

## TELEPHONE SETS

### 661 TYPE

#### 1.00 GENERAL

1.01 This section covers identification, operation, installation, maintenance, and connections for 661-type telephone set (Fig. 1 and 2).

1.02 The section is reissued to include the following changes:

- Add Table A showing standard coded sets.
- Eliminate ivory and add white to the list of available colors.
- Add information concerning use of current limiting resistor to protect contacts of the 40A dial.
- Add 5th pickup key to Fig. 6.

- Add hold key to Fig. 7.

- Add Table D and Table E, 3A speakerphone connections.

1.03 Due to extensive changes, marginal arrows have been omitted.

#### 2.00 IDENTIFICATION

2.01 The 661 telephone set is equipped with six square-face illuminated buttons and has an electromechanical dialing mechanism in addition to a regular rotary dial. It is designed to permit manual or automatic dialing, answering, signaling, and holding on central office, PBX, private, or intercommunicating lines in 1A, 1A1, or 6A key telephone systems.

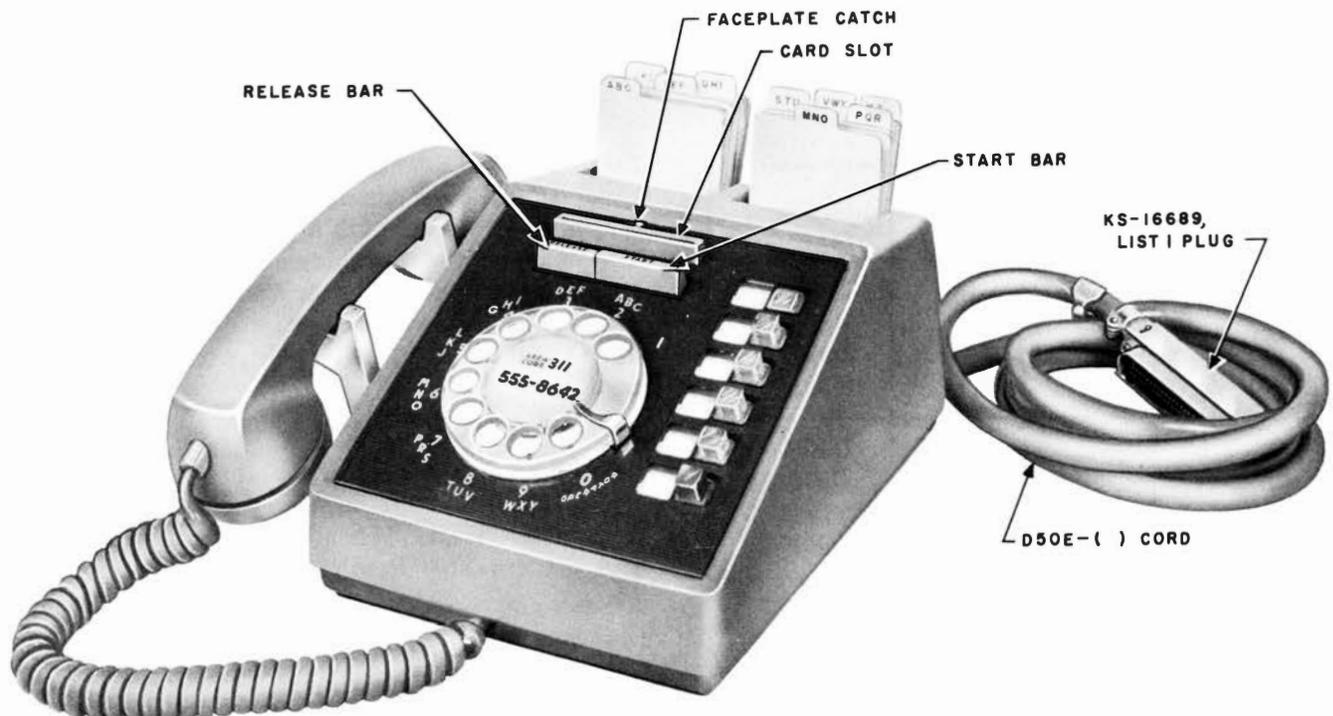


Fig. 1 — 661-Type Telephone Set

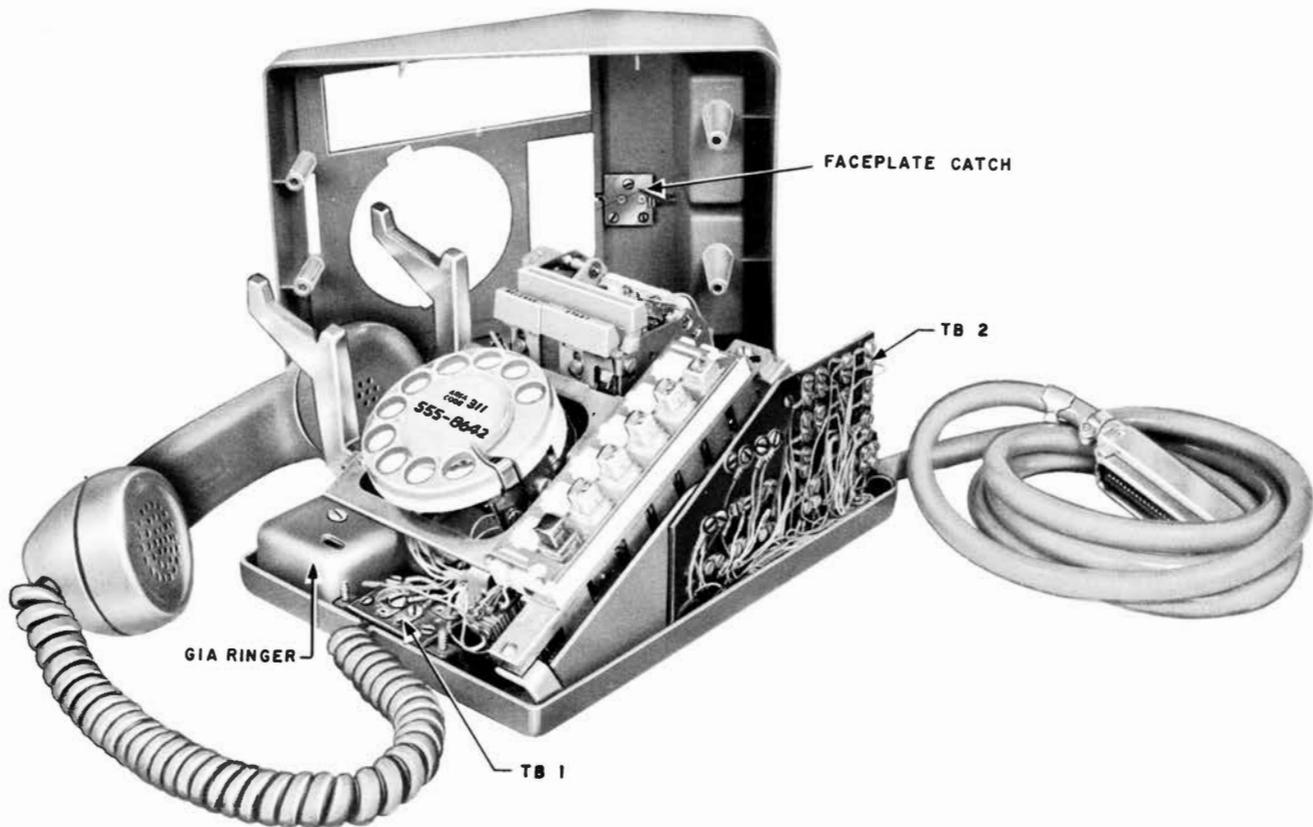


Fig. 2 — 661-Type Telephone Set, Cover Removed

TABLE A  
SELECTION OF SETS

Set Code	Color Code	Key	Mtg Cord
661A1-	51 58 60 61	599A	D50E-51 D50E-58 D50E-60 D50E-61
661A2-	51 58 60 61	598A	D50E-51 D50E-58 D50E-60 D50E-61
661A3-	51 58 60 61	599B	D50K-51 D50K-58 D50K-60 D50K-61

Note: Color codes shown are: (51) green, (58) white, (60) light beige, (61) light grey.

2.02 The set is available in four colors: green, white, light beige, and light grey.

