INTERCONNECTING DEVICES, COMMON EQUIPMENT
604B AND 604C PANELS
AND 21A APPARATUS UNIT

1. GENERAL

1.01 This section provides identification, installation and connection information for the 604B and 604C panels used to mount certain interconnecting units (IUs) and the 21A apparatus unit. The 604B panel has been rated Manufacture Discontinued (MD).

1.02 This section is reissued to include the 604C panel and the 21A apparatus unit.

1.03 The 604B and ▶604C◀ panels are not wired for the 103A (MD) pulse corrector which is no longer required. In existing installations using pulse correctors, the 103A (MD) pulse correctors must be removed when replacing the 101A or 102A IUs with 101B or 102B IUs.

1.04 The internal panel wiring is covered in this section. Refer to the section covering the specific Voice Connecting Arrangement (VCA) for connections to a particular IU and the customer-provided equipment (CPE).

1.05 ▶The 604C panel as supplied is used with a −24 volt supply only. If the 604C panel is to be used with a −48 volt supply, the 21A apparatus unit must be attached and wired to the 604C panel. Except for the supply voltage, the 604C panel is similar to the 604B panel in the construction and wiring.◀

2. IDENTIFICATION

DESCRIPTION

2.01 The 604B (Fig. 1 and 2) and ▶604C◀ panels (Fig. 3 and 4) provide connecting facilities between Bell System central office (CO) lines or trunks and a customer-provided (CP) PBX. They also provide connections for power (from a separate external supply) fuses and an optional remote fuse alarm indicator for the 101- and 102-type, 108A- and 120-type IUs.

2.02 ▶The 604B and 604C panels have a cast aluminum carrier and 2-level full rear panel. The rear panel is mounted on six standoffs between the rack upright guides. The 604B and 604C panels are 10 inches deep and require 8 inches of vertical space. The carrier is equipped with 14 each, 913A (20 pin) and 914A (40 pin) connectors for mounting 4- and/or 8-inch IUs. A P-40V590 guide assembly is required at the center of the panel to support each 4-inch IU installed in an upper connector.◀

2.03 The rear panel is arranged for power supply connections, fuses, and four plugs for voice control and alarm in and out connections.

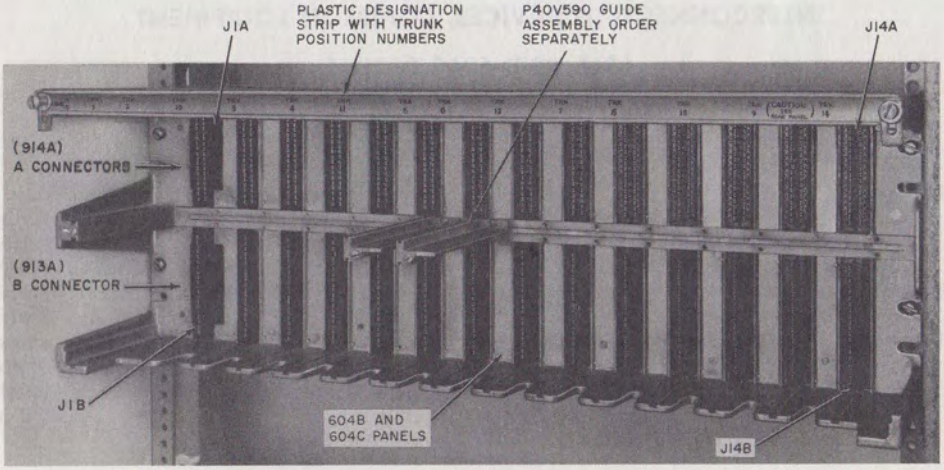
2.04 The panel is arranged to accept fourteen (voice only) 2-way ground or loop-start trunks or twelve (voice and/or data) trunks with automatic level control (ALC). The 75A control unit provides ALC over excessive data/voice signals. Each 75A control unit contains six ALC circuits and may be plugged into position 13 to control IUs in positions 1 through 6 (trunks 1, 2, 10, 3, 4, and 11), and position 14 to control IUs in positions 7 through 12 (trunks 5, 6, 12, 7, 8, and 13). For information on the 75A control unit, refer to Section 463-352-100.

2.05 ▶Fig. 5 shows the relation between connectors and trunks in the panel. The IUs should be installed in the ***trunk*** sequence shown to appear on the interface blocks in order.

> *Note:* On 604C and current production of the 604B panels, the designation strip will be of such a material that the line numbers may be written on it. Earlier production of the 604B showed position numbers.

The trunk and position numbers of the 604B/604C panels are the same as in the 604A panel to permit replacement or mixing of panels.◀

2.06 Positions 1 through 14 are equipped with an A and B connector. The arrangement



INSTALLATION SEQUENCE OF INTERCONNECTING UNITS

TRUNK NO.	1	2	10	3	4	11	5	6	12	7	8	13	9	14
POSITION NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14

Fig. 1—604B and 604C Panels (Front View)

