VOICE CONNECTING ARRANGEMENTS CEBAV AND CEBAW
111A INTERCONNECTING UNIT
69H APPARATUS MOUNTING
606A PANEL

1. GENERAL

1.01 This section provides identification, installation, operation, maintenance, and connection information on the 111A Interconnecting Unit (IU), formerly designated 432A KTU, and on the 69H apparatus mounting or 606A panel arranged to provide Voice Connecting Arrangements CEBAV and CEBAW which are used to couple Central Office (CO), Centrex, or PBX lines terminated on a key telephone set to customer-provided (CP) equipment.

1.02 This section is being reissued to include information on the 606A panel.

1.03 Voice Connecting Arrangements CEBAV and CEBAW provide for voice frequency coupling between a Bell System CO line and the CP equipment through a Bell System provided key telephone system (KTS). Supervision and network control signaling are provided by a Bell System key telephone station.

1.04 The size of the 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 or two 111A IUs and the 606A panel for three to six 111A IUs.

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-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 of connecting CP equipment, typically, communications systems (CEBAW) or announcement service (CEBAV) to key telephone system lines using a multibutton key telephone set as the controlling station.
- To hold the CO line circuit in a busy state
- To limit excessive levels from CP equipment and to provide protection for personnel against hazardous voltages
- To trip CO ringing if present on the line (CEBAV).

APPLICATION

- 1A2 Key Telephone Systems

ORDERING GUIDE

- Unit, Interconnecting, 111A (Fig. 1) formerly designated 432A KTU (one per CO line)

Associated Apparatus (Order Separately)

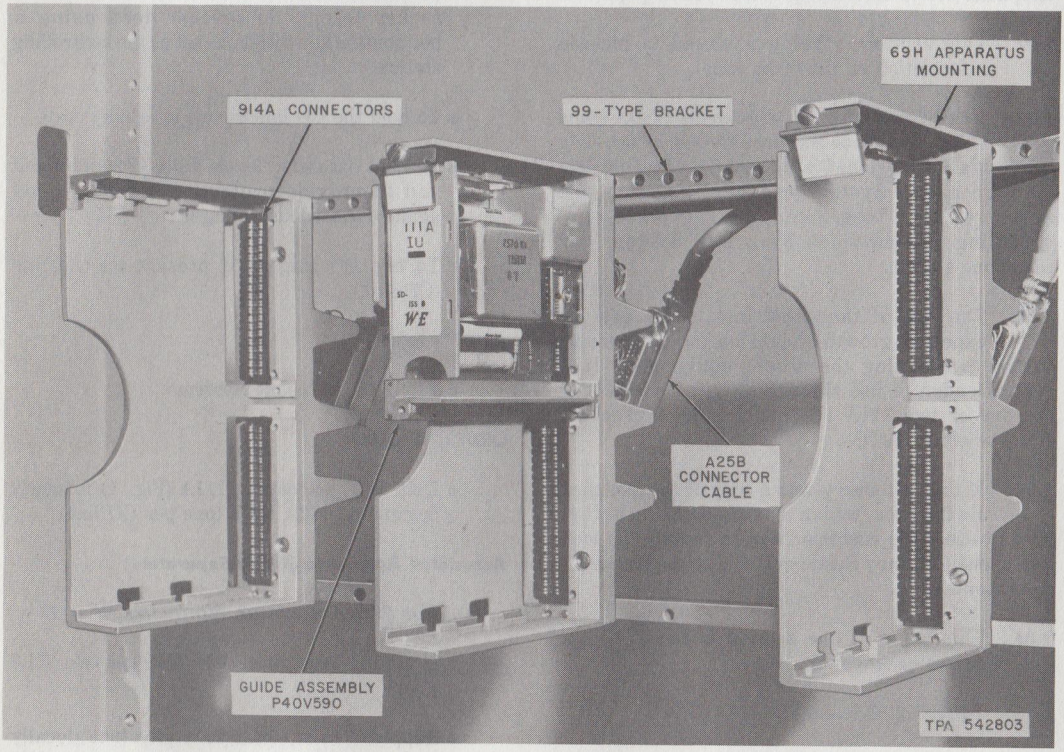
(a) ***For 69H Apparatus Mounting (Fig. 1)***

- Mounting, Apparatus, 69H (one per two 111A IUs)
- Supply, Power, 19C2 or equivalent (locally engineered and installed when existing KTS power supply is insufficient)

- Block, Connecting, 66M1-50 (Fig. 2, as required)
- Clip, Bridging, B (Fig. 2, as required)
- Wire, "D" inside, or equivalent (for cabling from 66M1-50 intermediate connecting block to 66M1-50 interface connecting block)
- Cable, Connector, A25B (one per 69H apparatus mounting)
- Diode, KS-15724, List 1, or equivalent (one per each key telephone set used as a control station)
- Bracket, 99-Type

(b) ◗*For 606A Panel (Fig. 3 and 4)*

- Panel, 606A (one per six 111A IUs)
- Supply, Power, 19C2 or equivalent (locally engineered and installed when existing key telephone system power supply is insufficient)
- Block, Connecting, 66M1-50 (as required)
- Clip, Bridging, B (Fig. 2, as required)
- Wire, "D" inside, or equivalent (for cabling from 66M1-50 intermediate connecting block to 66M1-50 interface connecting block)
- Cable, Connector, A25B (2 per 606A panel)
- Diode, KS-15724, List 1, or equivalent (one per each key telephone set used as a control station)



