

SERVICE

638- AND 639-TYPE TELEPHONE SETS

1. GENERAL

1.01 This section contains connection and maintenance information for 18- and 30-button telephone sets equipped with rotary dials, headset jacks and used with station line concentrators. Connection information for these sets was formerly contained in Section 502-636-402 which is hereby canceled.

1.02 These sets are not intended for use with 3-type speakerphone systems.

2. CONNECTIONS

2.01 See SD-69499-01 (key telephone systems, 6A, 1A1, and 1A2, station line concentrators) and appropriate sections in Division 518 for connections to station line concentrator using 235B or 236B key telephone units.

2.02 A 235A (MD) or B KTU is associated with each 638-type telephone set. A 236A (MD) or B KTU is associated with each 639-type telephone set. Because of the single common talking pair and control lead patterns used in these sets, a line concentrator unit must be associated with each telephone set installed and cannot be shared, even on a bridged station basis.

2.03 When 400-type KTU'S are used as line circuits, a 235B or 236B KTU must be used or a 235A (MD) or 236A (MD) KTU modified as shown in the section on station line concentrators in Division 518.

2.04 A 599B key may be used in the first key position to provide ringer or line cutoff

(Notes 5 and 6, Fig. 4 or 5). When other uses are required, they must be provided for by means of an auxiliary relay separately mounted and controlled by the turn key contacts since there are insufficient mounting cord conductors to permit full switching at the key.

2.05 Because of insufficient leads from the first module plug for use with a 599H key, the supplemental hold feature cannot be used in these sets.

2.06 To convert a key position from pickup (locking) to signaling (nonlocking) remove the screw detail P-10E837 entirely from the plunger at the key position to be converted. Make the necessary wiring changes as shown in Table A for sets equipped with current mounting cords or Table B for sets equipped with MD mounting cords.



Some spare-tipped conductors or mounting cord leads are insulated with tubing which should be cut off with electrician scissors or diagonal pliers. Other conductors are insulated with stiff plastic pockets. Pinch open the mouth to release the spade tips.

2.07 The P-90D033 Printed Wiring Board Assembly used to provide a station busy lamp circuit for 638- and 639-type telephone sets is intended to mount in the 235- or 236-type line concentrator key telephone unit associated with these sets. Connections to the telephone set are through the TA lead (Fig. 4 and 5). For connections to the Printed Wiring Board Assembly refer to Division 518 and SD-69580-01.

TABLE A — CONVERSION OF 638- AND 639-TYPE TELEPHONE SETS EQUIPPED WITH EVEN-COUNT COLOR-CODED CORDS

KEY POSITION		SERVICE FEATURE OPTIONS								LINE PICKUP
		BUZZER SIGNAL		6A ADD-ON		6A PUSHBUTTON		LOCKED-IN LAMP RELEASE		
638 TYPE TEL SETS	639 TYPE TEL SETS	CONNECT STORED SPADE-TIPPED LEAD INDICATED TO TERMINAL SG OF TB VI.	DISCONNECT SPADE-TIPPED LEAD INDICATED FROM ASSOC TB. INSULATE AND STORE.	CONNECT STORED SPADE-TIPPED LEAD INDICATED TO TERMINAL PB OR TB. VI.	DISCONNECT SPADE-TIPPED LEAD INDICATED FROM ASSOC TB. INSULATE AND STORE.	CONNECT STORED SPADE-TIPPED LEAD INDICATED TO TERMINAL A (638) OR TO TERMINAL 1A (639) OF TB VI.	DISCONNECT SPADE-TIPPED LEAD INDICATED FROM ASSOC TB. INSULATE AND STORE.	CONNECT STORED SPADE-TIPPED LEAD INDICATED TO TERMINAL SG OF TB VI.	MOVE SPADE-TIPPED LEAD INDICATED FROM ASSOC TB TO AVAIL. LAMP GRD.	
1	1	BL	R-BR	BL	R-BR	BL	R-BR	BL	R-BR	638 and 639— Factory equipped and wired
2	2	O	R-S	O	R-S	O	R-S	O	R-S	
3	3	G	BK-BL	G	BK-BL	G	BK-BL	G	BK-BL	
4	4	BR	BK-O	BR	BK-O	BR	BK-O	BR	BK-O	
5	5	S	BK-G	S	BK-G	S	BK-G	S	BK-G	
6	6	638—Not convertible. 639—Connect W to term. SG of TB VI. Connect one of two spares (S-BK) (BK-S) from Plug 2 to term. 6 of TBI.		638—Not convertible. 639—Connect W to term. PB of TB VI. Connect one of two spares (S-BK) (BK-S) from Plug 2 to term. 6 of TBI.		638—Not convertible. 639—Connect W to term. 1A of TB VI. Connect one of two spares (S-BK) (BK-S) from Plug 2 to term. 6 of TBI.		638—Not convertible. 639—Connect W to term. SG of TB VI. Connect one of two spares (S-BK) (BK-S) from Plug 2 to term. 6 of TBI. Connect G-R to avail. lamp grd.		Replace 599A or 657A key with 598A or 656A key. Connect G-R to avail. lamp grd. Connect W-O to term. A (638) or to term. 1A (639) of TBVI.
7	7	BL	BK-BR	BL	BK-BR	BL	BK-BR	BL	BK-BR	638 and 639— Factory equipped and wired
8	8	O	BK-S	O	BK-S	O	BK-S	O	BK-S	
9	9	G	Y-BL	G	Y-BL	G	Y-BL	G	Y-BL	
10	10	BR	Y-O	BR	Y-O	BR	Y-O	BR	Y-O	
11	11	S	Y-G	S	Y-G	S	Y-G	S	Y-G	
12	12	W	Y-BR	W	Y-BR	W	Y-BR	W	Y-BR	
	13	BL	W-BL	BL	W-BL	BL	W-BL	BL	W-BL	
	14	O	W-O	O	W-O	O	W-O	O	W-O	
	15	G	W-G	G	W-G	G	W-G	G	W-G	
	16	BR	W-BR	BR	W-BR	BR	W-BR	BR	W-BR	
	17	S	W-S	S	W-S	S	W-S	S	W-S	
	18	W	R-BL	W	R-BL	W	R-BL	(638—Not convertible.) W (639)	(638—Not convertible.) R-BL (639)	638—Connect R-BL to avail. lamp grd. 639—Factory equipped
	19	BL	R-O	BL	R-O	BL	R-O	BL	R-O	639—Factory equipped and wired
	20	O	R-G	O	R-G	O	R-G	O	R-G	
	21	G	R-BR	G	R-BR	G	R-BR	G	R-BR	
	22	BR	R-S	BR	R-S	BR	R-S	BR	R-S	
	23	S	BK-BL	S	BK-BL	S	BK-BL	S	BK-BL	
	24	W	BK-O	W	BK-O	W	BK-O	W	BK-O	
13	25	BL	Y-S	BL	Y-S	BL	Y-S	BL	Y-S	
14	26	O	V-BL	O	V-BL	O	V-BL	O	V-BL	
15	27	G	V-O	G	V-O	G	V-O	G	V-O	
16	28	BR	V-G	BR	V-G	BR	V-G	BR	V-G	
17	29	S	V-BR	S	V-BR	S	V-BR	S	V-BR	
18	30	W	V-S	W	V-S	W	V-S	W	V-S	

Note: All pickup key positions converted to nonlocking for features in Table A must have P-11E977 insulating details placed over the two key contacts adjacent to the key plunger. Insulating details are furnished with the telephone set. Remove the P-10E887 screw detail entirely from the plunger at the key position to be converted.

