

# VOICE CONNECTING ARRANGEMENTS CEBAX AND CEBBX

## 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 69H apparatus mounting or 606A panel.

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

**1.03** Voice Connecting Arrangements CEBAX and CEBBX provide for voice frequency coupling between a Bell System central office (CO) line and the customer-provided (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 customer should be informed of the proper use and operation of Voice Connecting Arrangement CEBAX and/or CEBBX by the manufacturer or supplier of his 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-69614-01 Issue 3D (111A IU)

If this section is to be used with equipment or apparatus reflecting a later issue 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.

#### 2. IDENTIFICATION

##### PURPOSE

- To provide a means of connecting CP equipment, typically conferencing devices, to KTS lines using a multibutton key telephone set as the controlling station
- To hold the CO line in a busy state
- To limit excessive levels from CP equipment and to provide protection for personnel against hazardous voltages.

##### APPLICATION

- 1A1 or 1A2 Key Telephone Systems.

##### ORDERING GUIDE

- Unit, Interconnecting, 111A (Fig. 1) formerly designated 432A KTU (one per voice connecting arrangement).

##### Associated Apparatus (Order Separately)

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

- Mounting, Apparatus, 69H (one per two 111A IUs)

or

- Panel, 606A (one per six 111A IUs)
- Bracket, 99B (Fig. 2)
- Block, Connecting, 66E3-25 (Fig. 3, as required)

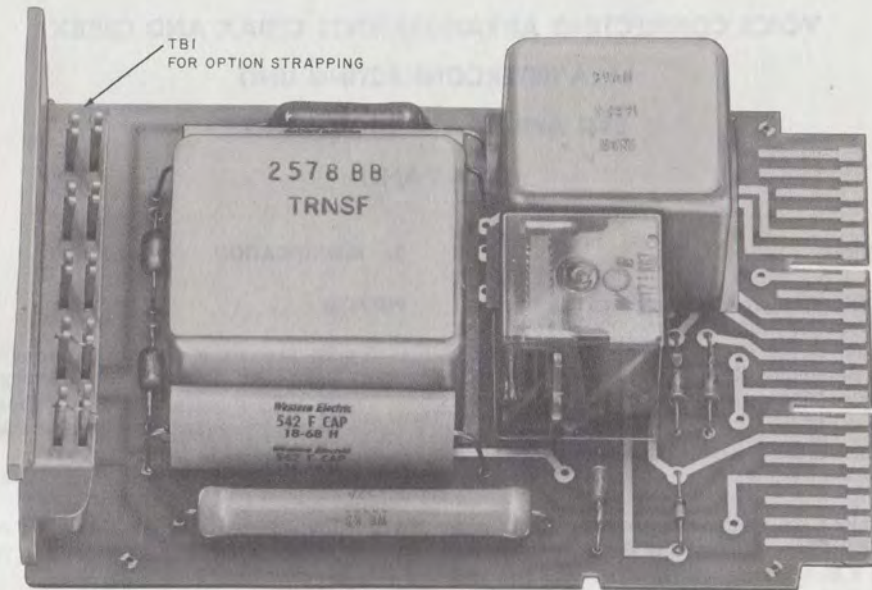


Fig. 1—111A Interconnecting Unit

- Block, Connecting, 66B4-25 (as required)

**Note:** Other connecting blocks can be used.

- Diode, KS-15724, List 1, or equivalent (one per each 111A IU, also one per each key telephone set used as a control station)
- Cable, Connector, A25B (one per 69H app mtg, two per 606A panel)
- Cable, Inside Wiring, D, or equivalent (for cabling from 66B4-25 connecting block to 66E3-25 interface connecting block)
- Fuse, 24E 1/2 ampere (eight per 606A panel)
- Unit, Power, 19C2, or equivalent (locally engineered and installed when existing KTS power supply is insufficient).

## DESIGN FEATURES

### 111A Interconnecting Unit

- Components mounted on 4-inch 40-pin double-sided printed wiring board
- Option terminals
- Provides voice frequency *only* access to the telecommunication network
- Provides a dry contact closure to signal CP equipment
- Provides for accepting 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 one KS-16671 50-pin plug
- Designed to mount two 111A IUs
- For mounting on standard relay rack or on 16C apparatus mounting using 99B brackets.

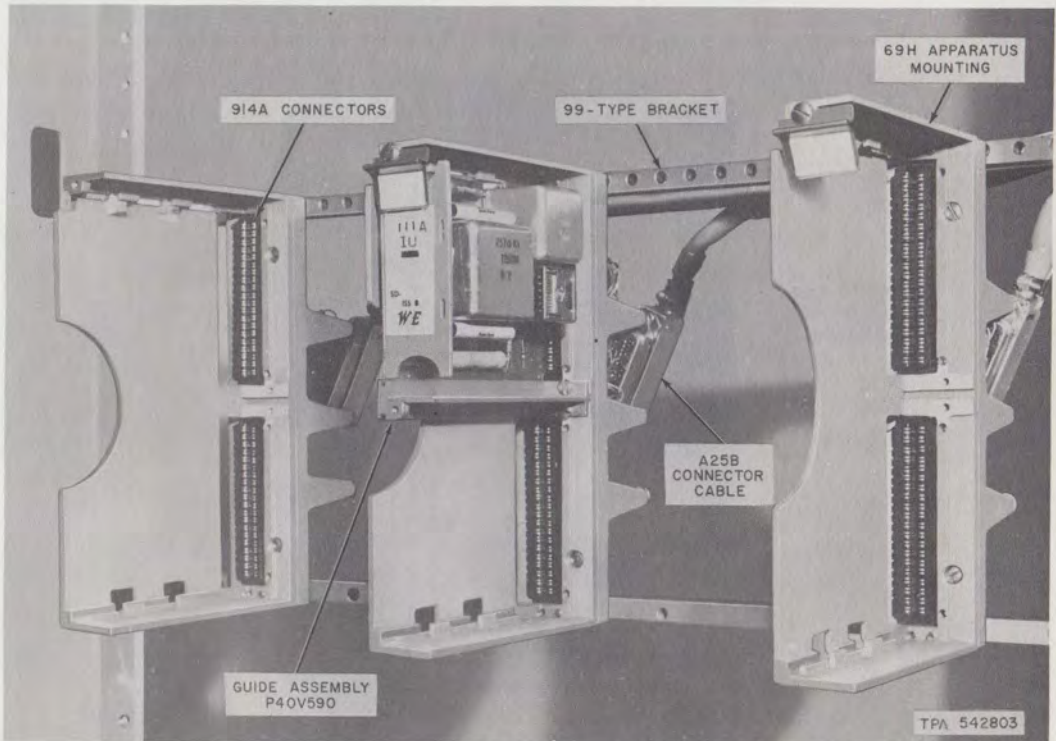


Fig. 2—69H Apparatus Mounting With 111A Interconnecting Unit

#### 606A Panel (Fig. 4 and 5)

- 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 16C apparatus mounting using 99B brackets
- Fuse panel included
- Approximate size 6 by 8 by 9 inches.

