

TELEPHONE STATION EQUIPMENT

K501A KEY SERVICE UNIT E/W 110-CX1 INTERCOM

IDENTIFICATION, INSTALLATION, AND OPERATION

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1. GENERAL

SCOPE

- 1.01 This publication covers Identification, Installation, and Operation of a K501A Key Telephone System equipped with a 110-CX1 Announce-a-Call Intercom Unit.
- 1.02 When this publication is revised, the reasons for revision will be listed in this paragraph.

EQUIPMENT COVERED

- 1.03 K501A type Key Service Units equipped with Key Telephone Units (KTUs) listed in Table A.

2. IDENTIFICATION (Table A)

- 2.01 Each key telephone system consists essentially of a Key Service Unit, with a dial intercom circuit, to which is added one 400 type CO/PBX line card for each incoming line.
- 2.02 The basic K501A KSU consists of a backboard with connecting blocks, cable clamps and hooks for station cables; a mounting frame (hinged and locked to the backboard) upon which is mounted a card mounting assembly including six connectors and an electro-mechanical interrupter. The interrupter is common to the entire

system and provides for lamp flashing, lamp winking, and interrupted ringing. The six connectors are factory wired to the connecting blocks on the backboard.

POWER SUPPLIES (Table B)

2.03 Power supplies are of three types:

- (1) 182141-101, used in 501A00-00P and 501A10-00P KSUs, is designed for buzzer signaling on intercom.
- (2) 180124-101 is used for floorstand units for up to 19 stations with buzzer signaling.
- (3) 180125-102 is used for floorstand units for up to 19 stations with buzzer or ringer signaling.

NOTE: Additional lamp battery (LB) will be required if more than 70 busy lamps are used in the system. Each lamp requires 40 ma (25 lamps per amp) of 10 V ac.

INTERCOM

- 2.04 The 110-CX1 Intercom Unit as installed in the K501A KSU provides a common talk path intercom with ten 2-digit rotary dial codes. *It does not include the Call Announcing/Tone Card.*
- 2.05 The intercom can be expanded to 20 or 30 dial codes by installing one or two 184397-101 10-station expansion cards.
- 2.06 The intercom can be adapted for Tel-Touch (DTMF) dialing by installing a piggyback card (P/N 183981-101) on the Intercom Card.
- 2.07 The intercom can be made to provide dial tone, ringback, and intermittent signaling by adding a 183973-191 Call Announcing/Tone card and connecting intercom A-leads.

2.08 If a 174B Call Announcer or a telephone equipped with a built-in call announcer is used at each station, the system will provide dial tone, a single return tone, and tone-and-voice signaling (call announcing) with handsfree answerback on intercom calls. The 193973-101 Call Announcing/Tone card must be installed.

CAUTION: The 110-CX1 Intercom is not compatible with telephones with special feature code 76 (exclusion).

CAUTION: Call announcers should not be used in noisy locations. They are voice-switched and noise will adversely affect operation.

INTERCOM

2.09 A system may use ringers or buzzers and call announcers mixed. Half of all station codes will be allocated for ringer or buzzer signaling and half for tone-and-voice signaling. With this arrangement, odd-numbered stations will be signaled by tone-and-voice with handsfree answerback, and even-numbered stations by ringers or buzzers. Even-numbered stations will be signaled by intermittent ringing, but the calling station will receive a single return tone, not intermittent ringback. If an intercom expansion card is used in a mixed system and is strapped for ringers, it will provide continuous ringing to its connected stations, not intermittent ringing. A mixed system may have the following configurations:

5 Call Announcers and 5 Ringer Stations;

10 Call Announcers and 10 Ringer Stations;

15 Call Announcers and 15 Ringer Stations.

2.10 Although the 110-CX1 can provide 30 dial codes, it has only one talk-link. If call announcers are used, one or more 401B Manual Intercom Cards may be installed in the system to provide one or more additional talk links. Signaling will be by Call Announcer (tone-and-voice), then both parties can go to a manual link for conversing.

2.11 For ringer or buzzer signaling for a maximum of 19 stations, station connections are the same for the K501A KSU equipped with the 110-CX1 as for the K501A KSUs equipped with 307A or 357A intercom units. However, if a Call Announcing Card is used, or if more than 19 stations are to be connected, a separate 66-type connecting

block mounted externally to the KSU will be required for termination of A-leads, Call Announcer reset (CA RST) leads and/or stations 29 through 39 intercom signal leads.

CAUTION: The internal intercom cable, P/N 185348-101, is not standard-wired according to color code at the connector end.

VOICE PAGING

CAUTION: The 110-CX1 Intercom KTU is not compatible with the 401PA Paging Adapter Unit as it does not provide a switched ground.

2.12 Voice Paging through a customer owned PA system from any station can be provided by either of two means: (1) button access to PA amplifier, or (2) dial access to PA amplifier.

2.13 *Button-Accessed Paging.* A K401B Manual Intercom card may be used to access the PA amplifier. A person at any station can page by holding down a line-pickup button that has been converted to non-locking operation and talking into his handset. In planning this type of installation, remember that a button will be used at each phone and a line card position in the KSU.

2.14 *Dial-Accessed Paging.* In a system using call announcers for intercom signaling, an intercom number is assigned to paging. An interface circuit consisting of a .1 Mfd, 25 V, capacitor and a 600-Ohm resistor must be connected to the PA amplifier input (Fig. 17). In a system not using call announcer, a 410A Paging Adapter KSU must be used.

Table A — Identification

CODE	DESCRIPTION
(1) 501A10-101	KSU, Wall Unit, E/W 110-CX1 Intercom KTU less Call Announcing/Tone Card, and less Power Supply
(2) 501A10-OOP	Same as (1) except E/W Power Supply less Ringing Generator
(3) 501A10-OOF	KSU, Floorstand Unit, E/W 110-CX1 Intercom KTU less Call Announcing/Tone Card, and less Power Supply
(4) 501A10-OPF	Same as (3) except E/W Power Supply less Ringing Generator
(5) 501A10-FPG	Same as (4) except E/W Ringing Generator
(6) 000400-OOE	KTU, CO/PBX Line Card (one required per incoming line)
(7) 000401-OOB	KTU, Manual Intercom. Can also be used for Button-Accessed Voice Paging
(8) 000403-OOA	KTU, Music-On-Hold Interface for 6 lines
(9) 000405-OOA	KTU, 2-Line Semi-Automatic Exclusion
(10) 183973-101	Card, Call Announcing/Tone
(11) 183981-101	Card, Tel-Touch (DTMF) Adapter for Intercom
(12) 184397-101	Card, 10-Station Intercom Expansion
(13) 000259-00B	Panel, 2-card
(14) 000359-00A	Panel, 1-card

Table B. — Technical Summary

ITEM	501A10-101	501A10-OOP	501A10-OOF	501A10-OFD	501A10-FPG
LINE CAPACITY	6	6	6	6	6
STATION CAPACITY	10	10	10	10	10
• Expandable to:	20,30	20,30	20,30	20,30	20,30
MOUNTING DIMENSIONS					
• Height, Inches, (cm)	17 (43)	17 (43)	28 (71)	28 (71)	28 (71)
• Width, Inches, (cm)	14 (36)	14 (36)	13 (33)	13 (33)	13 (33)
• Depth, Inches, (cm)	11 (28)	11 (28)	12 (31)	12 (31)	12 (31)
APPROXIMATE WEIGHT	21 lb	27 lb	42 lb	50 lb	53 lb
POWER SUPPLY	None	182141-101	None	180125-101	180125-102
• Input, V ac, 60 Hz	—	104-125	—	111,117,123	111,117,123
• A-Battery (-24 V dc, talk)	—	1.4A	—	0.9A	0.9A
• B-Battery (-24 V dc)	—	0.0	—	0.6A	0.6A
• Lamp Battery (10 V ac)	—	5.0A*	—	2.8A	2.8A
• Signal Battery (20 V ac)	—	2.0*	—	1.4A	1.4A
• Ringing Voltage, 30 Hz	—	0.0	—	0.0	100-118,.05A

*Total of 50 Volt-Amperes For 10 V ac and 20 V ac

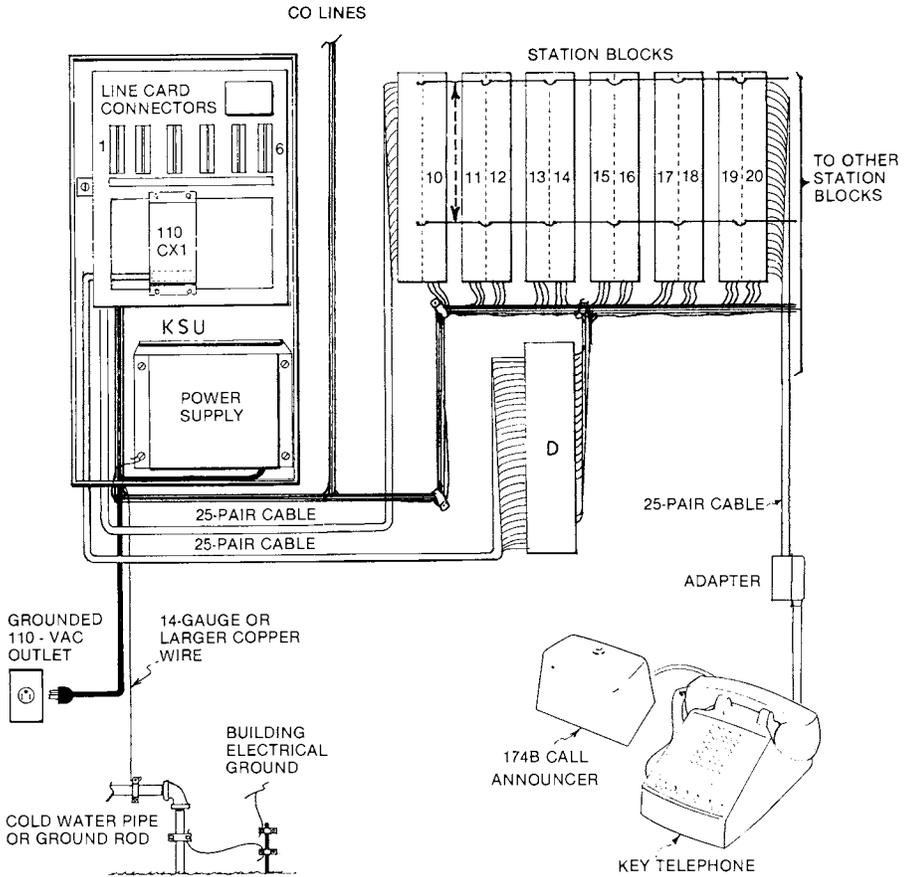


Fig. 1 — Typical Installation

3. INSTALLATION

MOUNT THE KEY SERVICE UNIT (Fig. 2)

3.01 The KSU should be centrally located to minimize the length of cable runs.

3.02 The mounting location should provide ample space for mounting the KSU and up to sixteen 66-type connecting blocks and to allow clearance to open the equipment rack. The KSU may be wall, floor, or shelf mounted.

