

## LOW SPEED SIGNALING SYSTEM USING DATA SET 115A INSTALLATION AND CONNECTIONS

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### 1. GENERAL

- 1.01** This section provides installation and connection procedures to be followed when installing a low speed signaling system using data set 115A.
- 1.02** Whenever this section is reissued, the reason for reissue will be listed in this paragraph.
- 1.03** Design of the low speed signaling system permits the system to be configured to meet customer requirements at each installation. The system therefore must be locally engineered. This section covers general installation and connection methods applicable to all installations.
- 1.04** All equipment is designed to fit a 23-inch frame. It is recommended that the key and lamp panel be installed near eye level and

directly above the 43A1 data mounting. The 233C mounting plate may be installed directly below the 43A1 data mounting. The equipment for interoffice links, if used, may be installed at any convenient location.

**1.05** One position in the first 43A1 data mounting and the first 233C mounting plate installed in each central office should be reserved for testing and for storage of the spare data set and interface driver, respectively. The 43A1 data mounting Option Z should not be applied to this position.

### 2. INSTALLATION AND CONNECTION PROCEDURES

#### INTRODUCTION

**2.01** The following procedures, in conjunction with local instructions, are used for initial installation of a low speed signaling system or, by omitting steps not required, are used to expand existing systems. Specific instructions for addition or deletion of a single leg are given in 2.20 through 2.23. Changeover from existing circuits to the low speed signaling system must be accomplished with minimum interference to service and with close coordination with the alarm company.

**Caution:** *Do not interrupt customer service by installation, testing, or maintenance procedures without knowledge and permission of the alarm company.*

#### PREINSTALLATION PREPARATIONS

**2.02** Terminal identification information for the D5A terminal strips used on the 233C mounting plate and the 43A1 data mounting is given in Fig. 1 and 2. Terminals are designated by a 2-digit number; the first digit denoting the column and the second the row. When viewed from the front panel, columns are numbered from right to left and rows from bottom to top. Terminal identification is given in Fig. 3 for the interface drivers [AE45

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circuit pack (CP)] and in Fig. 4 for the 547B key switches.

**2.03** Prepare the 233C mounting plate for installation as follows.

**Note:** All connections in the following steps are to be wire wrapped.

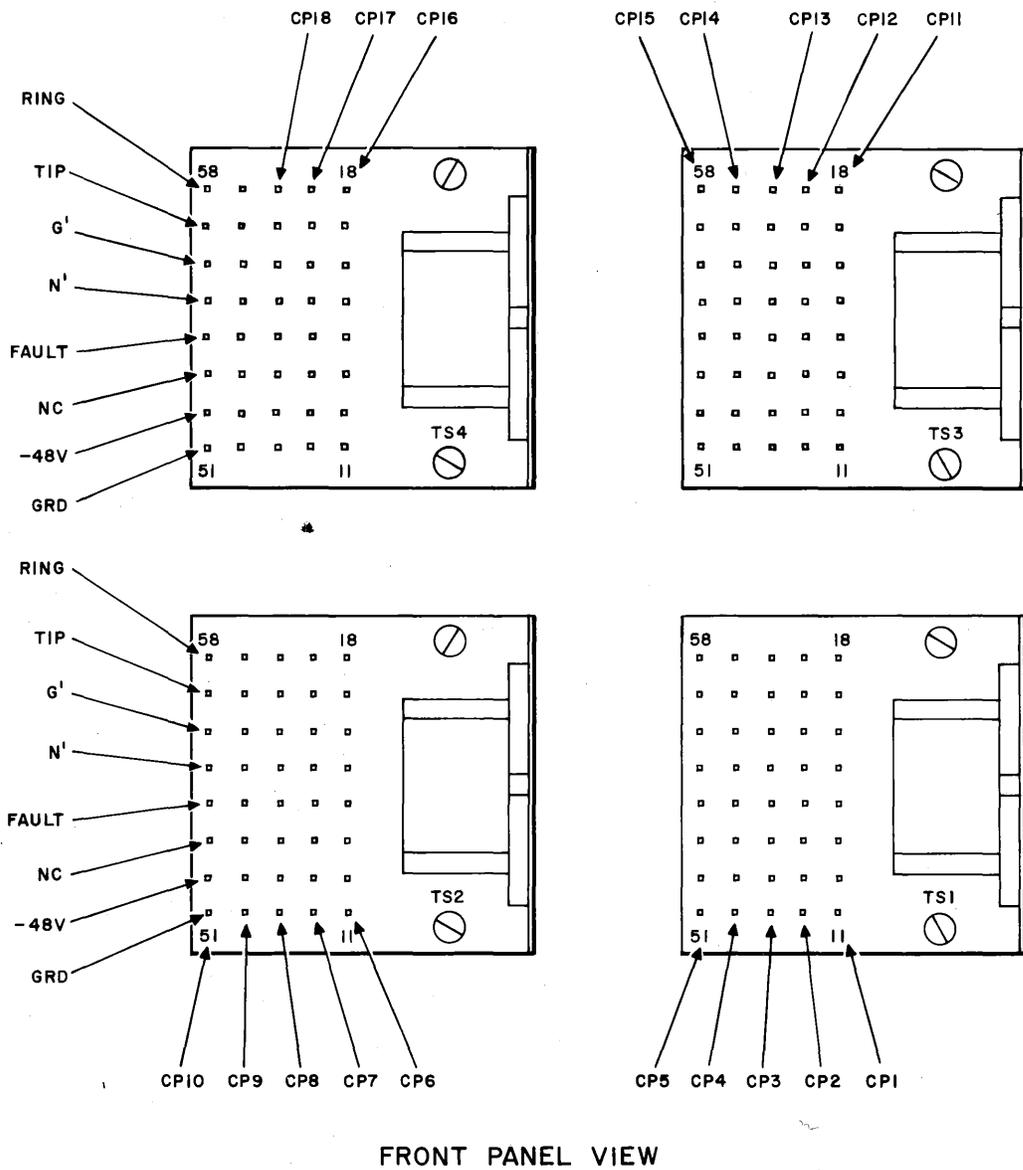
(a) Install interface drivers on 233C mounting plate (Fig. 5) per local instructions.

