

## SERVICE

### 110A APPARATUS MOUNTING

### 1A2 KEY TELEPHONE SYSTEM

#### 1. GENERAL

**1.01** This section provides identification, installation, and connection information for the 110A apparatus mounting (Fig. 1) used in the 1A2 Key Telephone System (KTS).

**1.02** This section is reissued to:

- Add information on snap-in card guide
- Delete ordering information on the guide card 841059280
- Add connection information for the 452A KTU (power failure ringing circuit).

**1.03** After January 1, 1980, connection of customer-provided equipment (CPE) or telephone company-provided equipment to the 1A2 KTS requires the use of a 33B voice coupler when providing music-on-hold. Also after January 1, 1980, the 401B, 415B, 471C, and 479C key telephone units (KTUs) must be used when providing their related services. Previously connected or Class C voice couplers and KTUs may be used for maintenance at grandfathered installations for the life of the equipment, provided they are not modified. Class C stock can be used in new installations after January 1, 1980.

**1.04** Incoming central office (CO) lines to be installed in compliance with the Federal Communications Commission's (FCC) Registration Program must be routed through a standard network interface. Information on approved interfaces is contained in Sections 463-400-100 through 463-400-150.

**1.05** This issue of the section is based on the following drawings:

SD-69812, Issue 1—110A Apparatus Mounting

SD-69513, Issue 15—400D KTU (MD)

SD-69651, Issue 5—400G KTU (MD)

SD-69942, Issue 2—400H KTU

SD-69475, Issue 6—401-Type KTU

SD-69567, Issue 15—407-Type, 420A, 422B, 423A, 424-Type, 425B, and 494A KTUs

SD-69590, Issue 3—413A, 421A, 448A, and 449A KTUs

SD-69559, Issue 10—414A, 415-Type, 416A, 418A, 419A, 461A, and 469A KTUs

SD-69561, Issue 2—417A KTU

SD-69489, Issue 6—428A KTU

♦SD-69530, Issue 6—429-Type and 430A KTUs♦

SD-69922, Issue 3—451B, 498A KTU, and 116A1 Circuit Module (CM)

♦SD-69652, Issue 3A—452A KTU♦

SD-69917, Issue 1—467A KTU

SD-69921, Issue 3—471-Type and 479-Type KTUs

SD-69931, Issue 1—478B KTU.

#### NOTICE

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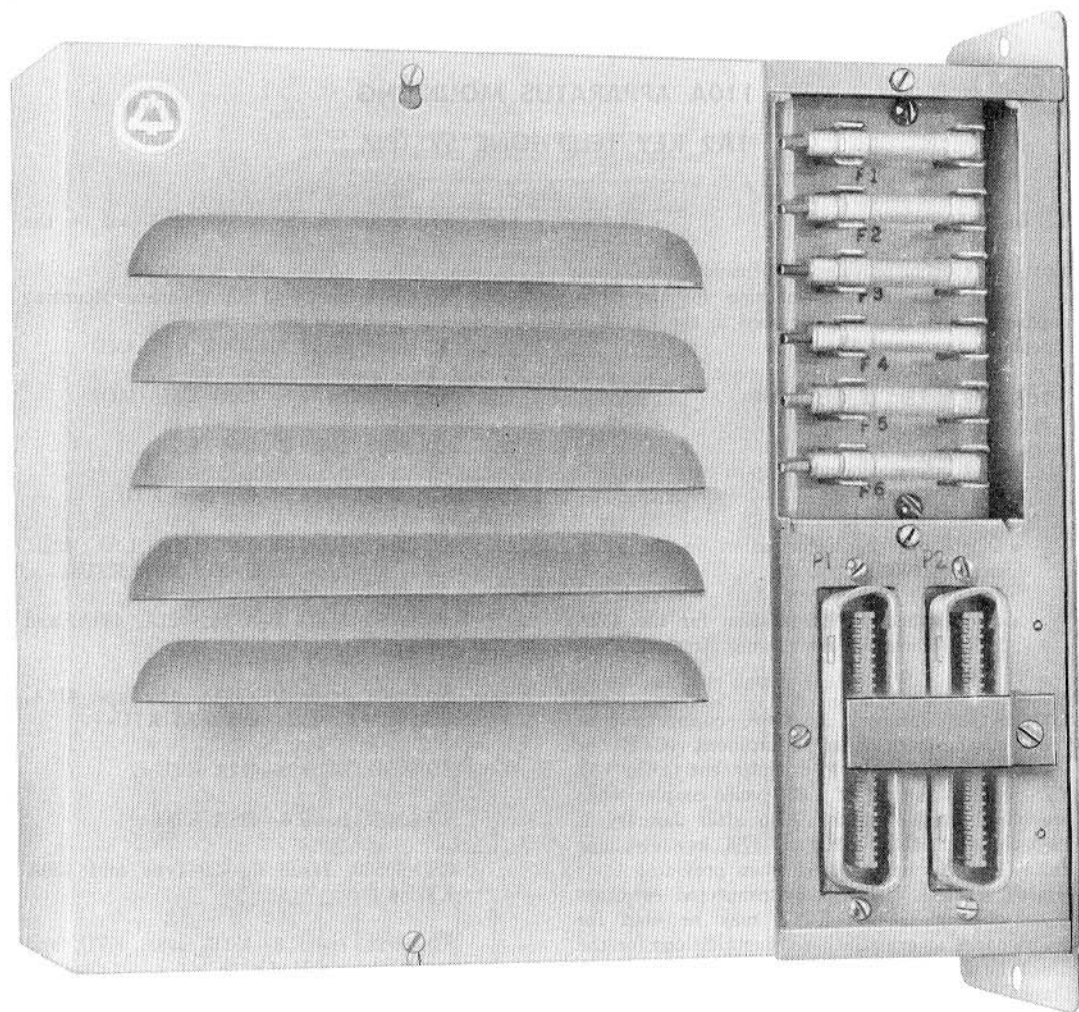


Fig. 1—110A Apparatus Mounting (With Cover)

If this section is to be used with equipment or apparatus reflecting later issues of the drawings, reference should be made to the SDs to determine the extent of the changes and the manner in which the section may be affected.

## 2. IDENTIFICATION

### PURPOSE

**2.01** The 110A apparatus mounting provides an alternate mounting facility for 400-series KTUs as add-on circuits to 1A2 KTS.

### ORDERING GUIDE

**2.02** Order basic unit as follows:

- Mounting, Apparatus, 110A (Fig. 1).

**2.03** Replaceable components for the 110A apparatus mounting are to be ordered as follows:

- Fuse, 70B
- Fuse, 70G
- Fuse, 70H
- ♦Guide, Card, Snap-in—furnished with 110A apparatus mounting (comcode 841683501).♦

**2.04** The following associated apparatus or equipment is to be ordered separately:

- Block, Connecting, 66B4-25—two required
- Cable, Connector, A25B—two required
- Unit, Telephone, Key—as required, see Table A.

### Design Features

**2.05** The 110A apparatus mounting (Fig. 2) is designed with the following features:

- (a) Equipped with two connectors (A and B) aligned vertically to accommodate one 8-inch KTU or two 4-inch KTUs (Table A).

♦**Note:** The 110A apparatus mounting is factory equipped with a snap-in guide card (comcode 841683501) which is used to guide

the 4-inch KTUs into connectors A and B. When using an 8-inch KTU, the snap-in guide card must be removed by unscrewing the two screws holding it to the connectors and then pulling the guide card from the connectors.♦

- (b) Connectors A and B are wired to two KS-16671, L1 plugs (P1 and P2) mounted on the lower right (or rear) of the apparatus mounting.

- (c) Louvered cover held in place on its upper and lower edges by screws.

- (d) Top, bottom, and center (when required for 4-inch KTUs) card guides hold KTUs in place.

- (e) Recessed fuse panel reveals 70-type fuses through a clear plastic cover. To replace fuse, remove cover by loosening two securing screws (Fig. 1 and Table B).

- (f) Dedicated leads (BAT, GRD, LF, LW, etc) appear on like-numbered pins of, and are strapped common between, connectors A and B. These leads are brought out of the apparatus mounting as individual conductors via plug P2.

- (g) Arranged for wall mounting with choice of positions:

- 2 by 8-1/2 inch surface using upper and lower holes provided on flanges
- 8-1/2 by 9 inch surface using three key holes inside apparatus.

- (h) Dimensions: approximately 8-1/2 inches by 9 inches by 2 inches.

- (i) A25B connector cables are required to extend the mountings to distributing terminals.

## 3. INSTALLATION

### PLANNING

**3.01** Select space for the apparatus mounting and connecting blocks in the same area as the KTS being supplemented and as reasonably close to its power supply as possible.

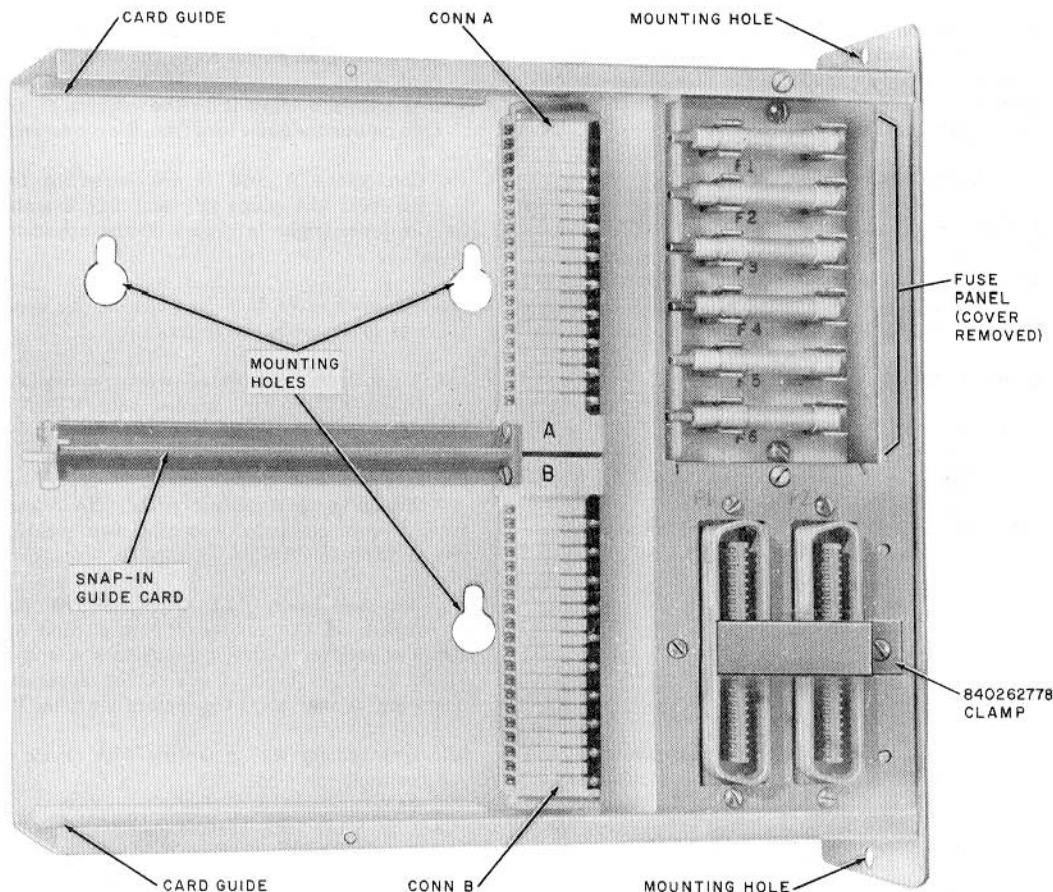


Fig. 2—110A Apparatus Mounting (With Card Guide, Cover Removed)

- 3.02 Decide which position and mounting holes of the apparatus mounting will be used.
- 3.03 Verify that fusing requirements for the apparatus mounting can be met (Table B).

#### INSTALLING

- 3.04 Mount the 110A apparatus mounting to the wall using appropriate fasteners.
- 3.05 Install the two 66B4-25 connecting blocks in the terminal field.



*In installations where several 110A apparatus mountings are installed, be sure the connecting blocks and apparatus mountings are appropriately identified.*

- 3.06 Connect the A25B connector cables to plugs P1 and P2 and secure them with the connector clamp and screw provided with the mounting.
- 3.07 Route A25B connector cables to the 66B4-25 connecting blocks and cut down as shown in Fig. 3.

◆ TABLE A ◆

## KTU SELECTION AND CONNECTION FIGURE INDEX

| KTU      | SIZE |      | CIRCUIT FUNCTION                                   | FIGURE<br>(SEE NOTE) | REMARKS                                                                                                                                                                                                                                                                                                                     |
|----------|------|------|----------------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | IN.  | PINS |                                                    |                      |                                                                                                                                                                                                                                                                                                                             |
| 400D,G,H | 4    | 18   | CO or PBX Line                                     | 5                    | When the 417A, 420A, or 421A KTU is used in the 110A apparatus mounting, the cable run from the apparatus mounting to the connecting block should be as short as possible, preferably not longer than 10 feet to reduce the possibility of noise pickup on unpaired leads.                                                  |
| 401-Type | 4    | 18   | Manual Intercom                                    | 6                    |                                                                                                                                                                                                                                                                                                                             |
| 407-Type | 8    | 80   | Dial Intercom<br>10-Code Selector                  | 34, 38               |                                                                                                                                                                                                                                                                                                                             |
| 413A     | 4    | 18   | Auxiliary Ringup                                   | 7                    |                                                                                                                                                                                                                                                                                                                             |
| 414A     | 4    | 20   | Manual Signaling,<br>Ringdown Private Line         | 8                    |                                                                                                                                                                                                                                                                                                                             |
| 415-Type | 4    | 18   | Automatic DC Signaling,<br>Private Line            | 9                    |                                                                                                                                                                                                                                                                                                                             |
| 416A     | 4    | 20   | Station Line                                       | 10                   |                                                                                                                                                                                                                                                                                                                             |
| 417A     | 4    | 20   | Add-On Conference                                  | 11                   |                                                                                                                                                                                                                                                                                                                             |
| 418A     | 4    | 20   | Short Range, DC Signaling,<br>Private Line         | 12                   |                                                                                                                                                                                                                                                                                                                             |
| 419A     | 8    | 80   | Automatic Signaling,<br>Ringdown Private Line      | 13                   |                                                                                                                                                                                                                                                                                                                             |
| 420A     | 4    | 18   | Long Line                                          | 14                   | <b>WORKING LIMITS:</b><br>The maximum permissible length of cable run for the lamp feeder pairs (10V±, LW, LF) is determined by the lamp load. For a load of 20 lamps, the run from apparatus mounting to power supply shall be a maximum of 30 feet. For lesser loads, the length of run may be increased proportionately. |
| 421A     | 4    | 18   | Power Failure Transfer                             | 15                   |                                                                                                                                                                                                                                                                                                                             |
|          |      |      | Audible Signal Suppressor                          | 16                   |                                                                                                                                                                                                                                                                                                                             |
|          |      |      | Direct Station Selector                            | 17                   |                                                                                                                                                                                                                                                                                                                             |
|          |      |      | Preset Conference                                  | 18, 42               |                                                                                                                                                                                                                                                                                                                             |
| 422B     | 4    | 40   | Station Busy Selector                              | 19                   |                                                                                                                                                                                                                                                                                                                             |
| 423A     | 4    | 20   | Dial Tone, Busy Tone, and<br>Audible Ringback Tone | 20                   |                                                                                                                                                                                                                                                                                                                             |

◆TABLE A (Contd)◆

## KTU SELECTION AND CONNECTION FIGURE INDEX

| KTU      | SIZE |      | CIRCUIT FUNCTION                           | FIGURE<br>(SEE NOTE) | REMARKS                                                                                                                                     |
|----------|------|------|--------------------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
|          | IN.  | PINS |                                            |                      |                                                                                                                                             |
| 424-Type | 8    | 80   | Dial Intercom,<br>19-Code Selector         | 35, 39               | <i>Note:</i> Connection figures<br>are designated for current<br>model KTUs but are<br>applicable for all codes<br>indicated in this table. |
| 425A     | 8    | 80   | Flashing Lamp Circuit                      | 40                   |                                                                                                                                             |
| 428A     | 4    | 40   | Multiline Exclusion                        | 21                   |                                                                                                                                             |
| 429-Type | 4    | 40   | Supplementary Hold Detector                | 22                   |                                                                                                                                             |
| 430A     | 4    | 20   | Flutter Generator                          |                      |                                                                                                                                             |
| 448A     | 4    | 40   | Variable Delay Timer                       | 23                   |                                                                                                                                             |
| 449A     | 4    | 40   | Immediate Transfer Control                 | 24                   |                                                                                                                                             |
| 451-Type | 4    | 40   | Music-on-Hold                              | 25                   |                                                                                                                                             |
| 498A     |      |      |                                            | 33                   |                                                                                                                                             |
| 452A     | 4    | 40   | Power Failure Ringing                      | 26                   |                                                                                                                                             |
| 461A     | 4    | 20   | Manual Signaling,<br>Ringdown Private Line | 27                   |                                                                                                                                             |
| 467A     | 4    | 18   | Voltage Monitor                            | 28                   |                                                                                                                                             |
| 469A     | 4    | 18   | Lamp Extender                              | 29                   |                                                                                                                                             |
| 471-Type | 4    | 18   | Battery Reversal<br>Toll Restriction       | 30                   |                                                                                                                                             |
| 478B     | 8    | 80   | TOUCH-TONE Adapter                         | 31                   |                                                                                                                                             |
| 471-Type | 8    | 20   | Rotary Dial<br>Toll Restriction            | 32                   |                                                                                                                                             |
| 494A     | 8    | 80   | TOUCH-TONE Selector                        | 36                   |                                                                                                                                             |

TABLE B

## FUSING FOR 110A APPARATUS MOUNTING

| DESIG | FUNCTION       |        | VOLTAGE | TYPE | SIZE (AMP) |
|-------|----------------|--------|---------|------|------------|
| F1    | Lamp Wink      | LW     | 10Vac   | 70B  | 2          |
| F2    | Lamp Steady    | 10Vac  |         |      |            |
| F3    | Lamp Flash     | LF     |         |      |            |
| F4    | Ringling       | 105Vac | 105Vac  | 70G  | 1/2        |
| F5    | Signal Battery | B Bat. | 24Vdc   | 70H  | 3/4        |
| F6    | Talk Battery   | A Bat. |         |      |            |

**Note:** When apparatus mounting is dedicated to a 407- or 424-type KTU, **do not** terminate final eight pairs of P1 connector cable (right connecting block). Tape and store those conductors. This provides terminals necessary for station multiples.

**3.08** Terminate dedicated leads from power supply and interrupter, if required, to connecting block 1 (left) (Fig. 4). These connections should be made before installing KTUs in the apparatus mounting. Dedicated leads are those, such as BAT, GRD, LF, LW, etc, which appear on the same-numbered pin of each KTU. The RN leads, previously treated as dedicated leads, must be placed separately when required.

#### 4. CONNECTIONS

**4.01** The nondedicated lead connections of the 400-series KTUs that can be installed in the 110A apparatus mounting are shown in Fig. 5 through 33. Each figure is divided into three sections: field connections are shown on the left, row assignments in the center, and connector pin numbers on the right. Pin numbers are shown for reference only and provide a complete picture of the KTU circuitry when the connection drawing of any KTU is compared to the functional schematic.

**4.02** Field connections are made for any KTU by determining the connector used (A or B) and the connecting block on which the connector appears. For example (Fig. 5), if a 400-type KTU

is installed in connector A, field connections are made to block 1 (left); and if KTU is installed in connector B, connections are made to block 2 (right).

**4.03** Power connections and strapping required to furnish a basic dial intercom, using a 407- or 424-type KTU, are shown in Fig. 34 and 35; connections and strapping required when using the 494A KTU for TOUCH-TONE® dialing only are shown in Fig. 36. Dial intercom station connections are covered in Fig. 37. Table C covers connections to optional KTUs.

**4.04** Power supply connections and strapping required to furnish a deluxe dial intercom are shown in Fig. 38 and 39 (407- and 424-type KTUs) and Fig. 40 (425B KTU). Dial intercom station connections are shown in Fig. 41 and Table C shows necessary connections to associated and optional KTUs.

