

## 4-WIRE PRIVATE LINE TERMINATING CIRCUIT SD-1G297-01 IDENTIFICATION, INSTALLATION, AND CONNECTIONS

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SPEAKERPHONE . . . . .	6	1. GENERAL	
4. INSTALLATION . . . . .	6	1.01 This section provides information on the 4-wire private line terminating circuit SD-1G297-01.	
5. CONNECTIONS . . . . .	6	1.02 This section is reissued to:	
INTERPANEL . . . . .	6	(a) Add information on the new J1G038A and B packaged systems	
POWER . . . . .	7	(b) Change drawings to make them compatible with the new packaged systems	
LINE . . . . .	7	(c) Rate packaged system J1G034B manufacture discontinued (MD)	

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- (d) Rate circuit packs (CPs) RT9, RT10, and RT11 MD
- (e) Add information on CP RT9B, RT10B, and RT11B.

Since this reissue is a general revision, arrows ordinarily used to indicate changes have been omitted. The Equipment Test List (ETL) is not affected.

**1.03** This section is based on drawing SD-1G297-01, Issue 7B. If this section is to be used with equipment or apparatus reflecting later issue(s) of the drawing, reference should be made to the CD and SD to determine the extent of changes and the manner in which the section may be affected.

**1.04** The 4-wire private line terminating circuit SD-1G297-01 is designed for use with loud-speaker (voice) calling, 30-Hz automatic or manual ringdown signaling, or with the SS-4 Selective Signaling System. It is compatible with and can be used in the same 4-wire private line telephone system with the SD-69566-01 4-wire private line terminating circuit (Section 480-615-100), SS-1 (SD-98093-01), or SS-1A (SD-69594-01) equipment.

**1.05** Incoming 30-Hz or SS-4 signals can be arranged for no time-out, 18-second (short interval) time-out, or for 45-second (long interval) time-out. Associated telephone sets can be connected with the 3- or 4-type speakerphone system. A maximum of 26 telephone sets may be off-hook simultaneously without degrading transmission. A data transfer circuit can be provided to permit data transmission over the 4-wire line.

**1.06** The 4-wire private line terminating circuit SD-1G297-01 may be ordered as a factory assembled and tested 4-wire private line packages (J1G034B [MD], J1G038A, and J1G038B) or separate 4-wire private line circuit panels (J1G034A) and plug-in CPs.

**1.07** The J1G034B (MD), J1G038A, and J1G038B 4-wire private line packages offer the opportunity of ordering a factory assembled, wired and tested, 4-wire private line system in two basic sizes, which with the addition of individual station or control CPs, may be configured in the field with a minimum of assembly and wiring.

## 2. IDENTIFICATION

**2.01** The 4-wire private line terminating circuit SD-1G297-01 consists of a J1G034A,L1 (MD) or L11 panel (Fig. 1) and the following plug-in CPs:

- RT9 (MD), RT9B — Option card
- RT10 (MD), RT10B — Line amplifier circuit
- RT11 (MD), RT11B — Talk-back amplifier for sidetone
- RT15 — Station circuit for 30-Hz or voice-signaling station
- RT16 — Signaling circuit for 30-Hz signaling
- RT17 — Miscellaneous circuit.

**2.02** The J1G034A,L1 (MD) or L11 panel mounts in a 23-inch by 4-inch mounting space. The front of the panel has fourteen 40-pin connectors (J1 through J14) for plug-in CPs. The back of the panel has one 20-pin connector (J15), two terminal strips (TSA for power connections and TSB for connections to succeeding panels), fuses, five plugs (P1 through P5) for connector cables, and one plug (P6) for the connector cable from a J1G033A-type SS-4 panel. The plugs are wired to the connectors in the following manner: connectors J1, J2, and J3 to P1; connectors J4, J5, and J6 to P2; connectors J7, J8, and J9 to P3; connectors J10, J11, and J12 to P4; and connectors J13 and J14 to P5 as shown in Fig. 1.

**2.03** The CPs used with the J1G034A,L1 (MD) or L11 panel are designed to be used in assigned connectors as shown in Fig. 2.

**2.04** Circuit pack **RT9 (MD) or RT9B** is an option card. The option it connects depends on how the card is inserted in connector J15. By turning the card over or by reversing the card, options are added or changed. The following options are connected via CP RT9 (MD) or RT9B :

- Option V — Succeeding panel used
- Option Y — 30-Hz or voice signaling with data access
- Option Z — 30-Hz or voice signaling without data access.

**Caution:** Before initially inserting CP *RT10 (MD)* or *RT10B* in the panel or when replacing CP *RT10 (MD)* or *RT10B*, make sure the *GAIN* and *EQ* controls are turned fully counterclockwise.

**2.05** Circuit pack *RT10 (MD)* or *RT10B* is a line amplifier circuit that provides the gain necessary for maintaining line transmission levels. In addition to a gain device, it is equipped with an equalizer circuit to equalize for line loss of high frequency signals. A test jack is provided in the CP to facilitate line testing. A J1G034A,L1 (MD) or L11 panel used as a first or only panel requires two line amplifiers — a transmit amplifier (in connector J1) and a receive amplifier (in connector J2).

**2.06** Circuit pack *RT11 (MD)* or *RT11B* is a talk-back amplifier that provides sidetone to the telephone set(s). The talk-back amplifier is factory-adjusted to maintain a 16-dB loss from the transmit to the receive side of the line. Two test jacks (J1 and J2) are provided in the CP for use in testing line amplifier gain and line levels. In a J1G034A,L1 (MD) or L11 panel used as a first or only panel, the talk-back amplifier is inserted in connector J3.

**Note:** The jack (J1) in CP *RT10 (MD)* or *RT10B* (line amplifier) and the jacks (J1 and J2) in CP *RT11 (MD)* or *RT11B* (talk-back amplifier) will accommodate a 310 plug.

**2.07** Circuit pack *RT15* is a 30-Hz or voice-signaling station circuit that:

- Furnishes talk battery to the telephone set
- Provides line pickup and cut-through to the telephone set
- Opens the talk path for the push-to-talk (PTT) feature
- Supplies a ground over the RL and CO leads to release a locked-in signal by an audible and visual signaling circuit or to operate a miscellaneous circuit
- Provides for loudspeaker cutoff when used with a voice-signaling circuit
- Closes a path for the S (signal) lead when used in a manual ringdown circuit

- Provides a ground over the AG lead to operate an external circuit or device when the PTT feature is provided or when S option is provided and the telephone set goes off-hook
- Provides -24 volts over the FW lead to operate the FW relay in a 2-/4-wire telephone set.

**2.08** Circuit pack *RT16* is a 30-Hz signaling circuit that responds to incoming 30-Hz ringing and transmits 30-Hz ringing for outgoing calls. When activated by an incoming 30-Hz signal, the circuit starts an interrupter circuit and cuts ringing and lamp voltages through to the telephone set(s) or operates an auxiliary signal control relay. Outgoing ringing can be an automatic 2-second spurt or can be under the control of a nonlocking signal key. The 30-Hz signaling circuit can be arranged for:

- Auxiliary relay control, option E
- Steady audible signal, option F
- Interrupted audible signal or common signal with diode matrix control, option G
- No time-out, option K
- Short time-out interval (18 seconds), option M
- Long time-out interval (45 seconds), omit option M
- Locked-in incoming signal, option N
- Automatic 2-second outgoing 30-Hz signaling, option Q.

**2.09** Circuit pack *RT17* is a miscellaneous circuit used with the various operations that may be required for 4-wire private lines. It may be used for loudspeaker control or data transfer arrangements.

**2.10** Circuit pack *RT18* provides the ringing and lamp voltages required for 4-wire private lines.

**2.11** Interrupted ringing and lamp signals used with the J1G034A,L1 (MD) or L11 panel and associated plug-in CPs may be supplied from an external interrupter circuit. A 232C KTU can be used as an external interrupter circuit (Fig. 3), or the ring-

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ing and lamp voltages can be wired through the interrupter of an existing key system panel.

### 3. ORDERING GUIDE

**Note:** Ordering information for the use of the 4-wire private line terminating equipment used in conjunction with the SS-4 selective signaling equipment is covered in Section 480-623-001.

#### 4-WIRE PRIVATE LINE PACKAGED SYSTEM, J1G034B (MD) (Fig. 4)

**3.01** The 4-wire private line packaged system may be ordered as follows:

- J1G034B,L1 (MD) — 4-wire private line system for up to 10 stations or miscellaneous CPs
- J1G034B,L3 (MD) — equipment for 14 additional stations
- J1G034B,L7 (MD) — CP RT15
- J1G034B,L8 (MD) — CP RT16
- J1G034B,L9 (MD) — CP RT17
- J1G034B,L10 (MD) — SD, CD, Installation, and Maintenance Bell System Practice.

**3.02** The 4-wire packaged system comes equipped with five 66M1-50 connecting blocks mounted on the backboard, marked and wired as shown in Fig. 5 for the number of panels (L1 and L2) ordered.

#### 4-WIRE PRIVATE LINE PACKAGED SYSTEM, J1G038A (TEN LINES) (Fig. 6)

**3.03** The 4-wire private line packaged system may be ordered as follows:

- J1G038A,L1 — cabinet assembly and wiring for up to 10 stations or miscellaneous CPs
- J1G034A,L11 — station circuit panel for up to 10 stations or miscellaneous CPs
- J1G034A,L2 — (one required) consisting of one CP RT9B, two CPs RT10B, one CP RT11B, and two CPs RT15

- J1G034A,L8 — one CP RT15 (order as required)
- J1G034A,L6 — one CP RT17 (order as required)
- J1G034A,L5 — one CP RT16 (order if required)
- J1G034A,L9 — one CP RT18 (one required).

**3.04** The 4-wire packaged system comes equipped with two 66M1-50 connecting blocks mounted on the backboard, marked and wired as shown in Fig. 7.

#### 4-WIRE PRIVATE LINE PACKAGED SYSTEM, J1G038B (24 LINES) (Fig. 8)

**3.05** The 4-wire private line packaged system may be ordered as follows:

- J1G038B,L1 — cabinet assembly and wiring for up to 24 stations or miscellaneous CPs
- J1G034A,L11 — station circuit panel for up to 10 stations or miscellaneous CPs (two required)
- J1G034A,L2 — (one required in first panel only) consists of one CP RT9B, two CPs RT10B, one CP RT11B, and two CPs RT15
- J1G034A,L8 — one CP RT15 (order as required)
- J1G034A,L6 — one CP RT17 (order as required)
- J1G034A,L5 — one CP RT16 (order as required)
- J1G034A,L9 — one CP RT18 (one required).

**3.06** The 4-wire packaged system comes equipped with five 66M1-50 connecting blocks mounted on the backboard, marked and wired as shown in Fig. 9.

#### 4-WIRE PRIVATE LINE TERMINATING PANEL AND CIRCUIT PACKS IF ORDERED SEPARATELY

**3.07** The 4-wire private line terminating panel and CPs for line amplification, talk-back (sidetone) and station functions are ordered as follows:

- Panel, J1G034A,L1 (MD) or L11 — order as required.
- Pack, Circuit, RT9 (MD) or RT9B — option card; one required for each J1G034A,L1 (MD) or L11 panel.
- Pack, Circuit, RT10 (MD) or RT10B — line amplifier; two required for first panel.
- Pack, Circuit, RT11 (MD) or RT11B — talk-back amplifier; one required for first panel.
- Pack, Circuit, RT15 — station circuit for 30-Hz or voice-signaling station; one required for each telephone set.
- Pack, Circuit, RT16 — signaling circuit for 30-Hz signaling; one required.
- Pack, Circuit, RT17 — miscellaneous control circuit; order as required.
- Pack, Circuit, RT18 — interrupter circuit.

#### INTERRUPTER

**3.08** The ringing and lamp voltages may be connected through the interrupter circuit of a 1A2 KTS panel or connected to a separate interrupter. A typical separate interrupter arrangement (Fig. 3) consists of an interrupter, KS-15900, L1 and a unit, telephone, key, 232C.

#### LOUDSPEAKERS

**3.09** The 106-type loudspeakers are compatible with all SD-1G297-01 circuit configurations utilizing loudspeakers. Refer to Section 463-220-100 for descriptive and ordering information on the 106-type loudspeakers.

#### CONNECTING BLOCKS AND CONNECTOR CABLES WHEN NOT USING PACKAGED SYSTEM

**3.10** Where the J1G034A,L1 (MD) or L11 panel is used as an only panel or as a first panel, up to four connector cables are used. Each cable is terminated on one 66-type connecting block. The connecting blocks are wired to correspond to the connectors in the panel with each block representing three connectors except block 5 which represents connectors J13 and J14 only (Fig. 10). A second or succeeding panel will accommodate up to five connector cables (Fig. 2). Connector cables and connecting blocks are ordered as cable, connector, A25B — (length must be specified) and block, connecting, 66B4-25.

#### POWER SUPPLY

**3.11** A single or succeeding J1G034A,L1 (MD) or L11 panel requires a 320C1, 19-type, or 20C3 power unit. One power unit has the capacity to power one J1G033A-type SS-4 panel and one J1G034A,L1 (MD) or L11 panel. Multiple power supplies shall have grounds tied common. Local conditions, such as power unit mounting arrangement and/or ringing requirements, will determine the type power unit(s) best suited for a particular installation. Refer to Section 167-440-201 and order power unit(s) as required.

#### DATA TRANSFER CIRCUIT

**3.12** Where the 4-wire private line circuit SD-1G297-01 is to be used for both voice and data transmissions, a data transfer circuit must be provided locally. A typical data transfer circuit, consisting of 200-type KTUs and other components, is shown in Fig. 11. Refer to Section 463-140-100 for apparatus mountings. Components for this arrangement are ordered as follows:

- Unit, Telephone, Key, 229B — one required
- Unit, Telephone, Key, 245A — one required
- Pack, Circuit, RT17 — two required with automatic dial transfer; with manual access only one required
- Resistor, 89AT — 9 dB receive pad; one required
- Resistor, 89GE — 27 dB transmit pad; one required.

## SPEAKERPHONE

**3.13** The 3- and 4-type speakerphone systems are compatible with stations connected to the 4-wire private line circuit SD-1G297-01. A J53041D speakerphone control unit is required to adapt the 3-type speakerphone for 4-wire operation. Refer to Sections 480-716-200 and 512-620-100 for ordering information. An 80A control unit is required to adapt the 4-type speakerphone for 4-wire operation. Refer to Section 512-700-100 for ordering information on 4A speakerphone equipment. The 80A control unit is ordered as unit, control, 80A-49 (one required for each 4A speakerphone).

## 4. INSTALLATION

**4.01** Install the packaged systems on wall as shown in Section 463-140-200 for 16C apparatus mountings. Make sure gates can open unhindered by adjacent equipment and that there is adequate working space to service and install equipment on both sides of gate with gate in open position.

**4.02** Ensure that there is adequate nonswitch controlled commercial power source for all equipment and space for necessary related equipment such as Interrupter and Data Transfer.

**4.03** When using individually ordered equipment, install the J1G034A,L1 (MD) or L11 panel in a 23-inch apparatus mounting, an equipment bay or equipment cabinet having adequate working space for making wiring connections, changing fuses, or plugging in connector cables on the back of the panel, and clearance in front for inserting the plug-in CPs. The panel occupies a 23-inch by 4-inch mounting space.

**4.04** When using packaged systems, the 66M1-50 connecting blocks are provided and mounted on the backboard of the package.

**4.05** When using individually ordered equipment, install 66B4-25 connecting blocks at telephone locations, at a key telephone system connecting block cross-connect field, or concentrate connecting blocks in a separate cross-connect field.

**4.06** Install telephone sets in the usual manner. The number of telephone sets that can be used with a J1G034A,L1 (MD) or L11 panel is controlled by the number of signaling circuits (CP RT15) and mis-

cellaneous control circuits (CP RT17) used in the panel. Each telephone set requires a station circuit (CP RT15), and the number of station circuits that can be used with the panel is reduced by one for each signaling circuit or miscellaneous circuit. Where the J1G034A,L1 (MD) or L11 panel is installed as the first panel or as a single panel, connectors J1 and J2 are occupied by line amplifiers (CP RT10 [MD] or RT10B) and connector J3 is for the talk-back amplifier (CP RT11 [MD] or RT11B) which further reduces the number of station circuits that can be used with the first panel.

**4.07** Install the data transfer circuit as near as practicable to the connecting block associated with plug 5 of the (first) J1G034A,L1 (MD) or L11 panel.

**4.08** Install loudspeakers where customer directs, provided the location affords the customer suitable speaker output and access to speaker controls and will not create a feedback oscillation condition with telephones located in the vicinity of the loudspeakers.

**4.09** To provide the PTT feature, replace the telephone handset with a G5BR or equivalent handset. For connections, refer to Fig. 25 and the section pertaining to the telephone set used.



*When the PTT feature is not provided, the S option strap (between terminal board terminals 5 and 6) must be installed in the station circuit (CP RT15).*

## 5. CONNECTIONS

**5.01** Typical circuit arrangements using the 4-wire private line terminating circuit SD-1G297-01 are shown in Fig. 12 and 13.

## INTERPANEL

**5.02** Connections between a J1G034A,L1 (MD) or L11 (4-wire private line terminating circuit) panel and a second or succeeding J1G034A,L1 (MD) or L11 panel are made from terminal strip B of the first panel to terminal strip B of the second or succeeding panel(s) as illustrated in Fig. 14.

**POWER**

- 5.03** Power for one J1G034A,L1 (MD) or L11 panel can be furnished by one 320C1, 19-type, or 20C3 power supply (Fig. 15). A single or succeeding J1G034A,L1 (MD) or L11 panel requires another 320C1, 19-type, or 20C3 power supply.
- 5.04** All power connections between the J1G034A,L1 (MD) or L11 panel and the power supply shall be 22-gauge wire or larger and are run directly from the power supply to terminal strip A on the panel (Fig. 15).
- 5.05** The RN, RG, ST, and MG leads between the J1G034A,L1 (MD) or L11 panel(s) and an interrupter circuit shall be 22-gauge wire or larger.
- 5.06** Refer to Section 463-220-100 for connecting power to the 106-type loudspeakers.
- 5.07** Ground the power supply to an acceptable ground. When a protector ground is provided, the power supply should be connected to protector ground if possible. Where several power supplies are used, strap the ground terminal of each supply (with a 12-gauge wire) to the ground terminal of the one that is connected to the acceptable ground.

**LINE**

- 5.08** Connections for the 4-wire facility from the serving central office are made on the connecting block associated with the connector cable connected to plug 5 of the first J1G034A,L1 (MD) or L11 panel. On this connecting block, the transmit (toward the CO) Tip and Ring (TT and TR) leads are connected to connecting block terminals 43 and 44. The receive (from the CO) Tip and Ring (RT and RR) leads are connected to terminals 45 and 46. See Fig. 12, 13, and Table A.



*Provide station protectors at the customer location when the 4-wire facility from the serving central office is an exposed facility. Also, an off-premises station requires electrical protection if the serving facility is exposed. Refer to Section 460-100-400 for explanation of exposed facilities and information on station protectors.*

**STATION**

- 5.09** Station connections (telephone set connections) are made at connecting blocks which are connected to the J1G034A,L1 (MD) or L11 panel by connector-ended cables. The connecting block arrangement is illustrated in Fig. 10 and Table A provides the lead assignment for the connecting blocks and connector cables.
- 5.10** Each telephone set served by a J1G034A,L1 (MD) or L11 panel requires the use of a station circuit — CP RT15 for 30-Hz and voice-signaling circuits. The connector used for the station circuit must correspond to the connecting block on which station connections are made (Fig. 10).
- 5.11** Typical connections for one telephone set are shown in Fig. 16 and 17. Typical connections for three telephone sets are illustrated in Fig. 18 and 19.
- 5.12** Ground for connecting the telephone set A1 lead appears on connecting blocks associated with cables 2 and 3. Lamp ground and ring ground appear on connecting blocks associated with cables 4 and 5 (Table A). Therefore, when making station connections, it may be necessary to terminate the station cable leads on as many as three connecting blocks. In the packaged system, there is a special block provided for grounds (Fig. 5).

**RELEASE LEADS**

- 5.13** Release (RL) leads must be provided between station circuits and signaling circuits. In response to incoming 30-Hz ringing or a ground via a C lead, the signaling circuit operates and locks operated. The operated signaling circuit extends audible and visual signals to the telephone set(s). An off-hook at a telephone set operates a station circuit, which applies ground over the RL lead to release the signaling circuit. When released, the signaling circuit cancels the audible signal and changes the lamp signal from flash to steady.
- 5.14** Connections for the RL lead(s) are made on the station connection blocks. Refer to Table A for RL terminals and see Fig. 17 and 19 for typical RL lead connections.

## SIMPLEX LEADS

5.15 The 30-Hz ringing signals are transmitted over the simplex of the 4-wire facility. In the 4-wire private line terminating circuit, SD-1G297-01, the simplex (SX) leads are derived from the center tap of the T2 transformer in the transmit line amplifier (TSX) and from the center tap of the T1 transformer in the receive line amplifier (RSX). The internal panel wiring for the SX leads in the J1G034A,L1 (MD) or L11 panel is shown in Fig. 20.

5.16 Connections for the SX leads depend on which connector the 30-Hz signaling circuit (CP RT16) is plugged into. Circuit pack RT16 can be used in connectors J10 through J14; however, connector J14 is the preferred location. When the signaling circuit is plugged into connector J14, SX lead connections are made via the option card (CP RT9 [MD] or RT9B). When the signaling circuit is used in connector J10, J11, J12, or J13, straps must be run from terminals 41 and 42 of connecting block associated with cable 5 to terminals 5 and 6 on the same connecting block or to terminals 37 and 38, 21 and 22, or 5 and 6 on connecting block associated with cable 4 (Fig. 20).

