

## 4-WIRE PRIVATE LINE TERMINATING CIRCUIT SD-69566-01

### IDENTIFICATION, INSTALLATION, CONNECTIONS

### LINEUP PROCEDURES

CONTENTS	PAGE
1. GENERAL . . . . .	1
2. IDENTIFICATION . . . . .	1
3. INSTALLATION . . . . .	5
4. CONNECTIONS . . . . .	6
5. LINEUP PROCEDURES . . . . .	7

#### 1. GENERAL

**1.01** This section contains identification, installation, connections, and lineup procedures to provide a means for talking, signaling, and data transmission on 4-wire private lines. The SD-69566-01 4-wire private line terminating circuit is arranged for use with 20 Hz or DX signaling, loudspeaker voice calling, or SS-1A or SS-3 Selective Signaling Systems. The circuit also permits exclusion of selected station sets at each branch terminal on a local basis.

**1.02** This section is reissued:

- To change E4B SF signaling unit (MD) in SS-1A Selective Signaling System (Fig. 3) to FWA SF signaling unit
- To add hold unit J53045M to Fig. 3
- To make reference to J53045 auxiliary unit for 4-wire private line service (powered from central office)
- To make minor changes and corrections in various parts of the section.

**1.03** This issue of the section is based on the following drawings:

SD-69566-01, Issue 4B

SD-69594-01, Issue 8B

If this section is to be used with equipment or apparatus reflecting later issues of the drawing, reference should be made to the SD and CD to determine the extent of the changes and the manner in which the section may be affected.

**1.04** Typical station connections for the three new units and both the MD and new list units are included in this section. The connections for the MD list units are found in the even numbered figures starting with Fig. 6. The connections for the new units and new list units are found in the odd numbered figures starting with Fig. 7.

#### 2. IDENTIFICATION

**2.01** The 4-wire private line terminating and station circuit equipment consists of the following:

- Terminating Unit (J53045A) (2.03)
- Multiple Station Line Pickup Relay Unit (J53045B) (2.09 through 2.11)
- Station Unit (J53045C) (2.12)
- Station and Pickup Relay Unit (J53045D) (2.13)
- Exclusion Unit (J53045E) (2.14)
- Selective Signaling Unit (J53045F) (2.15)

#### NOTICE

Not for use or disclosure outside the  
Bell System except under written agreement

- AC Signaling Unit (J53045G) (2.16)
- Dialing, Group Code, or Loudspeaker Control Unit (J53045H) (2.17 through 2.20)
- ♦Auxiliary Unit for 4-Wire Private Line Service (Powered From Central Office) (J53045J) (2.21)♦
- Privacy Interface Unit (J53045K) (2.22)
- Timeout Interrupter Circuit (J53045L) (2.23)
- Hold Unit (J53045M) (2.24)
- E and M Lead Signaling Unit (J53045N) (2.25)
- 4-Wire Private Line Pickup Relay Unit (J53045P) (2.26)
- Circuit Pack Assembly, Plug-in (ED-69524-1, Group 1) (2.27)
- Circuit Pack Assembly, Wired-in (ED-69525-1, Group 1) (2.28).
- ♦Circuit Pack Assemblies, Wired-in (ED-69901, Group 1 or ED-69902, Group 1) (2.29)♦

**2.02** Optional equipment which may be required but is not furnished with the 4-wire private line terminating unit is as follows:

- 30A Key Telephone Unit (2.30)
- 229B Key Telephone Unit (2.31)
- 232C Key Telephone Unit (2.32)
- 241B Key Telephone Unit (2.33)
- 245A Key Telephone Unit (2.33 and 2.34).
- ♦DX Signaling Unit (2.35)♦

**Terminating Unit (J53045A)**

**2.03** The terminating unit is required for terminating one 4-wire private line. The unit is equipped to provide a low impedance bus connection to a number of station sets and transmission between stations at the same customer location. An optional feature provides transmission testing from a central

office. The 2- by 23-inch mounting plate is equipped with wire wrap terminal strips for installer wiring.

**2.04** The J53045A terminating unit prior to Issue 4B of SD-69566-01 provided a 150-ohm (MD) or 600-ohm (MD) termination on the line side. The terminations are made by means of T3 (receive) and T4 (transmit) transformers. Use the 150-ohm termination for nonloaded cable facilities when the loss is greater than 3.3 dB. Use the 600-ohm termination for all lengths of loaded and nonloaded cable facilities when the loss is less than 3.3 dB. The 4-wire termination unit per SD-69566-01, Issue 4B is equipped for use with a 359-type equalizer. The 359-type equalizer (ordered separately) replaces T3 and T4 transformers (see Fig. 18 and 19).

**2.05** A low impedance bus connection on the station side is provided for a maximum of 20 stations, off-hook simultaneously, without appreciable loss in transmission capability.

**2.06** Loop transmission losses may be checked from a serving central office test center by applying 48 volts dc to the simplex leads of the line to operate a loop-back relay in the terminating unit. The loop-back circuit is operated when -44 to -52 volts dc is applied to the simplex leads of up to a 1500-ohm loop. Refer to SD-69566-01 for a typical central office arrangement.

**2.07** An optional talkback amplifier provides transmission between a number of station sets at the same location on the same 4-wire line. Talkback level will be adjusted to approximately the same level as the receive level.

**2.08** Wire wrap terminals are available on the unit to provide optional connections for selective signaling, data service, and 301 or 301A Switching System.

**4-Wire Private Line Multiple Station Line Pickup Relay Unit (J53045B)**

**2.09** The multiple station line pickup relay unit connects five 4-wire private lines to one key-type station set or five station sets to one line or any combination in between (Fig. 1 and 2). The unit contains five pickup relay circuits and is equipped with six wire-wrap terminal strips for installer connections. A selective signaling option is provided to extend dialing to the selective signaling equipment over the "1" and "2" leads (Fig. 3).

**2.10** When the loudspeaker control unit (J53045H) is provided to allow muting of a common loudspeaker for several station sets, the multiple station line pickup relay unit furnishes the control lead to the control unit. When the control unit is not provided, input and muting control for a loudspeaker used with one station set is furnished by the pickup relay.

**2.11** When local exclusion is furnished, the unit operates in conjunction with the exclusion unit to provide any one of the exclusion options.

#### **Station Unit (J53045C)**

**2.12** The station relay circuit provides talking battery and ground for a 4-wire type telephone set. If SS-1A selective signaling is provided, the station circuit converts loop dialing to "1"- and "2"-lead dialing. It also provides for station set push-to-talk operation. The station unit contains two station relay circuits.

#### **Station and Pickup Relay Unit (J53045D)**

**2.13** This unit combines one pickup relay circuit and one station circuit. The same circuits are available in separate units; one to provide the pickup relay circuit and one to provide the station circuit. The pickup circuit of the J53045D, L2 unit may be connected in parallel with other pickup relay circuits so that one station circuit on the J53045D unit may serve more than a single 4-wire line (Fig. 2).

#### **Exclusion Unit (J53045E)**

**2.14** The exclusion unit provides a means for disabling pickup relays of selected station sets at the customer location, preventing undesired access to selected stations or lines in use. The exclusion feature can be optionally arranged to exclude automatically when the set goes off-hook or by the operation of a key. Several optional levels of exclusion are provided as follows (see Fig. 4):

- (a) **Master Excluder:** Excludes all stations on-hook or off-hook except those wired for nonexclusion. Local conferencing with the master station is possible only with those stations that are wired for nonexclusion.

- (b) **Excluder and Excluded:** Initial exclusion is permitted only if stations are not already locked out. These stations may be excluded either by a master or another station with the same level of exclusion which has previously initiated lockout (exclusion).

- (c) **Excluded:** Excluded stations cannot exclude others but may be excluded.

- (d) **Nonexcluded:** Nonexcluded stations cannot be excluded but may be wired so that they exclude other stations on the same line.

#### **Selective Signaling Unit (J53045F)**

**2.15** Since selective signaling systems provide only a momentary incoming coded signal (100 ms) to a selected station, a selective signaling unit in conjunction with other signaling equipment is used to repeat and control the signal. One unit is needed for each three or less station codes per 4-wire private line equipped with selective signaling.

#### **AC Signaling Unit (J53045G)**

**2.16** When incoming or outgoing signaling, or both, is provided from a station using 20 Hz, the J53045G ac signaling unit is required. This unit detects inward signaling and originates outward signaling over the simplex leads of the 4-wire line. Part of the incoming signal detector is a wired-in circuit pack (CP1) to facilitate maintenance. This unit, in connection with others, provides both audible and visual signaling. One ac signaling unit is required for each line terminating unit. The ac signaling circuit operates from 20 Hz, 80 to 105 volts, over a maximum 1500-ohm loop.

#### **Dialing, Group Code, or Loudspeaker Control Unit (J53045H)**

**2.17** This unit can be used to accomplish any one of three functions. An AK relay is used in each unit which is arranged for two circuits.

**2.18** The *dialing unit*, in conjunction with the station circuit and the pickup relay circuit, prevents mutilation of dial pulses on a private line equipped with SS-1A selective signaling when a second station at the same location goes off-hook. When privacy or nonprivacy with station lockout during dialing is required, use one dialing circuit per station per 4-wire line with SS-1A. When

## SECTION 480-615-100

nonprivacy without station lockout during dialing is required, use one dialing circuit per 4-wire line with SS-1A.

**2.19** The *group code unit* provides a means of simultaneously signaling two groups of five stations each or one group of ten stations at one customer location.

**2.20** The *loudspeaker control unit* provides for control of a single loudspeaker from several station sets. A control group station disconnects the loudspeaker when off-hook and reconnects the loudspeaker when on-hook. It is required where any one of several station sets cuts off the same loudspeaker. It may also be used to provide a push-to-talk arrangement to cut off the loudspeaker.

### ◆ **Auxiliary Unit for 4-Wire Private Line Service (Powered From Central Office) (J53045J)**

**2.21** The auxiliary unit for 4-wire private line service ensures the continuous operation of a designated station set independent of local power. The operating power is generated from the central office over the simplex leads of the 4-wire line. The unit can also be used in multiple station arrangements or single stations with selective signaling to provide a backup power in case of local power failure. Refer to Section 480-010-100 for identification, connections, and tests of this unit.◆

### **Privacy Interface Unit (J53045K)**

**2.22** The privacy interface unit is designed primarily to provide a means of connecting the 4-wire private line terminating unit and the station circuit to an SS-3 Selective Signaling System equipped for privacy. The unit provides the Selective Signaling System with a means for enabling or disabling the TOUCH-TONE® dial as well as enabling or disabling the voice path. Busy tone is applied to all disabled voice paths. The selective signaling override tone, signaling a priority intrusion on the line, can be placed on the transmission path by any two of the four stations that a single interfaced unit connects. The privacy interface circuit also sends a signal to the selective signaling circuit indicating an on-hook or off-hook condition. A privacy protection feature prevents the loss of privacy should any two stations at a location go off-hook simultaneously.

### **Timeout Interrupter Unit (J53045L)**

**2.23** The timeout interrupter unit consists of the following:

- Controlled interval timeout circuit which provides ringing timeout for SS-1A, SS-3, 20-Hz, or E and M lead signaling
- Interrupter circuit which provides ringing, busy tone, and lamp interruption for SS-3 selective signaling.

When activated by an incoming signal, the controlled interval timeout circuit initiates a locked-in interval which guarantees a minimum ringing of 30 to 75 seconds. The desired interval may be manually set by turning an adjustable screw located on front of the timer. If not answered before the end of the timed interval, the receive circuit is released and the timer returns to an idle state. If equipped with SS-1A or SS-3 selective signaling, another signal received during the locked-up interval will reset the timer and start a new timing interval.

### **Hold Unit (J53045M)**

**2.24** The hold unit contains three hold circuits. One is required per station per 4-wire line when the hold feature (option YA) is specified. The hold circuit changes the line lamp from steady to a wink signal and holds the SS-1A or SS-3 selective signaling privacy circuits.◆

### **E and M Lead Signaling Unit (J53045N)**

**2.25** If E and M lead signaling is required, one E and M lead signaling unit is needed per 4-wire line. The signaling unit provides visual and audible signaling for associated station sets. A DX signaling circuit (SD-1C363-01) is required with the E and M lead signaling unit.

### **4-Wire Private Line Pickup Relay Unit (J53045P)**

**2.26** The J53045P unit in conjunction with the J53045D unit provides for connecting an additional two 4-wire private lines to one station set. The unit consists of two pickup relays with multiplied output leads serving one station set. The unit has options such as exclusion, hold, and loudspeaker muting.

**Plug-In Circuit Pack Assembly (Loop-Back) (ED 69524, Group 1)**

**2.27** The plug-in loop-back circuit pack can be provided when the loop-back feature is required. It has been arranged as a plug-in unit to facilitate maintenance and to permit optional use. The pack provides part of the terminating unit detection circuit for the loop-back maintenance feature.

