

VOICE CONNECTING ARRANGEMENTS CDN AND CD5

111A INTERCONNECTING UNIT, 69H APPARATUS MOUNTING AND 606A PANEL

1. GENERAL

1.01 This section provides identification, installation, operation, maintenance, and connection information on the 111A Interconnecting Unit (IU) and 69H apparatus mounting or 606A panel when used in Voice Connecting Arrangements CDN and CD5.

1.02 This section is being reissued to show information for the 606A panel.

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 to use the 69H apparatus mounting for one to two circuits and the 606A panel 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-69614-01 Issue 3D —111A IU

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 provide a means for connecting a Bell System 1A2 Key Telephone System (KTS) line to a customer-provided (CP) intercommunicating (intercom) system. Supervision and the means to establish

connections are provided by a Bell System key telephone control station.

- To limit excessive levels from CP equipment and to provide protection for personnel against hazardous voltages.

APPLICATION

- 1A2 Key Telephone System

ORDERING GUIDE

- Unit, Interconnecting 111A (one per central office[CO] line, Fig. 1)

Associated Apparatus (Order Separately)

For 69H Apparatus Mounting, Fig. 2.

- Mounting, Apparatus, 69H (one per two 111A IUs installed on a 23-inch relay rack using 99-type brackets or in a 16-type apparatus mounting).
- Block, Connecting, 66M1-50 (as required, Fig. 3).
- Block, Connecting, 66B4-25 (as required).
- Cable, Connector, A25B (one per 69H apparatus mounting).
- Clip, Bridging, B (as required, Fig. 3).
- Wire, "D" inside, or equivalent (for cabling from 66B4-25 connecting block to 66M1-50 interface connecting block).
- Unit, Telephone, Key, 400D (one per CO line and one per CP intercom line). Installed in key service unit or panel. (The 584-type panel or 69-type apparatus mounting may be used to mount 400D.)

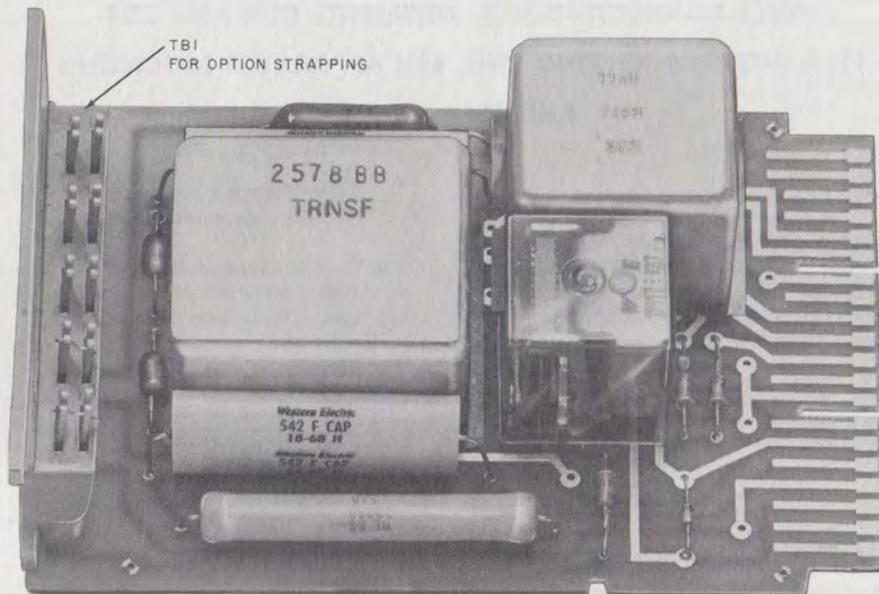


Fig. 1—111A Interconnecting Unit

- Diode, KS-15724, L1 or equivalent (one per each key telephone set used as a control station for Voice Connecting Arrangement CD5 or two per station if BL lead is multiplied).

◆ *For 606A Panel, Fig. 4 and 5*

- Panel, 606A (one per six 111A IUs).
- Brackets, 99-Type (one per three 606A panels).
- Fuse, 24E, 1/2 ampere (eight furnished per 606A panel).
- Block, Connecting, 66M1-50 (as required, Fig. 3).
- Clip, Bridging, B (as required, Fig. 3).
- Block, Connecting, 66B4-25 (as required).
- Cable, Connector, A25B (two per 606A panel).

- Wire, "D" inside, or equivalent (for cabling from 66B4-25 connecting block to 66M1-50 interface connecting block).
- Unit, Telephone, Key, 400D (one per CO line and one per CP intercom line). Installed in key service unit panel as required. (The 584-type panel or 69-type apparatus mounting may be used to mount 400D KTU.)
- Diode, KS-15724, L1 or equivalent (one per each key telephone set used as a control station for Voice Connecting Arrangement CD5, or two per station if BL lead is multiplied).◆

DESIGN FEATURES

111A Interconnecting Unit

- Circuitry is provided on a 4-inch, 40-pin printed wiring board.
- Provides voice frequency coupling only.