### 3. INSTALLATION

**Note 1:** A KS-15724, List 1 diode or equivalent must be strapped between terminals 2 and 4 on terminal board (TB1) of the 111A IU for

Voice Connecting Arrangements CEBAX and CEBBX (Fig. 6 and 7).

**Note 2:** A KS-15724, List 1 diode or equivalent must be installed as a station busy lamp circuit in each control station as shown in Service Section (Division 502) for the particular set involved.

**Note 3:** When Voice Connecting Arrangement CEBAX is used, a strap must be provided between G and BL leads (customer leads CG and CBL) at the interface connecting block on the Telephone Company side of the interface.

**3.01** Locate voice connecting arrangements as close as possible to the KTS for convenience of wiring and in an area free of dampness and excessive dust or dirt, with adequate room for

## 66E3-25 CONNECTING BLOCK

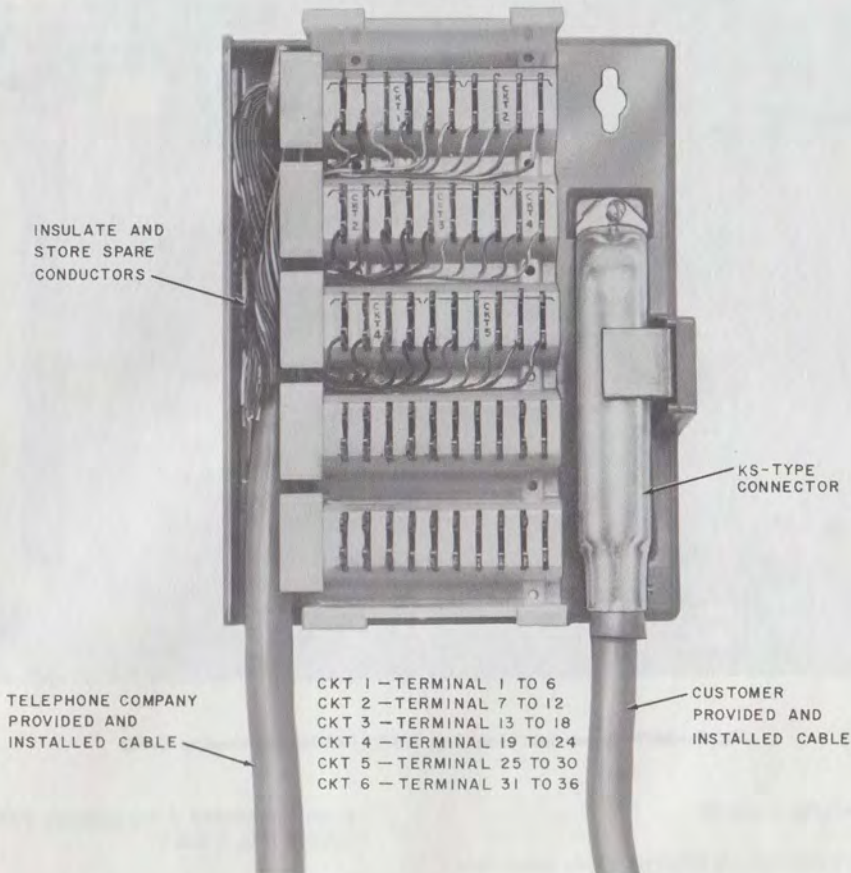


Fig. 3—66E3-25 Interface Connecting Block

access to front and rear of equipment and connecting blocks.

**3.02** The size of the initial installation and expected growth should be the determining factors in selecting the proper equipment. Use the 69H apparatus mounting for one or two 111A IUs and the 606A panel for three to six 111A IUs.

**3.03** One 111A IU must be provided per each CO line per control station to be connected

to the CP equipment for Voice Connecting Arrangement CEBAX (Fig. 6).

**3.04** One 111A IU must be provided per each CO line with any number of multiple control stations to be connected to the CP equipment for Voice Connecting Arrangement CEBBX (Fig. 7).

#### 69H Apparatus Mounting

**3.05** One A25B connector cable or equivalent must be provided for each 69H apparatus

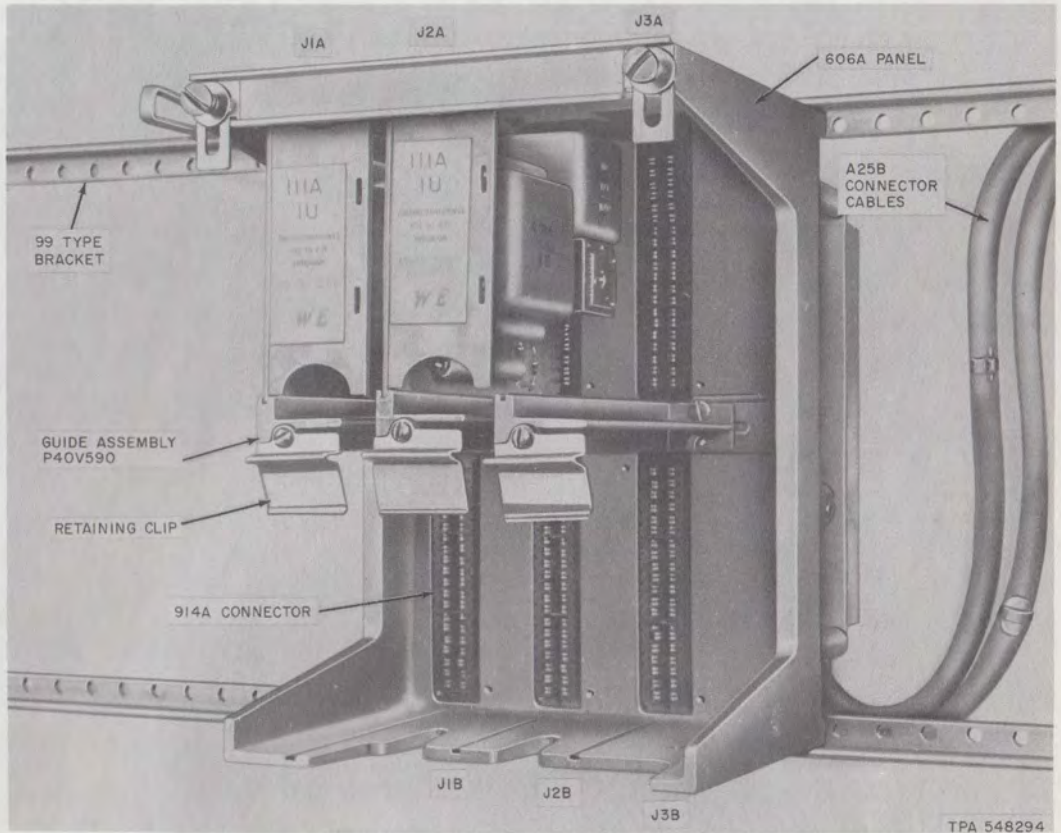


Fig. 4—606A Panel With 111A Interconnecting Unit

mounting installed. The A25B connector cable plugs into the 69H apparatus mounting.

