

SWITCHING SYSTEM NO. 400  
CONNECTIONS AND MAINTENANCE

1.00 GENERAL

1.01 This section covers connections for the following:

- Station lines (assigned, unassigned, arranged for hunting)
- Line, link, and connector units for station lines 40-49 and 50-59.
- Add-on line units (internally or externally mounted)
- Key telephone units (internally or externally mounted)
- Direct station selection units:
  - (a) Auxiliary relay units (internally or externally mounted)
  - (b) Auxiliary register unit (internal only)
- Universal line circuits:
  - (a) Assigned as station line.
  - (b) Connected to 3A code call
  - (c) Connected to two-way tie trunk, telephone dictation trunk, or customer-owned loudspeaker paging system.
- Alarm circuit.
- Fuse panel.
- Power supply

1.02 Apparatus added to a system should be mounted in accordance with C Section entitled Switching System No. 400, Installation.

1.03 The 66E1-32 (quick connect-type) connecting blocks in the crown of the cabinet are split 4-clip, 32-terminal blocks. For purposes of this practice, the method of designating and counting of blocks is

shown in Fig. 1. Blocks G thru L appear in list 2 cabinet assembly only. For information covering this type of block see C Section entitled Connecting Blocks, 66-Type.

1.04 Terminal strips of units are of the wire-wrap type. For information on connecting to this type terminal, see Plant Series Section 069-132-811.

1.05 For maintenance of the switching system No. 400 information contained in the various connection figures and test sections can be helpful, but for a detailed description of operations see CD- and SD-sections provided with each cabinet assembly.

2.00 STATION LINES (ASSIGNED, UNASSIGNED, ARRANGED FOR HUNTING)

2.01 These features for station lines are provided by placing and removing straps on terminal strip B of line, link, and connector unit associated with each tens group.



On initial installations strap all stations for either assigned or unassigned service.

2.02 Terminal strip B of each line, link, and connector unit has an H, S, S1, and G terminal for each station within the tens group (see Fig. 2).

2.03 Terminal strip B for each tens group is located as follows:

- Lines 20-29, slide 3, mounting space 15.
- Lines 30-39, slide 3, mounting space 21.
- Lines 40-49, if provided, slide 1, mounting space 1.
- Lines 50-59, if provided, slide 1, mounting space 7.

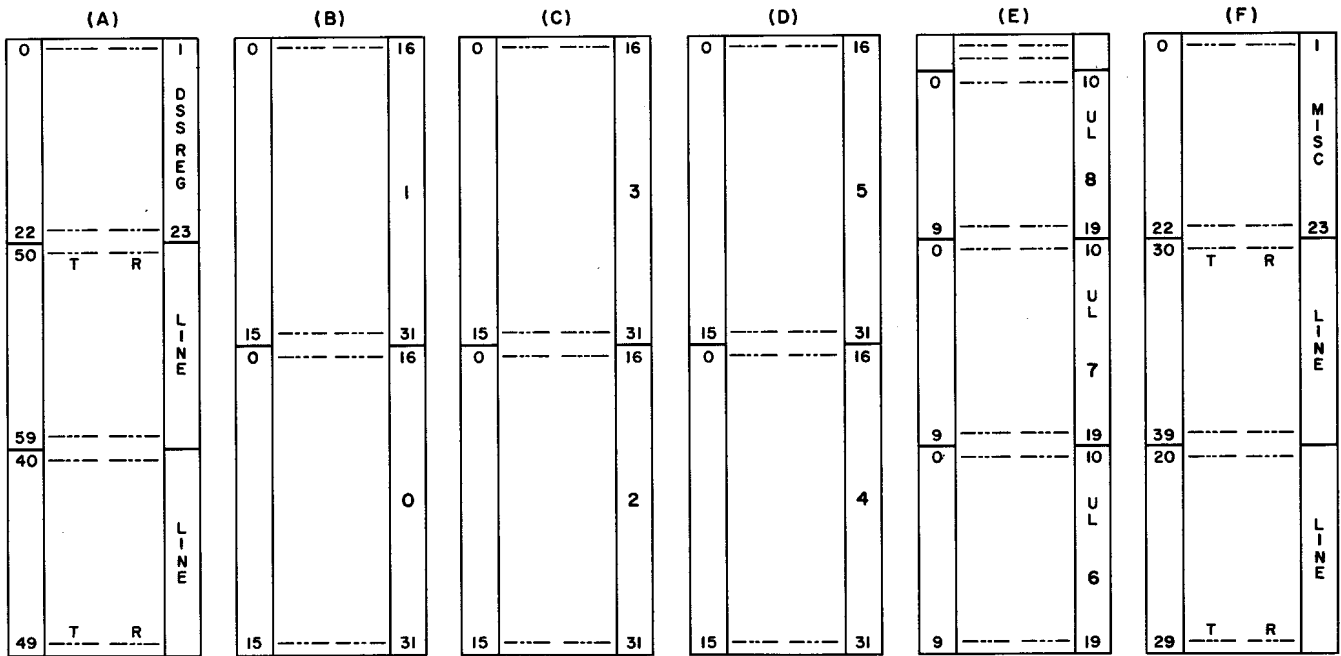
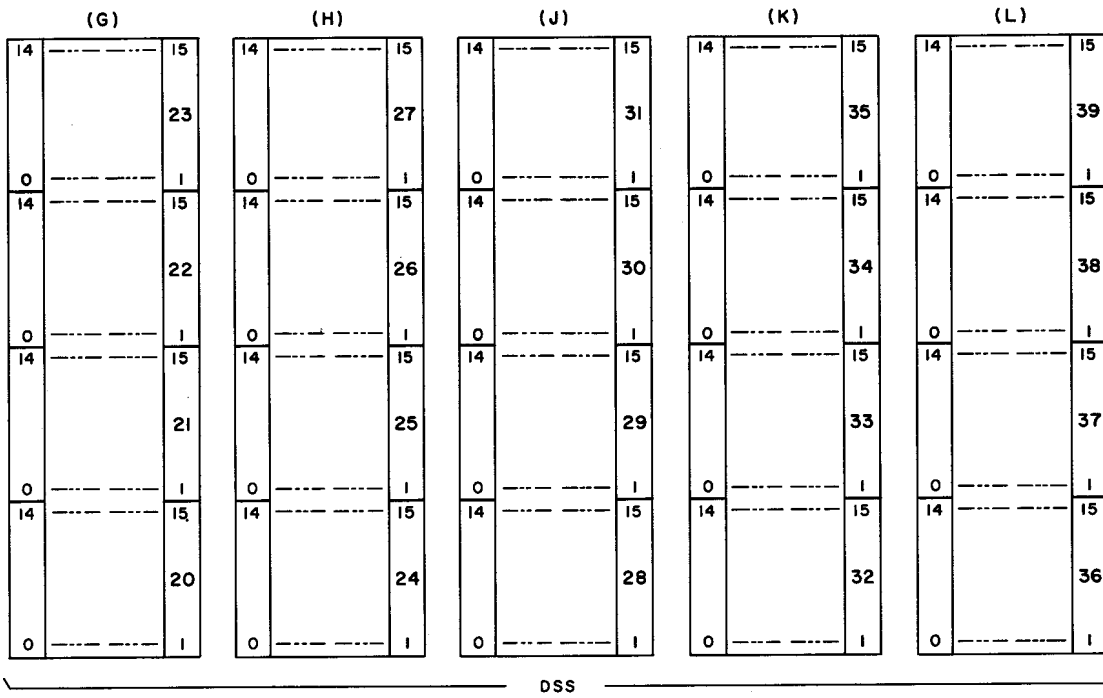
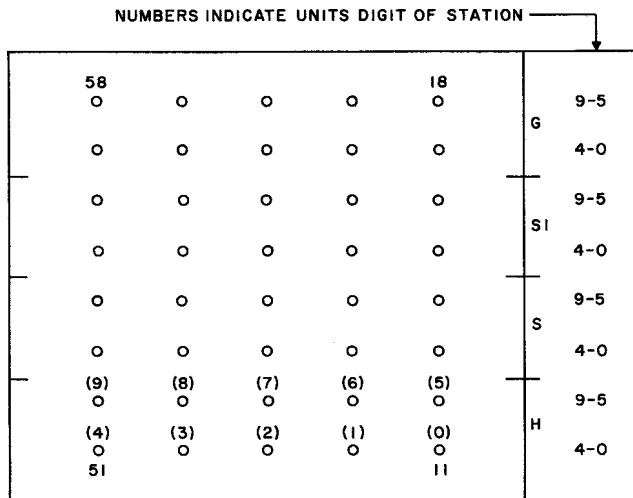


Fig. 1 - Method of Designating and Counting Connecting Blocks in Crown



**Note:** Numbers in parenthesis denote units digits of Station in H Terminal field. Shown here for clarity only.

Fig. 2 - Terminal Strip B of Line, Link, and Connector Unit

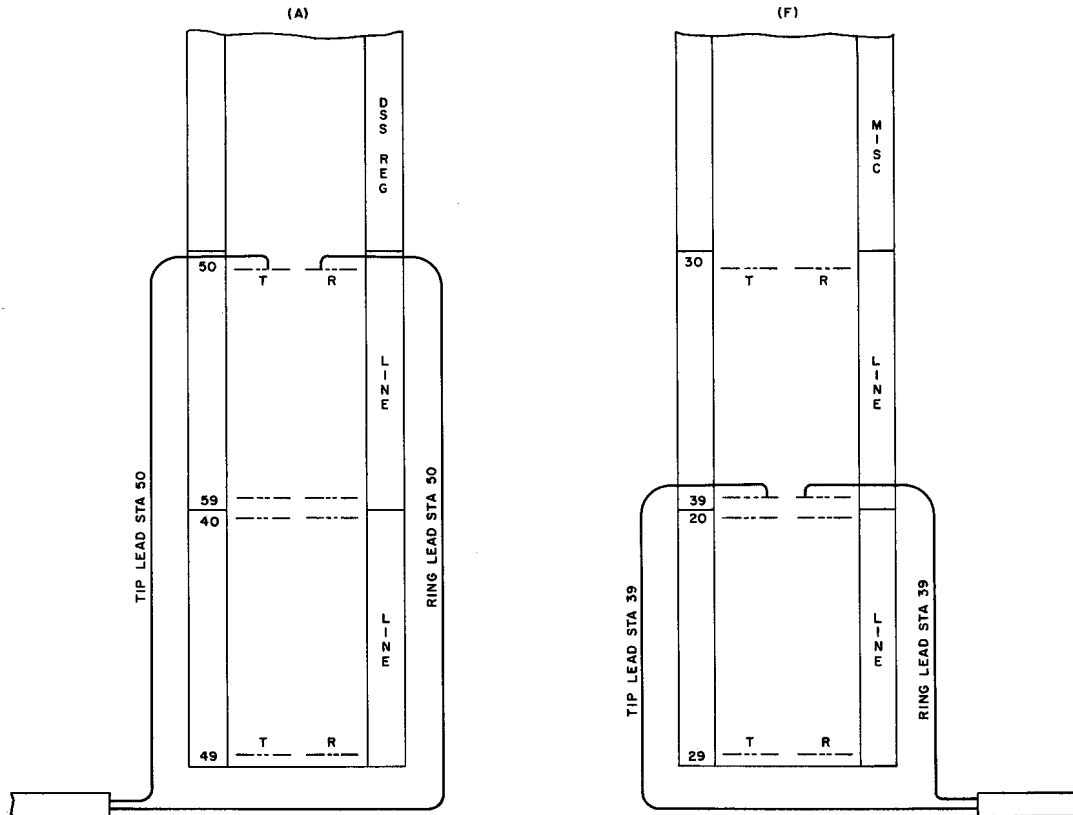
Assigned Station Lines

2.04 To place station in service proceed as follows:

- Connect T and R leads from station to designated terminals in crown of cabinet as shown in Fig. 3. Refer to Fig. 1 for position of blocks A and F.

