

## 6A KEY TELEPHONE SYSTEM

### TWO-TALKING LINK

### CONNECTIONS

#### 1. GENERAL

**1.01** Identification and installation information for this system is covered in Section 518-410-100.

**1.02** This section is reissued to revise connection information in all existing figures and to add a figure.

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

SD-69286-01 Issue 8D

SD-69447-01 Issue 6D

SD-69529-01 Issue 6B

If this section is to be used with equipment or apparatus reflecting later issue(s) of the drawing(s) reference should be made to the SDs and CDs to determine the extent of the changes and the manner in which the section may be affected.

**1.04** The visual and audible signal circuit referred to in this section is the electromechanical flash, wink, ring, and timeout circuit (232-type KTU).

#### 2. CONNECTIONS

**2.01** The connection diagrams serve as a guide to the installer in connecting the 6A Key Telephone System units to provide the desired features.

**2.02** When adding a TOUCH-TONE® adapter (247-type KTU) to a system that has TOUCH-TONE and rotary dial stations, the following applies:

- (a) TOUCH-TONE and rotary dial stations must be assigned line circuits on separate KTUs (222A or 223A). This insures that the TOUCH-TONE

adapter will be activated only by TOUCH-TONE dial stations.

- (b) The number of each type dial station determines whether they are assigned to the 9-station KTU (222A) or 3-station KTU (223A).

**2.03** Where diodes, resistors, etc, are furnished on a local basis, use a 228A KTU (bridging unit) or equivalent for terminations.

#### 2.04 Connection Index

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Fig. 9—▶ Addition of Auxiliary Relay Lamp Flash Circuit (227A or B KTU)◀

Fig. 10—▶ Addition of TOUCH-TONE Adapter Circuit (247A KTU [MD] with 222A and 223A KTUs)◀

Fig. 11—▶ Addition of TOUCH-TONE Adapter Circuit (247B KTU with 222A and 223A KTUs)◀

Fig. 12—▶ Y2 Card Options in 247B KTU◀

Fig. 13—▶ Addition of Station Busy Circuit (227A or B KTU)◀

**Note 1:** Provide *M* option when system is over 40 busy lamps.

**Note 2:** Provide *V* option when system is over 20 simultaneous flashing line lamps.

**Note 3:** A 207C KTU is required when dial tone is furnished.

**TABLE A**  
**WIRING OPTIONS ASSOCIATED**  
**WITH SYSTEM**

WIRING	OPTION	
X	Without (max 9 codes)	Transfer Circuit
W	With (over 9 codes)	
K	With	Preset Conference
J	Without	
G	With	Camp-On
T		
N	Without	
H	Without	Aux Rel Busy Lamp Ckt (Note 1)
M	With	
S	Without	Aux Rel Lamp Flash Ckt (Note 2)
V	With	
AK	Interrupted	Audible Signal
AL	Single Spurt	
AJ	Dial, Busy, and Audible Tone (Note 3)	
AQ	Busy Signal and Camp-On Control Circuit When Used With a 207B KTU	
AR	Preset Conference Time-Out Circuit	

**Notes:**

1. Provide *M* option when system is over 40 busy lamps.
2. Provide *V* option when system is over 20 simultaneous flashing line lamps.
3. A 207C KTU is required when dial tone is furnished.

**TABLE B**  
**WIRING OPTIONS ASSOCIATED**  
**WITH STATIONS**

WIRING	OPTION	
E	With	Automatic Cutoff (Note 1)
F	Without	
Y	Over <i>T &amp; R</i> Leads	Sta Aud Sig.
Z	Over Sep Sig Pair	
AA	Sta Assoc With Com Aud Arr	
AB	Sta to Originate Add-On Conference (MD)	
Q	With	Aux Rel Sta Ckt (MD) (Note 2)
AG	Without	
AG	Without	Add-On Transfer Ckt (Note 3)
AO	With	
AE	Local Sta or Off-Prem Sta When <i>AK</i> Opt is Provided	Sig Key Selection of Station
AF	Off-Prem Sta When <i>AL</i> Opt is Provided	
AS	Without	Station Busy
AT	With	

**Notes:**

1. A station wired for *F* option cannot camp on the system.
2. Provide *Q* option when a station that originates add-on conferencing (*AB* option) is also associated with *Z* or *AA* option.
3. Provide *AO* option for each station that originates the add-on conference circuit.



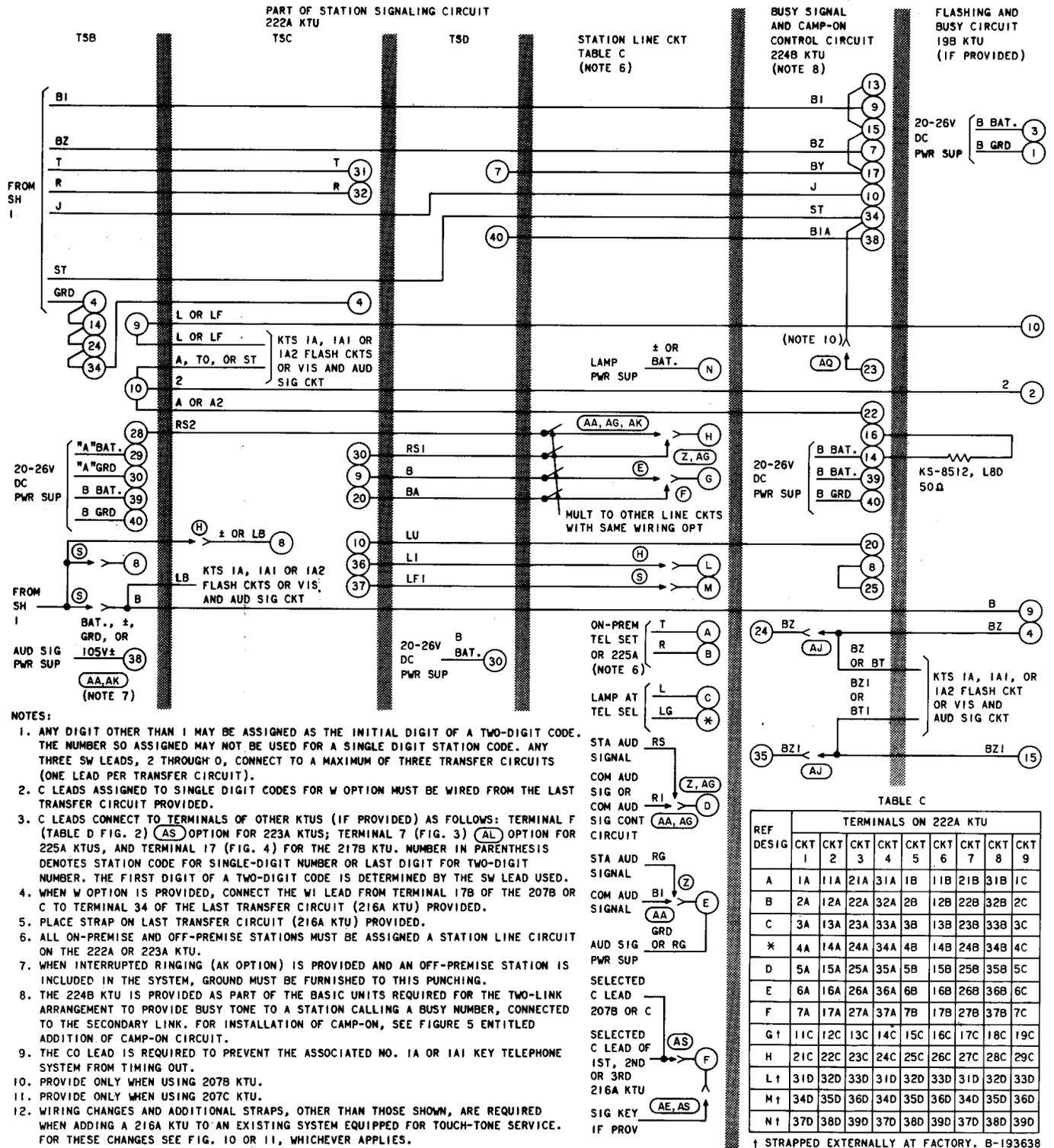


Fig. 1—Connections For Basic Units (207B or C, 216A, 222A, and 224A KTUs) (Sheet 2)

