

## CONNECTING ARRANGEMENT KTX

### 1. GENERAL

**1.01** This section provides identification, installation, operation, maintenance and connection information for the 122A interconnecting unit (IU) and 606A panel, when used as Connecting Arrangement (CA) KTX.

**1.02** This CA provides a means for connecting customer-provided equipment (CPE), typically call restricting equipment, to a telephone company provided key telephone system (KTS).

**1.03** CA KTX enables the CPE to provide a distinctive call restricting tone, or announcement, as a signal to the key station user that he has dialed a restricted call.

**1.04** The 122A IU is equipped with two circuits (for two central office [CO] lines associated with the KTS) that interface with CP call restricting equipment.

**1.05** 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.

**1.06** This issue of the section is based on the following drawing : SD-69659-01, Issue 2—122A IU. If this section is to be used with equipment or apparatus reflecting later issues of the drawing, reference should be made to the SD to determine the extent of the changes and the manner in which the section may be affected.

### 2. IDENTIFICATION

#### PURPOSE

- Provides access to a CO line for CP call restriction equipment to detect off-hook, on-hook and dialing signals on the line for an outgoing call.
- Transfers the originating station from the CO line to the CPE when signaled by the CPE (call restricted mode).

- Permits the CPE to provide a restricted tone to the originating station.
- Detects CO ringing when the circuit is in the call restricted mode.
- Forces cut-through of the station to the CO line on an incoming call, when the station is in the call restricted mode.

#### APPLICATION

- For use with telephone company KTS 1A1 or 1A2, CO or PBX line circuits.

#### ORDERING GUIDE

- Unit, Interconnecting, 122A (one per two CO lines, Fig. 1).

#### Associated Equipment (Order Separately)

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

- Panel, 606A (one per three 122A IUs, Fig. 2 and 3)
- Bracket, 99B (for mounting panel on rack or in 16C apparatus mounting)
- Block, Connecting, 66M1-50 (as required, Fig. 4)
- Block, Connecting, 66B3-50 (as required, Fig. 5)
- Clip, Bridging, B (25 per pkg., Fig. 4)

**Note:** Other connecting blocks may be used when specified by local supervision.

- Cable, Connector, A25B (two per 606A panel)
- Cable, Inside Wiring, D, 16-Pair, or equivalent (for cabling from intermediate connecting block to KTS)

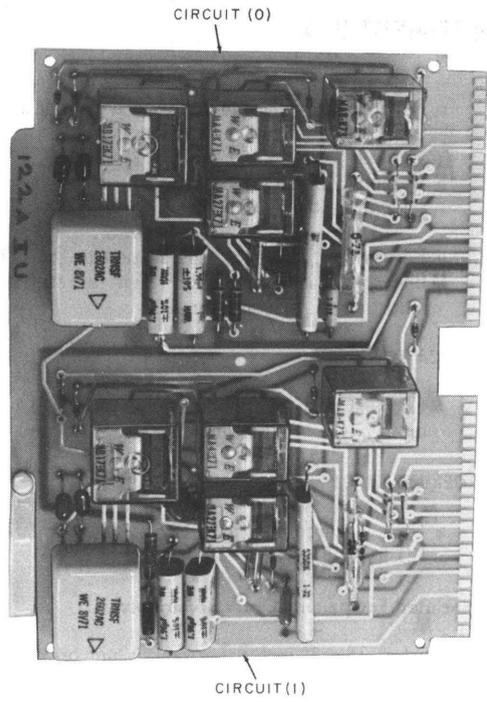


Fig. 1—122A Interconnecting Unit

- Cable, Inside Wiring, D, 25-pair, or equivalent (for cabling from intermediate connecting block to interface connecting block)
- Fuse, 24E, 1/2 ampere (eight per 606A panel)
- Unit, Power, 19C2 (or equivalent, if required, when KTS power supply is not sufficient)
- Cord, Power (for 19C2 power unit)
  - P40J326 (1-1/2 feet)
  - P40J327 (2 feet)
  - P40J328 (4 feet)
  - P40J329 (6 feet)
  - P40J099 (12 feet)

### DESIGN FEATURES

#### 122A IU

- Components for two circuits mounted on 8-inch printed circuit board.
- Maximum current drain for each of the two circuits is 0.090 ampere at 26V.
- Typical current drain per circuit is 0.077 ampere at 24V or 0.154 ampere per 122A IU.
- Maximum dc loop resistance of leads CS and CG is 50 ohms.
- Maximum dc resistance of lead A between one circuit of the 122A IU and KTU line circuit is 150 ohms.

#### 606A Panel

- Approximate size is 6 by 8 by 9 inches.
- Equipped with six 914A, 40-pin connectors wired to two KS-16671, List 1, 50-pin plugs.
- Mounts three 122A IUs (six CO lines).
- Fuse panel included (Fig. 3).
- Mounts on a 99B bracket, on a standard relay rack, or in a 16C apparatus mounting.