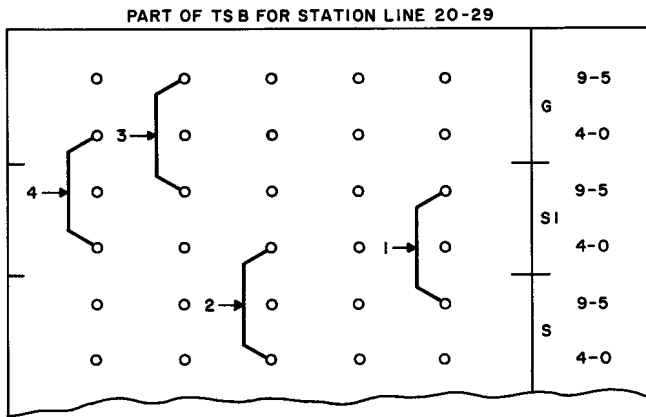
**Note:** List 2 cabinet assemblies are shop wired with a jumper cable from station lines 20-39 terminal block F to their respective DSS terminal block G thru L in crown. When installing a station line not arranged for direct station selection (DSS) disconnect T and R leads of jumper cable from station line block F and terminate leads from station. Insulate and turn back leads of jumper cable.

- Remove strap between terminals SI and G and place strap between terminals SI and S on terminal strip B of line, link, and connector unit (see Fig. 4).



NOTE: FACTORY WIRING ON OUTSIDE CLIPS.

Fig. 3 - Method of Terminating T and R Leads



EXAMPLES

- 1-STATION 25, ASSIGNED
- 2-STATION 22, ASSIGNED
- 3-STATION 28, UNASSIGNED
- 4-STATION 24, UNASSIGNED

Fig. 4 - Typical Strapping of Terminal Strip B of Line, Link, and Connector Unit (Station Lines 20 - 29)

Unassigned Station Lines

2.05 To remove a station from service proceed as follows:

- Remove T and R leads of station from designated terminals in crown of cabinet.
- Remove strap between terminals S1 and S and place strap between terminals S1 and G on terminal strip B of line, link, and connector unit. This places the station on a busy condition.

Note: Check H terminal field on terminal strip B and remove or bypass hunting feature from station if provided.

Hunting Arrangements

2.06 Hunting for station lines may be arranged within each tens group as follows:

- One-way nonsequential.
- One-way sequential.
- Two-way nonsequential.
- Combination of one-way and two-way nonsequential.

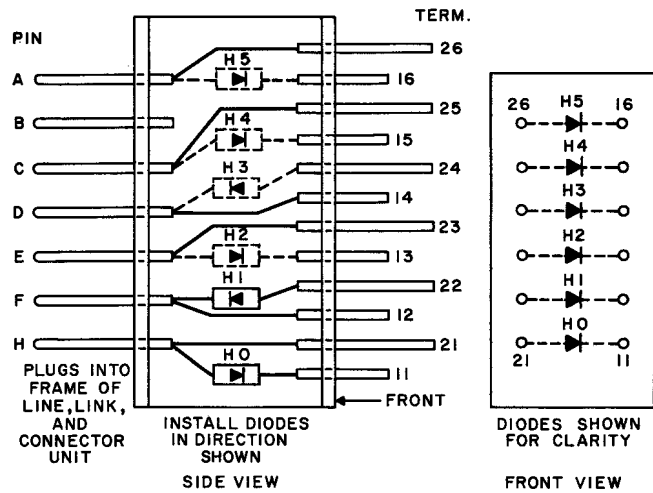


Fig. 5 - Front and Side View of Terminal Strip A

2.07 For one-way hunting purposes each line, link, and connector unit is furnished with two 426A diodes (H0 and H1) wired to terminal strip A. Terminal strip A is a plug-in assembly to facilitate placing of additional diodes in field. (See Fig. 5.) Strapping between terminal strip A and H terminal field of strip B inserts diodes into the circuit.

2.08 To facilitate removal of plug-in assembly, strapping between terminal strips A and B shall be as shown in Fig. 6.

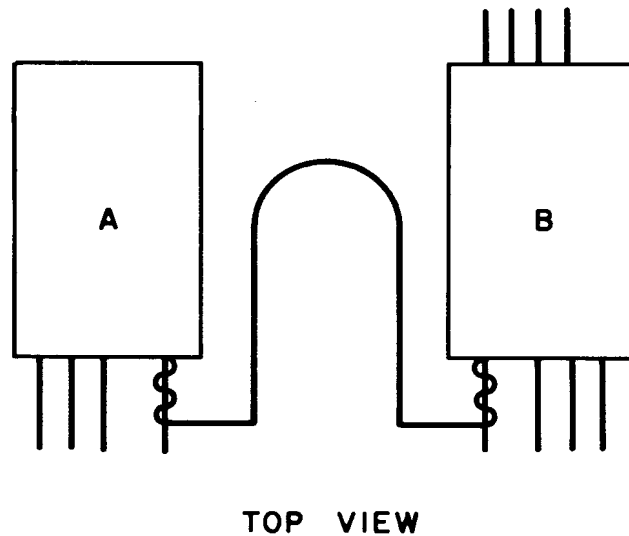


Fig. 6 - Method of Dressing Strapping Between Terminal Strips A and B



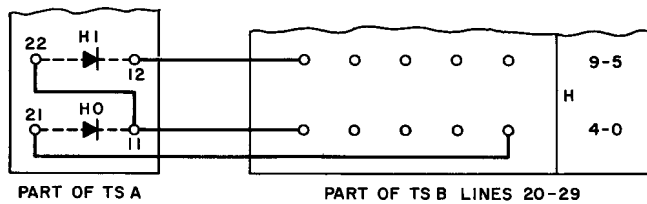


Fig. 7 - One-Way Nonsequential Hunting Group Consisting of Station Lines 20, 24, and 29

One-Way Nonsequential

2.09 One-way nonsequential hunting is provided by inserting H diodes between H terminals of the lines included in the group with the arrow on each diode pointing in the hunting direction desired (see Fig. 7). If line 20 is dialed and found busy, call will be completed indiscriminately to whichever of the other two lines is idle. If line 24 is dialed and found busy, call will be completed to line 29 if idle. If line 29 is dialed and found busy, call will be routed to busy tone.

One-Way Sequential

2.10 One-way sequential hunting can be provided only if all the lines to be included are in the same subgroup of 5 lines (0-4 or 5-9) and the hunting sequence conforms with the numerical sequence of the line numbers. For example, as shown in Fig. 8, if line 20 is dialed and found busy, call will be completed to line 22 if idle. If line 22 is busy however, call will be completed to line 24, if idle. If line 22 is dialed and found busy, call will be completed to line 24, if idle. If line 24 is dialed and found busy, call will be routed to busy tone.

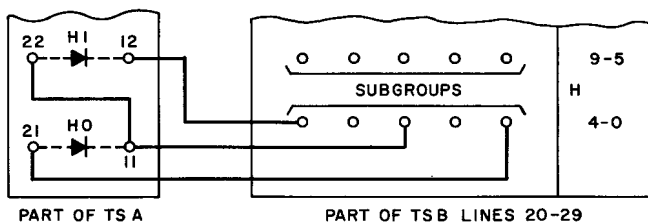


Fig. 8 - One-Way Sequential Hunting Group Consisting of Station Lines 20, 22, and 24

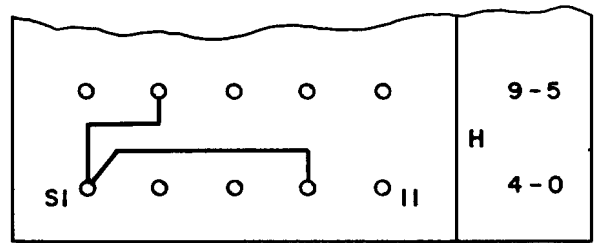


Fig. 9 - Two-Way Nonsequential Hunting Group Consisting of Station Lines 21, 24, and 28

Two-Way Nonsequential

2.11 A two-way nonsequential hunting group is formed by providing straps between the H terminals of the lines included in the group. For example, as shown in Fig. 9, if either line 21, 24, or 28 is dialed and found busy, call will be completed indiscriminately to whichever of the other two lines is idle.

Combination of One- and Two-Way Nonsequential

2.12 A combined hunting group is formed by providing straps and H diodes between the H terminals of the lines included in the group to produce the desired hunting pattern. For example as shown in Fig. 10, if line 20 is dialed and found busy, call will be completed to line 26, if idle. If line 26 is dialed and found busy, call will be completed to line 20, if idle. If line 27 is dialed and found busy, call will be completed indiscriminately to whichever of the other two lines is idle.