**Wired-in Circuit Pack Assembly (Signaling) (ED-69525, Group 1)**

**2.28** The wired-in signaling circuit pack assembly is part of the ac signaling circuit (J53045G). It contains part of the detection circuit for inward signaling. A circuit pack arrangement is used to facilitate maintenance.

**Wired-in Circuit Pack Assemblies (Reset) (ED-69901, Group 1 or ED-69902, Group 1)**

**2.29** The wired-in circuit pack assembly is part of the timeout interrupter unit (J53045L). ED-69901, Group 1 is for use with SS-1A selective signaling, ac, or E and M lead signaling. ED-69902, Group 1 is for use with SS-3 selective signaling. When used with selective signaling, another signal received during a locked-up interval will reset the timer and start a new timing interval.

**30A Key Telephone Unit**

**2.30** The 30A KTU provides a timeout circuit which is thermally controlled to release locked-in signals.

**229B Key Telephone Unit**

**2.31** The 229B KTU provides a single station pick-up relay where required.

**232B (MD) or 232C Key Telephone Unit**

**2.32** The 232B (MD) or 232C KTU provides interrupted ringing (interrupter ordered separately) and flashing lamp signals with timeout. When this unit is provided, the 30A KTU is not needed.

**241B and 245A Key Telephone Unit**

**2.33** The data transfer circuit (241B and 245A KTUs) provides means for transferring the 4-wire facility from the 4-wire telephone set to a standard data set (Fig. 20). The telephone attendant transfers to the data set by operating a button on the telephone set assigned to the transfer function.

**2.34** A loop-back pad (an additional 245A KTU) is required in conjunction with the data transfer circuit when the customer requires the data loop-back feature for the off-line data set while the line is in the normal voice mode (Fig. 20).

**DX Signaling Unit (J98605AJ)**

**2.35** The DX signaling unit is used in conjunction with the E and M lead signaling unit (J53045N) to convert DX signaling to E and M lead signaling, and vice versa.

**3. INSTALLATION**

**3.01** Figure 5 shows typical 4-wire private line arrangements which may be used to estimate space requirements. The arrangements, except for F, do not include provisions for power. The 4-wire private line equipment requires the following voltages:

- -24 or -48 volts signal battery
- -24 or -48 volts talk battery
- $\pm 105$  volts 20-Hz ringing supply.

The -24-volt talk and signal batteries may be furnished using 29C- or 30C-type power units or by existing power equipment. The -48-volt talk and signal batteries could be obtained from an existing source, such as that at a PBX. Single station installations may be powered from the central office via J53045J (2.21). Power requirements for the 4-wire private line units are shown in Table A.

**3.02** Power for visual lamp signals is not included. This requirement is determined by the number and type of station sets at individual customer locations.

**3.03** Table B shows equipment and mounting space requirement information.

## SECTION 480-615-100

**3.04** Factors which affect equipment arrangements are as follows:

- (a) Existing facilities with available space.
- (b) Customer-provided space for equipment cabinets or relay racks.
- (c) Type of equipment cabinets or racks specified for the installation. The 4-wire private line equipment may be mounted on miscellaneous relay racks or in cabinets on a customer premises.
- (d) The number of station sets to be provided.
- (e) The signaling option selected.
- (f) Other options to be provided.
- (g) The requirement to provide for expansion.

**3.05** Special tools are not required for installation of 4-wire private line equipment.

**3.06** When uncrating each unit, inspect carefully for the following:

- Transposed (crossed) contact springs
- Broken or jammed actuating cards
- Slipped coverplates
- Cracked plastic parts.



**Exercise care when handling, storing, and shipping system units to avoid damage to components.**

**3.07** When a 229B KTU is specified, the installer must mount a 446F diode (D3) between terminals 39 and 40 (cathode on TERM. 40) and must stamp PU on the relay.

**3.08** When unit J53045H is provided, installer shall stamp unit and relay designations in accordance with unit use, as shown in Table C.

**3.09** Use distinctive colors of 24-gauge BG or BW wire for strapping and cross-connecting units.

## 4. CONNECTIONS

**4.01** The connections required for a 4-wire terminating circuit will vary with the equipment selected to provide the desired arrangement. Refer to SD-69566-01 for strapping and cross-connecting the various units. The typical connecting figures shown in this section may be used as a guide for developing the station arrangement (Fig. 6 through 20).

**4.02** Figures 6 and 7 show the connections required for a single station set using voice signaling or simplex signaling with timeout. Connections for the 106-type loudspeaker are also shown.

**4.03** Connections required for selective signaling are contained in Sections 480-621-200 for SS-1, 480-622-200 for SS-1A, and 480-625-210 for SS-3. Fig. 3 shows connections required for a typical SD-69566-01 4-wire private line terminated station set using SS-1A selective signaling.

### 4-Wire Telephone Sets

**4.04** The telephone set selected for use at the customer station may be a single- or multi-line set. The set must be compatible for use with 4-wire facilities. Key conversions and internal wire changes will be required to provide features such as push-to-talk (PTT), signaling, lockout during dialing (ON), exclusion, and priority hold.

**4.05** The following are typical telephone sets that may be associated with the 4-wire line unit. The figure referenced by each set illustrates a typical method of connecting the set to the 4-wire line unit and the strapping required to provide various features. Lead designations for the 4-wire line unit do not correspond with present telephone set designations; therefore, both designations are shown for identification.

<u>CODE</u>	<u>TYPE</u>	<u>FIGURES IN THIS SECTION</u>	<u>REFER- ENCED SECTION</u>
500AD	Single-Line	8, 9	502-580-401
568HAA	6-Button	10, 11	502-541-425
608-Type	30-Button	12, 13	502-610-400
618-Type	18-Button	12, 13	502-610-400
682AA	18-Button	14, 15	502-610-412
683AA	30-Button	14, 15	502-610-412
2682AA	18-Button	15	502-612-425
2683AA	30-Button	15	502-612-425
2568HAA	6-Button	16, 17	502-543-410

**4.06** Refer to sections referenced by each of the telephone sets for the modifications required to convert line pick-up keys for signaling.

**4.07** To provide the PTT feature, replace the G3AR handset with a G5BR, or equivalent. Refer to the referenced figures for G5BR connections.



*When the PTT feature is not provided, the option S strap must be installed on the pickup relay unit J53045D, J53045B, J53045P, or 229B KTU. Refer to SD-69566-01 for connecting option S.*

**5. LINEUP PROCEDURES**

**5.01** Prior to performing the lineup procedures, verify that the local facilities between the serving test center and the station test within the limits of the expected measured loss requirements as specified locally. This is to ensure that a loss in a bad cable pair is not compensated by the gain in the terminating amplifiers.

**5.02** The lineup procedures are designed to be performed prior to placing the 4-wire private line in service. To perform operational transmission tests, the equipment should be taken out of service according to local procedures. See Fig. 20 for transmission levels and Note 305 of SD-69566-01 for 89-type resistors.

**5.03** The test equipment used to perform the 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 600 ohms or have a 600-ohm impedance (Fig. 18, 19, and 20).

**5.04** Preparation of the test equipment is not covered since numerous types can be used. The selected equipment, however, may be from the following:

21A Transmission Measuring Set, Oscillator and Detector

23A Transmission Measuring Set, Oscillator and Detector

TTS-4 Transmission Test Set, Oscillator and Detector

TTS-15 Transmission Test Set, Oscillator and Detector

3555B Transmission and Noise Measuring Set, Detector

236A Telephone Test Oscillator

KS-19353 Oscillator

KS-19260 Oscillator.

**5.05** A talking circuit should be established between the customer location and the serving test center before line up procedures are started.

**5.06** Set oscillator for 1000 Hz and adjust output using a 600-ohm detector for 0 dBm for signaling other than SS-3; when using SS-3 selective signaling, adjust to obtain +3 dBm.

5.07 Insert the oscillator output into the BUS IN jack. Insert the detector input into the BUS OUT jack.

5.08 If TB amplifier is provided, adjust to obtain a  $-16$  dBm reading at the detector, if using signaling other than SS-3; when using SS-3 selective signaling, adjust to obtain a  $-13$  dBm reading.

5.09 Adjust the TRMT amplifier until the serving test center receives the level indicated on the circuit layout card.

5.10 Remove oscillator from the BUS IN jack.

5.11 Request the serving test center to send the required 1000 Hz level and adjust the RCV amplifier until the detector in the BUS OUT jack reads  $-16$  dBm.

5.12 If data transfer is provided, the 89-type resistors used are determined by the required dB loss necessary to decrease the transmission level to the level required at the data set input and at the receiving side of the serving test desk. See Fig. 20 for transmission levels and note 305 of SD-69566-01 for 89-type resistors.

5.13 Remove all test equipment prior to placing the equipment in service.

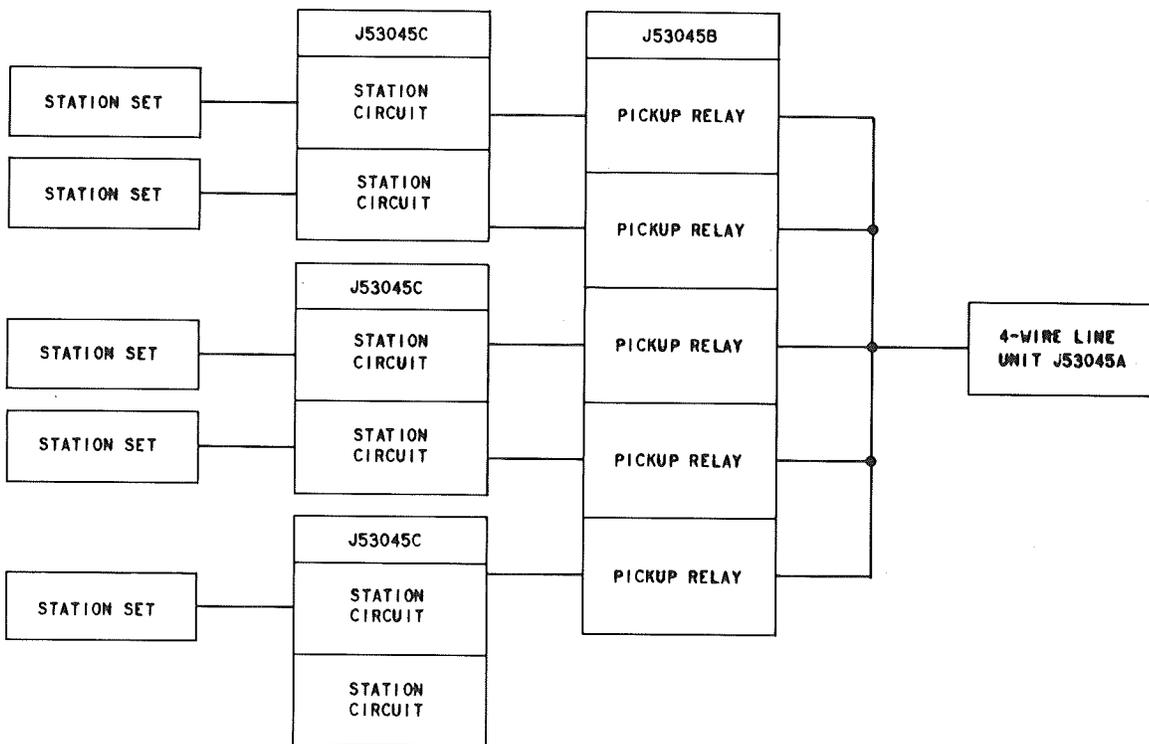


Fig. 1—Multiple Station Set Arrangement (Typical)