◗**Fig. 1—69H Apparatus Mounting With 111A Interconnecting Unit**◖

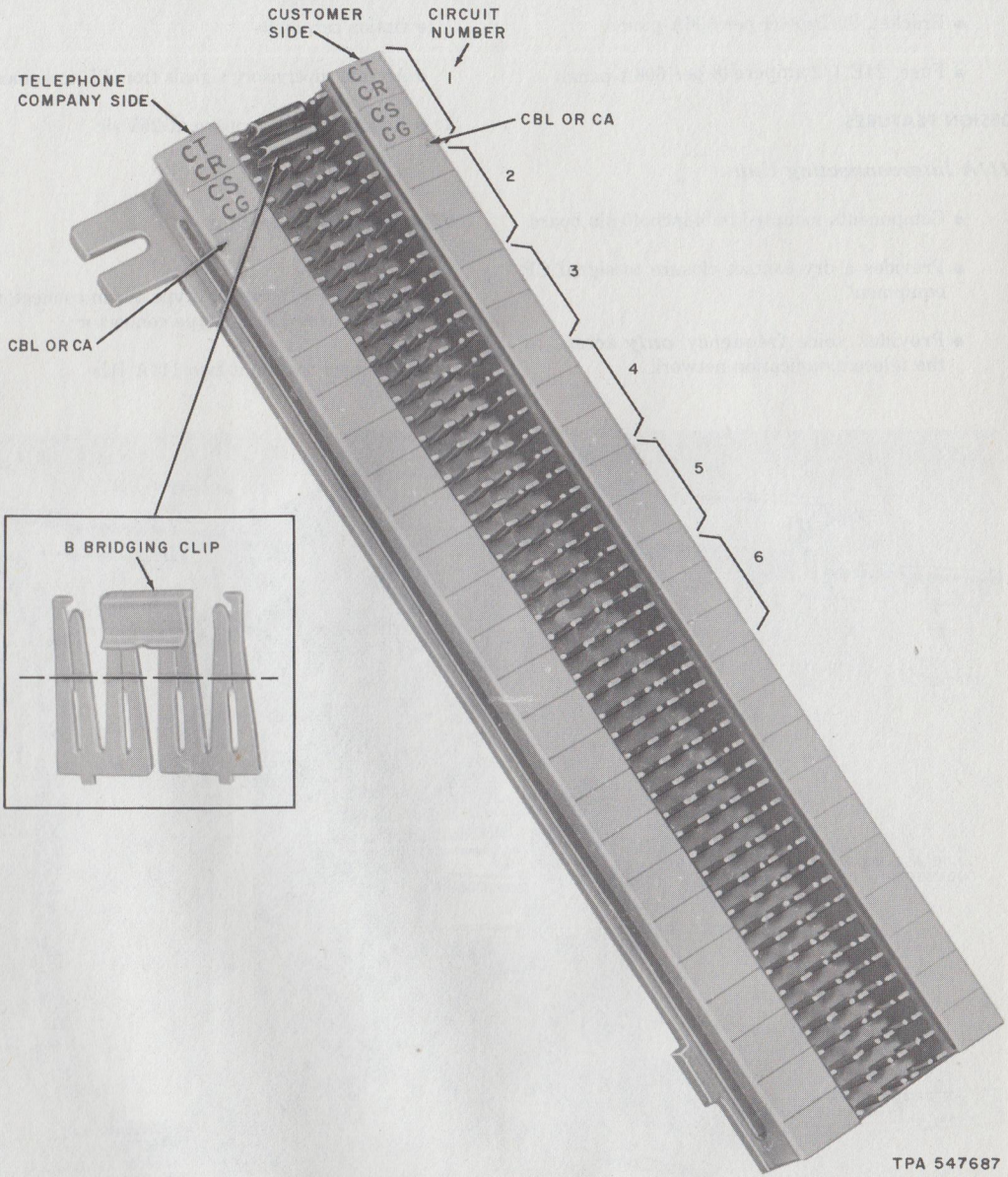


Fig. 2—66M1-50 Interface Connecting Block

- Bracket, 99-Type (1 per 606A panel)
- Fuse, 24E 1/2 ampere (8 per 606A panel)

DESIGN FEATURES

111A Interconnecting Unit

- Components mounted on 4-inch 40-pin board
- Provides a dry contact closure to signal CP equipment
- Provides voice frequency ***only*** access to the telecommunication network
- Option terminals
- Accepts supervisory signals from CP equipment
- Requires 0.047 ampere at 26V dc