References for 2.00: SD-69463-01  
SD-69469-01  
SD-69470-01

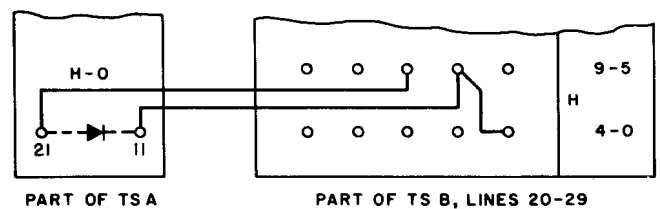


Fig. 10 - Combination of One- and Two-Way Nonsequential Hunting Group Consisting of Station Lines 20, 26, and 27

3.00 LINE, LINK, AND CONNECTOR UNITS FOR STATION LINES 40-49 AND 50-59.

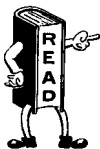
3.01 To place this unit in service after it has been mounted, straps have to be placed and removed on terminal strips of dial pulse registers 0 and 1. Terminal strips are located on mounting spaces 8 (register 0) and 12 (register 1) of slide 2. Proceed as follows:

● For lines 40-49

- (a) Remove strap between terminals 22 and 12, and place strap between terminals 22 and 32 on each dial pulse register terminal strip.
- (b) Install 70A fuse, if not provided, in fuse position L4 on fuse panel designated L, LK, AND CONN. Fuse panel located slide 1.

● For lines 50-59

- (a) Remove strap between terminals 23 and 13, and place strap between terminals 23 and 33 on each dial pulse register terminal strip.
- (b) Install 70A fuse, if not provided, in fuse position L5 on fuse panel designated L, LK, AND CONN. Fuse panel located slide 1.



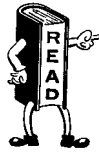
All station lines must be strapped for assigned or unassigned service when installing this unit. See 2.04 and 2.05.

References for 3.00: SD-69463-01  
SD-69469-01  
SD-69470-01

4.00 ADD-ON LINE UNITS (INTERNALLY OR EXTERNALLY MOUNTED)

4.01 An add-on line unit consists of two 1A1 key telephone system line circuits coupled together by a bridging circuit. A central office or PBX line is assigned to one line circuit and a switching system No. 400 station line is assigned to the other, with both lines appearing at the

same multibutton key telephone set. The bridging circuit which couples the two line circuits is activated by a signal key.



Trouble may occur between line circuits of an add-on line unit, when an add-on line circuit or portion thereof multiples at another telephone set.

The trouble occurs only when a station is using a portion of one add-on line unit and the other station operates the common signaling key to activate another add-on line unit. To avoid this type trouble, provide a separate signal key per add-on line circuit, whenever add-on circuits or portions thereof are multiplied at stations other than auxiliary answering positions.

4.02 The line circuits associated with add-on line units are identical in operation to and provide the same features as the 202DKTU, with the exception that internal strip mounted units require 48v dc for relay operation.

4.03 These line circuits can be used for regular 1A1 key telephone system installations when not required for add-on feature use.

4.04 The power failure feature is internally wired for each line circuit.

4.05 The ringing circuit for each line is arranged for either metallic or grounded ringing.



Internally mounted add-on line units of early manufacture were furnished with X and V options shop wired. On initial installation of these units, the option not required must be removed.

4.06 The R (ringup) relay of each line circuit can be modified to provide a nonlocking arrangement. For this modification, move the upper make-wire spring contact from its guide in contact 4 to the lower guide of contact position 5. Move the lower make-wire spring contact 4 to the upper guide of contact position 3. Contact positions 3 and 5 are unequipped and the stationary contacts are unwired.

4.07 The common equipment for line circuits of add-on units and key telephone units is located with the power supply

on slide 1. It consists of a TO relay for time-out purposes and an interrupter which provides flashing, winking, and ringing interruptions. The common equipment is furnished wired to all internal add-on and/or key telephone unit locations and to the miscellaneous terminal strip in crown of cabinet for connection to external add-on or key telephone units.

4.08 The line circuits are arranged for either the steady hold lamp or winking hold lamp feature.

**READ** Internally mounted add-on line units of early manufacture were furnished with J and H options shop wired. On initial installation of these units, the option not required must be removed.

4.09 Fig. 11 shows the connections for add-on units 0 and 1 as furnished with each cabinet assembly. It also shows the necessary connections to be made when add-on units 2-5 are added to system. Leads for add-on units 2-5 will be found in a tube at the respective mounting plate locations. Install 70A fuses, if not provided, in fuse positions 0-5, as required, on fuse panel designated ADD-ON & K TEL. Fuse panel located on slide 1.

4.10 Fig. 12 shows the connections to be made when adding external add-on units to system. Two 249A and one 250A key telephone units are required to provide the add-on feature for a central office or PBX line.

**READ** These units are connected to the common equipment supplied with the switching system No. 400. This precludes the possibility of any difficulty arising from having two different timing intervals appearing on lines connected to a multibutton key telephone set (ie, flashing lights, wink hold, ringing, time-out, etc).

References for 4.00: SD-69463-01  
SD-69466-01  
SD-69474-01

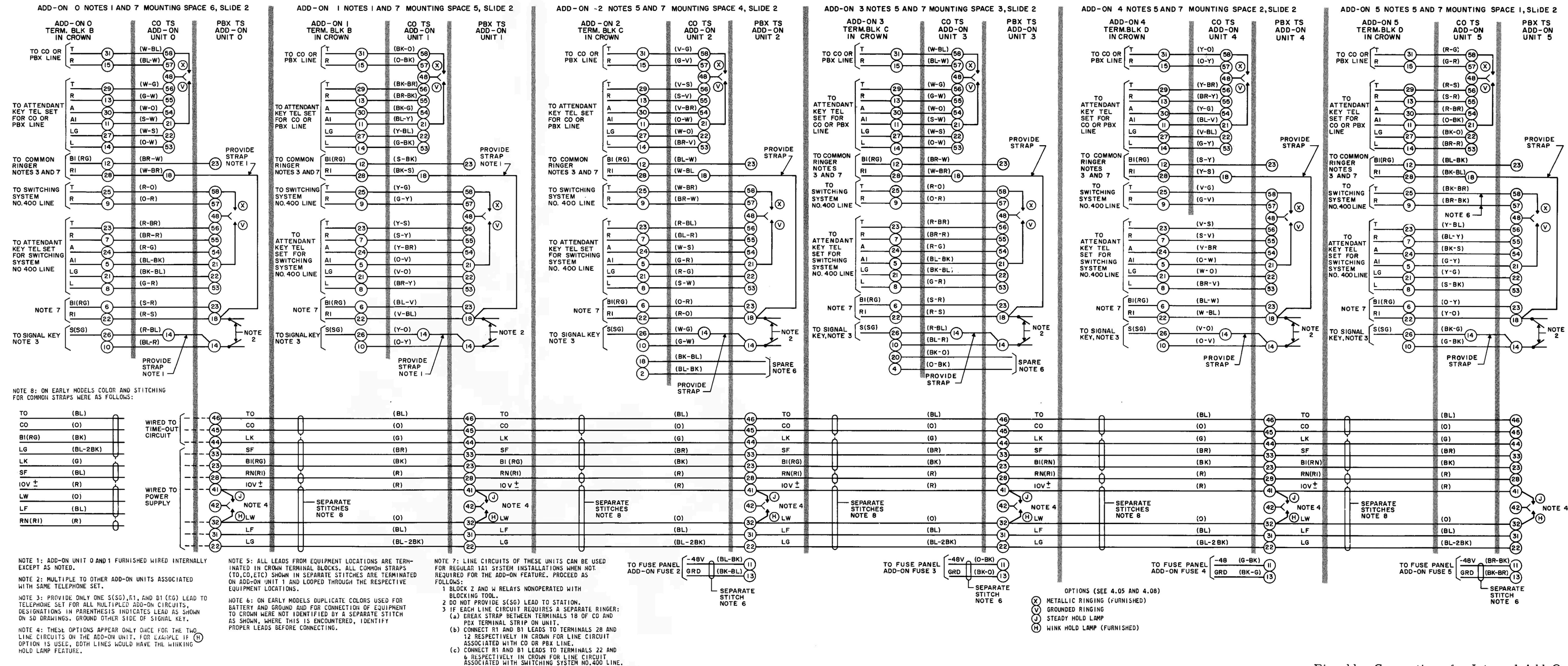


Fig. 11 - Connections for Internal Add-On Units

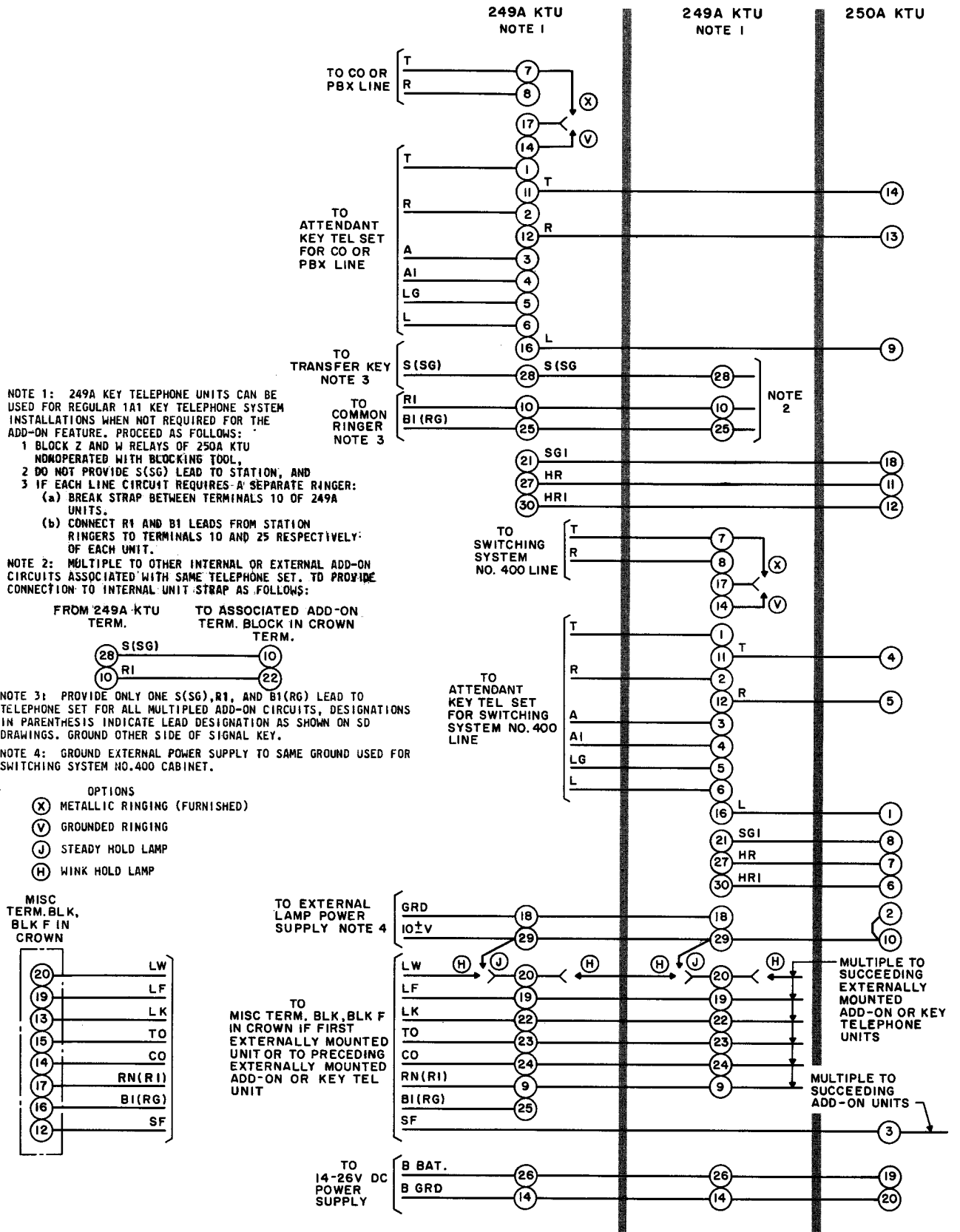


Fig. 12 - Connections for External Add-On Circuit

5.00 KEY TELEPHONE UNITS  
(INTERNALLY OR EXTERNALLY  
MOUNTED)

5.01 Internally mounted key telephone units contain 3-line circuits mounted on a 2-in. by 23-in. mounting plate. These line circuits are identical in operation to and provide the same features as 202D key telephone units except 48v dc is used for relay operation.

