables in conduit or running them exposed, both ends of the connector cables must be marked with an identical marking to prevent cable interchange.

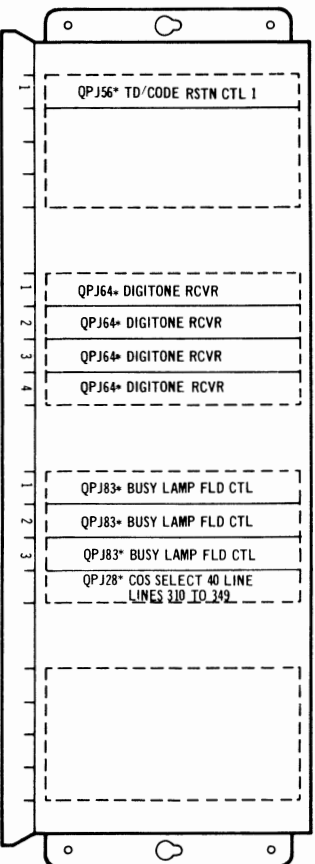
5.02 Entry into the cabinet is made from either the rear of the cabinet base or directly from the underfloor run or conduit through the base opening. When the base opening serves as a cable entry, the cables must be installed prior to placing the cabinet in its final location. Base entry is provided on slider cabinets only.

5.03 To place the connector cables through the cabinet rear entry (Fig. 32):

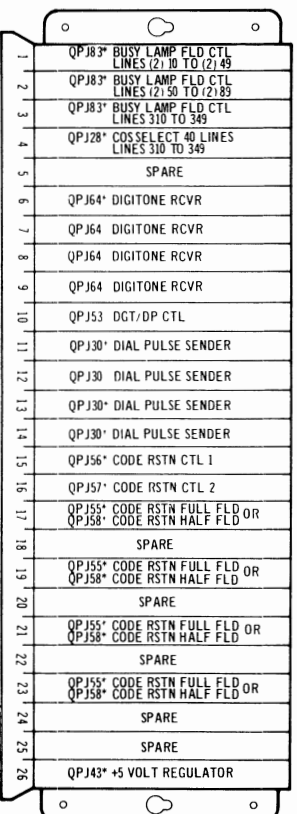
- (a) loosen the screw in the center of the adjustable plate closest to the cable run
- (b) slide the adjustable plate towards the side of the cabinet
- (c) insert the cables, including the power cord, through the opening into the cabinet base
- (d) pull the excess cable into the cabinet and coil it neatly in the base of the cabinet
- (e) slide the adjustable plate to close the opening, ensure that the cable is not squeezed against the metal edge of the opening.

TABLE D
TRUNKS-CIRCUIT PACK INSTALLATION
(Trunk Shelf No. 2)

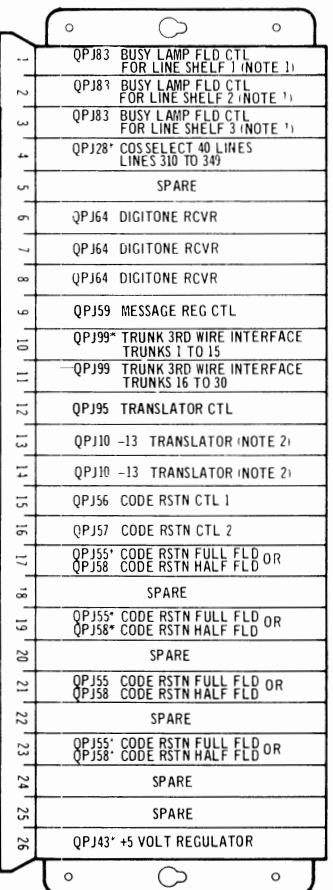
TRUNK NO.	CONN LOC	TIE TK DR OR OAID	TIE TK E&M, OR DX	CCSA	2-WAY FX W/GAIN OR WATS	2-WAY FX NON/GAIN OR WATS	DID	CO OR I/C FX W/GAIN	CO OR I/C FX NON/GAIN
		<i>Notes:</i>							
		1. Ensure that QPJ43* is installed in connector location 3 on power shelf no. 1.							
16	15	2. When special access trunks are installed, ensure that QPJ62* is installed in connector location 23, control shelf and for 2-digit station line numbering system QPJ28* is installed in connector location 24.							
17	16								
18	17								
19	18								
20	19								
21	20								
22	21								
23	22								
24	23								
25	24								
		3. If a customer-supplied audio source is connected to the music-on-hold (QPJ181*) trunk(s), one of the circuit packs in connector locations 5 through 9 must not be a QPJ69*.							
26	5	QPJ76*	QPJ69*	QPJ69*	QPJ(1)81*	QPJ38*	QPJ76*	QPJ(1)81*	QPJ38*
27	6	QPJ76*	QPJ69*	QPJ69*	QPJ(1)81*	QPJ38*	QPJ76*	QPJ(1)81*	QPJ38*
28	7	QPJ76*	QPJ69*	QPJ69*	QPJ(1)81*	QPJ38*	QPJ76*	QPJ(1)81*	QPJ38*
29	8	QPJ76*	QPJ69*	QPJ69*	QPJ(1)81*	QPJ38*	QPJ76*	QPJ(1)81*	QPJ38*
30	9	QPJ76*	QPJ69*	QPJ69*	QPJ(1)81*	QPJ38*	QPJ76*	QPJ(1)81*	QPJ38*