69H Apparatus Mounting

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

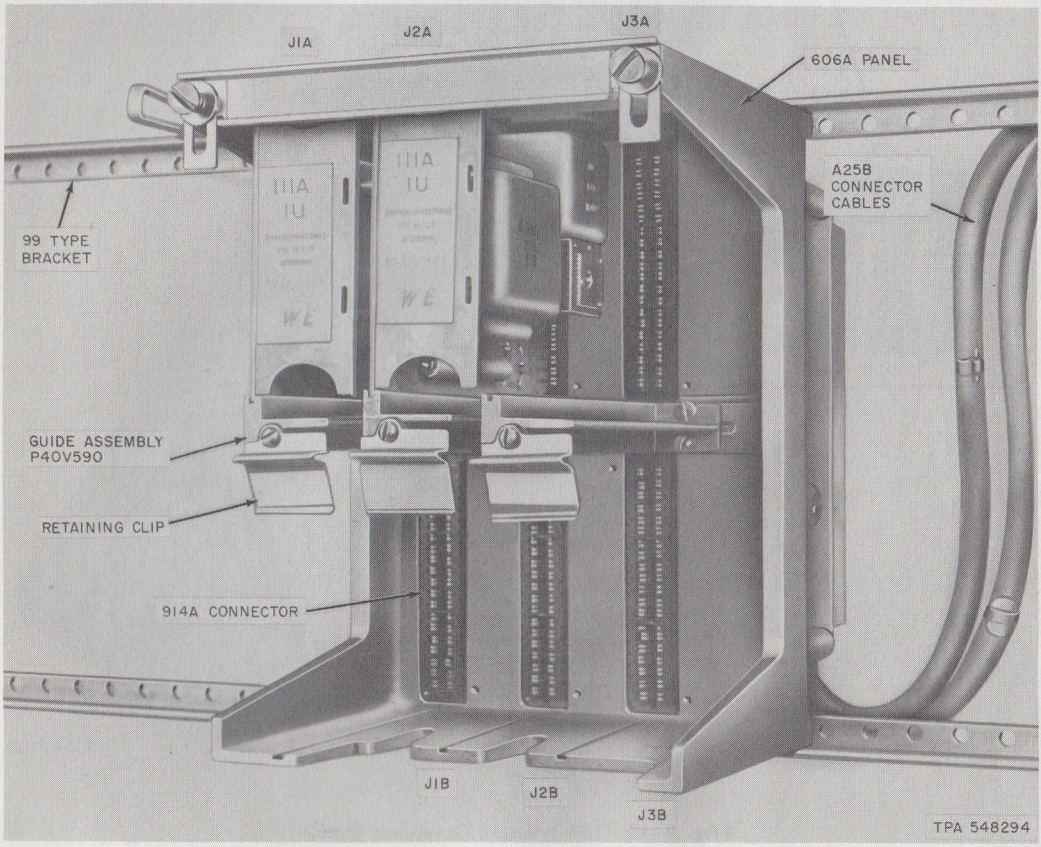


Fig. 3—606A Panel With 111A Interconnecting Unit

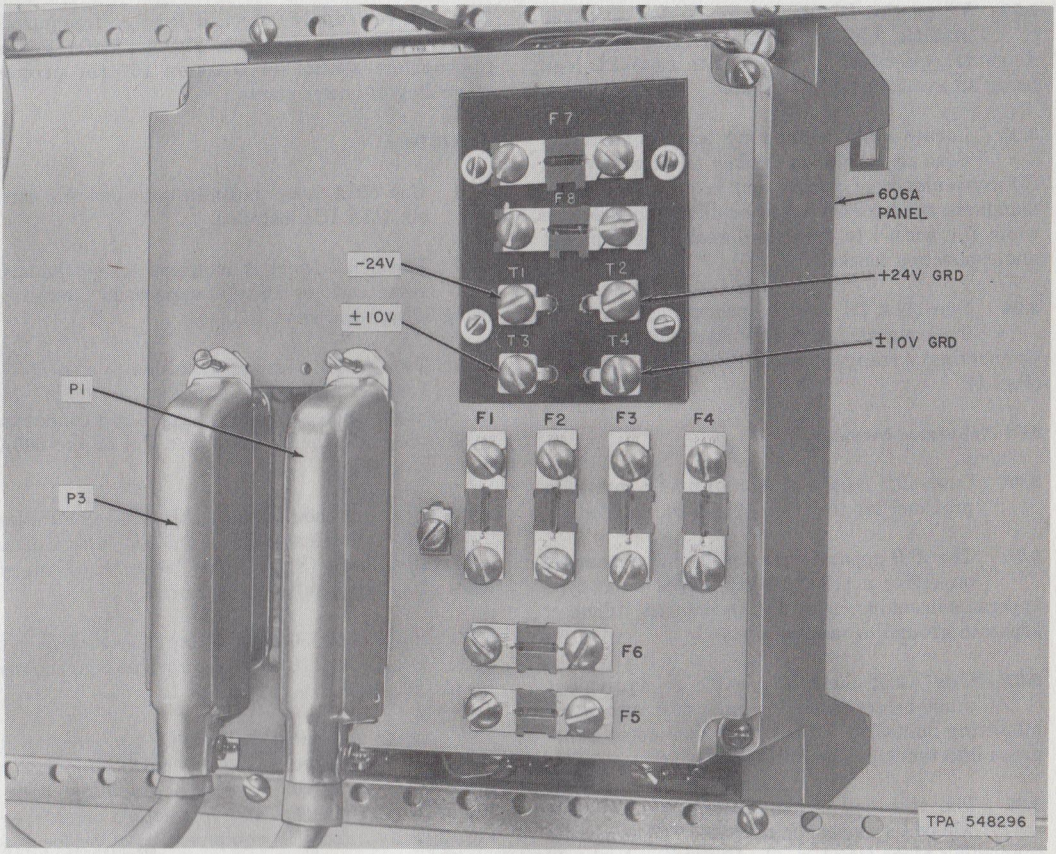


Fig. 4—606A Panel (Rear View)

- For mounting on standard relay rack or on 16-type apparatus mountings using 99A or 99B brackets.