3.03 The KSU must be within five feet (length of power cord) of a 115 V ac wall service outlet which is not controlled by a switch accessible for false operation.

CAUTION: Do not splice or add extensions to the power cord as it may cause low voltage and create a fire hazard.

3.04 The wall service outlet must be grounded and should be an individual circuit.

INSTALL FRAME GROUND (Fig. 2)

3.05 Using 14-gauge or larger copper wire, connect the cabinet to an approved (earth) ground such as a cold water pipe. This ground should be bonded to the building electrical ground. Connect the wire at one of the power supply mounting screws.

NOTE: A ground strap located on the front of the power supply connects the circuit ground to the frame ground. If this strap remains connected, and the 110-V ac outlet is properly grounded, the cold-water pipe ground is not required.

INSTALL STATION CONNECTING BLOCKS AND BLOCK D IF REQUIRED

3.06 Block A in the KSU has terminals for connecting a maximum of five station cables. If more than five phones are to be connected, two or more phones can be connected in parallel to each cable (multiples), or station blocks can be installed near the KSU and jumpers connected from Block A and B to the station blocks according to lead designations.

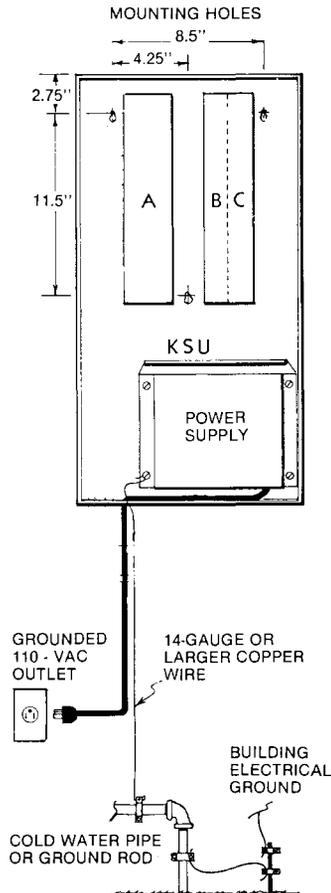


Fig. 2 — Mounting and Grounding KSU

3.07 Figure 1 illustrates a typical installation using external split blocks for station connections. The first side of the first station block is used for terminating a cable from Block A of the Key Service Unit (KSU).

3.08 If more than 19 stations are to be connected or if the Call Announcing/Tone card is used, install a 66-type block near the KSU and label it "D". (Fig. 4)

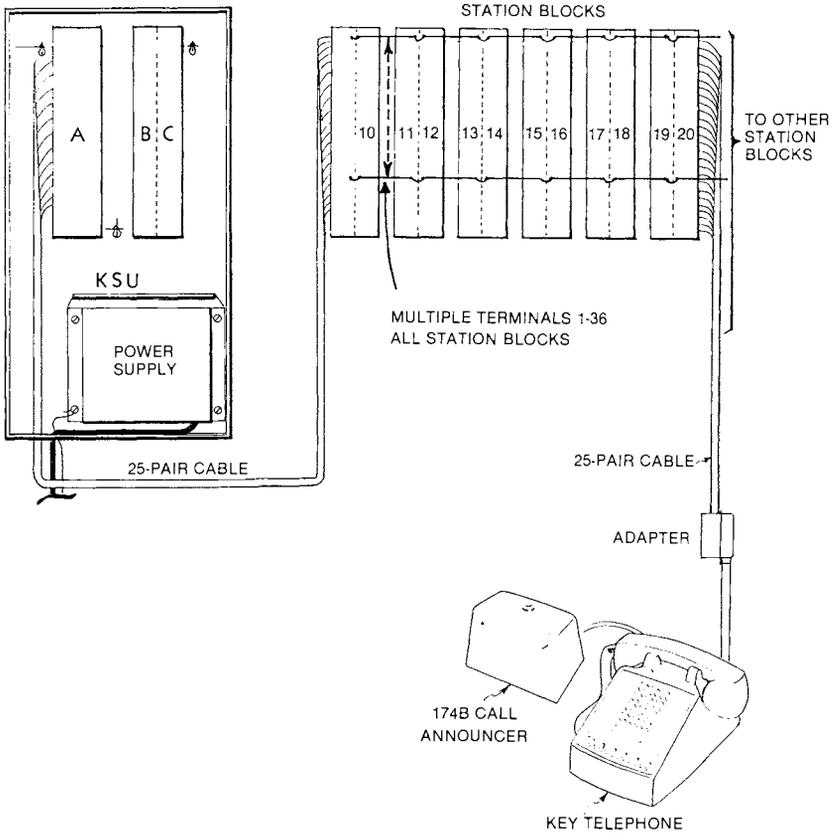


Fig. 3 — Installation of Station Blocks Showing Method of Connection to Block A and to Stations

CONNECT STATION BLOCKS TO BLOCK A (Fig. 3)

3.09 Use a length of 25-pair cable (approximately 6 feet) and multiple terminals 1 through 36 and 39 through 42 of Block A to the first Station Block. Cut these cable conductors down on the first column of clips on the first station block.

NOTE: The wiring arrangement described will cause line 1 to appear at button 1, line 2 at button 2, etc. The last button is shown connected for dial intercom. If lines are to appear on different buttons, the station block jumpers must be cross-connected as desired.

CONNECT PHONES TO STATION BLOCKS

3.10 Use 25-pair cable to connect each station to its assigned station connecting block. Punch 6-button phone cables down as shown in Table C; punch 10-button call-announcer phones down as shown in Table D. All station cable conductors should be cut down on the outer column of terminal clips.

CONNECT CALL ANNOUNCER TO 6-BUTTON PHONES.

3.11 If call announcers are used, connect them to 6-button telephones as follows:

- (1) Remove Red ringer lead from RR on Terminal Board. Tape and store lead.
- (2) Remove Black ringer lead from RT on Terminal Board. Tape and Store lead.
- (3) Connect Green (CA RT) lead to RR on Terminal Board. (SI-YI lead of mounting cord.)
- (4) Connect Red (CA RST) lead to RT on Terminal Board. (YI-SI lead of mounting cord.)
- (5) Connect Black (-24 V dc) lead to 3 on Terminal Board. (Orn-Yel lead of mounting cord.)
- (6) Connect Yellow (GND) lead to 4 on Terminal Board. (Yel-Orn lead of mounting cord.)

NOTE: If the Yel-Orn lead is used for busy-lamp field, connect the Yellow CA lead to 1B on Terminal Board.

MULTIPLE THE STATION BLOCKS (Fig. 3)

3.12 Use jumpers to multiple terminals 1-36 of all station blocks to the first station block. Use loop - through termination (the blade of the punch-down tool must be reversed) and connect jumpers to clips 3 and 4 (the two center clips in each row) of all station blocks.

MULTIPLE COMMON INTERCOM CONNECTIONS

3.13 Use jumpers to multiple terminals 39-42 of the first side of the first station block (A¹) to the T, R, LG, and L terminals assigned to intercom on all station blocks.

EXAMPLES: To use the last button on a 6-button phone for intercom, connect as follows:

A39 (ICM T) - Terminal 25 on station block

A40 (ICM R) - Terminal 26 on station block

A41 (ICM LG) - Terminal 29 on station block

A42 (ICM L) - Terminal 30 on station block

To use the last button on a 10-button call announcer phone (model 870 or 2870) for intercom, connect the intercom T, R, and L terminals to 9T, 9R, and 9L on the station block as follows:

A39 (ICM T) - Terminal 49 on station block

A40 (ICM R) - Terminal 50 on station block

A41 (ICM LG) - No connection

A42 (ICM L) - Terminal 46 on station block

INSTALL BLOCK D IF MORE THAN 19 STATIONS ARE USED OR IF THE CALL ANNOUNCING/TONE CARD IS INSTALLED.

3.14 Install Block D at a position convenient to the KSU and to the station blocks.

3.15 Use a short length of 25-pair cable with a 50-pin connector (female) on one end and connect the plug from the 110-CX1 Intercom Unit to Block D using standard wiring pattern.

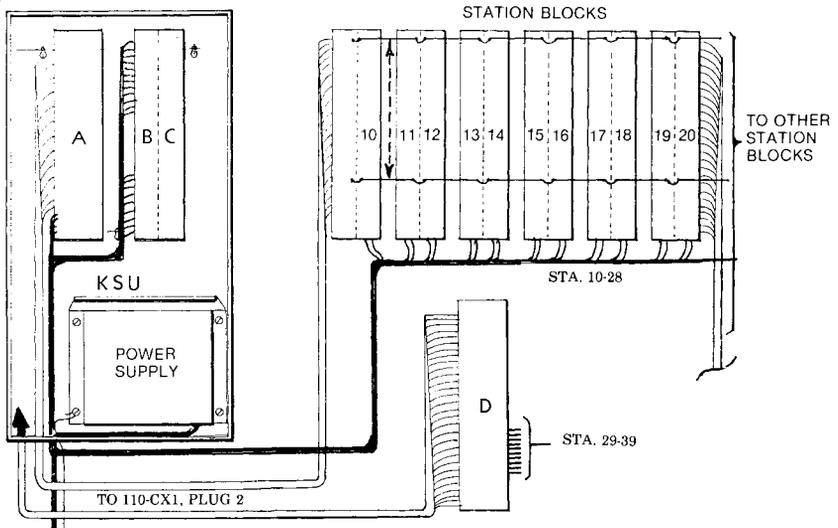


Fig. 4 — Installation of Block D and Connection of Intercom Signal Leads

CONNECT INTERCOM SIGNAL LEADS (Fig. 4 and Table E)

3.16 Use individual jumpers and connect intercom signal "R" lead from each station block to its assigned "R" terminal on Block A, B, or D. For 6-Button phones, this will be terminal 40 on station blocks; for 10-Button phones, this will be terminal 45 on station blocks.