(a) QSP6P Option Shelf

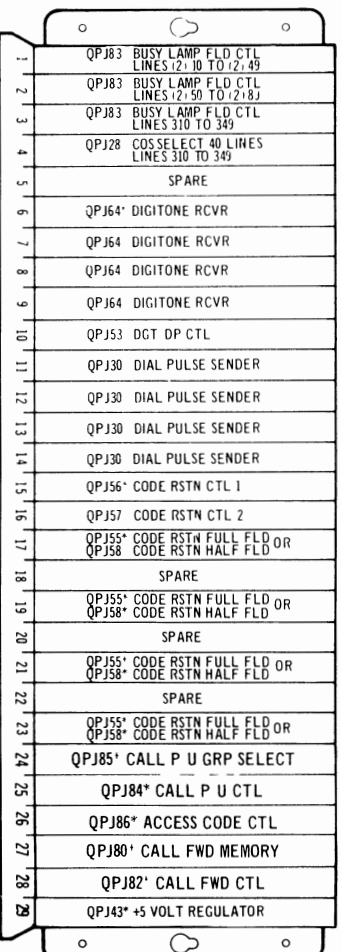


(b) QSP6M Option Shelf



(c) QSP6R Option Shelf
(Hotel/Motel Service Only)

NOTES
 1 FOR HOTEL/MOTEL SERVICE QPJ83-TYPE CIRCUIT PACKS ARE USED TO DRIVE MESSAGE REGISTRATION EQUIPMENT
 2 THE CODE NUMBER OF THE TRANSLATOR DEPENDS UPON THE CHOICE OF ROOM NUMBERING PLAN
 3 THE QSP6R3 HOTEL/MOTEL SHELF INCLUDES CAPABILITIES FOR A BUSY LAMP FIELD QPJ83-TYPE CIRCUIT PACKS ARE INSTALLED IN CONNECTOR LOCATION 25A 25B AND 25C



(d) QSP6U Option Shelf

Fig. 31 — Fully Equipped Option Shelf

TABLE E
OPTIONAL CIRCUIT PACK INSTALLATION
(EXCLUDING HOTEL/MOTEL SERVICE)

FEATURES	CIRCUIT PACK APPARATUS CODE	CONNECTOR LOCATION	SHELF	REMARKS
Call Transfer – Individual Consultation Hold, Add-On	QPJ60*	8 9	Control Shelf	
Exec. Ring- back and Exec. Over- ride	QPJ77* QPJ61*	6 9	Control Shelf Control Shelf	QPJ28* circuit pack must be installed for each line shelf QPJ61* also provides Camp-On Individual and TAFAS Features
Traffic Measurement	QPJ74* QPJ78* QPJ78*	3 2 1	Control Shelf Control Shelf Control Shelf	
Camp-On Indi- vidual, TAFAS	QPJ61*	9	Control Shelf	Already provided when Executive Ringback and Override are installed.
Attendant Conference	QPJ72* QPJ71* QPJ65*	10 11 5	Trunk Shelf No. 1 Trunk Shelf No. 1 Control Shelf	
Busy Ver., Barge-In Lockout, Secrecy	QPJ63*	10	Control Shelf	
Maintenance Test	QPJ97*	2	Control Shelf	
DIGITONE Attendant Sending	QPJ68*	7	Control Shelf	Replaces QPJ30*
Dial Pulse Attendant Sending	QPJ30*	7	Control Shelf	Replaces QPJ68*
2-Digit Station Line Numbering	QPJ19*	4	Control Shelf	Replaces QPJ54* to convert station line numbering from 3-digit to 2-digit Strap pins given in Section 553-5011-204 cannot be used if call-pickup or call-forward features are provided.
3-Digit Station Line Numbering	QPJ54*	4	Control Shelf	Provides 3-digit station line numbering when inserted in lieu of QPJ19* Strap pins given Section 553-5011-204. A QPJ54B or later vintage is required if call-pickup or call-forward features are provided.
DIGITONE to Dial Pulse Conversion and DIGITONE Dialing	QPJ67* QPJ30* QPJ30* QPJ30* QPJ30* QPJ53* QPJ64* QPJ64* QPJ64* QPJ64* QPJ43*	3 11 12 13 14 10 6 7 8 9 †26	Trunk Shelf No. 1 QSP6M or QSP6U Option Shelf † QPJ43* is located in con- nector 29 in QSP6U Option Shelf	Refer to Table G for the number of QPJ64* and QPJ30* circuit packs to be inserted QPJ43* is common for both DGT/DP Conversion and Code Restriction. QPJ43 is not required when the integrated power shelf is provided.

TABLE E (Cont)
OPTIONAL CIRCUIT PACK INSTALLATION
(EXCLUDING HOTEL/MOTEL SERVICE)