606A Panel

- Equipped with six 914-type 40-pin connectors factory wired to two KS-16671 50-pin plugs
- Designed to mount six 111A IUs
- For mounting on standard relay rack or on 16-type apparatus mountings using 99-type brackets
- Fuse panel included
- Approximate size 6 by 8 by 9 inches

3. INSTALLATION

General

3.01 A KS-15724, List 1 diode or equivalent must be installed as a station busy lamp circuit in each control station for Voice Connecting Arrangement CEBAV as shown in Division 502, Section entitled 2565HK Telephone Sets.

3.02 When the BL lead is multipled to other stations (CEBAV) install a KS-15724, List 1 diode or equivalent in series with each BL lead using an available spare terminal.

3.03 Locate voice connecting arrangements as close as possible to the key telephone system for convenience of wiring and in an area free of dampness and excessive dust or dirt, with adequate room for access to front and rear of equipment and connecting blocks.

3.04 One 111A IU must be provided for each CO line connected to the CP equipment for Voice Connecting Arrangements CEBAV and CEBAW (Fig. 5).

69H Apparatus Mounting

3.05 One 69H apparatus mounting must be provided for each two 111A IUs installed.

3.06 The 69 H apparatus mounting can be mounted on either a standard relay rack or 16-type apparatus mounting, using 99-type brackets. (Connect separate ground to rack or mounting.)

3.07 One A25B connector cable or equivalent must be provided for each 69H apparatus mounting installed. The A25B connector cable plugs into the 69H apparatus mounting.

3.08 The stub end of the A25B connector cable will be terminated on the 66M1-50 intermediate connecting block (see Fig. 6). Unused leads should be insulated and stored.

3.09 Install 66M1-50 intermediate connecting blocks as required (one block will accommodate connections for six 111A IUs).

3.10 Leads associated with the CP equipment will be terminated on an interface connecting block (66M1-50). Circuit numbers or lead designations should be stenciled on the connecting block (see Fig. 2 and 6). The CP equipment must be located so that maximum loop resistance of the CA, CS leads does not exceed 50 ohms measured at the interface connecting block.

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

3.12 Power supply (supplied locally, if required) connects as shown in Fig. 6. Refer to the appropriate section in Division 167 for proper grounding of power plants.

606A Panel

3.13 One 606A panel must be provided for each six 111A IUs installed.

3.14 The 606A panel is mounted on a standard relay rack or 16-type apparatus mounting using 99-type brackets.

3.15 Two A25B connector cables are used to connect the 606A panel to the 66M1-50 intermediate connecting block. The A25B connector cables plug into the back (P1 and P3) of the 606A panel (Fig. 4).

3.16 The stub ends of the A25B connector cables will be terminated on the 66M1-50 intermediate connecting block (Fig. 7 and Table A). Unused leads should be insulated and stored.

3.17 Install 66M1-50 intermediate connecting blocks as required. One block provides connections for six 111A IUs.

3.18 Leads associated with the CP equipment will be terminated on an interface connecting block (66M1-50). Circuit numbers or lead designations should be stenciled on the connecting block (see Fig. 2 and 7). The CP equipment must be located so that maximum loop resistance of the CA, CS leads does not exceed 50 ohms measured at the interface connecting block.

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

3.20 Power supply (supplied locally, if required) connects as shown in Fig. 4. Refer to the appropriate section in Division 167 for proper grounding of power plants.

111A Interconnecting Unit

3.21 Strap W option, when required, per Fig. 8 before installing IU in apparatus mounting. Check option strap for continuity.

