

## TELEPHONE SETS

### 662 TYPE

#### 1.00 GENERAL

1.01 This section covers identification, assembly, installation, maintenance, and connections for the 662-type telephone set. (See Fig. 1 and 2.)

1.02 The 662-type telephone set is similar in appearance and operation to the 661-type set. Additional features of the 662-type set are:

- New card dialer (41A)
- Exclusion feature when desired
- Provision for converting sets without exclusion to one with exclusion by means of a kit of parts.



Fig. 1 - 662-Type Telephone Set

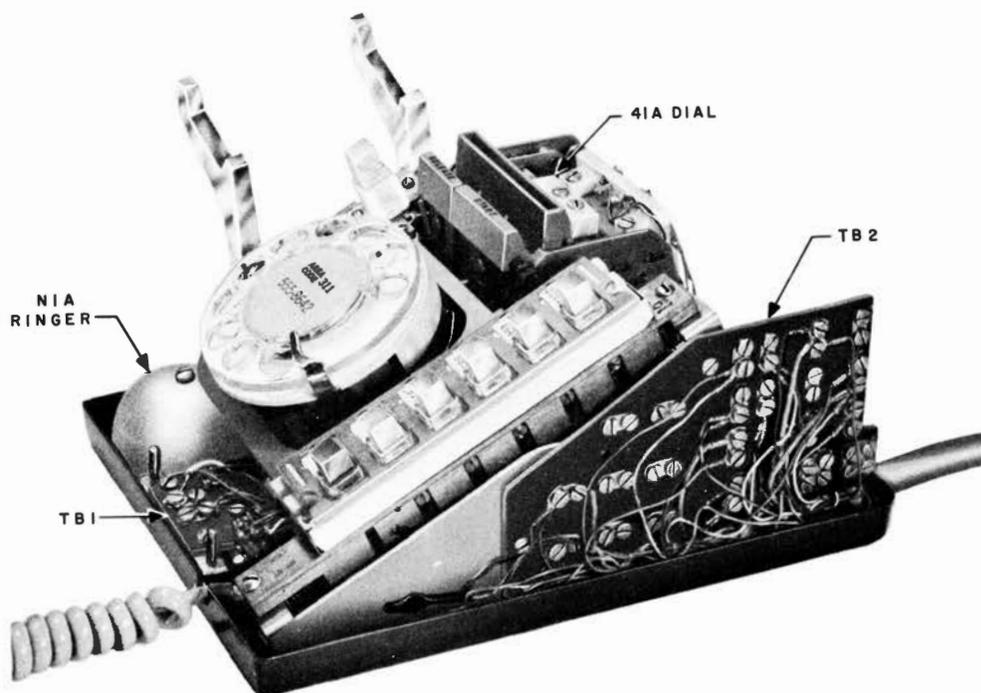


Fig. 2 - 662-Type Telephone Set, Cover Removed

2.00 IDENTIFICATION

2.01 The 662-type telephone set is designed to permit manual or automatic dialing, answering, signalling and holding on central office, PBX, private or intercommunicating lines in 1A, 1A1, 1A2, or 6A key telephone systems. The sets are supplied shop wired for 1A1 or 1A2 key telephone systems. Provision is made for addition of 3A speakerphone and exclusion when required.



Speakerphone and exclusion cannot be provided at the same time because of insufficient mounting cord conductors.

2.02 Although there are six sets coded as shown in Table A, only the 662A1 will be manufactured. Conversion to the other codes can be done at the distributing house or in the field.

TABLE A

SELECTION OF SETS

Set Code	Key	Exclusion Provided
662A1	599A	No
662A2	598A	
662A3	599B	
662A4	599A	Yes
662A5	598A	
662A6	599B	

2.03 In addition to an 8C rotary dial, an electromechanical automatic dial (41A) is provided. Unlike earlier model card dialers, the 41A dial does not require correct line polarity and does not operate from line current. It does require an external low-voltage ac supply to drive a synchronous motor. To operate the card dialer a coded card is inserted in the card slot. Depressing the START bar closes the start contacts allowing the motor to drive the

commutator disc. The card is fed past the reader mechanism and the coded portion of the card controls the output of the dial. If for any reason the user wishes to stop the dial, depressing the RELEASE bar ejects the card without further pulsing.

2.04 The power to drive the motor in the 41A dial may be obtained from the 18V ac taps on the 101G or 101J power supply or from an auxiliary power transformer.

2.05 Two packages (P-13E353) each containing twenty code cards and one set (P-13E363) of nine index cards are supplied with each set.

2.06 The N1A ringer in the set can be used as an individual ringer or as a common audible signal. A lever at the left front of the set permits adjustment of the ringer between high and low volume. A machine screw blocks the volume control from the OFF position. For ringer cutoff remove the screw through a hole provided in the base of the set. Provision is made for mounting a KS-8109 buzzer which can be used as an auxiliary signal when required.

2.07 The exclusion feature, if provided, is actuated by pulling up on the plastic button (Fig. 1) at the left top of the faceplate. The exclusion switch is connected to the switchhook assembly by means of a wire link so that exclusion is cancelled when the handset is restored to its cradle. Sets can be converted to provide exclusion by the installation of a kit of parts. (See Table B.)

2.08 The 662-type telephone set is manufactured in four colors - white (-58), green (-51), light beige (-60), and light grey (-61). The set is also available on special order in black (-3), yellow (-56), rose pink (-59), aqua blue (-62) and turquoise (-64). These special color sets are not to be promoted and should be ordered only on specific request of the customer.

TABLE B  
PIECE PART INFORMATION

Set Code*	Key	Rotary Dial	Card Dialer	Cord*	Regular Faceplate	Nonglare Faceplate	Hand-Set*	Exclusion Conversion Kit#	Housing*
662A1-	599A	8A	41A	D50K	P-13E059	P-25E607	G3AR	D-179887	P-82B0
662A2-	598A								
662A3-	599B								
662A4-	599A								
662A5-	598A								
662A6-	599B								
					P-24E672	P-25E606			

\*Add suffix for desired color:

(-51) Green            (-60) Light Beige  
(-58) White            (-61) Light Grey

\*Kit contains parts necessary to add exclusion to these sets.