(b) Install four D5A terminal strips (TS1 through TS4) on 233C mounting plate.

(c) Connect, in sequence, all terminals in row 1 on front of TS1 through TS4 (Fig. 1).

(d) Connect, in sequence, all terminals in row 2 on front of TS1 through TS4.

(e) Install options for interface drivers (Fig. 3).



**Fig. 1—233C Mounting Plate—D5A Terminal Identification**

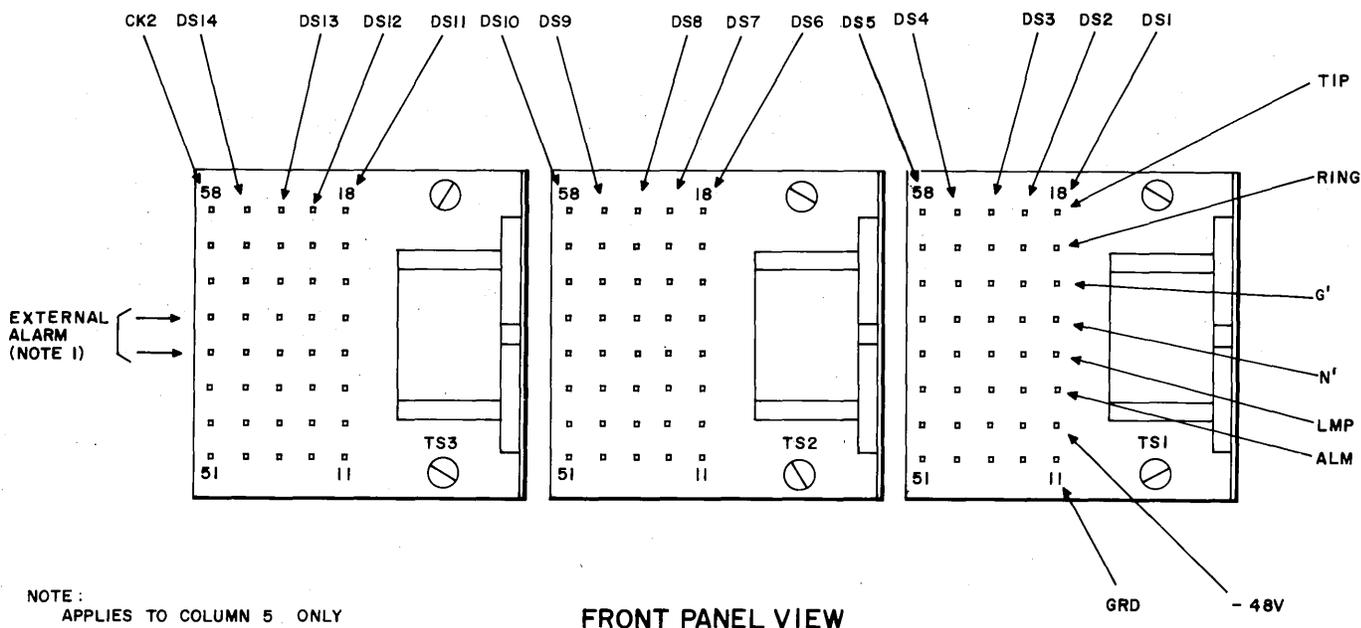


Fig. 2—43A1 Data Mounting—D5A Terminal Identification

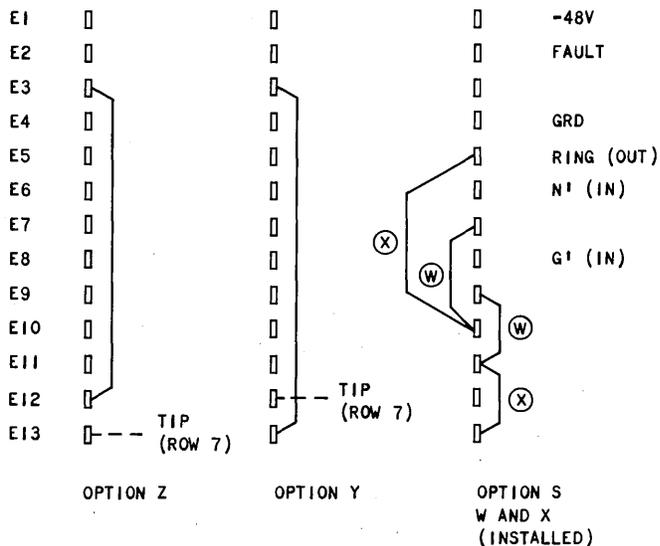


Fig. 3—Interface Driver—Terminal and Option Identification

(f) Connect interface driver terminals to terminal strips as given in Table A.

2.04 Prepare the 248A jack mounting for installation as follows.

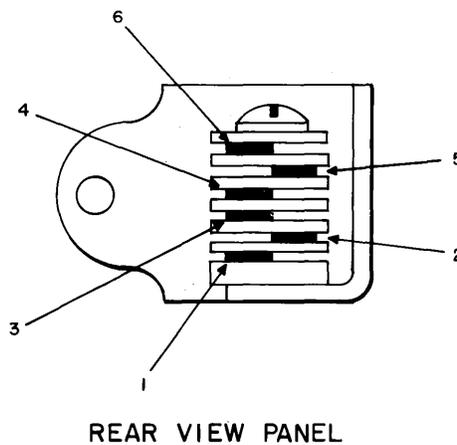


Fig. 4—547B Key Switch—Terminal Identification

*Note:* All connections in the following steps are to be wrapped and soldered.

(a) Install 47A lamp holders and 547B key switches on the key and lamp panel (Fig. 6) as required. It is recommended that the lamp and key switches associated with a data set 115A be located adjacent to each other with the lamp in the left-most position (when viewed from front panel).