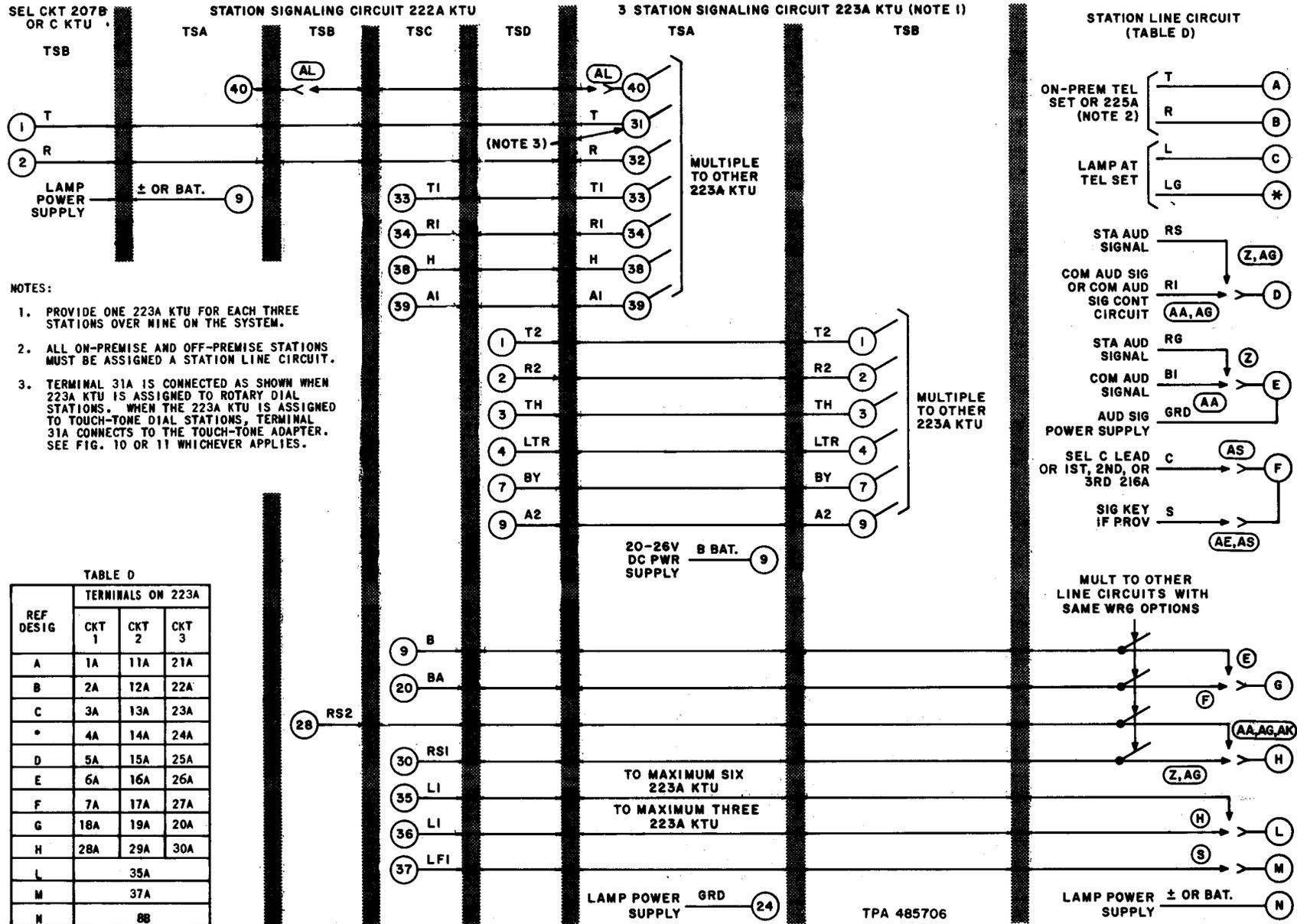
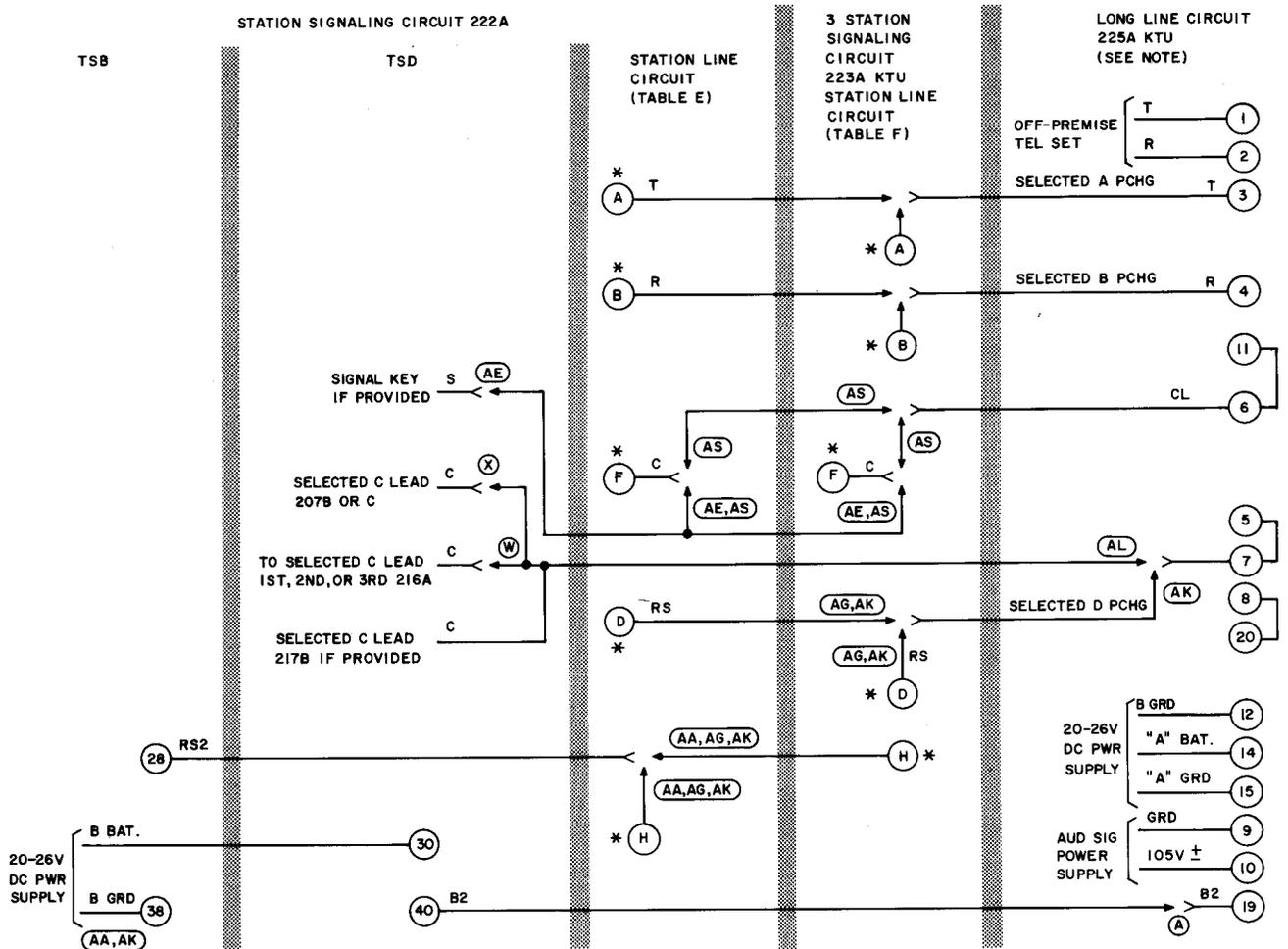


Fig. 2—Addition of Three Station Line Circuits (223A KTU)

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NOTE:  
 EACH OFF-PREMISE STATION MUST BE ASSIGNED A STATION CIRCUIT ON THE 222A OR 223A KTU.  
 \* LINE CIRCUIT ASSIGNED TO OFF-PREMISE STATION.

TABLE E

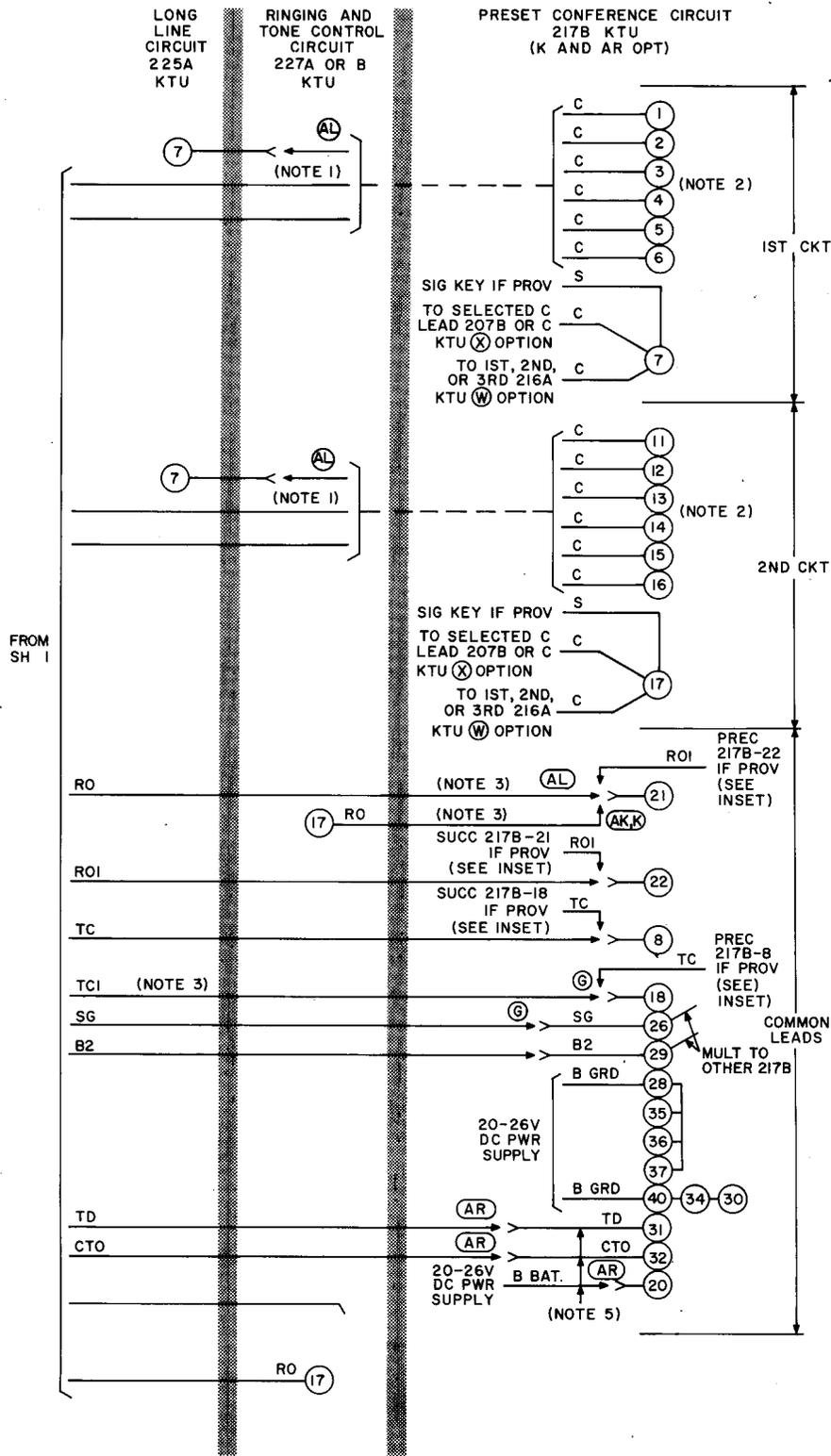
REF DESIG	TERMINALS ON 222A								
	CKT 1	CKT 2	CKT 3	CKT 4	CKT 5	CKT 6	CKT 7	CKT 8	CKT 9
A*	1A	11A	21A	31A	1B	11B	21B	31B	1C
B*	2A	12A	22A	32A	2B	12B	22B	32B	2C
D*	5A	15A	25A	35A	5B	15B	25B	35B	5C
F*	7A	17A	27A	37A	7B	17B	27B	37B	7C
H*	21C	22C	23C	24C	25C	26C	27	28C	29C

