

## MATRIX BLOCK—1A1

### IDENTIFICATION, INSTALLATION, WIRING, AND MAINTENANCE

#### 1. GENERAL

**1.01** This section provides identification, installation, wiring, and maintenance information for the 1A1 Matrix Block when used in key telephone systems KTSs to provide for diode control of station audible signals (Fig. 1).

**1.02** This section is reissued to:

- Add information that the 446F diode is replaced by the 533F diode or equivalent
- Change Fig. 7 to show the 446F diode replaced by the 533F diode or equivalent.

#### 2. IDENTIFICATION

**2.01** The 1A1 Matrix Block consists of a molded plastic block equipped with horizontally and vertically aligned rows of terminal connectors (commonly referred to as clip terminals) arranged to receive pigtailed 533F or equivalent diodes.

**Note:** The diodes are not supplied with matrix block and must be ordered separately.

**2.02** Overall dimensions of the block are approximately 6-3/8 inches long, 2-13/16 inches wide, and 1-1/4 inches thick including the projection of the clip terminals.

**2.03** The various components used in the assembly of a complete 1A1 Matrix Block are shown in Fig. 2. It will be noted that the cross-grid or MATRIX array consists of five vertically positioned rows of a 8-clip terminal (8-terminal connector). The uppermost clip is for the termination of connecting circuit leads. The bottom (end) clip serves as a multiplying point for extending the capacity of the matrix unit. Six rows of a 7-clip terminal (7-terminal connector) are positioned at right angles to these. The left-hand clip on each serves to terminate external circuit leads. The

right side (clip) serves as a multiplying point for extending the horizontal capacity (Fig. 3, 4, and 5).

**2.04** Vertical rows of terminals are **numbered** 1 through 5 at the top of the block. Space is provided in the upper right-hand corner of each block for designating each of these five rows as desired. Horizontal rows of terminals are labeled **alphabetically** A through F with ample area available to the left of each row for circuit identification.

**2.05** Depending on the diode placement (polarity direction), one matrix block can be used to control six ringers **less capacitors** from five separate key system line circuit units or vice versa. This, then, can be called a "6 by 5" or "5 by 6" matrix unit, capacity-wise.



**For proper circuit operation, diode controlled ringers must be properly poled and connected without capacitors.**

#### 3. INSTALLATION

**3.01** The 1A1 Matrix Block should be mounted on a flat surface, using mounting holes provided. Where extended capacity beyond one block is necessary, modular arrays (Fig. 3, 4, and 5) may be employed. Respectively, these offer the following additional capacities:

FIGURE	CAPACITY
3	10 by 6 or 6 by 10
4	5 by 12 or 12 by 5
5	10 by 12 or 12 by 10

#### NOTICE

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Bell System except under written agreement

**3.02** Diodes are installed using the 714B tool.

For ease of installation, it is recommended the first pigtail termination be made in the *lettered* (horizontal) terminal clip, with the remaining pigtailed end seated and cut in the *numbered* (vertical) clip associated with the given matrix crosspoint (indicated by the diagonal marking on the face of the block). These two operations are shown in Fig. 6.



**When seating and cutting conductor, push the tool straight over the clip. Avoid bending or twisting the clip.**

**3.03** To allow for proper seating of the diodes onto the undercut face of the block, a 1/8-inch length of pigtail lead should exist between the body of the diode and the clip terminal.

#### 4. WIRING

**4.01** As previously noted, the 1A1 Matrix Block can be used to control station ringers, through the use of 533F or equivalent diodes, from 5 (or 6) key system line circuit units. Using the 1A2 Systems 400D key telephone unit (KTU) as an example, its *ringing control* (RC) lead would be terminated on one of the top clips on the matrix block (vertical row 1, 2, 3, 4, or 5). Station ringers to be activated, when the line circuit is rung, are then *cross-connected* via diodes on the face of the block (to stations A, B, C, D, E, and F, as required). A typical block schematic layout of this sort is illustrated in Fig. 7.