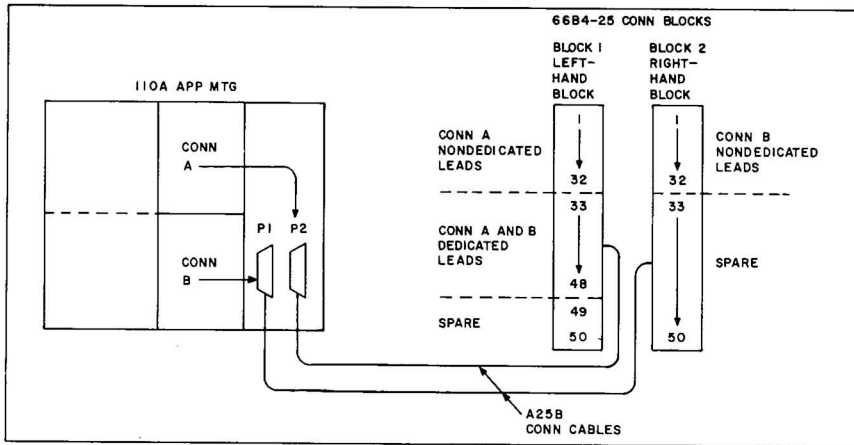
#### CONNECTION INDEX

Fig. 3—Schematic of 110A Apparatus Mounting and Connections of the A25B Connector Cables to 66B4-25 Connecting Blocks

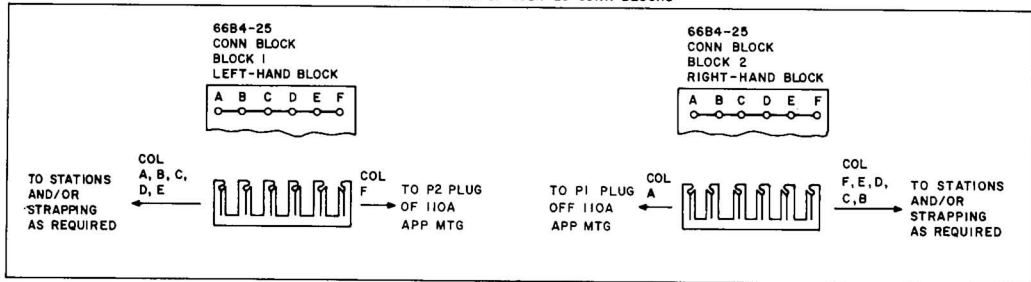
Fig. 4—Dedicated Lead Connections (Interrupter and Power) for 110A Apparatus Mounting



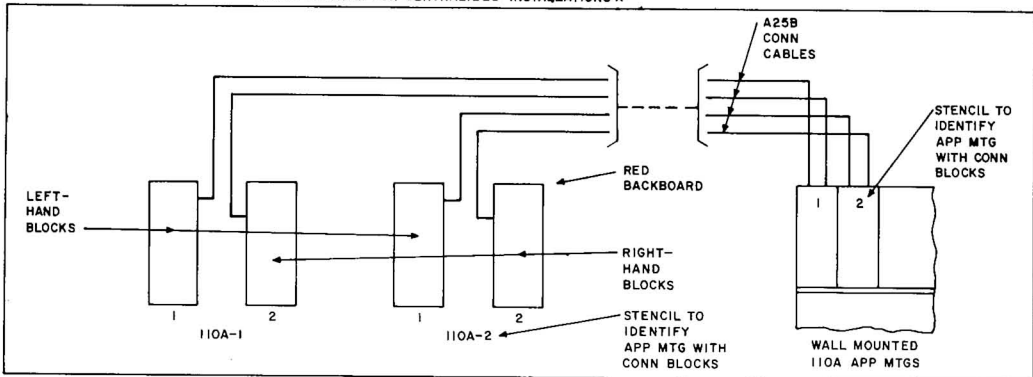
BLOCK DIAGRAM 110A APP MTG



BLOCK DIAGRAM OF 66B4-25 CONN BLOCKS



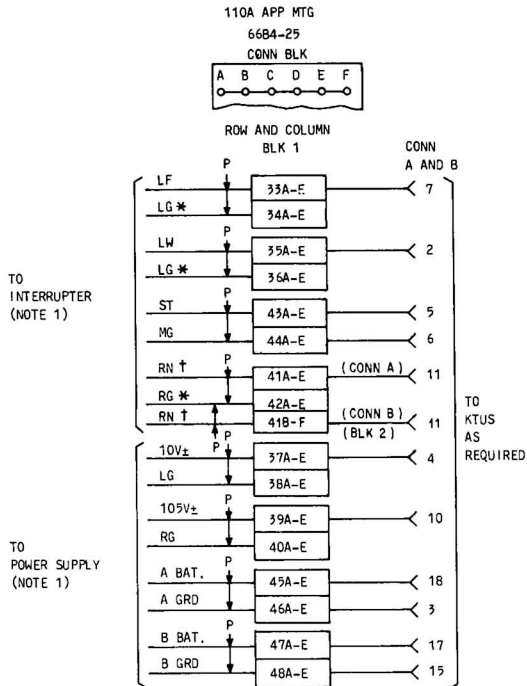
BLOCK DIAGRAM FOR CENTRALIZED INSTALLATIONS\*



\* REFER TO SECTION 518-010-101 FOR BACKBOARDS TO BE USED IN CENTRALIZED LOCATIONS.

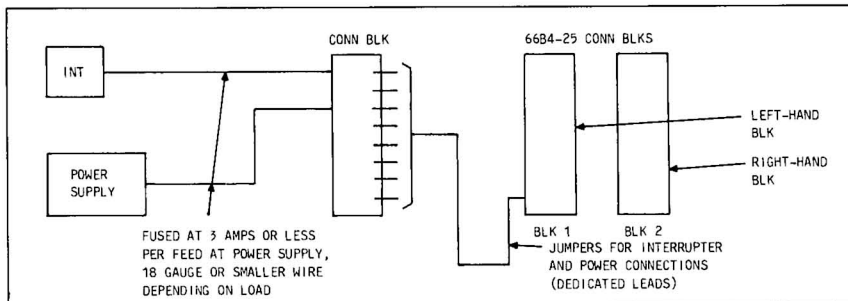
Fig. 3—Schematic of 110A Apparatus Mounting and Connections of the A25B Connector Cables to 66B4-25 Connecting Blocks (Sheet 2 of 2)





\* THESE LEADS USED FOR BALANCING PURPOSES TO PREVENT INDUCED NOISE. THEY MUST BE TERMINATED TO APPROPRIATE GROUND TERMINAL ON PANEL NEAR THE INTERRUPTER.

† RN LEADS ARE TO BE PLACED INDIVIDUALLY AS REQUIRED PER CONNECTOR.

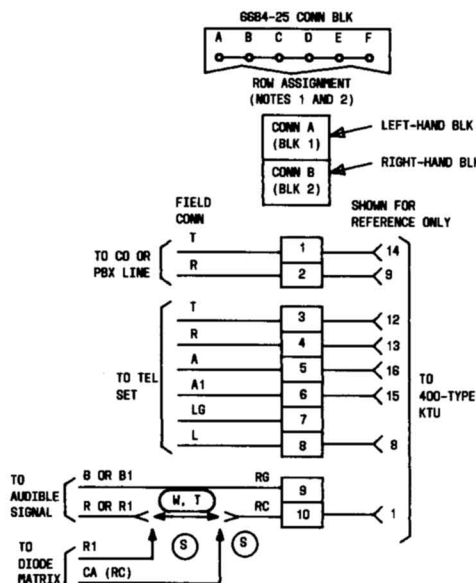


BLOCK DIAGRAM FOR CENTRALIZED INSTALLATION (NOTE 2)

NOTES:

1. CONNECT AS REQUIRED SO AS NOT TO EXCEED THE MAXIMUM LOAD LIMITATIONS OF THE POWER SUPPLY.  
THESE LEADS MAY BE MULTIPLIED FROM BLOCK TO BLOCK PROVIDING THE LIMITATION OF THE POWER SUPPLY IS NOT EXCEEDED.
2. REFER TO SECTION 518-010-101 FOR BACKBOARDS TO BE USED IN CENTRALIZED INSTALLATIONS.

**Fig. 4—Dedicated Lead Connections (Interrupter and Power) for 110A Apparatus Mounting**



## NOTES:

1. SEE BLOCK DIAGRAM COVERING 6884-25 CONNECTING BLOCK IN FIG. 3.
2. TERMINATE DEDICATED LEADS PER FIG. 4.
3. WHEN ZC OPTION IS USED, DUE TO THE DELAYED RELEASE OF THE HOLD BRIDGE, SOME TRANSMISSION LOSS IS ENCOUNTERED FOR APPROXIMATELY ONE SECOND WHEN STATION REENTERS A HELD CALL.
4. OPTION PLUG NOT PROVIDED FOR THIS POSITION: USE PLUG NORMALLY USED TO PROVIDE OPTION R.

## \* FACTORY PROVIDED OPTIONS

† TO PROVIDE TIME-OUT CYCLES OF RING-UP CIRCUITS FROM 2.5 TO 7.5 SECONDS, INSTALL KS-13490, L1, 1 WATT OR EQUIVALENT RESISTOR BETWEEN TERMINALS 1 AND 3 WITH A STRAP FROM 1 TO 2. TIME-OUT CYCLE AND RESISTOR VALUES ARE AS FOLLOWS:

2.5 SECONDS - 0.13 MEGOHM RESISTOR

3.3 SECONDS - 0.20 MEGOHM RESISTOR

5.0 SECONDS - 0.39 MEGOHM RESISTOR

6.7 SECONDS - 0.75 MEGOHM RESISTOR

7.5 SECONDS - 1.2 MEGOHM RESISTOR

‡ FOR 30-SECOND TIME-OUT CYCLE REMOVE ALL STRAPS FROM TERMINALS 1, 2, AND 3. WHEN THE DURATION OF MACHINE RINGING IS 1 SECOND OR LESS, TIME-OUT SHALL NOT BE REDUCED BELOW 5 SECONDS.

## OPTION STRAPPING ON 400D (MD) KTU OPTION BLK

| OPT         | FEATURE                                                                  |                                                                                                                        | STRAP TERMINALS                                    |
|-------------|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| W*          | AUDIOIBLE SIGNALS                                                        | INTERRUPTED RING                                                                                                       | 5 TO 8 *                                           |
| T           |                                                                          | STEADY RING                                                                                                            | 6 TO 8                                             |
| S*          |                                                                          | COMMON WITH DIODE MATRIX CONTROL                                                                                       | 5 TO 8 *                                           |
| Y*          | VISUAL HOLD CIRCUIT                                                      | LAMP WINK                                                                                                              | 7 TO 10 *                                          |
| X           |                                                                          | LAMP STEADY                                                                                                            | 7 TO 9                                             |
| Z †         | TIMEOUT                                                                  | TIME SHORT (10 SECONDS)                                                                                                | 1 TO 2 †                                           |
| ‡           |                                                                          | DELAY LONG                                                                                                             | ‡                                                  |
| ZC (NOTE 3) | RELEASE OF HOLDING BRIDGE FROM CO OR PBX LINE CURRENT OPENS GREATER THAN | 500 MILLISECOND WHEN ASSOCIATED WITH NO. 1 ESS HAVING RESWITCH CAPABILITY                                              | 2 TO 3 USING 601A (5 UF) CAPACITOR OR EQUIVALENT   |
| ZD          |                                                                          | 100 MILLISECOND WHEN ASSOCIATED WITH 800A PBX AND/OR NO. 5 X-BAR CENTREX NOT HAVING AUTOMATIC PERMANENT SIGNAL RELEASE | 2 TO 3 USING 575A (1 UF) CAPACITOR OR EQUIVALENT   |
| ZJ          |                                                                          | 50 MILLISECOND WHEN ASSOCIATED WITH NO. 5 X-BAR CENTREX HAVING AUTOMATIC PERMANENT SIGNAL RELEASE                      | 2 TO 3 USING 575B (0.5 UF) CAPACITOR OR EQUIVALENT |

400D (MD) KTU

Fig. 5—Nondedicated Lead Connections for 400D (MD), 400G (MD), and 400H KTUs (CO/PBX) in 110A Apparatus Mounting (Sheet 1 of 2)

**Nondedicated Lead Connections for 400-Series KTUs Used in 110A Apparatus Mounting**

Fig. 5—400D (MD), 400G (MD), and 400H KTUs (CO/PBX)

Fig. 6—401-Type KTU (Manual Intercom)

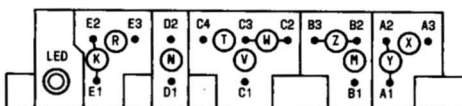
Fig. 7—413A KTU (Auxiliary Ringup)

Fig. 8—414A KTU (Manual Signaling, Ringdown Private Line)

| OPT | FEATURE                                           |                                                                      |                                                  | OPTION<br>PLUG TO<br>TERMINALS |
|-----|---------------------------------------------------|----------------------------------------------------------------------|--------------------------------------------------|--------------------------------|
| M   | TIMEOUT                                           | TIME<br>DELAY                                                        | LONG      APPROXIMATELY<br>20 SECONDS            | B1 - B2                        |
| Z*  |                                                   |                                                                      | SHORT      APPROXIMATELY<br>6 SECONDS (±1.5 SEC) | *<br>B2 - B3                   |
| Y*  | VISUAL<br>HOLD<br>CIRCUIT                         | LAMP<br>WINK                                                         |                                                  | *<br>A1 - A2                   |
| X   |                                                   | LAMP<br>STEADY                                                       |                                                  | A2 - A3                        |
| W*  | AUDIBLE<br>SIGNAL                                 | INTERRUPTED                                                          |                                                  | *<br>C2 - C3                   |
| T   |                                                   | STEADY                                                               |                                                  | C3 - C4                        |
| S   |                                                   | COMMON                                                               | DIODE MATRIX CONTROL                             |                                |
| V   |                                                   |                                                                      | RELAY CONTROL                                    | C1 - C3                        |
| R   | DELAYED<br>HOLD<br>RELEASE                        | RELEASE OF HOLDING BRIDGE<br>FROM CO OR PBX<br>BY LINE CURRENT OPENS | MINIMUM<br>OF 25 MS                              | E2 - E3                        |
| K*  |                                                   |                                                                      | 600 MS                                           | *<br>E1 - E2                   |
| N   | CONNECTS TO 50A CUSTOMER PREMISES SYSTEM (NOTE 4) |                                                                      |                                                  | D1 - D2                        |

## 400G (MD) KTU

TOP VIEW OF OPTION BLOCK WITH HANDLE TOWARD  
USER. OPTION SYMBOLS SHOWN CONNECTED TO  
TERMINALS INDICATE FACTORY PROVIDED OPTIONS.



| OPT | FEATURE                    |             |                                           | OPTION<br>PLUG TO<br>TERMINALS |
|-----|----------------------------|-------------|-------------------------------------------|--------------------------------|
| T*  | CO OR PBX LINE CIRCUIT     |             |                                           | (J1 - J3) *                    |
| W*  | AUDIBLE<br>SIGNAL          | INTERRUPTED |                                           | A2 - A3 *                      |
| X   |                            | COMMON      | DIODE MATRIX CONTROL                      |                                |
| V   |                            |             | RELAY CONTROL                             | A1 - A3                        |
| S*  | HOLD<br>CIRCUIT<br>RELEASE | LONG        | ESS #1, ESS #2, DIMENSION<br>812, 770 PBX | B1 - B2 *                      |
| R   |                            | SHORT       | ALL OTHERS                                | B2 - B3                        |

## 400H KTU

TOP VIEW OF OPTION BLOCK WITH HANDLE TOWARD  
USER. OPTION SYMBOLS SHOWN CONNECTED TO  
TERMINALS INDICATE FACTORY PROVIDED OPTIONS.

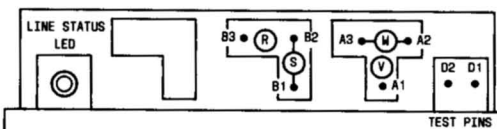


Fig. 5—Nondedicated Lead Connections for 400D (MD), 400G (MD), and 400H KTUs (CO/PBX) in 110A Apparatus Mounting (Sheet 2 of 2)

- Fig. 9—415-Type KTU (Automatic, DC Signaling Private Line)
- Fig. 10—416A KTU (Station Line)
- Fig. 11—417A KTU (Add-On Conference)
- Fig. 12—418A KTU (Short Range, DC Signaling Private Line)
- Fig. 13—419A KTU (Automatic Signaling, Ringdown Private Line)
- Fig. 14—420A KTU (Long Line)
- Fig. 15—421A KTU (Power Failure Transfer)
- Fig. 16—421A KTU (Wired for Audible Signal Suppressor)
- Fig. 17—421A KTU (Wired for DSS Feature)
- Fig. 18—421A KTU (Wired for Preset Conference)
- Fig. 19—422B KTU (Station Busy Selector)
- Fig. 20—423A KTU (Dial Tone, Busy Tone, and Audible Ringback Tone)
- Fig. 21—428A KTU (Multiline Exclusion)
- Fig. 22—429-Type KTU (Supplementary Hold Detector) and 430A KTU (Flutter Generator)
- Fig. 23—448A KTU (Variable Delay Timer)
- Fig. 24—449A KTU (Immediate Transfer Control)
- Fig. 25—451B KTU (Music-On-Hold)
- Fig. 26—452A KTU (Power Failure Ringing)
- Fig. 27—461A KTU (Manual Signaling, Ringdown Private Line)
- Fig. 28—467A KTU (Voltage Monitor)
- Fig. 29—469A KTU (Lamp Extender)

- Fig. 30—471-Type KTU (Battery Reversal Toll Restriction)
- Fig. 31—478B KTU (TOUCH-TONE Adapter)
- Fig. 32—479-Type KTU (Rotary Dial Toll Restriction)
- Fig. 33—498A KTU and 116A1 CM (Music-On-Hold)

### **Dial Intercoms**

Table C—Basic and Deluxe Dial Intercom Connections—407- and 424-Type KTUs to Associated and Optional KTUs

#### **—Basic Dial Intercom**

- Fig. 34—Strapping and Power Supply Connections for 407-Type KTU
- Fig. 35—Strapping and Power Supply Connections for 424-Type KTU
- Fig. 36—With TOUCH-TONE Dialing, Strapping and Power Supply Connections for 494A KTU
- Fig. 37—Station Connections

#### **—Deluxe Dial Intercom**

- Fig. 38—Strapping and Power Supply Connections for 407-Type KTU
- Fig. 39—Strapping and Power Supply Connections for 424-Type KTU
- Fig. 40—Strapping and Power Supply Connections for 425B KTU
- Fig. 41—Station Connections
- Fig. 42—Nondedicated Lead Connections for Preset Conference Circuit of a Deluxe Dial Intercom Line (421A and 413A KTUs) in 110A Apparatus Mounting

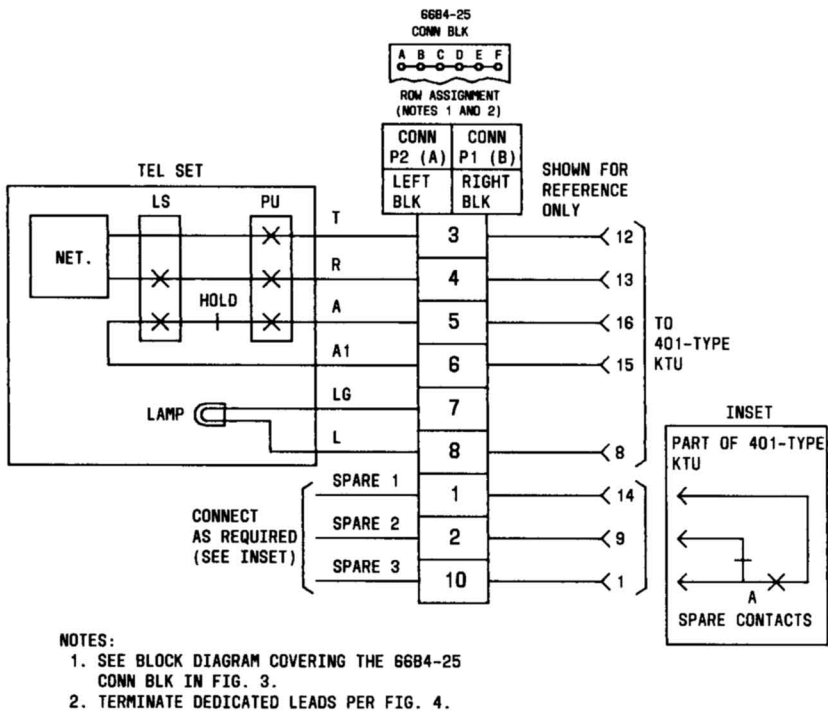
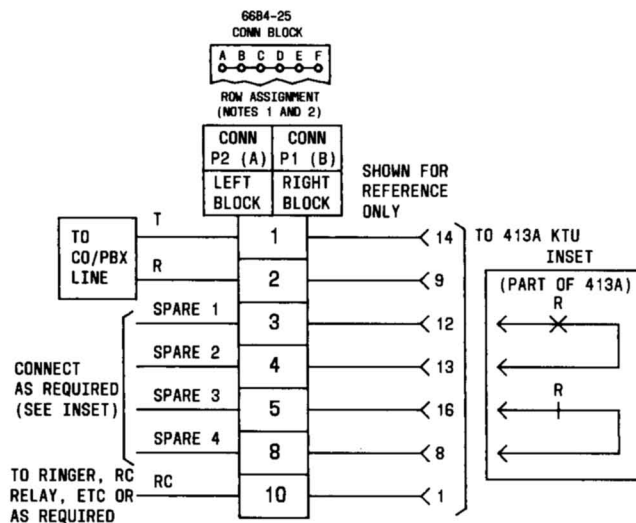


Fig. 6—Nondedicated Lead Connections for 401-Type KTU (Manual Intercom Line) in 110A Apparatus Mounting



## NOTES:

1. SEE BLOCK DIAGRAM COVERING THE 6684-25 CONN BLK IN FIG. 3.
2. TERMINATE DEDICATED LEADS PER FIG. 4.

## OPTION STRAPPING ON 413A KTU OPTION BLK

| OPTION | FEATURES           |                  | STRAP<br>TERMINALS |
|--------|--------------------|------------------|--------------------|
| X      | AUDIBLE<br>SIGNALS | STEADY RING      | 9 TO 10            |
| Z      |                    | INTERRUPTED RING | 8 TO 10            |

Fig. 7—Nondedicated Lead Connections for 413A KTU (Auxiliary Ringup) in 110A Apparatus Mounting

## NOTES:

1. SEE BLOCK DIAGRAM COVERING 66B4-25 CONN BLK IN FIG. 3.
2. TERMINATE DEDICATED LEADS PER FIG. 4.
3. PVT LINE CKT AT DISTANT END MAY BE A 414A KTU, 419A KTU, 204A KTU, OR ANY OTHER TYPE PVT LINE UNIT REQUIRING RINGING VOLTAGE FOR THE RINGUP CIRCUIT AND FURNISHING RINGING VOLTAGE FROM THE SIGNALING CKT.
4. SIGNAL KEY MAY BE A CONVERTED PICKUP KEY OR ANY EXTERNAL NONLOCKING KEY.
5. FOR SATISFACTORY AUDIBLE RINGBACK TONE, THE RINGING SUPPLY MUST CONTAIN AN AUDIBLE COMPONENT.