### 3. INSTALLATION (Fig. 5 and 6)

- 3.01** Locate the 606A panel close to the KTS equipment in an area free of dampness and dust and with adequate room for access to front and rear.
- 3.02** Mount the 606A panel on a 23-inch relay rack or 16C apparatus mounting using the 99B bracket for mounting. Remove the center mounting bar from the 16C apparatus mounting to provide adequate mounting space.
- 3.03** Mount the 66B3-50 intermediate connecting block within 25 feet of the 606A panel and close to the KTS line circuits. Mount the 66MI-50 interface connecting block close to the intermediate block and in a location mutually agreeable to the customer and with sufficient access for making

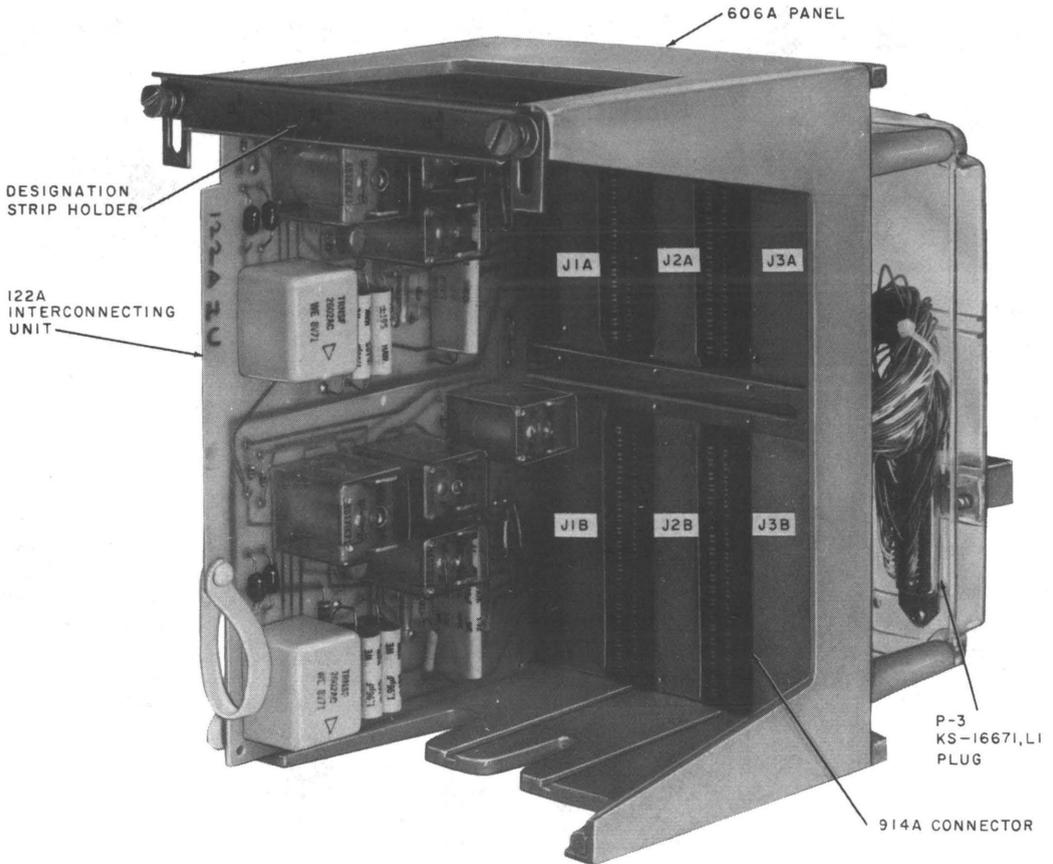


Fig. 2—122A IU Mounted in 606A Panel

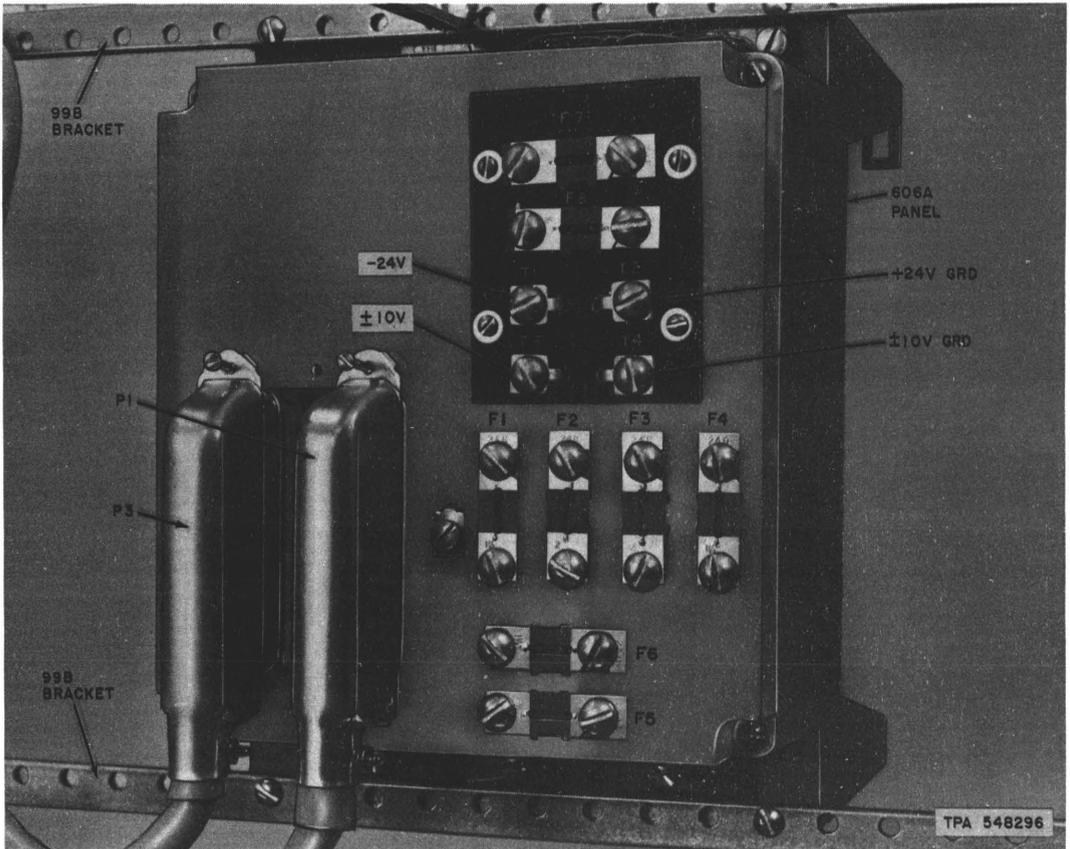
connections. The maximum dc loop resistance on the CS and CG leads from the 606A panel to the CPE should not exceed 50 ohms.