5.02 Externally mounted key telephone units may be standard 1A1 key telephone system line circuits (202D, 230B, KTU, etc).

5.03 The power failure feature is internally wired for each line circuit.

5.04 The R (ringup) relay of each line circuit can be modified to provide a nonlocking arrangement (see 4.06).

5.05 The common equipment for line circuits, whether internally or externally mounted, is the same as used for add-on line units (see 4.07).

5.06 Internally mounted key telephone units of early manufacture were furnished with X, V, J, and H options shop wired. On initial installation of these units, options not required must be removed.

5.07 A switching system No. 400 line assigned to a multibutton key telephone set can be connected to line circuits of key telephone units to provide the same features as found on central office or PBX lines (ie, pickup, flashing, holding, etc).

5.08 Fig. 13 shows the connections for internally mounted J53035-CG, L1 key telephone units. Necessary leads for key telephone units (9-12, 6-8, 3-5, and 0-2) will be found in a tube at the respective mounting plate locations. Install 70A fuses, if not provided, in fuse positions 2-5 as required, on fuse panel designated ADD-ON & K TEL. Fuse panel located on slide 1.

5.09 Fig. 14 shows the connections to be made when adding external panel mounted key telephone units.



These units are connected to the common equipment supplied with the switching system No. 400. This precludes the possibility of any difficulty arising from having two different timing intervals appearing on lines connected to a multibutton key telephone set (ie, flashing lights, wink hold, ringing, time-out, etc).

References for 5.00: SD-69463-01  
SD-69466-01  
SD-69474-01

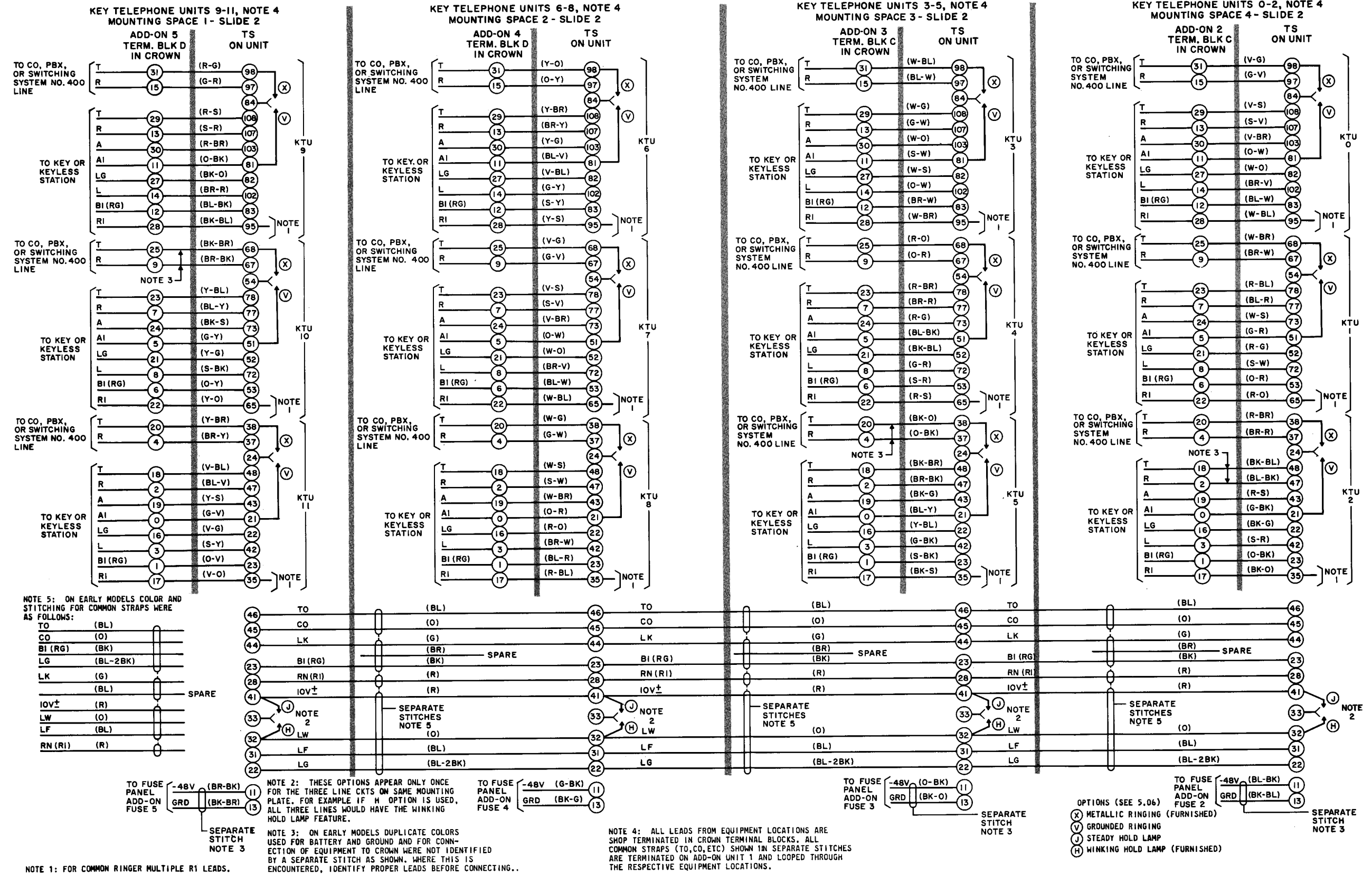
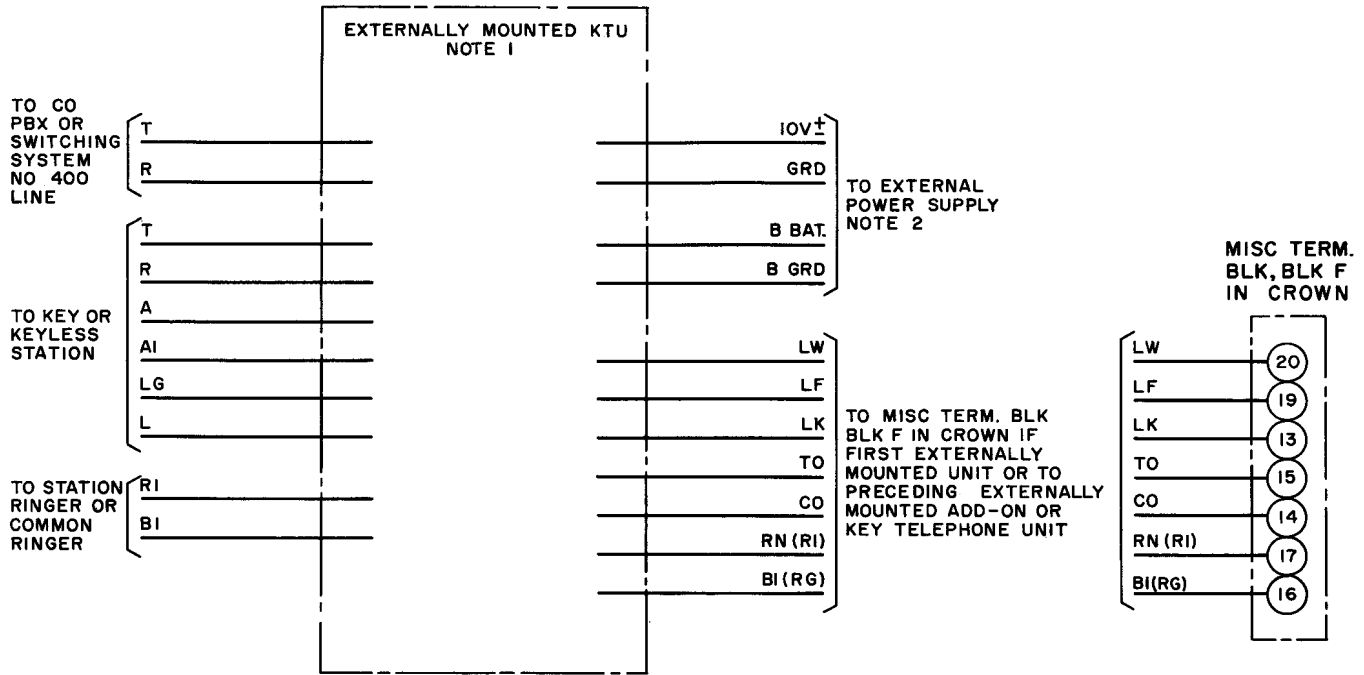


Fig. 13 - Connections for Internal Key Telephone Units





NOTE 1: MAY BE ANY STANDARD 1A1 KEY TELEPHONE SYSTEM LINE CIRCUIT (202D, 230B KTU, ETC). OPTIONS REQUIRED MUST BE WIRED IN LOCALLY. FOR CONNECTIONS SEE SECTION COVERING TYPE OF UNIT PROVIDED.

NOTE 2: GROUND EXTERNAL POWER SUPPLY TO SAME GROUND USED FOR SWITCHING SYSTEM NO. 400 CABINET.