**3.06** One 66B4-25 connecting block should be provided (one block will accommodate connections for six 111A IUs).

**3.07** The stub end of the A25B connector cable will be terminated on the 66B4-25 connecting block (see Tables A and B); unused leads should be insulated and stored.

**3.08** Leads associated with the CP equipment with access to the CO line will be terminated on an interface connecting block (66E3-25). Circuit

numbers or lead designations should be stenciled on the connecting block (see Fig. 3 and Table C). 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.

**3.09** The interface connecting block may be located at the control station at customer request.



*This may require customer billing.*

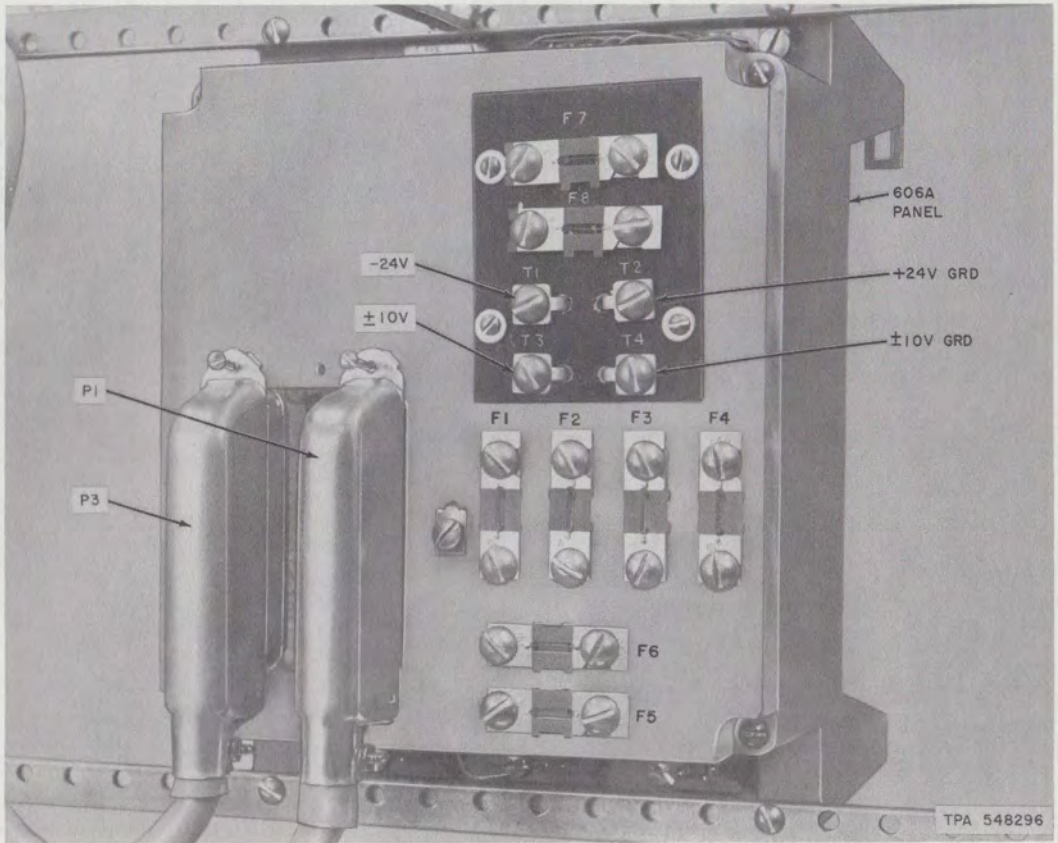


Fig. 5—606A Panel (Rear View)

**3.10** The customer must terminate the CP equipment to the KS-16672, List 3 connector on the 66E3-25 connecting block (Fig. 3) using an Amphenol No. 57-10500-7 plug, Cinch No. 223-32-50-023 plug, or equivalent.

**3.11** Power supply (supplied locally if required) connects to the 66B4-25 connecting block as shown in Fig. 8 and 9. Fuses must be provided locally for the 69H apparatus mounting. Each 111A IU requires 0.047 ampere at 26V dc. Refer to the appropriate section in Division 518 for proper grounding of power plants.

#### 606A Panel

**3.12** Two A25B connector cables are used to connect the 606A panel to the 66B4-25 intermediate connecting block. The A25B connector cables plug into the back (P1 and P3) of the 606A panel (Fig. 5).

**3.13** The stub ends of the A25B connector cables will be terminated on the 66B4-25 intermediate connecting block (Fig. 6 or 7 and Table D or E). Unused leads should be insulated and stored.