2.03 The set comes equipped with a D50E or D50K 50-conductor cord (Table A). The set end is equipped with a KS-16671, List 1 plug. The opposite end terminates in a KS-16689, List 1 plug for connection to an A25B connector cable. The cords are interchangeable except for the 661A3 set which must be equipped with a D50K cord.

2.04 The sets are also equipped with a 599A, 598A, or 599B key. Keys are interchangeable between sets. When replacing keys, remove and discard any P-10E865 wire clips found in place.

2.05 The electromechanical dialer (40A dial) provides for automatic dialing up to 14 digits. It is a dc pulse generator drawing its operating power from two sources: line current and a

spring motor. Its output is controlled by contacts on the fingers of a card reading device. Insertion of the card winds the spring motor. Operation of the START bar allows the card to be fed past the reader mechanism, and the coded portion of the card controls the output of the pulse generator. If the user wishes to stop dialing for any reason, depression of the RELEASE bar ejects the card without further dial pulsing.

**2.06** The cards used in the 40A dial are coded P-13E353 (20-card package, 2 packages with each set). A set of nine index cards coded P-13E363 is also furnished with the set. Both cards and index cards will be furnished in white only.

**2.07** The 4010A network used in the set is electrically the same as the 425B network, but is physically much smaller.

**2.08** The G1A ringer in the set can be used as an individual line ringer or as a common audible signal. It also has a volume control adjustment for high volume and low volume. A machine screw is factory placed, blocking the volume control from the OFF position. For ringer cutoff, remove machine screw through a hole provided in the base of the set.

