

VOICE CONNECTING ARRANGEMENT LOH
110A INTERCONNECTING UNIT
69H APPARATUS MOUNTING
606A PANEL

1. GENERAL

1.01 This section provides identification, installation, operation, maintenance and connection information for the 110A interconnecting unit (IU) and the 69H apparatus mounting or 606A panel when used in Voice Connecting Arrangement (VCA) LOH.

1.02 This section is reissued to:

- Revise illustrations
- Include information for multiplying HOLD jacks with busy indication
- Show 606A panel mounted in a 16C apparatus mounting.

1.03 The size of the job on initial installation and the expected growth should be the determining factor in selecting the proper equipment. It is recommended that the 69H apparatus mounting should be used for one or two circuits and the 606A panel should be used for three to six circuits.

1.04 If the customer wants a copy of the Technical Reference which covers this interface specification, the customer should contact the local Telephone Company Business Office or the Marketing Representative.

1.05 This issue of the section is based on the following drawing:

- SD-69627-01, Issue 1—110A Interconnecting Unit

If this section is to be used with equipment or apparatus reflecting later issue(s) of the drawing(s), reference should be made to the SDs and CDs to determine the extent of the changes and the manner in which the section may be affected.

2. IDENTIFICATION

PURPOSE

- To adapt a customer-provided (CP) source of recorded music or information to a line (station or trunk) placed on hold at a Bell System cord-type switchboard
- To limit excessive signal levels from CP equipment and to provide protection for personnel against hazardous voltages.

APPLICATION

- 551, 552, 555, 556, 557, 605A, 606, 607, and 608 PBXs.

ORDERING GUIDE

- Unit, Interconnecting, 110A (Fig. 1 as required).

Associated Apparatus (Order Separately)

For 69H Apparatus Mounting (Fig. 1)

Note: If a 23-inch relay rack is not provided on customer premises, provide a 16C apparatus mounting or equivalent.

- Mounting, Apparatus, 69H (one per two 110A IUs).
- Bracket, 99B.
- Supply, Power, 19C2 or equivalent (locally engineered and installed), when existing PBX power supply is insufficient.
- Block, Connecting, 66M1-50 (Fig. 2).

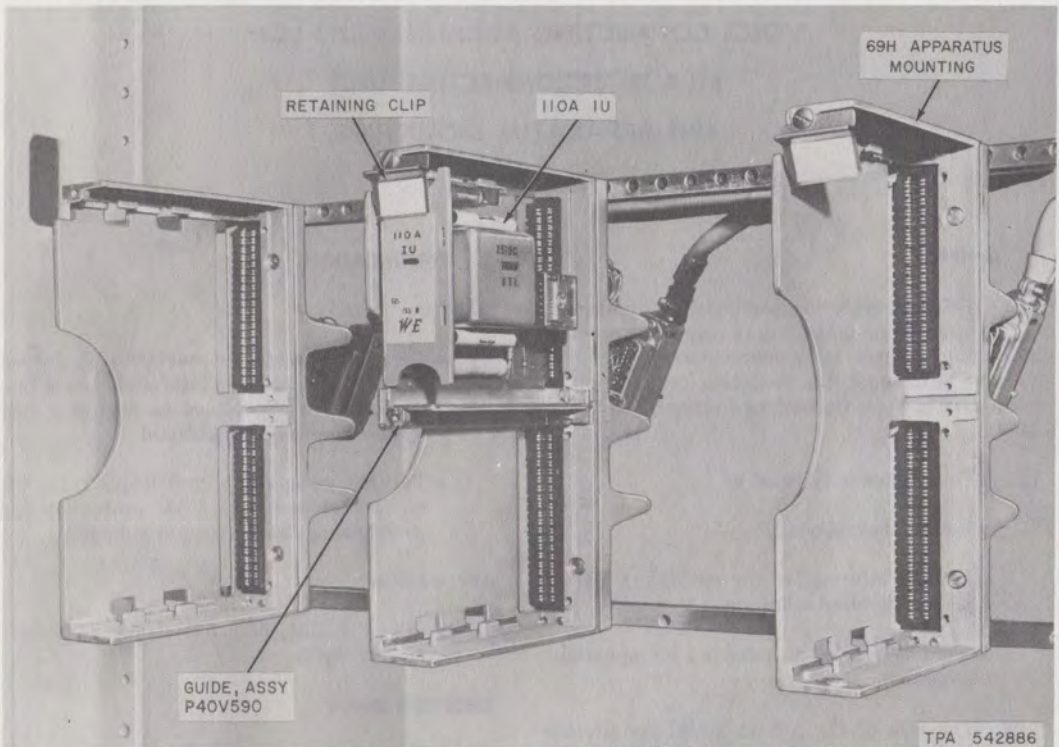


Fig. 1—69H Apparatus Mounting Mounted on Relay Rack

- Block, Connecting, 66B4-25 (common buss, one per two 69H apparatus mountings).
- Cable, Connector, A25B (one single-ended length per 69H apparatus mounting).
- Jack (See Table A for part number, as required.)
- Mounting, Jack (See Table A for part number, one per 10 jacks provided.)
- Mounting, Lamp (See Table A for part number, one per 10 lamps provided.)
- Resistor, 8-ohm, 1-watt (one per CP recorder music or information source). Resistor should have pigtailed no larger than 19 gauge to connect in quick-connect clip-type terminals.

If wire size is larger than 19 gauge, pigtailed should be soldered on the terminals.

- Clip, Bridging, B (25 per package).
- Wire, "D," inside or equivalent (for cabling from 66B4-25 connecting block to 66M1-50 interface connecting block).

Note: Other type blocks may be used when specified by local engineering.

For 606A Panel (Fig. 3 and 4)

Note: If a 23-inch relay rack is not provided on customer premises, provide a 16C apparatus mounting or equivalent.

- Panel, 606A (one per six 110A IUs).