FEATURES	CIRCUIT PACK APPARATUS CODE	CONNECTOR LOCATION	SHELF	REMARKS
DIGITONE Dialing without DGT/DP Conversion	QPJ67* QPJ64* QPJ64* QPJ64* QPJ64*	3 6 7 8 9	Trunk Shelf No. 1 QSP6M or QSP6U Option Shelf	2-QPJ64* for 1 to 40 lines 3-QPJ64* for 41 to 80 lines 4-QPJ64* for 81 to 120 lines
Busy Lamp Field	QPJ83* QPJ83* QPJ83*	1 2 3	QSP6M or QSP6U Option Shelf	Station Lines (2)10 to (2)49 Station Lines (2)50 to (2)89 Station Lines 310 to 349
Class of Service Selection for Station Lines 310 to 349	QPJ28*	4	QSP6M or QSP6U Option Shelf	For diode pin assignment see Section 553-5011-204
Code Restriction Full Field or Half Field	QPJ43* QPJ56* QPJ57* QPJ55* QPJ55* QPJ55* QPJ55* QPJ58* QPJ58* QPJ58* QPJ58*	26 15 16 17 19 21 23 17 19 21 23	QSP6M or QSP6U Option Shelf	QPJ43* is common to other features on the QSP6M Option Shelf. The half field QPJ58* circuit pack occupies the same connector as the QPJ55* circuit pack. A QPJ55* cannot be installed in connector location 23, if a QPJ85* is installed in connector location 24. QPJ43* is not required when the integrated power shelf is provided.
Toll Denial	QPJ56 ¹	15	QSP6M or QSP6U Option Shelf	
DIGITONE Dialing without DGT/DP Conversion	QPJ67 ¹ QPJ64 ² QPJ64 ² QPJ64 ³ QPJ64 ⁴	3 1 2 3 4	Trunk Shelf No. 1 DIGITONE Subshelf in QSP6P Option Shelf	2 required for 1 to 40 lines 3 required for 41 80 lines 4 required for 81 120 lines Refer to Section 553-5011-204 to provide the feature at the station line.
Busy Lamp Field	QPJ83 ² QPJ83 QPJ83 ²	1 2 3	Busy Lamp Field Subshelf in QSP6P Option Shelf	Station Lines 210 to 249 Station Lines 250 to 289 Station Lines 310 to 349
Class of Service Selection for station lines 310 to 349	QPJ28*	4	Busy Lamp Field Subshelf in QSP6P Option Shelf	For diode pin assignment see Section 553-5011-504
Toll Denial	QPJ56*	1	Toll-Denial Subshelf in QSP6P Option Shelf	
Call Forward	QPJ80* QPJ82* QPJ86* QPJ43* QPJ54B	27 28 26 29 4	QSP6U Option Shelf Control Shelf	QPJ43* is common to other features on the QSP6U Option Shelf. QPJ86* is common to Call Pickup and Call Forward. QPJ43* is not required when the integrated power shelf is provided. Strap pins for 3 digit numbering plan given in Section 553-5011-204.

TABLE E (Cont)
OPTIONAL CIRCUIT PACK INSTALLATION
(EXCLUDING HOTEL/MOTEL SERVICE)

FEATURES	CIRCUIT PACK APPARATUS CODE	CONNECTOR LOCATION	SHELF	REMARKS
Call Pickup W/O Group Pickup	QPJ84*	25	QSP6U Option Shelf	QPJ43* is common to other features on the QSP6U Option Shelf. QPJ86* is common to Call Pickup and Call Forward. QPJ43* is not required when the integrated power shelf is provided.
	QPJ86*	26		
QPJ43*	29			
	QPJ54B	4	Control Shelf	Strap pins for 3-digit numbering plan given in Section 553-5011-204.
Call Pickup W/Group Pickup	QPJ85*	24	QSP6U Option Shelf	QPJ43* is common to other features on the QSP6U Option Shelf. QPJ86* is common to Call Pickup and Call Forward. QPJ43* is not required when the integrated power shelf is provided.
	QPJ84*	25		
	QPJ86*	26		
	QPJ43*	29		
	QPJ54B	4	Control Shelf	Strap pins for 3-digit numbering plan given in Section 553-5011-204



**TABLE F
OPTIONAL CIRCUIT PACK INSTALLATION
(HOTEL/MOTEL SERVICE ONLY)**

FEATURES	CIRCUIT PACK APPARATUS CODE	CONNECTOR LOCATION	SHELF	REMARKS
Call Transfer – Individual Consultation Hold, Add-On	QPJ60*	8	Control Shelf	
Exec. Ring-back and Exec. Override	QPJ77* QPJ61*	6 9	Control Shelf Control Shelf	QPJ28* circuit pack must be installed for each line shelf. QPJ61* also provides Camp-On Individual and TAFAS features.
Traffic Measurement	QPJ74* QPJ78* QPJ78*	3 2 1	Control Shelf Control Shelf Control Shelf	
Camp-On Individual, TAFAS	QPJ61*	9	Control Shelf	Already provided when Executive Ringback and Override are installed.
Attendant Conference	QPJ72* QPJ71* QPJ65*	10 11 5	Trunk Shelf No. 1 Trunk Shelf No. 1 Control Shelf	
Busy Ver., Barge-In Lockout, Secrecy	QPJ63*	10	Control Shelf	
Maintenance Test	QPJ97*	2	Control Shelf	
DIGITONE Attendant Sending	QPJ68*	7	Control Shelf	Replaces QPJ30*
Dial Pulse Attendant Sending	QPJ30*	7	Control Shelf	Replaces QPJ68*

TABLE F (Cont)
OPTIONAL CIRCUIT PACK INSTALLATION
(HOTEL/MOTEL SERVICE ONLY)