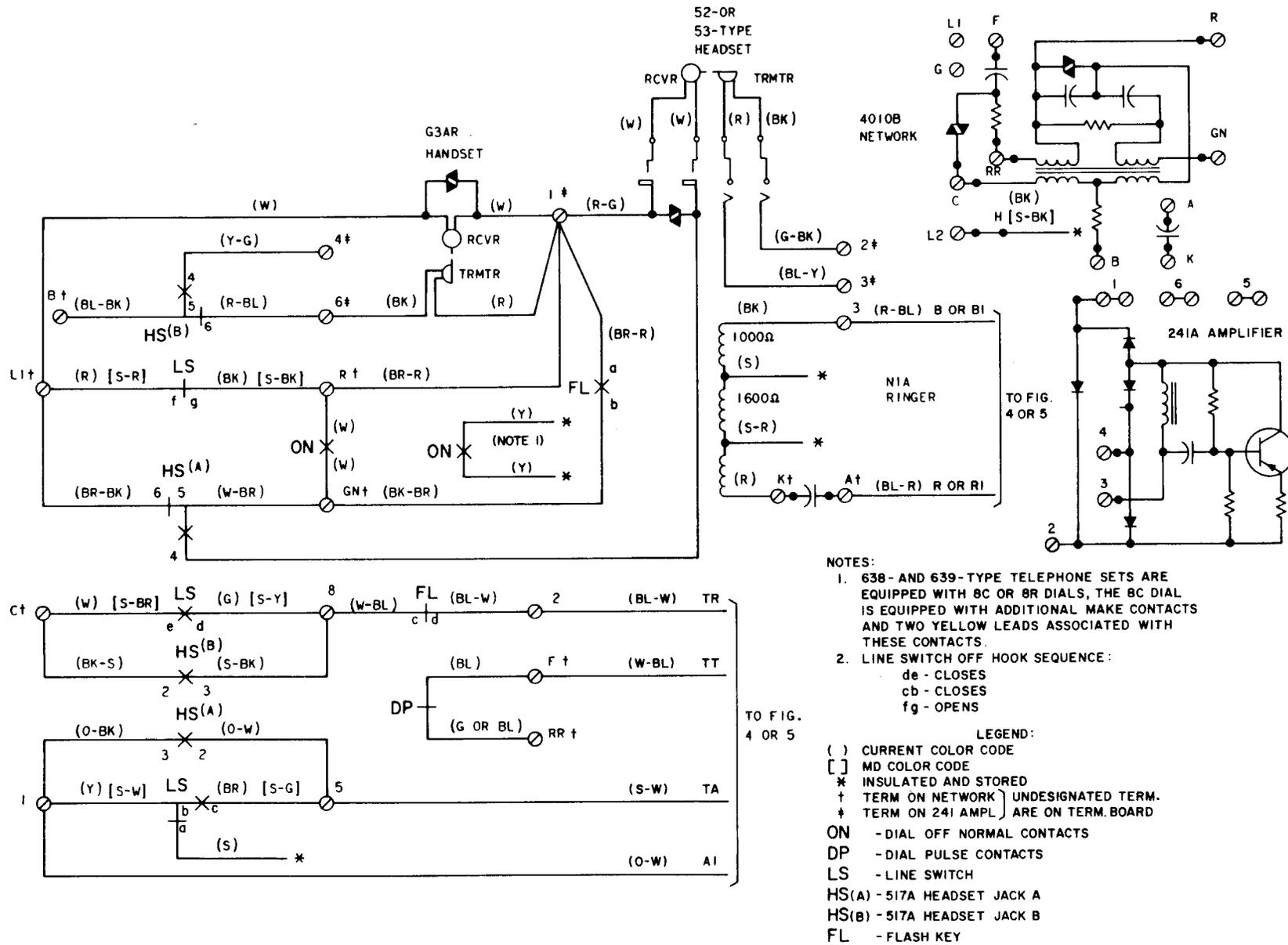


Fig. 1—638- and 639-Type Telephone Set, Connections (Current Production)

