

## SERVICE

### 630- AND 631-TYPE TELEPHONE SETS

#### 1. GENERAL

**1.01** This section contains connection and maintenance information for 18- and 30-button, rotary dial, general purpose CALL DIRECTOR<sup>®</sup> telephone sets.

**1.02** Connection information for these sets was formerly contained in Section 502-630-401 which is hereby canceled.

#### 2. CONNECTIONS

**2.01** These sets are factory-wired for use with 1A1, 1A2, or 6A key telephone systems. They may also be used with 1A KTS line circuits by modifying the telephone set as shown in Table A. Line circuits for 1A, 1A1, or 1A2 KTS may be connected to the same set under the following conditions:

- (a) 1A1 or 1A2 KTS lines must be connected to the first key module with 1A lines connected to supplementary key modules.
- (b) 1A, 1A1, or 1A2 KTS lines should not be connected to the same 6 line key module.
- (c) 1A, 1A1, and 1A2 KTS lines appearing behind a manual switchboard should not be intermixed on a CALL DIRECTOR telephone set due to the different time out intervals provided by the associated KTU's.

**2.02** Tip, ring, A, and lamp leads of lines wired for supplementary hold feature must be routed per SD-69530-01 and Division 518 rather than directly to the line circuit. Supplementary hold can be furnished in either of the following arrangements.

(a) **I Hold:** Transfer **A** lead from ground to -24 volt (Fig. 7); connect stored (BR-V) [S-Y] lead from first module plug to any spare mounting cord lead using spare terminal or D-161488 connector. Mounting cord lead becomes SP lead at key equipment (Fig. 7).

(b) **Priority Hold:** Substitute the 599- or 657-type key in the first module with a 599H or 657H key which is equipped with a second hold button and wired per Fig. 8 to transfer the **A** lead from ground to -24 volt.

**2.03** To convert a key position from pickup (locking) to signal (nonlocking) remove the screw detail P-10E837 entirely from plunger at the key position to be converted. Make the necessary wiring changes as shown in Table B.

**2.04** At the key telephone system, connector cable lead termination for sets equipped with even-count color-coded cords differ from those for sets equipped with MD color-coded cords (Fig. 3 and 4). If MD sets are replaced by current production sets, it will be necessary to rearrange the connector cable leads at the key telephone system.



**Some spade-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.**

**2.05** A 661A or 667-type speakerphone transmitter unit may be used in the third key position of an 18-button set or fifth key position of a 30-button set. See appropriate sections for connections to speakerphone systems.

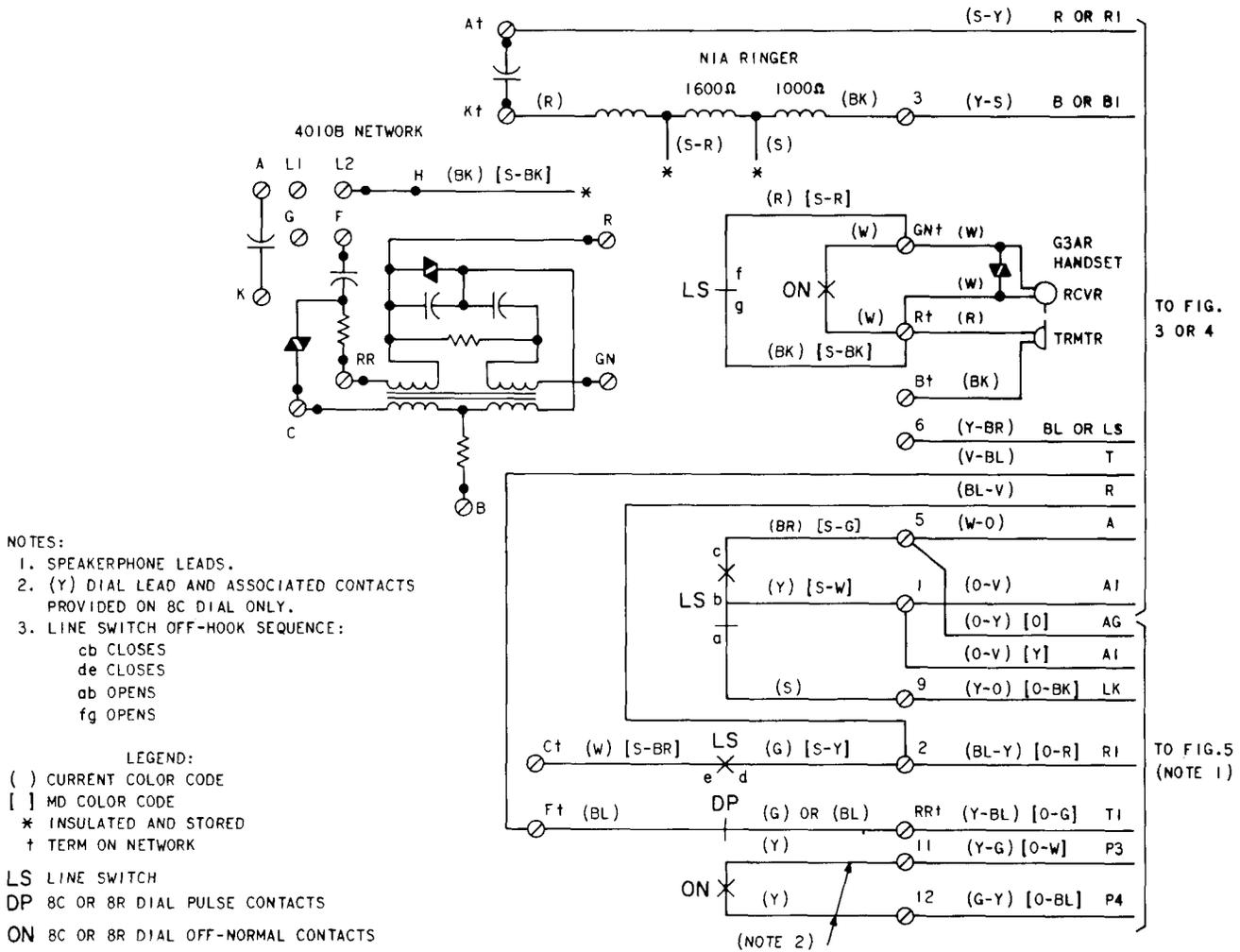
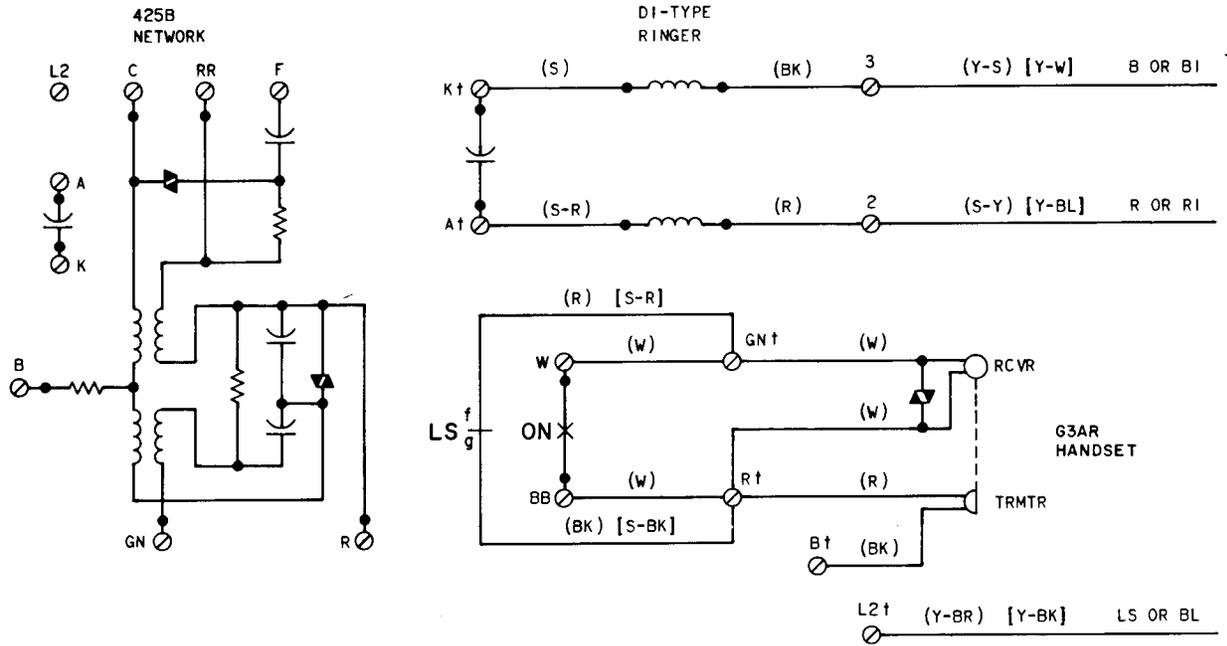