## LOUDSPEAKERS

5.17 Voice-signaling circuits require the use of 106-type loudspeakers for detecting incoming calls. However, the use of loudspeakers is not limited to voice-signaling circuits. Loudspeakers can be used with a 30-Hz signaling circuit. Examples of loudspeaker arrangements and connections are listed. Other arrangements can be locally engineered. Typical loudspeaker arrangements are:

- (a) **No Loudspeaker Cutoff (Fig. 21):** Loudspeaker is connected to the receive side of the line at all times.
- (b) **Loudspeaker Cutoff Controlled by One Telephone Set (Fig. 22):** As shown in Fig. 22, speaker leads are connected through break contacts of the PU relay in the station circuit (CP RT15). When the telephone set goes off-hook, ground over the A lead operates the PU relay in the station circuit to cut off the loudspeaker.
- (c) **Loudspeaker Cutoff Controlled by More Than One Telephone Set (Fig. 23):** As shown in Fig. 23, speaker leads are connected

through break contacts of the MC relay in a miscellaneous circuit (CP RT17). When a telephone set goes off-hook, ground over the A lead operates the PU relay in a station circuit (CP RT15). The operated PU relay connects a ground to the CO lead which operates the MC relay to cut off the loudspeaker.

(d) **Loudspeaker Cutoff Controlled by PTT Handset:** To arrange loudspeakers to be cut off when the switch in a PTT handset is operated, connect the speaker as shown in Fig. 23, except connect the AG lead from the station circuit (Fig. 24) to CP RT17 instead of the CO lead and omit S option from the station circuit.

5.18 For loudspeaker power connections and options, refer to Section 463-220-100.

## AG LEAD

5.19 The AG lead provides a ground for special applications (Fig. 24). An AG lead is available from each station circuit (CP RT15) and may be arranged to provide a ground when a telephone set goes off-hook (S option) or when the switch in a PTT handset is operated. The AG lead may be connected as required for local needs. For example, the AG lead could be connected to the CO, C lead of a miscellaneous circuit (CP RT17) for loudspeaker cutoff under control of the PTT handset.

## DATA SERVICE

5.20 Data sets are connected to the SD-1G297-01 private line terminating circuit via a locally provided data transfer circuit. The transfer circuit must have the ability to:

- Transfer the 4-wire circuit from the private line stations to the data set
- Attenuate line levels to and from the data set
- Light a transfer lamp to indicate when the line is in the data mode
- Light the line lamp on a key telephone set(s) where the line is terminated in key telephone sets.

5.21 Line connections to the data transfer circuit are made on the connecting block, ie, associ-

ated with plug 5 of the J1G034A,L1 (MD) or L11 panel. Additional connections are required to supply a ground to the RL lead(s) of the station circuit(s) and to the PR lead on the J1G034A,L1 (MD) or L11 panel, lamp voltage to the data transfer lamp, and a circuit to the data transfer key. See Fig. 11 for a typical data transfer circuit.



**When transferring the circuit to the data mode, the data transfer key must be operated before the telephone handset is placed on-hook.**

#### PUSH-TO-TALK HANDSETS

**5.22** Telephone sets associated with the 4-wire private line terminating circuit SD-1G297-01 can be equipped with PTT handsets. Where the PTT handset is used, the transmit side of the line is open in the station circuit (CP RT15) until the PTT switch in the handset is operated. Depressing the PTT switch in the handset applies ground over a PT lead from the telephone set to the station circuit to operate the PT relay in the station circuit (Fig. 25). The operated PT relay connects the transmit side of the circuit to the telephone set. Refer to Section 501-210-102 for information covering the G5BR-handset. See section pertaining to the type telephone set being used for connecting the handset to the telephone set.

#### OPTIONS

**5.23** Options for the J1G034A,L1 (MD) or L11 (SD-1G297-01) 4-wire private line terminating circuit panel (Table B) are provided by:

- Proper insertion of option card
  - Straps placed on terminal boards of the CPs
  - A strap on terminal strip A of the panel
  - Turndown screws on the CPs
  - External connections to data equipment, keys, lamps, and audible signaling devices.
- (a) **Z Option — 30-Hz or Voice Signaling, Without Data Access Required:** Option Z is provided by inserting the option card, CP RT9 (MD) or RT9B, in panel connector J15, positioned

for Z option. Connector J15 is located on the back of the panel.

(b) **Y Option — 30-Hz or Voice Signaling, Data Access Required:** Option Y is provided by inserting the option card in panel connector J15, positioned for Y option, and by connecting data leads from the station connecting block to the data equipment. See Fig. 11, 12, 13, and Table A.

(c) **V Option — Succeeding Panel Used:** Option V is provided by inserting the option card in connector J15, positioned for V option, and by making interpanel connections as shown in Fig. 14.

(d) **S Option — PTT Handset Not Used:** Option S is provided by placing a strap between terminals 5 and 6 on the terminal board of the station circuit (CP RT15).

(e) **R Option — Station Without A Lead Control:** Option R is provided by a strap between terminals 3 and 4 on the terminal board of CP RT15.

(f) **Q Option — 30 Hz, 2-Second Automatic Ringdown, Outgoing Signaling:** Option Q is provided by a strap between terminals 1 and 2 on the terminal board of the 30-Hz signaling circuit (CP RT16).

(g) **N Option — Locked-In Incoming 30-Hz Signal:** Option N is provided by a strap between terminals 9 and 10 on the terminal board of the 30-Hz signaling circuit (CP RT16).

(h) **M Option — Audible and Visual Signal Time-Out, Short Interval:** Option M is provided by turning down the S1 screw on the 30-Hz signaling circuit (CP RT16). A time-out interval of 18 seconds is established by turning down the S( ) screw. With the S( ) screw up, the time-out interval is extended to 45 seconds.

(i) **K Option — Audible and Visual Signal Time-Out Disabled:** Option K is provided by a strap between terminals 5 and 6 on the terminal board of CP RT16. With K option, the incoming 30-Hz audible and visual signal is locked in until released by a telephone set going off-hook.

(j) **G Option — Interrupted Audible Signal or Common Audible With Diode Matrix:**

Option G is provided by a strap between terminals 7 and 8 on the terminal board of CP RT16. Refer to Fig. 26 and Table A.

(k) **F Option — Steady Audible Signal:**

Option F is provided by a strap between terminals 3 and 7 on the terminal board of CP RT16. Refer to Fig. 27 and Table A.

(l) **E Option — Audible Signal, Common With Auxiliary Relay Control:**

Option E requires a strap on CP RT16 and a connection to the ring relay in a separate signaling arrangement, or the use of CP RT17 (Fig. 28). A strap is required between terminals 6 and 7 on the terminal board of CP RT16. Connections to the ring relay of a separate signaling circuit are made from the RC-R1 terminal of the station connecting block associated with the signaling circuit (CP RT16). Connections for using CP RT17 (miscellaneous control circuit) are made on the station connecting block associated with CPs RT16 and RT17. The RC-R1 lead of CP RT16 is connected to the C lead of CP RT17. The signaling device is connected to the M lead, and the ringing supply, battery, or ground to operate the signaling device is connected to terminal F. See Table A for terminal locations on the station connecting blocks and Fig. 27 for E option connections.

#### MISCELLANEOUS CONTROL CIRCUIT (CP RT17)

5.24 Circuit pack RT17 (Fig. 29) is a general use unit for activating or deactivating loudspeakers, lamps, control relays and signaling devices, or data transfer arrangements. Circuit pack RT17 can only be used in connectors J10 through J14 in the J1G034A,L1 (MD) or L11 panel (Fig. 2). Connections to CP RT17 are made on the station connecting block(s) associated with connectors J10 through J14 (Fig. 10). See Table A for lead terminations on the station connecting blocks. The BG (busy ground), L (lamp), BL (busy lamp), B battery and B ground leads are wired to the connector terminals as part of the panel wiring. A terminal board is provided on the CP for strapping options or for features that may be required by local conditions. Special arrangements should be referred to engineering.

#### SPEAKERPHONE CONNECTIONS

5.25 Connections for the 3-type speakerphone are shown in Fig. 30 and SD-69542-01. Refer to Section 512-620-430 for information on the J53041D-1 speakerphone control unit and Section 512-620-100 for information on the 3-type (MD) speakerphone. Connections for the 4-type speakerphone are shown in Fig. 31 and Section 512-730-460. Refer to SD-69923-01 for information on the 80A speakerphone control unit.

#### VOICE-DATA TRANSFER ARRANGEMENT

5.26 Voice-data transfer arrangement (Fig. 11) can be provided to transfer the private line to data or voice using a key.

#### 6. LINEUP PROCEDURES

6.01 Prior to performing any tests on a point-to-point or multipoint private line, a transmission circuit layout (TCL) card should be available. The TCL card will identify the 4-wire facility and give the expected measured loss (EML) of the facility between the customer location and the Serving Test Center (STC).

6.02 Before verifying the 4-wire facility loss or starting the circuit lineup procedure, a talking circuit must be established between the STC and the customer location.

6.03 As various types of test equipment may be used for circuit lineup, test set preparation is not covered.

6.04 The test equipment used for circuit lineup must be capable of generating and detecting a 1000-Hz signal within the output level range of +3 and -20 dBm. The equipment must be set up for a 600-ohm impedance.

6.05 Test jacks are provided on the line amplifiers (CP RT10 [MD] or RT10B) and the talk-back amplifier (CP RT11 [MD] or RT11B) to facilitate level adjustments. The cord(s) used to connect test equipment to the CPs must be equipped with a 310 plug.



*Lineup procedures are to be performed before placing the 4-wire private line in service. When making operational transmission tests, the*

*equipment should be taken out of service according to local procedures.*

- 6.06** Set oscillator for 1000 Hz and adjust output using a 600-ohm detector set for 0 dBm.
- 6.07** Measure the 4-wire facility between the STC and the customer location:
- (a) Connect the transmission measuring set (TMS) oscillator to the line jack (J1) of the transmit line amplifier (located in connector J1 of the J1G034A,L1 [MD] or L11 panel).
  - (b) Connect the TMS 600-ohm detector to the line jack (J1) of the receive line amplifier (located in connector J2 of the J1G034A,L1 [MD] or L11 panel).
  - (c) Request the STC to transmit the normal 1000-Hz test tone at a 0-dBm level.
  - (d) Record the level as measured by the TMS detector.
  - (e) Send 1000-Hz test tone at a 0-dBm level to the STC.
  - (f) Record the level as measured at the STC.
  - (g) Disconnect test equipment.
  - (h) Verify that the facilities between the STC and the customer location test within the limits of the EML as specified on the TCL card. In the event the facilities do not meet the EML requirements, consult engineering or proceed according to local instructions.
- 6.08** Circuit lineup procedures are as follows:

#### 1000- AND 2800-Hz TESTS

- (a) **Test the Talk-Back Amplifier (CP RT11 [MD] or RT11B):** Set the TMS oscillator at 1000-Hz and 0-dBm level and connect it to the TRANSMIT BUS jack on CP RT11 (MD) or RT11B. Connect the 600-ohm TMS detector to the RECEIVE BUS jack. Verify a -16 dBm ( $\pm 1.5$  dB) reading for the talk-back amplifier.

- (b) **Test Receive Level:** Remove the TMS oscillator from the TRANSMIT BUS on CP RT11 (MD) or RT11B. (The TMS detector remains connected to the RECEIVE BUS.) Request the STC to send a 1000-Hz test tone at a 0-dBm level. Adjust the GAIN control on the receive line amplifier until a -16 dBm reading is indicated on the TMS detector.

- (c) **Equalization of Receive Line Amplifier:** With the TMS detector on the RECEIVE BUS of CP RT11 (MD) or RT11B:

- (1) Request the STC to send 2800-Hz test tone at 0-dBm level
- (2) Adjust the EQUALIZER ADJUST control on the receive line amplifier until a -16 dBm reading is obtained
- (3) Disconnect test equipment.

**Note:** Use 2800-Hz test tone for equalization as the 2400- and 2600-Hz tones may be filtered out before reaching the RECEIVE BUS in CP RT11 (MD) or RT11B.

- (d) **Test Transmit Level Using TMS Oscillator:**

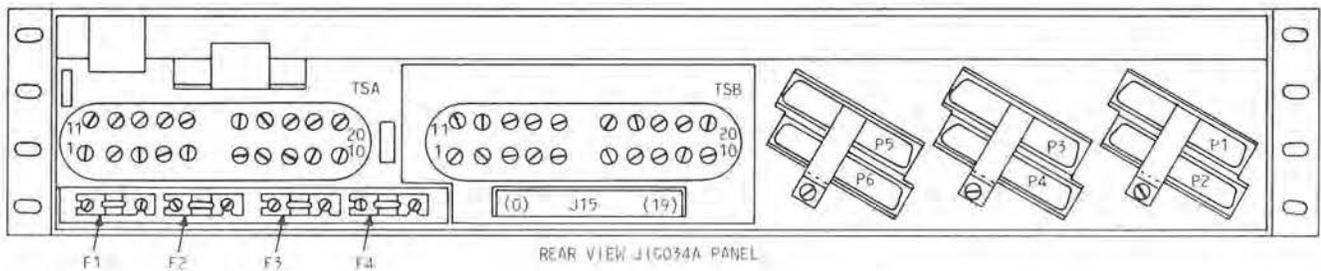
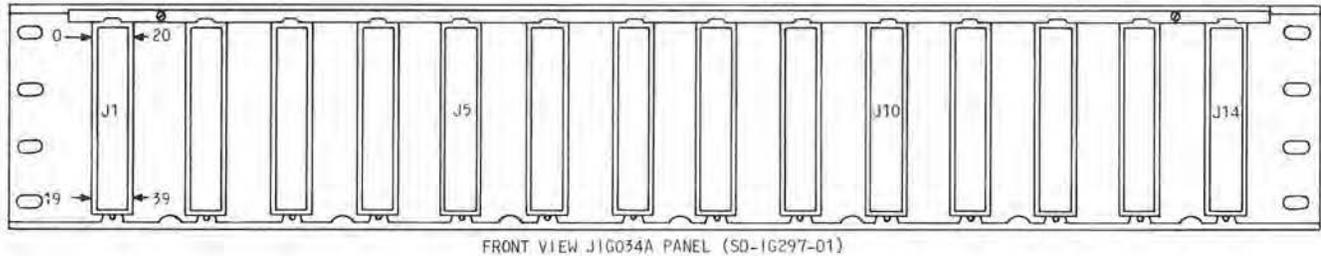
- (1) Set the transmit amplifier EQUALIZER control to the fully counterclockwise position.

**Note:** The transmit amplifier EQUALIZER CONTROL will remain in the full counterclockwise position. Only the receive amplifier EQUALIZER CONTROL is adjusted.

- (2) Remove the TMS detector from the RECEIVE BUS of CP RT11 (MD) or RT11B and connect it to the TT and TR leads, terminals 43 and 44 on connecting block associated with the J1G034A,L1 (MD) or L11 panel. (Change test set cords as required.) Remove TT and TR cross-connections to the central office. Connect the TMS oscillator to the TRANSMIT BUS jack on CP RT11 (MD) or RT11B. Send a 1000-Hz test tone at 0 dBm and adjust the GAIN control on the transmit line amplifier until a 0-dBm level is indicated on the TMS detector.
- (3) Disconnect test equipment.

(4) Replace the TT and TR cross-connections.

6.09 Refer to Fig. 32 and 33 for typical transmission diagrams and levels. See Fig. 7 for data transfer circuit and information on 89-type resistors.



NOTES:

1. THE J1G034A, L1 (MD) OR L11 PANEL MOUNTS IN A 25-INCH BY 4-INCH MOUNTING SPACE.
2. POWER CONNECTIONS AND INTERRUPTER LEAD CONNECTIONS ARE MADE ON TERMINAL STRIP A.
3. CONNECTIONS TO SUCCEEDING OR PRECEDING PANELS ARE MADE ON TERMINAL STRIP B.
4. PLUGS 1 THROUGH 5 ACCOMMODATE CONNECTOR CABLES TO STATION CONNECTING BLOCKS.
5. PLUG 6 ACCOMMODATES THE CONNECTOR CABLE FROM A 55-A PANEL (J1G033A-1 (MD) OR J1G033A-2).
6. CONNECTORS J1 THROUGH J11 ACCOMMODATE THE PLUG-IN CIRCUIT PACKS FOR STATION FUNCTIONS.
7. CONNECTOR J15 (ON REAR OF PANEL) IS USED ONLY FOR THE RT5 (MD) OR RT4B OPTION CARD.