FEATURES	CIRCUIT PACK APPARATUS CODE	CONNECTOR LOCATION	SHELF	REMARKS
DIGITONE Dialing	QPJ67* QPJ64* QPJ64* QPJ64*	3 6 7 8	Trunk Shelf No. 1 QSP6R Option Shelf	DGT/DP Conversion feature is not available with hotel/motel service. 2-QPJ64* for 1 to 40 lines 3-QPJ64* for 41 to 120 lines
Class of Service Selection for Station Lines 310 to 349	QPJ28*	4	QSP6R Option Shelf	For diode pin assignment see Section 553-5011-204
Code Restriction Full Field or Half Field	QPJ43* QPJ56* QPJ57* QPJ55* QPJ55* QPJ55* QPJ55* QPJ58* QPJ58* QPJ58* QPJ58*	26 15 16 17 19 21 23 17 19 21 23	 QSP6R Option Shelf	QPJ43* is common to other features on the QSP6R Option Shelf. The half field QPJ58* circuit pack occupies the same connector as the QPJ55* circuit pack. QPJ43* is not required when the integrated power shelf is provided.
Toll Denial	QPJ56*	15	QSP6R Option Shelf	
Number Translation	QPJ95* QPJ10*-13* QPJ10*-13*	12 13 14	QSP6R Option Shelf	For translator numbering plans (dialed numbers vs. system numbers). See Section 553-5011-207.
Message Registration	QPJ59* QPJ99* QPJ99* QPJ83* QPJ83* QPJ83*	9 10 11 1 2 3	QSP6R Option Shelf	QPJ99* required only if Trunk 3rd Wire Control is used. System numbers 210 to 249. System numbers 250 to 289. System numbers 310 to 349.
Busy Lamp Field	QPJ83*	25A 25B 25C	QSP6R3 Option shelf. Special console no. sheet also required.	System numbers 210 to 249 System numbers 250 to 289 System numbers 310 to 349

5.04 For base cable entry slider cabinet only: ←

- (a) remove the four self-tapping screws securing the plate to the base of the cabinet
- (b) remove the plate and store it in the cabinet base
- (c) store the screws by placing and tightening them in their original location.

5.05 For both rear and base entry, attach the connector cables to the cabinet frame with cable ties.

COMMERCIAL-POWER-SOURCE CONNECTION

5.06 The commercial power source is connected to the system by a 15-foot, 3-conductor, 16-AWG cab tire cord, fitted with one male, 3-pin, U-type, grounded plug and one female Hubbell twist-lock connector. The U-type plug connects to a commercial power source of 115-V, 60-Hz fused for 15 A.

CONNECTOR-CABLE CONNECTIONS

5.07 The internal cabinet wiring from the equipment shelves is terminated on connectors located on a connector panel (Fig. 33). The connector-cables connections described in Chart 23, extend the wiring from the panel to a cross-connecting terminal. A typical terminal layout is shown in Fig. 34.

5.08 To connect connector cables to the traffic measurement interface:

- (a) enter the cables in the cabinet through either the base or rear openings

(b) place the cables behind the retaining bars at the back of the cabinet

(c) with cable ties, tie the cable to the wire harness from slide no. 1

(d) dress the connector cables so that they do not obstruct the opening of slide no. 1.

GROUND CONNECTION

5.09 The system must be connected to an approved ground. Use a 10-AWG wire (when cabinet is located 10 feet or less from the approved local ground) or a 6-AWG wire (when cabinet is located more than 10 feet from the approved ground) from the ground lug on the connector panel (Fig. 33, 34 and 35). All external equipment connected to the PULSE 120 EPABX must use this approved ground when required.

6. ATTENDANT CONSOLE

6.01 The console is installed by plugging the mounting cord into the appropriate cable connectors as described in Part 7.

FACEPLATE REPLACEMENT

6.02 The faceplate of the console may be removed either for replacement by an optional faceplate (blue or green) or to gain access to the interior of the console. The procedure for removal and replacement is given in Chart 24.

BUSY LAMP FIELD PANEL REPLACEMENT

6.03 The procedure for removal and replacement of the busy-lamp-field panel is given in Chart 25.

TABLE G
DIGITONE TO DIAL PULSE CONVERSION
CIRCUIT PACK REQUIREMENT

NO. OF O/G TRUNKS REQUIRING DIAL PULSE CONVERSION	0 – 20 LINES		21 – 40 LINES		41 – 80 LINES		81 – 120 LINES	
	NO. QPJ64*	NO. QPJ30*	NO. QPJ64*	NO. QPJ30*	NO. QPJ64*	NO. QPJ30*	NO. QPJ64*	NO. QPJ30*
0	2	0	3	0	3	0	3	0
1	2	2	3	2	3	2	3	2
2	3	2	3	2	3	2	3	2
3	3	3	3	3	3	3	3	3
4	3	3	3	3	3	3	3	3
5	3	3	3	3	3	3	3	3
6	3	3	3	3	3	3	3	3
7	3	3	3	3	4	3	4	3
8			3	3	4	3	4	3
9			3	3	4	4	4	4
10			3	3	4	4	4	4
11					4	4	4	4
12					4	4	4	4
13					4	4	4	4
14					4	4	4	4
15					4	4	4	4
18							4	4
20							4	4
22							4	4
25							4	4
30							4	4

DESIGNATION CARDS

6.04 The designations for the buttons and their associated lamp indicators are placed in the console before shipping. Paper strips are supplied with the console to designate incoming call indicator lamps and circuit-group busy-lamps. The strips are inscribed as required and placed over the appropriate row of lamps by the installer (Chart 26.)