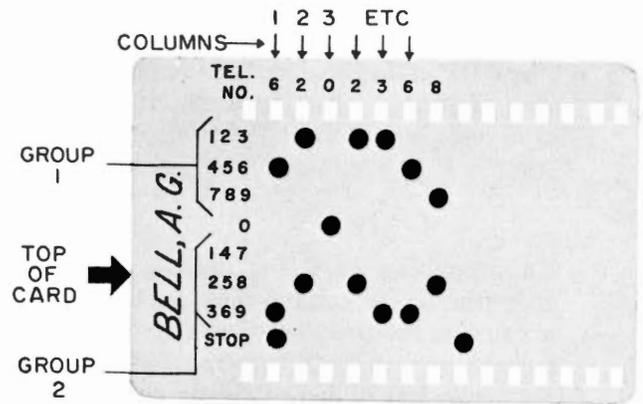
**3.00 OPERATION**

**3.01** The operation of the 661-type telephone set keys is the same as for the regular 4- or 6-button sets.

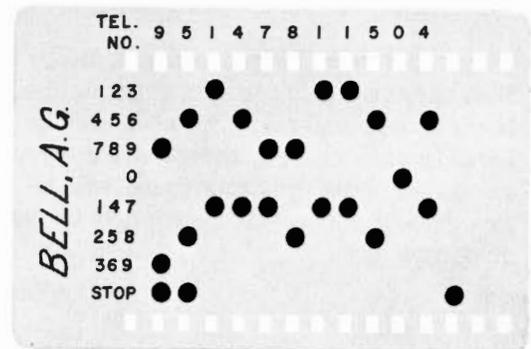
**3.02** It is important that the cards be properly punched and checked for accuracy in order to ensure satisfactory performance.

**3.03** Coding instructions for cards (Fig. 3 and 4) are as follows:

- Write the name and the desired telephone number in the spaces provided as shown in Fig. 3 and 4. Convert the two exchange letters to numbers by referring to your telephone dial. (For example use 2 for A or B or C.)
- 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



**Fig. 3 — 7-Digit Card Coded for Telephone Number 620-2368 (MAin O-2368)**



**Fig. 4 — 11-Digit Card Coded 9 (Access Code for Central Office Dial Tone), STOP, 514 (Area Code), 781-1504 (SUNset 1-1504, Local Telephone Number)**

number in group 1 and punch out the perforation with a pencil or ball point pen. (In Fig. 3 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. 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.
- To prepare a card for dialing an access code, the STOP column must be used 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.
- 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.

**3.04** The operation of the card dialer is as follows:

1. Remove handset.

2. Listen for dial tone.
3. Insert punched card into dialer slot, 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.

**3.05** 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.

#### 4.00 INSTALLATION

**4.01** The 661-type set can be installed as a regular 4- or 6-button set, in accordance with standard sections.



*Correct line polarity must be maintained on all lines for proper operation. Dialer will not operate properly if line is reversed. In dial PBX systems, any reversal in the switching train will cause failure of the 40A dial, but not the 8C dial.*



*Never place 48-volt test battery across tip and ring of 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 40A dial.*

**4.02** 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 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 CONNECTIONS

**5.01** Connections for 661A1 with 599A key are shown in Fig. 5.

**5.02** Connections for 661A2 with 598A key are shown in Fig. 6.

**5.03** Connections for 661A3 with 599B key are shown in Fig. 7.

**5.04** The schematic drawings (Fig. 5, 6, and 7) show only a portion of the 40A dial circuit. See section covering station dials, 40 type, for complete schematic drawing and description of dial.

**5.05** The 661 telephone set comes wired for 1A1 key telephone systems. Conversion to 1A key telephone systems is shown in Fig. 7, Table B.

**5.06** Connections to 3A speakerphone system are shown in Table C and D.

## 6.00 MAINTENANCE

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



*Check all lines for proper polarity.*

- 40A 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.
- See appropriate sections for maintenance of 8C dial, 40-type dial, G3-type hand set, and keys.
- If trouble still persists, replace set.