Fig. 1—630- and 631-Type Telephone Set, Connections (Current Production)



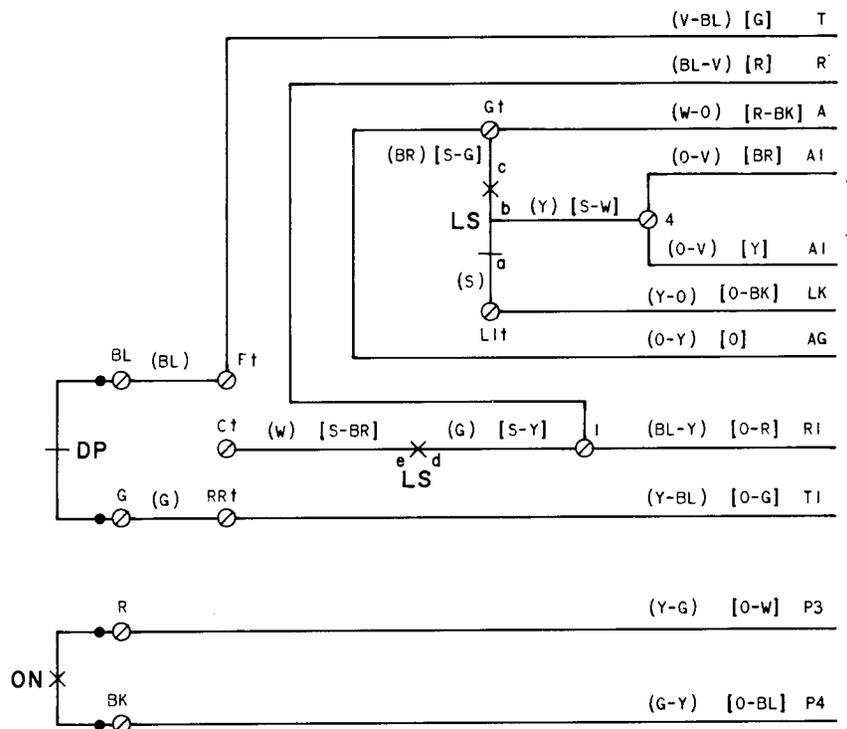
TO FIG.3 OR 4

NOTES:

1. SPEAKERPHONE LEADS
2. LINE SWITCH OFF-HOOK SEQUENCE:
  - cb - CLOSES
  - de - CLOSES
  - ab - OPENS
  - fg - OPENS

LEGEND:

- LS-LINE SWITCH
- DP-DIAL PULSE CONTACTS
- ON-DIAL OFF NORMAL CONTACTS
- ( ) CURRENT COLOR CODE
- [ ] MD COLOR CODE



TO FIG.5 (NOTE 1)

Fig. 2—630- and 631-Type Telephone Set, Connections (Early Production)

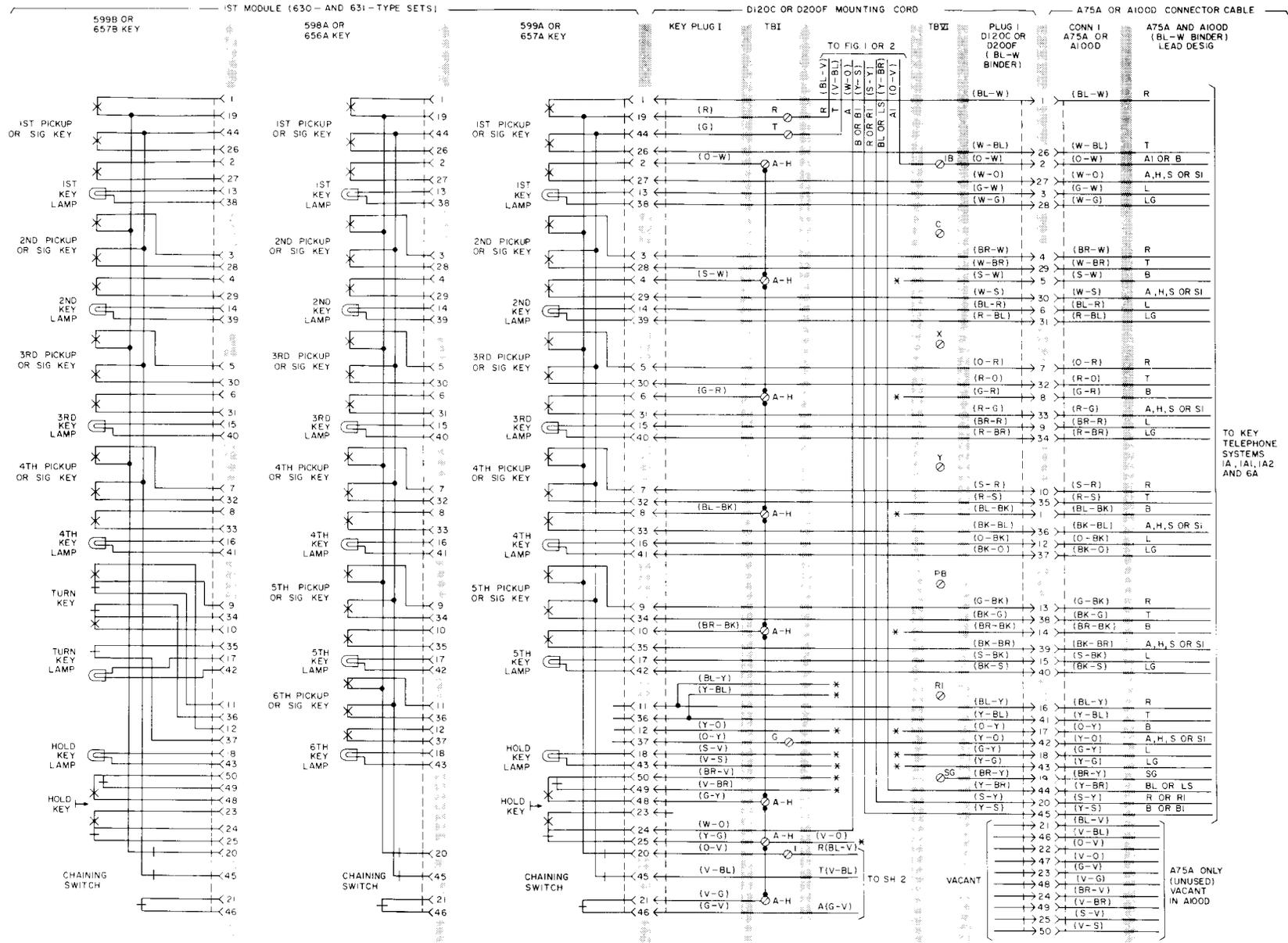
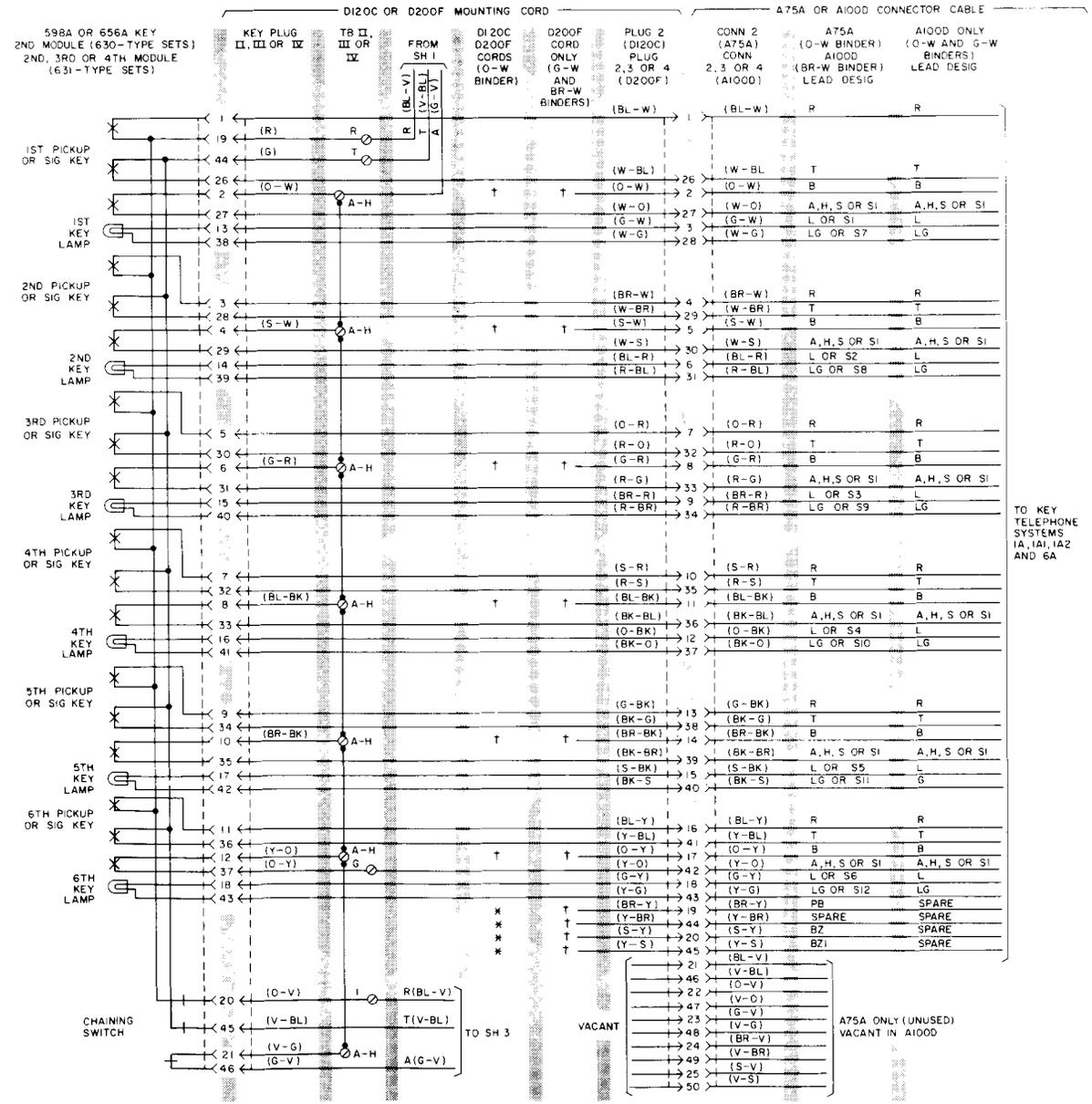
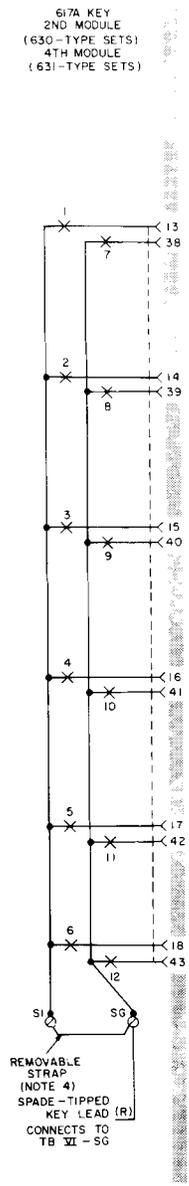