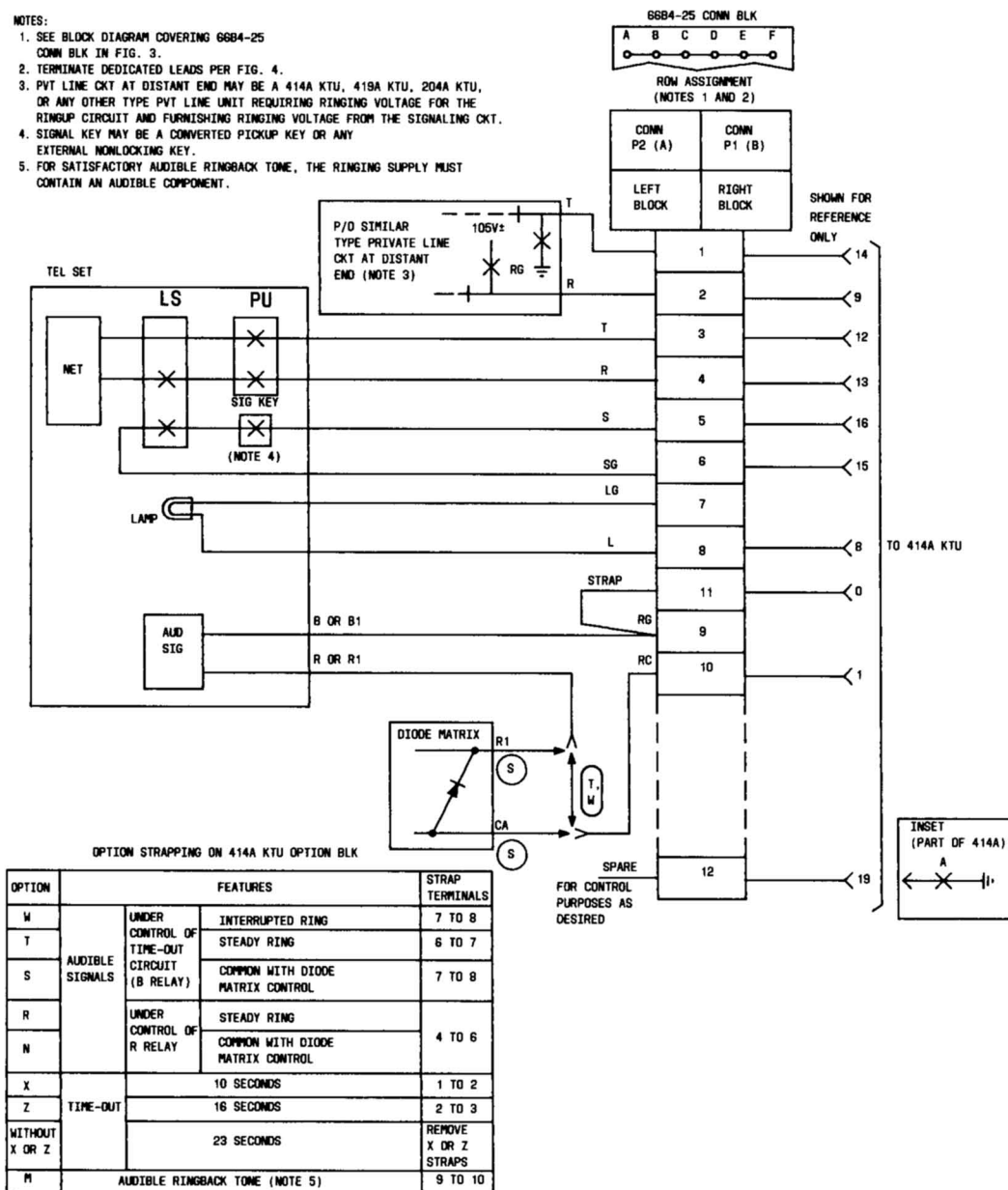
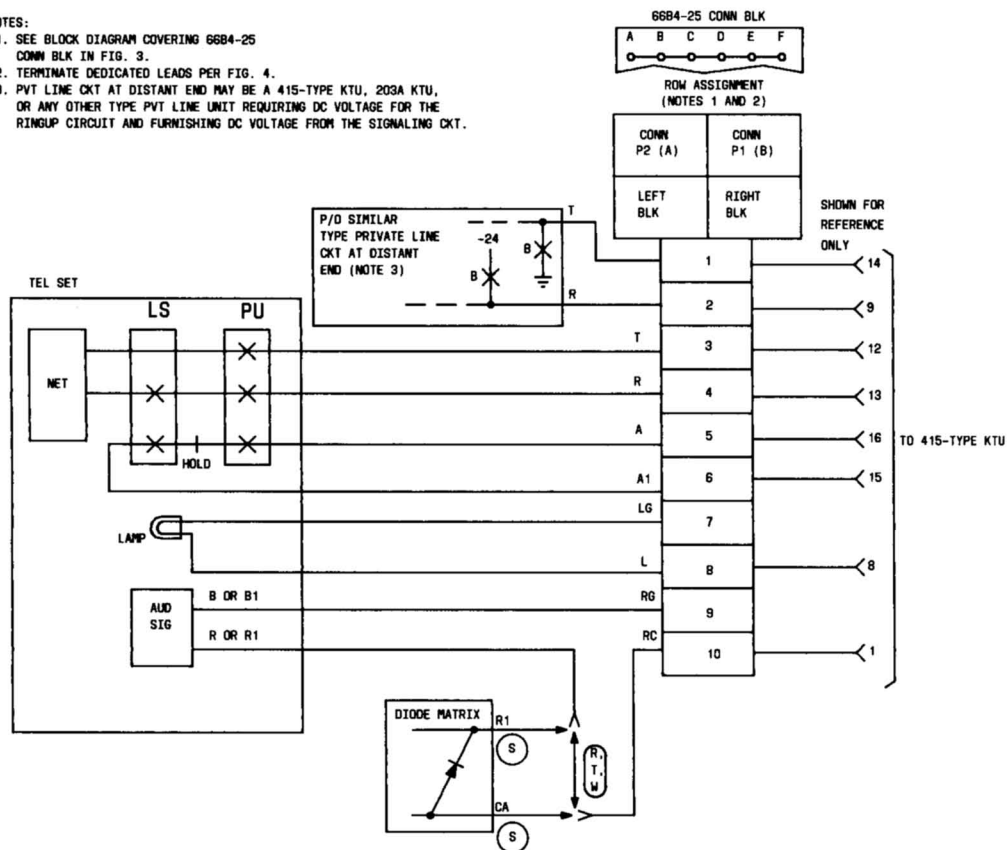


Fig. 8—Nondedicated Lead Connections for 414A KTU (Manual Signaling, Ringdown Private Line) in 110A Apparatus Mounting

## NOTES:

1. SEE BLOCK DIAGRAM COVERING 66B4-25 CONN BLK IN FIG. 3.
2. TERMINATE DEDICATED LEADS PER FIG. 4.
3. PVT LINE CKT AT DISTANT END MAY BE A 415-TYPE KTU, 203A KTU, OR ANY OTHER TYPE PVT LINE UNIT REQUIRING DC VOLTAGE FOR THE RINGUP CIRCUIT AND FURNISHING DC VOLTAGE FROM THE SIGNALING CKT.



## OPTION STRAPPING ON 415-TYPE KTU OPTION BLK\*

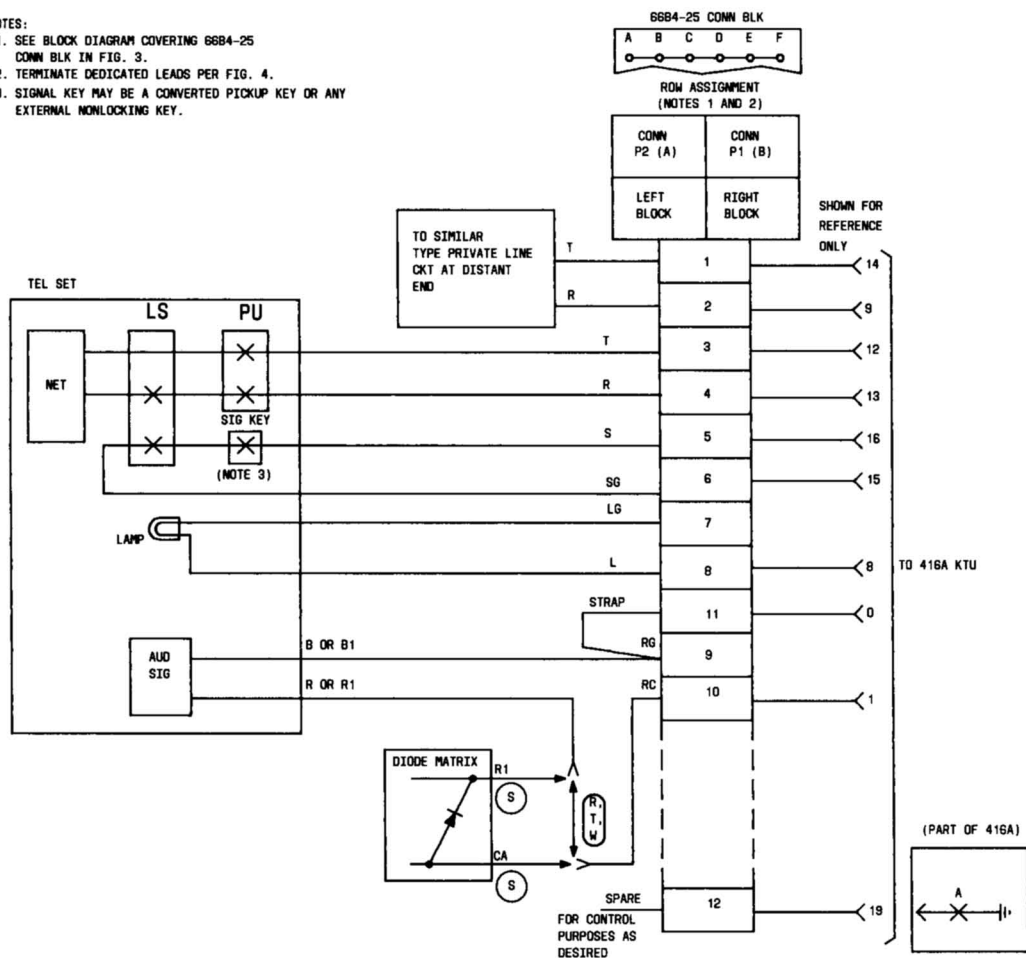
| OPTION | FEATURES              |                                  | STRAP TERMINALS |
|--------|-----------------------|----------------------------------|-----------------|
| W      | AUDIBLE SIGNALS       | INTERRUPTED RING                 | 4 TO 6          |
| T      |                       | STEADY RING                      | 5 TO 6          |
| S      |                       | COMMON WITH DIODE MATRIX CONTROL | 4 TO 6          |
| M      | AUDIBLE RINGBACK TONE |                                  | 1 TO 2          |
| Y      | VISUAL HOLD SIGNAL    |                                  | 7 TO 8          |

\* FOR IDLE LINE TERMINATION, CONNECT A KS-13490, L1 910-ΩMM RESISTOR IN SERIES WITH A 542F, 2 μF CAPACITOR ACROSS TERMINALS 9 AND 10. ORDER COMPONENTS LOCALLY AND INSTALL.

Fig. 9—Non-dedicated Lead Connections for 415-Type KTU (Automatic, DC Signaling Private Line) in 110A Apparatus Mounting

## NOTES:

1. SEE BLOCK DIAGRAM COVERING 68B4-25 CONN BLK IN FIG. 3.
2. TERMINATE DEDICATED LEADS PER FIG. 4.
3. SIGNAL KEY MAY BE A CONVERTED PICKUP KEY OR ANY EXTERNAL NONLOCKING KEY.



## OPTION STRAPPING ON 416A KTU OPTION BLK

| OPTION | FEATURES              |                                     | STRAP<br>TERMINALS |
|--------|-----------------------|-------------------------------------|--------------------|
| W      | AUDIBLE<br>SIGNALS    | INTERRUPTED RING                    | 5 TO 8             |
| T      |                       | STEADY RING                         | 7 TO 8             |
| S      |                       | COMMON WITH DIODE<br>MATRIX CONTROL | 5 TO 8             |
| M      | AUDIBLE RINGBACK TONE |                                     | 9 TO 10            |

Fig. 10—Nondedicated Lead Connections for 416A KTU (Station Line) in 110A Apparatus Mounting

## NOTES:

1. SEE BLOCK DIAGRAM COVERING 66B4-25 CONN BLK IN FIG. 3.
2. TERMINATE DEDICATED LEADS PER FIG. 4.
3. ASSOCIATED LAMP AND RINGING CKTS FROM 400-TYPE KTU AND DIAL INTERCOM LINE CONNECT DIRECTLY TO TELEPHONE SETS.
4. STATION LEADS FROM THE TEL SET FOR THE 1ST LINE MUST ALSO BE TERMINATED TO THE STA SIDE OF THE ASSIGNED 400-TYPE KTU.
5. REMOVE AND INSULATE EXCLUSION KEY LEADS FROM IT AND IR IN THE TEL SET IF SO CONNECTED.
6. SIGNAL KEY MAY BE A CONVERTED PICKUP KEY OR AN EXTERNAL NONLOCKING KEY.
7. A DIODE MUST BE INSTALLED IN THE "A" LEAD OF THE TEL SET WHEN Z OPTION IS PROVIDED. FOR METHOD OF CONNECTION USE STATION BUSY LAMP OPTION AS SHOWN IN CONNECTION SECTION OF TYPE SET USED.
8. LAMP INDICATING CONFERENCE CKT IS ACTIVATED.

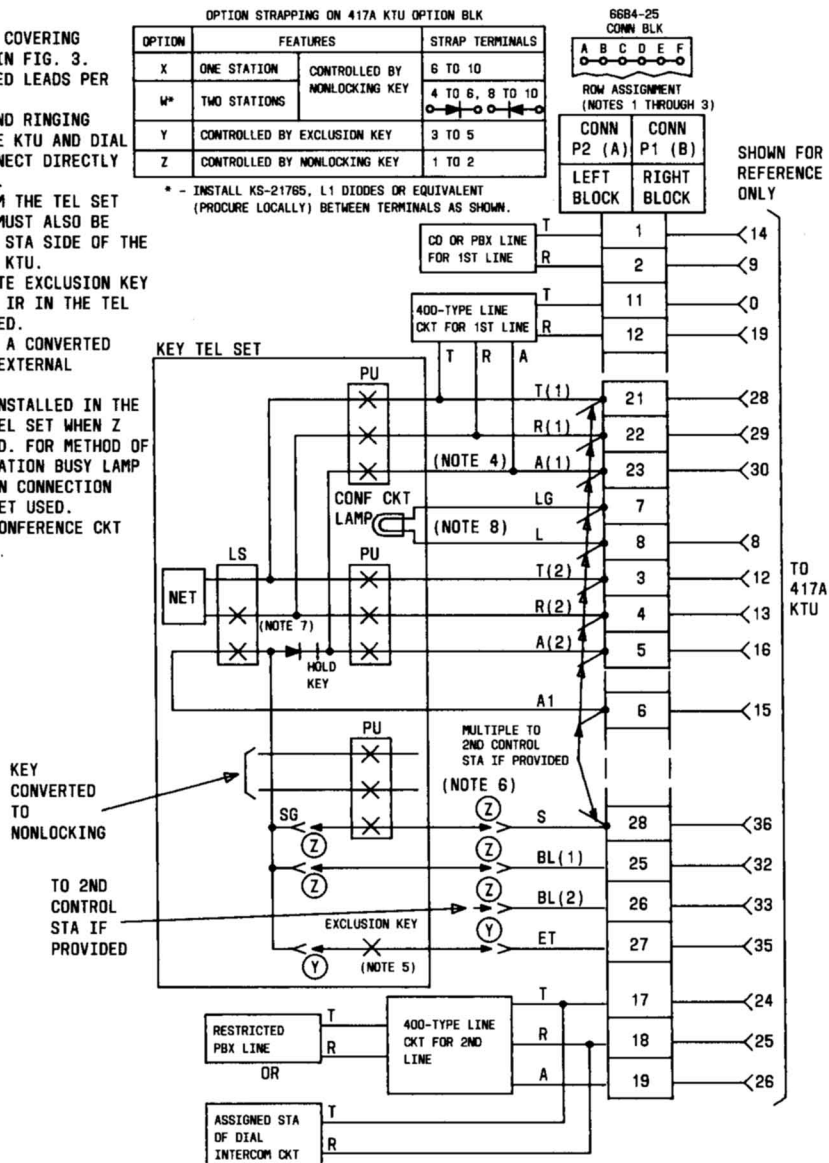
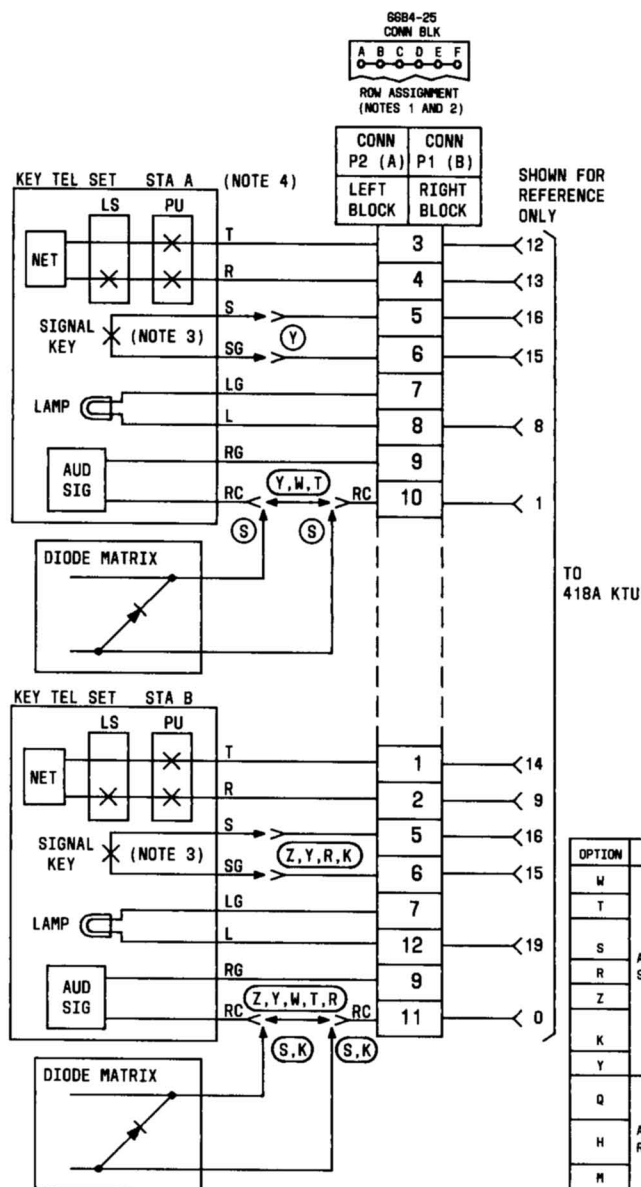


Fig. 11—Nondedicated Lead Connections for 417A KTU (Add-On Conference) in 110A Apparatus Mounting



## NOTES:

1. SEE BLOCK DIAGRAM COVERING 66B4-25 CONN BLK IN FIG. 3.
2. TERMINATE DEDICATED LEADS PER FIG. 4.
3. SIGNAL KEY MAY BE A CONVERTED PICKUP KEY OR AN EXTERNAL NONLOCKING KEY.
4. STATION "A" IS ALWAYS ASSIGNED AS THE AUTOMATIC SIGNALING STATION WHENEVER THE ONE-WAY AUTOMATIC, ONE-WAY MANUAL SIGNALING OPTION IS USED.
5. THESE OPTIONS APPLY TO THE SIGNAL KEY AND AUDIBLE SIGNAL AT STA "B" ONLY. THE AUDIBLE SIGNAL AT STA "A" IS UNDER CONTROL OF THE SIGNAL KEY OF STA "B". THE AUDIBLE SIGNAL AT STA "A" MAY BE PART OF A COMMON AUDIBLE ARRANGEMENT PROVIDED THE DIODE MATRIX IS USED FOR CONTROL.
6. THE AUDIBLE SIGNALS AT STAS "A" AND "B" MAY BE PART OF A COMMON AUDIBLE ARRANGEMENT PROVIDED THE DIODE MATRIX IS USED FOR CONTROL.

OPTION STRAPPING ON 418A KTU OPTION BLK

| OPTION | FEATURES                   |                                                  | STRAP TERMINALS           |
|--------|----------------------------|--------------------------------------------------|---------------------------|
| W      | TWO-WAY<br>AUTOMATIC       | INTERRUPTED RING                                 | 2 TO 3 TO 4 *             |
| T      |                            | STEADY RING                                      | 1 TO 2 TO 4 *             |
| S      |                            | COMMON WITH DIODE<br>MATRIX CONTROL              | 2 TO 3 TO 4 *             |
| R      |                            | ONE-WAY<br>AUTOMATIC, ONE-WAY<br>MANUAL (NOTE 5) | 3 TO 4                    |
| Z      | TWO-WAY<br>MANUAL (NOTE 6) | INTERRUPTED RING                                 | 3 TO 4                    |
| K      |                            | STEADY RING                                      | 1 TO 4                    |
| Y      |                            | COMMON WITH DIODE<br>MATRIX CONTROL              | 3 TO 4                    |
| Q      |                            | TWO-WAY AUTOMATIC                                | 9 TO 10,<br>5 TO 7 TO 8 * |
| H      | TWO-WAY<br>RING-BACK       | ONE-WAY AUTOMATIC,<br>ONE-WAY MANUAL             | 5 TO 7, 9 TO 10           |
| M      |                            | TWO-WAY MANUAL                                   | 9 TO 10                   |

\* - USE CONTINUOUS METHOD OF STRAPPING

Fig. 12—Nondedicated Lead Connections for 418A KTU (Short Range, DC Signaling Private Line) in 110A Apparatus Mounting

## NOTES:

1. SEE BLOCK DIAGRAM COVERING 6GB4-25 CONN BLK IN FIG. 3.
2. TERMINATE DEDICATED LEADS PER FIG. 4.
3. THE 419A KTU REQUIRES THE USE OF BOTH CONNECTORS IN THE APP MGT BUT CONNECTIONS ARE ONLY MADE THROUGH THE "A" CONNECTOR.
4. PVT LINE CKT AT DISTANT END MAY BE A 419A, 414A, OR 204A KTU OR ANY OTHER TYPE PVT LINE UNIT REQUIRING RINGING VOLTAGE FOR THE RINGUP CIRCUIT AND FURNISHING RINGING VOLTAGE FROM THE SIGNALING CKT.