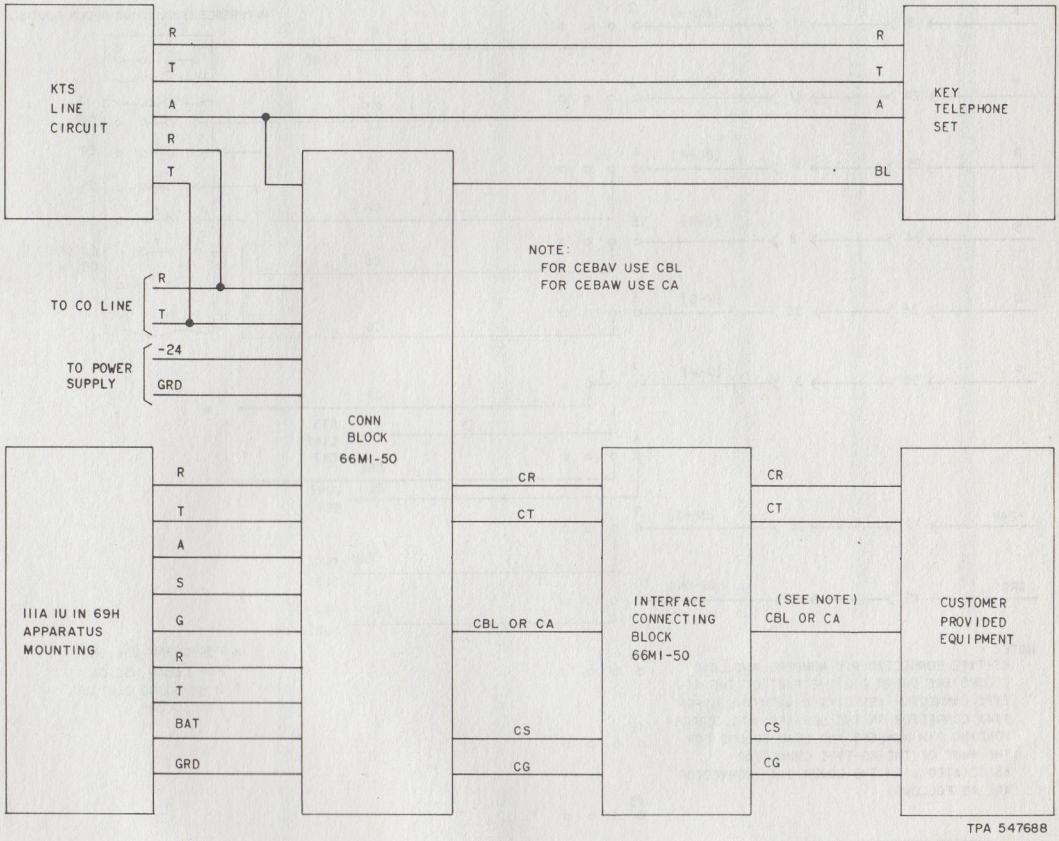
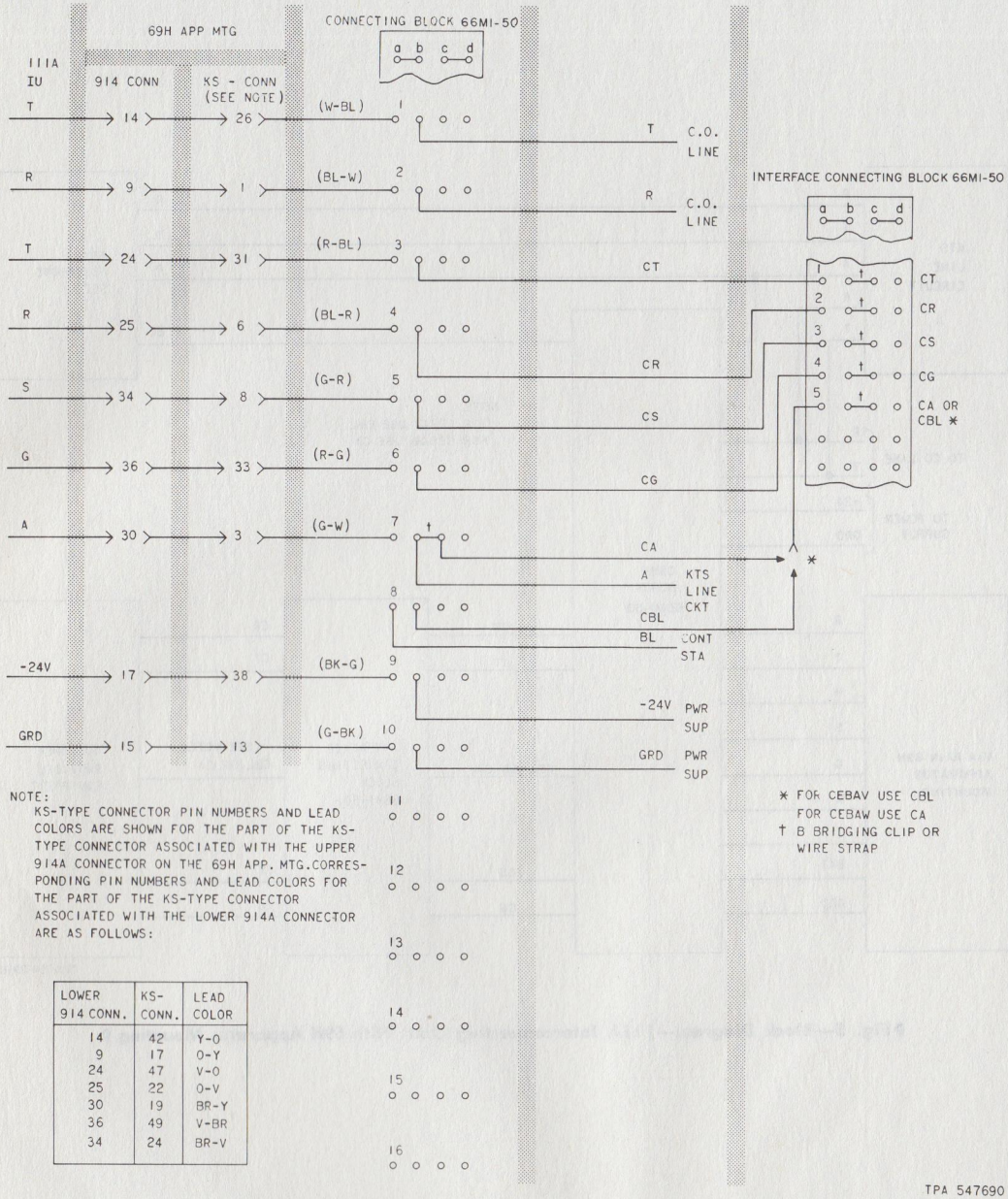