G3 - TYPE  
HAND SET

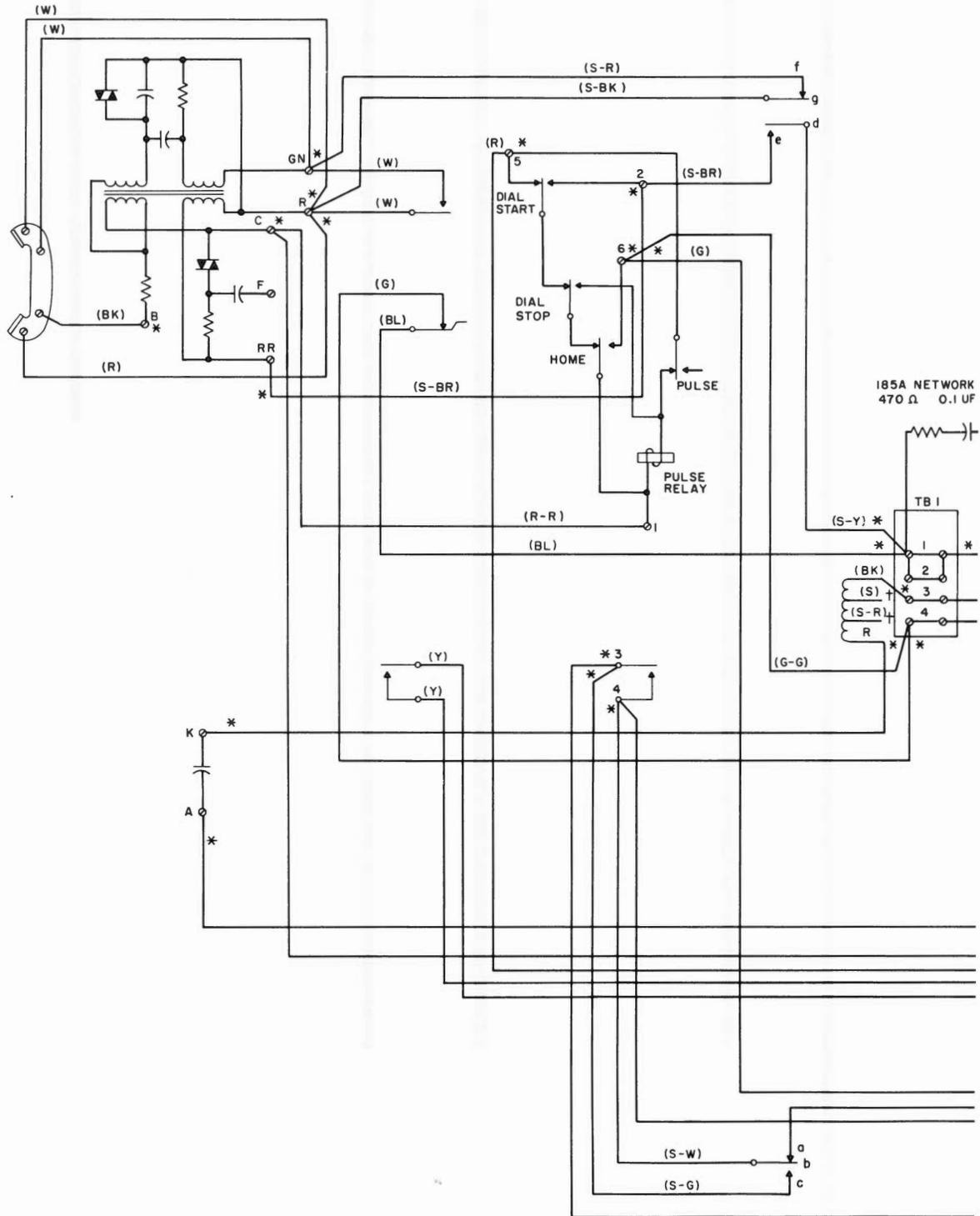
4010A NETWORK

8C DIAL

40A DIAL

SET  
SWITCH  
NOTE 2

GIA RINGER



599A KEY

CONN PLUG

D50E CORD

CORD COLOR