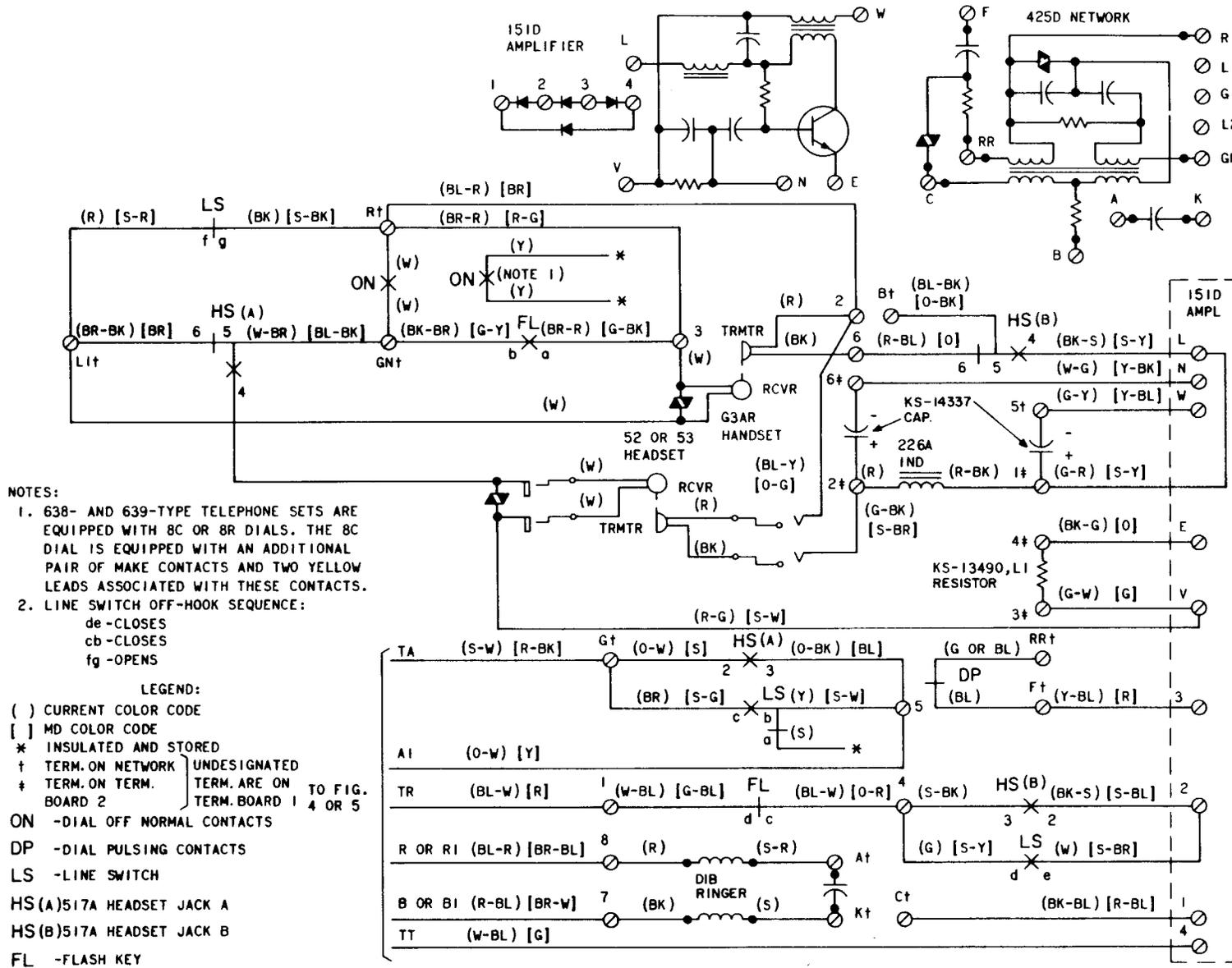


Fig. 2—638- and 639-Type Telephone Set, Connections (Early Production)

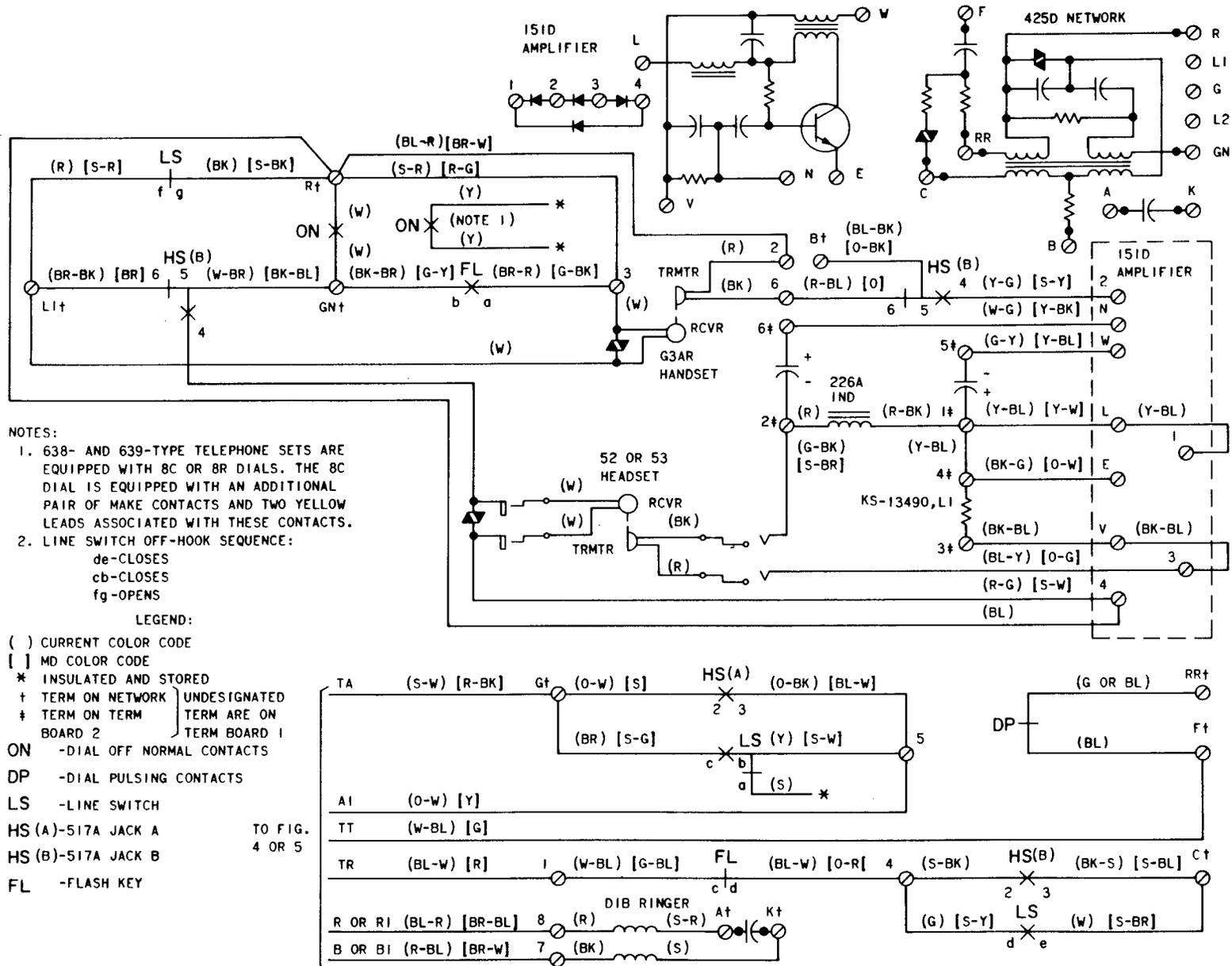


Fig. 3—638- and 639-Type Telephone Set, Connections (Amplifier Wired for Polarity Guard Diode Protection)

NOTES FOR FIG. 4 AND 5:

1. WHEN 599A, 599B, 657A OR 657B KEYS ARE USED IN FIRST MODULE HOLD KEY LAMP (6TH LAMP) MAY BE USED FOR A MISCELLANEOUS VISUAL SIGNAL. CONNECT INDICATED LEAD TO AN AVAILABLE LAMP GROUND. WHEN 598A OR 656A KEY IS USED IN FIRST MODULE, INDICATED LEAD IS CONNECTED TO GROUND ON TERMINAL 5 OF TB1.
2. WHEN 598A OR 656A KEY IS USED IN FIRST MODULE, INDICATED LEAD IS CONNECTED TO TERMINAL A OF TB6 ON 638-TYPE SETS AND TERMINAL 1A OF TB6 ON 639-TYPE SETS
3. WHEN 598A OR 656A KEY IS USED IN THIRD MODULE OF 638-TYPE TELEPHONE SET, (V-S) (O-W) LEAD IS CONNECTED TO TERMINAL 5 OF TB3.
4. TO CONVERT A KEY POSITION FROM PICKUP (LOCKING) TO SIGNALING (NONLOCKING) REMOVE THE SCREW DETAIL P-10E837 ENTIRELY FROM THE PLUNGER AT THE KEY POSITION TO BE CONVERTED. MAKE THE NECESSARY CHANGES AS SHOWN IN CONVERSION TABLES A OR B. TO CONVERT A KEY POSITION FROM NONLOCKING TO LOCKING, INSERT SCREW DETAIL P-10E837. WHEN CONVERTING A KEY FOR SIGNALING, PLACE A P-11E977 INSULATING DETAIL OVER THE 2 KEY CONTACTS ADJACENT TO KEY PLUNGER.
5. CUTOFF OF THE INTERNAL RINGER CAN BE PROVIDED USING THE 599B OR 657B KEY IN FIRST MODULE. TRANSFER B1 LEAD FROM TERMINAL 3 OF TERMINAL BOARD (FIG.1) OR TERMINAL 7 OF TERMINAL BOARD (FIG. 2 OR 3) TO TERMINAL 6 OF TB1 (FIG.4 OR 5) TRANSFER (R) [S-BK] LEAD FROM TERMINAL 5 OF TB1 (FIG.4 OR 5). TO TERMINAL VACATED BY B1 LEAD.
6. WHEN 599B OR 657B KEY IS USED IN FIRST MODULE TO PROVIDE CUTOFF, SWITCHING, OR TRANSFER FEATURES, TRANSFER (Y-BR) [Y-BK] LEAD FROM TERMINAL 6 OF TB1 TO TERMINAL SG OF TBVI. THESE SERVICE FEATURES ARE PROVIDED BY AN AUXILIARY RELAY (229B KTU OR EQUIVALENT) SEPARATELY MOUNTED AND CONTROLLED BY THE TURN KEY CONTACTS THROUGH THE LGS, C, S, SI LEAD.
7. CONTACTS OF TURN KEY CONNECTED TO TERMINALS 9 AND 11 MUST BE ISOLATED FROM EACH OTHER WITH INSULATING DETAIL P13E443 (FURNISHED WITH 599B OR 657B KEY) TO PREVENT INTERFERENCE WITH WORKING CIRCUITS.
8. THE TURN KEY LAMP CAN BE ILLUMINATED IN ACCORDANCE WITH, OR INDEPENDENT OF TURN KEY OPERATION.
9. WHEN THE 617A KEY IS REQUIRED AS A DUAL-PURPOSE KEY, THE BRASS STRAP BETWEEN THE S1 AND SG TERMINALS OF THE KEY MAY BE REMOVED. USE MIW CORD OR EQUIVALENT TO CONNECT S1 TERMINAL OF 617A TO A DISSIMILAR GROUND OR A NONGROUNDED CIRCUIT.
10. CONNECTIONS FOR THE STATION BUSY LAMP FEATURE ARE PROVIDED ON THE 235- AND 236-TYPE KTU. REFER TO THE SECTION ON LINE CONCENTRATORS IN DIVISION 518 FOR THIS CONNECTION INFORMATION.
11. CORDS MANUFACTURED BEFORE APRIL 1968 HAVE SOME LEADS SOLDERED TO THE TB.

LEGEND:

- * LEADS ARE SPADE TIPPED, INSULATED AND STORED.
- () CURRENT COLOR CODE.
- [] MD COLOR CODE.

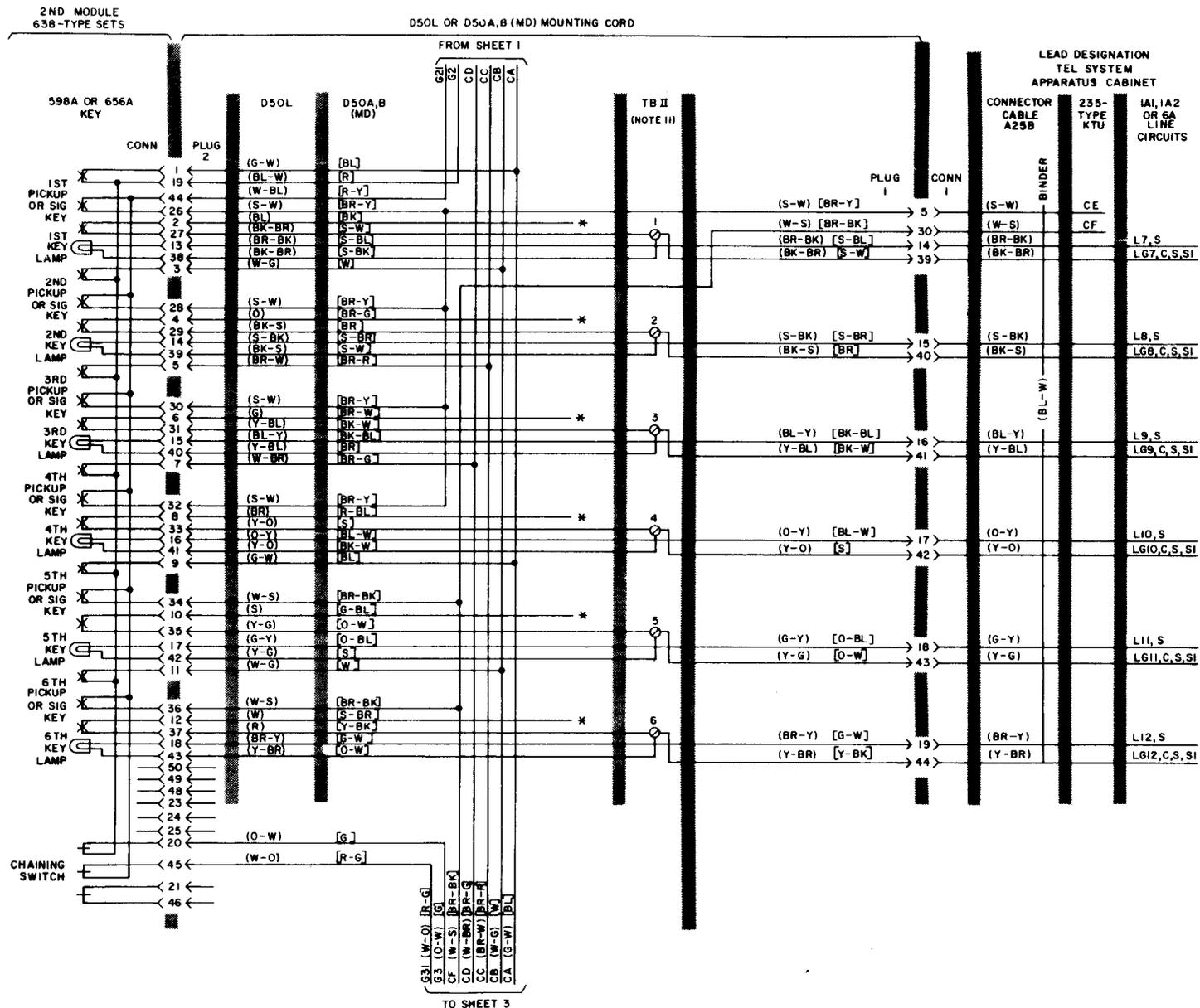


Fig. 4—Module Arrangements and Cord and Cable Connections for 638-Type Telephone Sets (Equipped with Even-Count and MD Color-Coded Cords) (Sheet 2 of 3)