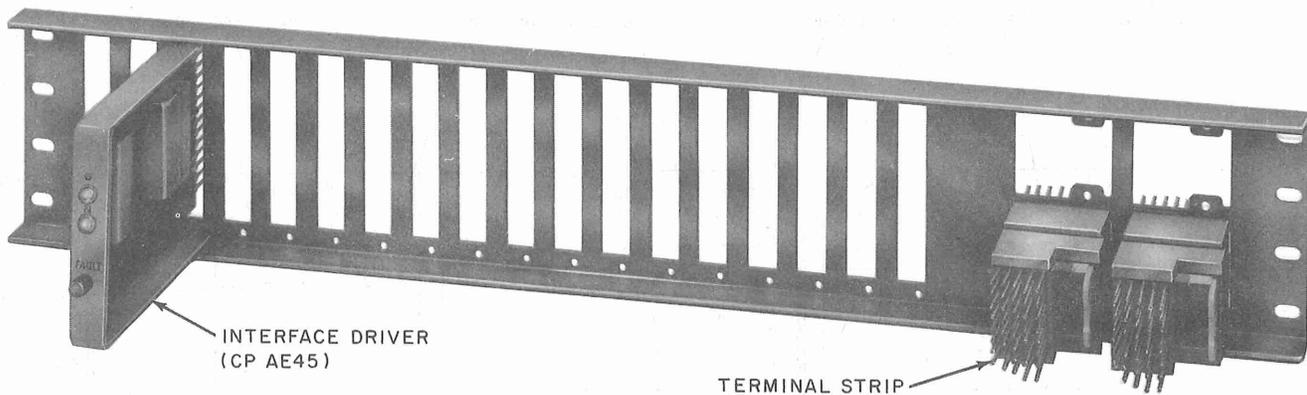


Fig. 5—233C Mounting Plate (Partially Equipped)

TABLE A  
233C MOUNTING PLATE  
CONNECTIONS

TERMINAL STRIP ROW (2.02)	INTERFACE DRIVER TERMINAL (Fig. 4)
1	E4
2	E1
3	NC
4	E2
5	E6
6	E8
7	E13 — Option Z E12 — Option Y
8	E5

(b) Connect together, in sequence, one contact of each lamp holder forming a common lamp buss. (The same contact of each lamp holder should be used.)

(c) Connect terminal 1 to terminal 5 on each key switch (Fig. 4).

(d) Within each group of key switches, that is, those associated with a single data set 115A, connect terminal 2 of the first key switch (left-most position viewed from front panel) to terminal 5 of the adjacent key switch. Continue, in sequence, making similar connections for each key switch in the group.

(e) Install 2Y lamps and 2AY lamp caps. Install 39B apparatus blanks in unused holes in the 248A jack mounting.

#### INSTALLATION

**2.05** To install the 43A1 data mounting, first remove the two nuts (Fig. 7) which secure the mounting plate to the shipping bars and the apparatus mounting assembly. Insert the 43A1 data mounting into the frame at a slight angle, rotate into place, and secure to frame.

**2.06** When installing the key and lamp panel, setting-out bracket P-185087 or equivalent may be used to bring the panel forward to a more convenient position for operation.