Fig. 5—Block Diagram—111A Interconnecting Unit With 69H Apparatus Mounting



NOTE:
KS-TYPE CONNECTOR PIN NUMBERS AND LEAD COLORS ARE SHOWN FOR THE PART OF THE KS-TYPE CONNECTOR ASSOCIATED WITH THE UPPER 914A CONNECTOR ON THE 69H APP. MTG. CORRESPONDING PIN NUMBERS AND LEAD COLORS FOR THE PART OF THE KS-TYPE CONNECTOR ASSOCIATED WITH THE LOWER 914A CONNECTOR ARE AS FOLLOWS:

LOWER 914 CONN.	KS-CONN.	LEAD COLOR
14	42	Y-O
9	17	O-Y
24	47	V-O
25	22	O-V
30	19	BR-Y
36	49	V-BR
34	24	BR-V

Fig. 6—Connections for 69H Apparatus Mounting

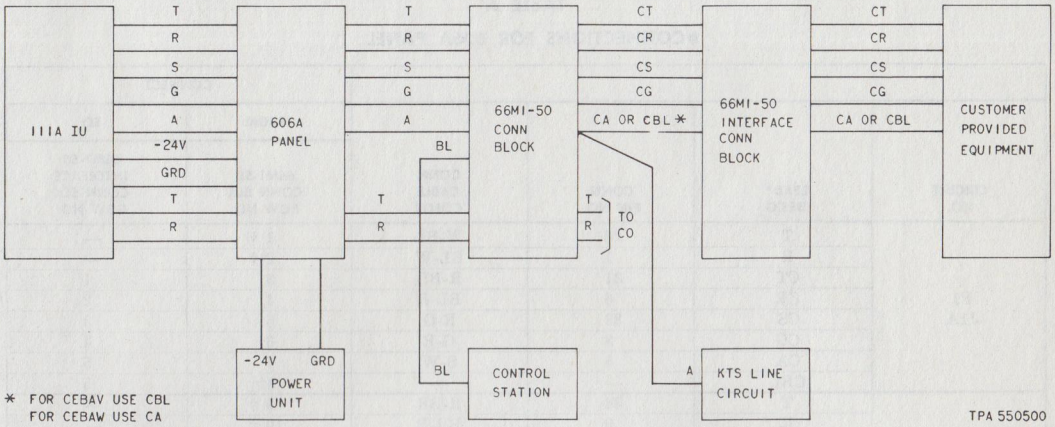


Fig. 7—Block Diagram—111A Interconnecting Unit With 606A Panel

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

3.23 Align IU in mounting guides and properly seat connector of printed wiring board in connector of mounting.

3.24 Position retaining clip or designation bar on rear of IU and tighten screw.

3.25 Stencil circuit and connection information as required to designation strip or retaining clip.

3.26 Perform tests shown in Part 5 after installation.

4. OPERATION (Fig. 8)

Connection—Voice Connecting Arrangement CEBAV (V Option)

4.01 When the Bell System control station is busy (off-hook) and receives an incoming call on another CO line, the CP announcement device can connect to this CO line through the IU by operating the CP locking key (make contact) associated with this line. This will complete an operate path for the TR relay over the CS, CA, and *A* lead to the A1 ground. The TR relay will remain operated under the control of the CP equipment and the handset of the Bell System key telephone set.
TR relay operated:

(a) Connects ground potential to the associated *A* lead holding the CO line circuit in the busy state.

(b) Connects the transmission path from transformer T1 to the CP delayed announcement device via CR and CT leads.

(c) Connects T and R leads of transformer T1 to the CO line, which will trip the CO ringing and provide a dc holding path for the CO line, as well as a transmission path through the IU to the CP equipment.

4.02 Capacitor C2 blocks dc from transformer T1 and the varistors. Varistors RV1 and RV2 serve as power limiting devices.

4.03 ***Bell System Station Disconnect:*** The control station handset must remain off-hook to maintain interconnection between the Bell System CO line and the CP announcement device. Disconnect can be achieved by placing the handset on-hook which in turn removes ground from the TR relay in the associated IU and disconnects the CP equipment restoring the circuit to normal. When there are multiple stations associated with this

TABLE A

◗CONNECTIONS FOR 606A PANEL

				CONNECT	
				FROM	TO
CIRCUIT NO.	LEAD* DESIG	CONN PIN NO.	CONN CABLE COLOR	66M1-50 CONN BLK ROW NO.	66M1-50 INTERFACE CONN BLK ROW NO.
P1 J1A	T	26	W-BL	1 †	—
	R	1	BL-W	2 †	—
	CT	31	R-BL	3	1
	CR	6	BL-R	4	2
	CS	33	R-G	5	3
	CG	8	G-R	6	4
	CA	5	S-W	7	5
	CBL	—	—	8††	5
P1 J2A	T	34	R-BR	9 †	—
	R	9	BR-R	10 †	—
	CT	39	BK-BR	11	6
	CR	14	BR-BK	12	7
	CS	41	Y-BL	13	8
	CG	16	BL-Y	14	9
	CA	13	G-BK	15	10
	CBL	—	—	16††	10
P1 J3A	T	42	Y-O	17 †	—
	R	17	O-Y	18 †	—
	CT	47	V-O	19	11
	CR	22	O-V	20	12
	CS	49	V-BR	21	13
	CG	24	BR-V	22	14
	CA	21	BL-V	23	15
	CBL	—	—	24††	15
P3 J1B	T	26	W-BL	25 †	—
	R	1	BL-W	26 †	—
	CT	31	R-BL	27	16
	CR	6	BL-R	28	17
	CS	33	R-G	29	18
	CG	8	G-R	30	19
	CA	5	S-W	31	20
	CBL	—	—	32††	20
P3 J2B	T	34	R-BR	33 †	—
	R	9	BR-R	34 †	—
	CT	39	BK-BR	35	21
	CR	14	BR-BK	36	22
	CS	41	Y-BL	37	23
	CG	16	BL-Y	38	24
	CA	13	G-BK	39	25
	CBL	—	—	40††	25
P3 J3B	T	42	Y-O	41 †	—
	R	17	O-Y	42 †	—
	CT	47	V-O	43	26
	CR	22	O-V	44	27
	CS	49	V-BR	45	28
	CG	24	BR-V	46	29
	CA	21	BL-V	47	30
	CBL	—	—	48††	30
	SPARE	—	—	49	—
	SPARE	—	—	50	—

