

**SS-4 SELECTIVE SIGNALING SYSTEM
IDENTIFICATION, INSTALLATION, AND CONNECTIONS
PRIVATE LINE TELEPHONE SERVICE**

CONTENTS	PAGE	CONTENTS	PAGE
1. GENERAL	1	PRIVACY OVERRIDE	19
SYSTEM ARRANGEMENTS	2	DISABLE PRIVACY OVERRIDE	19
2. IDENTIFICATION	3	3- AND 4-TYPE SPEAKERPHONES	20
J-1G033A1 (MD) AND J-1G033A2 PANELS	3	DATA SERVICE	20
J-1G034A1,L1 PANEL	5	LOUDSPEAKERS	20
3. ORDERING GUIDE	6	AG LEAD GROUND, FOR SPECIAL APPLICATIONS	21
4. INSTALLATION	7	6. LINEUP PROCEDURES	21
5. CONNECTIONS	8		
INTERPANEL	8	1. GENERAL	
POWER	8	1.01 This section contains identification, installation and connection information on the SS-4 Selective Signaling System, and describes the service options used in the system.	
LINE	9	1.02 This section is reissued to add the following information:	
STATION	9	• Add TOUCH-TONE® dialing to the system	
CODE LEAD (C LEAD)	9	• Add information on the 4-type speakerphone	
RELEASE LEADS	9	• Add information on the new RT19, RT20, and RT21 circuit packs	
OPTIONS	16	• Add information on the new J-1G033A2 SS-4 panel	
A. J-1G033A1 (MD) and J-1G033A2 SS-4 Panels	16	• Rate the J-1G033A1 SS-4 panel MD	
B. J-1G034A1,L1 4-Wire Private Line Terminating and Station Circuit Panel	17	• Revise circuit lineup procedures in Part 6	
MISCELLANEOUS CONTROL CIRCUIT (RT17 CP)	19		

NOTICE

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- Add new illustration on Data Transfer Circuit (Fig. 22).

1.03 This section is based on SD-1G296-01 and SD-1G297-01, Issue 3B. If this section is to be used with equipment or apparatus reflecting later issue(s) of the drawings, reference should be made to the CDs and SDs to determine the extent of changes and the manner in which the section may be affected.

1.04 The SS-4 System provides sending, receiving, decoding, and controlling functions required for dial-controlled signaling between stations of a 4-wire private line telephone system. A station is signaled by dialing a 2-digit code. Eighty-one codes are available. The 2-digit station codes, which are generated from a rotary or TOUCH-TONE dial, are converted to frequency shift signals by a keyer circuit and transmitted over a 4-wire facility to all stations. The signals are detected and reconverted to dial pulses by a 2600-Hz detector circuit. The reconverted pulses are counted by decoders which generate a ground pulse to operate a signal at the called station set. The signal at the called station can be audible and/or visual signal or can be used to operate a turnon/turnoff device.

1.05 Addition of TOUCH-TONE dialing to the SS-4 System is optional and is accomplished by adding the RT19 and RT20 circuit packs to the new J-1G033A2 panel. TOUCH-TONE signaling cannot be added to the J-1G033A1 (MD) panel. The SS-4 System can have rotary signaling only, TOUCH-TONE signaling only, or both.

SYSTEM ARRANGEMENTS

1.06 The SS-4 System is designed to be arranged for:

- Privacy or nonprivacy**—provided by means of option straps. Automatic privacy automatically activates the privacy feature at all station locations except the calling station and the called station. Manual privacy allows a station equipped with a privacy key to manually activate the privacy feature and to lock out all stations except those stations that are off-hook when the privacy key is operated.
- Privacy override**—may be arranged for system privacy override or for local privacy override. In the **system override** arrangement,

by means of an override key, a locked-out station transmits a disconnect tone to release privacy on the entire system. Once the system is in the nonprivacy mode, any station can dial a station code or operate a privacy key to reestablish a new privacy condition. The new privacy originator and all called stations will be the only stations connected to the call when privacy is reestablished. **Local override** of privacy at selected stations permits intrusion into a conversation without privacy release. Operation of the local override key applies a steady intrusion tone on the system and permits the overriding party to enter the conversation to request that the circuit be relinquished. The overriding party gains control of the circuit only after the call-originating station is placed on-hook.

- System privacy lamp**—can be provided for a visual privacy indication.
- System busy lamp**—can be provided for a visual indication that the system, equipped for privacy, is in the busy condition.
- Way station lockout**—controls access circuits that may be associated with a way station. It prevents signaling SS-4 stations when multidigit dial pulses are transmitted over the line to the access circuits. Each way station must be wired for way station lockout when any way station in the SS-4 System is equipped with an access circuit.
- Incoming signals**—incoming signals at a called station can be arranged for no time-out, 18-second (short interval) time-out, or for a long time-out (45 seconds).
- Data access**—permits the 4-wire facility to be used for data transmission. Privacy must be provided to deny stations access to the line during data transmissions, and privacy override must be disabled.

1.07 The SS-4 System is installed on customer premises, and the only equipment required in the central office is a 4-wire bridge and associated amplifiers. The bridge is connected to standard 4-wire facilities.

1.08 The SS-4 System is compatible with and can be used in the same 4-wire private line

telephone system with SS-1 (SD-98093-01) and SS-1A (SD-69594-01) equipment.



◆ **When SS-4 equipment is used with SS-1 and/or SS-1A equipment, the SS-1 and/or SS-1A equipment must be checked to insure that 2400- and 2600-Hz frequencies and timing meet minimum requirements. This is necessary as the SS-4 equipment will not function if there is frequency drift and/or the timing is not within limits. Refer to Section 480-621-502 for SS-1 and Section 480-622-502 for SS-1A test requirements.**◆

- 1.09 In the SS-4 System, each SS-4 terminal can have a maximum of 26 telephone sets off-hook simultaneously without degrading transmission.
- 1.10 The SS-4 System ◆is compatible with the 3- and 4-type speakerphones (Fig. 20 and 21).◆
- 1.11 When required, 106-type loudspeakers can be used in the SS-4 System. Various control arrangements can be provided to activate or deactivate the loudspeakers to meet customer requirements.

2. IDENTIFICATION

2.01 The basic SS-4 equipment consists of a ◆J-1G033A1 (MD) panel (Fig. 1) or a J-1G033A2 panel (Fig. 2)◆ and the following plug-in circuit packs (CPs):

- RT2—2600-Hz detector circuit
- RT3—Oscillator control circuit
- RT4—Keyer circuit
- RT5—Dial pulse and privacy detector circuit
- RT6—Pulse counter decoder circuit
- RT7—Common control circuit
- RT8—Code lead selector circuit
- ◆RT19—Binary to dial-pulse converter (J-1G033A2 panel only)
- RT20—TOUCH-TONE adapter (J-1G033A2 panel only)
- RT21—Voltage regulator (J-1G033A2 panel only).◆

J-1G033A1 (MD) AND J-1G033A2 PANELS

2.02 The J-1G033A1 (MD) panel mounts in a 23-inch by 4-inch mounting space. The front of the panel has ten 40-pin connectors (J1 through J10) for the plug-in CPs and a terminal strip (TSB) for connecting station code leads and miscellaneous leads. The back of the panel has a terminal strip (TSA) for power connections, fuses, an RT1 CP (voltage regulator), and a 24-inch connector-ended (J11) connector cable.

2.03 ◆The J-1G033A2 panel mounts in a 23-inch by 4-inch mounting space. The front of the panel has fourteen 40-pin connectors (J1-J14). Connectors J12 and J13 are spare. The back of the panel has a terminal strip (TSA) for options and power connections and a 24-inch connector-ended (J15) connector cable for connection to the J-1G034A1,L1 4-wire private line panel. Two connectors which contain the miscellaneous and station C leads are also mounted on the rear of the panel. Two A25B connector cables are used to connect the connectors to 66-type connecting blocks in the cross-connect field.◆

2.04 Connectors J1 through J9 on the J-1G033A1 (MD) and J-1G033A2 panels are arranged for specific CPs:

- Connector J1—CP RT2
- Connector J2—CP RT3
- Connector J3—CP RT4
- Connector J4—CP RT5
- Connector J5—CP RT6
- Connector J6—CP RT7
- Connector J7—CP RT8 for station codes 00 through 39
- Connector J8—CP RT8 for station codes 40 through 69

SECTION 480-623-001

- Connector J9—CP RT8 for station codes 70 through 99.

2.05 ¶The arrangement of connectors J10, J11, J12, J13, J14, and J15 is explained below:

(a) **J-1G033A1 (MD) Panel:**

- Connector J10—not furnished
- Connector J11—(see Note).

Note: Connector J11 is located at the end of the 24-inch connector cable and connects to plug 6 of an associated J-1G034A1,L1 4-wire private line terminating circuit.

(b) **J-1G033A2 Panel:**

- Connector J10—CP RT19 (for TOUCH-TONE dialing only)
- Connector J11—CP RT20 (for TOUCH-TONE dialing only)
- Connectors J12 and J13—SPARE
- Connector J14—CP RT21
- Connector J15—(see Note).

Note: Connector J15 is located at the end of the 24-inch connector cable and connects to plug 6 of an associated J-1G034A1,L1 4-wire private line terminating circuit. Connectors 1 and 2 are located on the rear of the panel and are connected to 66-type connecting blocks in the cross-connect field with single end A25B connector cables.¶

2.06 Circuit pack **RT1** is a voltage regulator circuit that supplies -23V to CP RT2 and -5V to CPs RT4, RT5, RT6, and RT7. It is fused by panel fuse 3 and is furnished with the panel. ¶The RT1 CP is used in the J-1G033A1 (MD) panel only.¶

2.07 A description of the circuit packs used in the J-1G033A1 (MD) and J-1G033A2 panels follows:

- (a) Circuit pack **RT2** is a 2600-Hz detector circuit that counts the number of times the frequency, transmitted over the 4-wire private

line, shifts from 2600 Hz to 2400 Hz and relays the information to CP RT6 (pulse counter decoder circuit).

- (b) Circuit pack **RT3** is an oscillator control circuit that originates the 2600-2400 Hz tones used for selective signaling.

- (c) Circuit pack **RT4** is a keyer circuit that converts pulses from a telephone set rotary dial to pulses of the proper duration to control the 2600-2400 Hz oscillator signals for selective signaling.

- (d) Circuit pack **RT5** is a dial pulse and privacy detector circuit which:

- Permits on-premises dialing between telephones on the same line having different station codes
- Responds to privacy signals for switching the SS-4 equipment in and out of the privacy mode
- Contains the way station lockout circuitry that locks out the SS-4 functions when a lockout code is dialed
- Transmits an unlock pulse to the 4-wire line on the termination of a privacy call.

- (e) Circuit pack **RT6** is a pulse counter decoder circuit that registers the number of pulses received by the 2600-Hz detector circuit. It converts the registered pulses to ground signals and connects them to CP RT8 over the tens and units leads.

- (f) Circuit pack **RT7** is a common control circuit that provides a locking ground for privacy and stores disconnect signals.

- (g) Circuit pack **RT8** is a code lead selector circuit. It receives ground signals over the tens and units leads, from CP RT6, and converts these signals to a single ground which is connected to the selected or dialed code (C) lead.

2.08 ¶The following circuit packs are used in the J-1G033A2 panel only:

- (a) Circuit pack **RT19** converts binary coded decimal pulses to rotary dial pulses that are

used to pulse the keyer for outgoing signaling. Used for the **TOUCH-TONE option only**.

(b) Circuit pack **RT20** is a TOUCH-TONE adapter which receives local TOUCH-TONE signals and converts them to binary coded decimal (BCD) pulses. Used for the **TOUCH-TONE option only**.

(c) Circuit pack **RT21** is a voltage regulator which provides -5 volt and filtered -23 volt power to the system.

J-1G034A1,L1 PANEL

2.09 Additional circuitry, including line amplifiers for the SS-4 System, is provided by the J-1G034A1,L1 panel and associated plug-in CPs.

2.10 The J-1G034A1,L1 panel (Fig. 3) 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 rear 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-P5) for connector cables, and one plug (P6) for the connector cable from the J-1G033A-type SS-4 panel. The plugs are wired to the connectors in the following manner: connectors J1, J2, and J3 to plug 1; connectors J4, J5, and J6 to plug 2; connectors J7, J8 and J9 to plug 3; connectors J10, J11, and J12 to plug 4; and connectors J13 and J14 to plug 5.

2.11 When the J-1G034A1,L1 panel is used with the SS-4 panel (J-1G033A-type), the CPs required for SS-4 functions are assigned as shown in Fig. 4.

2.12 Circuit pack **RT9** is an option card. The option provided depends on how the card is inserted in the connector (J15). By turning the card over or by reversing the card, options are added or changed. The following options, used in the SS-4 System, are connected by means of CP RT9:

- Option V—Succeeding (J-1G034A1,L1) panel used
- Option W—SS-4 System with data access
- Option X—SS-4 System with no data access.

2.13 Circuit pack **RT10** is a line amplifier circuit that provides the gain necessary for maintaining line transmission levels to and from the SS-4 panel. 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. In a J-1G034A1,L1 panel used as a first or only panel, 2-line amplifiers are required—a transmit amplifier (connector J1) and a receive amplifier (connector J2).

Caution: Before initially inserting an **RT10 CP** in the panel, make sure the **GAIN** and **EQ** controls are turned fully counterclockwise.

2.14 Circuit pack **RT11** is a talk-back amplifier that provides sidetone to the telephone set(s). The talk-back amplifier is factory-adjusted to maintain 16 dB loss from the transmit to the receive sides 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 J-1G034A1,L1 panel used as a first or only panel, the talk-back amplifier is inserted in connector J3.

Note: The jack in the RT10 CP (line amplifier) and the jacks in the RT11 CP (talk-back amplifier) will accommodate a 310 plug.

2.15 Circuit pack **RT12** is a 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 feature
- Pulses the dial leads to the SS-4 panel under control of the telephone set rotary dial or TOUCH-TONE converter circuit
- Supplies a ground to the RL and CO leads to release a locked-in signal by an audible and visual signaling circuit, or operates a miscellaneous circuit
- Removes the low tone (busy tone) from a called station in the SS-4 privacy system.

One RT12 CP is required for each telephone set.

2.16 Circuit pack **RT13** consists of three separate audible and visual signaling circuits. An audible and visual signaling circuit is activated by a ground over the C lead from the SS-4 panel. When activated, the circuit starts an interrupter circuit and cuts ringing and lamp voltages through to the telephone set or operates an auxiliary signal control relay. The audible and visual 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.

One RT13 CP will accommodate three station codes.

2.17 Circuit pack **RT14** is a combined signaling and group code circuit, consisting of one audible and visual signaling circuit and a group code circuit. The audible and visual signaling part of this CP has the same circuit functions as those described in paragraph 2.16 for CP RT13. The group code circuit consists of a group code relay which is operated by a ground over the group code C lead from the SS-4 panel. When operated, the group code relay connects ground to a maximum of six audible and visual signaling circuits associated with the telephone sets that are to be signaled by the group code.

2.18 Circuit pack **RT17** is a miscellaneous circuit used for the various operations that may be required with an SS-4 installation. It may be used to provide a busy lamp indication (B option) when SS-4 (with privacy) is busy, or it may be used to indicate privacy (A option) when the SS-4 System is activated. It may also be used for dialup and dialdown or turnon and turnoff arrangements with the SS-4 System.

2.19 Interrupted ringing and lamp signals used with the J-1G034A1,L1 panel and associated plug-in CPs must be supplied from an external

interrupter circuit. A 232C KTU can be used as an external interrupter circuit (Fig. 5), or the ringing and lamp voltages can be wired through the interrupter of an existing key system panel.

3. ORDERING GUIDE

3.01 SS-4 Panel: The SS-4 panel and CPs for selective signaling functions are ordered as follows:

- Panel, J-1G033A2,L1—one required for each 4-wire private line termination in a selective signaling system.
- Pack, Circuit RT2—2600-Hz detector circuit; one required for each J-1G033A2,L1 panel
- Pack, Circuit RT3—Oscillator control circuit; one required for each J-1G033A2,L1 panel
- Pack, Circuit RT4—Keyer circuit; one required for each J-1G033A2,L1 panel
- Pack, Circuit RT5—Dial pulse and privacy detector circuit; one required for each J-1G033A2,L1 panel
- Pack, Circuit RT6—Pulse counter decoder circuit; one required for each J-1G033A2,L1 panel
- Pack, Circuit RT7—Common control circuit; one required for each J-1G033A2,L1 panel
- Pack, Circuit RT8—Code lead selector circuit; one required for station codes 00-39; one required for station codes 40-69; one required for station codes 70-99—maximum of 3 CPs for each J-1G033A2,L1 panel
- Pack, Circuit RT21—Voltage regulator circuit; one required for each J-1G033A2,L1 panel.

3.02 SS-4 Panel—Addition of TOUCH-TONE Signaling: The following circuit packs, in addition to those listed in paragraph 3.01, are required for TOUCH-TONE signaling:

- Pack, Circuit RT19—Binary to dial-pulse converter; one required for each J-1G033A2,L1 panel

- Pack, Circuit RT20—TOUCH-TONE adapter; one required for each J-1G033A2,L1 panel.⚡

3.03 4-Wire Private Line Termination

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

- Panel, J-1G034A1,L1—Order as required
- Pack, Circuit RT9—Option card; one required for first J-1G034A1,L1 panel
- Pack, Circuit RT10—Line amplifier; two required for first J-1G034A1,L1 panel
- Pack, Circuit RT11—Talk-back amplifier; one required for first J-1G034A1,L1 panel
- Pack, Circuit RT12—Station circuit; one required for each telephone set or key pickup
- Pack, Circuit RT13—Audible and visual signaling circuit; CP contains three circuits and will accommodate three station codes; order as required
- Pack, Circuit RT14—Combined signaling and group code circuit; CP contains one audible and visual signaling circuit and one group code relay; order as required
- Pack, Circuit RT17—Miscellaneous control circuit; order as required.

3.04 Interrupter: The ringing and lamp voltages for the SS-4 System can be connected through the interrupter circuit of a 1A2 KTS panel or connected to a separate interrupter. A typical interrupter arrangement (Fig. 5) is ordered as follows:

- Interrupter, KS-15900,L1
- Unit, Telephone, Key 232C.

3.05 Connecting Blocks and Connector Cables:

Where the J-1G034A1,L1 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. 6). A second or succeeding panel will accommodate up to five connector cables, see Fig. 4. Connector cables and connecting blocks are ordered as follows:

- Cable, Connector, A25B—order as required (length must be specified)
- Block, Connecting, 66B4-25—order as required.

3.06 Power Supply: One 320C1, 19- or 20-type power unit has the capacity to power one J-1G033A-type and one J-1G034A1,L1 panel. Each succeeding J-1G034A1,L1 panel requires an additional 19- or 20-type power unit. Local conditions, such as power unit mounting arrangement and/or ringing requirements, will determine the type power unit(s) to be used with the SS-4 System. Refer to Section 167-440-201 and order power unit(s) as required.

3.07 Speakerphone: ⚡The 3-type (Fig. 20) and 4-type (Fig. 21) speakerphone systems are compatible with stations connected to the SS-4 System and the 4-wire private line circuit. A J-53041D1 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 80B control unit is required to adapt the 4-type speakerphone for 4-wire operation. Refer to Section 512-700-100 for additional information on 4-type speakerphone equipment. The 80B control unit is ordered as:

- Unit, Control, 80-49—one required for each 4A speakerphone.⚡

3.08 Data Transfer Circuit: ⚡Where the 4-wire private line circuit SD-1G297-01 with SS-4 is to be used for both voice and data transmission, a data transfer circuit must be provided locally. Refer to Section 480-617-100, Part 3, for ordering and installation information on this circuit.

3.09 The **106-type loudspeakers** are compatible with the SS-4 System. Refer to Section 463-220-100 for descriptive and ordering information on the 106-type loudspeakers.

4. INSTALLATION

4.01 Install the J-1G033A-type and J-1G034A1,L1 panels in a 23-inch apparatus mounting,

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 panels. Each panel occupies a 23-inch by 4-inch mounting space.

4.02 Mount the (first) J-1G034A1,L1 panel adjacent to the J-1G033A-type panel. The panels must be mounted close enough together for the 24-inch connector cable of the J-1G033A-type panel to connect to plug 6 of the J-1G034A1,L1 panel. A second or succeeding J-1G034A1,L1 panel does not connect to the J-1G033A-type panel but should be located close to the first panel to facilitate cross-connections.

4.03 Install 66B4-25 connecting blocks in a convenient location, at telephone locations, at a key telephone system connecting block cross-connect field, or concentrate blocks in a separate SS-4 cross-connect field.

4.04 Install telephone sets in the usual manner. The number of telephone sets that can be used with a J-1G034A1,L1 panel is controlled by the number of circuits (signaling circuits RT13 and RT14, and miscellaneous control circuit RT17) used in the panel. Each telephone requires a station circuit (RT12), and the number of station circuits that can be used with the panel is reduced by one for each signaling circuit (RT13 or RT14) or miscellaneous circuit (RT17) used. Where a J-1G034A1,L1 panel is used as a first or single panel, connectors J1 and J2 are occupied by line amplifiers (RT10); and connector J3 is for the talk-back amplifier (RT11), which further reduces the number of station circuits that can be used with the first panel.