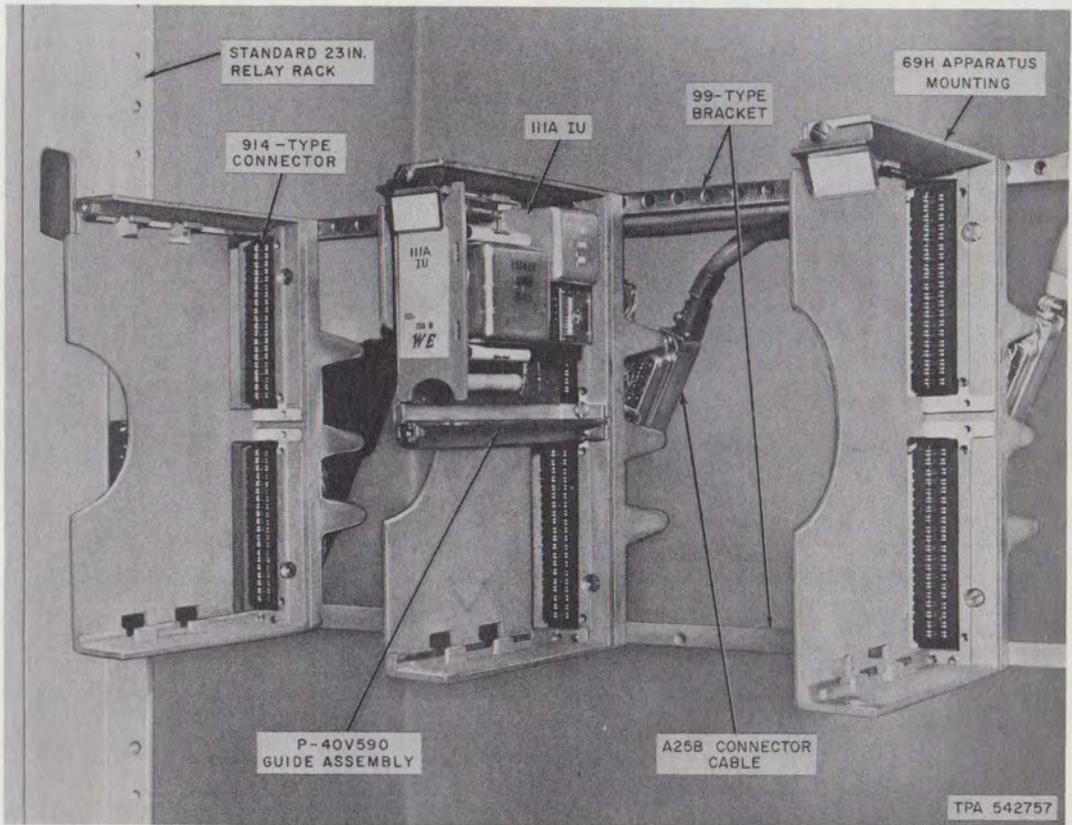


Fig. 2—69H Apparatus Mounting With 111A Interconnecting Unit

- Option terminals.
- Mounts in 69H apparatus mounting or #606A panel.
- Prevents switchhook dialing from the CP equipment.
- Requires 0.047 ampere at 26V dc.
- Voice Connecting Arrangement CDN (Z option) provides a supervisory lamp at the Bell System control station and circuit release control at the CP intercom station.
- Voice Connecting Arrangement CD5 (Y option) provides supervision and circuit release control at the Bell System control station.
- Provides a holding bridge across the tip and ring of both associated 400D KTUs.

69H Apparatus Mounting

- Equipped with two 914-type 40-pin connectors factory-wired to a 50-pin KS-type connector
- Designed to mount two 111A IUs