* Stencil Lead Designations on Fanning Strips.
† Connections to CO Lines.
†† Connect to BL Lead of Key Telephone Set.

arrangement, all stations must be on-hook to effect release of the 111A IU.

4.04 ***Customer-Provided Equipment Disconnect:*** Disconnect can be achieved by releasing the associated locking key to open its contact. This removes ground from the CS lead of the associated IU to release its TR relay which will disconnect the CP equipment and restore the circuit to normal.

Connection—Voice Connecting Arrangement CEBAW (W Option)

4.05 To connect the CP communication system to the CO line through the IU a call is first established on the associated CO line at the Bell System station. The normally open (make) contact which is furnished in the CP communication system is then operated. This will complete an operate path for TR relay over CS, CA, and ***A*** leads to A1 ground. Another CP normally open contact is operated to provide a lockup path for TR relay over CG and CS leads. TR relay operated:

(a) Connects ground potential to the CG lead holding the TR relay operated under the control of the CP equipment.

(b) Closes ground potential to the associated ***A*** lead holding the CO line circuit in the busy state.

(c) Connects the transmission path from transformer T1 to the CP communications system via the CR and CT leads.

(d) Connects the T and R path of the CO line to T1 via the T and R leads.

4.06 Transformer T1 serves as a dc holdng path to the CO line when another pickup key at the Bell System control station is depressed to establish a call on another CO line, if desired. Once the interconnection is established, the Bell System station may go on-hook.

4.07 Capacitor C2 blocks dc from transformer T1 and the varistors. Varistors RV1 and RV2 serve as power limiting devices.

4.08 ***Disconnect:*** Disconnect can be accomplished by CP equipment only. When the CP contact closure in the lockup path opens, ground is removed from the CS lead of the associated IU to release the TR relay which will disconnect the CP equipment and restore the circuit to normal.

5. MAINTENANCE (Fig. 8)

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

5.02 Open circuit at 66M1-50 interface connecting block by removing B bridging clips (or wire straps) on all leads of circuit under test (Fig. 2). Perform the following tests.

Option V

(a) Using a 1013A or equivalent hand test set, clip to the tip and ring of the CO trunk associated with the IU under test at the 66M1-50 intermediate connecting block.

(b) Operate the switch on the hand test set to TALK position; dial a CO number that will return a busy signal or 1000 Hz test tone.

(c) Ground CS lead on the telephone company side of the 66M1-50 interface connecting block; TR relay should operate.

(d) Remove the hand test set from tip and ring of CO line, operate switch to MON position, and clip to CT and CR at 66M1-50 interface connecting block. Busy signal or 1000 Hz tone should be heard.

(e) Remove ground from CS lead; TR relay will release, and busy signal or 1000 Hz tone will not be heard.

Option W

(a) Place a strap (short) across CS and CG terminals 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 trunk associated with the IU under test at the 66M1-50 intermediate connecting block.

(c) Operate the switch on the hand test set to the TALK position; dial a CO number that will return a busy signal or 1000 Hz tone.

(d) Ground CS lead on the 66M1-50 interface connecting block; TR relay should operate.

(e) Remove the hand test set from tip and ring of CO line, operate switch to MON position, and clip CT and CR at 66M1-50 interface connecting block. Busy signal or 1000 Hz tone should be heard.

(f) Remove ground from CS lead; busy signal or 1000 Hz tone should still be heard.

(g) Remove strap from CS and CG terminals; TR relay will release, and busy signal or 1000 Hz tone will not be heard.

5.03 If the results described are not obtained, check wiring, battery, and ground to unit. If battery and ground are present and wiring is correct, replace IU and retest.

5.04 When trouble is suspected in the 111A IU, exchange it with another unit known to be functioning properly.

5.05 If the tests described are satisfactory, restore circuit to normal by replacing B bridging clips (or wire straps).

Do not attempt any tests or repairs to the CP equipment.