4.05 Install the data transfer circuit as near as practical to the connecting block associated with plug 5 of the (first) J-1G034A1,L1 panel.

4.06 Install the 106-type loudspeakers where the customer directs, provided the location offers the customer suitable speaker output and access to speaker controls. Do not locate loudspeakers where they can create a feedback oscillation condition with nearby telephone sets.

4.07 Where a push-to-talk (PTT) feature is provided, replace the telephone handset with a G5BR or equivalent handset. For connections,

refer to Section 590-101-103 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 station circuit CP RT12.

4.08 Refer to Fig. 30 for the grounding procedure for a typical 4-wire private line with SS-4 signaling. All telephones, key systems, and power supplies associated with these systems shall be grounded in accordance with Section 518-010-105.

4.09 Information note 310 in SD-1G296-01 provides information for adapting the 300 Switching System to the SS-4 Signaling System. In addition, this note also provides information for the removal of local sidetone when it is provided by the Sending Test Center (STC).

5. CONNECTIONS

5.01 A typical SS-4 arrangement is shown in Fig. 7.

INTERPANEL

5.02 Connections between the J-1G033A-type (SS-4) panel and a J-1G034A1,L1 (4-wire private line terminating and station circuit) panel are made via the connector-ended connector cable of the J-1G033A-type panel to plug 6 of the J-1G034A1,L1 panel. A J-1G033A-type panel cannot be directly connected to more than one J-1G034A1,L1 panel. Connections to a second or succeeding J-1G034A1,L1 panel are made from terminal strip B of the first panel to terminal strip B of the succeeding panel(s) as illustrated in Fig. 8.

POWER

5.03 Power for one J-1G033A-type panel and one J-1G034A1,L1 panel can be furnished by one 320C1, 19- or 20-type power supply. Each succeeding J-1G034A1,L1 panel requires an additional 19- or 20-type power supply.

5.04 All power connections between the J-1G033A-type panel and the power supply shall be 20-gauge wire or larger. The power leads are run directly from the power supply to terminal strip A on the panel (Fig. 8).

5.05 All power connections between the J-1G034A1,L1 panel and the power supply shall be 20-gauge wire or larger and are run directly from the power supply to terminal strip A on the panel (Fig. 8).

5.06 The RN, RG, ST, and MG leads between the J-1G034A1,L1 panel(s) and an interrupter circuit shall be 22-gauge wire.

5.07 All power supplies shall be grounded to an approved 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 J-1G034A1,L1 panel. On connecting block 5, the transmit (toward the CO) tip (TT) and ring (TR) leads are connected to connecting block terminals 43 and 44. The receive (from the CO) tip (RT) and ring (RR) leads are connected to terminals 45 and 46. See Fig. 6, 7, and Table A.

STATION

5.09 Station connections (telephone set connections) in the SS-4 System are made at connecting blocks which are connected to the J-1G034A1,L1 panel by connector-ended cables. Figure 6 illustrates the connecting block arrangement and Table A provides the lead assignment for the connecting blocks and connector cables. Typical connections for one 4-wire telephone set are shown in Fig. 9, and typical connections for three telephone sets are illustrated in Fig. 10.

5.10 Ground for connecting A1 leads (also P3 lead when required) appears on connecting blocks 2 and 3. Lamp ground and ring ground appear on connecting blocks 4 and 5 (see Table A). Therefore, when making station connections, it may be necessary to terminate the station connector cable leads on as many as three connecting blocks.

CODE LEAD (C LEAD)

5.11 Code leads (C leads) must be provided from the J-1G033A-type (SS-4) panel to the signaling circuit and the station circuit. The SS-4 equipment supplies ground over the C lead to activate signaling circuits. These signaling circuits control audible and visual signals to the telephone sets and control

the privacy feature in the station circuits. These C leads can also be connected:

- To miscellaneous circuits (RT17) to operate turnon- and turnoff-type circuits as well as miscellaneous circuits
- To operate the way station lockout
- For group code operation.

5.12 ♦The **J-1G033A1 (MD)** panel C lead connections are made by placing a strap from terminal strip B on the front of the panel to C terminals on the station connecting blocks associated with the station signaling circuits of the J-1G034A1,L1 panel. The C leads are associated with the station circuits that are to respond to a designated station code. Where a group code is used, an additional strap must be run on the connecting blocks. The additional strap connects the C lead of the signaling circuit and the station circuit to a contact (C1 through C6) of the group code relay. Figure 11 gives the location of the C leads on terminal strip B of the J-1G033A1 (MD) panel.

5.13 The **J1G033A2** panel C lead connections are made by placing a strap from a terminal on a 66-type block associated with connector 1 or 2 to C lead terminals on the station connecting blocks associated with the station signaling circuits of the J-1G034A1,L1 panel. The C leads are associated with the station circuits that are to respond to a designated station code. Where a group code is used, an additional strap must be run on the connecting blocks. The additional strap connects the C lead of the signaling circuit and the station circuit to a contact (C1 through C6) of the group code relay. Figure 12 gives the location of the C leads on the 66-type connecting blocks associated with connectors 1 and 2 of the J-1G033A2 panel. Table B provides cable pair assignments for the 66-type connecting blocks associated with connectors 1 and 2.♦

RELEASE LEADS

5.14 Release (RL) leads must be provided between station circuits and signaling circuits. In response to 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

TABLE A

J-1G034A1, L1 4-WIRE PRIVATE LINE PANEL
LEAD ASSIGNMENT FOR PLUGS, CONNECTOR CABLES, AND CONNECTING BLOCKS

66B4-25 CONN BLK TERMINAL (BLK 1, 2, OR 3)	STA CKT RT12 CP LEAD DESIG	A25B CONN CABLE COLOR	CONN CABLE 1 (SEE NOTE)		CONN CABLE 2 OR 3			
			PLUG NO. 1	CONNECTOR	PLUG NO. 2 OR 3	CONNECTOR		
							PIN NO.	TERM.
1	RT	W-BL	26		12	26		12
2	RR	BL-W	1		13	1		13
3	T	W-O	27		26	27		26
4	R	O-W	2		24	2		24
5	A	W-G	28		16	28		16
6	FW	G-W	3		25	3		25
7	PT	W-BR	29		1	29		1
8	S	BR-W	4	J-1	22	4	J-4 or J-7	22
9	ON	W-S	30		0	30		0
10	CO	S-W	5		30	5		30
11		R-BL	31		SPARE	31		SPARE
12	AG	BL-R	6		27	6		27
13		R-O	32		SPARE	32		SPARE
14	RL	O-R	7		36	7		36
15		R-G	33		SPARE	33		SPARE
16	C	G-R	8		39	8		39
17	RT	R-BR	34		12	34		12
18	RR	BR-R	9		13	9		13
19	T	R-S	35		26	35		26
20	R	S-R	10		24	10		24
21	A	BK-BL	36		16	36		16
22	FW	BL-BK	11		25	11		25
23	PT	BK-O	37	J-2	1	37	J-5 or J-8	1
24	S	O-BK	12		22	12		22
25	ON	BK-G	38		0	38		0
26	CO	G-BK	13		30	13		30
27		BK-BR	39		SPARE	39		SPARE
28	AG	BR-BK	14		27	14		27
29		BK-S	40		SPARE	40		SPARE
30	RL	S-BK	15		36	15		36
31		Y-BL	41		SPARE	41		SPARE
32	C	BL-Y	16		39	16		39
33	RT	Y-O	42		12	42		12
34	RR	O-Y	17		13	17		13
35	T	Y-G	43		26	43		26
36	R	G-Y	18		24	18		24
37	A	Y-BR	44		16	44		16
38	FW	BR-Y	19		25	19		25
39	PT	Y-S	45		1	45		1
40	S	S-Y	20	J-3	22	20	J-6 or J-9	22
41	ON	V-BL	46		0	46		0
42	CO	BL-V	21		30	21		30
43		V-O	47		SPARE	47		SPARE
44	AG	O-V	22		27	22		27
45		V-G	48		SPARE	48		SPARE
46	RL	G-V	23		36	23		36
47		V-BR	49		SPARE	49		SPARE
48	C	BR-V	24		39	24		39
49		V-S	50		SPARE	50		GRD
50		S-V	25		SPARE	25		GRD

Note: Plug 1, Connector Cable 1, not used with first panel; used only with second or succeeding panel.

TABLE A (Contd)

LEAD ASSIGNMENT FOR PLUG 4, CONNECTOR CABLE 4								
66B4-25 CONN BLK TERM.	STA CKT RT12 CP LEAD DESIG	SIG CKT RT13 CP LEAD DESIG	SIG CKT RT14 CP LEAD DESIG	MISC CKT RT17 CP LEAD DESIG	A25B CONN CABLE COLOR	PLUG PIN NO.	CONNECTOR	
								TERM.
1	RT	C(1)	GC	T	W-BL	26	J10	12
2	RR	RL(1)	C1	R	BL-W	1		13
3	T	R1-RC(1)	C2	T1	W-O	27		26
4	R	C(2)	C3	R1	O-W	2		24
5	A	RL(2)	C4	T2	W-G	28		16
6	FW	R1-RC(2)	C5	R2	G-W	3		25
7	PT	C(3)	C6	F	W-BR	29		1
8	S	RL(3)		M	BR-W	4		22
9	ON	R1-RC(3)		B	W-S	30		0
10	CO		C	MD	S-W	5		30
11		LG(1)			R-BL	31		L GRD
12	AG	L(1)	RL	GM	BL-R	6		27
13		LG(2)			R-O	32		L GRD
14	RL	L(2)	R1-RC	GB	O-R	7		36
15		LG(3)	LG		R-G	33		L GRD
16	C	L(3)	L	C	G-R	8		39
17	RT	C(1)	GC	T	R-BR	34	J-11	12
18	RR	RL(1)	C1	R	BR-R	9		13
19	T	R1-RC(1)	C2	T1	R-S	35		26
20	R	C(2)	C3	R1	S-R	10		24
21	A	RL(2)	C4	T2	BK-BL	36		16
22	FW	R1-RC(2)	C5	R2	BL-BK	11		25
23	PT	C(3)	C6	F	BK-O	37		1
24	S	RL(3)		M	O-BK	12		22
25	ON	R1-RC(3)		B	BK-G	38		0
26	CO		C	MD	G-BK	13		30
27		LG(1)			BK-BR	39		L GRD
28	AG	L(1)	RL	GM	BR-BK	14		27
29		LG(2)			BK-S	40		L GRD
30	RL	L(2)	R1-RC	GB	S-BK	15		36
31		LG(3)	LG		Y-BL	41		L GRD
32	C	L(3)	L	C	BL-Y	16		39

TABLE A (Contd)

LEAD ASSIGNMENT FOR PLUG 4, CONNECTOR CABLE 4 (Contd)								
66B4-25 CONN BLK TERM.	STA CKT RT12 CP LEAD DESIG	SIG CKT RT13 CP LEAD DESIG	SIG CKT RT14 CP LEAD DESIG	MISC CKT RT17 CP LEAD DESIG	A25B CONN CABLE COLOR	PLUG PIN NO.	CONNECTOR	
							TERM.	
33	RT	C(1)	GC	T	Y-O	42	J-12	12
34	RR	RL(1)	C1	R	O-Y	17		13
35	T	R1-RC(1)	C2	T1	Y-G	43		26
36	R	C(2)	C3	R1	G-Y	18		24
37	A	RL(2)	C4	T2	Y-BR	44		16
38	FW	R1-RC(2)	C5	R2	BR-Y	19		25
39	PT	C(3)	C6	F	Y-S	45		1
40	S	RL(3)		M	S-Y	20		22
41	ON	R1-RC(3)		B	V-BL	46		0
42	CO		C	MD	BL-V	21		30
43		LG(1)			V-O	47		L GRD
44	AG	L(1)	RL	GM	O-V	22		27
45		LG(2)			V-G	48		L GRD
46	RL	L(2)	R1-RC	GB	G-V	23		36
47		LG(3)	LG		V-BR	49		L GRD
48	C	L(3)	L	C	BR-V	24		39
49		RG	RG		V-S	50		RG
50		RG	RG		S-V	25		RG
LEAD ASSIGNMENT FOR PLUG 5, CONNECTOR CABLE 5								
1	RT	C(1)	GC	T	W-BL	26		J-13
2	RR	RL(1)	C1	R	BL-W	1	13	
3	T	R1-RC(1)	C2	T1	W-O	27	26	
4	R	C(2)	C3	R1	O-W	2	24	
5	A	RL(2)	C4	T2	W-G	28	16	
6	FW	R1-RC(2)	C5	R2	G-W	3	25	
7	PT	C(3)	C6	F	W-BR	29	1	
8	S	RL(3)		M	BR-W	4	22	
9	ON	R1-RC(3)		B	W-S	30	0	
10	CO		C	MD	S-W	5	30	
11		LG(1)			R-BL	31	L GRD	
12	AG	L(1)	RL	GM	BL-R	6	27	
13		LG(2)			R-O	32	L GRD	
14	RL	L(2)	R1-RC	GB	O-R	7	36	
15		LG(3)	LG		R-G	33	L GRD	
16	C	L(3)	L	C	G-R	8	39	

TABLE A (Contd)

LEAD ASSIGNMENT FOR PLUG 5, CONNECTOR CABLE 5 (Contd)								
66B4-25 CONN BLK TERM.	STA CKT RT12 CP LEAD DESIG	SIG CKT RT13 CP LEAD DESIG	SIG CKT RT14 CP LEAD DESIG	MISC CKT RT17 CP LEAD DESIG	A25B CONN CABLE COLOR	PLUG PIN NO.	CONNECTOR	
								TERM.
17	RT	C(1)	GC	T	R-BR	34	J-14	12
18	RR	RL(1)	C1	R	BR-R	9		13
19	T	R1-RC(1)	C2	T1	R-S	35		26
20	R	C(2)	C3	R1	S-R	10		24
21	A	RL(2)	C4	T2	BK-BL	36		16
22	FW	R1-RC(2)	C5	R2	BL-BK	11		25
23	PT	C(3)	C6	F	BK-O	37		1
24	S	RL(3)		M	O-BK	12		22
25	ON	R1-RC(3)		B	BK-G	38		0
26	CO		C	MD	G-BK	13		30
27		LG(1)			BK-BR	39		L GRD
28	AG	L(1)	RL	GM	BR-BK	14		27
29		LG(2)			BK-S	40		L GRD
30	RL	L(2)	R1-RC	GB	S-BK	15		36
31		LG(3)	LG		Y-BL	41		L GRD
32	C	L(3)	L	C	BL-Y	16		39
49		RG	RG		V-S	50		RG
50		RG	RG		S-V	25	RG	
	EXTERNAL CROSS-CONNECTIONS							
	LEAD DESIG	FROM	TO					
33	DT1	Data Trmsn Circuit When Specified	Trmsn Amplr Via Option Card	Y-O	42	J-15	13	
34	DT2			O-Y	17		15	
35	DT3			Y-G	43		14	
36	DT4			G-Y	18		16	
37	DR1	Data Receive Ckt When Specified	Rec Amplr Via Opt 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 Sig Ckt as Reqd	Amplr SX Path Via Opt Ckt	V-BL	46		19	
42	RSX			BL-V	21		17	
43	TT	Trmsn to Serving CO	Trmsn Amplr	V-O	47	J-1	5	
44	TR			O-V	22	6		
45	RT	Rec From Serving CO	Rec Amplr	V-G	48	J-2	5	
46	RR			G-V	23	6		
47	RT	Misc Ckts As Specified	Common Rec Bus	V-BR	49	J-3	14	
48	RR			BR-V	24	9		

TABLE B4

J-1G033A2 SS-4 PANEL LEAD ASSIGNMENT FOR CONNECTOR 1, CONNECTOR CABLE 1

66B4-25 CONN BLK TERM.	A25B CONN CABLE COLOR	DESIG	CONNECTOR		66B4-25 CONN BLK TERM.	A25B CONN CABLE COLOR	DESIG	CONNECTOR		
				TERM.					TERM.	
1	W-BL	P3	J6	37	26	G-BK	26		11	
2	BL-W	02	J7	22	27	BK-BR	27	J7	08	
3	W-O	03		23	28	BR-BK	28		12	
4	O-W	04		05	29	BK-S	29		30	
5	W-G	05		25	30	S-BK	30		34	
6	G-W	06		20	31	Y-BL	PG		J6	30
7	W-BR	07		21	32	BL-Y	32	J7	31	
8	BR-W	08		24	33	Y-O	33		32	
9	W-S	09		27	34	O-Y	34		35	
10	S-W	WSL		J4	35	35	Y-G		35	J7
11	R-BL	P4	J6	34	36	G-Y	36		15	
12	BL-R				37	Y-BR	37		14	
13	R-O				38	BR-Y	38		16	
14	O-R				39	Y-S	39		33	
15	R-G				40	S-Y	40		J8	28
16	G-R				41	V-BL	BG	J6	5	
17	R-BR				42	BL-V	42	J8	22	
18	BR-R				43	V-O	43		23	
19	R-S				44	O-V	44		05	
20	S-R	20	J7	29	45	V-G	45		25	
21	BK-BL	50	J6	36	46	G-V	46		20	
22	BL-BK	22	J7	10	47	V-BR	47		21	
23	BK-O	23		09	48	BR-V	48		24	
24	O-BK	24		07	49	V-S	49		27	
25	BK-G	25		06	50	S-V	50		29	

♦TABLE B4 (Contd)

J-1G033A2 SS-4 PANEL LEAD ASSIGNMENT FOR CONNECTOR 2, CONNECTOR CABLE 2

66B4-25 CONN BLK TERM.	A25B CONN CABLE COLOR	DESIG	CONNECTOR		66B4-25 CONN BLK TERM.	A25B CONN CABLE COLOR	DESIG	CONNECTOR	
				TERM.					TERM.
1	W-BL	PO	J2	38	26	G-BK	76		20
2	BL-W	52	J8	10	27	BK-BR	77	J9	21
3	W-O	53		09	28	BR-BK	78		24
4	O-W	54		07	29	BK-S	79		27
5	W-G	55		06	30	S-BK	80		29
6	G-W	56		11	31	Y-BL	See Par. 6.08		J2
7	W-BR	57		08	32	BL-Y	82	J9	10
8	BR-W	58		12	33	Y-O	83		09
9	W-S	59		30	34	O-Y	84		07
10	S-W	60		34	35	Y-G	85		06
11	R-BL	NPL		J4	38	36	G-Y		86
12	BL-R	62	J8	31	37	Y-BR	87		08
13	R-O	63		32	38	BR-Y	88		12
14	O-R	64		35	39	Y-S	89		30
15	R-G	65		36	40	S-Y	90		34
16	G-R	66		15	41	V-BL	See Par. 6.08		J9
17	R-BR	67		14	42	BL-V	92	31	
18	BR-R	68		16	43	V-O	93	32	
19	R-S	69		33	44	O-V	94	35	
20	S-R	70		28	45	V-G	95	36	
21	BK-BL					46	G-V	96	15
22	BL-BK	72	J9	22	47	V-BR	97	14	
23	BK-O	73		23	48	BR-V	98	16	
24	O-BK	74		05	49	V-S	99	33	
25	BK-G	75		25	50	S-V	00	J7	28

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.

5.15 The RL lead(s) can be connected to cancel incoming signals for:

- Station code
- Group code
- Any or all station codes and group codes.

5.16 Connections for the RL lead(s) are made on the station connecting block. See Table A for RL terminals. Figure 9 and 10 show typical RL lead connections.

OPTIONS

A. J-1G033A1 (MD) and J-1G033A2 SS-4 Panels

5.17 The J-1G033A1 (MD) SS-4 panel connections for options (Table C) are made by placing straps on terminal boards on the CPs, strapping a C lead to terminal 10 on terminal strip B, and/or connecting to an external key.

5.18 The J-1G033A2 SS-4 panel connections for options (Table C) are made by placing straps on terminal boards on the CPs, strapping a C lead to terminal 10 on a 66-type connecting block associated with connector 1, and/or an external key, and placing a strap on terminal strip A.

Z Option—No Privacy

5.19 Option Z is provided by a strap between terminals 9 and 10 on the terminal board of the common control circuit (RT7 CP). The RT7 is associated with panel connector J6.

Y Option—Automatic Privacy

5.20 Option Y is provided by straps between terminals 1 and 2, terminals 3 and 4, and terminals 5 and 6 on the terminal board of the RT7 CP.