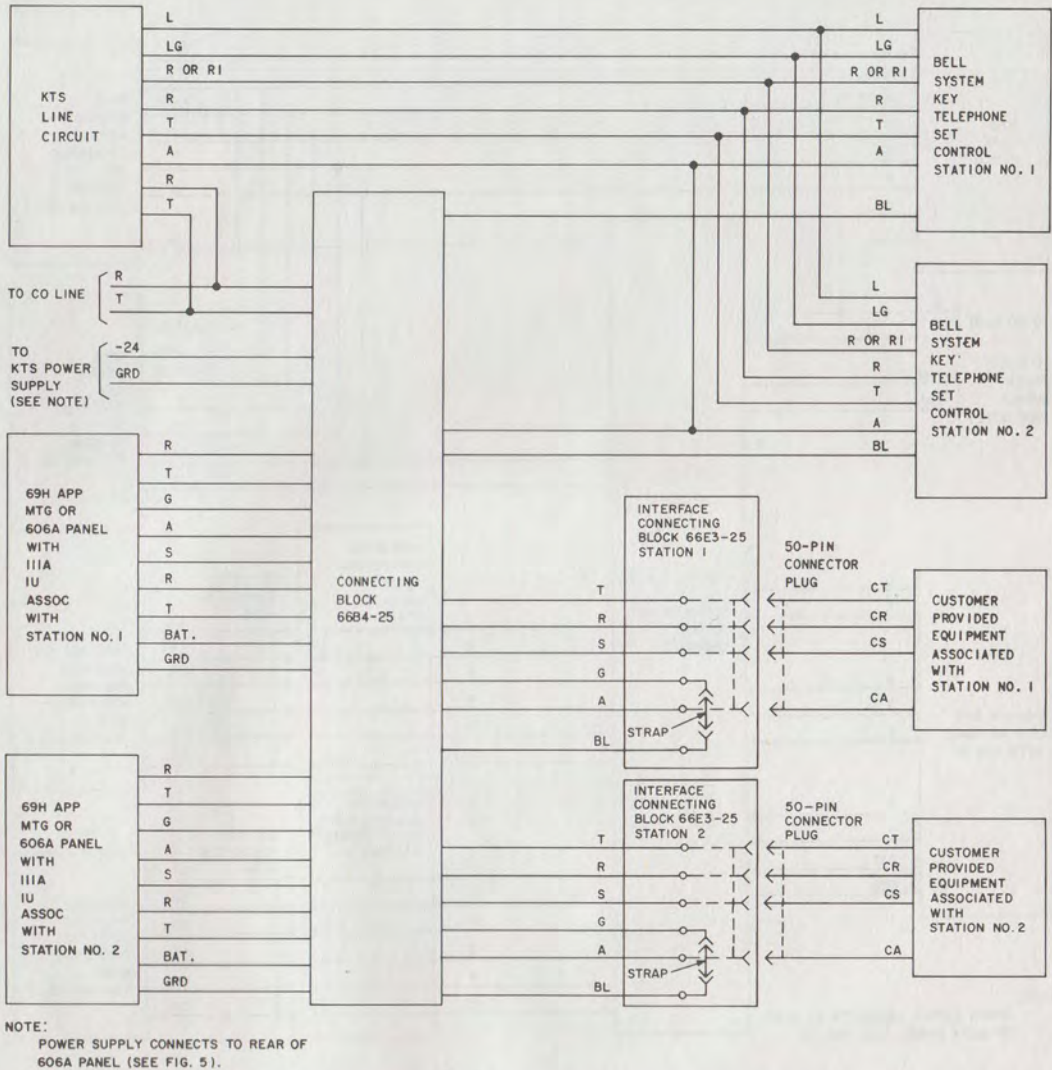


Fig. 6—Block Diagram—Voice Connecting Arrangement CEBAX

**3.14** Install 66B4-25 intermediate connecting blocks as required. One block provides connections for six 111A IUs.

**3.15** Leads associated with the CP equipment will be terminated on an interface connecting block (66E3-25). Circuit numbers or lead designations should be stenciled on the connecting block (See

Fig. 3 and Table D or E). 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.

**3.16** The interface connecting block may be located at the control station at customer request.

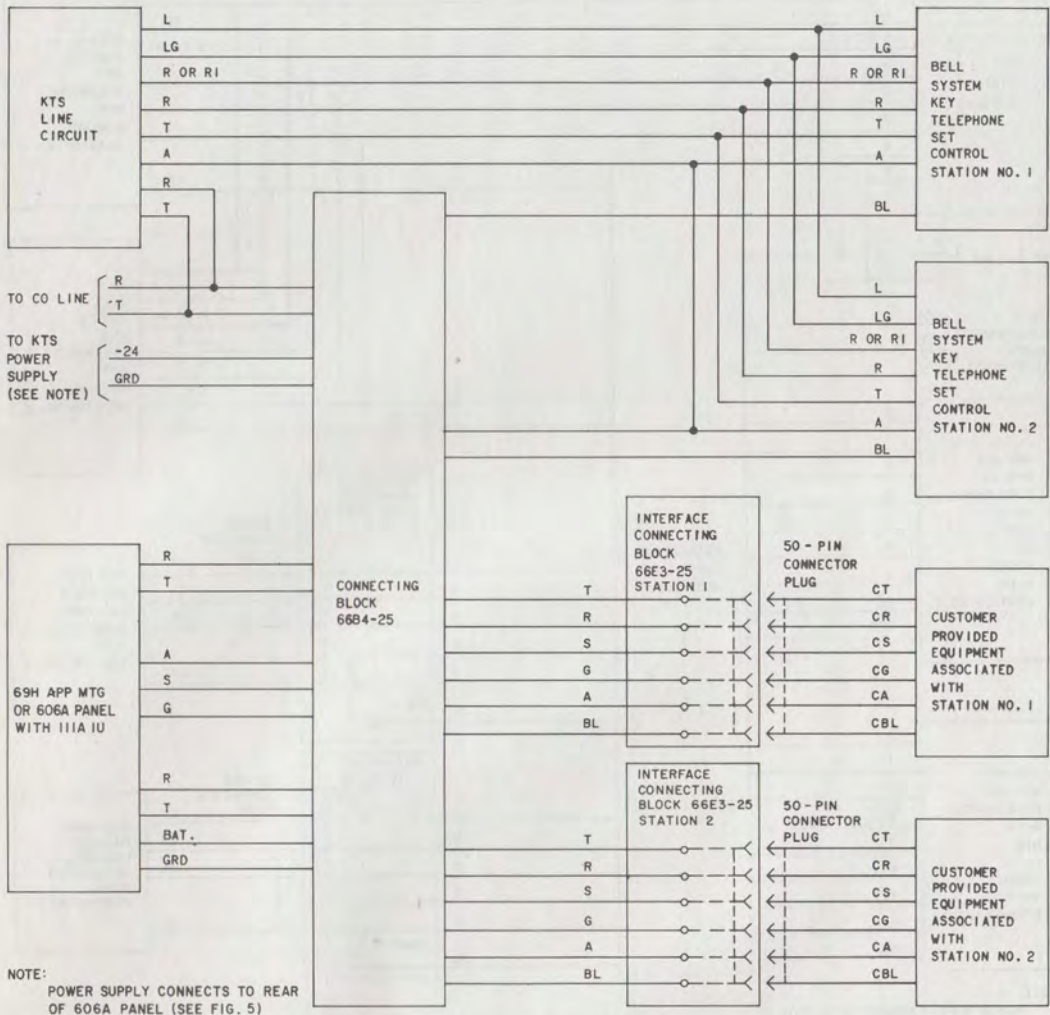


Fig. 7—Block Diagram—Voice Connecting Arrangement CEBBX



*This may require customer billing.*

**3.17** The customer must terminate the CP equipment to the KS-16672, List 3 connector on the 66E3-25 connecting block (Fig. 3) using an

Amphenol No. 57-10500-7 plug, Cinch No. 223-32-50-023 plug, or equivalent.

**3.18** Power supply (supplied locally, if required) connects to the rear of the 606A panel as shown in Fig. 5. Refer to the appropriate section in Division 518 for proper grounding of power plants.