Fig. 1—J1G034A,L1 (MD) or L11 4-Wire Private Line Terminating Panel

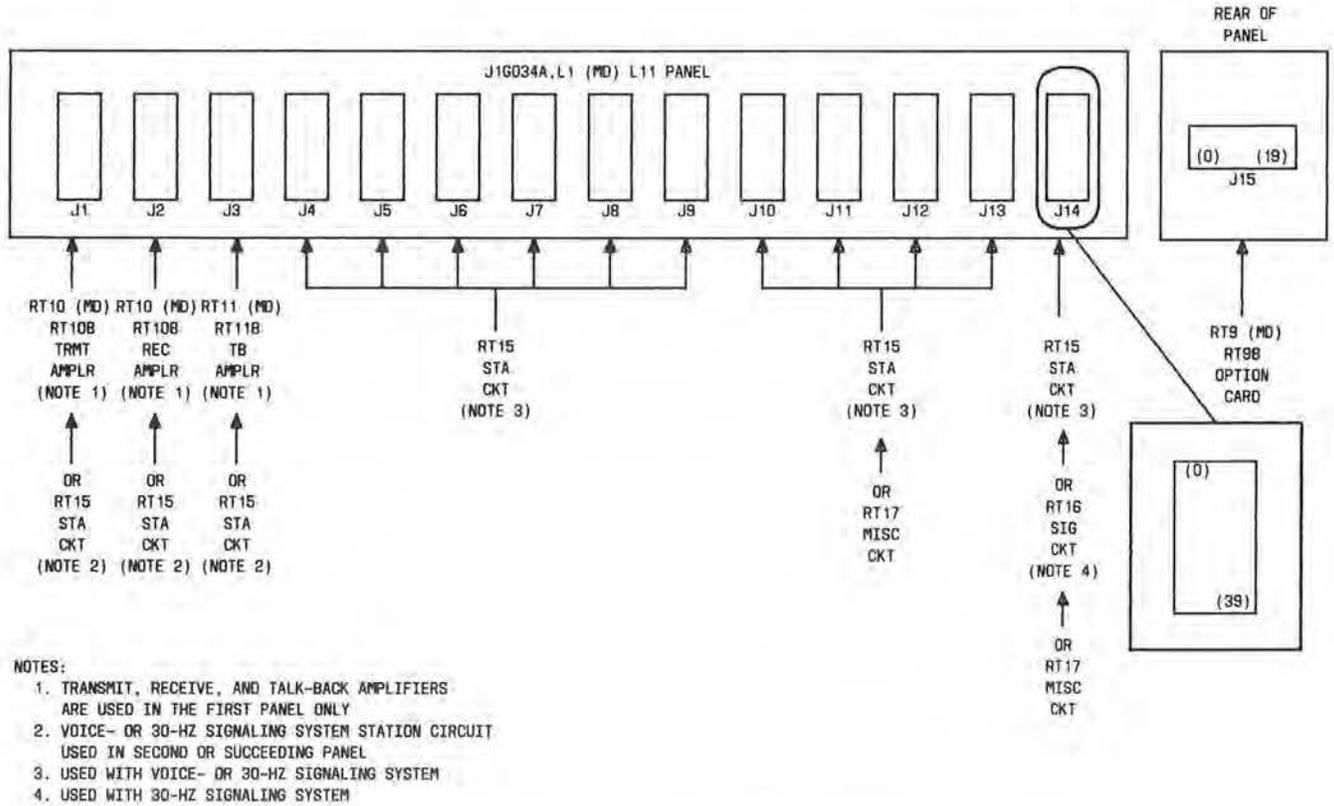


Fig. 2—Circuit Pack Assignment for J1G034A,L1 (MD) or L11 Panel



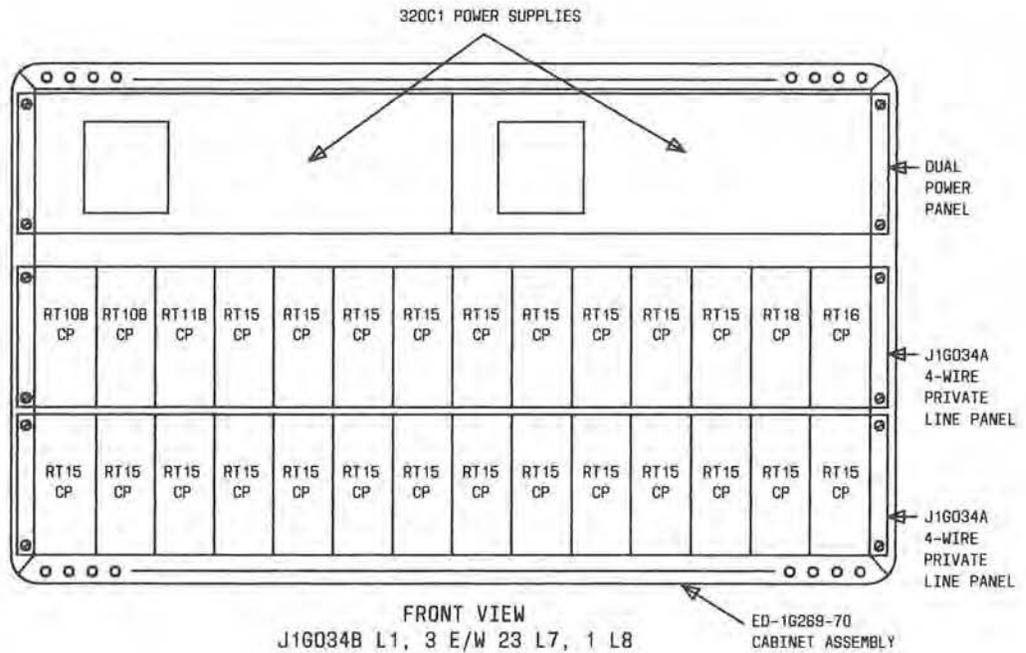
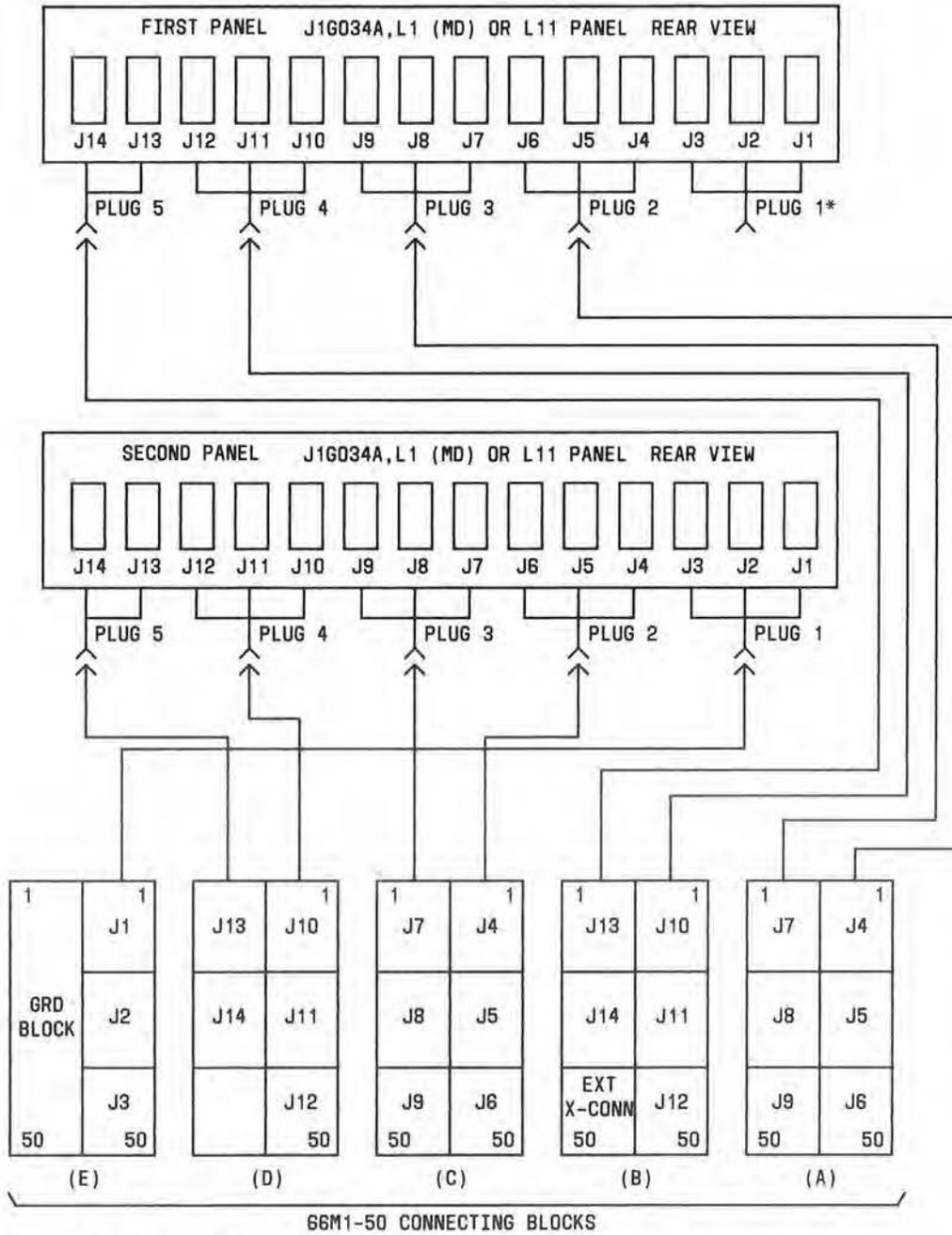


Fig. 4—J1G034B (MD) 4-Wire Private Line Packaged System (Front View)



\* PLUG 1 NOT USED ON FIRST PANEL

Fig. 5—Connecting Blocks Associated With Connectors in J1G034B (MD) 4-Wire Packaged System

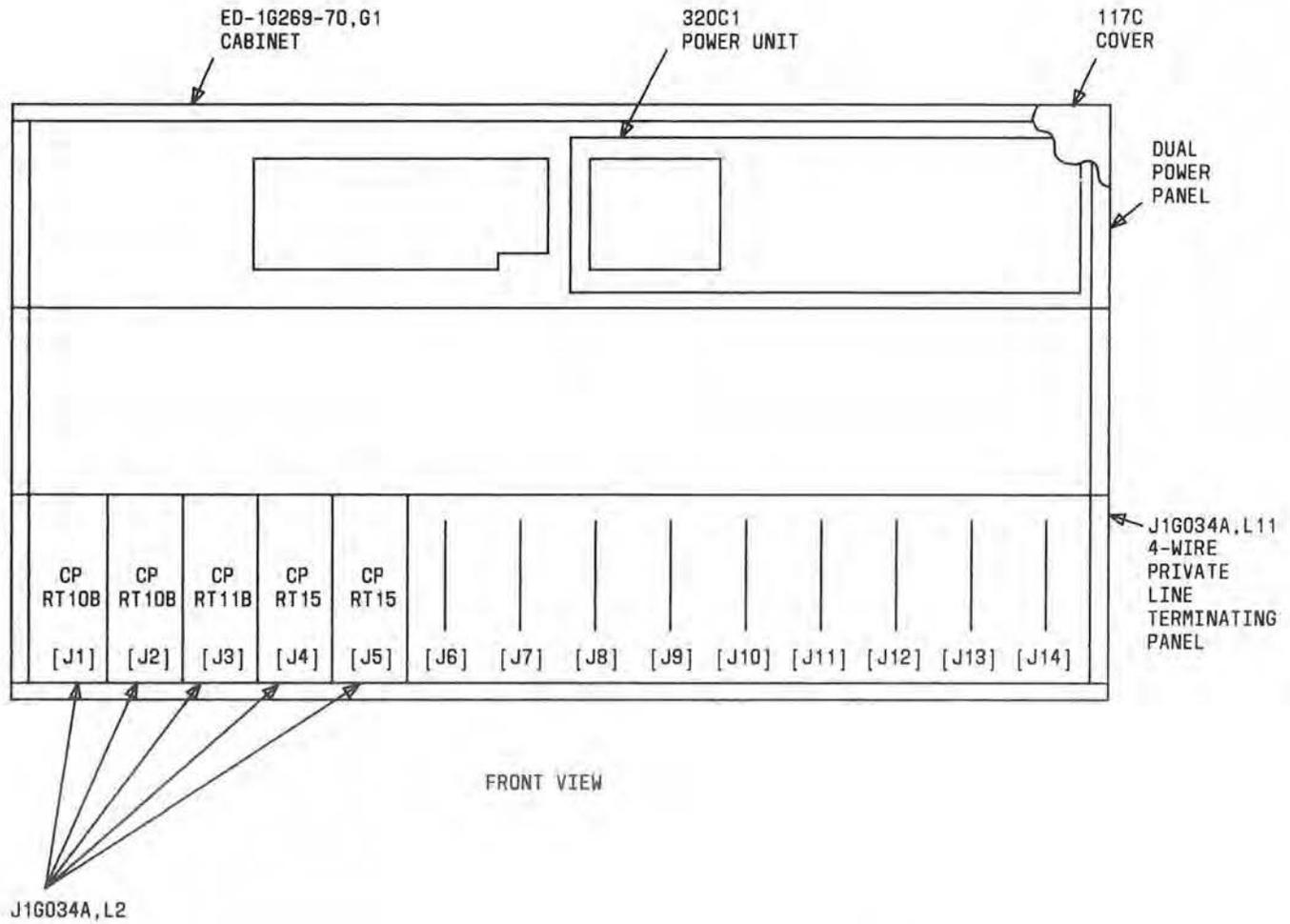


Fig. 6—J1G038A 4-Wire Private Line Packaged System (10 Stations)

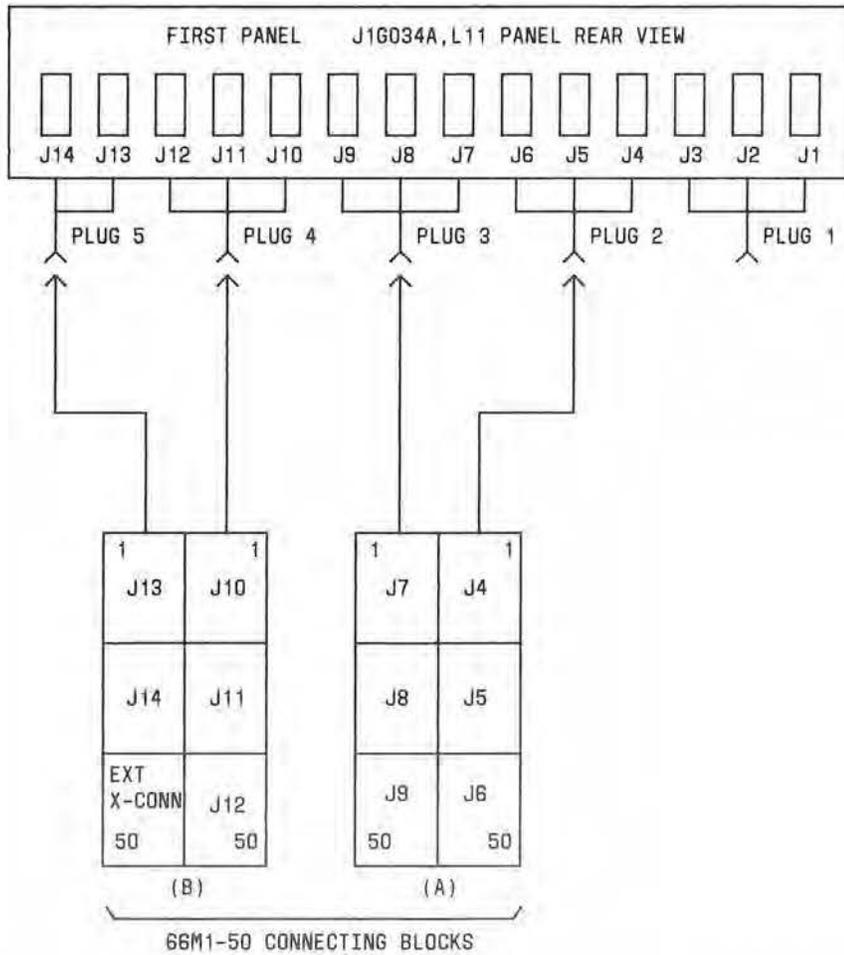


Fig. 7—Connecting Blocks Associated With Connectors in J1G038A 4-Wire Packaged System

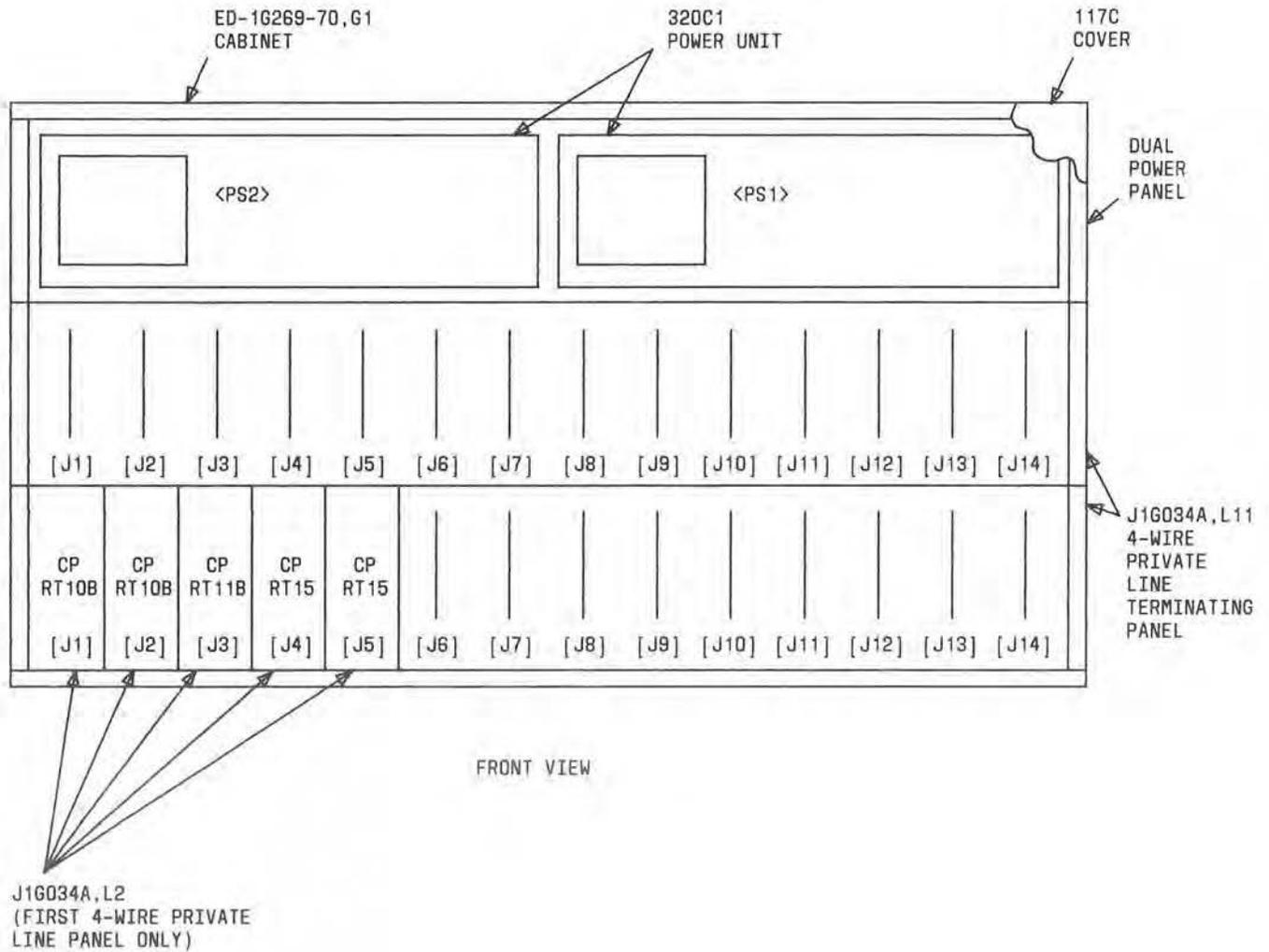


Fig. 8—J1G038B 4-Wire Private Line Packaged System (24 Stations)

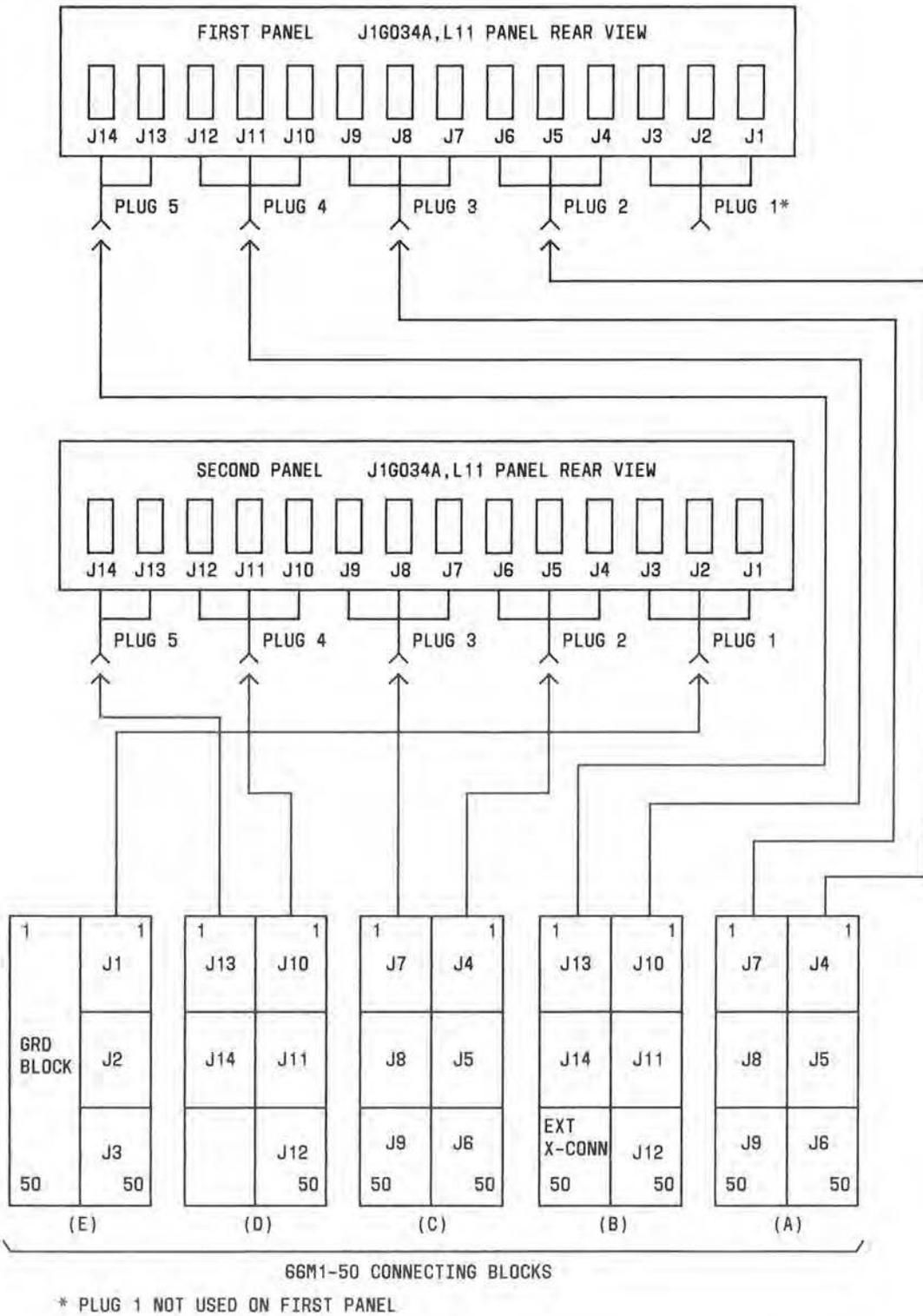


Fig. 9—Connecting Blocks Associated With Connectors in J1G038B 4-Wire Packaged System

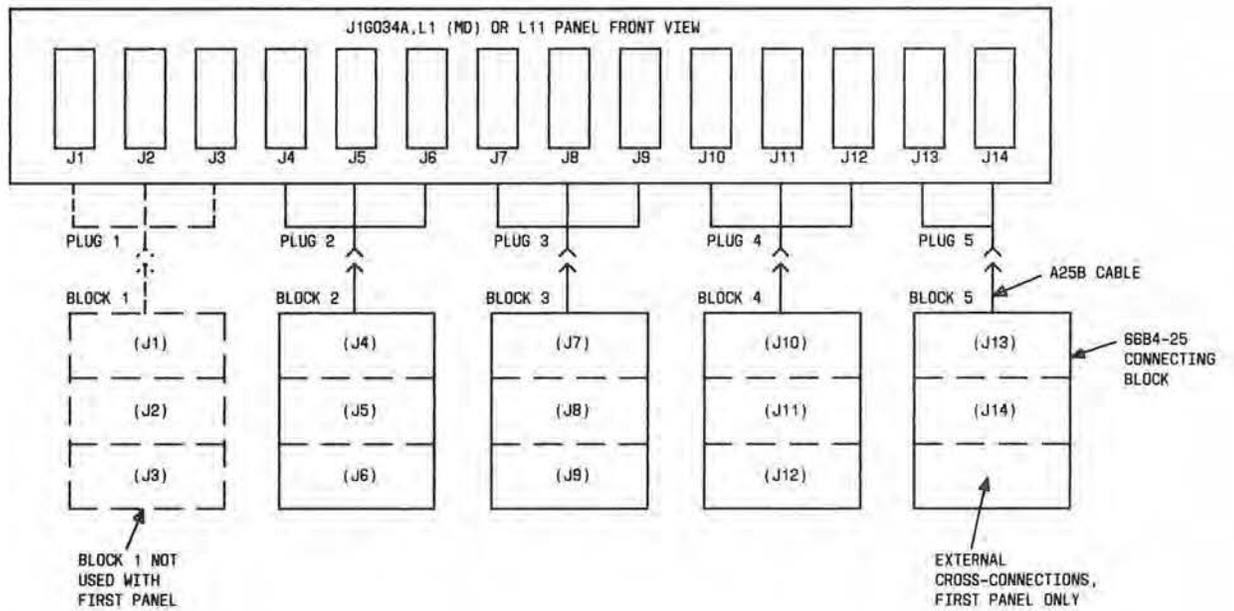


Fig. 10—How Connecting Blocks are Associated With Connectors in J1G034A,L1 (MD) or L11 Panel (Nonpackaged System)