Fig. 3—Module Arrangements and Cord and Cable Connections for Sets Equipped With Even-Count Color-Coded Cords (Sheet 1 of 3)

**NOTES:**

- WITH 599A OR 657A KEY IN FIRST MODULE, SPADE TIPPED LEADS FROM KEY PLUG 1 AND MOUNTING CORD BINDER GROUP (BL-W) ARE INSULATED AND STORED.  
WITH 599B OR 657B KEY IN FIRST MODULE, (BR-BK) LEAD MUST BE REMOVED FROM A-H OF TBI, INSULATED AND STORED.  
WITH 598A OR 656A KEY IN FIRST MODULE, CONNECT (V-O) STRAP FROM A-H OF TBI TO TERMINAL 5 ON TELEPHONE SET TERMINAL BOARD.  
CONNECT (Y-O) AND (BR-BK) LEADS FROM KEY PLUG 1 TO A-H OF TBI.  
TO EXTEND LAMP LEADS CONNECT (S-V) AND (V-S) KEY PLUG LEADS TO (G-Y) AND (Y-G) MOUNTING CORDS LEADS RESPECTIVELY USING SPARE TERMINALS OR D-161488 CONNECTORS.
  - FOR USE WITH IA KEY SYSTEM ONLY, MOVE A1 (O-V) STRAP FROM 1B TO 5G ON TBI AND MAKE CONVERSION SHOWN IN TABLE A.
  - FOR ADD-ON CONFERENCE CONTROL IN THE 6A KEY TELEPHONE SYSTEM, CONNECT (BR-Y) MOUNTING CORD LEAD (O-W BINDER GROUP) TO TBI - PB. ALSO REMOVE COMMON LEAD OF ADD-ON CONFERENCE BUTTON (CONVERTED TO SIGNALING) FROM A-H TERMINAL AND CONNECT TO PB. THE 617A KEY MAY ALSO BE USED IN A SIMILAR MANNER. ALSO SEE NOTE 4.
  - WHEN THE 617A KEY IS REQUIRED AS A DUAL-PURPOSE KEY, THE BRASS STRAP BETWEEN THE S1 AND S2 TERMINALS OF THE KEY MAY BE REMOVED. USE MW CORD OR EQUIVALENT TO CONNECT S1 TERMINAL OF 617A KEY TO A DISSIMILAR GROUND OR A NONGROUNDED CIRCUIT.
- \* INSULATED AND STORED  
† DEAD ENDED



**Fig. 3—Module Arrangements and Cord and Cable Connections for Sets Equipped With Even-Count Color-Coded Cords (Sheet 2 of 3)**

TABLE A

**1A AND 1A1 SYSTEM CONVERSIONS  
CONNECTIONS FOR SETS USING D120B(MD), D120C, D200B(MD), OR D200F MOUNTING CORDS**

| KEY TELEPHONE SYSTEM<br>CENTRAL OFFICE OR<br>PBX LINE FEATURE         | LEADS            |                 |                |                 |                  |                               |                               |                               |                               |                               |               |              |               |   |
|---|------------------|-----------------|----------------|-----------------|------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|---------------|--------------|---------------|---|
|   | HOLD KEY         |                 |                |                 |                  | CHAINING SWITCH               |                               |                               |                               |                               | STRAP         |              | LINE SWITCH   |   |
|   |                  |                 |                |                 |                  | 630 AND 631 SETS              |                               |                               | 631 SETS ONLY                 |                               |               |              |               |   |
|   | (Y-G)<br>[BK-BL] | (G-Y)<br>[BK-W] | (V-O)<br>[S-W] | (BR-V)<br>[S-Y] | (V-BR)<br>[S-BK] | (V-G)<br>[BL-W]<br>1ST<br>KEY | (V-G)<br>[BL-W]<br>2ND<br>KEY | (V-G)<br>[BL-W]<br>3RD<br>KEY | (V-G)<br>[BL-W]<br>4TH<br>KEY | (V-G)<br>[BL-W]<br>5TH<br>KEY | (BL-V)<br>[R] | (O-V)<br>[Y] | (BR)<br>[S-G] |   |
| 1A1 or 1A2 only (as furnished by shop)                                | A-H<br>(I)       | A-H<br>(I)      | *              | *               | *                | A-H<br>(I)                    | A-H<br>(II)                   | A-H<br>(III)                  | A-H<br>(IV)                   | A-H<br>(V)                    | R<br>(I)      | 1B<br>(VI)   | †             |   |
| First key unit 1A1 or 1A2 remaining key units 1A                      | A-H<br>(I)       | §               | *              | 1‡<br>(I)       | R<br>(II)        | §                             | A-H<br>(II)                   | A-H<br>(III)                  | A-H<br>(IV)                   | A-H<br>(V)                    | R<br>(I)      | 1B<br>(VI)   | †             |   |
| First and second key units 1A1 or 1A2; remaining key units 1A         | A-H<br>(I)       | §               | *              | 1‡<br>(II)      | R<br>(III)       | A-H<br>(I)                    | §                             | A-H<br>(III)                  | A-H<br>(IV)                   | A-H<br>(V)                    | R<br>(I)      | 1B<br>(VI)   | †             |   |
| First, second, and third key units 1A1 or 1A2; remaining key units 1A | 631 sets only    | A-H<br>(I)      | §              | *               | 1‡<br>(III)      | R<br>(IV)                     | A-H<br>(I)                    | A-H<br>(II)                   | §                             | A-H<br>(IV)                   | A-H<br>(V)    | R<br>(I)     | 1B<br>(VI)    | † |
| First through fourth key units 1A1 or 1A2; fifth key unit 1A          |                  | A-H<br>(I)      | §              | *               | 1‡<br>(IV)       | R<br>(V)                      | A-H<br>(I)                    | A-H<br>(II)                   | A-H<br>(III)                  | X<br>(VI)                     | A-H<br>(V)    | R<br>(I)     | 1B<br>(VI)    | † |
| 1A only (see connection note 2 in Fig. 3)                             | §                | A-H<br>(I)      | *              | R1<br>(VI)      | R<br>(I)         | A-H<br>(I)                    | A-H<br>(II)                   | A-H<br>(III)                  | A-H<br>(IV)                   | A-H<br>(V)                    | R1<br>(VI)    | SG<br>(VI)   | ¶             |   |

**Note:** Roman numerals in parentheses indicate terminal board designations.

\* Lead is spade tipped, insulated, and stored.