X Option—Manual Privacy

5.21 Option X consists of straps on the keyer circuit (RT4), the dial pulse and privacy

TABLE C

OPTIONS FOR J-1G033A1 (MD) AND J-1G033A2 PANELS AND ASSOCIATED CIRCUIT PACKS

OPTIONS (SEE NOTE)	STRAPS TO BE PROVIDED ON TERM. BOARD (77A BLOCK) OF CIRCUIT PACKS		
	RT4 CP	RT5 CP	RT7 CP
Z			9-10
Y			1-2 3-4 5-6
X	1-2 3-4	1-2	1-2 3-4 9-10
J-1G033A1 (MD) PANEL ONLY			
X	STRAP ON TERMINAL STRIP B		
W	Term. 10 to C Lead* Term.		
J-1G033A2 PANEL ONLY			
W	CONN 1	CONN 1 OR 2	
	Term. 10	C Lead* Term.	
X	STRAP ON TERMINAL STRIP A		
Q	Terminals 15 and 16		

Note: Z — No Privacy, Y — Automatic Privacy, X — Manual Privacy, W — Way Station Lockout, Q — Without TOUCH-TONE dial.

* Connects to C lead of code assigned for lockout.

detector circuit (RT5), the RT7 CP, and connects to an external nonlocking key(s) which supplies ground to operate the privacy feature. Straps are placed between terminals on the terminal boards of the CPs as follows:

- RT4—1-2, 3-4
- RT5—1-2
- RT7—1-2, 3-4, 9-10

The RT4 CP is associated with panel connector J3, and RT5 is associated with connector J4.

5.22 The nonlocking key(s) connects to the S terminal on the station connecting block associated with the J-1G034A1,L1 panel as shown in Fig. 13. Refer to Table A for S terminal locations.

W Option—Way Station Lockout

5.23 Option W is provided on the J-1G033A1 (MD) SS-4 panel by placing a strap from a designated C lead terminal to terminal 10 on terminal strip B. Option W is provided on the J-1G033A2 SS-4 panel by placing a strap from a designated C lead to terminal 10 on the 66-type connecting block associated with connector 1.

B. J-1G034A1,L1 4-Wire Private Line Terminating and Station Circuit Panel

5.24 Options for the 4-wire private line panel (Table D) are provided by:

- Proper insertion of option card
- Straps placed on terminal boards of the CPs
- Turndown screws on the CPs
- External connections to data equipment, lamps, and audible signaling devices.

X Option—SS-4 System, No Data Access Required

5.25 Option X is provided by inserting the option card, RT9 CP, in panel connector J15, positioned for X option. Connector J15 is located on the back of the panel.

W Option—SS-4 System, Data Access Required

5.26 Option W is provided by inserting the option card in panel connector J15, positioned for W option, and by connecting data leads from the station connecting block (block 5) to the data equipment. See Fig. 7 and Table A.

V Option—Succeeding Panel Used

5.27 Option V is provided by inserting the option card in panel connector J15, positioned for

V option, and by making interpanel connections as shown in Fig. 8.

S Option—Push-To-Talk Handset Not Used

5.28 Option S is provided by placing a strap between terminals 5 and 6 on the terminal board of the station circuit (RT12).

R Option—Station Without "A" Lead Control

5.29 Option R is provided by a strap between terminals 3 and 4 on the terminal board of the RT12 CP.

M Option—Audible and Visual Time-Out, Short Interval

5.30 Option M is provided by turning down the S1 (circuit 1), S2 (circuit 2), or S3 (circuit 3) screw on the audible and visual circuit (RT13), or by turning down the S1 screw on the combined audible and visual circuit (RT14). 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.

Note: The RT13 CP contains three circuits.

K Option—Audible and Visual Time-out Disabled

5.31 Option K is provided by a strap between terminals 9 and 2 (circuit 1), terminals 9 and 4 (circuit 2), or terminals 9 and 1 (circuit 3), on the terminal board of the RT13 CP, or by a strap between terminals 5 and 2 on the terminal board of the RT14 CP.

G Option—Interrupted Audible Signal or Common Audible With Diode Matrix Control

5.32 Option G is provided by a strap between terminals 5 and 6 (circuit 1), terminals 5 and 8 (circuit 2), or terminals 5 and 10 (circuit 3), on the terminal board of the RT13 CP, or by a strap between terminals 4 and 6 on the terminal board of the RT14 CP. Ring and lamp leads are connected as required from the station connecting blocks; see Table A for ringing and lamp terminals.

F Option—Steady Audible Signal

5.33 Option F is provided by a strap between terminals 7 and 6 (circuit 1), terminals 7

♦TABLE D♦

OPTIONS FOR J-1G034A1, L1 PANEL AND ASSOCIATED CIRCUIT PACKS

OPTIONS (SEE NOTE)	OPTION CARD FOR CONN J15 RT9 CP	STRAPS TO BE PROVIDED ON TERMINAL BOARD (77A BLOCK) OF CIRCUIT PACKS			
		RT12 CP	RT13 CP	RT14 CP	RT17 CP
X	Insert card for option X				
W	Insert card for option W				
V	Insert card for option V				
S		5-6			
R		3-4			
M*			S1 Down Ckt 1 S2 Down Ckt 2 S3 Down Ckt 3	S1 Down	
K			9-2 Ckt 1 9-4 Ckt 2 9-1 Ckt 3	5-2	
G			5-6 Ckt 1 5-8 Ckt 2 5-10 Ckt 3	4-6	
F			7-6 Ckt 1 7-8 Ckt 2 7-10 Ckt 3	8-6	
E			9-6 Ckt 1 9-8 Ckt 2 9-10 Ckt 3	5-6	
B					5-6 7-8
A					7-8

Notes:

X — SS-4 System, no data access required.

W — SS-4 System, data access required.

V — Succeeding panel used.

S — Push-To-Talk handset not used.

R — Station without A lead control.

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

K — Audible and visual 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.

B — SS-4 busy lamp when using automatic or manual privacy system.

A — SS-4 privacy busy lamp indicates system busy and in privacy

* S() up for long interval (30 seconds) time-out.

and 8 (circuit 2), or terminals 7 and 10 (circuit 3), on the terminal board of the RT13 CP, or by a strap between terminals 6 and 8 on the terminal board of RT14 CP.

E Option—Audible Signal, Common With Auxiliary Relay Control

5.34 Option E requires a strap on the terminal board of the RT13 or RT14 CP and a connection to the ring relay in a separate signaling arrangement, or the use of an RT17 CP (Fig. 14). A strap is required between terminals 9 and 6 (circuit 1), terminals 9 and 8 (circuit 2), or terminals 9 and 10 (circuit 3), on the terminal board of the RT13 CP, or a strap between terminals 5 and 6 on the terminal board of the RT14 CP.

5.35 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 (RT13 or RT14). Connections for using an RT17 CP (miscellaneous control circuit) are made on the station connecting blocks associated with the RT13 or RT14 and RT17 CPs. The RC-R1 lead of the RT13 or RT14 CP is connected to the C lead of the RT17 CP. The signaling device is connected to the M lead; and the ringing supply, battery; or ground to operate the signaling device are connected to terminal F. See Table A for terminal locations on the station connecting blocks.

B Option—SS-4 Busy Lamp When Using Automatic or Manual Privacy

5.36 Option B is provided by a strap from terminal 5 to terminal 6 and a strap from terminal 7 to terminal 8 on the terminal board of the RT17 CP (Fig. 15). See Table A for location of L terminals on the station connecting blocks.

A Option—Privacy Busy Lamp Indicating System Busy and In-Privacy

5.37 Option A requires a strap from terminal 31 (on terminal strip B on the SS-4 panel) to a C lead terminal on the station connecting block associated with an RT17 CP (Fig. 16). A strap is required between terminals 7 and 8 on the terminal board of the RT17 CP. See Table A for location of L terminals on the station connecting blocks for lamp connections.

MISCELLANEOUS CONTROL CIRCUIT (RT17 CP)

5.38 The RT17 CP is a general use unit for activating or deactivating loudspeakers, lamps, control relays, signaling devices, or may be used to disable the privacy override keys (Fig. 17). The RT17 CP can only be used in connectors J10 through J14 in the J-1G034A1,L1 panel (see Fig. 4). Connections to the RT17 CP are made on the station connecting block associated with connectors J10 through J14 (Fig. 6). See Table A for lead terminals 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 (see paragraph 5.36 and 5.37) or for features that may be required by local conditions. Special arrangements should be referred to engineering.

PRIVACY OVERRIDE

5.39 Connections for system privacy override consist of a lead run from a nonlocking key to terminal 21, terminal strip B, on the SS-4 panel (Fig. 18). When operated, the nonlocking key applies ground over the SO lead to operate the SO relay in the common control circuit (RT7).

5.40 Connections for local privacy override are made by running a lead from a nonlocking key to a designated terminal on the J-1G033A-type SS-4 panel (Fig. 18). When operated, the nonlocking key applies ground over the PO lead to operate the PO relay in the oscillator control circuit (RT3).

DISABLE PRIVACY OVERRIDE

5.41 The privacy override feature can be disabled so that nondata stations cannot access the line (by means of override) while the facility is being used for data transmission. An RT17 CP is required to provide this function. Figure 19 illustrates connecting the lead from a privacy override key(s) through unoperated relay contacts of the RT17 CP. A code lead is connected from the J-1G033A-type panel to the CP via the station connecting block.

5.42 By dialing a designated code (assigned to disable privacy override), ground over the code lead causes the MC relay in the RT17 CP to operate. The MC relay is held operated by ground

over the BG lead until the calling station terminates the call.

3- AND 4-TYPE SPEAKERPHONES

5.43 Connections for the 3-type speakerphone are shown in Fig. 20 and SD-69542-01. Refer to Section 480-716-200 for information on the J-53041D1 speakerphone control unit and Section 512-620-100 for information on the 3-type speakerphone.

5.44 Connections for the 4-type speakerphone are shown in Fig. 21 and SD-69909-01. Refer to SD-69923-01 for information on the 80B control unit and Section 512-730-460 for information on the 4A speakerphone.

DATA SERVICE

5.45 Data sets are connected to the SS-4 System by means of a locally provided data transfer circuit. The transfer circuit must be arranged to:

- Transfer the 4-wire circuit from the SS-4 stations to 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 appears on a key telephone set(s)
- Extend a ground to the SS-4 equipment to hold the privacy feature in a privacy system.

5.46 Line connections to the data transfer circuit are made on the connecting block (block 5) that is associated with plug 5 of the (first) J-1G034A1,L1 panel. Additional connections are required to supply a ground to the RI lead(s) of the station circuit(s) and to the PR lead on the J-1G034A1,L1 panel. Additional connections are also required for lamp voltage to a data transfer lamp and to a data transfer key (DT lead). See Fig. 22 for a typical data transfer circuit.



The data transfer key must be operated to transfer the line to the data mode before the telephone handset is placed on hook. Otherwise, privacy will be lost in a privacy system.

LOUDSPEAKERS

5.47 Loudspeakers (106-type) can be incorporated in an SS-4 System. Examples of loudspeaker arrangements and connections are listed below. Other arrangements may be locally engineered. Typical loudspeaker arrangements are:

- (a) **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 control circuit (RT17 CP). When a telephone set goes off-hook, ground over the A lead operates the PU relay in the station circuit (RT12). The operated PU relay connects a ground to the CO lead which operates the MC relay to cut off the loudspeaker.
- (b) **Loudspeaker cut off when privacy is initiated in a manual privacy SS-4 System (Fig. 24):** As shown in Fig. 24, speaker leads are connected through break contacts of the MC relay in an RT17 CP. When privacy is initiated in the SS-4 System, ground is connected over the PG lead from the SS-4 equipment to operate the MC relay which cuts off the loudspeaker. A strap must be connected from the SS-4 panel to the connecting block associated with the RT17 CP.
- (c) **Loudspeaker activated and cut off by SS-4 codes (Fig. 25):** As shown in Fig. 25, the speaker leads are connected through make contacts of the MC relay in an RT17 CP. When an activate SS-4 code is dialed, ground over the (activate) C lead causes the MC relay to operate. The MC relay locks operated (through its contacts and through contacts of the MD relay) and closes the speaker leads to turn on the loudspeaker. When an SS-4 cutoff code is dialed, ground over the (cutoff) C lead causes the MD relay to operate momentarily. The operated MD relay releases the MC relay which in turn opens the speaker leads to cut off the loudspeaker. Straps must be placed between terminals 1 and 2 and 4 and 6 on the terminal board of the RT17 CP. Also, code leads must

be run from the SS-4 panel to the connecting block associated with the RT17 CP.

(d) **Loudspeaker activated by SS-4 code, automatic cutoff (Fig. 26):** As shown in Fig. 26, the speaker leads are connected through make contacts of the MC relay of an RT17 CP. When an activate SS-4 code is dialed, ground over the C lead causes the MC relay to operate. The MC relay locks operated [through its own contacts to the SS-4 busy ground (BG lead)] and closes the speaker leads to turn on the loudspeaker. The loudspeaker remains connected to the receive side of the line until the SS-4 equipment returns to the idle condition and removes ground from the BG lead. Straps must be placed between terminals 1 and 5 and 4 and 6 on the terminal board of the RT17 CP. Also, a code lead must be run from the SS-4 panel to the connecting block associated with the RT17 CP.

(e) **Loudspeaker cutoff controlled by PTT handset:** To arrange loudspeakers to be cut off when the PTT switch in a PTT handset is operated, connect the loudspeaker as shown in Fig. 23, except connect the AG lead (instead of the CO lead) from the station circuit (Fig. 27) to the RT17 CP, and omit S option from the station circuit.

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

AG LEAD GROUND, FOR SPECIAL APPLICATIONS

5.49 The AG lead provides a ground for special applications (Fig. 27). An AG lead is available from each station circuit (RT12 CP) and may be arranged to provide a ground when a telephone set goes off-hook (S option) or when the PTT 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 control circuit (RT17 CP) for loudspeaker cutoff under control of the PTT handset.

6. LINEUP PROCEDURES

6.01 Prior to performing any test on point-to-point or multipoint private line, a transmission circuit layout (TCL) card should be available. The TCL card will identify the 4-wire facilities and give

the expected measured loss (EML) of the facilities 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 (RT10 CPs) and the talk-back amplifier (RT11 CP) to facilitate level adjustments. The cord(s) used to connect test equipment to the circuit packs 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 instructions.

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 J-1G034A1,L1 panel).

(b) Connect the TMS 600-ohm detector to the line jack (J1) of the receive line amplifier (located in connector J2 of the J-1G034A1,L1 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.

SECTION 480-623-001

- (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 (RT11)**

CP): Set the TMS oscillator at 1000-Hz and 0 dBm level and connect it to the TRANSMIT BUS jack on the RT11 CP. Connect the 600-ohm TMS detector to the RECEIVE BUS jack. Verify a -16 dBm (± 1.5 dB) reading for the talk-back amplifier.

(b) **Test receive level:** Remove the TMS oscillator from the TRANSMIT BUS on the RT11 CP. (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 the RT11 CP:

- (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 the RT11 CP.

(d) **Test transmit level:**

(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 the RT11 CP and connect it to the TT and TR leads, terminals 43 and 44 on connecting block 5 associated with the J-1G034A1,L1 panel. (Change test set cords as required.) Remove TT and TR crossconnections to the central office. Connect the TMS oscillator to the TRANSMIT BUS jack on the RT11 CP. 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 crossconnect.

(e) **2600-Hz oscillator level adjustment:**

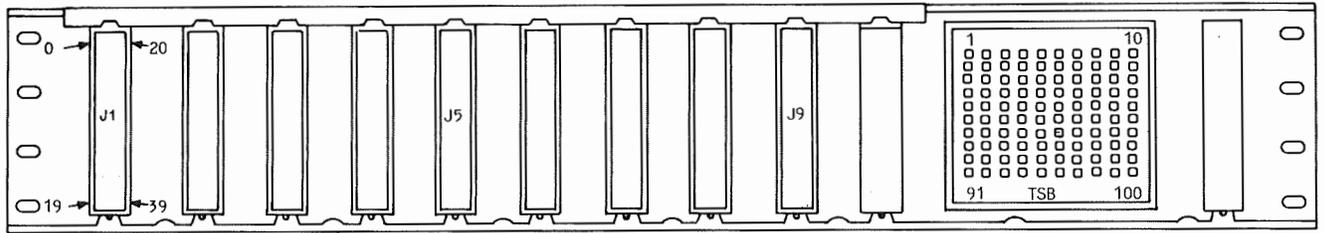
[This adjustment must be made after the 1000-Hz tests have been made as described in (d) above.]

(1) Place a temporary strap between terminals 81 and 91 on terminal strip B of the J-1G033A1 (MD) panel or terminals 31 and 41 of the 66-type connecting block associated with connector 2 of the J-1G033A2 panel. This will send a continuous 2600-Hz tone to the STC.

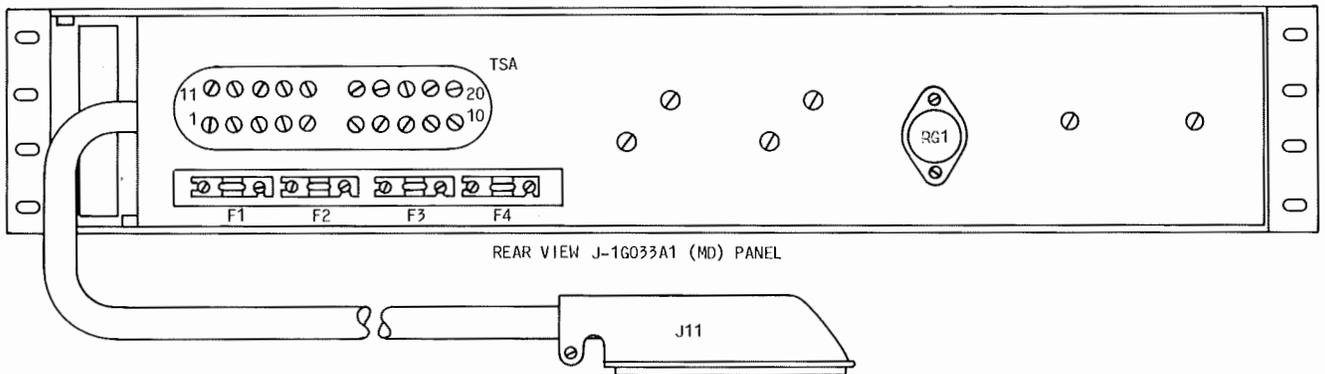
(2) Adjust the LEVEL ADJ control on the RT3 CP (oscillator control circuit) until the 2600-Hz tone is 8 dB below the 1000-Hz test tone level at the STC. The RT3 CP is located in connector J2 in the J-1G033A-type (SS-4) panel.

(3) Remove the temporary strap between terminals 81 and 91 on terminal strip B of the J-1G033A1 (MD) panel or terminals 31 and 41 of the 66-type connecting block associated with connector 2 of the J-1G033A2 panel.

6.09 Refer to Fig. 28 and 29 for typical transmission diagrams and levels. See Fig. 22 for data transfer circuit and information on 89-type resistors.



FRONT VIEW J-1G033A1 (MD) PANEL (SD-1G296-01)

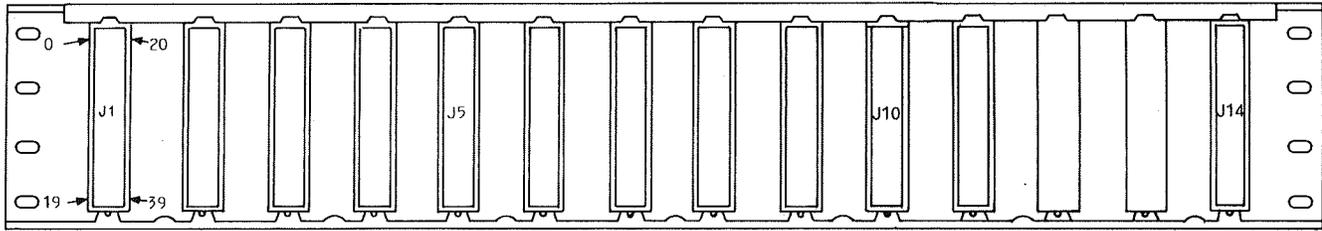


REAR VIEW J-1G033A1 (MD) PANEL

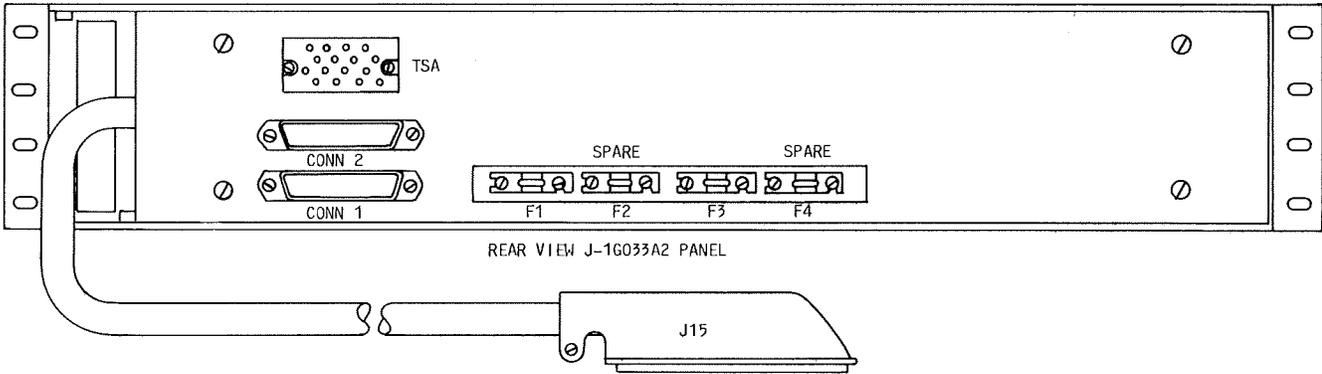
NOTES:

1. THE J-1G033A1, (MD) PANEL MOUNTS IN A 23-INCH BY 4-INCH MOUNTING SPACE.
2. POWER CONNECTIONS ARE MADE ON TERMINAL STRIP A.
3. CODE LEADS AND MISCELLANEOUS LEADS ARE CONNECTED TO TERMINAL STRIP B.
4. CONNECTORS, J1 THROUGH J9, ACCOMMODATE THE PLUG-IN CIRCUIT PACKS THAT COMPRISE THE SS4 CIRCUITRY.
5. THE 24-INCH CONNECTOR ENDED, CONNECTOR CABLE CONNECTS TO PLUG 6 OF AN ASSOCIATED J-1G034A1,L1 4-WIRE PRIVATE LINE TERMINATING CIRCUIT.