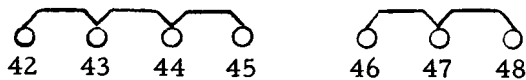
Fig. 14 - Connections for External Key Telephone Units Associated with Switching System No. 400

## 6.00 DIRECT STATION SELECTION (DSS) UNITS

6.01 Direct station selection (DSS) units consist of:

- Auxiliary relay units (internally or externally mounted)
- Auxiliary register unit (internal only)

6.02 List 1 and 2 cabinet assemblies are shop wired with straps on terminal strips of dial pulse registers 0 and 1 as follows:



When initially installing DSS, remove strap between terminals 43 and 44 and 47 and 48 on terminal strip of each dial pulse register circuit. Terminal strips are located on slide 2 mounting spaces 8 (register 0) and 12 (register 1). This is shown as V and W options on SD-69470-01-G1 cad 1.

6.03 List 2 cabinet assemblies are shop wired so that internally mounted auxiliary relay units 0-19 are always assigned to station lines 20-39 respectively.

6.04 For DSS, list 2 cabinet assemblies are furnished with:

- Two auxiliary relay units (0-3 and 4-7) wired as shown in Fig. 15 and 16.
- Eight plug-in diode assemblies mounted in jacks on auxiliary relay units (see Note 1, Fig. 18 for location).
- Auxiliary register unit wired as shown in Fig. 16.
- Local cabling for adding three additional auxiliary relay units in cabinet.
- A jumper cable from station lines 20-39 on terminal block F to their respective DSS terminal block G-L in crown (refer to Fig. 1 for location of blocks in crown).

6.05 For DSS, list 1 cabinet assemblies are furnished only with:

- A cable from DSS REG terminal block A in crown to mounting space location of auxiliary register unit.
- Necessary leads from dial pulse registers 0 and 1 to mounting space location of auxiliary register unit.

### Adding Additional Auxiliary Relay Units to List 2 Cabinet Assembly

6.06 To add additional auxiliary relay units, proceed as follows:

- Install unit as per Section entitled Switching System No. 400, Installation
- Connect unit as shown in Fig. 15 and 16. Fig. 15 extends the necessary leads from unit to associated DSS terminal blocks in crown for connection to station. Leads will be found in tube at equipment mounting location. Fig. 16 shows the multiple strapping to preceding unit. These leads have to be provided.
- Install plug-in diode assemblies into appropriate jacks as required.
- To place station arranged for DSS in service, see 6.10.

### Adding Externally Mounted Auxiliary Relay Units to List 2 Cabinet Assembly Equipped With Internal Units

6.07 To add externally mounted auxiliary relay units, proceed as follows:

- Install unit in external cabinet.
- Connect unit as shown in Fig. 16 and 17. Connection to external unit shown in Fig. 17 can be direct or through a distributing terminal. Fig. 16 shows multiple strapping that is required between the first externally mounted unit and the last internally mounted unit. Connections for multiple strapping cannot be made in crown DSS REG terminal block because only one wire can be terminated in clip. Cable from external unit to internal unit should follow existing cables to avoid interfering with opening and closing of slide.



- Install plug-in diode assemblies into appropriate jacks as required.
- To place station arranged for DSS in service, see 6.10.

Mounting All Auxiliary Relay Units Associated With List 2 Cabinet Assembly in External Cabinet

6.08 When the line, link, and connector unit for station lines 50-59 is added to a list 2 cabinet assembly, all internally mounted auxiliary relay units must be mounted externally. Proceed as follows:

- Remove all internal units after disconnecting leads from LA, LB, LG, and REG LK terminal strips. Fig. 15 and 16 should be used. Do not disconnect leads used for wiring of unit. Store leads in tubes at mounting plate locations.
- Remove leads from inside clips of DSS REG terminal block A in crown. Turn back leads on form.
- Remove leads from outside clips of DSS terminal blocks G-L in crown. Turn back leads on form.
- Mount units in external cabinet.
- Connect units as shown in Fig. 15 and 16. Provide cable for connection from first externally mounted unit to inside clips of DSS REG terminal block A in crown for multiple strapping as shown in Fig. 16 and to outside clips of DSS terminals G-L for reconnecting leads required for stations as shown in Fig. 15.

Adding DSS to List 1 Cabinet Assembly

6.09 To add DSS, proceed as follows:

- Mount auxiliary register unit in mounting space 10, slide 2.
- Connect auxiliary register unit as

shown in Fig. 16. Leads will be found in tube at equipment mounting space location.

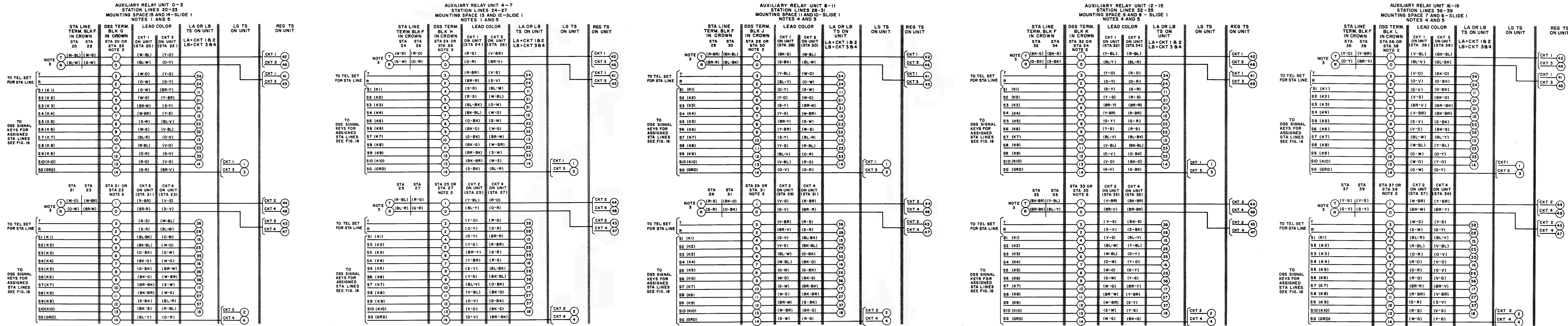
- Install auxiliary relay units in external cabinet
- Connect units as shown in Fig. 16 and 17. Provide cable from first externally mounted unit to DSS REG terminal block A in crown for multiple strapping as shown in Fig. 16. Fig. 17 shows leads to station directly or through a distributing terminal.
- Install plug-in diode assemblies into appropriate jacks as required.
- To place station arranged for DSS in service, see 6.10.

Placing Station Arranged for DSS In Service

6.10 To place station arranged for DSS in service, proceed as follows:

- Remove straps on dial pulse registers 0 and 1 as covered in 6.01 if this is first station assigned.
- Connect station line in crown to assigned auxiliary relay unit. In list 2 cabinet assemblies station lines 20-39 are already wired to respective DSS terminal blocks in crown. (To assign station line, see 2.05)
- Connect telephone set leads and signal key leads as shown in Fig. 15 and 17. When key sets are used, line circuits of key telephone units are inserted between telephone set and DSS equipment.
- Provide straps between the tens and the units' terminal strips on auxiliary relay units to assign called stations to signal keys (see Fig. 18).

References for 6.00: SD-69463-01  
SD-69467-01  
SD-69470-01

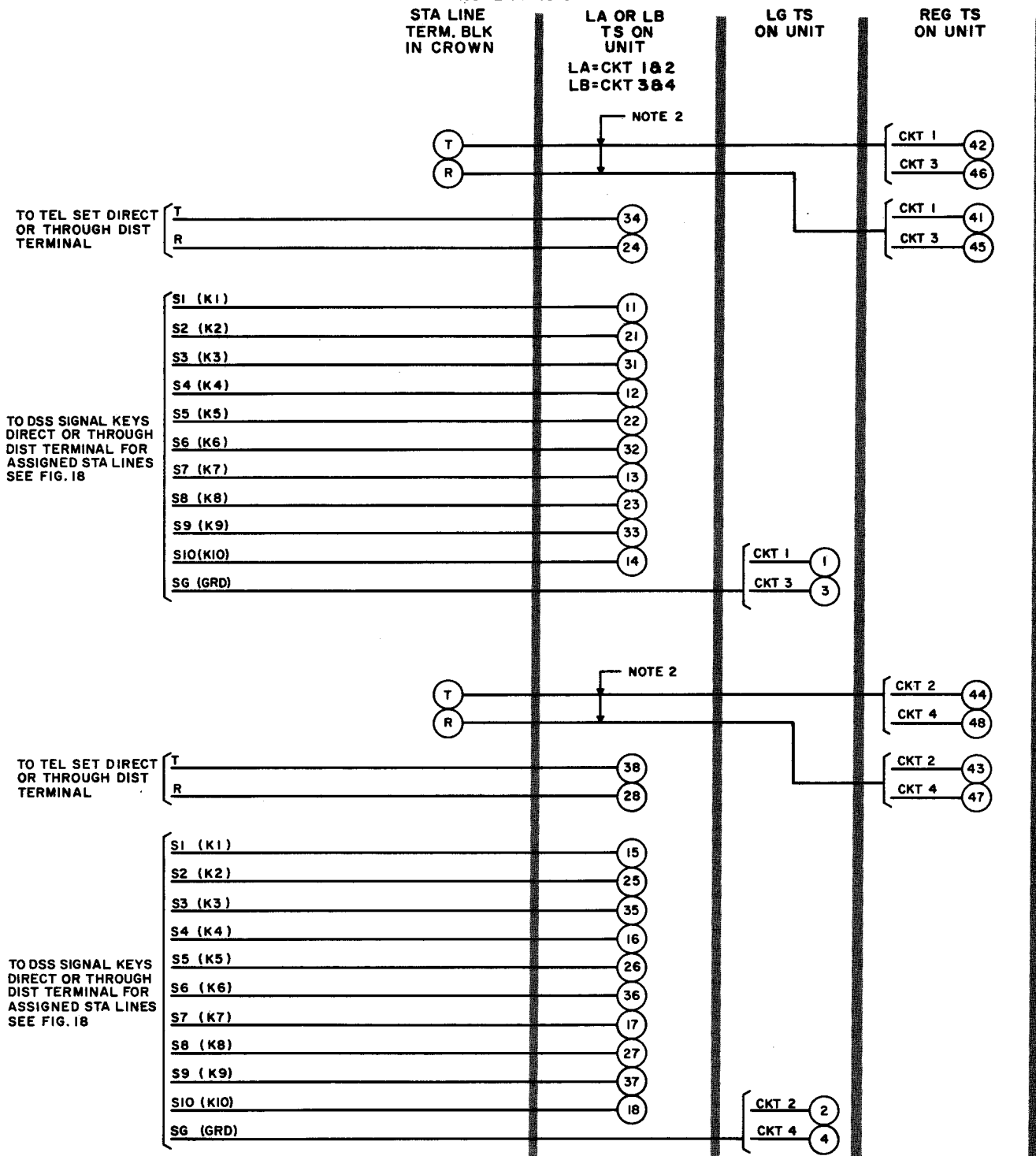


NOTE 1: AUXILIARY RELAY UNITS 0-3 AND 4-7 ARE FURNISHED WIRED AS SHOWN WITH LIST 2 CABINET ASSEMBLY.  
 NOTE 2: EACH STATION IS ASSIGNED TERMINALS 0-15 ON DSS TERMINAL BLOCKS IN CROWN OF CABINET. SEE FIG. 1.  
 NOTE 3: STATION LINES 20-39 ARE FURNISHED WIRED TO THEIR RESPECTIVE DSS TERMINAL BLOCKS IN CROWN.  
 NOTE 4: ALL LEADS FROM EQUIPMENT LOCATIONS ARE SHOP TERMINATED IN CROWN DSS TERMINAL BLOCKS.  
 NOTE 5: ADDITIONAL STRAPPING SHOWN IN FIG. 16 AND 18.