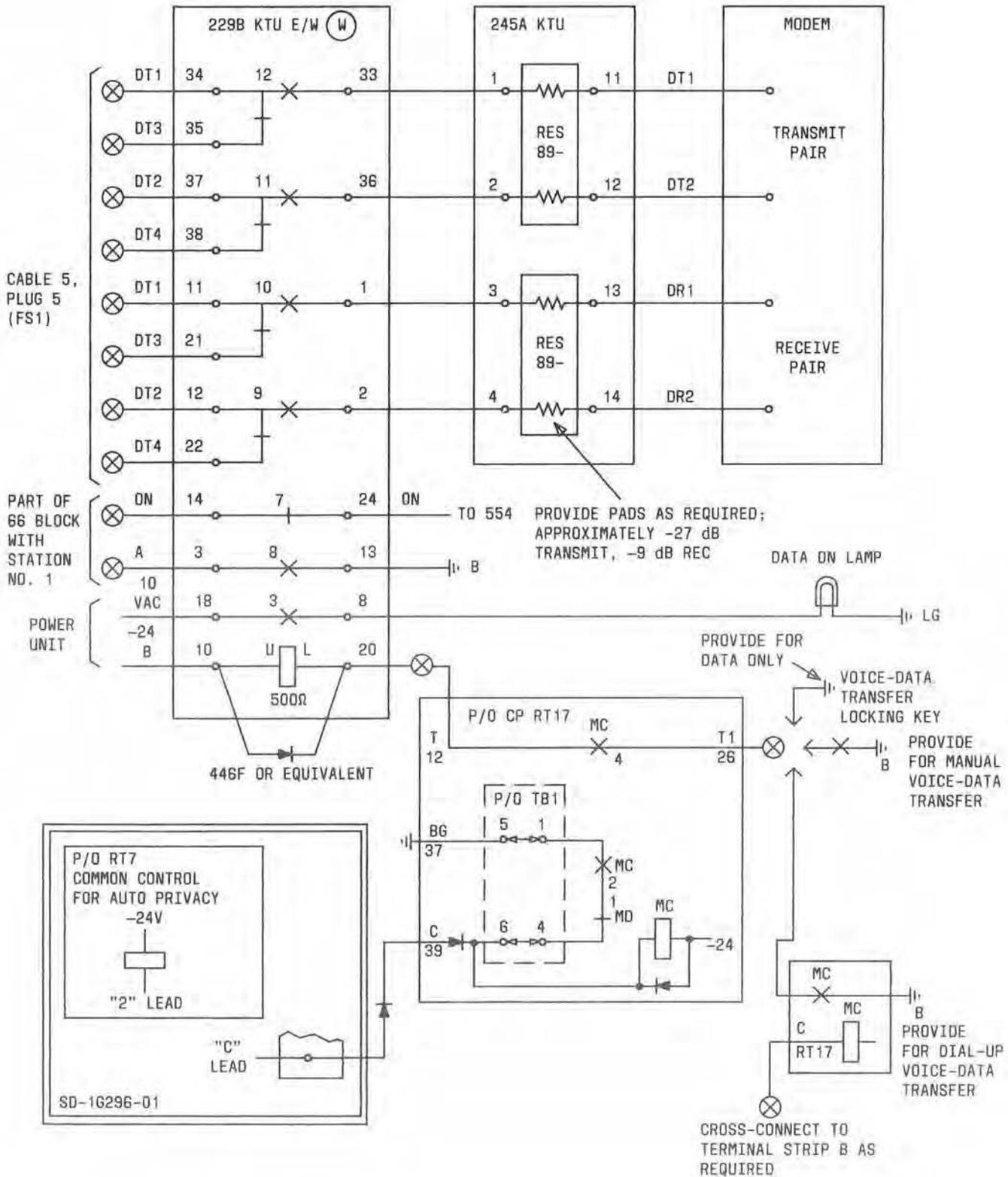


Fig. 11—Voice-Data Transfer Arrangement

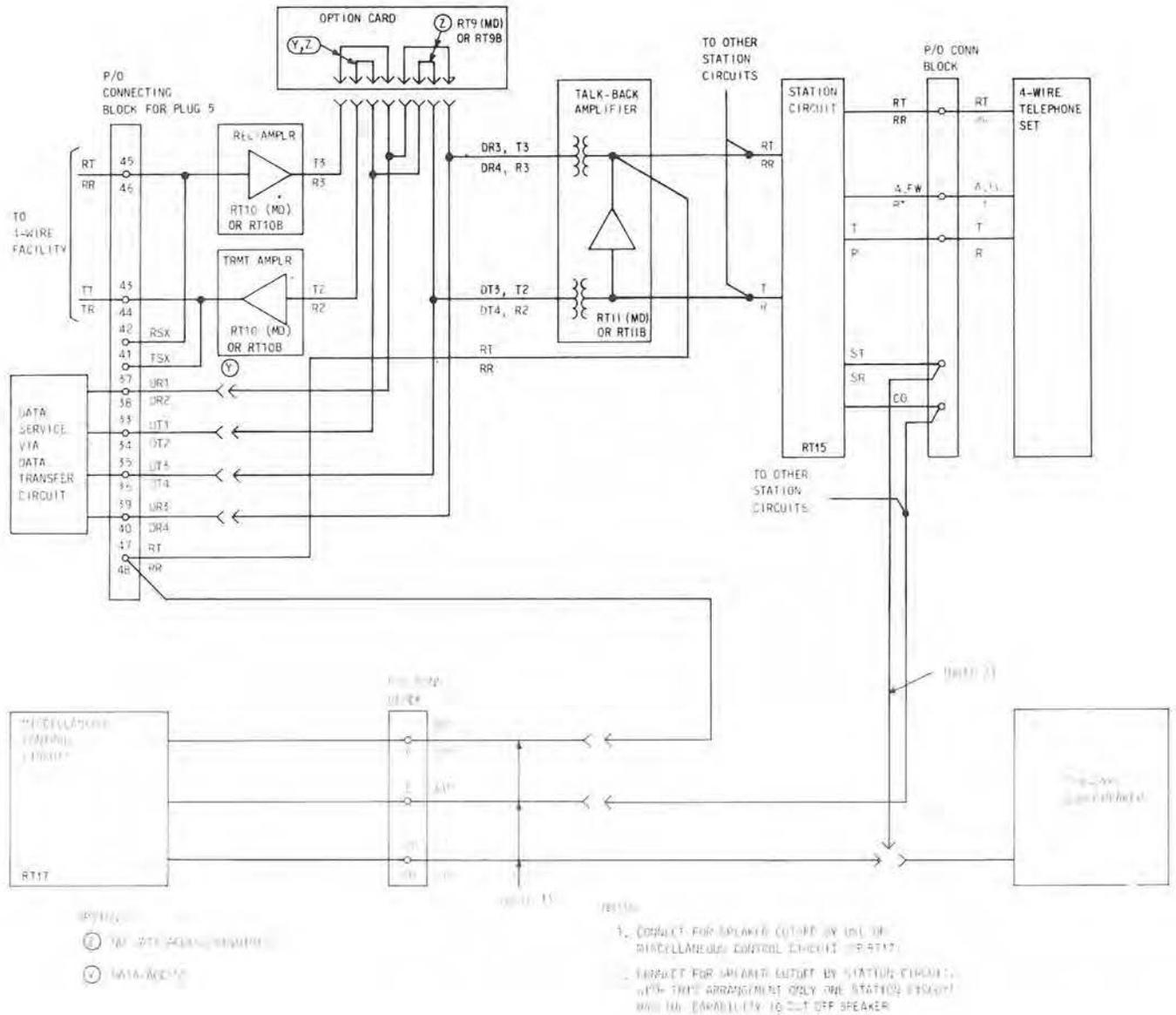


Fig. 12—Voice-Signaling Arrangement

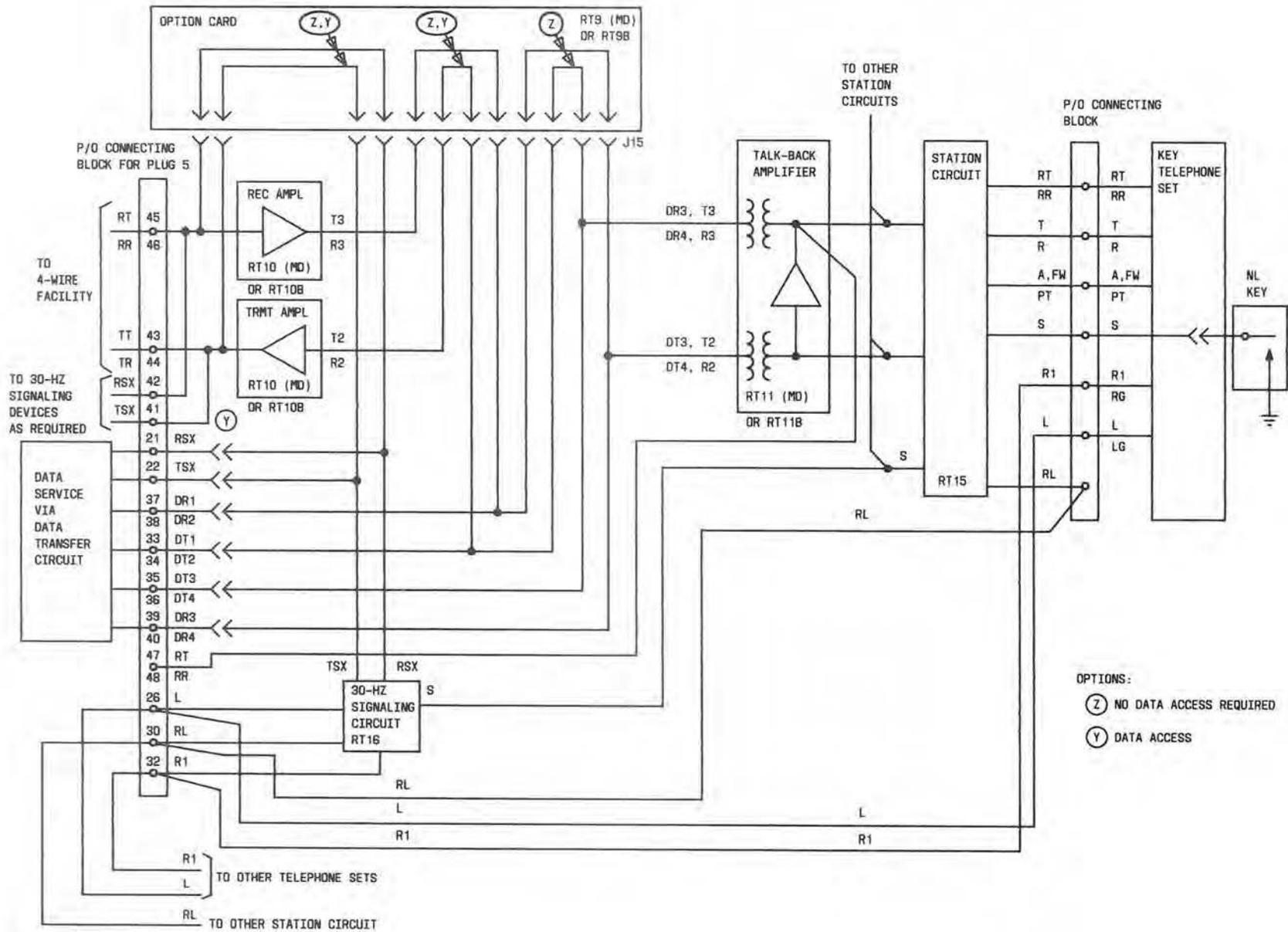


Fig. 13—30-Hz Manual or 2-Second Automatic Ringdown Arrangement

NOTES:

1. ALL POWER CONNECTIONS TO TERMINAL STRIPS SHALL BE 22-GAUGE OR LARGER.
2. ALL POWER SUPPLIES SHALL BE GROUNDED TO AN APPROVED GROUND.
3. OPTION V, SECOND OR SUCCEEDING PANEL.
4. INTERRUPTER CIRCUIT AND THE  $\pm 105V$ , RG, RN, LF, MG, AND MS LEADS ARE NOT REQUIRED FOR VOICE-SIGNALING CIRCUITS.
5. EXTERNAL INTERRUPTER CONNECTIONS SHOWN NOT REQUIRED WHEN CP RT18 IS USED.

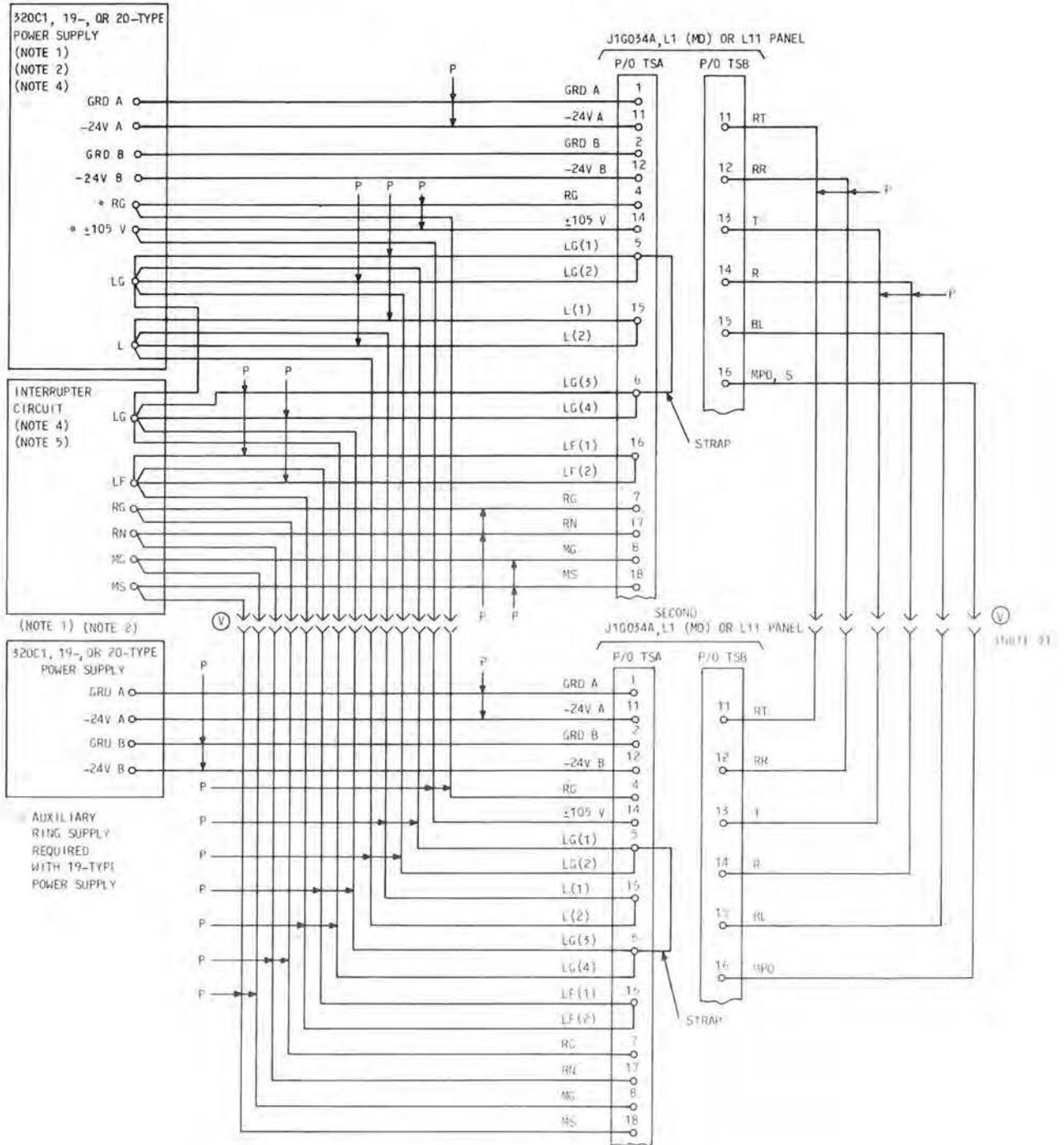


Fig. 14—Power and Interpanel Connections, 30-Hz or Voice Signaling

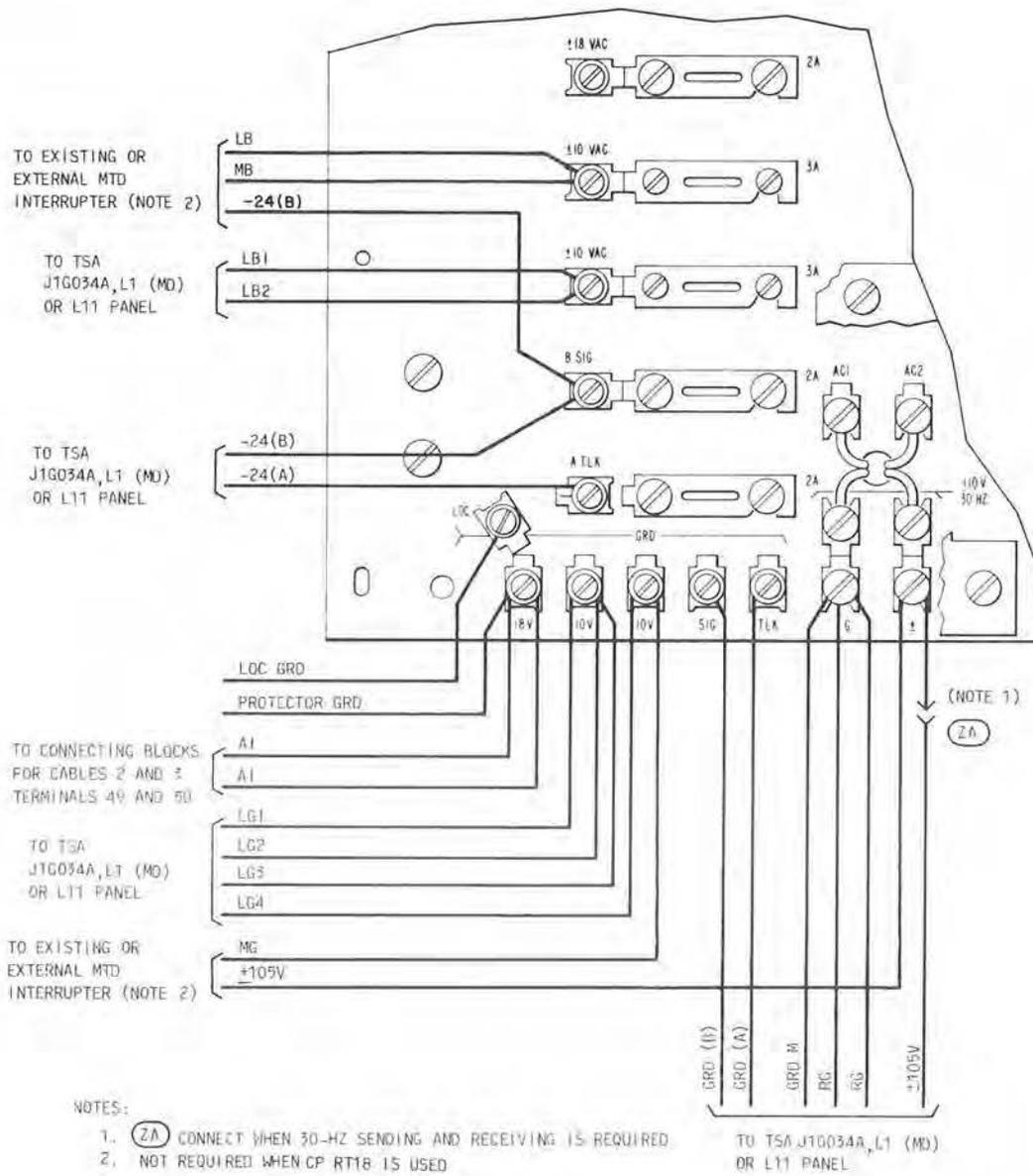


Fig. 15—Typical Connections for Power Supply

TABLE A

LEAD ASSIGNMENT FOR PLUGS, CONNECTOR  
CABLES, AND CONNECTING BLOCKS

LEAD ASSIGNMENT FOR PLUG 1, CONNECTOR CABLE 1, WHEN USED WITH SECOND OR SUCCEEDING PANEL (NOTE)					
66B4-25 CONN BLK TERM.	STA CKT CP RT15 LEAD DESIG	A25B CONN CABLE COLOR	PLUG PIN NO.	CONNECTOR	
					TERM.
1	RT	W-BL	26	J1	12
2	RR	BL-W	1		13
3	T	W-O	27		26
4	R	O-W	2		24
5	A	W-G	28		16
6	FW	G-W	3		25
7	PT	W-BR	29		1
8	S	BR-W	4		22
9	ST	W-S	30		0
10	SR	S-W	5		30
11	—	R-BL	31		Spare
12	AG	BL-R	6		27
13	—	R-O	32		Spare
14	RL	O-R	7		36
15	—	R-G	33		Spare
16	CO	G-R	8		39
17	RT	R-BR	34	J2	12
18	RR	BR-R	9		13
19	T	R-S	35		26
20	R	S-R	10		24
21	A	BK-BL	36		16
22	FW	BL-BK	11		25
23	PT	BK-O	37		1
24	S	O-BK	12		22
25	ST	BK-G	38		0

*Note:* Plug 1, connector cable 1, not used with first panel.

TABLE A (Contd)

LEAD ASSIGNMENT FOR PLUGS, CONNECTOR  
CABLES, AND CONNECTING BLOCKS

LEAD ASSIGNMENT FOR PLUG 1, CONNECTOR CABLE 1, WHEN USED WITH SECOND OR SUCCEEDING PANEL (NOTE) (Contd)					
66B4-25 CONN BLK TERM.	STA CKT CP RT15 LEAD DESIG	A25B CONN CABLE COLOR	PLUG PIN NO.	CONNECTOR	
					TERM.
26	SR	G-BK	13	J2 (Contd)	30
27	—	BK-BR	39		Spare
28	AG	BR-BK	14		27
29	—	BK-S	40		Spare
30	RL	S-BK	15		36
31	—	Y-BL	41		Spare
32	CO	BL-Y	16		39
33	RT	Y-O	42	J3	12
34	RR	O-Y	17		13
35	T	Y-G	43		26
36	R	G-Y	18		24
37	A	Y-BR	44		16
38	FW	BR-Y	19		25
39	PT	Y-S	45		1
40	S	S-Y	20		22
41	ST	V-BL	46		0
42	SR	BL-V	21		30
43	—	V-O	47		Spare
44	AG	O-V	22		27
45	—	V-G	48		Spare
46	RL	G-V	23	36	
47	—	V-BR	49	Spare	
48	CO	BR-V	24	39	
49	—	V-S	50	Spare	
50	—	S-V	25	Spare	

*Note:* Plug 1, connector cable 1, not used with first panel.