TABLE F

REF DESIG	TERMINALS ON 223A		
	CKT 1	CKT 2	CKT 3
A*	1A	11A	21A
B*	2A	12A	22A
D*	5A	15A	25A
F*	7A	17A	27A
H*	28A	29A	30A

Fig. 3—Addition of Long Line Circuit (225A KTU)





NOTES:

1. WHEN AK OPTION (INTERRUPTED AUDIBLE SIGNAL) IS FURNISHED THE C LEAD FOR THE OFF-PREMISE STATION CONNECTS TO THE F TERMINAL OF THE STATION LINE CIRCUIT ASSIGNED TO IT ON THE 222A or 223A KTU.
2. TO MAXIMUM OF SIX STATION LINE OR LONG LINE CIRCUITS (ONE CIRCUIT PER C LEAD). A STATION MAY APPEAR ON MORE THAN ONE CONFERENCE CIRCUIT.
3. PROVIDE STRAP TO FIRST 217B KTU ONLY.
4. PROVIDE STRAP TO LAST 217B KTU ONLY.
5. PROVIDE TD, CTO, AND B BAT. STRAPS ON FIRST 217B KTU ONLY.

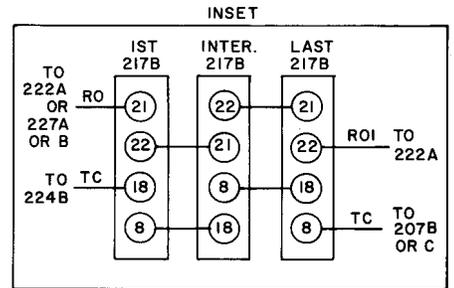


TABLE G

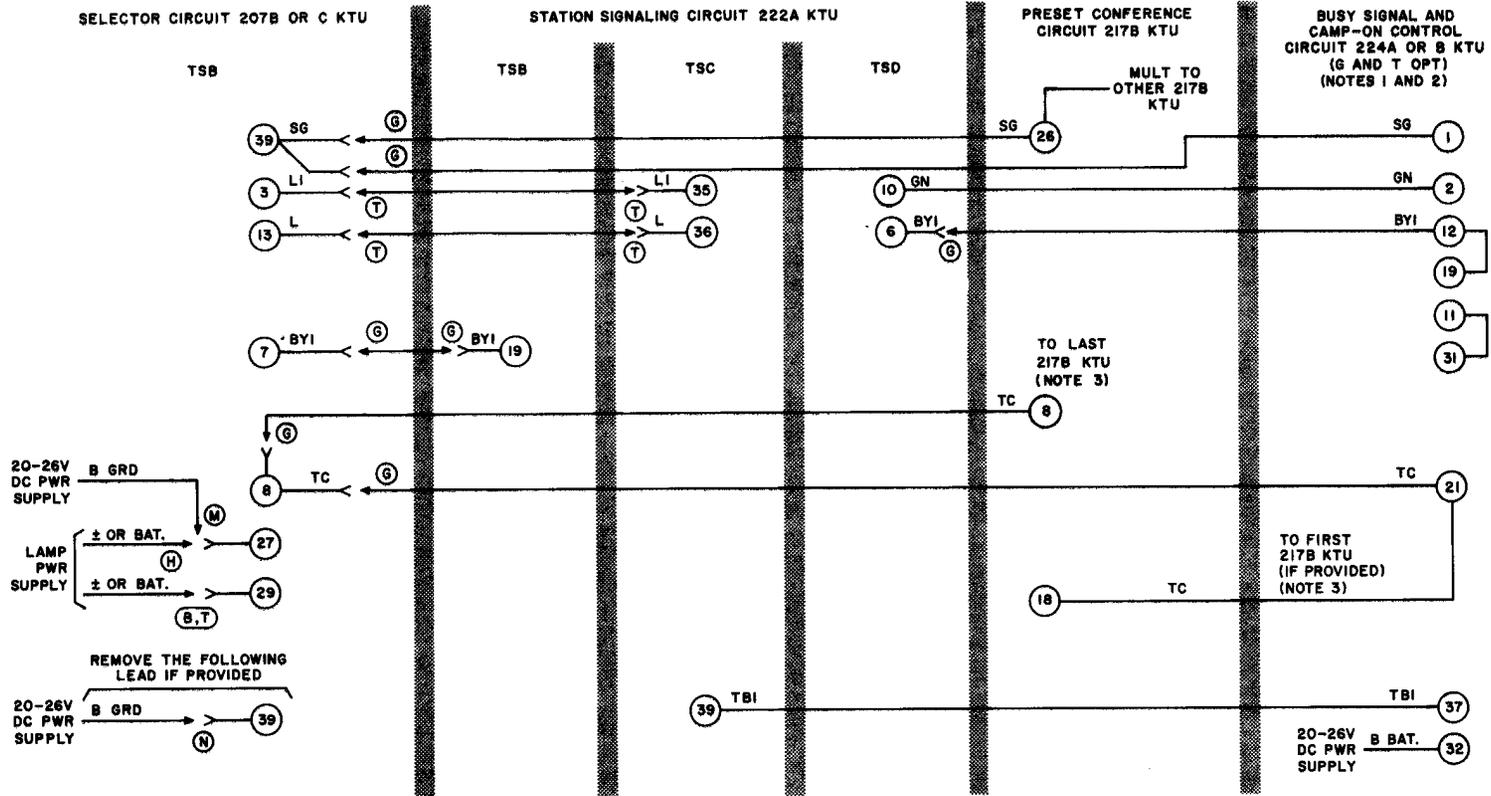
REF DESIG	TERMINALS ON 222A								
	CKT 1	CKT 2	CKT 3	CKT 4	CKT 5	CKT 6	CKT 7	CKT 8	CKT 9
F*	7A	17A	27A	37A	7B	17B	27B	37B	7C

TABLE H

REF DESIG	TERMINALS ON 223A		
	CKT 1	CKT 2	CKT 3
F*	7A	17A	27A

\* LINE CIRCUIT OF STATION ASSIGNED TO PRESET CONFERENCE CKT.

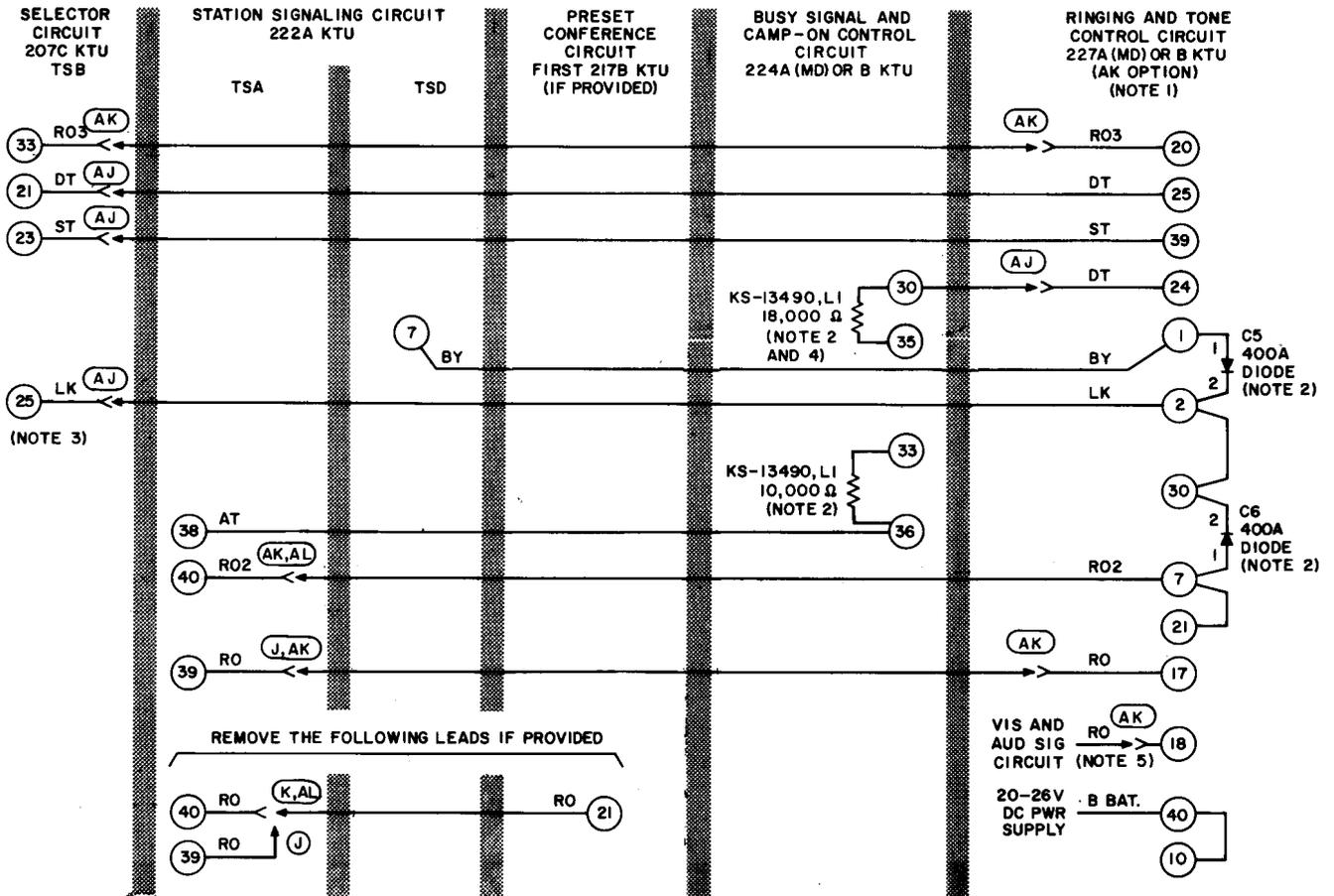
Fig. 4—Addition or Pre-set Conference and Time-Out Circuit (217B KTU) (Sheet 2)