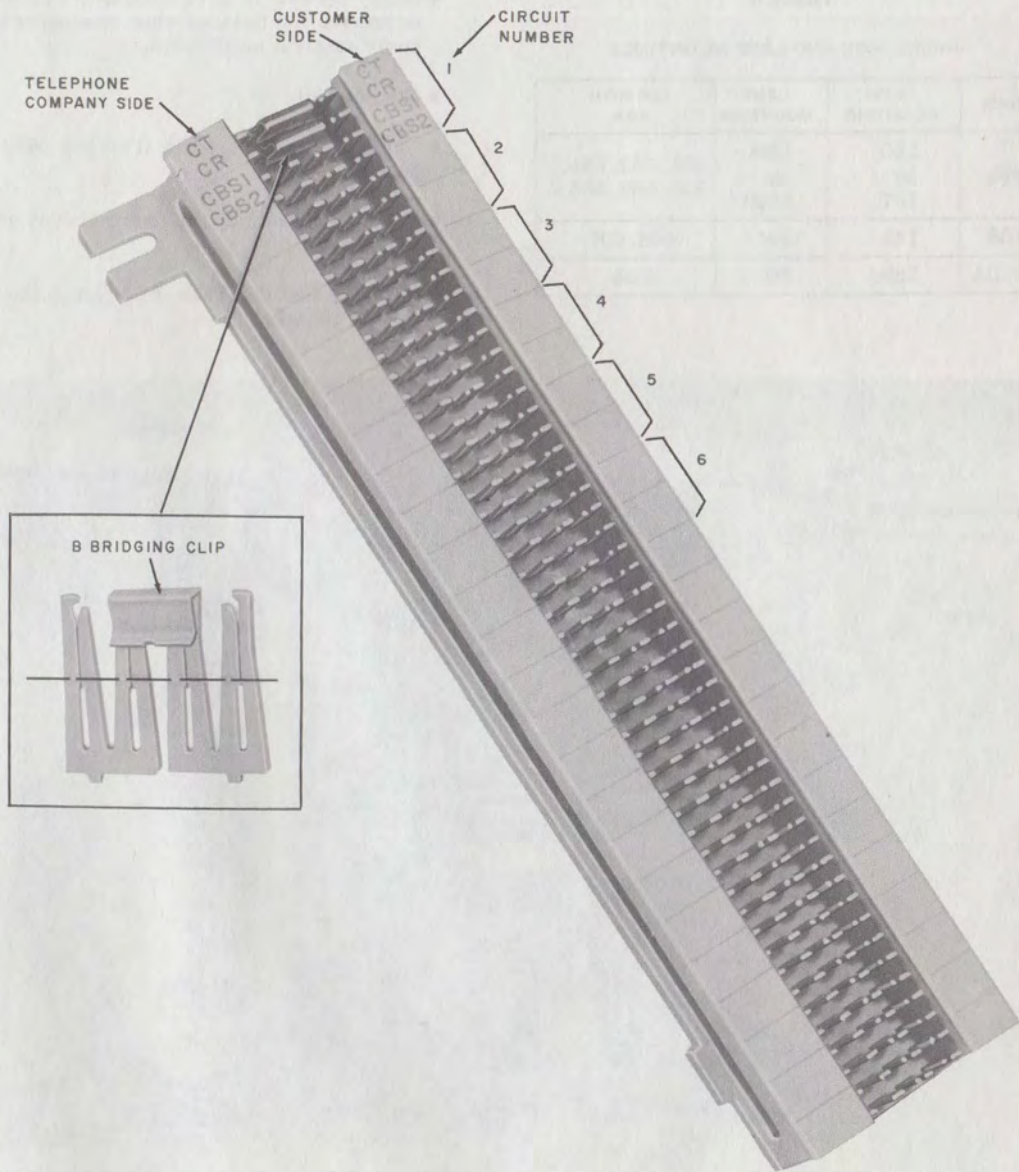


Fig. 2—66M1-50 Interface Connecting Block

TABLE A

JACKS, JACK AND LAMP MOUNTINGS

JACK	JACK MOUNTING	LAMP MOUNTING	USE WITH PBX
295	136 or 137	136C or 282B	551, 552, 555, 556, 557, 605A
408	145	294A	606, 607
510A	259A	282D	608

- Supply, Power, 19C2 or equivalent (locally engineered and installed when existing PBX power supply is insufficient).
- Bracket, 99B.
- Cable, Connector, A25B (two per 606A panel).
- Jack, (See Table A for part number, as required.)
- Mounting, Jack (See Table A for part number, one per 10 jacks.)