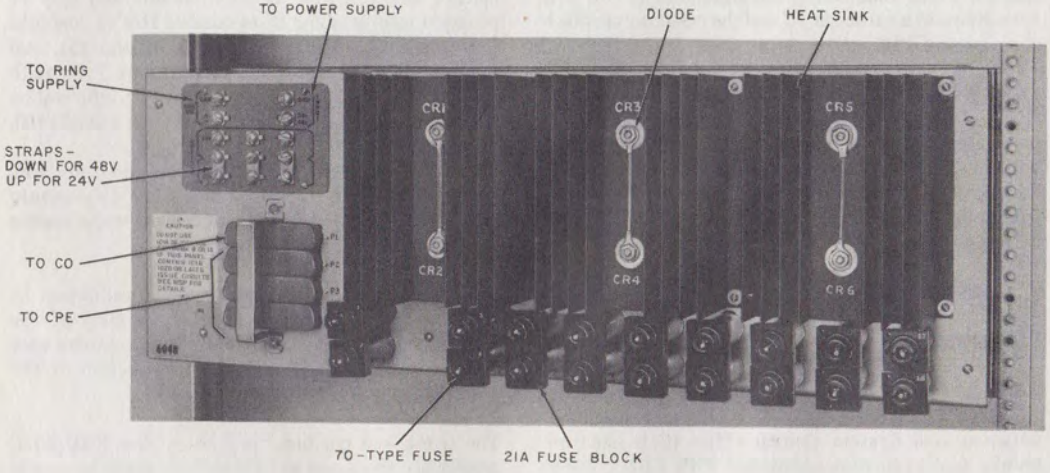


Fig. 2—604B Panel (Rear View)

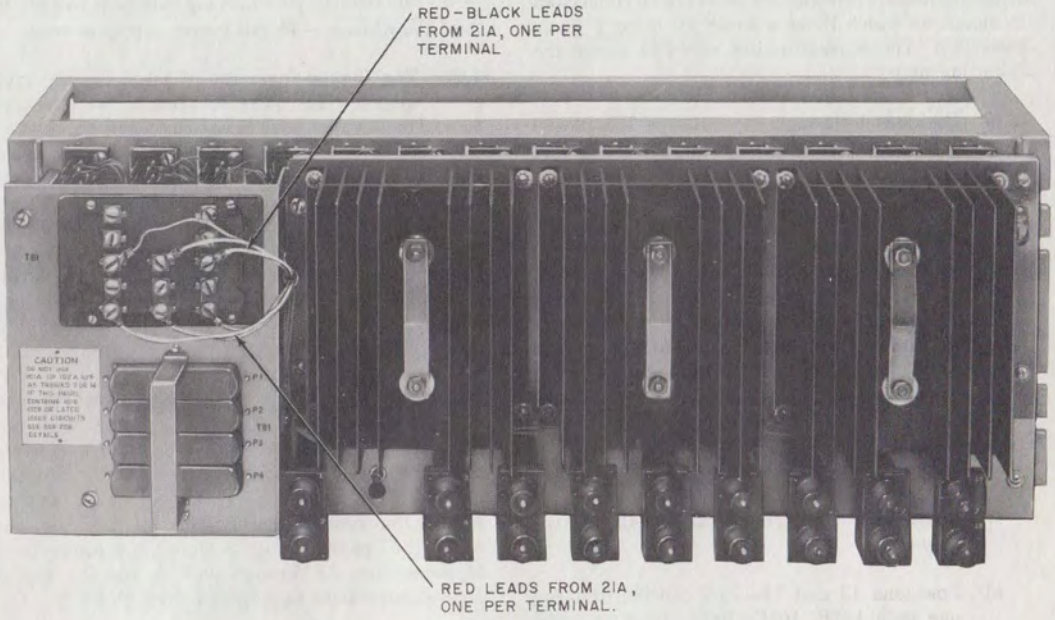


Fig. 3—604C Panel With 21A Apparatus Unit

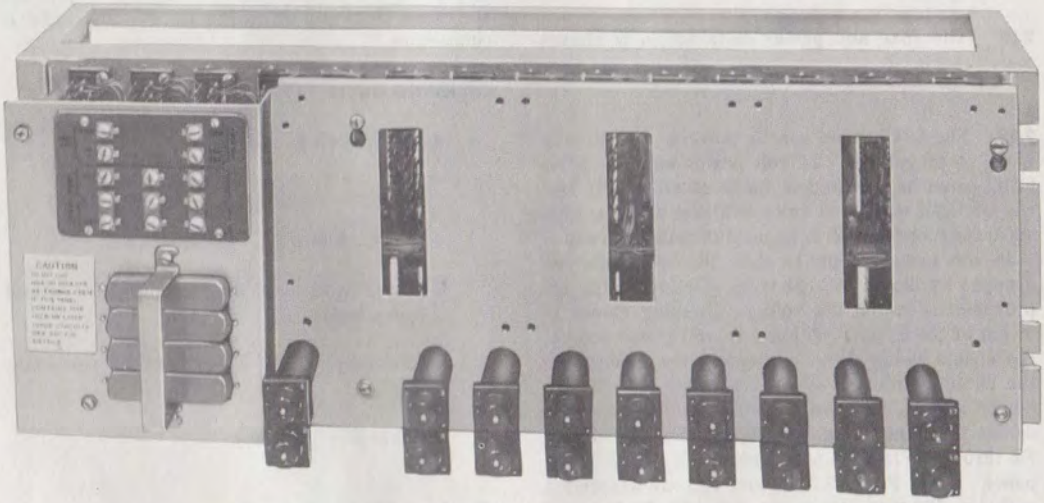


Fig. 4—604C Panel Without 21A Apparatus Unit

of the connectors provides for two vertical connectors to mount an 8-inch IU or a 4-inch IU using a guide assembly. The connectors are wired to accept the following units:

(a) Positions 1 through 14—101-type IUs (2-way ground-start trunk) or 102-type IUs (2-way loop-start trunk)

Caution: Do not use a 102A IU as trunk 9 (position 13) if a 102B is used as trunk 1 or 3 (position 1 or 4). Do not use a 101A IU as trunk 14 (position 14) if a 101B or C is used as trunk 5 or 7 (position 7 or 10). Doing so may cause trouble in positions 1, 4, 7, or 10 due to the internal wiring of the panel.