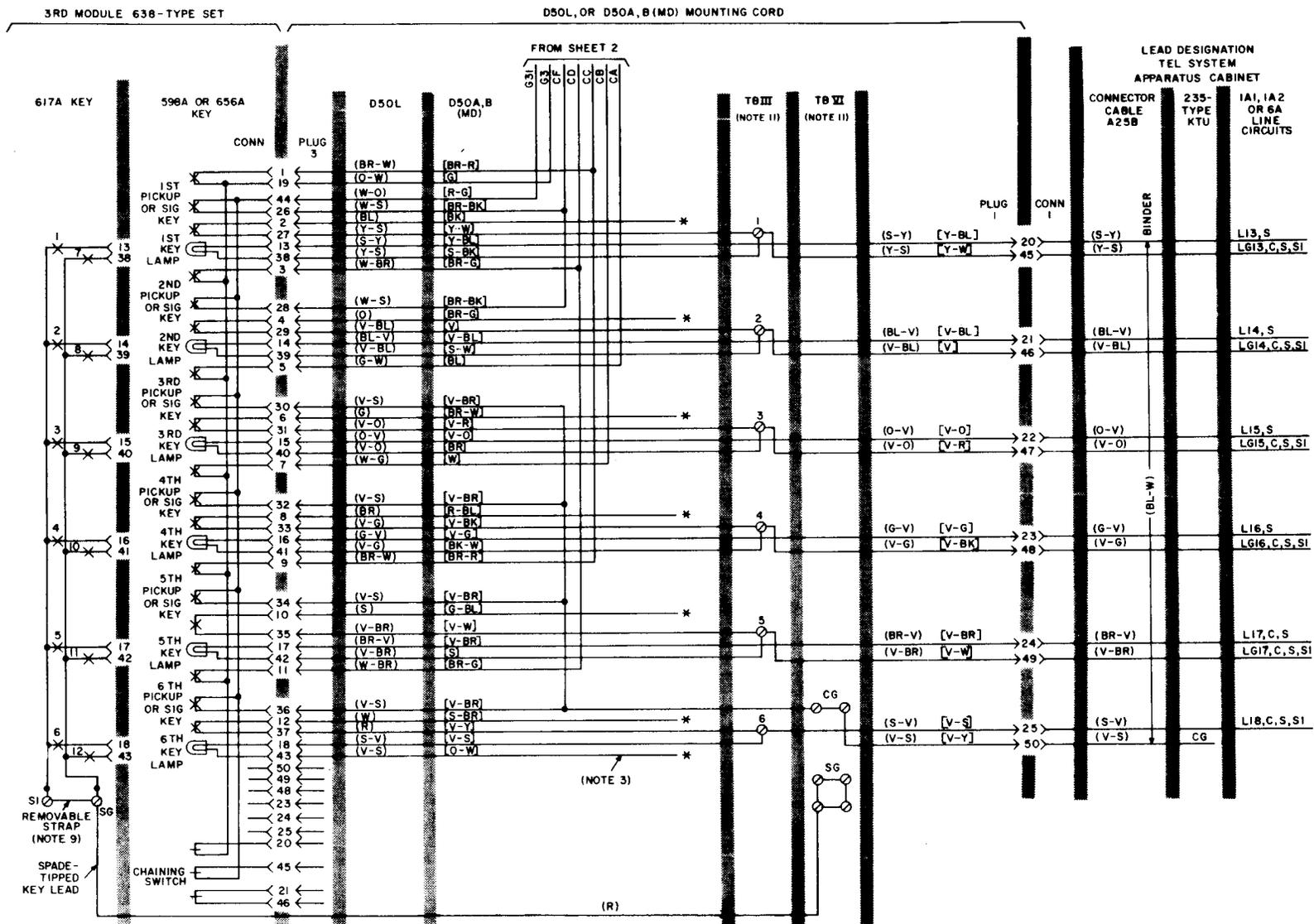


Fig. 4—Module Arrangements and Cord and Cable Connections for 638-Type Telephone Sets (Equipped with Even-Count and MD Color-Coded Cords) (Sheet 3 of 3)

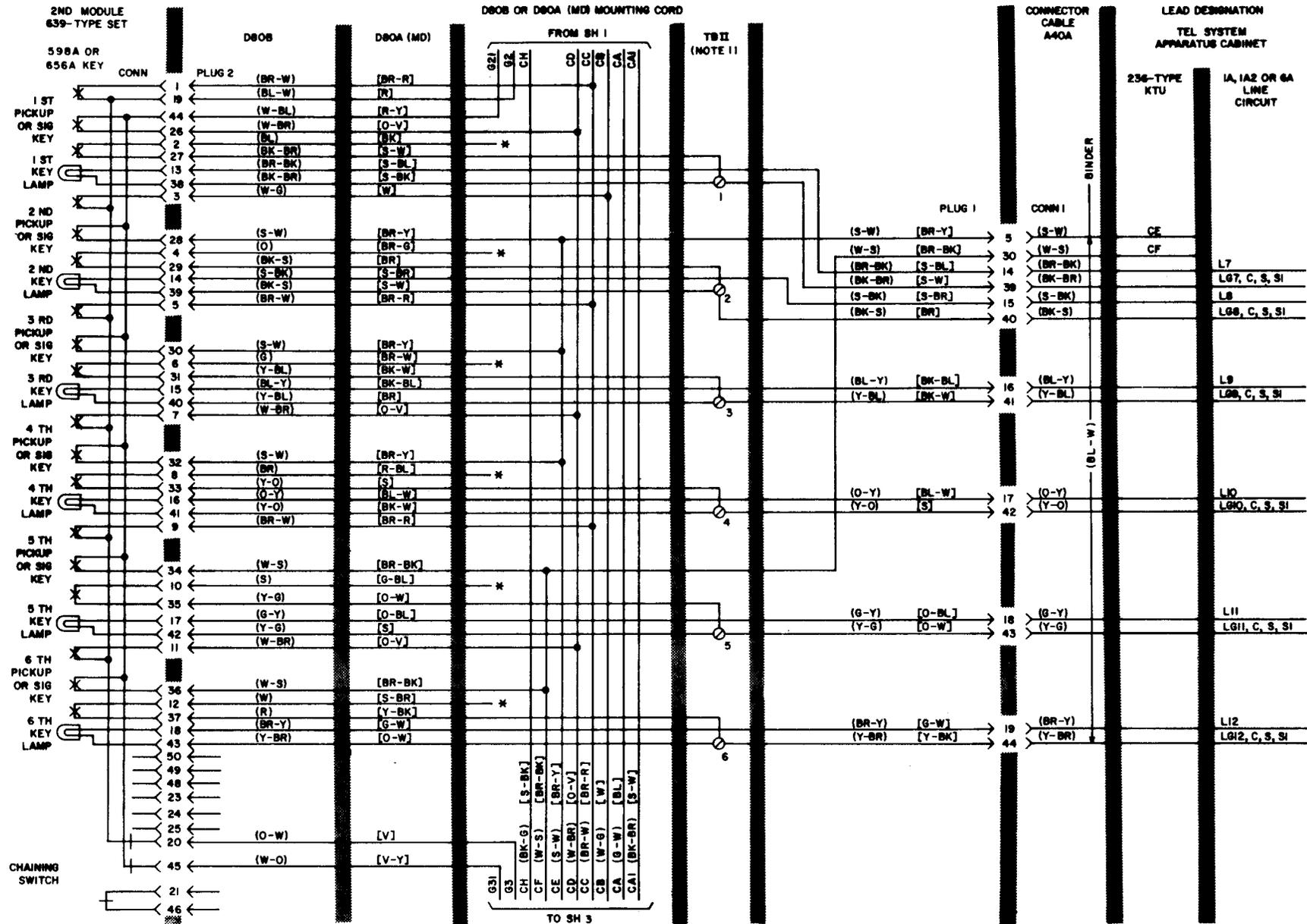


Fig. 5—Module Arrangements and Cord and Cable Connections for 639-Type Telephone Sets (Equipped with Even-Count and MD Color-Coded Cords) (Sheet 2 of 5)