### 3.00 ASSEMBLY

3.01 Piece part information for the 662-type telephone set may be found in Table B.

3.02 To convert a key position from pick-up (locking) to signalling (nonlocking) remove the screw detail P-10E837 from the key to be converted. Place screw detail when converting key back to original status.

3.03 To remove housing, loosen four captive screws through access holes in bottom of base. Lift housing straight off.

3.04 To remove 8C dial:

1. Loosen three screws holding dial adapter.
2. Shift dial to left until adapter clears screws.
3. Lift dial straight up and out. On sets with exclusion disengage wire link from switchhook assembly.

3.05 To replace 8C dial:

1. Remove dial from set as shown in 3.04.
2. Disconnect spade-tipped dial leads.
3. Loosen two screws holding dial to adapter and remove dial.
4. Attach replacement dial to adapter making sure dial is positioned properly.
5. Reterminate dial leads.
6. On sets with exclusion, start wire link from exclusion switch into hole on switchhook assembly. (See Fig. 3.)
7. Start slots in dial adapter under mounting screws.
8. Move dial to right as far as possible and tighten screws.
9. Check operation of 8C dial and exclusion switch if provided.

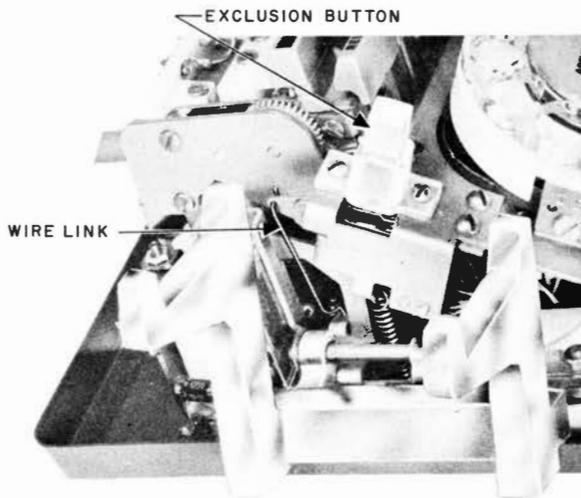


Fig. 3 - Exclusion Assembly

3.06 To replace 41A dial:

1. Disconnect 18V supply to dial temporarily.



If dial receives its power from a common source such as a 101G power supply, care must be taken that other services are not affected.

2. Disconnect wiring from terminal strip on rear of dial.
3. Turn set on side and remove three screws holding dial to base plate. Dial can now be removed.
4. Place new dial in position taking care not to pinch any wiring between dial and base plate.
5. Fasten replacement dial to base plate with three mounting screws.
6. Reterminate leads to dial on terminal strip.
7. Reconnect power supply.
8. Using a properly punched card, check the operation of the dial.

3.07 Sets without exclusion may be converted to include exclusion by the addition of a kit of parts (D-179887). This kit contains:

- Exclusion switch assembly with leads and terminal board attached
- Wire link
- Faceplate with opening for exclusion key
- Necessary hardware.

3.08 To convert set from nonexclusion to exclusion:

1. If set is equipped with KS-8109 buzzer, remove buzzer, and save plastic screws and spacers.
2. Remove 8C dial as shown in 3.04.
3. Attach exclusion switch assembly to dial adapter with two screws provided.
4. Dress exclusion switch leads across front of 41A dial and between 41A dial and key so that terminal board is at rear of set in position formerly occupied by buzzer.
5. Connect wire link to exclusion switch assembly by placing end of wire link having two 90-degree bends into hole provided in switch assembly. (See Fig. 3.)
6. Remount 8C dial making sure that wire link enters hole provided in switchhook assembly. Tighten dial mounting screws.
7. If buzzer is not provided, mount terminal board to base using plastic screws and spacers provided with set. If buzzer is provided, mount buzzer above terminal board with spacers between terminal board and buzzer to prevent interference between circuits. (See Fig. 4.)