† BR lead connects to terminal 5 of telephone set terminal board when station busy lamp circuit is not required or to terminal 6 when station busy lamp is required.

‡ Disconnect, insulate, and store R (BL-V) chaining lead.

§ Connect to terminal X of TBIV on 18-button sets or to terminal X of TBVI on 30-button sets.

¶ Terminal on telephone set terminal block.

( ) Current color code

[ ] MD color code

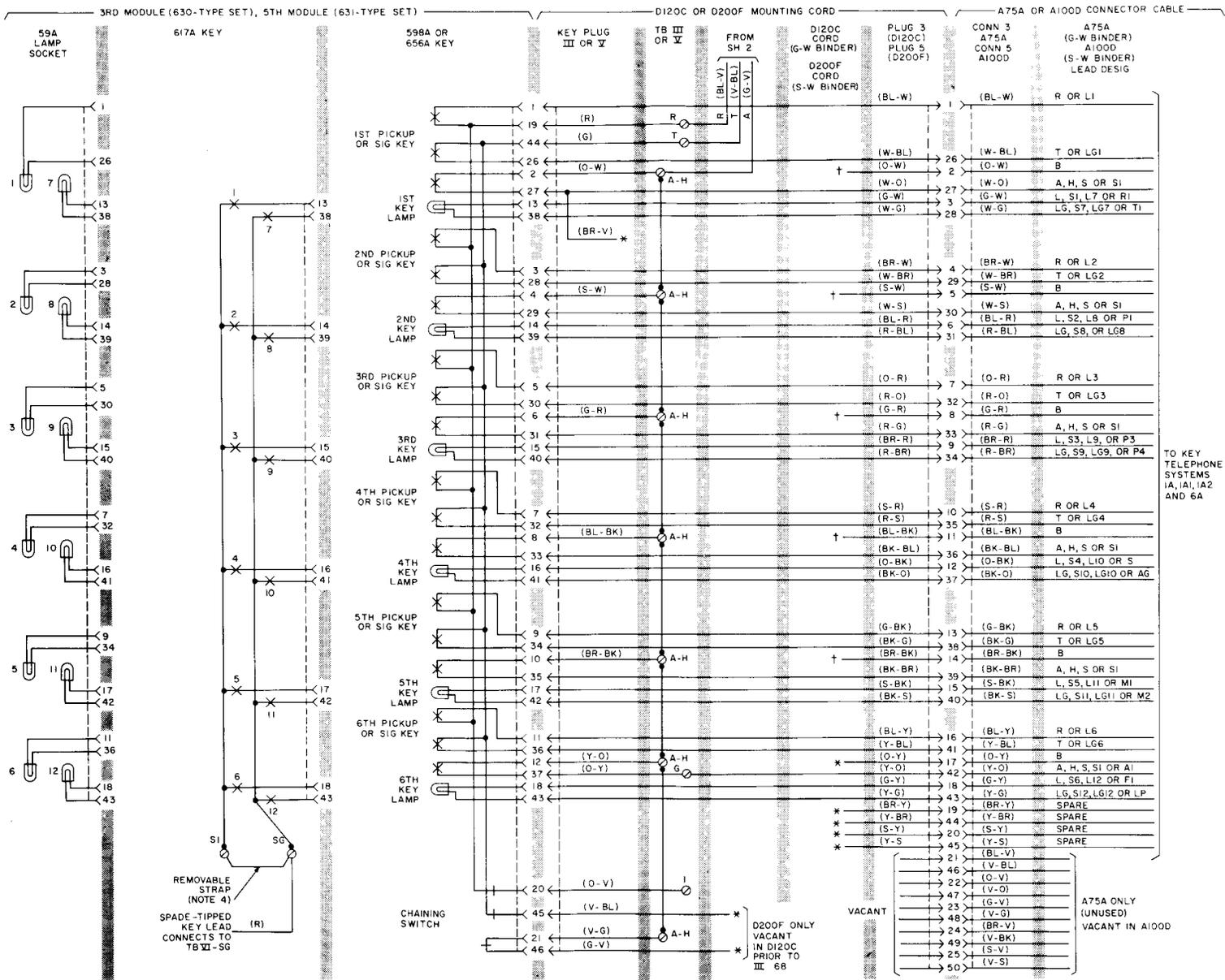


Fig. 3—Module Arrangements and Cord and Cable Connections for Sets Equipped With Even-Count Color-Coded Cords (Sheet 3 of 3)

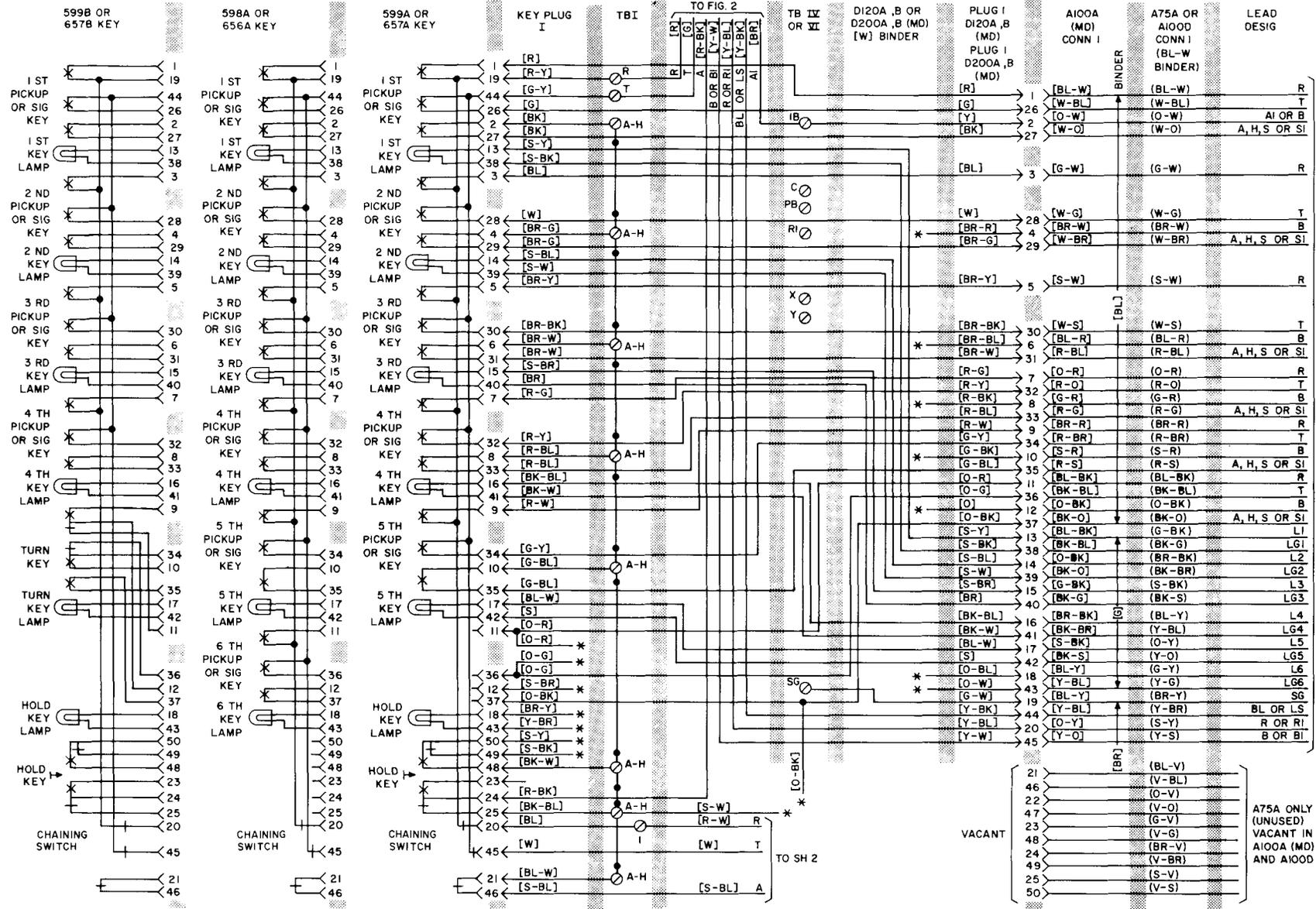
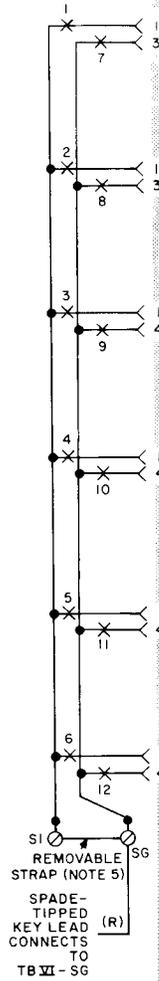
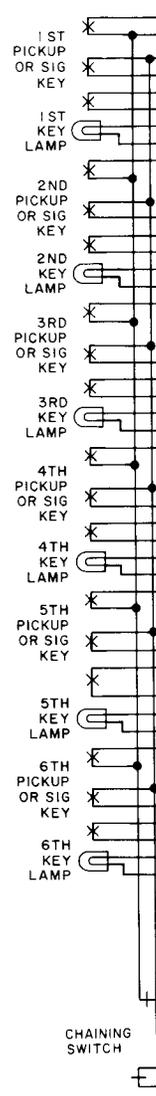