**3.04** Connect the two A25B connector cables to the two plugs, P1 and P3 (Fig. 3), on the rear of the 606A panel. P1 is wired to the three upper 914A connectors (J1A, J2A, J3A) and P3 is wired to the three lower 914A connectors (J1B, J2B, J3B). See Fig. 6 for connector and trunk arrangement in 606A panel. Terminate the raw ends of the two A25B connector cables on the 66B3-50 intermediate connecting block following the wiring plan shown in Fig. 5 and 6 and connections

shown in Fig. 8 and 9. **Do not use B bridging clips or wire straps** with the intermediate block. Terminate the cable from P1 on column A of the block and terminate the cable from P3 on column F (Fig. 8). Stencil lead designations on fanning strip.

**3.05** Use 16-pair "D" inside wiring cable to extend the T, R, and T, R, A leads from the intermediate block to the connecting block associated with the KTS line circuits.

**3.06** Use 25-pair "D" inside wiring cable to extend the eight interface leads for each of six



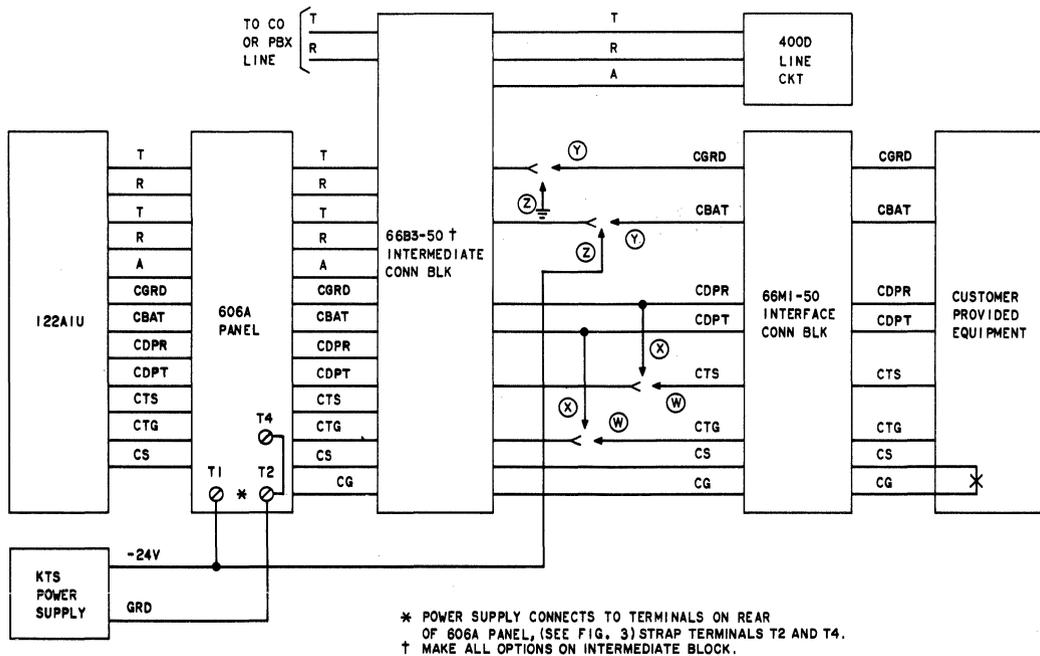
**Fig. 3—606A Panel-Rear View**

circuits from left and right sides of the 66B3-50 intermediate connecting block to 66M1-50 interface connecting block. Terminate by cutting cable down the interface block in standard even count code as shown by Fig. 9. Assign leads as required and shown in Fig. 9 for the 66B3-50 intermediate block. Refer to Fig. 5, 7, and 9 for options (see 6.02). Make all options on the intermediate block. If option Z is required, run  $-24V$  to the intermediate block and connect as shown in Fig. 9. Use B bridging clips to connect B and C columns together on interface block. Insulate and store unused leads at intermediate block. Stencil lead designations on fanning strip of interface block.

**3.07** Raise the designation strip holder on the 606A panel to provide access to connectors. Align the 122A IU in the mounting guides and slide it in until the printed wiring board is properly seated in the connector of the 606A panel. Lower the designation strip holder to lock IUs in panel; tighten screws if necessary to increase pressure of holder against IUs.

**3.08** Use D station wire, or equivalent, to connect the KTS power supply to terminals T1 ( $-24V$ ) and T2 (GRD) and strap T2 and T4 on rear of 606A panel. (See Fig. 3.) If KTS power supply is insufficient, use 19C2 power unit (or equivalent)





**Fig. 5—Block Diagram—Voice Connecting Arrangement KTX**

to supply power. Typical current drain is 0.154 ampere per 122A IU.

**3.09** Perform tests shown in Part 5 after installation is completed.

#### 4. OPERATION (Fig. 7)

##### Outgoing Call

**4.01** When a key telephone station goes off-hook and seizes the CO line, the station set grounds the A lead. Ground on lead A operates the A relay through its EMB4 contact. Hold current for the A relay is then provided through diodes CR6 and CR7. Relay A operated connects the CDPT and CDPR leads to tip and ring of line through resistors R2 and R1. The CPE detects the off-hook condition and dial pulsing or TOUCH-TONE® address signals over leads CDPT and CDPR.