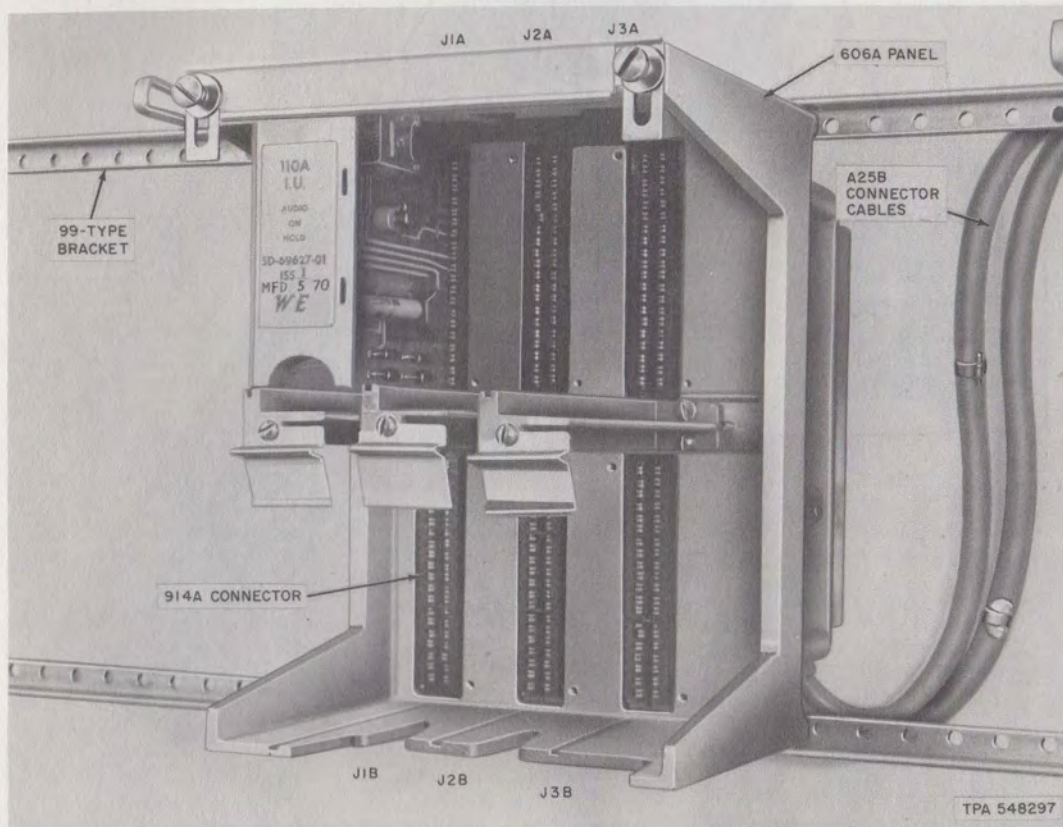


Fig. 3—606A Panel Mounted on Relay Rack

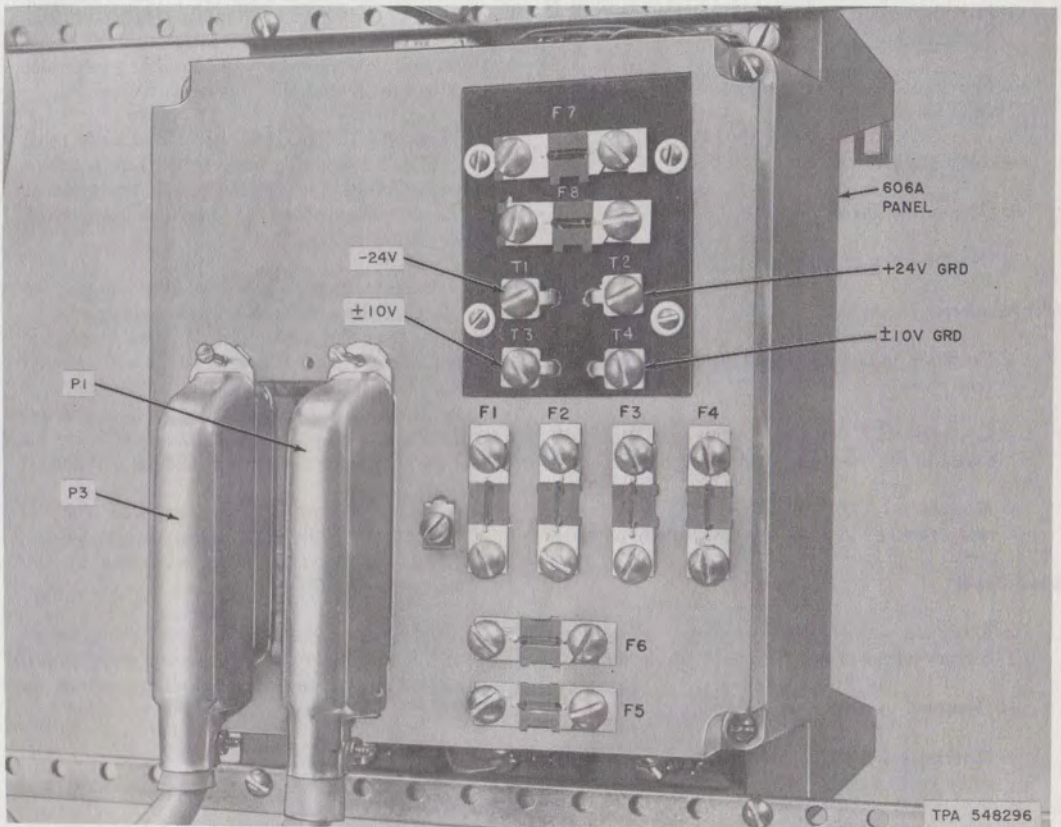


Fig. 4—606A Panel (Rear View)

- Mounting, Lamp (See Table A for part number, one per 10 lamps.)
- Fuse, 24E, 1/2 ampere (eight per 606A panel).
- Block, Connecting, 66M1-50 (Fig. 2).
- Block, Connecting, 66B4-25 (one per 606A panel).
- Resistor, 8-ohm, 1 watt (one per CP music or information source). Resistor should have pigtailed no larger than 19 gauge to connect in quick-connect terminals. If wire size is larger than 19 gauge, pigtailed should be soldered on terminals.

- Clip, Bridging, B (25 per package).

- Wire, "D", inside or equivalent (for cabling from 66B4-25 connecting block to 66M1-50 interface connecting block).

Note: Other type blocks may be used when specified by local engineering.

DESIGN FEATURES

110A Interconnecting Unit

- Components mounted on 4-inch printed wiring board.

- Provides a dry contact closure to signal CP equipment.
- Provides voice frequency coupling to CP equipment.
- Requires 0.030 ampere at 26V dc.
- Option terminals.
- Designed for H lead ground control.

69H Apparatus Mounting

- Provides mounting facilities for two 110A IUs
- Equipped with two 40-pin connectors factory-wired to one 50-pin KS-type plug
- Mounts on a 99B bracket, on a standard relay rack, or in a 16C apparatus mounting.

606A Panel

- Equipped with six 914-type 40-pin connectors factory-wired to two KS-16671 50-pin plugs
- Designed to mount six 110A IUs
- Mounts on a 99B bracket, on a standard relay rack, or in a 16C apparatus mounting
- Fuse panel included
- Approximate size: 6 by 8 by 9 inches.

3. INSTALLATION

69H Apparatus Mounting

- 3.01** Install the 69H apparatus mounting on a standard 23-inch relay rack or in a 16C apparatus mounting using a 99B mounting bracket. The center mounting bar must be removed from the 16C apparatus mounting. Connect a separate ground to rack or mounting.
- 3.02** Electrical connection is made to the 69H apparatus mounting through a single-ended 25-pair connector cable equipped with a 50-pin connector (A25B connector cable). Terminate the raw end of the cable to a 66B4-25 connecting block. Follow the wiring plan shown in Fig. 6, 7, and 8.

Insulate and store all spare leads. (Refer to Part 6 for wire strap and resistor connections.) Fuses and -24 volt power are provided locally (-24 volts connect to row 37 and GRD connects to row 38).

3.03 Extend CT, CR, CBS1, and CBS2 leads from 66B4-25 connecting block to 66M1-50 interface connecting block for access to CP equipment. Stencil lead designations on interface connecting block as shown in Fig. 2.