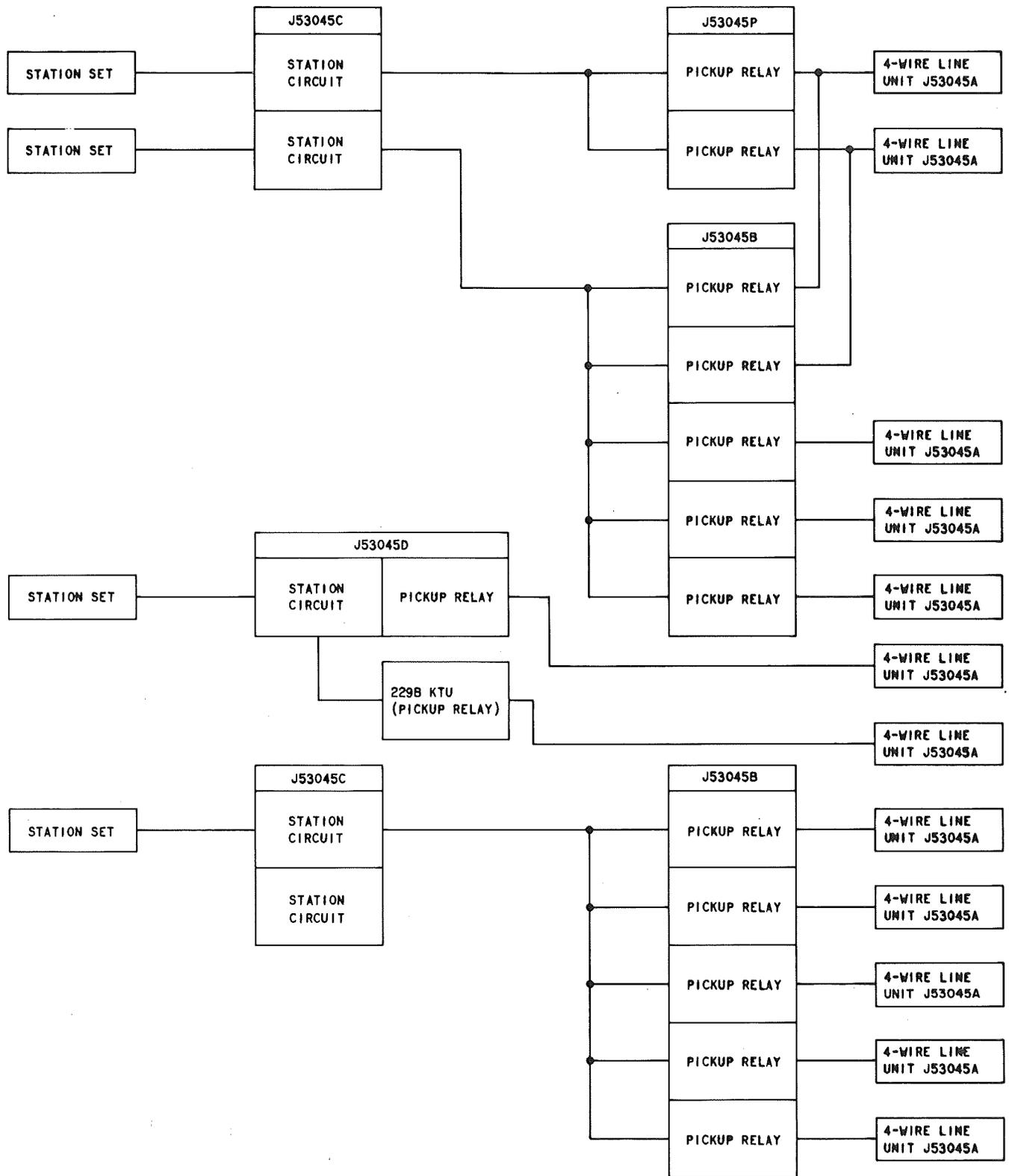


Fig. 2—Multiple 4-Wire Line Unit Arrangement (Typical)

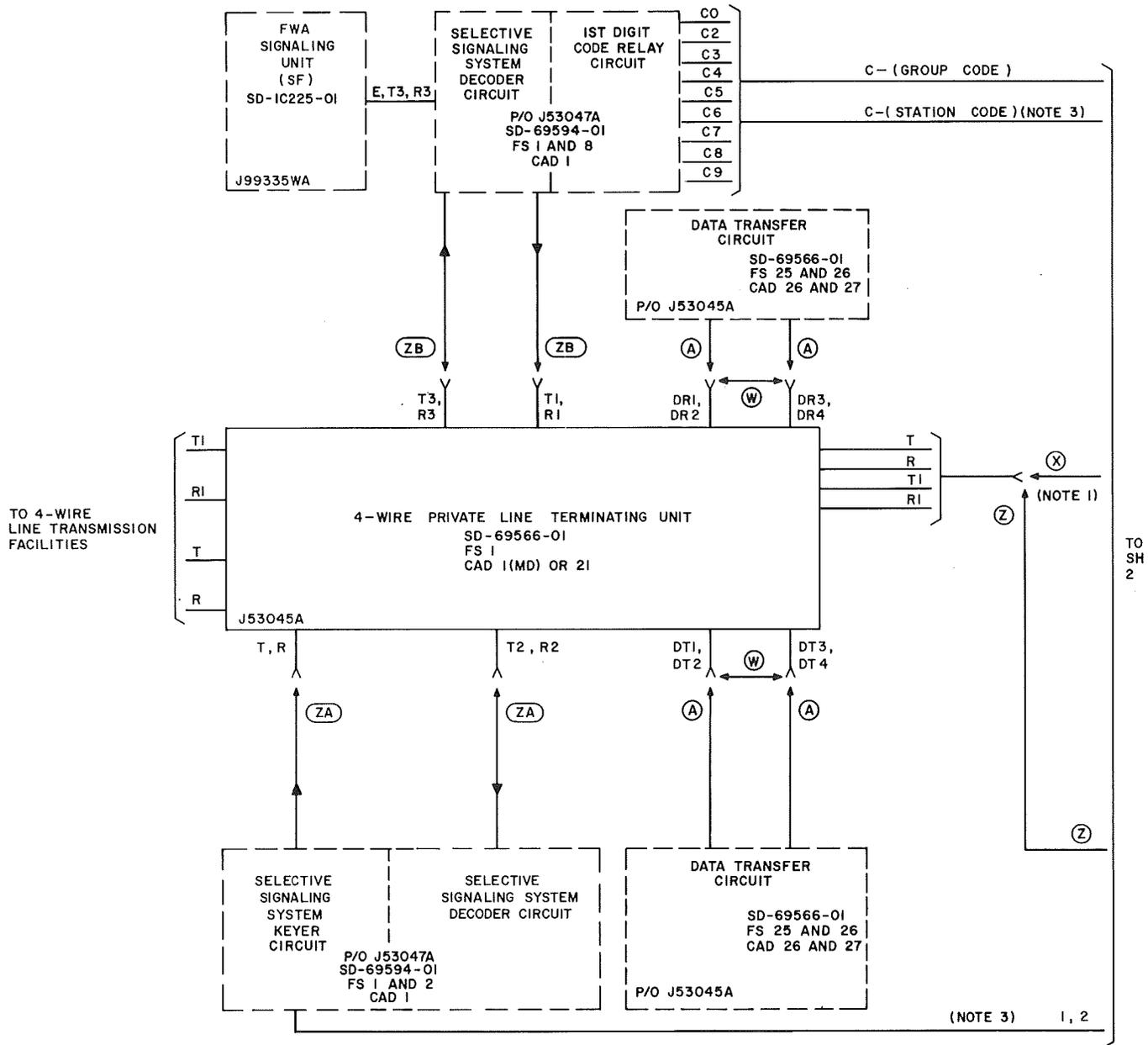


Fig. 3—Block Diagram of Typical 4-Wire Line Terminated Station Set Arrangement Using SS-1A Selective Signaling (Sheet 1)

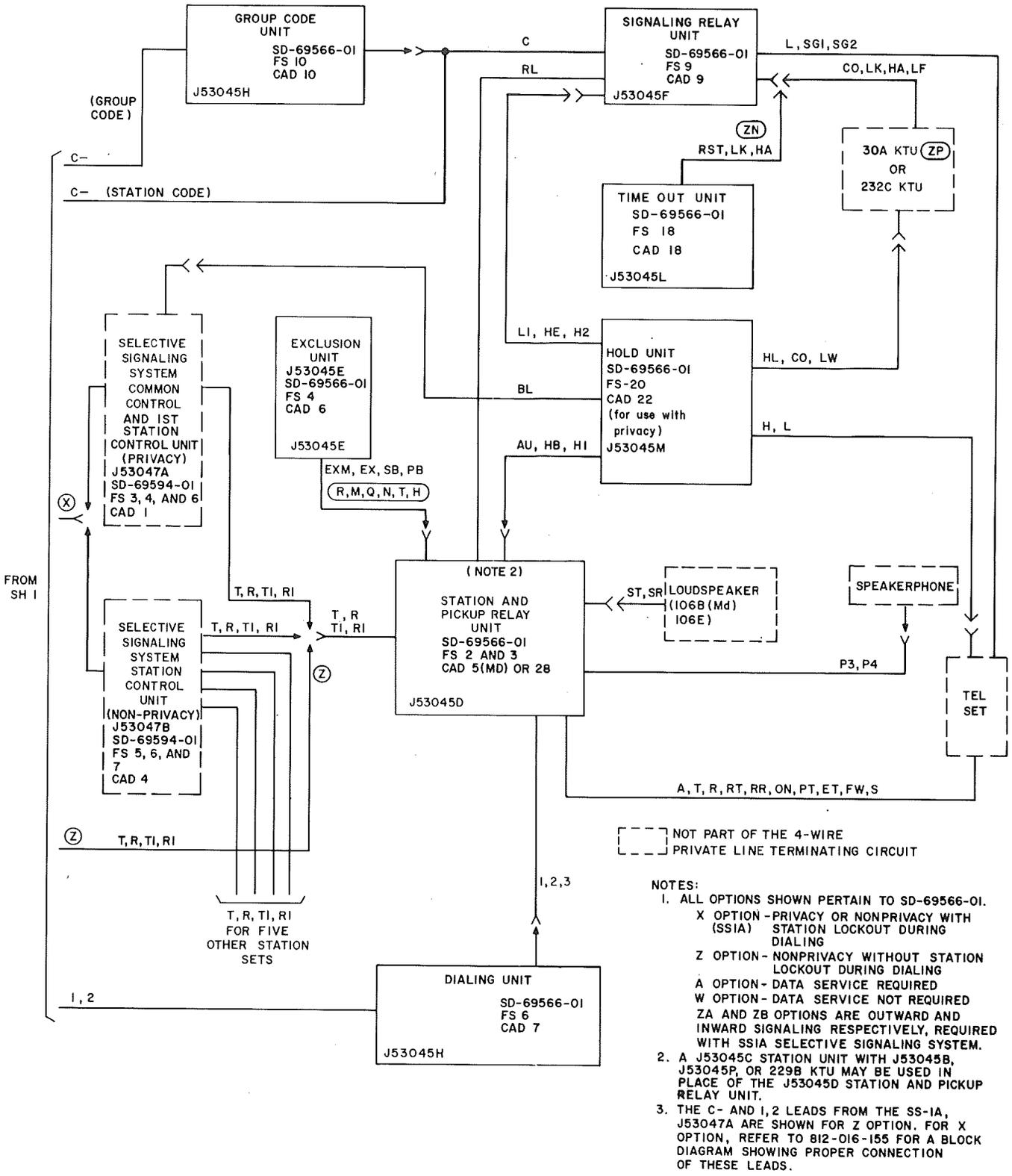


Fig. 3—Block Diagram of Typical 4-Wire Line Terminated Station Set Arrangement Using SS-1A Selective Signaling (Sheet 2)

SECTION 480-615-100

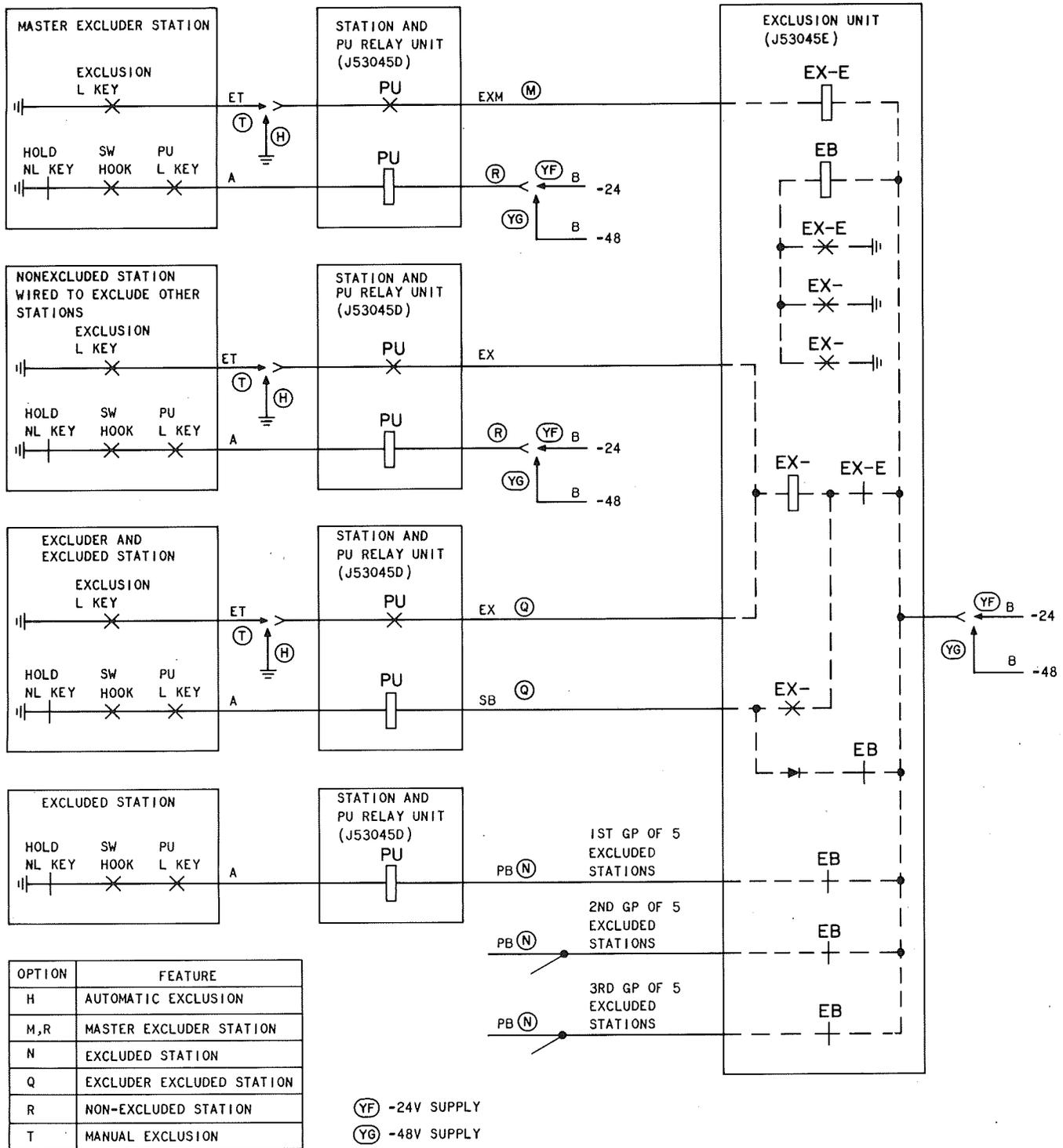
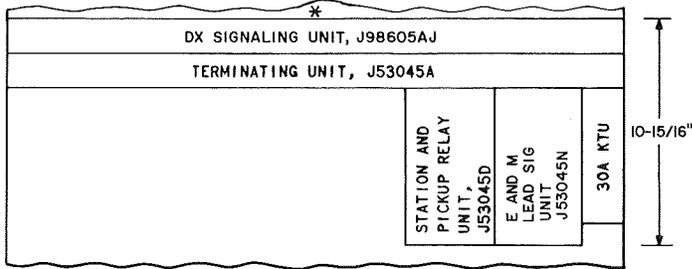
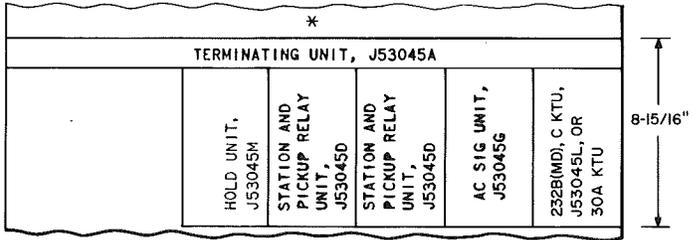