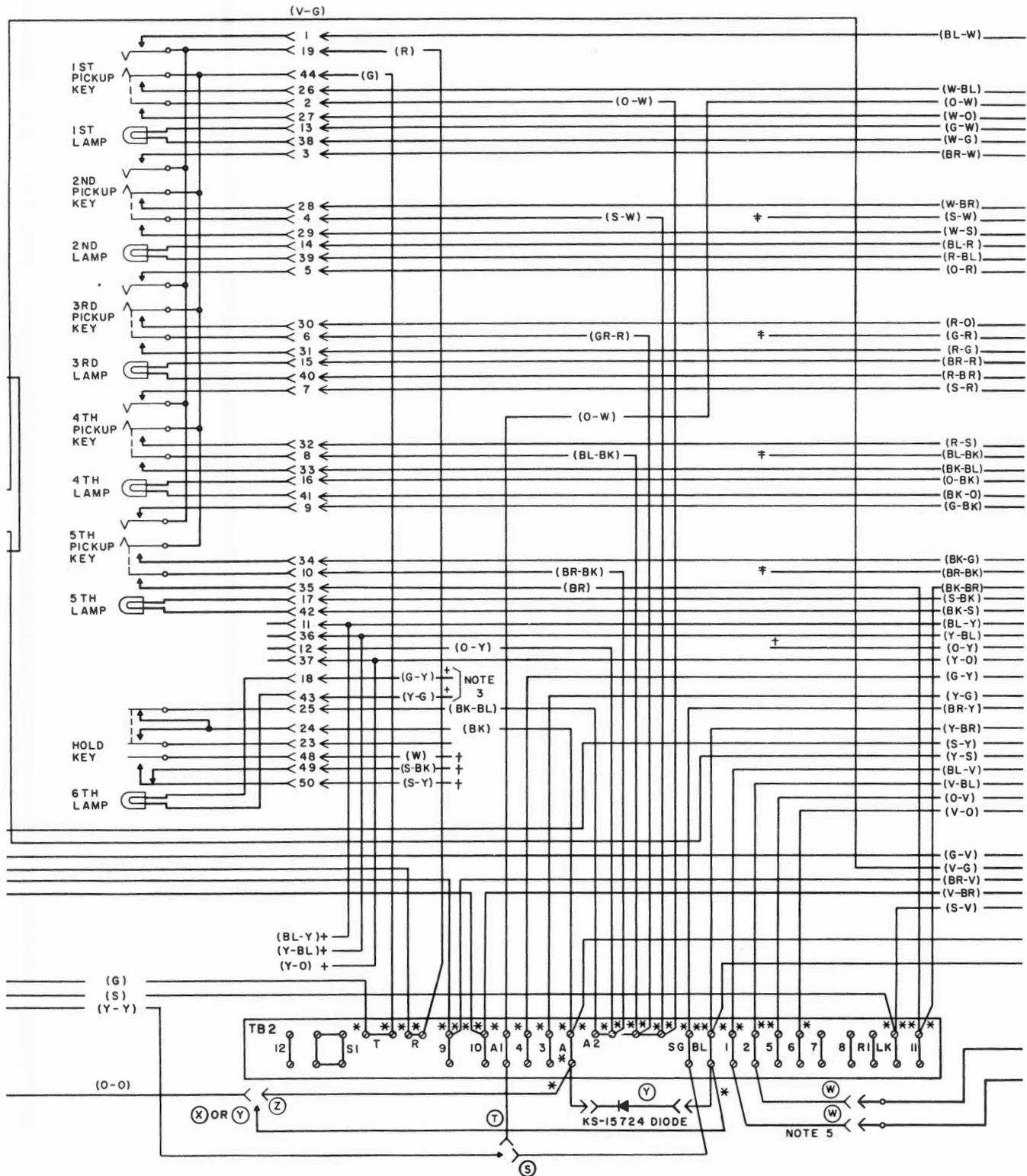


Fig. 5 - 661A1 Telephone Set with 599A Key

G3 - TYPE  
HAND SET

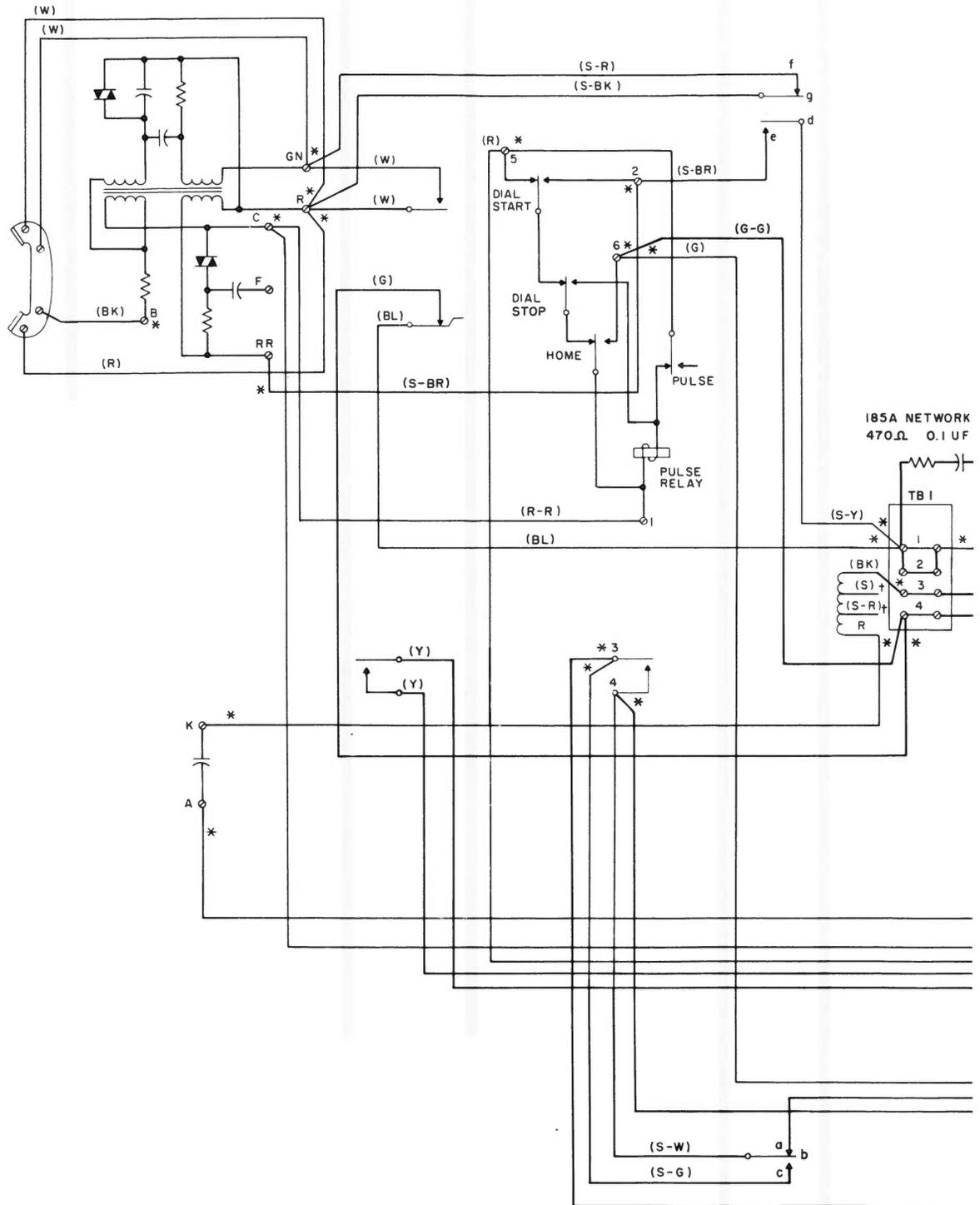
4010A NETWORK

8C DIAL

40A DIAL

SET  
SWITCH  
NOTE 2