IF RINGERS OR BUZZERS ARE USED FOR INTERCOM

3.17 Use individual jumpers and connect intercom signal "B" lead from each station block to its assigned "B" terminal on Block A or B. For stations 29-39 multiple this terminal of the station blocks and connect to one of the "RG" terminals on Block C (C47 or C49).

TO USE BUZZERS FOR INTERCOM SIGNALING, RINGERS FOR CO LINES

3.18 To use buzzers for intercom signaling and ringers for CO signaling, change wiring on Block C as follows:

- (1) Remove BRN strap from C48 and C50
- (2) Connect Ring Battery (110 V ac) to C48
- (3) Move W-BN from C48 to C50
- (4) Connect 18 V ac to C50.

NOTE: To use buzzers for CO and ringers for intercom, connect 18 V ac to C48 and Ringer Battery to C50.

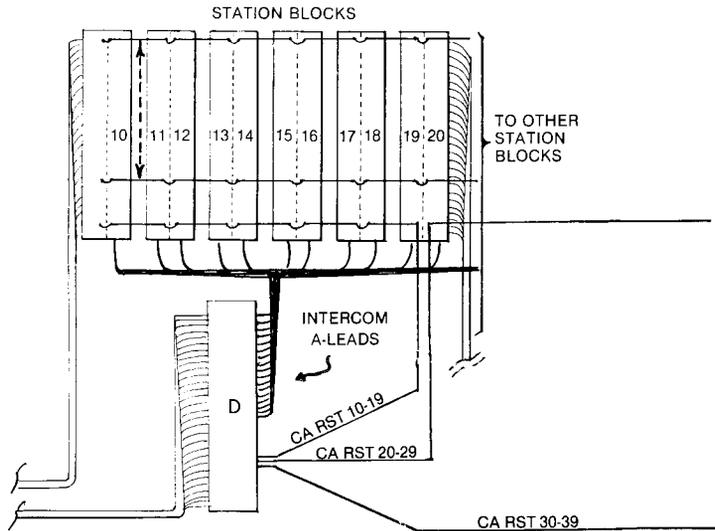


Fig. 5 — Connection of Intercom A-Leads and Call Announcer Reset (CA RST) Leads

CONNECT INTERCOM A-LEADS IF CALL ANNOUNCING/TONE CARD IS USED (Fig. 5)

3.19 If the Call-Announcing/Tone card is used, connect the A-lead from the intercom button of each station to its designated A-terminal on Block D:

- (a) For 6-button phones, connect a jumper from the designated A-terminal to station block terminal 27.
- (b) For 10-button phones, connect a jumper from the designated A-terminal to terminal 10 on the station block.

NOTE: Do not multiple A-leads.

CONNECT CALL ANNOUNCER RESET (CA RST) LEADS IF CALL ANNOUNCERS ARE USED (Fig.5)

3.20 If Call Announcers are used, connect call announcer reset (CA RST) terminals on Block D to station blocks as follows:

For 6-button phones;

Connect D45 to terminal 39 of station blocks 10-19.

Connect D46 to terminal 39 of station blocks 20-29,

Connect D47 to terminal 39 of station blocks 30-39.

For 10-button call-announcer phones;

Connect D45 to terminal 47 of station blocks 10-19,

Connect D46 to terminal 47 of station blocks 20-29,

Connect D47 to terminal 47 of station blocks 30-39.

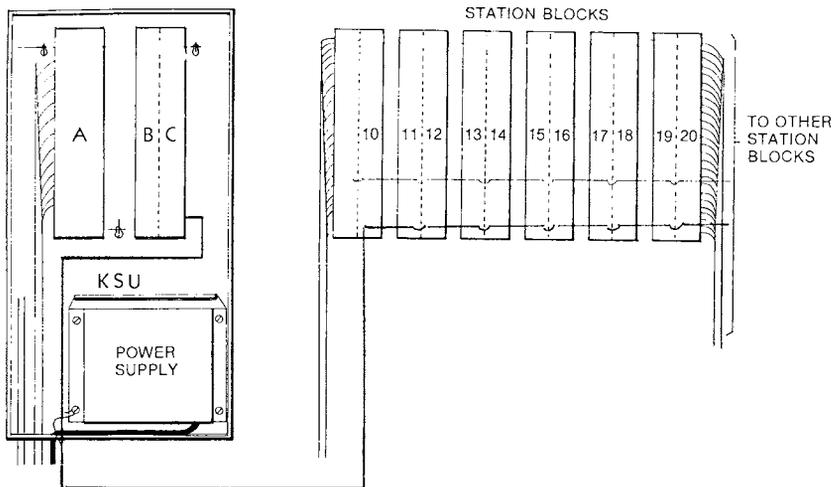


Fig. 6 — Installation of -24 VT (AB) Jumper

CONNECT A-BATTERY AND A-GROUND TO STATION BLOCKS IF CALL ANNOUNCERS ARE USED

3.21 If call announcers are used, A-Battery and A-Ground must be provided to the station blocks as required:

- (a) For 6-button phones using call announcers, multiple terminal 33 (Yel-Orn) of station blocks and connect to C43 (AG). Multiple terminal 34 (Orn-Yel) of all station blocks and connect to C44 (AB).
- (b) For 10-button call-announcer phones, multiple terminal 33 (Yel-Orn) of station blocks and connect to C43 (AG). Multiple terminal 41 (Vi-B) of station blocks and connect to C44 (AB).

CONNECT CO/PBX LINES

- 3.22 Connect CO/PBX lines to terminals C25 through C36 as designated on the block.
- 3.23 If a separate ring (RU) lead is used connect it to the AG terminal (near the top of Block C) associated with the line position used. The RU lead will then be connected to Pin 3 of the 400E Line Card.
- 3.24 Refer to Figure 14 and strap the 400E KTU for the desired options.
- 3.25 Be sure card retainer is in unlocked position and install one K400E type KTU for each CO or PBX line by plugging the KTUs into the KTU connectors with the printed circuit side to the installer's left. Push each KTU in firmly. Raise card retainer to locking position and tighten screws.

Table C — Connections to Station Blocks, 6-Button Telephones (Numbers in parentheses refer to notes on Page 8)

CIRCUIT DESIG- NATION	MOUNTING CORD	PLUG PIN	RUNNING CABLE	STATION			BLOCK			JUMPERS TO A, B, C, AND D BLOCKS
				<input type="checkbox"/>						
1T	W-BL	26	W-BL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>	A1
1R	BL-W	1	BL-W	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	A2
1A	W-O	27	W-O	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3	<input type="checkbox"/>	<input type="checkbox"/>	A3
A1	O-W	2	O-W	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	<input type="checkbox"/>	<input type="checkbox"/>	A4
1LG	W-G	28	W-G	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5	<input type="checkbox"/>	<input type="checkbox"/>	A5
1L	G-W	3	G-W	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6	<input type="checkbox"/>	<input type="checkbox"/>	A6
2T	W-BN	29	W-BN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7	<input type="checkbox"/>	<input type="checkbox"/>	A7
2R	BN-W	4	BN-W	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8	<input type="checkbox"/>	<input type="checkbox"/>	A8
2A	W-SL	30	W-SL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9	<input type="checkbox"/>	<input type="checkbox"/>	A9
A1	SL-W	5	SL-W	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10	<input type="checkbox"/>	<input type="checkbox"/>	A10
2LG	R-BL	31	R-BL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11	<input type="checkbox"/>	<input type="checkbox"/>	A11
2L	BL-R	6	BL-R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12	<input type="checkbox"/>	<input type="checkbox"/>	A12
3T	R-O	32	R-O	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13	<input type="checkbox"/>	<input type="checkbox"/>	A13
3R	O-R	7	O-R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14	<input type="checkbox"/>	<input type="checkbox"/>	A14
3A	R-G	33	R-G	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15	<input type="checkbox"/>	<input type="checkbox"/>	A15
A1	G-R	8	G-R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16	<input type="checkbox"/>	<input type="checkbox"/>	A16
3LG	R-BN	34	R-BN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17	<input type="checkbox"/>	<input type="checkbox"/>	A17
3L	BN-R	9	BN-R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18	<input type="checkbox"/>	<input type="checkbox"/>	A18
4T	R-SL	35	R-SL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	19	<input type="checkbox"/>	<input type="checkbox"/>	A19
4R	SL-R	10	SL-R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20	<input type="checkbox"/>	<input type="checkbox"/>	A20
4A	BK-BL	36	BK-BL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	21	<input type="checkbox"/>	<input type="checkbox"/>	A21
A1	BL-BK	11	BL-BK	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	22	<input type="checkbox"/>	<input type="checkbox"/>	A17
4LG	BK-O	37	BK-O	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	23	<input type="checkbox"/>	<input type="checkbox"/>	A23
4L	O-BK	12	O-BK	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	24	<input type="checkbox"/>	<input type="checkbox"/>	A24
5T	BK-G	38	BK-G	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	25	<input type="checkbox"/>	<input type="checkbox"/>	A39
5R	G-BK	13	G-BK	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	26	<input type="checkbox"/>	<input type="checkbox"/>	A40
5A	BK-BN	39	BK-BN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	27	<input type="checkbox"/>	<input type="checkbox"/>	D1-D30 (Table H)
A1	BN-BK	14	BN-BK	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	28	<input type="checkbox"/>	<input type="checkbox"/>	A33
5LG	BK-SL	40	BK-SL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	29	<input type="checkbox"/>	<input type="checkbox"/>	A41
5L	SL-BK	15	SL-BK	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	30	<input type="checkbox"/>	<input type="checkbox"/>	A42
AG For CA	Y-O	42	Y-O	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	33	<input type="checkbox"/>	<input type="checkbox"/>	C43
AB For CA	O-Y	17	O-Y	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	34	<input type="checkbox"/>	<input type="checkbox"/>	C44
B (CA RST)	Y-SL	45	Y-SL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	39	<input type="checkbox"/>	<input type="checkbox"/>	D45,46,47 (Table H)*
R (CA RT)	SL-Y	20	SL-Y	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	40	<input type="checkbox"/>	<input type="checkbox"/>	ICM SIGNAL (Table E)

*For buzzers or ringers, connect terminal 39 of each station block back to that station's assigned "B" terminal on Block A or B.(see Table E)

For call announcing, multiple terminal 39 of stations 10-19 and connect to D45; stations 20-29 to D46.(see Table H)

For all applications, connect terminal 40 of each station block to its assigned "R" terminal on Block A or B.(see Table E)

CHECK VOLTAGE

3.26 Before operation of the system, test and adjust the Power Supply output as follows:

- (1) Plug power cord into a wall service outlet.
- (2) Use a DC voltmeter and measure Talk (A) and Relay (B) Battery outputs.
- (3) If readings are lower than 21 V, unplug power cord and move primary tap from 117 V terminal to 111 V terminal.
- (4) If reading is higher than 28 V, unplug power cord and move primary tap from 117 V terminal to 123 V terminal.