#### INTERCONNECTION

**2.07** Interconnect the 248A key and lamp panel and 43A1 data mounting as follows.

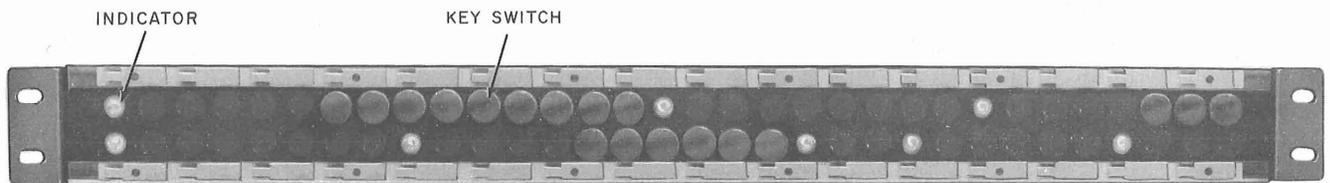


Fig. 6—Key and Lamp Panel

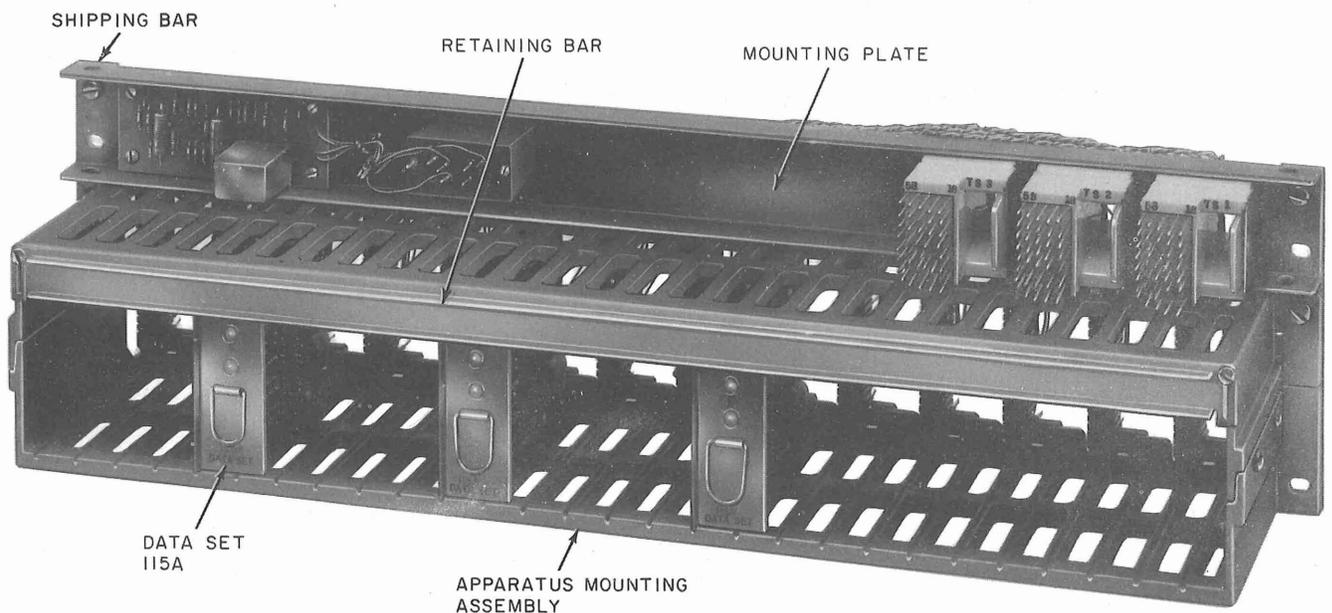


Fig. 7—43A1 Data Mounting (Partially Equipped)

- Note:** In the following steps, all connections to the key and lamp panel are to be wrapped and soldered. All connections to the data mounting are to be wire wrapped.
- (a) Connect terminal 5 (Fig. 4) of the left-most (viewed from front panel) key switch of each group to the terminal in row 7 (Fig. 2) corresponding to the associated data set 115A.
  - (b) Connect terminal 2 of the right-most key switch of each group to the terminal in row 8 corresponding to the associated data set 115A.
  - (c) Connect lamp holders to the terminal in row 4 corresponding to the associated data set 115A.
  - (d) Connect the common lamp buss to the  $-48$  volt central office battery.
  - (e) Install lamps and covers in lamp holders.
- 2.08** Interconnect 43A1 data mounting with 233C mounting plate or equipment for interoffice links as given in local instructions. Terminals in rows 5 and 6 (except for column 5 of TS3) of the 43A1 data mounting terminal strips are connected to terminals in rows 5 and 6, respectively, of the 233C mounting plate terminal strips. Interoffice links must use separate data sets for the N' and G' signals. A M25G cord may be used for interconnections with a 405A data set.
- 2.09** Install Option Z, if required, in 43A1 data mounting by strapping terminal 22 to terminal

