

SERVICE
597- AND 598-TYPE PANELS
IDENTIFICATION, INSTALLATION, AND CONNECTIONS
1A2 KEY TELEPHONE SYSTEM

1. GENERAL

1.01 This section provides information on the 400-series key telephone units (KTUs) used in the 597- and 598-type panels.

1.02 This section is reissued to:

- Add registration program information
- Revise all connection diagrams to associate panel connectors with connecting block terminals
- Add connections for 452A.

1.03 This issue of the section is based on drawing SD-69608-01, Issue 4. If this section is to be used with equipment or apparatus reflecting later issues of the drawing, reference should be made to the SD to determine the extent of the changes and the manner in which the section may be affected.

1.04 ♦The 597- and 598-type panels have not been registered with the Federal Communications Commission (FCC) and cannot be installed new on any service order after January 1, 1980. Previously connected or Class C panels may be used for maintenance at grandfathered installations for the life of the equipment, provided they are not modified.♦

2. IDENTIFICATION

2.01 Purpose: The 597-type (Fig. 1) and 598-type (Fig. 2) panels provide auxiliary mounting facilities for 20- and 40-pin (4-inch) 400-series KTUs, respectively.

2.02 Application: Large centralized installations of 1A2 Key Telephone System arrangements.

2.03 Ordering Guide:

(a) **Basic Units**

Panel, 597B (Fig. 1)

Panel, 598B (Fig. 2)

(b) **Replaceable Components**

- Fuse, 24G (1-1/3 amperes)

(c) **Associated Apparatus (Order Separately)**

- Block, Connecting, 66B4-25 (four required for 597-type; ten required for 598-type)
- Cable, Connector, A25B (four required for 597-type; ten required for 598-type)
- Unit, Telephone Key (as required; order per Table A).

2.04 Design Features: Both panels have essentially the same basic features, differing only in the number of connector pins provided.

(a) Each panel is 4-inches high and mounts on any frame structure designed for 23-inch wide mounting plates.

(b) Accepts up to fourteen 400-series KTUs in any combination. The KTUs may be intermixed in any connector position. See Table A.

NOTICE

Not for use or disclosure outside the
Bell System except under written agreement.

- (c) The 597-type panel accepts only 20-pin KTUs, and the 598-type panel accepts either 20- or 40-pin KTUs.
- (d) Factory wiring is provided from the KTU connectors to the plugs, permitting the use of A25B connector cables for line and station terminations.
- (e) Dedicated leads such as LF, LW, battery, ground, etc, are factory wired between the connectors and screw terminal field (TSA).
- (f) Screw terminal field (TSA) for power connections and interpanel wiring.
- (g) Screw terminal field (TSB on 597 type) for optional field connections.
- (h) Fuse panel provided with 24G fuses for power distribution (Table B).
- (i) A retainer is provided to lock the KTUs in place in the connectors.

3. INSTALLATION

3.01 For information on apparatus mountings and relay racks on which the 597- and 598-type panels can be mounted, refer to Section 463-140-100.

3.02 Install panel on relay rack or in apparatus cabinet in the usual manner.

3.03 Install 66B4-25 connecting blocks and stencil each block.

3.04 ♦Connect the A25B connector cables to the plugs on the rear of the panel and route to location of proper 66B4-25 connecting block. The panels are wired so that the nondedicated leads appear in a pair of connector cables which are terminated on one left-hand and one right-hand block. Figures 3 and 4 show the relationship between the KTU connectors, connector cables, and connecting blocks.♦

3.05 ♦The A25B connector cables are cut down on the connecting blocks as shown in Fig. 5 and 6. On the odd or left-hand blocks (1, 3, 5, 7, 9), the cable from the panel is terminated on column F, leaving columns A to E for field connections. On the even or right-hand blocks (2,

4, 6, 8, 10), the cable from the panel is terminated on column A, leaving columns B to F for field connections. Figures 5 and 6 contain a block diagram showing the path of a typical lead through the panel.♦

3.06 Dedicated lead connections for both panels are shown in Fig. 7. Fuse functions are shown in Table B. These connections should be made before installing KTUs in the panels. Dedicated leads are those leads such as BAT, GRD, LF, LW, etc, that appear on the same numbered pin of each KTU. These panels must obtain interrupted lamps and ringing signals from 583- or 584-type panel.

3.07 Install KTUs as required.

4. CONNECTIONS

4.01 If 414A or 416A KTUs are to be installed in the 597-type panel, wire G option per Fig. 8 to place ring ground on pin 0 of required connector.

4.02 Figures 9 through 56 cover the nondedicated lead connections for the 400-series KTUs that can be installed in the 597- and 598-type panels. Field connections are shown on the left, connecting block row assignments in the center, and connector pin numbers on the right. Pin numbers are shown for reference only, so that a complete picture of the KTU circuitry can be seen when the connection drawing of a KTU is compared with the functional schematic.

4.03 Field connections are made for any KTU by determining which connector on the panel is to be used and its related connecting block (Fig. 3 or 4). For example:

- (a) If a 400-type KTU (Fig. 9, 10, or 11) is installed in connector J1 of a 597-type panel (Fig. 3), field connections are made to terminals 1, 2, 4, and 6 on connecting block 1 and to terminals 1, 2, 3, 4, 5, and 6 on connecting block 2.
- (b) If the 400-type KTU (Fig. 9, 10, or 11) is installed in connector J14 of a 597-type panel (Fig. 3), field connections are made to terminals 37, 38, 40, and 42 on connecting block 3 and to terminals 37, 38, 39, 40, 41, and 42 on connecting block 4.

(c) If the 400-type KTU (Fig. 28, 29, or 30) is installed in connector J8 of a 598-type panel (Fig. 4), field connections are made to terminals 17, 18, 21, and 22 on connecting block 5 and to terminals 17, 18, 19, 20, 21, and 22 on connecting block 6.

CONNECTION INDEX

Fig. 5—A25B Connector Cables to 66B4-25 Connecting Blocks for 597-Type Panel

Fig. 6—A25B Connector Cables to 66B4-25 Connecting Blocks for 598-Type Panel

Fig. 7—Dedicated Leads (Signaling and Power Connections) for 597- and 598-Type Panels

Fig. 8—Wiring of Connector Terminal 0 in 597-Type Panel for G Option

Nondedicated Lead Connections for 597-Type Panel:

Fig. 9—400D KTU (MD) (CO or PBX Line Circuit)

Fig. 10—400G KTU (MD) (CO or PBX Line Circuit)

Fig. 11—400H KTU (CO or PBX Line Circuit)

Fig. 12—401A KTU (Manual Intercom Line Circuit)

Fig. 13—413A KTU (Auxiliary Ringup Circuit)

Fig. 14—414A KTU (Manual Signaling, Ringdown Private Line Circuit)

Fig. 15—415A KTU (Automatic, DC Signaling, Private Line Circuit)

Fig. 16—416A KTU (Station Line Circuit)

Fig. 17—418A KTU (Short Range, DC Signaling, Private Line Circuit)

Fig. 18—420A KTU (Long Line Circuit)

Fig. 19—421A KTU (Power Failure Transfer Circuit)

Fig. 20—421A KTU (Audible Signal Suppression Circuit) Arranged to Suppress Bridged Ringing and Intercom Audible Signal

Fig. 21—421A KTU (Audible Signal Suppression Circuit) Arranged to Suppress Common Audible Ringing and Intercom Audible Signal

Fig. 22—423A KTU (Dial Tone, Busy Tone, and Audible Ringback Tone Circuit)

Fig. 23—430A KTU (Flutter Generator Circuit)

Fig. 24—461A KTU (Manual Signaling, Ringdown Private Line Circuit)

Fig. 25—467A KTU (Low Voltage Monitor Circuit)

Fig. 26—469A KTU (Lamp Extender Circuit)

Fig. 27—471B KTU (Battery Reversal Toll Restriction Circuit)

Nondedicated Lead Connections for 598-Type Panel:

Fig. 28—400D KTU (MD) (CO or PBX Line Circuit)

Fig. 29—400G KTU (MD) (CO or PBX Line Circuit)

Fig. 30—400H KTU (CO or PBX Line Circuit)

Fig. 31—401A KTU (Manual Intercom Line Circuit)

Fig. 32—413A KTU (Auxiliary Ringup Circuit)

Fig. 33—414A KTU (Manual Signaling, Ringdown Private Line Circuit)

Fig. 34—415A KTU (Automatic, DC Signaling, Private Line Circuit)

Fig. 35—416A KTU (Station Line Circuit)

Fig. 36—417A KTU (Add-On Conference Circuit)

Fig. 37—418A KTU (Short Range, DC Signaling, Private Line Circuit)

Fig. 38—420A KTU (Long Line Circuit)

Fig. 39—421A KTU (Power Failure Transfer Circuit)

Fig. 40—421A KTU (Wired for DSS Feature for Dial Intercom Line)

Fig. 41—421A KTU (Audible Signal Suppression Circuit) Arranged to Suppress Bridged Ringing and Intercom Audible Signal

Fig. 42—421A KTU (Audible Signal Suppression Circuit) Arranged to Suppress Common Audible Ringing and Intercom Audible Signal

Fig. 43—421A KTU or 413A KTU (Wired for Preset Conference Circuit for Deluxe Dial Intercom Line)

Fig. 44—422B KTU (Station Busy Selector Circuit)

Fig. 45—423A KTU (Dial Tone, Busy Tone, and Audible Ringback Tone Circuit)

Fig. 46—428A KTU (Multiline Exclusion Circuit)

Fig. 47—429-Type KTU (Supplementary Hold Detector Circuit) and 430A KTU (Flutter Generator Circuit)

Fig. 48—448A KTU (Variable Delay Timer Circuit)

Fig. 49—449A KTU (Immediate Transfer Control Circuit)

Fig. 50—451B KTU (Music-On-Hold)

Fig. 51—452A KTU (Power Failure Ringing Circuit)

Fig. 52—461A KTU (Manual Signaling, Ringdown Private Line Circuit)

Fig. 53—467A KTU (Low Voltage Monitor Circuit)

Fig. 54—469A KTU (Lamp Extender Circuit)

Fig. 55—471B KTU (Battery Reversal Toll Restriction Circuit)

Fig. 56—498A KTU (Music-On-Hold).

♦ TABLE A ♦

KTU SELECTION AND CONNECTION FIGURE INDEX FOR 597B AND 598B PANELS (SEE NOTE)

KTU	CIRCUIT FUNCTION		PANEL	
			597B	598B
			FIG.	FIG.
400D	CO or PBX Line		9	28*
400G			10	29*
400H			11	30*
401A	Manual Intercom Line		12	31*
413A	Auxiliary Ringup		13	32*
	Preset Conference for Dial Intercom Line		na	43*
414A	Manual Signaling, Ringdown Private Line		14	33*
415A	Automatic, DC Signaling, Private Line		15	34*
416A	Station Line		16	35*
417A	Add-On Conference		na	36
418A	Short Range, DC Signaling, Private Line		17	37*
420A	Long Line		18	38*
421A	Power Failure Transfer		19†	39*
	Direct Station Selection (DSS)		na	40
	Audible Signal Suppression	Bridged Ringing	20	41*
		Common Audible	21	42*
	Preset Conference for Dial Intercom		na	43
422A, B	Station Busy Selector		na	44
423A	Dial Tone, Busy Tone, and Audible Ringback Tone		22	45*
428A	Multiline Exclusion		na	46
429A, B	Supplementary Hold Detector		na	47
430A	Flutter Generator		23	47*
448A	Variable Delay Timer		na	48
449A	Immediate Transfer Control		na	49
451B	Music-On-Hold		na	50
498A			na	56

◆ TABLE A (Contd) ◆

KTU SELECTION AND CONNECTION FIGURE INDEX FOR 597B AND 598B PANELS (SEE NOTE)

KTU	CIRCUIT FUNCTION	PANEL	
		597B	598B
		FIG.	FIG.
452A	Power Failure Ringing	na	51
461A	Manual Signaling, Ringdown Private Line	24	52*
467A	Low Voltage Monitor	25	53*
469A	Lamp Extender	26	54*
471B	Battery Reversal Toll Restriction	27	55*

Note: Connection figures are designated for current model KTUs but are applicable for all codes indicated on this table.

* Not recommended for initial installations; use for growth only when necessary.

† Will transfer only one circuit.

na—Not applicable.

TABLE B
FUSE FUNCTIONS FOR 597- AND
598-TYPE PANELS

CONN SERVED	A BAT.	B BAT.
J1-7	F1	F3
J8-14	F2	F4

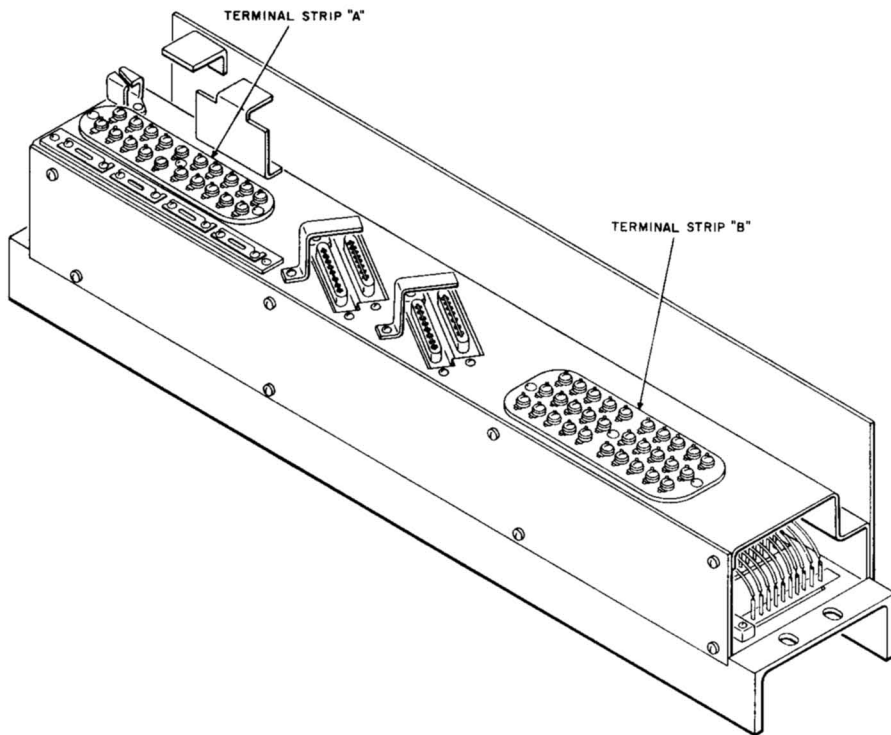


Fig. 1—597-Type Panel

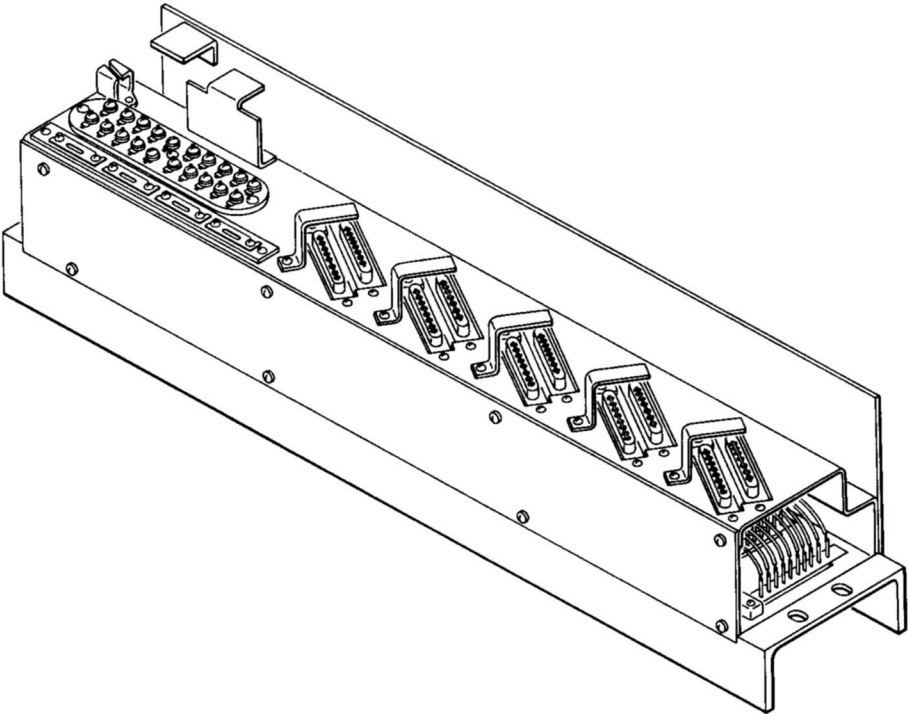


Fig. 2—598-Type Panel

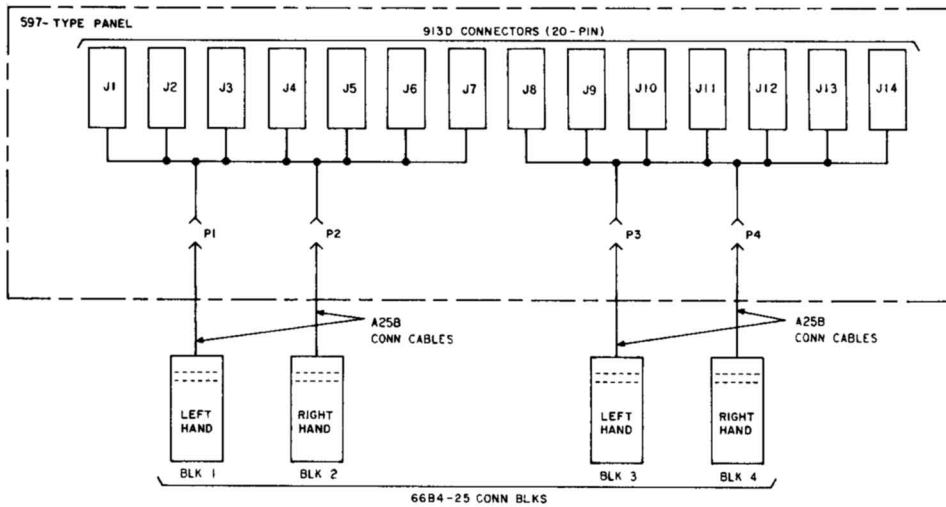


Fig. 3—597-Type Panel With Connecting Block Layout

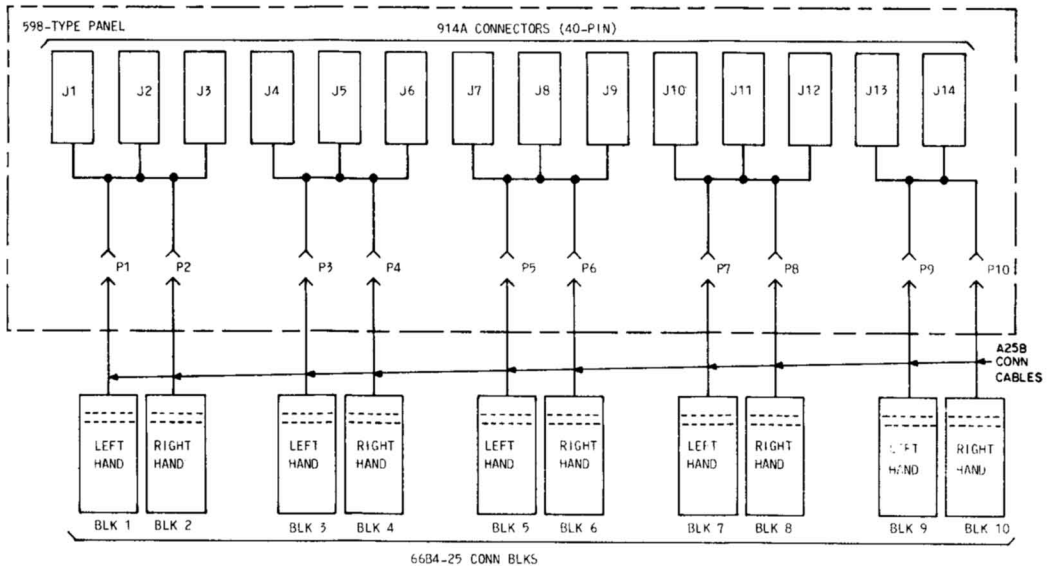


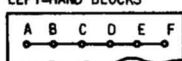
Fig. 4—598-Type Panel With Connecting Block Layout

66B4-25

CONN BLOCK

BLOCKS 1 AND 3

LEFT-HAND BLOCKS

A25B
CONN
CABLES

P1, P3

PANEL
CONNECTOR

P2, P4

A25B
CONN
CABLES
(W-BL)

66B4-25

CONN BLOCK

BLOCKS 2 AND 4

RIGHT-HAND BLOCKS

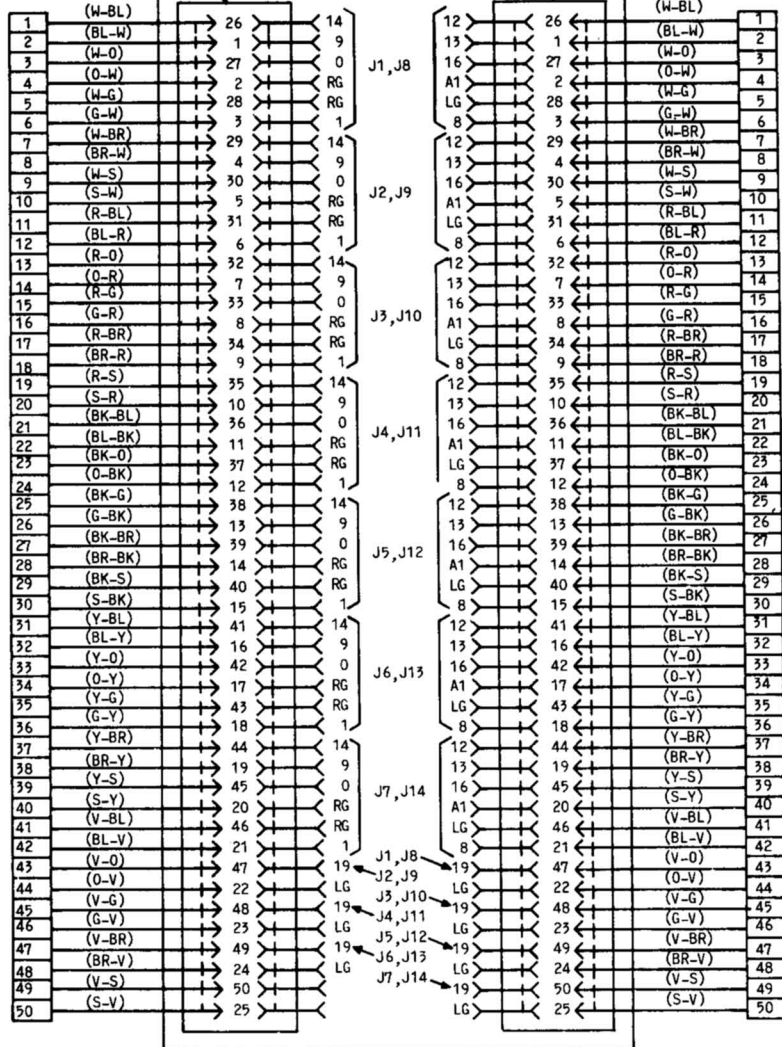
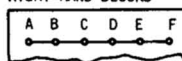


Fig. 5—Connections for A25B Connector Cables to 66B4-25 Connecting Blocks for 597-Type Panel (Sheet 1 of 2)