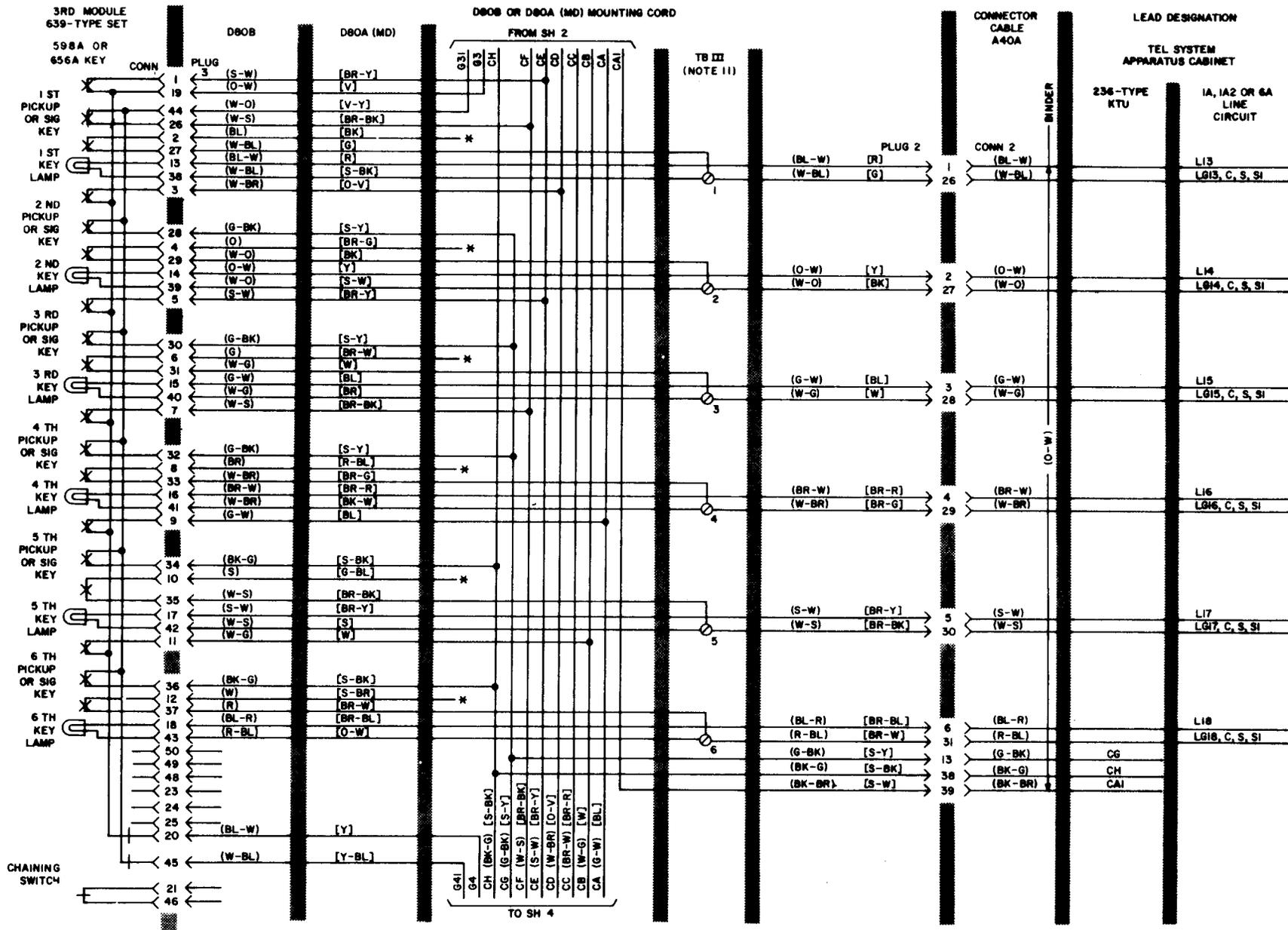


Fig. 5—Module Arrangements and Cord and Cable Connections for 639-Type Telephone Sets, (Equipped with Even-Count and MD Color-Coded Cords) (Sheet 3 of 5)

TABLE B
CONVERSION OF 638- AND 639-TYPE TELEPHONE SETS
EQUIPPED WITH MD CORDS

FEATURE	WORK OPERATION	KEY POSITION							
		1-7-13-19-25	2-8-14-20-26	3-9-15-21-27	4-10-16-22-28	5-11-17-23-29	12-24-30	18	6
Buzzer Signal	Connect stored spade-tipped lead indicated to term. SG of TB VI.	BK	BR-G	BR-W	R-BL	G-BL	S-BR	S-BR	638—Not convertible. 639—Connect S-BR to term. SG of TB VI. Connect one of two spares from Fig. 5 to term. 6 of TB I.
	Disconnect spade-tipped lead indicated from assoc TB. Insulate and store.	S-BK	S-W	BR	BK-W	S	O-W	O-W	
6A Add-on	Connect stored spade-tipped lead indicated to term. PB of TB VI.	BK	BR-G	BR-W	R-BL	G-BL	S-BR	S-BR	638—Not convertible. 639—Connect S-BR to term. PB of TB VI. Connect one of two spares from Fig. 5 to term. 6 of TB I.
	Disconnect spade-tipped lead indicated from assoc TB. Insulate and store.	S-BK	S-W	BR	BK-W	S	O-W	O-W	
6A Pushbutton	Connect stored spade-tipped lead indicated to term. A (638) or to term. 1A (639) of TB VI.	BK	BR-G	BR-W	R-BL	G-BL	S-BR	S-BR	638—Not convertible. 639—Connect S-BR to term. 1A of TB VI. Connect one of two spares from Fig. 5 to term. 6 of TB I.
	Disconnect spade-tipped lead indicated from assoc TB. Insulate and store.	S-BK	S-W	BR	BK-W	S	O-W	O-W	
Locked-in Lamp Release	Connect stored spade-tipped lead indicated to term. SG of TB VI.	BK	BR-G	BR-W	R-BL	G-BL	S-BR	S-BR (639) (638—Not convertible.)	638—Not convertible. 639—Connect S-BR to term. SG of TB VI. Connect one of two spares from Fig. 5 to term. 6 of TB I. Connect O-W to avail. lamp grd.
	Move spade-tipped lead indicated from assoc TB to avail. lamp grd.	S-BK	S-W	BR	BK-W	S	O-W	O-W (639) (638—Not convertible.)	
Line Pickup		Factory equipped and wired						639—Factory equipped. 638—Connect O-W to avail. lamp grd.	Replace 599A key with 598A key. Connect O-W to avail. lamp grd. Connect BR-BL to term. A (638) or to term. 1A (639) of TB VI.