Fig. 4—Block Diagram of Optional Exclusion Control Arrangements Showing Leads and Options Involved

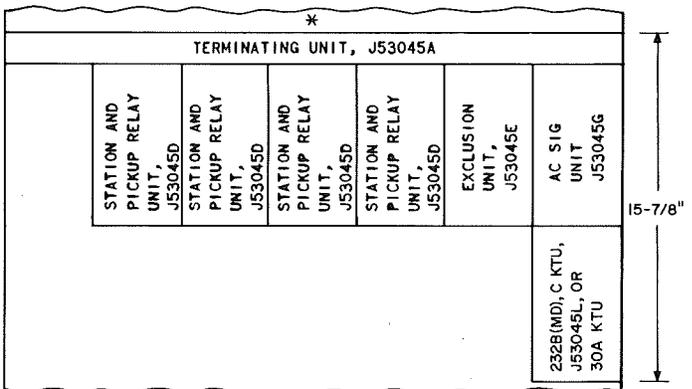
(A) FOR ONE STATION SET USING DX SIGNALING.



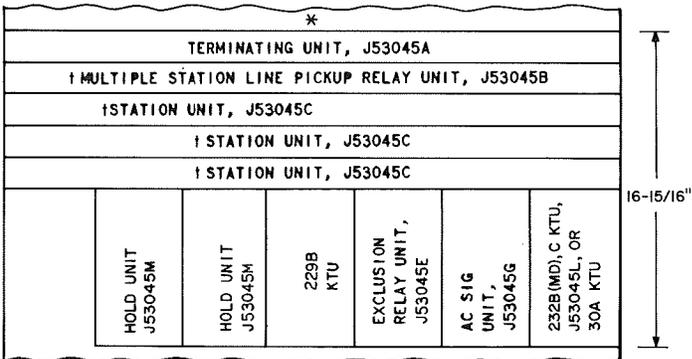
(B) FOR TWO STATION SETS USING SIMPLEX SIGNALING WITH HOLD.



(C) FOR FOUR STATION SETS USING SIMPLEX SIGNALING WITH EXCLUSION.

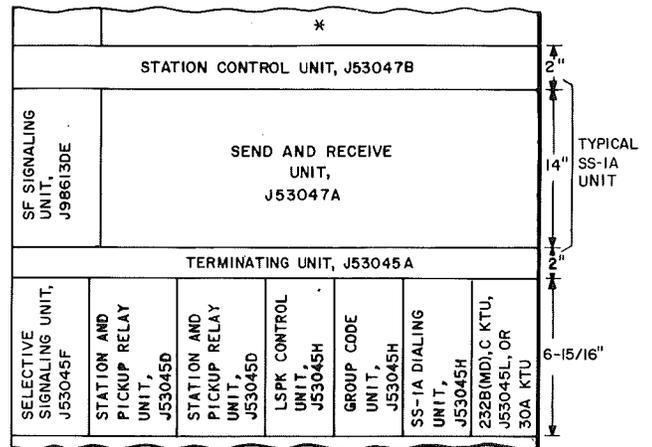


(D) FOR SIX STATION SETS USING SIMPLEX SIGNALING WITH EXCLUSION AND HOLD.

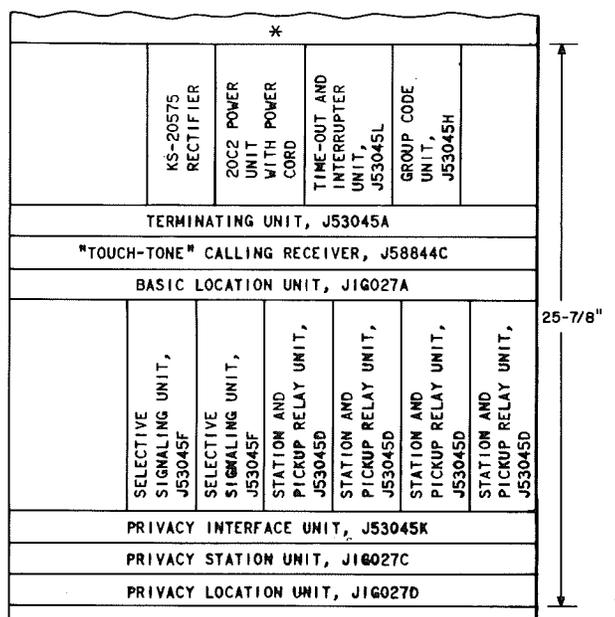


\* ALLOW SPACE AT TOP OF ARRANGEMENT FOR UPWARD GROWTH.  
 † SIX STA AND PU REL UNITS (J53045D) MAY BE USED INSTEAD OF ONE MULT STA LINE PU REL UNIT (J53045B), THREE STA UNITS (J53045C), AND ONE 229B KTU.

(E) FOR TWO STATION SETS USING SELECTIVE SIGNALING SS-1A WITHOUT PRIVACY.



(F) FOR FOUR STATION SETS USING SS3 SELECTIVE SIGNALING PACKAGED UNIT WITH PRIVACY.



(G) FOR TWO STATION SETS USING SIMPLEX SIGNALING. EACH PICKING UP THE SAME TWO 4-WIRE LINES.

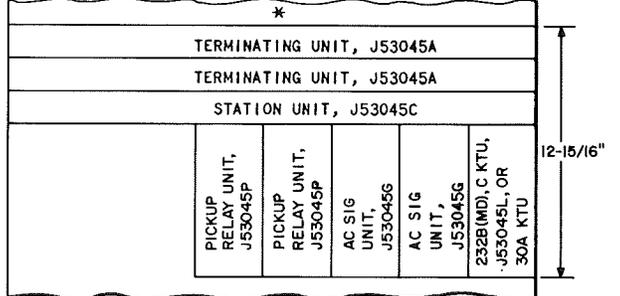


Fig. 5 Typical Equipment Arrangements on Mounting Frames

TABLE A

## 4-WIRE PRIVATE LINE EQUIPMENT POWER REQUIREMENTS

UNIT	DESIG	APP FIG. SD-69566	CURRENT AMPS			POTENTIAL
			-24V	+24V	-48V	
Terminating	TALK A	1(MD), 18	.080	—	.160	14-28 Vdc or 44-52 Vdc
Multiple Station Line PU	SIG B	2, 25	.088	—	.176	14-28 Vdc or 44-52 Vdc
229B KTU	SIG B	12	.088	—	.176	14-28 Vdc or 44-52 Vdc
Station Unit	TALK A	3	.060	—	.120	14-28 Vdc or 44-52 Vdc
	SIG B	3	.090	—	.180	14-28 Vdc or 44-52 Vdc
Exclusion	SIG B	4	.090	—	.180	14-28 Vdc or 44-52 Vdc
Dialing	SIG B	5	.045	—	.090	14-28 Vdc or 44-52 Vdc
AC Signaling	SIG B	6(MD), 21	.110	—	.220	14-28 Vdc or 44-52 Vdc
Selective Signaling	SIG B	7	.140	—	.280	14-28 Vdc or 44-52 Vdc
Group Code (SS-1A)	SIG B	8	.090	—	.180	14-28 Vdc or 44-52 Vdc
Group Code (SS-3)	SIG B (SS-3)	8	—	.090	—	14-28 Vdc
Loudspeaker Control	SIG B	9	.090	—	.180	14-28 Vdc or 44-52 Vdc
Privacy Interface Without Data Option (SS-3)	SIG B	13	.360	—	.720	14-28 Vdc or 44-52 Vdc
	SIG B (SS-3)	13	—	.180	—	14-28 Vdc
Controlled Interval Timeout (SS-1A, 20 Hz, or E&M)	SIG B	14, 16	.025	—	.050	14-28 Vdc or 44-52 Vdc
	TALK A	14, 16	.050	—	.100	14-28 Vdc or 44-52 Vdc
Controlled Interval Timeout (SS-3)	TALK A	14, 17	.050	—	.100	14-28 Vdc or 44-52 Vdc
	+24(SS-3)	14, 17	—	.180	—	14-28 Vdc
Hold	SIG B	19	.135	—	.270	14-28 Vdc or 44-52 Vdc
232C KTU	SIG B	20	.400	—	.800	14-28 Vdc or 44-52 Vdc
E and M Lead Signaling	SIG B	22	.180	—	.360	14-28 Vdc or 44-52 Vdc
241B KTU	SIG B	23	.150	—	.300	14-28 Vdc or 44-52 Vdc
Interrupter (KS-19175, L1)	SIG D	15	—	.310	—	8-11 Vac
Interrupter (KS-15900, L1)	SIG D	20	—	.300	—	8-11 Vac

→TABLE B←

## EQUIPMENT AND MOUNTING SPACE REQUIREMENTS

UNIT	DESCRIPTION	NUMBER OF UNITS REQUIRED	HEIGHT INCHES	WIDTH INCHES	MODULES (1) MOD = 7/16"
J53045A	One 4-Wire Terminating Circuit	One per 4-Wire Customer Location	2	23	—
J53045B	Five Pickup Relay Circuits	One Pickup Relay per Station per 4-Wire Line	2	23	—
J53045C	Two Station Circuits	One per Two Station Sets	2	23	—
J53045D	One Pickup Relay and Station Circuit	One per Station Set	6-15/16	3-15/32	6
J53045E	One Exclusion Circuit	One per 15 Excluded Stations per 4-Wire Line	6-15/16	3-1/32	7
J53045F	One Selective Signaling Receive Circuit (three codes)	One per Every Three Codes at Customer Location	6-15/16	3-1/32	7
J53045G	One ac Signaling Circuit	One per 4-Wire Line	6-15/16	3-5/8	8
J53045H	Two Dialing Circuits	One per Two Stations per 4-Wire Line or One per Two 4-Wire Lines When Equipped With SS-1A Selective Signaling	6-15/16	3-1/32	7
	One Group Code Circuit	One per Group of Ten Codes or One per Two Groups of Five Codes			
	Two Loudspeaker Control Circuits	One per Two Station Groups Each Served by One Loudspeaker			
J53045J	One Auxiliary Unit for 4-Wire Private Line Service (Powered from CO)	One per 4-Wire Line	2	23	—
J53045K	Privacy Interface Circuit	One per Four Stations when equipped with SS-3 Selective Signaling	2	23	—
J53045L	Timeout Interrupter Circuit	One per Group of Stations With Same Timeout	6-15/16	3-29/32	9
J53045M	Three Hold Circuits	One Hold Circuit per Station per 4-Wire Line	6-15/16	3-1/32	7
J53045N	One E and M Lead Signaling Circuit	One Circuit per 4-Wire Line	6-15/16	3-5/8	8

→TABLE B← (Cont)

EQUIPMENT AND MOUNTING SPACE REQUIREMENTS

UNIT	DESCRIPTION	NUMBER OF UNITS REQUIRED	HEIGHT INCHES	WIDTH INCHES	MODULES (1) MOD = 7/16"
J53045P	Two Pickup Relay Circuits	One per Station per Two 4-Wire Lines	6-15/16	3-1/32	7
30A KTU	One Timeout Circuit	One per Group of Stations With Same Timeout	5-7/32	1-23/32	4*
229B KTU	One Pickup Relay Circuit	One per Station per 4-Wire Line	6-15/16	3-1/32	7
232B (MD) or 232C KTU	One Visual and Audible Signaling Circuit	One per Customer Location	6-15/16	3-15/32	8
241B KTU	One Data Transfer Circuit	One per 4-Wire Line	6-15/16	3-1/32	7
245A KTU			6-15/16	2-5/32	5
J98605AJ	Ten DX Signaling Circuits	One per 4-Wire Line	2	23	—

\*Mounted on 813722048 (P37B204) bracket.