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23 of nest connector. Option Z is applied only to data set position actually in service, since if no data set is installed in a position with Option Z applied, a central office major alarm results.

**2.10** Install data sets 115A in 43A1 data mounting as follows.

- (a) Loosen machine screws at each end of retaining bar (Fig. 6).
- (b) Lift retaining bar and insert data sets in nest.
- (c) Lower retaining bar and secure machine screws at each end of bar.

**2.11** Connect power to the 43A1 data mounting and 233C mounting plate as follows.

- (a) Connect (wire wrap) terminal 11 of TS1 to central office ground.
- (b) Connect (wire wrap) terminal 12 of TS1 to -48 volt central office battery distribution.

### PRELIMINARY INSTALLATION TESTS

**2.12** Perform preliminary tests of the low speed signaling system as given below.

**Caution:** *The following test procedures are used only when no connections have been made to the alarm loop or alarm company office.*

- (a) Energize the equipment by installing 1-1/3 A fuse.
- (b) Verify that all  $\bar{N}$  indicator light-emitting diodes (LEDs) on data set 115A, indicator lamps on key and lamp panel, and  $N'$  indicator LEDs on the interface driver are illuminated. The  $G'$  indicator LED may flash for one second and then extinguish.
- (c) Simultaneously depress and hold for at least one second all key switches associated with one data set and verify that the associated  $\bar{N}$  indicator LED, lamp on key and lamp panel, and  $N'$  and  $G'$  indicator LEDs on the interface driver are extinguished. Repeat this for each group of key switches.