(b) Positions 1A through 14A—108A IUs (one-way incoming loop-start trunk)

(c) Positions 1 through 14—120A IUs (2-wire loop start)

(d) Positions 13 and 14—75A control unit for use with 101B, 101C, 102B, 120A or 120B IUs, in positions 1 through 12.

Fig. 6 shows the lead designations and pin numbers for the above IUs and Table A shows the connectors in which they are used.

2.07 The fuse and power distribution is shown in Fig. 7.

2.08 The 604B panel can be powered by either a −48 volt or −24 volt power supply. The 604C panel as supplied is for −24 volts only but can be used with −48 volts with the addition of a separately ordered 21A apparatus unit. When a −48 volt power supply is used, the −48 volts are dropped by diodes to −24 volts. Option straps are provided to switch the voltage dropping diodes in or out of the circuit. With a −48 volt power source, the straps swing down connecting the diodes into the circuit (option Y in Fig. 7). With a −24 volt power source, the straps swing up removing the diodes from the circuit (option Z in Fig. 7). Fuses F2 through F15 feed −24 volts to the IUs in the panel. Fuses F1, F16, F17, and F18 are associated with the 120-type IUs only. Fuse F1 feeds ±105 volts ac, 20 Hz, or ±125 volts ac, 30 Hz, to provide ringing voltage to CPE. Fuses F16, F17, and F18 feed −48 volts to provide long-loop talk battery to the CPE when a −48 volt power supply is used.

2.09 The 70-type fuses are of the indicating type (pop up) for quick location of an operated fuse. The 21A fuse holders have a colored designation pin and the color of the pin must match the color on the end of the fuse for correct fusing. Leads have been provided on plug P3 to provide voltage for operating optional remote attendant alarm indicators (17C49 indicator or equivalent). The M1 lamp under the red lens will light when a 48-volt fuse blows, and the A3 lamp under the green lens will light when a 24-volt fuse blows. Table B shows the fuse assignment.

2.10 The 913A and 914A connectors are factory-wired to four 50-pin KS-16671, List 1 plugs on the rear of the panel. Plug P1 provides for tip and ring connections between the CO/PBX trunks and the 604B or C panels. Plugs P2, P3, and P4 provide for connections between the CPE and the 604B or C panels. Fig. 8 shows the connections to connectors J1 through J14, A and B. Fig. 9 shows connections to plugs P1 through P4.

2.11 The connectors in the 604B and 604C panels are equipped with index clips to match the code slots in the 101B, 101C, 102B, 108A, 120A, 120B IUs and 75A control unit. When using 101A or 102A IUs, it will be necessary to pull out the clips between contacts 9 and 10 in the B connectors.

ORDERING GUIDE

- Panel, 604B (MD)

  or

- Panel, 604C
- Unit, Apparatus, 21A (required for 48-volt operation)
- Assembly, Guide, P-40V590 (one per 4-inch IU)
- Cable (See Table C.)

Replaceable Components

- Fuse, 70A (1-1/3 ampere, three per panel)

- Fuse, 70G (1/2 ampere, two per panel)
- Fuse, 70F (1/4 ampere, thirteen per panel)

3. INSTALLATION

3.01 The 604B or ▸604C◂ panel will mount on a standard relay rack or in an ED-91180-72, Group 21 equipment cabinet. The cabinet will hold either two 604B or ▸604C◂ panels and a power unit ▸or three 604B or C panels when the power unit is externally mounted◂ when the drawing holder on the lower half of the cover is removed. (Ground relay rack or equipment cabinet separately.)

3.02 ▸The 21A apparatus unit is attached to the rear of the 604C panel using four 8-32 by 3/16-inch screws supplied with the apparatus unit as a loose item. Electrical connection to the 604C panel is made by attaching any of the red lead wires to the 48-volt option terminals and any of the red-black lead wires to the 24-volt option terminals (one lead per terminal [total 6 leads]). (See Fig. 10.)◂

3.03 Electrical connection is made to the panels through connector cables to four KS-16671, List 1 plugs (P1, P2, P3, and P4 on rear of panel). Arrangement of the KS-16671, List 1 plugs restricts the first plug to an A25B connector cable. Plugs 2, 3, and 4 are arranged to adapt to a choice of cable sizes. (See Table C.)

3.04 Connect an A25B connector to P1 on the panel and terminate the other end on the 66B4-25 connecting block to the CO trunks. Refer to section on VCA being installed for connections.

3.05 Connect the other connector cables to P2, P3, and P4 on the 604B or ▸604C◂ panel and terminate at the customer end on the 66M1-50 interface connecting block to the CPE. (Stencil lead designations on the fanning strip as shown in section on VCA being installed.) Insulate and store spare leads.