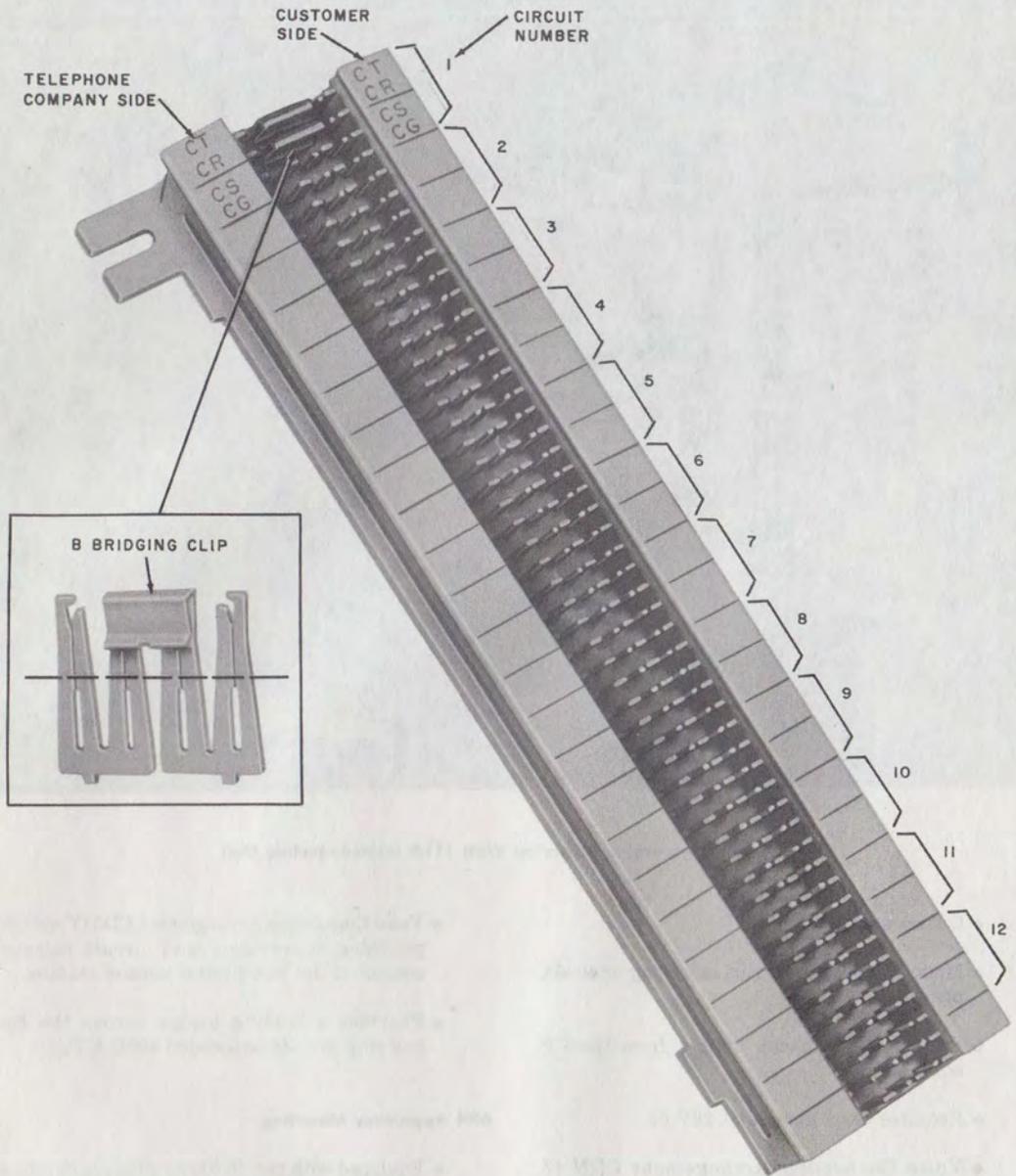


Fig. 3—66M1-50 Interface Connecting Block

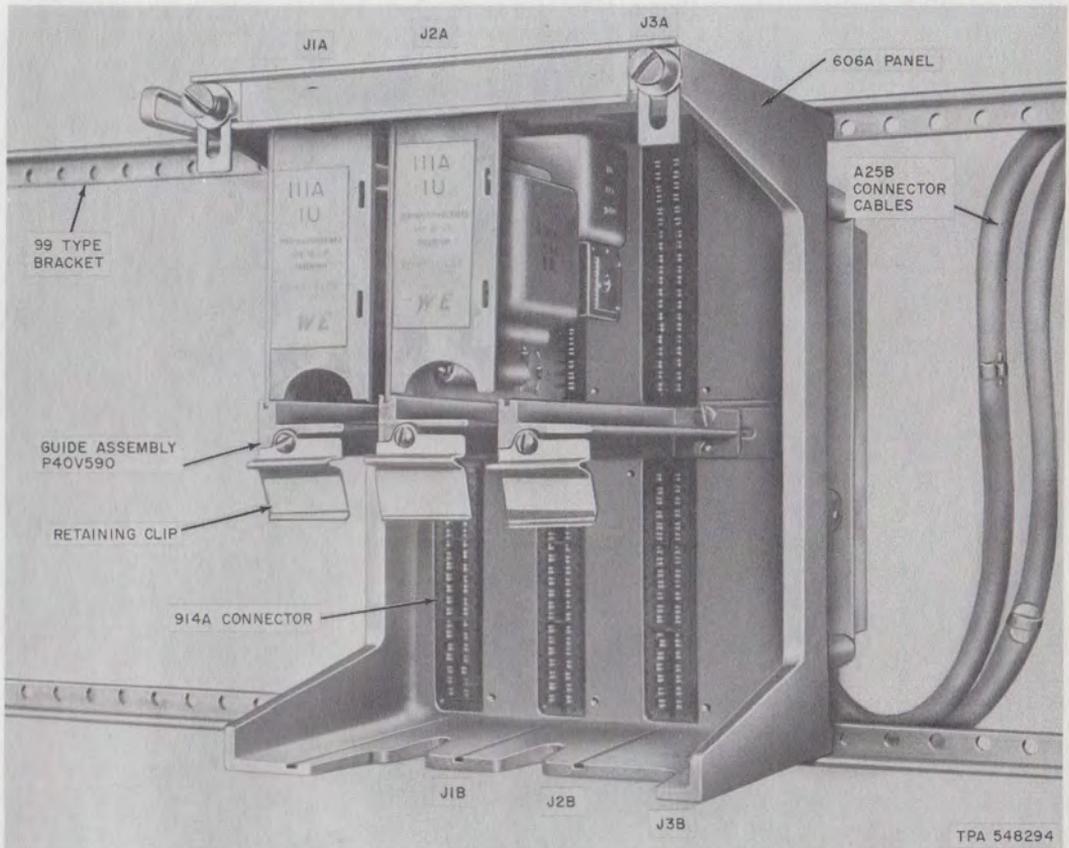


Fig. 4—606A Panel With 111A Interconnecting Unit

- For mounting on a standard relay rack using 99-type brackets or in a 16-type apparatus mounting.
- For mounting on a standard relay rack using 99-type brackets or in a 16-type apparatus mounting.

606A Panel

- Equipped with six 914-type 40-pin connectors and two factory-wired 50-pin KS-16671 plugs
- Designed to mount six 111A IUs
- Fuse panel included
- Approximate size 6 by 8 by 9 inches

3. INSTALLATION

- 3.01** Locate Connecting Arrangement CDN or CD5 in an area free of dampness and excessive dust or dirt with adequate room for access to front and rear of equipment.
- 3.02** The CP equipment must be located so that the maximum loop resistance from the 111A IU does not exceed 50 ohms (Fig. 6).