Fig. 15 - Connections for Auxiliary Relay Units (Connections Shown Are in Addition to Fig. 16 and 18)

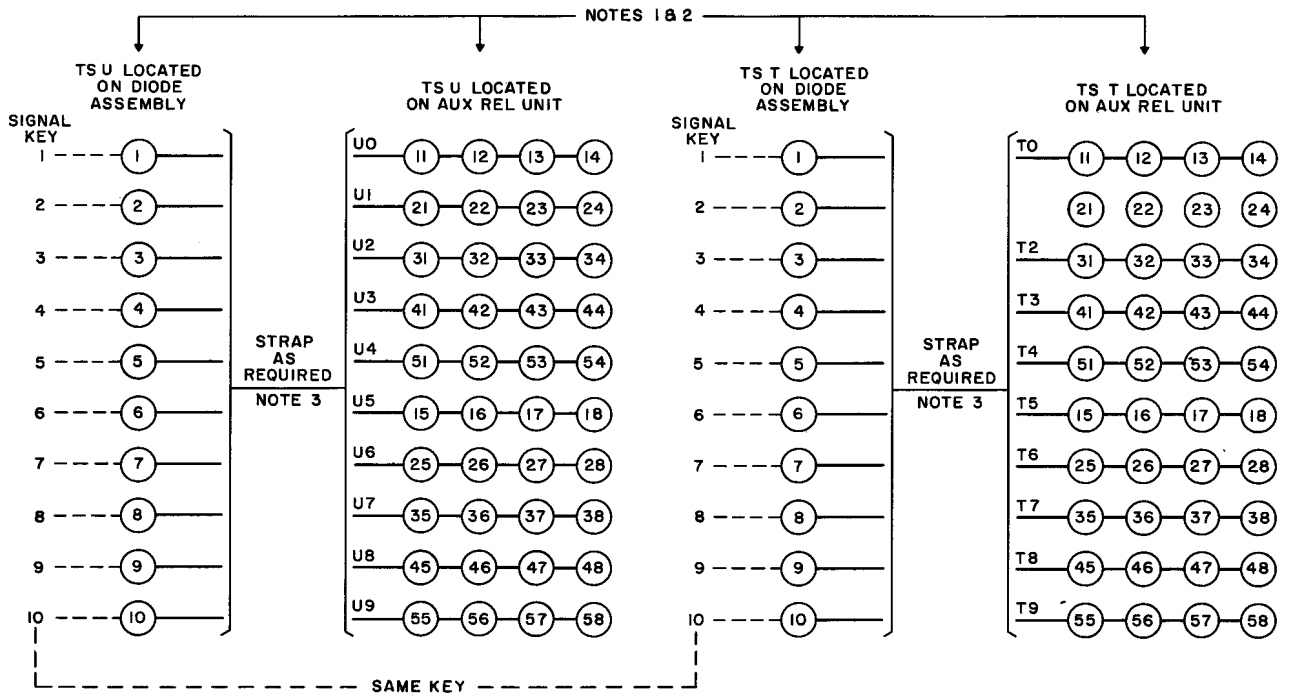


AUXILIARY RELAY UNIT  
MOUNTED IN EXTERNAL EQUIPMENT CABINET  
NOTE 1 AND 3

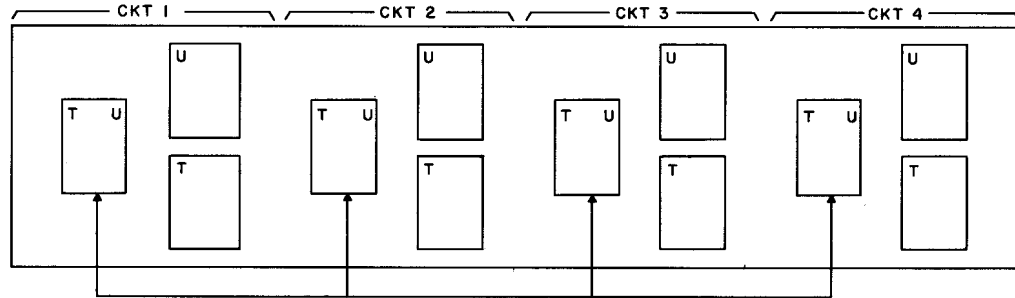


NOTE 1: CONNECTIONS SHOWN ARE FOR ONE AUXILIARY RELAY UNIT ONLY. CONNECT ALL EXTERNAL UNITS AS SHOWN.  
NOTE 2: MAY CONNECT TO ANY STATION LINE.  
NOTE 3: ADDITIONAL STRAPPING SHOWN IN FIG.16 AND 18.

Fig. 17 - Connections for Externally Mounted Auxiliary Relay Units  
(Connections Shown Are in Addition to Fig. 16 and 18)

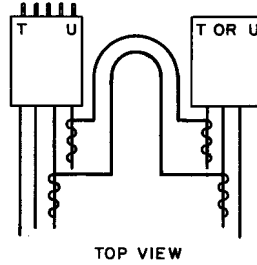


NOTE 1: LOCATION OF TERMINAL STRIPS ON AUXILIARY RELAY UNIT.



PLUG-IN DIODE ASSEMBLIES

NOTE 2: STRAP AS SHOWN TO FACILITATE REMOVAL OF ASSEMBLY FOR DIODE REPLACEMENT.



NOTE 3: STRAP AS REQUIRED TO ASSIGN STATION LINE TO SPECIFIC SIGNAL KEY. FOR EXAMPLE, TO ASSIGN STATION 35 TO SIGNAL KEY 1 STRAP AS FOLLOWS:

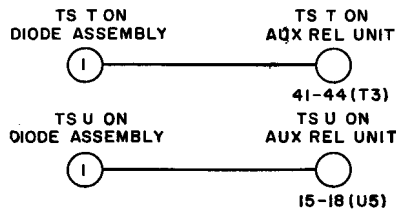
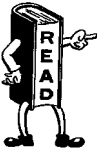


Fig. 18 - Connections for Assigning Station Lines to Signal Keys for DSS

7.00 UNIVERSAL LINE CIRCUITS

- Assigned as station line, Fig. 19
- Connected to 3A code call, Fig. 20
- Connected to two-way tie trunk, telephone dictation trunk, or customer owned loudspeaker paging system, Fig. 21.



Cabinet assemblies of early manufacture were furnished shop wired for connection to all of above listed circuits. When initially assigning a universal line to one of these circuits, shop wiring for other circuits must be removed as shown in Fig. 19, 20, or 21.

7.01 Universal line circuits 6, 7, and 8 are always assigned to single digits 6, 7, and 8 respectively.

7.02 To place universal line in service using Fig. 19, 20, or 21:

- Make connections as shown to terminals in crown of assigned universal line. See Fig. 1 for location of block E and method of counting terminals.
- Assign battery pair to equipment, if required.
- Provide and remove straps on terminal strip of assigned universal line on line, link, and connector unit (terminal strip UL6 if universal line 6 is assigned, etc).
- Provide and remove straps for assigned universal line on terminal strips of each dial pulse register.

7.03 To remove universal line from service:

- Remove leads of external circuits from terminals in crown of line be-

ing removed from service.

- On terminal strip of each dial pulse register located on mounting spaces 8 and 12 of slide 2 perform the following:

(a) For universal line 6, remove strap between 34 and 24 and provide strap between 24 and 14.

(b) For universal line 7, remove strap between 36 and 25 and provide strap between 25 and 15.

(c) For universal line 8, remove strap between 38 and 26 and provide strap between 26 and 16.