3.06 Either telephone company or CP ringing supply and dc power are connected to the terminals shown in Table D. Customer-provided dc power must be routed through the KS-20944 protector before connecting to the power terminals on the 604B and ▸604C◂ panels. Refer to Section 463-300-109 for information on the KS-20944 protector (CA VCP).

3.07 When telephone company-provided power supplies are used (if required by VCA installation), the customer must provide a 105- to 130-volt, 60-Hz outlet within reach of available power cords (locally furnished). This electrical outlet should not be under control of a wall switch.

3.08 Refer to the appropriate section in Division 518 for proper grounding of power plants. Proper grounding of equipment and power unit is important to prevent damage from power line surges.

3.09 When installing the IUs in the panel, position the board in the guide grooves and slide the unit in until it is properly seated in the connectors. Lower the designation strip to hold IUs in place. Refer to Fig. 1 for installation sequence of the IUs in the panel. The suggested sequence has been established to correspond to the plug arrangement.

3.10 After installation is complete, apply power and perform tests shown in the section for the particular VCA being installed. To protect the electrical components of interconnecting units, always remove the fuse associated with that particular circuit before removing or installing an interconnecting unit. See Table B.

4. CONNECTIONS

4.01 Refer to Fig. 7 and Table D for connections to power supplies.

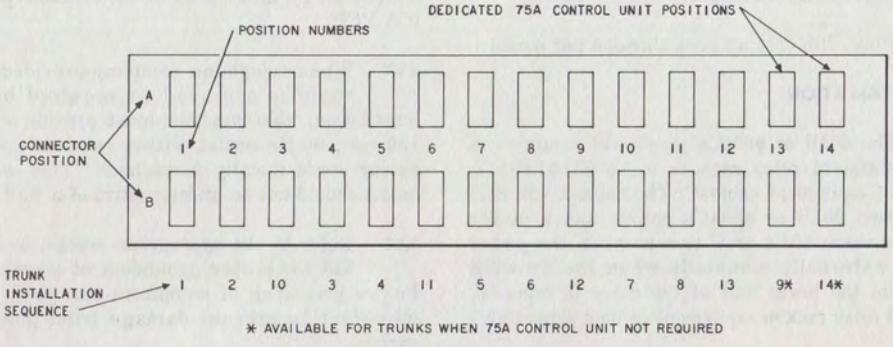
4.02 Refer to Fig. 3, 9 and Table C for connections to CO lines and CPE.

4.03 Refer to Fig. 6 for connections to IUs.

4.04 Refer to Fig. 7 for connections to fuses, fuse alarm, and power distribution.

4.05 Refer to Fig. 8 for connections to A and B connectors.

4.06 Refer to Fig. 10 for connections of 21A apparatus unit to 604C panel.



MAXIMUM NUMBER OF TRUNKS PROVIDED	
DATA	VOICE
12	14

Fig. 5—Connector and Trunk Arrangement in 604B and 604C Panels

LEAD DESIGNATIONS FOR UNITS

101A	102A	101B/C	102B	120A/B	108A	75A	A AND B CONN	
-24V	-24V	-24V	-24V	-24V	-24V	-24V	A0	J1 TO J14
CS	CS	CS	CS		CS		A1	
						AGC1-1	A2	J13 AND J14
						AGC2-1	A3	
R	R	R	R	R	R		A4	J1 TO J14
						AGC1-2	A5	J13 AND J14
CT	CT	CT	CT	CT	CT		A6	J1 TO J14
CBS1		CBS1					A7	
						AGC2-2	A8	J13 AND J14
						AGC1-3	A9	
C1	C1	C1	C1		C1		A10	J1 TO J14
C2	C2	C2	C2		C2		A11	
T	T	T	T	T	T		A13	
CRV1	CRV1	CRV1	CRV1				A14	
CR	CR	CR	CR	CR	CR		A15	
CBS2		CBS2					A16	
						AGC2-3	A17	J13 AND J14
				-48V			A18	J1 TO J14
CRV2	CRV2	CRV2	CRV2				A19	
		AGC1	AGC1	AGC1			A24	
		AGC2	AGC2	AGC2			A28	
				RS			A35	
GRD	GRD	GRD	GRD	GRD		GRD	B2	J13 AND J14
						AGC1-4	B3	
						AGC2-4	B4	
						AGC1-5	B10	
						AGC2-5	B11	
						AGC1-6	B18	
						AGC2-6	B19	