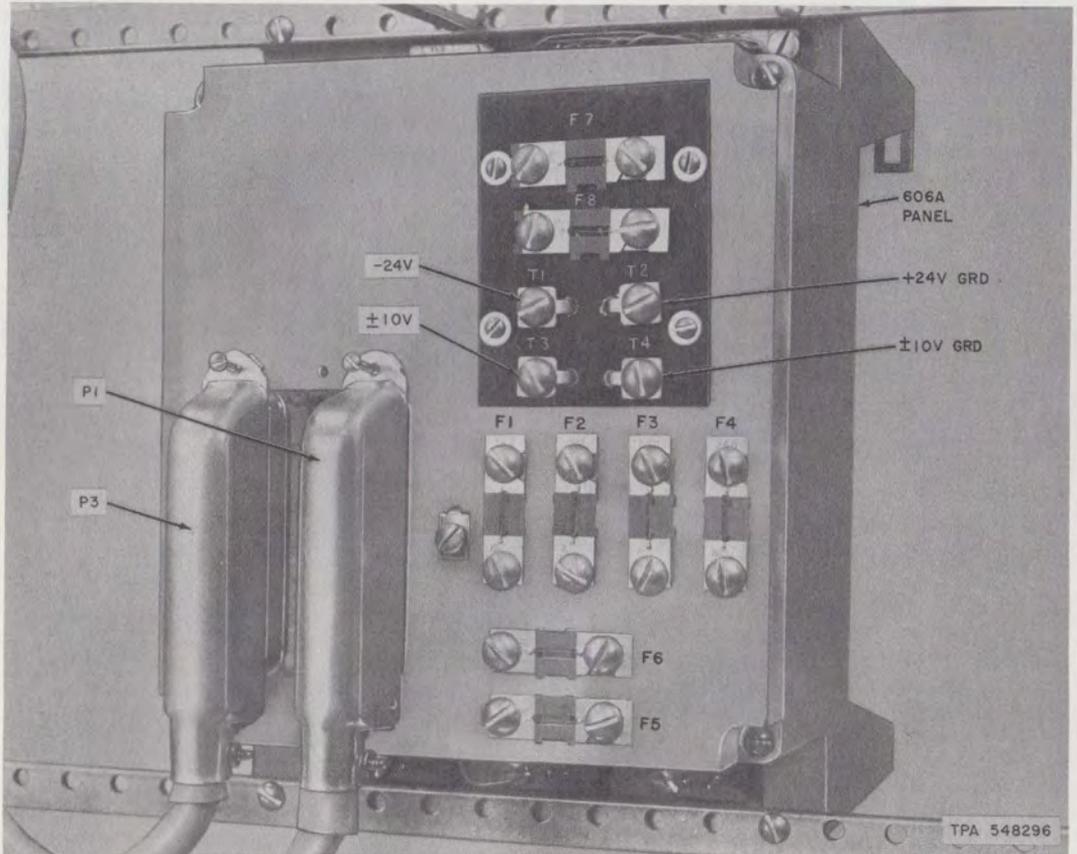


Fig. 5—606A Panel (Rear View)

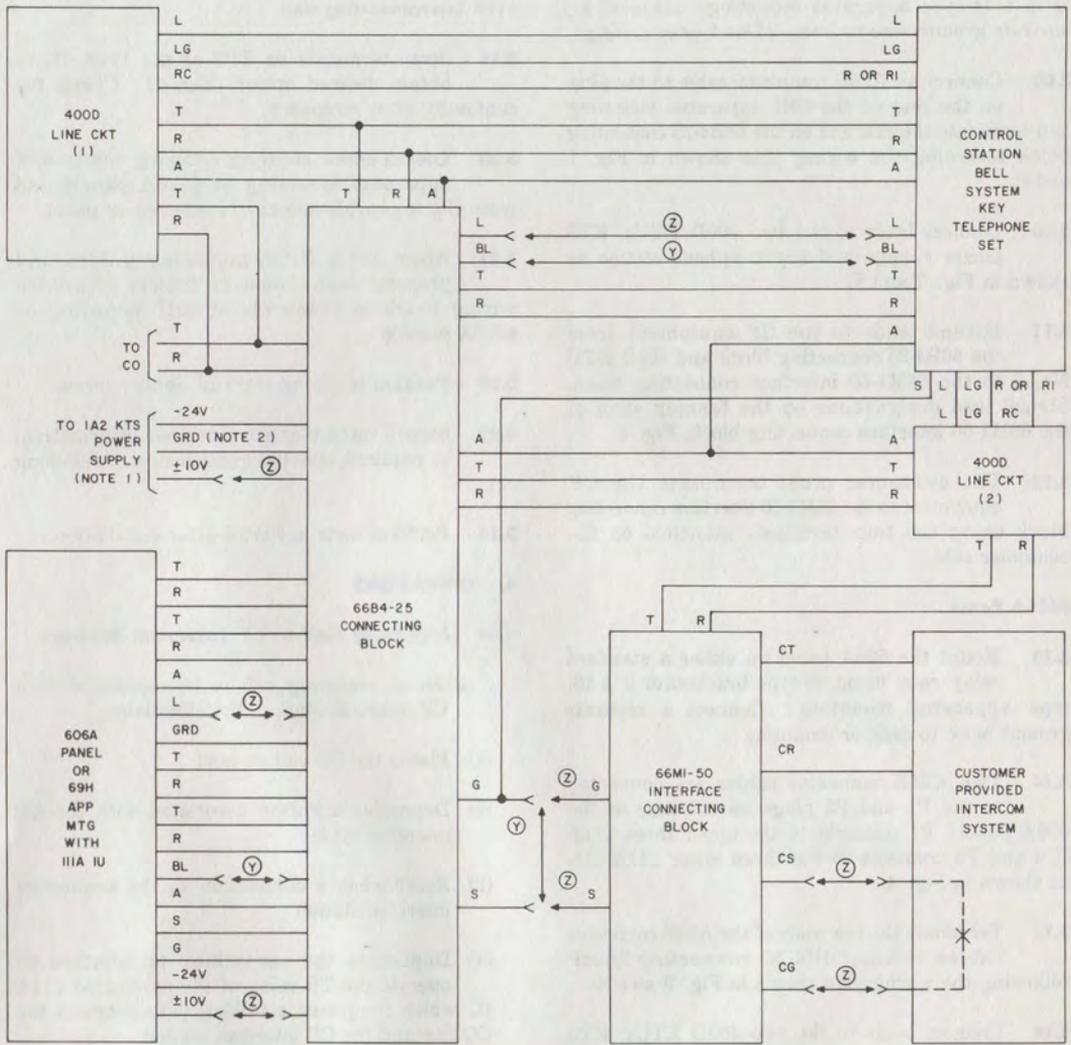
- 3.03** One 111A IU must be provided for each circuit between the CP intercom system and a Bell System CO line.
- 3.04** The connecting arrangement should be located as close as possible to the 1A2 KTS for convenience in wiring and strapping.
- 3.05** Leads associated with each circuit to a CP intercom line should be terminated on a 66M1-50 connecting block and lead designations should be stenciled (Fig. 3).
- 3.06** *CD5 (Y Option):* Install station busy lamp circuit in Bell System control station key telephone set. A KS-15724, List 1 diode (or