6.05 The number card is placed (Chart 27) under a designation window situated below the DIGITONE dial on the console.

CRADLE ATTACHMENT

6.06 The cradle is attached to the console as described in Chart 28.

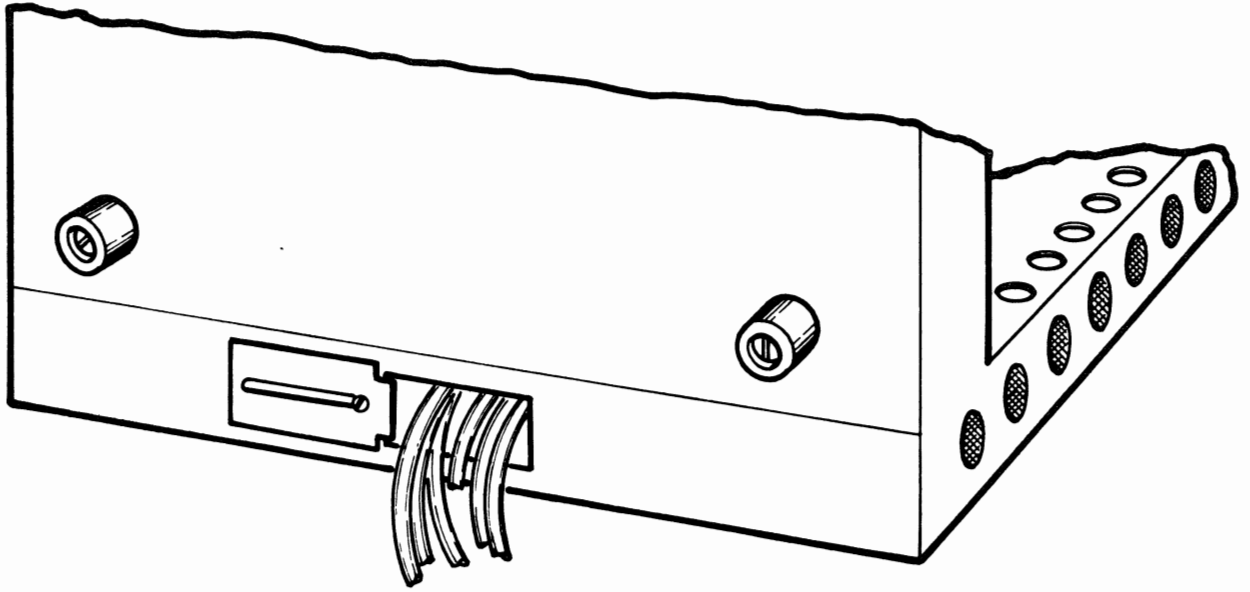