Table D — Connections to Station Block, 870,2870 Telephones

CIRCUIT DESIG- NATION	MOUNTING CORD	PLUG PIN	RUNNING CABLE	STATION BLOCK				JUMPERS TO A, B, C, AND D BLOCKS (NOTE 1)	
				□	□	□	□		
1T	W-BL	26	W-BL	□	□	□	1	□	A1
1R	BL-W	1	BL-W	□	□	□	2	□	A2
1A	W-O	27	W-O	□	□	□	3	□	A3
A1	O-W	2	O-W	□	□	□	4	□	A4
1LG	W-G	28	W-G	□	□	□	5	□	A5
1L	G-W	3	G-W	□	□	□	6	□	A6
2T	W-BN	29	W-BN	□	□	□	7	□	A7
2R	BN-W	4	BN-W	□	□	□	8	□	A8
2A	W-SL	30	W-SL	□	□	□	9	□	A9
9A (ICM)	SL-W	5	SL-W	□	□	□	10	□	D1-D30 (Table H)
2LG	R-BL	31	R-BL	□	□	□	11	□	A11
2L	BL-R	6	BL-R	□	□	□	12	□	A12
3T	R-O	32	R-O	□	□	□	13	□	A13
3R	O-R	7	O-R	□	□	□	14	□	A14
3A	R-G	33	R-G	□	□	□	15	□	A15
8A	G-R	8	G-R	□	□	□	16	□	—
3LG	R-BN	34	R-BN	□	□	□	17	□	A17
3L	BN-R	9	BN-R	□	□	□	18	□	A18
4T	R-SL	35	R-SL	□	□	□	19	□	A19
4R	SL-R	10	SL-R	□	□	□	20	□	A20
4A	BK-BL	36	BK-BL	□	□	□	21	□	A21
7A	BL-BK	11	BL-BK	□	□	□	22	□	—
4LG	BK-O	37	BK-O	□	□	□	23	□	A23
4L	O-BK	12	O-BK	□	□	□	24	□	A24
5T	BK-G	38	BK-G	□	□	□	25	□	A25
5R	G-BK	13	G-BK	□	□	□	26	□	A26
5A	BK-BN	39	BK-BN	□	□	□	27	□	A27
6A	BN-BK	14	BN-BK	□	□	□	28	□	A33
5LG	BK-SL	40	BK-SL	□	□	□	29	□	A29
5L	SL-BK	15	SL-BK	□	□	□	30	□	A30
6T	Y-BL	41	Y-BL	□	□	□	31	□	A31
6R	BL-Y	16	BL-Y	□	□	□	32	□	A32
AG (Call An.)	Y-O	42	Y-O	□	□	□	33	□	C43
SPARE	O-Y	17	O-Y	□	□	□	34	□	—
6LG	Y-G	43	Y-G	□	□	□	35	□	A35
6L	G-Y	18	G-Y	□	□	□	36	□	A36
7T	Y-BN	44	Y-BN	□	□	□	37	□	—
7R	BN-Y	19	BN-Y	□	□	□	38	□	—
B1	Y-SL	45	Y-SL	□	□	□	39	□	CO Audible Sig. B1 (Block B)
R1 (4)	SL-Y	20	SL-Y	□	□	□	40	□	CO Audible Sig. R1 (Block B)
AB (Call An.)	V-BL	46	V-BL	□	□	□	41	□	C44
7L	BL-V	21	BL-V	□	□	□	42	□	—
8T	V-O	47	V-O	□	□	□	43	□	—
8R	O-V	22	O-V	□	□	□	44	□	—
R or CA RT	V-G	48	V-G	□	□	□	45	□	ICM SIGNAL LEAD (NOTE 2) (Table E)
9L (ICM)	G-V	23	G-V	□	□	□	46	□	A42
B or CA RST	V-BN	49	V-BN	□	□	□	47	□	D45, 46, or 47 (NOTE 3)(Table H)
8L	BN-V	24	BN-V	□	□	□	48	□	—
9T (ICM)	V-SL	50	V-SL	□	□	□	49	□	A39
9R (ICM)	SL-V	25	SL-V	□	□	□	50	□	A40

NOTES :

- Use 25-pair cable to jump from Block A to the first station block. Use individual wires for other jumpers.
- For stations 10-28, use individual jumpers and connect terminal 45 of each station block back to the "R" terminal on Block A or B assigned to that station.
- For buzzers or ringers, use individual jumpers and connect terminal 47 of each station block back to the "R" terminal on Block B or Block A assigned to that station. For call announcing multiple terminal 47 of stations 10-19 and connect to D45. Multiple terminal 47 of stations 20-29 and connect to D46.

Table E — Intercom Number Assignments

Intercom Number	Desig. Notation	Block Term. No.			
10	B	B18	25	B	B45
	R	B17		R	B46
11	B	A47	26	B	B47
	R	A48		R	B48
12	B	B1	27	B	B49
	R	B2		R	B50
13	B	B3	28	B	A45
	R	B4		R	A46
14	B	B5	29	B	D48*
	R	B6		R	D42
15	B	B7	30	B	D48*
	R	B8		R	D32
16	B	B9	31	B	D48*
	R	B10		R	D31
17	B	B11	32	B	D48*
	R	B12		R	D34
18	B	B13	33	B	D48*
	R	B14		R	D33
19	B	B15	34	B	D49*
	R	B16		R	D36
20	B	A49	35	B	D49*
	R	A50		R	D35
21	B	B37	36	B	D49*
	R	B38		R	D38
22	B	B39	37	B	D49*
	R	B40		R	D37
23	B	B41	38	B	D49*
	R	B42		R	D40
24	B	B43	39	B	D50*
	R	B44		R	D39

* Install Jumper from D48, D49, and D50 to C49 (RG).

Table F — Connections to Block A

FEATURE	LEAD DESIG.	TERM. NO.	BLOCK "A"					
			CLIP					
			1	2	3	4	5	6
LINE 1	T	1						
	R	2						
	A	3						
	A1	4						
	LG	5						
LINE 2	L	6						
	T	7						
	R	8						
	A	9						
	A1	10						
LINE 3	LG	11						
	L	12						
	T	13						
	R	14						
	A	15						
LINE 4	A1	16						
	LG	17						
	L	18						
	T	19						
	R	20						
LINE 5	A	21						
	A1	22						
	LG	23						
	L	24						
	T	25						
LINE 6	R	26						
	A	27						
	A1	28						
	LG	29						
	L	30						
DIAL SELECTIVE INTERCOM LINE	T	31						
	R	32						
	A	33						
	A1	34						
	LG	35						
SPARE NOTE 4	L	36						
	T	37						
	R	38						
	T	39						
	R	40						
SPARE NOTE 4	LG	41						
	L	42						
	LG	43						
	L	44						
	B	45						
R	46							
B	47							
R	48							
B	49							
R	50							

NOTES: (Tables F and G)

1. Terminate connector or running cables to right on clips as required.
2. Shop wiring from apparatus is terminated this clip.
3. When K401B KTU, manual intercom is required, associated BAT. A and GND. A leads are to be strapped to terms. 44 and 43 of Block C.

Table G — Connections to Blocks B and C

BLOCK "B"				BLOCK "C"							
FEATURE	LEAD DESIG.	TERM. NO.	CLIP			CLIP			TERM. NO.	LEAD DESIG.	FEATURE
			1	2	3	3	2	1			
DIAL SELECTIVE INTERCOM STATION SIGNALS	B "2"	1	NOTE 1	NOTE 1	NOTE 2	NOTE 2	NOTE 3	1	AG	LINE 1	
	R "2"	2						2	AB		
	B "3"	3						3	AG	LINE 2	
	R "3"	4						4	AB		
	B "4"	5						5	AG	LINE 3	
	R "4"	6						6	AB		
	B "5"	7						7	AG	LINE 4	
	R "5"	8						8	AB		
	B "6"	9						9	AG	LINE 5	
	R "6"	10						10	AB		
	B "7"	11						11	AG	LINE 6	
	R "7"	12						12	AB		
	B "8"	13						13			
	R "8"	14						14			
	B "9"	15						15			
	R "9"	16						16			
	B "0"	17						17			
	R "0"	18						18			
STATION AUDIBLE SIGNALS	LINE 1	B1, BZ1	19	NOTE 1	17	BZ	COMMON CONTROL LEADS TO OTHER CONNECTING EQUIPMENT	18	BZ1		
		R1, BZ	20		19	RN					
	LINE 2	B1, BZ1	21		20	ST					
		R1, BZ	22		21	LF1					
	LINE 3	B1, BZ1	23		22	LW1					
		R1, BZ	24		23	LF2					
LINE 4	B1, BZ1	25	24	LW2	25	T	LINE 1				
	R1, BZ	26	26	R							
LINE 5	B1, BZ1	27	27	T	27	T	LINE 2				
	R1, BZ	28	28	R							
LINE 6	B1, BZ1	29	29	T	29	T	LINE 3				
	R1, BZ	30	30	R							
COMMON AUDIBLE SIGNALING CIRCUIT	CAS	CAS	31	NOTE 1	31	T	LINE 4				
	CAS	CAS	32		32	R					
	CAS	CAS	33		33	T					
	CAS	CAS	34		34	R					
	CAS	CAS	35		35	T					
	CAS	CAS	36		36	R					
SPARE NOTE 4			37	NOTE 2	37	LG1	POWER SUPPLY	38	LB1	LP. GND.	
			38		38	LB1		LP. BAT.			
			39		39	LG2		LP. GND.			
			40		40	LB2		LP. BAT.			
			41		41	BG		RLY. GND.			
			42		42	BB		RLY. BAT.			
			43		43	AG		TLK. GND.			
			44		44	AB		TLK. BAT.			
			45		45	BG		RLY. GND.			
			46		46						
			47		47	RG		R. G. GND.			
			48		48	RB		R. C. 2			
			49		49	RG		BZ. GND.			
			50		50	RB		BZ. 2			