NOTES:

1. ADDITION OF 224B KTU IS NOT REQUIRED FOR CAMP-ON CONTROL CIRCUIT AS THIS IS PROVIDED AS PART OF BASIC UNITS. (SEE FIG. 1 SHEET 2).
2. WHEN THE 224A KTU IS PROVIDED AND THE CAMP-ON CIRCUIT FAILS TO CUT-THROUGH DURING LINK TRANSFER, DUE TO RELAY (LTR) OPERATING AND RELEASING BEFORE RELAY (BY) RELEASES, DISCONNECT THE "LU" LEAD FROM TERMINAL 20 AND CONNECT A 3900 OHM KS-13490, L1 RESISTOR ACROSS TERMINALS 20 AND 30 OF THE 224A KTU. CONNECT THE "LU" LEAD TO TERMINAL 30.
3. WHEN MORE THAN ONE 217B KTU IS PROVIDED, THE TC LEAD MUST BE STRAPPED BETWEEN THE 217B KTU'S (SEE INSET FIG. 4).

Fig. 5—Addition of Camp-On Control Circuit (224A or B KTU)



NOTES:

1. WHEN INTERRUPTED RINGING (AK OPTION) IS ADDED TO AN EXISTING SYSTEM, CHANGES ARE REQUIRED ON LONG LINE CIRCUITS, IF PROVIDED. (SEE FIGURE 3 ENTITLED ADDITION OF LONG LINE CIRCUIT.)
2. ORDER AND PLACE LOCALLY.
3. WHEN DIAL TONE IS ADDED TO AN EXISTING SYSTEM EQUIPPED WITH A "TOUCH-TONE" ADAPTER (247A(MD) OR B KTU), THE LK LEAD IS CONNECTED DIFFERENTLY THAN IS SHOWN. SEE FIG. 10 OR 11 WHICHEVER APPLIES.
4. PLACE AN 18,000 OHM RESISTOR FOR "TOUCH-TONE" SERVICE (247A OR B KTU) ONLY. FOR ROTARY DIAL SERVICE TERMINATE DT LEAD ON 224A KTU TERMINAL 35.
5. TO TERMINAL 34 OF 232-TYPE KTU IF PROVIDED.

Fig. 6—Addition of Dial Tone, Audible Tone and Interrupted Ringing (227A or B KTU)

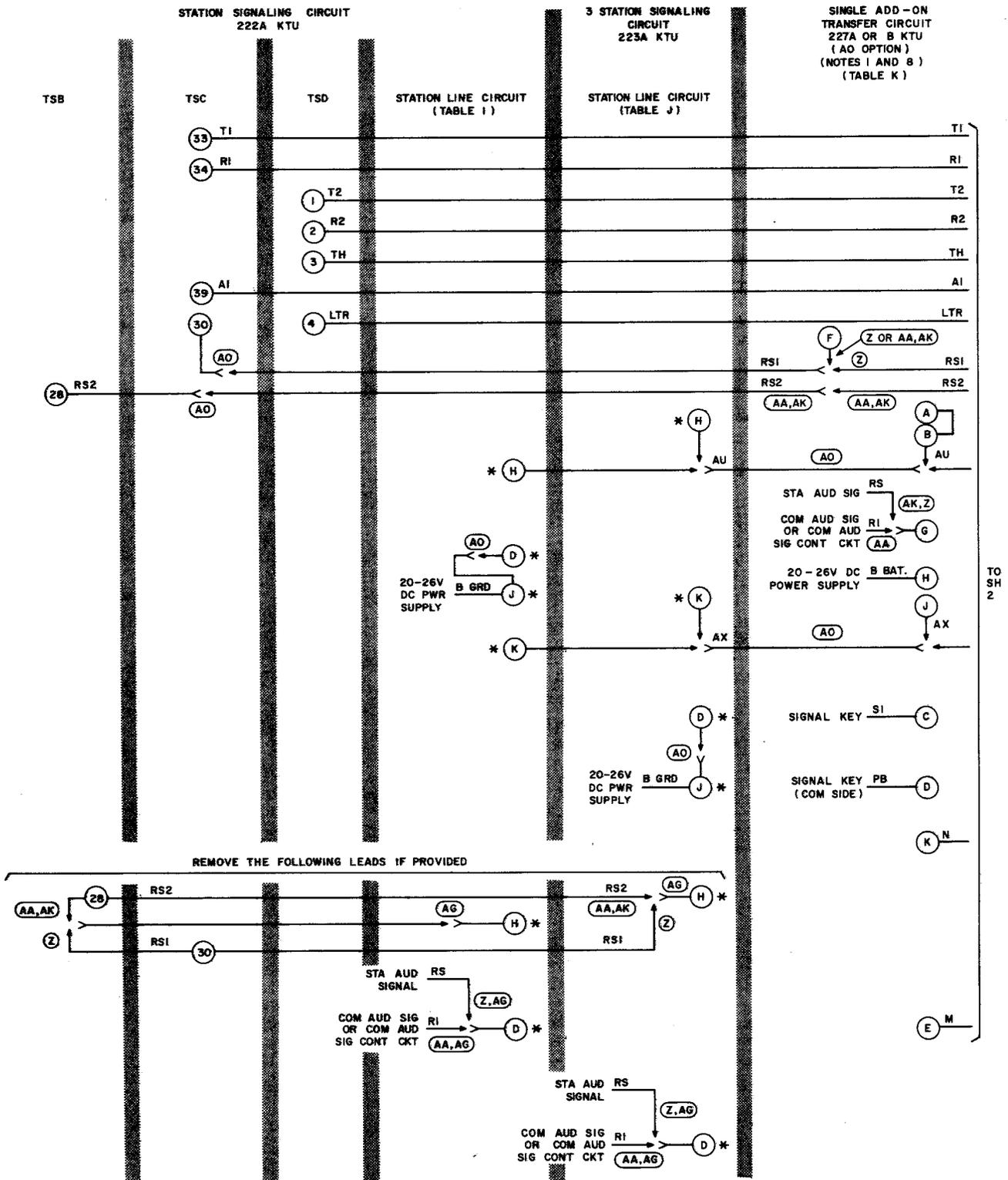
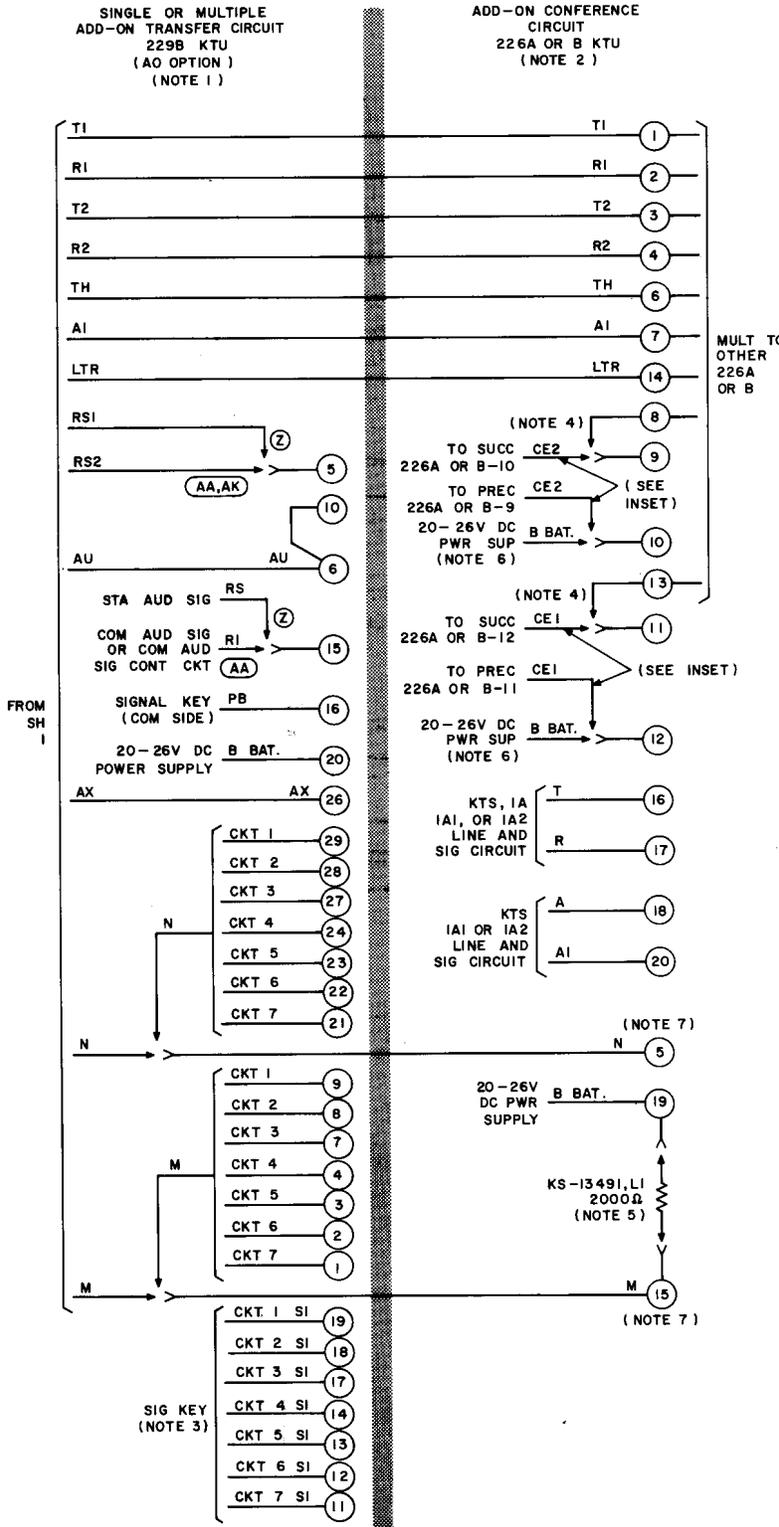