Fig. 1—J-1G033A1 (MD) SS-4 Panel



FRONT VIEW J1G033A2 PANEL (SD 1G296-01)

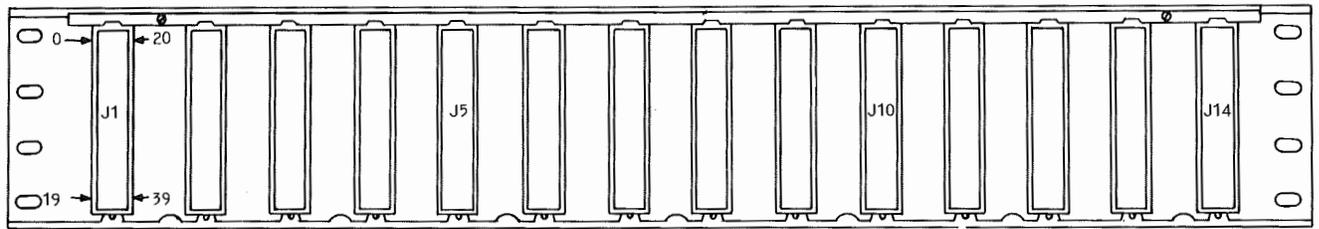


REAR VIEW J-1G033A2 PANEL

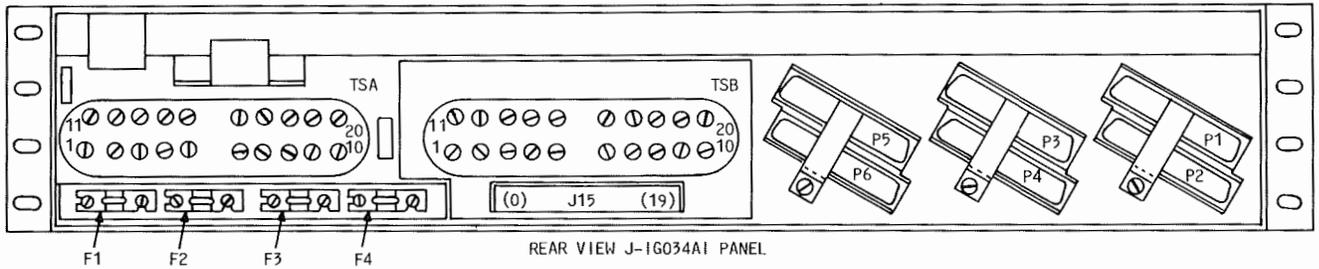
NOTES:

1. THE J-1G033A2 PANEL MOUNTS IN A 23-INCH BY 4-INCH MOUNTING SPACE.
2. POWER CONNECTIONS ARE MADE ON TERMINAL STRIP A.
3. CODE LEADS AND MISCELLANEOUS LEADS ARE CONNECTED TO CONNECTORS 1 AND 2 WHICH SHOULD BE TERMINATED ON 66 TYPE BLOCKS WITH A 25B CONNECTOR CABLES.
4. CONNECTORS, J1-J11 AND J14, ACCOMMODATE THE PLUG-IN CIRCUIT PACKS THAT COMPRISE THE SS4 CIRCUITY.
5. THE 24-INCH CONNECTOR ENDED, CONNECTOR CABLE CONNECTS TO PLUG 6 OF AN ASSOCIATED J1G034A1,L1 4-WIRE PRIVATE LINE TERMINATING CIRCUIT.

Fig. 2—J-1G033A2 SS-4 Panel



FRONT VIEW J-1G034A1 PANEL (SD-1G297-01)



REAR VIEW J-1G034A1 PANEL

NOTES:

1. THE J-1G034A1, L1 PANEL MOUNTS IN A 23-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 ACCOMMODATE THE CONNECTOR CABLE FROM A SS4 PANEL (J-1G033A1(MD) OR J1G033A2).
6. CONNECTORS, J1 THROUGH J14, ACCOMMODATE THE PLUG-IN CIRCUIT PACKS FOR STATION FUNCTIONS.
7. CONNECTOR J15 (ON REAR OF PANEL) IS USED ONLY FOR THE RT 9 OPTION CARD.

Fig. 3—J-1G034A1,L1 4-Wire Private Line Terminating Panel

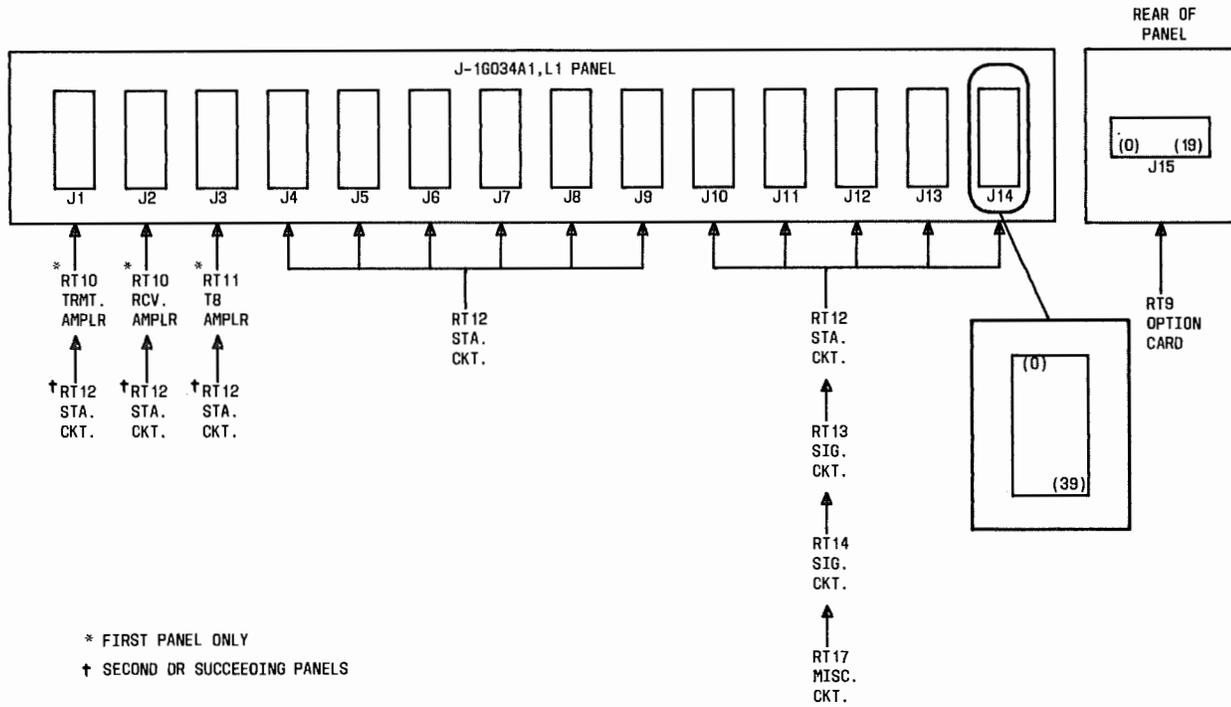


Fig. 4—Circuit Pack Assignment for J-1G034A1,L1 Panel Used With SS-4 System

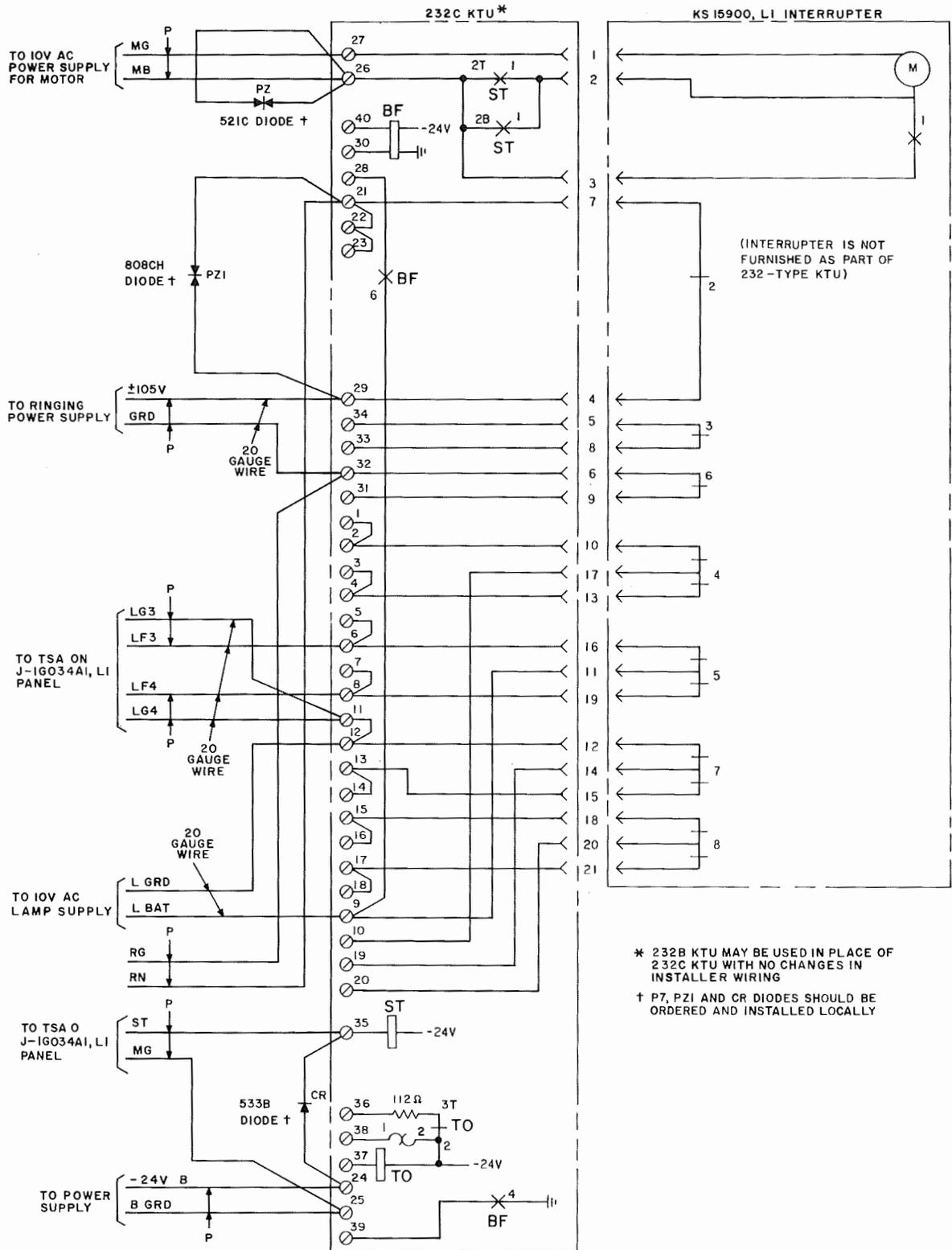


Fig. 5—Interrupter Circuit, 232C KTU

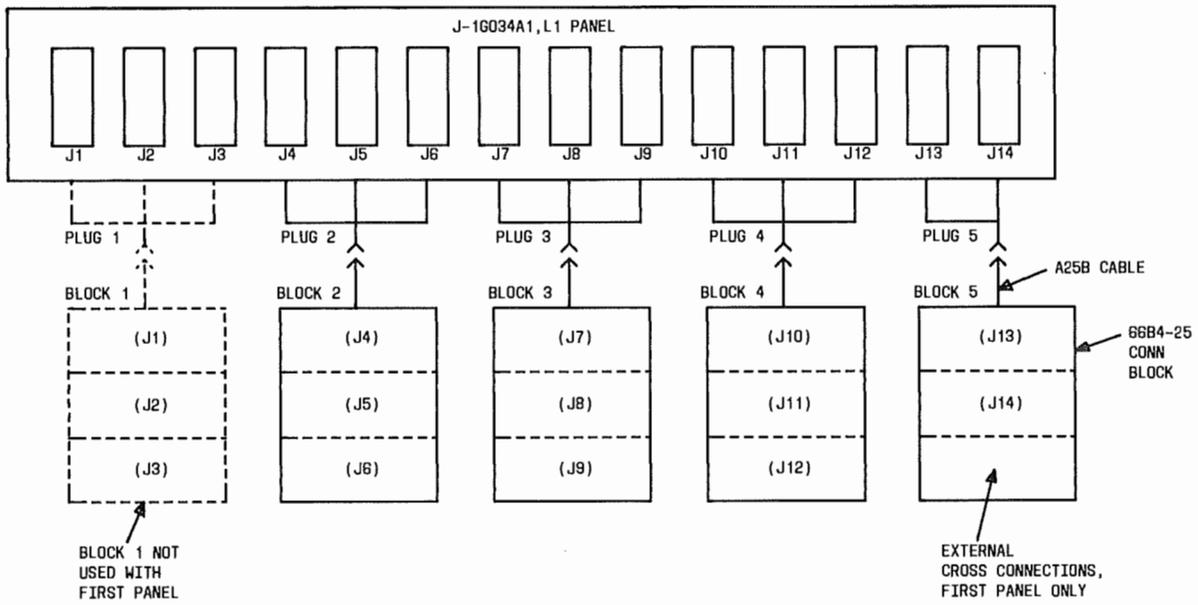


Fig. 6—How Connecting Blocks are Associated With Connectors in J-1G034A1,L1 Panel

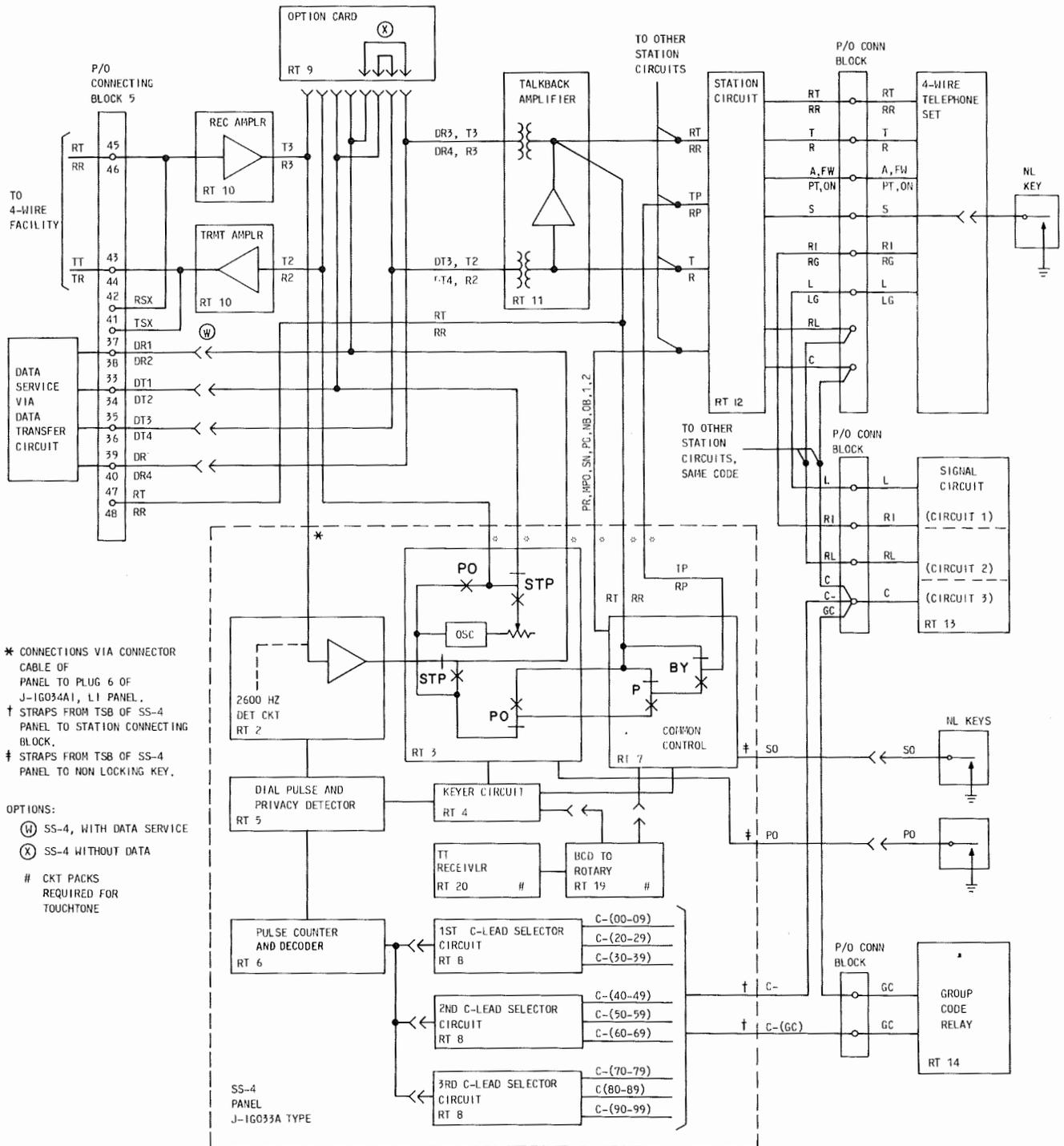
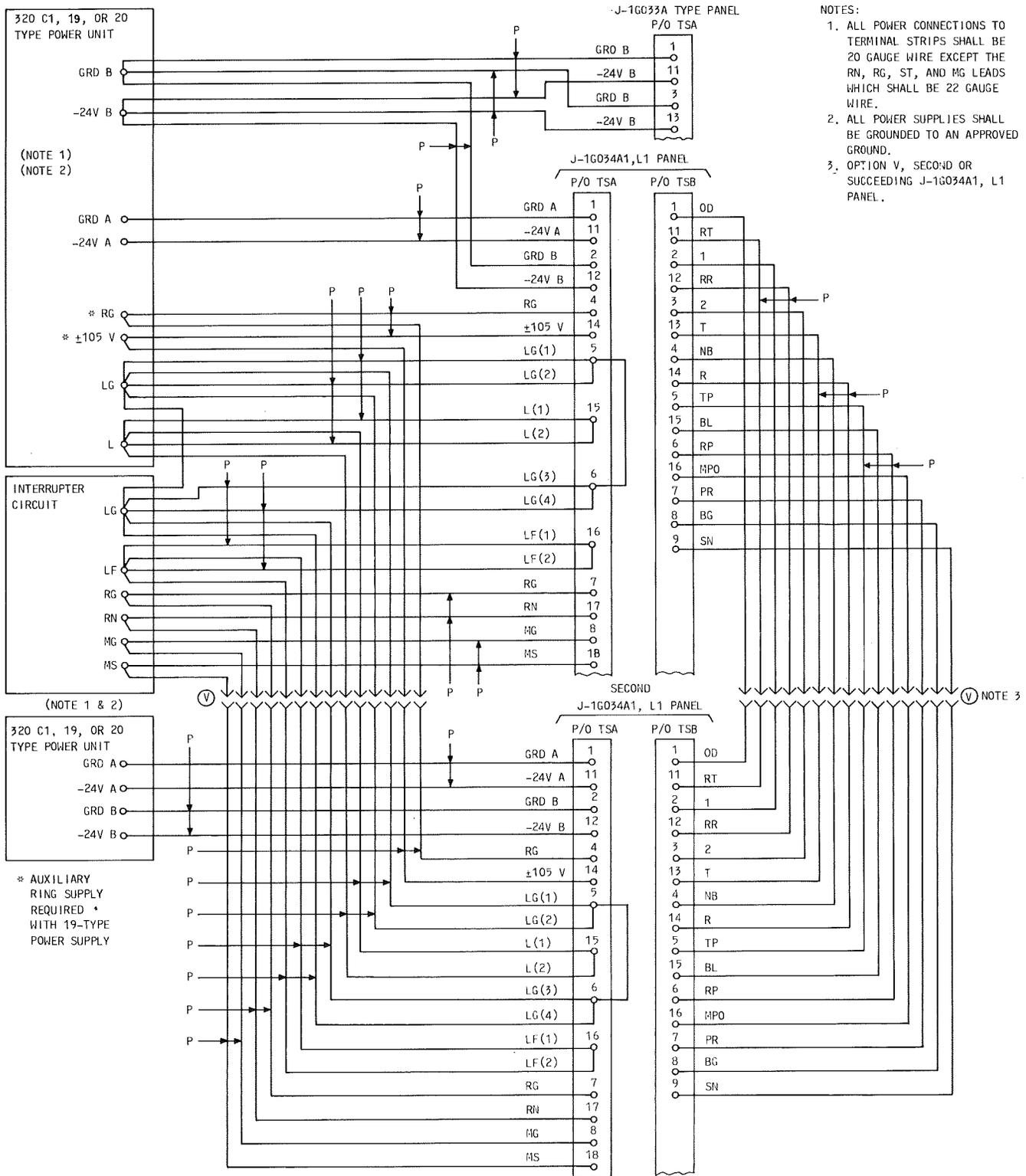


Fig. 7—SS-4 Arrangement



- NOTES:
1. ALL POWER CONNECTIONS TO TERMINAL STRIPS SHALL BE 20 GAUGE WIRE EXCEPT THE RN, RG, ST, AND MG LEADS WHICH SHALL BE 22 GAUGE WIRE.
 2. ALL POWER SUPPLIES SHALL BE GROUNDED TO AN APPROVED GROUND.
 3. OPTION V, SECOND OR SUCCEEDING J-1G034A1, L1 PANEL.