MANUAL INTERCOM BATTERY FEED

CO OR PBX LINES (NOTE 5)

Table H — Connections to Block D (External Block)

CIRCUIT DESIG- NATION	PLUG 6 PIN NO.	RUNNING CABLE	BLOCK D		TERMINAL ON STATION BLOCK(S)
			48	49	
A32	26	W-BL	1	1	
A33	1	BL-W	2	1	
A24	27	W-O	3	1	
A23	2	O-W	4	1	
A34	28	W-G	5	1	
A25	3	G-W	6	1	
A22	29	W-BN	7	1	
A35	4	BN-W	8	1	
A26	30	W-SL	9	1	
A31	5	SL-W	10	1	
A36	31	R-BL	11	1	
A27	6	BL-R	12	1	
A10	32	R-O	13	1	
A37	7	O-R	14	1	
A28	33	R-G	15	1	Intercom Station "A" Lead (Note 1)
A21	8	G-R	16	1	
A38	34	R-BN	17	1	
A29	9	BN-R	18	1	
A18	35	R-SL	19	1	
A39	10	SL-R	20	1	
A20	36	BK-BL	21	1	
A11	11	BL-BK	22	1	
A30	37	BK-O	23	1	
A13	12	O-BK	24	1	
A16	38	BK-G	25	1	
A19	13	G-BK	26	1	
A14	39	BK-BN	27	1	
A17	14	BN-BK	28	1	
A12	40	BK-SL	29	1	
A30	15	SL-BK	30	1	
R31 (CART)	41	Y-BL	31	1	
R30	16	BL-Y	32	1	
R33	42	Y-O	33	1	
R32	17	O-Y	34	1	
R35	43	Y-G	35	1	
R34	18	G-Y	36	1	
R37	44	Y-BN	37	1	Intercom Station Signal Lead (Note 2)
R36	19	BN-Y	38	1	
R39	45	Y-SL	39	1	
R38	20	SL-Y	40	1	
--	46	V-BL	41	1	
R29	21	BL-V	42	1	
--	47	V-O	43	1	
--	22	O-V	44	1	
CA RST 10-19	48	V-G	45	1	
CA RST 20-29	23	G-V	46	1	(Call Announcer Reset)
CA RST 30-39	49	V-BN	47	1	(NOTE 3)
--	24	BN-V	48	1	
--	50	V-SL	49	1	
--	25	SL-V	50	1	

NOTES:

- (1) Applicable leads must be connected if Call Announcing Card is used.
- (2) Install a jumper from C48 to D49, and D50 and terminate station RG leads on these terminals if ringers or buzzers are used.
- (3) Common CA RST (Call Announcer Reset) leads and connect as shown; i.e. Stations 10-19 to term. 45, etc.

- NOTES:
- ONLY CLIPS 1, 2, 3, 4 and 5 OF BLOCK "A" AND CLIPS 2 AND 3 OF BLOCK B ARE USEABLE IN TERMINATION OF STATION CONN. OR EXTERNAL CONN. BLOCK CABLES.
 - COMMON AUDIBLE SIGNAL TERMINATION FOR SIX CO OR PBX LINES, STRAP DESIRED TERMINALS TOGETHER AND CONNECT SLT-YEL CABLE CONDUCTOR TO THE STRAPPED GROUP AND YEL-SLT CABLE CONDUCTOR TO A VACANT B1 TERMINAL.
 - DEPENDING UPON WHERE THE 401B OR 410A KTUs CARD IS INSERTED, IT IS NECESSARY TO STRAP THE CORRESPONDING AG AND AB CLIPS TO CLIPS 43 AND 44 RESP.
 - TO USE BUZZERS FOR INTERCOM SIGNALS AND RINGERS FOR CO LINES, CHANGE STRAPPING AS FOLLOWS:
 - REMOVE BRN STRAP FROM 48 AND 50 ON BLOCK "C"
 - CONNECT RING BATTERY TO TERMINAL 48 ON BLOCK "C"
 - MOVE W-BN FROM C48 TO C50.
 - CONNECT 18 V± FROM POWER SUPPLY TO TERMINAL 50 OF BLOCK "C".

- TO USE RINGERS FOR INTERCOM SIGNALS AND BUZZERS FOR CO LINES, CONNECT 105V ± TO TERMINALS 50 AND 18V ± TO TERMINAL 48 ON BLOCK "C".
- IF DIAL INTERCOM IS INCLUDED IN THE PACKAGE, THE CONDUCTORS NORMALLY USED FOR LINE 5 MUST BE CONNECTED FOR DIAL INTERCOM AS SHOWN.
- IF RINGERS ARE USED FOR AUDIBLE SIGNALS, CONNECT YEL-SLT TO B OR B1 TERMINAL.

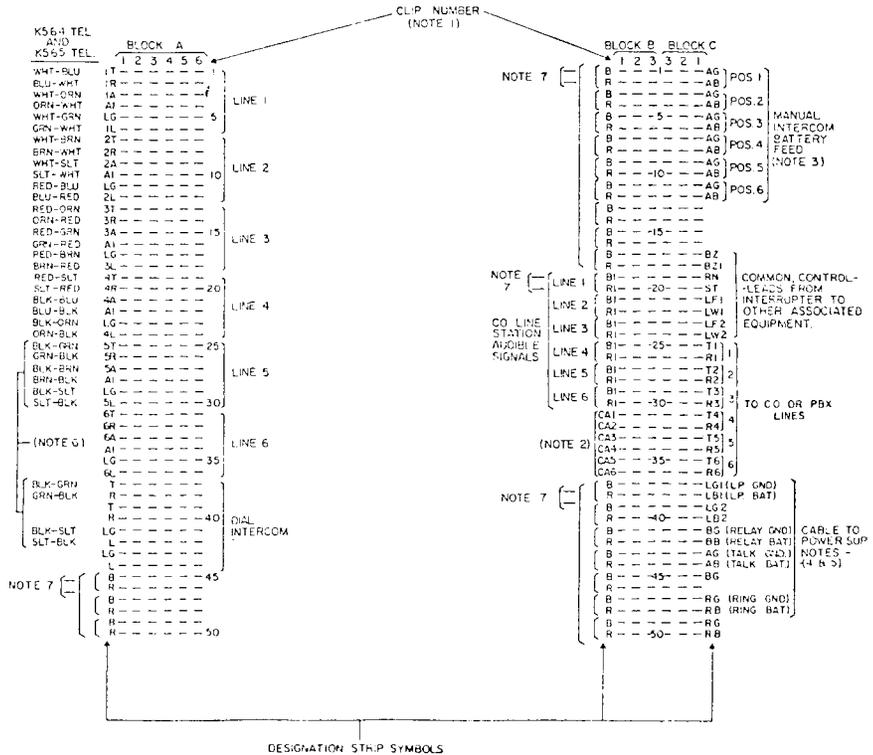
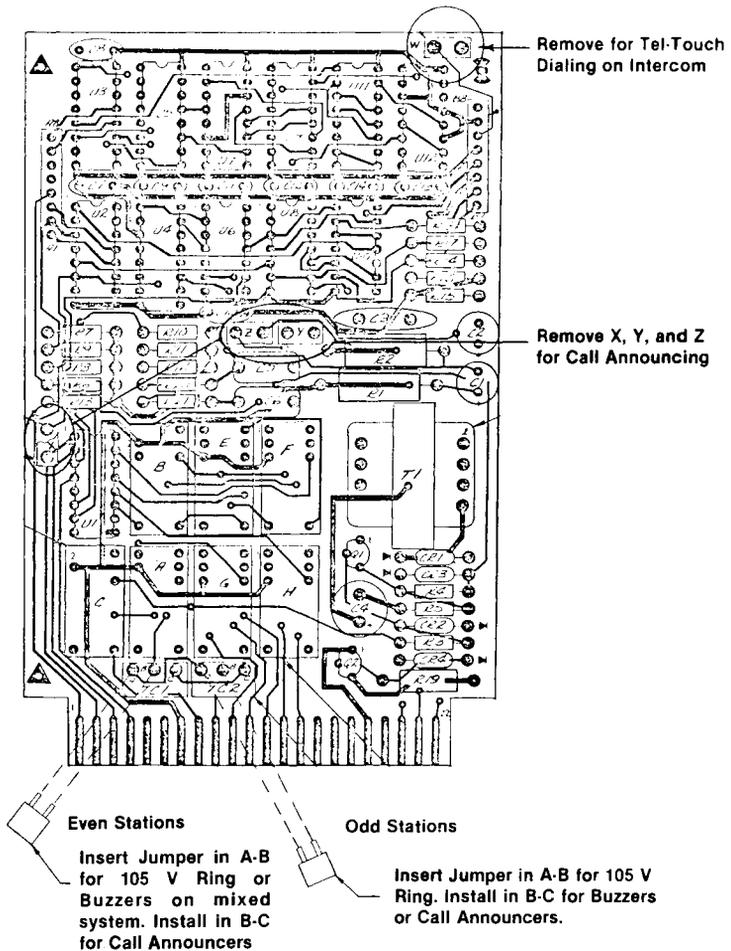


Fig. 7 — Connections to Block A, B, and C

TABLE I — P.C.B. Programming Chart (110-CX1 Intercom)

P.C.B. to be Strapped	Desired System Condition	Required Strapping
183977 Intercom Card (Figure 9)	All Call Announcers only	In TC1 install B-C. In TC2 install B-C. Remove X, Y, and Z straps.
	*See Note 1 "Mixed" system, i.e. ringers or buzzers and Call Announcers	In TC1 install A-B for 105 V ring or buzzers at even stations. In TC2 install B-C for C.A.'s at odd stations. Remove X, Y, and Z straps (for Call Announcing).
	*See Note 3 All ringers or all buzzers	In TC1 install A-B. In TC2 install A-B. Remove X, Y, and Z straps.
183973 Call Announcer Card (Figure 10)	For Tel-Touch/Rotary Dialing	Install W strap for rotary dialing. Remove W strap for Tel-Touch/Rotary dialing.
	Mandatory strapping when either "Mixed" system or all Call Announcers are used.	Install J-K and G-H straps. Install C-D jumper. Remove L-M and E-F straps. Remove A-B jumper.
	To provide dial tone and ring-back for dial intercom. No C.A.'s (Future)	Install J-K and G-H straps. Install A-B jumper. Remove L-M and E-F straps. Remove C-D jumper.
184397 Intercom Expansion Card (Figure 11) *See Note 2	All Call Announcers only	In TC1 install B-C jumper. In TC2 install B-C jumper. Install E-F strap.
	*See Note 1 "Mixed" system, i.e. ringers and Call Announcers	In TC1 install A-B for 105 V ring or buzzers at even stations. In TC2 install B-C for C.A.'s at odd stations. Install E-F strap.
Announce-a-Call System "Motherboard" (Figure 12)	All ringers or all buzzers	In TC1 install A-B jumper. In TC2 install A-B jumper. Install E-F strap.
	All Call Announcers only	Install A-B strap. Install E-F strap. Remove A-C strap. Remove A-D strap.
	*See Note 1 "Mixed" system, i.e., Ringers and Call Announcers	Install A-C strap. Install E-F strap. Remove A-B strap. Remove A-D strap.
	All Ringers or all buzzers	Install A-D strap. Install E-F strap. Remove A-B strap. Remove A-C strap.