**The JKT, SK, and B service wires have steel cores which will damage the cutting edge of the 714B tool. It is necessary to cut these wires with diagonal pliers, leaving approximately 1/16 inch of wire protruding through clip, then terminate with seating end of 714B tool.**

**4.02** The arrangement of the wiring and positioning of the diodes on the block are further

amplified in Fig. 8. Installations can be of either polarity, but no block can have a mixture of both. For instance, Fig. 8A shows the ringing control (RC) leads from the line circuits connected at the top, with the common audible (CA) leads associated with the station ringers connected at the side. The diode should always be pointed (diode symbol apex) toward the station ringer—in this case, all diode arrows pointed downward.

**4.03** Proper audible signal control requires the use of a diode per line, per ringer. In cases where only one ringer is to be connected to one line, a bare wire strap can be substituted for a diode at the proper crosspoint on the matrix block. However, when additional ringers are to be associated with that line, or where other lines are to ring that common audible signal, the wire strap must be removed and 533F or equivalent diodes placed at the proper coordinate points. To illustrate using Fig. 8B as a given matrix block installation:

LINE CIRCUIT (RC LEAD)	OPERATES STATION RINGER
A	2 and 3
B	1
C	2 and 4
D	2
E	5 (note strap)
F	1, 3, and 4

#### 5. MAINTENANCE

**5.01** Maintenance procedures for the 1A1 Matrix Block are the same as for the 66-type connecting blocks. For terminal alignment and adjustment see Section 461-604-100.

**5.02** Field replacement of connectors in these blocks is not recommended. Replace matrix blocks having terminal damage which cannot be corrected.