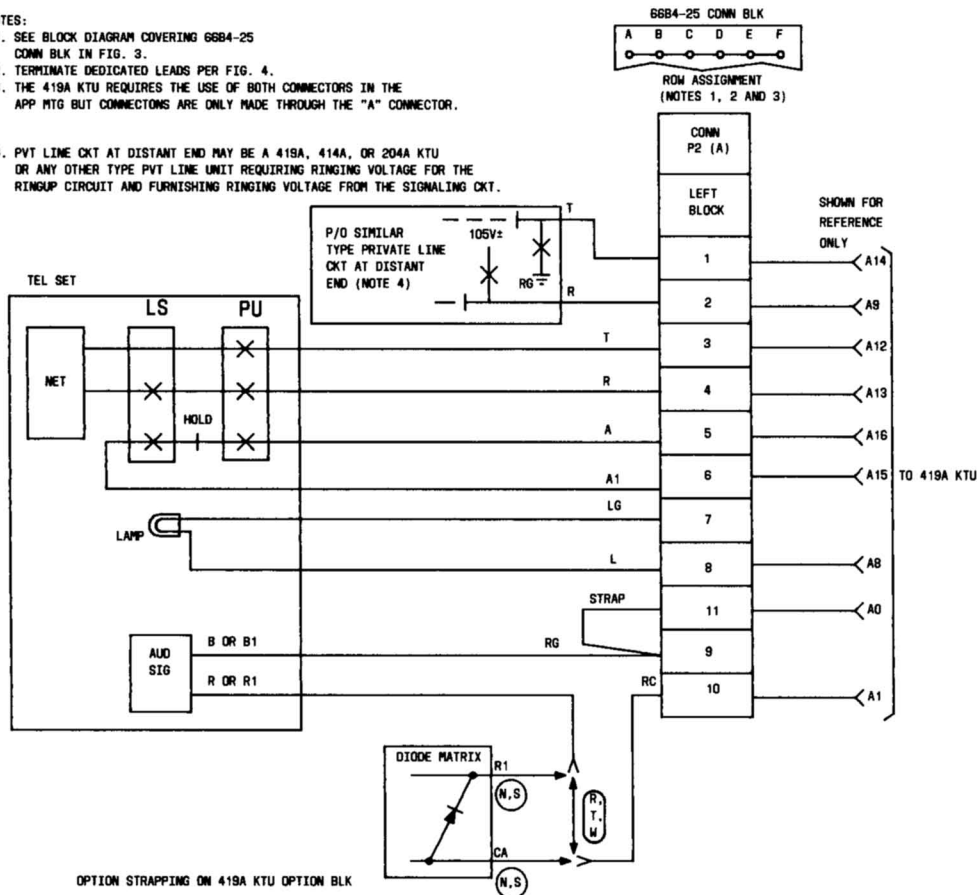
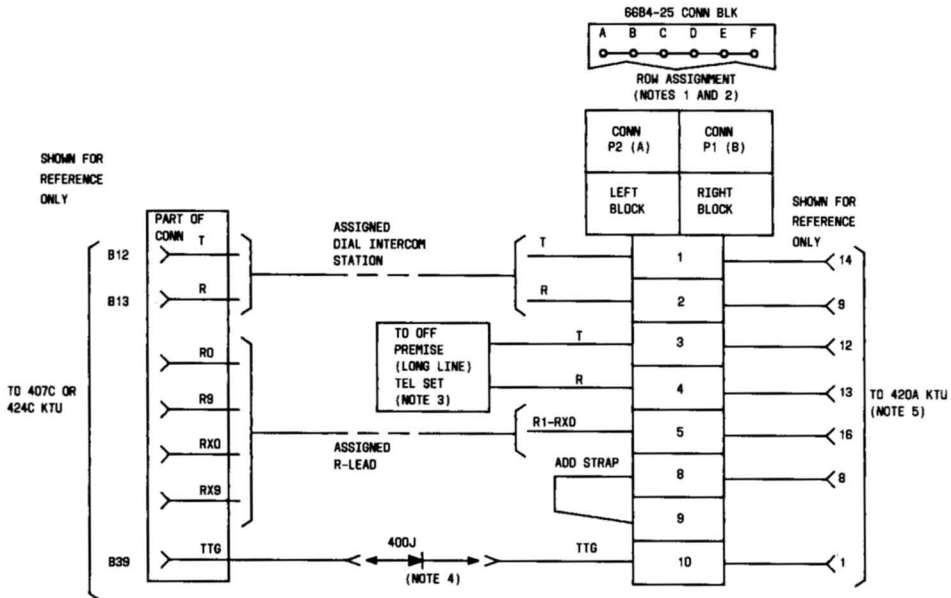


Fig. 13—Non-dedicated Lead Connections for 419A KTU (Automatic Signaling, Ringdown Private Line) in 110A Apparatus Mounting



## NOTES:

1. SEE BLOCK DIAGRAM COVERING 6684-25 CONN BLK IN FIG. 3.
2. TERMINATE DEDICATED LEADS PER FIG. 4.
3. MAXIMUM STATION CONDUCTOR LOOP IS 500 OHMS. OFF-PREMISE (LONG LINE) TELEPHONE SET MAY BE EQUIPPED WITH A "TOUCH-TONE" DIAL PROVIDED THE INTERCOM CIRCUIT IS SO EQUIPPED.
4. PROVIDE A 400J DIODE FOR EACH 420A KTU INSTALLED WHEN THE INTERCOM IS EQUIPPED WITH THE "TOUCH-TONE" ADAPTER (440A OR 478B KTU)
5. THE CABLE RUN FROM THE APPARATUS MOUNTING TO THE CONNECTING BLOCK SHOULD BE AS SHORT AS POSSIBLE, PREFERABLY LESS THAN 10 FT.

## OPTION STRAPPING ON 420A KTU OPTION BLK

| OPTION | FEATURE         |                               | STRAP TERMINALS |
|--------|-----------------|-------------------------------|-----------------|
| J,X    | AUDIBLE SIGNALS | AC BUZZER, 18V± OR 10V±       | 1 TO 4, 7 TO 8  |
| K,X    |                 | DC BUZZER, 24V DC             |                 |
| M,X,R  |                 | RINGER, 105V± STEADY          | 2 TO 4, 7 TO 8  |
| X      |                 | INTERRUPTED                   |                 |
| R      |                 | INTERRUPTED WITH STATION BUSY |                 |

Fig. 14—Nondedicated Lead Connections for 420A KTU (Long Line) in 110A Apparatus Mounting

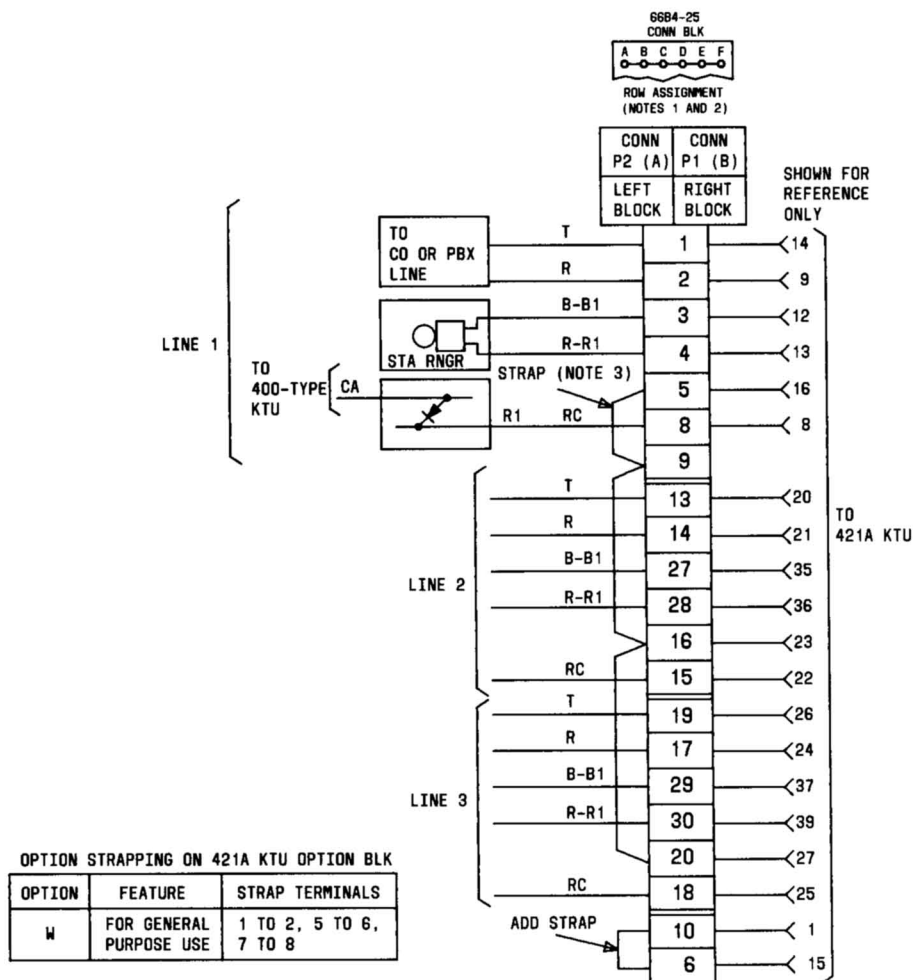


Fig. 15—Nondedicated Lead Connections for 421A KTU (Power Failure Transfer) in 110A Apparatus Mounting

## NOTES:

1. SEE BLOCK DIAGRAM COVERING 66B4-25 CONN BLK IN FIG. 3.
2. TERMINATE DEDICATED LEADS PER FIG. 4.
3. OPTION (W) REQUIRED WHEN 421A KTU IS USED FOR AUDIBLE SIGNAL SUPPRESSION.
4. 400-TYPE KTU WIRED FOR COMMON AUDIBLE WITH DIODE MATRIX OPTION.
5. REFER TO SECTION PERTAINING TO TELEPHONE SET USED.

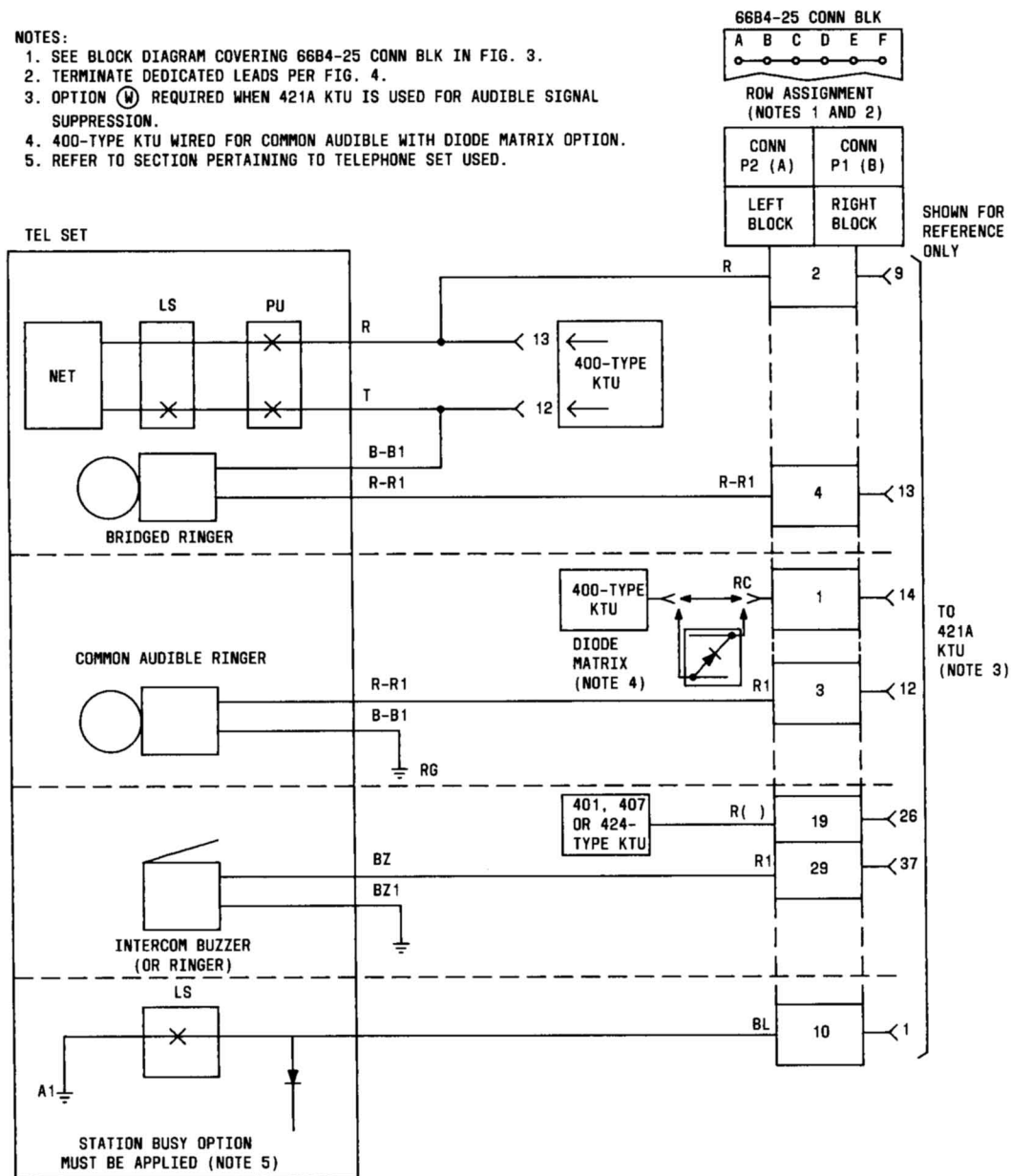
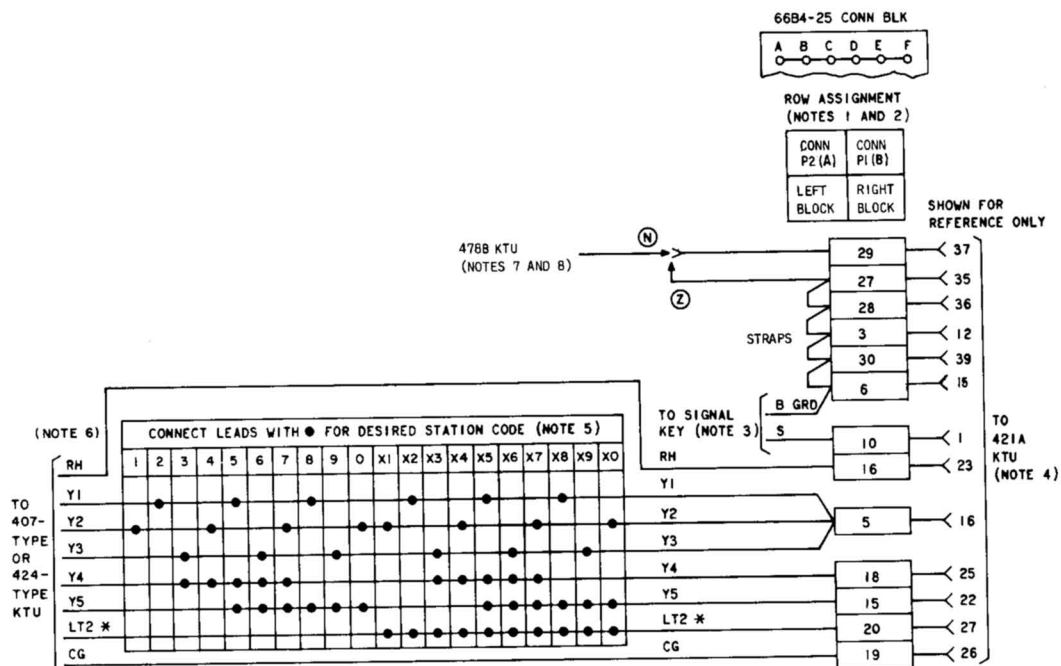
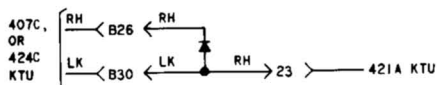


Fig. 16—Nondedicated Lead Connections for 421A KTU (Wired for Audible Signal Suppressor) in 110A Apparatus Mounting

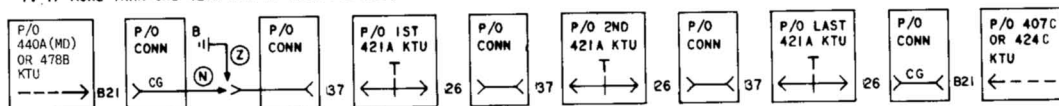


## NOTES:

- SEE BLOCK DIAGRAM COVERING 66B4-25 CONN BLK IN FIG. 3.
- TERMINATE DEDICATED LEADS PER FIG. 4.
- PROVIDE SEPARATE SIGNAL KEY FOR EACH STATION CODE TO BE SELECTED.
- PROVIDE A SEPARATE 421A KTU FOR EACH STATION CODE TO BE SELECTED.
- SELECT CODE AND CONNECT LEADS FOR SELECTED CODE AS SHOWN IN VERTICAL COLUMN.
- A 400J DIODE (PROCURE LOCALLY) MUST BE CONNECTED AS SHOWN BELOW WHEN PROVIDING DSS IN A DIAL EQUIPPED SELECTOR ONLY ARRANGEMENT.



7. IF MORE THAN ONE 421A KTU IS USED FOR DSS, CONNECT AS SHOWN:

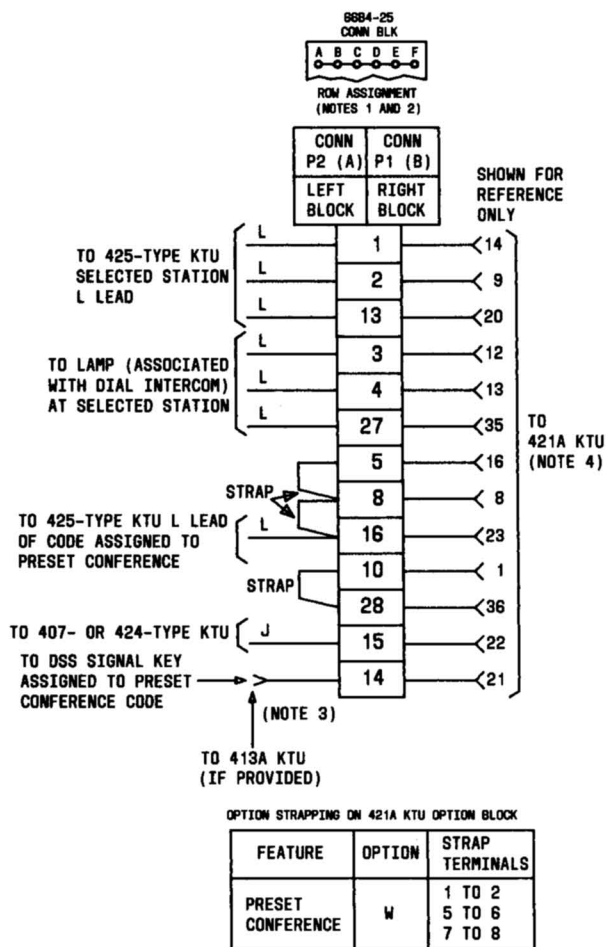


8. (N) WITH "TOUCH-TONE".

(Z) WITHOUT "TOUCH-TONE".

\* USE WITH 424C KTU.

Fig. 17—Nondedicated Lead Connections for 421A KTU (Wired for DSS Feature) in 110A Apparatus Mounting



## NOTES:

- SEE BLOCK DIAGRAM COVERING 6684-25 CONN BLK IN FIG. 3.
- TERMINATE DEDICATED LEADS PER FIG. 4.
- PROVIDE 413A KTU ONLY WHEN ACCESS TO THE PRESET CONFERENCE IS BY DIAL CODE OR BY DIAL CODE AND DSS. DO NOT PROVIDE 413A KTU WHEN ACCESS TO THE PRESET CONFERENCE IS LIMITED TO DSS.
- PROVIDE (W) OPTION.