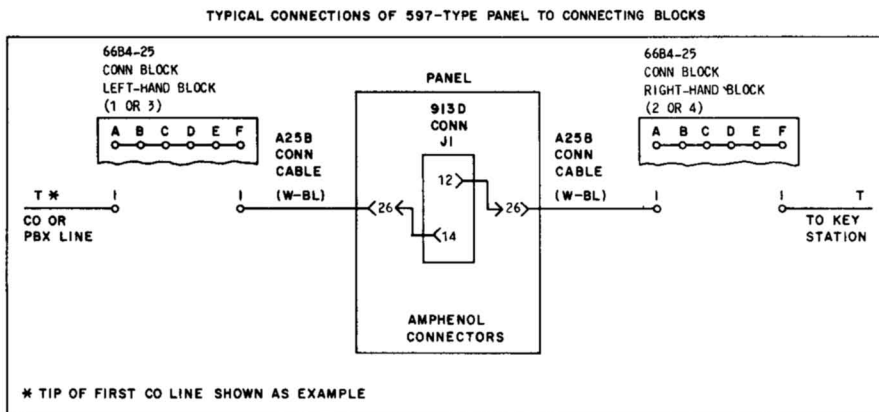
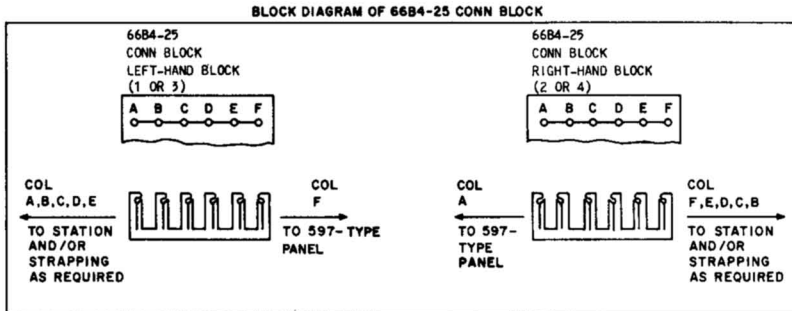
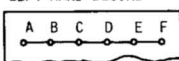


Fig. 5—Connections for A25B Connector Cables to 66B4-25 Connecting Blocks for 597-Type Panel (Sheet 2 of 2)

66B4-25
CONN BLOCK
BLOCKS 1,3,5,7,9
LEFT-HAND BLOCKS



A25B
CONN
CABLES

P1, P3, P5
P7, P9

PANEL
CONNECTOR

P2, P4, P6
P8, P10

A25B
CONN
CABLES

66B4-25
CONN BLOCK
BLOCKS 2,4,6,8,10
RIGHT-HAND BLOCKS

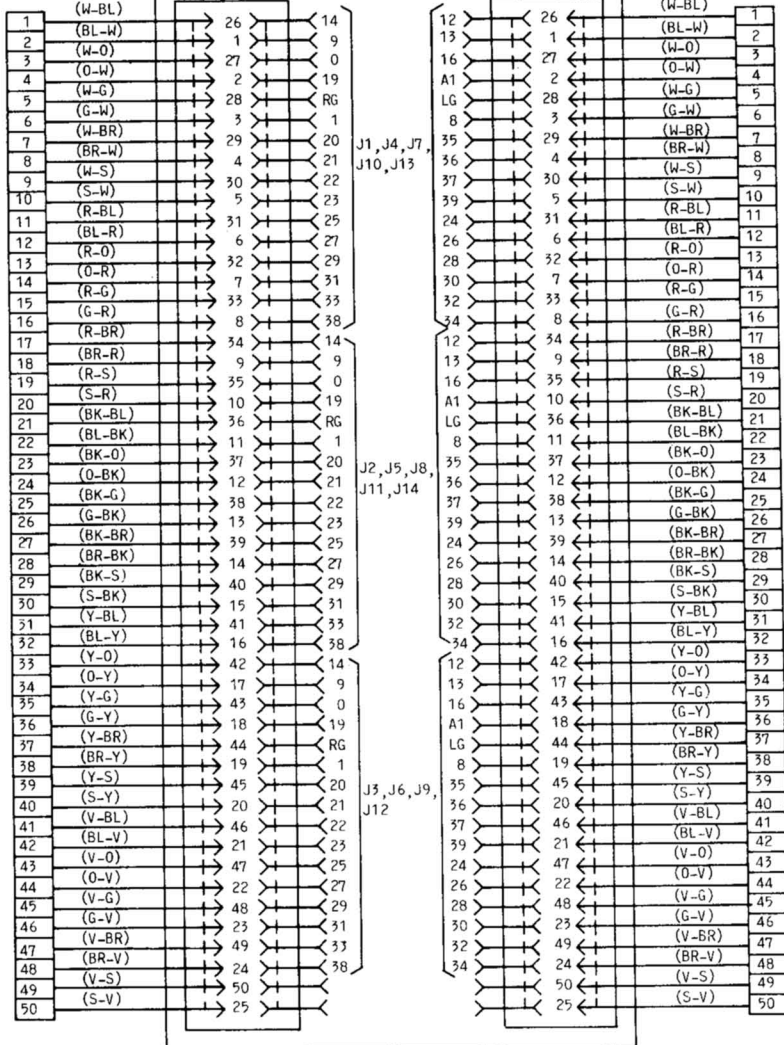
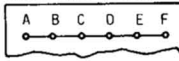
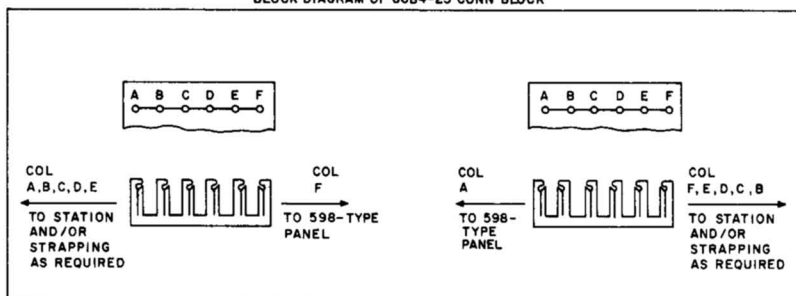
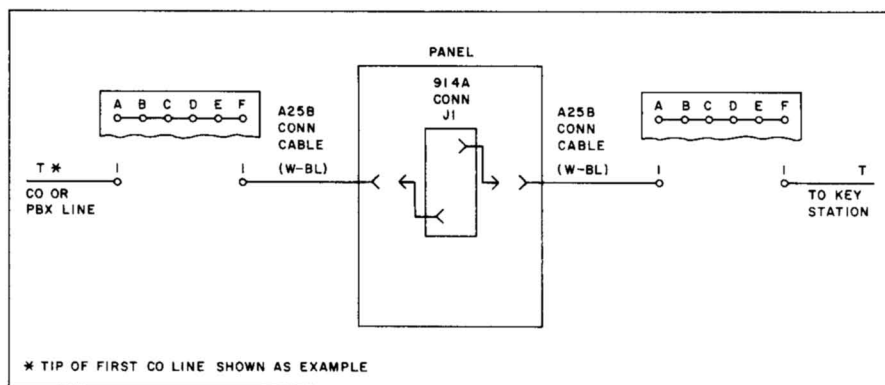


Fig. 6—Connections for A25B Connector Cables to 66B4-25 Connecting Blocks for 598-Type Panel (Sheet 1 of 2)†

BLOCK DIAGRAM OF 66B4-25 CONN BLOCK



TYPICAL CONNECTIONS OF 598-TYPE PANEL TO CONNECTING BLOCKS



NOTE:

TERMINALS 33 THROUGH 48 ARE SPARES ON CONNECTING BLOCKS 9 AND 10.

Fig. 6—Connections for A25B Connector Cables to 66B4-25 Connecting Blocks for 598-Type Panel (Sheet 2 of 2)

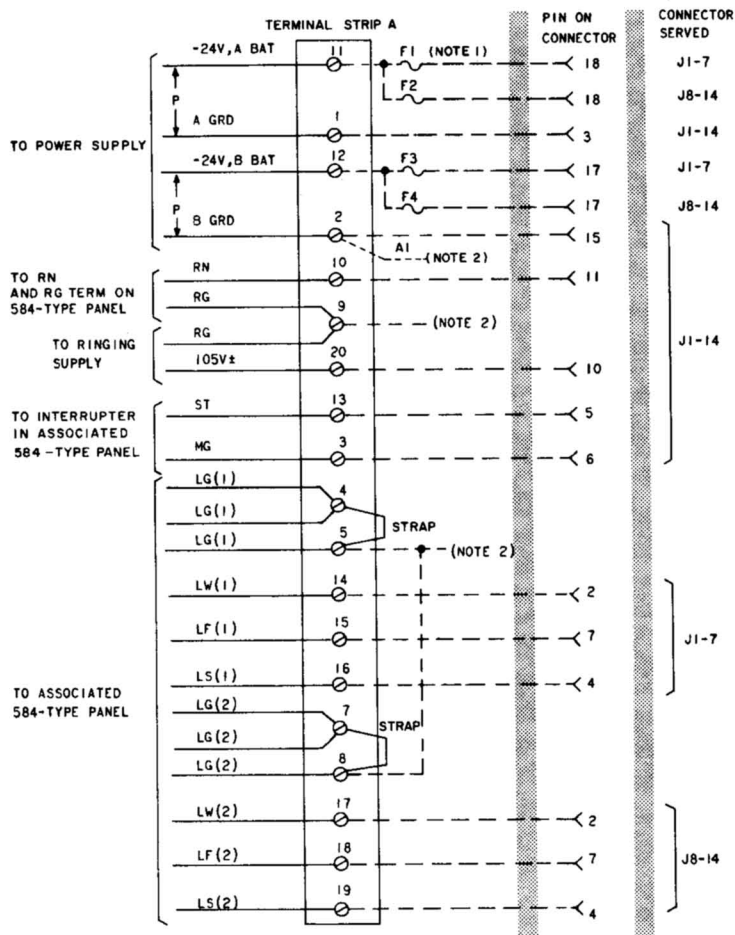
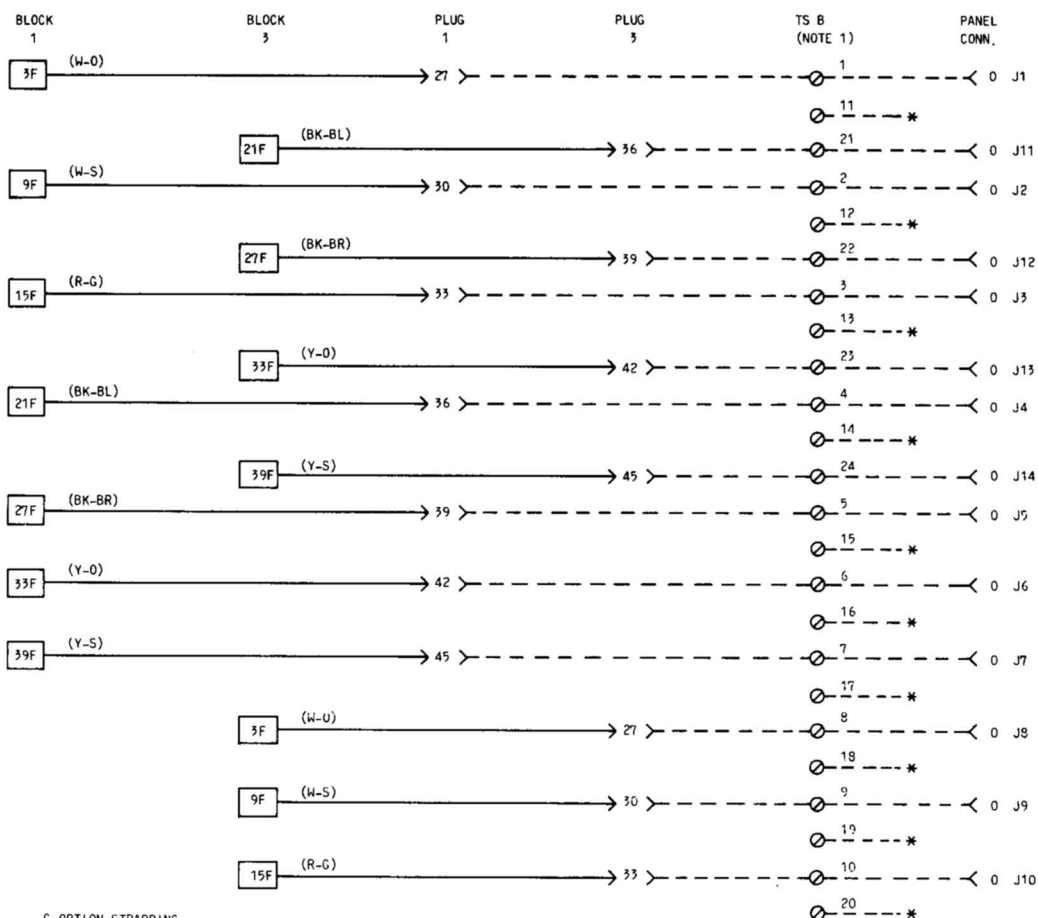


Fig. 7—Connections for Dedicated Leads (Signaling and Power Connections) for 597- and 598-Type Panels



G OPTION STRAPPING
TS B

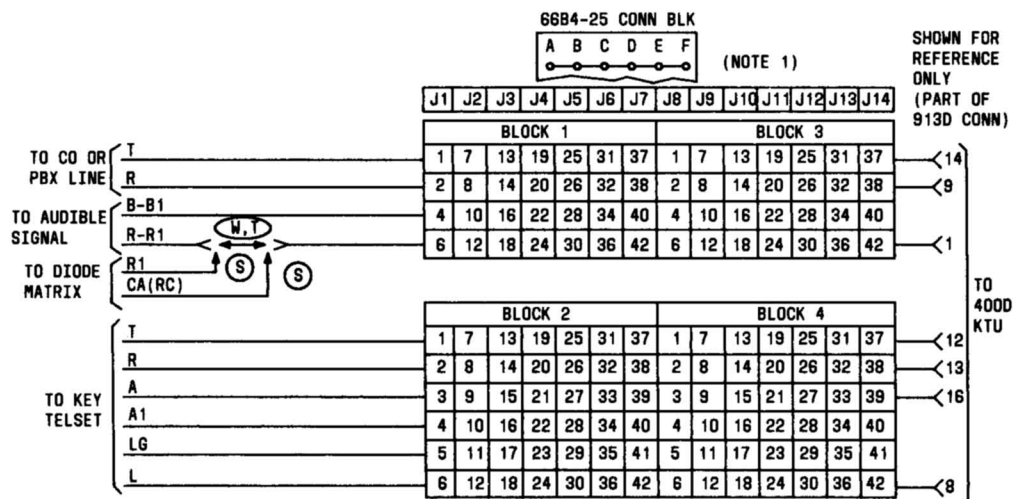
CONN	PLACE STRAP
J1	1 TO 11
J2	2 TO 12
J3	3 TO 13
J4	4 TO 14
J5	5 TO 15
J6	6 TO 16
J7	7 TO 17
J8	8 TO 18
J9	9 TO 19
J10	10 TO 20
J11	11 TO 21
J12	12 TO 22
J13	13 TO 23
J14	14 TO 24

* TO RING GROUND MULTIPLE

NOTES:

1. TERMINALS 25 THRU 30 ARE SPARE
2. DASHED LINES INDICATE FACTORY WIRING
3. WHEN INSTALLING A 414A OR 416A KTU IN A 597-TYPE PANEL, ADD OPTION G TO DESIRED CONNECTOR PER TABLE.

Fig. 8—Wiring of Connector Terminal 0 in 597-Type Panel for G Option



OPTION STRAPPING ON 400D KTU OPTION BLK

FEATURES		OPTION	400A,B,C	400D
AUDIBLE SIGNALS	INTERRUPTED RING	W	5 TO 6	5 TO 8
	STEADY RING	T	4 TO 6	6 TO 8
	COMMON WITH DIODE MATRIX CONTROL	S	5 TO 6	5 TO 8
VISUAL HOLD CIRCUIT	LAMP WINK	Y	8 TO 9	10 TO 7
	LAMP STEADY	X	7 TO 9	7 TO 9
TIME-OUT CONTROL	SHORT TIME DELAY (10 SECONDS)	Z*	1 TO 2	1 TO 2
	LONG TIME DELAY	†	†	†
RELEASE OF HOLDING BRIDGE FROM CO OR PBX LINE CURRENT OPENS GREATER THAN	500 MILLISECONDS WHEN ASSOCIATED WITH NO. 1 ESS HAVING RESWITCH CAPABILITY	ZC (NOTE 2)	2 TO 3 USING 601A (5 UF) CAPACITOR OR EQUIVALENT	
	100 MILLISECONDS WHEN ASSOCIATED WITH 800A PBX AND/OR NO. 5 X-BAR CENTREX NOT HAVING AUTOMATIC PERMANENT SIGNAL RELEASE	ZD	2 TO 3 USING 575C (1 UF) CAPACITOR OR EQUIVALENT	
	50 MILLISECONDS WHEN ASSOCIATED WITH NO. 5 X-BAR CENTREX HAVING AUTOMATIC PERMANENT SIGNAL RELEASE	ZJ	2 TO 3 USING 575B (0.5 UF) CAPACITOR OR EQUIVALENT	

* 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

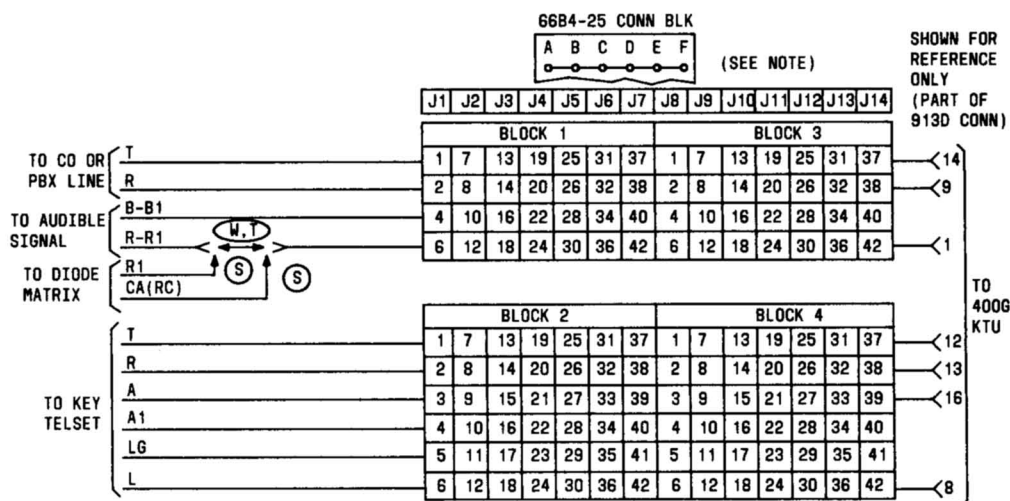
2.5 SECONDS - 0.13 MEGOHM RESISTOR
 3.3 SECONDS - 0.20 MEGOHM RESISTOR
 5.0 SECONDS - 0.39 MEGOHM RESISTOR
 6.7 SECONDS - 0.75 MEGOHM RESISTOR
 7.5 SECONDS - 1.2 MEGOHM RESISTOR

† 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.

NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1 OR 3) IS A-E AND FOR RIGHT-HAND BLK (2 OR 4) IS F-B.
2. 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.

Fig. 9—Connections for 400D KTU (MD) (CO or PBX Line Circuit) in 597-Type Panel



NOTES:

COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1 OR 3) IS A-E AND FOR RIGHT-HAND BLK (2 OR 4) IS F-B.

OPTION STRAPPING

OPT	FEATURES	
M	TIMEOUT	LONG TIME DELAY (APPROXIMATELY 20 SECONDS)
Z		SHORT TIME DELAY (APPROXIMATELY 5 SECONDS)
Y	VISUAL	LAMP WINK
X		LAMP STEADY
W	AUDIBLE SIGNAL	INTERRUPTED RING
T		STEADY RING
S	COMMON WITH RELAY CONTROL	COMMON WITH DIODE MATRIX CONTROL
V		COMMON WITH RELAY CONTROL
R	DELAYED HOLD RELEASE	RELEASE OF HOLDING BRIDGE FROM CO OR PBX BY LINE CURRENT OPENS
K		MINIMUM OF 25 MS
		600 MS

OPTION	CONNECT OPTION PLUG TO TERMINALS
Z	B2-B3
Y	A1-A2
X	A2-A3
T	C3-C4
W	C2-C3
V	C1-C3
R	E2-E3
K	E1-E2
M	B1-B2

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

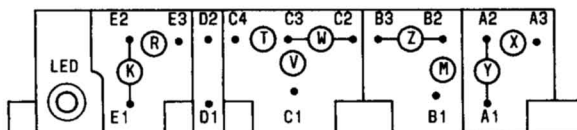
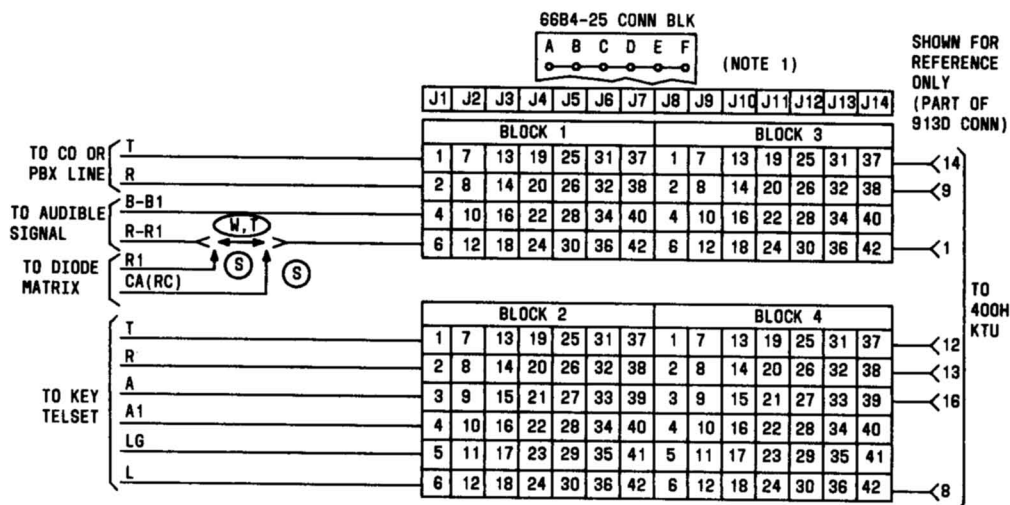


Fig. 10—Connections for 400G KTU (MD) (CO or PBX Line Circuit) in 597-Type Panel

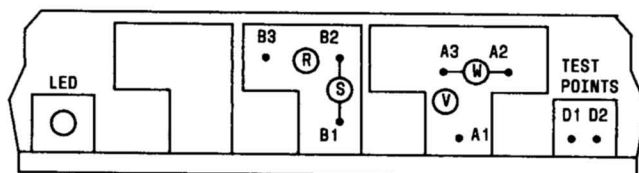


OPTION	FEATURE	PLUG POSITION
W	INTERRUPTED RING	A2-A3*
V	COMMON AUDIBLE WITH RELAY CONTROL	A1-A3
X	COMMON AUDIBLE WITH DIODE MATRIX	A2-A3*
S	LONG HOLD RLS #1 ESS, #2 ESS, 812 770, DIMENSION PBX	B1-B2*
R	SHORT HOLD RLS ALL OTHERS	B2-B3

* FACTORY PROVIDED

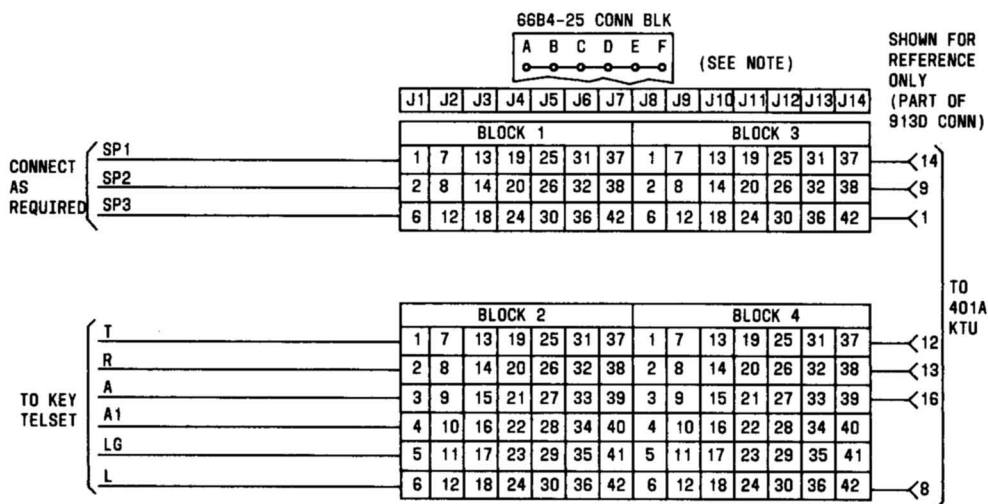
NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1 OR 3) IS A-E AND FOR RIGHT-HAND BLK (2 OR 4) IS F-B.
2. RING TIMEOUT IS NOT ADJUSTABLE; OCCURS IN 5 TO 8-1/2 SECONDS.



TOP VIEW OF OPTION-HANDLE ASSEMBLY. OPTION SYMBOLS SHOWN CONNECTED ARE FACTORY-INSTALLED OPTIONS.