Fig. 7—Addition of Add-On Conference Circuit (226A or B KTU) (Sheet 1)



- NOTES:
1. AN ADD-ON TRANSFER CIRCUIT IS REQUIRED FOR EACH STATION ORIGINATING ADD-ON CONFERENCE. USE A 227A OR B KTU FOR SINGLE-LINE ADD-ON OR A 229B KTU FOR SINGLE OR MULTIPLE LINE ADD-ON.
  2. PROVIDE ONE 226A OR B FOR EACH CENTRAL OFFICE OR PBX LINE TO BE CONFERENCED.
  3. PROVIDE ONE NONLOCKING SIGNAL KEY FOR EACH ADD-ON CONFERENCE CIRCUIT.
  4. PLACE STRAP ON LAST 226A OR B ONLY.
  5. RESISTOR REQUIRED ON 226A ONLY. ORDER AND PLACE LOCALLY.
  6. PLACE B BATTERY ON FIRST 226A OR B ONLY.
  7. MORE THAN ONE STATION CAN ORIGINATE THE SAME ADD-ON CONFERENCE CIRCUIT BY MULTIPLYING THE "M" AND "N" LEAD CONNECTIONS OF THE ADD-ON TRANSFER CKTS, TO RESPECTIVE TERMINALS 15 AND 5 OF THE SAME 226A OR B.
  8. USE ONLY THE MS RELAY ON THE 227A KTU OR ANY RELAY (CA1, CA2, OR MS) OF THE 227B KTU FOR A SINGLE ADD-ON TRANSFER CIRCUIT. (SEE TABLE K)
- \* LINE CIRCUIT OF STATION ORIGINATING CONFERENCE

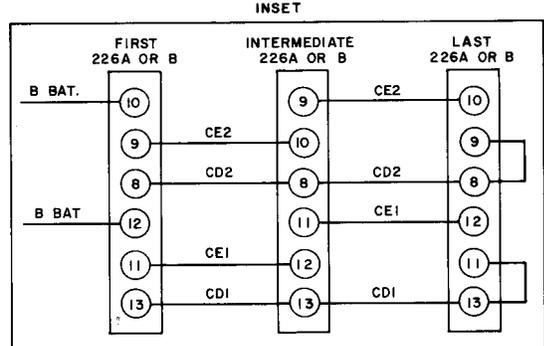


TABLE J

REF DESIG	TERMINALS ON 223A		
	CKT 1	CKT 2	CKT 3
D	5A	15A	25A
H	28A	29A	30A
J	11B	13B	15B
K	12B	14B	16B

TABLE K

REF DESIG	RELAY AND TERMINAL DESIGNATIONS		
	227B		
	227A		
	CA1 RELAY	CA2 RELAY	MS RELAY
A	5	8	2
B	14	20	26
C	12	18	24
D	15	21	27
E	11	17	23
F	36	34	30
G	31	33	39
H	1	10	40
J	16	22	28
K	13	19	25

TABLE I

REF DESIG	TERMINALS ON 222A								
	CKT 1	CKT 2	CKT 3	CKT 4	CKT 5	CKT 6	CKT 7	CKT 8	CKT 9
D	5A	15A	25A	35A	5B	15B	25B	35B	5C
H	21C	22C	23C	24C	25C	26C	27C	28C	29C
J	11D	12D	13D	14D	15D	16D	17D	18D	19D
K	21D	22D	23D	24D	25D	26D	27D	28D	29D

Fig. 7—Addition of Add-On Conference Circuit (226A or B KTU) (Sheet 2)

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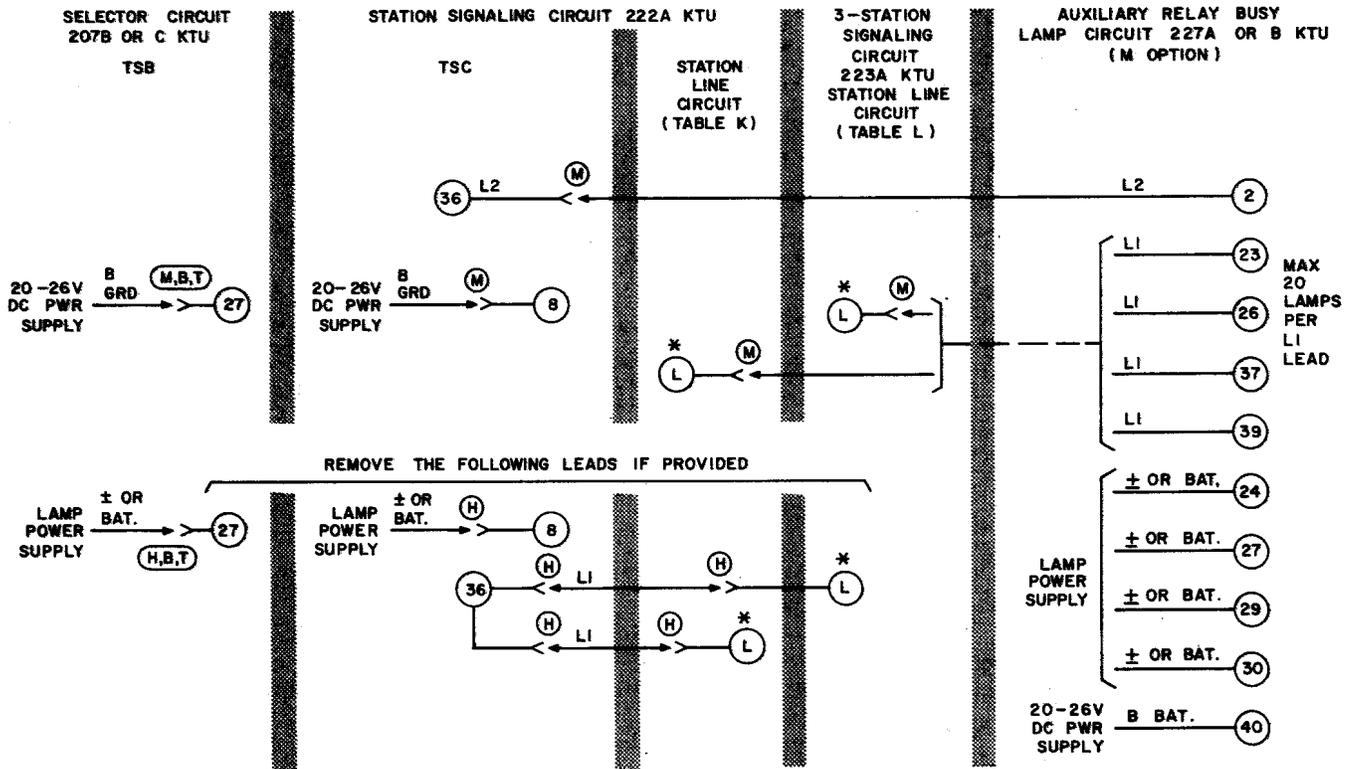


TABLE K

REF DESIG	TERMINALS ON 222A								
	CKT 1	CKT 2	CKT 3	CKT 4	CKT 5	CKT 6	CKT 7	CKT 8	CKT 9
L	31D	32D	33D	31D	32D	33D	31D	32D	33D

TABLE L

REF DESIG	TERMINALS ON 223A		
	CKT 1	CKT 2	CKT 3
L	35A		

\* LINE CIRCUIT INVOLVED

Fig. 8—Addition of Auxiliary Relay Busy Lamp Circuit (227A or B KTU)