Note: All pickup key positions converted to nonlocking for features in Table B must have P-11E977 insulating details placed over the two key contacts adjacent to the key plunger. Insulating details are furnished with the telephone set. Remove the P-10E837 screw detail entirely from the plunger at the key position to be converted.

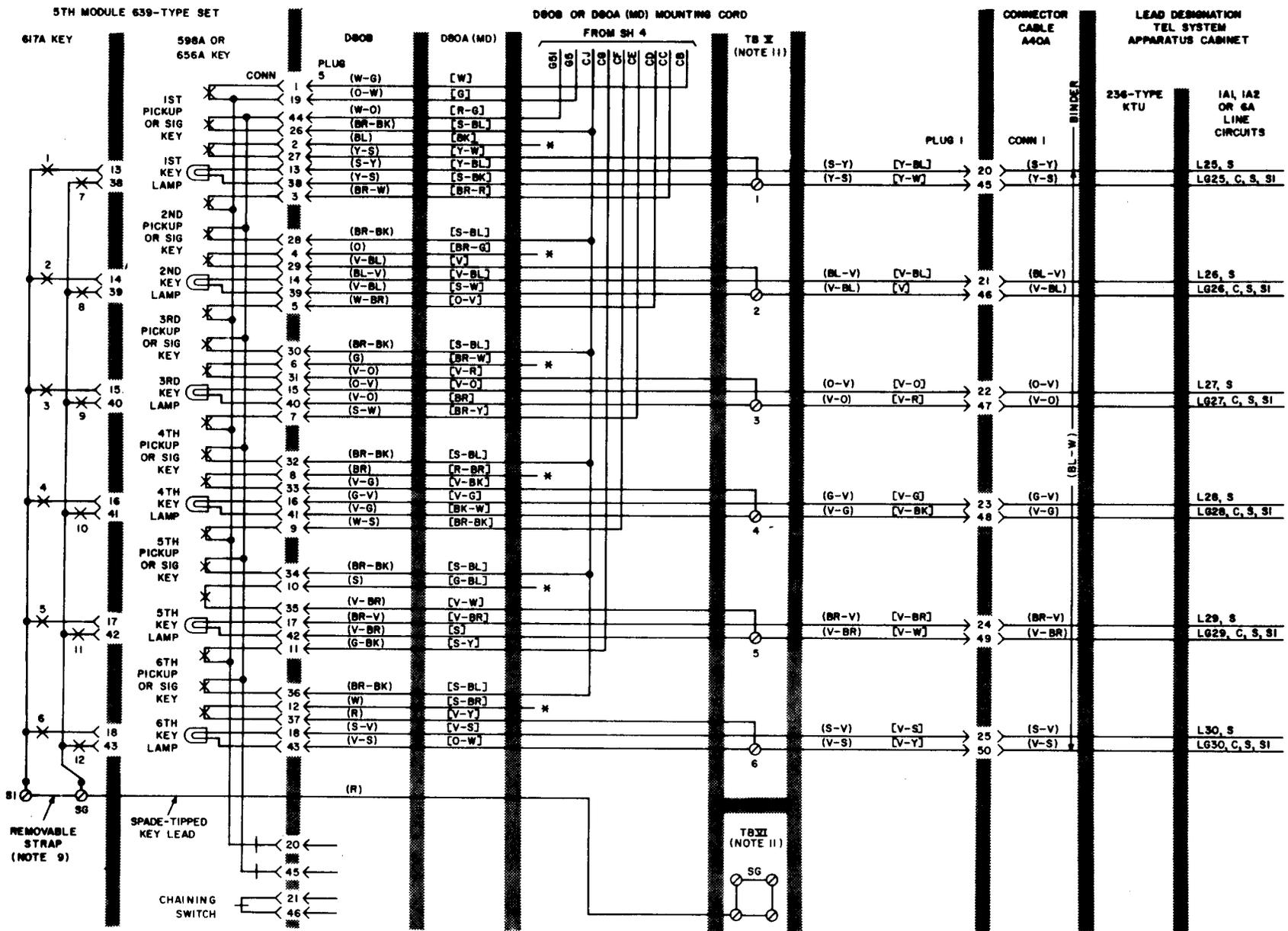


Fig. 5—Module Arrangements and Cord and Cable Connections for 639-Type Telephone Sets, (Equipped with Even-Count and MD Color-Coded Cords) (Sheet 5 of 5)

3. MAINTENANCE

3.01 Maintenance of handset, dials, ringers, and modular keys is outlined in section covering these components.

3.02 Refer to the appropriate Reference section in Division 502 for replaceable components.

3.03 The use of the head telephone set requires an amplifier to equalize the level of the N1 transmitter with the T1 transmitter in the handset. If the headset transmission is too loud or inadequate the 241A amplifier should be replaced.

3.04 In early production sets a 151D amplifier is used. If the headset transmission is too loud replace the 30 ohm resistor on TB2 between terminals 3 and 4 with a 62 ohm KS-13490L1 1/2-watt resistor.

Note: If handset transmission is too loud check connections to the amplifier to insure that the handset transmitter output is not being amplified.

3.05 Two KS-14337 capacitors on terminals 1 and 5, and 2 and 6 may be replaced if defective. These capacitors are polarized electrolytics and polarity must be maintained (Fig. 2 and 3).

3.06 To remove a defective N1A ringer from current production telephone sets or D1B ringer from early production sets:

- (1) Remove housing.
- (2) Loosen dial mounting plate and move to left.
- (3) Disconnect ringer leads.
- (4) Remove ringer mounting screws as shown in Fig. 6 or 7.
- (5) Lift out ringer.