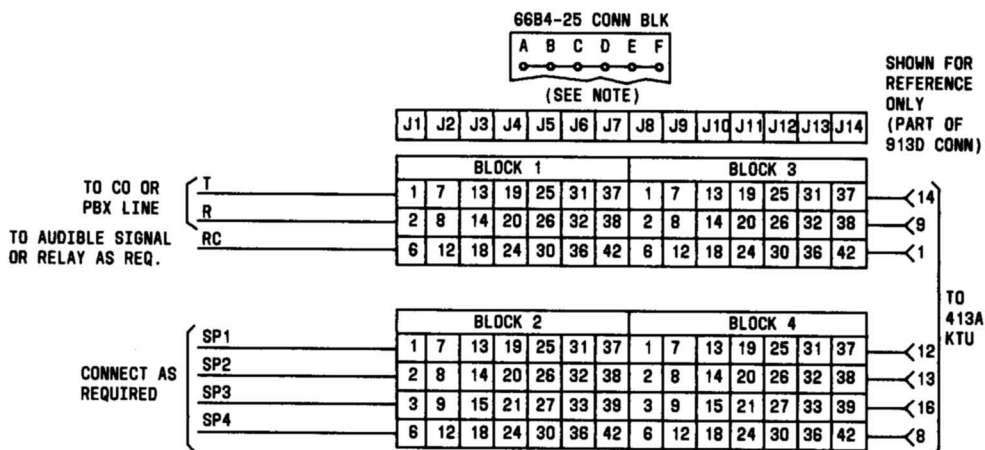
Fig. 11—Connections for 400H KTU (CO or PBX Line Circuit) in 597-Type Panel



NOTE:

COLUMN ASSIGNMENT FOR LEFT-HAND
BLK (1 OR 3) IS A-E AND FOR
RIGHT-HAND BLK (2 OR 4) IS F-B.

Fig. 12—Connections for 401A KTU (Manual Intercom Line Circuit) in 597-Type Panel



NOTES:

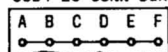
COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1 OR 3)
IS A-E AND FOR RIGHT-HAND BLK (2 OR 4) IS F-B.

* OPTION STRAPPING ON 413A KTU OPTION BLK

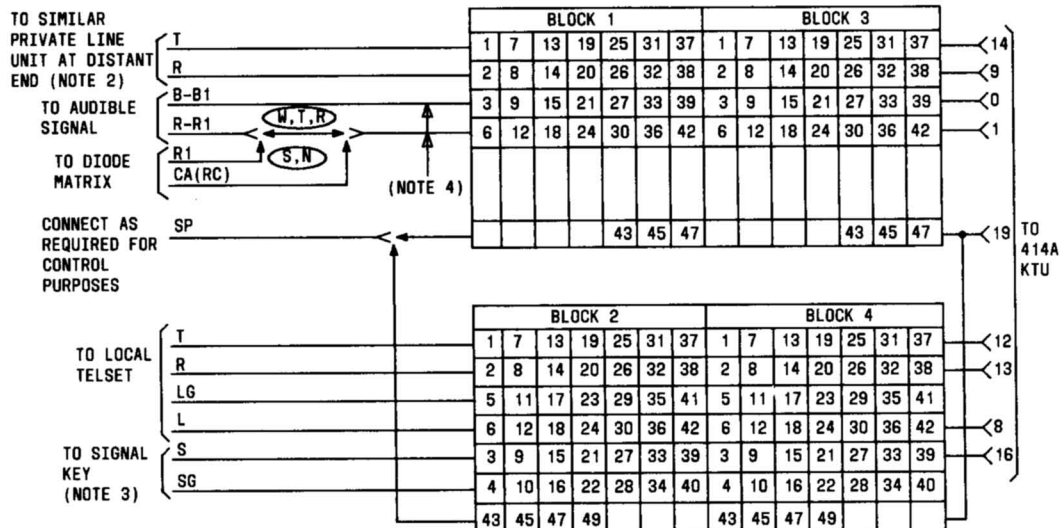
FEATURES		OPTION	STRAP TERMINALS
AUDIBLE SIGNALS	STEADY RING	X	9 TO 10
	INTERRUPTED RING	Z	8 TO 10

Fig. 13—Connections for 413A KTU (Auxiliary Ringup Circuit) in 597-Type Panel

6684-25 CONN BLK



(NOTE 1)

SHOWN FOR
REFERENCE
ONLY
(PART OF
913D CONN)

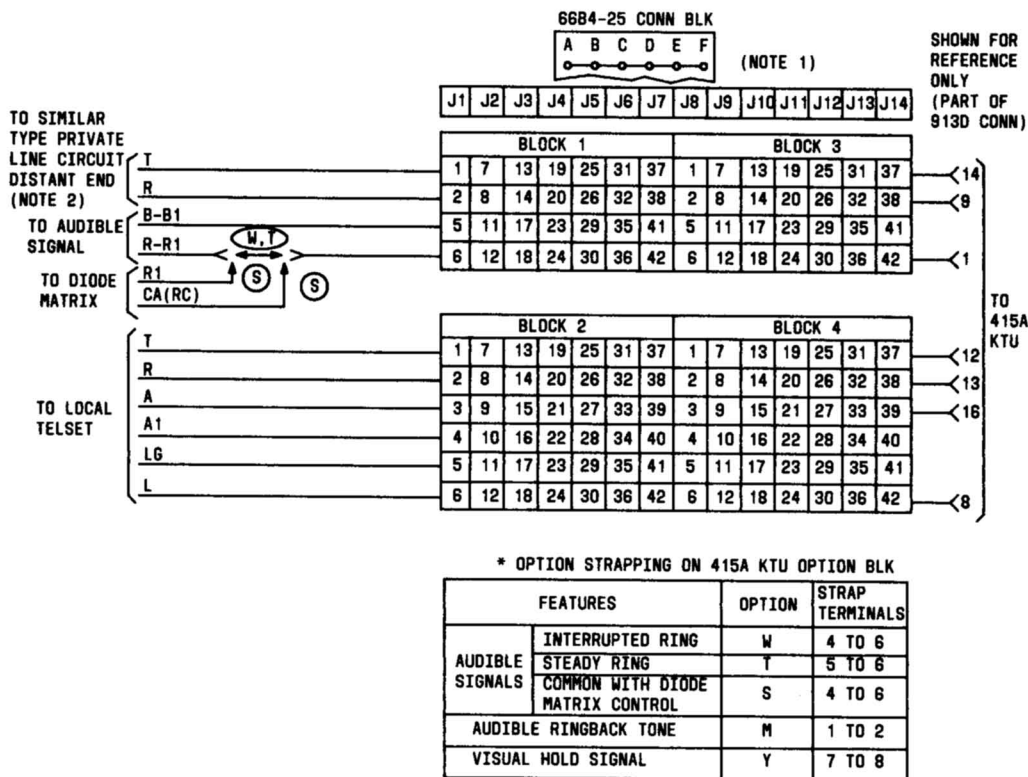
OPTION STRAPPING ON 414A KTU (MD) OPTION BLK

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

NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1 OR 3) IS A-E AND FOR RIGHT-HAND BLK (2 OR 4) IS F-B.
2. PRIVATE LINE CIRCUIT AT DISTANT END MAY BE A 414A KTU (MD), 419A KTU, 461A KTU, OR ANY OTHER TYPE PRIVATE LINE UNIT REQUIRING RINGING VOLTAGE FOR THE RING UP CIRCUIT AND FURNISHING RINGING VOLTAGE FROM THE SIGNALING CIRCUIT.
3. SIGNAL KEY MAY BE A CONVERTED PICKUP KEY OR AN EXTERNAL NON LOCKING KEY.
4. SEE FIG. 8 CONNECTIONS TO BE MADE ON OPTION TERMINAL STRIP B (6 OPTION).

Fig. 14—Connections for 414A KTU (Manual Signaling, Ringdown Private Line Circuit) in 597-Type Panel

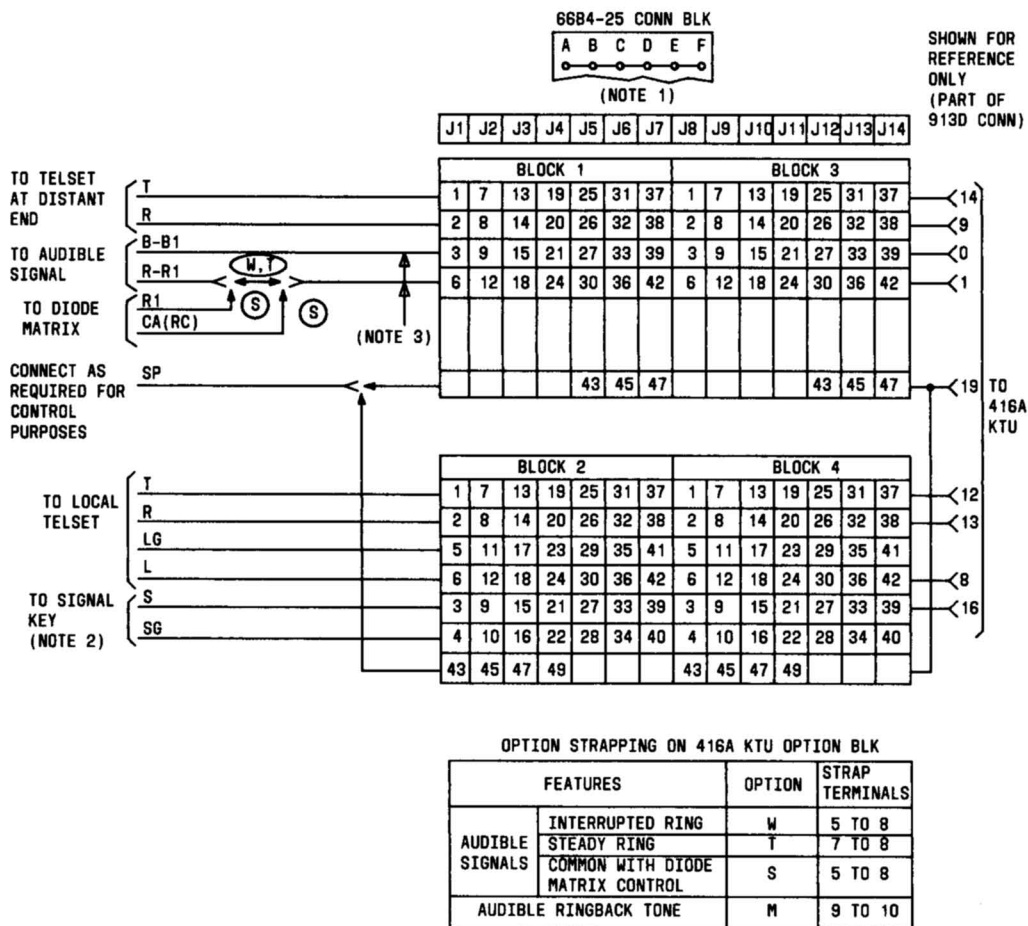


NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1 OR 3) IS A-E AND FOR RIGHT-HAND BLK (2 OR 4) IS F-B.
2. PRIVATE LINE CIRCUIT AT DISTANT END MAY BE A 415A KTU OR ANY OTHER TYPE PRIVATE LINE UNIT REQUIRING DC VOLTAGE FOR THE RING UP CIRCUIT AND FURNISHING DC VOLTAGE FROM THE SIGNALING CIRCUIT.

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

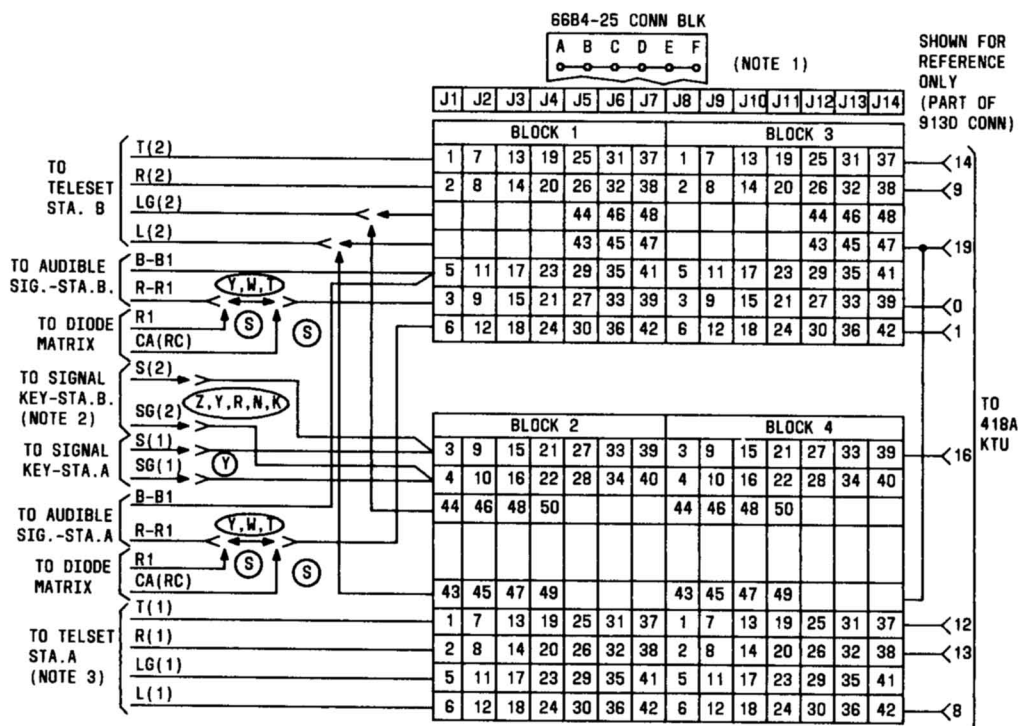
Fig. 15—Connections for 415A KTU (Automatic, DC Signaling, Private Line Circuit) in 597-Type Panel



NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1 OR 3) IS A-E AND FOR RIGHT-HAND BLK (2 OR 4) IS F-B.
2. SIGNAL KEY MAY BE A CONVERTED PICKUP KEY OR AN EXTERNAL NON LOCKING KEY.
3. SEE FIG. 8 FOR CONNECTIONS TO BE MADE ON OPTION TERMINAL STRIP B (G OPTION).

Fig. 16—Connections for 416A KTU (Station Line Circuit) in 597-Type Panel



OPTION STRAPPING ON 418A KTU OPTION BLK

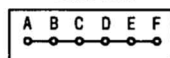
FEATURES			OPTION	STRAP TERMINALS
AUDIBLE SIGNALS	TWO-WAY AUTOMATIC	INTERRUPTED RING	W	2 TO 3 TO 4*
		STEADY RING	T	1 TO 2 TO 4*
		COMMON WITH DIODE MATRIX CONTROL	S	2 TO 3 TO 4*
	ONE-WAY AUTOMATIC, ONE-WAY MANUAL (NOTE 4)	INTERRUPTED RING	R	3 TO 4
		STEADY RING	Z	1 TO 4
AUDIBLE RING-BACK	TWO-WAY AUTOMATIC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

* USE CONTINUOUS METHOD OF STRAPPING

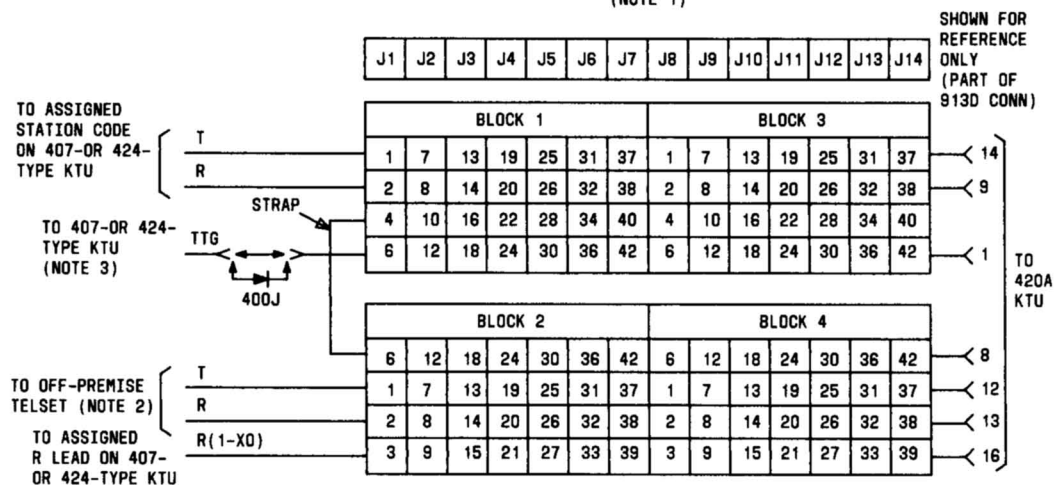
NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1 AND 3) IS A-E AND FOR RIGHT-HAND BLK (2 AND 4) IS F-B.
2. SIGNAL KEY CAN BE A CONVERTED PICKUP KEY OR ANY EXTERNAL NONLOCKING KEY.
3. STATION "A" IS ALWAYS ASSIGNED AS THE AUTOMATIC SIGNALING STATION WHENEVER THE ONE-WAY AUTOMATIC, ONE-WAY MANUAL SIGNALING OPTION IS USED.
4. THESE OPTIONS APPLY TO THE SIGNAL KEY AND AUDIBLE SIGNAL AT STATION "B" ONLY. THE AUDIBLE SIGNAL AT STATION "A" IS UNDER CONTROL OF SIGNAL KEY AT STATION "B". THE AUDIBLE SIGNAL AT STATION "A" MAY BE PART OF A COMMON AUDIBLE ARRANGEMENT PROVIDED THE DIODE MATRIX IS USED FOR CONTROL.
5. THE AUDIBLE SIGNALS AT STATION "A" AND "B" MAY BE PART OF A COMMON AUDIBLE ARRANGEMENT PROVIDED THE DIODE MATRIX IS USED FOR CONTROL.

Fig. 17—Connections for 418A KTU (Short Range, DC Signaling, Private Line Circuit) in 597-Type Panel

66B4-25
CONN BLK

(NOTE 1)



NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1 OR 3) IS COLUMN A-E AND FOR RIGHT-HAND BLK (2 OR 4) IS COLUMN F-B.
2. MAXIMUM STATION CONDUCTOR LOOP IS 500 OHMS. OFF-PREMISE TELEPHONE SET MAY BE EQUIPPED WITH A "TOUCH-TONE" DIAL PROVIDED THE INTERCOM CIRCUIT IS SO EQUIPPED.
3. PROVIDE A 400J DIODE FOR EACH 420A KTU INSTALLED WHEN THE INTERCOM IS EQUIPPED WITH THE "TOUCH-TONE" ADAPTER (426/427-TYPE, 440A, OR 478B KTU) DIODE NOT REQUIRED WITH 494A KTU

OPTION STRAPPING ON 420A KTU OPTION BLK

FEATURE		OPTION	STRAP TERMINALS
AUDIBLE SIGNALS	AC BUZZER, 10V±, 18V±	J	1 TO 4
	DC BUZZER, 24 VDC	K	7 TO 8
	RINGER, 105V± STEADY	M	2 TO 4 7 TO 8

Fig. 18—Connections for 420A KTU (Long Line Circuit) in 597-Type Panel

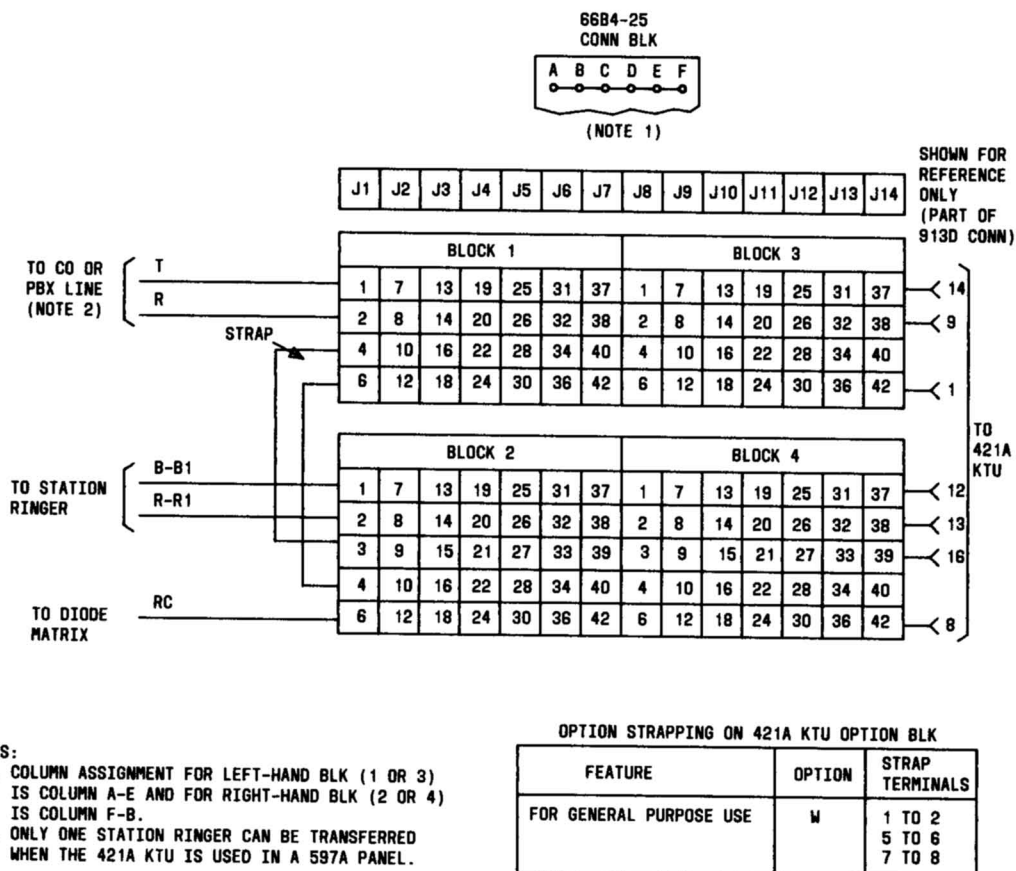
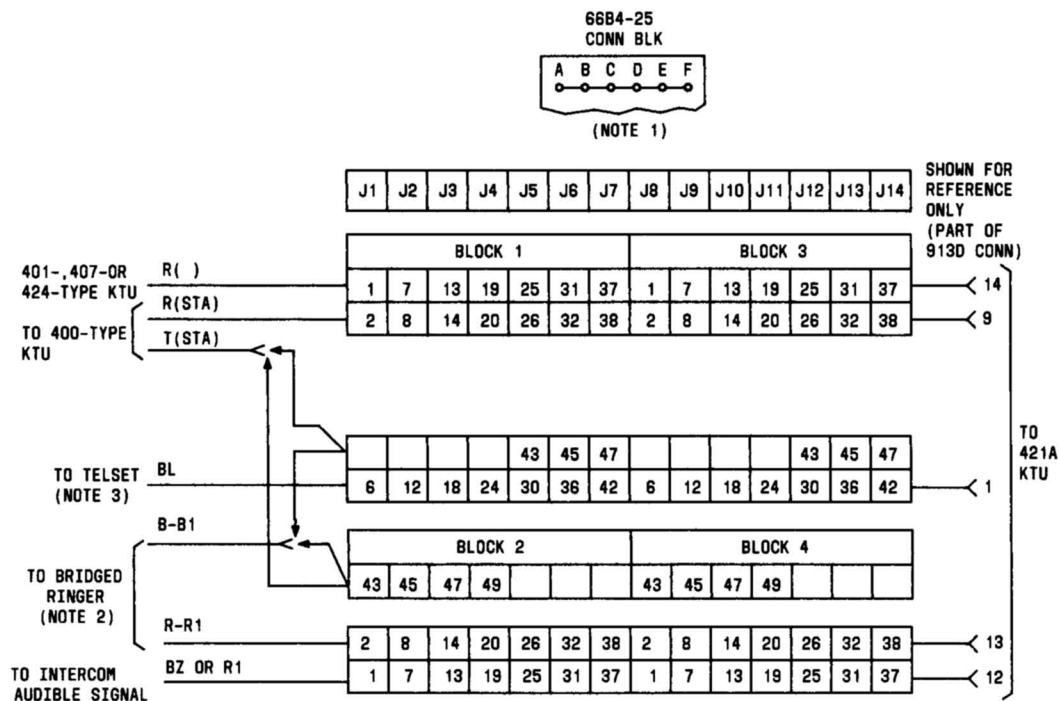


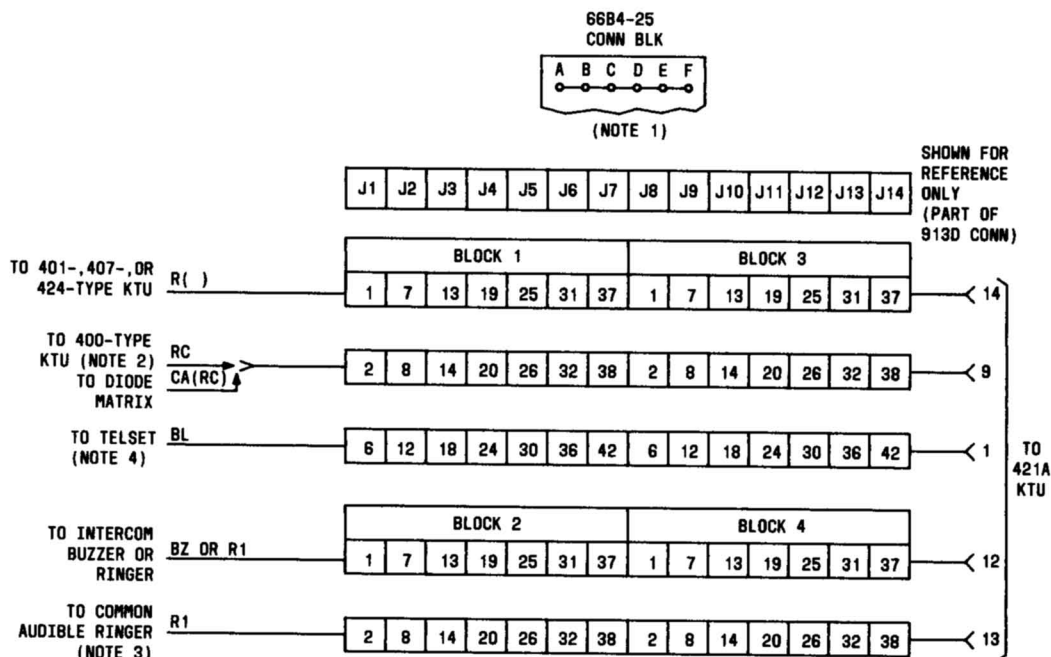
Fig. 19—Connections for 421A KTU (Power Failure Transfer Circuit) in 597-Type Panel



NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1 OR 3) IS A-E AND FOR RIGHT-HAND BLK (2 OR 4) IS F-B.
2. ONLY ONE BRIDGED RINGER CAN BE SUPPRESSED WHEN THE 421A KTU IS USED IN A 597A PANEL
3. TELEPHONE SET MUST BE EQUIPPED WITH STATION BUSY OPTION

Fig. 20—Connections for 421A KTU (Audible Signal Suppression Circuit) in 597-Type Panel Arranged to Suppress Bridged Ringing and Intercom Audible Signal



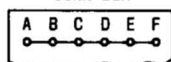
NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1 OR 3) IS A-E AND FOR RIGHT-HAND BLK (2 OR 4) IS F-B.
2. REFER TO 400-TYPE KTU FOR OPTION.
3. ONLY ONE COMMON RINGER CAN BE SUPPRESSED WHEN THE 421A KTU IS USED IN A 597A PANEL.
4. TELEPHONE SET MUST BE EQUIPPED WITH STATION BUSY OPTION.