1. Caution: Call Announcers must be on odd stations in a "Mixed" system, (Call Announcers at some stations, ringers at others.)
2. On the expansion board, the TC2 jumper is between the D-E-F strap position and the TC1 jumper position.
3. The X, Y, and Z straps are required when there is no Call-Announcing/Tone card. The Call Announcing/Tone card provides dial tone, ringback and intermittent signaling for dial intercom when call announcers are not used.



CAUTION: Call announcers must be on odd stations in a mixed system, (call announcers at some stations, ringers or buzzers at others).

Fig. 9 — Strapping Options on Intercom Card (see Table I)

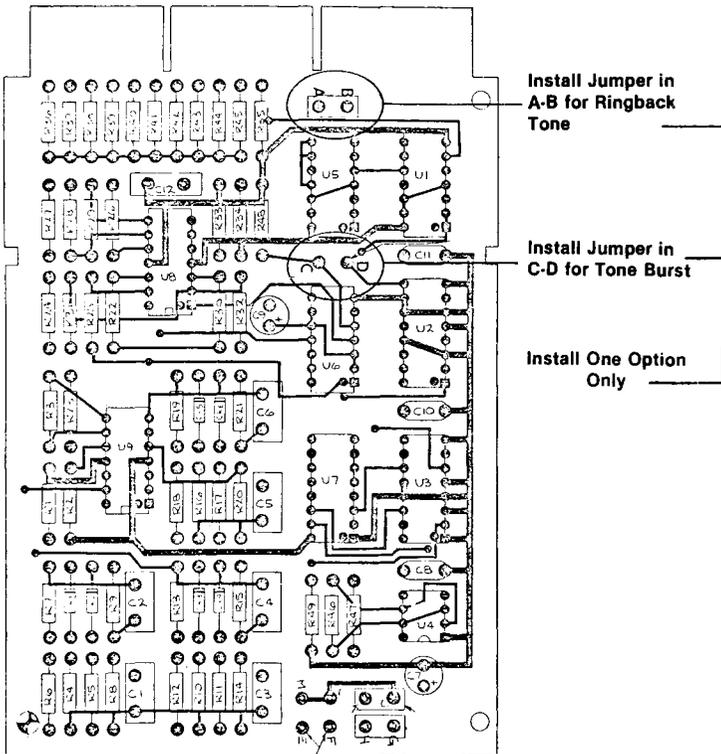


Fig. 10 — Strapping Options on Call Announcing Card (see Table I)

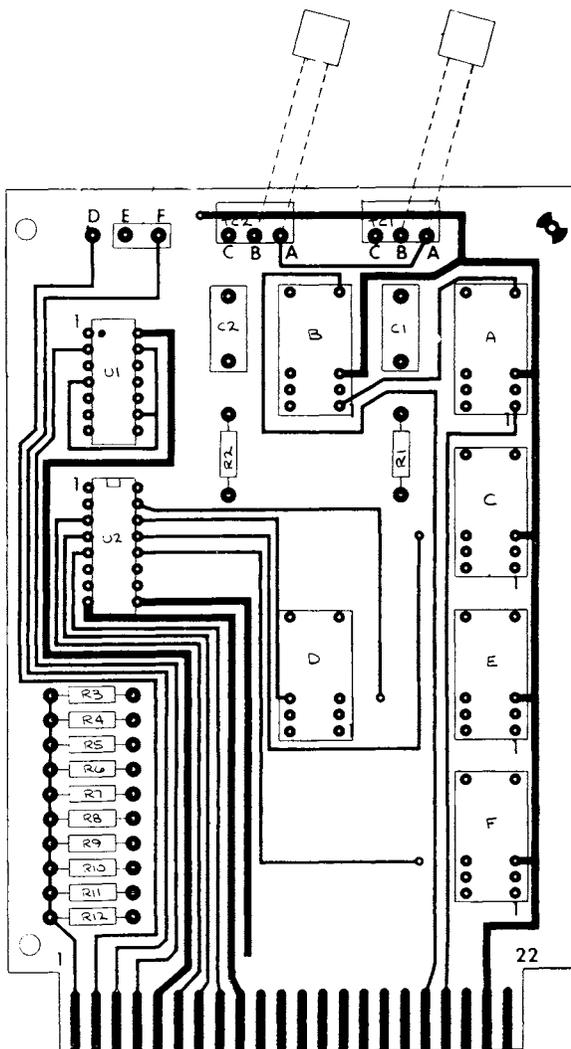


Fig. 11 — Strapping Options on Intercom Expansion Card (see Table I)

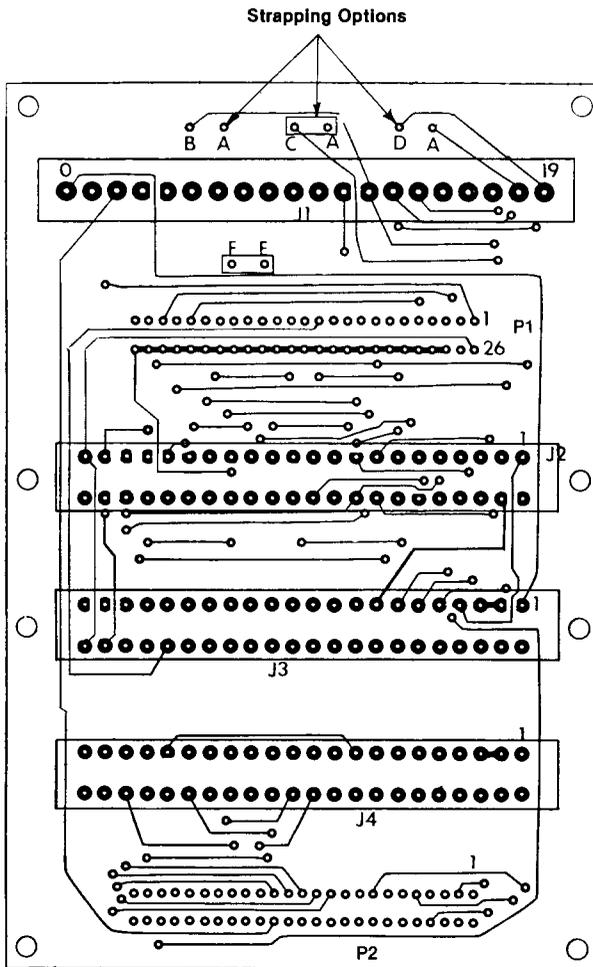


Fig. 12 — Strapping Options on Intercall System Motherboard (see Table I)

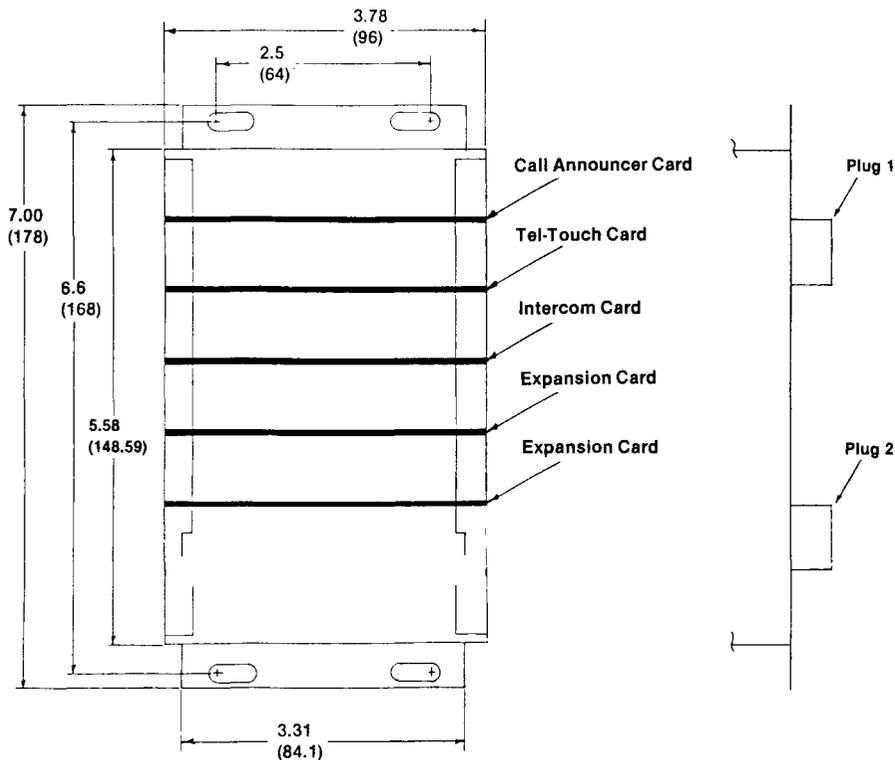
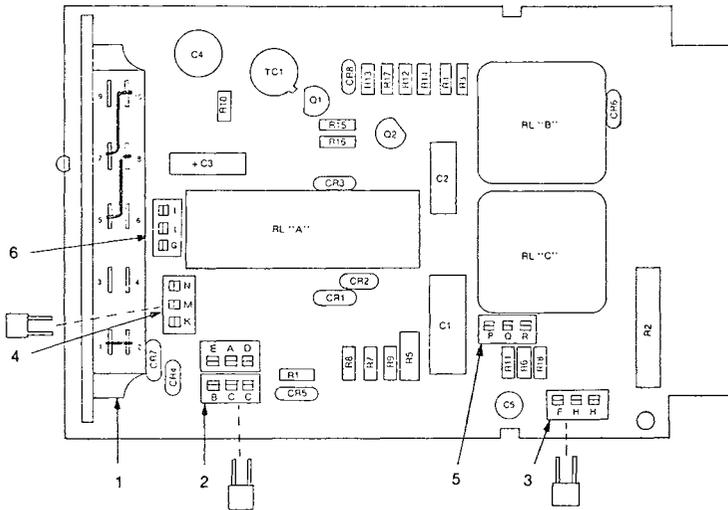