3.04 The interface connecting block should be located close to the 66B4-25 connecting block. Locate so that the maximum dc loop resistance between the CT and CR leads will not exceed approximately 1-1/4 ohms (25 feet of 24 gauge or equivalent) when measured at the 66B4-25 connecting block, with the 8-ohm resistor disconnected and the CT and CR leads strapped at the CP equipment.

3.05 The customer must terminate the CP equipment on the 66M1-50 interface connecting block using the four terminals stenciled on the customer side (Fig. 2).

3.06 The HOLD jacks for connecting arrangement LOH may be multiplied between switchboard positions if busy lamp indication is provided as shown in Fig. 11.

606A Panel

3.07 Install the 606A panel on a standard 23-inch relay rack or in a 16C apparatus mounting using a 99B mounting bracket (Fig. 5). The center mounting bar should be removed from the 16C apparatus mounting. Connect a separate ground to rack or mounting.

3.08 Electrical connection is made to the 606A panel through two A25B connector cables. These cables connect to plugs P1 and P3 (Fig. 4) on the rear of the 606A panel. P1 connects to the upper row of 914A connectors J1A, J2A, and J3A (Fig. 3), and P3 connects to the lower row of 914A connectors J1B, J2B, and J3B. Terminate the raw end of the A25B connector cables on the 66B4-25 connecting block following the wiring plan shown in Fig. 6, 7, 9, and 10. (Refer to Part 6 for wire strap and resistor connections.) Connect -24 volt power to fuse panel on rear of 606A panel (-24 volts connect to T1 and GRD connects to T2).

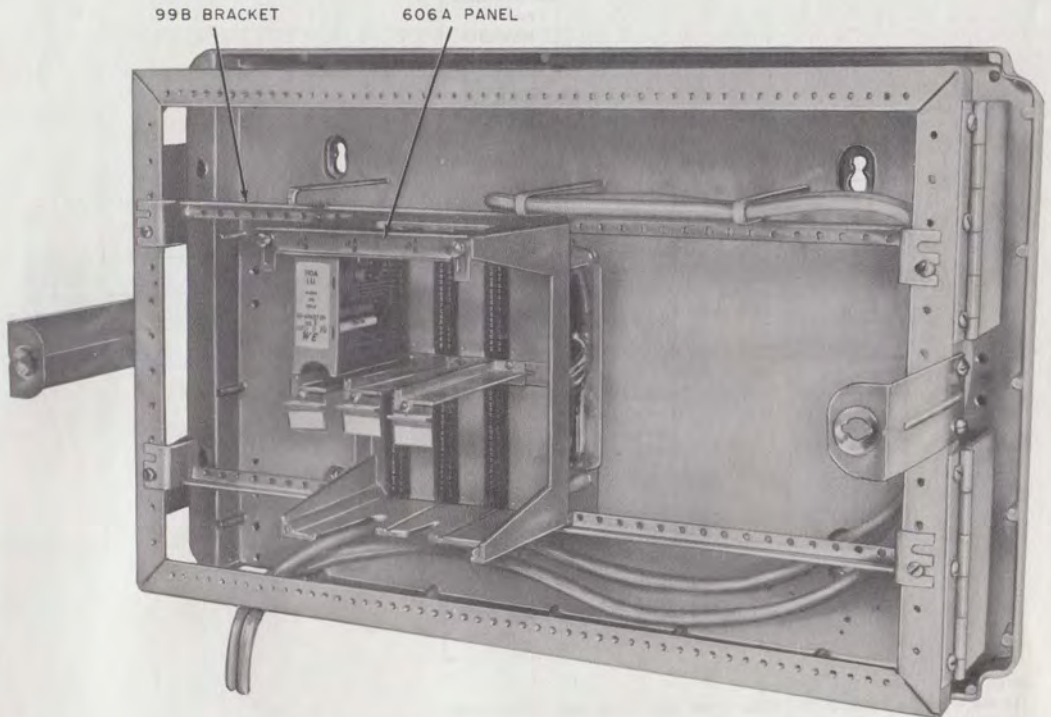


Fig. 5—606A Panel Mounted in 16C Apparatus Mounting

3.09 Extend CT, CR, CBS1, and CBS2 leads from the 66B4-25 connecting block to the 66M1-50 interface connecting block for access to the CP equipment. Stencil lead designations on 66M1-50 connecting block as shown in Fig. 2.

3.10 The interface connecting block should be located close to the 66B4-25 connecting block. Locate so that the maximum dc loop resistance of the CT and CR leads does not exceed approximately 1-1/4 ohms (25 feet of 24 gauge or equivalent) when measured at the 66B4-25 connecting block with the 8-ohm resistor disconnected and the CT and CR leads strapped at the CP equipment.

3.11 The customer must terminate the CP equipment to the 66M1-50 connecting block using the four terminals stenciled on the customer side.

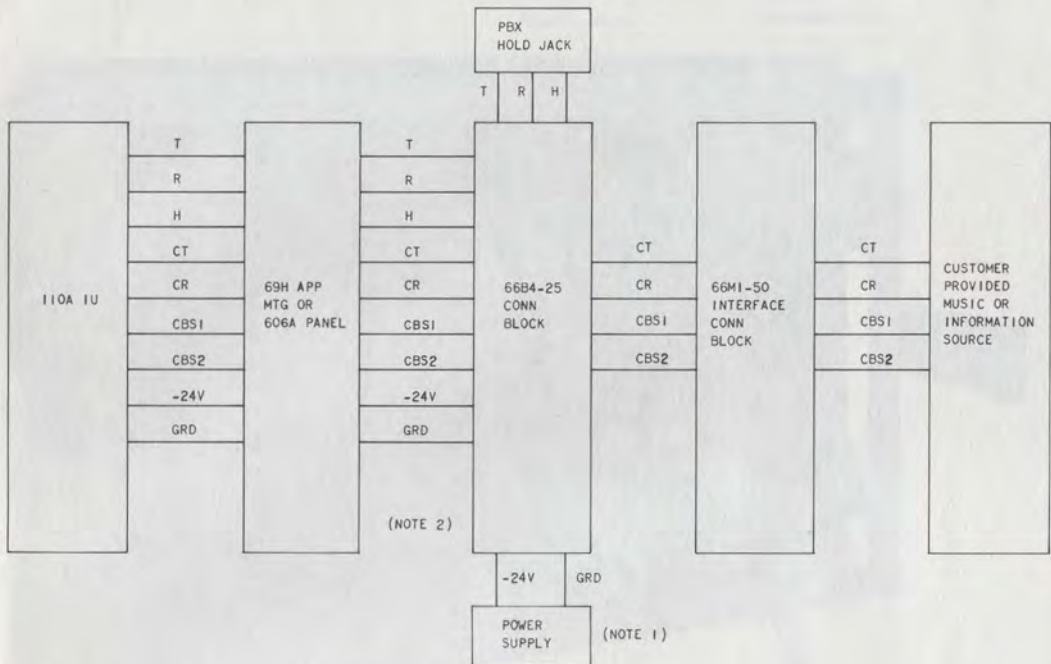
3.12 The HOLD jacks for connecting arrangement LOH may be multiplied between switchboard positions if busy lamp indication is provided as shown in Fig. 11.