TABLE A (Contd)

LEAD ASSIGNMENT FOR PLUGS, CONNECTOR  
CABLES, AND CONNECTING BLOCKS

LEAD ASSIGNMENT FOR PLUG 2, CONNECTOR CABLE 2					
66B4-25 CONN BLK TERM.	STA CKT CP RT15 LEAD DESIG	A25B CONN CABLE COLOR	PLUG PIN NO.	CONNECTOR	
					TERM.
1	RT	W-BL	26	J4	12
2	RR	BL-W	1		13
3	T	W-O	27		26
4	R	O-W	2		24
5	A	W-G	28		16
6	FW	G-W	3		25
7	PT	W-BR	29		1
8	S	BR-W	4		22
9	ST	W-S	30		0
10	SR	S-W	5		30
11	—	R-BL	31		Spare
12	AG	BL-R	6		27
13	—	R-O	32		Spare
14	RL	O-R	7		36
15	—	R-G	33		Spare
16	CO	G-R	8		39
17	RT	R-BR	34	J5	12
18	RR	BR-R	9		13
19	T	R-S	35		26
20	R	S-R	10		24
21	A	BK-BL	36		16
22	FW	BL-BK	11		25
23	PT	BK-O	37		1
24	S	O-BK	12		22
25	ST	BK-G	38		0

TABLE A (Contd)

LEAD ASSIGNMENT FOR PLUGS, CONNECTOR  
CABLES, AND CONNECTING BLOCKS

LEAD ASSIGNMENT FOR PLUG 2, CONNECTOR CABLE 2 (Contd)					
66B4-25 CONN BLK TERM.	STA CKT CP RT15 LEAD DESIG	A25B CONN CABLE COLOR	PLUG PIN NO.	CONNECTOR	
					TERM.
26	SR	G-BK	13	J5 (Contd)	30
27	—	BK-BR	39		Spare
28	AG	BR-BK	14		27
29	—	BK-S	40		Spare
30	RL	S-BK	15		36
31	—	Y-BL	41		Spare
32	CO	BL-Y	16		39
33	RT	Y-O	42		12
34	RR	O-Y	17	13	
35	T	Y-G	43	26	
36	R	G-Y	18	24	
37	A	Y-BR	44	16	
38	FW	BR-Y	19	25	
39	PT	Y-S	45	1	
40	S	S-Y	20	J6	22
41	ST	V-BL	46	0	
42	SR	BL-V	21	30	
43	—	V-O	47	Spare	
44	AG	O-V	22	27	
45	—	V-G	48	Spare	
46	RL	G-V	23	36	
47	—	V-BR	49	Spare	
48	CO	BR-V	24	39	
49	—	V-S	50	—	A1 GRD
50	—	S-V	25	—	A1 GRD

TABLE A (Contd)

LEAD ASSIGNMENT FOR PLUGS, CONNECTOR  
CABLES, AND CONNECTING BLOCKS

LEAD ASSIGNMENT FOR PLUG 3, CONNECTOR CABLE 3					
66B4-25 CONN BLK TERM.	STA CKT CP RT15 LEAD DESIG	A25B CONN CABLE COLOR	PLUG PIN NO.	CONNECTOR	
					TERM.
1	RT	W-BL	26	J7	12
2	RR	BL-W	1		13
3	T	W-O	27		26
4	R	O-W	2		24
5	A	W-G	28		16
6	FW	G-W	3		25
7	PT	W-BR	29		1
8	S	BR-W	4		22
9	ST	W-S	30		0
10	SR	S-W	5		30
11	—	R-BL	31		Spare
12	AG	BL-R	6		27
13	—	R-O	32		Spare
14	RL	O-R	7		36
15	—	R-G	33		Spare
16	CO	G-R	8	39	
17	RT	R-BR	34	J8	12
18	RR	BR-R	9		13
19	T	R-S	35		26
20	R	S-R	10		24
21	A	BK-BL	36		16
22	FW	BL-BK	11		25
23	PT	BK-O	37		1
24	S	O-BK	12		22
25	ST	BK-G	38		0

TABLE A (Contd)

LEAD ASSIGNMENT FOR PLUGS, CONNECTOR  
CABLES, AND CONNECTING BLOCKS

LEAD ASSIGNMENT FOR PLUG 3, CONNECTOR CABLE 3 (Contd)					
6684-25 CONN BLK TERM.	STA CKT CP RT15 LEAD DESIG	A25B CONN CABLE COLOR	PLUG PIN NO.	CONNECTOR	
					TERM.
26	SR	G-BK	13	J8 (Contd)	30
27	—	BK-BR	39		Spare
28	AG	BR-BK	14		27
29	—	BK-S	40		Spare
30	RL	S-BK	15		36
31	—	Y-BL	41		Spare
32	CO	BL-Y	16		39
33	RT	Y-O	42		12
34	RR	O-Y	17	13	
35	T	Y-G	43	26	
36	R	G-Y	18	24	
37	A	Y-BR	44	16	
38	FW	BR-Y	19	25	
39	PT	Y-S	45	1	
40	S	S-Y	20	22	
41	ST	V-BL	46	0	
42	SR	BL-V	21	30	
43	—	V-O	47	Spare	
44	AG	O-V	22	27	
45	—	V-G	48	Spare	
46	RL	G-V	23	36	
47	—	V-BR	49	Spare	
48	CO	BR-V	24	39	
49	—	V-S	50	—	GRD
50	—	S-V	25	—	GRD

TABLE A (Contd)

LEAD ASSIGNMENT FOR PLUGS, CONNECTOR  
CABLES, AND CONNECTING BLOCKS

LEAD ASSIGNMENT FOR PLUG 4, CONNECTOR CABLE 4							
66B4-25 CONN BLK TERM.	STA CKT CP RT15 LEAD DESIG	SIG CKT CP RT16 LEAD DESIG	MISC CKT CP RT17 LEAD DESIG	A25B CONN CABLE COLOR	PLUG PIN NO.	CONNECTOR	
							TERM.
1	RT	—	T	W-BL	26	J10	12
2	RR	—	R	BL-W	1		13
3	T	—	T1	W-O	27		26
4	R	—	R1	O-W	2		24
5	A	—	T2	W-G	28		16
6	FW	—	R2	G-W	3		25
7	PT	—	F	W-BR	29		1
8	S	—	M	BR-W	4		22
9	ST	—	B	W-S	30		0
10	SR	—	MD	S-W	5		30
11	—	LG	—	R-BL	31		L GRD
12	AG	L	GM	BL-R	6		27
13	—	—	—	R-O	32		L GRD
14	RL	RL	GB	O-R	7		36
15	—	—	—	R-G	33		L GRD
16	CO	R1-RC	C	G-R	8		39
17	RT	—	T	R-BR	34	J11	12
18	RR	—	R	BR-R	9		13
19	T	—	T1	R-S	35		26
20	R	—	R1	S-R	10		24
21	A	—	T2	BK-BL	36		16
22	FW	—	R2	BL-BK	11		25
23	PT	—	F	BK-O	37		1
24	S	—	M	O-BK	12		22
25	ST	—	B	BK-O	38		0

**TABLE A (Contd)**  
**LEAD ASSIGNMENT FOR PLUGS, CONNECTOR**  
**CABLES, AND CONNECTING BLOCKS**

LEAD ASSIGNMENT FOR PLUG 4, CONNECTOR CABLE 4 (Contd)							
66B4-25 CONN BLK TERM.	STA CKT CP RT15 LEAD DESIG	SIG CKT CP RT16 LEAD DESIG	MISC CKT CP RT17 LEAD DESIG	A25B CONN CABLE COLOR	PLUG PIN NO.	CONNECTOR	
							TERM.
26	SR	—	MD	0-BK	13	J11 (Contd)	30
27	—	LG	—	BK-BR	39		L GRD
28	AG	L	GM	BR-BK	14		27
29	—	—	—	BK-S	40		L GRD
30	RL	RL	GB	S-BK	15		36
31	—	—	—	Y-BL	41		L GRD
32	CO	RI-RC	C-	BL-Y	16		39
33	RT	—	T	Y-O	42	J12	12
34	RR	—	R	O-Y	17		13
35	T	—	T1	Y-G	43		26
36	R	—	R1	G-Y	18		24
37	A	—	T2	Y-BR	44		16
38	FW	—	R2	BR-Y	19		25
39	PT	—	F	Y-S	45		1
40	S	—	M	S-Y	20		22
41	ST	—	B	V-BL	46		0
42	SR	—	MD	BL-V	21		30
43	—	LG	—	V-O	47		L GRD
44	AG	L	GM	O-V	22		27
45	—	—	—	V-G	48		L GRD
46	RL	RL	GB	G-V	23	36	
47	—	—	—	V-BR	49	L GRD	
48	CO	RI-RC	C-	BR-V	24	39	
49	—	RG	—	V-S	50	—	R GRD
50	—	RG	—	S-V	25	—	R GRD

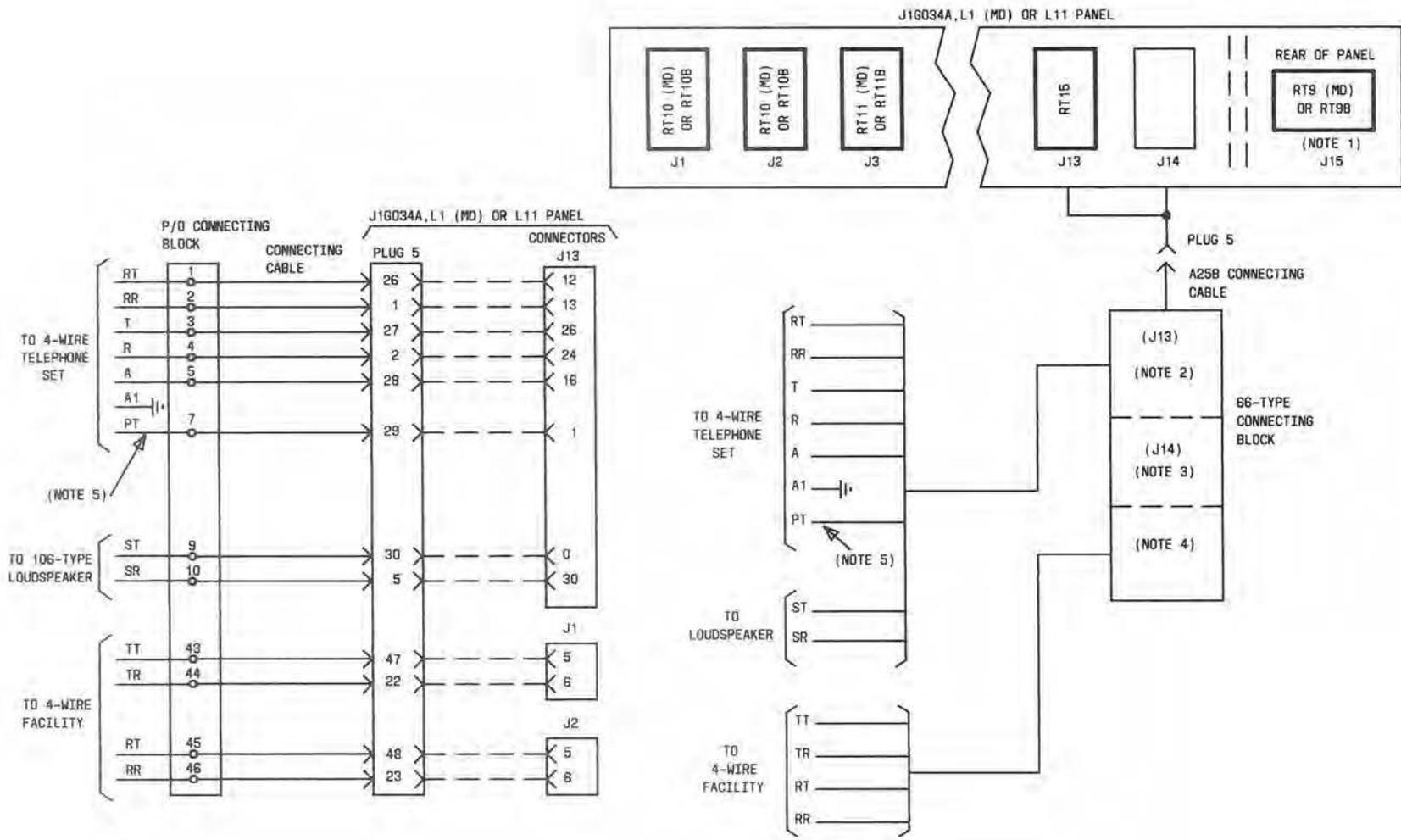
TABLE A (Contd)  
LEAD ASSIGNMENT FOR PLUGS, CONNECTOR  
CABLES, AND CONNECTING BLOCKS

LEAD ASSIGNMENT FOR PLUG 5, CONNECTOR CABLE 5							
66B4-25 CONN BLK TERM.	STA CKT CP RT15 LEAD DESIG	SIG CKT CP RT16 LEAD DESIG	MISC CKT CP RT17 LEAD DESIG	A25B CONN CABLE COLOR	PLUG PIN NO.	CONNECTOR	
							TERM.
1	RT	—	T	W-BL	26	J13	12
2	RR	—	R	BL-W	1		13
3	T	—	T1	W-O	27		26
4	R	—	R1	O-W	2		24
5	A	—	T2	W-G	28		16
6	FW	—	R2	G-W	3		25
7	PT	—	F	W-BR	29		1
8	S	—	M	BR-W	4		22
9	ST	—	B	W-S	30		0
10	SR	—	MD	S-W	5		30
11	—	LG	—	R-BL	31		L GRD
12	AG	L	GM	BL-R	6		27
13	—	—	—	R-O	32		L GRD
14	RL	RL	GB	O-R	7		36
15	—	—	—	R-G	33		L GRD
16	CO	R1-RC	C	G-R	8		39
17	RT	—	T	R-BR	34	J14	12
18	RR	—	R	BR-R	9		13
19	T	—	T1	R-S	35		26
20	R	—	R1	S-R	10		24
21	A	—	T2	BK-BL	36		16
22	FW	—	R2	BL-BK	11		25
23	PT	—	F	BK-O	37		1
24	S	—	M	O-BK	12		22
25	ST	—	B	BK-O	38		0

TABLE A (Contd)

LEAD ASSIGNMENT FOR PLUGS, CONNECTOR  
CABLES, AND CONNECTING BLOCKS

LEAD ASSIGNMENT FOR PLUG 5, CONNECTOR CABLE 5 (Contd)							
6684-25 CONN BLK TERM.	STA CKT CP RT15 LEAD DESIG	SIG CKT CP RT16 LEAD DESIG	MISC CKT CP RT17 LEAD DESIG	A25B CONN CABLE COLOR	PLUG PIN NO.	CONNECTOR	
							TERM.
26	SR	—	MD	O-BK	13	J14 (Contd)	30
27	—	LG	—	BK-BR	39		L GRD
28	AG	L	GM	BR-BK	14		27
29	—	—	—	BK-S	40		L GRD
30	RL	RL	GB	S-BK	15		36
31	—	—	—	Y-BL	41		L GRD
32	CO	R1-RC	C	BL-Y	16		39
49	—	RG	—	V-S	50		—
50	—	RG	—	S-V	25	—	R GRD
<b>EXTERNAL CROSS-CONNECTIONS</b>							
	<b>LEAD DESIG</b>	<b>FROM</b>	<b>TO</b>				
33	DT1	Data transmit circuit when specified	Transmit amplifier via option card	Y-O	42	J15	13
34	DT2			O-Y	17		15
35	DT3			Y-G	43		14
36	DT4			G-Y	18		16
37	DR1	Data receive circuit when specified	Receive amplifier via option card	Y-BR	44		9
38	DR2			BR-Y	19		11
39	DR3			Y-S	45		10
40	DR4			S-Y	20		12
41	TSX	External signal circuit as required	Amplifier SX path via option card	V-BL	46	19	
42	RSX			BL-V	21	17	
43	TT	Transmit to serving CO	Transmit amplifier	V-O	47	J1	5
44	TR			O-V	22		6
45	RT	Receive from serving CO	Receive amplifier	V-G	48	J2	5
46	RR			G-V	23		6
47	RT	Miscellaneous circuits as specified	Common receive bus	V-BR	49	J3	14
48	RR			BR-V	24		9



- NOTES:
1. INSERT OPTION CARD (CP RT9 [MD] OR RT9B) FOR 2 OPTION
  2. PART OF CONNECTING BLOCK ASSOCIATED WITH CONNECTOR J13
  3. PART OF CONNECTING BLOCK ASSOCIATED WITH CONNECTOR J14
  4. PART OF CONNECTING BLOCK FOR LINE CONNECTIONS
  5. CONNECT PT LEAD WHEN TELEPHONE SET IS EQUIPPED WITH PUSH-TO-TALK HANDSET AND OMIT S OPTION IN STATION CIRCUIT (CP RT15)

Fig. 16—Connections for One 4-Wire Telephone Set, Voice Signaling

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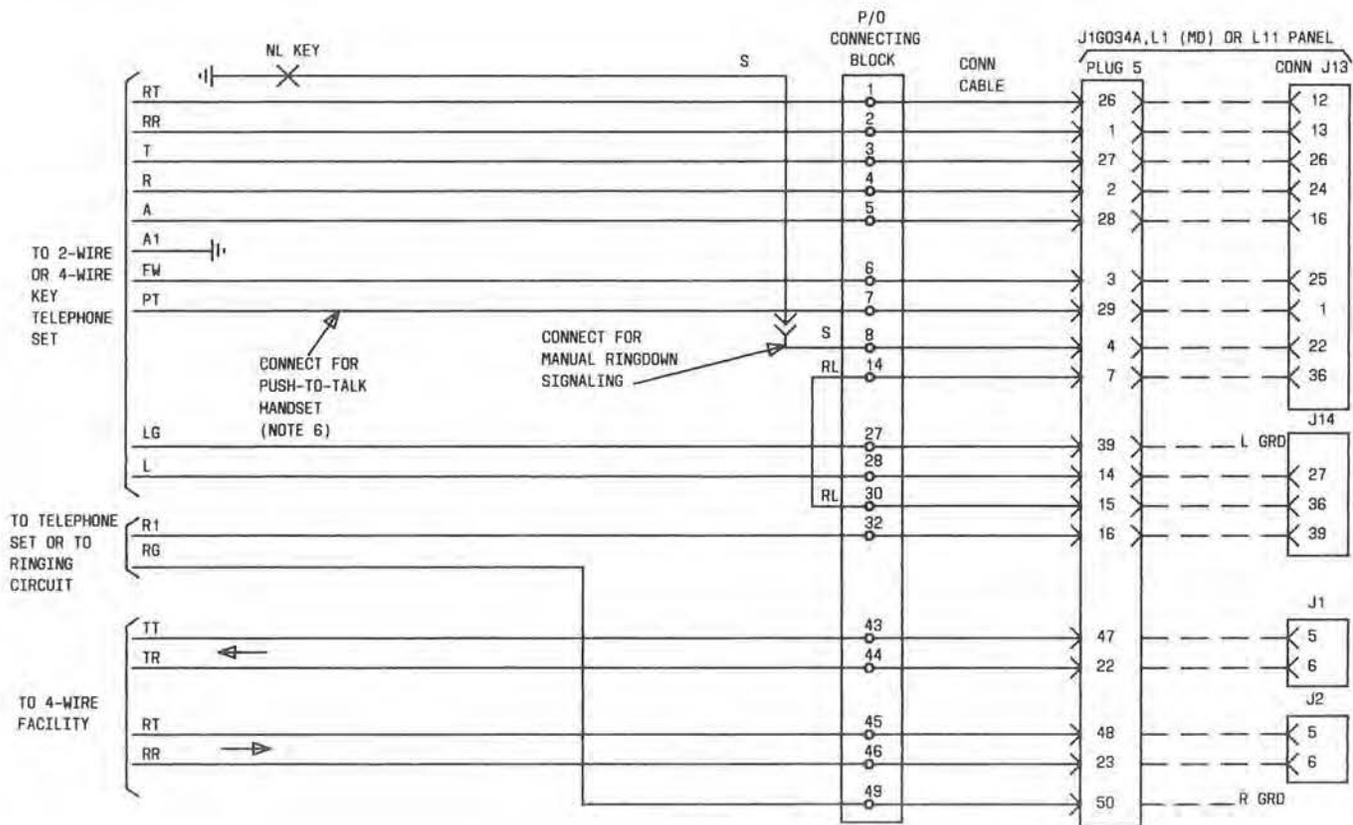


Fig. 17—Connections for One 2-/4-Wire Telephone Set, 30-Hz Signaling  
(Sheet 1 of 2)

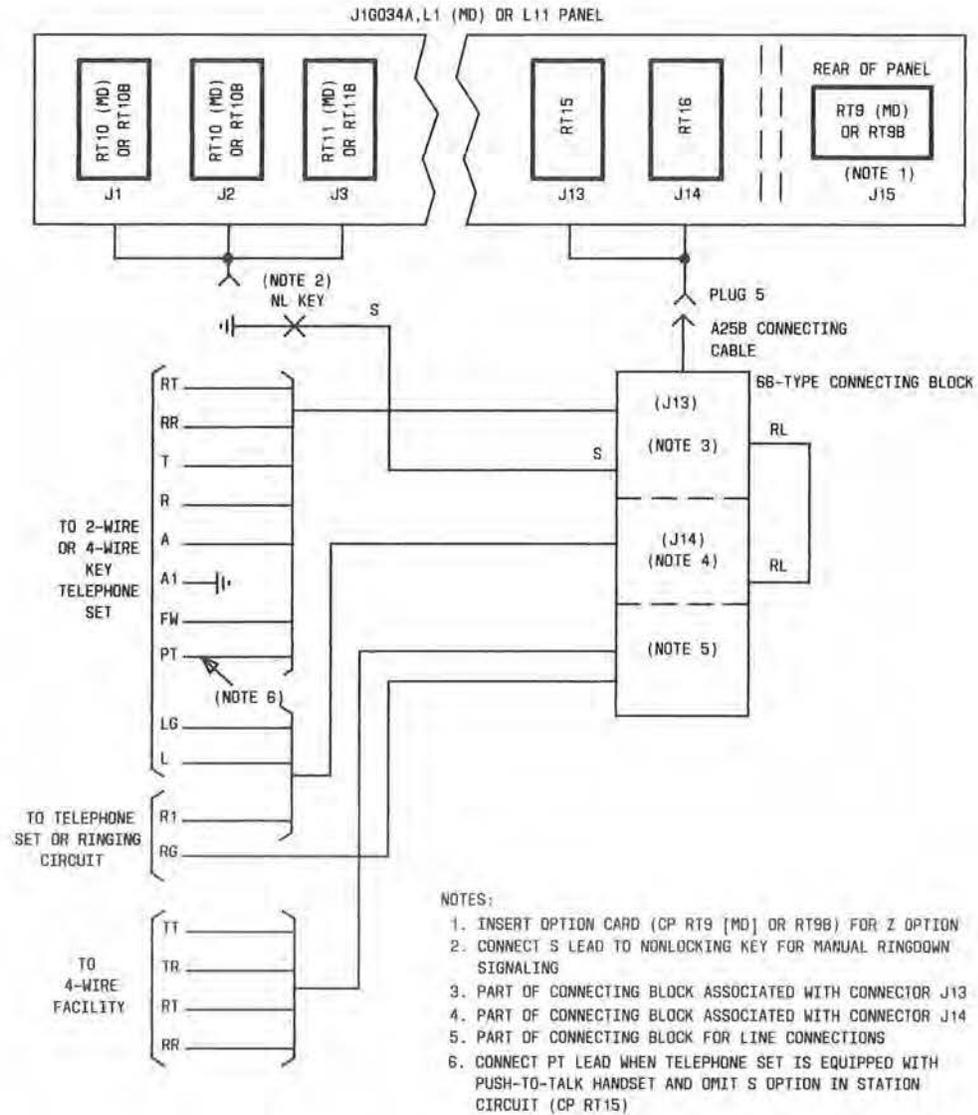


Fig. 17—Connections for One 2-/4-Wire Telephone Set, 30-Hz Signaling  
(Sheet 2 of 2)