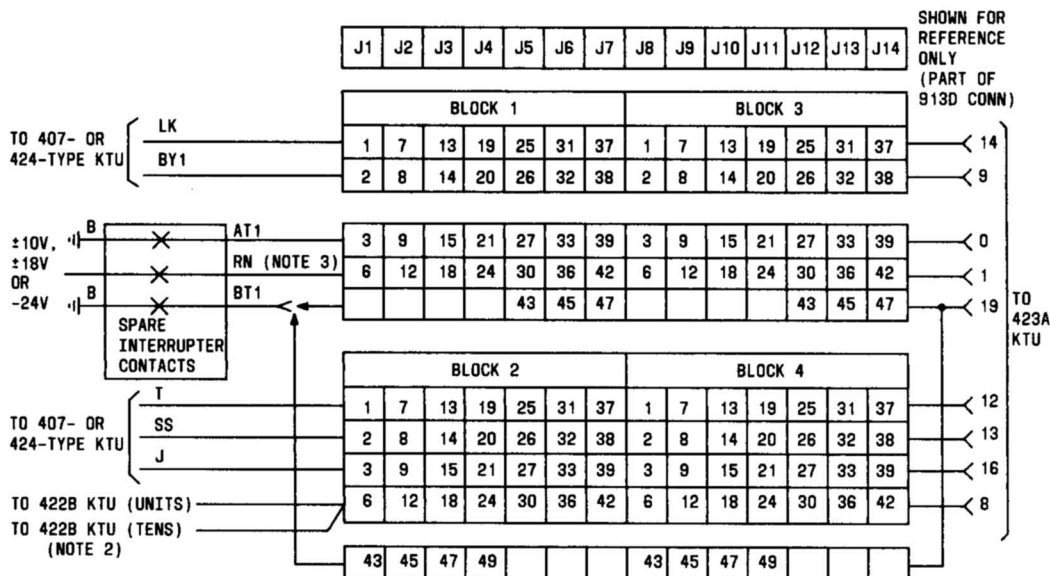
421A KTU OPTION

OPTION	PLACE STRAP
W	1 TO 2

Fig. 21—Connections for 421A KTU (Audible Signal Suppression Circuit) in 597-Type Panel Arranged to Suppress Common Audible Ringing and Intercom Audible Signal

66B4-25
CONN BLK

(NOTE 1)



NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1 OR 3) IS COLUMN A-E AND FOR RIGHT-HAND BLK (2 OR 4) IS COLUMN F-B.
2. 422B KTUS ASSOCIATED WITH THE SAME DIAL INTERCOM AS THE 423A KTU.
3. 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.
4. TURN KNURLED WHEEL TO FULL CLOCKWISE POSITION FOR MINIMUM DIAL TONE VOLUME AND TO FULL COUNTERCLOCKWISE POSITION FOR MAXIMUM DIAL TONE VOLUME.

FEATURE	423A	
	OPTION	STRAP
DIAL TONE	T	1-2
STATION BUSY TONE	R	4-6
AUDIBLE RINGBACK	S	*

* REQUIRES NO STRAPPING ON KTU

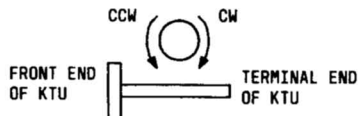


Fig. 22—Connections for 423A KTU (Dial Tone, Busy Tone, and Audible Ringback Tone Circuit) in 597-Type Panel

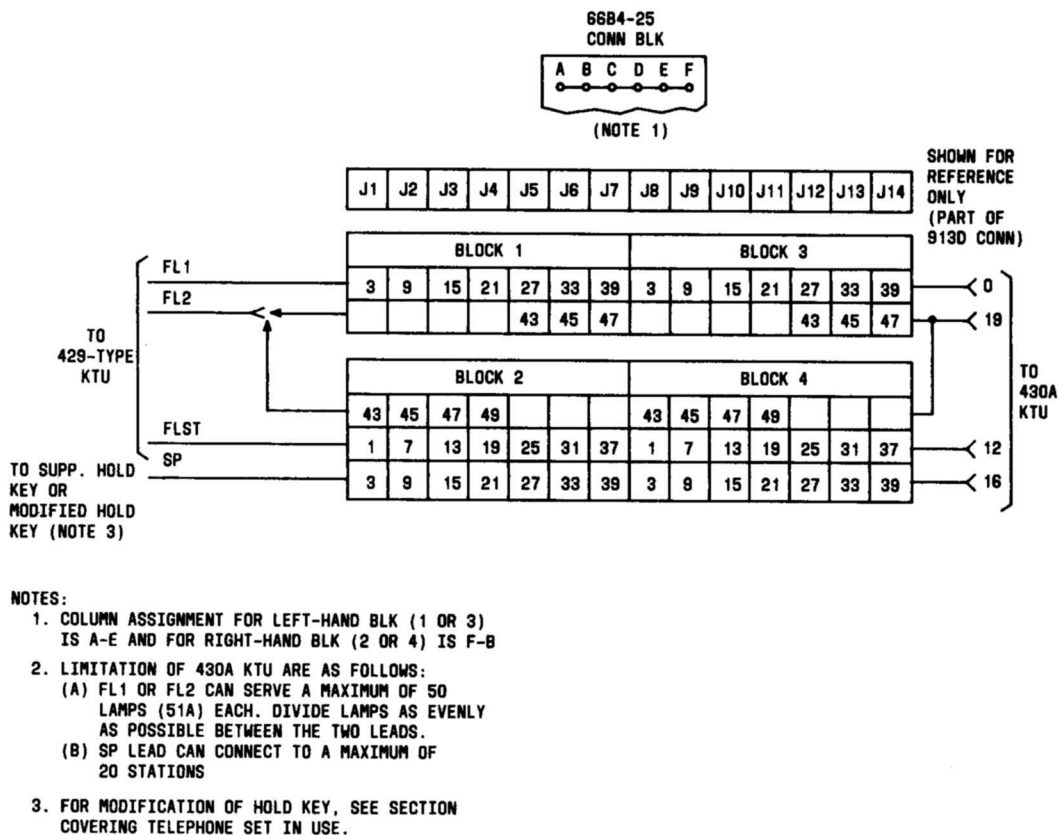
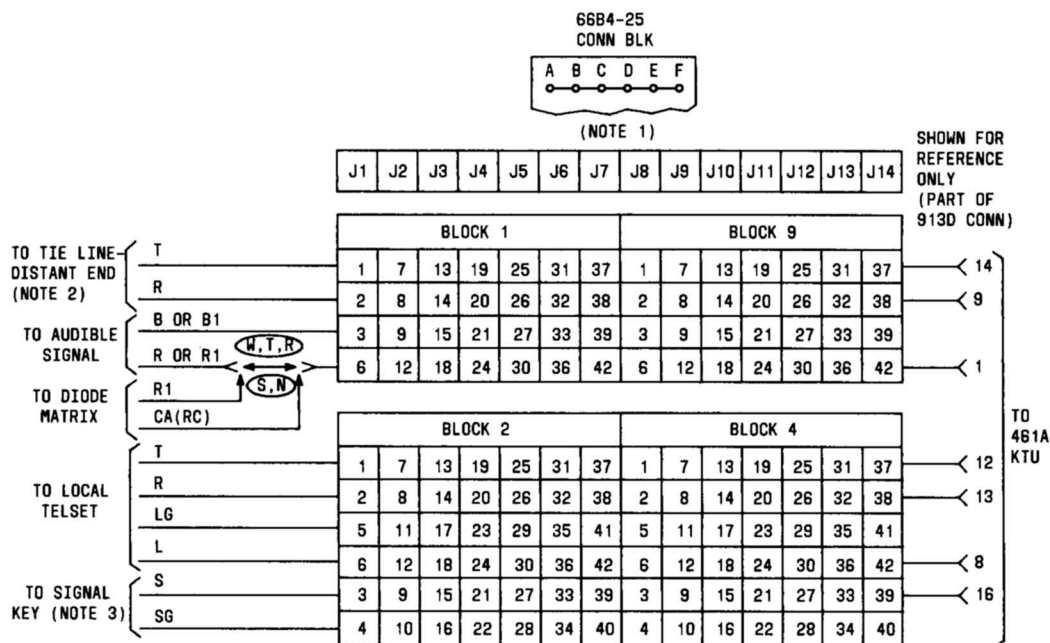


Fig. 23—Connections for 430A KTU (Flutter Generator Circuit) in 597-Type Panel



OPTION STRAPPING ON 461A KTU OPTION BLK

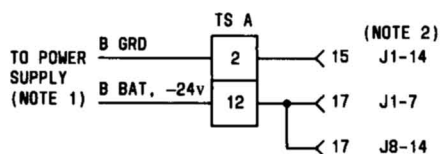
FEATURES			OPTIONS	STRAP TERMINALS
AUDIBLE SIGNALS	UNDER CONTROL OF TIME-OUT CIRCUIT (B RELAY)	INTERRUPTED RING	W	7 TO 8
		STEADY RING	T	6 TO 7
		COMMON WITH DIODE MATRIX CONTROL	S	7 TO 8
	UNDER CONTROL OF R RELAY	STEADY RING	R	
		COMMON WITH DIODE MATRIX CONTROL	N	4 TO 6
TIME-OUT	10 SECONDS		X	1 TO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

NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1 OR 3) IS A-E AND FOR RIGHT-HAND BLK (2 OR 4) IS F-B.
2. PRIVATE LINE CIRCUIT AT DISTANT END MAY BE A 414A KTU (MD), 419A KTU, 461A KTU, OR ANY OTHER TYPE PRIVATE LINE UNIT REQUIRING RINGING VOLTAGE FOR THE RING UP CIRCUIT AND FURNISHING RINGING VOLTAGE FROM THE SIGNALING CIRCUIT.
3. SIGNAL KEY MAY BE A CONVERTED PICKUP KEY OR ANY EXTERNAL NONLOCKING KEY.

Fig. 24—Connections for 461A KTU (Manual Signaling, Ringdown Private Line Circuit) in 597-Type Panel

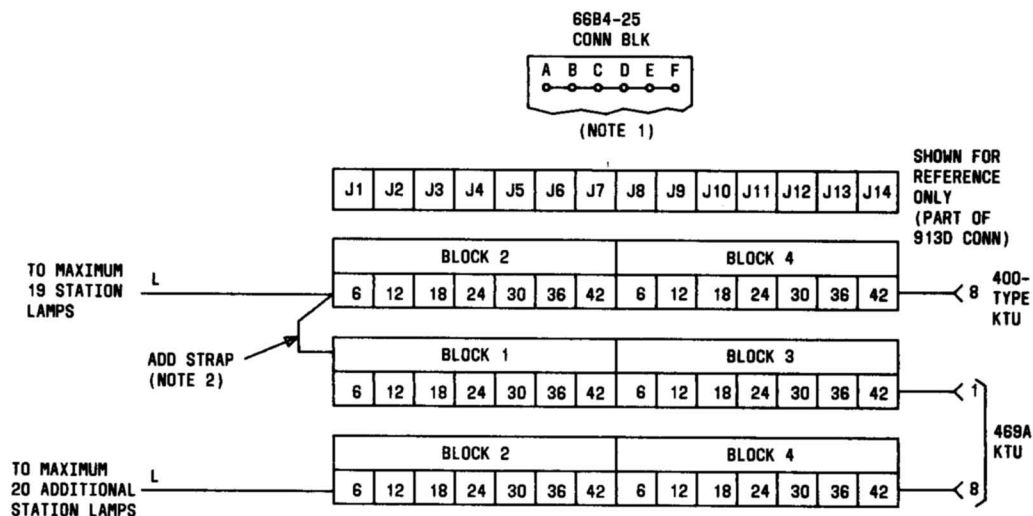
SHOWN FOR REFERENCE ONLY



NOTES

1. B BAT AND GRD PROVIDED AS DEDICATED WIRING, NO OTHER CONNECTIONS ARE REQUIRED.
2. KTU MAY BE INSTALLED IN ANY AVAILABLE JACK.

Fig. 25—Connections for 467A KTU (Low Voltage Monitor Circuit) in 597-Type KTU



NOTES:

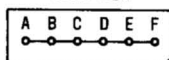
1. COLUMN ASSIGNMENT FOR LEFT-HAND BLOCK (1 OR 3) IS A-E AND FOR RIGHT-HAND BLOCK (2 OR 4) IS F-B.
2. ADD STRAP FROM JACK CONTAINING 400-TYPE KTU REQUIRING LAMP MULTIPLE TO JACK CONTAINING 469A KTU. CONNECT ADDITIONAL LAMP LEADS TO L LEAD OF 469A KTU.

Fig. 26—Connections for 469A KTU (Lamp Extender Circuit) in 597-Type KTU

NOTE:

COLUMN ASSIGNMENT FOR LEFT-HAND
BLK (1 OR 3) IS A-E AND FOR
RIGHT-HAND BLK (2 OR 4) IS F-B

6684-25
CONN BLK



(SEE NOTE)

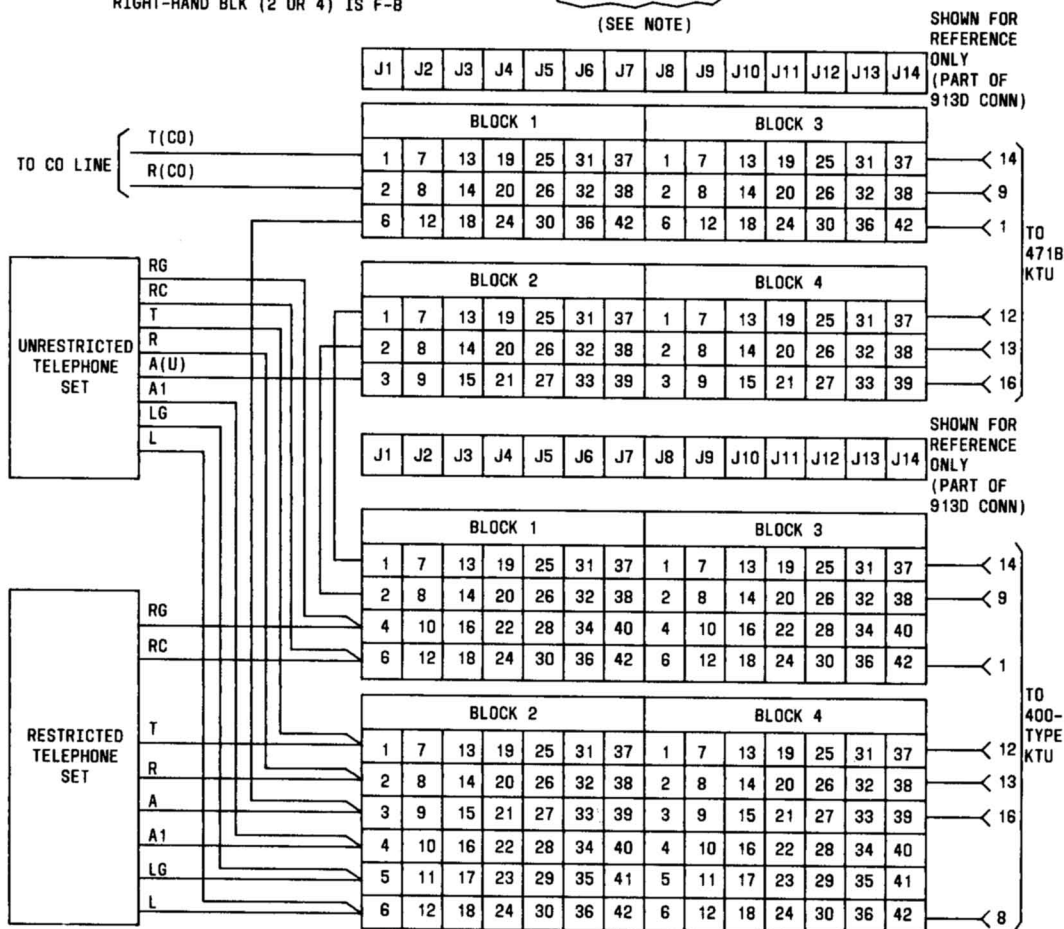
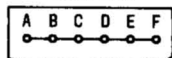


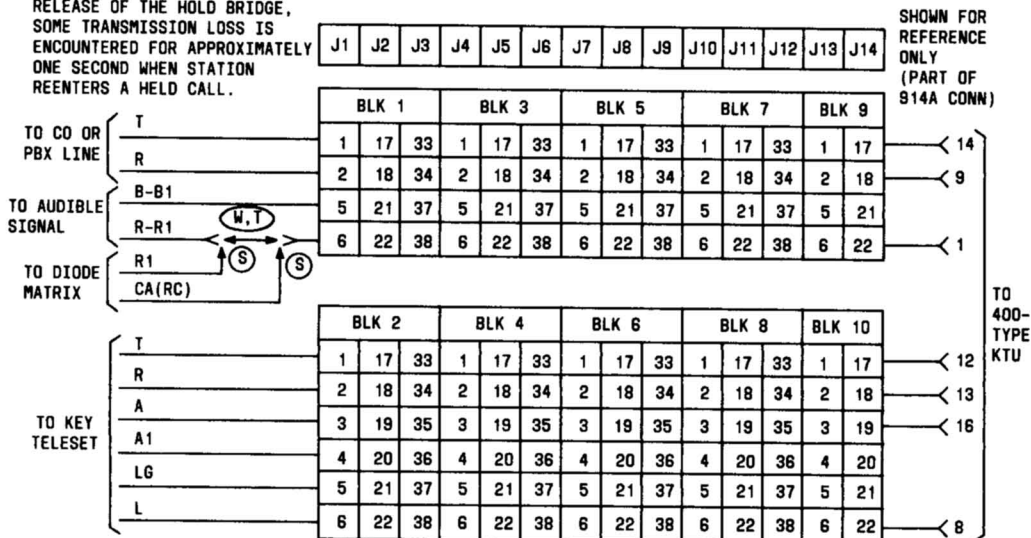
Fig. 27—Connections for 471B KTU (Battery Reversal Toll Restriction Circuit) in 597-Type Panel

NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1,3,5,7,9) IS A-E AND FOR RIGHT-HAND BLK (2,4,6,8,10) IS F-B.
2. TERMINALS 33 THRU 48 ARE SPARES ON CONN BLKS 9 AND 10.
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.

66B4-25
CONN BLK

(NOTES 1 AND 2)



- * 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 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-SECONDS 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.

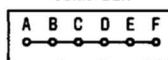
OPTION STRAPPING ON 400-TYPE KTU OPTION BLK

FEATURES		OPTION	400A,B,C	400D
AUDIBLE SIGNALS	INTERRUPTED RING	W	5 TO 6	5 TO 8
	STEADY RING	T	4 TO 6	6 TO 8
	COMMON WITH DIODE MATRIX CONTROL	S	5 TO 6	5 TO 8
VISUAL HOLD CIRCUIT	LAMP WINK	Y	8 TO 9	10 TO 7
	LAMP STEADY	X	7 TO 9	7 TO 9
TIME-OUT CONTROL	SHORT TIME DELAY (10 SECONDS)	Z*	1 TO 2	1 TO 2
	LONG TIME DELAY	†	†	†
RELEASE OF HOLDING BRIDGE FROM CO OR PBX LINE CURRENT OPENS GREATER THAN	500 MILLISECONDS WHEN ASSOCIATED WITH NO. 1 ESS HAVING RESWITCH CAPABILITY	ZC (NOTE 3)	2 TO 3 USING 601A (5 UF) CAPACITOR OR EQUIVALENT	
	100 MILLISECONDS WHEN ASSOCIATED WITH 800A PBX AND/OR NO. 5 X-BAR CENTREX NOT HAVING AUTOMATIC PERMANENT SIGNAL RELEASE	ZD	2 TO 3 USING 575C (1 UF) CAPACITOR OR EQUIVALENT	
	50 MILLISECONDS WHEN ASSOCIATED WITH NO. 5 X-BAR CENTREX HAVING AUTOMATIC PERMANENT SIGNAL RELEASE	ZJ	2 TO 3 USING 575B (0.5 UF) CAPACITOR OR EQUIVALENT	

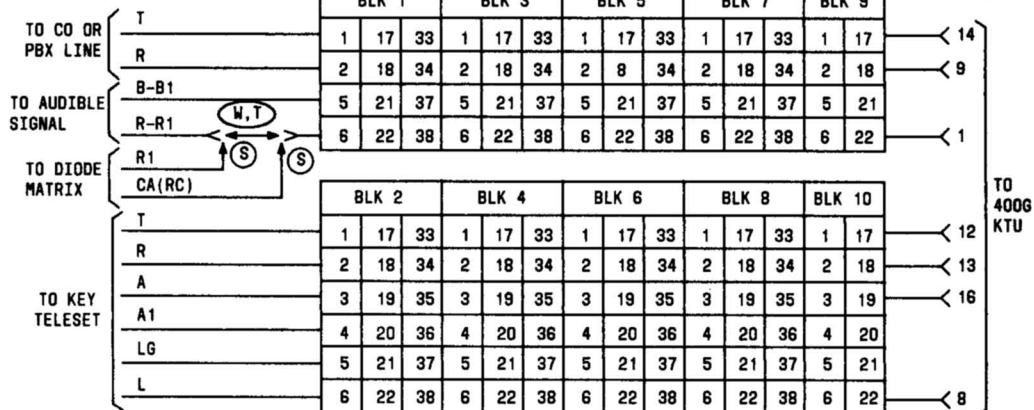
Fig. 28—Connections for 400D KTU (MD) (CO or PBX Line Circuit) in 598-Type Panel

NOTES:

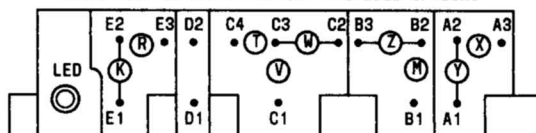
1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1,3,5,7,9) IS A-E AND FOR RIGHT-HAND BLK (2,4,6,8,10) IS F-F.
2. TERMINALS 33 THRU 48 ARE SPARES ON CONN BLKS 9 AND 10.