- (d) Temporarily connect a ground to terminals in row 8 (except terminal 8 of TS3) of terminal strips TS1 through TS3 of the data mounting (Fig. 2).

- (e) Verify that all  $\bar{N}$  and  $G$  indicator LEDs on data set 115A, lamps on key and lamp panel, and  $N'$  and  $G'$  indicator LEDs on the interface driver are illuminated.

- (f) Remove temporary ground connections made in (d) above.

### FINAL CONNECTION AND TEST

**2.13** Notify the alarm company that the equipment is prepared for final connection. Request verification that the alarm loop is operating correctly. ***Make no change to existing connections until permission is granted by the alarm company.***

**2.14** Remove data sets 115A from 43A1 data mounting. If facilities are being added to an existing installation, remove only those data sets associated with the addition.

**2.15** When permission is given to proceed, disconnect the existing alarm loop circuits and connect (***wrap and solder***) the legs to terminals 3 (tip) and 4 (ring) of the key switches (Fig. 4) as given in local instructions.

**2.16** Measure alarm loop series resistance using KS-20538 volt-ohm-milliammeter or equivalent. On the 43A1 data mounting, measure resistance between the terminals in rows 7 and 8 of TS1 through TS3 associated with the legs being connected. Resistance must be equal to or less than 10K ohms.

**Note:** The above step may be omitted if 13 or less legs are connected to a single data set 115A and no interoffice cable is involved.

**2.17** Wire wrap tip and ring lines from the alarm company central station to terminals in rows 7 and 8, respectively, of the associated column on the terminal strip of the 233C mounting plate.

**2.18** After all connections are complete and the loop to the alarm company central station is energized (by the alarm company), verify that the  $\bar{N}$  and  $G$  indicator LEDs on data set 115A and

the N', G', and FAULT indicator LEDs on the interface driver are not constantly illuminated.

**Note:** If the FAULT indicator LED illuminates when the loop to the alarm company central station is energized, verify that the polarity of the loop agrees with the option installed in the interface driver: Option Y, tip positive with respect to ring; Option Z, tip negative with respect to ring. For other trouble indications, see Section 312-812-300.

**2.19** Notify alarm company that loop is ready.

#### ADDITION OF LEGS TO EXISTING LOOPS

**2.20** An additional leg is connected as follows.

**Note:** In the following steps, all connections will be wrapped and soldered.

- (a) Notify alarm company that connection of the leg is to be made. ***Make no connections until permission is granted by the alarm company.***
- (b) Install 547B key switch on key and lamp panel adjacent to the right-most (viewed from front panel) existing key switch, if possible.
- (c) Connect terminal 1 to terminal 5 of new key switch (Fig. 4).
- (d) Connect added leg to terminals 3 (tip) and 4 (ring) of new key switch.
- (e) Disconnect wire (tip lead) from 43A1 data mounting on terminal 2 of the last existing key switch (right-most position viewed from front panel).

(f) Connect terminal 2 of existing key switch to terminal 6 of the new key switch.

(g) Connect wire disconnected in (e) above to terminal 2 of new key switch.

**2.21** After connection of the additional leg is completed, perform, with permission of the alarm company, the following checks.

- (a) Verify that the  $\bar{N}$  and G indicators on data set 115A are not illuminated.
- (b) Slowly depress key switch and verify that the  $\bar{N}$  indicator on data set 115A illuminates then extinguishes.

**2.22** Notify alarm company that loop is ready.

#### DELETION OF LEGS FROM EXISTING LOOPS

**2.23** A leg is deleted from an existing loop as follows.

- (a) Notify alarm company that the leg is to be disconnected. ***Make no disconnections or connections until permission is granted by the alarm company.***
- (b) Connect a jumper between terminal 2 of key switch (Fig. 4) to left (viewed from front panel) of the switch associated with the leg being deleted to terminal 6 of key switch to right of the switch associated with the deleted leg.
- (c) Disconnect deleted leg from terminals 3 and 4 of key switch.
- (d) Remove key switch associated with the deleted leg and insert 39B apparatus blank in panel.