**4.02** If the call is not to be restricted, the CPE provides no signal to the 122A IU in use.

If the CPE determines that the number being dialed is to be restricted, a momentary contact closure (at least 50 ms) from the CPE is provided on leads CG and CS. This closure grounds lead CS to operate relay CR (call restrict) through contact 4B of relay CI (call incoming).

**4.03** Relay CR is held operated from ground on lead A through diodes CR7, CR6, CR2, contact M1 of relay CR, and contact B4 of relay CI. Relay CR operated transfers the station T and R leads from the CO line to the CPE with contacts EMB2, EMB5, and M4 through transformer T1. It also connects the ring detector across the CO line with contact M3. The CPE may provide a tone or announcement on leads CTS and CTG (W option) or leads CDPT and CDPR (X option) to indicate to the station that the call has been restricted.

**4.04 Incoming Call in Restricted Mode:** An incoming call on the CO line, when the station is connected to the CPE, causes relay R (ring) to operate from the ringing signal. Contact M4 of

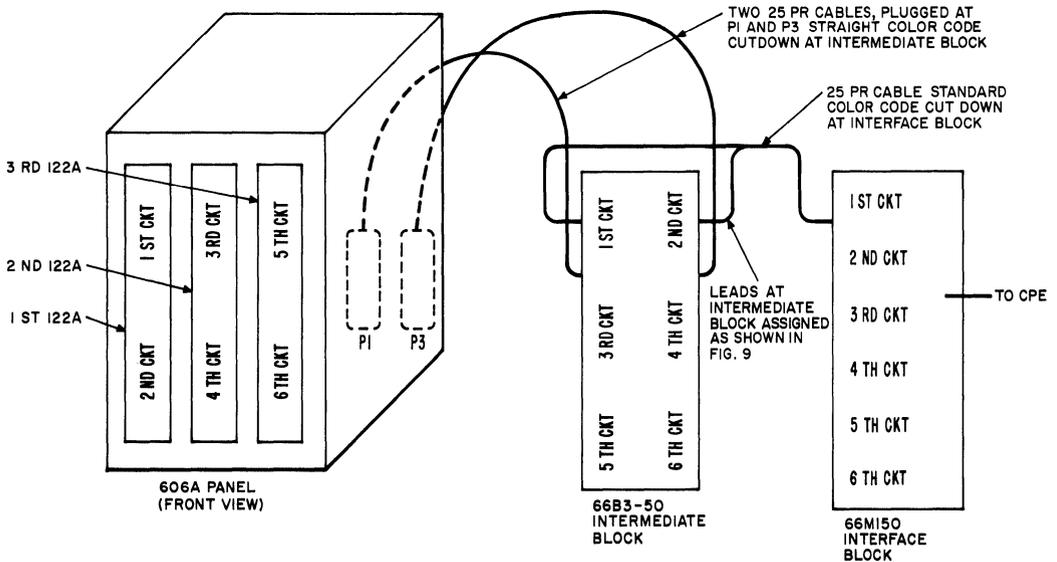


Fig. 6—Cabling Diagram—Voice Connecting Arrangement KTX

relay R operates relay CI from ground on lead A through diodes CR7, CR6, CR2 and contact M1 of operated relay CR. Relay CI holds operated through its own M1 contact to ground on lead A.

**4.05** Relay CI operated opens the hold path to relay CR with contact B4 and releases it. Relay CR released opens contact M3 to disconnect the ring detector from the CO line, opens contact M1 to release relay CI and operates contacts EMB2 and EMB5 to transfer the station T and R leads back to the CO line. Since the station is off-hook, CO ringing is tripped and the incoming call is completed to the station. This feature is included to insure that incoming calls will not be affected by the CP call restriction equipment.

**4.06 Station Disconnect in Restricted Mode:**

When the station is in the restricted mode, relays A and CR are operated. If the station goes on-hook, ground is removed from lead A and will cause relays A and CR to release. Relay A released disconnects the CDPT and CDPR leads from the station T and R leads. Relay CR released transfers the station T and R leads back to the CO line and the 122A IU returns to idle condition.