66B4-25
CONN BLK

(NOTES 1 AND 2)

SHOWN FOR
REFERENCE
ONLY
(PART OF
914A CONN)

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

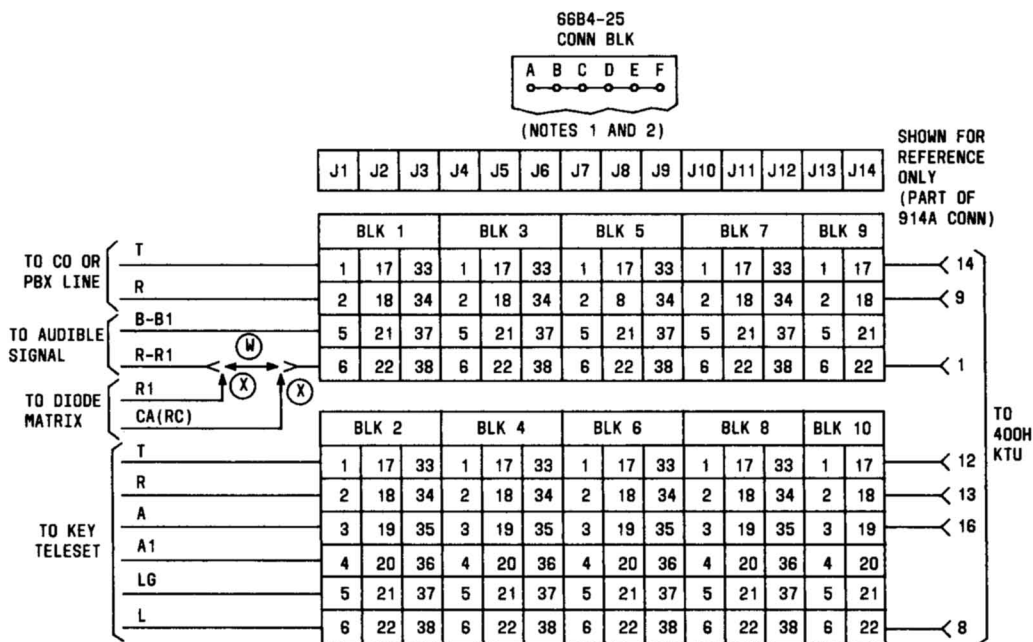


OPTION STRAPPING

OPT	FEATURES	
M	TIMEOUT	LONG TIME DELAY (APPROXIMATELY 20 SECONDS)
Z		SHORT TIME DELAY (APPROXIMATELY 5 SECONDS)
Y	VISUAL HOLD CKT	LAMP WINK
X		LAMP STEADY
W	AUDIBLE SIGNAL	INTERRUPTED RING
T		STEADY RING
S		COMMON WITH DIODE MATRIX CONTROL
V		COMMON WITH RELAY CONTROL
R	DELAYED HOLD RELEASE	RELEASE OF HOLDING BRIDGE FROM CO OR PBX BY LINE CURRENT OPENS
K		MINIMUM OF 25 MS 600 MS

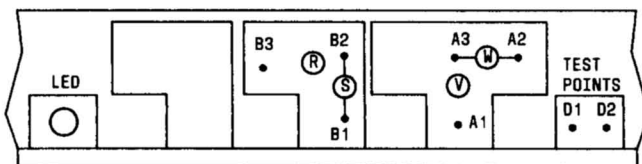
OPTION	CONNECT OPTION PLUG TO TERMINALS
Z	B2-B3
Y	A1-A2
X	A2-A3
T	C3-C4
W	C2-C3
V	C1-C3
R	E2-E3
K	E1-E2
M	B1-B2

Fig. 29—Connections for 400G KTU (MD) (CO or PBX Line Circuit) in 598-Type Panel



NOTES:

1. COLUMN ASSIGNMENTS FOR LEFT-HAND BLK (1,3,5,7,9) IS A-E AND FOR RIGHT BLK (2,4,6,8,10) IS F-B.
2. TERMINALS 33 THRU 48 ARE SPARES ON CONN BLKS 9 AND 10.
3. RING TIMEOUT IS NOT ADJUSTABLE; OCCURS IN 5 TO 8-1/2 SECONDS.

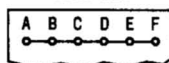


TOP VIEW OF OPTION-HANDLE ASSEMBLY, OPTION SYMBOLS
SHOWN CONNECTED ARE FACTORY-INSTALLED OPTIONS.

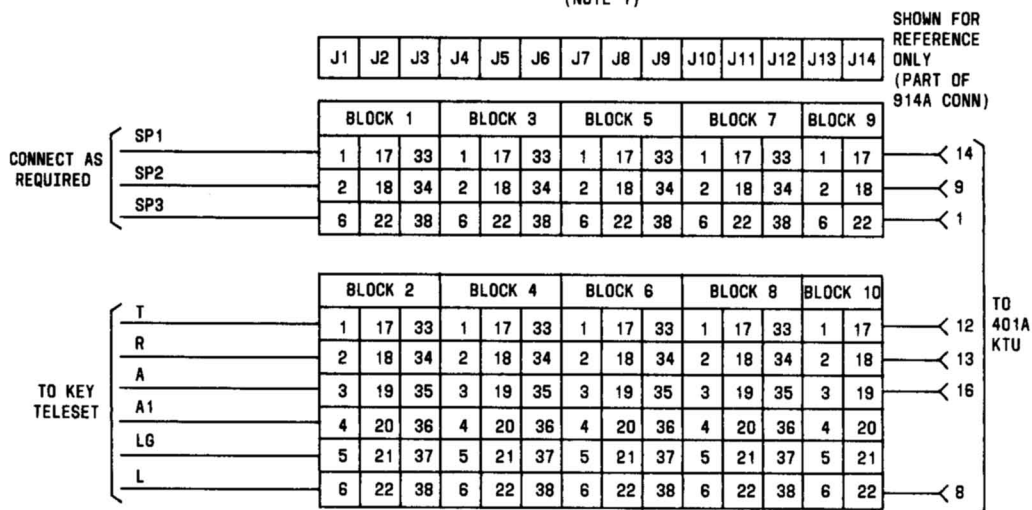
OPTION	FEATURES	PLUG POSITION
W	INTERRUPTED RING	A2-A3*
V	COMMON AUDIBLE WITH RELAY CONTROL	A1-A3
X	COMMON AUDIBLE WITH DIODE MATRIX	
S	LONG HOLD RLS #1 ESS, #2 ESS, 812 770, DIMENSION PBX	B1-B2*
R	SHORT HOLD RLS ALL OTHER	B2-B3

*FACTORY PROVIDED

Fig. 30—Connections for 400H KTU (CO or PBX Line Circuit) in 598-Type Panel

6684-25
CONN BLK

(NOTE 1)



NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1, 3, 5, 7, 9) IS A-E AND FOR RIGHT-HAND BLK (2, 4, 6, 8, 10) IS F-B.
2. TERMINALS 33 THRU 48 ARE SPARES ON CONN BLKS 9 AND 10.

Fig. 31—Connections for 401A KTU (Manual Intercom Line Circuit) in 598-Type Panel

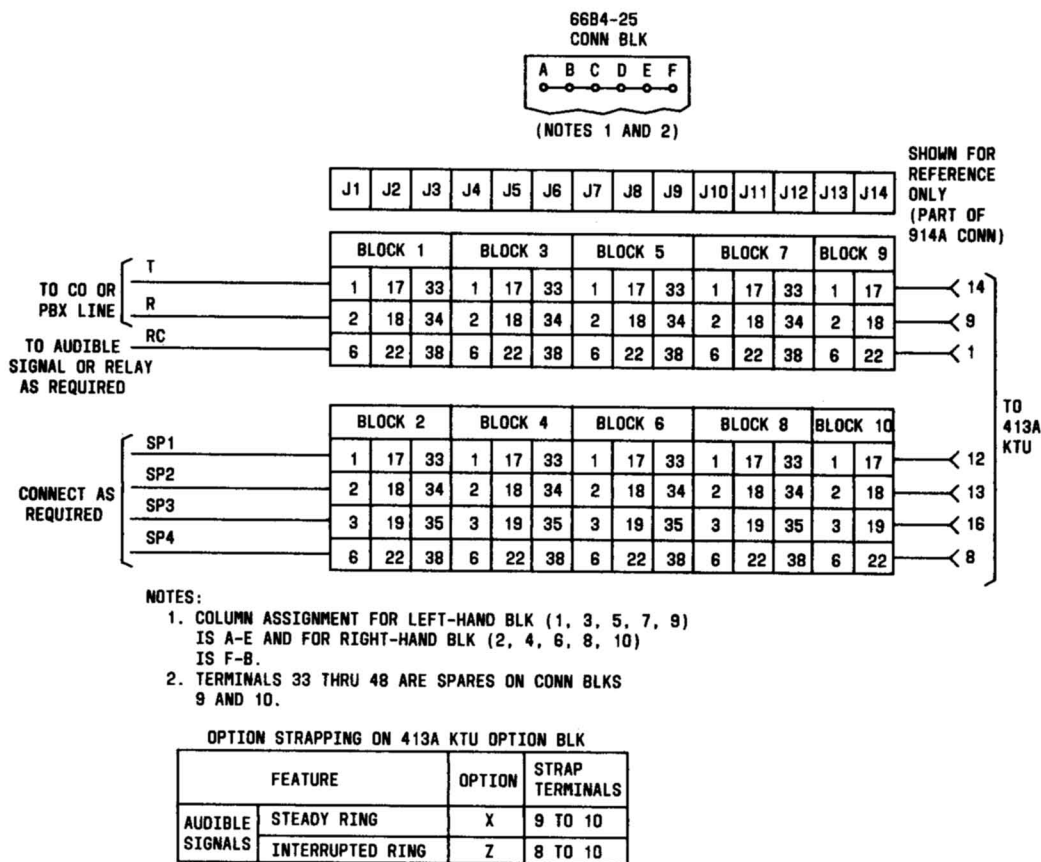
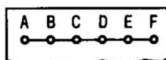


Fig. 32—Connections for 413A KTU (Auxiliary Ringup Circuit) in 598-Type Panel

66B4-25
CONN BLK

(NOTE 1)

SHOWN FOR
REFERENCE
ONLY
(PART OF
914A CONN)TO SIMILAR
TIE LINE CKT
DISTANT END
(NOTE 3)
CONNECT AS
REQ. FOR
CONTROLTO AUDIBLE
SIGNALTO DIODE
MATRIXTO LOCAL
TELSETTO SIGNAL
KEY (NOTE 4)

J1 J2 J3 J4 J5 J6 J7 J8 J9 J10 J11 J12 J13 J14

	BLK 1			BLK 3			BLK 5			BLK 7			BLK 9		
T	1	17	33	1	17	33	1	17	33	1	17	33	1	17	
R	2	18	34	2	18	34	2	18	34	2	18	34	2	18	
SP	4	20	36	4	20	36	4	20	36	4	20	36	4	20	
STRAP	5	21	37	5	21	37	5	21	37	5	21	37	5	21	
B-B1	3	19	35	3	19	35	3	19	35	3	19	35	3	19	
R-R1	6	22	38	6	22	38	6	22	38	6	22	38	6	22	
R1															
CA(RC)															

	BLK 2			BLK 4			BLK 6			BLK 8			BLK 10		
T	1	17	33	1	17	33	1	17	33	1	17	33	1	17	
R	2	18	34	2	18	34	2	18	34	2	18	34	2	18	
LG	5	21	37	5	21	37	5	21	37	5	21	37	5	21	
L	6	22	38	6	22	38	6	22	38	6	22	38	6	22	
S	3	19	35	3	19	35	3	19	35	3	19	35	3	19	
SG	4	20	36	4	20	36	4	20	36	4	20	36	4	20	

TO
414A
KTU

OPTION STRAPPING ON 414A KTU (MD) OPTION BLK

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

NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1,3,5,7,9) IS A-E AND FOR RIGHT-HAND BLK (2,4,6,8,10) IS F-B.
2. TERMINALS 33 THRU 48 ARE SPARES ON CONN BLKS 9 AND 10.
3. PRIVATE LINE CIRCUIT AT DISTANT END MAY BE A 414A KTU, OR ANY OTHER TYPE PRIVATE LINE UNIT REQUIRING RINGING VOLTAGE FOR THE RING UP CIRCUIT AND FURNISHING RINGING VOLTAGE FROM THE SIGNALING CIRCUIT.
4. SIGNAL KEY MAY BE A CONVERTED PICKUP KEY OR ANY EXTERNAL NONLOCKING KEY.

Fig. 33—Connections for 414A KTU (Manual Signaling, Ringdown Private Line Circuit) in 598-Type Panel

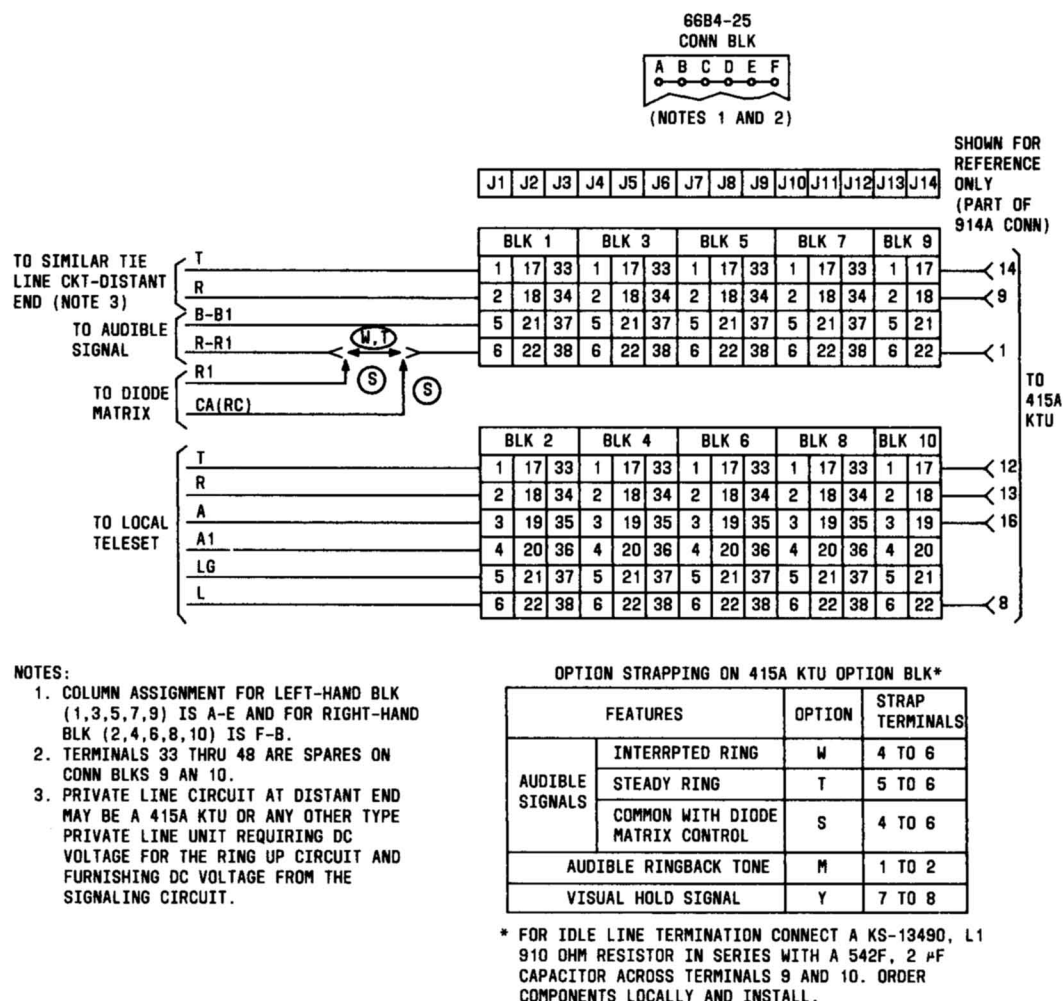


Fig. 34—Connections for 415A KTU (Automatic, DC Signaling, Private Line Circuit) in 598-Type Panel

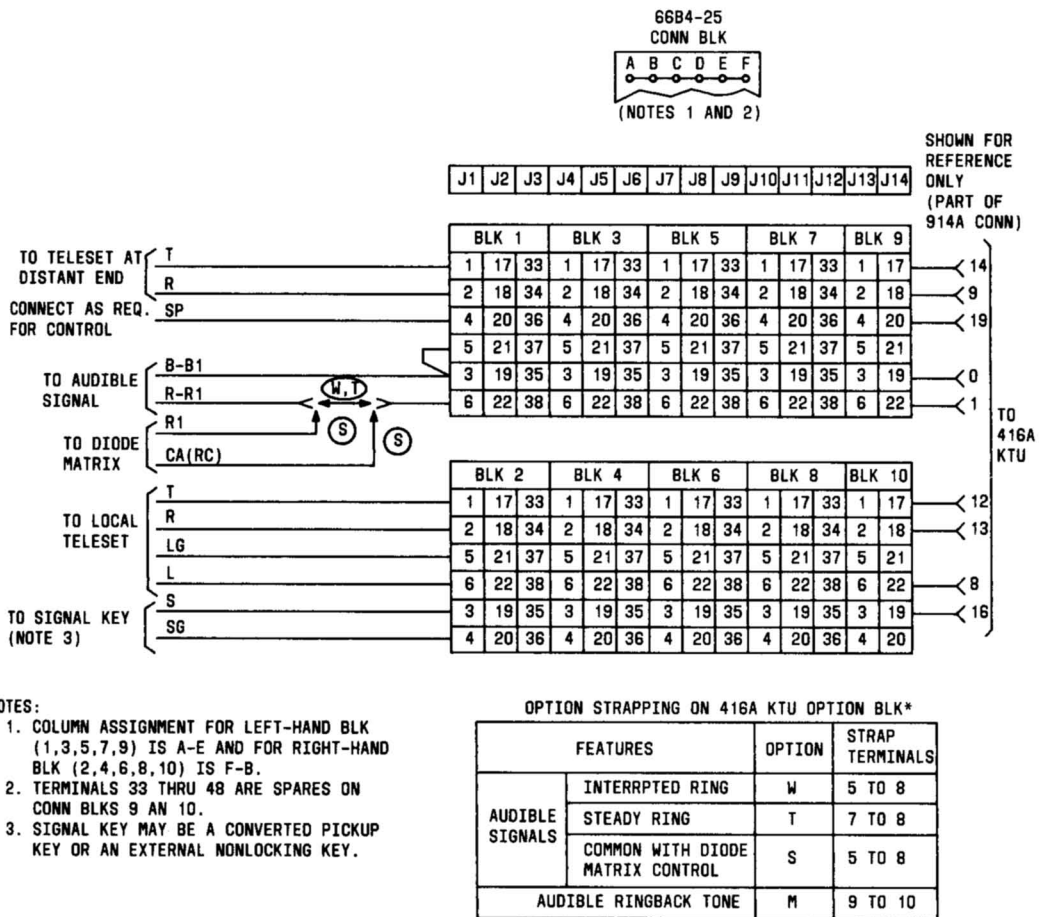


Fig. 35—Connections for 416A KTU (Station Line Circuit) in 598-Type Panel

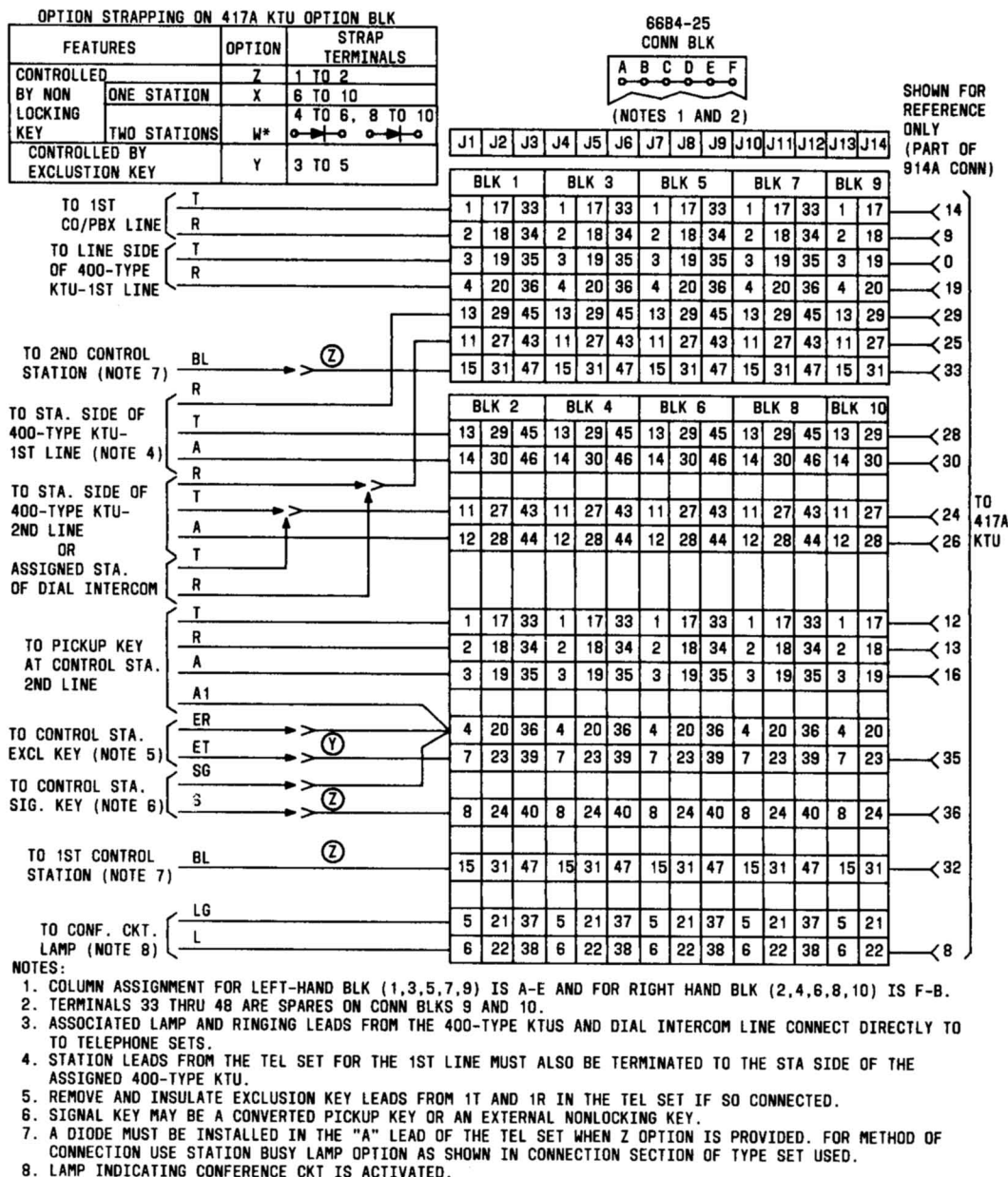


Fig. 36—Connections for 417A KTU (Add-On Conference Circuit) in 598-Type Panel

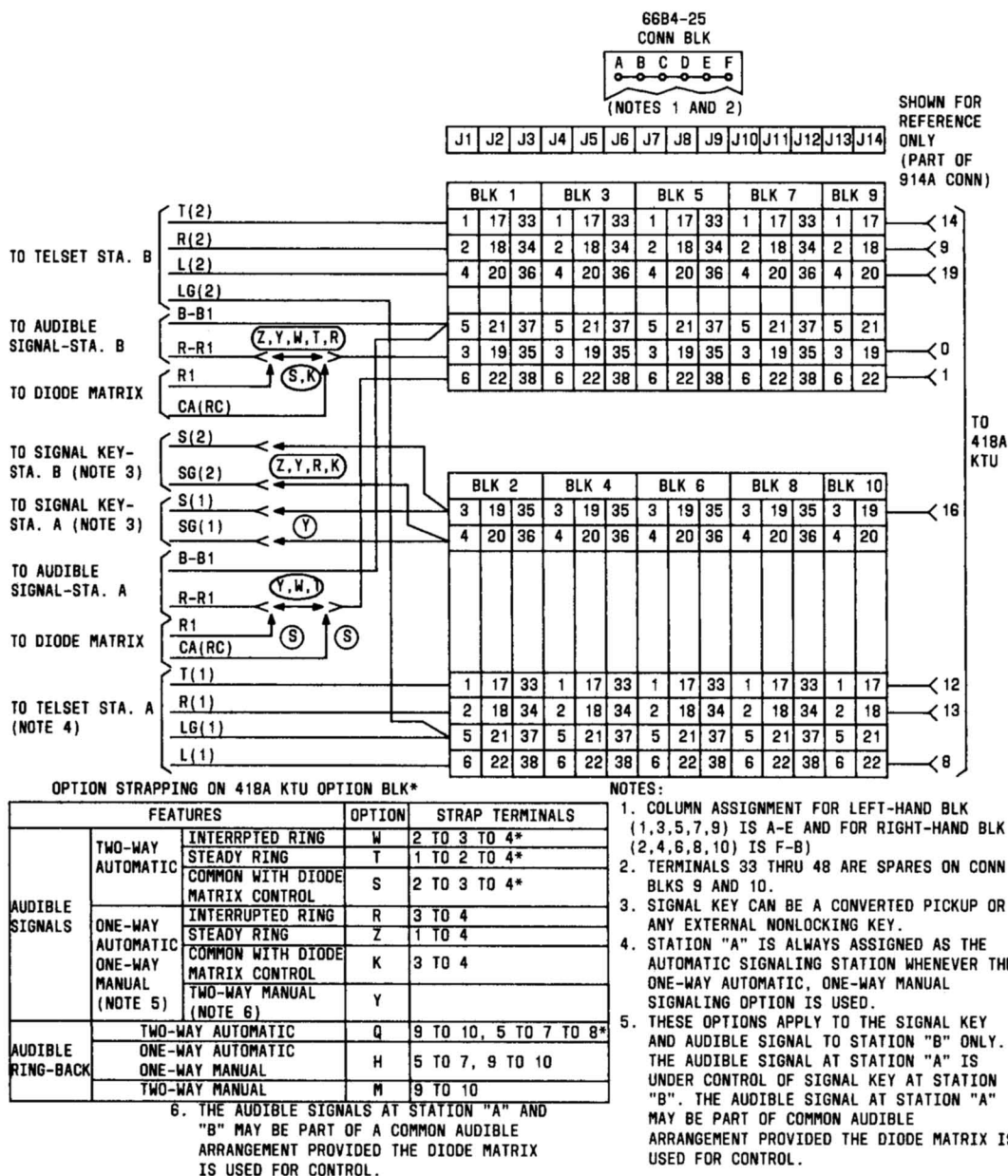


Fig. 37—Connections for 418A KTU (Short Range, DC Signaling, Private Line Circuit) in 598-Type Panel