110A Interconnecting Unit

3.13 Strap Z option per Fig. 7 before installing IU in apparatus mounting or panel.

Note: The 109A IU is not recommended for this arrangement but can be used if a 110A IU is not available.

3.14 Loosen screw securing retaining clip to apparatus mounting or panel and raise clip or designation bar to provide access to mounting.



NOTES:

1. POWER SUPPLY CONNECTS TO T1(-24V) AND T2(GRD) ON BACK OF 606A PANEL
2. INSULATE AND STORE UNUSED LEADS

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Fig. 6—Block Diagram Voice Connecting Arrangement LOH

- 3.15 Align IU in mounting guides and properly seat connector of printed wiring board in connector of apparatus mounting or panel.
- 3.16 Position retaining clip or designation bar against the IU and tighten screw.
- 3.17 Stencil circuit and connection information as required on designation strip or retaining clip.
- 3.18 Perform tests shown in Part 5 after installation.

4. OPERATION (Fig. 7)

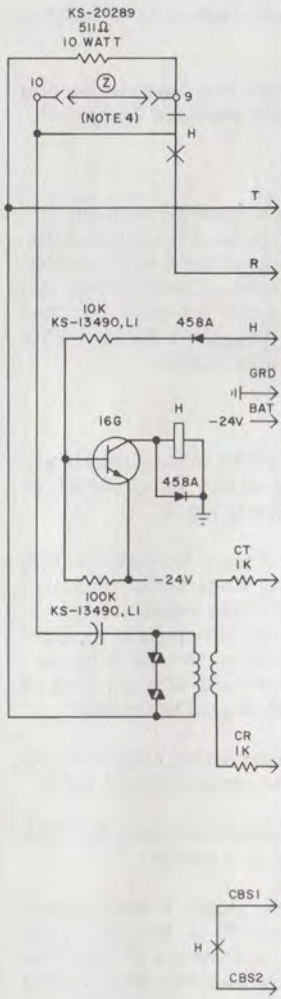
4.01 **Incoming Call:** A call from the central office (CO) trunk is answered in the normal manner by inserting the trunk answering cord of a cord pair in the incoming trunk jack and testing

the desired station for busy, using the station cord. If the station is busy and the calling party desires to hold, the station cord is inserted in a jack associated with the 110A IU and the TALK key is released. Inserting the station cord into the HOLD jack associated with the 110A IU causes the busy indication lamp to light (if multiple switchboard positions are provided) and applies ground to the H lead causing H relay to operate. The H relay operated provides a start signal to the CP recorded music or information source and couples this source to the tip and ring of the held party via the PBX HOLD jack and cord circuit.

4.02 **Monitoring and Talking to Party on Hold:**

To monitor the connection to the CP equipment, the PBX attendant operates the TALK-DIAL key of the cord pair to the TALK position and converses with the party on hold while the music is on the

110A INTERCONNECTING UNIT

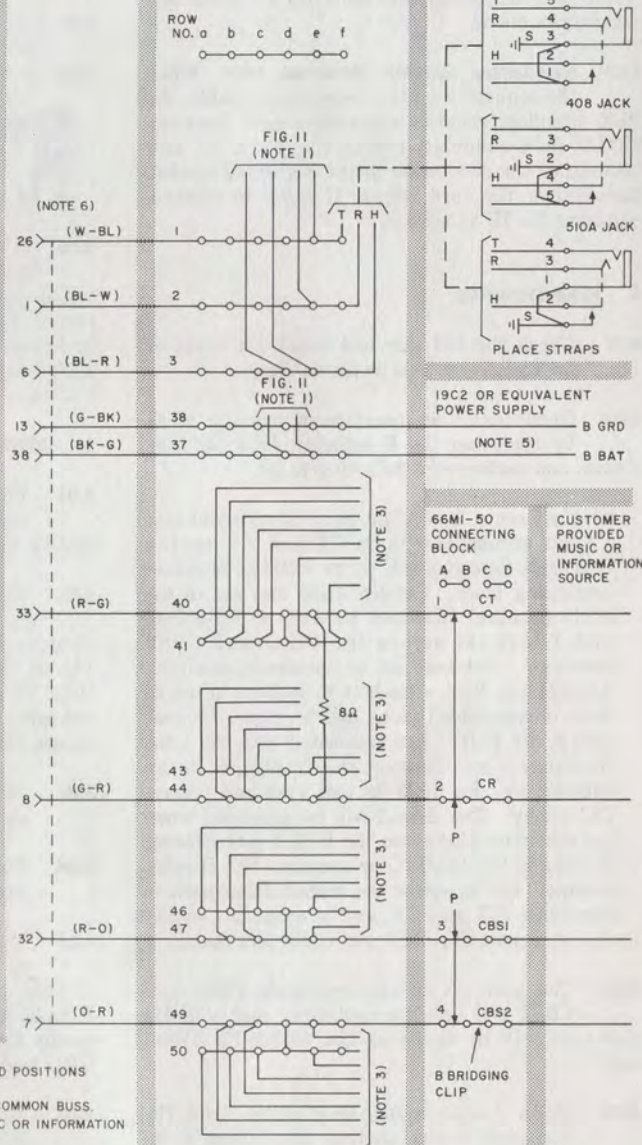


914A CONNECTOR ON 69H APP MTG

50-PIN CONNECTOR OF CONN CABLE

66B4-25 CONNECTING BLOCK (NOTE 2)

PBX SWITCHBOARD HOLD JACK (SEE TABLE A)



- NOTES:
1. MULTIPLE TO HOLD JACKS AT OTHER SWITCHBOARD POSITIONS IF USED.
 2. USE LOWER ROWS OF TERMINALS (ROWS 40-50) AS COMMON BUSS.
 3. MULTIPLE TO OTHER IU'S COMMON TO THIS MUSIC OR INFORMATION SOURCE.
 4. INSTALL (Z) OPTION.
 5. GRD SAME AS PBX GRD.
 6. INSULATE AND STORE SPARE LEADS.