equivalent) is required for each busy lamp circuit. When BL lead is multiplied, a KS-15724, List 1 diode or equivalent must be installed in series with each BL lead, using an available spare terminal. All associated stations must be on-hook to release the circuit.

- 3.07** *CDN (Z Option):* Install a lamp ($\pm 10V$ ac) in or associated with the nonlocking key in the control station.

69H Apparatus Mounting

- 3.08** Mount the 69H apparatus mounting on either a standard relay rack using 99-type brackets



NOTES:

1. POWER SUPPLY CONNECTS TO REAR OF 606A PANEL (SEE FIG 5).
2. GROUND RETURN SHALL BE COMMON WITH KTS

⓪ OPTION, VCA-CDN

Ⓢ OPTION, VCA-CD5

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Fig. 6—Block Diagram—Voice Connecting Arrangement CDN or CD5

or in a 16-type apparatus mounting. Connect a separate ground wire to frame of rack or mounting.

3.09 Connect an A25B connector cable to the plug on the rear of the 69H apparatus mounting and terminate the raw end on the 66B4-25 connecting block following the wiring plan shown in Fig. 7 and 8.

3.10 Connect leads to the two 400D KTUs, KTS power supply, and key telephone station as shown in Fig. 7 and 8.

3.11 Extend leads to the CP equipment from the 66B4-25 connecting block and 400D KTU No. 2 to the 66M1-50 interface connecting block. Stencil lead designations on the fanning strip of the 66M1-50 interface connecting block, Fig. 3.

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

606A Panel

3.13 Mount the 606A panel on either a standard relay rack using 99-type brackets or in a 16-type apparatus mounting. Connect a separate ground wire to rack or mounting.

3.14 Two A25B connector cables are connected to the P1 and P3 plugs on the rear of the 606A panel. P1 connects to the upper three 111A IUs and P3 connects to the three lower 111A IUs as shown in Fig. 4.

3.15 Terminate the raw ends of the A25B connector cables to the 66B4-25 connecting block following the wiring plan shown in Fig. 9 and 10.

3.16 Connect leads to the two 400D KTUs, KTS power supply, and key telephone station as shown in Fig. 5, 7, 9, and 10.

3.17 Extend leads to the CP equipment from the 66B4-25 and 400D No. 2 to the 66M1-50 interface connecting block. Stencil lead designations on the fanning strip of the connecting block, Fig. 3.

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

111A Interconnecting Unit

3.19 Strap terminals on TB1 of the 111A IU to obtain desired option (Fig. 1). Check for continuity after strapping.

3.20 Loosen screw securing retaining clip to 69H apparatus mounting or 606A panel and raise clip to provide access to mounting or panel.

3.21 Align 111A IU in mounting guides and properly seat connector fingers of printed wiring board in connector of 69H mounting or 606A panel.

3.22 Position retaining clip and tighten screw.

3.23 Stencil circuit and connection information, as required, onto designation strip of retaining clip.

3.24 Perform tests in Part 5 after installation.

4. OPERATIONS

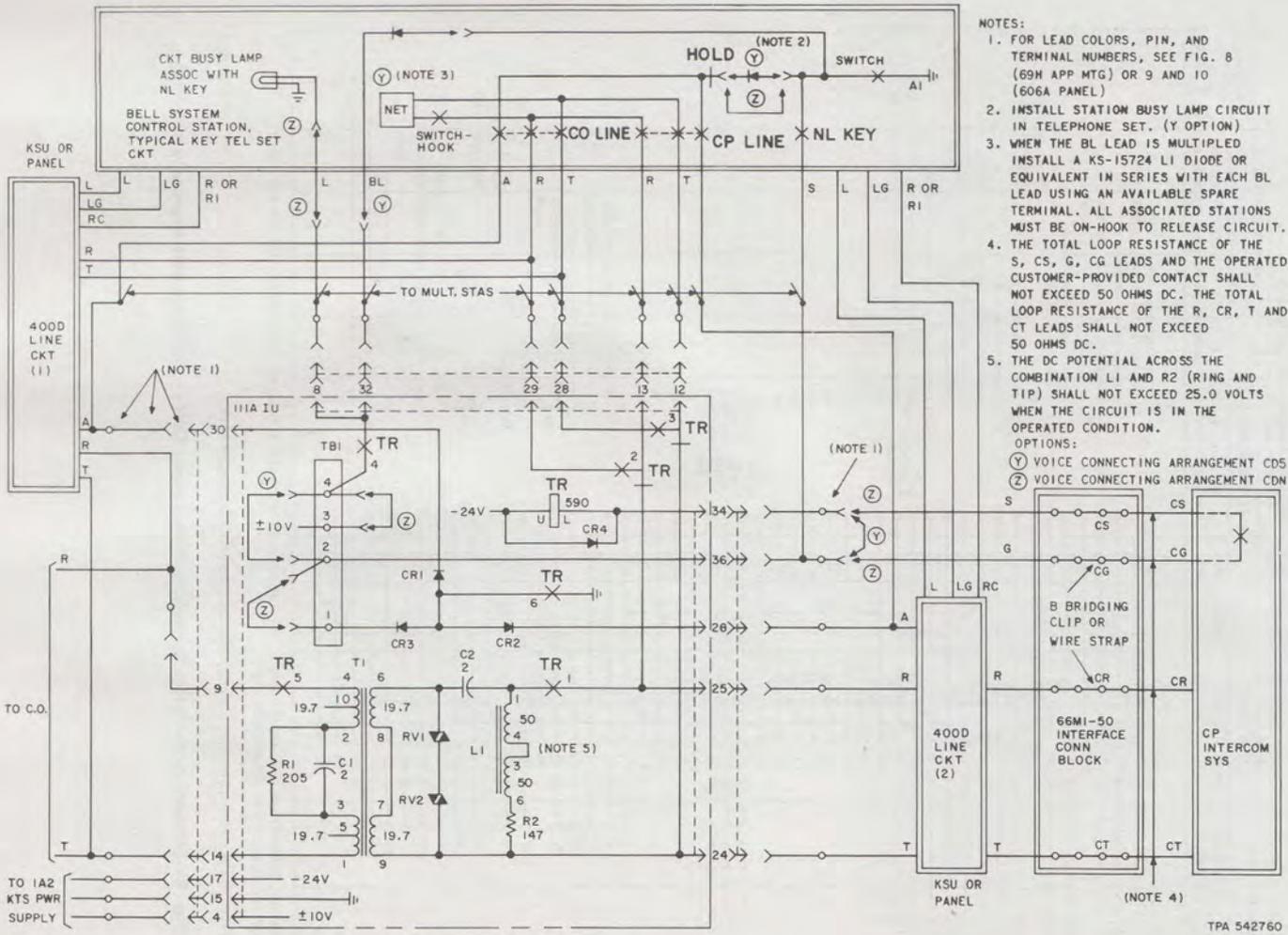
4.01 Incoming Call to CP Intercom Station:

- On an incoming call to be connected to a CP intercom station, the attendant:

- (1) Places the CO call on hold
- (2) Depresses a button associated with the CP intercom system
- (3) Establishes a connection to the requested intercom station
- (4) Depresses the nonlocking pushbutton to operate the TR relay of the associated 111A IU which completes a talking path between the CO line and the CP intercom station.

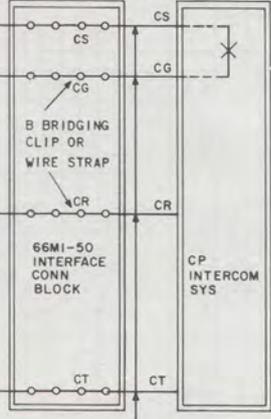
CDN (Z Option)

- (5) When step (4) is completed, the attendant may use other pickup buttons to answer incoming calls or establish outgoing calls or the attendant can go on-hook.
- (6) When the CP intercom station goes on-hook, the 111A IU and all associated line units are restored to normal.



- NOTES:
1. FOR LEAD COLORS, PIN, AND TERMINAL NUMBERS, SEE FIG. 8 (69H APP MTG) OR 9 AND 10 (606A PANEL)
 2. INSTALL STATION BUSY LAMP CIRCUIT IN TELEPHONE SET. (Y OPTION)
 3. WHEN THE BL LEAD IS MULTIPLIED INSTALL A KS-15724 LI DIODE OR EQUIVALENT IN SERIES WITH EACH BL LEAD USING AN AVAILABLE SPARE TERMINAL. ALL ASSOCIATED STATIONS MUST BE ON-HOOK TO RELEASE CIRCUIT.
 4. THE TOTAL LOOP RESISTANCE OF THE S, CS, G, CG LEADS AND THE OPERATED CUSTOMER-PROVIDED CONTACT SHALL NOT EXCEED 50 OHMS DC. THE TOTAL LOOP RESISTANCE OF THE R, CR, T AND CT LEADS SHALL NOT EXCEED 50 OHMS DC.
 5. THE DC POTENTIAL ACROSS THE COMBINATION L1 AND R2 (RING AND TIP) SHALL NOT EXCEED 25.0 VOLTS WHEN THE CIRCUIT IS IN THE OPERATED CONDITION.