Fig. 4—Module Arrangements and Cord and Cable Connections for Sets Equipped With MD Cords (Sheet 1 of 4)

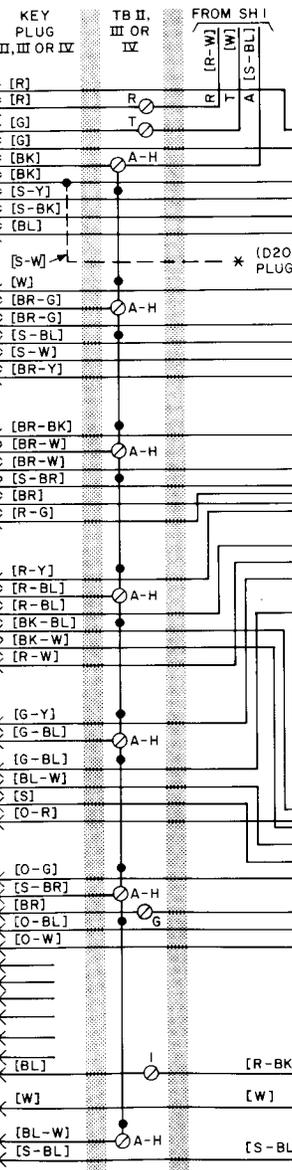
617A KEY  
2ND MODULE  
(630-TYPE SETS)  
4TH MODULE  
(631-TYPE SETS)



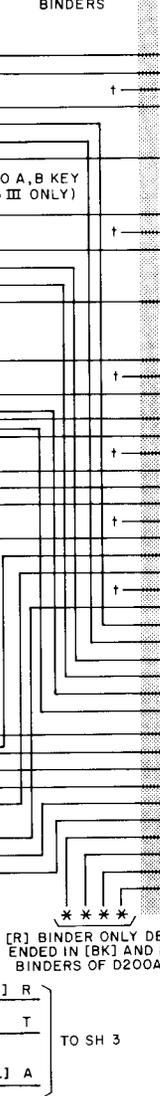
598A OR 656A KEY  
2ND MODULE  
(630-TYPE SETS)  
2ND, 3RD OR 4TH  
MODULE  
(631-TYPE SETS)



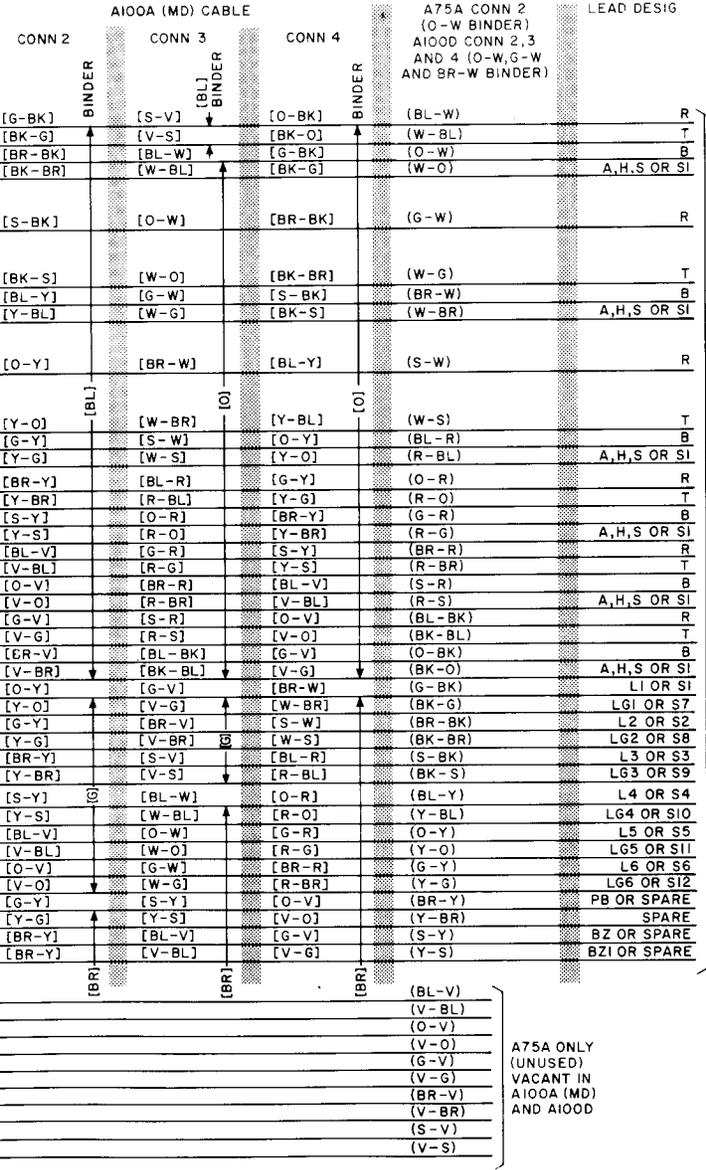
D120A, B (MD) OR D200A, B (MD) MOUNTING CORD



PLUG 2  
D120A, B (MD)  
D200A, B (MD),  
[R, BK AND G]  
BINDERS

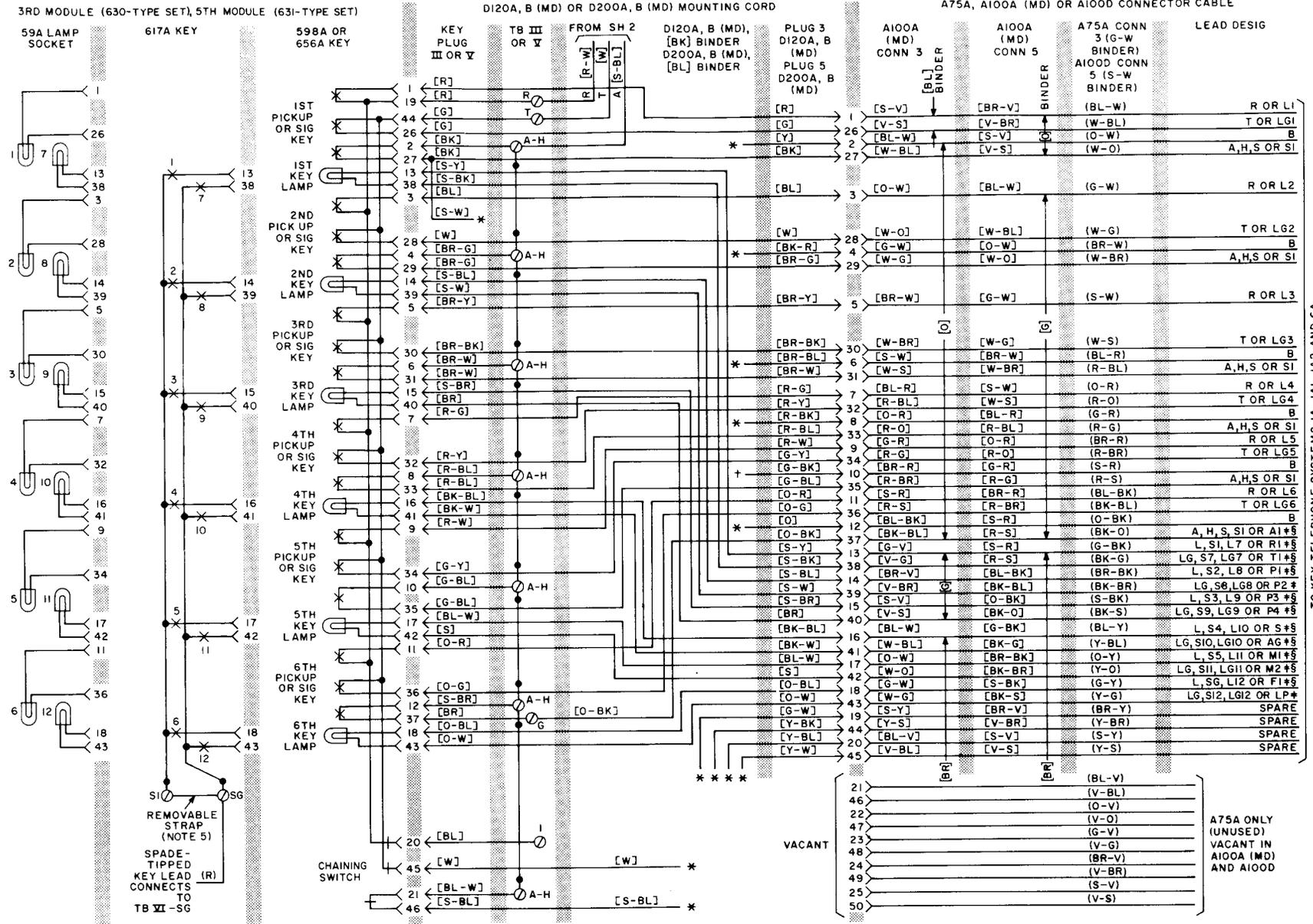


A75A, A100A (MD) OR A100D CONNECTOR CABLE



TO KEY TELEPHONE SYSTEMS IA, IA1, IA2 AND 6A

Fig. 4—Module Arrangements and Cord and Cable Connections for Sets Equipped With MD Cords (Sheet 2 of 4)



TO KEY TELEPHONE SYSTEMS 1A, 1A1, 1A2 AND 6A

Fig. 4—Module Arrangements and Cord and Cable Connections for Sets Equipped With MD Cords (Sheet 3 of 4)

NOTES:

1. WITH 599A OR 657A KEY IN FIRST MODULE; SPADE TIPPED LEADS FROM KEY PLUG I AND MOUNTING CORD BINDER GROUP (W) ARE INSULATED AND STORED AS SHOWN.  
  