Fig. 6—Lead Designations for Interconnecting Units

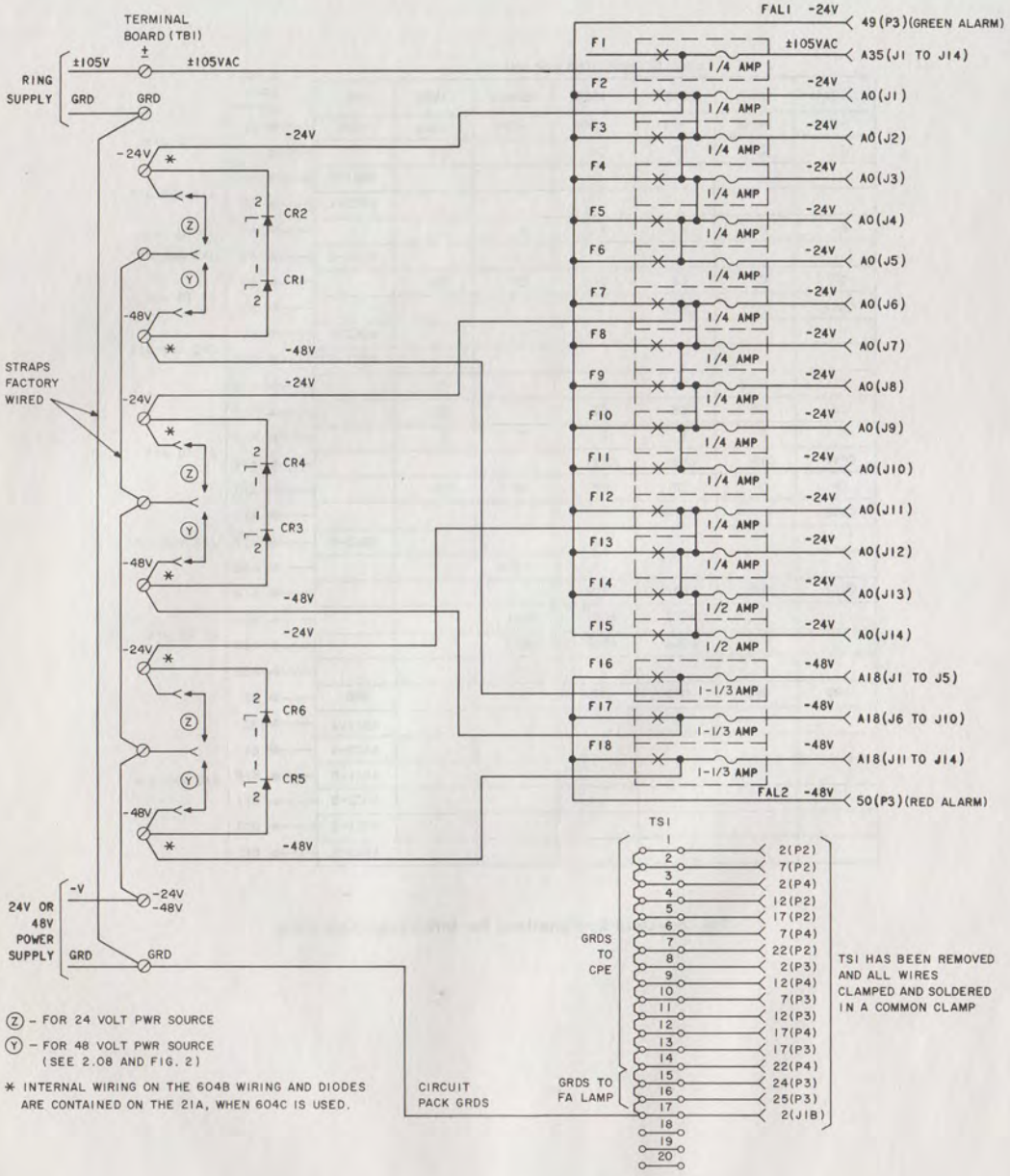


Fig. 7—Fuse and Power Distribution

J1A	J2A	J3A	J4A	J5A	J6A	J7A
13 T → 26(P1)	13 T → 27(P1)	13 T → 35(P1)	13 T → 28(P1)	13 T → 29(P1)	13 T → 36(P1)	13 T → 30(P1)
4 R → 1(P1)	4 R → 2(P1)	4 R → 10(P1)	4 R → 3(P1)	4 R → 4(P1)	4 R → 11(P1)	4 R → 5(P1)
6 CT → 26(P2)	6 CT → 31(P2)	6 CT → 26(P4)	6 CT → 36(P2)	6 CT → 41(P2)	6 CT → 31(P4)	6 CT → 46(P2)
15 CR → 1(P2)	15 CR → 6(P2)	15 CR → 1(P4)	15 CR → 11(P2)	15 CR → 16(P2)	15 CR → 6(P4)	15 CR → 21(P2)
1 CS → 27(P2)	1 CS → 32(P2)	1 CS → 27(P4)	1 CS → 37(P2)	1 CS → 42(P2)	1 CS → 32(P4)	1 CS → 47(P2)
10 C1 → 28(P2)	10 C1 → 33(P2)	10 C1 → 28(P4)	10 C1 → 38(P2)	10 C1 → 43(P2)	10 C1 → 33(P4)	10 C1 → 48(P2)
11 C2 → 3(P2)	11 C2 → 8(P2)	11 C2 → 3(P4)	11 C2 → 13(P2)	11 C2 → 18(P2)	11 C2 → 8(P4)	11 C2 → 23(P2)
14 CRV1 → 29(P2)	14 CRV1 → 34(P2)	14 CRV1 → 29(P4)	14 CRV1 → 39(P2)	14 CRV1 → 44(P2)	14 CRV1 → 34(P4)	14 CRV1 → 49(P2)
19 CRV2 → 4(P2)	19 CRV2 → 9(P2)	19 CRV2 → 4(P4)	19 CRV2 → 14(P2)	19 CRV2 → 19(P2)	19 CRV2 → 9(P4)	19 CRV2 → 24(P2)
7 CBS1 → 30(P2)	7 CBS1 → 35(P2)	7 CBS1 → 30(P4)	7 CBS1 → 40(P2)	7 CBS1 → 45(P2)	7 CBS1 → 35(P4)	7 CBS1 → 50(P2)
16 CBS2 → 5(P2)	16 CBS2 → 10(P2)	16 CBS2 → 5(P4)	16 CBS2 → 15(P2)	16 CBS2 → 20(P2)	16 CBS2 → 10(P4)	16 CBS2 → 25(P2)
0 -24V → F2	0 -24V → F3	0 -24V → F4	0 -24V → F5	0 -48V → F6	0 -24V → F7	0 -24V → F8
18 -48V → F16	18 -48V → 18(J1A)	18 -48V → 18(J2A)	18 -48V → 18(J3A)	18 -48V → 18(J4A)	18 -48V → F17	18 -48V → 18(J6A)
24 AGC1 → 2(J13A)	24 AGC1 → 5(J13A)	24 AGC1 → 9(J13A)	24 AGC1 → 3(J13B)	24 AGC1 → 10(J13B)	24 AGC1 → 18(J13B)	24 AGC1 → 2(J14A)
28 AGC2 → 3(J13A)	28 AGC2 → 8(J13A)	28 AGC2 → 17(J13A)	28 AGC2 → 4(J13B)	28 AGC2 → 11(J13B)	28 AGC2 → 19(J13B)	28 AGC2 → 3(J14A)
35 RS → F1	35 RS → 35(J1A)	35 RS → 35(J2A)	35 RS → 35(J3A)	35 RS → 35(J4A)	35 RS → 35(J5A)	35 RS → 35(J6A)