Fig. 8—Power and Interpanel Connections

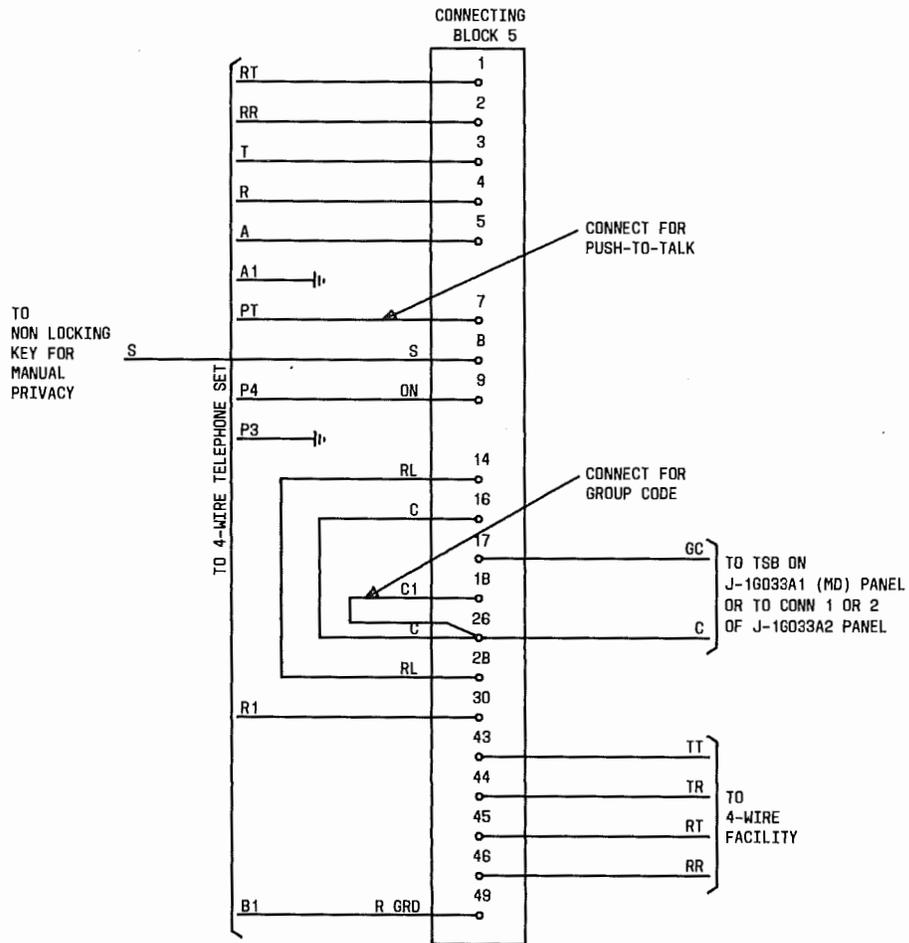


Fig. 9—Connections for One 4-Wire Telephone Set (Sheet 1 of 2)

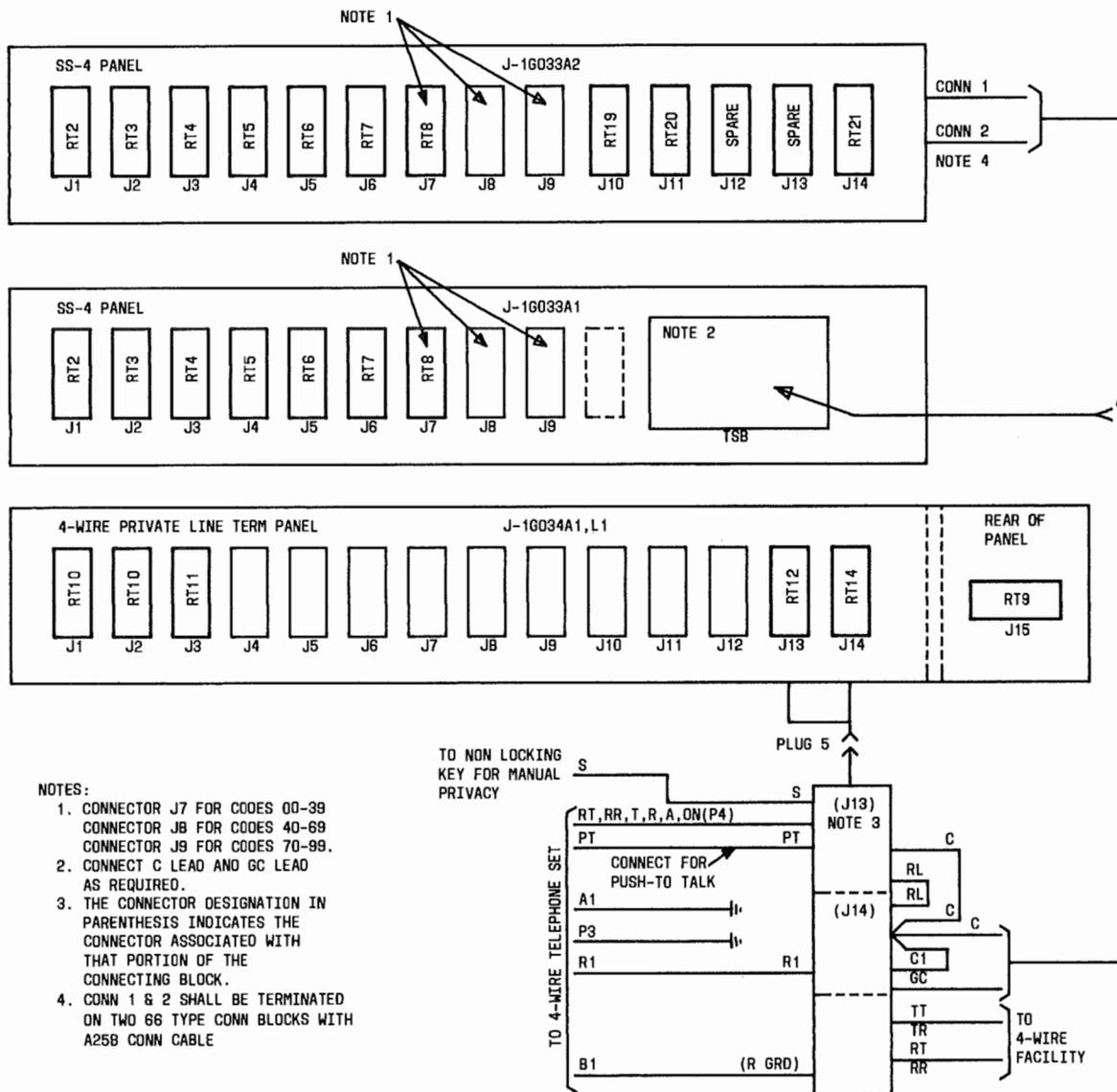


Fig. 9—Connections for One 4-Wire Telephone Set (Sheet 2 of 2)

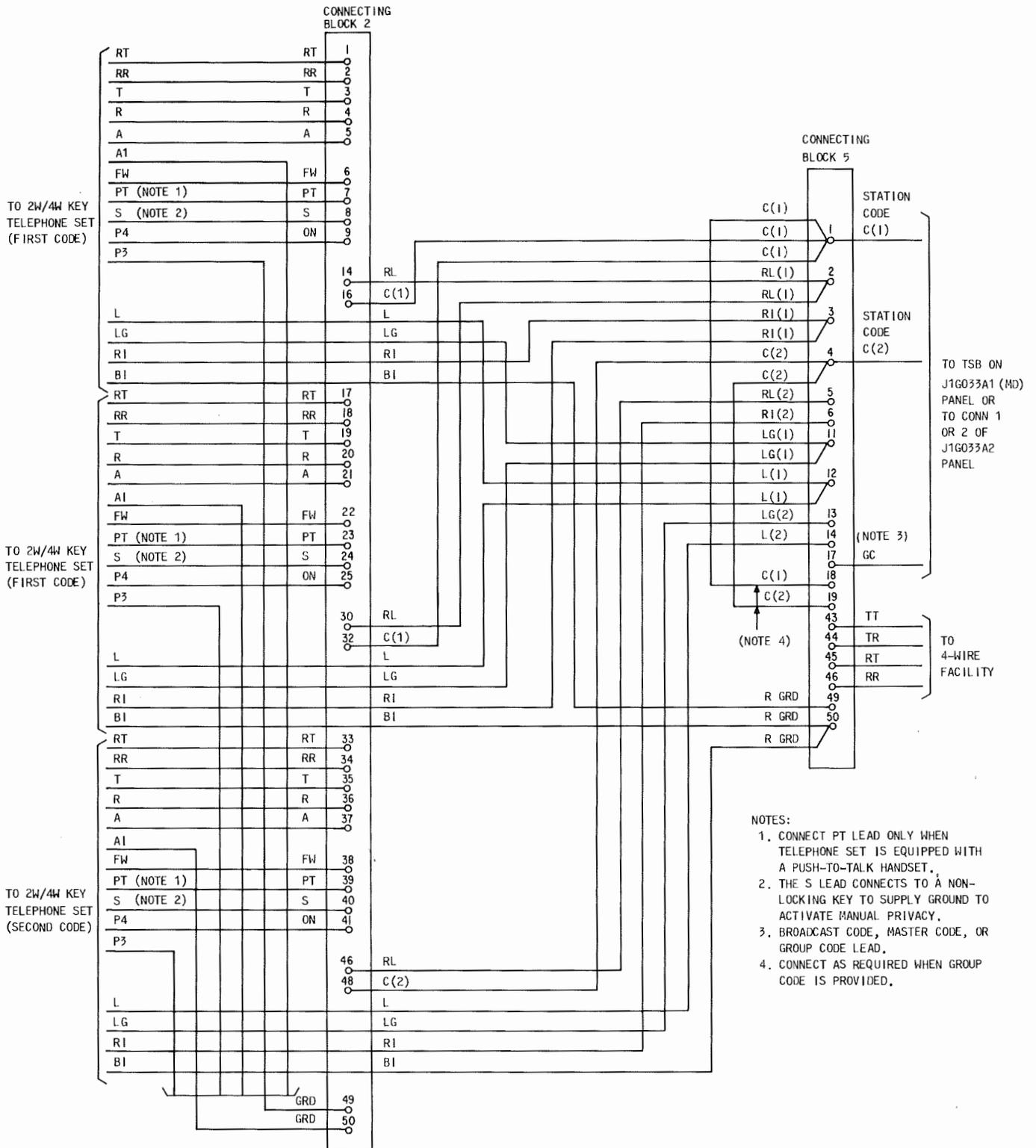


Fig. 10—Connections for Three Telephone Sets and Two Station Codes (Sheet 1 of 2)

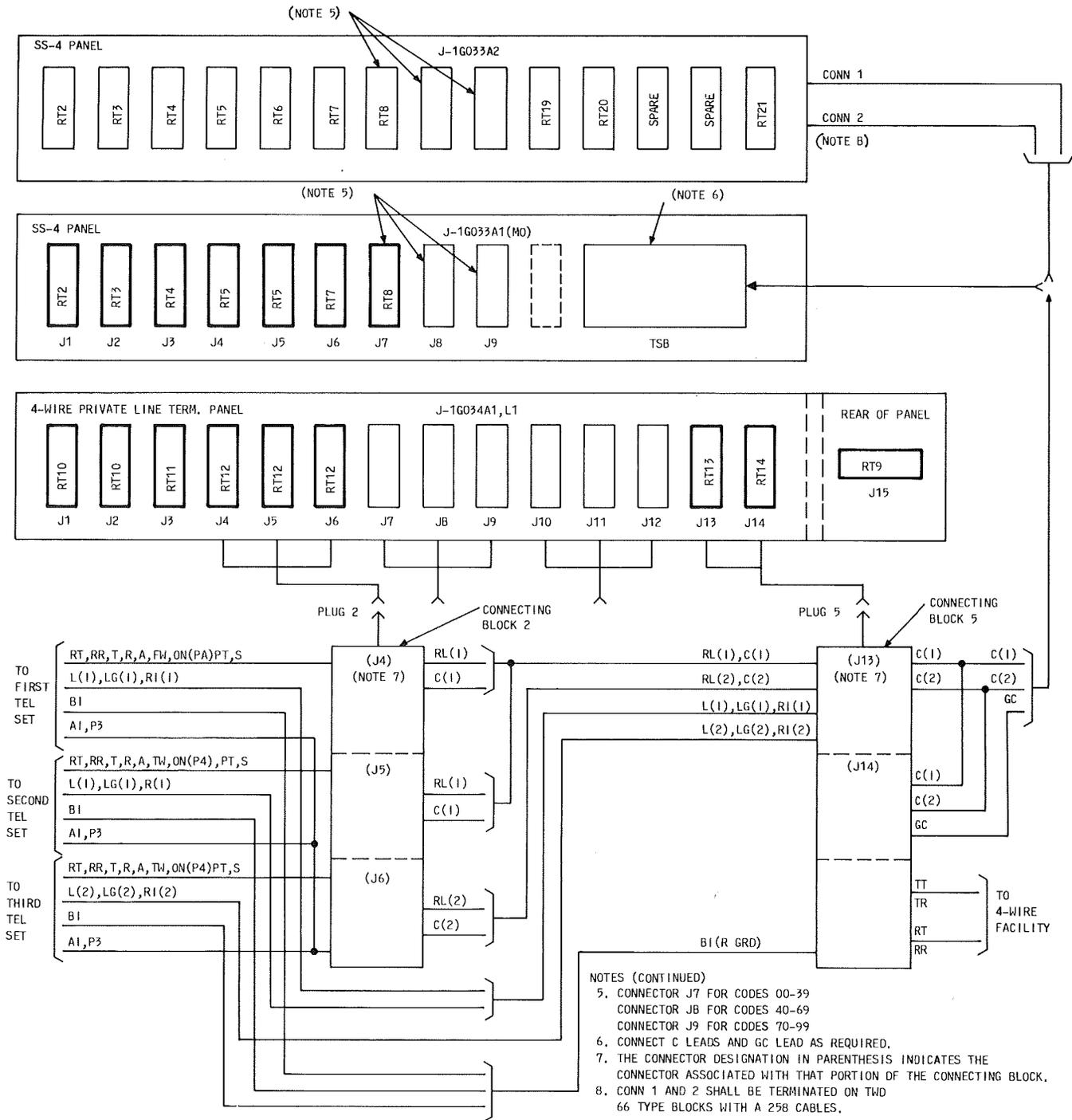
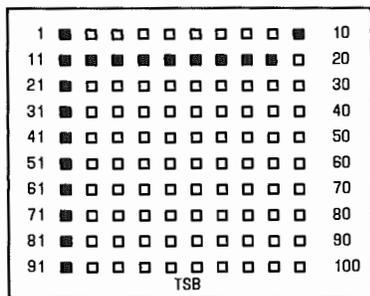


Fig. 10—Connections for Three Telephone Sets and Two Station Codes (Sheet 2 of 2)



TERMINAL STRIP 8 ON (SS-4)
J-1G033A1 (MD) PANEL

■ = MISCELLANEOUS TERMINALS
□ = STATION CODE LEAD TERMINALS

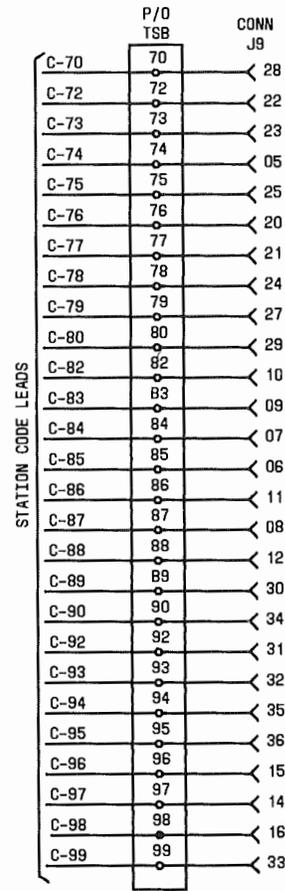
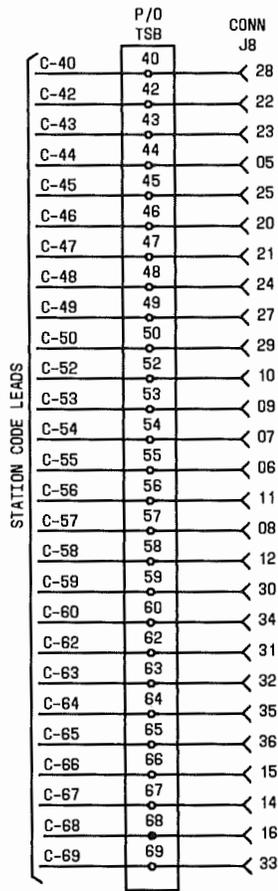
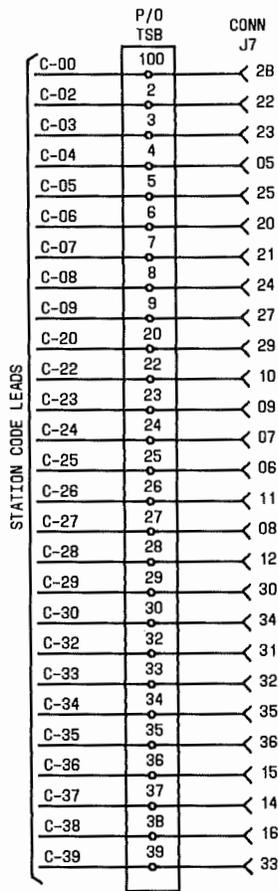


Fig. 11—Station Code Lead Terminals on J-1G033A1 (MD) Panel

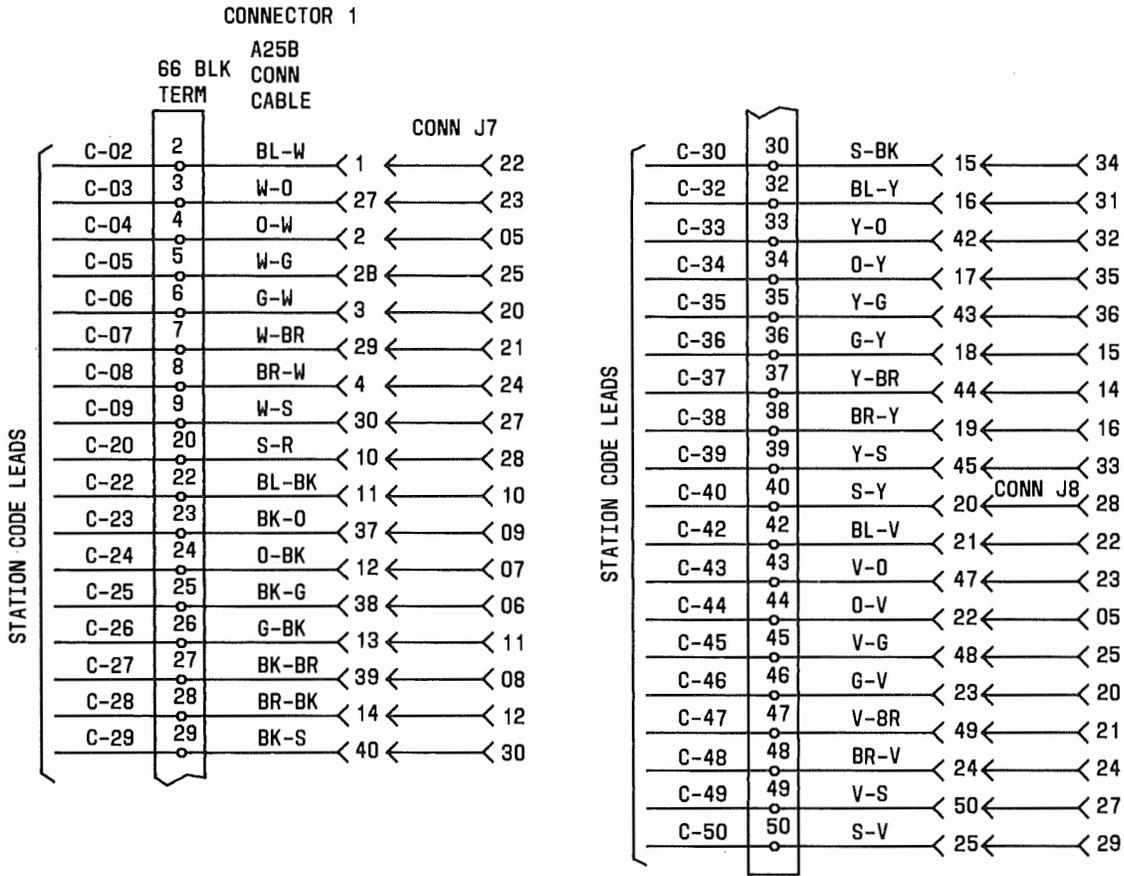


Fig. 12—Station Code Lead Terminals for J-1G033A2 SS-4 Panel, Connectors 1 and 2 (Sheet 1 of 2)