Fig. 18—Nondedicated Lead Connections for 421A KTU (Wired for Preset Conference) in 110A Apparatus Mounting

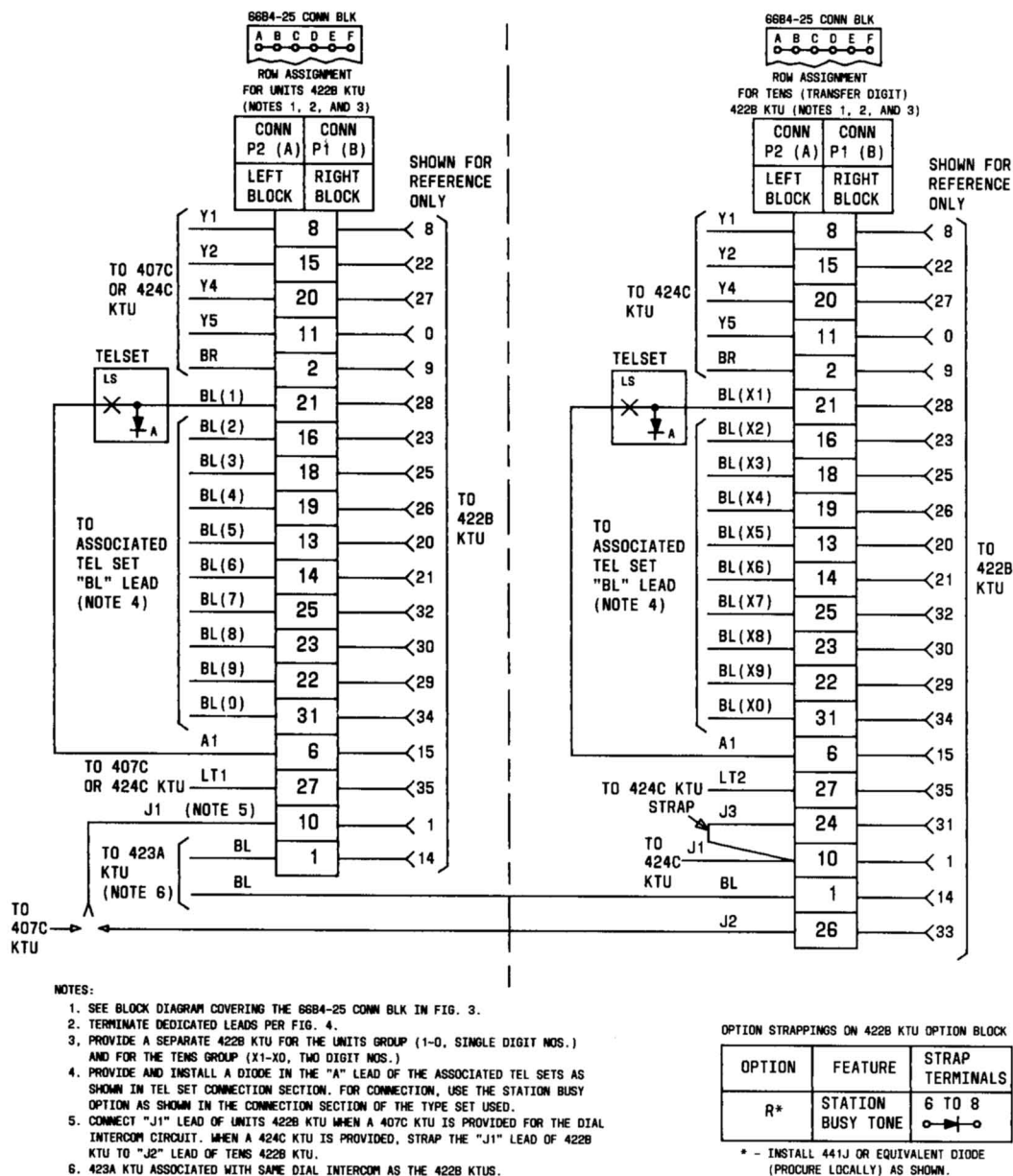
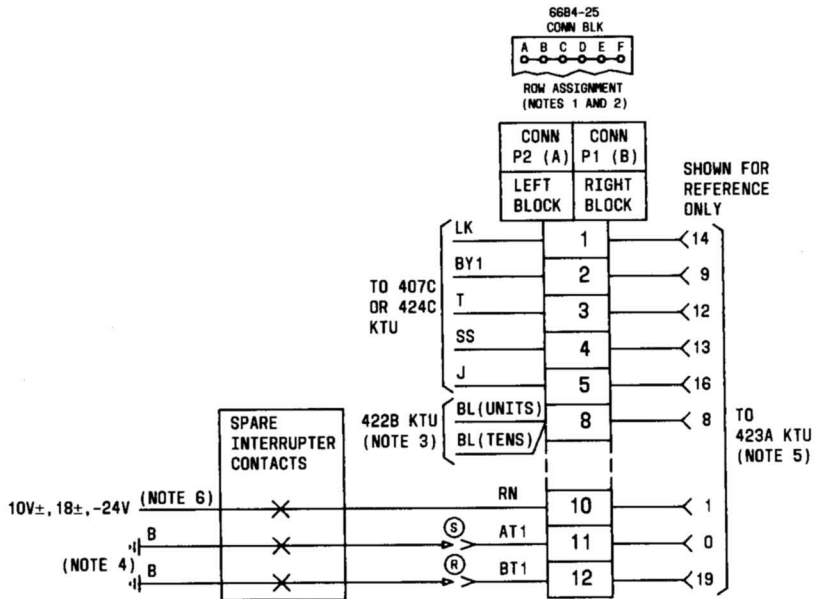
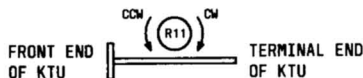


Fig. 19—Non-dedicated Lead Connections for 422B KTU (Station Busy Selector) in 110A Apparatus Mounting



## NOTES:

1. SEE BLOCK DIAGRAM COVERING THE 66B4-25 CONN BLK IN FIG. 3.
2. TERMINATE DEDICATED LEADS PER FIG. 4.
3. 422B KTUS ASSOCIATED WITH THE SAME DIAL INTERCOM AS THE 423A KTU.
4. CONNECT TO B GRD AS SHOWN.
5. TO ADJUST DIAL TONE VOLUME ON 423A KTU TURN KNURLED WHEEL TO FULL CLOCKWISE POSITION FOR MINIMUM DIAL TONE VOLUME AND TO FULL COUNTERCLOCKWISE POSITION FOR MAXIMUM DIAL TONE VOLUME.

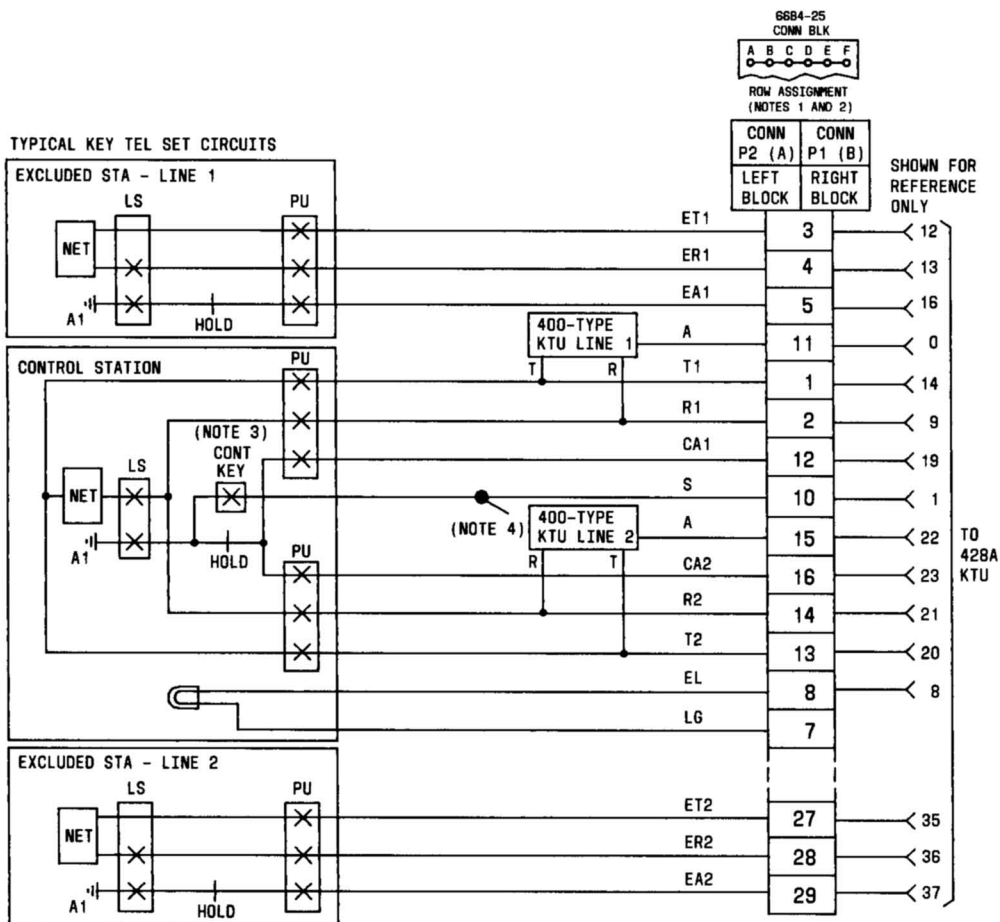


6. IF INTERRUPTED 105V± IS USED FOR DIAL INTERCOM, DO NOT CONNECT THIS LEAD. IF BUZZERS ARE USED FOR DIAL INTERCOM, AUDIBLE SIGNAL IS SUPPLIED ON THIS LEAD VIA SPARE INTERRUPTER CONTACTS TO PIN 1 OF 423A KTU ON 423A KTU OPTION BLK, STRAP TERMINALS 6 TO 7 AND REMOVE (R) OPTION STRAP BETWEEN TERMINALS 4 AND 6.

OPTION STRAPPING ON KTU OPTION BLOCK

| OPTION | FEATURE           | STRAP TERMINALS<br>ON 423A |
|--------|-------------------|----------------------------|
| T      | DIAL TONE         | 1 TO 2                     |
| R      | STATION BUSY TONE | 4 TO 6                     |
| S      | AUDIBLE RINGBACK  | NO STRAP                   |

Fig. 20—Nondedicated Lead Connections for 423A KTU (Dial Tone, Busy Tone, and Audible Ringback Tone) in 110A Apparatus Mounting



## NOTES:

1. SEE BLOCK DIAGRAM COVERING 66B4-25 CONN BLK IN FIG. 3.
2. TERMINATE DEDICATED LEADS PER FIG. 4.
3. CONTROL KEY MAY BE LOCKING OR NONLOCKING.
4. S LEAD CAN ONLY MULTIPLE OTHER 428A KTUS CONTROLLED BY THE SAME STATION.

Fig. 21—Nondedicated Lead Connections for 428A KTU (Multiline Exclusion) in 110A Apparatus Mounting

## NOTES:

1. SEE BLOCK DIAGRAM COVERING 6884-25 CONN BLK IN FIG. 3.
2. TERMINATE DEDICATED LEADS PER FIG. 4.
3. T AND R LEADS FROM STATION SIDE OF 400-TYPE KTU TERMINATE DIRECTLY TO THE ASSIGNED PICKUP KEY AT TELEPHONE SET.
4. LIMITATIONS OF 430A KTU ARE AS FOLLOWS:
  - (A) FL1 OR FL2 CAN SERVE A MAXIMUM OF 50 LAMPS (51A) EACH. DIVIDE LAMPS AS EVENLY AS POSSIBLE BETWEEN THE TWO LEADS.
  - (B) SP LEAD CAN CONNECT TO A MAXIMUM OF 20 STATIONS.
5. ANY TELEPHONE SET EQUIPPED WITH A HOLD KEY HAVING A SET OF TRANSFER CONTACTS AND SUFFICIENT CORD LEADS CAN INITIATE I HOLD. REWIRE HOLD KEY ACCORDING TO CONNECTION SECTION OF TYPE SET USED.
6. WHEN USED WITH CONCENTRATOR SETS AND THE 657 KEY MODULE, CONNECT AS FOLLOWS:

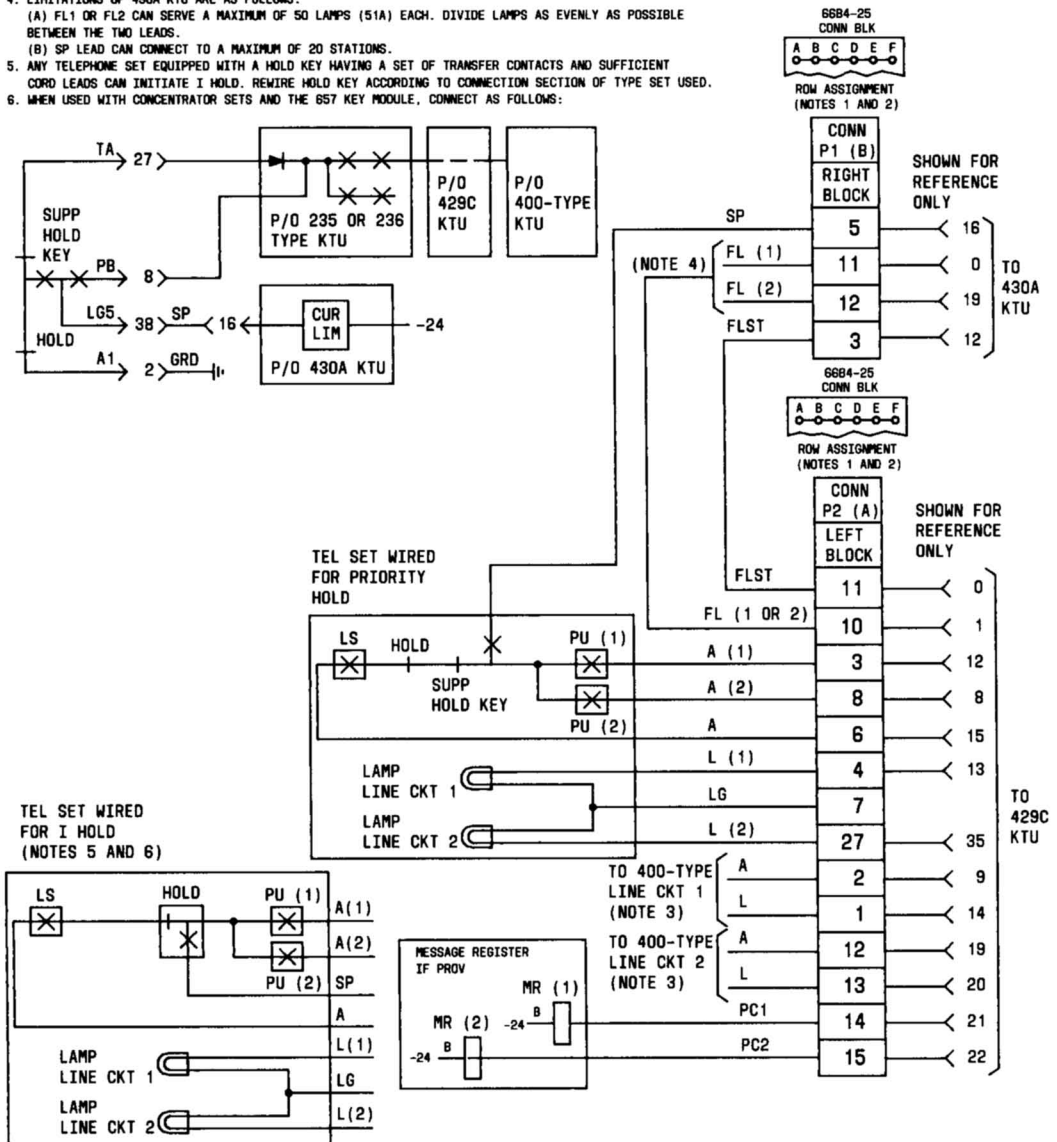
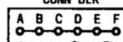


Fig. 22—Nondedicated Lead Connections for 429-Type KTU (Supplementary Hold Detector) and 430A KTU (Flutter Generator) in 110A Apparatus Mounting

## NOTES:

1. SEE BLOCK DIAGRAM COVERING THE 6684-25 CONN BLK IN FIG. 3.
2. TERMINATE DEDICATED LEADS PER FIG. 4.
3. IF IMMEDIATE RINGER TRANSFER IS REQUIRED, CONNECT TO A TURN KEY OR A 449A KTU.
4. MULTIPLE RC LEADS FROM BOTH CIRCUITS TO SAME AUDIBLE SIGNAL AT ATTENDANT STATION.
- \* FOR LINE RINGING.
- † FOR COMMON AUDIBLE RINGING.
- ‡ CONNECT WHEN COMMON AUDIBLE IS USED AND RINGER IS NOT TO BE CUT OFF.

6684-25  
CONN BLKROW ASSIGNMENT  
(NOTES 1 AND 2)

## OPTION STRAPPING ON 448A KTU OPTION BLOCK

| AUDIBLE SIGNALS | OPTION | FEATURE          | STRAP TERMINALS     |                     |
|-----------------|--------|------------------|---------------------|---------------------|
|                 |        |                  | 1ST CKT             | 2ND CKT             |
|                 | W      | INTERRUPTED RING | 9 TO 7 <sup>8</sup> | 3 TO 5 <sup>8</sup> |
|                 | T      | STEADY RING      | 8 TO 6              | 3 TO 4              |
|                 | X      | STEADY BUZZER    | 8 TO 10             | 3 TO 1              |

B FACTORY PROVIDED

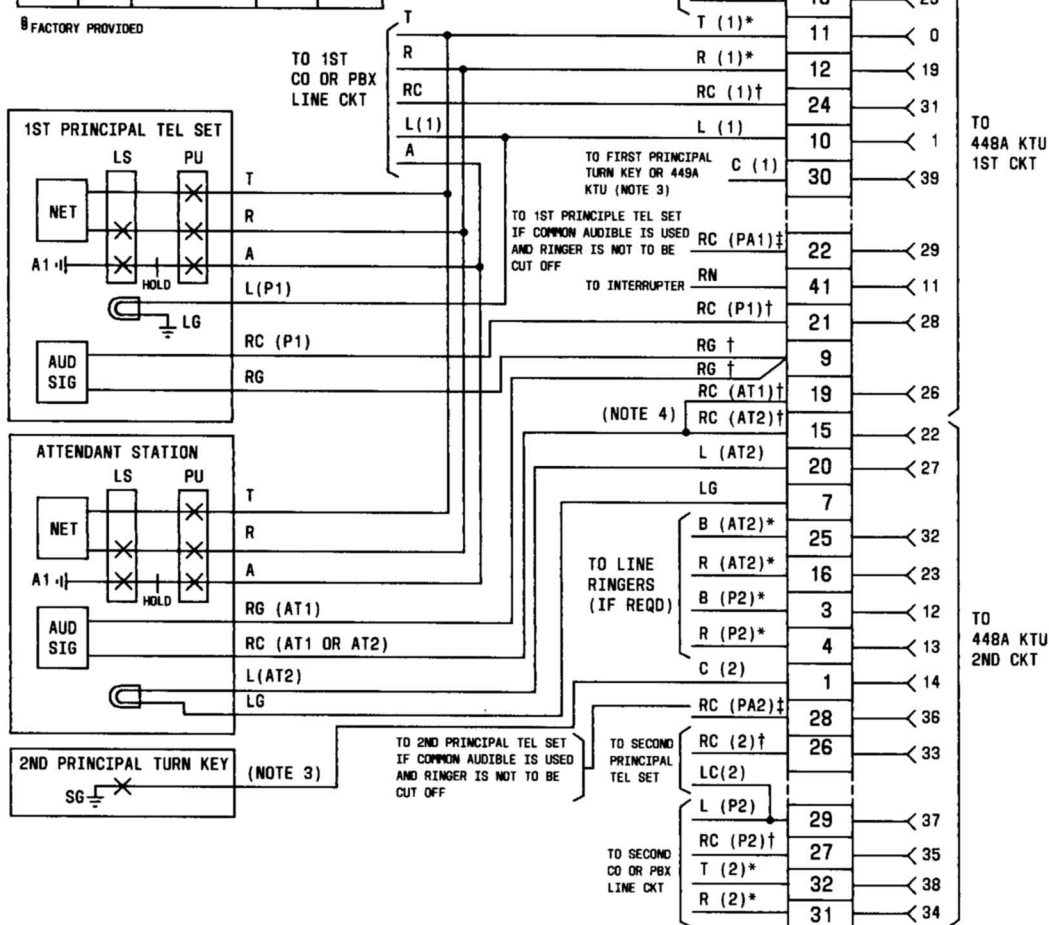


Fig. 23—Nondedicated Lead Connections for 448A KTU (Variable Delay Timer) in 110A Apparatus Mounting

## NOTES:

1. SEE BLOCK DIAGRAM COVERING THE 6684-25 CONN BLK IN FIG. 3.
2. TERMINATE DEDICATED LEADS PER FIG. 4.
3. PROVIDE STRAP ONLY IF CKT IS USED WITH A 448A KTU. IF USED WITH 448A KTU, NONE OF THE RINGER CONNECTIONS SHOWN FOR THAT CKT ARE REQUIRED.
4. MULTIPLE RINGING LEADS FROM BOTH CIRCUITS TO THE SAME AUDIBLE SIGNAL AT THE ATTENDANT STATION.

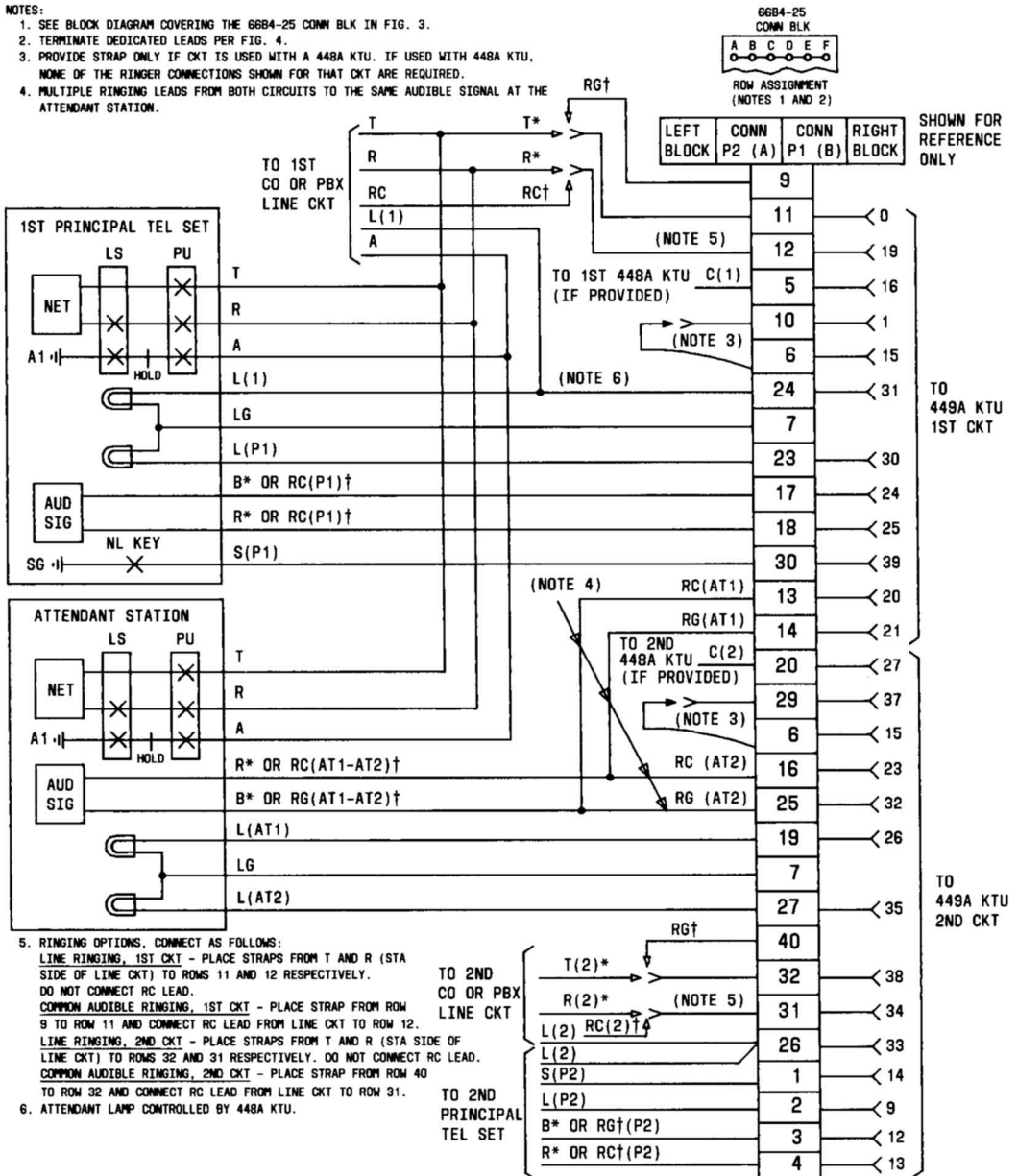
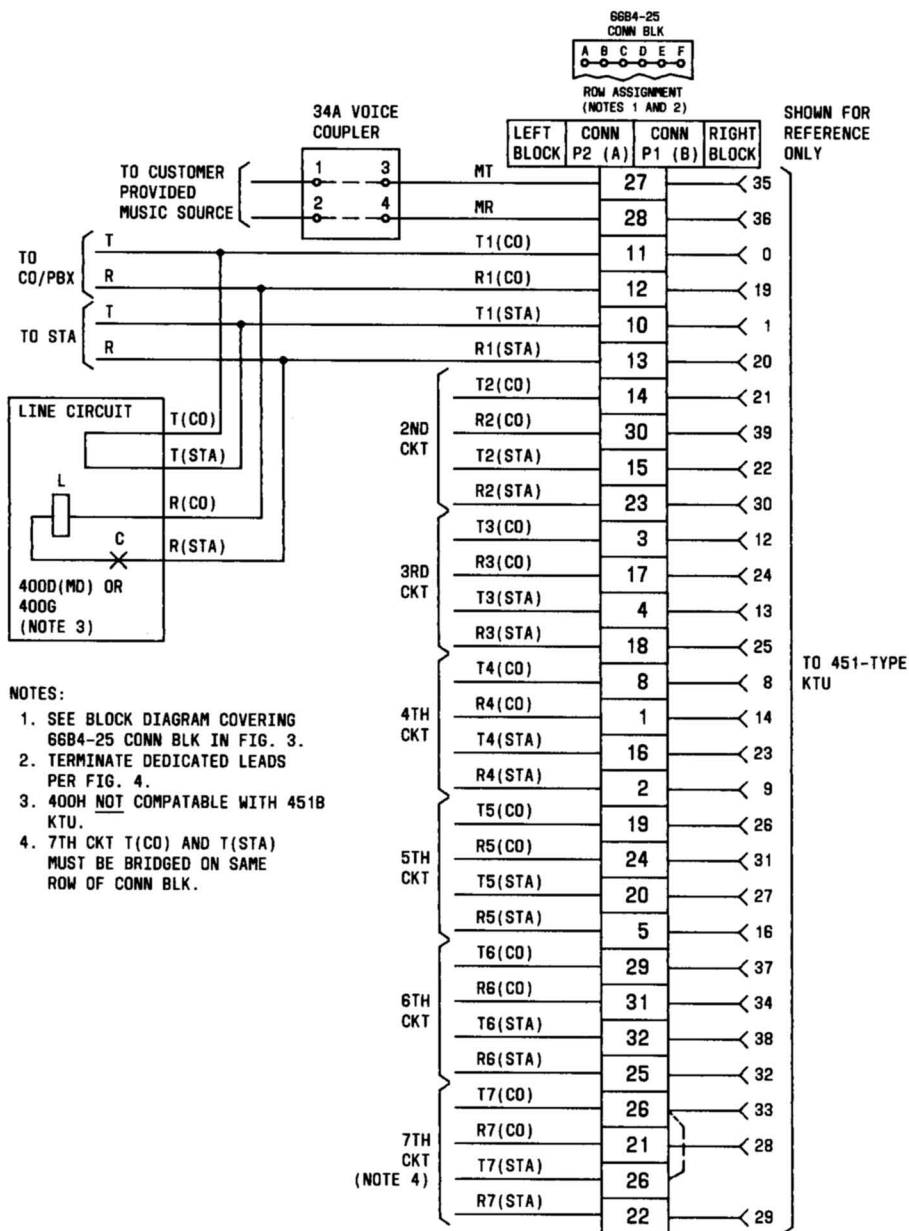