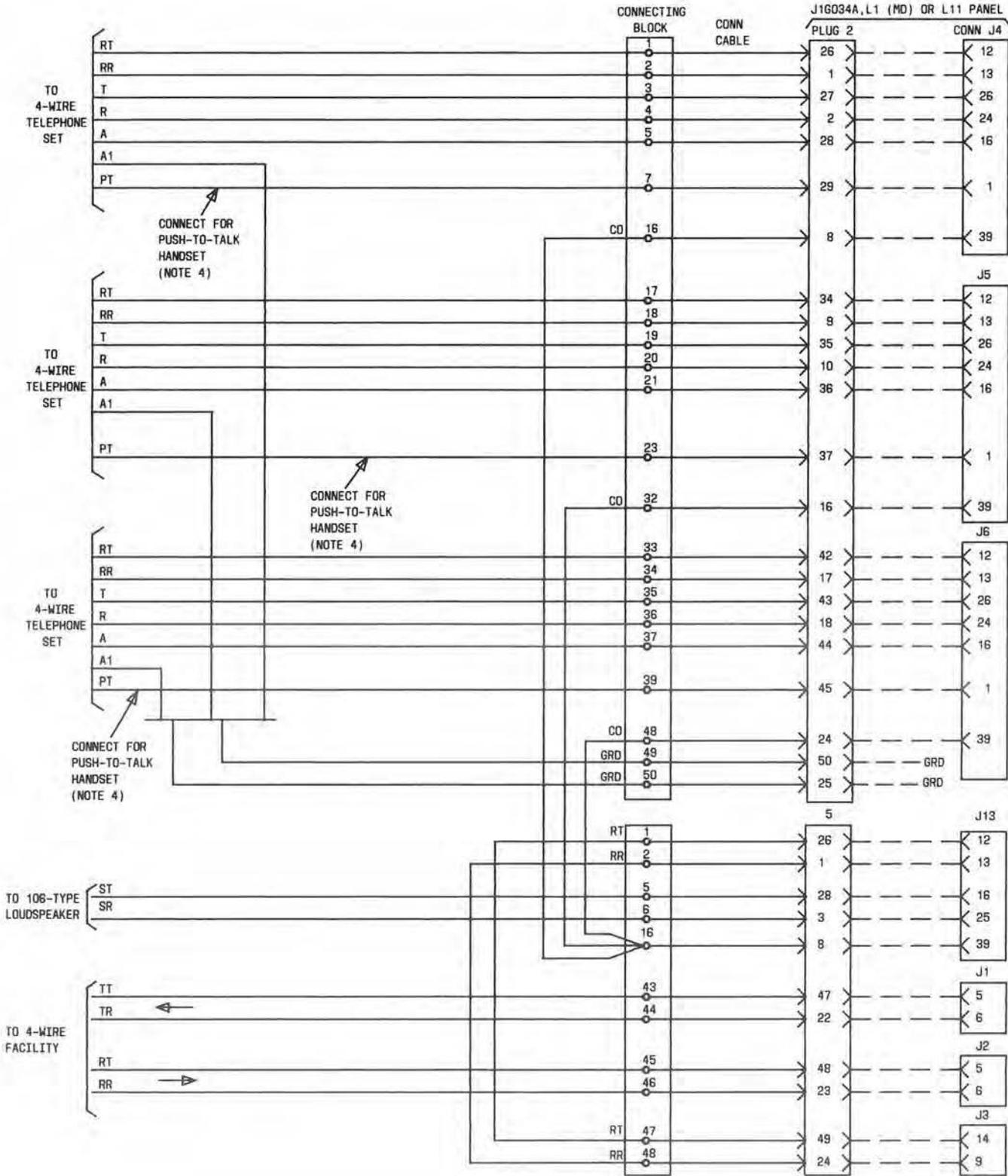


Fig. 18—Connections for Three 4-Wire Telephone Sets, Voice Signaling (Sheet 1 of 2)

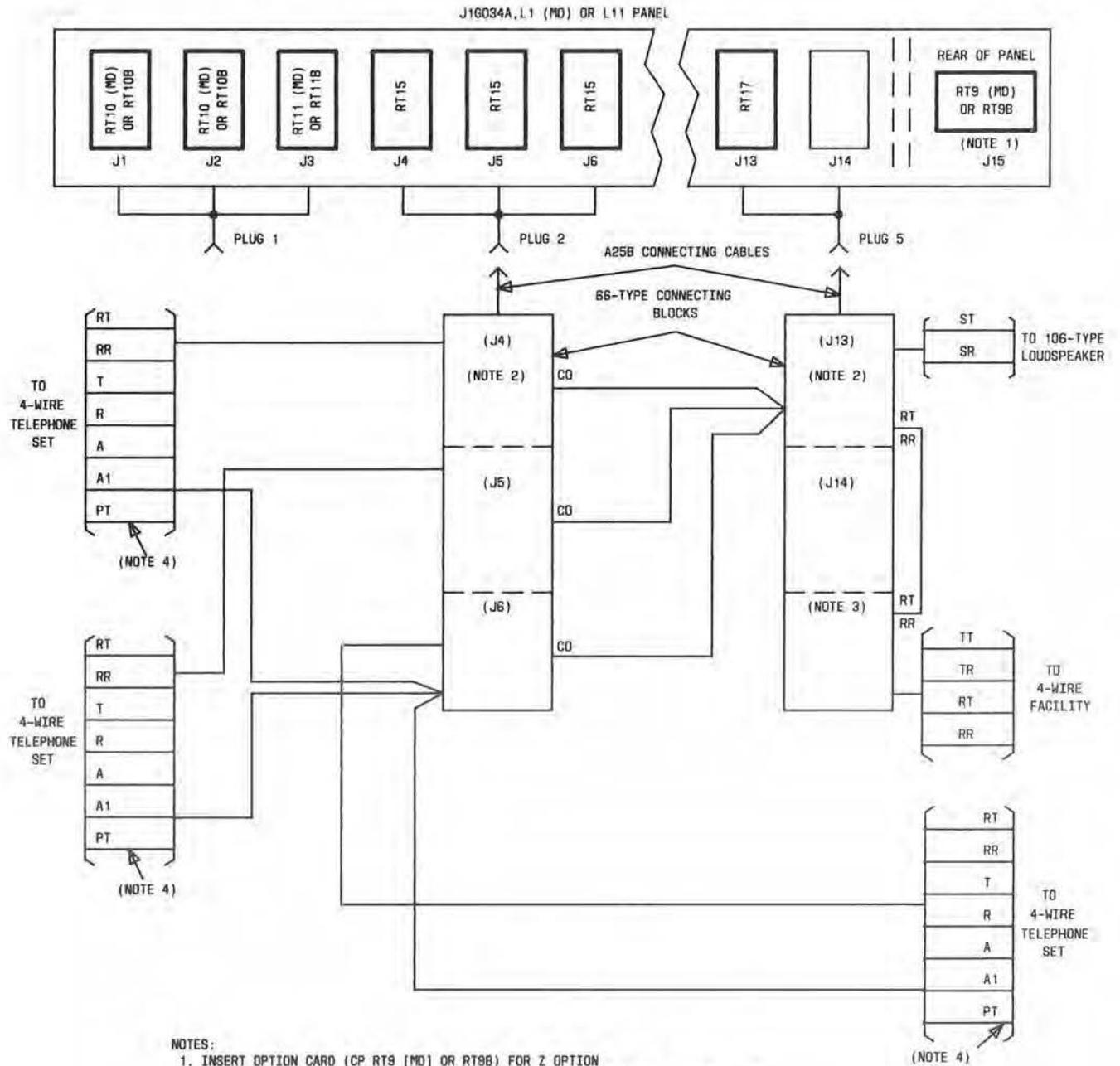


Fig. 18—Connections for Three 4-Wire Telephone Sets, Voice Signaling (Sheet 2 of 2)

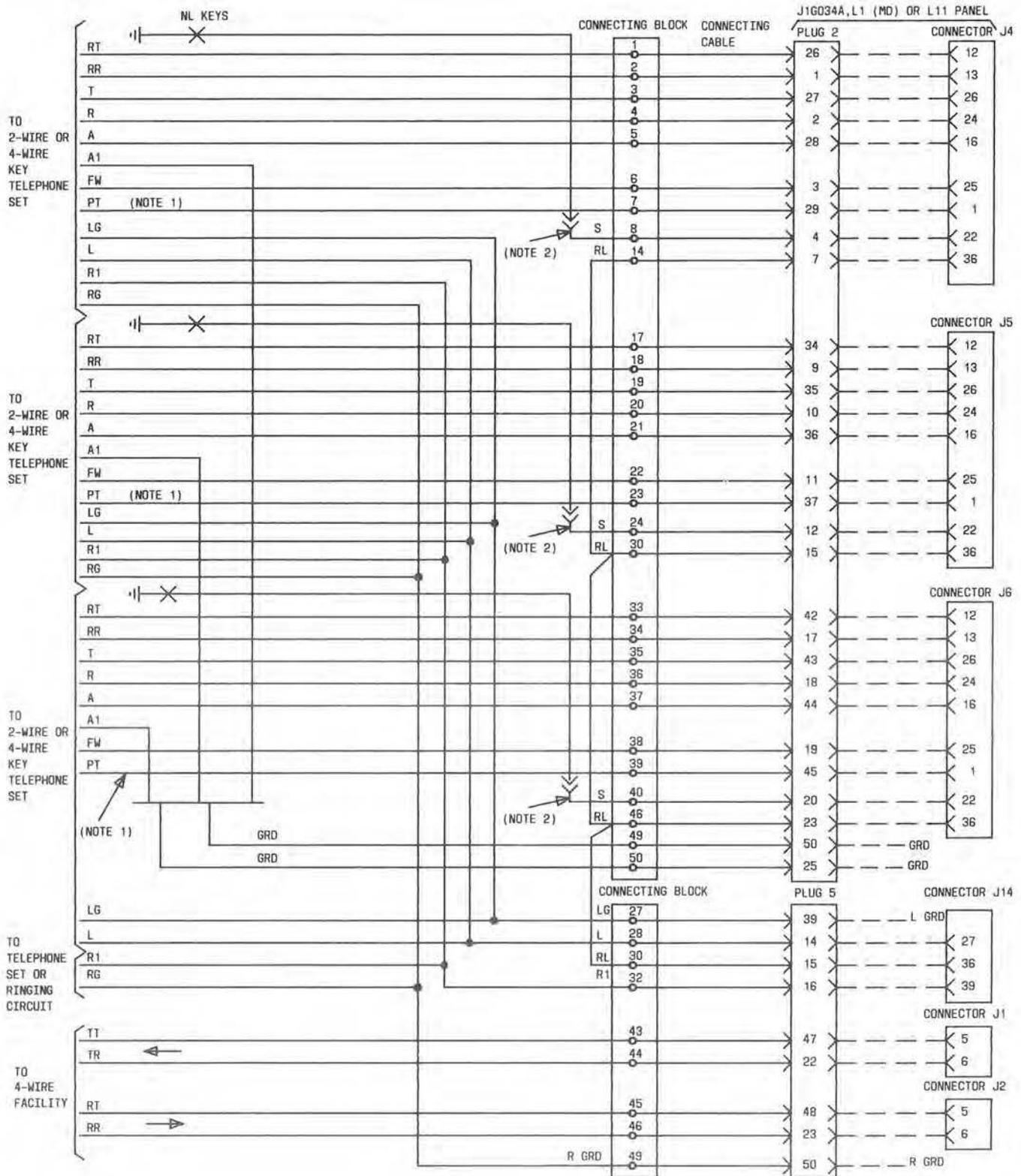


Fig. 19—Connections for Three 2-/4-Wire Telephone Sets, 30-Hz Signaling  
(Sheet 1 of 2)

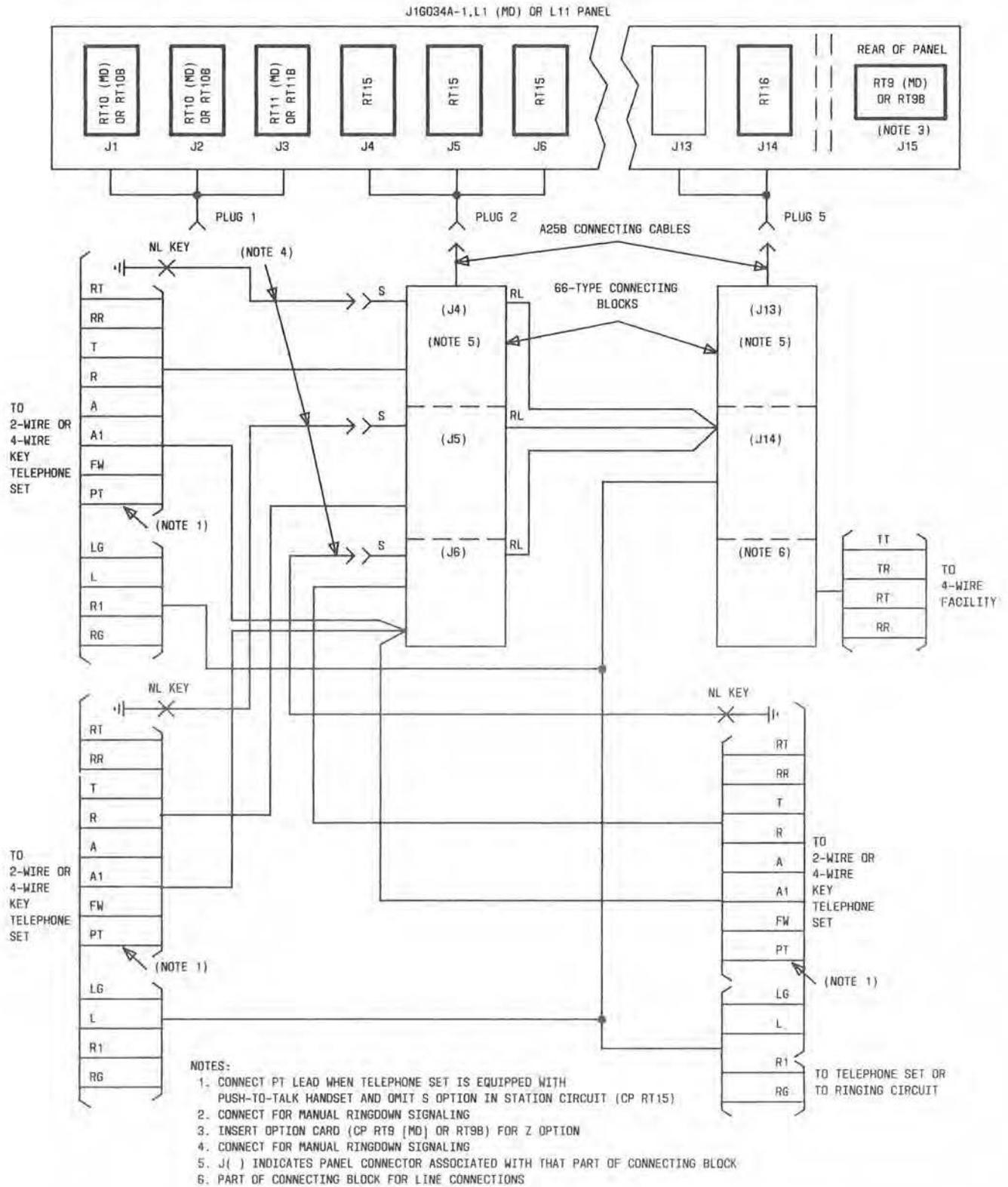
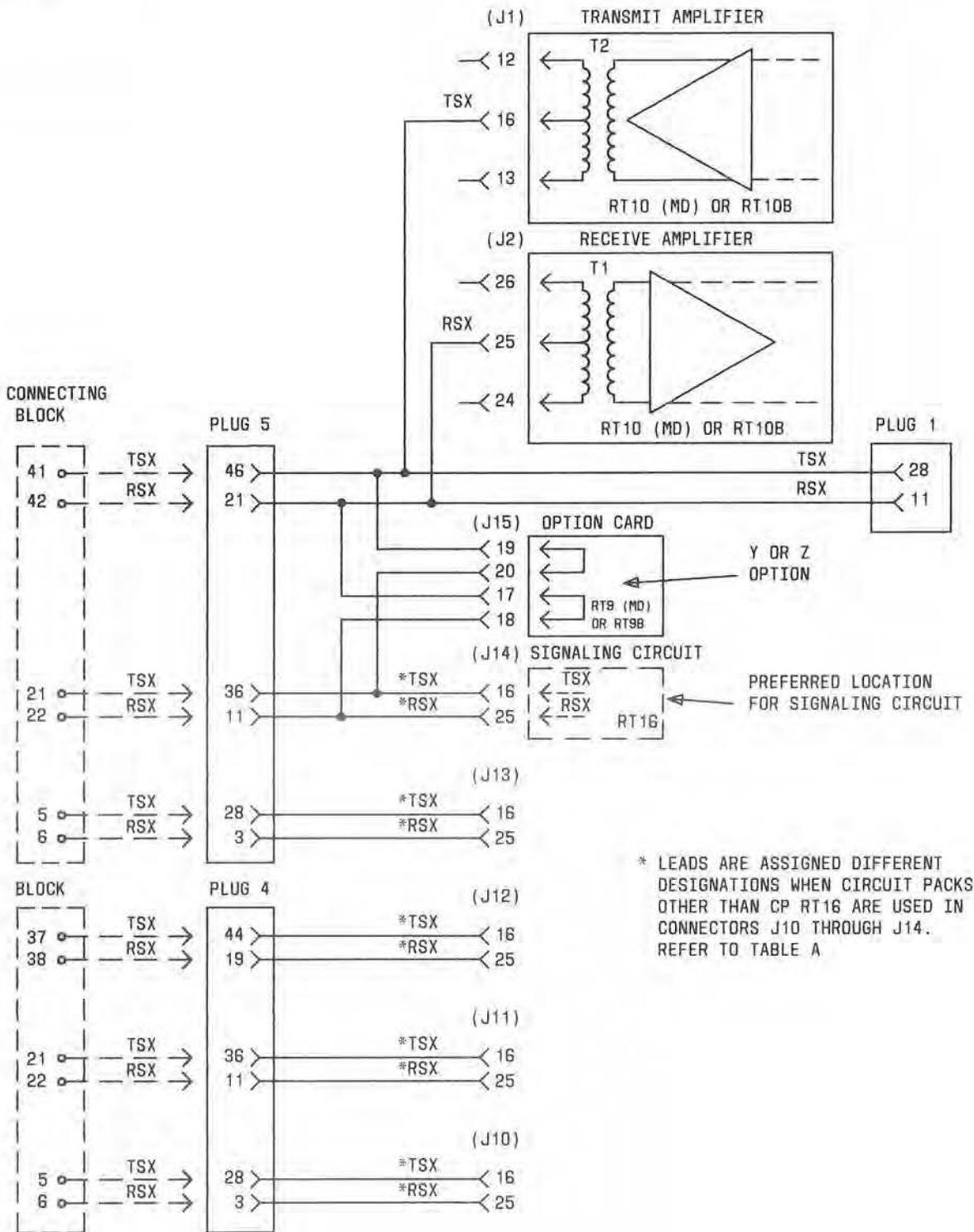


Fig. 19—Connections for Three 2-/4-Wire Telephone Sets, 30-Hz Signaling  
(Sheet 2 of 2)



\* LEADS ARE ASSIGNED DIFFERENT DESIGNATIONS WHEN CIRCUIT PACKS OTHER THAN CP RT16 ARE USED IN CONNECTORS J10 THROUGH J14. REFER TO TABLE A