WITH 599B OR 657B KEY IN FIRST MODULE; [G-BL] LEAD MUST BE REMOVED FROM A-H OF TBI, INSULATED AND STORED.  
  
WITH 598A OR 656A KEY IN FIRST MODULE. CONNECT [S-W] STRAP FROM A-H OF TBI TO TERMINAL G OF NETWORK. CONNECT [S-BR] AND [G-BL] LEADS FROM KEY PLUG I TO A-H OF TBI. TO EXTEND LAMP LEADS CONNECT [BR-Y] AND [BR-BK] KEY PLUG LEADS TO [O-BL] AND [O-W] MOUNTING CORD LEADS RESPECTIVELY USING SPARE TERMINALS OR D-161488 CONNECTORS.
2. FOR USE WITH IA KEY SYSTEM ONLY, MOVE A1[BR] STRAP FROM 1B TO SG ON TBIV (630) OR VI (631). MAKE CONVERSION SHOWN IN TABLE A.
3. FOR ADD-ON CONFERENCE CONTROL IN THE 6A KEY TELEPHONE SYSTEM, CONNECT [G-W] MOUNTING CORD LEAD ([R] BINDER GROUP) TO TERMINAL PB ON TBIV OR VI. ALSO REMOVE COMMON LEAD OF ADD-ON CONFERENCE BUTTON (CONVERTED TO SIGNALING) FROM A-H TERMINAL AND CONNECT TO PB. THE 617A KEY MAY ALSO BE USED IN A SIMILAR MANNER. ALSO SEE NOTE 5.
4. TERMINAL DESIGNATIONS ON TBI THRU TB VI ARE SHOWN FOR D120B AND D200B CORDS. TERMINAL DESIGNATIONS FOR D120A AND D200A DIFFER AS SHOWN BELOW.
5. 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 KEY TO DISSIMILAR GROUND OR A WONGROUNDED CIRCUIT.

| TERMINAL BOARD | D200B          | D200A          |
|----------------|----------------|----------------|
| TBI            | G              | H1             |
|                | AH             | A1             |
| TBII           | G              | H2             |
|                | AH             | A2             |
| TBIII          | G              | H3             |
|                | AH             | A3             |
| TBIV           | G              | H4             |
|                | AH             | A4             |
| TBV            | G              | H5             |
|                | AH             | A5             |
| TBVI           | C              | C1, C2, C3, C4 |
|                | X              | —              |
|                | Y              | —              |
|                | PB             | —              |
|                | —              | G1, G2, G3, G4 |
| —              | S2, S3, S4, S5 |                |

| TERMINAL BOARD | D120B  | D120A  |
|----------------|--------|--------|
| TBI            | G      | H1     |
|                | AH     | A1     |
| TBII           | G      | H2     |
|                | AH     | A2     |
| TBIII          | G      | H3     |
|                | AH     | A3     |
| TBIV           | C      | C1, C2 |
|                | X      | —      |
|                | Y      | —      |
|                | PB     | —      |
|                | —      | G1, G2 |
| —              | S2, S3 |        |

- \* INSULATED AND STORED.
- † DEAD ENDED.
- ‡ IA AND IA1 SPEAKERPHONE SYSTEM.
- § 3-TYPE SPEAKERPHONE SYSTEM.
- ( ) CURRENT COLOR CODE.
- [ ] MD COLOR CODE.

Fig. 4—Module Arrangements and Cord and Cable Connections for Sets Equipped With MD Cords (Sheet 4 of 4)

TABLE B

## PICKUP-SIGNAL KEY CONVERSION (3RD OR 5TH MODULE)

| CONVERSION OPTIONS<br>(NOTES) | 598A OR 656A KEY |                 |                 |                   |                   |                 |                 |
|-------------------------------|------------------|-----------------|-----------------|-------------------|-------------------|-----------------|-----------------|
|                               | (O-W)<br>[BK]    | (S-W)<br>[BR-G] | (G-R)<br>[BR-W] | (BL-BK)<br>[R-BL] | (BR-BK)<br>[G-BL] | (Y-O)<br>[S-BR] | (O-Y)<br>[O-BK] |
| PPPPPP                        | A-H              | A-H             | A-H             | A-H               | A-H               | A-H             | G               |
| PPPPPS                        | A-H              | A-H             | A-H             | A-H               | A-H               | SG              | G               |
| PPPPSS                        | A-H              | A-H             | A-H             | A-H               | SG                | SG              | G               |
| PPSSSS                        | A-H              | A-H             | A-H             | SG                | SG                | SG              | G               |
| PPSSSS                        | A-H              | A-H             | SG              | SG                | SG                | SG              | G               |
| PSSSSS                        | A-H              | SG              | SG              | SG                | SG                | SG              | G               |
| SSSSSS                        | SG               | SG              | SG              | SG                | SG                | SG              | G               |
| PPPP*P*S                      | A-H              | A-H             | A-H             | C                 | C                 | A-H†            | C               |
| PPP*P*P*S                     | A-H              | A-H             | C               | C                 | C                 | A-H†            | C               |
| PP*P*P*P*S                    | A-H              | C               | C               | C                 | C                 | A-H†            | C               |
| P*P*P*P*P*S                   | C                | C               | C               | C                 | C                 | A-H†            | C               |

**Notes:**

- Convert buttons on right hand key module first. If more than six (five with common signaling) are required use module preceeding right hand position, repeat connection modifications as shown in table.
  - All key positions are arranged in the shop as pickup positions. To convert to signaling (nonlocking), remove the screw detail P-10E837 from the plunger at the key position to be converted. Make the necessary connection changes as shown in Table B.
- \* These arrangements use line switch controlled ground for common signal key used with private or intercommunicating lines. Common signal should be used to operate a common signal relay. Do not wire directly to a buzzer.
- † Terminal A-H used with 1A1 or 1A2 KTS, and terminal 5 used with 1A KTS.
- ( ) Current color code.
- [ ] MD color code.