Fig. 24—Nondedicated Lead Connections for 449A KTU (Immediate Transfer Control) in 110A Apparatus Mounting



**Fig. 25—Nondedicated Lead Connections for 451B KTU (Music-On-Hold) in 110A Apparatus Mounting**

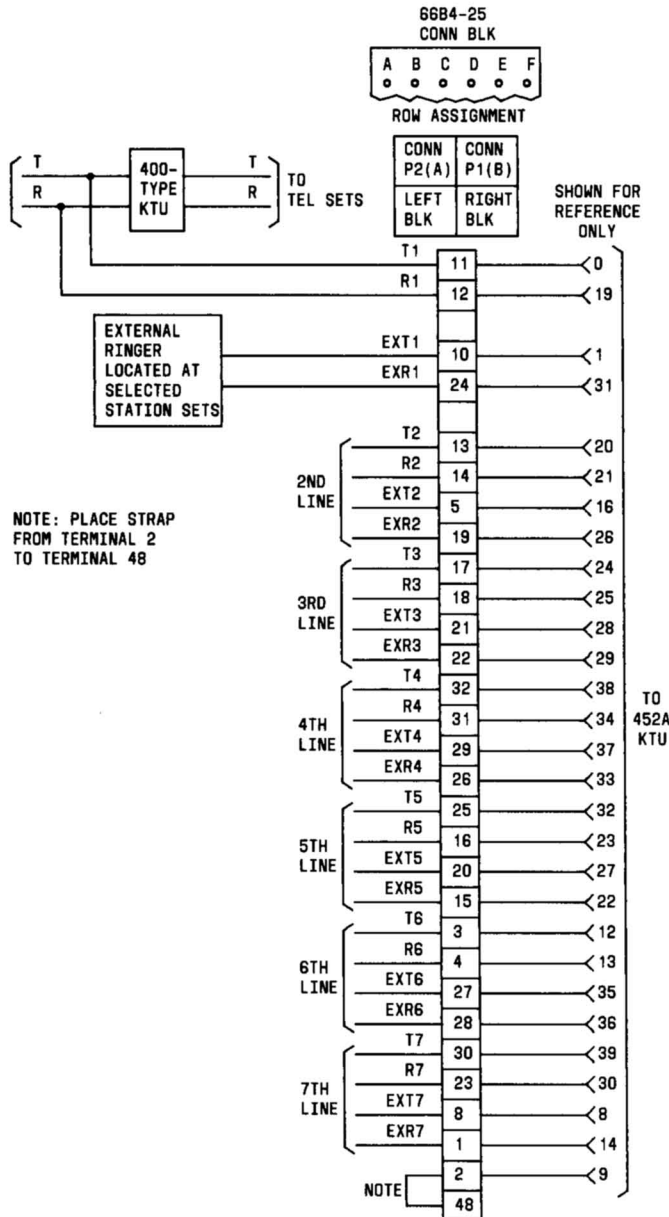
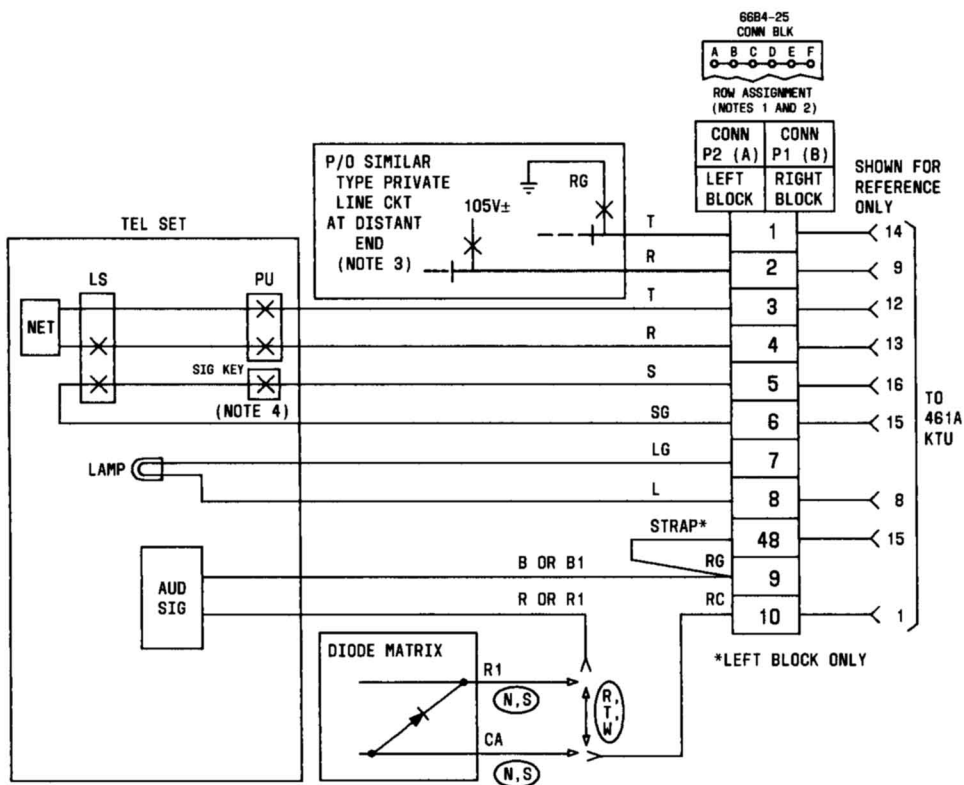


Fig. 26—Nondedicated Lead Connections for 452A KTU (Power Failure Ringing) in 110A Apparatus Mounting



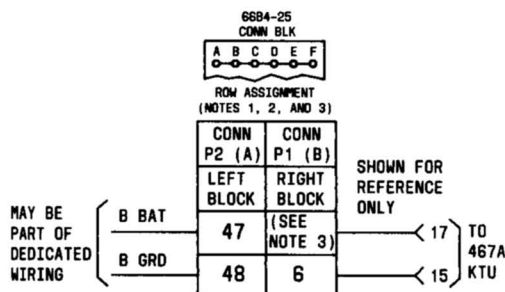
OPTION STRAPPING ON 461A KTU OPTION BLK

| OPTION            | FEATURES                       |                                                         |                                     | STRAP<br>TERMINALS         |
|-------------------|--------------------------------|---------------------------------------------------------|-------------------------------------|----------------------------|
| W                 | AUDIBLE<br>SIGNALS             | UNDER<br>CONTROL OF<br>TIME-OUT<br>CIRCUIT<br>(8 RELAY) | INTERRUPTED RING                    | 7 TO 8                     |
| T                 |                                |                                                         | STEADY RING                         | 6 TO 7                     |
| S                 |                                |                                                         | COMMON WITH DIODE<br>MATRIX CONTROL | 7 TO 8                     |
| R                 |                                |                                                         | STEADY RING                         |                            |
| N                 |                                | UNDER<br>CONTROL<br>OF R RELAY                          | COMMON WITH DIODE<br>MATRIX CONTROL | 4 TO 6                     |
| X                 | TIME-OUT                       |                                                         | 10 SECONDS                          | 1 TO 2                     |
| Z                 |                                |                                                         | 16 SECONDS                          | 2 TO 3                     |
| WITHOUT<br>X OR Z |                                |                                                         | 23 SECONDS                          | REMOVE<br>X OR Z<br>STRAPS |
| M                 | AUDIBLE RINGBACK TONE (NOTE 5) |                                                         |                                     | 9 TO 10                    |

## NOTES:

- SEE BLOCK DIAGRAM COVERING 66B4-25 CONNECTING BLOCK IN FIG. 3.
- TERMINATE DEDICATED LEADS PER FIG. 4.
- PVT LINE CKT AT DISTANT END MAY BE A 414A KTU, 419A KTU, 204A KTU, OR ANY OTHER TYPE PVT LINE UNIT REQUIRING RINGING VOLTAGE FOR THE RINGUP CIRCUIT AND FURNISHING RINGING VOLTAGE FROM THE SIGNALING CKT.
- SIGNAL KEY MAY BE A CONVERTED PICKUP KEY OR ANY EXTERNAL NONLOCKING KEY.
- FOR SATISFACTORY AUDIBLE RINGBACK TONE, THE RINGING SUPPLY MUST CONTAIN AN AUDIBLE COMPONENT.

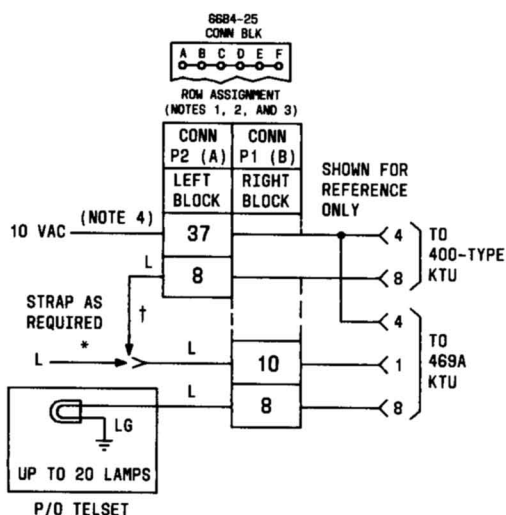
Fig. 27—Nondedicated Lead Connections for 461A KTU (Manual Signaling, Ringdown Private Line) in 110A Apparatus Mounting



## NOTES:

1. SEE BLOCK DIAGRAM COVERING 66B4-25 CONN BLK IN FIG. 3.
2. TERMINATE DEDICATED LEADS PER FIG. 4.
3. KTU MAY BE PLUGGED INTO EITHER CONNECTOR, BUT B BAT IS APPLIED AS A DEDICATED LEAD ON ROW 47 OF THE LEFT BLOCK ONLY.

Fig. 28—Nondedicated Lead Connections for 467A KTU (Voltage Monitor) in 110A Apparatus Mounting



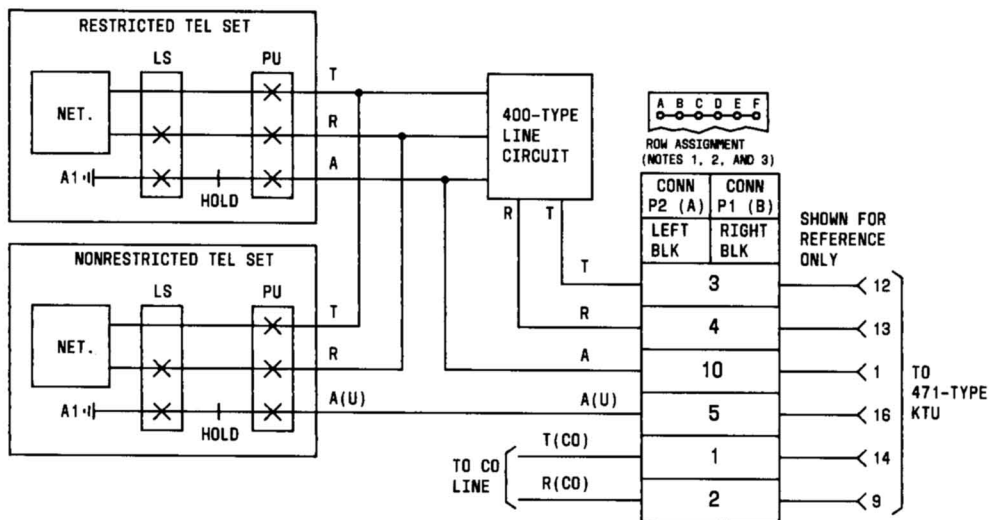
## NOTES:

1. SEE BLOCK DIAGRAM COVERING 66B4-25 CONN BLK IN FIG. 3.
2. TERMINATE DEDICATED LEADS PER FIG. 4.
3. 469A KTU MAY BE PLACED IN CONN A OR B WITH L LEAD EXTENDED FROM AN EXTERNAL LINE CIRCUIT OR PAIRED WITH LINE CIRCUIT AS IN THIS EXAMPLE.
4. 10 VAC IS APPLIED AS DEDICATED LEAD ON ROW 37 OF LEFT BLOCK ONLY.

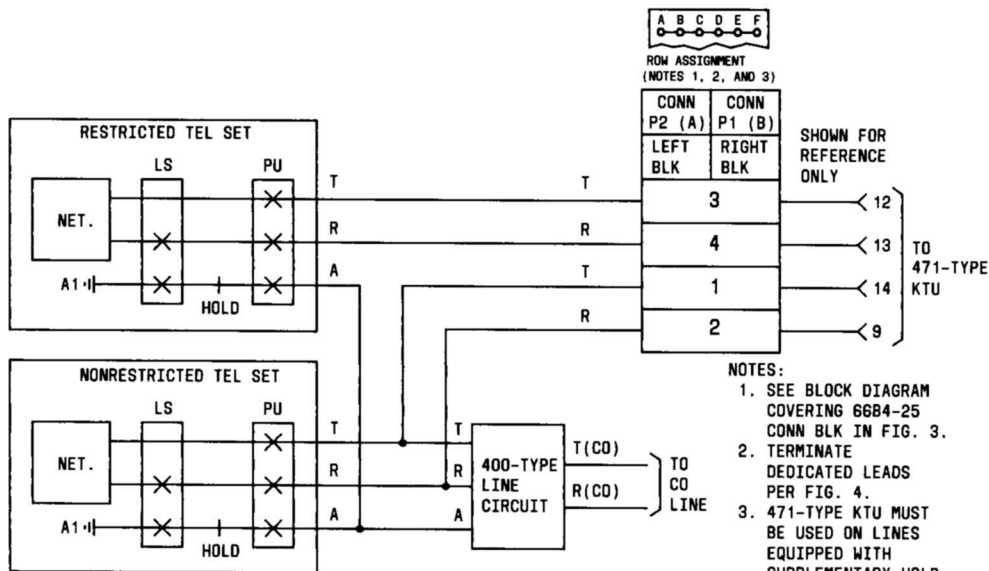
\* EXTERNAL LINE CKT

† LINE CKT IN CONN A

Fig. 29—Nondedicated Lead Connections for 469A KTU (Lamp Extender) in 110A Apparatus Mounting

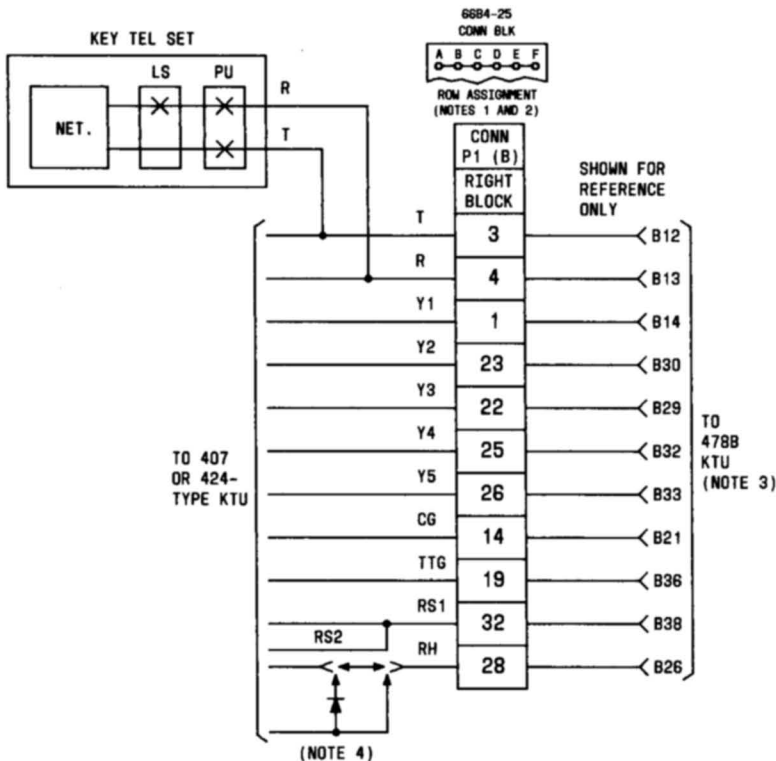


A. STANDARD (PREFERRED) WIRING ARRANGEMENT



B. ALTERNATE WIRING ARRANGEMENT

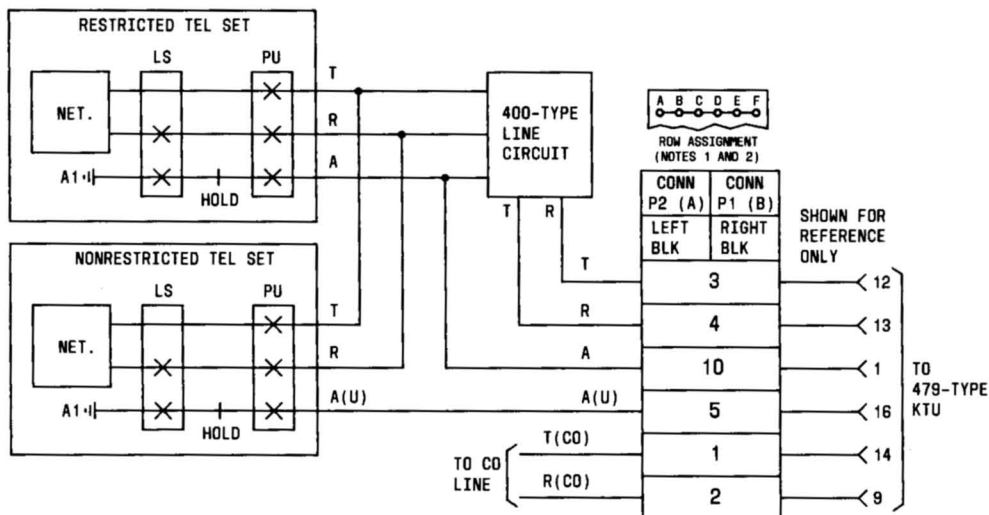
Fig. 30—Nondedicated Lead Connections for 471-Type KTU (Battery Reversal Toll Restriction) in 110A Apparatus Mounting



## NOTES:

1. SEE BLOCK DIAGRAM COVERING 6684-25 CONN BLK IN FIG. 3.
2. TERMINATE DEDICATED LEADS PER FIG. 4.
3. REQUIRES USE OF BOTH A AND B CONNECTORS.
4. DIODE (400J, LOCALLY PROVIDED) MUST BE FURNISHED IN SYSTEM EQUIPPED WITH DIAL TONE.