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Fig. 7—Schematic Diagram Voice Connecting Arrangement LOH Using 69H Apparatus Mounting

line. However, for better transmission, the attendant may remove the station cord from the HOLD jack associated with the 110A IU which will remove the music.

4.03 Requested Station Becomes Idle: When the requested station becomes available, the PBX attendant removes the station cord from the HOLD jack associated with the 110A IU and establishes the connection to the requested station. Removal of the cord causes H relay to release, restoring the IU to normal.

5. MAINTENANCE

5.01 Check the CO pair and check for loose or broken connections or blown fuses.

5.02 Open circuit at interface connecting block by removing the B bridging clips (or wire straps) and perform the following tests:

(a) Connect a 1013A (or equivalent) hand test set across terminals CT and CR on the Telephone Company side of the 66M1-50 interface connecting block. Set the hand test set to the MON position. Connect an 81A or KS-16990, List 1 test set across the CBS1 and CBS2 terminals. Set test set to continuity position. Request the PBX attendant to remove all cords from music-on-hold jacks and to place the rear cord in the HOLD jack associated with the 110A IU under test. Connect the front cord to an outside line, dial 1000-Hz test tone and release TALK key. The H lead will be grounded when the attendant plugs into the HOLD jack causing H relay in the 110A IU to operate. The H relay operated will complete the transmission path to terminals CT and CR and provide a contact closure across the CBS1 and CBS2 terminals.

5.03 The test set across terminals CBS1 and CBS2 will indicate continuity and 1000-Hz test tone will be heard on the 1013A hand test set.

5.04 When trouble is suspected in the 110A IU, exchange it with another unit known to be functioning properly.

Caution: Remove fuse for particular circuit before replacing 110A IU.

5.05 Remove all test connections to restore the circuit to normal and replace the B bridging clips (or wire straps).



Do not attempt any tests or repairs to the customer-provided equipment.

5.06 When in the repairman's judgment the trouble is located in the CP equipment, the Repair Service Bureau should be notified so that proper Maintenance of Service Charge billing can be initiated as outlined in BSP 660-101-312 entitled Maintenance of Service Charge on Services With Customer-Provided Equipment (CPE).

6. CONNECTIONS

6.01 Place straps on the 66B4-25 connecting blocks between terminals 40 and 41, 43 and 44, 46 and 47, 49 and 50 as shown in Fig. 8.

6.02 Place 8-ohm load resistor (furnished locally) across tip and ring leads to CP equipment at the common buss (66B4-25 connecting block, Fig. 8). The resistor should have pigtailed no larger than 19 gauge to connect in the quick connect clip-type terminals. If wire size is larger than 19 gauge, pigtailed should be soldered to terminals.

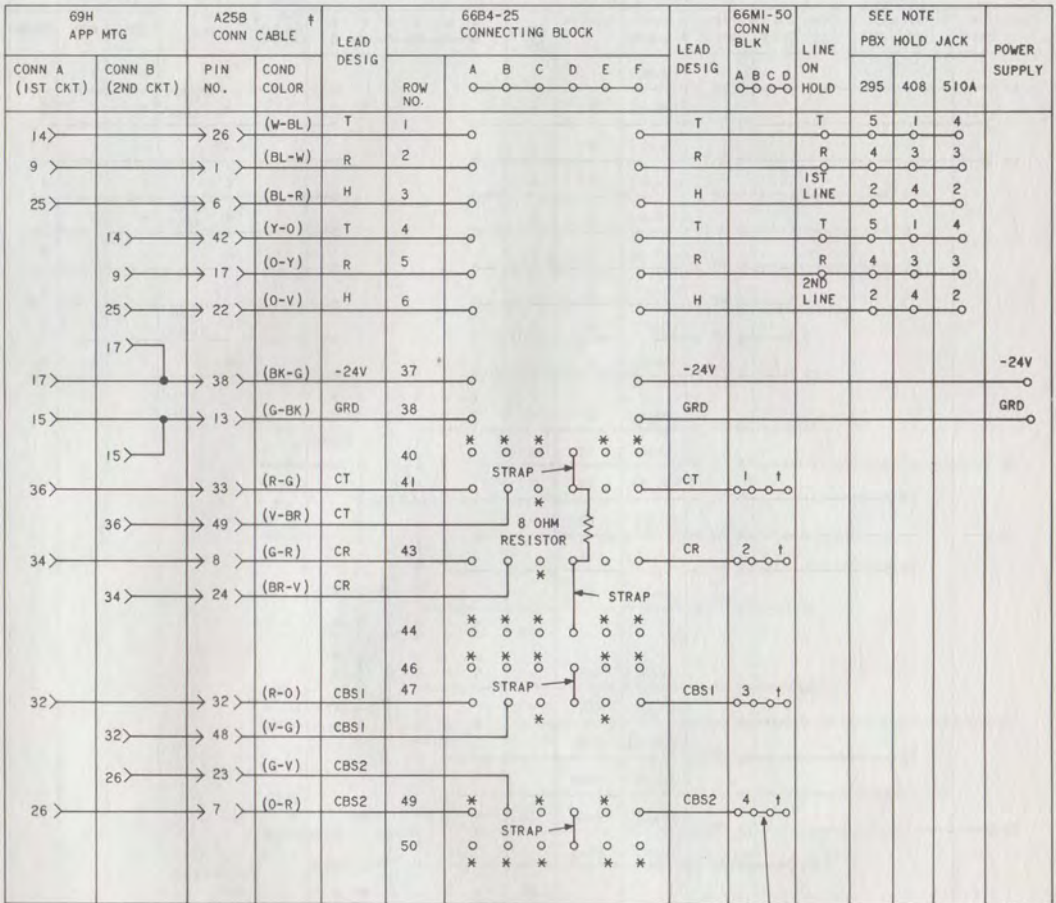
6.03 For connection information using the 69H apparatus mounting, refer to Fig. 7 and 8.