Fig. 20—J1G034A,L1 (MD) or L11 Panel Wiring, Simplex Leads

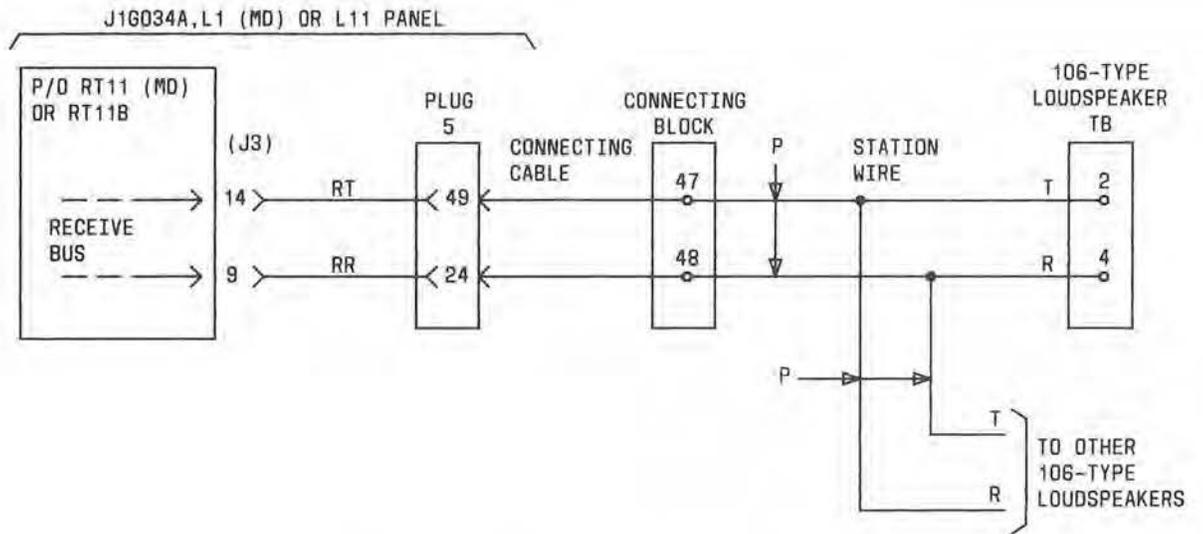


Fig. 21—Loudspeaker Connections, No Speaker Cutoff

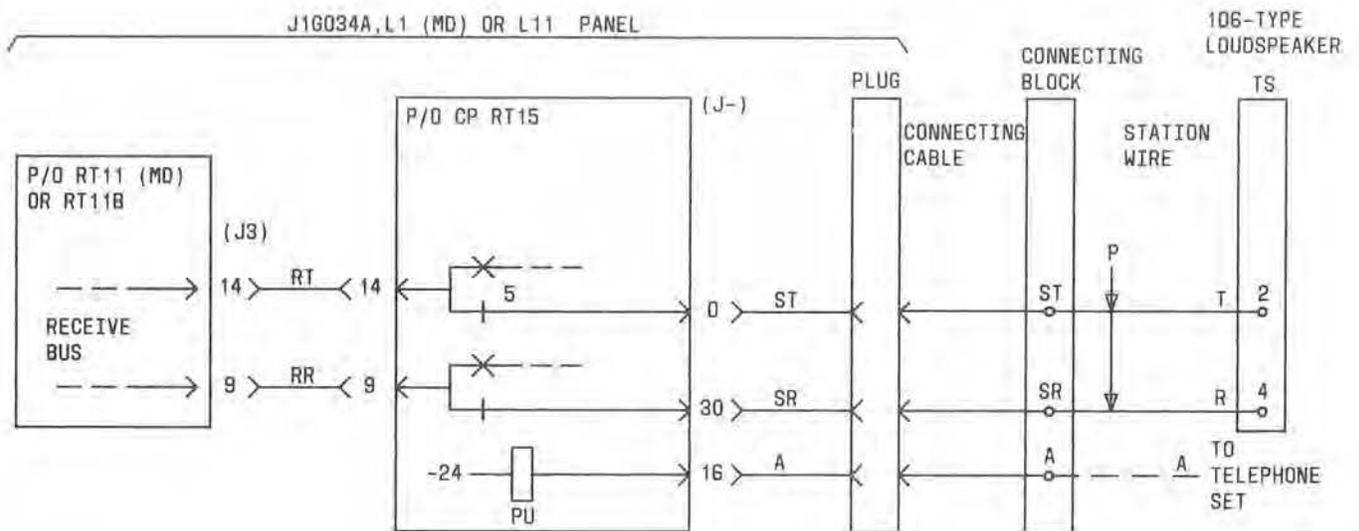


Fig. 22—Loudspeaker Connections, Cutoff Controlled by One Telephone Set

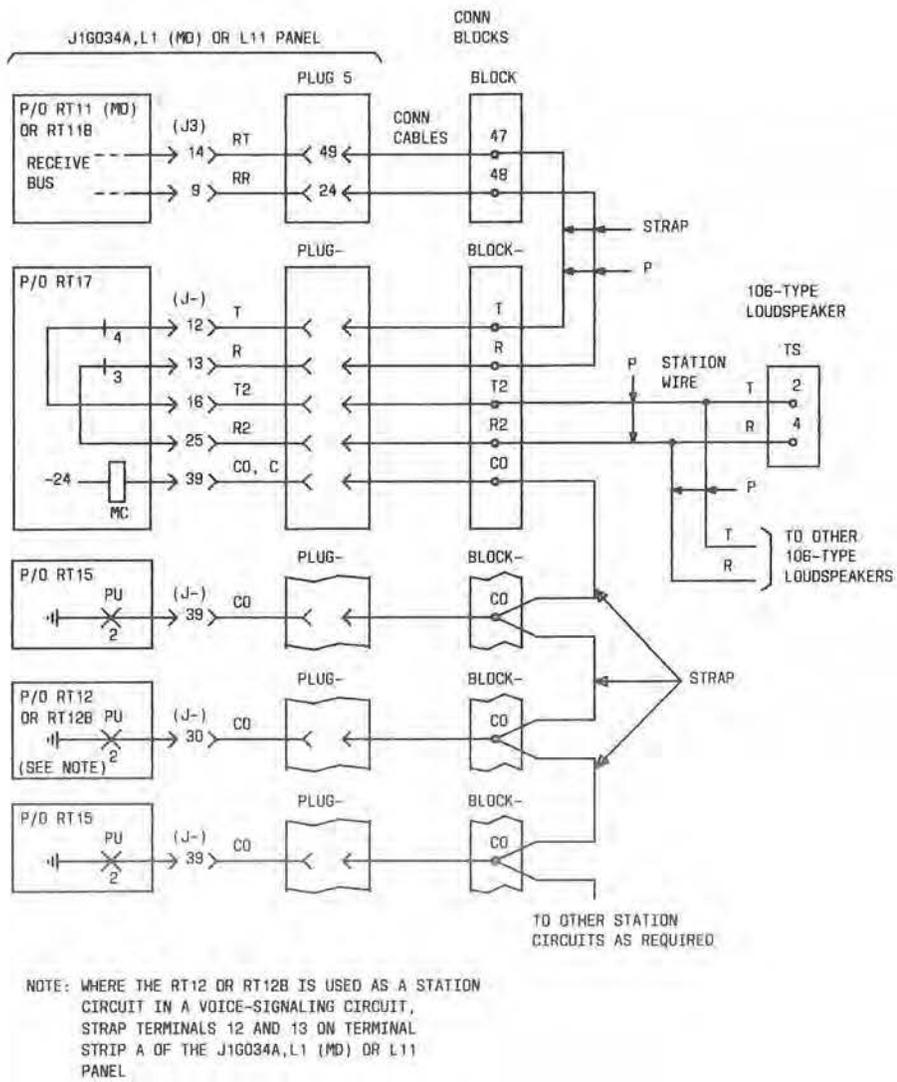


Fig. 23—Loudspeaker Connections, Cutoff Controlled by More Than One Telephone Set

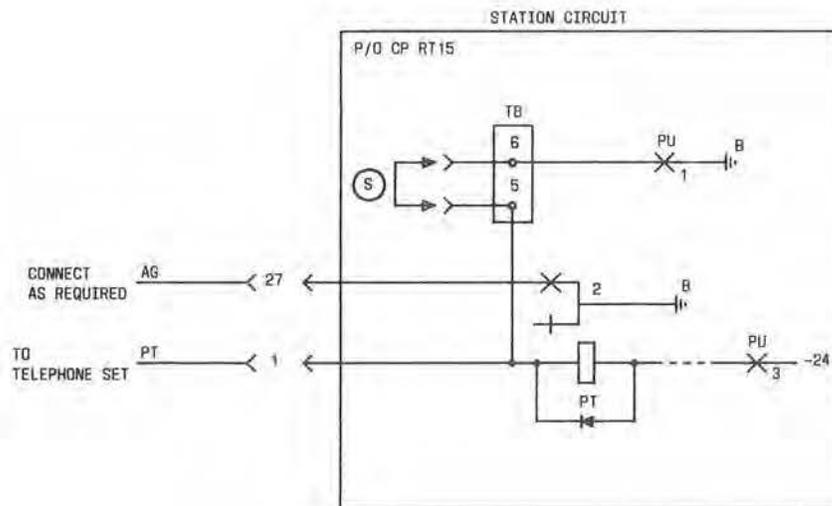


Fig. 24—AG Lead Ground for Special Application

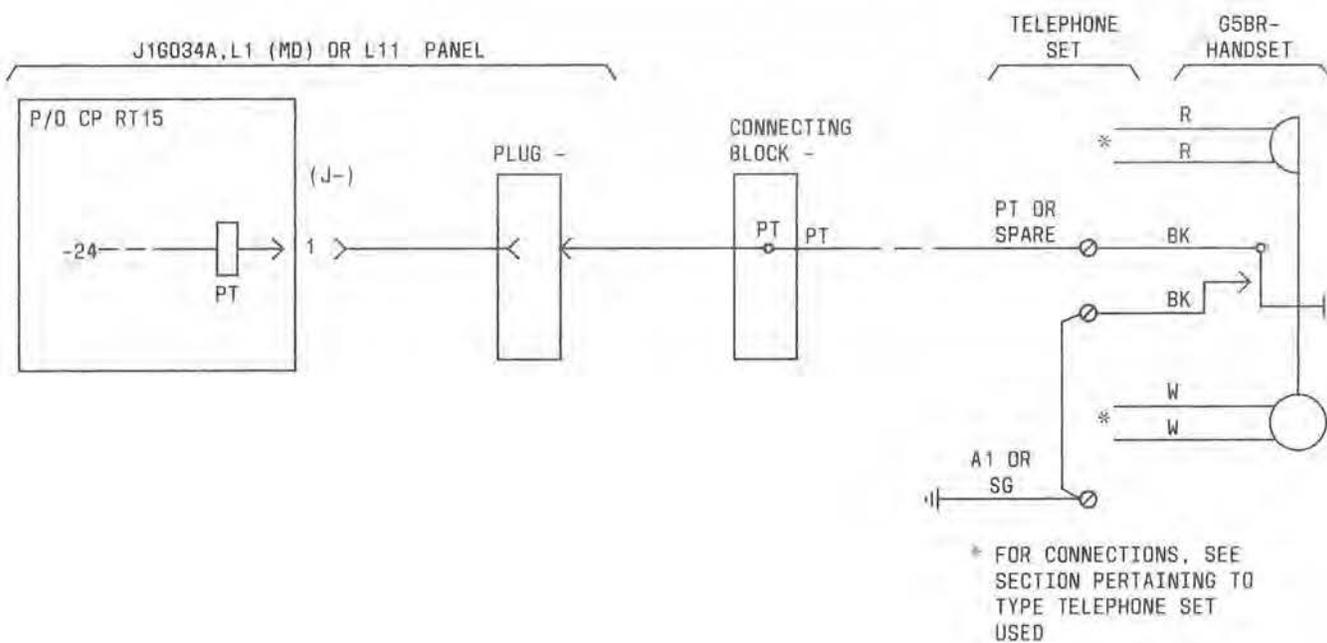


Fig. 25—Push-to-Talk Handset

**TABLE B**  
**OPTIONS FOR J1G034A,L1 (MD) OR L11 PANEL AND ASSOCIATED**  
**CIRCUIT PACKS**

OPTIONS*	OPTION CARD CP RT9 (MD) OR RT9B	STRAPS TO BE PROVIDED ON TERMINAL BOARD (77A BLOCK) OR TURNDOWN SCREW ADJUSTMENT ON CIRCUIT PACKS		
		RT15	RT16	RT17
Z	Insert card for Z option			
Y	Insert card for Y option			
V	Insert card for V option			
S		5-6		
R		3-4		
Q			1-2	
N			9-10	
M†			S1 down	
K			5-6	
G			7-8	
F			3-7	
E			6-7	

\* Z—Voice or 30-Hz signaling, no data access required

Y—Voice or 30-Hz signaling, data access required

V—Succeeding panel used

S—Push-to-talk handset not used

R—Station without A lead control

Q—30-Hz, 2-second automatic ringdown, outgoing signaling

N—Locked-in incoming signal

M—Audible and visual signal (incoming) time-out, short interval (18 seconds)

K—Audible and visual signal (incoming) time-out disabled

G—Interrupted audible signal or common audible with diode matrix control

F—Steady audible signal

E—Audible signal, common with auxiliary relay control

† S ( ) up for long interval (45 seconds) time-out.

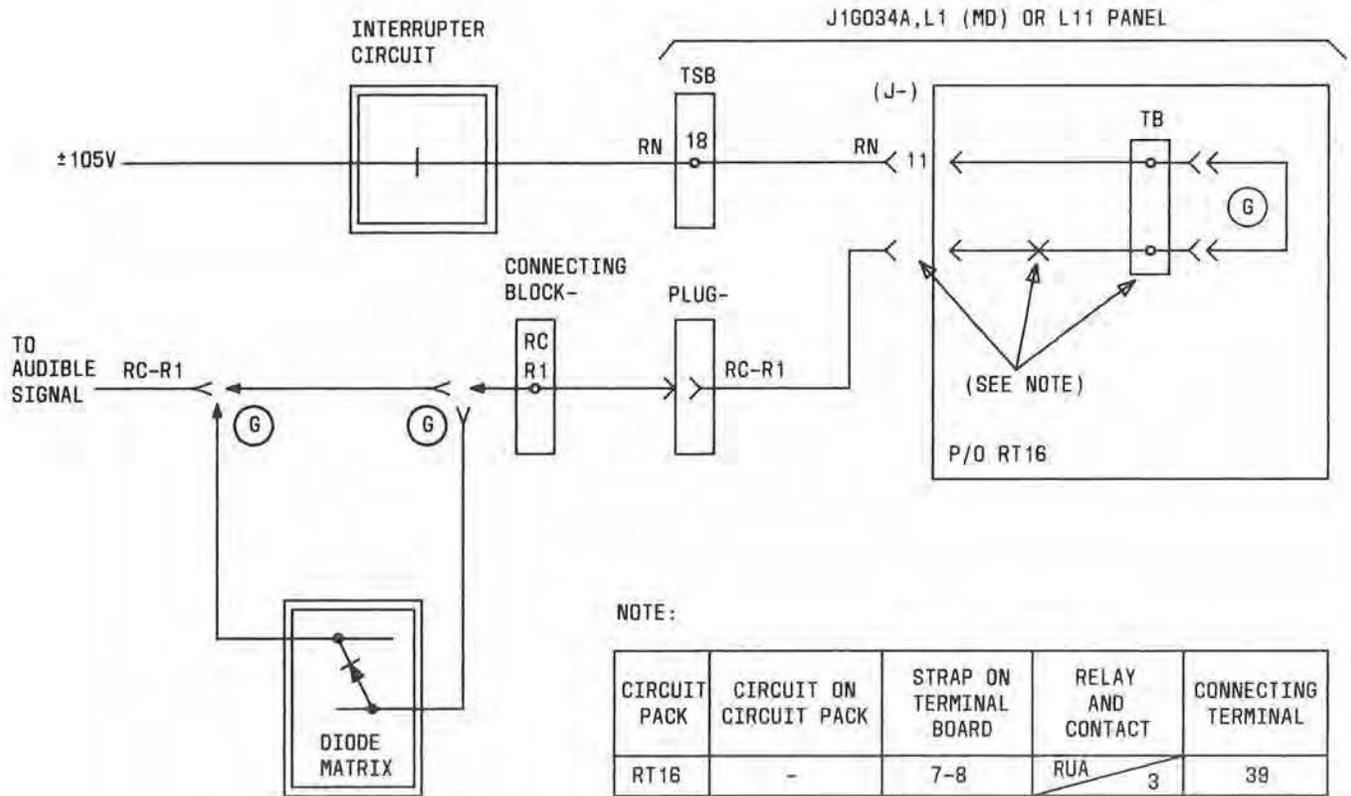
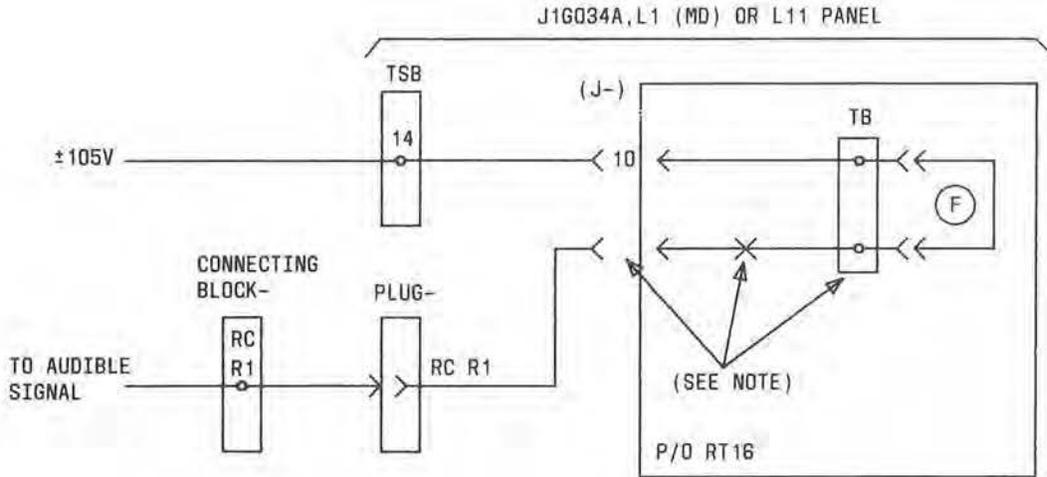


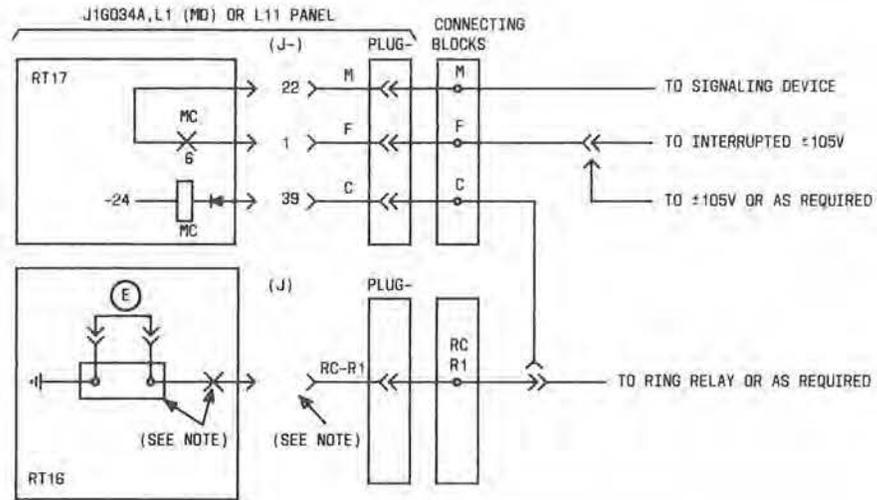
Fig. 26—Connections for G Option



NOTE :

CIRCUIT PACK	CIRCUIT ON CIRCUIT PACK	STRAP ON TERMINAL BOARD	RELAY AND CONTACT	CONNECTING TERMINAL
RT16	-	3-7	RUA / 3	39

Fig. 27 — Connections for F Option



NOTE:

CIRCUIT PACK	CIRCUIT ON CIRCUIT PACK	STRAP ON TERMINAL BOARD	RELAY AND CONTACT	CONNECTING TERMINAL
RT16	-	6-7	RUA / 3	39

Fig. 28—Connections for E Option



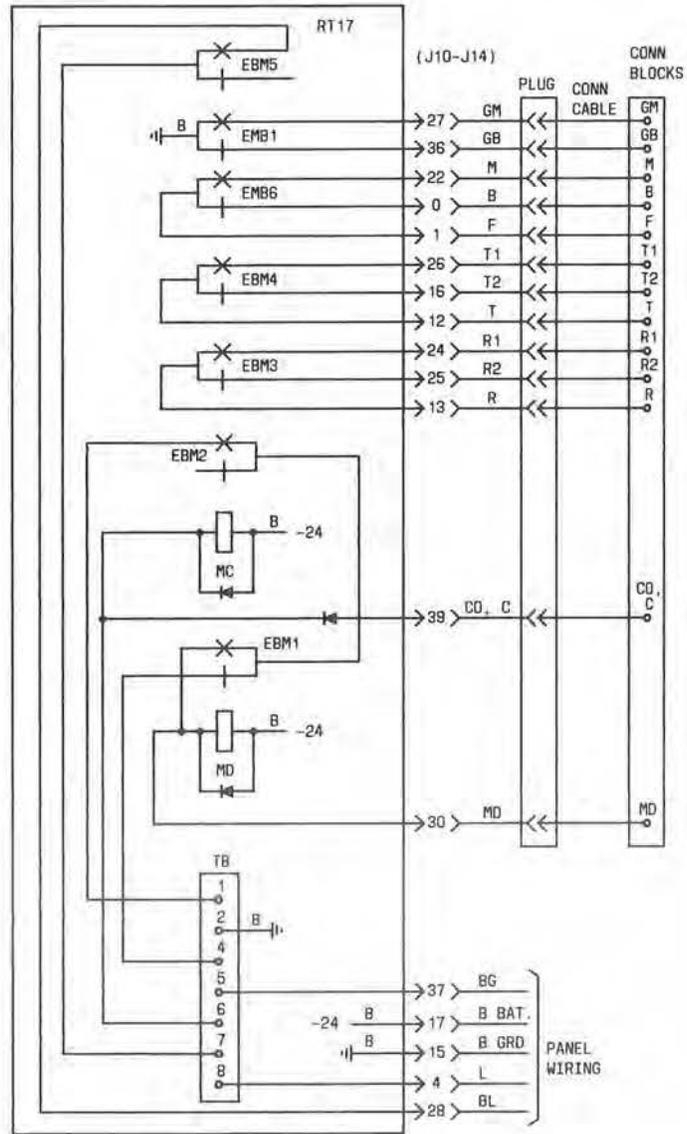
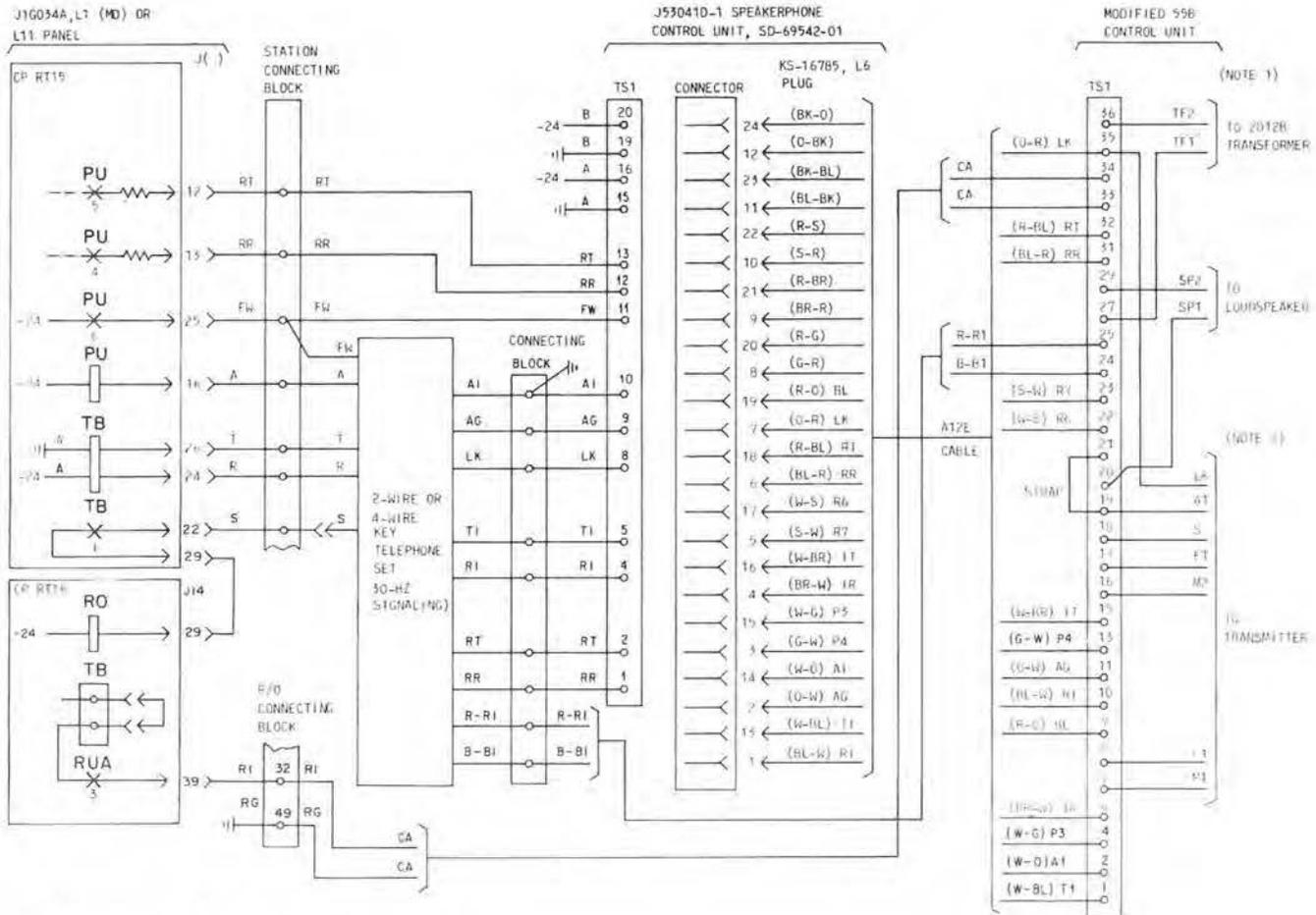
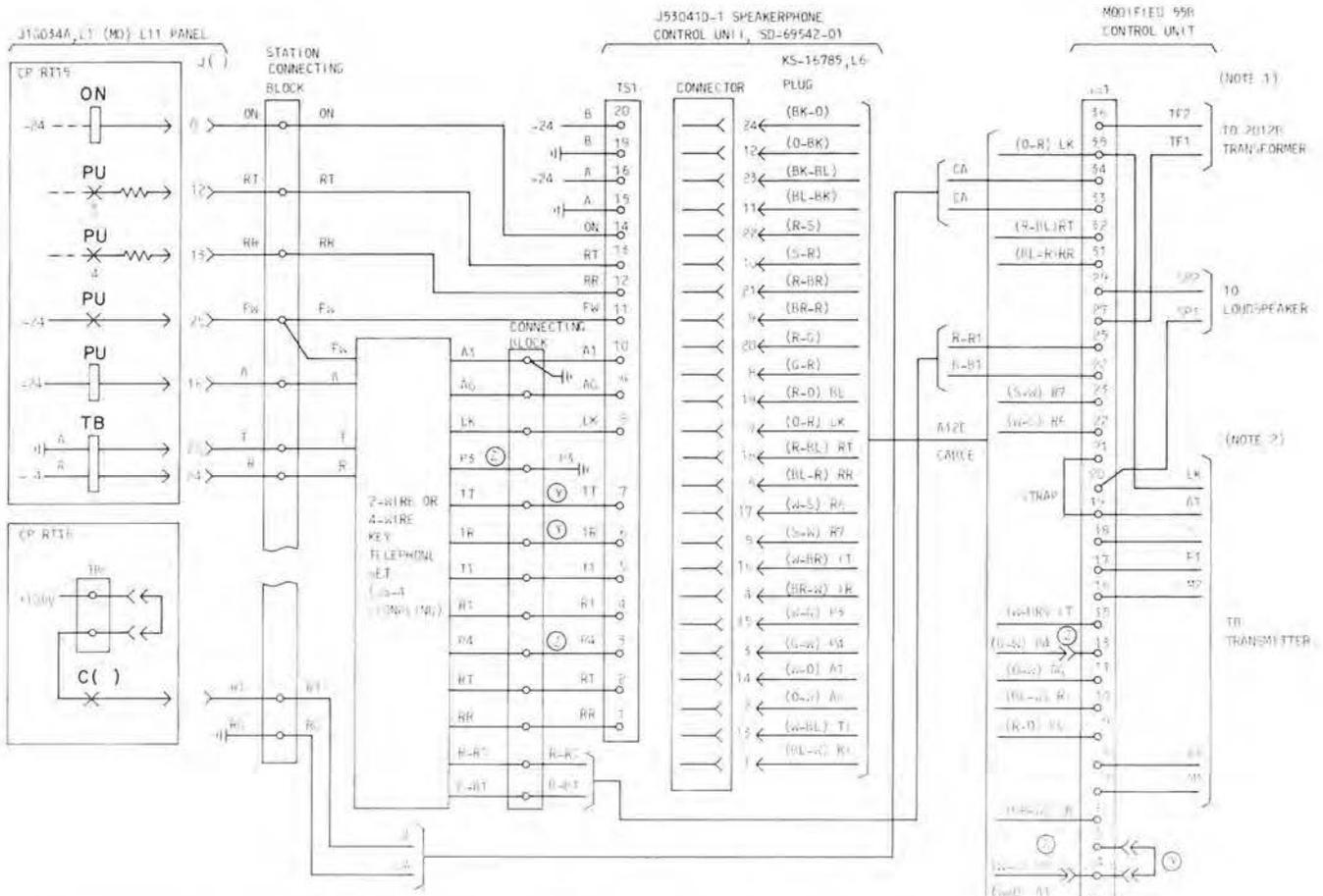


Fig. 29—Circuit Pack RT17, Lead Designations



- NOTE 1:
1. MODIFY THE CONTROL UNIT AS FOLLOWS:
    - a. SOLDER A RESISTOR (R6) FROM TERMINAL 5 OF TRANSFORMER (TF2)
    - b. SOLDER A RESISTOR (R7) FROM TERMINAL 1 OF TRANSFORMER (TF1)
    - c. MOUNT TWO WIRE TERMINAL ASSEMBLIES (TA) WHICH MOUNTING WIRE OF TRANSFORMERS (TF1) AND (TF2) IN SUCH A POSITION THAT THEY DO NOT INTERFERE WITH ADJACENT TERMINALS
    - d. SOLDER ONE END OF THE FREE WIRE OF RESISTOR (R6) TO ONE TERMINAL ASSEMBLY
    - e. SOLDER THE OTHER END OF RESISTOR (R7) TO THE OTHER TERMINAL ASSEMBLY
  2. REMOVE FOUR MACHINE SCREWS HOLDING TERMINAL BOARD TO EXPOSE INTERNAL WIRING CONNECTIONS
  3. INSTALL AND SOLDER FOUR NEW WIRES AS FOLLOWS:
    - a. TERMINAL 22 OF TERMINAL BOARD TO TERMINAL ASSEMBLY ASSOCIATED WITH RESISTOR (R6)
    - b. TERMINAL 25 OF TERMINAL BOARD TO TERMINAL ASSEMBLY ASSOCIATED WITH RESISTOR (R7)
    - c. TERMINAL 41 OF TERMINAL BOARD TO TERMINAL 1 OF TRANSFORMER (TF2)
    - d. TERMINAL 42 OF TERMINAL BOARD TO TERMINAL 1 OF TRANSFORMER (TF1)
  4. REPLACE TERMINAL BOARD AND SCREWS
  5. REFER TO SECTION 312-620-100 FOR 3-TYPE SPEAKERPHONE

Fig. 30—3A Speakerphone (MD) Connections (Sheet 1 of 2)



- A. INSTALL RESISTOR (R5) FROM TERMINAL 22 OF TRANSFORMER (T2)
- B. INSTALL RESISTOR (R7) FROM TERMINAL 3 OF TRANSFORMER (T2)
- C. INSTALL TWO WIRE TERMINAL ASSEMBLIES AND TWO MOUNTING NUTS OF TRANSFORMERS (T1) AND (T2) IN SUCH A POSITION THAT THEY DO NOT INTERFERE WITH ADJACENT TERMINALS
- D. CORRECTLY AND SOLDER THE FREE WIRE OF RESISTOR (R5) TO ONE TERMINAL ASSEMBLY
- E. CORRECTLY AND SOLDER THE FREE WIRE OF RESISTOR (R7) TO THE OTHER TERMINAL ASSEMBLY
- F. REMOVE FOUR MACHINE SCREWS HOLDING TERMINAL BOARD TO EXPOSE INTERNAL WIRING CONNECTIONS
- G. INSTALL AND SOLDER FOUR NEW WIRES AS FOLLOWS:
  1. TERMINAL 22 OF TERMINAL BOARD TO TERMINAL ASSEMBLY ASSOCIATED WITH RESISTOR (R5)
  2. TERMINAL 25 OF TERMINAL BOARD TO TERMINAL ASSEMBLY ASSOCIATED WITH RESISTOR (R7)
  3. TERMINAL 31 OF TERMINAL BOARD TO TERMINAL 5 OF TRANSFORMER (T2)
  4. TERMINAL 32 OF TERMINAL BOARD TO TERMINAL 1 OF TRANSFORMER (T2)
- H. REPLACE TERMINAL BOARD AND SCREWS
- I. STENCIL COVER "MODIFIED" FOR SD-69542-01
- J. REFER TO SECTION 512-617-100 FOR 3-TYPE SPEAKERPHONE

- "TOUCH-TONE" SIGNALING
- ROTARY SIGNALING

Fig. 30—3A Speakerphone (MD) Connections (Sheet 2 of 2)

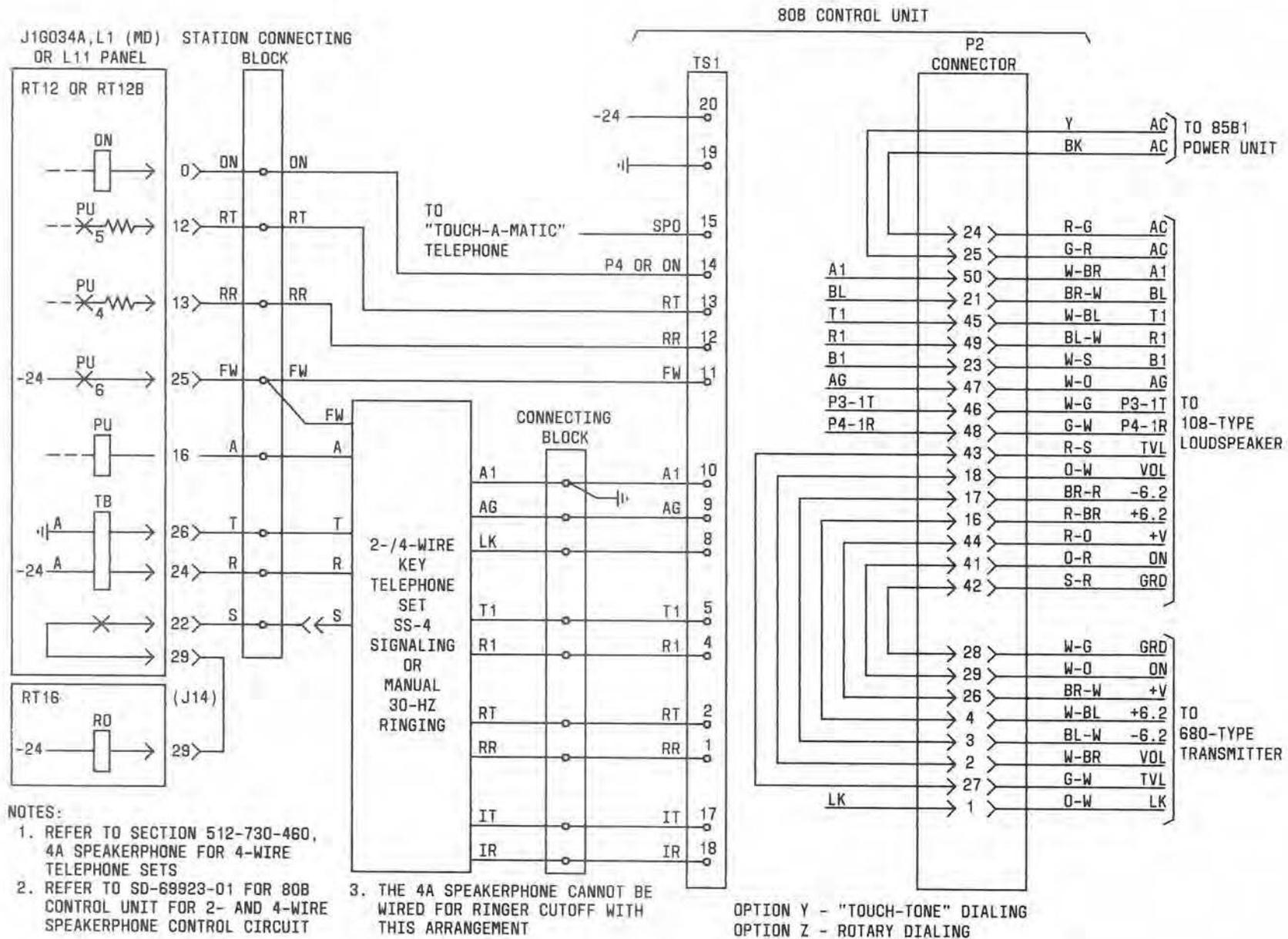


Fig. 31—4A Speakerphone Connections

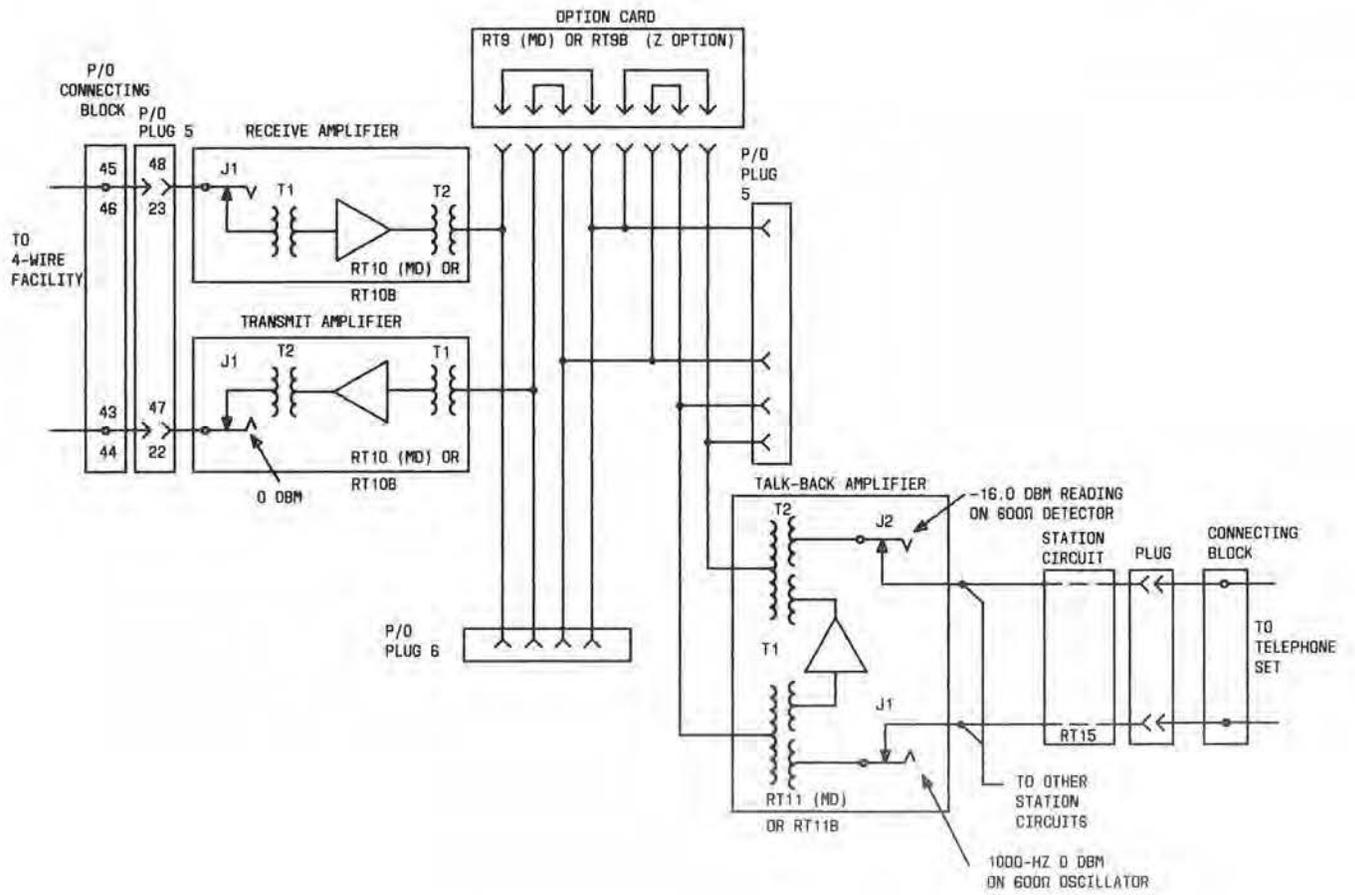


Fig. 32—Transmission Diagram, 30-Hz or Voice Signaling, Without Data Access

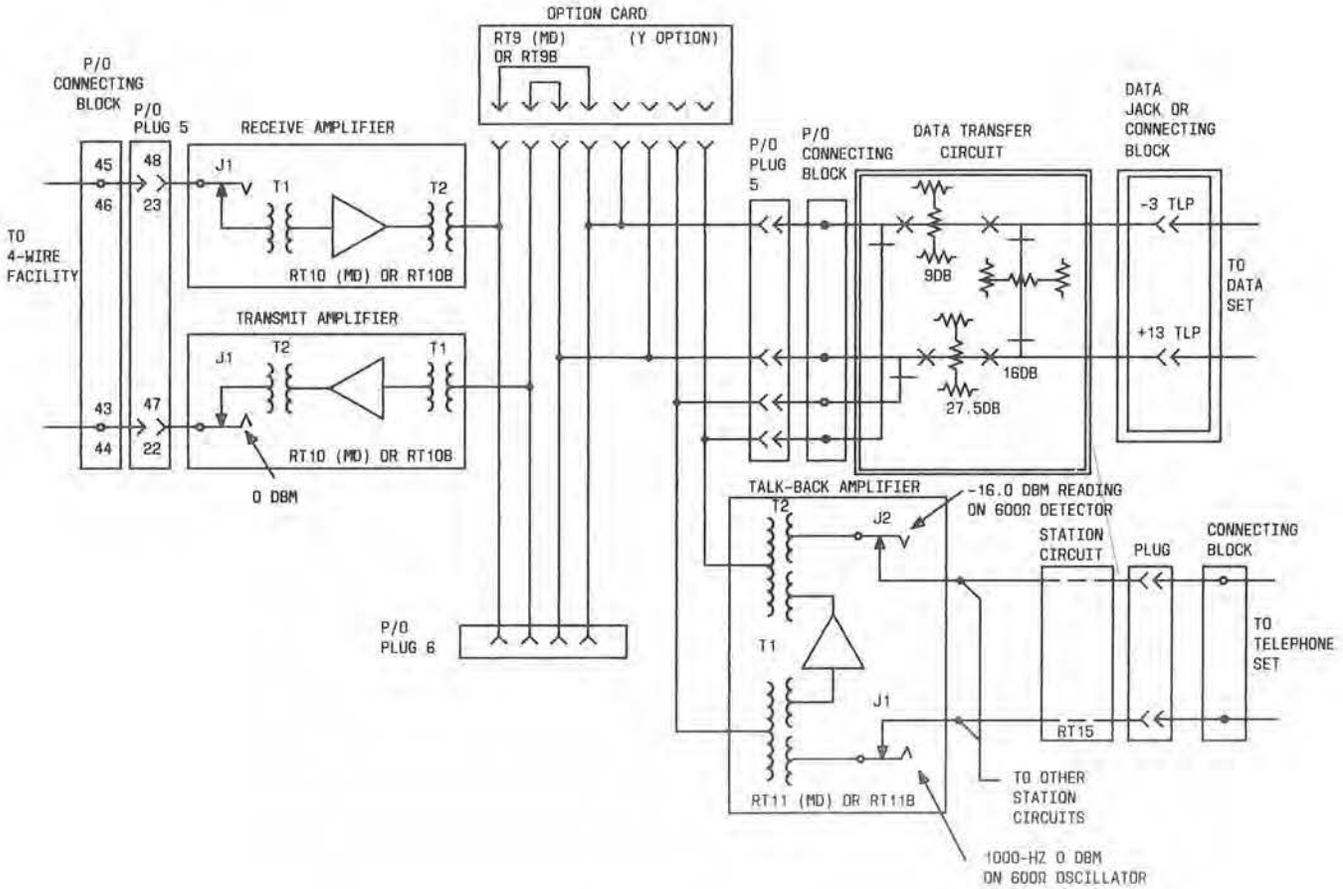


Fig. 33—Transmission Diagram, 30-Hz or Voice Signaling, With Data Access