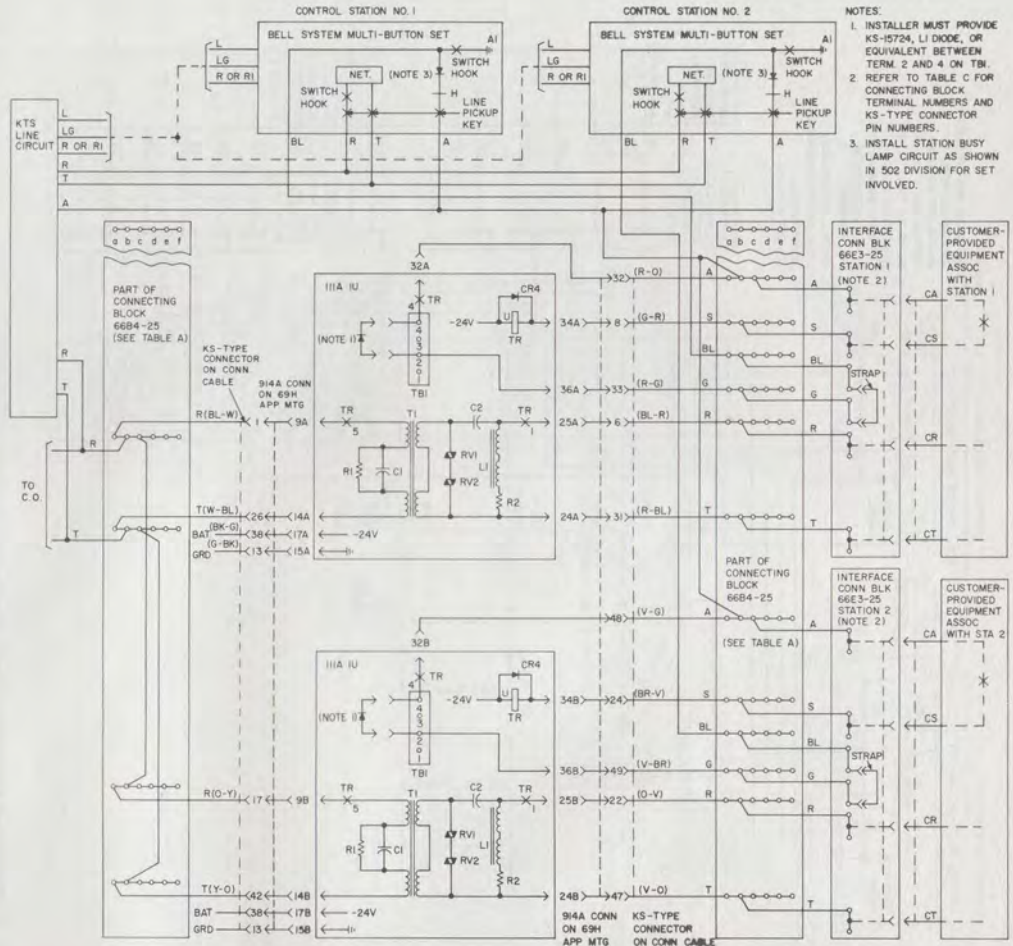


Fig. 8—Simplified Schematic-Voice Connecting Arrangement CEBAX

**111A Interconnecting Unit**

**3.19** Install diode between terminals 2 and 4 of TB1 as shown in Fig. 8 or 9 before installing 111A IU in apparatus mounting.

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

**3.21** Align 111A IU in mounting guides and properly seat connector of printed wiring board in connector of mounting.

**3.22** Position retaining clip or designation bar on rear of 111A IU and tighten screw.

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

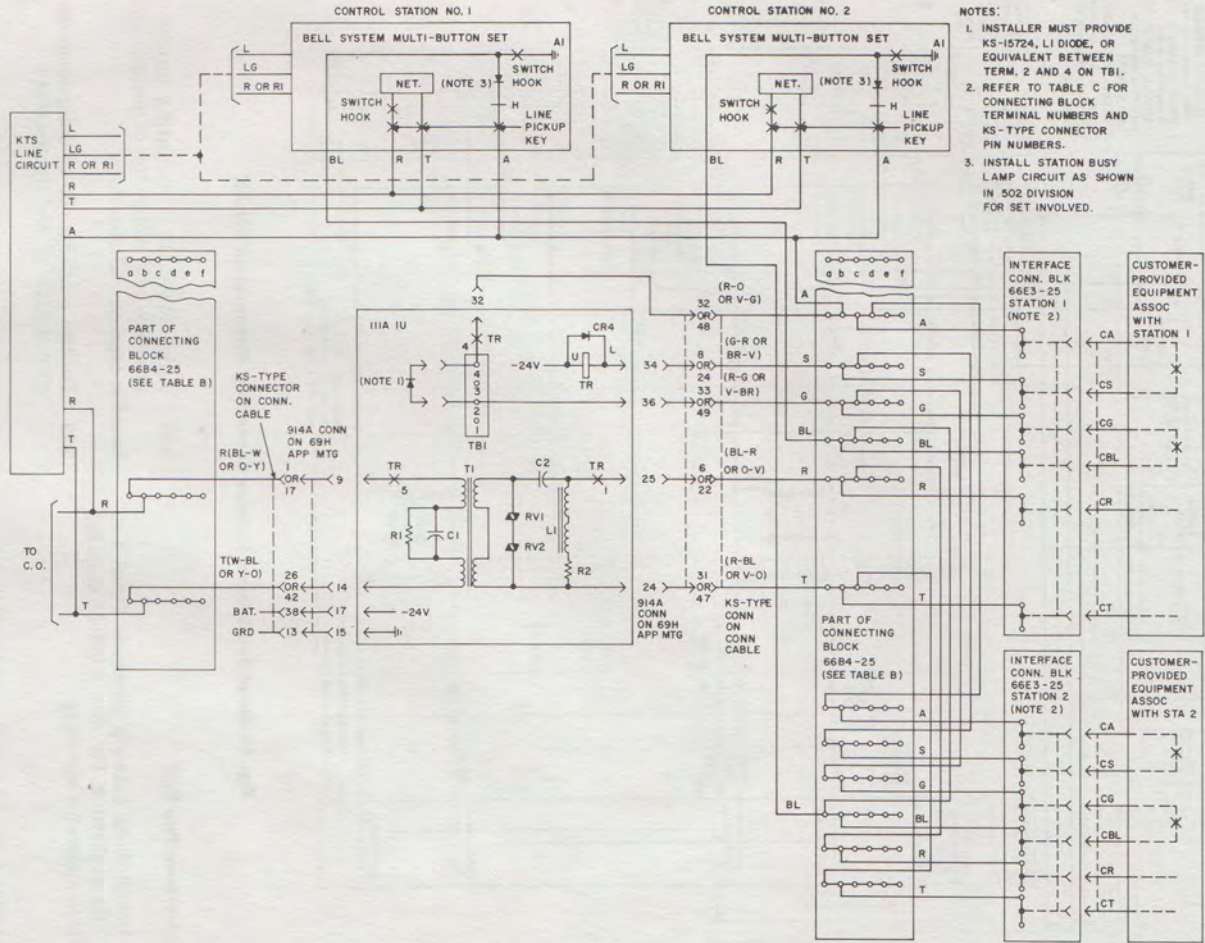


Fig. 9—Simplified Schematic—Voice Connecting Arrangement CEBBX

3.24 Perform tests shown in Part 5 after installation.

#### 4. OPERATION

##### 4.01 *Connection—Voice Connecting Arrangement CEBAX* (Fig. 8)

(a) An incoming or outgoing call is handled in the normal manner for a key telephone set. If a connection to the CP equipment is desired, the control station attendant operates the CP equipment to provide a locking closure on the CA and CS leads associated with the control station and the 111A IU for the connected line. The control station pickup key for the connected line must be operated.