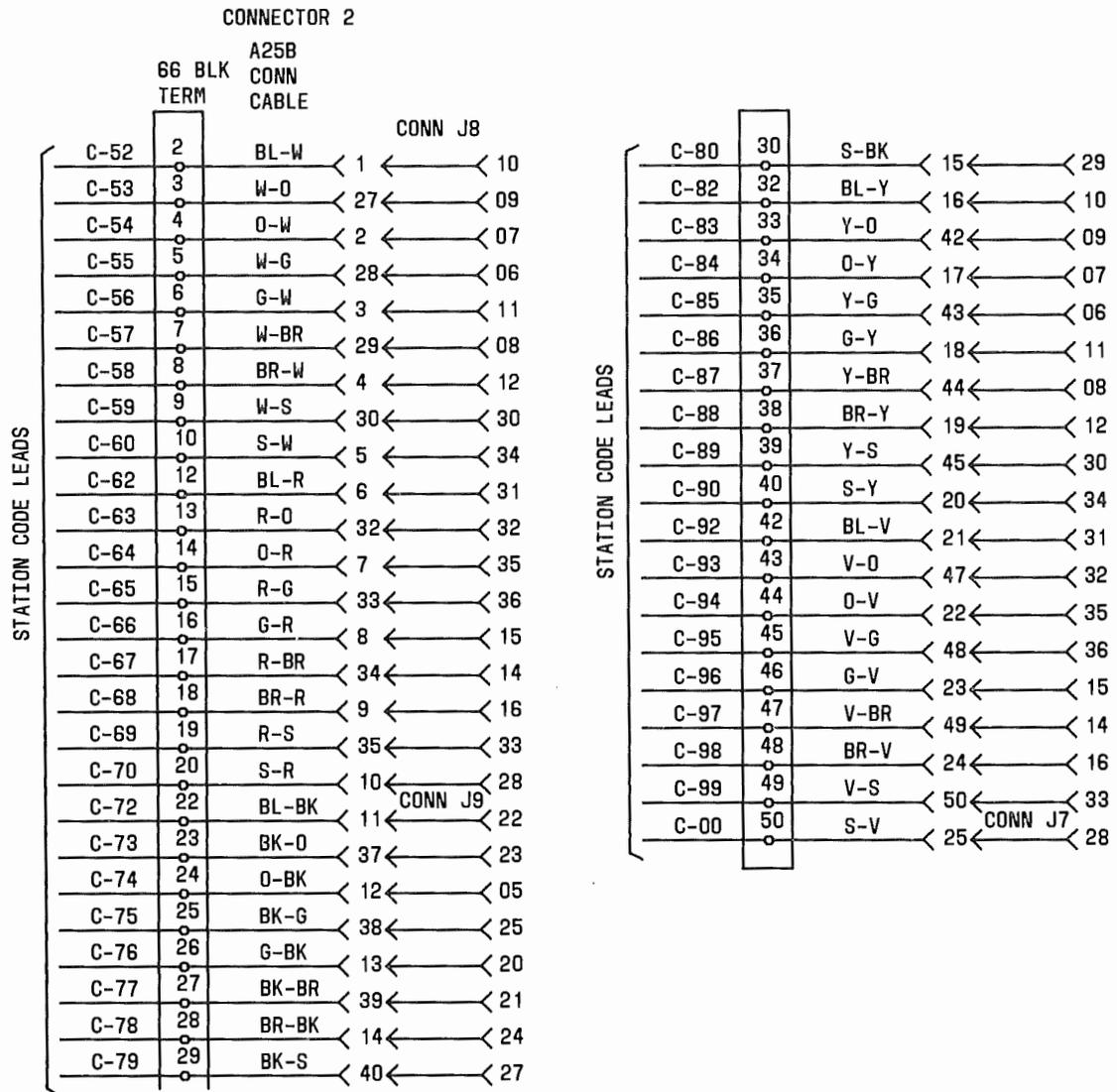


Fig. 12—Station Code Lead Terminals for J-1G033A2 SS-4 Panel, Connectors 1 and 2 (Sheet 2 of 2)

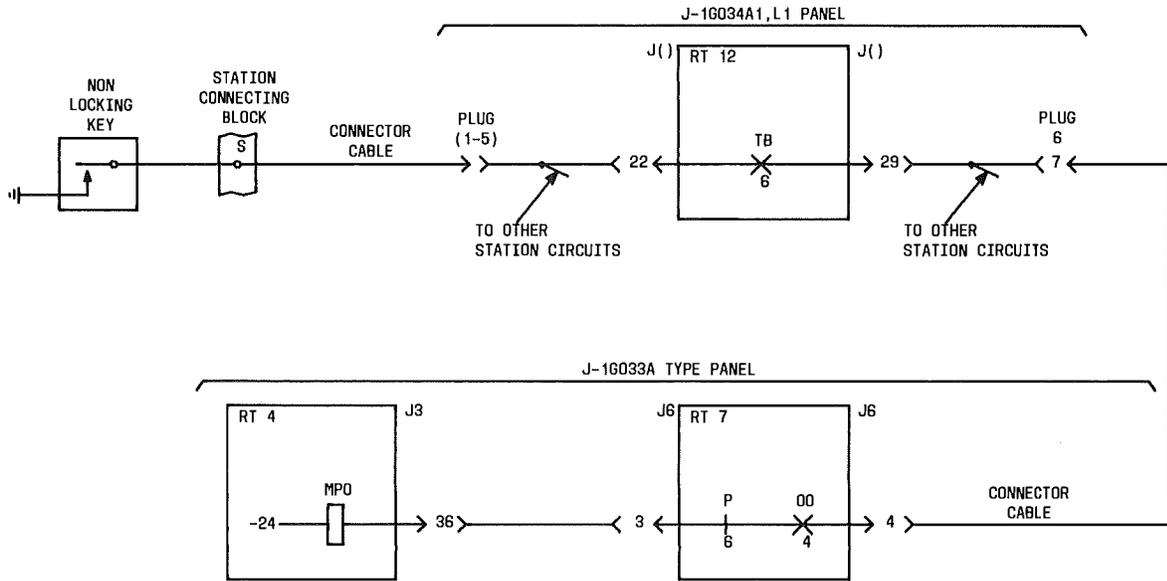
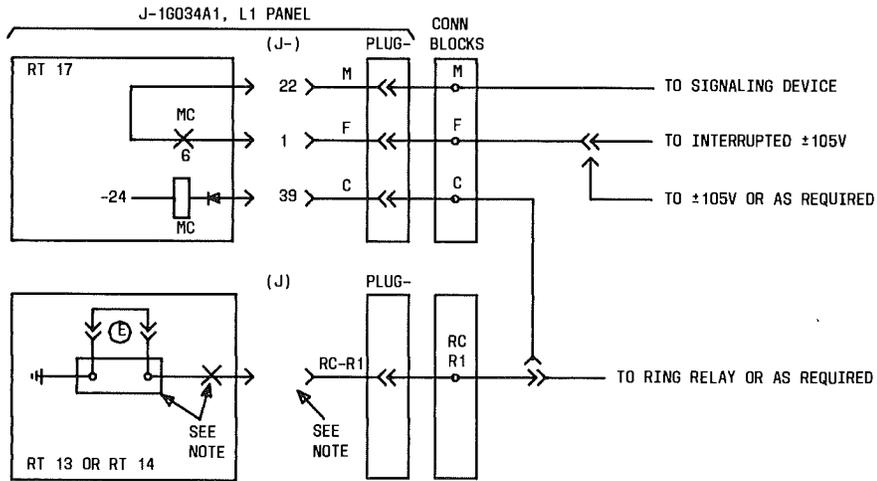


Fig. 13—Connections for Manual Privacy



NOTE:

CKT PACK	CKT ON CKT PACK	STRAP ON TERMINAL BOARD	RELAY AND CONTACT	CONN TERM
RT13	1	9-6	C1 / 2	26
	2	9-8	C2 / 2	25
	3	9-10	C3 / 2	0
RT14	-	5-6	C / 2	36