TABLE C

RELAY STAMPING  
(SEE NOTE)

UNIT DESIGNATION	RELAY DESIGNATION
SS-1 DIAL	P
GRP CODE	GC
LS CONT	LS

*Note:* Use table when J53045H unit is provided to stamp relay designation in accordance with unit use.

TABLE D

**LETTER DESIGNATED PLUG TERMINALS FOR USE WITH  
KEY TELEPHONE SET CONNECTION DIAGRAMS**

LETTERED TERMINAL	LEAD DESIGNATION	MOUNTING CORD PLUG TERMINALS				
		1ST PICKUP KEY	2ND PICKUP KEY	3RD PICKUP KEY	4TH PICKUP KEY	5TH PICKUP KEY
A	A	27 (W-O)	30 (W-S)	33 (R-G)	36 (BK-BL)	39 (BK-BR)
B	R	1 (BL-W)	4 (BR-W)	7 (O-R)	10 (S-R)	13 (G-BK)
C	T	26 (W-BL)	29 (W-BR)	32 (R-O)	35 (R-S)	38 (BK-G)
D	L	3 (G-W)	6 (BL-R)	9 (BR-R)	12 (O-BK)	15 (S-BK)
E	LG	28 (W-G)	31 (R-BL)	34 (R-BR)	37 (BK-O)	40 (BK-S)

SECTION 480-615-100

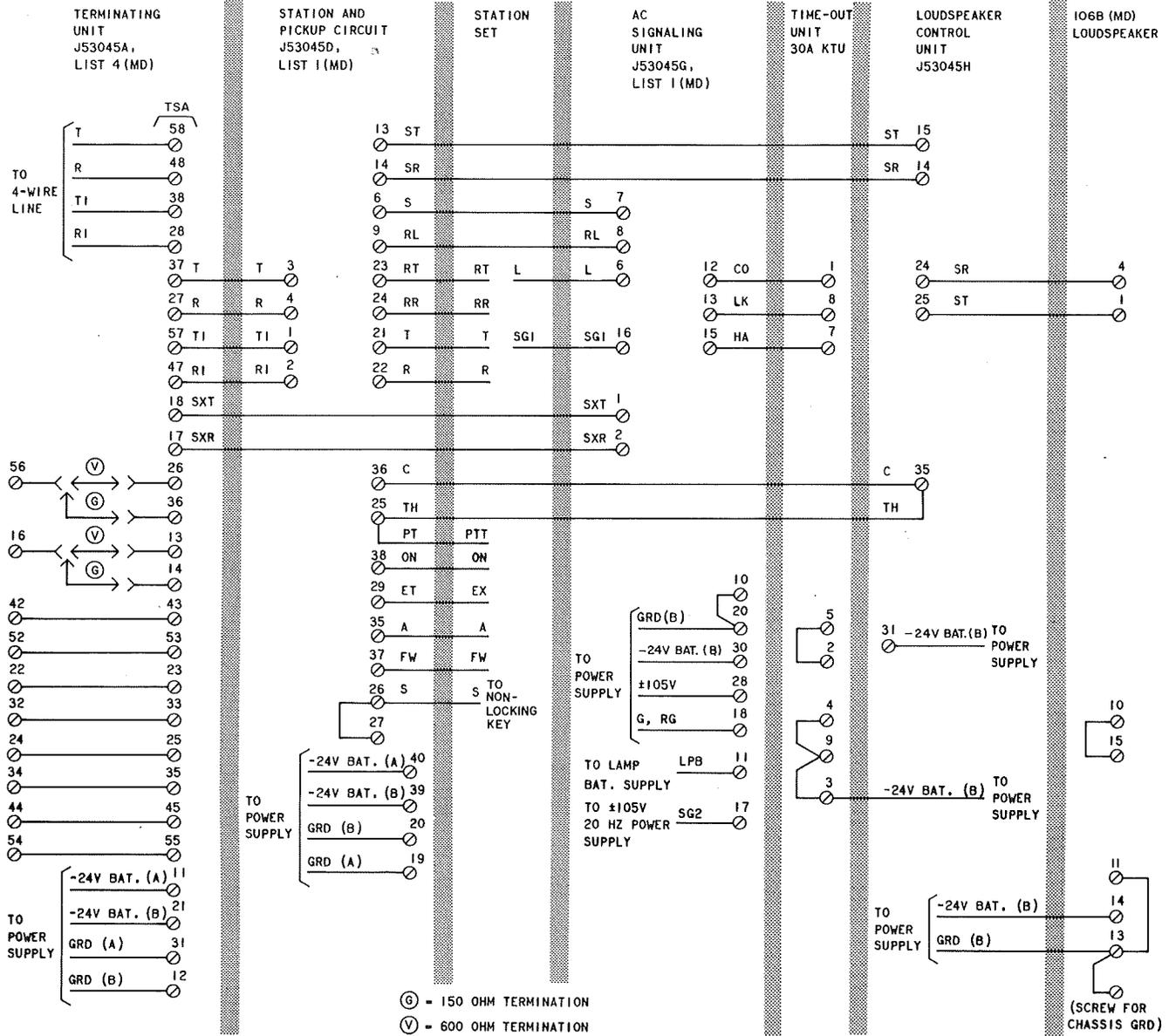


Fig. 6—Typical Connections for One Station Set Using Voice Signaling or Simplex Signaling With Timeout Using MD List Units

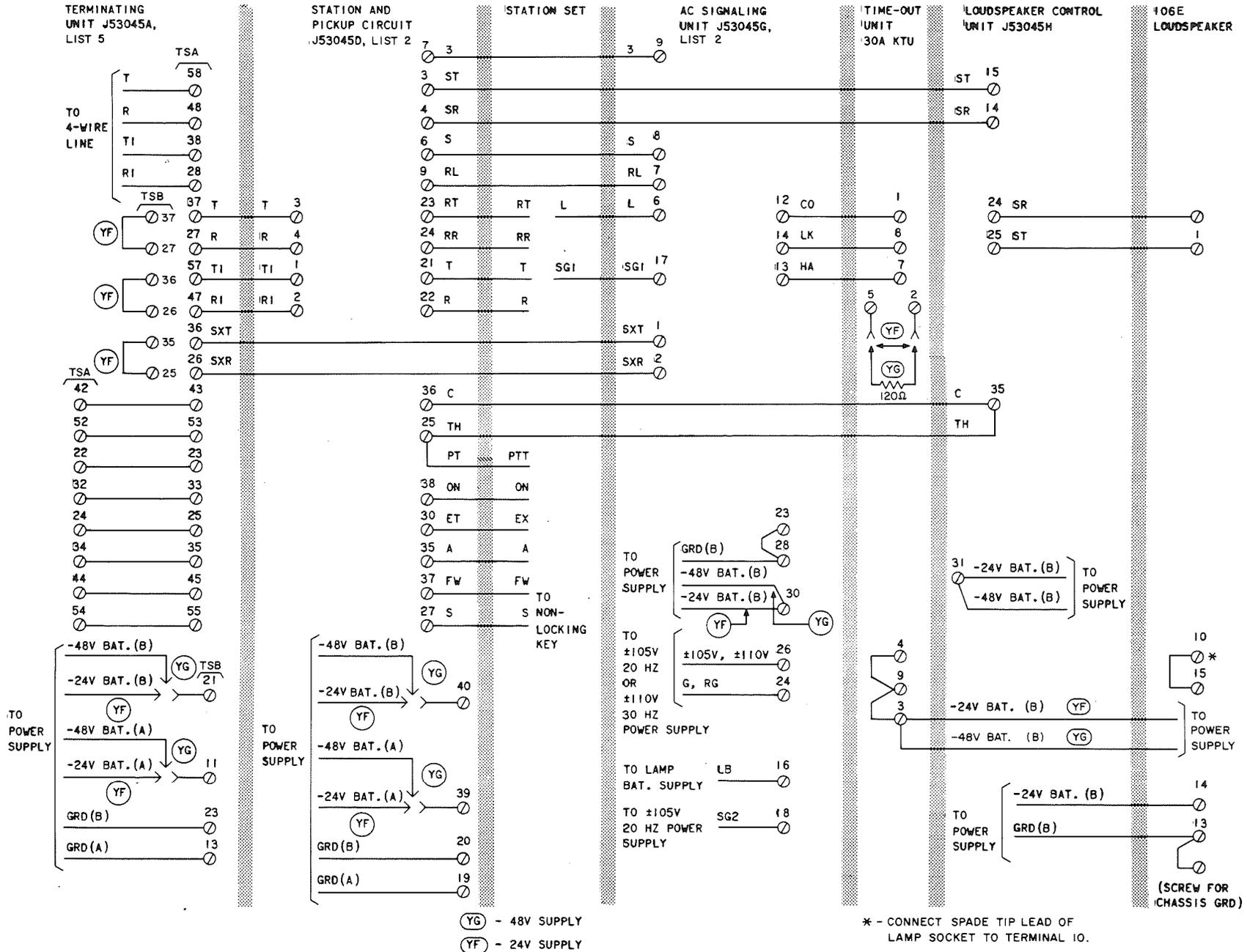


Fig. 7—Typical Connections for One Station Set Using Voice Signaling or Manual Simplex Signaling With Timeout Using Current List Units

4-WIRE PRIVATE LINE TERMINATING UNIT SD-69566-01

500AD TELEPHONE SET

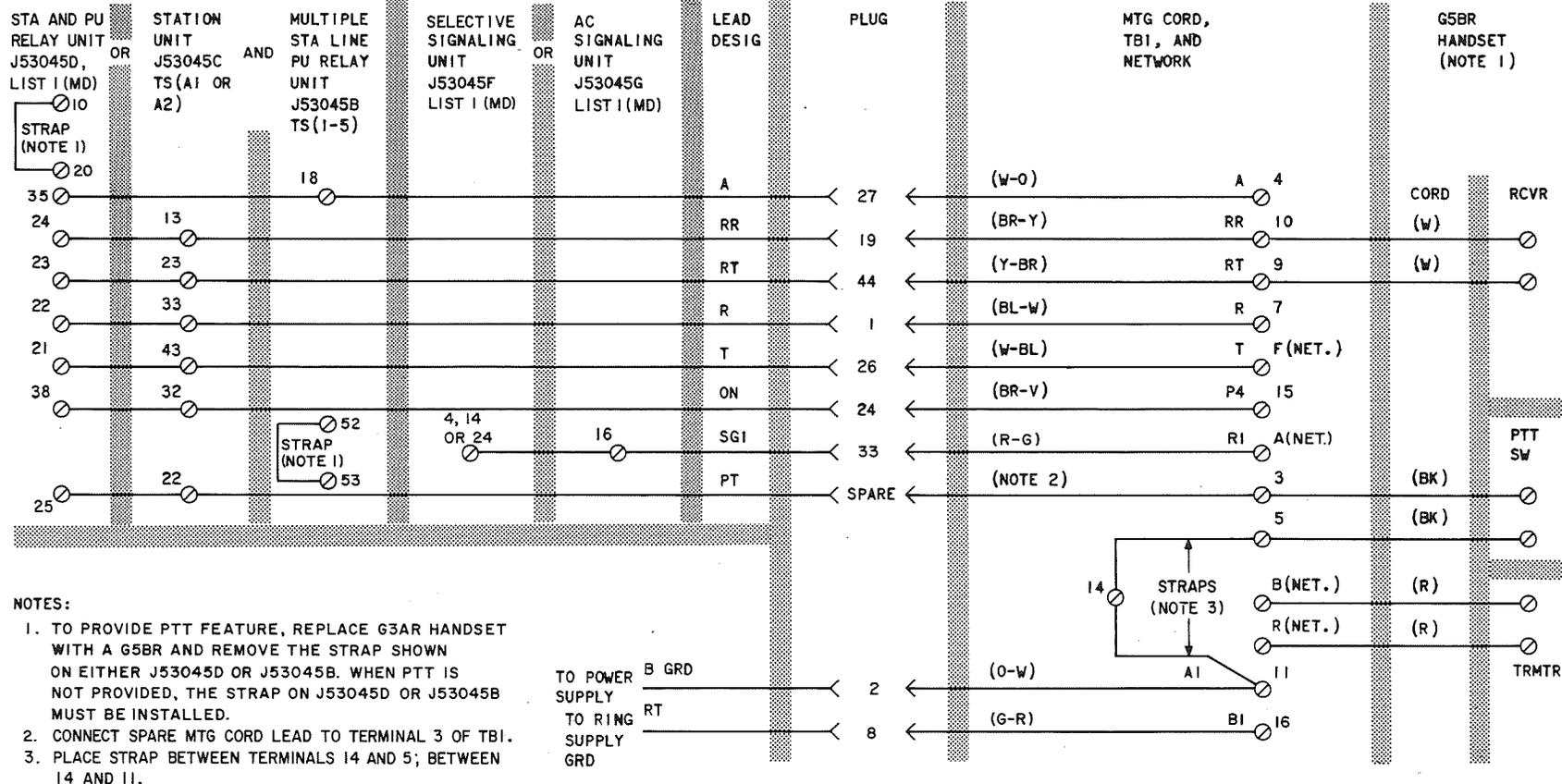


Fig. 8—500AD Telephone Set Connections Arranged for Use With SD-69566-01 Using MD List Units