**TABLE C**  
**CONNECTIONS FOR 599B KEY (TURN KEY)**

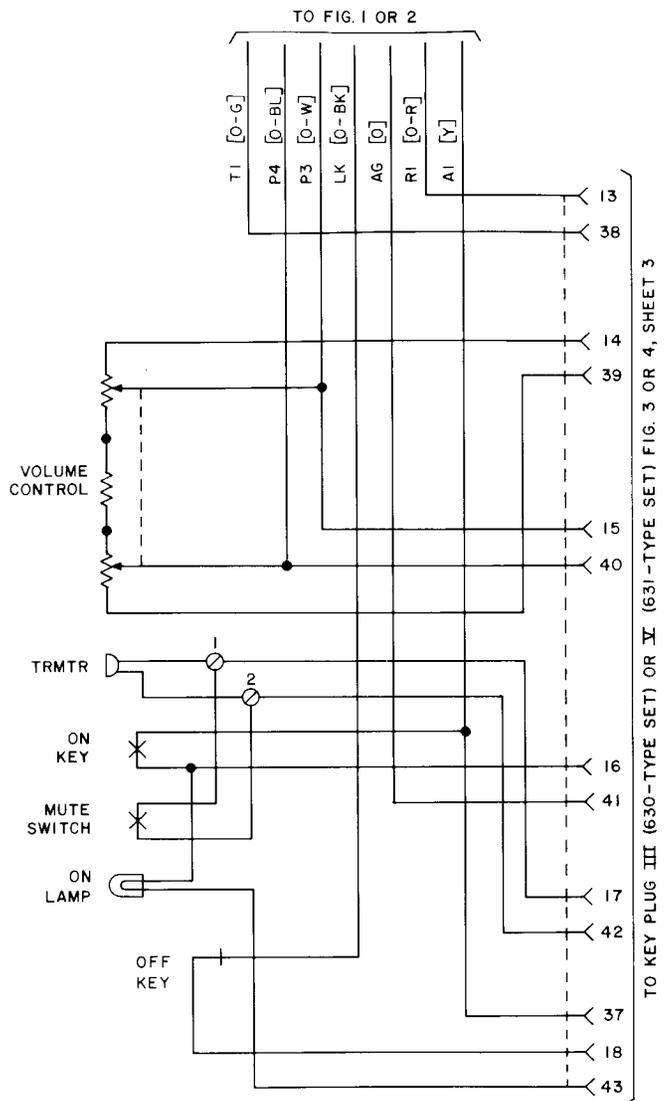
| FEATURE  | FIRST MODULE LEADS                     |       |       |                    |                         |       |              |                    |                    |          |
|--|--|-------|-------|--------------------|-------------------------|-------|--------------|--------------------|--------------------|----------|
|  | 5TH PICKUP KEY POSITION                |       |       |                    | 6TH PICKUP KEY POSITION |       |              |                    | STORED             |          |
|  | R                                      | T     | A     | A-H                | R                       | T     | A            | A-H                |                    |          |
| (MD) Color code  | R-W                                    | G-Y   | G-BL  | G-BL               | O-R                     | O-G   | O-BK         | S-BR               | O-R                | O-G      |
| Cord pin numbers                                       | 9-9                                    | 34-34 | 35-35 | 10-AH              | 11-11                   | 36-36 | 37-G-37      | 12-†               | 11-†               | 36-†     |
| Even-count color code                                  | G-BK                                   | BK-G  | BK-BR | BR-BK              | BL-Y                    | Y-BL  | O-Y<br>Y-O   | Y-O                | BL-Y               | Y-BL     |
| Cord pin numbers                                       | 9-13                                   | 34-38 | 35-39 | 10-AH              | 11-16                   | 36-41 | 37-G<br>G-42 | 12-†               | 11-†               | 36-†     |
| Cutoff station on 1A1 system                           | To equip.                              |       |       | Insulate and Store | To ext sta              |       |              | Insulate and Store |                    |          |
| Cutoff station on 1A system without hold feature       | To equip.                              |       |       | Insulate and Store | To ext sta              |       |              | Insulate and Store |                    |          |
| Cutoff station on 1A system with hold feature (Note 2) | To aux relay to cutoff<br>T, R, B, & H |       |       | SG<br>TBVI         |                         |       |              | SG<br>TBVI         | Insulate and store |          |
| Cutoff ext ringer or buzzer                            | To equip.                              |       |       | Insulate and Store | To ext ringer or buzzer |       |              | Insulate and Store |                    |          |
| Cutoff ringer in set                                   | To equip.                              |       |       | Insulate and Store |                         |       |              | Insulate and Store | Ringer*<br>TB      |          |
|  |  |       |       |                    |                         |       |              |                    | 2                  | 3        |
| Cutoff buzzer in set                                   | To equip.                              |       |       | Insulate and Store |                         |       |              | Insulate and Store | Buzzer*            |          |
|  |  |       |       |                    |                         |       |              |                    | D                  | C        |
|  |  |       |       |                    |                         |       |              |                    | A                  | C        |
|  |  |       |       |                    |                         |       |              |                    |                    |          |
| Monitoring   | To mon equip.                          |       |       |                    |                         |       |              |                    | R<br>TB1           | T<br>TB1 |

Notes 1: The [O-R] or (BL-Y), and [O-G] or (Y-BL) mounting cord leads should be insulated and stored at the equipment when the bridged spade-tipped leads are used in set.

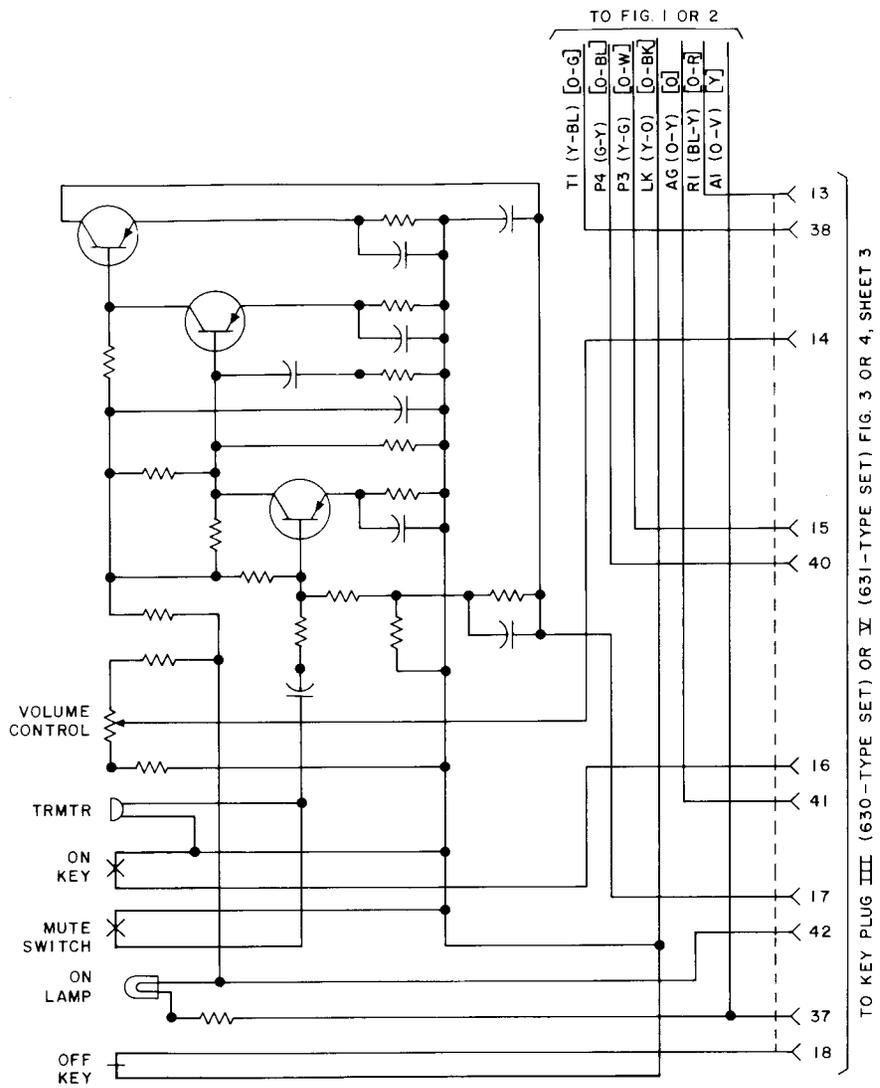
2: Use auxiliary relay arrangement (such as 5A or 17B key telephone unit) to control circuit leads.

\* Insulate and store BZ and BZ1 leads to buzzer or to ringer terminal board.

† Indicates leads are factory insulated and stored.



661A TRANSMITTER (MD)