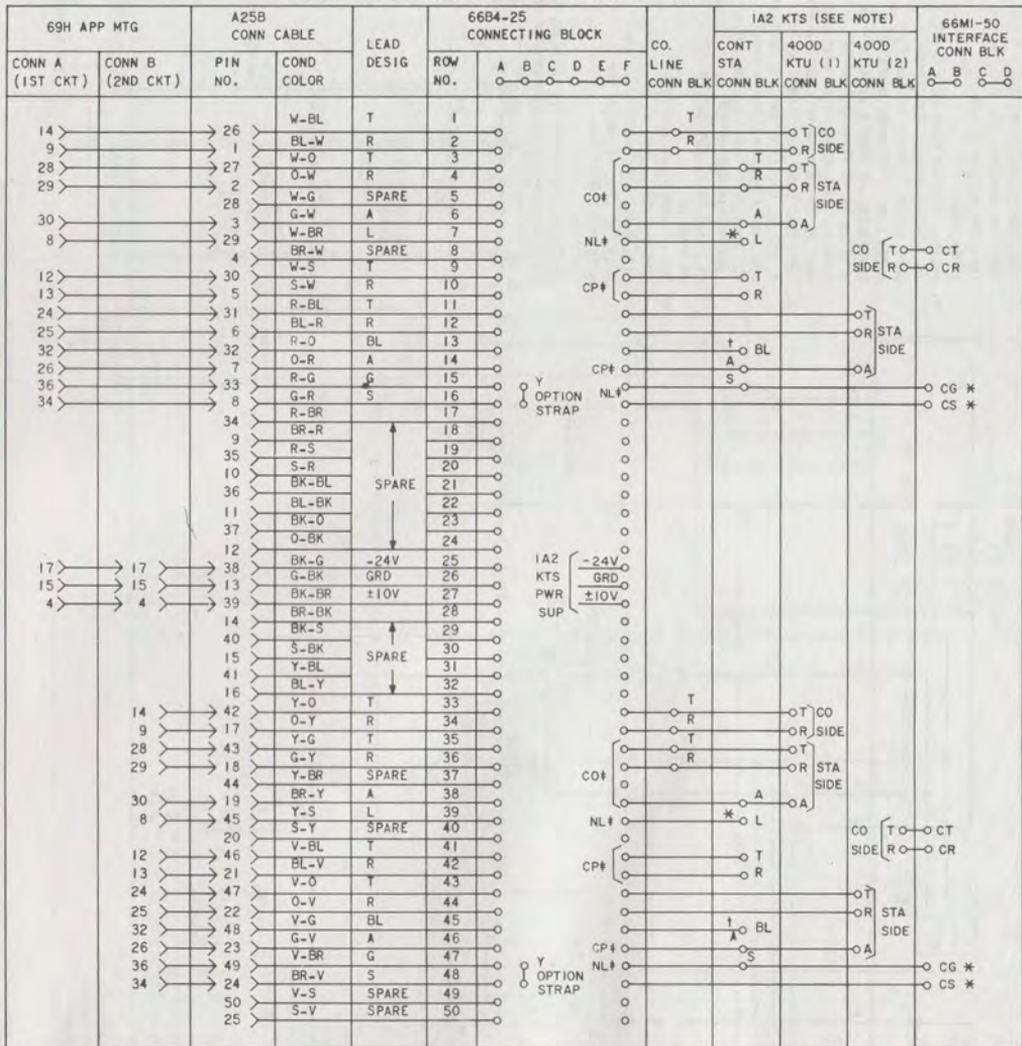
- OPTIONS:
- Y VOICE CONNECTING ARRANGEMENT CD5
 - Z VOICE CONNECTING ARRANGEMENT CDN



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Fig. 7—Simplified Schematic Voice Connecting Arrangement CDN or CD5 Using 69H Apparatus Mounting

CONNECTIONS FOR VOICE CONNECTING ARRANGEMENT CDN OR CD5



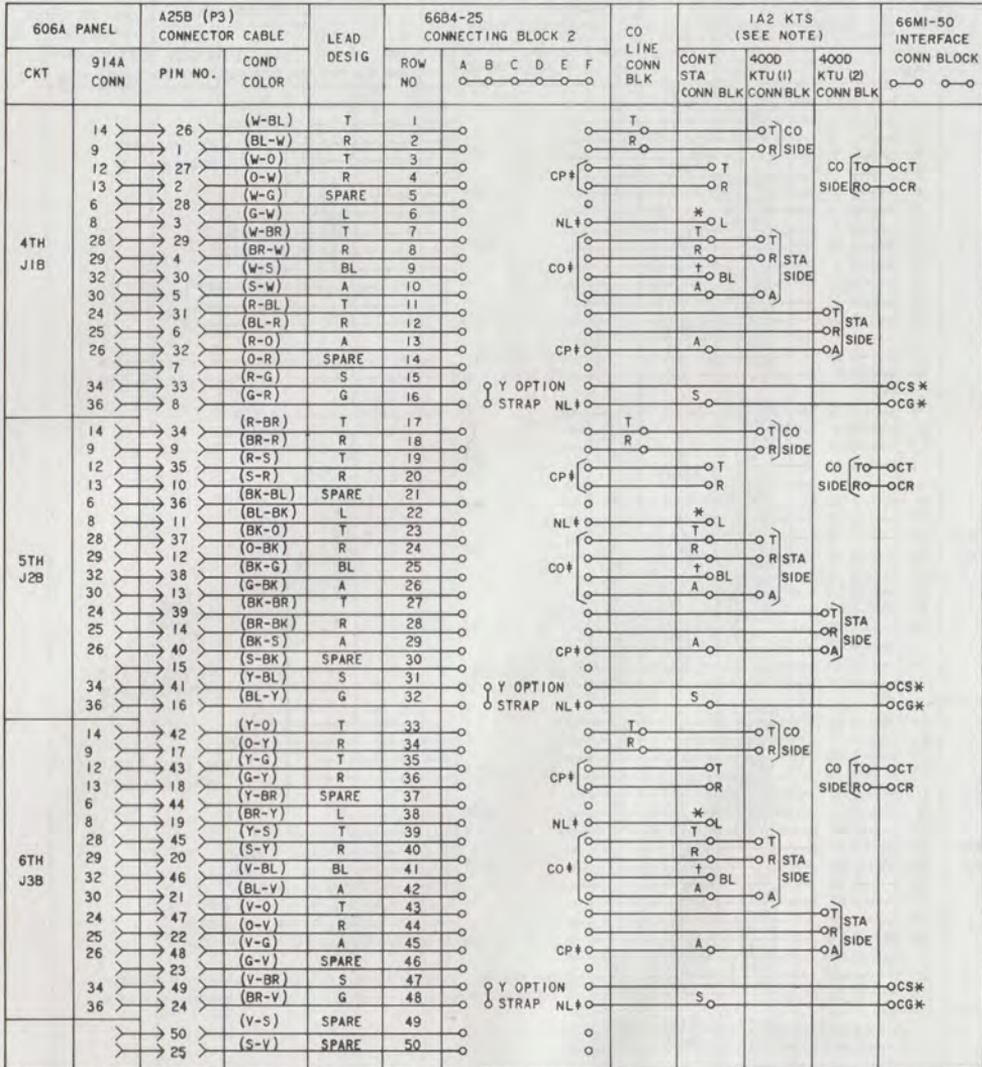
* Z OPTION (CONNECTING ARRANGEMENT CDN) † ASSOCIATED WITH KEY APPEARANCE AT CONTROL STATION. SEE FIG. 7
 † Y OPTION (CONNECTING ARRANGEMENT CD5)

NOTE:
 REFER TO FIG. 7 FOR ADDITIONAL CONTROL STATION CONNECTIONS TO 400D KTUS.