Fig. 13 — Mounting Dimensions and Card Position of the Announce-a-Call Unit

TABLE J — Intercom Expansion, and Call Announcer Test

Test No.	Test	Check for These Conditions
1	Depress Intercom button on any station, pick up handset.	Intercom indicator lamps on for all stations. Dial tone audible.
2	Dial 1 for access to stations #10 thru #19.	Dial tone not audible.
3	Dial any digit, 0 - 9.	Tone burst at end of dial tone. Dialed station rings or Call Announcers at dialed stations turns on with tone burst. Indicator lamps flash.
4	Lift handset on dialed station and press intercom button.	Indicator lamps are on. Station no longer rings. Transmission possible. Call Announcer is no longer active (where applicable).
5	Replace both handsets.	All lamps are off.
6	Repeat step 2 dialing a "2" instead of a "1" for access to stations #20 thru #29 — repeat steps 3 thru 5.	
7	Repeat step 2 dialing a "3" instead of a "1" for access to stations #30 thru #39 — repeat steps 3 thru 5.	

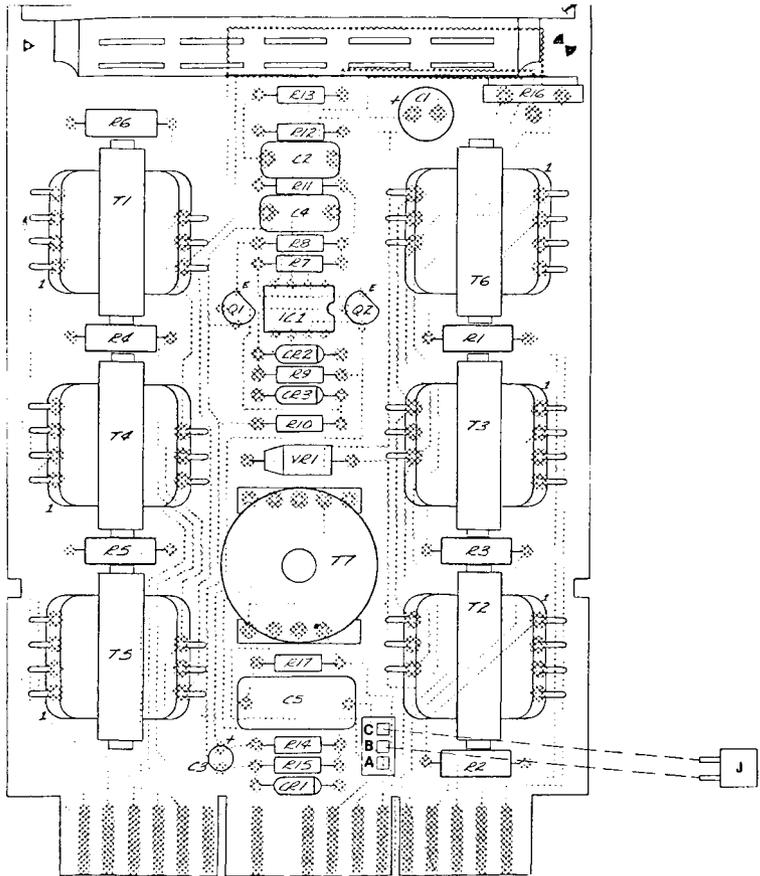
Note: For functional tests without Call Announcing/Tone Card, delete requirement for tones. Operation without the Call Announcing/Tone Card gives simple single burst ring with no tones.



CODE	OPTION	OPTION BLOCK No.	JUMPER	
			Install	Remove
Z	Short time-out *	(1)	1 - 2*	—
W	Interrupted ringing *	(1)	5 - 8*	—
T	Steady ringing	(1)	6 - 8	5 - 8*
V	Auxiliary Common Audible signal control	(1)	4 - 8	5 - 8*
Y	Winking lamp on "Hold" *	(1)	10 - 7*	—
X	Steady lamp on "Hold"	(1)	9 - 7	10 - 7*
BR	Bridged ringing*	(2), (4)	C-D, M-N*	—
RG	Ringng from Ring side of line to Ground	(2), (4)	C-B, M-N	C-D
TU	Ringng from a separate lead to Tip side of line	(2), (4)	C-A, K-M	C-D, M-N
RU	Ringng from a separate lead to Ring side of line	(2), (4)	C-A, M-N	C-D
DR	Direct ringing (-24V dc applied thru relay contact)	(2), (4)	A-E	C-D, M-N
RPC	Registered Protective Coupler*	(2), (4), (6)	A-E, I-I	C-D, M-N, I-G
M	Music-on-Hold (Requires additional equipment)	(3)	F-H	H-H
RD	Hold release delay (short)* (long ESS)	(5)	Q-R *	P-Q
		(5)	P-Q	Q-R*

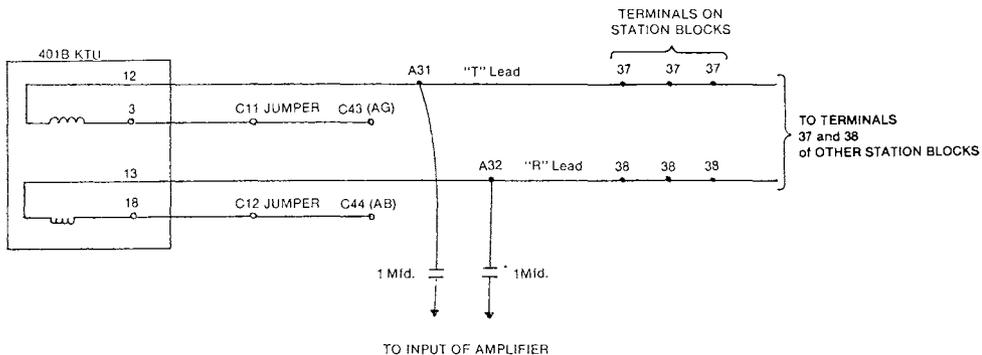
* Factory Strapping

Fig. 14 — K400E CO/PBX Card Strapping Options



NOTE: For low input impedance, (500 Ohm), Jumper plugs into B and C of Option Block.
 For high input impedance, (8000 Ohm), Jumper plugs into A and B of Option Block.

Fig. 15 — Location of Option Blocks on 403A Music-on-Hold KTU



**Fig. 16 — Schematic, Button-Accessed Paging
401B KTU Installed in J6 and Line
Button Number 7 Used for Access Button**

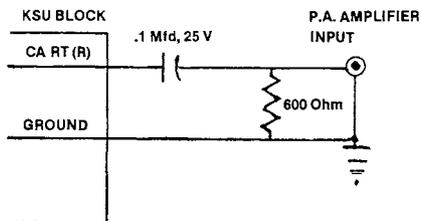


Fig. 17 — Wiring Connections For Voice Paging With A System Using Call Announcers

4. AUXILIARY FEATURES

MUSIC-ON-HOLD (K403A KTU)

- 4.01 Instructions covering this feature are covered in KSP403-00A.

NOTE: K400E Line Cards are required for Music-On-Hold. Also a music source must be customer provided.

MANUAL INTERCOM (K401B KTU)

- 4.02 Instructions covering manual intercom are covered in KSP401-00B. The 401B Manual Intercom may be installed in any vacant card connector in the KSU. A-Battery must be supplied to Pin 18 and A-Ground to Pin 3 of the K401B. To accomplish this, connect C43 and C44 to AG and AB (respectively), of the connector used. For example, if connector number 6, (CKT6), is used, connect C43 to C11 and C44 to C12. The K401B provides talk and lamp circuitry. A signaling arrangement external to the K401B must be separately provided.

BUTTON-ACCESSED PAGING (K401B KTU)

- 4.03 Pushbutton access to a PA system for voice paging from intercom stations can be provided by installing a K401B KTU.

- 4.04 The 401B KTU can be installed in any vacant CO/PBX line card slot of the KSU or mounted in a 359A Panel.

- 4.05 After determining the line card slot to be used, strap AB to pin 18 and AG to pin 3 of that card connector. (Note 1, Fig. 19) For example, if line card slot 6 is used for the 401B, strap C11-C43 and C12-C44.

- 4.06 Convert a spare button of each telephone to non-locking operation by unscrewing the interlock pin from the plunger until the pin clears the interlock slides. (See instructions packed with telephone.)

- 4.07 Connect the T and R leads from this button to T and R of the K401B KTU on the KSU block. For example, if line card slot 6 is used for the 401B, connect T leads to A31 and R leads to A32.

- 4.08 Connect a 1-mfd capacitor in series with each amplifier input and the T and R leads from the stations (see Fig. 16). For example, if line

card slot 6 is used for the 401B, connect one capacitor between A31 and one amplifier input and the other capacitor between A32 and the other amplifier input.

- 4.09 Button-accessed paging is accomplished by going off-hook, holding down the designated non-locking button, and talking into the telephone handset. The user's voice will go out over the PA system. When the button is released, the connection is broken.

DIAL-ACCESSED PAGING

General

- 4.10 Dial access to a customer furnished PA system for voice paging from intercom stations can be provided by one of the following methods:

- (1) In a system using all call announcers for intercom signaling, an intercom number may be assigned to voice paging.
- (2) In a system using ringers and buzzers for intercom signaling (with or without dial tone and ringback) a 410A Paging Adapter KTU may be installed in any vacant line card position. Any unused intercom number may be assigned to the feature.
- (3) In a mixed system, using call announcers at some stations and ringers or buzzers at other stations, either of the above methods may be used. If a call announcer number is assigned to voice paging, it must be an odd number; if a 410A KTU is used, an even number must be assigned to voice paging.