Fig. 14—Connections for E Option

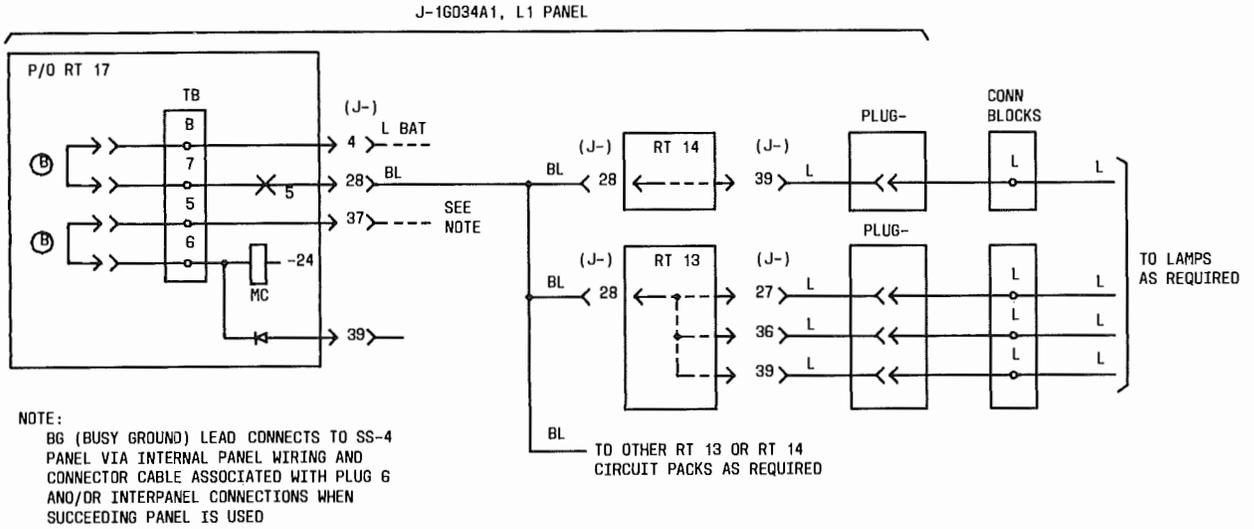


Fig. 15—Connections for B Option

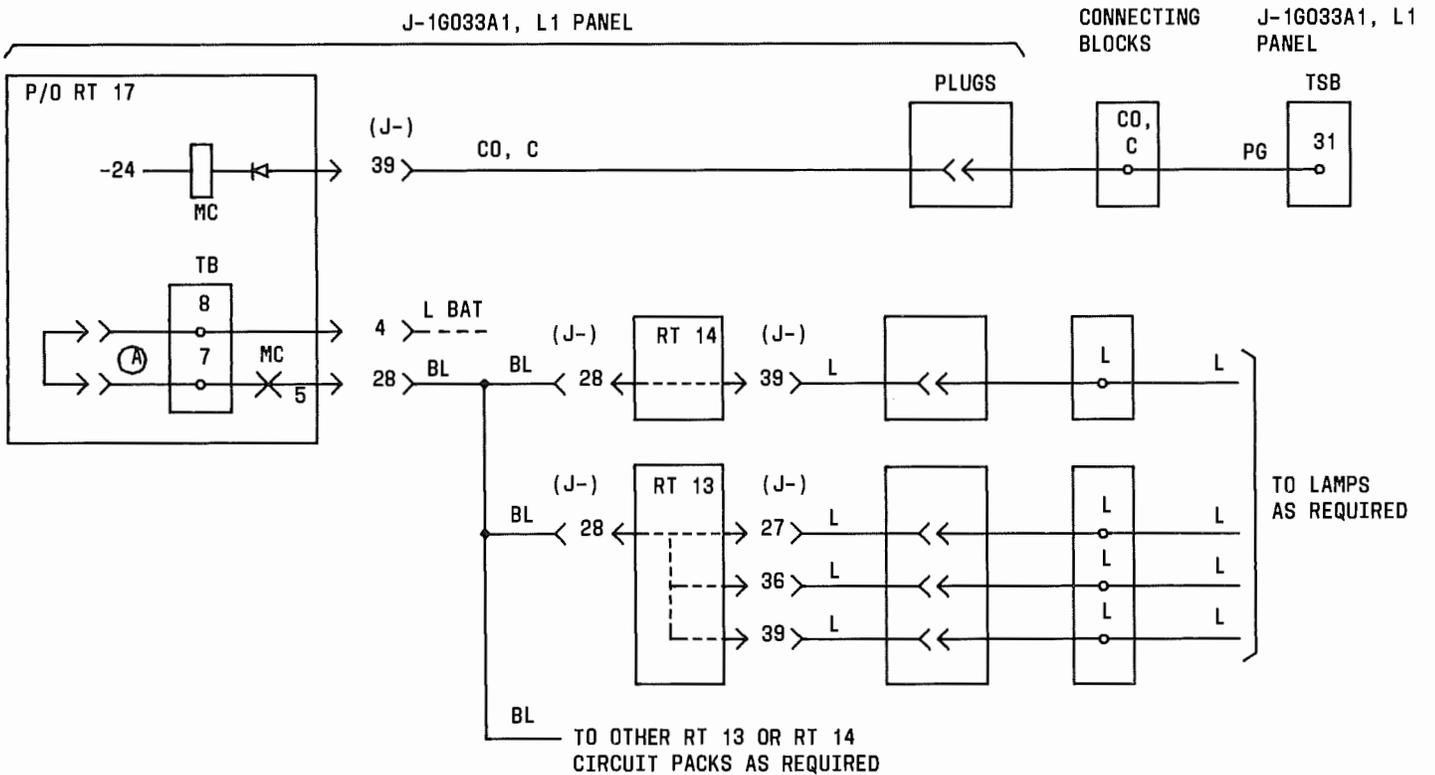


Fig. 16—Connections for A Option

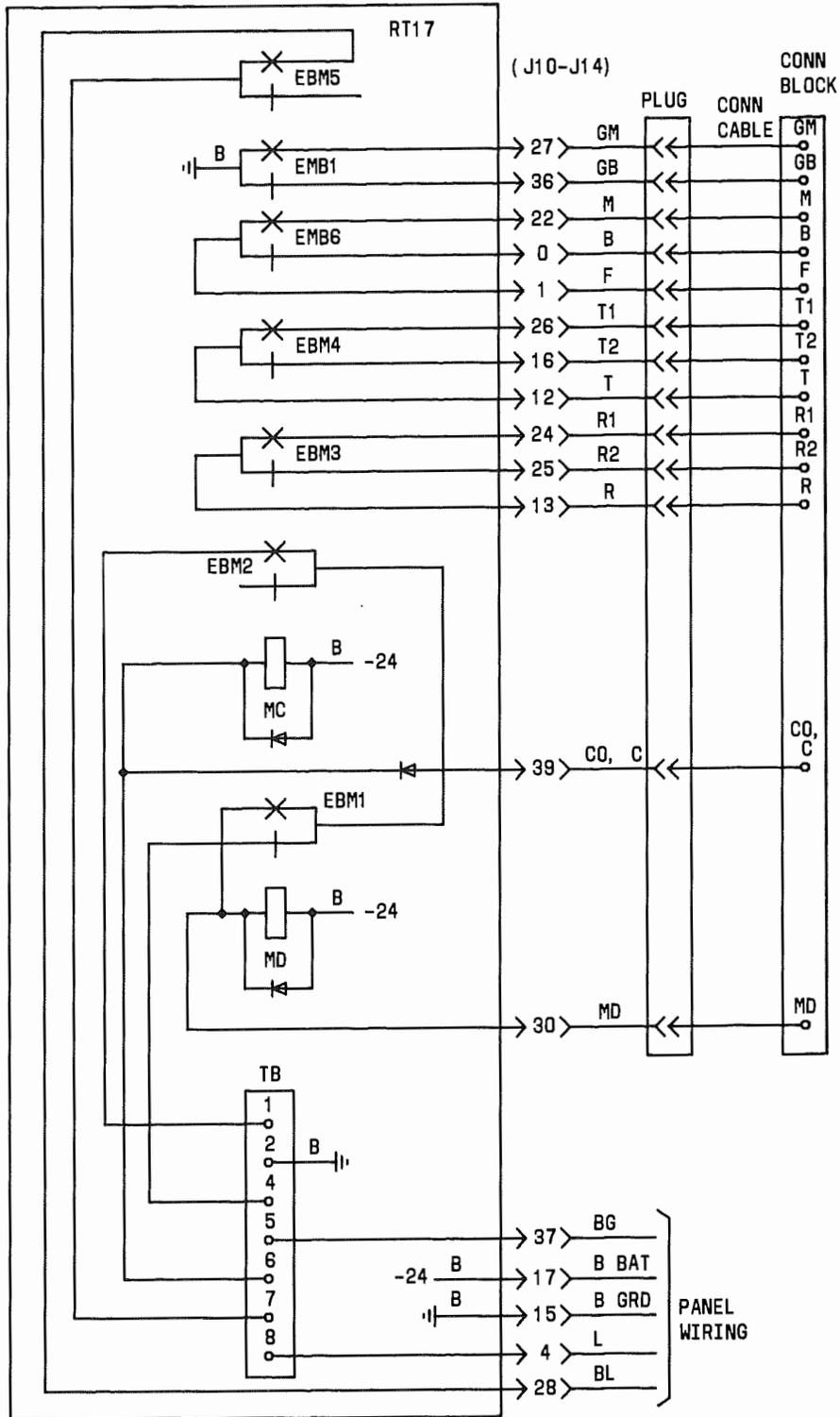


Fig. 17—RT17 Circuit Pack, Lead Designation

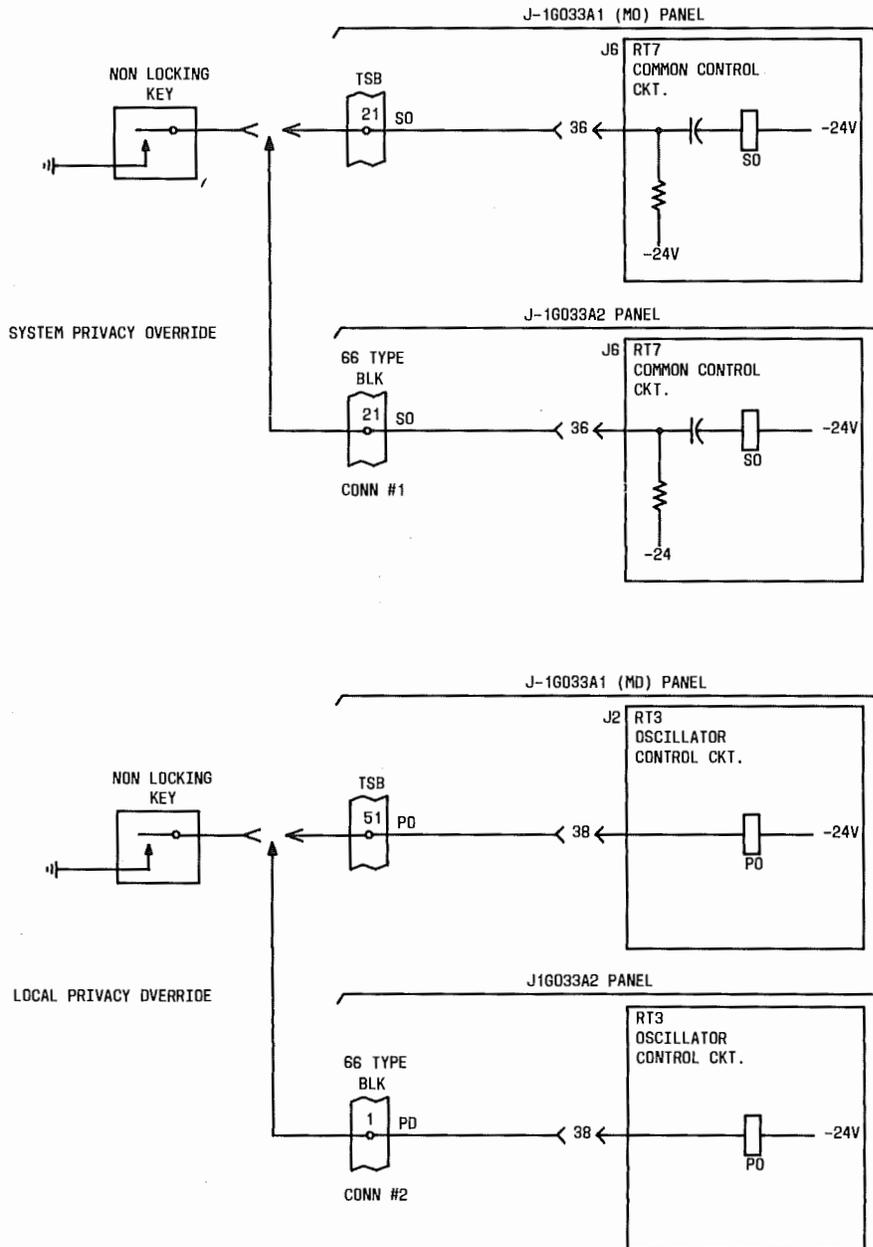


Fig. 18—Connections for Privacy Override

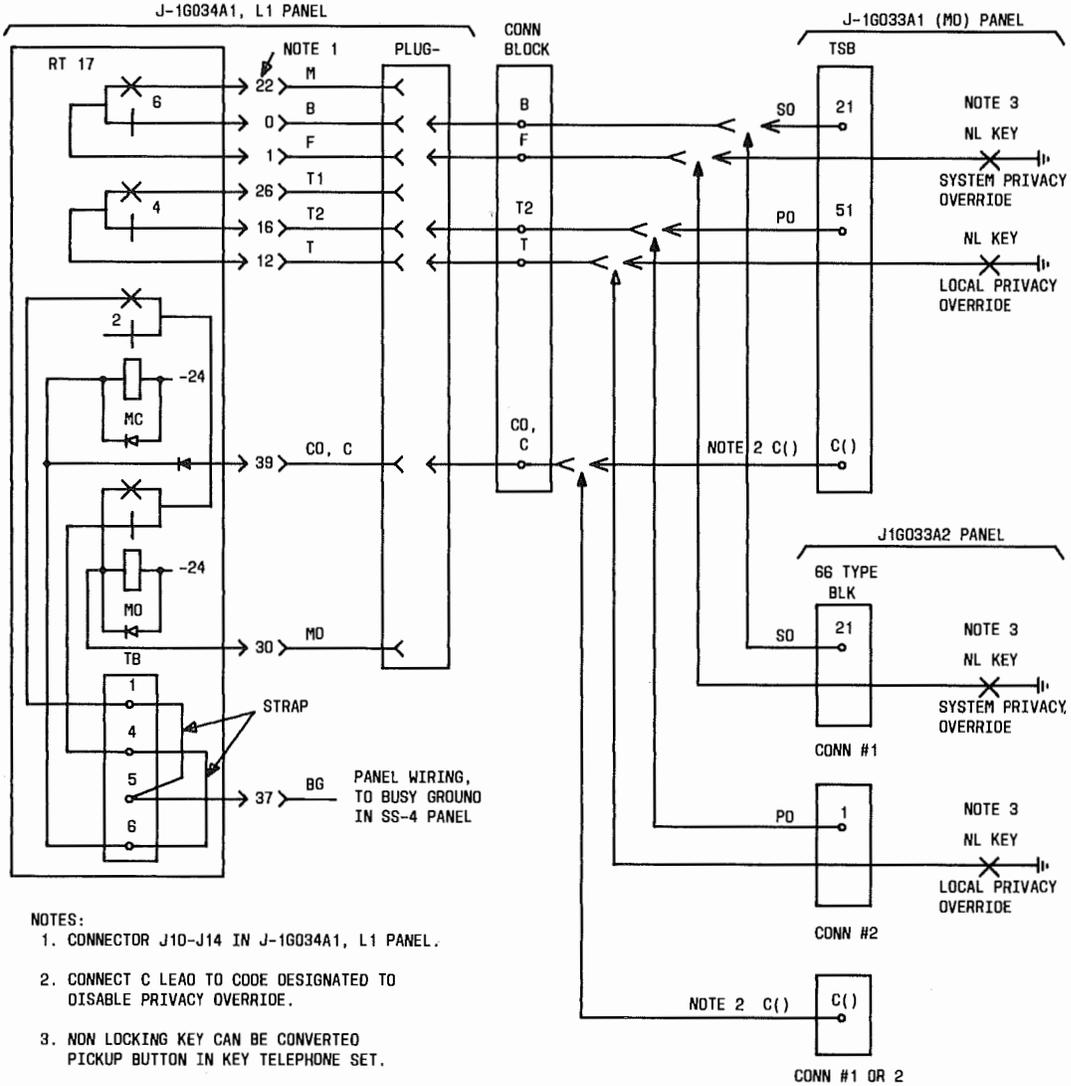
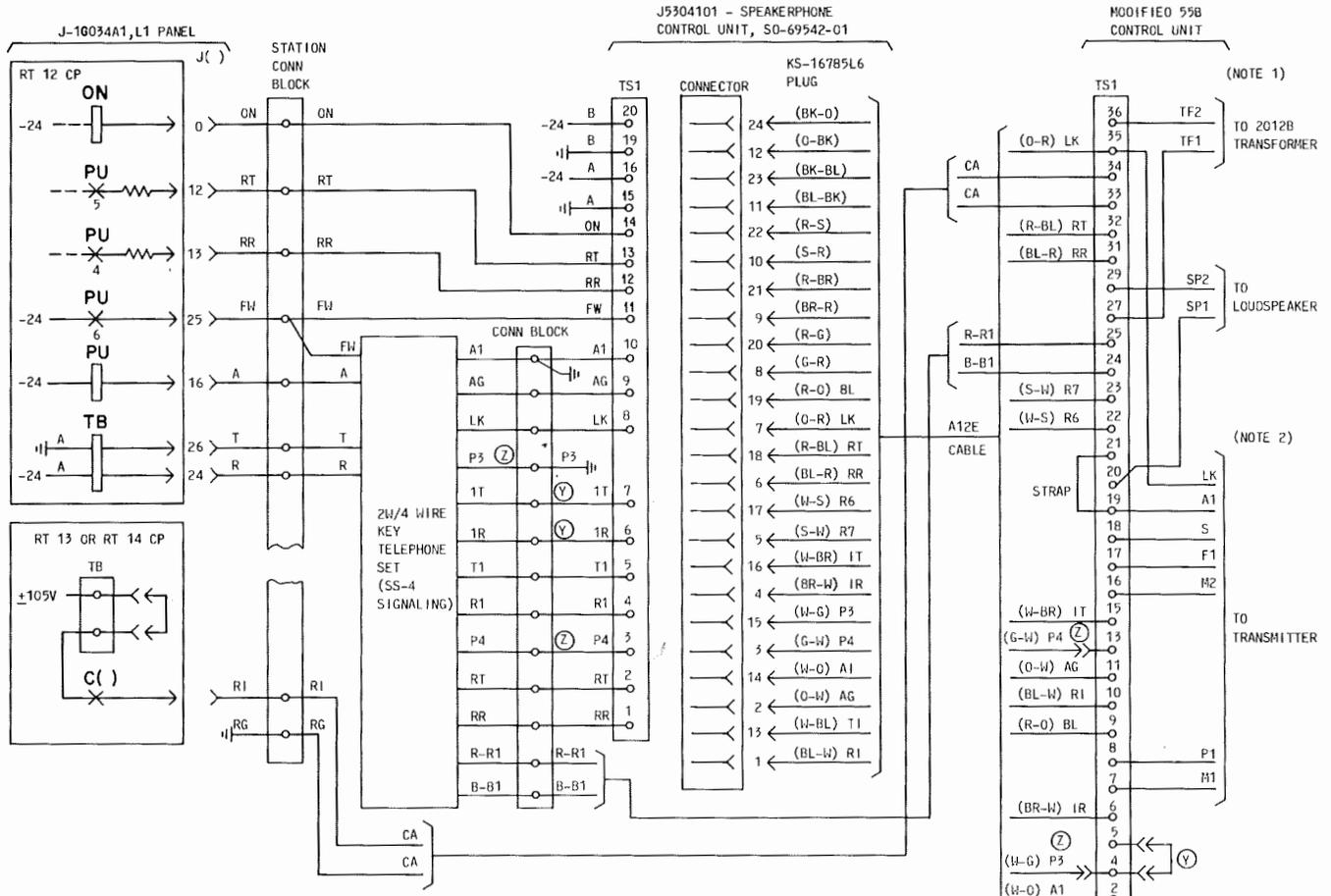


Fig. 19—Arrangement to Disable Privacy Override



- NOTES:
- MODIFY 55B CONTROL UNIT AS FOLLOWS:
 - UNSDOER RESISTOR (R6) FROM TERMINAL 3 OF TRANSFORMER (T2).
 - UNSDOER RESISTOR (R7) FROM TERMINAL 1 OF TRANSFORMER (T2).
 - INSTALL TWO 20BA TERMINAL ASSEMBLIES UNDER MOUNTING NUTS OF TRANSFORMERS (T1) AND (T2) IN SUCH A POSITION THAT THEY DO NOT INTERFERE WITH ADJACENT TERMINALS.
 - CONNECT AND SOLDER THE FREE WIRE OF RESISTOR (R6) TO ONE TERMINAL ASSEMBLY.
 - CONNECT AND SOLDER THE FREE WIRE OF RESISTOR (R7) TO THE OTHER TERMINAL ASSEMBLY.
 - REMOVE FOUR MACHINE SCREWS HOLDING TERMINAL BOARD TO EXPOSE INTERNAL WIRING CONNECTIONS.
 - INSTALL AND SOLDER FOUR NEW WIRES AS FOLLOWS:
 - TERMINAL 22 OF TERMINAL BOARD TO TERMINAL ASSEMBLY ASSOCIATED WITH RESISTOR (R6).
 - TERMINAL 23 OF TERMINAL BOARD TO TERMINAL ASSEMBLY ASSOCIATED WITH RESISTOR (R7).
 - TERMINAL 31 OF TERMINAL BOARD TO TERMINAL 3 OF TRANSFORMER (T2).
 - TERMINAL 32 OF TERMINAL BOARD TO TERMINAL 1 OF TRANSFORMER (T2).
 - REPLACE TERMINAL BOARD AND SCREWS.
 - STENCIL COVER "MODIFIED PER SD-69542-01".
 - REFER TO SECTION 512-620-10D FOR 3-TYPE SPEAKERPHONE.

(Y) TOUCHTONE
(Z) ROTARY

Fig. 20—3A Speakerphone Connections

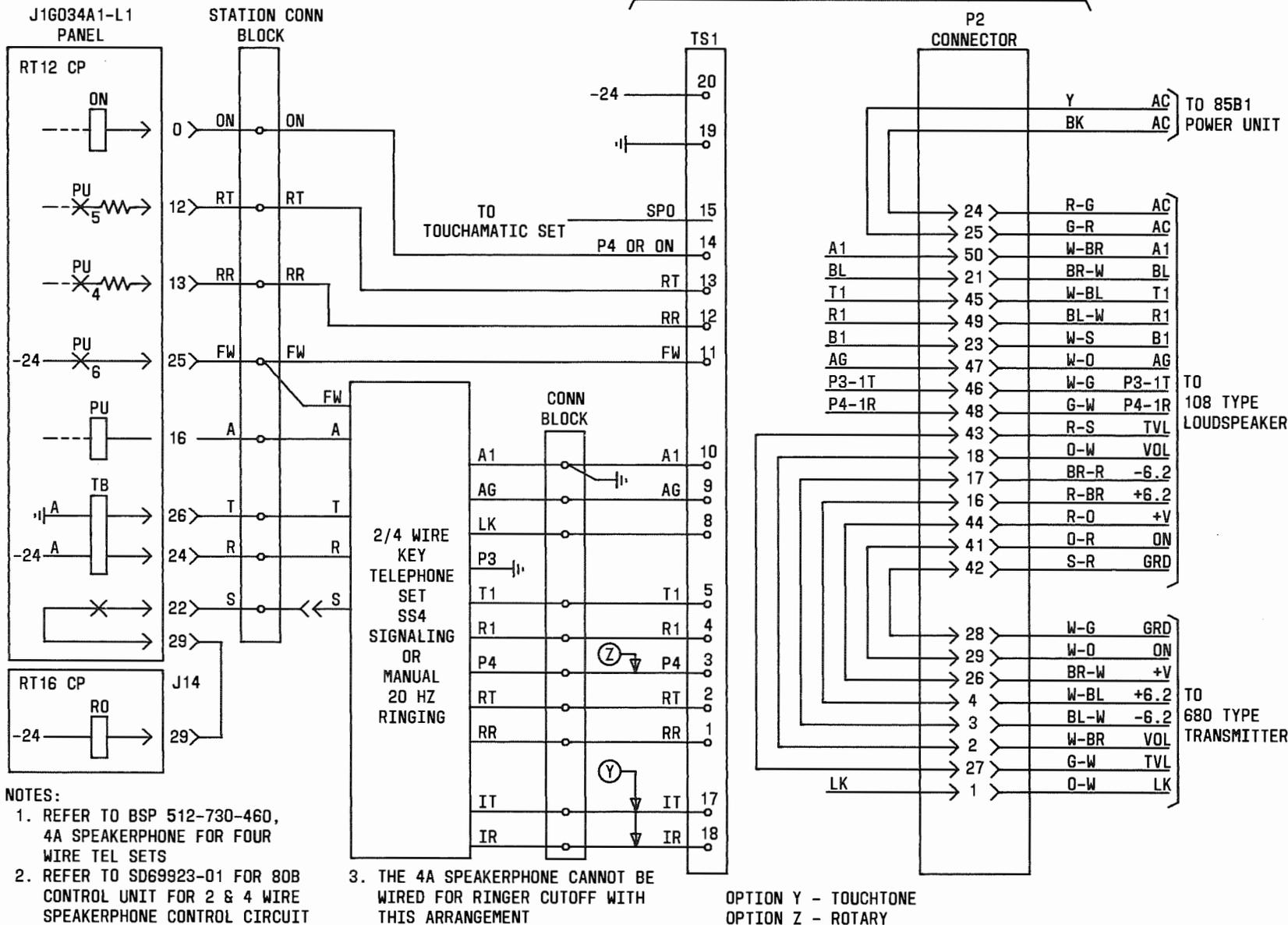
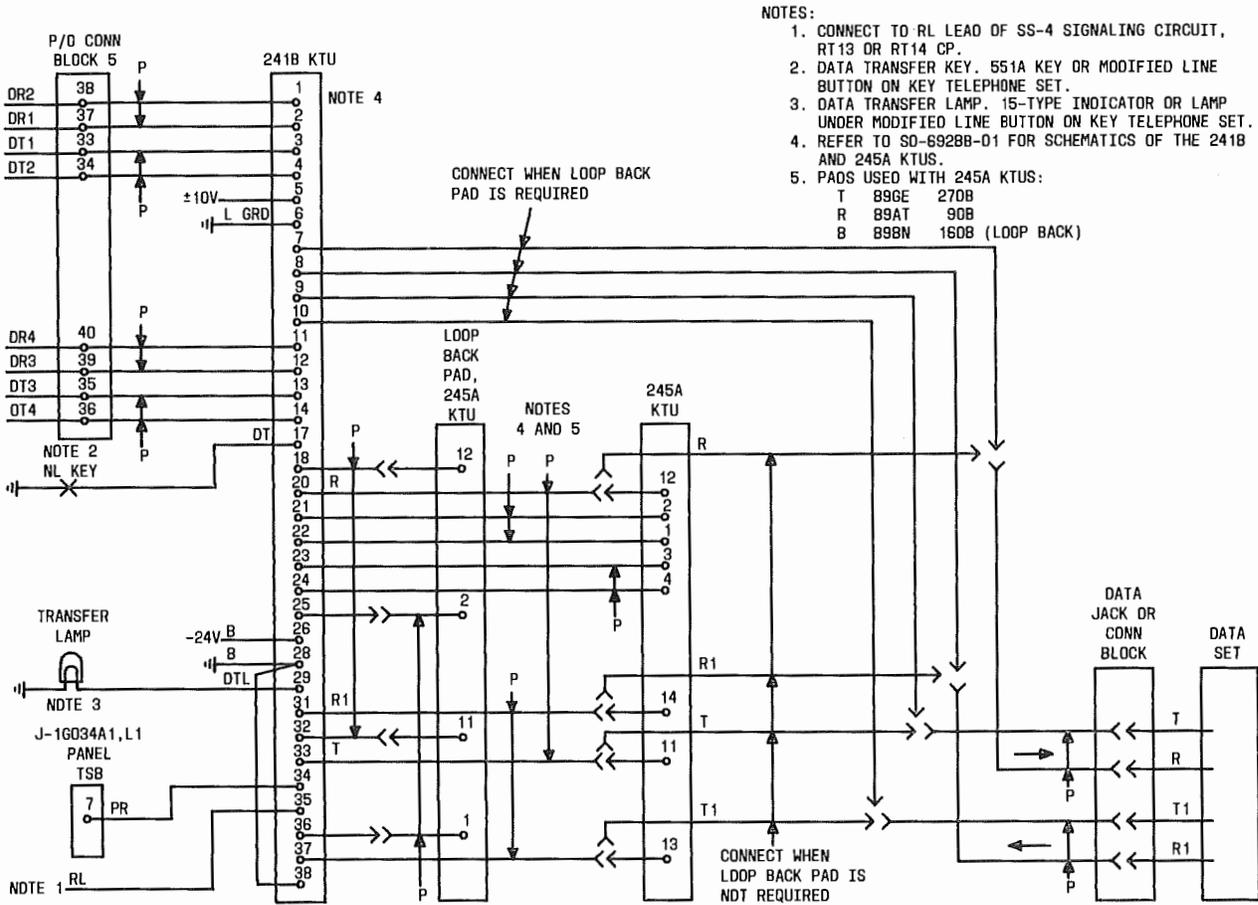


Fig. 21—4A Speakerphone Connections



NOTES:

1. CONNECT TO RL LEAD OF SS-4 SIGNALING CIRCUIT, RT13 OR RT14 CP.
2. DATA TRANSFER KEY. 551A KEY OR MODIFIED LINE BUTTON ON KEY TELEPHONE SET.
3. DATA TRANSFER LAMP. 15-TYPE INDICATOR OR LAMP UNDER MODIFIED LINE BUTTON ON KEY TELEPHONE SET.
4. REFER TO SD-6928B-01 FOR SCHEMATICS OF THE 241B AND 245A KTUS.
5. PADS USED WITH 245A KTUS:

T	89GE	270B
R	89AT	90B
B	89BN	160B (LOOP BACK)