3.07 When an operated pickup key does not remain depressed or release any previously operated key on current production sets:

- (1) Check that key latch arm is properly inserted in the pivot bar (Fig. 8).
- (2) Adjustment of the key can be made by loosening the mounting screws and shifting



Fig. 6—Location of Mounting Screws for N1A Ringers

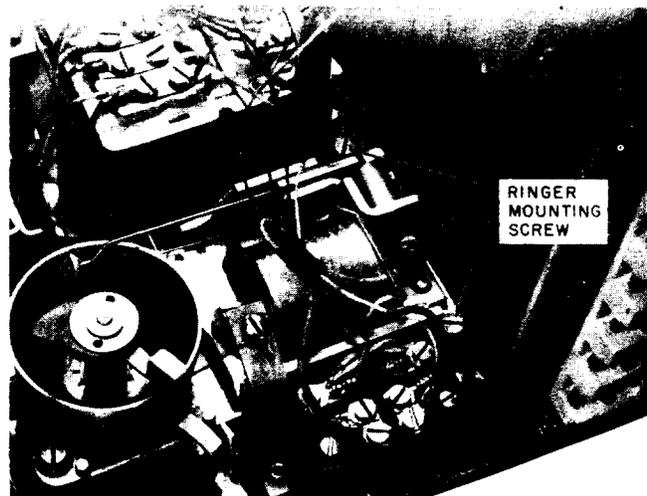


Fig. 7—Location of Mounting Screws for D1B Ringers

the key within limits of oversized hole provided for the mounting screws before refastening mounting screws.

- (3) If malfunction is related to one key module test key for proper operation.

3.08 When an operated pickup key does not remain depressed or release any previously

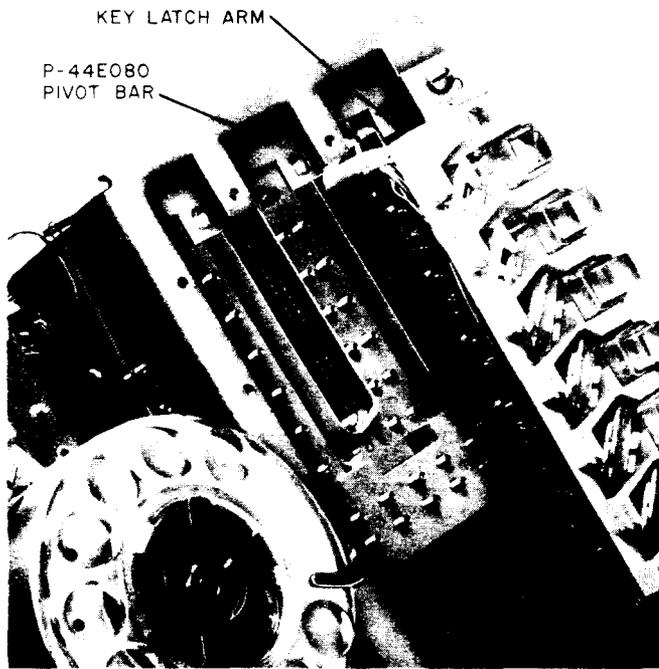


Fig. 8—Pivot Bar, Top View (Current Production)

operated key on early production sets adjust the latch arm assembly (Fig. 9) as follows:

- (1) Loosen P-44E054 screw holding latch arm assembly on the pivot bar.
- (2) Move latch arm assembly to position where front edge of the shorter arm extends 1/16-inch beyond front edge of the pivot bar.
- (3) Tighten screw.
- (4) Test operation of key unit.

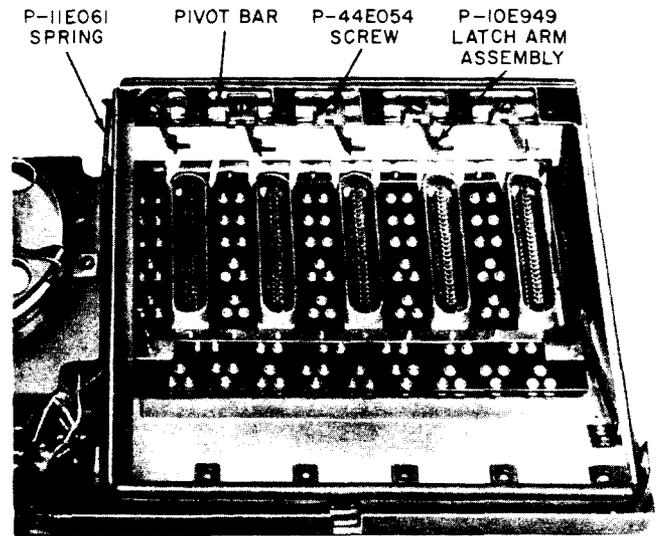


Fig. 9—Pivot Bar Assembly (Early Production)

3.09 To prevent release button from binding on 638- and 639-type early production sets install a P-12E672 collar as follows:

- (1) Remove faceplate assembly.
- (2) Remove two switch assembly screws (Fig. 10).
- (3) Remove button assembly.
- (4) Place P-12E672 collar around P-11E928 plunger (Fig. 10).
- (5) Reassemble switch assembly.

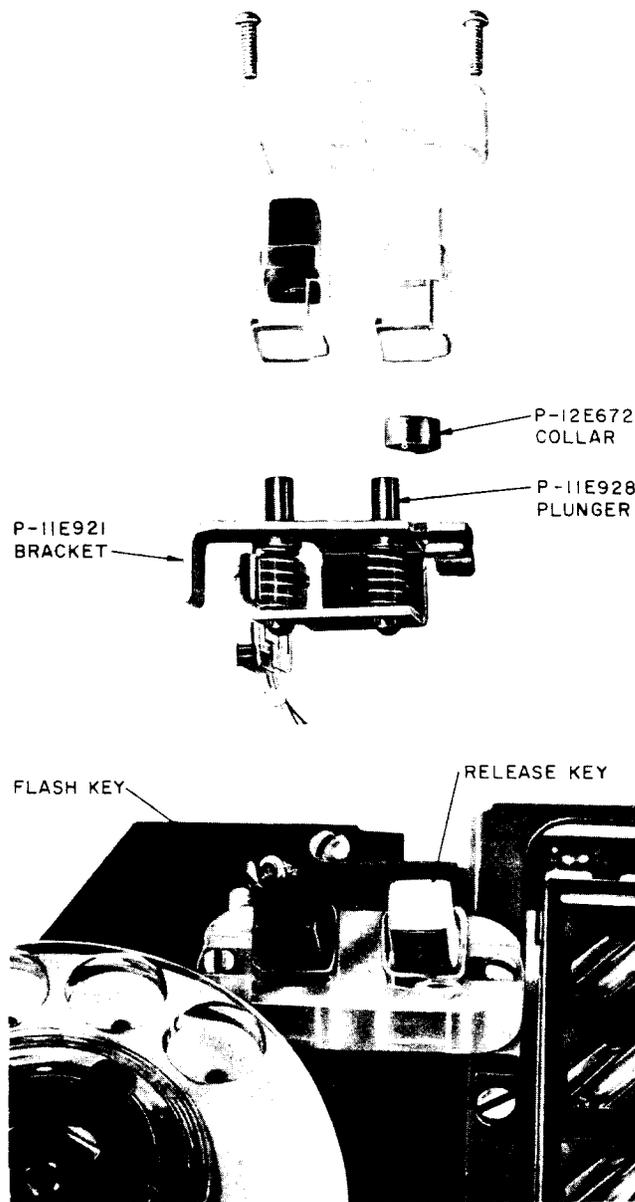


Fig. 10—P-11F987 Switch Assembly