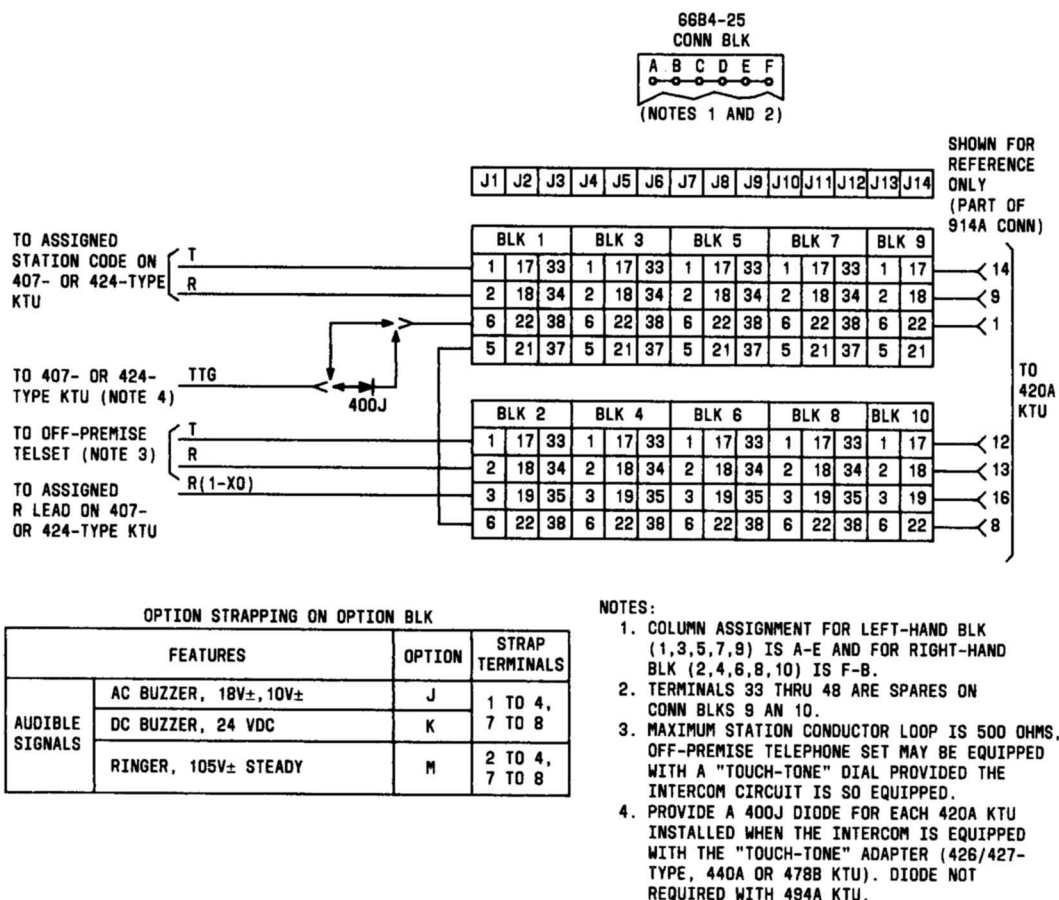
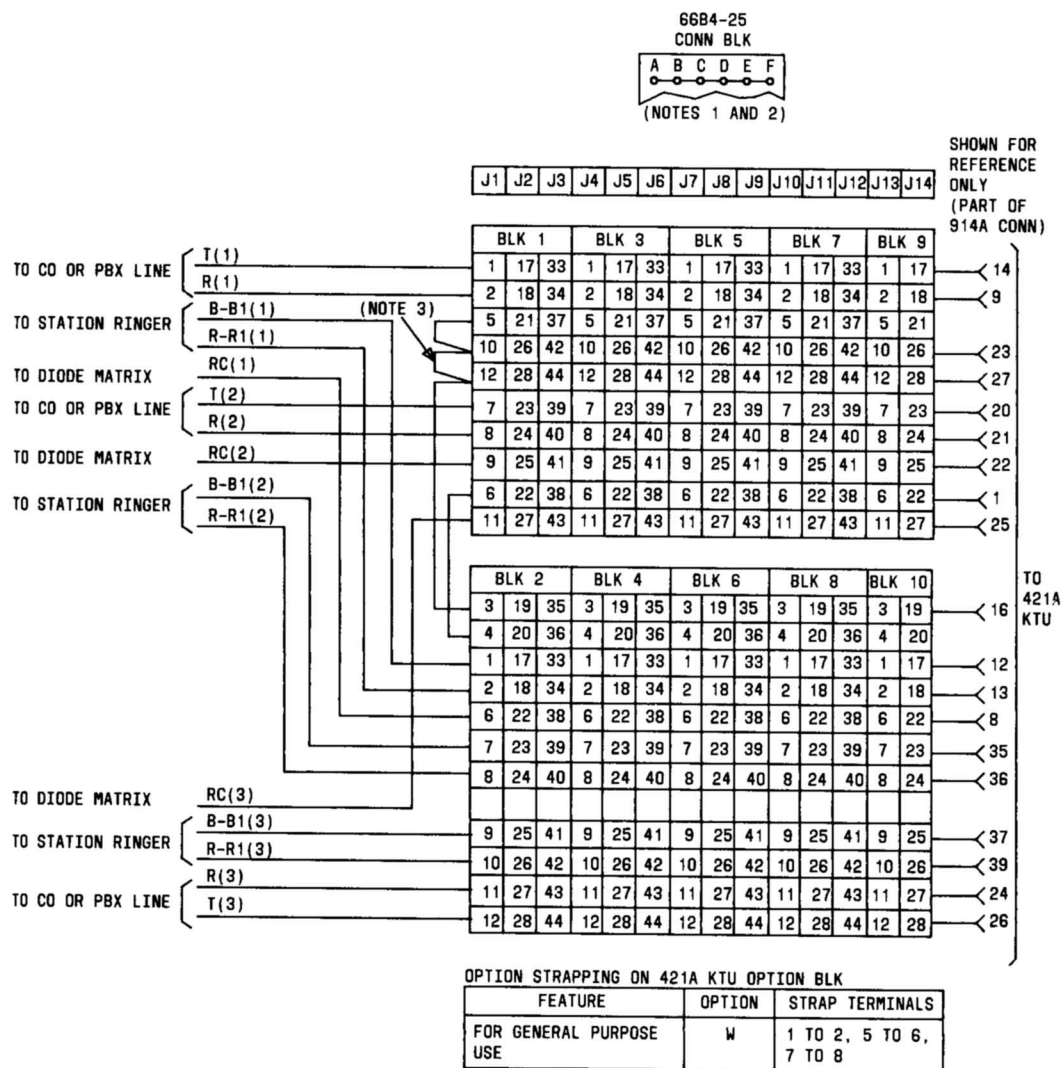


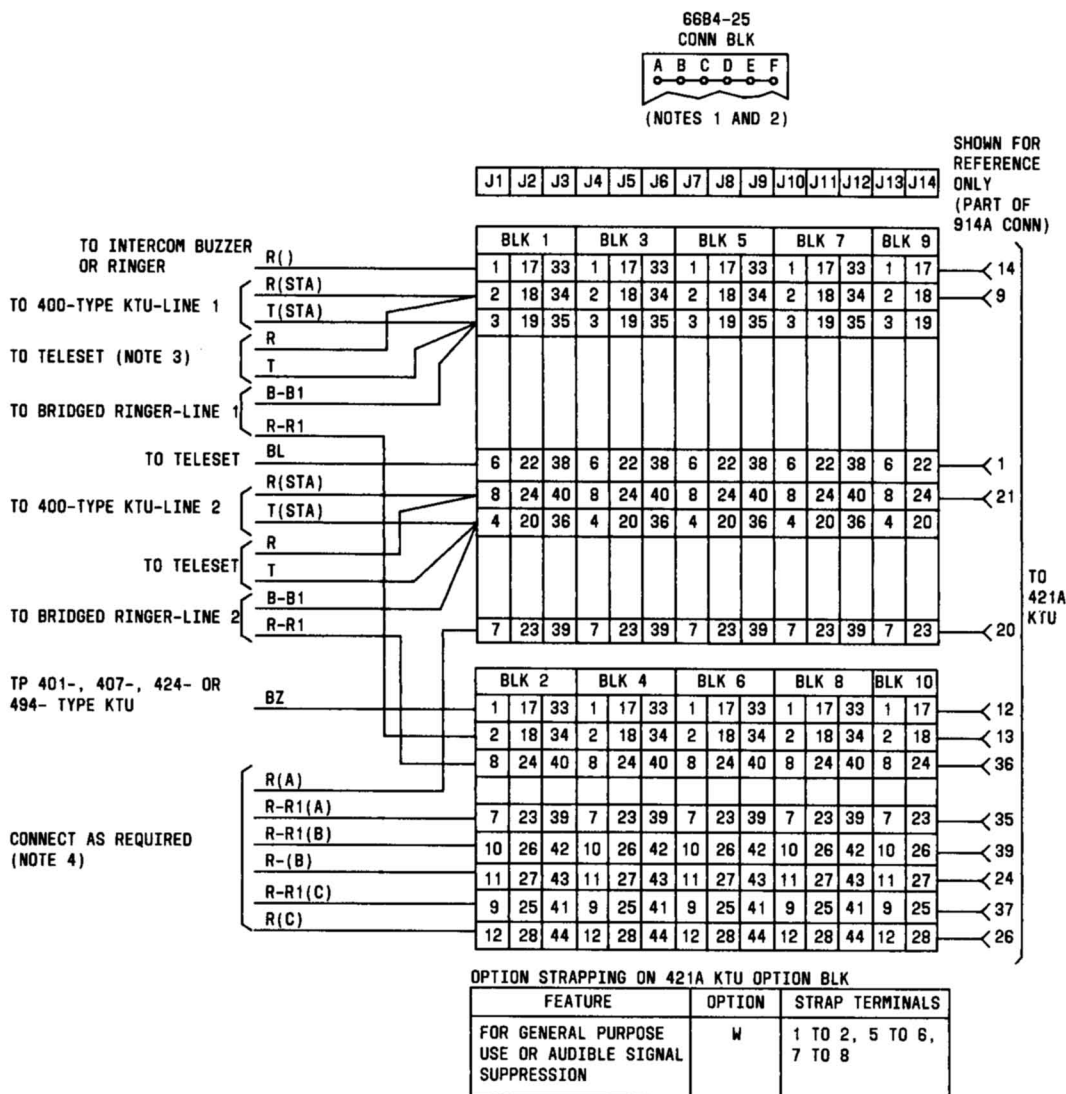
Fig. 38—Connections for 420A KTU (Long Line Circuit) in 598-Type Panel



NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1,3,5,7,9) IS A-E AND FOR RIGHT HAND BLK (2,4,6,8,10) IS F-B.
2. TERMINALS 33 THRU 48 ARE SPARES ON CONN BLKS 9 AND 10.
3. ADD STRAPS ACCORDING TO NUMBER OF LINES SERVED.

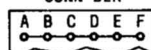
Fig. 39—Connections for 421A KTU (Power Failure Transfer Circuit) in 598-Type Panel



NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1,3,5,7,9) IS A-E AND FOR RIGHT HAND BLK (2,4,6,8,10) IS F-B.
2. TERMINALS 33 THRU 48 ARE SPARES ON CONN BLKS 9 AND 10.
3. TELEPHONE SET MUST BE EQUIPPED WITH STATION BUSY OPTION.
4. LETTERS IN PARENTHESES ARE FOR REFERENCE ONLY. CONNECT AS REQUIRED TO SUPPRESS BRIDGED RINGERS ON ADDITIONAL LINES.

Fig. 41—Connections for 421A KTU (Audible Signal Suppression Circuit) in 598-Type Panel Arranged to Suppress Bridged Ringing and Intercom Audible Signal

6684-25
CONN BLK

(NOTES 1 AND 2)

SHOWN FOR
REFERENCE
ONLY
(PART OF
914A CONN)TO 401-, 407- OR
424-TYPE KTU

R()

TO 400-TYPE KTU

RC (NOTE 3)

TO DIODE MATRIX

CA(RC)

TO TELSET (NOTE 4)

BL

CONNECT AS

REQUIRED (NOTE 5)

RC, CA(B)

RC, CA(A)

TO INTERCOM BUZZER

OR RINGER

BZ OR R1

TO COMMON

AUDIBLE RINGER

R1

R1(B)

R1(A)

R1(D)

R1(C)

RC, CA(C)

RC, CA(D)

CONNECT AS
REQUIRED
(NOTE 5)

J1 J2 J3 J4 J5 J6 J7 J8 J9 J10 J11 J12 J13 J14

BLK 1	BLK 3	BLK 5	BLK 7	BLK 9
1 17 33	1 17 33	1 17 33	1 17 33	1 17
2 18 34	2 18 34	2 18 34	2 18 34	2 18
6 22 38	6 22 38	6 22 38	6 22 38	6 22
7 23 39	7 23 39	7 23 39	7 23 39	7 23
8 24 40	8 24 40	8 24 40	8 24 40	8 24

BLK 2	BLK 4	BLK 6	BLK 8	BLK 10
1 17 33	1 17 33	1 17 33	1 17 33	1 17
2 18 34	2 18 34	2 18 34	2 18 34	2 18
7 23 39	7 23 39	7 23 39	7 23 39	7 23
8 24 40	8 24 40	8 24 40	8 24 40	8 24
9 25 41	9 25 41	9 25 41	9 25 41	9 25
10 26 42	10 26 42	10 26 42	10 26 42	10 26
11 27 43	11 27 43	11 27 43	11 27 43	11 27
12 28 44	12 28 44	12 28 44	12 28 44	12 28

TO
421A
KTU

NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1, 3, 5, 7, 9) IS A-E AND FOR RIGHT-HAND BLK (2, 4, 6, 8, 10) IS F-B.
2. TERMINALS 33 THRU 48 ARE SPARES ON CONN BLKS 9 AND 10.
3. REFER TO 400-TYPE KTU FOR OPTION.
4. TELEPHONE SET MUST BE EQUIPPED WITH STATION BUSY OPTION.
5. LETTERS IN PARENTHESIS ARE FOR REFERENCE ONLY.

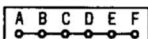
OPTION STRAPPING ON 421A KTU OPTION BLK

FEATURES	OPTION	STRAP TERMINALS
FOR GENERAL PURPOSE USE OR AUDIBLE SIGNAL SUPPRESSION	W	1 TO 2, 5 TO 6, 7 TO 8

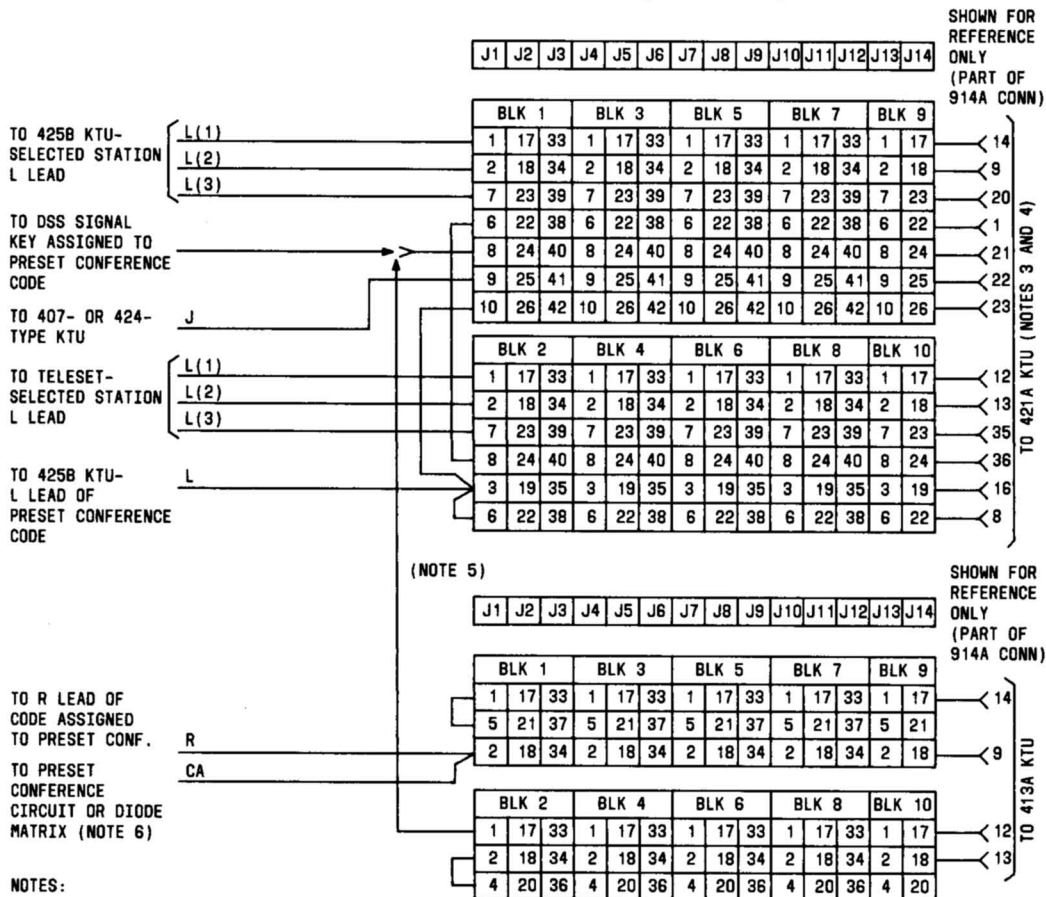
Fig. 42—Connections for 421A KTU (Audible Signal Suppression Circuit) in 598-Type Panel Arranged to Suppress Common Audible Ringing and Intercom Audible Signal

OPTION STRAPPING 421A KTU

OPTION	STRAP TERMINALS
W	1 TO 2, 7 TO 8

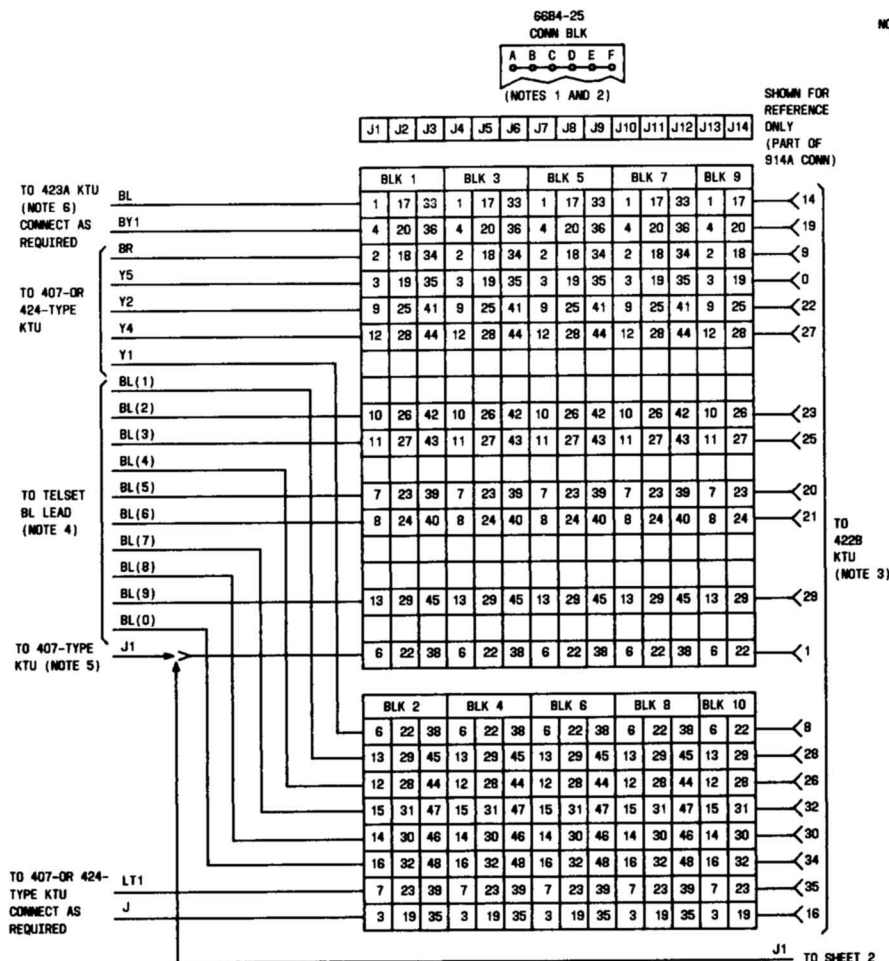
66B4-25
CONN BLK

(NOTES 1 AND 2)



1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1,3,5,7,9) IS A-E AND FOR RIGHT-HAND BLK (2,4,6,8,10) IS F-B.
2. TERMINALS 33 THRU 48 ARE SPARES ON CONN BLKS 9 AND 10.
3. WHEN THIS CIRCUIT IS PROVIDED, RING VOLTAGE (150V±) MUST BE USED TO OPERATE THE AUDIBLE SIGNALS CONNECTED TO THE DIAL INTERCOM LINE.
4. "W" OPTION MUST BE PROVIDED ON THE 421A KTU.
5. 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.
6. THE "CA" LEAD MUST CONNECT TO THE DIODE MATRIX WHETHER OR NOT THE 413A KTU IS PROVIDED.