6.04 For connection information using the 606A panel, refer to Fig. 4, 9 and 10.

6.05 If a separate power supply is used, connect to terminals T1 and T2 on rear fuse panel of 606A panel. Connect to terminals 37 and 38 on 66B4-25 for 69H apparatus mounting. Provide fuses locally for the 69H apparatus mounting. Bond the GRD lead to the PBX GRD.

6.06 For connection information using multiplied HOLD jacks with -24 volt lamp supply, refer to Fig. 11.

CONNECTIONS FOR CONNECTING ARRANGEMENT LOH



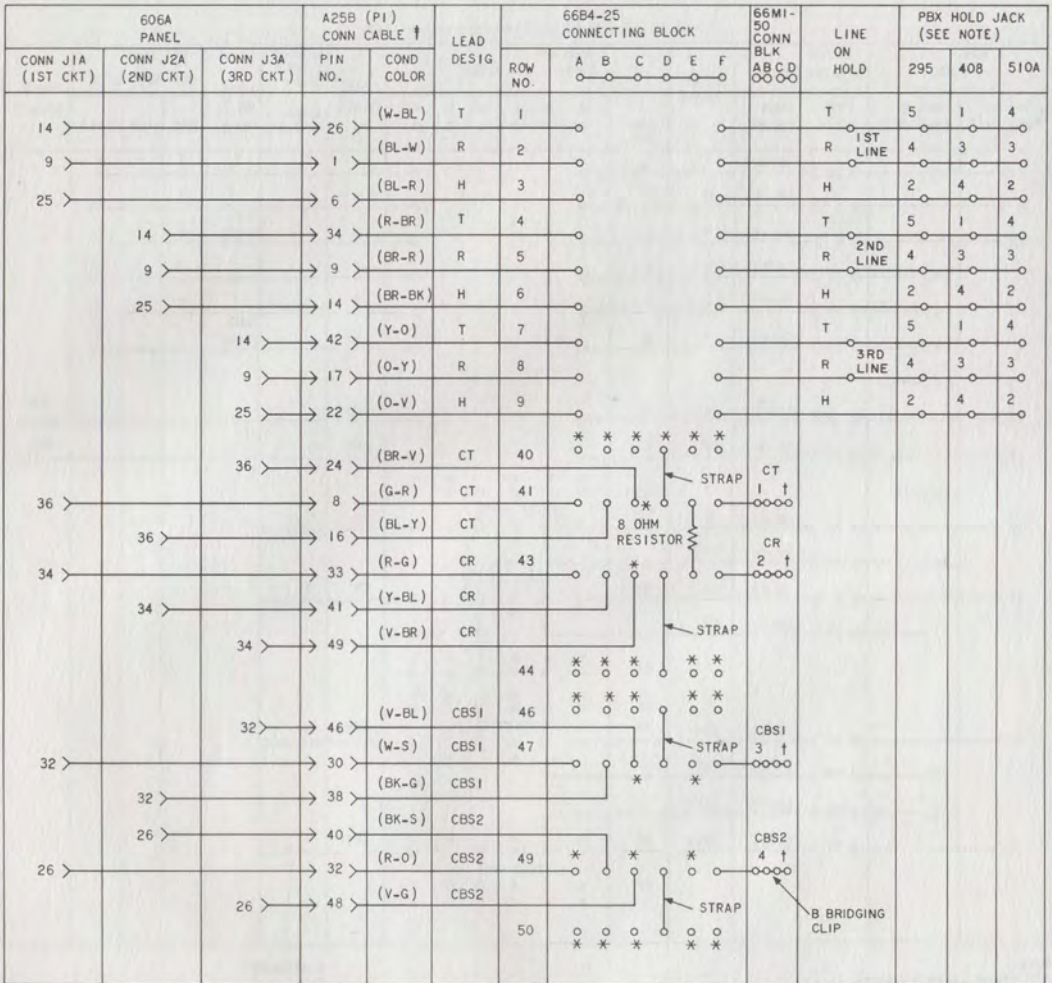
NOTE:
 STRAP JACKS AS SHOWN IN FIG. 7.
 * MULTIPLIED TO OTHER INTERCONNECTING UNITS COMMON TO THIS MUSIC SOURCE.
 † CONNECTIONS FOR CP EQUIPMENT.
 ‡ INSULATE AND STORE UNUSED LEADS

B BRIDGING CLIP

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Fig. 8—Connections Using 69H Apparatus Mounting