Dial Accessed Voice Paging Using Call Announcing Intercom Number

- 4.11 If the system uses all call announcers for intercom signaling, any intercom number may be assigned to voice paging. If the system is mixed (call announcers and ringers or buzzers), an odd intercom number must be assigned to voice paging.

- 4.12 Connect the CA RT lead assigned to voice paging to one amplifier input and ground to the other amplifier input using interface circuit shown in Figure 17.

Table K — Connections to 410A Paging Adapter KTU Using CO/PBX Line Card Connector No. 5 and Intercom No. 14

CARD CONN. PIN NO.	CONN. BLOCK TERM.	CONNECTION
1(RT)	B28	B6 (Intercom Signal Lead)
8(5L)	A30	Background Music Source
9(R5)	C34	Background Music Source
9(R5)	C34	Amplifier Input
14(T5)	C33	Amplifier Input
12(5T)	A25	A37 (Intercom T)
13(5R)	A26	A38 or A40 (Intercom R)
17(BB)	INTERNAL	None (Provided in Connector)

AMPLIFIER SWITCHING		

15(GND)	INTERNAL	None (Provided in Connector)
16(5A)	A27	Relay Lead (x) or Amp Power Lead (W)
18(AB)	C10	C44 (If Option X is used)

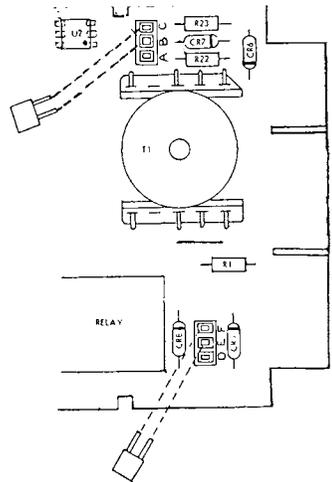
Installation of 410A KTU to Provide Dial-Accessed Voice Paging

4.13 Connect Amplifier Leads. Determine the line card slot to be used for installing the 410A KTU and connect the amplifier input leads to the "T" and "R" terminals of that line position (on Block C). For example, if line card slot 5 is used, connect amplifier input leads to T5 and R5 on Block C.

4.14 Connect Intercom RT Leads. Determine the intercom number that will be assigned to voice-paging and install a jumper from that "R" terminal on Block B to the "R1" terminal for the line position used. For example, if intercom number 14 is used and line slot 6 is used, install the jumper from B6 to B30.

4.15 Connect Intercom "T" Leads. Install a jumper from "T" terminal of the line position used (on Block A) to intercom "T" (on Block A). For example: if the 410A KTU is to be installed in line card slot number 5, connect A31 to A37 or A39.

4.16 Connect Intercom "R" Leads. Connect a 56 Ohm resistor between the "R" terminal of the line position used (on Block A) and the intercom "R" terminal (on Block A). For example: if line position 5 is used, install the 56 Ohm resistor between A26 and A38 or A40.



Option	Strap	Description
W	E to F	Ground switched to pin 16
D	D to E	-24 Vdc switched from pin 18 to 16
X	A to B	14 Vac + 40% signal voltage
U	B to C	100 Vac + 30% signal voltage

Fig. 18 — Location of Option Blocks, 410A KTU

4.17 Additional connections when switched contacts are used for control of paging amplifier power source are as follows:

- (1) If the -24 V dc on pin 18 of the K410A STU is used to operate a relay, connect the lead from the relay to terminal 16 of the line position used for the K410A KTU and strap the K410A for option "X". Connect AB to pin 18.
- (2) If a separate power supply is to be fed via the contacts, connect one amplifier power lead to the "A" terminal (on station block) for the K410A, connect the other amplifier power lead to voltage, and strap the K410A for option "W".

5. OPERATION

GENERAL

- 5.01 A typical station telephone will have one red Hold button and a number of pickup buttons.
- 5.02 Lamp under the pickup buttons indicate the status of each line whether idle (dark lamp), busy (steady lamp), call coming in (flashing lamp), or on hold (winking lamp or optionally steady lamp).

CENTRAL OFFICE OR PBX LINES

Incoming Call

- 5.03 An incoming call is indicated by ringing and a flashing line button at all connected telephones. To answer a call, depress the flashing button and pick up the handset.

NOTE: If the telephone is equipped with the hookswitch-button-restoration feature, the handset must be picked up before a button is depressed.

Outgoing Call

- 5.04 An outgoing call is originated by picking up the handset and pressing an idle line button.

Holding

- 5.05 When it is desired to hold a call, the hold button is depressed. When the pick-up button associated with that line is depressed again, the hold condition is automatically released.
- 5.06 The "wink" signal feature uses the same signal lamp used for incoming calls and busy

signals, but has a long "on" period and a short "off" period, giving the impression of a wink when the line is in a held position.

NOTE: During power failure all lamp functions become inoperative.

Disconnection

- 5.07 Upon completion of the conversation, returning the handset to the cradle will extinguish the signal lamp and restore the line to the idle condition.

INTERCOM

Placing A Call — Manual Intercom

- 5.08 Lift the handset, depress the button associated with manual intercom, and operate the manual signaling button.

NOTE: If call announcing is used for signaling, place the call as described in paragraph 5.09. When the called party answers, advise him to go to manual intercom, then go to manual intercom yourself. This leaves the dial intercom idle and ready for another call.

Placing A Call — Dial Intercom

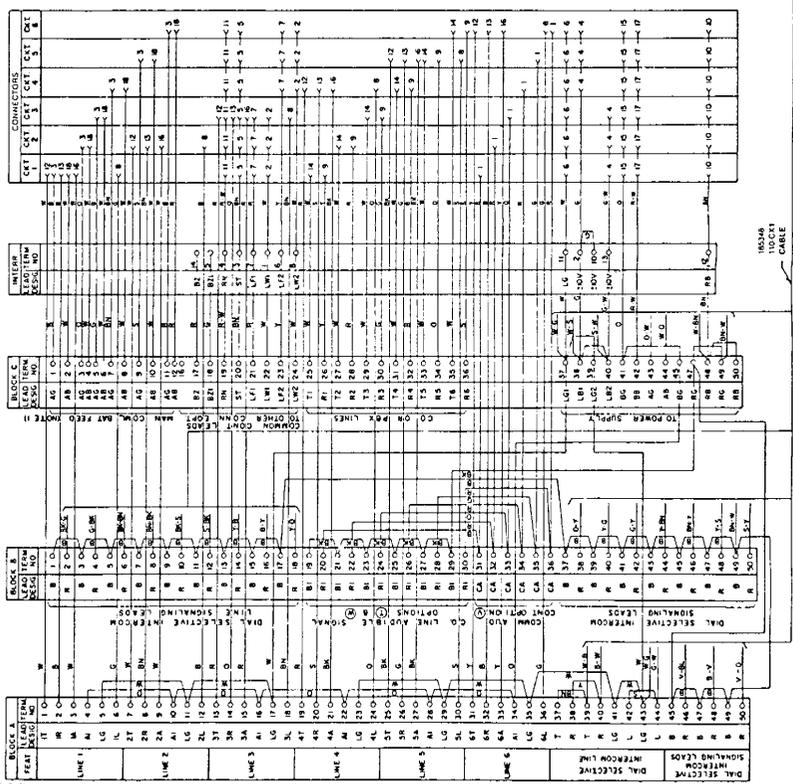
- 5.09 An intercom call is originated by lifting the handset, depressing the button associated with the intercom line and dialing the required two digits. At the completion of dialing, the buzzer, bell, or call announcer at the called station will alert the party that a call is to be answered.

Answering A Call — Manual Intercom And Dial-Selective Intercom

- 5.10 An intercom call is answered by lifting the handset and pressing the line pick-up button associated with the intercom. If call announcing is used, the called party can reply handsfree via the call announcer, or they can lift the handset and the call will be switched from the call announcer to the handset.

Paging

- 5.11 For dial-accessed paging, lift your handset and dial the paging number. For pushbutton-accessed paging, lift your handset and press and hold down the button assigned to paging.



- (1) When K&D KTU Manual intercom is required, associated Bal A and B D leads are to be strapped to terminals 44 and 45 and Block C.
- (2) For K&D Cable 183026 and for K337A use Cable 183025; For 110 C&T use Cable 165348.

Fig. 19 — K501 Key Service Unit Wiring Diagram

110 C&T BLOCKS	110 C&T LEADS	110 C&T NOTE #	
A39	W/B	26	A32
A40	B/W	1	A33
A41	O/W	27	A24
A42	O/W	28	A24
A43	W/C	28	A34
A44	G/W	7	A25
A45	B/W	3	A25
B49	B/W	3	A22
C48	W/S	27	LB1
C49	S/W	3	A31
C50	W/C	3	LB2
C51	B/W	5	A31
C52	B/W	5	A31
B4	G/B	16	R12
B5	B/S	16	R13
B6	B/S	16	R14
B7	B/S	16	R14
B8	B/S	16	R14
B9	B/S	16	R14
B10	B/S	19	R16
B11	B/S	19	R16
B12	B/S	20	R17
B13	B/S	20	R17
B14	B/S	21	R19
B15	B/S	22	A18
B16	Y/O	13	R10
B17	Y/O	13	R10
B18	Y/O	13	R10
B19	Y/O	13	R10
B20	Y/O	5	A20
B21	Y/O	5	A20
B22	Y/O	5	A20
B23	Y/O	5	A20
B24	Y/O	7	R23
B25	Y/O	7	R23
B26	Y/O	7	R23
B27	Y/O	7	R23
B28	Y/O	7	R23
B29	Y/O	7	R23
B30	Y/O	7	R23
B31	Y/O	7	R23
B32	Y/O	7	R23
B33	Y/O	7	R23
B34	Y/O	7	R23
B35	Y/O	7	R23
B36	Y/O	7	R23
B37	Y/O	7	R23
B38	Y/O	7	R23
B39	Y/O	7	R23
B40	Y/O	7	R23
B41	Y/O	7	R23
B42	Y/O	7	R23
B43	Y/O	7	R23
B44	Y/O	7	R23
B45	Y/O	7	R23
B46	Y/O	7	R23
B47	Y/O	7	R23
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B37	Y/O</		