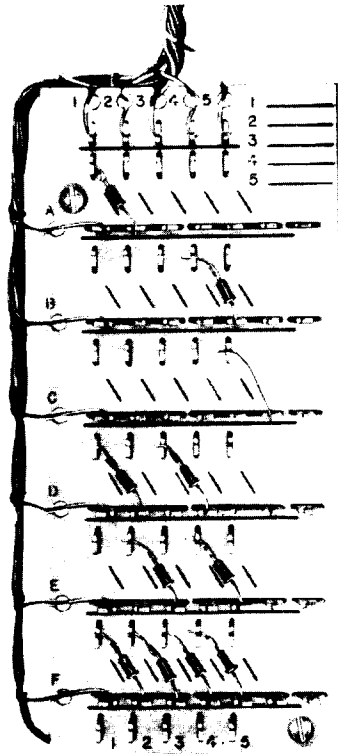


Fig. 1—1A1 Matrix Block—Typical Diode Installation

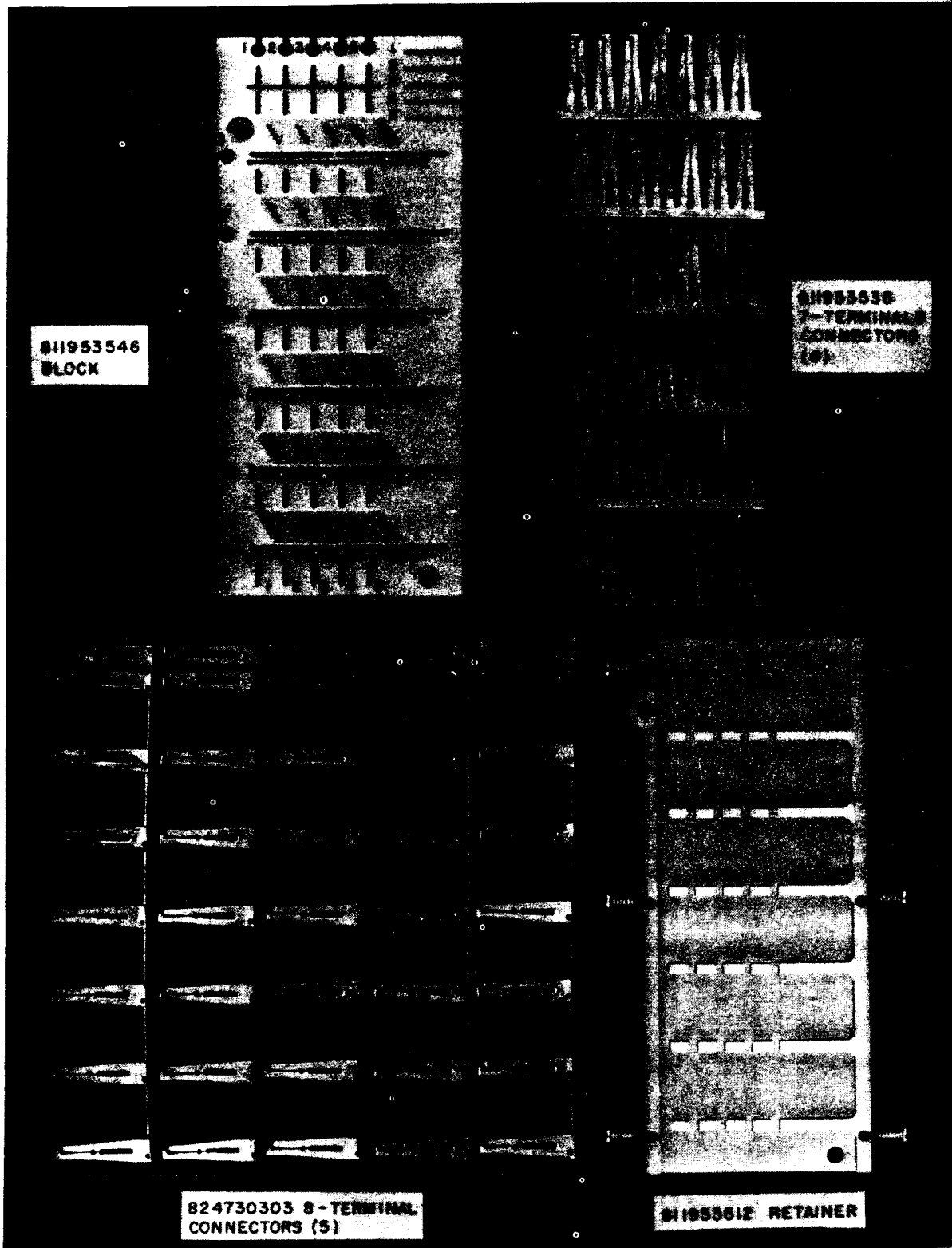


Fig. 2—1A1 Matrix Block—Components

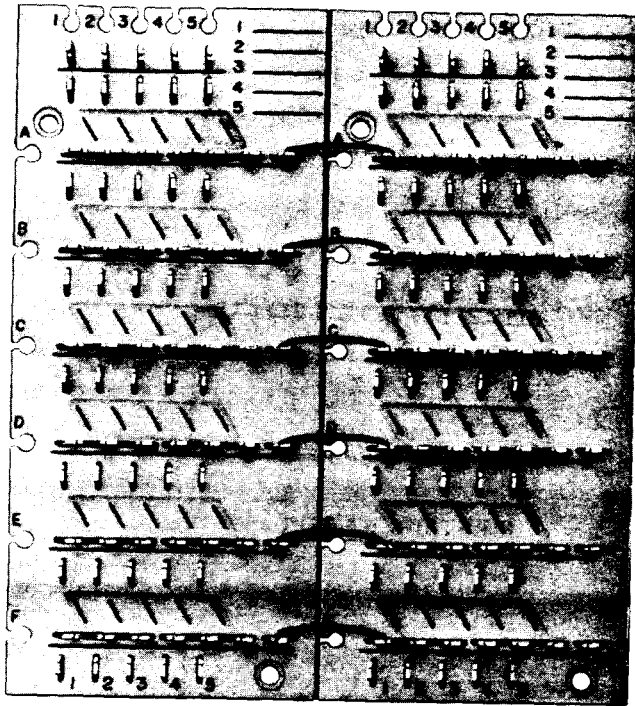


Fig. 3—Modular Array (Multiplied Horizontally)