667-TYPE TRANSMITTER

Fig. 5—661A (MD) and 667-Type Transmitter

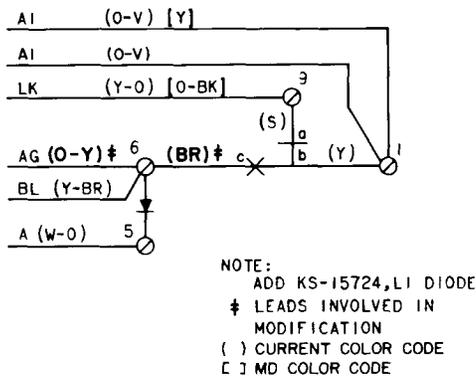
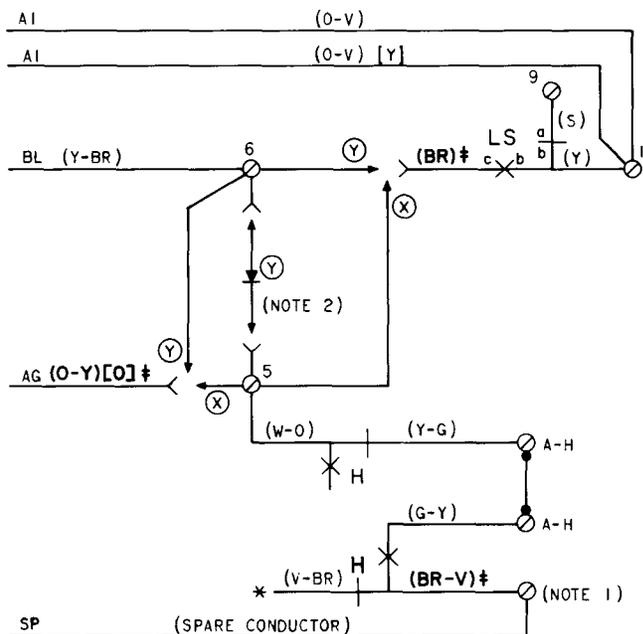
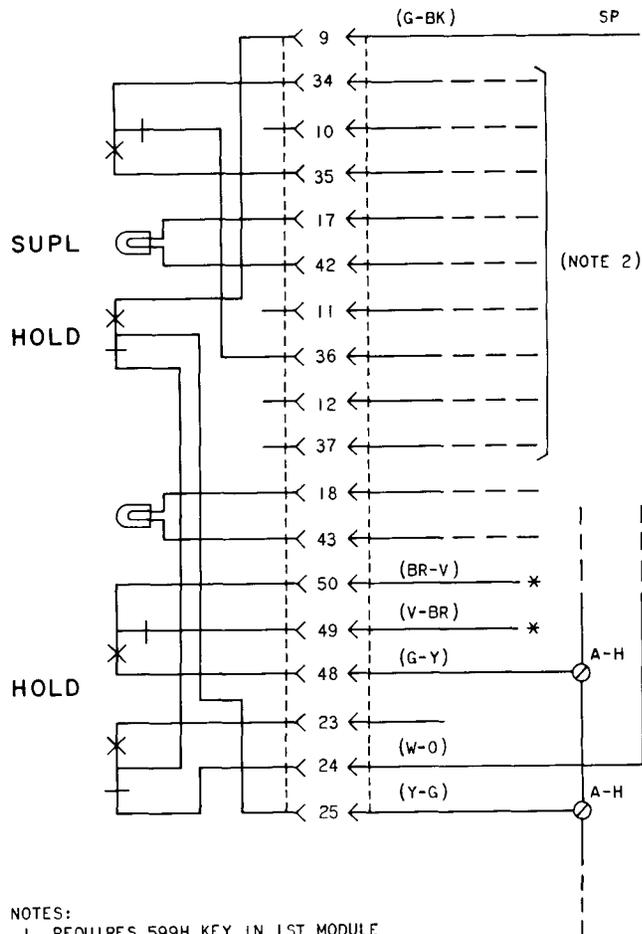


Fig. 6—Station Busy Lamp Circuit (Current Telephone Sets Without I Hold)



- NOTES:
1. SPARE TERMINAL OR D-161488 CONNECTOR
  2. ADD KS-15724, LI DIODE
- (X) WITHOUT STATION BUSY LAMP  
 (Y) WITH STATION BUSY LAMP  
 \* INSULATED AND STORED  
 ‡ LEADS INVOLVED IN MODIFICATION  
 ( ) CURRENT COLOR CODE  
 [ ] MD COLOR CODE  
 LS—LINE SWITCH  
 H—HOLD KEY

Fig. 7—I Hold Arrangement (With or Without Station Busy Lamp Feature)



- NOTES:
1. REQUIRES 599H KEY IN 1ST MODULE
  2. DO NOT USE THESE LEADS FOR OTHER FEATURES WHEN ASSOCIATED WITH 599H KEY

Fig. 8—Circuit of 599H or 657H Keys Associated With Priority Hold

## SECTION 502-610-406

### 3. MAINTENANCE

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

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

**3.03** To remove a defective ringer from early or current production sets:

- (1) Remove housing.
- (2) Loosen dial mounting plate and move to left.
- (3) Disconnect ringer leads.
- (4) Remove N1A ringer mounting screws from underside of baseplate (Fig. 9) or loosen captive screws of D1-type ringers (Fig. 10)
- (5) Lift out ringer.

**3.04** When an operated pickup key does not remain depressed or release any previously operated key on current sets (Fig. 11):

- (1) Check that key latch arm is properly inserted in the pivot bar.
- (2) Adjust key by loosening the mounting screws and shifting the key within limits of oversized hole provided for the mounting screws before refastening mounting screws.
- (3) Test key for proper operation if malfunction is related to one key module.

**3.05** When an operated pickup key does not remain depressed or release any previously operated key on early production sets, adjust the latch arm assembly (Fig. 12) 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.

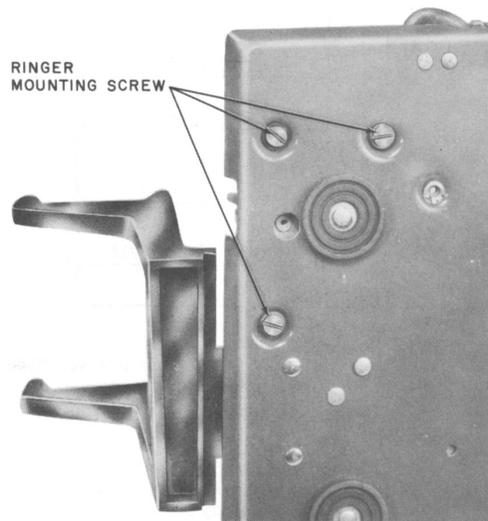
(3) Tighten screw.

(4) Test operation of key unit.

**3.06** Improper operation of 667-type transmitters may be caused by interference between the printed circuit board and terminal screw of TBVI of the cord assembly. This condition can be corrected by replacing P-180801 5/16-inch machine screw with P-180800 1/4-inch binder head machine screw.

**Note:** The longer screws were used in D120B (MD) and D200B (MD) cord assemblies.

**3.07** To eliminate mechanical vibration pickup in the 667-type transmitter install a modified 667B transmitter which includes a 1-inch vinyl sleeve which is to be placed over the pivot bar spring. Order as "Transmitter, 667B modified per D-180196."



**Fig. 9—Location of Ringer Mounting Screws for N1A Ringers**

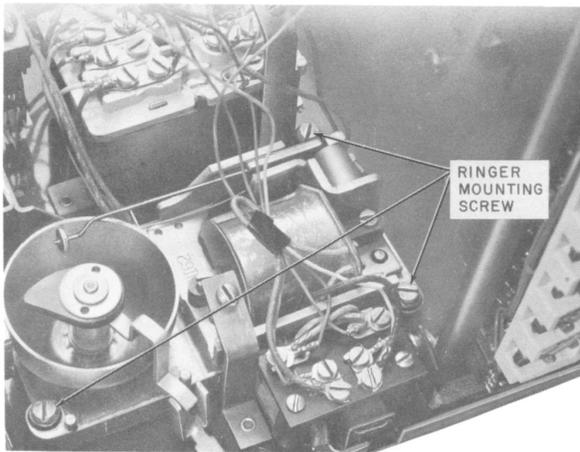


Fig. 10—Location of Ringer Mounting Screws for D1-Type Ringers

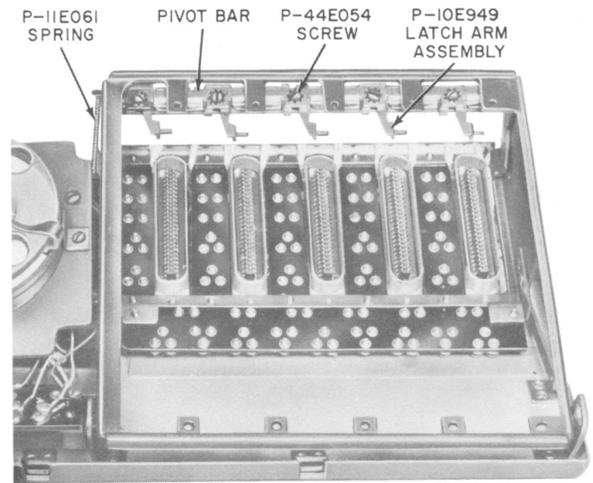


Fig. 12—Pivot Bar Assembly (Early Production)

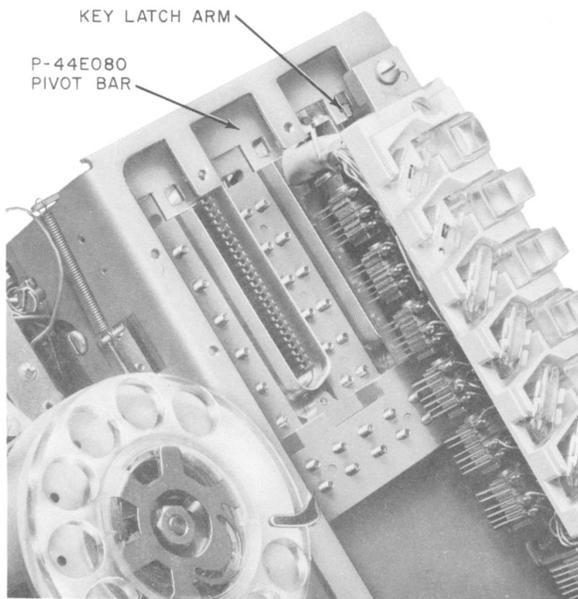


Fig. 11—Pivot Bar Top View (Current Production)