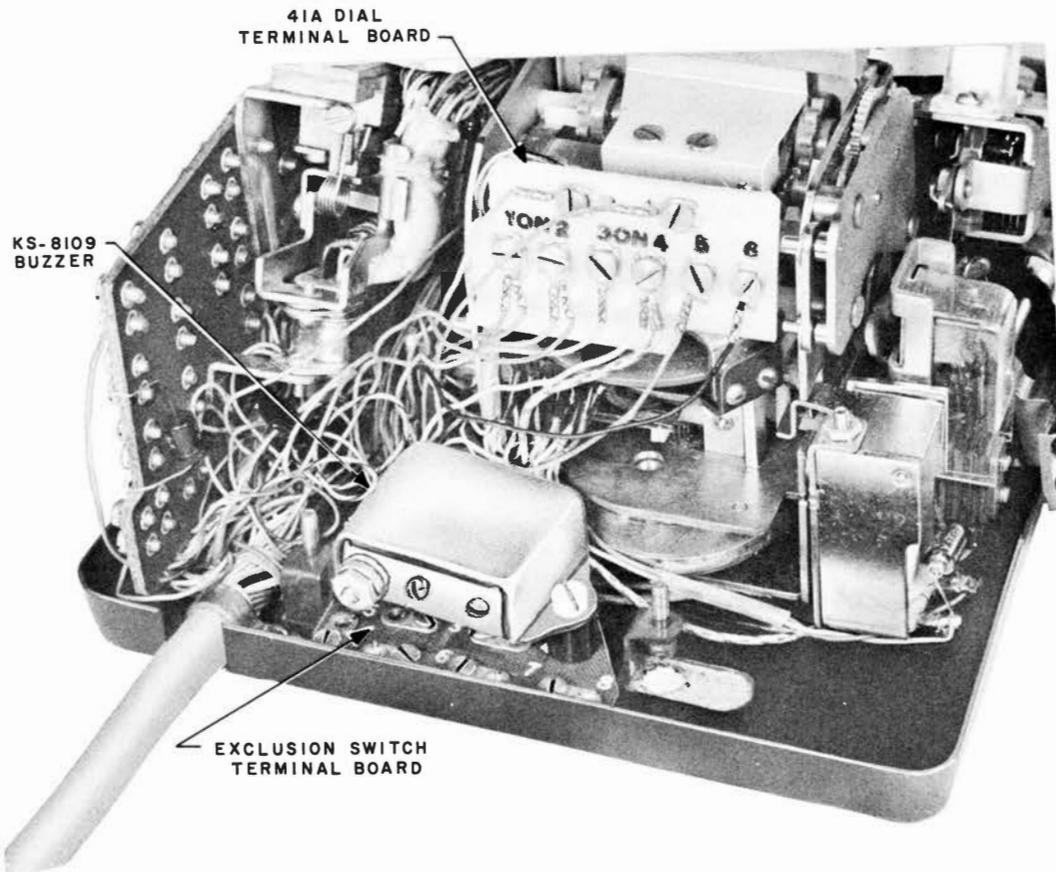


Fig. 4 - Location of Buzzer and Terminal Board

8. Replace faceplate with one providing opening for exclusion button.
9. Replace housing and check for proper operation.

#### 4.00 INSTALLATION

4.01 The 662-type set can be installed as a regular 4- or 6-button set in accordance with standard sections.

Caution: Never place 48-volt test battery across tip and ring or pickup keys without placing a current resistor in series with the battery. Use a KS-13490, List 1 (1000 ohm, 1/2 watt) resistor or one of equivalent value. Failure to do so will result in damage to the pulsing switch or the start switch of the 41A dial.

4.02 It is important that the cards be properly punched and checked for accuracy in order to ensure satisfactory performance.

4.03 Coding instructions for cards (Fig. 5 and 6) are as follows:

1. Write the name and the desired telephone number in the spaces provided as shown in Fig. 5 and 6. Convert the two exchange letters to numbers by referring to your telephone dial. (For example, use 2 for A or B or C.)
2. Note that there are two groups of numbers 1 through 9 at the left of the card, as shown. Zero appears only once. Each digit in the telephone number heads a column. In

column 1 locate the first digit of the telephone number in group 1 and punch out the perforation with a pencil or ball point pen. (In Fig. 5 the number is 6.) In the same column locate the same number in group 2 and punch out the perforation. If not already removed, punch out the STOP in this same column.

- Repeat this procedure for each digit in the telephone number. If the number is zero, only one hole is punched.

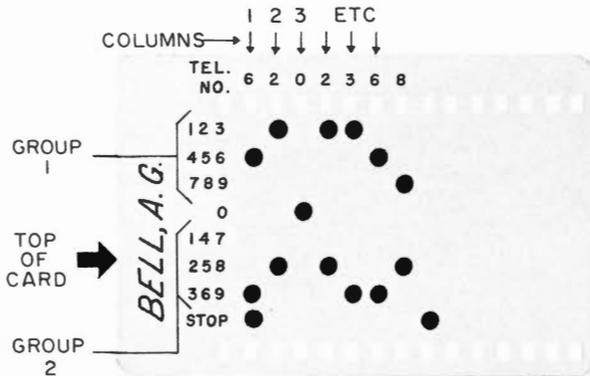


Fig. 5 - 7-Digit Card Coded for Telephone Number 620-2368 (MAIn 0-2368)

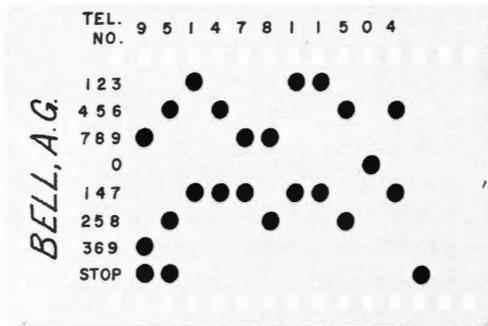


Fig. 6 - 11-Digit Card Coded 9 (Access Code for Central Office Dial Tone), STOP, 514 (Area Code), 781-1504 (SUNset 1-1504, Local Telephone Number)

- In the column immediately following the last digit, punch out the STOP hole (this hole will stop the card and immediately prepare the telephone for talking even though the card still has some distance to travel).
- For DDD calls punch out the required digits including the directing code, if required, area code, and 7-digit local telephone number.

4.04 To prepare a card for dialing an access code:

- Use the STOP column where a pause is required between digits (this occurs in certain PBX systems where the access code 9 is dialed to obtain central office dial tone).
- Punch out the proper holes in the access code number.
- In the next column punch out the STOP hole and starting in this same column, punch out the remainder of the telephone number, including the area code, in the regular manner.

- If the last column is used for the fourteenth digit, no STOP is required.

4.05 Check the card before using it to be sure that the card has been properly punched for the number desired. There should be two holes in each column except where zero appears; in those columns there will be only one. It is important that each hole be punched completely.

4.06 The operation of the card dialer is as follows:

- Remove handset.
- Listen for dial tone.
- Insert punched card into dialer slot and push down all the way. Card can be inserted only with name on top, facing front of set.

- 4. Depress dialer START bar.
  - 5. After call is completed, replace handset.
  - 6. Depress RELEASE bar.
  - 7. Remove card from dialer.
  - 8. Operation of RELEASE bar will release card at any time.
- 101G or 101J power supply
  - KS-16886, List 2 transformer, terminals 4 and 6
  - 2075A transformer
- 4.07 Cards coded for the STOP feature operate the same as in Steps 1 through 4. After dialer dials access code, it stops. After second dial tone is heard, depress the START bar again and the remaining digits will be dialed. Steps 5 through 8 then apply.
- 4.08 The 41A dial requires 12.5 to 19 volts ac for proper operation. (See Table C.) Power for the dial can be obtained from one of the following:
- 4.09 Table C is based on the premise that the power supply is used for powering card dialers only and each dialer is wired independently back to the power supply. If the power supply is used for other services such as lamps, buzzers, etc, or if it is found necessary to power more than one dial per conductor loop, it will be necessary to check the voltage at the dial. When checking the voltage, any auxiliary equipment should be operating to ensure that the load placed on the power supply is typical of what can be expected during normal operation.
- 4.10 An E-4646 designation strip is supplied with each set. To gain access to the key, place the KS-16750, List 1 releaser at edge of faceplate catch. Push faceplate

TABLE C

POWER SUPPLY CAPACITIES

Type Of Power Supply	Capacity Of Power Supply	Maximum Distance Between Dial and Power Supply (in feet)		
		Cable BUA (22 ga)	Cable D, I. W. (24 ga)	JKT (20 ga)
101G or 101J	6 Dials	600	400	1000
KS-16886, L2 Transformer	3 Dials	1150	700	1850
2075A Transformer	1 Dial	675	425	1075

catch toward rear of set until releaser engages notched portion of faceplate cutout. Turn point of releaser under faceplate and raise faceplate. To restore, reverse the procedure. Designation strip is installed in the usual manner.