(b) The CP contact closure completes an operate path for TR relay over CS, CA, and A leads to A1 ground. Relay TR operated places a holding bridge across the line and couples it to the CP equipment. The line lamp (if provided) at the control station remains lighted steadily.

(c) TR relay is held operated by the control station ground over the BL lead, through the Telephone Company provided strap between the G and BL leads at the interface connecting block and the CP contact closure between the CA, CS leads.

(d) The control station must remain off-hook for the duration of the connection since the holding ground for the 111A IU is provided through the switchhook contact of the control station. If the control station attendant desires to leave the connection, the HOLD key at the control station may be depressed to release the pickup key, (this does not place the line on hold). The control station can originate and answer calls on other line pickup keys but must not go on-hook until the connection to the CP equipment is no longer required.

##### 4.02 *Connection—Voice Connecting Arrangement CEBBX* (Fig. 9)

(a) An incoming or outgoing call is handled in the normal manner for a key telephone set. If a connection to the CP equipment is desired, the control station attendant operates the CP equipment to provide a locking closure on the CA and CS leads and a locking closure on the CG and CBL leads associated with the control

station and the 111A IU for the connected line. The control station pickup key for the connected line must be operated.

(b) The first CP contact closure completes an operate path for TR relay over CS, CA, and A leads to A1 ground. The second CP contact closure provides a holding path for TR relay. Relay TR operated places a holding bridge across the line and couples it to the CP equipment. The line lamp (if provided) on the control station remains lighted steadily.

(c) The TR relay is held operated by the control station ground over the BL lead, through the CP contact closures between the CA, CS and CG, CBL leads. This permits more than one control station to be provided per line using only one 111A IU.

(d) The control station must remain off-hook for the duration of the connection since the holding ground for the 111A IU is provided through the switchhook contact of the control station. If the control station attendant desires to leave the connection, the HOLD key at the control station may be depressed to release the pickup key (this does not place the line on hold). The control station can originate and answer calls on other line pickup keys but must not go on-hook until the connection to the CP equipment is no longer required.

##### 4.03 *Disconnection—Voice Connecting Arrangements CEBAX and CEBBX*

(a) To disconnect all connections at one time, the control station goes on-hook. This breaks the switchhook controlled holding ground to the interconnecting units, releasing all operated TR relays. Release of the TR relays opens the circuits to the CO and the control station going on-hook causes all lighted line lamps to extinguish. The control station attendant must release the CP contact closure(s) associated with each line to prevent accidental connection to the CP equipment on subsequent use of the line.

(b) To disconnect a single connection from the network, the control station attendant opens the CP contact closure(s) associated with the line to be disconnected. Opening the CP contact closure(s) removes ground from the CS lead to the IU associated with the disconnected station

allowing the TR relay to release. Release of the TR relay opens the circuit to the CO permitting the line circuit associated with the disconnected line to release and the line lamp to extinguish.

## 5. MAINTENANCE

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

**5.02** Open circuit at 66E3-25 interface connecting block by removing the customer plug from the KS-type connector (Fig. 3). Perform the following tests.

### CEBAX (Fig. 8)

(a) Place a strap across CS and CA terminals on the Telephone Company side of the 66E3-25 interface connecting block.

(b) Go off-hook and operate the line pickup key for the connected line. The TR relay should operate and cut through the transmission path to the CT and CR terminals.

(c) Dial a CO number from telset that will return a busy signal or 1000-Hz tone.

(d) With switch in MON position, clip hand test set to terminals CT and CR at 66E3-25 connecting block. Tone should be heard in hand test set receiver.

(e) Release the pickup key. Busy signal or 1000-Hz tone should still be heard.

(f) Go on-hook at the control key telephone set. TR relay will release, and busy signal or 1000-Hz tone will not be heard.

### CEBBX (Fig. 9)

(g) Strap terminals CS and CA and strap terminals CBL and CG on the Telephone Company side of the 66E3-25 interface connecting block.

(h) Go off-hook and operate the line pickup key for the connected line. The TR relay should operate and cut through the transmission path to the CT and CR terminals.

(i) Dial a CO number from telset that will return a busy signal or 1000-Hz tone.

(j) With switch on MON position, clip hand test set to terminals CT and CR at 66E3-25 connecting block. Tone should be heard in hand test set receiver.

(k) Release the pickup key; busy signal or 1000-Hz tone should still be heard.

(l) Go on-hook at the control key telephone set. 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 111A 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 the customer plug in the KS-16672, List 3 connector on the 66E3-25 interface connecting block.



*Do not attempt any tests or repairs to the CP 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 Section 660-101-312 entitled Maintenance of Service Charge on Services with Customer-Provided Equipment (CPE).

## 6. CONNECTIONS

**6.01** For connecting information using the 69H apparatus mounting, refer to Fig. 8 or 9 and Table A or B.

**6.02** The 111A IU is shown schematically in Fig. 8 and 9. The 69H apparatus mounting has provisions for installing two 111A IUs. Terminal designations for the KS-type connector associated with the 66E3-25 interface connecting block are shown in Table C.

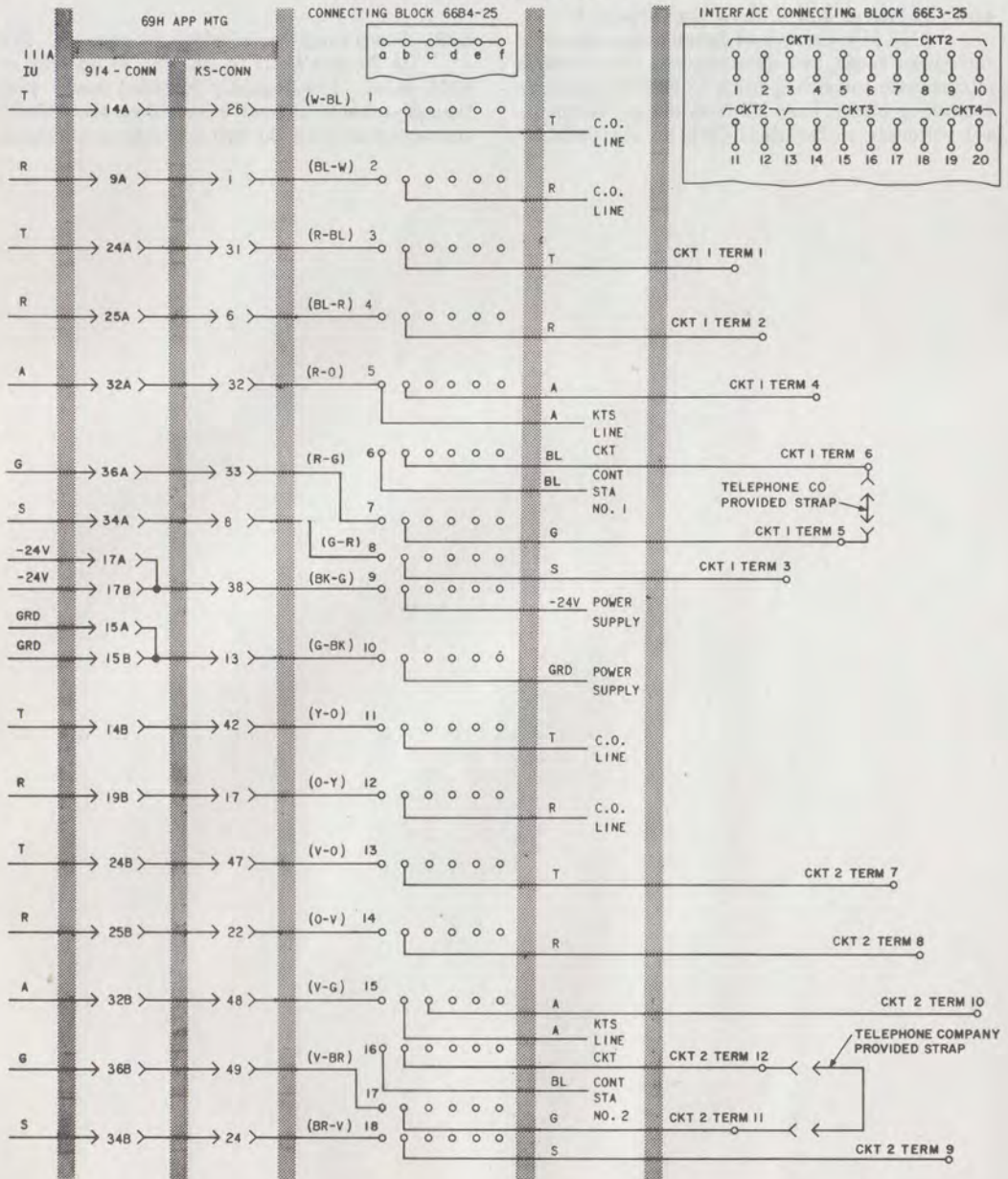
**6.03** For connecting information using the 606A panel, refer to Fig. 6 or 7 and Table D or E.