6. CONNECTIONS

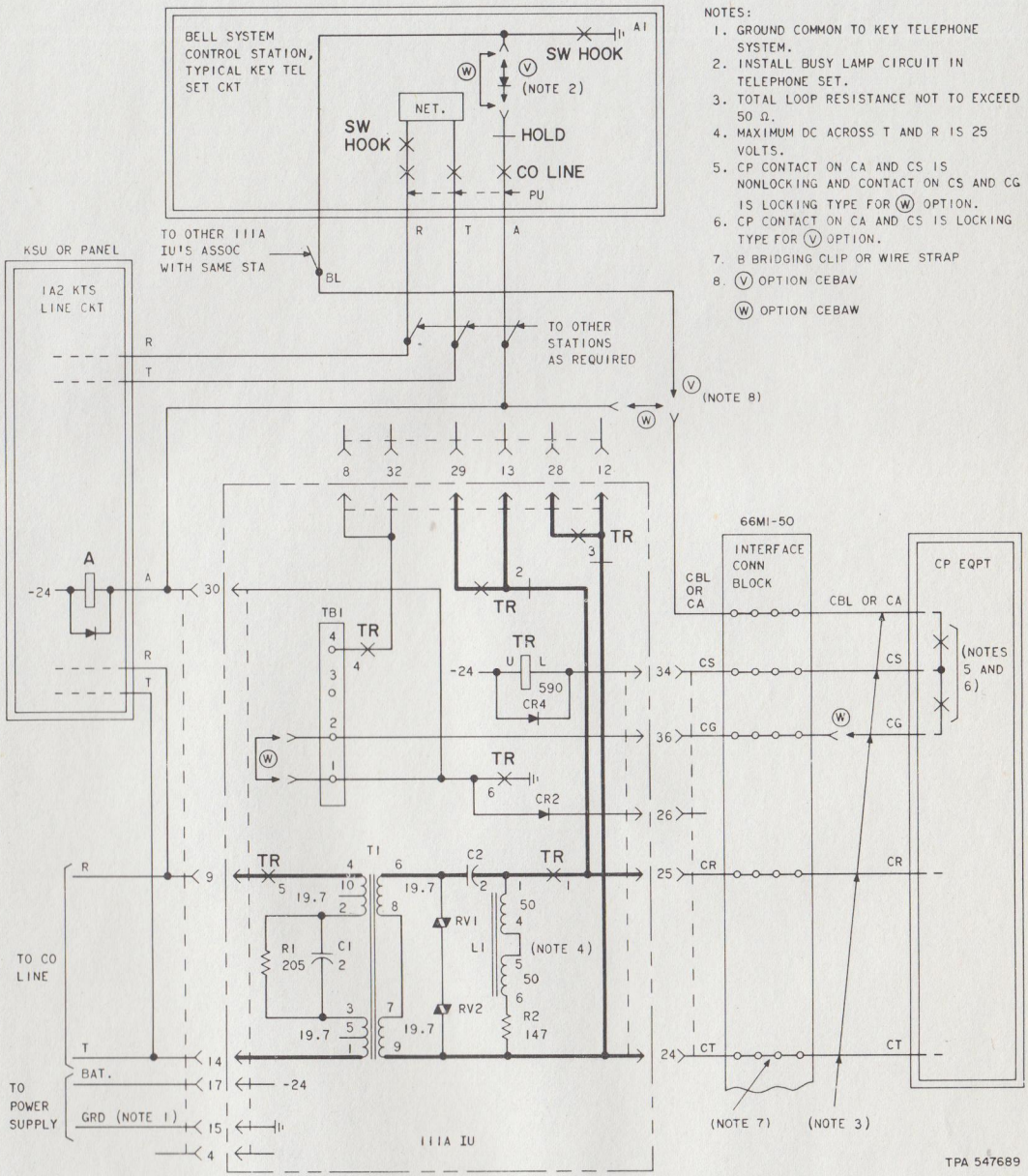
6.01 For connecting information using the 69H apparatus mounting, refer to Fig. 6 and 8.

6.02 The 111A IU is shown schematically in Fig. 8. The 69H apparatus mounting has provisions for installing two 111A IUs. Terminal designations for the KS-type connector associated with the apparatus mountings in Fig. 6 provide for installing 111A IUs in both positions.

6.03 ◗For connecting information using the 606A panel, refer to Fig. 8 and Table A.◖

6.04 Table A shows connections for six 111A IUs, circuit lead designations, connector cable color codes, and cross-connects from 66M1-50 intermediate connecting block to 66M1-50 interface connecting block. Lead BL from the key telephone set connects to terminal CBL on the 66M1-50 connecting block.

◗Lead A from the key telephone system line circuit connects to terminal CA on the 66M1-50 intermediate connecting block. Power supply (supplied locally) connects −24V to T1 and GRD to T2 (Fig. 4) on rear of 606A panel.◖



NOTES:
1. GROUND COMMON TO KEY TELEPHONE SYSTEM.
2. INSTALL BUSY LAMP CIRCUIT IN TELEPHONE SET.
3. TOTAL LOOP RESISTANCE NOT TO EXCEED 50 Ω.
4. MAXIMUM DC ACROSS T AND R IS 25 VOLTS.
5. CP CONTACT ON CA AND CS IS NONLOCKING AND CONTACT ON CS AND CG IS LOCKING TYPE FOR (W) OPTION.
6. CP CONTACT ON CA AND CS IS LOCKING TYPE FOR (V) OPTION.
7. B BRIDGING CLIP OR WIRE STRAP
8. (V) OPTION CEBAV
   (W) OPTION CEBAW

Fig. 8—Schematic—Voice Connecting Arrangements CEBAV & CEBAW