#### 5.00 MAINTENANCE

5.01 Maintenance on the 661-type telephone set is limited to the following items:

- 41A dial -- On mechanical trouble reports such as cards sticking, etc, make a visual inspection of dial for loose parts or wires interfering with the dialer. Check to see if any foreign material (paper clips, hairpins, etc) is lodged in the card slot. Faulty cards should be checked for proper size by comparison with a working card. Bent or mutilated cards should be replaced. Do not attempt to adjust springs or dialer contacts.
- For electrical troubles, such as dialing wrong numbers, use a card coded with a local test number. Check at least twice on each line with test code card. Inspect customer cards for proper coding. Check power supply at dial for proper voltage.

5.02 See appropriate sections for maintenance of 8C dial, 41-type dial, G3-type hand set, and keys.

5.03 If trouble still persists, replace set.

#### 6.00 CONNECTIONS

6.01 Connections for 662A1 and 662A4 telephone sets are shown in Fig. 7.

6.02 Connections for 662A2 and 662A5 telephone sets are shown in Fig. 8.

6.03 Connections for 662A3 and 662A6 telephone sets are shown in Fig. 9.

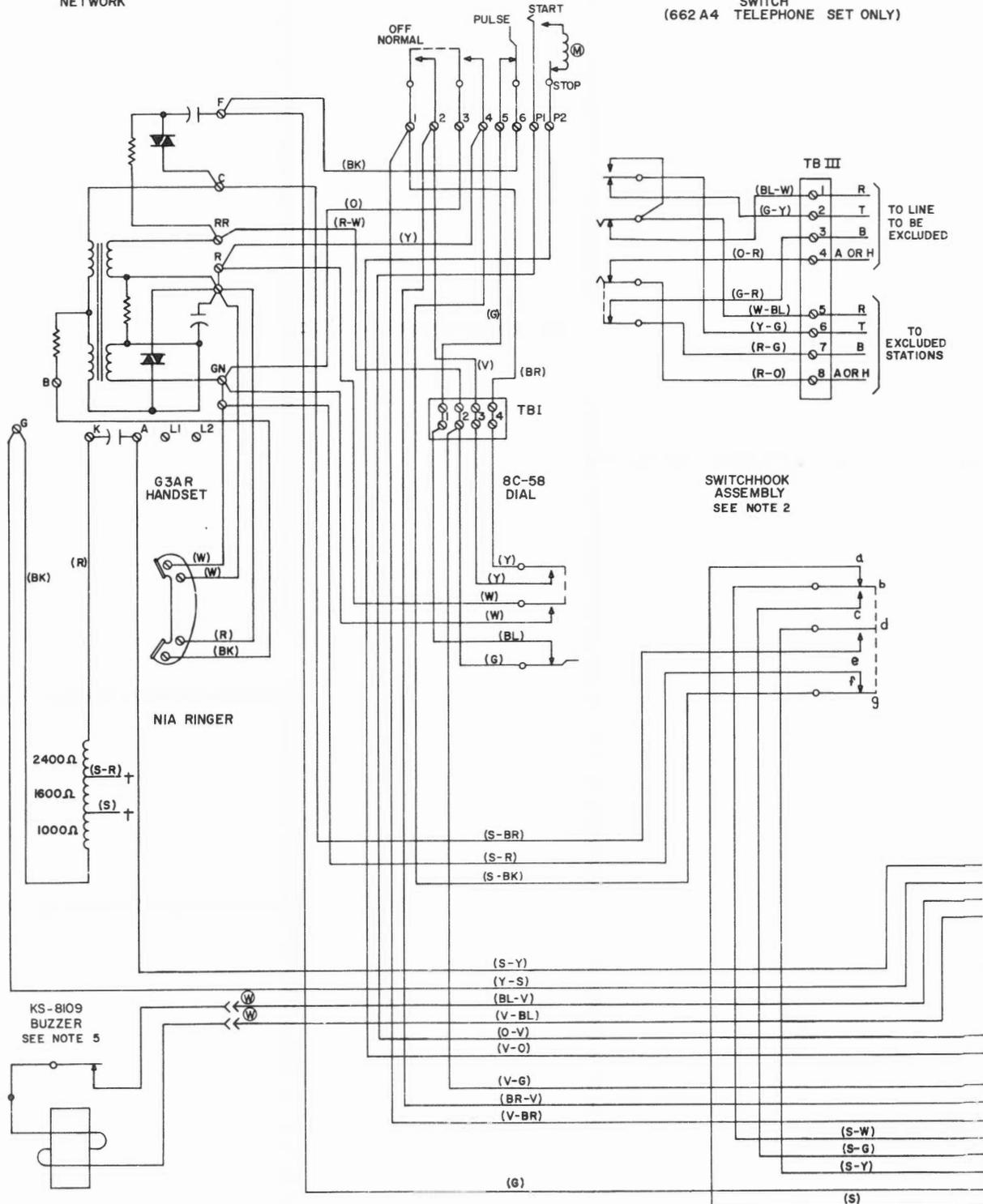
6.04 The schematic drawings (Fig. 7, 8, and 9) show only a portion of the 41A dial circuit. See section entitled Station Dials, 41 Type, for complete schematic drawing and description of dial.