Fig. 31—Nondedicated Lead Connections for 478B KTU (TOUCH-TONE Adapter) in 110A Apparatus Mounting



## OPTIONS:

| UNIT             | OPT | FEATURE                                   | PLACE KS-CONN (NOTE 3) |
|------------------|-----|-------------------------------------------|------------------------|
| 479B KTU         | W   | TOLL ALLOWED                              | G-H                    |
|                  | X   | TOLL DENIED                               | H-J                    |
|                  | Y   | LOOP START                                | B-C<br>E-F             |
|                  | Z   | GROUND START                              | A-B<br>D-E             |
| 107A CM          | V   | 2-DIGIT ABSORPTION                        | A-B                    |
|                  |     | 1ST DIGIT                                 | (NOTE 4)               |
|                  |     | 2ND DIGIT                                 |                        |
|                  |     | ABSORB REPEATEDLY AND/OR ABSORB ONLY ONCE | (NOTE 5)               |
| 107B CM (NOTE 7) |     | NPA CODE RESTRICTION                      | (NOTE 6)               |

## NOTES:

- SEE BLOCK DIAGRAM COVERING 66B4-25 CONN BLK IN FIG. 3.
- TERMINATE DEDICATED LEADS PER FIG. 4.
- PLACE KS-21290 L1 CONNECTOR ON TERMINALS AS INDICATED.
- PLACE KS-CONN ACROSS LIKE-NUMBERED TERMINALS AS NUMBER TO BE ABSORBED:
  - 1ST DIGIT-IN OPTION FIELD AR/1
  - 2ND DIGIT-IN OPTION FIELD A/2
- REMOVE KS-CONN, IF PROVIDED, FROM TERMINALS A-B, AND PLACE KS-CONN ACROSS LIKE-NUMBERED TERMINALS AS EACH NUMBER TO BE ABSORBED AS FOLLOWS:
  - REPEATEDLY-IN OPTION FIELD AR/1
  - ONLY ONCE-IN OPTION FIELD A/2
- PLACE KS-CONN ACROSS LIKE-NUMBERED TERMINALS AS NPA CODE TO BE RESTRICTED. EACH 107B CIRCUIT MODULE WILL HANDLE TWO NPA CODES.
- IF 107A IS NOT REQUIRED, TWO 107B MODULES CAN BE MOUNTED ON THE 479-TYPE KTU FOR A TOTAL OF FOUR NPA CODES.

Fig. 32—Nondedicated Lead Connections for 479-Type KTU (Rotary Dial Toll Restriction) in 110A Apparatus Mounting

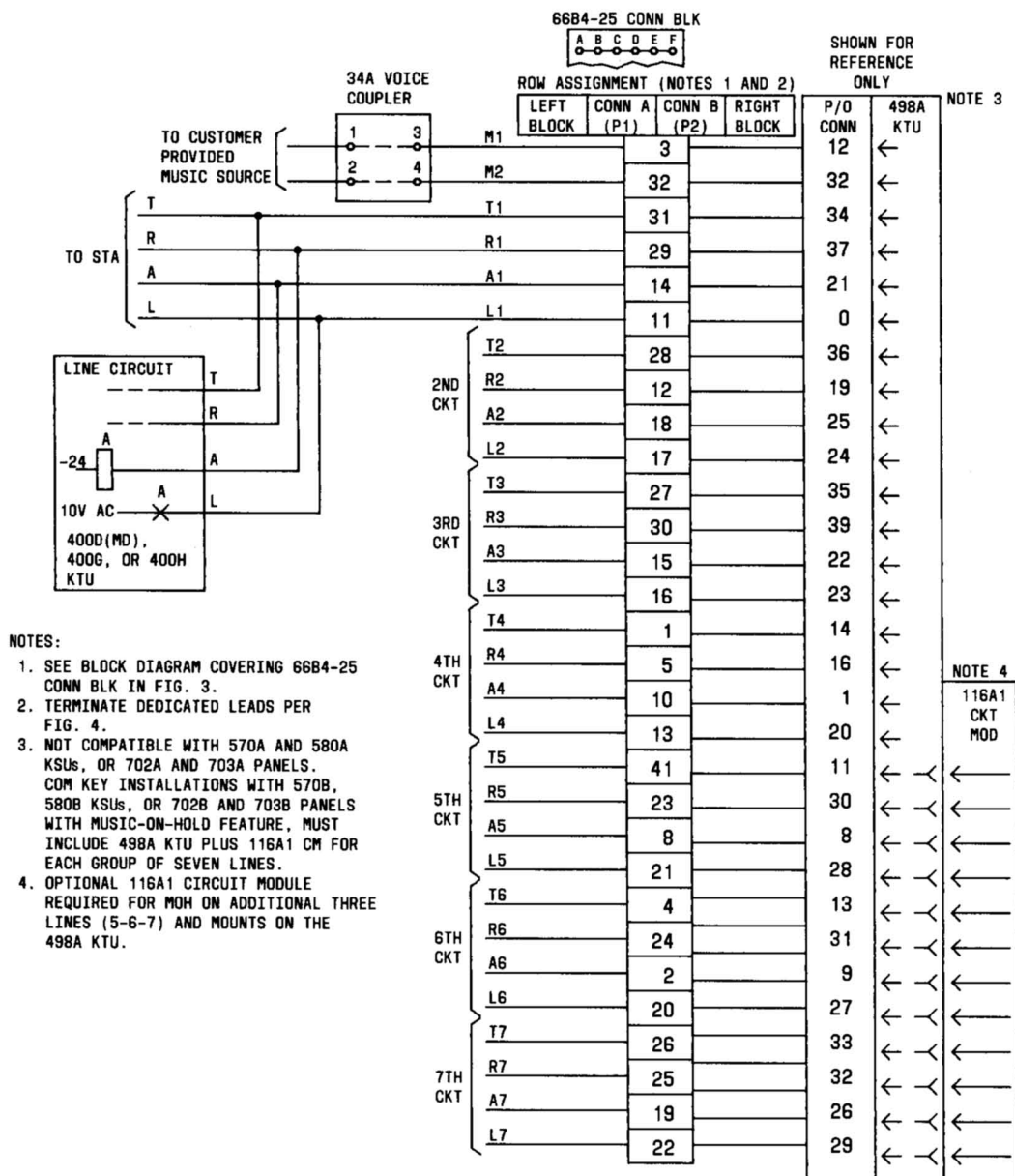


Fig. 33—Nondedicated Lead Connections for 498A KTU and 116A1 CM (Music-On-Hold) in 110A Apparatus Mounting

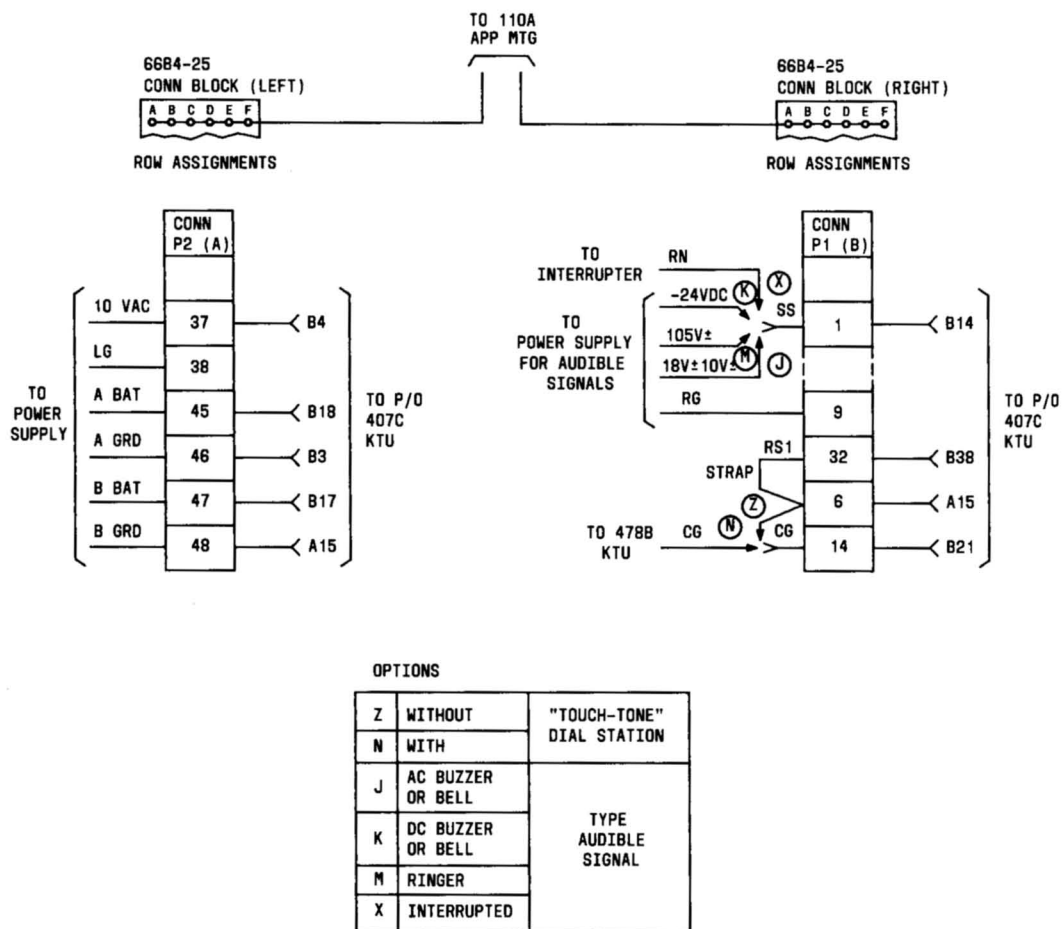


Fig. 34—Basic Dial Intercom, Strapping and Power Supply Connections for 407-Type KTU in 110A Apparatus Mounting

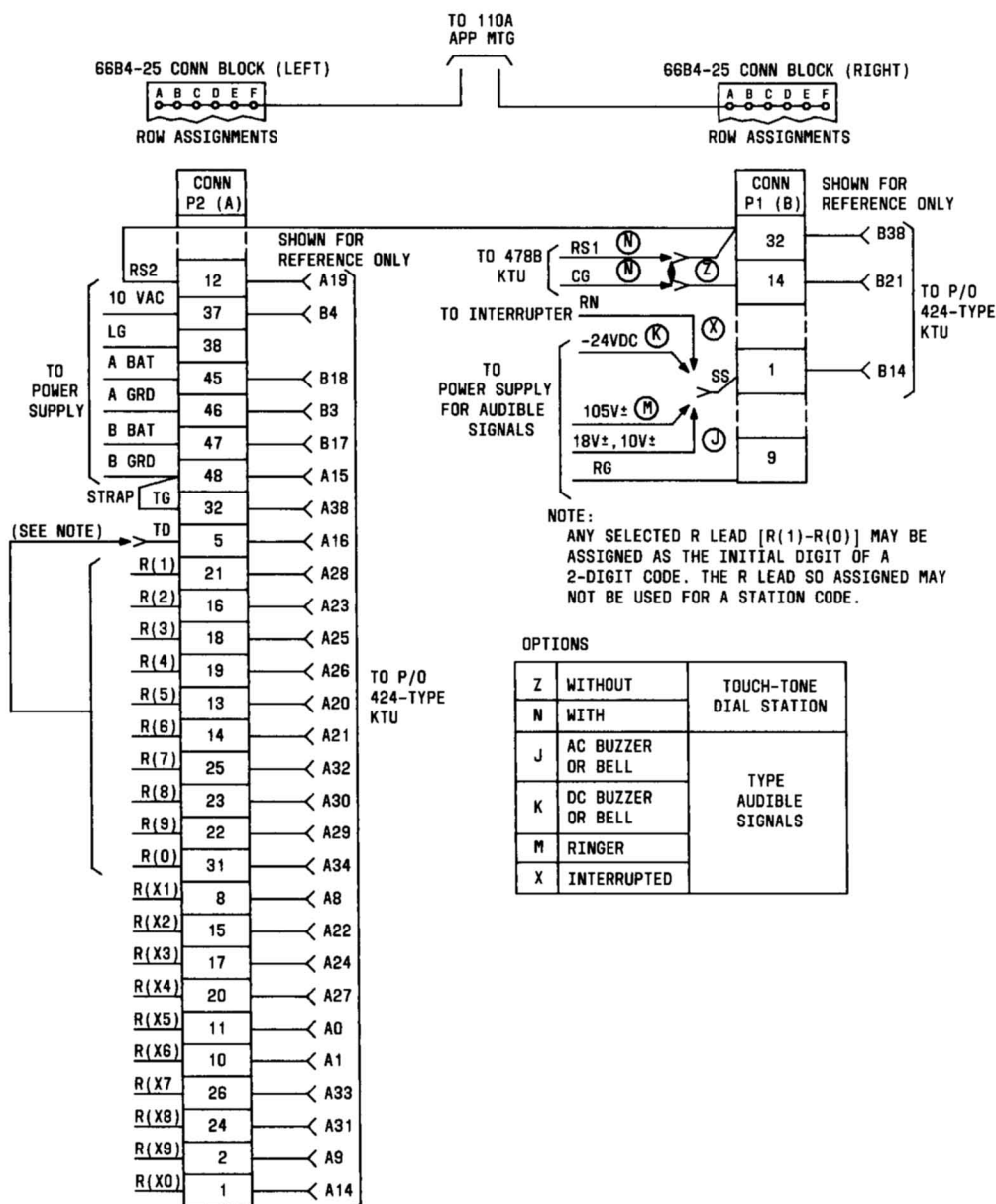


Fig. 35—Basic Dial Intercom, Strapping and Power Supply Connections for 424-Type KTU in 110A Apparatus Mounting

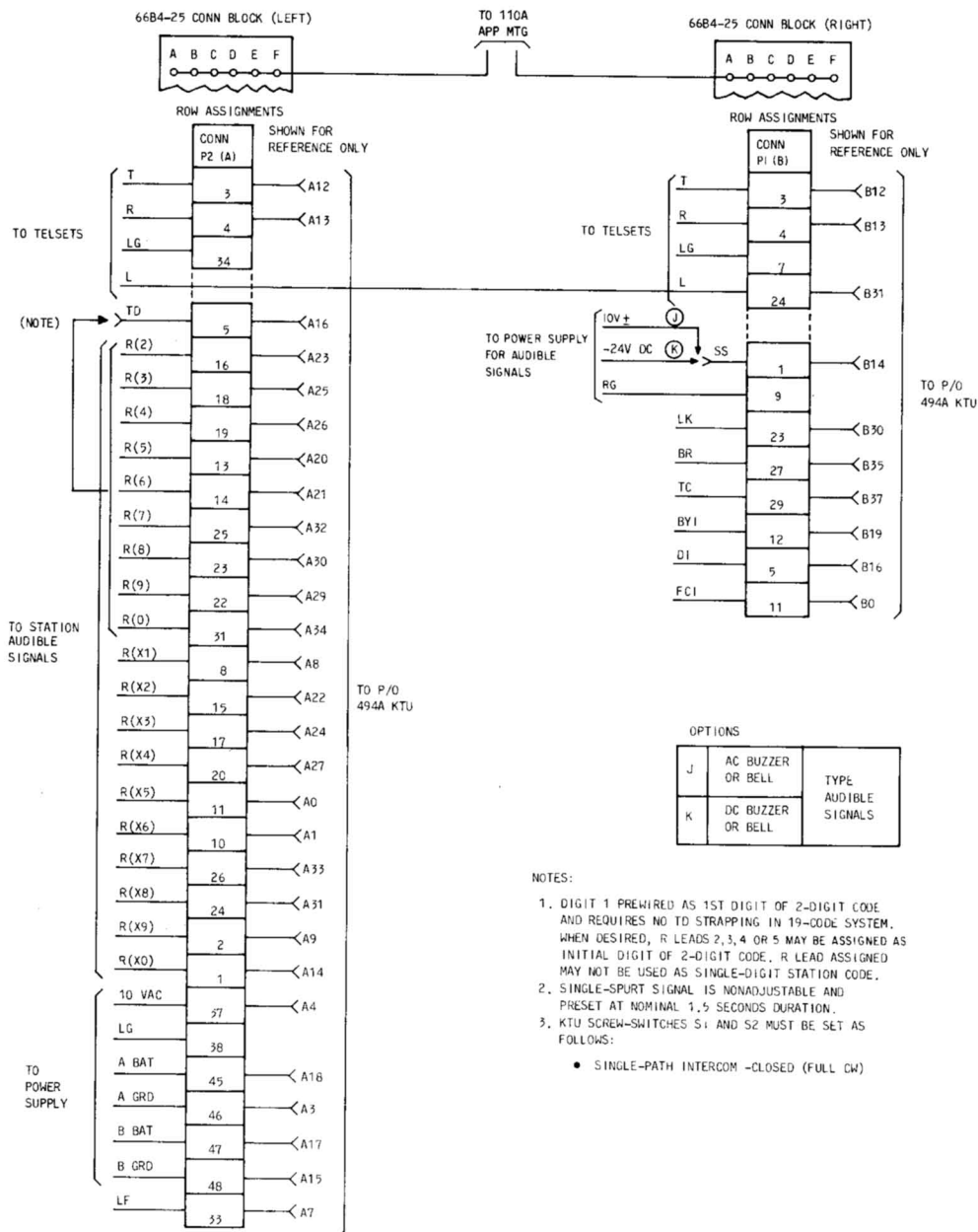


Fig. 36—Basic Dial Intercom With TOUCH-TONE Dialing, Strapping and Power Supply Connections for 494A KTU in 110A Apparatus Mounting

TABLE C

**BASIC AND DELUXE DIAL INTERCOM CONNECTIONS**  
**407- AND 424-TYPE KTUS TO ASSOCIATED AND OPTIONAL KTUS**

| LEAD<br>DESIGNATION<br>KTU |          | 8684-25<br>CONN BLOCKS<br>ROW AND COL<br>ASSIGNMENTS |              | ASSOCIATED KTUs TO PROVIDE<br>DELUXE DIAL INTERCOM |      |                  |                   | OPTIONAL KTUs   |                      |      |      |              |
|----------------------------|----------|------------------------------------------------------|--------------|----------------------------------------------------|------|------------------|-------------------|-----------------|----------------------|------|------|--------------|
|                            |          |                                                      |              | STA BUSY SEL                                       |      | AUDIBLE<br>TONES | FLASHING<br>LAMPS | "TOUCH<br>TONE" | PRESET<br>CONFERENCE |      | DSS  | LONG<br>LINE |
|                            |          |                                                      |              | UNITS                                              | TENS |                  |                   |                 |                      |      |      |              |
| 407-TYPE                   | 424-TYPE | (LEFT)<br>1                                          | (RIGHT)<br>2 | 422B                                               | 422B | 423A             | 425B              | 478B            | 413A                 | 421A | 421A | 420A         |
| T                          | T        |                                                      | 3F-B         |                                                    |      | •                |                   | •               |                      |      |      | •            |
| R                          | R        |                                                      | 4F-B         |                                                    |      |                  |                   | •               |                      |      |      | •            |
| Y1                         | Y1       |                                                      | 18F-B        | •                                                  | •    |                  |                   | •               |                      |      | •    |              |
| Y2                         | Y2       |                                                      | 17F-B        | •                                                  | •    |                  |                   | •               |                      |      | •    |              |
| Y3                         | Y3       |                                                      | 15F-B        |                                                    |      |                  |                   | •               |                      |      | •    |              |
| Y4                         | Y4       | 28A-E                                                |              | •                                                  | •    |                  |                   | •               |                      |      | •    |              |
| LR                         | LR       | 28A-E                                                |              |                                                    |      |                  | •                 |                 |                      |      |      |              |
| Y5                         | Y5       | 29A-E                                                |              | •                                                  | •    |                  |                   | •               |                      |      | •    |              |
| LA                         | LA       |                                                      | 24F-B        |                                                    |      |                  | •                 |                 |                      |      |      |              |
| J                          | J        |                                                      | 31F-B        | *                                                  |      | •                | •                 |                 |                      | •    |      |              |
| RS1                        | RS1      |                                                      | 32F-B        |                                                    |      |                  |                   | •               |                      |      |      |              |
| FC1                        | FC1      |                                                      | 11F-B        |                                                    |      |                  | •                 |                 |                      |      |      |              |
| FC2                        | FC2      |                                                      | 13F-B        |                                                    |      |                  | •                 |                 |                      |      |      |              |
| FC3                        | FC3      |                                                      | 10F-B        |                                                    |      |                  | •                 |                 |                      |      |      |              |
| AL1                        | AL1      |                                                      | 21F-B        |                                                    |      |                  | •                 |                 |                      |      |      |              |
| AL2                        | AL2      |                                                      | 20F-B        |                                                    |      |                  | •                 |                 |                      |      |      |              |
| TC                         | TC       |                                                      | 29F-B        |                                                    |      |                  | •                 |                 |                      |      |      |              |
| D1                         | D1       |                                                      | 5F-B         |                                                    |      |                  | •                 |                 |                      |      |      |              |
| TTG                        | TTG      |                                                      | 30F-B        |                                                    |      |                  |                   | •               |                      |      |      | •            |
| BR                         | BR       |                                                      | 27F-B        | •                                                  | •    |                  | •                 |                 |                      |      |      |              |
| LK                         | LK       |                                                      | 23F-B        |                                                    |      | •                |                   |                 |                      |      |      |              |
| RH                         | RH       |                                                      | 19F-B        |                                                    |      |                  |                   | •               |                      |      | •    |              |
| CG                         | CG       |                                                      | 14F-B        |                                                    |      |                  |                   | •               |                      |      | •    |              |
| BY1                        | BY1      |                                                      | 12F-B        |                                                    |      | •                | •                 |                 |                      |      |      |              |
| SS                         | SS       |                                                      | 1F-B         |                                                    |      | •                |                   |                 |                      |      |      |              |
|                            | LT1      | 27A-E                                                |              | †                                                  |      |                  | †                 |                 |                      |      |      |              |
|                            | LT2      | 30A-E                                                |              |                                                    | †    |                  | †                 |                 |                      |      | †    |              |
|                            | TG       | 32A-E                                                |              |                                                    |      |                  |                   |                 |                      |      |      |              |
|                            | TD       | 5A-E                                                 |              |                                                    |      |                  |                   |                 |                      |      |      |              |
| B(1-0)                     | B(1-X0)  | As Assigned<br>for Station<br>Connection             |              |                                                    |      |                  |                   |                 |                      |      |      | •            |
| R(1-0)                     | R(1-X0)  |                                                      |              |                                                    |      |                  |                   |                 | •                    |      |      | •            |

\* To 407-Type KTU Only.

† To 424-Type KTU Only.