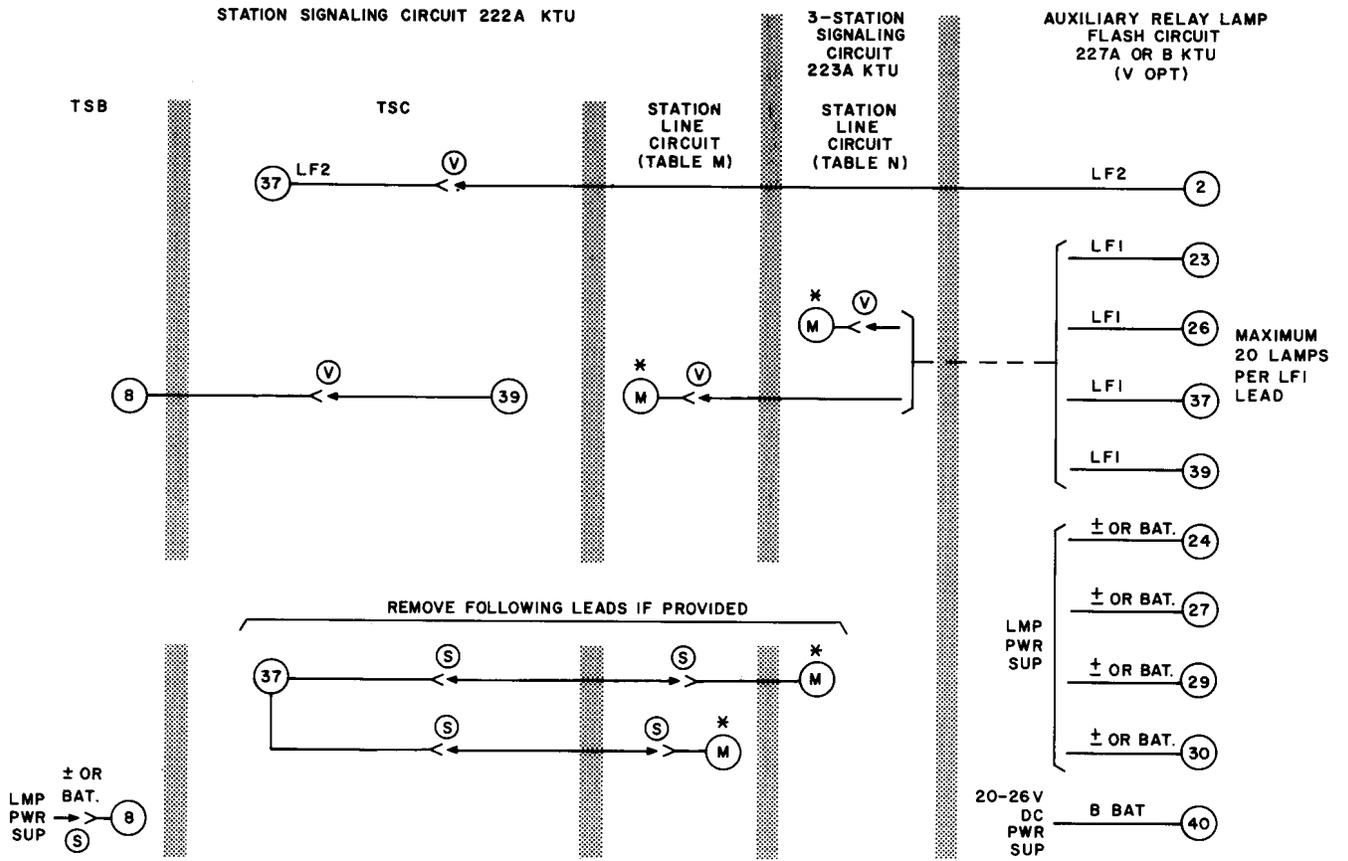


TABLE M

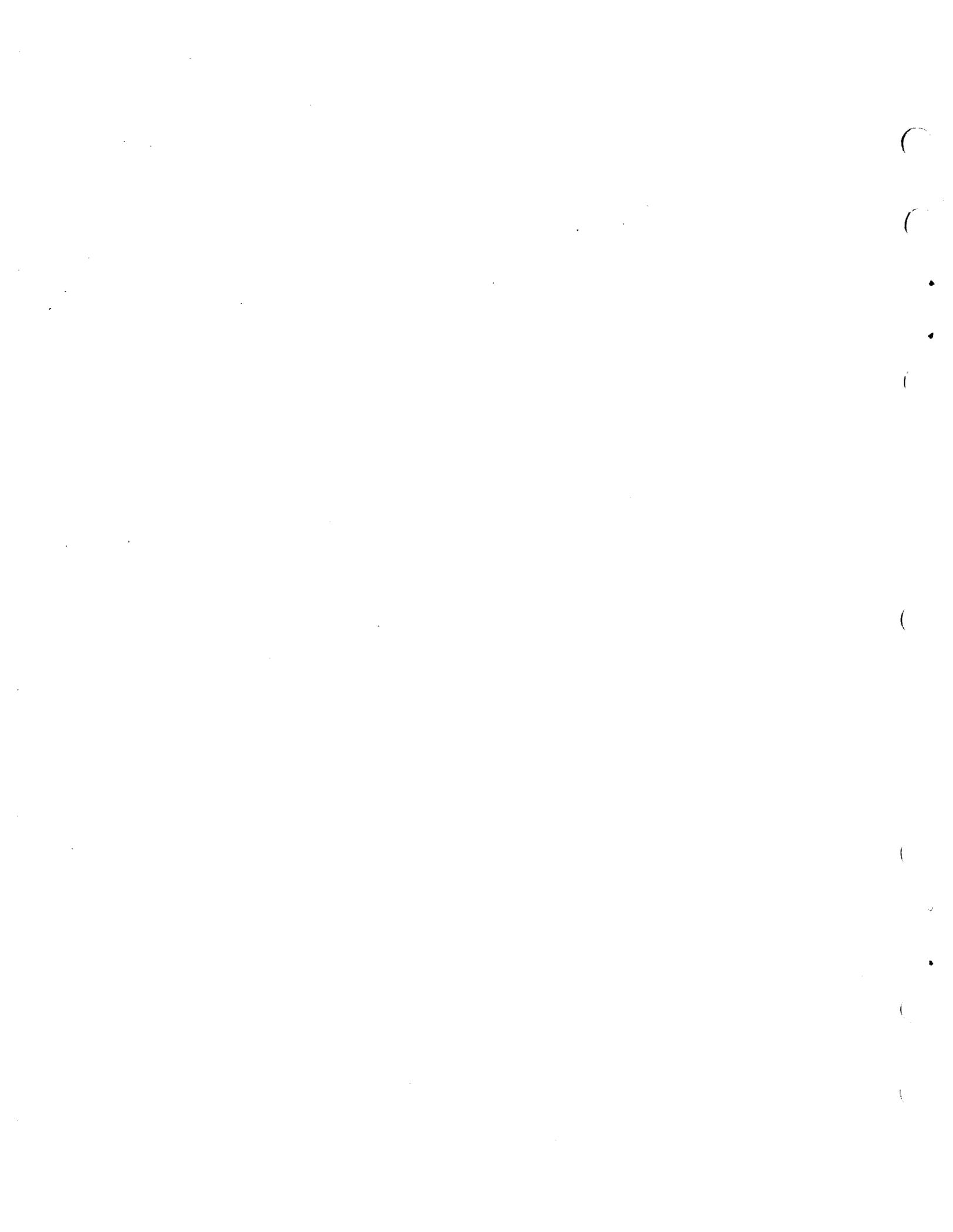
REF DESIG	TERMINALS ON 222A								
	CKT 1	CKT 2	CKT 3	CKT 4	CKT 5	CKT 6	CKT 7	CKT 8	CKT 9
M	34D	35D	36D	34D	35D	36D	34D	35D	36D