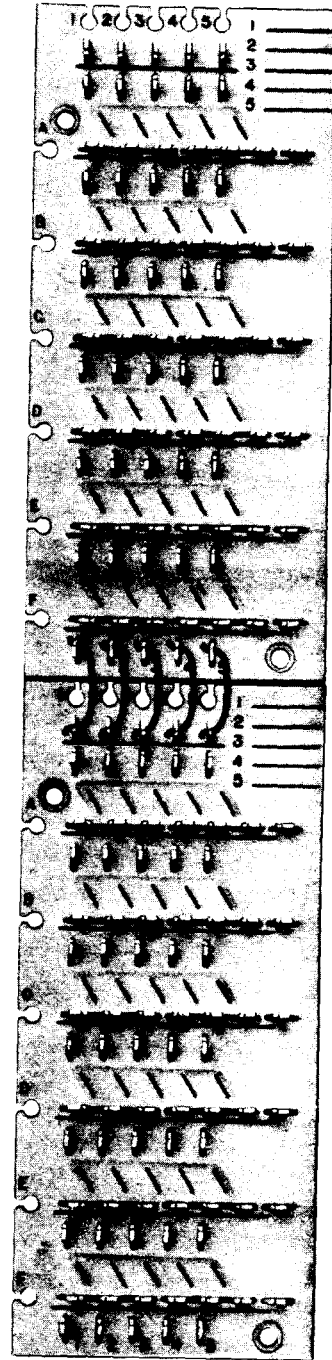


Fig. 4—Modular Array (Multiplied Vertically)

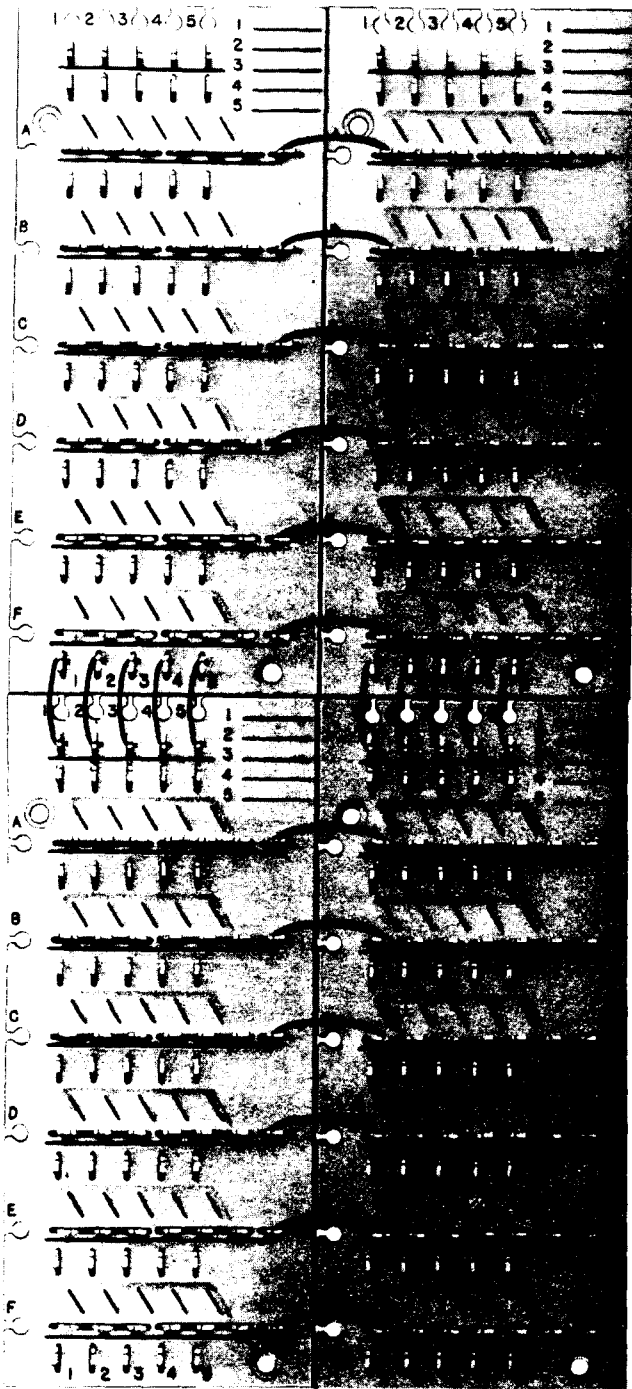
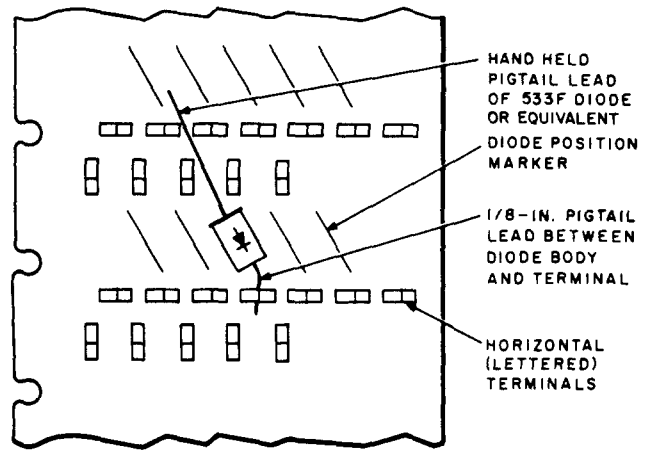
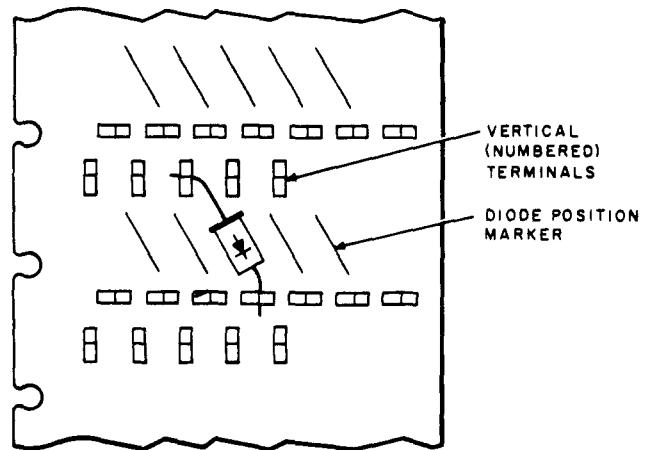