6.05 Connections to 3A speakerphone system are shown in Tables E and F and Fig. 10.

4010 B NETWORK

41A DIAL

EXCLUSION SWITCH  
(662 A4 TELEPHONE SET ONLY)



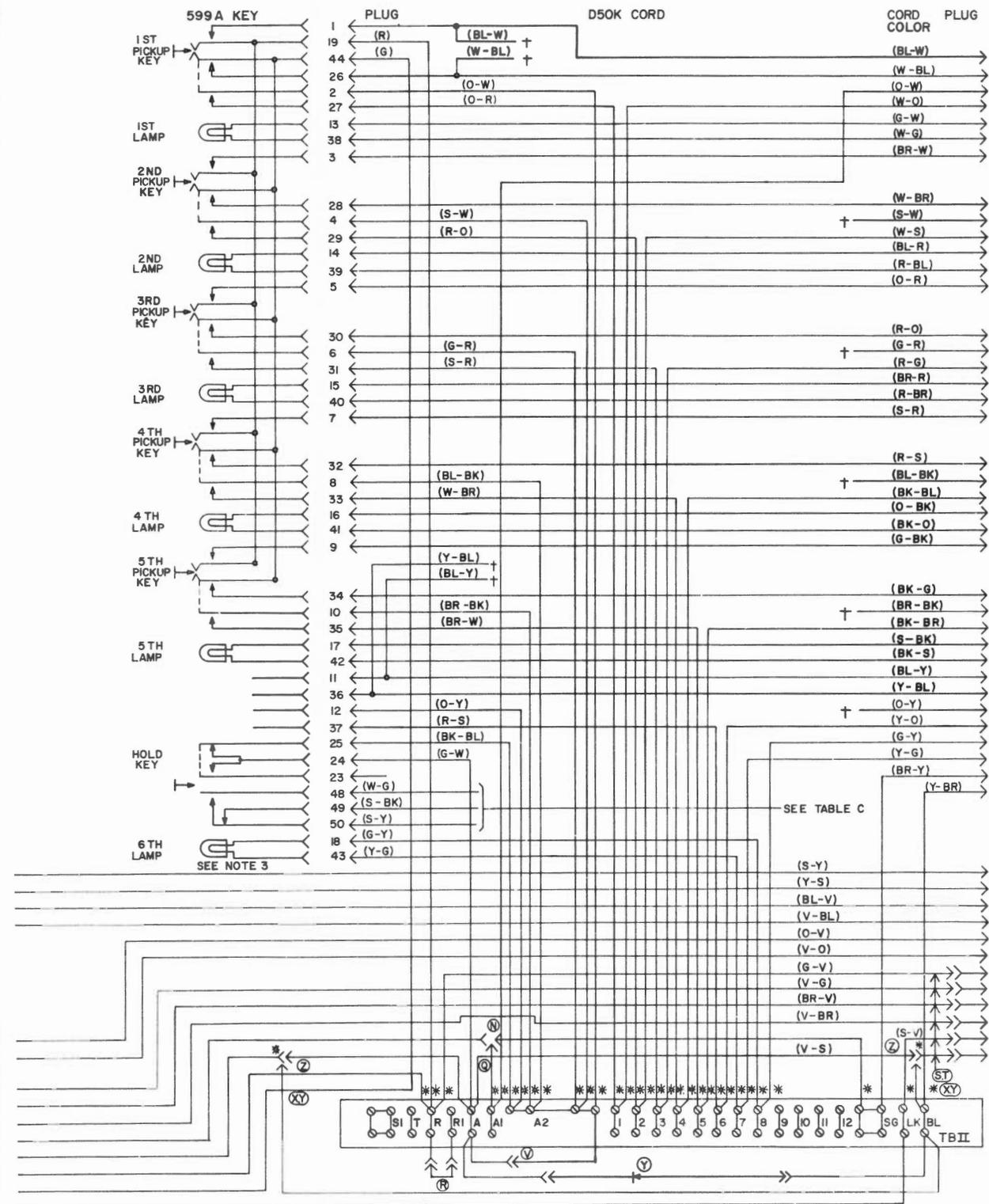
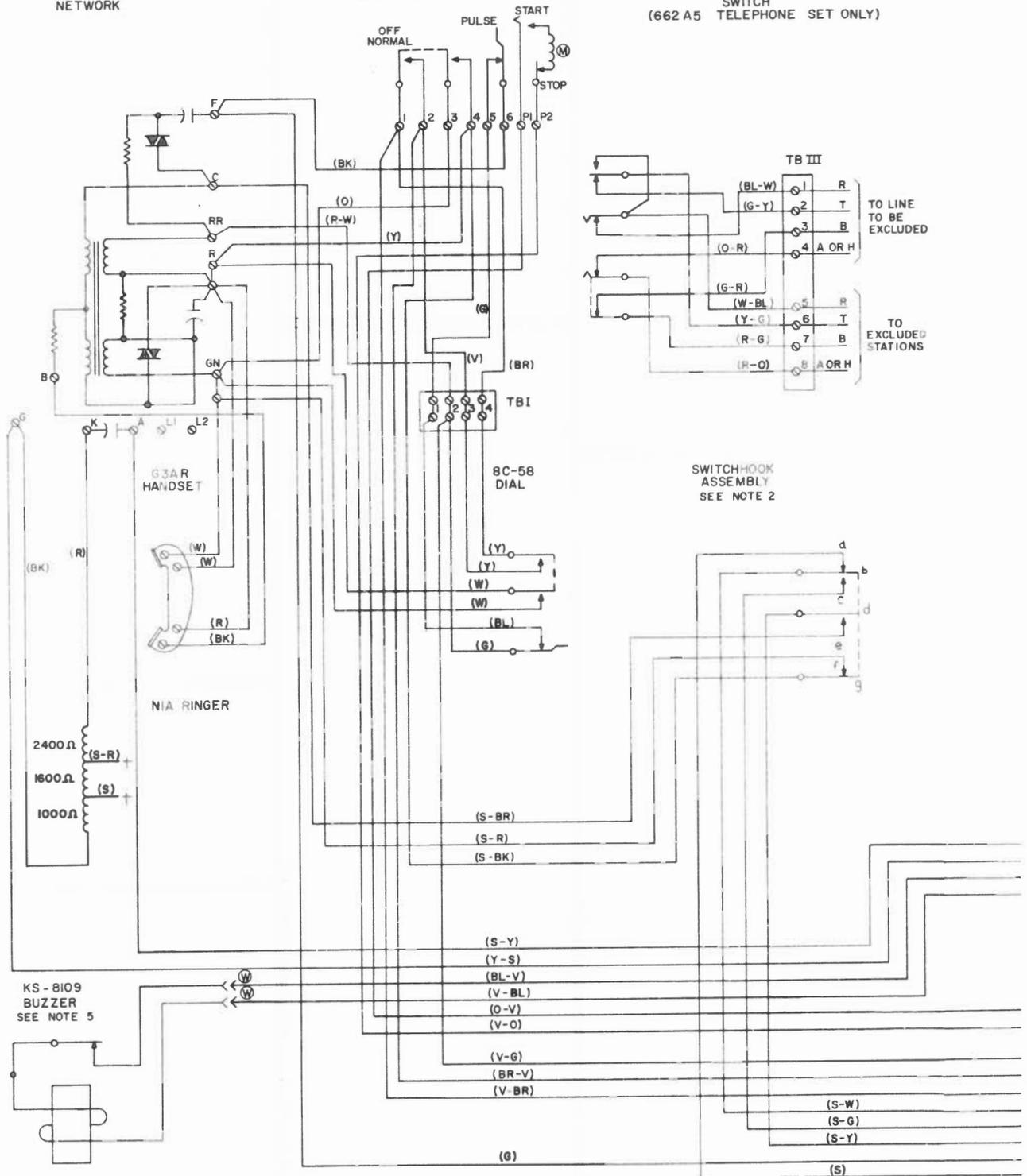