GIA RINGER



598A KEY

CONN PLUG

D50E CORD

CORD COLOR

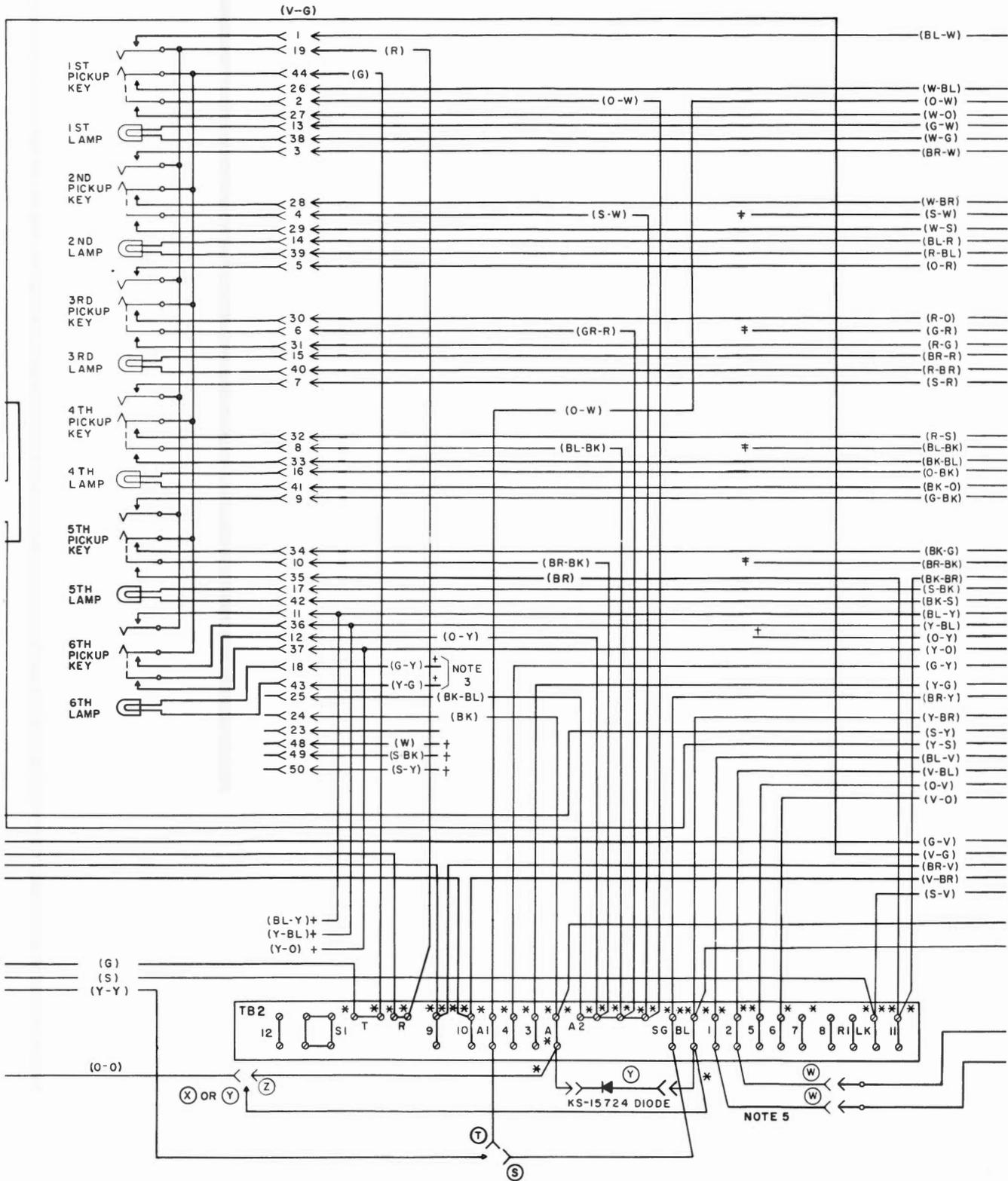


Fig. 6 - 661A2 Telephone Set with 598A Key

G3 - TYPE  
HAND SET

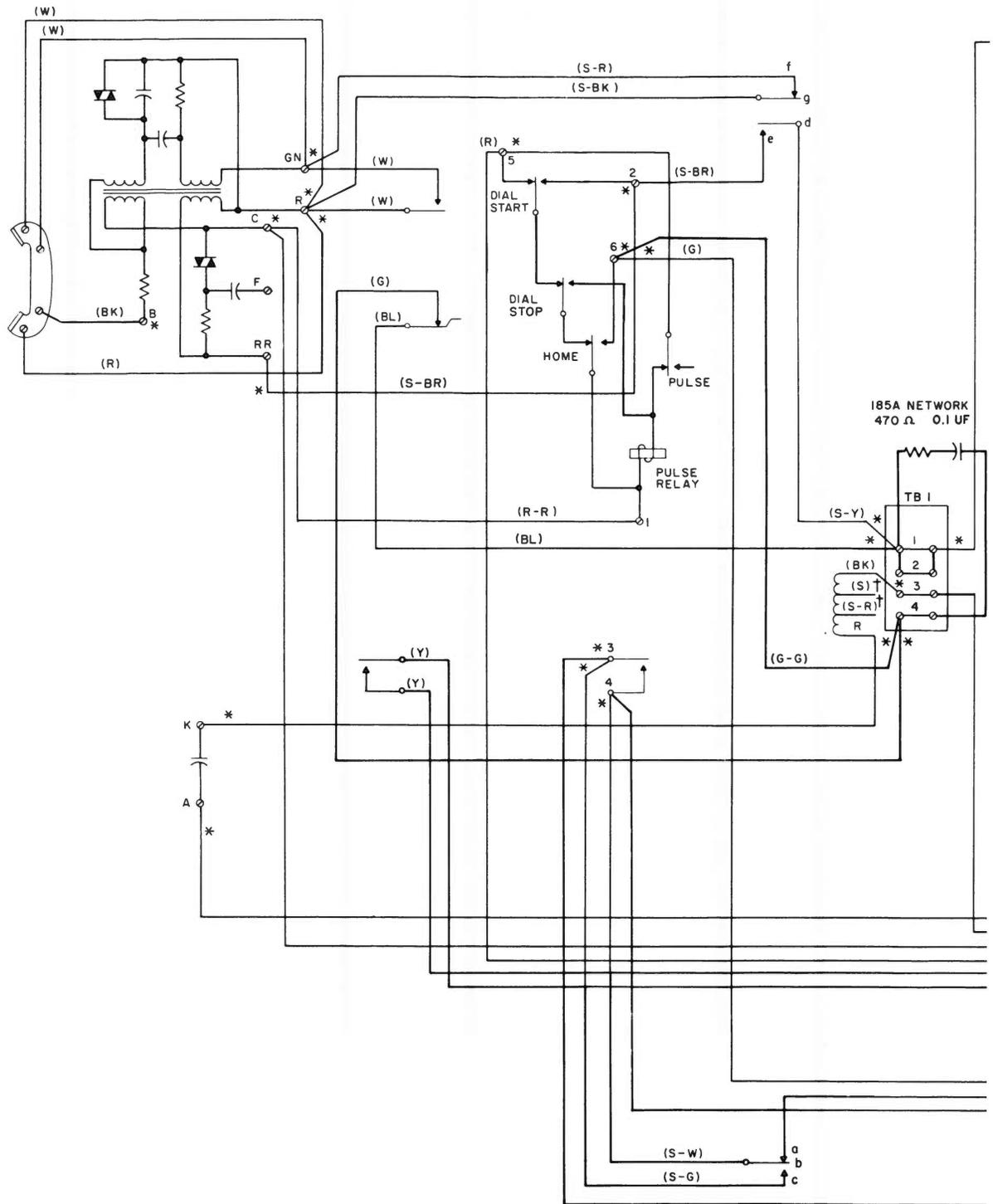