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Fig. 8—Connections for Voice Connecting Arrangement CDN or CD5 Using 69H Apparatus Mounting

CONNECTIONS FOR VOICE CONNECTING ARRANGEMENT CDN OR CD5



* Z OPTION (CONNECTING ARRANGEMENT CDN)
 † Y OPTION (CONNECTING ARRANGEMENT CD5)

‡ ASSOCIATED WITH KEY APPEARANCE AT CONTROL STATION. SEE FIG. 7

NOTE:
 CONNECT IA2 KTS POWER SUPPLY TO FUSE PANEL ON REAR OF 606A PANEL, REFER TO FIG. 7
 FOR ADDITIONAL STATION CONNECTIONS TO 400D KTU'S

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Fig. 10—Connections for Voice Connecting Arrangement CDN or CD5 Using 606A Panel

CD5 (Y Option)

(7) When step (4) is completed, the attendant may use other pickup buttons to answer incoming calls or establish outgoing calls or operate the HOLD key.



The attendant cannot go on-hook until conversation is terminated because TR relay is held operated by a ground through the switchhook contacts.

(8) By periodically monitoring the connection, the attendant determines when the conversation has been terminated and then goes on-hook to release the 111A IU and associated line units.

4.02 Outgoing Call from CP Intercom Station:

- On an outgoing call from a CP intercom station to be connected to a CO line, the attendant at the control station:

- (1) Places the intercom station on HOLD.
- (2) Depresses a button associated with a CO line.
- (3) Dials the requested CO number.
- (4) When connection is established between the Bell System control station and the CO line, the attendant depresses the nonlocking pushbutton to operate the TR relay of the associated 111A IU which completes a talking path between the CP intercom station and the CO line.

CDN (Z Option)

- (5) When step (4) is completed, the attendant may use other pickup buttons to answer incoming calls or establish outgoing calls or the attendant can go on-hook.
- (6) When the intercom station goes on-hook, the 111A IU and all associated line units are restored to normal.

CD5 (Y Option)

- (7) When step (4) is completed, the attendant may use other pickup buttons to answer

incoming calls or establish outgoing calls or operate HOLD key.



The attendant cannot go on-hook until conversation is terminated because TR relay is held operated by a ground through the switchhook contacts.

- (8) By periodically monitoring the connection, the attendant determines when conversation is terminated and then goes on-hook to release the 111A IU and associated line units.

5. MAINTENANCE

- 5.01** Check the CO line and check for blown fuses, loose or broken connections.
- 5.02** Open the four leads to the circuit under test at the interface connecting block by removing the B bridging clips (or wire straps) and perform the following tests:

CD5 (Y Option)

- (a) Using a 1013A (or equivalent) hand test set, clip to the tip and ring of the CO line associated with the 111A IU under test at the 66B4-25 connecting block.
- (b) Operate the switch on the hand test set to TALK; dial a CO number that will return 1000 Hz test tone.
- (c) Go off-hook and operate NL key on Bell System control key telephone set, momentarily. The TR relay should operate cutting through the transmission path.
- (d) Remove the hand test set from tip and ring of the CO line, operate switch to MON, and clip to terminals CT and CR at the 66M1-50 interface connecting block. 1000-Hz test tone should be heard.
- (e) Go on-hook at Bell System control key telephone set. The TR relay should release and 1000-Hz test tone will be removed.

CDN (Z Option)

- (a) Connect a strap between terminals CS and CG on the Telephone Company side of the 66M1-50 interface connecting block.
 - (b) Using a 1013A (or equivalent) hand test set, clip to the tip and ring of the CO line associated with the 111A IU under test, at the 66B4-25 connecting block.
 - (c) Operate the switch on the hand test set to TALK, dial a CO number that will return 1000-Hz test tone.
 - (d) Ground terminal CS on the 66M1-50 interface connecting block. TR relay should operate cutting through the transmission path.
 - (e) Remove the hand test set from tip and ring of CO line, operate switch to MON, and clip to terminals CT and CR at the 66M1-50 interface connecting block. 1000-Hz test tone should be heard.
 - (f) Remove ground from terminal CS and 1000-Hz test tone will still be heard.
 - (g) Remove the strap from terminals CS and CG; TR relay should release and the 1000-Hz test tone will be removed.
- 5.03** If the tests are not satisfactory, check wiring, battery and ground to unit. If battery and ground are present and wiring is correct, replace 111A IU and retest.

- 5.04** If the tests described are satisfactory, remove all test connections and replace the B bridging clips (or wire straps) on the interface connecting block.



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

6. CONNECTIONS

- 6.01** For connecting information using the 69H apparatus mounting, refer to Fig. 6, 7, and 8.
- 6.02** For connecting information using the 606A panel, refer to Fig. 6, 9, and 10.
- 6.03** The same power supply used for the 1A2 KTS should be used for the voice connecting arrangement.
- 6.04** Refer to the appropriate section in Division 518 for 1A2 KTS information and connections.
- 6.05** The following are typical connecting circuits.
- (a) Key Telephone System No. 1A2, CO or PBX line circuits—SD-69513-01.
 - (b) Dial Intercom and Miscellaneous Panels—SD-69608-01
 - (c) Key Telephone System No. 1A2; 513-, 514-, and 515-Type Key Service Units—SD-69597-01.