J1B	J2B	J3B	J4B	J5B	J6B	J7B
2 GRD → 17(TS1)	2 GRD → 2(J1B)	2 GRD → 2(J2B)	2 GRD → 2(J3B)	2 GRD → 2(J4B)	2 GRD → 2(J5B)	2 GRD → 2(J6B)

J8A	J9A	J10A	J11A	J12A	J13A	J14A
13 T → 31(P1)	13 T → 37(P1)	13 T → 32(P1)	13 T → 33(P1)	13 T → 38(P1)	13 T → 34(P1)	13 T → 39(P1)
4 R → 6(P1)	4 R → 12(P1)	4 R → 7(P1)	4 R → 8(P1)	4 R → 13(P1)	4 R → 9(P1)	4 R → 14(P1)
6 CT → 26(P3)	6 CT → 36(P4)	6 CT → 31(P3)	6 CT → 36(P3)	6 CT → 41(P4)	6 CT → 41(P3)	6 CT → 46(P4)
15 CR → 1(P3)	15 CR → 11(P4)	15 CR → 6(P3)	15 CR → 11(P3)	15 CR → 16(P4)	15 CR → 16(P3)	15 CR → 21(P4)
1 CS → 27(P3)	1 CS → 37(P4)	1 CS → 32(P3)	1 CS → 37(P3)	1 CS → 42(P4)	1 CS → 42(P3)	1 CS → 47(P4)
10 C1 → 28(P3)	10 C1 → 38(P4)	10 C1 → 33(P3)	10 C1 → 38(P3	10 C1 → 43(P4)	10 C1 → 43(P3)	10 C1 → 48(P4)
11 C2 → 3(P3)	11 C2 → 13(P4)	11 C2 → 8(P3)	11 C2 → 13(P3)	11 C2 → 18(P4)	11 C2 → 18(P3)	11 C2 → 23(P4)
14 CRV1 → 29(P3)	14 CRV1 → 39(P4)	14 CRV1 → 34(P3)	14 CRV1 → 39(P3)	14 CRV1 → 44(P4)	14 CRV1 → 44(P3)	14 CRV1 → 49(P4)
19 CRV2 → 4(P3)	19 CRV2 → 14(P4)	19 CRV2 → 9(P3)	19 CRV2 → 14(P3)	19 CRV2 → 19(P4)	19 CRV2 → 19(P3)	19 CRV2 → 24(P4)
7 CBS1 → 30(P3)	7 CBS1 → 40(P4)	7 CBS1 → 35(P3)	7 CBS1 → 40(P3)	7 CBS1 → 45(P4)	7 CBS1 → 45(P3)	7 CBS1 → 50(P4)
16 CBS2 → 5(P3)	16 CBS2 → 15(P4)	16 CBS2 → 10(P3)	16 CBS2 → 15(P3)	16 CBS2 → 20(P4)	16 CBS2 → 20(P3)	16 CBS2 → 25(P4)
0 -24V → F9	0 -24V → F10	0 -24V → F11	0 -24V → F12	0 -24V → F13	0 -24V → F14	0 -24V → F15
18 -48V → 18(J7A)	18 -48V → 18(J8A)	18 -48V → 18(J9A)	18 -48V → F18	18 -48V → 18(J11A)	18 -48V → 18 (J12A)	18 -48V → 18(J13A)
24 AGC1 → 5(J14A)	24 AGC1 → 9(J14A)	24 AGC1 → 3(J14B)	24 AGC1 → 10(J14B)	24 AGC1 → 18(J14B)	2 AGC1 → 24(J1A)	2 AGC1 → 24(J7A)
28 AGC2 → 8(J14A)	28 AGC2 → 17(J14A)	28 AGC2 → 4(J14B)	28 AGC2 → 11(J14B)	28 AGC2 → 19(J14B)	3 AGC2 → 28(J1A)	3 AGC2 → 28(J7A)
35 RS → 35(J7A)	35 RS → 35(J8A)	35 RS → 35(J9A)	35 RS → 35(J10A)	35 RS → 35(J11A)	35 RS → 35(J12A)	35 RS → 35(J13A)
					9 AGC1 → 24(J3A)	9 AGC1 → 24(J9A)
					17 AGC2 → 28(J3A)	17 AGC2 → 28(J9A)
					5 AGC1 → 24(J2A)	5 AGC1 → 24(J8A)
					8 AGC2 → 28(J2A)	8 AGC2 → 28(J8A)