Fig. 7 - 662A1 and 662A4 Telephone Set

4010 B NETWORK

41A DIAL

EXCLUSION SWITCH  
(662 A5 TELEPHONE SET ONLY)

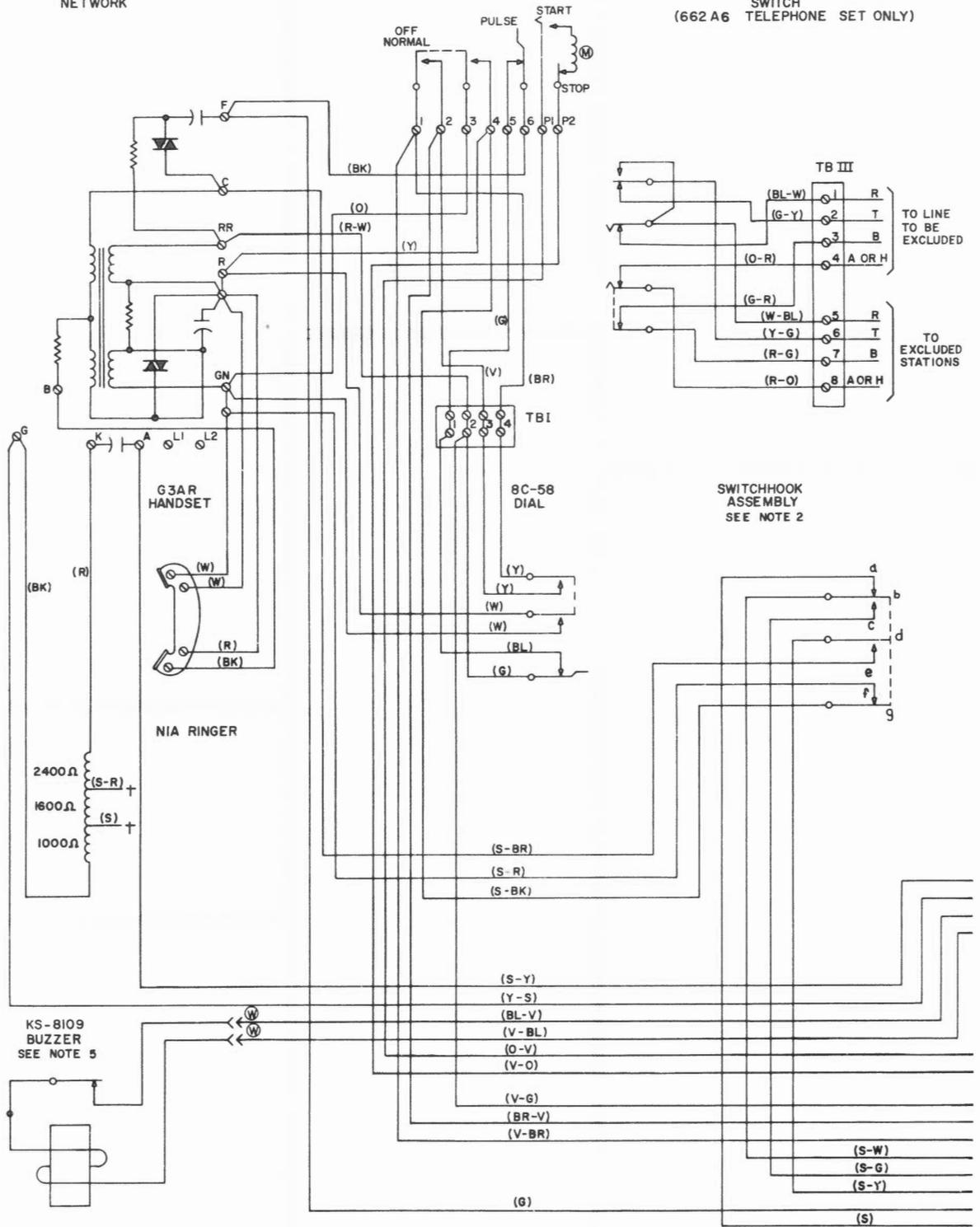


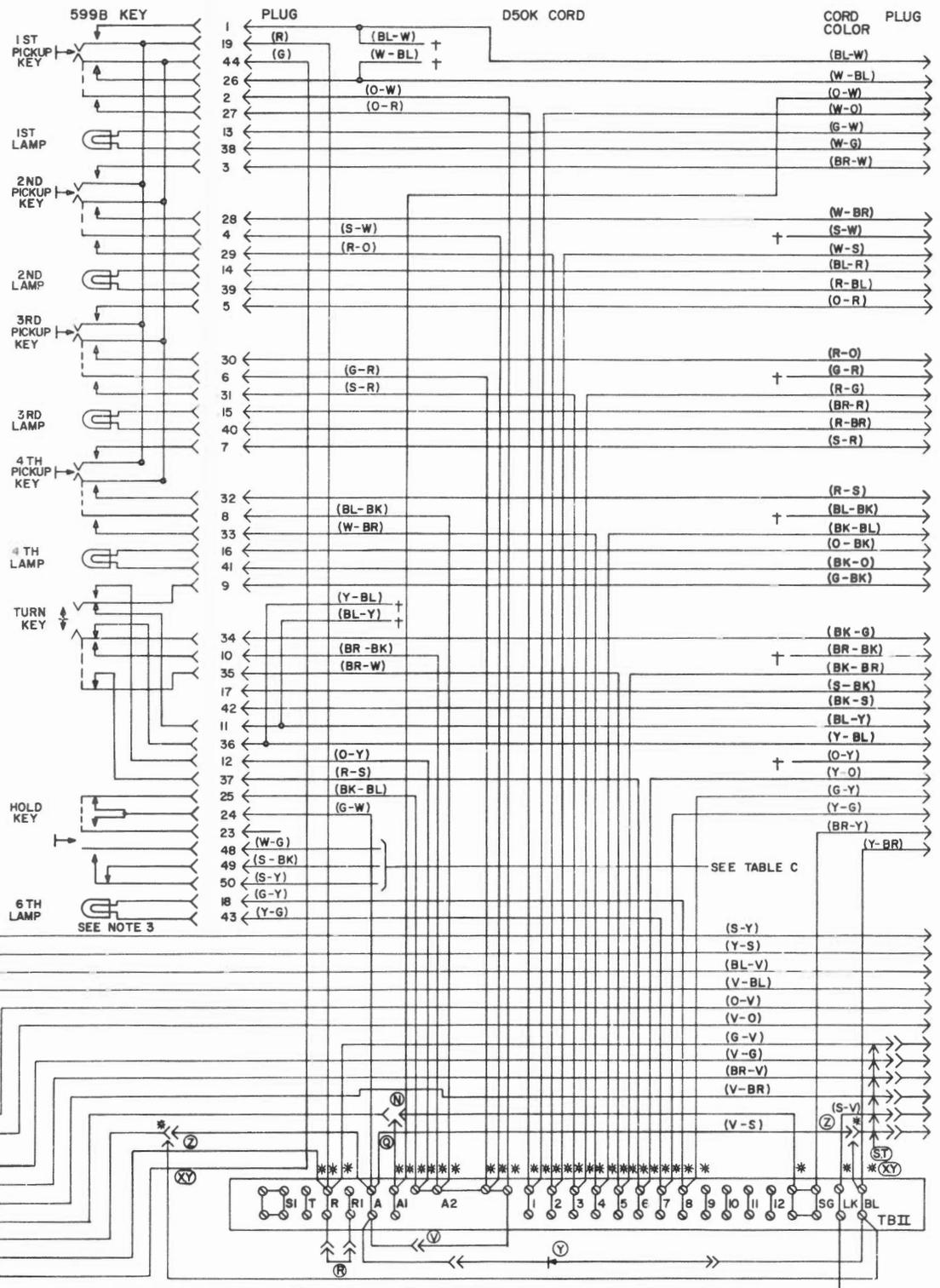


4010 B NETWORK

41A DIAL

EXCLUSION SWITCH  
(662 A6 TELEPHONE SET ONLY)





A25B CONNECTOR CABLE

CONN	LEAD DESIGNATION	CABLE COLOR
1	R	(BL-W)
26	T	(W-BL)
2	A1 OR B	(O-W)
27	A,H,S OR SI	(W-O)
3	L	(G-W)
28	LG	(W-G)
4	R	(BR-W)
29	T	(W-BR)
5	B	(S-W)
30	A,H,S OR SI	(W-S)
6	L	(BL-R)
31	LG	(R-BL)
7	R	(O-R)
32	T	(R-O)
8	B	(G-R)
33	A,H,S OR SI	(R-G)
9	L	(BR-R)
34	LG	(R-BR)
10	R	(S-R)
35	T	(R-S)
11	B	(BL-BK)
36	A,H,S OR SI	(BK-BL)
12	L	(O-BK)
37	LG	(BK-O)
13	R	(G-BK)
38	T	(BK-G)
14	B	(BR-BK)
39	A,H,S OR SI	(BK-BR)
15	L	(S-BK)