TABLE N

REF DESIG	TERMINALS ON 223A		
	CKT 1	CKT 2	CKT 3
M	37A		

\* LINE CIRCUIT INVOLVED

Fig. 9—Addition of Auxiliary Relay Lamp Flash Circuit 227A or B KTU



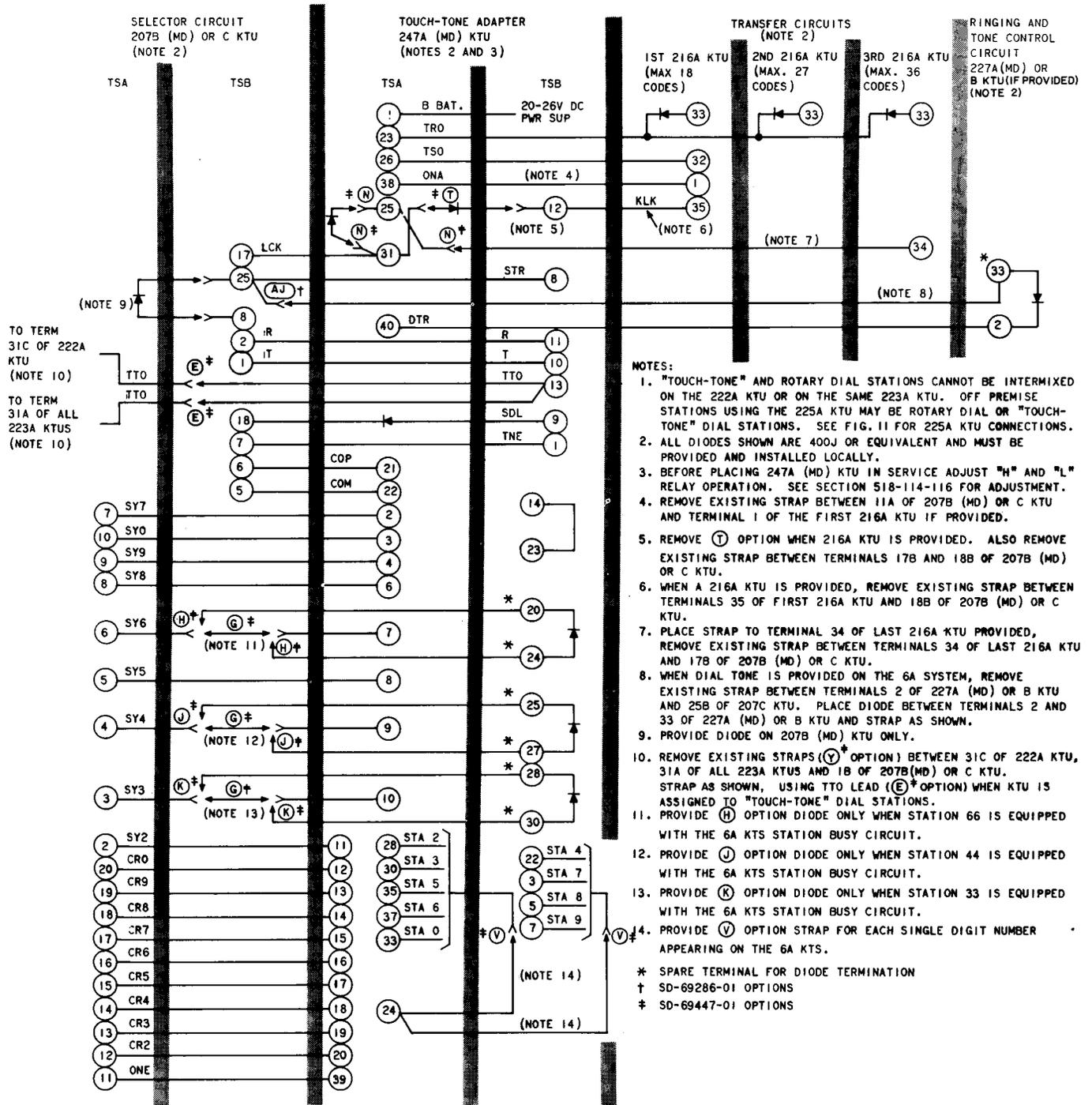


Fig. 10—Addition of TOUCH-TONE® Adapter Circuit (247A KTU [MD] With 222A and 223A KTUs)¶

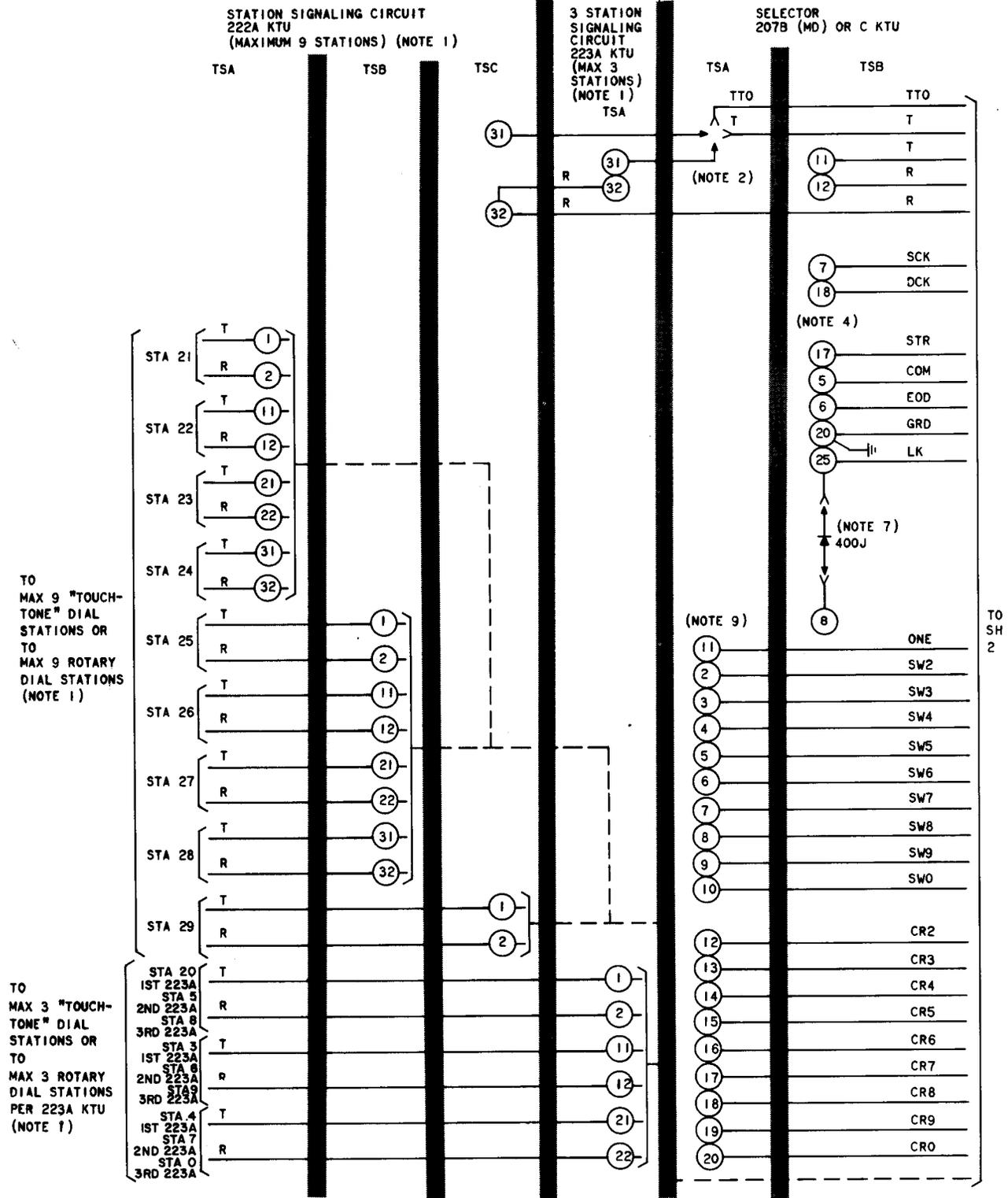


Fig. 11—Addition of TOUCH-TONE® Adapter Circuit (247B KTU with 222A and 223A KTUs) (Sheet 1)

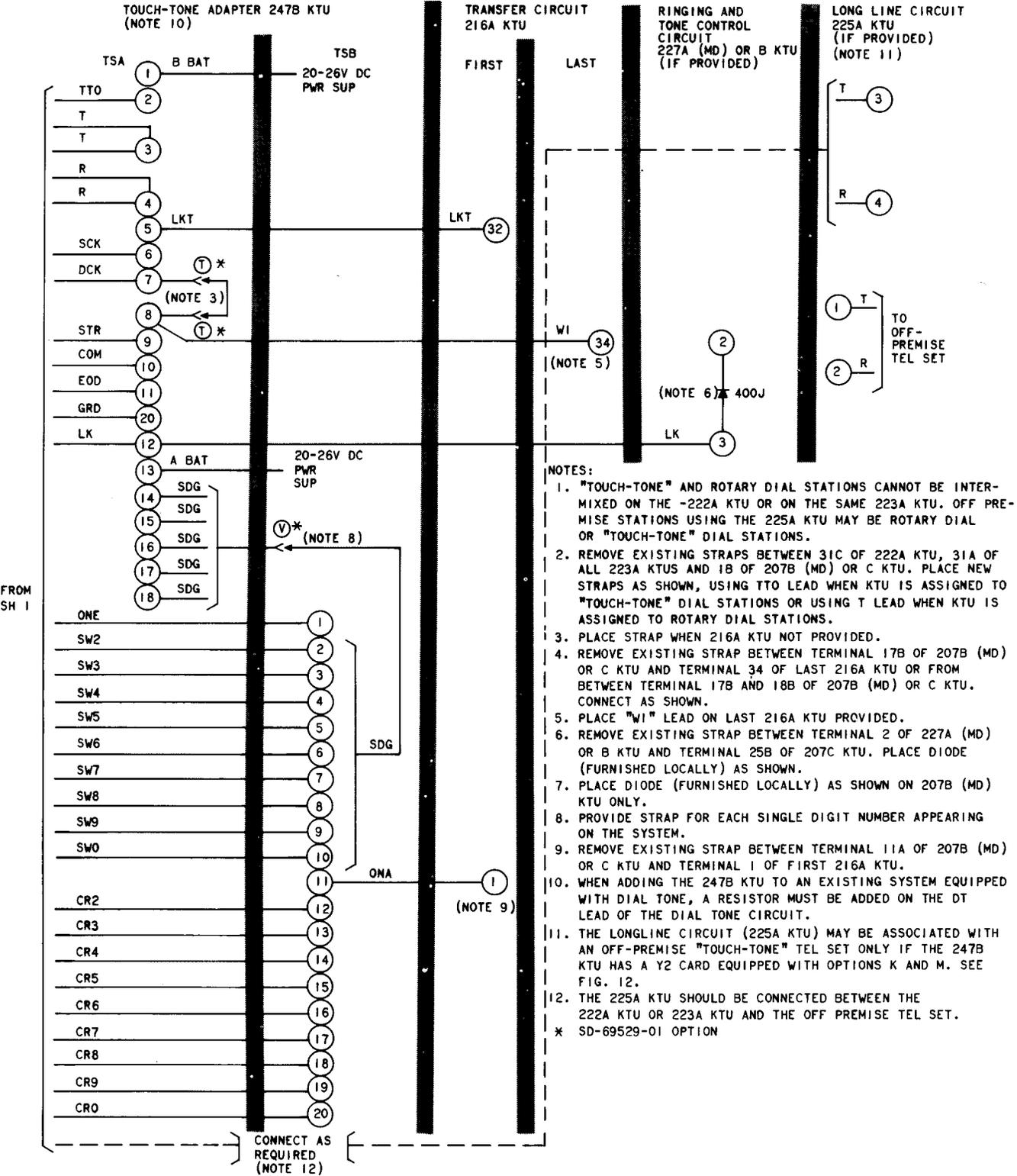
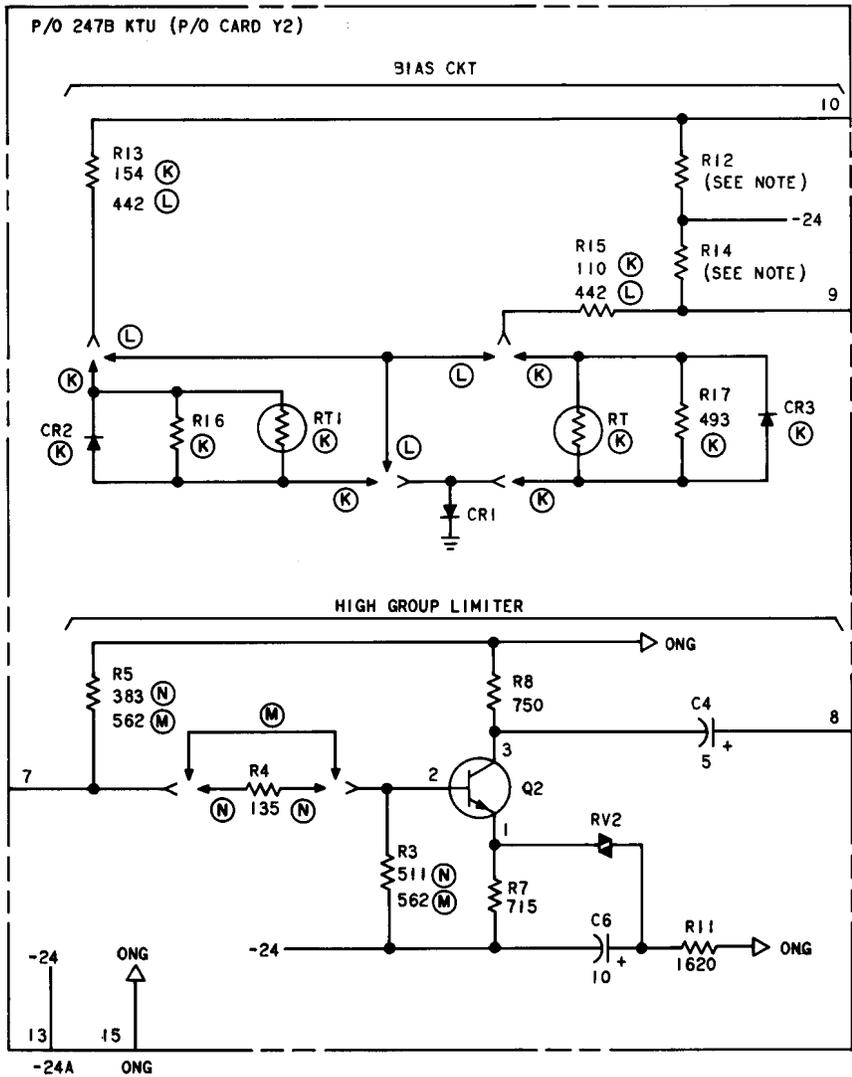