Fig. 32 - Cable Entry at the Rear of the EPABX

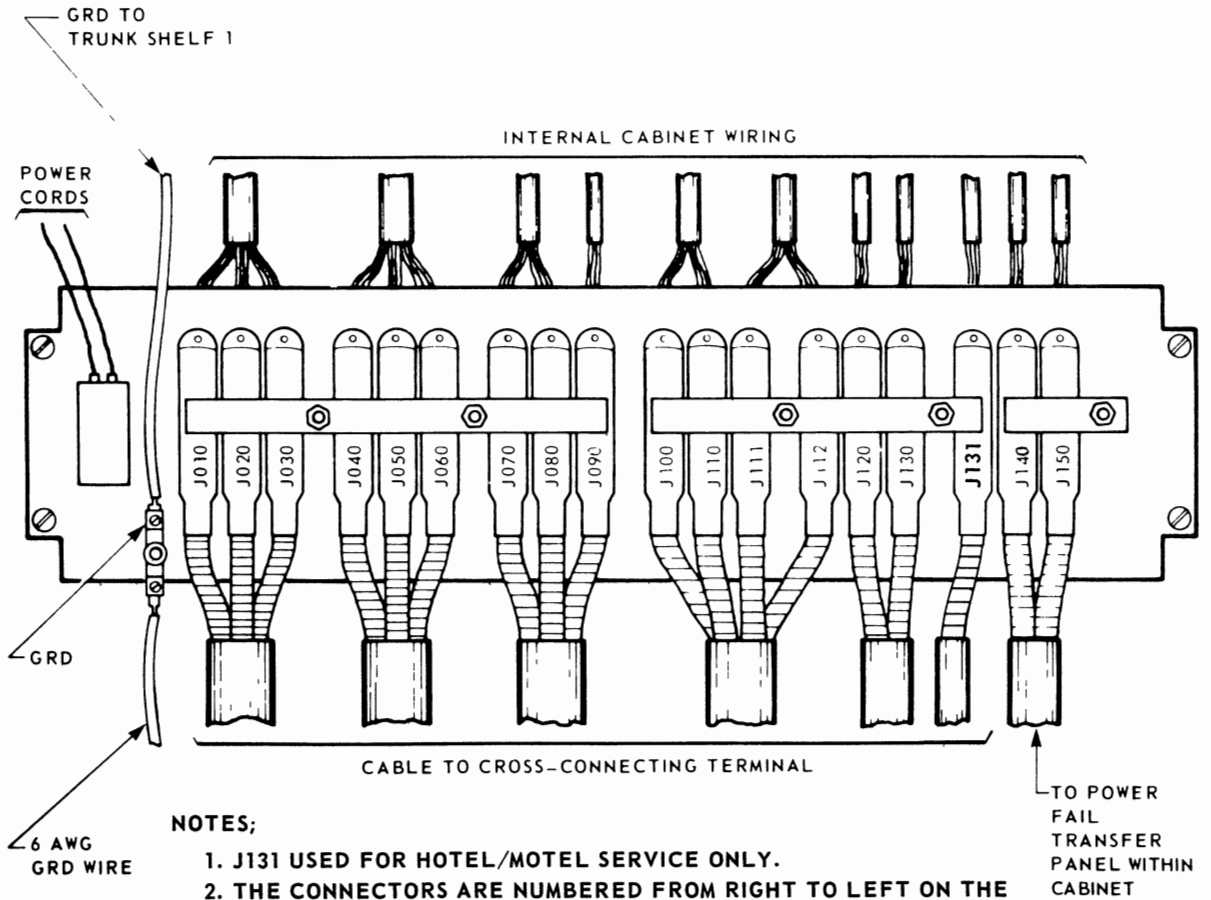


Fig. 33 - Distribution of Cables From the Connector Panel

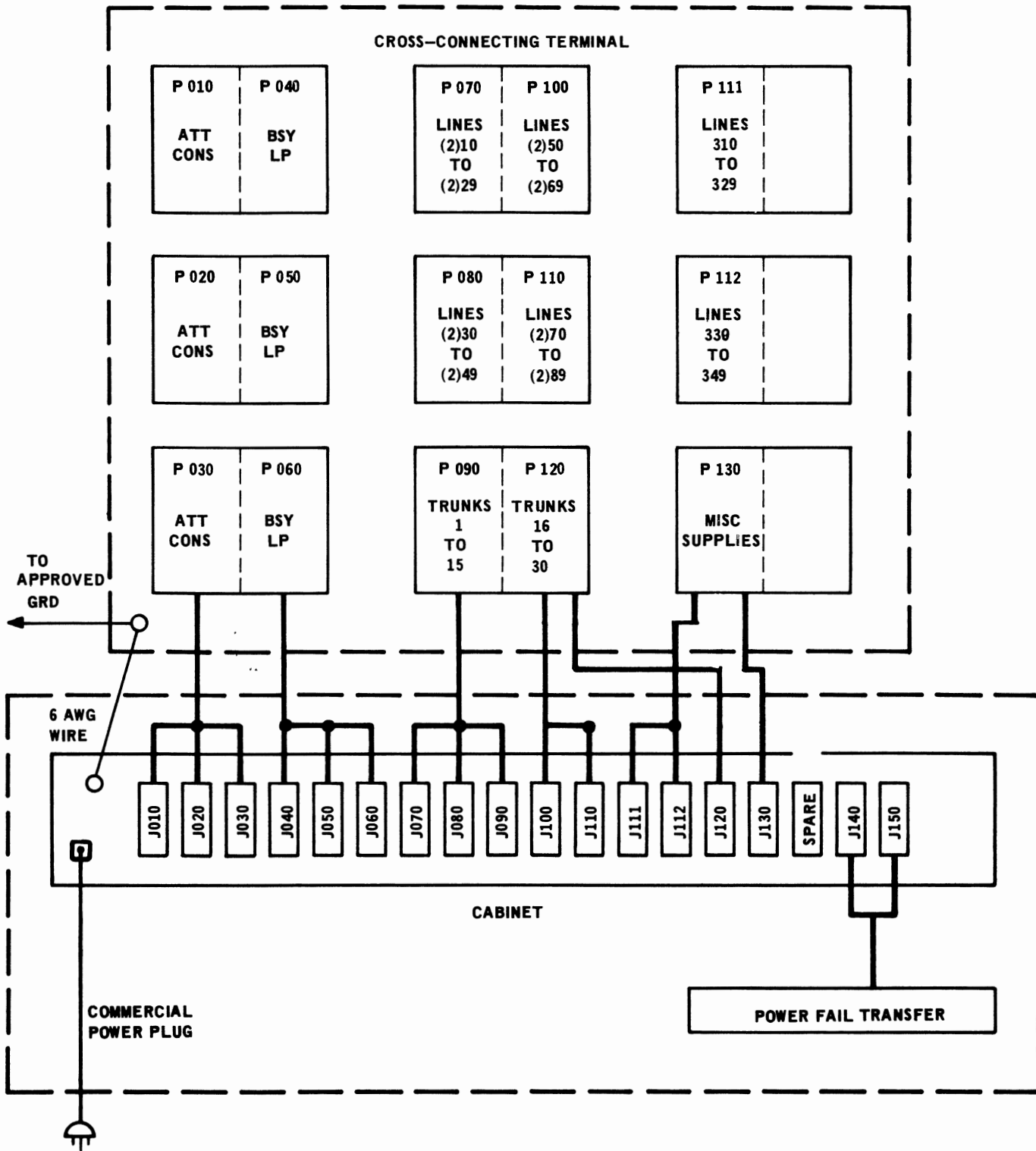
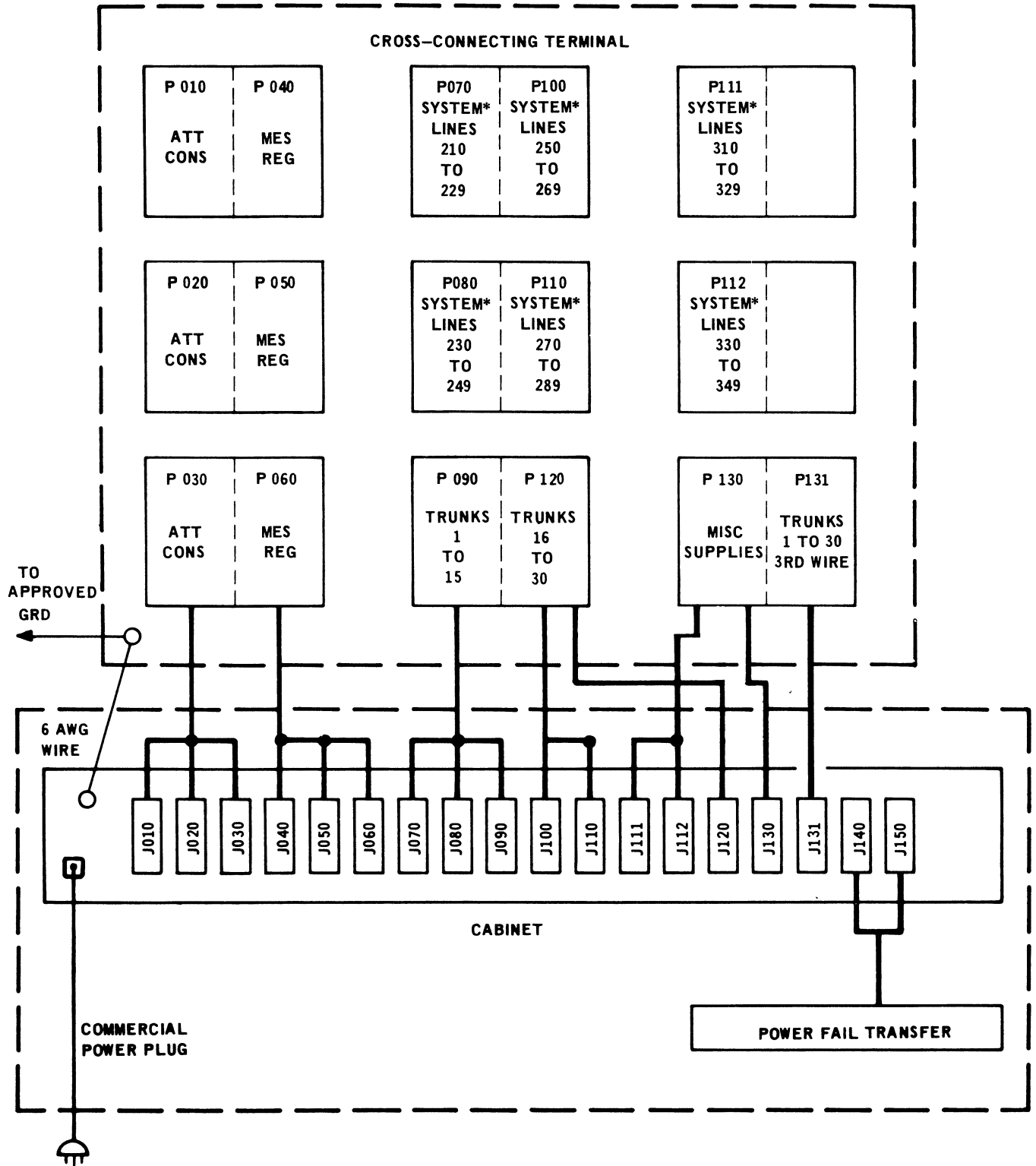