40	LG	(BK-S)
16	R	(BL-Y)
41	T	(Y-BL)
17	B	(O-Y)
42	A,H,S OR SI	(Y-O)
18	L	(G-Y)
43	LG	(Y-G)
19	SG	(BR-Y)
44	BL OR LS	(Y-BR)
20	R OR RI	(S-Y)
45	B OR BI	(Y-S)
21	BZ	(BL-V)
46	BZI	(V-BL)
22	DP1	(O-V)
47	DP2	(V-O)
23	R1	(G-V)
48	T1	(V-G)
24	P4	(BR-V)
49	P3	(V-BR)
25	LK	(S-V)
50	AG	(V-S)

- Ⓢ BUZZER
- Ⓢ 1A KEY TELEPHONE SYSTEM
- Ⓢ 1A WITH STATION BUSY LAMP
- Ⓢ 1A WITHOUT HOLD (598A KEY)
- Ⓢ 1A WITH 3A SPEAKERPHONE
- Ⓢ 1A1 OR 1A2 KEY TELEPHONE SYSTEM
- Ⓢ 1A1 OR 1A2 WITH STATION BUSY LAMP
- Ⓢ 1A1 OR 1A2 WITHOUT STATION BUSY LAMP
- Ⓢ 1A1 OR 1A2 WITHOUT HOLD (598A) KEY
- Ⓢ 1A1 OR 1A2 WITH 3A SPEAKERPHONE

NOTE 1: SET IS FURNISHED WIRED FOR 1A1 OR 1A2 KEY TELEPHONE SYSTEM. SEE TABLE C FOR CONNECTION TO 1A KEY TELEPHONE SYSTEM.