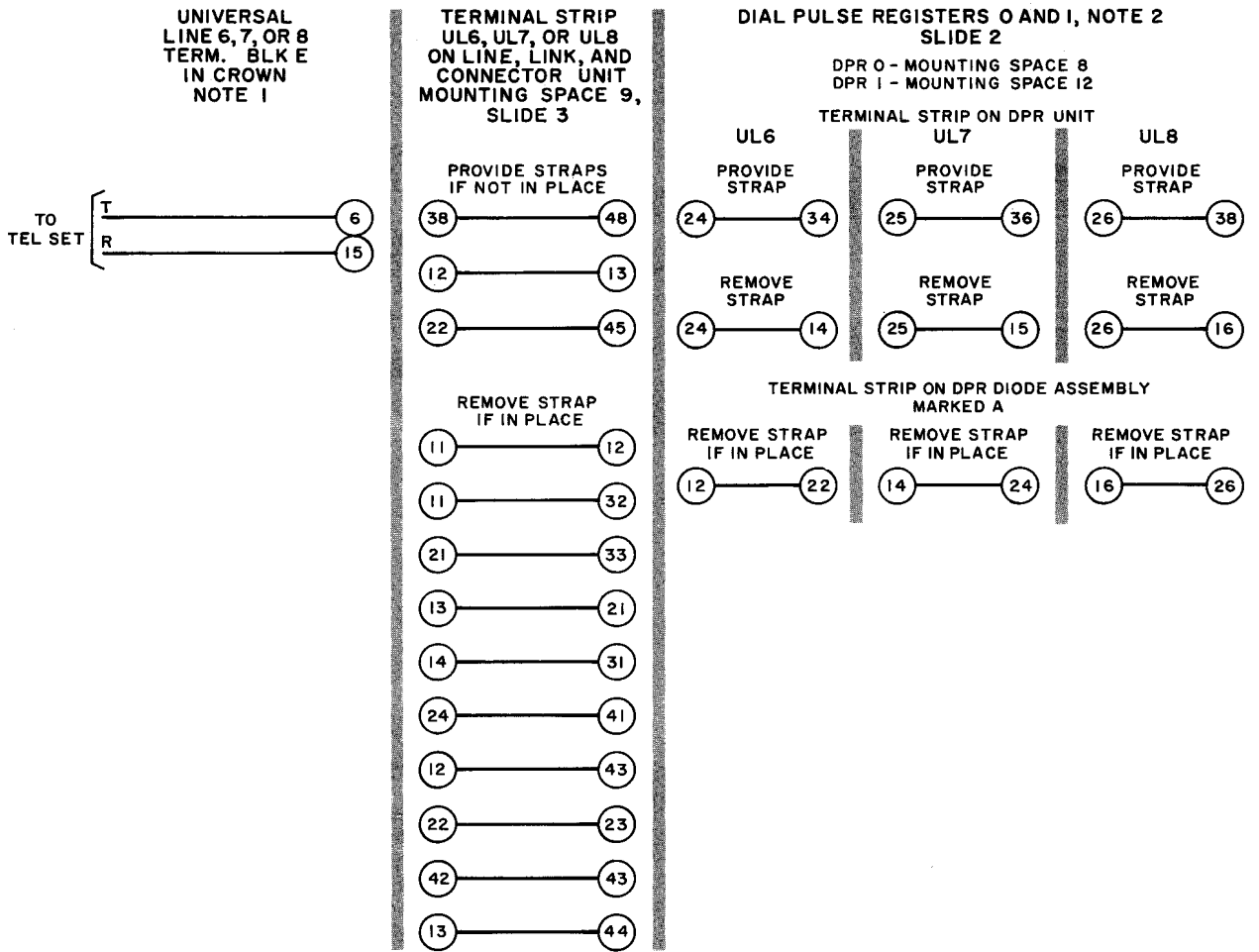
- Digits 6, 7, and 8 are now connected to the busy tone trunk and all calls directed to these digits will receive the busy signal.

7.04 The following SD drawings should be used for connecting information of listed equipment.

- Dial Repeating Type Tie Trunks - SD-65718-01 or SD-65755-01 (typical circuits)
- Recorded Telephone Dictation Trunk SD-65788-01
- 3A Code Call Circuit - SD-66610-01

7.05 A two-way hunting group of universal lines can be formed by strapping between terminals 18 of terminal strips UL6, UL7, and UL8. Terminal strips are located on line, link, and connector unit, slide 3, mounting space 9.

References for 7.00: SD-69463-01  
SD-69469-01  
SD-69470-01

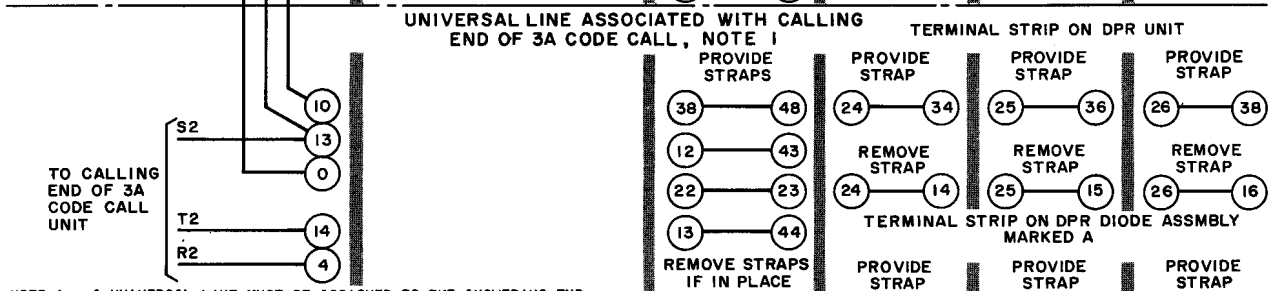
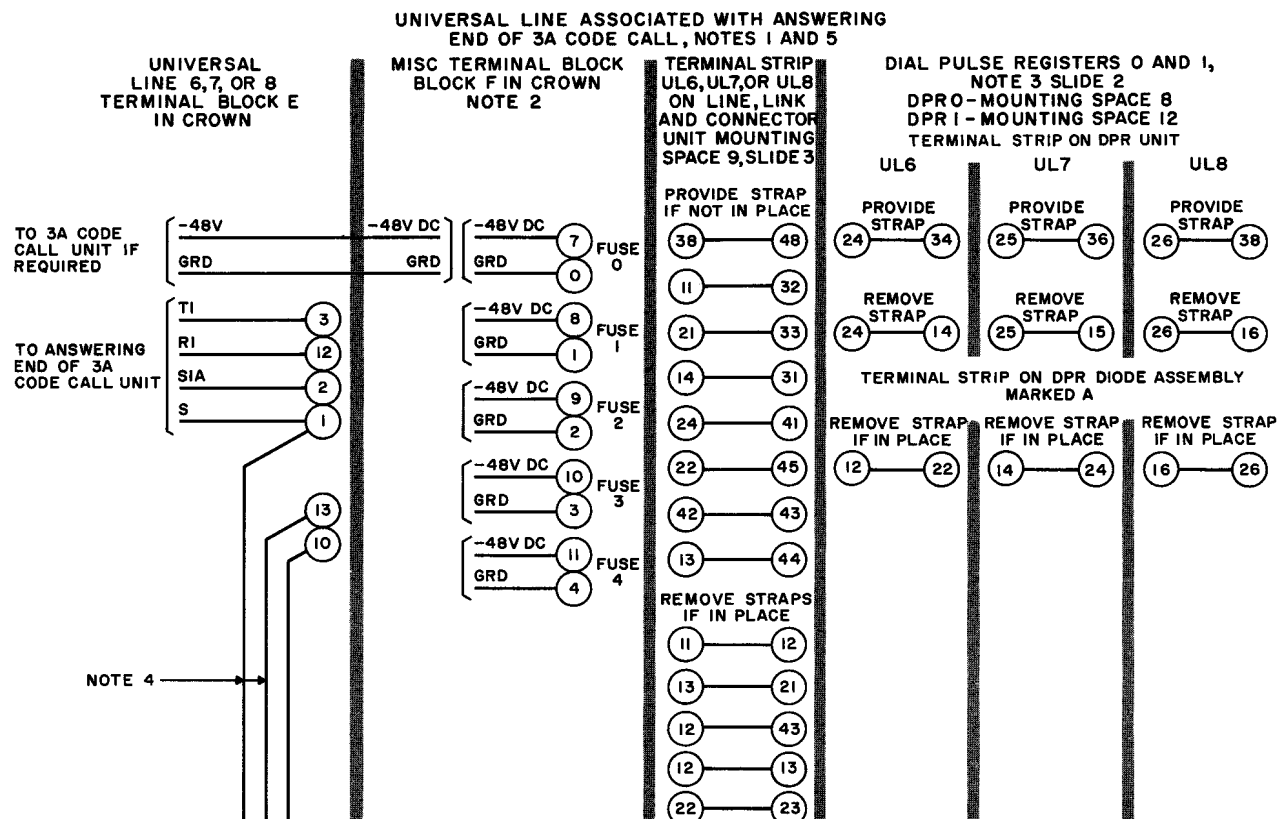


NOTE 1: ASSIGN ANY VACANT UNIVERSAL LINE CIRCUIT. DIGITS 6, 7 AND 8 ARE ALWAYS ASSIGNED TO UL 6, 7 AND 8 RESPECTIVELY.

NOTE 2: PROVIDE AND REMOVE STRAPS AS SHOWN ON BOTH DIAL PULSE REGISTER CIRCUITS FOR ASSIGNED UNIVERSAL LINE ONLY.

Fig. 19 Connection for Universal Line Assigned as Station Line





NOTE 1: A UNIVERSAL LINE MUST BE ASSIGNED TO THE ANSWERING END AND CALLING END OF 3A CODE CALL UNIT. DIGITS 6,7 AND 8 ARE ALWAYS ASSIGNED TO UL 6,7 AND 8 RESPECTIVELY.

NOTE 2: ASSIGN TO ANY VACANT BATTERY PAIR. PLACE ASSOCIATED FUSE, IF NOT PROVIDED, IN FUSE PANEL DESIGNATED MISC, SLIDE 1.

NOTE 3: PROVIDE AND REMOVE STRAPS AS SHOWN ON BOTH DIAL PULSE REGISTER CIRCUITS FOR UNIVERSAL LINE ASSIGNED TO ANSWERING END AND CALLING END OF 3A CODE CALL.

NOTE 4: DUE TO SPACE LIMITATIONS OF TERMINALS IN CROWN, LOOP S LEAD THROUGH TERMINAL 1 OF ASSIGNED UNIVERSAL LINE AND CONTINUE WITH LEAD TO TERMINAL 0 OF UNIVERSAL LINE ASSIGNED TO CALLING END. DO THE SAME FOR S2 LEAD FROM CALLING END.