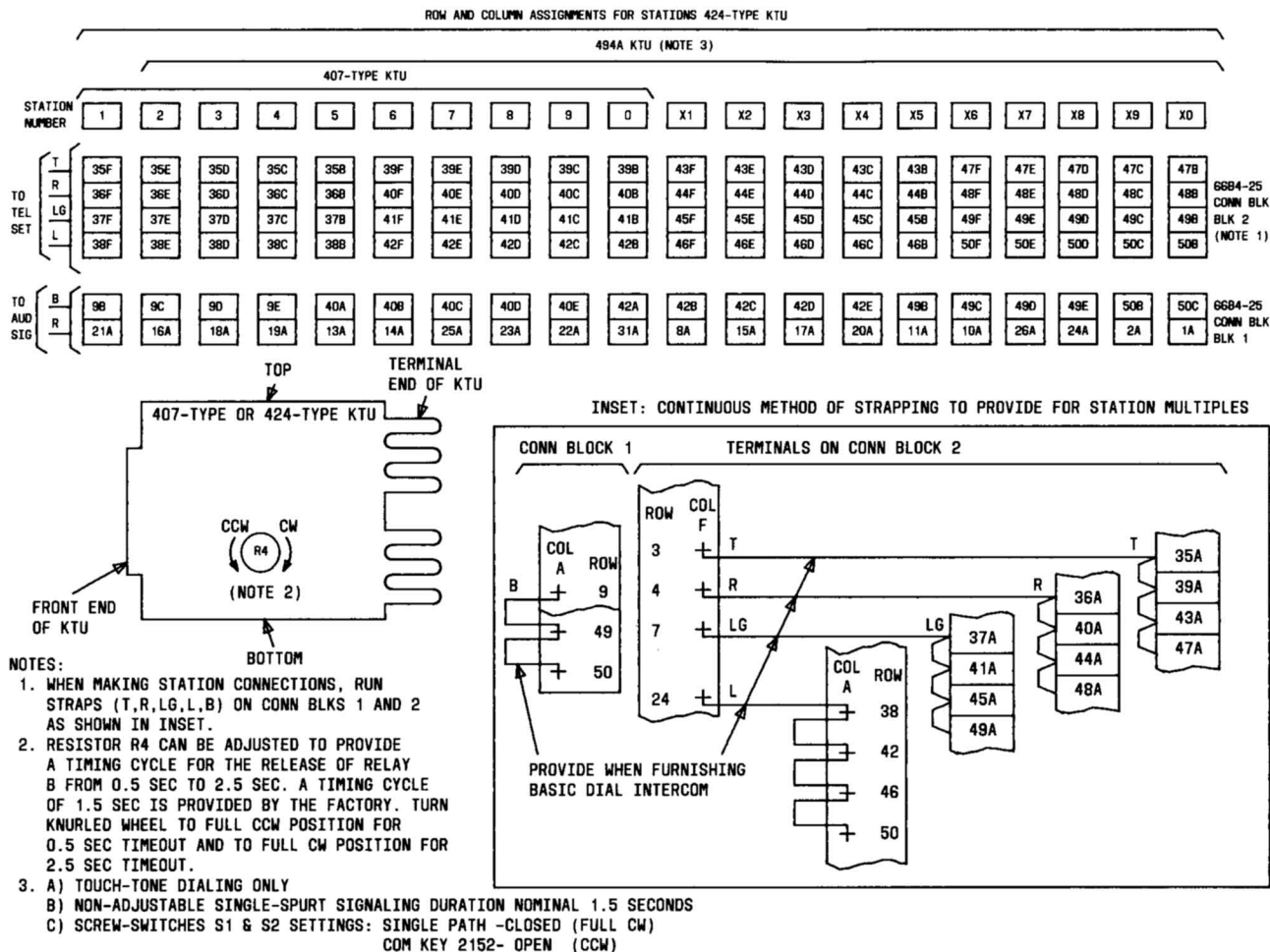
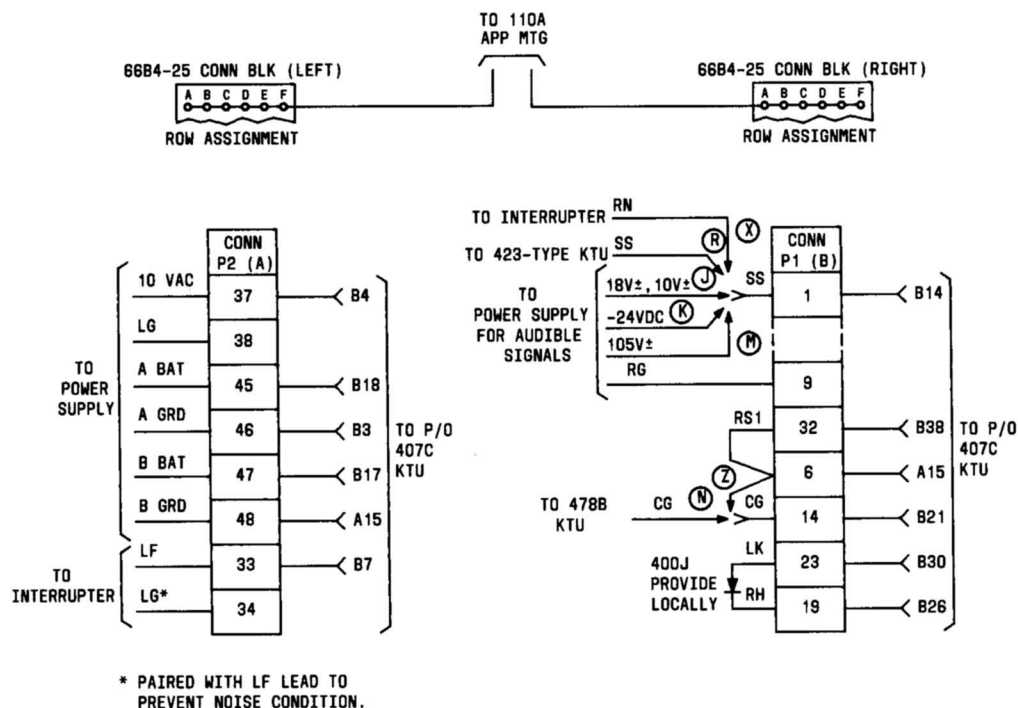


Fig. 37—Basic Dial Intercom, Station Connections



## OPTIONS

| Z | WITHOUT                            | TOUCH-TONE DIAL STATION |
|---|------------------------------------|-------------------------|
| N | WITH                               |                         |
| J | AC BUZZER OR BELL                  | TYPE AUDIBLE SIGNALS    |
| K | DC BUZZER OR BELL                  |                         |
| M | RINGER                             |                         |
| X | INTERRUPTED                        |                         |
| R | INTERRUPTED WITH STATION BUSY TONE |                         |

Fig. 38—Deluxe Dial Intercom, Strapping and Power Supply Connections for 407-Type KTU in 110A Apparatus Mounting

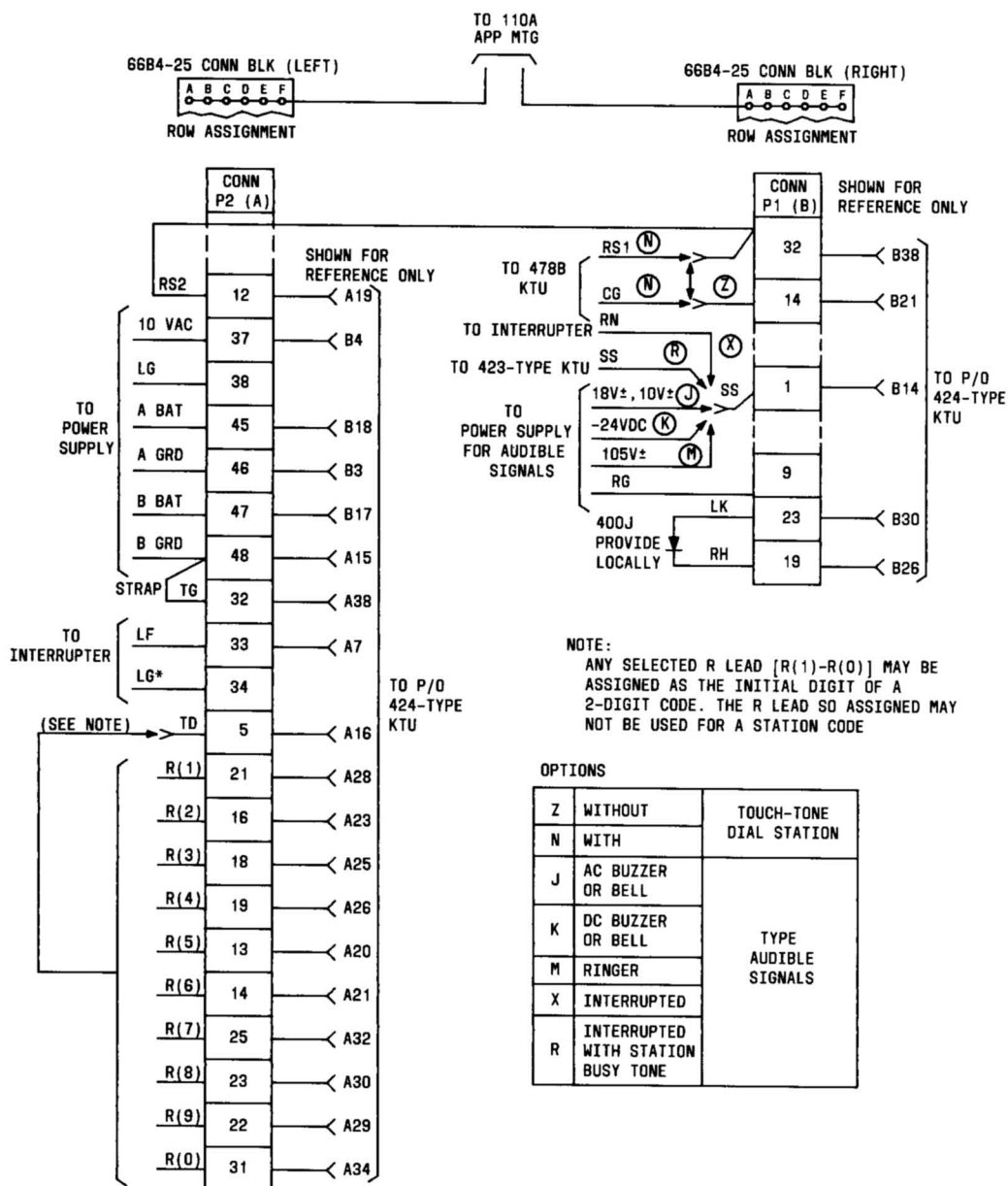


Fig. 39—Deluxe Dial Intercom, Strapping and Power Supply Connections for 424-Type KTU in 110A Apparatus Mounting

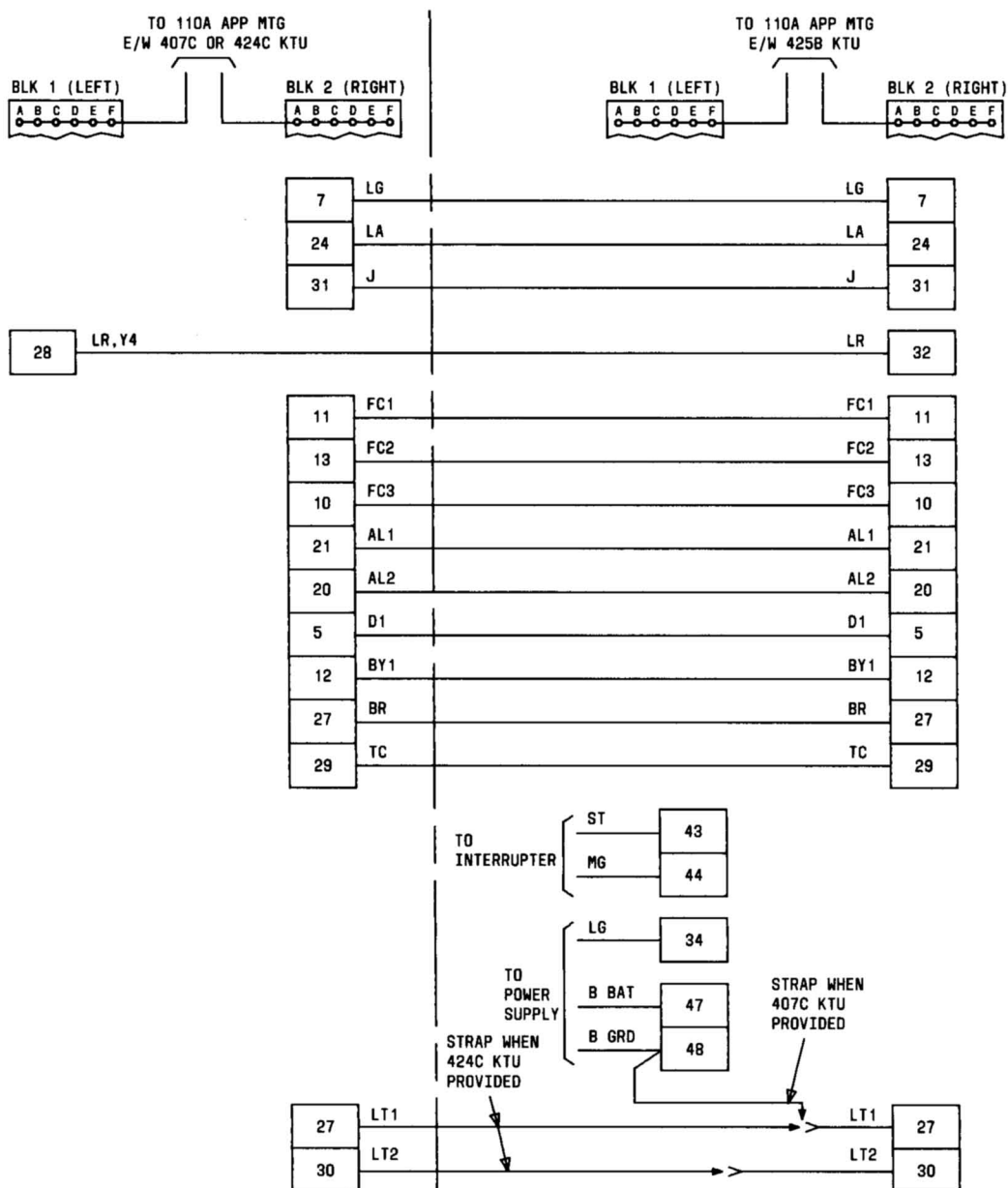


Fig. 40—Deluxe Dial Intercom, Strapping and Power Supply Connections for 425B KTU in 110A Apparatus Mounting

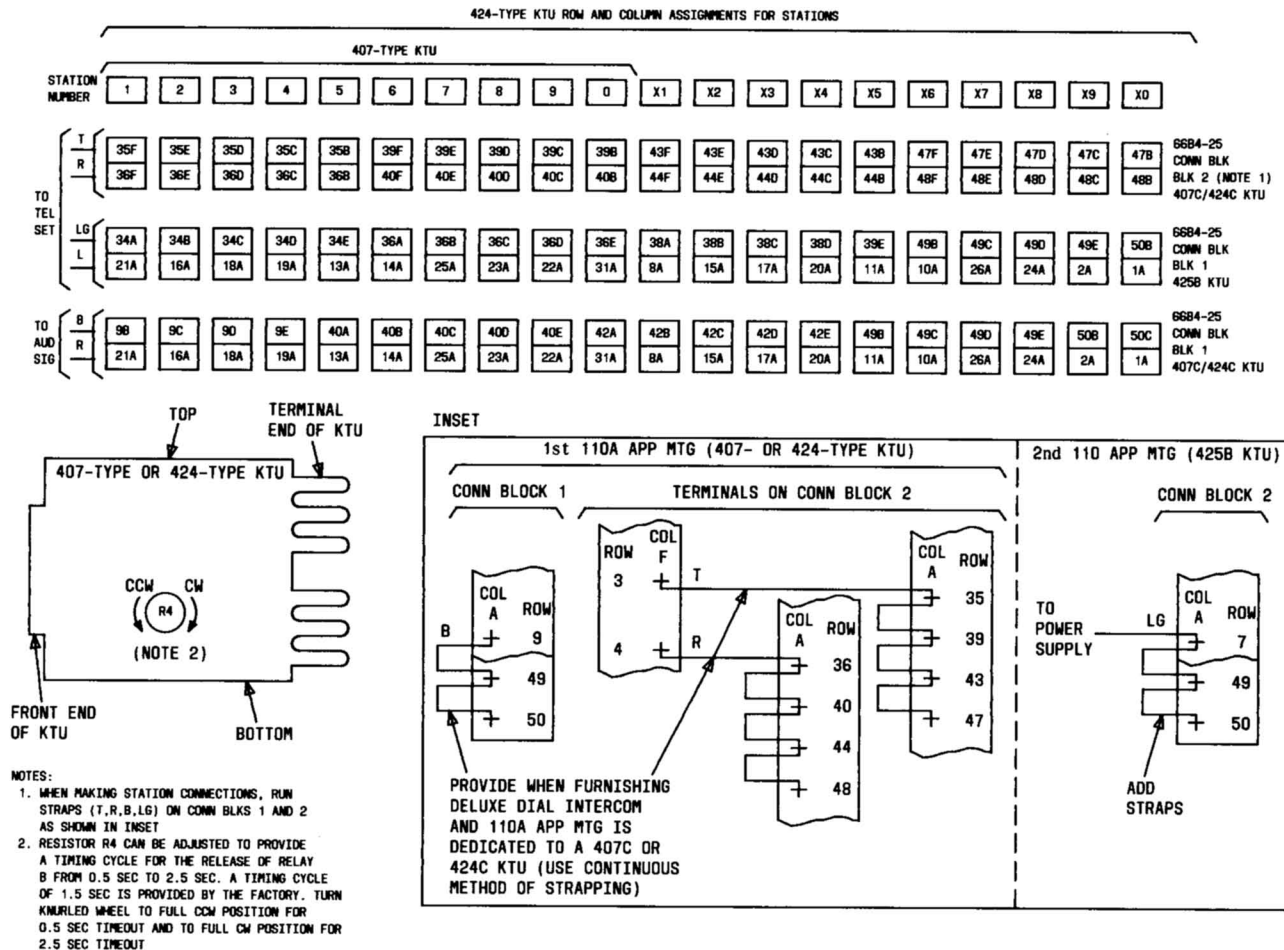
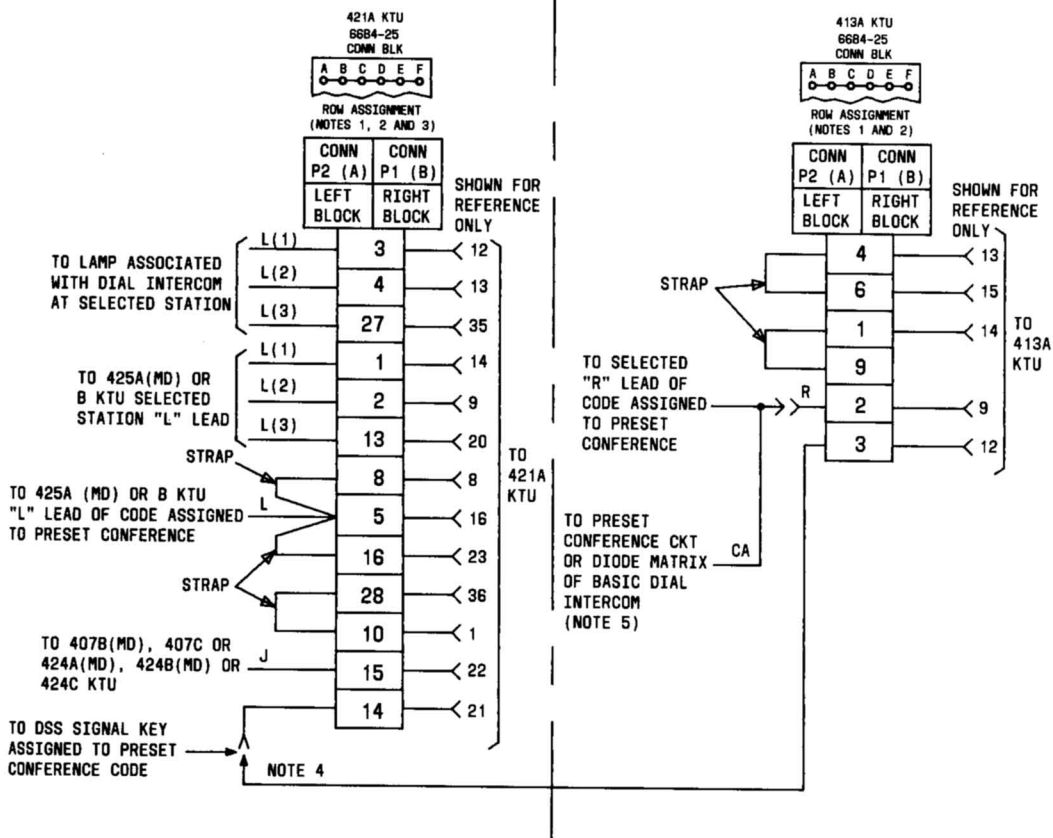


Fig. 41—Deluxe Dial Intercom, Station Connections



## NOTES:

1. SEE BLOCK DIAGRAM COVERING 6684-25 CONN BLK IN FIG. 3.
2. TERMINATE DEDICATED LEADS PER FIG. 4.
3. WHEN THIS CIRCUIT IS PROVIDED, RING VOLTAGE (105V±) MUST BE USED TO OPERATE THE AUDIBLE SIGNALS CONNECTED TO THE DIAL INTERCOM LINE.
4. PROVIDE THE 413A KTU ONLY WHEN ACCESS TO THE PRESET CONFERENCE IS BY DIAL CODE OR BY DIAL CODE AND DSS. DO NOT PROVIDE THE 413A KTU WHEN ACCESS TO THE PRESET CONFERENCE IS LIMITED TO DSS.
5. THE "CA" LEAD MUST CONNECT TO THE DIODE MATRIX WHETHER OR NOT THE 413A KTU IS PROVIDED.

OPTION STRAPPING ON 421A KTU  
OPTION BLK

| OPTION | FEATURE           | STRAP TERMINALS   |
|--------|-------------------|-------------------|
| W      | PRESET CONFERENCE | 1 TO 2,<br>7 TO 8 |

Fig. 42—Non-dedicated Lead Connections for Preset Conference Circuit of a Deluxe Dial Intercom Line (421A and 413A KTUs) in 110A Apparatus Mounting