Fig. 22—Data Transfer Circuit

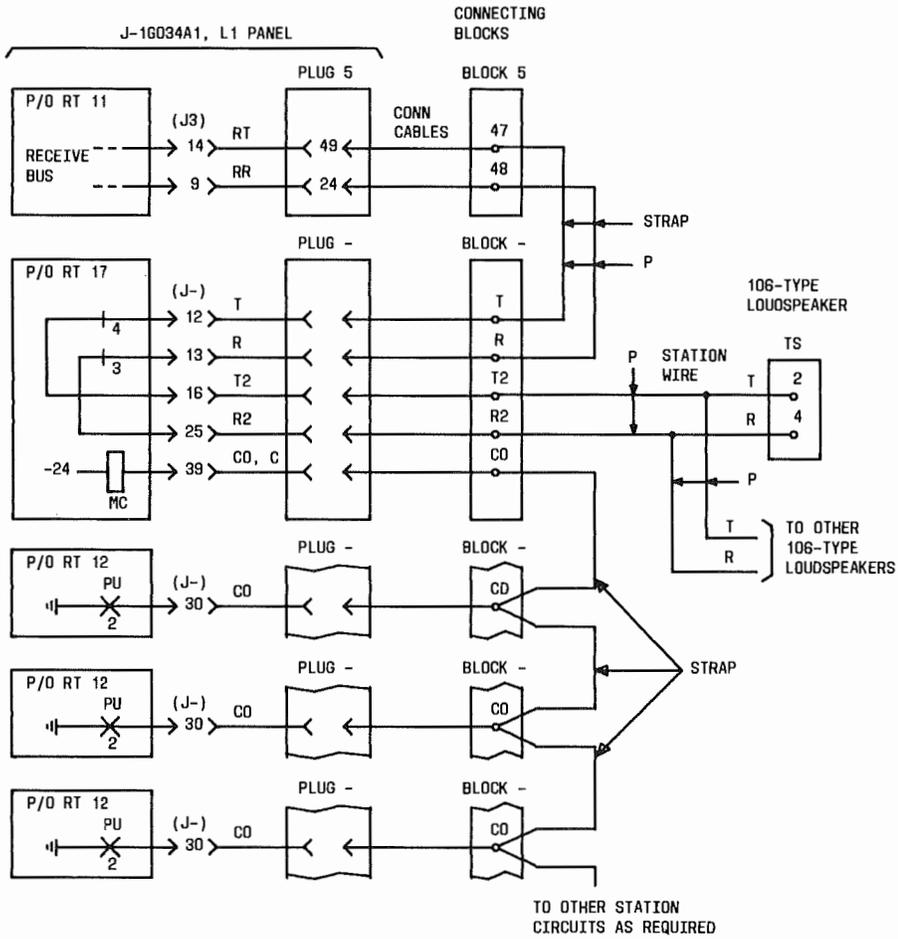


Fig. 23—Loudspeaker Connections, Cutoff Controlled by More Than One Telephone

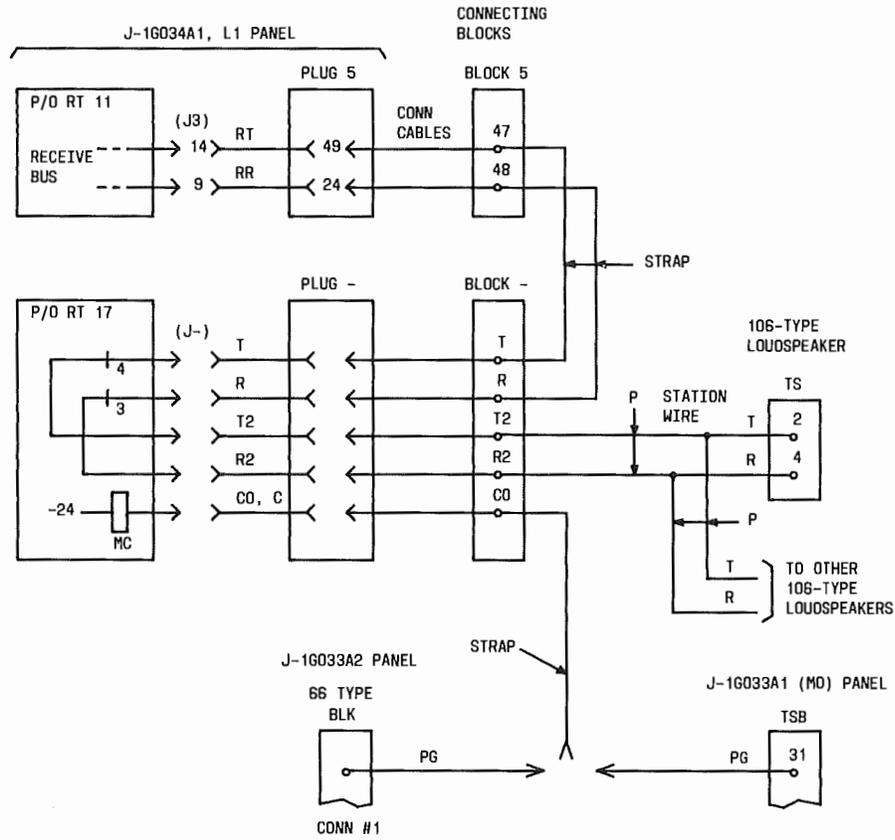


Fig. 24—Loudspeaker Connections, Speaker Cut Off When Privacy is Initiated in a Privacy SS-4 System

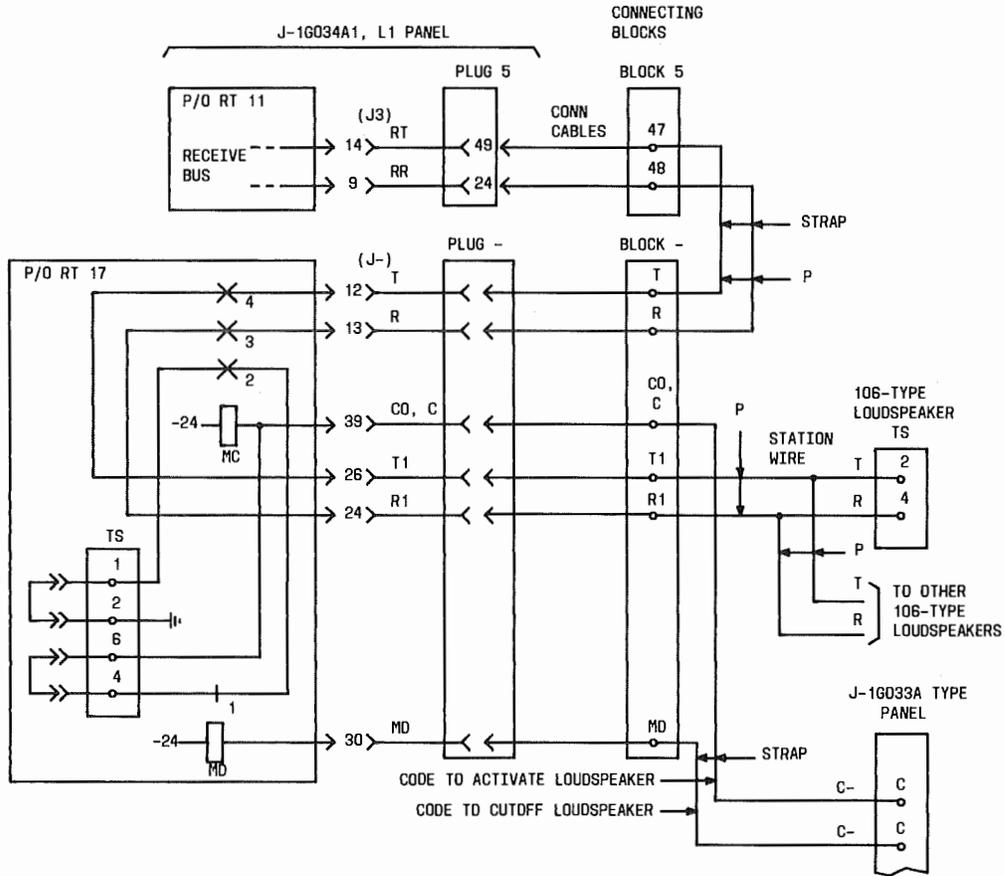


Fig. 25— Loudspeaker Connections, Speaker Activated and Cut Off by SS-4 Codes

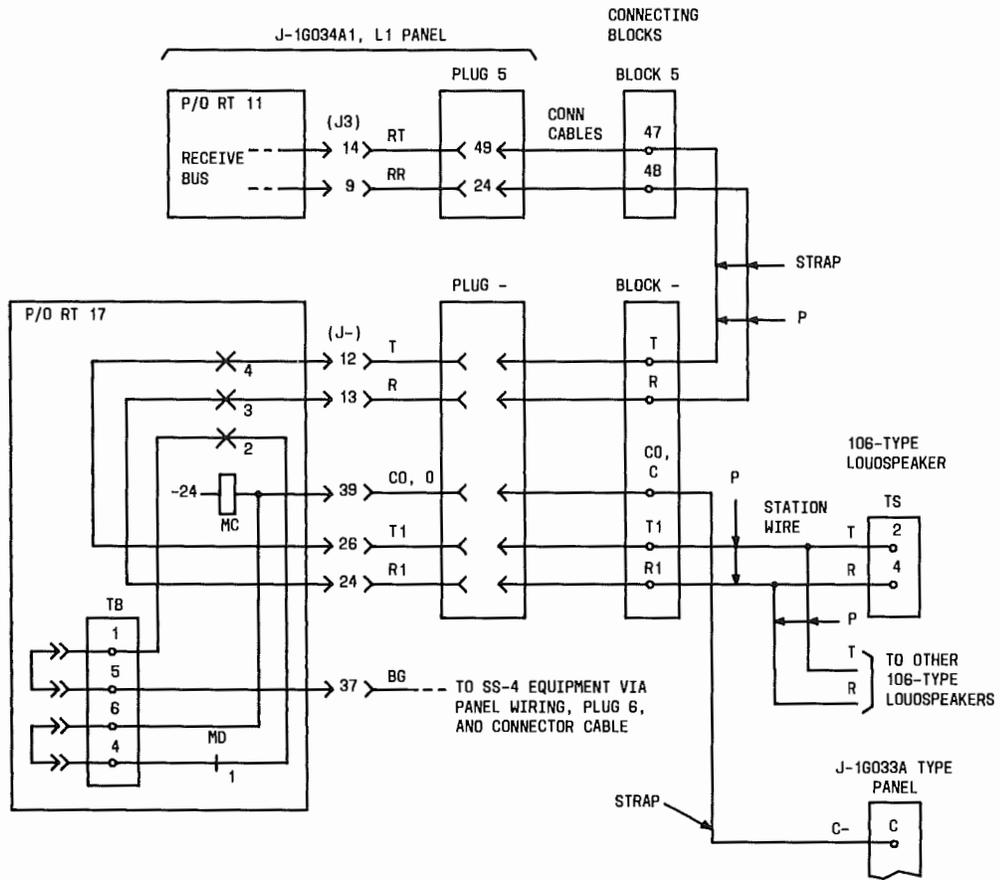


Fig. 26—Loudspeaker Connections, Speaker Activated by SS-4 Code, Automatic Cutoff

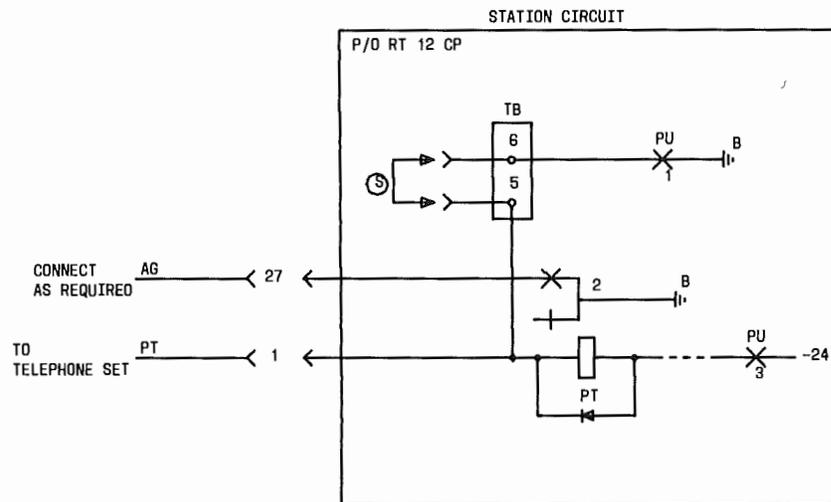


Fig. 27—AG Lead Ground, For Special Applications

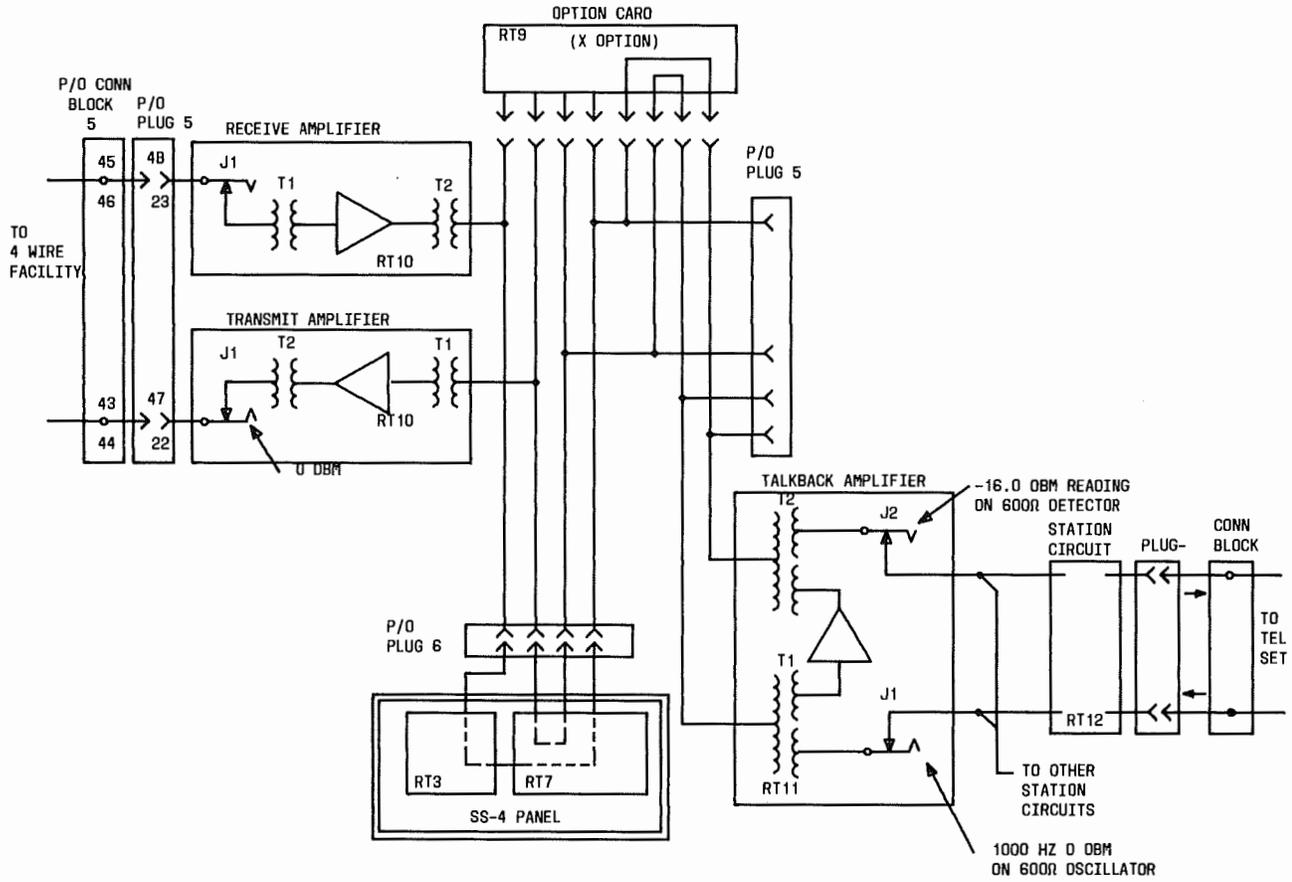


Fig. 28—Typical Transmission Diagram, SS-4 Without Data Access

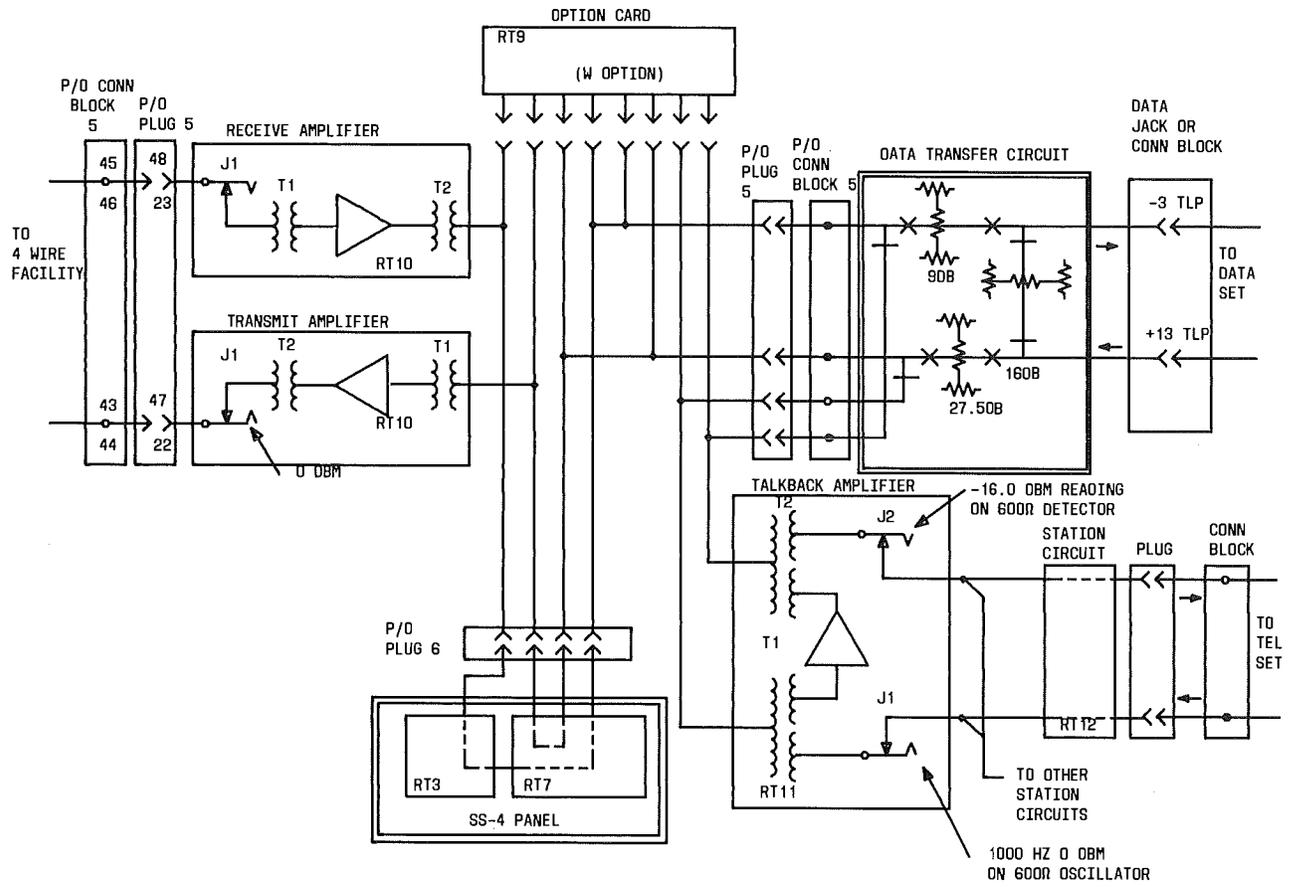


Fig. 29—Typical Transmission Diagram, SS-4 With Data Access

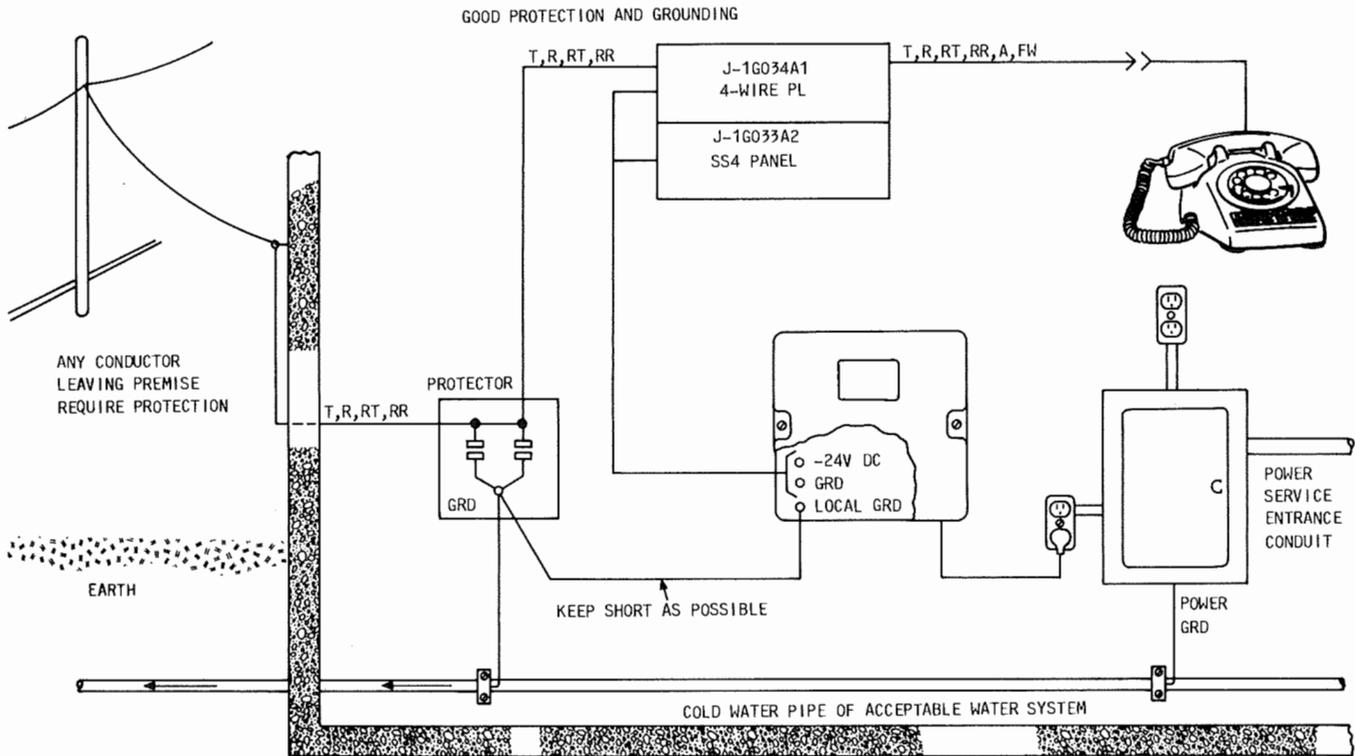


Fig. 30—System Grounding