Fig. 11—Addition of TOUCH-TONE® Adpater Circuit (247B KTU with 222A and 223A KTUs) (Sheet 2)



**NOTE:**

THE VALUES OF RESISTORS R12 AND R14 SHOULD BE SELECTED FROM THE FOLLOWING LIST TO PROVIDE REQUIRED BIAS.

VOLTAGE ACROSS CR1	RESISTANCE VALUE			
	R12		R14	
	(K)	(L)	(K)	(L)
5.8V TO 6.0V	3120	3320	4020	4270
6.1V TO 6.3V	3650	3920	4810	5230
6.4V TO 6.6V	4480	4750	6420	6810

**OPTIONS:**

(K) AND (M) ARE FACTORY FURNISHED.

**Fig. 12—Y2 Card Options in 247B KTU**

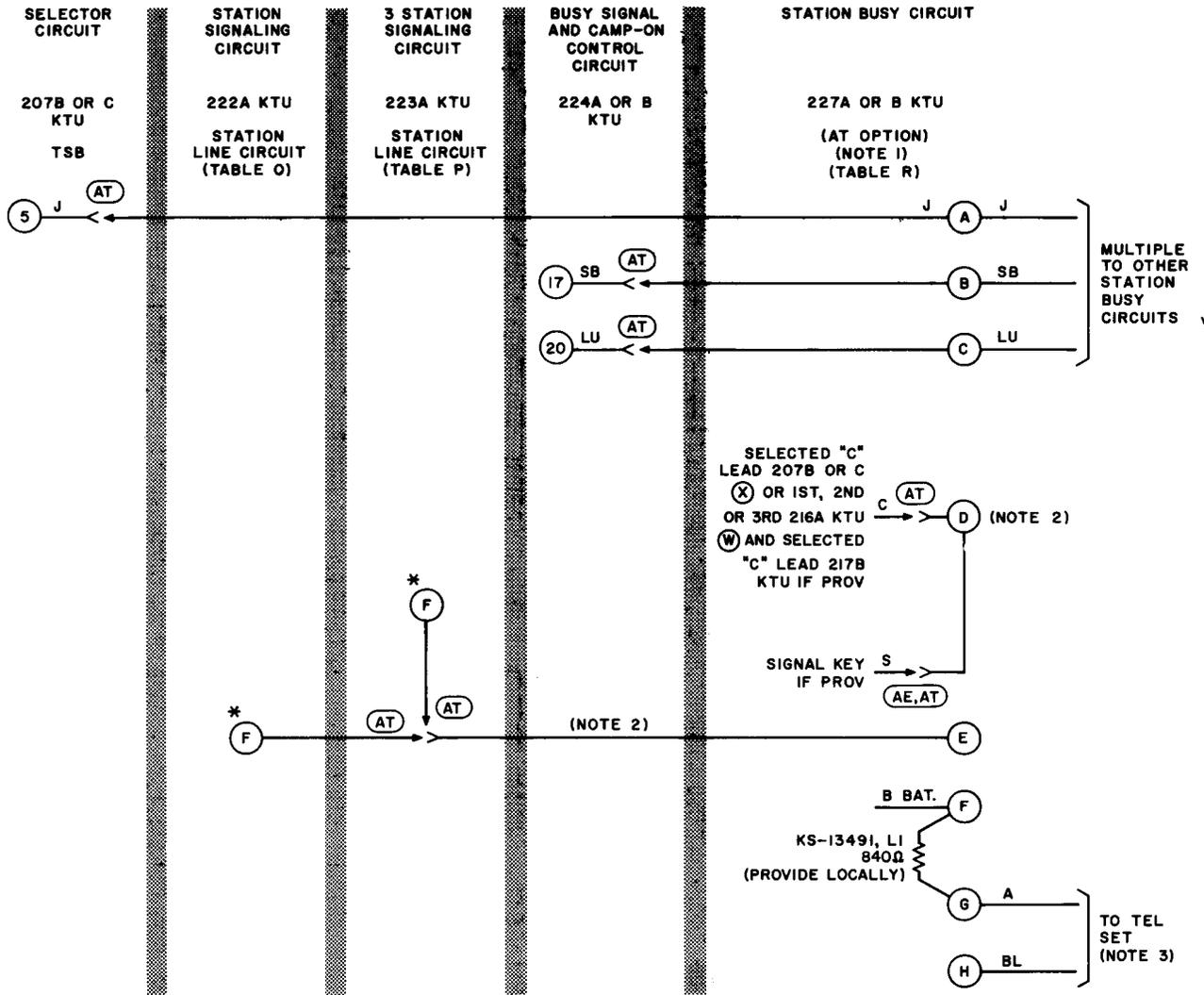


TABLE O

REF DESIG	TERMINALS ON 222A KTU								
	CKT 1	CKT 2	CKT 3	CKT 4	CKT 5	CKT 6	CKT 7	CKT 8	CKT 9
F	7A	17A	27A	37A	7B	17B	27B	37B	7C

TABLE P

REF DESIG	TERMINALS ON 223A KTU		
	CKT 1	CKT 2	CKT 3
F	7A	17A	27A

TABLE R

REF DESIG	RELAY AND TERM. ON		
	CA1 RELAY	CA2 RELAY	NS RELAY
A	11	17	23
B	14	20	26
C	12	18	24
D	15	21	27
E	16	22	28
F	3	36	37
G	1	10	40
H	5	8	2

NOTES:

1. THE STATION BUSY CIRCUIT REQUIRES A RELAY PER STATION SO EQUIPPED. A 227A KTU WILL PROVIDE FOR TWO STATIONS AND A 227B KTU WILL PROVIDE FOR THREE STATIONS (SEE TABLE R). WHEN USING THE 227B KTU, THE CA1 RELAY CANNOT BE USED TO PROVIDE OTHER 6A FEATURES.
  2. REMOVE EXISTING C AND S LEADS ((AS) OPTION) FROM SELECTED "F" TERMINAL AND CONNECT ((AT) OPTION) TO REFERENCE DESIGNATION TERMINAL "D" OF THE 227A OR B KTU. CONNECT SELECTED "F" TERMINAL TO 227A OR B KTU AS SHOWN.
  3. WHEN CONNECTING "BL" LEAD BE SURE TO INSTALL DIODE IN TEL SET. USE STATION BUSY OPTION AS SHOWN IN CONNECTION PRACTICE OF TYPE SET USED. CONNECT "A" LEAD TO PICKUP KEY ASSIGNED TO PICKUP 6A LINE.
- \* LINE CIRCUIT OF STATION ORIGINATING THE STATION BUSY CIRCUIT.

Fig. 13—Addition of Station Busy Circuit (227A or B KTU)