J8B	J9B	J10B	J11B	J12B	J13B	J14B
2 GRD → 2(J7B)	2 GRD → 2(J8B)	2 GRD → 2(J9B)	2 GRD → 2(J10B)	2 GRD → 2(J11B)	2 GRD → 2(J12B)	2 GRD → 2(J13B)
					3 AGC1 → 24(J4A)	3 AGC1 → 24(J10A)
					4 AGC2 → 28(J4A)	4 AGC2 → 28(J10A)
					10 AGC1 → 24(J5A)	10 AGC1 → 24(J11A)
					11 AGC2 → 28(J5A)	11 AGC2 → 28(J11A)
					18 AGC1 → 24(J6A)	18 AGC1 → 24(J12A)
					19 AGC2 → 28(J6A)	19 AGC2 → 28(J12A)

Fig. 8—Connections For Jacks J1 to J14

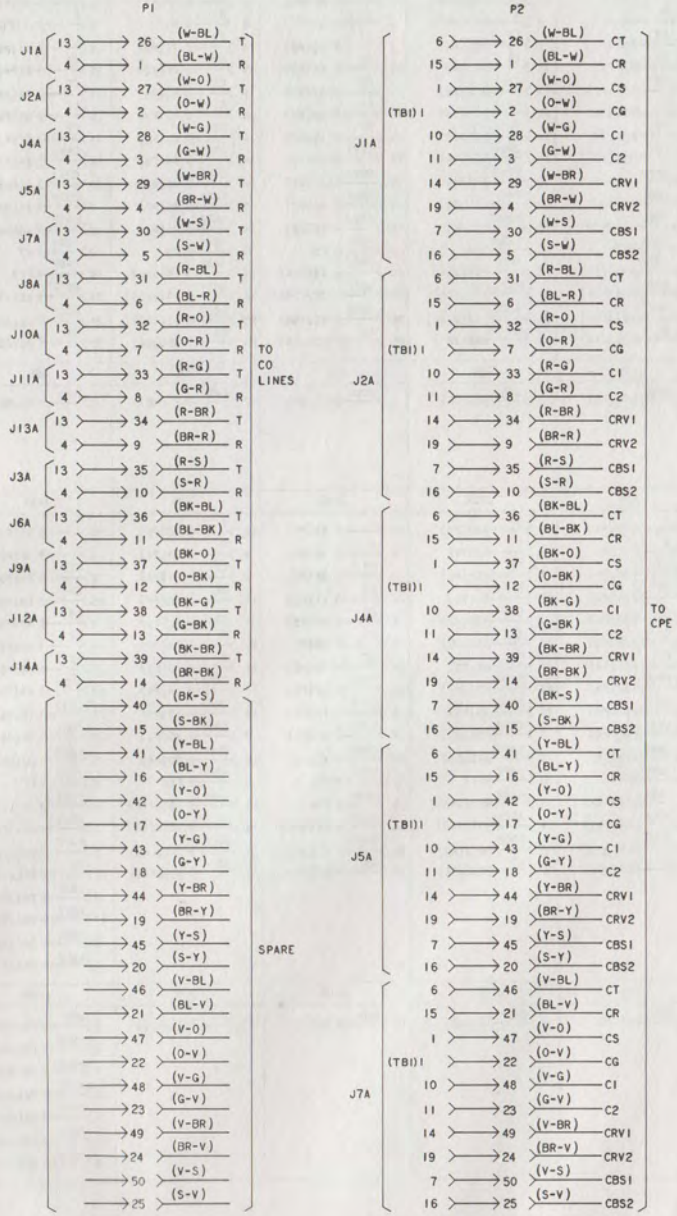


Fig. 9—Connections For Plugs P1 to P4 (Sheet 1)