**6.04** Tables D and E show connections for six 111A IUs, circuit lead designations, connector cable color codes, and cross-connects from 66B4-25 intermediate connecting block to 66E3-25 interface connecting block. Lead BL from the key telephone set connects to terminal CBL on the 66B4-25

connecting block. Lead A from the KTS line circuit connects to terminal A on the 66B4-25 intermediate connecting block.

**6.05** Power supply (supplied locally) connects -24V to T1 and GRD to T2 (Fig. 5) on rear of 606A panel. Power supply (supplied locally with fusing) connects to rows 9 and 10 on the 66B4-25 connecting block for the 69H apparatus mountings.

**TABLE A**  
**CONNECTIONS FOR VOICE CONNECTING ARRANGEMENT CEBAX**  
**USING 69H APPARATUS MOUNTING**



**TABLE B**  
**CONNECTIONS FOR VOICE CONNECTING ARRANGEMENT CEBBX**  
**USING 69H APPARATUS MOUNTING**

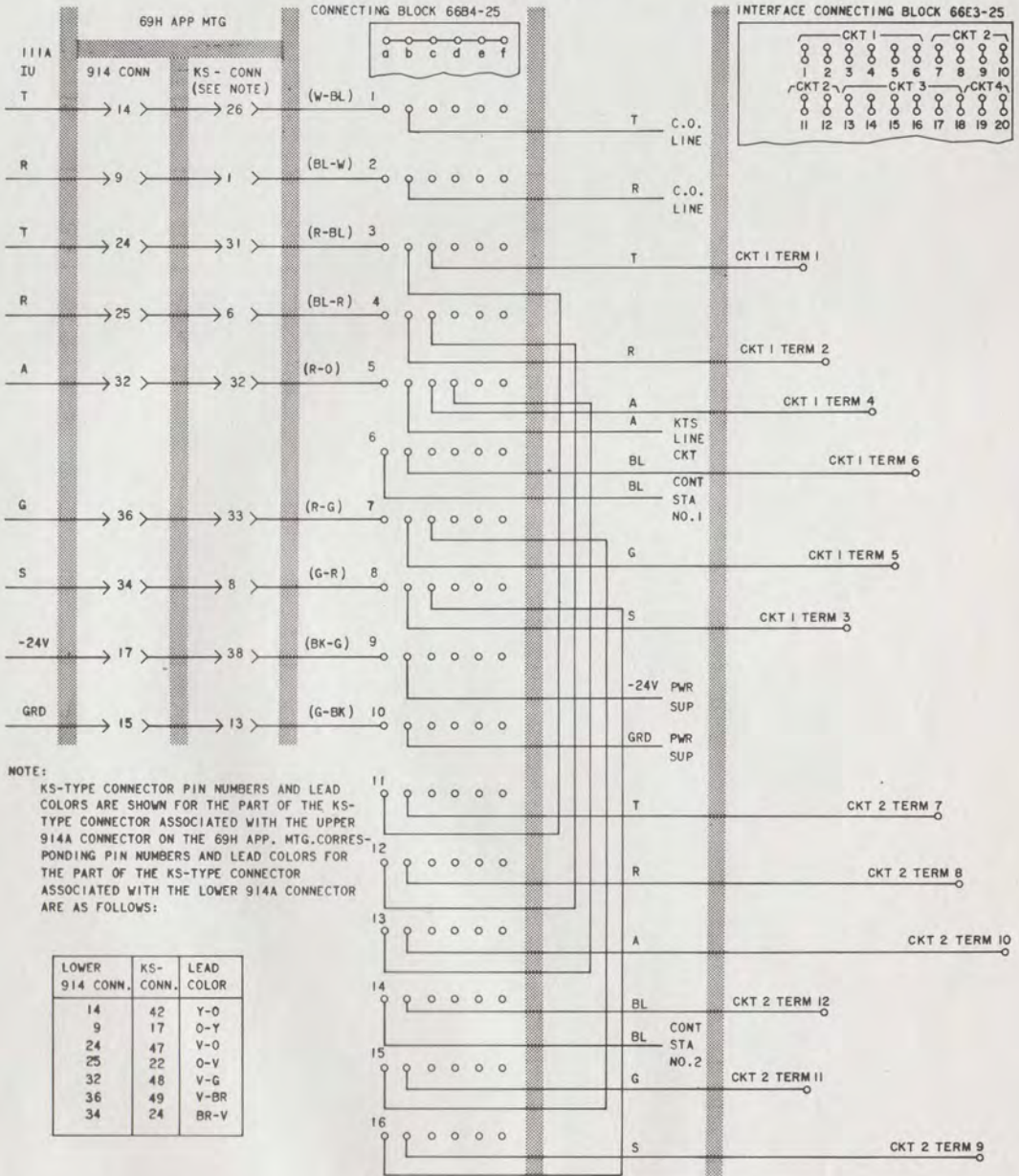


TABLE C  
INTERFACE CONNECTING BLOCK (66E3-25) CONNECTIONS

CIRCUIT NO.	BELL SYSTEM LEAD DESIG.	66E3-25 CONN. BLOCK TERM. NO.	66E3-25 KS-TYPE CONN. PIN NO.	CUSTOMER LEAD DESIG.
1	T	1	26	CT
	R	2	1	CR
	S	3	27	CS
	A	4	2	CA
	G	* 5	28	CG
STA 1	BL	* 6	3	CBL
2	T	7	29	CT
	R	8	4	CR
	S	9	30	CS
	A	10	5	CA
	G	*11	31	CG
STA 2	BL	*12	6	CBL
3	T	13	32	CT
	R	14	7	CR
	S	15	33	CS
	A	16	8	CA
	G	*17	34	CG
STA 3	BL	*18	9	CBL
4	T	19	35	CT
	R	20	10	CR
	S	21	36	CS
	A	22	11	CA
	G	*23	37	CG
STA 4	BL	*24	12	CBL
5	T	25	38	CT
	R	26	13	CR
	S	27	39	CS
	A	28	14	CA
	G	*29	40	CG
STA 5	BL	*30	15	CBL

\*For Voice Connecting Arrangement CEBAX, strap G and BL leads.



◆ TABLE D ◆

CONNECTIONS FOR VOICE CONNECTING ARRANGEMENT CEBAX  
USING 606A PANEL

606A PANEL CIRCUIT NO.	LEAD* DESIG	A25B CONN PIN NO.	A25B CONN CABLE COLOR	CONNECT	
				FROM	TO
				66B4-25 CONN BLK ROW NO.	66E3-25 INTERFACE CONN BLK TERM. NO.
1 (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
	CA	5	S-W	6	4
	CG	8	G-R	7	5§
STA 1	CBL	—	—	8††	6§
2 (P1 J2A)	T	34	R-BR	9†	—
	R	9	BR-R	10†	—
	CT	39	BK-BR	11	7
	CR	14	BR-BK	12	8
	CS	41	Y-BL	13	9
	CA	13	G-BK	14	10
CG	16	BL-Y	15	11§	
STA 2	CBL	—	—	16††	12§
3 (P1 J3A)	T	42	Y-O	17†	—
	R	17	O-Y	18†	—
	CT	47	V-O	19	13
	CR	22	O-V	20	14
	CS	49	V-BR	21	15
	CA	21	BL-V	22	16
	CG	24	BR-V	23	17§
STA 3	CBL	—	—	24††	18§
4 (P3 J1B)	T	26	W-BL	25†	—
	R	1	BL-W	26†	—
	CT	31	R-BL	27	19
	CR	6	BL-R	28	20
	CS	33	R-G	29	21
	CA	5	S-W	30	22