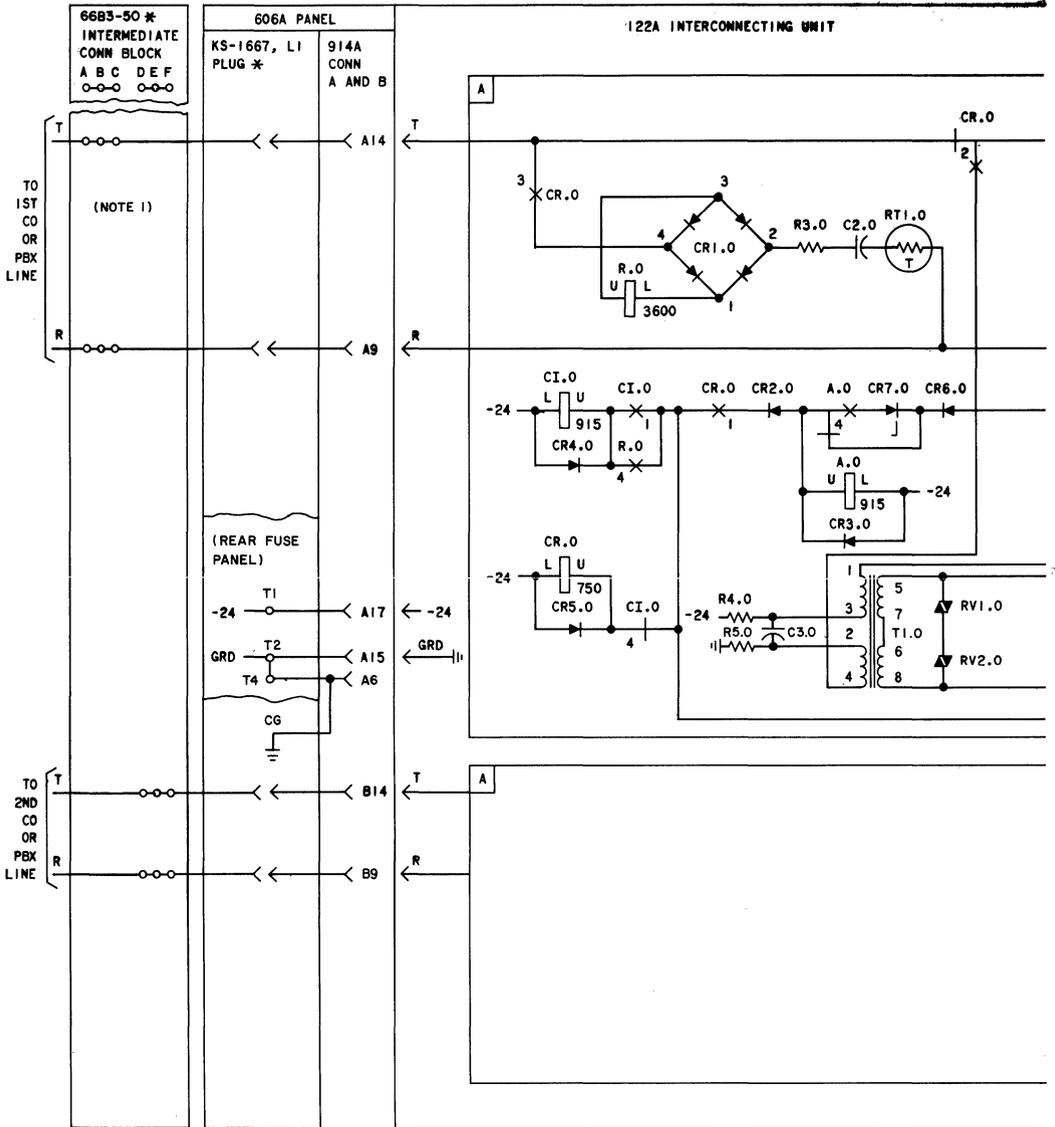
**4.07** The 122A IU circuit in use and the associated key telephone line circuit (400D KTU) have a common A lead. When these two circuits have separate power supplies, a condition can occur where a maximum of 6 volts may develop across relays A, CI, and CR when the A lead ground is removed (station goes on-hook). Zener diode CR7 has a breakdown voltage of approximately 4 volts which insures that the relays release on disconnect.

**5. MAINTENANCE**

**5.01** When trouble is reported, check for blown fuses, loose or broken connections and check the CO pair to the 122A IU in use.

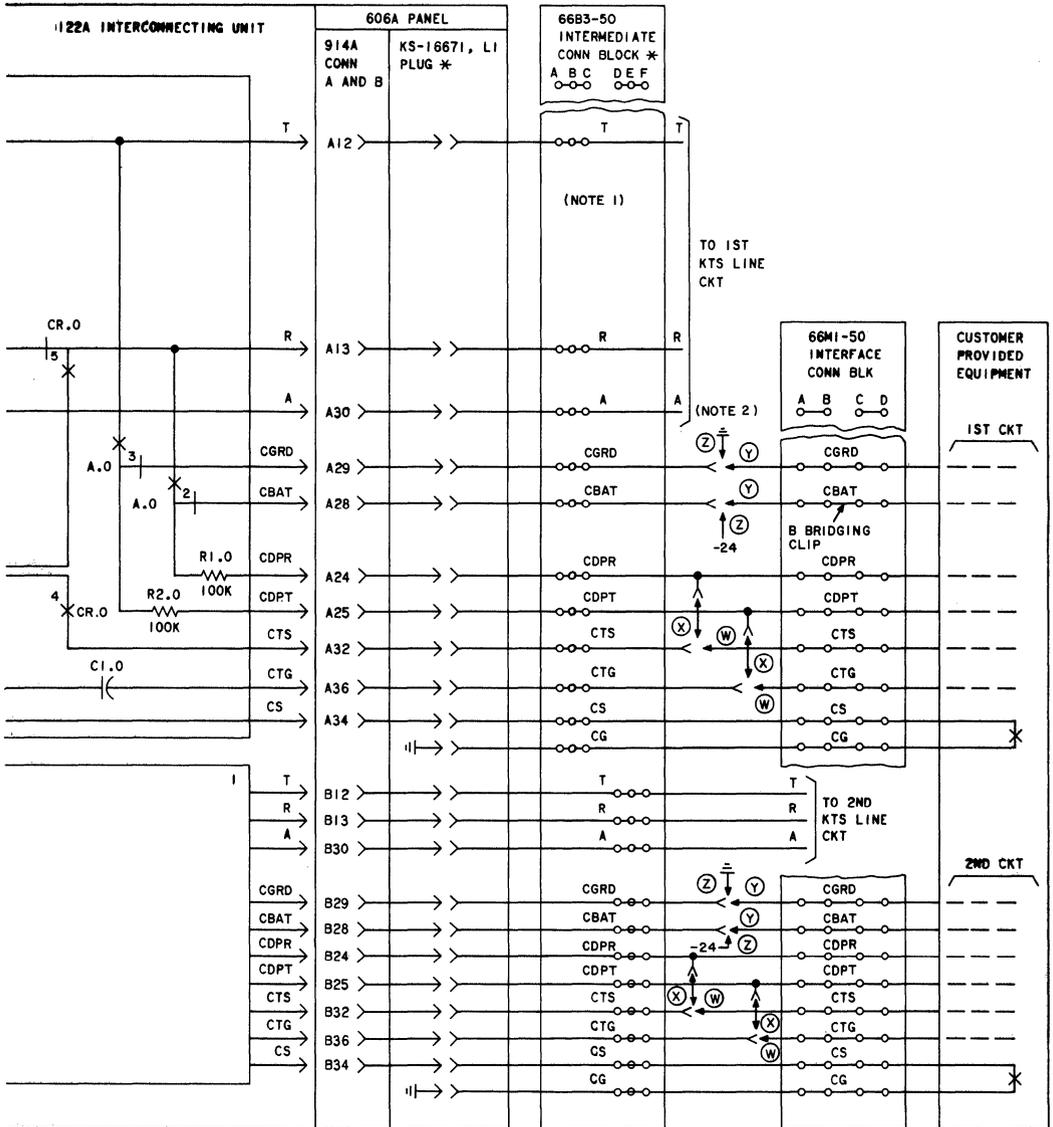
**5.02** Precautions should be taken when performing tests to avoid affecting service to the customer. Local instructions should be followed with reference to notifying the customer before performing tests.