Fig. 34 Terminal Arrangement, Showing Cabinet Connectors (Excluding Hotel/Motel Service)



* FOR ASSOCIATED DIALED NUMBERS, REFER TO TABLES IN SECTION 553-5011-207.

Fig. 35 – Terminal Arrangement, Showing Cabinet Connectors (Hotel/Motel Service Only)

CHART 23 – CONNECTION OF CONNECTOR-CABLES IN CABINET

STEP	PROCEDURE
1	Remove nuts and lock washers securing connector clamp bars to connector panel.
2	Remove connector clamp bars from connector panel.
3	Mate connector-cables jacks to plugs P010 to P090.
4	Fit the longest of the two connector clamp bars over the connector-cable jacks P010 to P090 so the bolt protrudes through the clamp.
5	Place lock washers and tighten nuts on bolts until all the connector-cable jacks are well seated in the plugs.
6	Mate connector-cables jacks to plugs P100, P111, P112, P120, P130 (and P131 for hotel/motel service).
7	Fit the shortest of the two connector clamp bars over connector-cables jacks P100, P111, P112, P120, P130 (and P131 if applicable) so the bolt protrudes through the clamp. <i>Note:</i> Two long connector clamps are used in swing gate cabinets. One covers P100, P111, P112, P120, P130, P131, P140 and P150. The other clamp covers P010 to P090.
8	Place lock washers and tighten nuts on bolts until all the connector-cables jacks are well seated in the plugs
9	Dress cables in the base of the cabinet.

CHART 24 – REMOVAL AND REPLACEMENT OF CONSOLE FACEPLATE

STEP	PROCEDURE
1	Grasp the upper corners of the faceplate with the fingertips.
2	Pull the faceplate away from the body of the console until the zipper material, which secures the faceplate, is separated. When necessary, a screwdriver may be inserted in the two slots in the edge of the faceplate to assist in its removal from the QCN100B console. On the QCN102A console these slots are masked by the busy-lamp-field panel.
3	To replace the faceplate, hold it in position, and apply firm pressure on the side edges to secure it.

CHART 25 – REMOVAL AND REPLACEMENT OF BUSY-LAMP-FIELD PANEL

STEP	PROCEDURE
1	Remove the console faceplate as described in Chart 23.
2	Grasp the upper edge of the panel with the fingertips, approximately 3 inches from the ends.
3	Press down and pull away from the upper housing until the panel releases at the top.
4	To replace the panel, hold it in position and apply firm pressure on the top edge until the panel snaps into position in the upper housing.
5	Replace the console faceplate as described in Chart 23.

CHART 26 – REPLACEMENT OF BUTTON DESIGNATIONS

STEP	PROCEDURE
1	Remove the console faceplate as described in Chart 23.
2	Remove the collar which retains the buttons in position and the button cap.
3	Insert a new designation strip in the cap.
4	Replace the cap, collar, and faceplate.

CHART 27 – PLACING OF NUMBER CARD**APPARATUS:**

1 NE-KS16750L3 releaser tool

STEP	PROCEDURE
1	Insert NE-KS16750L3 releaser tool in the hole in the designation window.
2	Bow the designation window and lift so the window clears the edge of the opening.
3	Pull the designation window away from the opening.