Fig. 43—Connections for 421A KTU or 413A KTU (Wired for Preset Conference Circuit for Deluxe Dial Intercom Line) in 598-Type Panel



NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1, 3, 5, 7, 9) IS A-E AND FOR RIGHT-HAND BLK (2, 4, 6, 8, 10) IS F-B.
2. TERMINALS 33 THRU 48 ARE SPARES ON CONN BLKS 8 AND 19.
3. PROVIDE SEPARATE 422B KTU FOR THE UNITS GROUPS (1-0, SINGLE DIGIT NOS.) AND FOR THE TENS GROUP (X1-X0, TWO DIGIT NOS.).
4. PROVIDE AND INSTALL A DIODE IN THE A LEAD OF THE ASSOCIATED TELSETS. FOR CONNECTION, USE THE STATION BUSY OPTION AS SHOWN IN THE CONNECTION SECTION OF THE TYPE SET USED.
5. CONNECT J1 LEAD OF UNITS 422B KTU WHEN A 407-TYPE KTU IS PROVIDED FOR THE DIAL INTERCOM CIRCUIT. WHEN A 424-TYPE KTU IS PROVIDED, STRAP THE J1 LEAD OF UNITS 422B KTU TO J2 LEAD OF TENS 422B KTU.
6. 423A KTU ASSOCIATED WITH SAME DIAL INTERCOM AS THE 422B KTUS.

Fig. 44—Connections for 422B KTU (Station Busy Selector Circuit) in 598-Type Panel (Sheet 1 of 2)

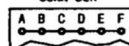
OPTION STRAPPING ON 422B KTU OPTION BLK

FEATURE	OPTION	STRAP TERMINALS
STATION BUSYTONE	R *	6 TO 8

* INSTALL 441J OR EQUIVALENT DIODE (PROCURE LOCALLY) AS SHOWN

6684-25

CONN BLK



(NOTES 1 AND 2)

SHOWN FOR
REFERENCE
ONLY
(PART OF
914A CONN)

CONNECT AS
REQUIRED

TO 424-
TYPE KTU

TO TETSET
BL LEAD
(NOTE 4)

TO 423A
KTU (NOTE 6)

TO 424-
TYPE KTU

FROM SHEET 1
CONNECT
AS REQUIRED

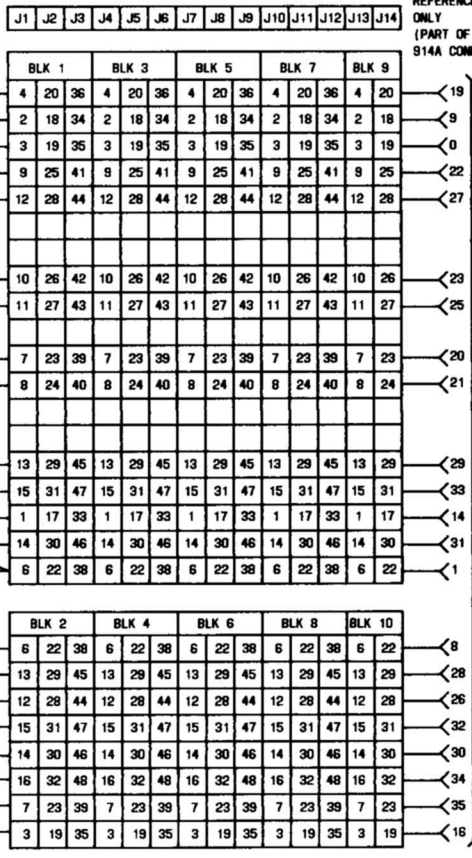


Fig. 44—Connections for 422B KTU (Station Busy Selector Circuit) in 598-Type Panel (Sheet 2 of 2)

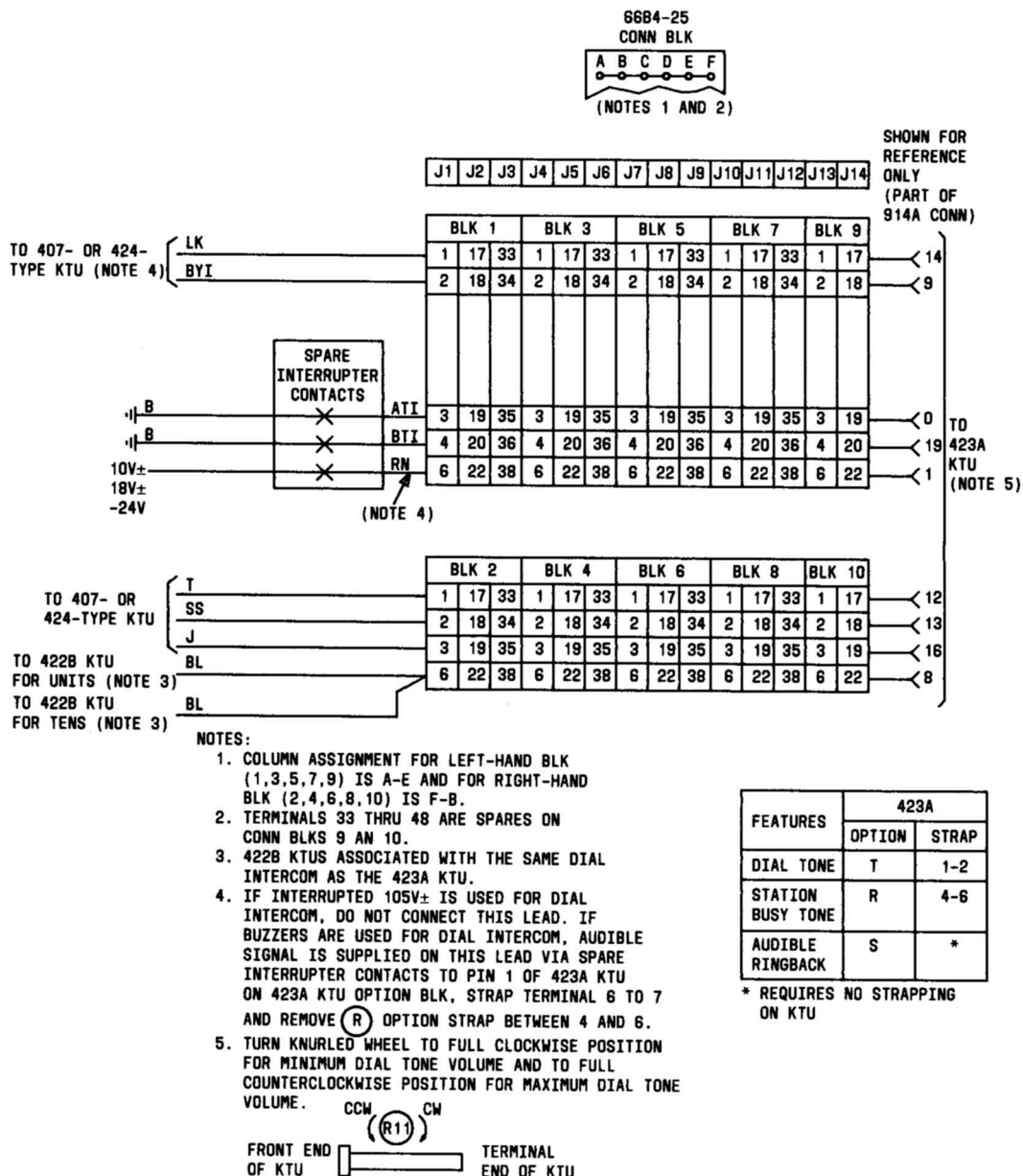
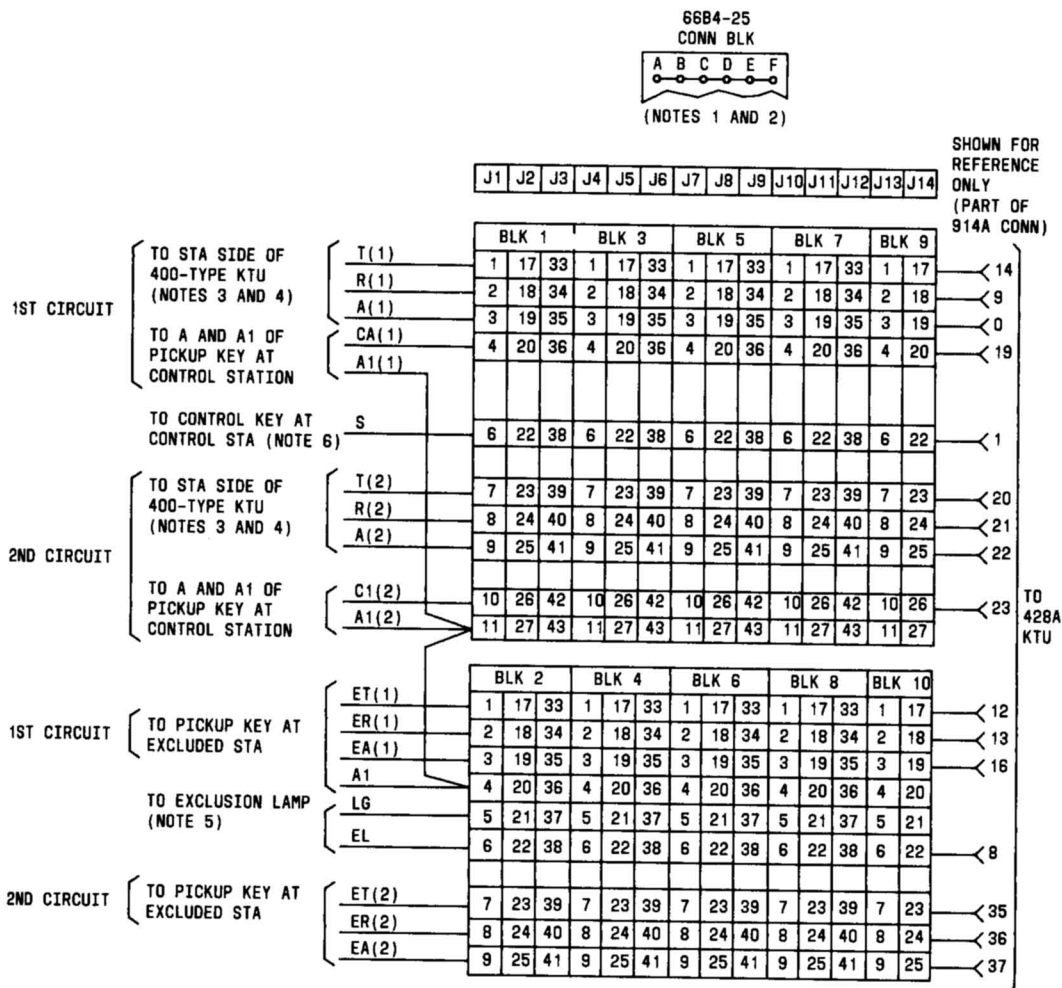


Fig. 45—Connections for 423A KTU (Dial Tone, Busy Tone, and Audible Ringback Tone Circuit) in 598-Type Panel



NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1,3,5,7,9) IS A-E AND FOR RIGHT HAND BLK (2,4,6,8,10) IS F-B.
2. TERMINALS 33 THRU 48 ARE SPARES ON CONN BLKS 9 AND 10.
3. ASSOCIATED LAMP LEADS FROM THE 400-TYPE KTU TERMINATE DIRECTLY TO TEL SETS.
4. T AND R LEAD FROM STATION SIDE OF 400-TYPE KTU ALSO TERMINATES TO TEL SET OF CONTROL STATION. "A" LEAD FROM STATION SIDE OF 400-TYPE KTU MUST CONNECT THROUGH 428A KTU BEFORE CONNECTING TO TEL SET (CA(1) OR CA(2) LEAD).
5. LAMP INDICATING AN EXCLUSION CIRCUIT IS ACTIVATED
6. CONTROL KEY MAY BE A LOCKING OR NONLOCKING TYPE.

Fig. 46—Connections for 428A KTU (Multiline Exclusion Circuit) in 598-Type Panel

6684-25 CONN BLK



(NOTES 1 AND 2)

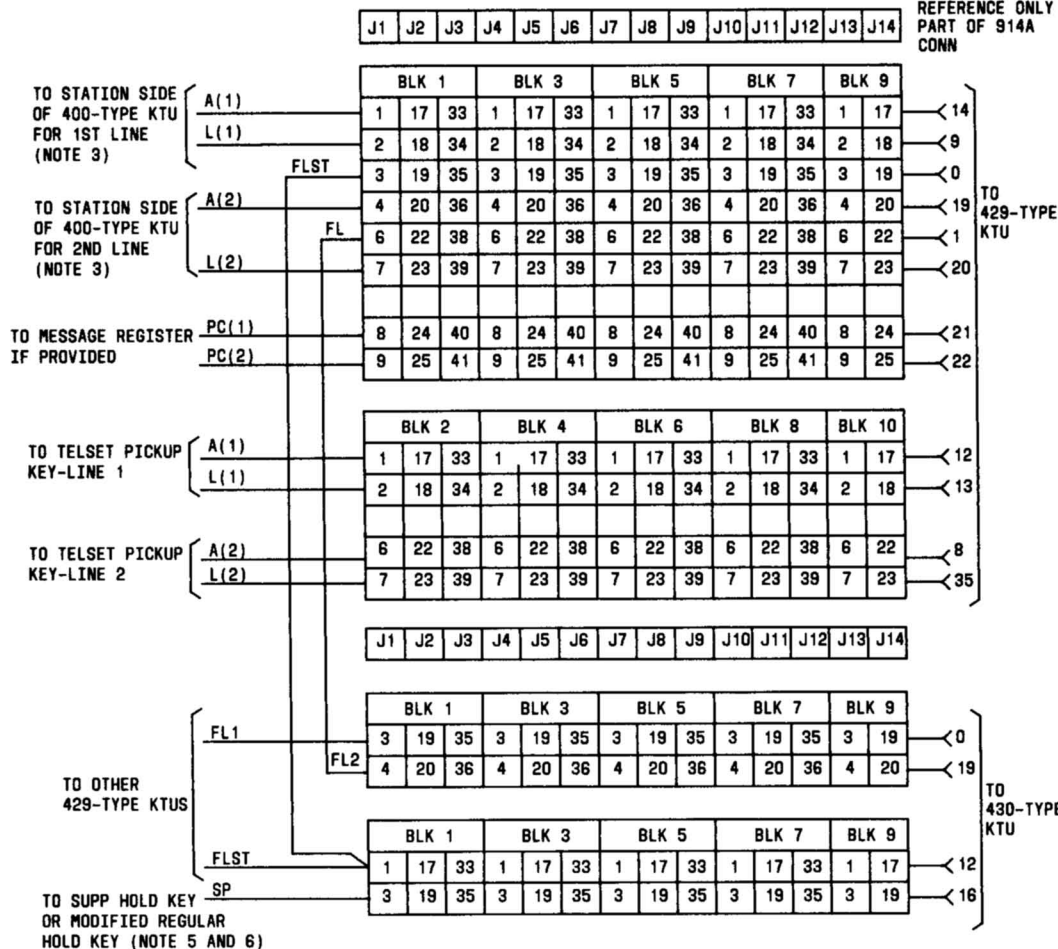
SHOWN FOR
REFERENCE ONLY
PART OF 914A
CONN

Fig. 47—Connections for 429-Type KTU (Supplementary Hold Detector Circuit) and 430A KTU (Flutter Generator Circuit) in 598-Type Panel (Sheet 1 of 2)

NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1,3,5,7,9) IS A-E AND FOR RIGHT-HAND BLK (2,4,6,8,10) F-B.
2. TERMINALS 33 THRU 48 ARE SPARES ON CONN BLKS 9 AND 10.
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:

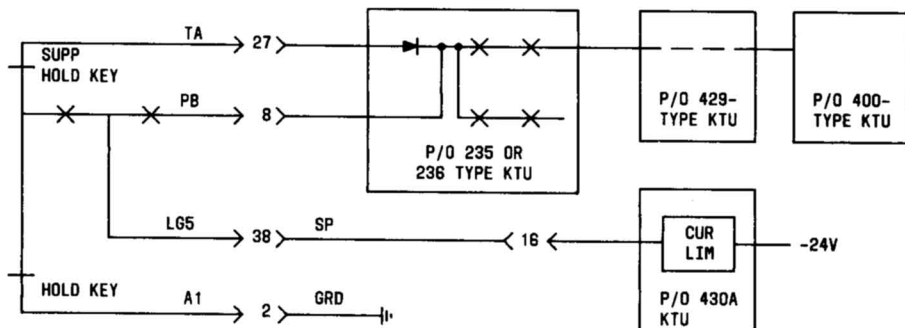


Fig. 47—Connections for 429-Type KTU (Supplementary Hold Detector Circuit) and 430A KTU (Flutter Generator Circuit) in 598-Type Panel (Sheet 2 of 2)

66B4-25 CONN BLK



(NOTES 1 AND 2)

SHOWN FOR
REFERENCE ONLY
PART OF 914A
CONNTO 449A KTU
FOR 2ND CIRCUIT
(IF PROVIDED) C(2)TO 1ST
PRINCIPAL
TELSETTO 1ST
CO/PBX LINETO ATTENDANT
STATIONTO 2ND
CO/PBX LINETO 2ND
PRINCIPAL
TELSET

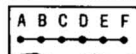
J1 J2 J3 J4 J5 J6 J7 J8 J9 J10 J11 J12 J13 J14

BLK 1	BLK 3	BLK 5	BLK 7	BLK 9
1 17 33	1 17 33	1 17 33	1 17 33	1 17
13 29 45	13 29 45	13 29 45	13 29 45	13 29
3 19 35	3 19 35	3 19 35	3 19 35	3 19
4 20 36	4 20 36	4 20 36	4 20 36	4 20
5 21 37	5 21 37	5 21 37	5 21 37	5 21
6 22 38	6 22 38	6 22 38	6 22 38	6 22
16 32 48	16 32 48	16 32 48	16 32 48	16 32
14 30 46	14 30 46	14 30 46	14 30 46	14 30
12 28 44	12 28 44	12 28 44	12 28 44	12 28
9 25 41	9 25 41	9 25 41	9 25 41	9 25
15 31 47	15 31 47	15 31 47	15 31 47	15 31
49 50	49 50	49 50	49 50	49 50

TO
448A
KTU

Fig. 48—Connections for 448A KTU (Variable Delay Timer Circuit) in 598-Type Panel (Sheet 1 of 2)

66B4-25 CONN BLK



(NOTES 1 AND 2)

SHOWN FOR
REFERENCE ONLY
PART OF 914A
CONN

J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	J13	J14
BLK 2			BLK 4			BLK 6			BLK 8			BLK 10	
4	20	36	4	20	36	4	20	36	4	20	36	4	20
13	29	45	13	29	45	13	29	45	13	29	45	13	29
5	21	37	5	21	37	5	21	37	5	21	37	5	21
3	19	35	3	19	35	3	19	35	3	19	35	3	19
12	28	44	12	28	44	12	28	44	12	28	44	12	28
6	22	38	6	22	38	6	22	38	6	22	38	6	22
16	32	48	16	32	48	16	32	48	16	32	48	16	32
9	25	41	9	25	41	9	25	41	9	25	41	9	25
7	23	39	7	23	39	7	23	39	7	23	39	7	23
8	24	40	8	24	40	8	24	40	8	24	40	8	24
10	16	42	10	16	42	10	16	42	10	16	42	10	16

TO 1ST
PRINCIPAL
TELSET

TO ATTENDANT
STATION

TO 2ND
CO/PBX LINE

TO 2ND
PRINCIPAL
TELSET

TO 448A KTU
FOR 1ST CIRCUIT
(IF PROVIDED)

TO
448A
KTU

NOTES:

1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1, 3, 5, 7, 9) IS A-E AND FOR RIGHT-HAND BLK (2, 4, 6, 8, 10) IS F-B.
2. TERMINALS 33 THRU 48 ARE SPARES ON CONN BLKS 9 AND 10.

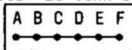
§ USE FOR COMMON AUDIBLE SIGNALING WHEN RINGER IS NOT TO BE CUT OFF.

OPTION STRAPPING ON 448A KTU OPTION BLOCK

FEATURES		OPTION	STRAP TERMINALS	
			1ST CKT	2ND CKT
AUDIBLE SIGNALS	INTERRUPTED RING	W	5 TO 8	1 TO 4
	STEADY RING	T	6TO 8	2 TO 4
	STEADY BUZZER	X	9 TO 8	3 TO 4

Fig. 48—Connections for 448A KTU (Variable Delay Timer Circuit) in 598-Type Panel (Sheet 2 of 2)

66B4-25 CONN BLK



(NOTES 1 AND 2)

SHOWN FOR
REFERENCE ONLY
PART OF 914A
CONN

J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	J13	J14
----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----

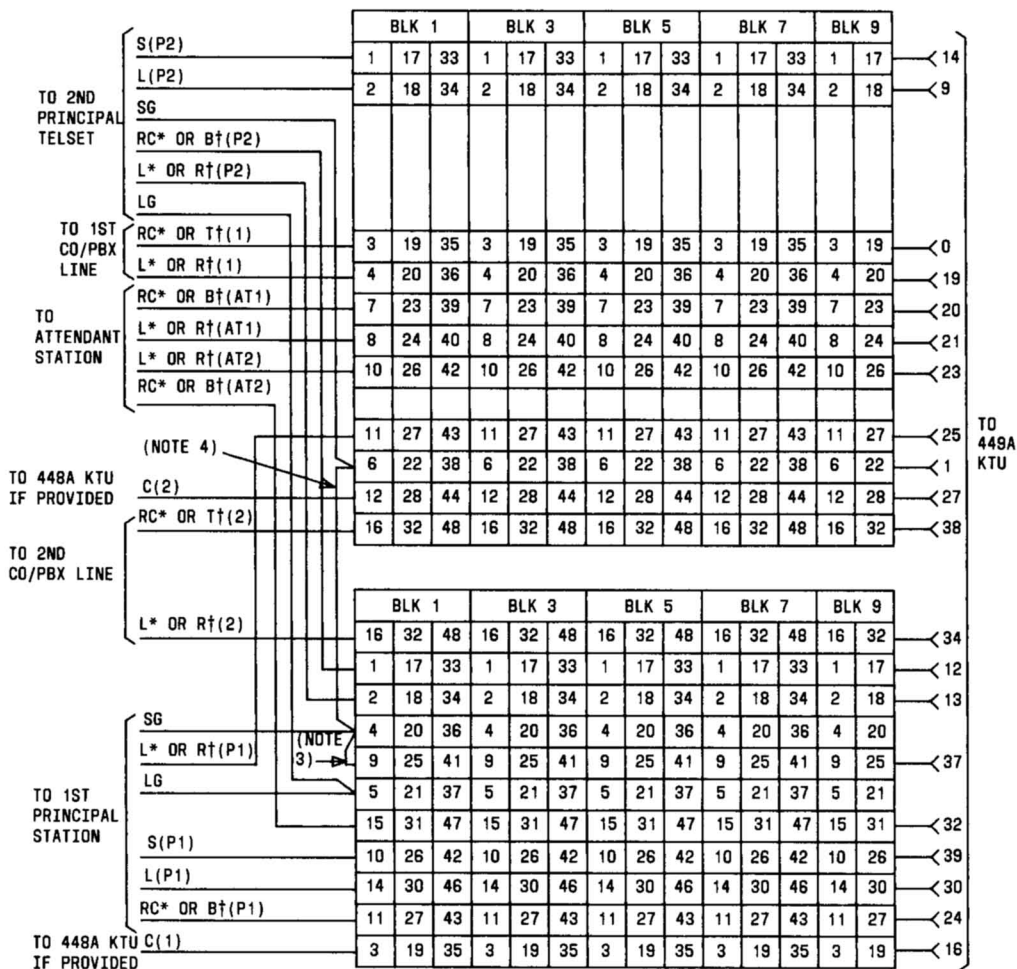
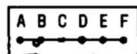


Fig. 49—Connections for 449A KTU (Immediate Transfer Control Circuit) in 598-Type Panel

66B4-25 CONN BLK



(NOTES 1 AND 2)