NOTE 2: CONTACT SEQUENCE FOR SWITCH SHALL BE AS FOLLOWS:

- \*REMOVING HANDSET
  1. cb MAKES
  2. de MAKES
  3. ab BREAKS (MAY BREAK BEFORE de MAKES)
  4. fg BREAKS AFTER de MAKES
- \*RESTORING HANDSET
  1. ab MAKES AND de BREAKS BEFORE cb BREAKS
  2. OTHER CONTACTS, NO REQUIREMENTS

NOTE 3: TO USE 6TH LAMP EQUIP KEY WITH PROPER LAMP AND CONNECT ASSOCIATED LEADS AT EQUIPMENT OR DISTRIBUTION TERMINAL AS REQUIRED.

NOTE 4: LEADS FOR 3A SPEAKERPHONE MUST BE TERMINATED WHEN FEATURE IS DESIRED. A 148A OR 149A ADAPTER MAY BE REQUIRED FOR CONNECTION TO SPEAKERPHONE CONTROL UNIT. (SEE TABLES E AND F)

NOTE 5: WHEN KS-8109 BUZZER IS PROVIDED CONNECT BZ (BL-V) AND BZI (V-BL) TO TERMINALS OF BUZZER. CARE SHOULD BE TAKEN THAT TERMINAL OF BUZZER DOES NOT TOUCH BASE OF SET.

NOTE 6: WHEN EXCLUSION FEATURE IS DESIRED CONNECT EXCLUSION SWITCH TO STATIONS BY MEANS OF PAIRS NOT BEING USED FOR OTHER FUNCTIONS. WHEN CONNECTED TO 1A KEY TELEPHONE SYSTEM THE "H" AND "B" LEADS MUST BE PAIRED. WHEN CONNECTED TO 1A1 OR 1A2 THE "A" LEADS OF THE LINE AND EXCLUDED STATIONS MAY BE CONNECTED TO PAIRED OR NON-PAIRED CONDUCTORS.

TO DISTRIBUTION TERMINAL OR AP- PARATUS CABINET

TABLE C  
1A1 AND 1A2 OR 1A CONVERSION AT TERM. BOARD II

OPTION	BK-BL	R OF KEY	G-W	W-G	S-BK	S-Y
1A1 AND 1A2	A2	R	A	+	+	+
1A	+	R1	+	A2	R1	R

TABLE D  
PICKUP TO SIGNAL KEY CONVERSION

KEY NO.	CORD COLOR	FROM PICKUP	TO INDIVIDUAL SIGNAL	TO COMMON SIGNAL
6	O-Y	A2	SG	S1
5	BR-BK	A2	SG	S1
4	BL-BK	A2	SG	S1
3	G-R	A2	SG	S1
2	S-W	A2	SG	S1
1	O-W	A2	SG	S1

\*SPADE-TIPPED LEAD  
+INSULATE WITH KS-19147 LIST 1 CORD TIP INSULATOR AND STORE

Fig. 9 - 662A3 and 662A6 Telephone Set  
Tables C, D

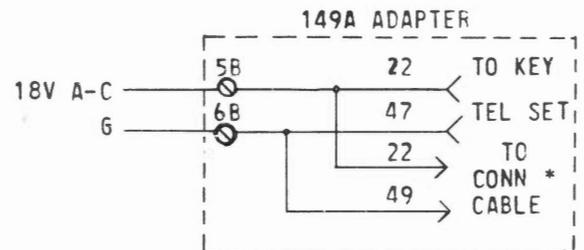
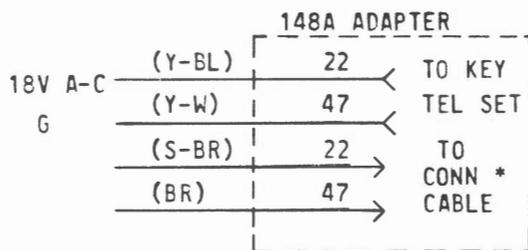
TABLE E  
CONNECTIONS TO 3A SPEAKERPHONE  
USING 148A ADAPTER

TERMINATIONS IN SET	MOUNTING CORD	148A ADAPTER CORD	LEAD DESIGN	TERM. ON 55A CONTROL UNIT
A OR BL	V-S	S-BK	AG	5
LK	S-V	S-Y	LK	*
KS-8109 BUZZER	V-BL	Y-BK	BZ1	6
KS-8109 BUZZER	BL-V	G-W	BZ	7
2(41A DIAL)	V-BR	S	P3	21
1(41A DIAL)	BR-V	BL-W	P4	3C
2+	V-G	BK-W	T1	19
R	G-V	BK-BL	R1	20
G‡	Y-S	G-Y	B OR B1	8
A‡	S-Y	R-W	R OR R1	9
A1	G-W	G-BK	A1	17

TABLE F  
CONNECTIONS TO 3A SPEAKERPHONE  
USING 149A ADAPTER

TERMINATIONS IN SET	MOUNTING CORD	149A ADAPTER TERMINALS	LEAD DESIGN	TERM. ON 55A CONTROL UNIT
A OR BL	V-S	12A	AG	5
LK	S-V	11A	LK	*
2(41A DIAL)	V-BR	10A	P3	21
1(41A DIAL)	BR-V	9A	P4	30
2+	V-G	8A	T1	19
R	G-V	7A	R1	28
G‡	Y-S	2A	B OR B1	8
A‡	S-Y	1A	R OR R1	9
A1	G-W	A1	A1	12
KS-8109 BUZZER	V-BL	4B	BZ1	6
KS-8109 BUZZER	BL-V	3B	BZ	7

- \* CONNECT TO BK OR 666A TRANSMITTER
- + TB1
- ‡ TERMINAL ON NETWORK



\* DO NOT USE CORRESPONDING CONNECTOR CABLE CONDUCTORS AT EQUIPMENT

Fig. 10 - Connections for Auxiliary Power to 41A Dial