4-WIRE PRIVATE LINE TERMINATING UNIT SD-69566-01

500AD TELEPHONE SET

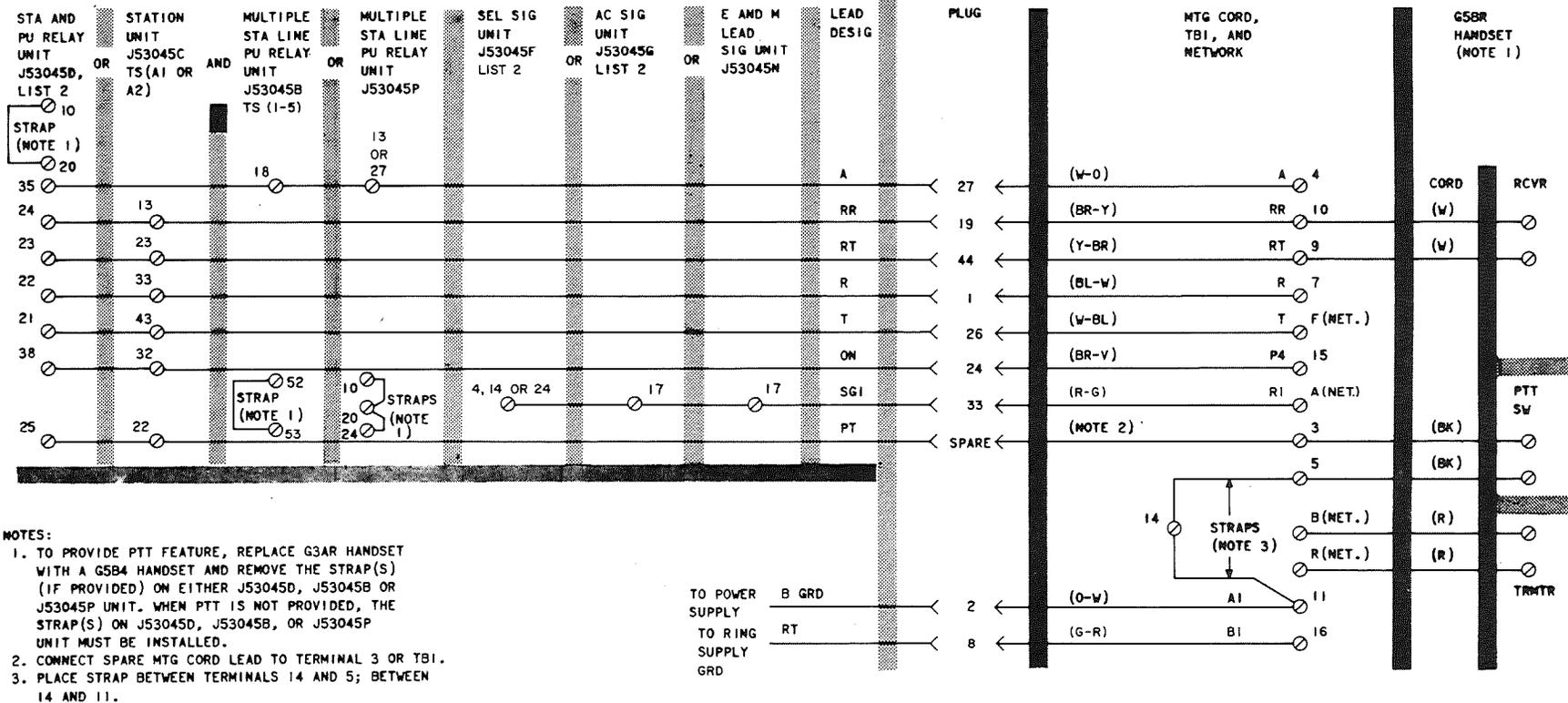


Fig. 9—500AD Telephone Set Connections Arranged for Use With SD-69566-01 Using Current List Units

4-WIRE PRIVATE LINE TERMINATING UNIT SD-69566-01

568HAA TELEPHONE SET

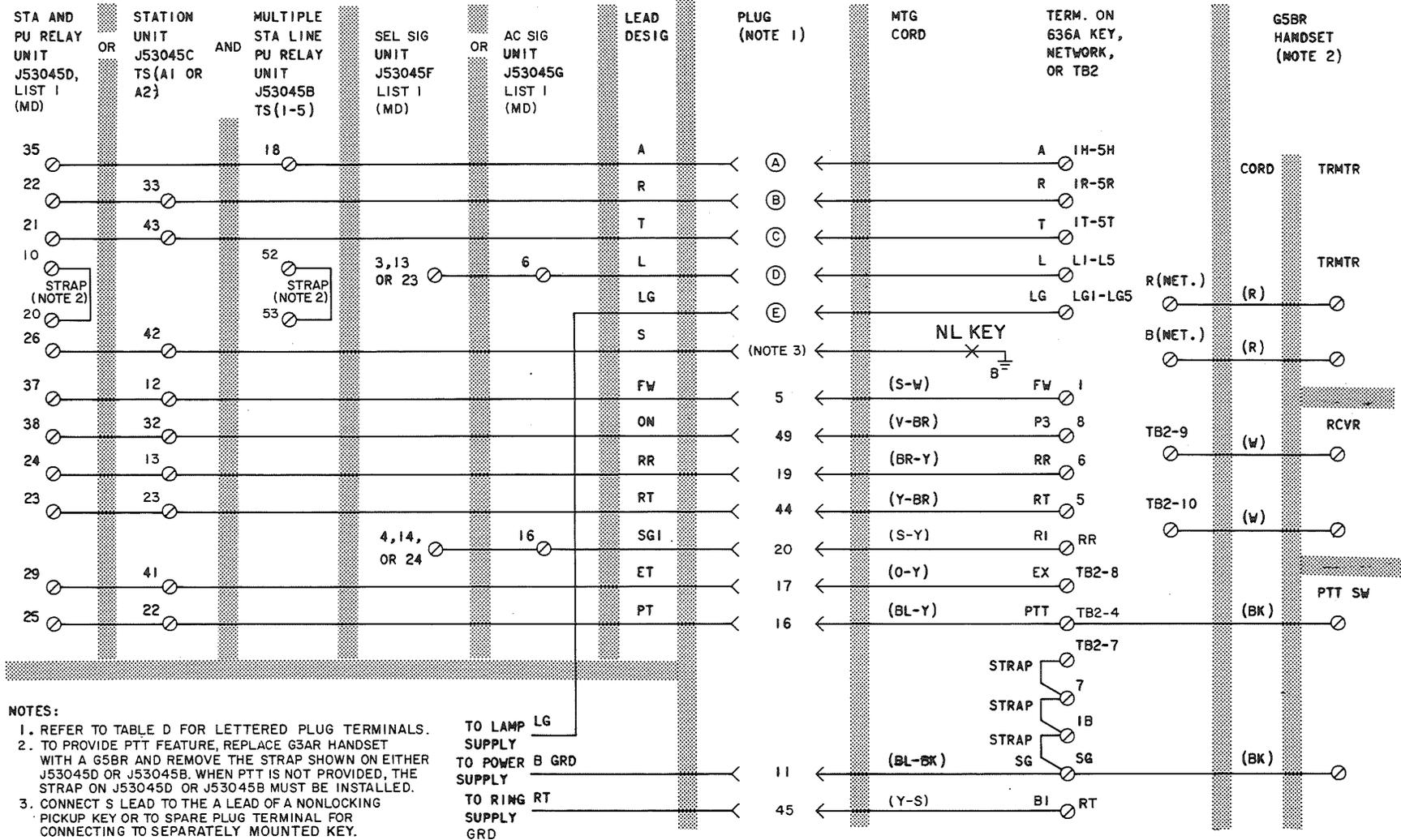


Fig. 10—568HAA Telephone Set Connections Arranged for Use With SD-69566-01 Using MD List Units



SECTION 480-615-100

4-WIRE PRIVATE LINE  
TERMINATING UNIT  
SD-69566-01

608-(MD) AND 618-(MD) TYPE  
TELEPHONE SET

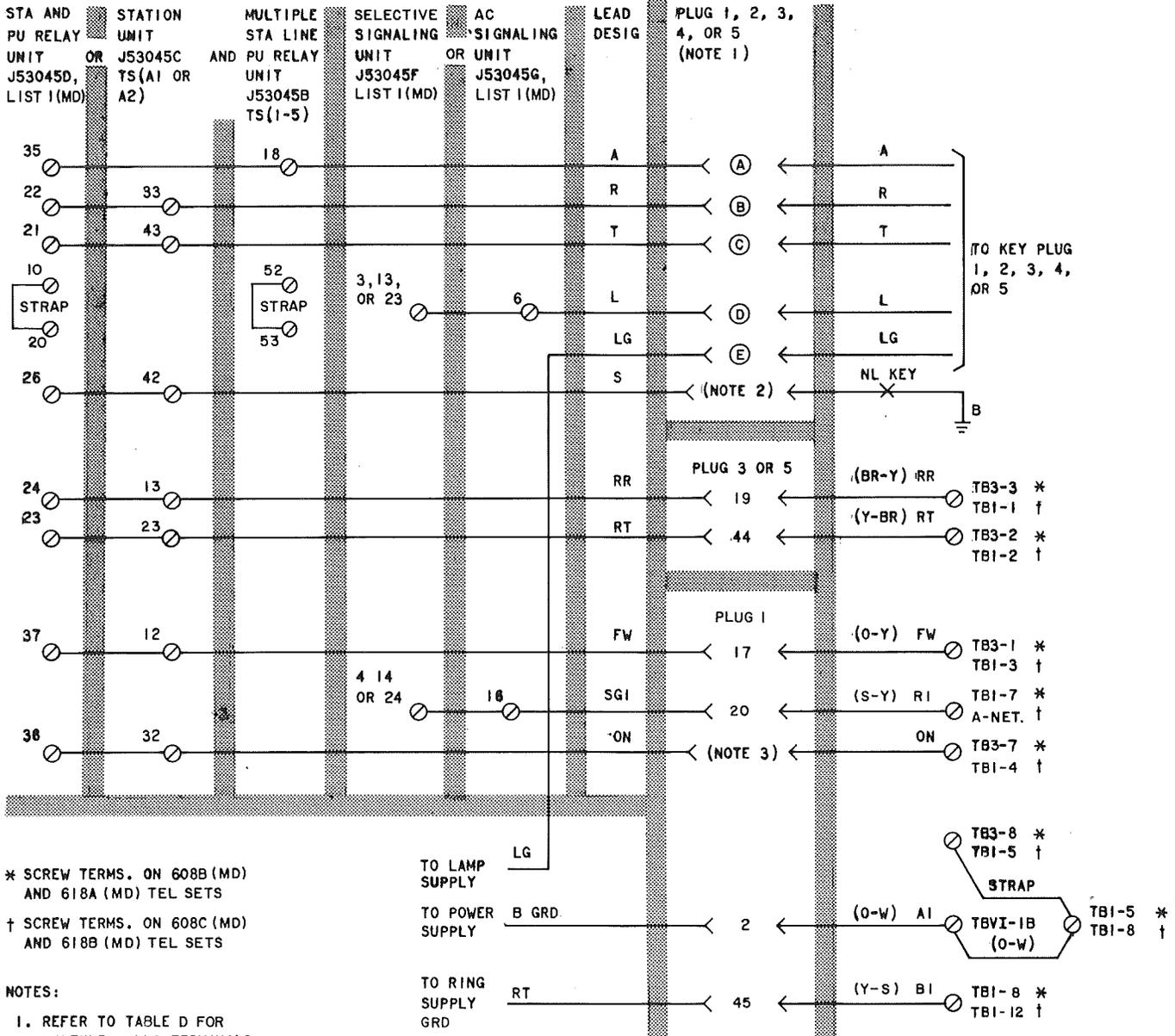


Fig. 12—608-Type (MD) and 618-Type (MD) Telephone Set Connections Arranged for Use With SD-69566-01 Using MD List Units