**5.03** Open the leads to the circuit under test by removing the B bridging clips (or wire straps) at the 66M1-50 interface connecting block.



- \* REFER TO FIG. 8 FOR PIN OR TERMINAL NUMBERS.
- (W) CP CALL RESTRICTED TONE SIGNAL ON CTS AND CTG LEADS.
- (X) CP CALL RESTRICTED TONE SIGNAL ON CDPT AND CDPR LEADS.
- (Y) CP BAT AND GRD CONNECTED TO CDPT AND CDPR LEADS IN IDLE CONDITION.
- (Z) LOCAL BAT AND GRD CONNECTED TO CDPT AND CDPR LEADS IN IDLE CONDITION.

Fig. 7—Schematic-Voice Connecting Arrangement KTX (Sheet 1 of 2)



NOTES:

1. DO NOT USE B BRIDGING CLIPS ON INTERMEDIATE BLOCK. CIRCUITS 1, 3 AND 5 TERMINATE ON LEFT SIDE OF BLOCK, AND CIRCUITS 2, 4 AND 6 TERMINATE ON RIGHT SIDE OF BLOCK. SEE FIG. 9.
2. ALL OPTIONS ARE MADE ON INTERMEDIATE BLOCK

Fig. 7—Schematic-Voice Connecting Arrangement KTX (Sheet 2 of 2)

Make all test connections on the telephone company side of the interface connecting block.

**5.04** Prepare circuit for test as follows:

**Note:** —24V battery is present on the CBAT lead at the interface connecting block. Avoid shorting this lead to ground or to other leads.

- (a) Open the T, R, and A leads to the KTS line circuit. Connect a 1013A (or equivalent) hand test set to the T and R terminals to the KTS line circuit and connect a ground strap to the A lead terminal to be used later for grounding the A lead.
- (b) Connect a strap to terminal CG, to be used later for momentary connection to CS.
- (c) Connect a second 1013A (or equivalent) hand test set across terminals CT and CR; place test set in "MON" position.

**5.05** Perform tests as follows:

- (1) Place the switch of the first hand test set in the TALK position. After receiving dial tone, ground lead A and verify presence of —48V line voltage using a voltmeter across terminals CDPT and CDPK.
- (2) Momentarily strap CS to CG and verify absence of dial tone on hand test set at T and R.
- (3) Remove ground from lead A, receive dial tone, and dial the test desk and request ringing voltage be applied to line in 30 seconds. Ground lead A and momentarily strap CS to CG. The hand test set will be transferred to the CTS and CTG leads; when ringing voltage is received, the hand test set will be transferred back to the CO line.

**5.06** If tests are satisfactory, remove all test connections, replace all disconnected leads to return circuit to normal, and replace B bridging clips on 66M1-50 interface connecting block.

**5.07** When trouble is suspected in the 122A IU, exchange it with another unit known to be functioning properly.

**5.08** When trouble is suspected in the transmission path (T and R) or KTS circuits, use normal practices to perform circuit transmission tests.

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



**Do not attempt any tests or repairs on the CPE.**

## 6. CONNECTIONS

**6.01** For connecting information, refer to Fig. 3 through 9.

**6.02** Four, six or eight leads of the eight leads run from the intermediate block to the interface block may be used depending on requirements of the CPE. The monitoring leads CDPT and CDPK and call restricting leads CS and CG are always required. The restricted tone leads CTS and CTG (option W) are used when the CPE requires separate leads for returning the call restricted tone. Option X is used when the restricted tone is returned on the CDPT and CDPK leads. The customer power leads CBAT and CGRD (option Y) are used when the customer supplies battery to his CDPT and CDPK leads in the idle condition. Option Z is used when local battery and ground are connected to the CDPT and CDPK leads. Options Z and Y are not used when an open circuit is required on leads CDPT and CDPK during idle condition.

**6.03** Options W and Y do not require any special strapping; they are connected by the wiring between the connecting blocks. Refer to Fig. 9 for details of strapping options X and Z. Disconnect unused leads; insulate and store at intermediate block.