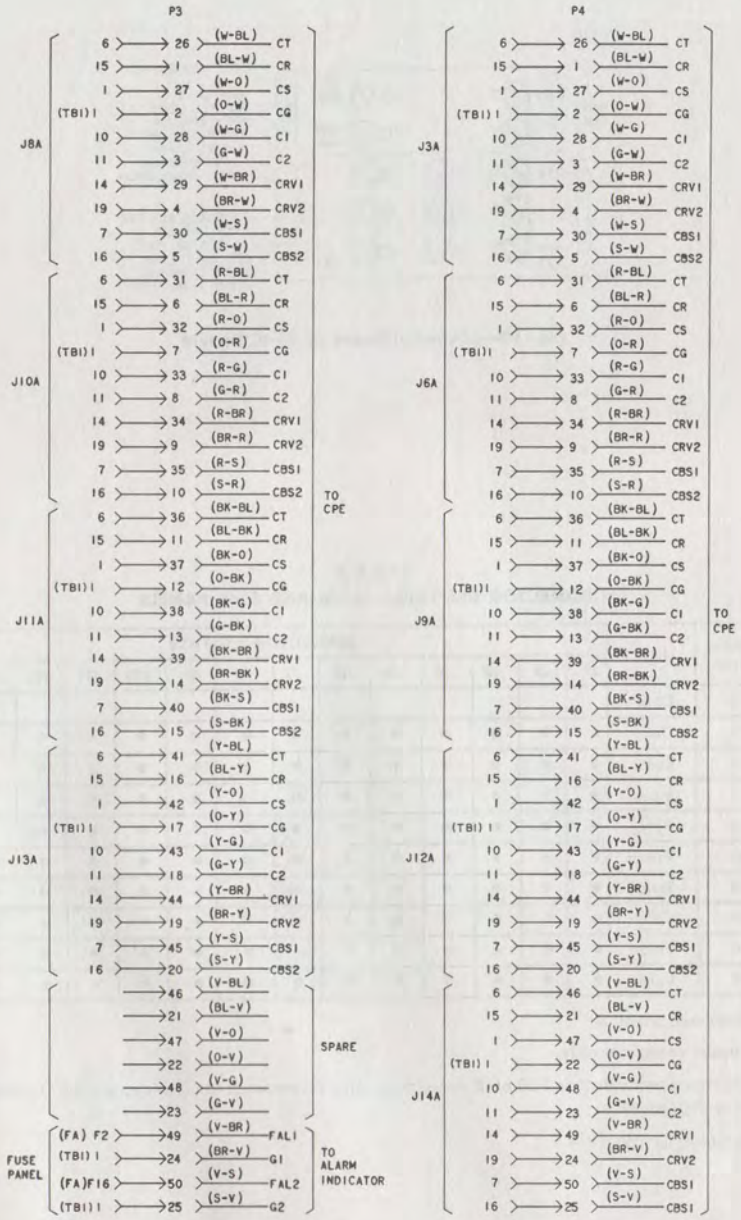


Fig. 9—Connections For Plugs P1 to P4 (Sheet 2)

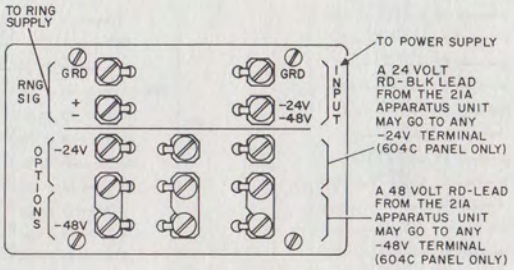


Fig. 10—Terminal Board on 604C Panel

TABLE A
CONNECTOR USE TABLE—604B AND 604C PANELS

UNIT CODE	SIZE (IN)	USE	CONNECTOR POSITION													
			J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	J13	J14
75A	8	Data													●	●
101B/C	8	Data	●	●	●	●	●	●	●	●	●	●	●	●		
102B	8	Data	●	●	●	●	●	●	●	●	●	●	●	●		
120A/B	8	**Voice**	●	●	●	●	●	●	●	●	●	●	●	●		
101A†	8	Voice	●	●	●	●	●	●	●	●	●	●	●	●	‡	●
101B/C	8	Voice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
102A†	8	Voice	●	●	●	●	●	●	●	●	●	●	●	●	●	‡
102B	8	Voice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
108A*	4	Voice	●	●	●	●	●	●	●	●	●	●	●	●	●	●
120A/B	8	Voice	●	●	●	●	●	●	●	●	●	●	●	●	●	●

● Usable in indicated position.

* Mounts in upper connector only.

† Index clip between contacts 9 and 10 on B connectors must be removed to permit mounting 101A and 102A IUs in 604B or 604C panels.

‡See paragraph 2.06(a) for CAUTION.

TABLE B
604B AND 604C PANEL FUSE ASSIGNMENT

FUSE NO.	PANEL POSITION	VOLTAGE
F1*	J1A thru J14A	±105V
F2*	J1A	−24V
F3*	J2A	
F4*	J3A	
F5*	J4A	
F6*	J5A	
F7*	J6A	
F8*	J7A	
F9*	J8A	
F10*	J9A	
F11*	J10A	
F12*	J11A	
F13*	J12A	
F14†	J13A	
F15†	J14A	
F16‡	J1A thru J5A	−48V
F17‡	J6A thru J10A	
F18‡	J11A thru J14A	

* 70F fuses 1/4 Ampere.
† 70G fuses 1/2 Ampere.
‡ 70A fuses 1-1/3 Ampere.

TABLE C
OPTIONAL CABLE ARRANGEMENTS TO PROVIDE CONNECTIONS FOR FOUR KS-16671, L1 PLUGS ON 604B AND 604C PANELS

CABLE DESIGNATION (NOTE)	MAXIMUM NO. OF CABLES REQUIRED		
	ARRANGEMENTS (SEE 3.03)		
	Arrangement 1	Arrangement 2	Arrangement 3
A25B	1	4	2
A50B			1
A75A	1		

Note: Arrangement of interconnecting units and local requirements will determine the size and maximum length of cable required.

TABLE D

POWER CONNECTIONS

INPUT VOLTAGE	604B OR 604C PANELS*
−24V Talk Bat.	INPUT −24V
−48V Talk Bat.	INPUT −48V
GRD	INPUT GRD
or ±105V 20 Hz ±125V 30 Hz	RNG SIG±
±GRD	RNG SIG GRD

* Terminals on rear of panel stamped as shown. Position option straps for −24V or −48V.