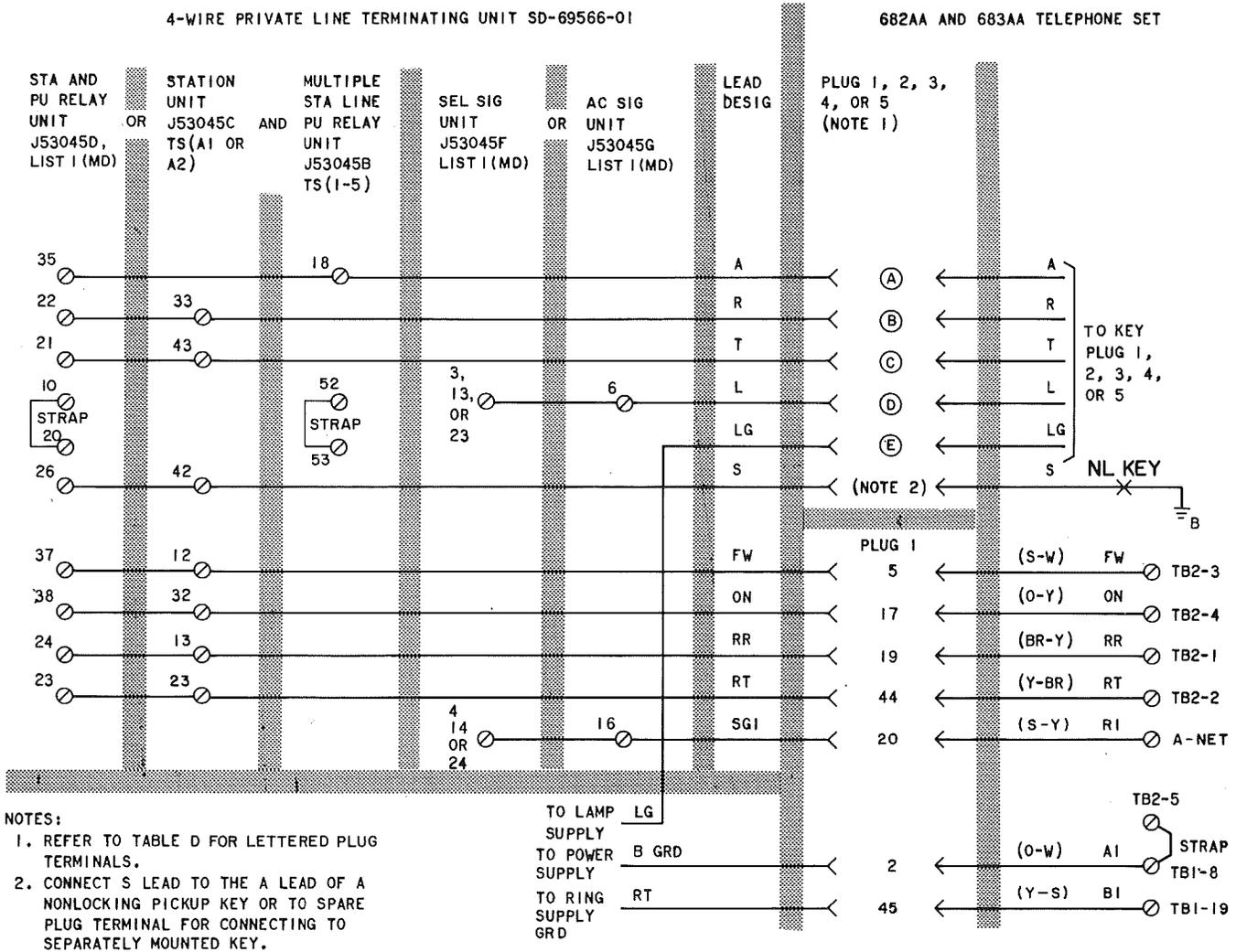


Fig. 14—682AA and 683AA Telephone Set Connections Arranged for Use With SD-69566-01 Using MD List Units

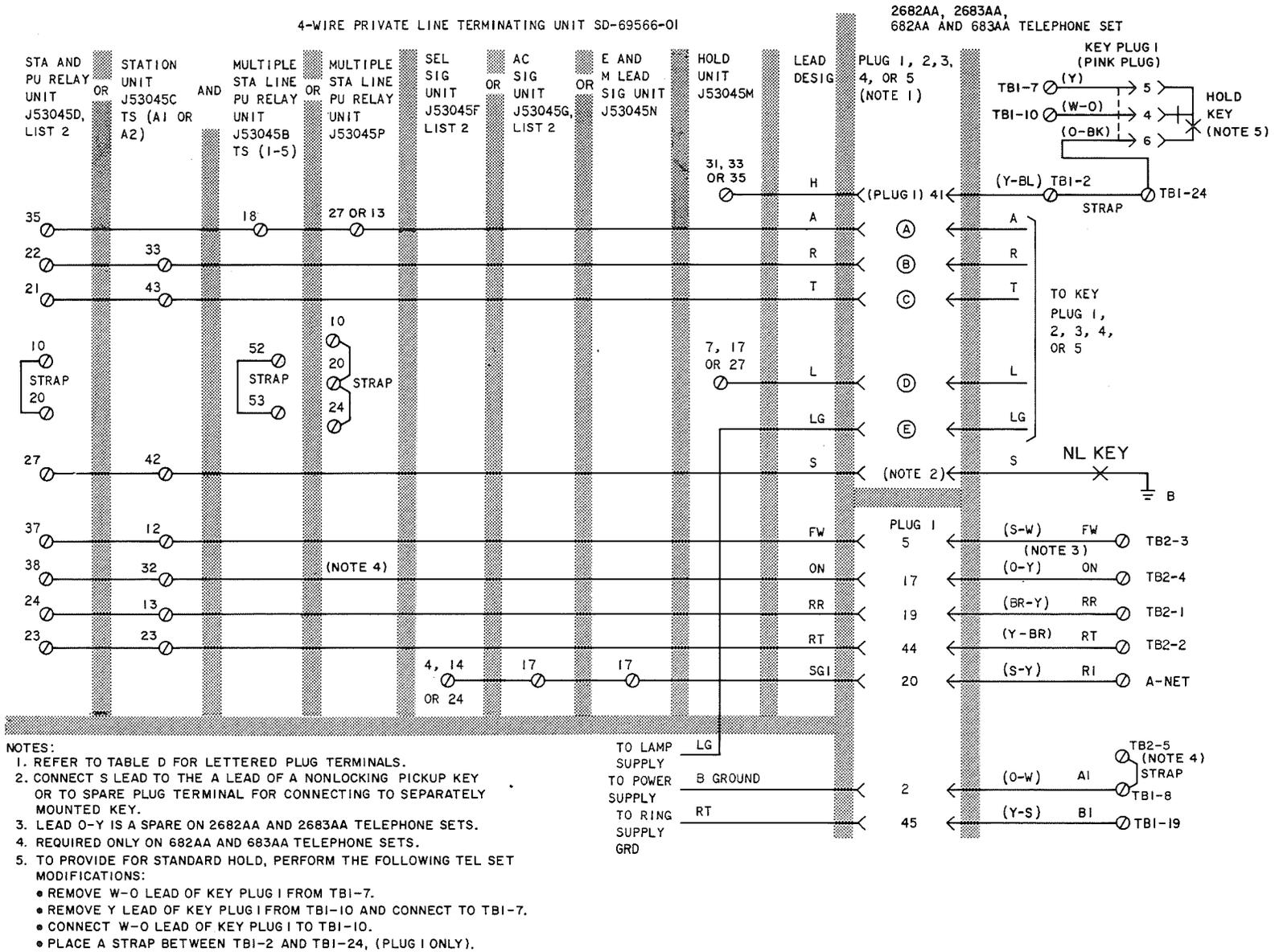


Fig. 15—682AA, 2682AA, 683AA, and 2683AA Telephone Set Connections Arranged for Use With SD-69566-01 Using Current List Units

4-WIRE PRIVATE LINE TERMINATING UNIT SD-69566-01

2568HAA TELEPHONE SET

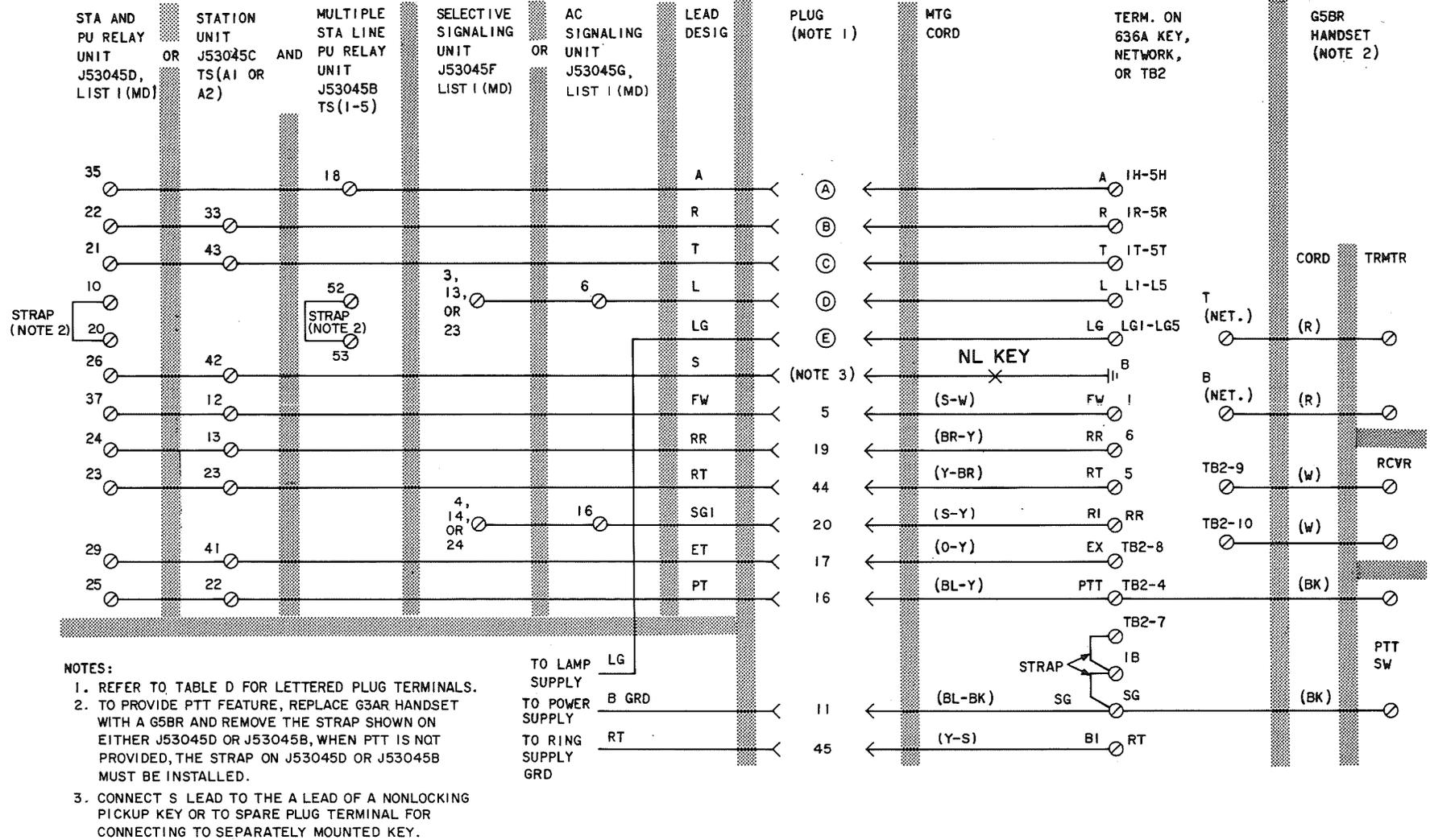


Fig. 16—2568HAA Telephone Set Connections Arranged for Use With SD-69566-01 Using MD List Units