**6.04** The following are typical connecting circuits:

- (a) Key Telephone Systems No. 1A2—CO or PBX Line Circuits—SD-69513-01
- (b) Key Telephone Systems No. 1A1—CO or PBX Line Circuit—SD-69270-01

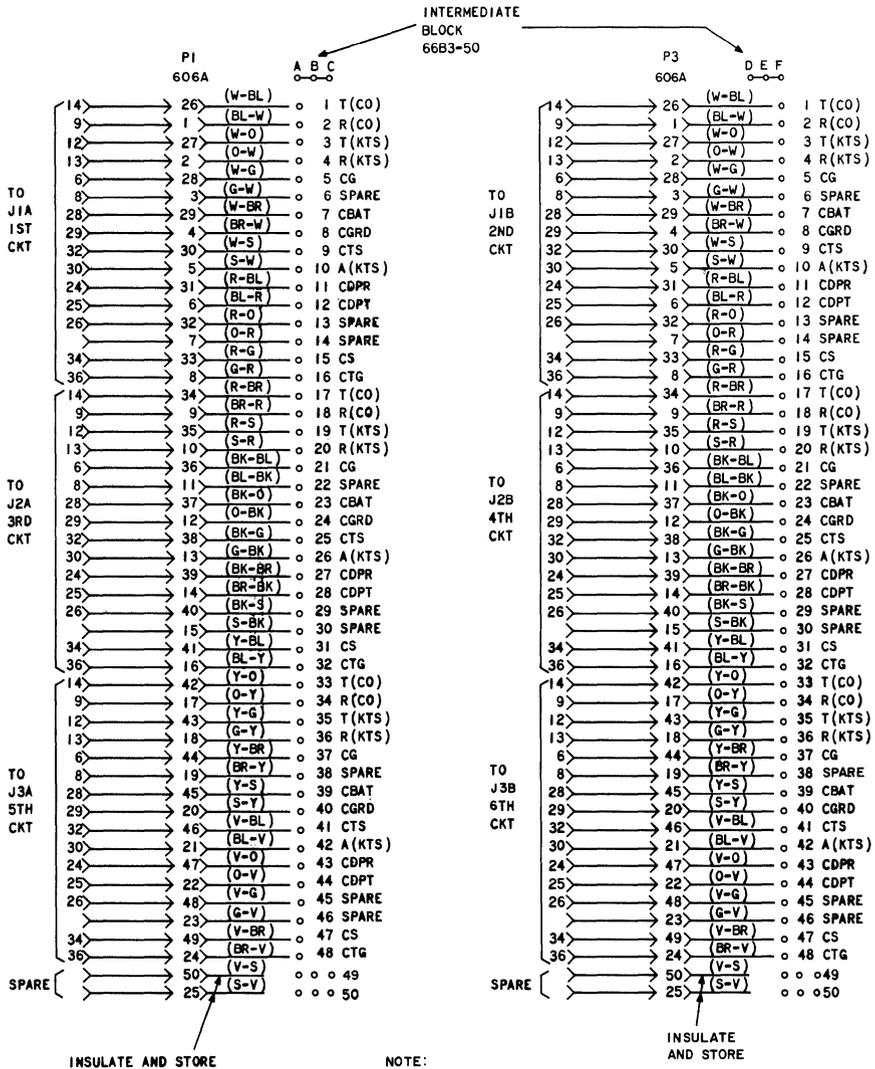


Fig. 8—Connections for Plugs P1 and P3 to Intermediate Block

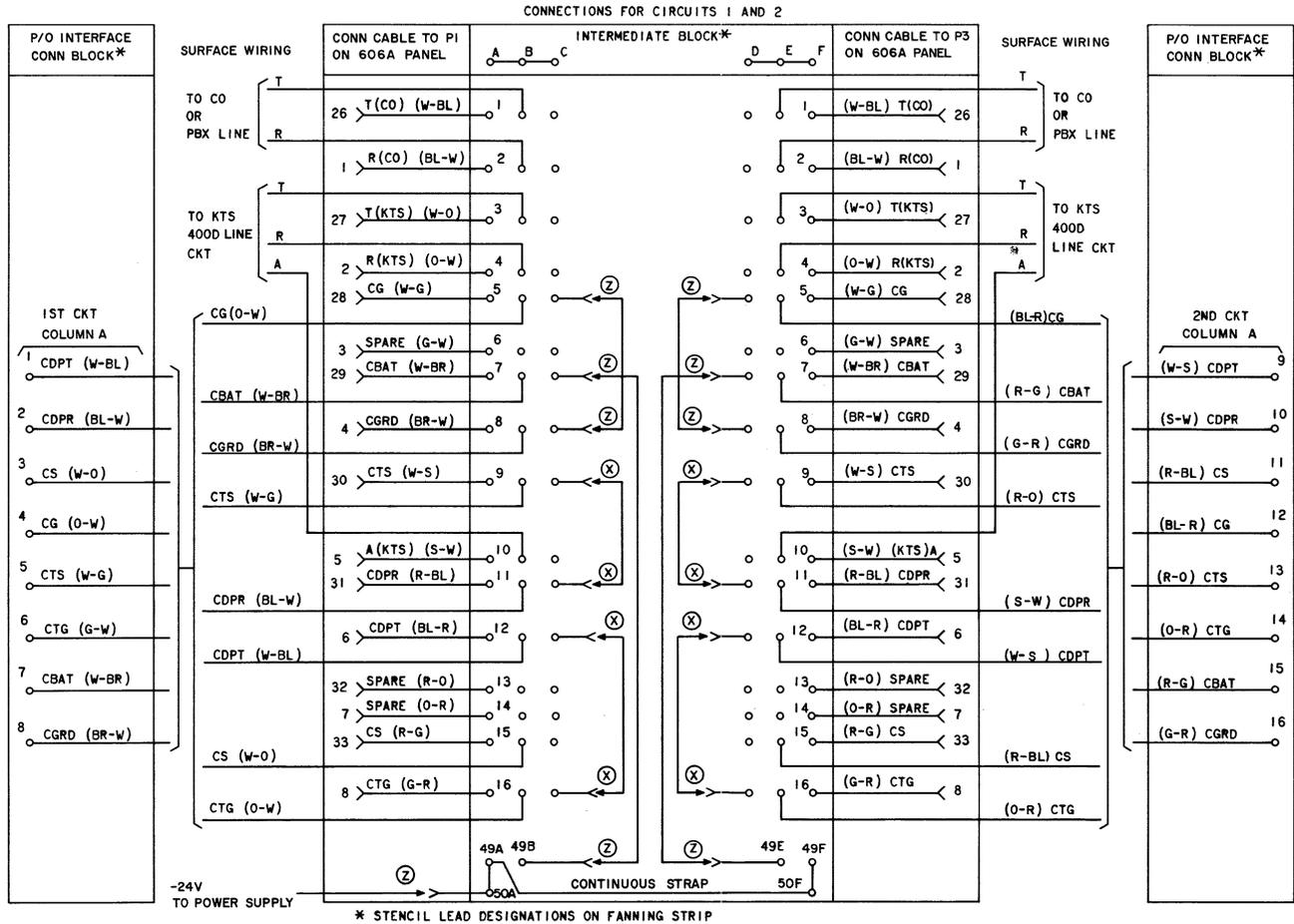