	CG	8	G-R	31	23§
STA 4	CBL	—	—	32††	24§

◆ TABLE D (Cont) ◆

CONNECTIONS FOR VOICE CONNECTING ARRANGEMENT CEBAX  
USING 606A PANEL

606A PANEL CIRCUIT NO.	LEAD* DESIG	A25B CONN PIN NO.	A25B CONN CABLE COLOR	CONNECT	
				FROM	TO
				66B4-25 CONN BLK ROW NO.	66E3-25 INTERFACE CONN BLK TERM. NO.
5 (P3 J2B)	T	34	R-BR	33†	—
	R	9	BR-R	34†	—
	CT	39	BK-BR	35	25
	CR	14	BR-BK	36	26
	CS	41	Y-BL	37	27
	CA	13	G-BK	38	28
	CG	16	BL-Y	39	29§
STA 5	CBL	—	—	40††	30§
6 (P3 J3B)	T	42	Y-O	41†	—
	R	17	O-Y	42†	—
	CT	47	V-O	43	31
	CR	22	O-V	44	32
	CS	49	V-BR	45	33
	CA	21	BL-V	46	34
	CG	24	BR-V	47	35§
STA 6	CBL	—	—	48††	36§
	SPARE	—	—	49	—
	SPARE	—	—	50	—

\* Stencil Lead Designations on Fanning Strips.

† Connections to CO Lines.

†† Connect to BL Lead of Key Telephone Set.

§ Strap Leads CG and CB.

◆ TABLE E ◆

CONNECTIONS FOR VOICE CONNECTING ARRANGEMENT CEBBX  
USING 606A PANEL

606A PANEL CIRCUIT NO.	LEAD* DESIG	A25B CONN PIN NO.	A25B CONN CABLE COLOR	CONNECT	
				FROM	TO
				66B4-25 CONN BLK ROW NO.	66E3-25 INTERFACE CONN BLK TERM. NO.
1 (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
	CA	5	S-W	6	4
	CG	8	G-R	7	5
STA 1	CBL	—	—	8††	6
2 (P1 J2A)	T	34	R-BR	9†	—
	R	9	BR-R	10†	—
	CT	39	BK-BR	11	7
	CR	14	BR-BK	12	8
	CS	41	Y-BL	13	9
	CA	13	G-BK	14	10
	CG	16	BL-Y	15	11
STA 2	CBL	—	—	16††	12
3 (P1 J3A)	T	42	Y-O	17†	—
	R	17	O-Y	18†	—
	CT	47	V-O	19	13
	CR	22	O-V	20	14
	CS	49	V-BR	21	15
	CA	21	BL-V	22	16
	CG	24	BR-V	23	17
STA 3	CBL	—	—	24††	18
4 (P3 J1B)	T	26	W-BL	25†	—
	R	1	BL-W	26†	—
	CT	31	R-BL	27	19
	CR	6	BL-R	28	20
	CS	33	R-G	29	21
	CA	5	S-W	30	22
	CG	8	G-R	31	23
STA 4	CBL	—	—	32††	24

◆ TABLE E (Cont) ◆

CONNECTIONS FOR VOICE CONNECTING ARRANGEMENT CEBBX  
USING 606A PANEL

606A PANEL CIRCUIT NO.	LEAD* DESIG	A25B CONN PIN NO.	A25B CONN CABLE COLOR	CONNECT	
				FROM	TO
				66B4-25 CONN BLK ROW NO.	66E3-25 INTERFACE CONN BLK TERM. NO.
5 (P3 J2B)	T	34	R-BR	33†	—
	R	9	BR-R	34†	—
	CT	39	BK-BR	35	25
	CR	14	BR-BK	36	26
	CS	41	Y-BL	37	27
	CA	13	G-BK	38	28
	CG	16	BL-Y	39	29
STA 5	CBL	—	—	40††	30
6 (P3 J3B)	T	42	Y-O	41†	—
	R	17	O-Y	42†	—
	CT	47	V-O	43	31
	CR	22	O-V	44	32
	CS	49	V-BR	45	33
	CA	21	BL-V	46	34
	CG	24	BR-V	47	35
STA 6	CBL	—	—	48††	36
	SPARE	—	—	49	—
	SPARE	—	—	50	—

\* Stencil Lead Designations on Fanning Strips.

† Connections to CO Lines.

†† Connect to BL Lead of Key Telephone Set.