4-WIRE PRIVATE LINE TERMINATING UNIT SD-69566-01

2568HAA TELEPHONE SET

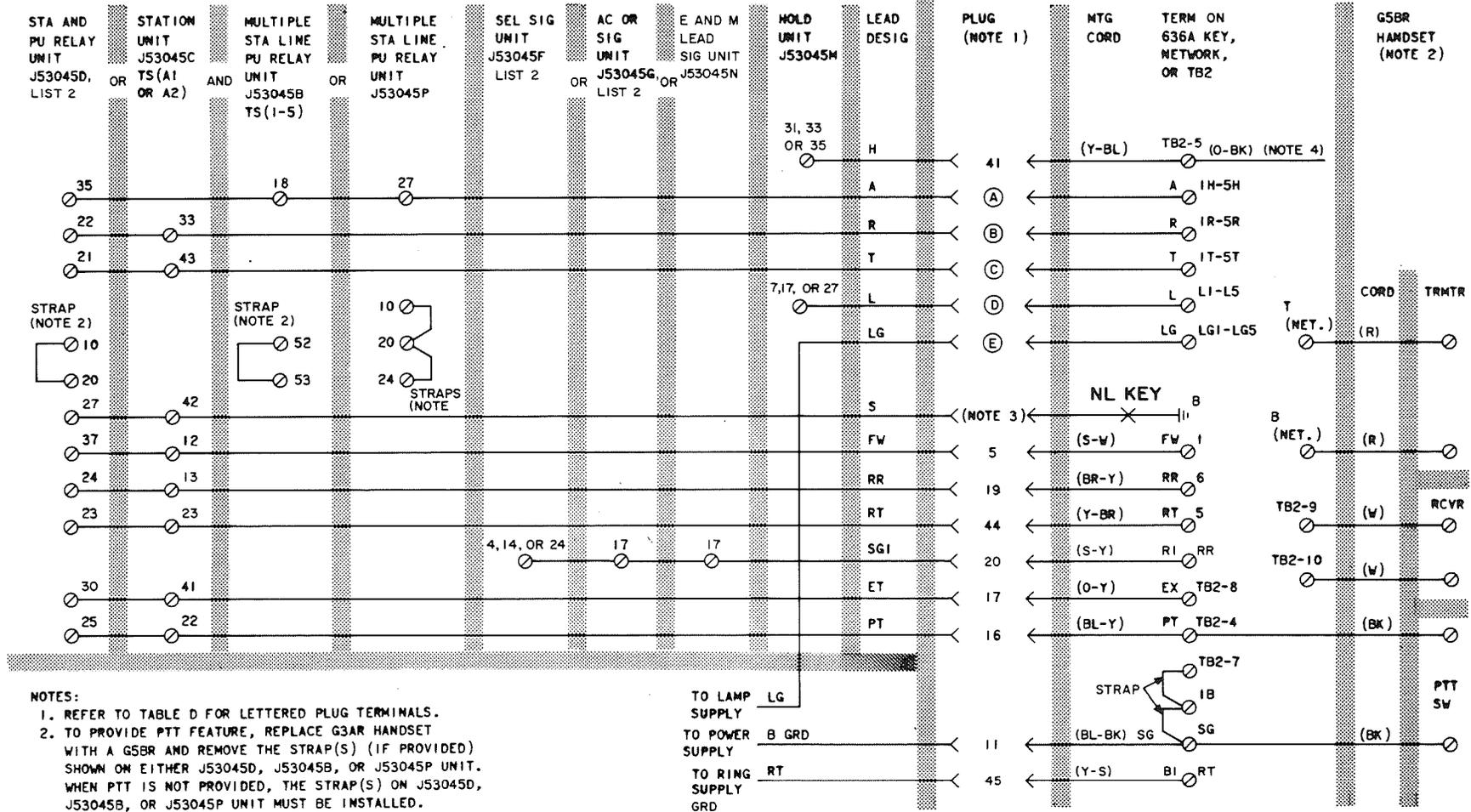
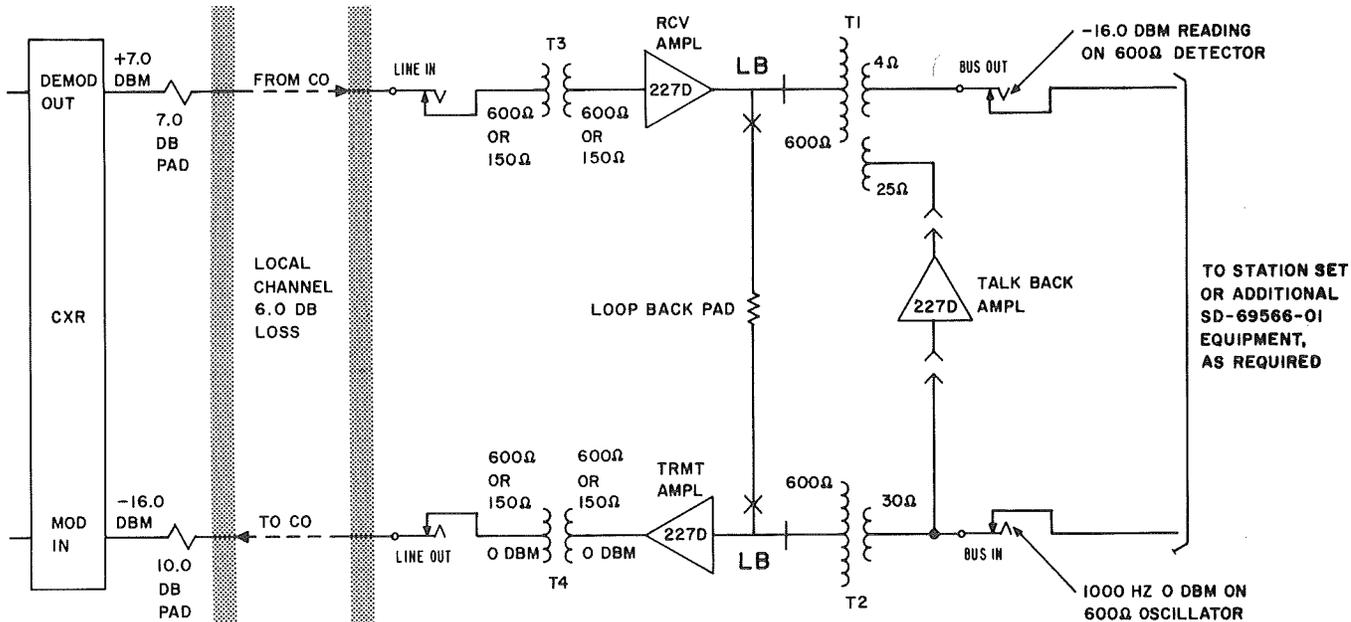
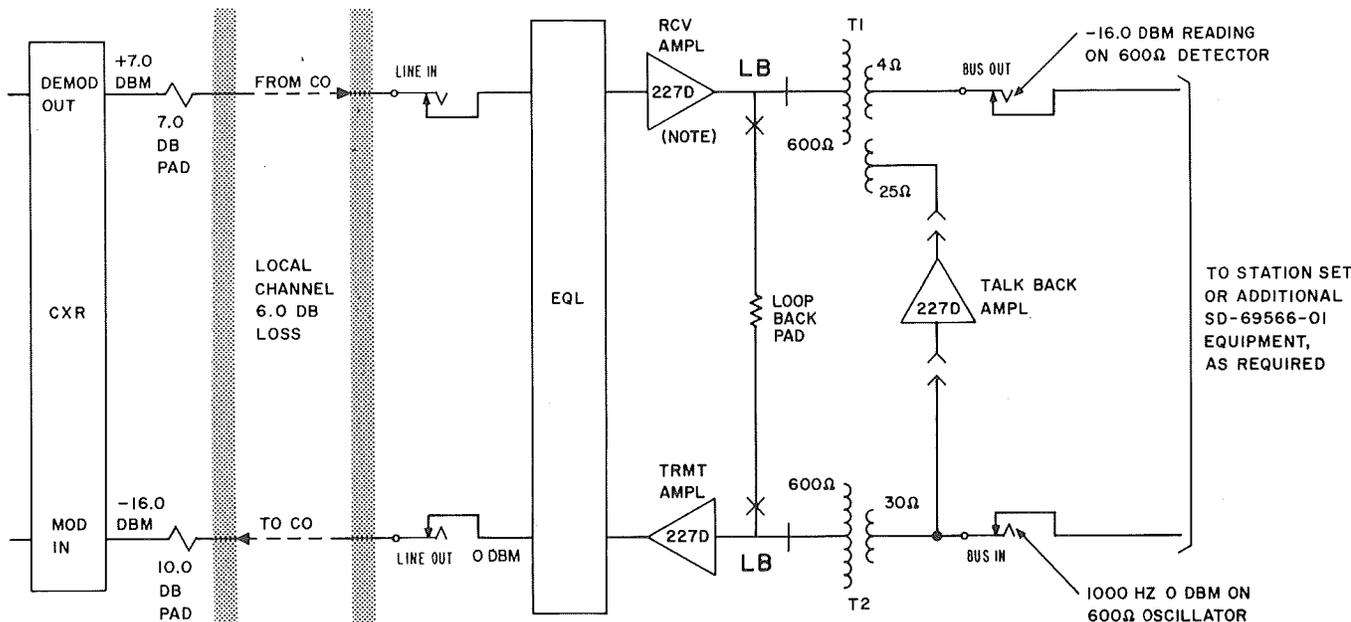


Fig. 17—2568HAA Telephone Set Connections Arranged for Use with SD-69566-01 Using Current List Units



NOTE:  
 IN SERVICE, THE INPUT POWER TO THE RCV AMPLIFIER IS NOT FIXED.  
 THE GAIN OF THE RCV AMPLIFIER IS ADJUSTED TO GIVE -16 DBM AT THE  
 "BUS OUT" REGARDLESS OF THE INPUT POWER.

Fig. 18—Typical Transmission Diagram Without Equalizer (MD)



NOTE:  
 IN SERVICE, THE INPUT POWER TO THE RCV AMPLIFIER IS NOT FIXED.  
 THE GAIN OF THE RCV AMPLIFIER IS ADJUSTED TO GIVE -16 DBM AT THE  
 "BUS OUT" REGARDLESS OF THE INPUT POWER.

Fig. 19—Typical Transmission Diagram With Equalizer

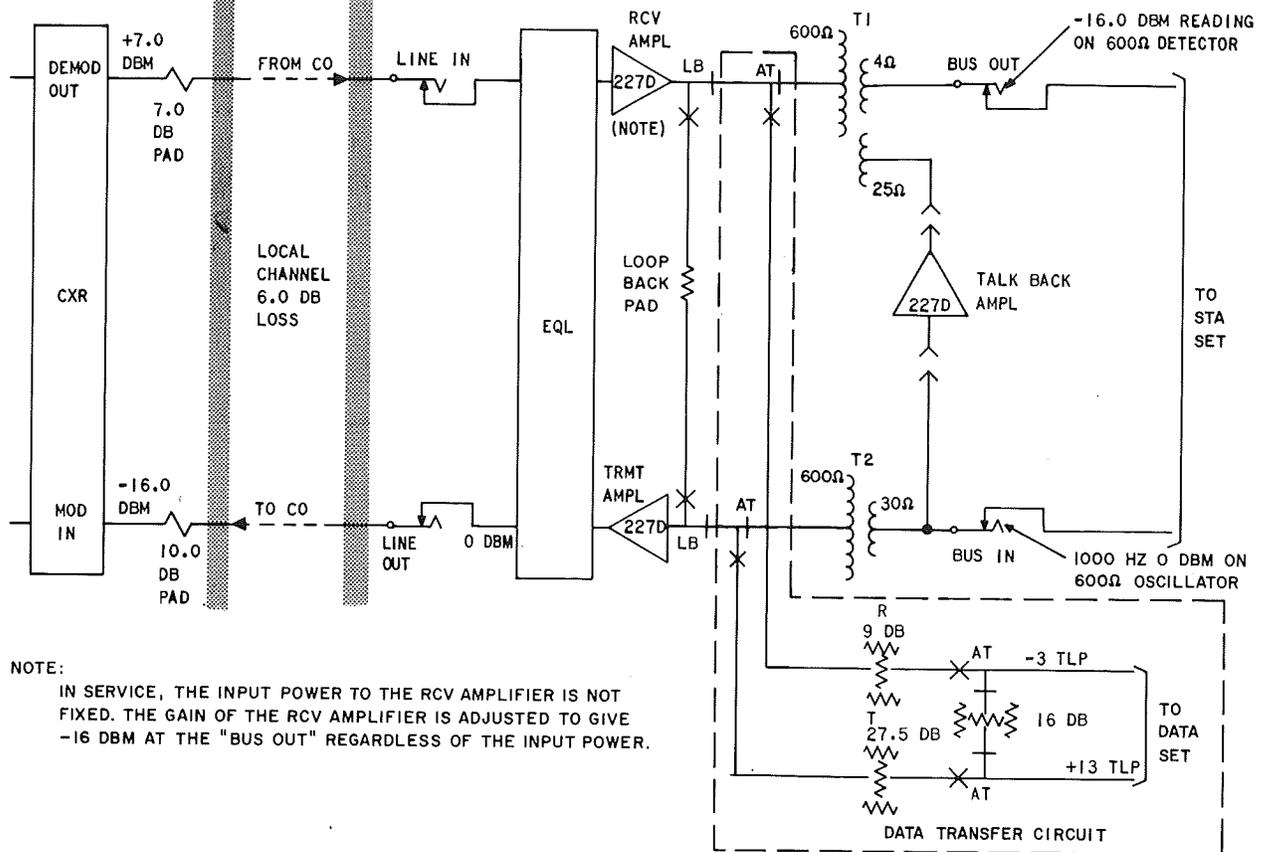


Fig. 20—Typical Voice and Data Transmission Diagram