7. CONSOLE CABLE CONNECTIONS

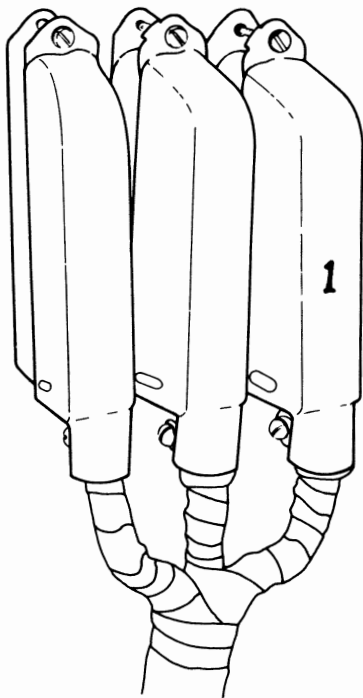
CONSOLE MOUNTING CORDS

7.01 The console is fitted with a mounting cord 8 feet long as shown in Table H.

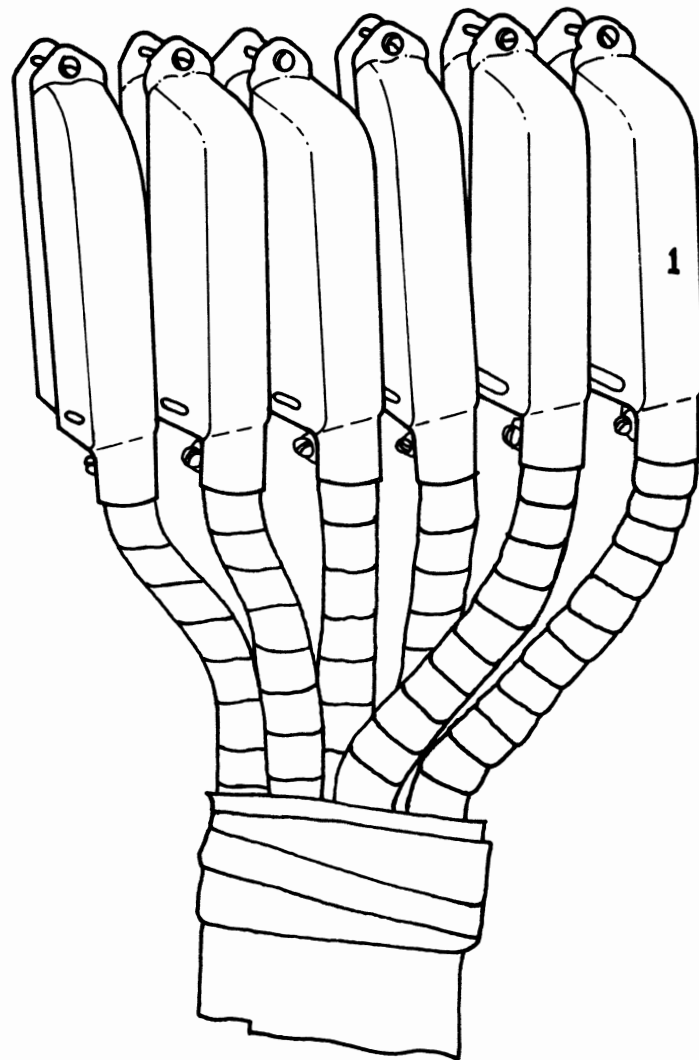
7.02 The first plug in the group is identified by the number 1 marked on the back of the plug, as shown in Fig. 36.

TABLE H
CONSOLE MOUNTING CORDS

CONSOLE TYPE	CORD	CONNECTORS
QCN100B	NE-D120QD	3 Plugs
QCN102A	NE-D270QA	6 Plugs



NE-D120QD Cord



NE-D270QA Cord

Fig. 36 – Identification of Console Mounting Cord Plugs

CHART 28 – ATTACHING CRADLE TO CONSOLE	
APPARATUS:	
1 Screwdriver	
STEP	PROCEDURE
1	Tilt console on its back edge.
2	Align the cradle between the guiders in the base of the console.
3	Press the zipper pads on the cradle to the base of the console.
4	Fasten the screw on the cradle to the console base.

CONSOLE CONNECTOR CABLES

7.03 The cable length from the console to the cabinet must not exceed 300 feet.

7.04 Connector cables are used to extend the console mounting cords to the cross-connecting terminal. The plugs and connectors used on these cables and mounting cords must be attached to a permanent fixture or placed in a service fitting, since they are neither waterproof nor moistureproof.

7.05 A 75-pair connector cable (A75A) is used to extend the leads from the QCN100B-type console to the cross-connecting terminal. The first connector of the group is marked by the number 1 and contains the blue-white binder of the cable.

7.06 Two connector cables are required to extend the leads from the QCN102A-type console: a 75-pair connector cable (A75A) containing the control leads for the console, and a

75-pair connector cable (A75A) containing the busy-lamp leads. The first connector on both A75A connector cables is marked with the number 1 on the back of the connector. The first connector in both types of connector cable contains the blue-white binder of the cable.

7.07 The connector cables from the console and the console connections from the cabinet are terminated on the same quick clips at the cross-connecting terminal. This method of connection avoids the use of jumper wires.

7.08 Similarly the busy-lamp-field connection from the console and from the cabinet share the same quick clips at the cross-connecting terminal.

7.09 The lead designations for the two types of console are shown in tables in Section 553-5011-203.

**CHART 29 – CONNECTION OF THE CONNECTOR CABLE TO THE
CONSOLE MOUNTING CORD**

STEP	PROCEDURE
1	Remove the plastic sleeve protecting the plugs.
2	Remove the plastic sleeve protecting the connectors.
3	Mate the connector from the cable marked with the number 1 with the plug from the console marked with number 1.
4	Mate the remaining connector with the corresponding plugs.
5	Tighten the captive screws which lock the connectors and plugs together.
6	Secure the connectors and plugs to a permanent fixture or place in a service fitting.