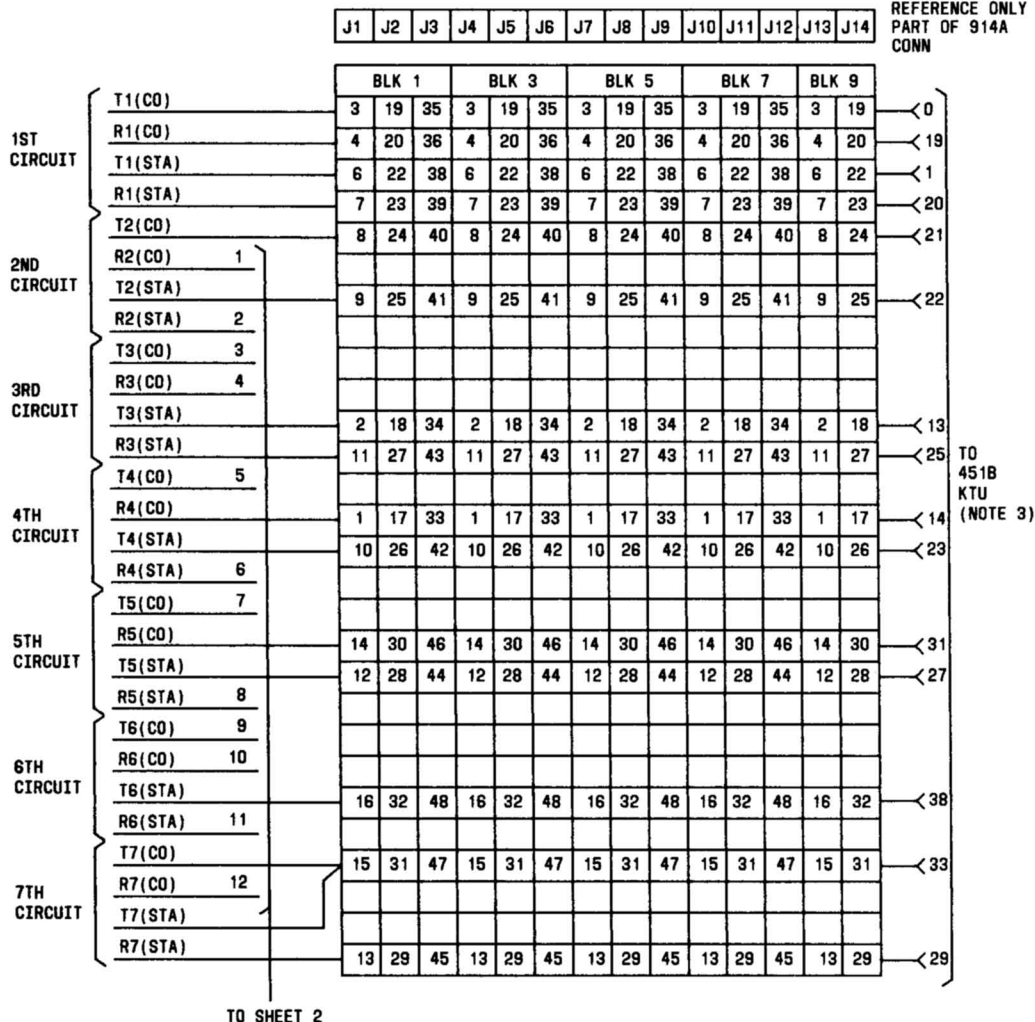
SHOWN FOR
REFERENCE ONLY
PART OF 914A
CONN

Fig. 50—Connections for 451B KTU (Music-On-Hold) in 598-Type Panel (Sheet 1 of 2)

6684-25 CONN BLK



(NOTES 1 AND 2)

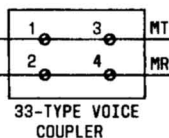
SHOWN FOR
REFERENCE ONLY
PART OF 914A
CONN

J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	J13	J14
----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----

	BLK 2			BLK 4			BLK 6			BLK 8			BLK 10	
1	10	26	42	10	26	42	10	26	42	10	26	42	10	26
2														
3	14	30	46	14	30	46	14	30	46	14	30	46	14	30
4	1	17	33	1	17	33	1	17	33	1	17	33	1	17
	11	27	43	11	27	43	11	27	43	11	27	43	11	27
5														
	6	22	38	6	22	38	6	22	38	6	22	38	6	22
6														
7	2	18	34	2	18	34	2	18	34	2	18	34	2	18
	12	28	44	12	28	44	12	28	44	12	28	44	12	28
8														
	3	19	35	3	19	35	3	19	35	3	19	35	3	19
9	9	25	41	9	25	41	9	25	41	9	25	41	9	25
10	16	32	48	16	32	48	16	32	48	16	32	48	16	32
11														
	15	31	47	15	31	47	15	31	47	15	31	47	15	31
12														
	13	29	45	13	29	45	13	29	45	13	29	45	13	29
	7	23	39	7	23	39	7	23	39	7	23	39	7	23
	8	24	40	8	24	40	8	24	40	8	24	40	8	24

FROM SHEET 1

TO CUSTOMER PROVIDED MUSIC SOURCE



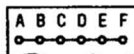
NOTES:

1. COLUMN ASSIGNMENTS FOR LEFT-HAND BLK IS A-E AND FOR RIGHT-HAND BLK F-B.
2. TERMINALS 33 THRU 48 ARE SPARES ON CONN BLKS 9 AND 10.
3. 400H KTU NOT COMPATIBLE WITH 451B KTU.

TO 451B
KTU
(NOTE 3)

Fig. 50—Connections for 451B KTU (Music-On-Hold) in 598-Type Panel (Sheet 2 of 2)

6684-25 CONN BLK



(NOTES 1 AND 2)

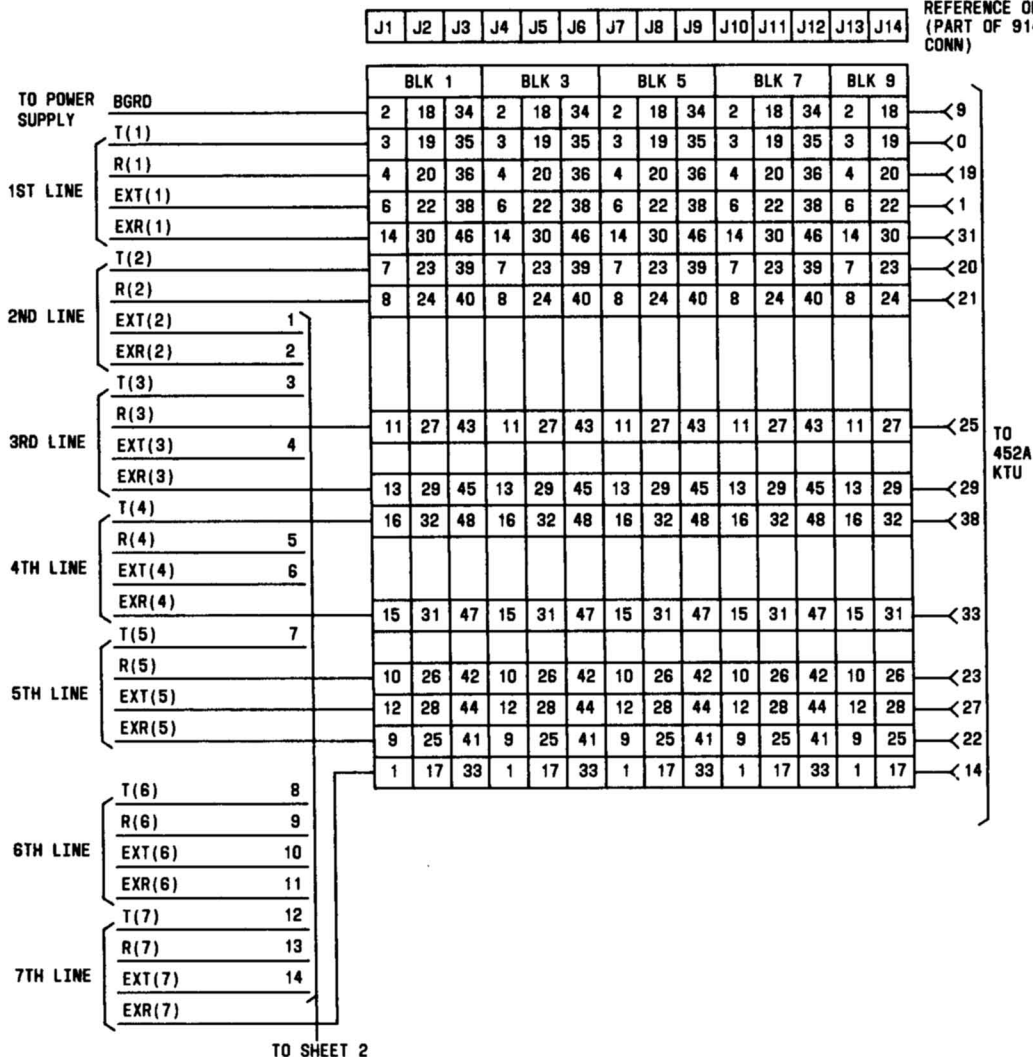
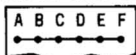
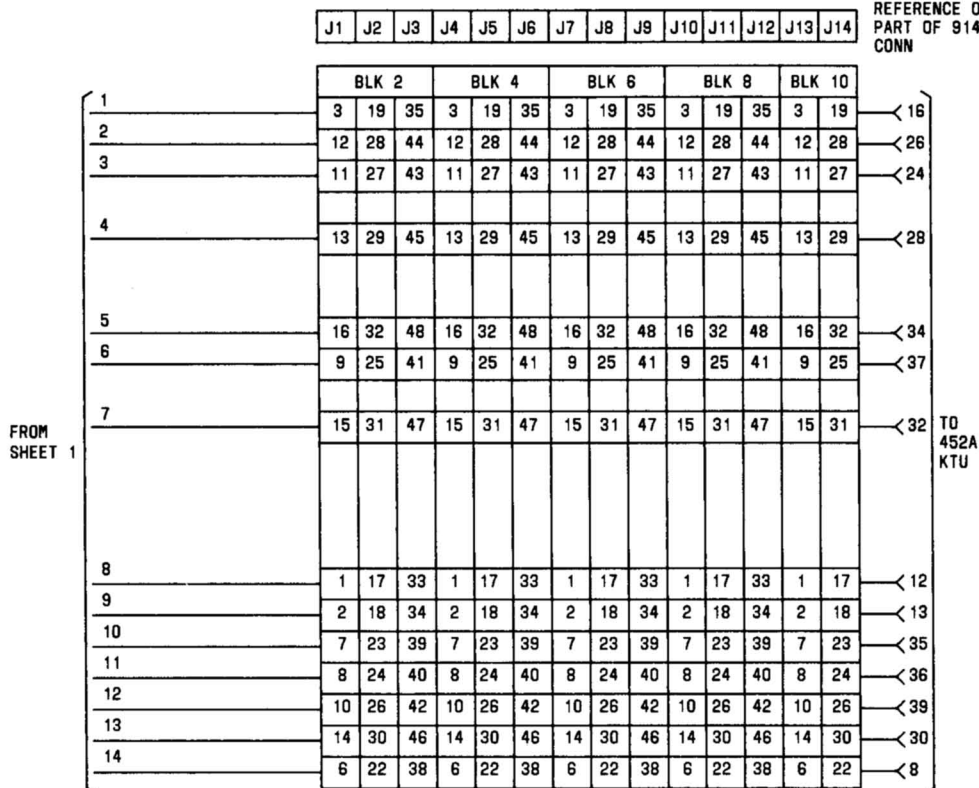
SHOWN FOR
REFERENCE ONLY
(PART OF 914A
CONN)

Fig. 51—Connections for 452A KTU (Power Failure Ringing Circuit) in 598-Type Panel (Sheet 1 of 2)

66B4-25 CONN BLK



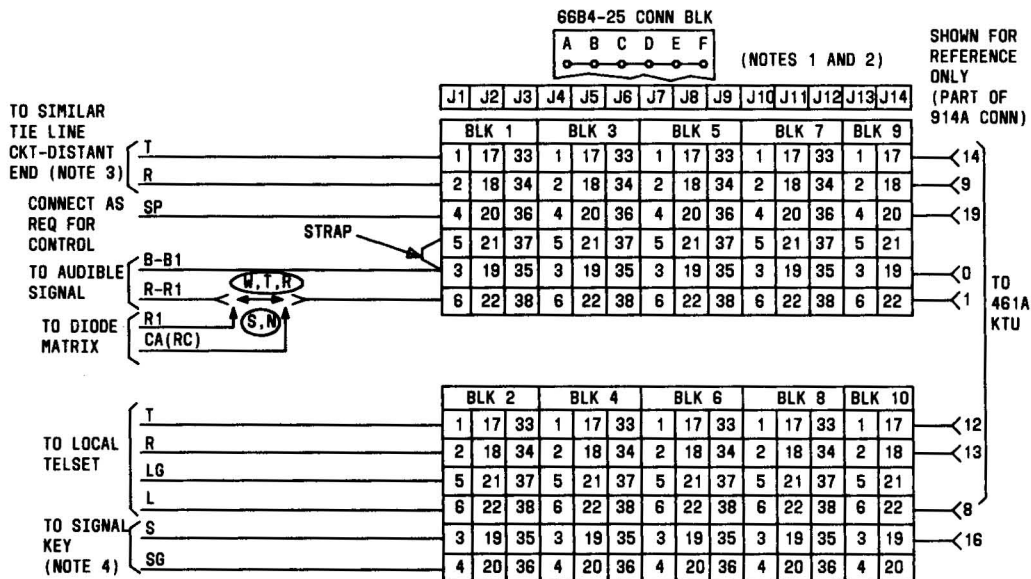
SHOWN FOR
REFERENCE ONLY
PART OF 914A
CONN



NOTES:

1. COLUMN ASSIGNMENTS FOR LEFT-HAND BLK (1, 3, 5, 7, 9) BLK IS A-E AND FOR RIGHT-HAND BLK (2, 4, 6, 8, 10) IS F-B.
2. TERMINALS 33 THRU 48 ARE SPARES ON CONN BLKS 9 AND 10.

Fig. 51—Connections for 452A KTU (Power Failure Ringing Circuit) in 598-Type Panel (Sheet 2 of 2)



NOTES:

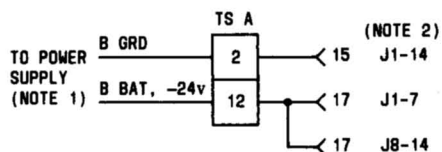
1. COLUMN ASSIGNMENT FOR LEFT-HAND BLK (1,3,5,7,9) IS A-E AND FOR RIGHT-HAND BLK (2,4,6,8,10) IS F-B.
2. TERMINALS 33 THRU 48 ARE SPARES ON CONNECTING BLOCKS 9 AND 10.
3. PRIVATE LINE CIRCUIT AT DISTANT END MAY BE A 414A KTU (MD), 416A KTU, OR ANY OTHER TYPE PRIVATE LINE UNIT REQUIRING RINGING VOLTAGE FOR THE RING UP CIRCUIT AND FURNISHING RINGING VOLTAGE FROM THE SIGNAL CIRCUIT.
4. SIGNAL KEY MAY BE A CONVERTED PICKUP KEY OR ANY EXTERNAL NONLOCKING KEY.

OPTION STRAPPING ON 461A KTU OPTION BLK

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

Fig. 52—Connections for 461A KTU (Manual Signaling, Ringdown Private Line Circuit) in 598-Type Panel

SHOWN FOR REFERENCE ONLY

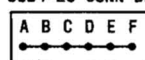


NOTES

1. B BAT AND GRD PROVIDED AS DEDICATED WIRING, NO OTHER CONNECTIONS ARE REQUIRED.
2. KTU MAY BE INSTALLED IN ANY AVAILABLE JACK.

Fig. 53—Connections for 467A KTU (Low Voltage Monitor Circuit) in 598-Type Panel

66B4-25 CONN BLK



(NOTES 1 AND 2)

SHOWN FOR
REFERENCE ONLY
PART OF 914A
CONN

TO TELESSET LAMPS
POWERED FROM
400-TYPE KTU

L

J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	J13	J14
----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----

BLK 2			BLK 4			BLK 6			BLK 8			BLK 10	
6	22	38	6	22	38	6	22	38	6	22	38	6	22

8 400-TYPE
KTU

(NOTE 3)

J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	J13	J14
----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----

BLK 1			BLK 3			BLK 5			BLK 7			BLK 9	
6	22	38	6	22	38	6	22	38	6	22	38	6	22

1

TO TELESSET LAMPS
POWERED FROM
469A KTU

L

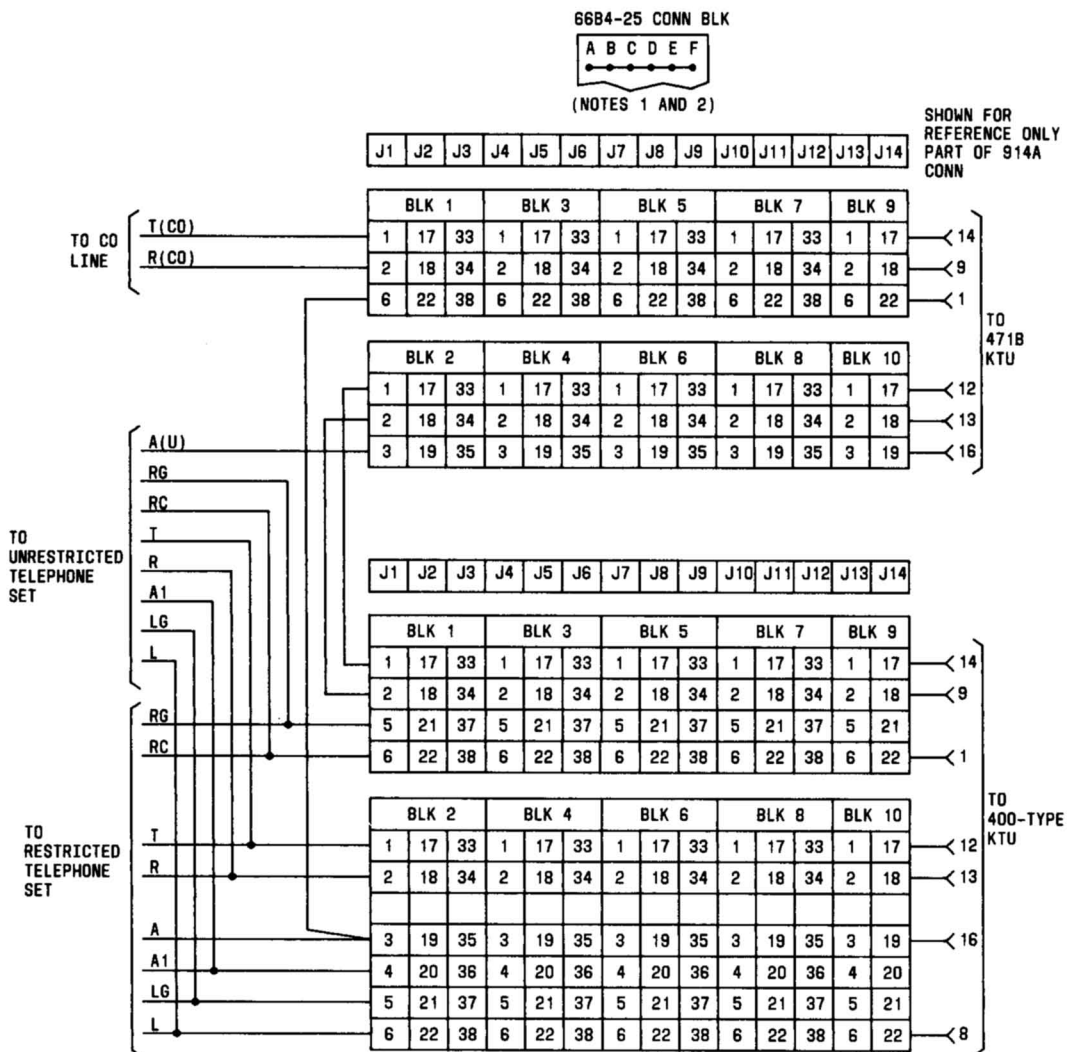
BLK 2			BLK 4			BLK 6			BLK 8			BLK 10	
6	22	38	6	22	38	6	22	38	6	22	38	6	22

8 469A
KTU

NOTES:

1. COLUMN ASSIGNMENTS FOR LEFT-HAND BLK (1,3,5,7,9) IS A-E AND FOR RIGHT-HAND BLK (2,4,6,8,10) IS F-B.
2. TERMINALS 33 THRU 48 ARE SPARES ON CONN BLKS 9 AND 10.
3. PLACE STRAP FROM CONNECTOR TERMINAL OF 400-TYPE KTU REQUIRING LAMP MULTIPLE TO CONNECTOR TERMINAL OF 469A KTU. ADDITIONAL LAMPS ARE POWERED FROM 469A KTU.

Fig. 54—Connections for 469A KTU (Lamp Extender Circuit) in 598-Type Panel

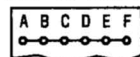


NOTES:

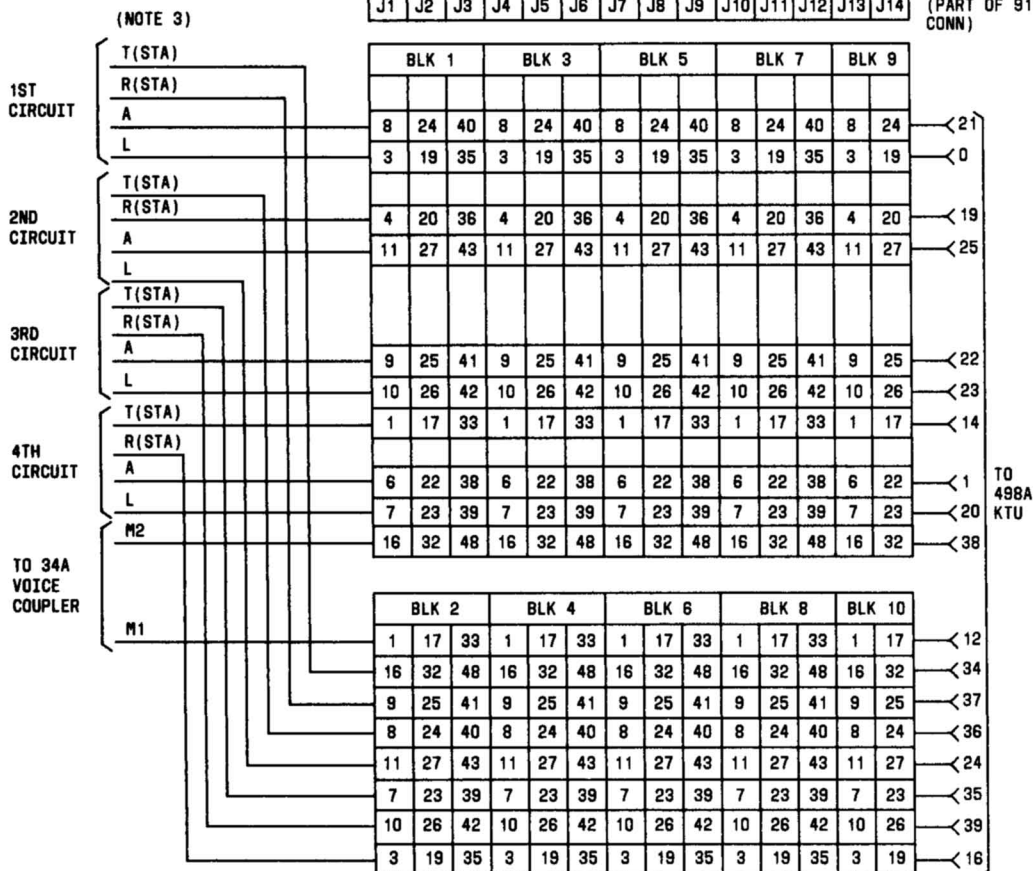
1. COLUMN ASSIGNMENTS FOR LEFT-HAND BLK (1,3,5,7,9) IS A-E AND FOR RIGHT-HAND BLK (2,4,6,8,10) IS F-B.
2. TERMINALS 33 THRU 48 ARE SPARES ON CONN BLKS 9 AND 10.

Fig. 55—Connections for 471B KTU (Battery Reversal Toll Restriction Circuit) in 598-Type Panel

8684-25 CONN BLK



(NOTES 1 AND 2)

SHOWN FOR
REFERENCE ONLY
(PART OF 914A
CONN)

NOTES:

1. COLUMN ASSIGNMENTS FOR LEFT-HAND BLK IS A-E AND FOR RIGHT-HAND BLK IS F-B.
2. TERMINALS 33 THROUGH 48 ARE SPARES ON CONN BLKS 9 AND 10.
3. THIS KTU SHOULD BE USED FOR 4 CIRCUITS ONLY. THE 116A1 CIRCUIT MODULE SHOULD NOT BE ADDED TO THIS UNIT BECAUSE OF WIRING INCOMPATIBILITY IN THE 598-TYPE PANEL.

Fig. 56—Connections for 498A KTU (Music-On-Hold) in 598-Type Panel