CONNECTIONS FOR CONNECTING ARRANGEMENT LOH

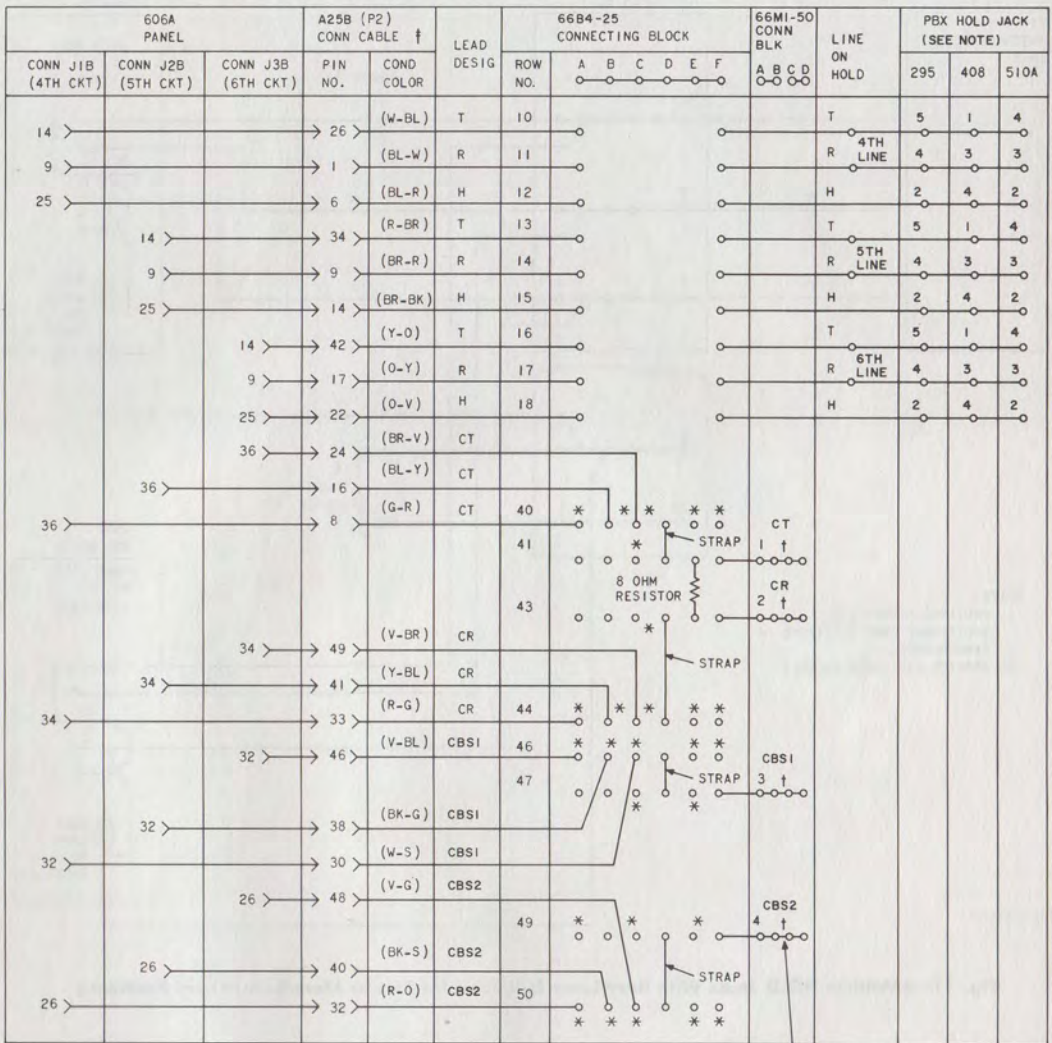


NOTE:
 STRAP JACKS AS SHOWN IN FIG. 7.
 * MULTIPLIED TO OTHER INTERCONNECTING UNITS COMMON TO THIS MUSIC SOURCE.
 † CONNECTIONS FOR CP EQUIPMENT.
 ‡ INSULATE AND STORE UNUSED LEADS.

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Fig. 9—Connections Using 606A Panel (A-Connectors)

CONNECTIONS FOR CONNECTING ARRANGEMENT LOH



NOTE:
STRAP JACKS AS SHOWN IN FIG. 7.

* MULTIPLIED TO OTHER INTERCONNECTING UNITS
COMMON TO THIS MUSIC SOURCE.

† CONNECTIONS FOR CP EQUIPMENT

‡ INSULATE AND STORE UNUSED LEADS

B BRIDGING
CLIP

TPA 550560

Fig. 10—Connections Using 606A Panel (B-Connectors)

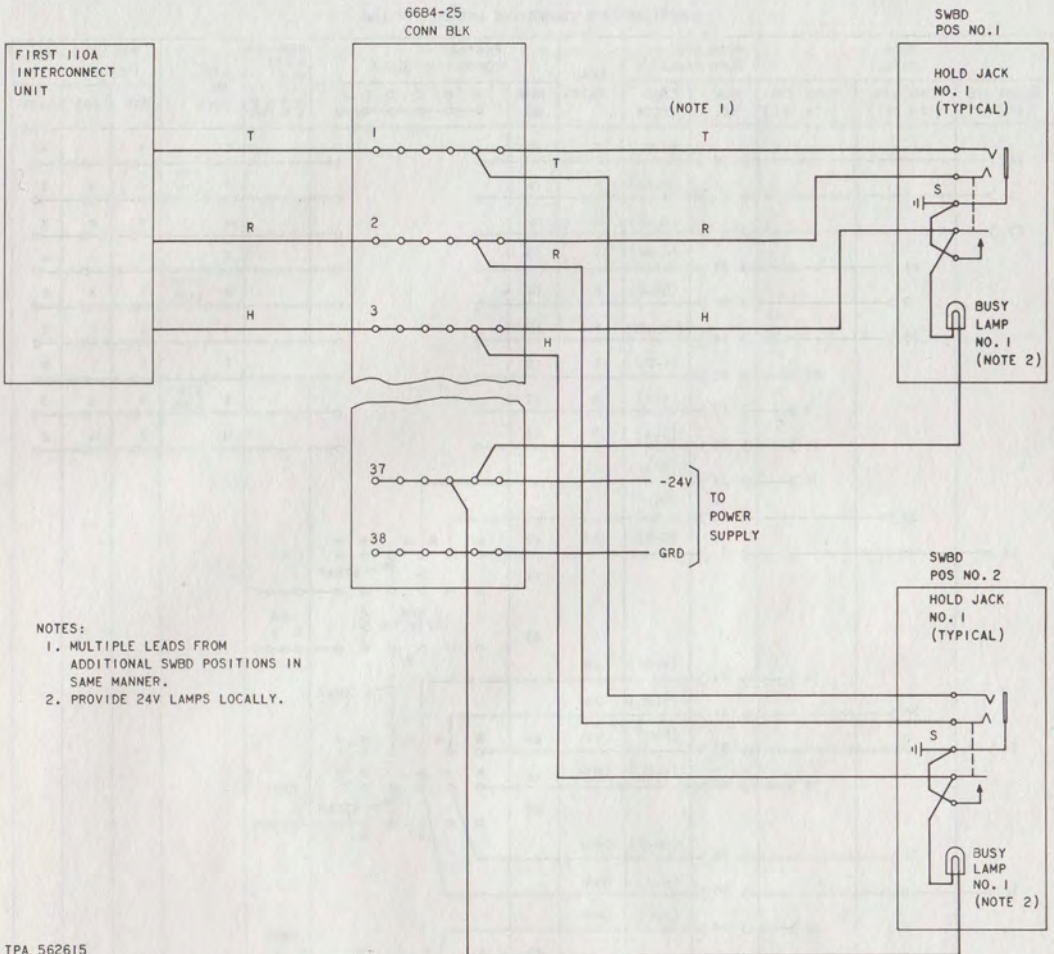


Fig. 11—Multiple HOLD Jacks With Busy Lamp Indication for Two or More Switchboard Positions