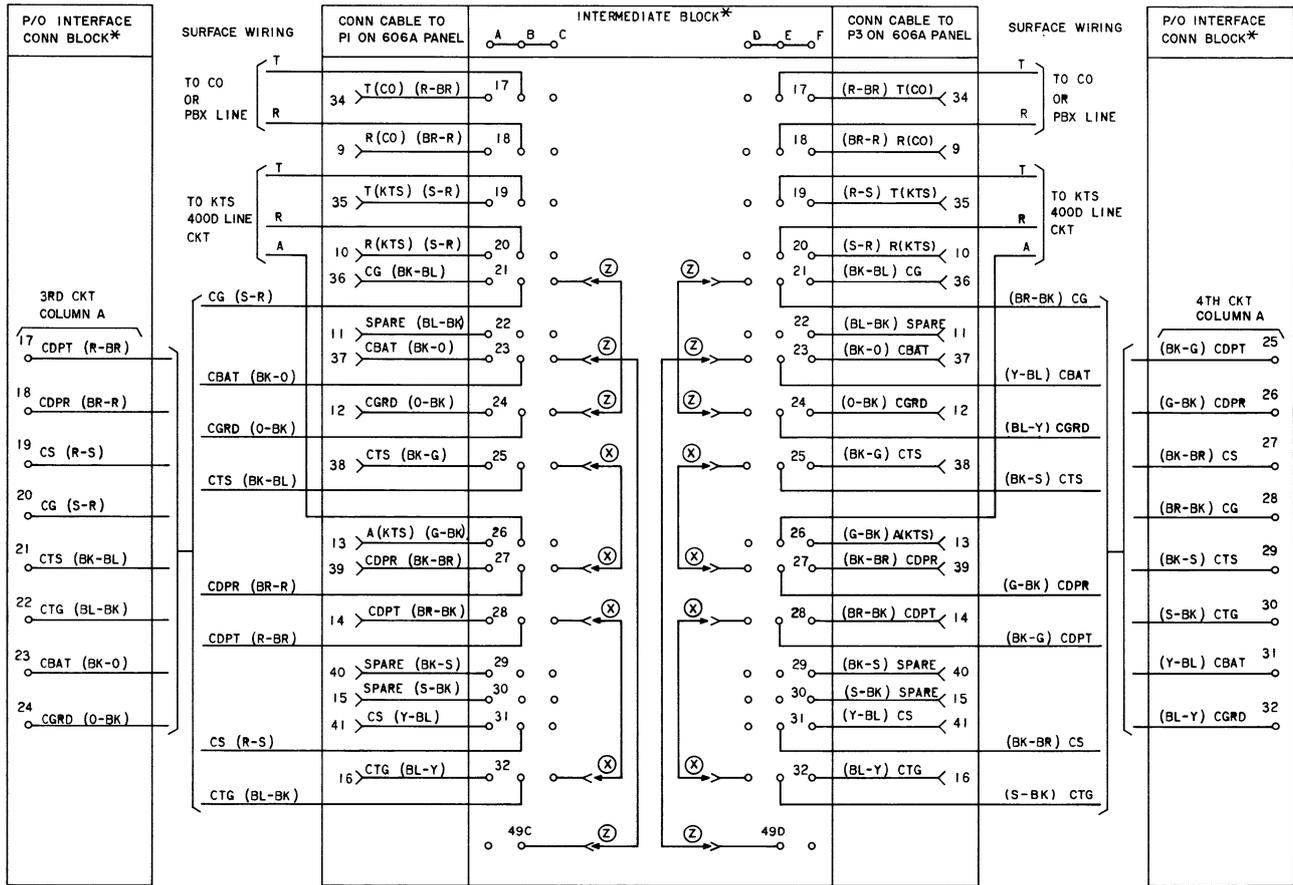


Fig. 9—Connections From Intermediate Connecting Block to Interface Connecting Block (Sheet 1 of 3)

CONNECTIONS FOR CIRCUITS 3 AND 4



\* STENCIL LEAD DESIGNATIONS ON FANNING STRIP

Fig. 9—Connections From Intermediate Connecting Block to Interface Connecting Block (Sheet 2 of 3)