S

----- 1- UL ASSIGNED TO ANSWERING END

----- 0- UL ASSIGNED TO CALLING END

S2

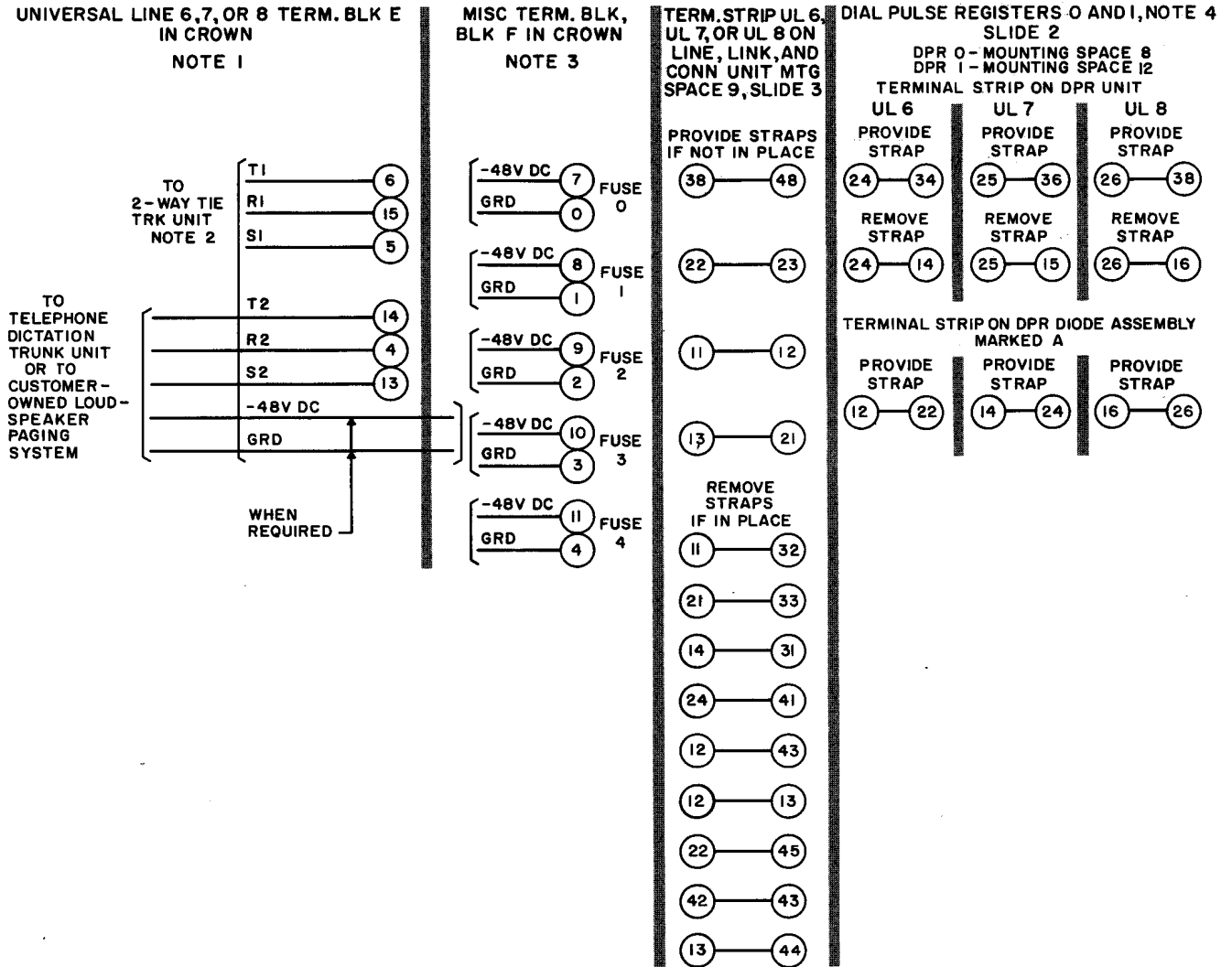
----- 13- UL ASSIGNED TO CALLING END

----- 13- UL ASSIGNED TO ANSWERING END

NOTE 5: PLACE 950B TOOL IN 1-2B AND 1-2T CONTACT OF HOLD MAGNET OFF-NORMAL SPRINGS OF UNIVERSAL LINE ASSIGNED TO ANSWERING END OF 3A CODE CALL. HOLD MAGNETS HM 10,15,16 ARE ASSOCIATED WITH UL 6,7 AND 8 RESPECTIVELY.

Fig. 20 - Connection for Universal Lines Assigned to Answering and Calling Ends of a 3A Code Call Unit





NOTE 1: ASSIGN ANY VACANT UNIVERSAL LINE CIRCUIT. DIGITS 6, 7, AND 8 ARE ALWAYS ASSIGNED TO UL 6, 7 AND 8, RESPECTIVELY

NOTE 2: MAY BE ANY STANDARD 2-WAY TIE TRUNK UNIT. S1 LEAD NOT REQUIRED FOR SOME UNITS.

NOTE 3: ASSIGN TO ANY VACANT BATTERY PAIR. PLACE ASSOCIATED FUSE, IF NOT PROVIDED, IN FUSE PANEL DESIGNATED MISC, SLIDE 1.

NOTE 4: PROVIDE AND REMOVE STRAPS AS SHOWN ON BOTH DIAL PULSE REGISTER CIRCUITS FOR ASSIGNED UNIVERSAL LINE ONLY.

Fig. 21 - Connections for Universal Line Assigned to 2-Way Tie Trunk Unit, Loud-speaker Paging Trunk Unit or Telephone Dictation Trunk Unit

8.00 ALARM CIRCUIT

8.01 This circuit provides alarm indications as follows:

- By lighting the TR lamp located on slide 1 of cabinet assembly (always provided).
- By transmitting an alarm signal to the central office (optional).

8.02 If providing the central office alarm, connect T and R of alarm pair to terminals 23 and 22 respectively of misc terminal block F in crown. Two types of alarm signals are available, marginal or reverse battery.



Both types are shop wired as shown in Fig. 22. Remove option not required at contacts of TR relay, located slide 1, mounting space 17.

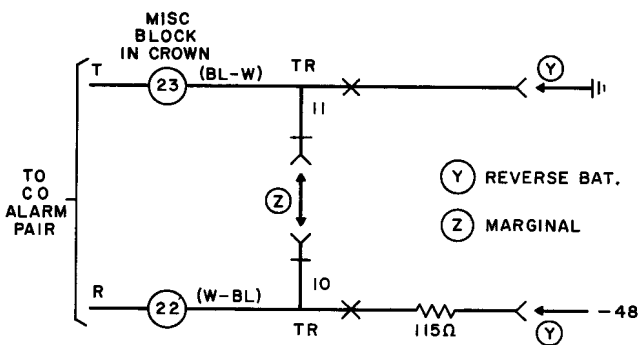


Fig. 22 - Alarm to Central Office

8.03 Three types of failures will bring in an alarm:

- Operation of either a positive or negative 48-volt battery supply fuse.
- Operation of a 10v ac fuse in power supply
- A marker trouble which prevents the marker from timing out and releasing within a period of 7.5 to 15 seconds.

8.04 To restore alarm circuit to normal, either replace operated fuse or

momentarily operate AR key, located slide 1, mounting space 16 if marker failure caused alarm.

References for 8.00: SD-69463-01  
SD-69471-01

9.00 FUSE PANEL

9.01 70A fuses are provided for all circuits of the switching system No. 400 as shown in Fig. 23. Fuse panel is located on slide 1, mounting spaces 16 and 17.



On initial installations remove 70A fuses and replace with 72A dummy fuses for all unused circuits.

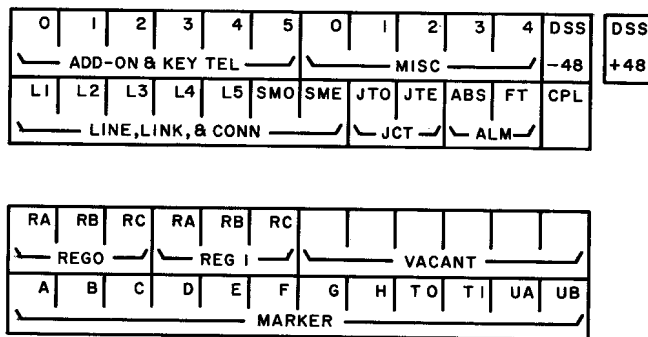


Fig. 23 - Switching System No. 400 Fuse Panel

References for 9.00: SD-69471-01

10.00 POWER SUPPLY

10.01 Power for the switching system No. 400 is supplied by a J86812A, L1 power plant located top of slide 1. It consists of the following:

- J87205B, L1 rectifier supplying -48v dc for relay operation and talking purposes.
- J86812B, L1 equipment supplying the following:

- (a) +48v dc for operation of the SC relay associated with direct station selection.

- (b) 10v± for station lamp and interrupter motor operation.
- (c) 90 or 105v ±20 cycles for operating ringers and bells
- (d) Tone
- (e) KS-15984, L1 plug-in type interrupter supplying various interruptions required for lamps, busy tone, ringing etc.

Caution: Disconnect ac supply before working on power plant except as necessary to make tests. While making tests avoid all contact with terminals, as high voltages are present. Do not allow a test pick to touch two metal parts at the same time or destructive and dangerous short circuits may occur.

10.02 Three 7000 microfarad capacitors located in the crown of the cabinet are furnished wired across the -48v dc output. These capacitors are used for filtering purposes as well as to sustain the system in case of power failure of less than 1/4-second duration.

10.03 Two line switches for the ac input supply are provided. One is located on the front panel of the J87205B, L1 rectifier unit just below the output meter and one is on the front panel of the J86812B, L1 equipment in the upper right hand corner. The switch located on J86812B, L1 equipment controls the ac input for the entire power plant, while the switch on the rectifier unit controls the ac input for this unit only.

10.04 Fusing for the J86812A, L1 power plant is as follows:

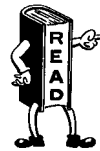
Input

- Busman MDX 6.25 ampere designated FN located front panel of J87205B, L1 rectifier unit
- Busman MDL-2, 2-ampere fuse-tron designated F1 located front panel of J86812B, L1 equipment.

Output (fuses located front panel of J86812B, L1 equipment)

- 70B, 2 ampere designated ±10v (for station lamps)
- 70A, 1-1/3 ampere designated Int. (10v± for interrupter motor)
- 70B, 2 ampere designated RB1 (-48v dc superimposed on ringing voltage for tripping during ringing cycle).
- Busman ABC-15, 15 ampere designated -48v (-48v dc for distribution to circuits via fuse panel).

10.05 The KS-15984, L1 interrupter furnished as part of the J86812B, L1 equipment is located on the back of slide 1. The interrupter requires no lubrication and maintenance should be limited to cleaning dirty contacts.



When returning KS-15984, L1 interrupter to distributing house, for any reason, attach ticket stating reason for return.

10.06 To place power plant in service proceed as follows:

- Place line switches for ac input supply of both the J87205B, L1 rectifier unit and J86812B, L1 equipment to the OFF position, which is down.
- Using 300v ac scale, connect volt-ohm-milliammeter to terminals 1 and 2 of TS1, located upper left hand side on back of J86812B, L1 equipment as viewed from back.
- Insert power cord into receptacle and place line switch on J86812, L1 equipment to ON position. Take reading of ac input supply voltage.
- Remove power cord and place line switch to OFF position. Disconnect meter.
- Connect green spade tipped wire from F1 fuse terminal to terminal 7 (111v), 6 (117v), or 5 (123v) of TS1 depending on the ac input voltage as read on the meter. This regulates the output of 10v± and +48v dc only.

Note: Green spade tipped wire from F1 fuse terminal may be found on 5, 6, or 7 of TS1 depending on the input voltage when power plant was factory tested.

- Insert power cord into receptable and place line switch of J86812B, L1 equipment to ON position.

- No regulation of rectifier unit is necessary. Place line switch of rectifier unit to ON position. Meter on unit should indicate between 45-52 volts.

- Power plant is now in service.

References for 10.00: SD-69463-01  
SD-69471-01  
SD-81564-01  
SD-81577-01