4010A NETWORK

8C DIAL

40A DIAL

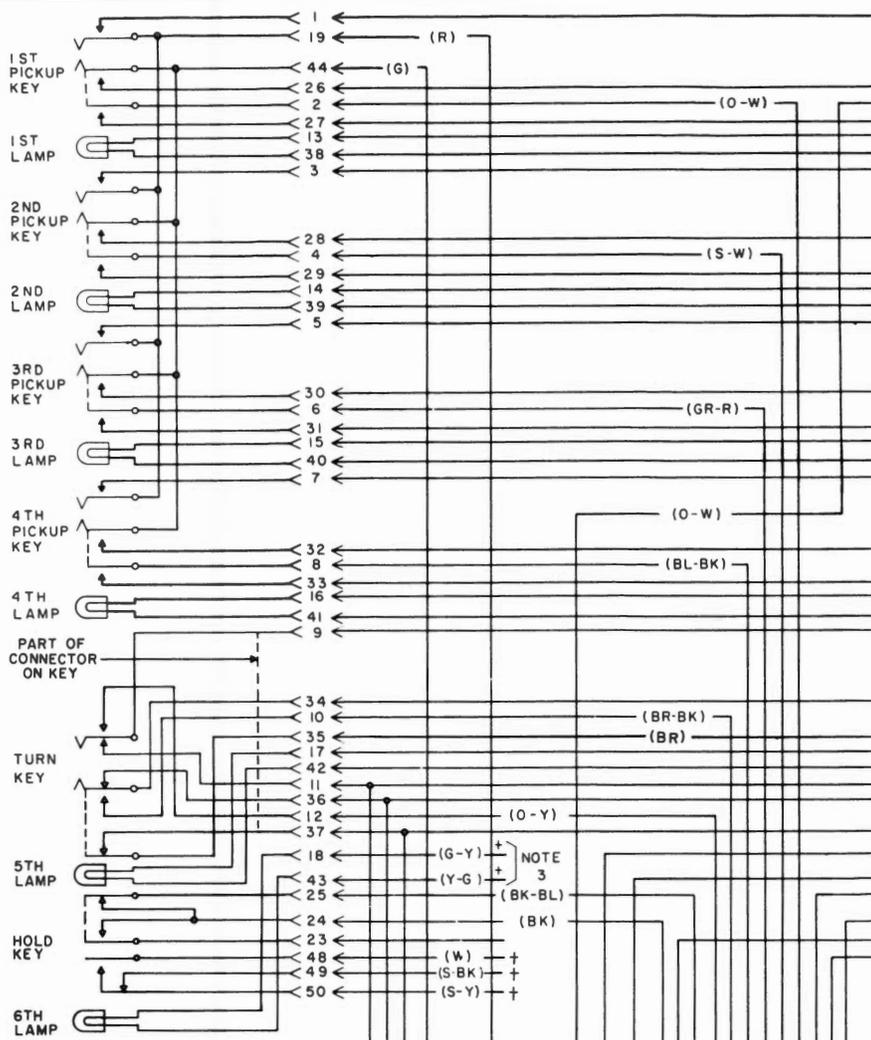
SET  
SWITCH  
NOTE 2

GIA RINGER

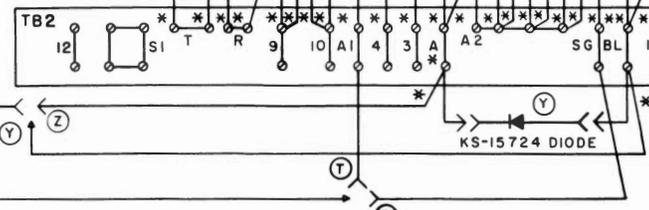


185A NETWORK  
470 Ω 0.1 UF

(V-G)



NOTE 3



FOLD



TABLE

CABLE  
COLOR

— (BL-W) —
— (W-BL) —
— (O-W) —
— (W-O) —
— (G-W) —
— (W-G) —
— (BR-W) —
— (W-BR) —
— (S-W) —
— (W-S) —
— (BL-R) —
— (R-BL) —
— (O-R) —
— (R-O) —
— (G-R) —
— (R-G) —
— (BR-R) —
— (R-BR) —
— (S-R) —
— (R-S) —
— (BL-BK) —
— (BK-BL) —
— (O-BK) —
— (BK-O) —
— (G-BK) —
— (BK-G) —
— (BR-BK) —
— (BK-BR) —
— (S-BK) —
— (BK-S) —
— (BL-Y) —
— (Y-BL) —
— (O-Y) —
— (Y-O) —
— (G-Y) —
— (Y-G) —
— (BR-Y) —
— (Y-BR) —
— (S-Y) —
— (Y-S) —
— (BL-V) —
— (V-BL) —
— (O-V) —
— (V-O) —
— (G-V) —
— (V-G) —
— (BR-V) —
— (V-BR) —
— (S-V) —
— (V-S) —

TO DISTRIBUTION  
TERMINAL OR  
APPARATUS CABINET

**Note 1:** Set is wired for 1A1 key tele-  
tem. See conversion tables for 1A key  
system.

**Note 2:** Contact sequence for switch is  
follows:

- Removing Handset
  1. cb makes
  2. de makes
  3. ab breaks (may break k  
makes)
  4. fg breaks after de makes.
- Restoring Handset
  1. ab makes and de breaks  
breaks
  2. other contacts, no requirem

**Note 3:** When 6th lamp is used connect  
terminal 3, Y-G to terminal 4, and L (L  
LG (Y-G) to terminal 3 and 4, respec  
terminal strip.

**Note 4:** Set is shop wired for use with  
3A speakerphone. A 149A adapter m  
quired for connection to speakerpho  
unit.

**Note 5:** When KS-8109 buzzer is prov  
BZ(BL-V) and BZ1(V-BL) from termi  
2 of TB2 to terminals of buzzer. The bu  
be mounted to the two pem nuts on the  
by means of two plastic screws and  
washers to insulate it from the base  
plastic screws and fiber washers are fu  
place as part of the telephone set. Care  
taken that terminal of buzzer does not  
of set.

\* Spade-tipped lead.

† Insulate cord tip with KS-19147, List  
insulator and store.

‡ Dead end at butt.

phone sys-  
telephone

**TABLE B**

**1A1, 1A CONVERSION TERMINAL STRIP TB 2**

Lead Color	BK-BL	R of Key	W	S-BK	S-Y
1A1	A2	R	†	†	†
1A	†	R1	A2	R1	R

shall be as

**TABLE C**

**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

before de

before cb

ent.

ect G-Y to  
(G-Y) and  
ctively, of

h external  
ay be re-  
e control

ided move  
nals 1 and  
uzzer shall  
-base plate  
two fiber  
plate. The  
rnished in  
should be  
touch base

1 cord tip

- Ⓜ Buzzer
- ⓧ 1A key telephone system
- Ⓨ 1A1 with station busy lamp
- Ⓩ 1A1 no station busy lamp
- Ⓢ 1A key telephone system with 3A speaker-phone on 1st pickup key
- Ⓣ 1A key telephone system with 3A speaker-phone on 2nd through 6th pickup key

**Fig. 7 — 661A3 Telephone Set with 599B Key**

**TABLE D**  
**CONNECTIONS TO 3A SPEAKERPHONE**  
**USING 148A ADAPTER**

Terminals in Set	Mtg Cord	148A Adapter Cord	Lead Desig	Term. on 55A Control Unit
A-BL	V-S	S-BK	AG	5
LK	S-V	S-Y	LK	*
2	V-BL	Y-BK	BZ1	6
1	BL-V	G-W	BZ	7
10	V-BR	S	P3	21
9	BR-V	BL-W	P4	30
1 †	V-G	BK-W	T1	19
C ‡	G-V	BK-BL	R-1	28
3 †	Y-S	G-Y	B-B1	8
A ‡	S-Y	R-W	R-R1	9
A1	O-W	G-BK	A1	12 §
		O-W	A1	12 §

**TABLE E**  
**CONNECTIONS TO 3A SPEAKERPHONE**  
**USING 149A ADAPTER**

Terminals in Set	Mtg Cord	149A Adapter Terminals	Lead Desig	Term. on 55A Control Unit
A-BL	V-S	12A	AG	5
LK	S-V	11A	LK	*
10	V-BR	10A	P3	21
9	BR-V	9A	P4	30
1 †	V-G	8A	T1	19
C ‡	G-V	7A	R1	28
3 †	Y-S	2A	B-B1	8
A ‡	S-Y	1A	R-R1	9
A1	O-W	A1	A1	12 §
SG	BR-Y	SG	SG	12 §
1	V-BL	4B	BZ1	6
2	BL-V	3B	BZ	7

**Note:** For 3A speakerphone component connections refer to section entitled 3A Speakerphone System, Connections, 660 Telephone Sets.

\* Connect to BK of 666A transmitter.

† TB1.

‡ Terminals on Network.

§ See option (S) or (T), Fig. 7.