Fig. 5—Modular Array (Multiplied Horizontally and Vertically)

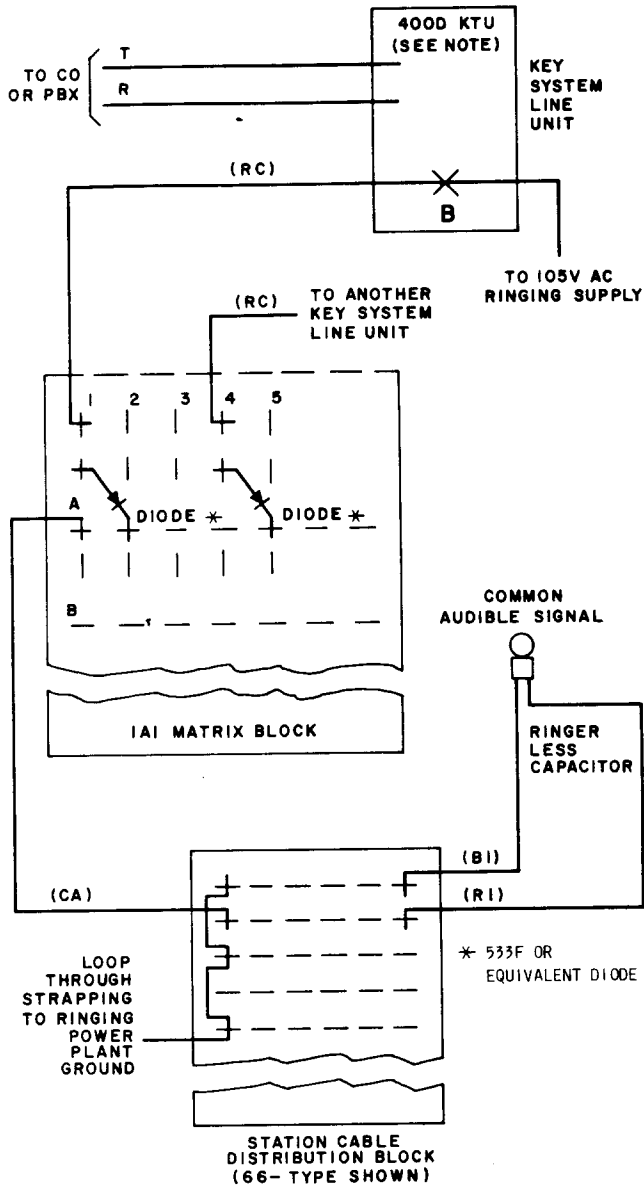


FIRST OPERATION



SECOND OPERATION

Fig. 6—Diode Installation



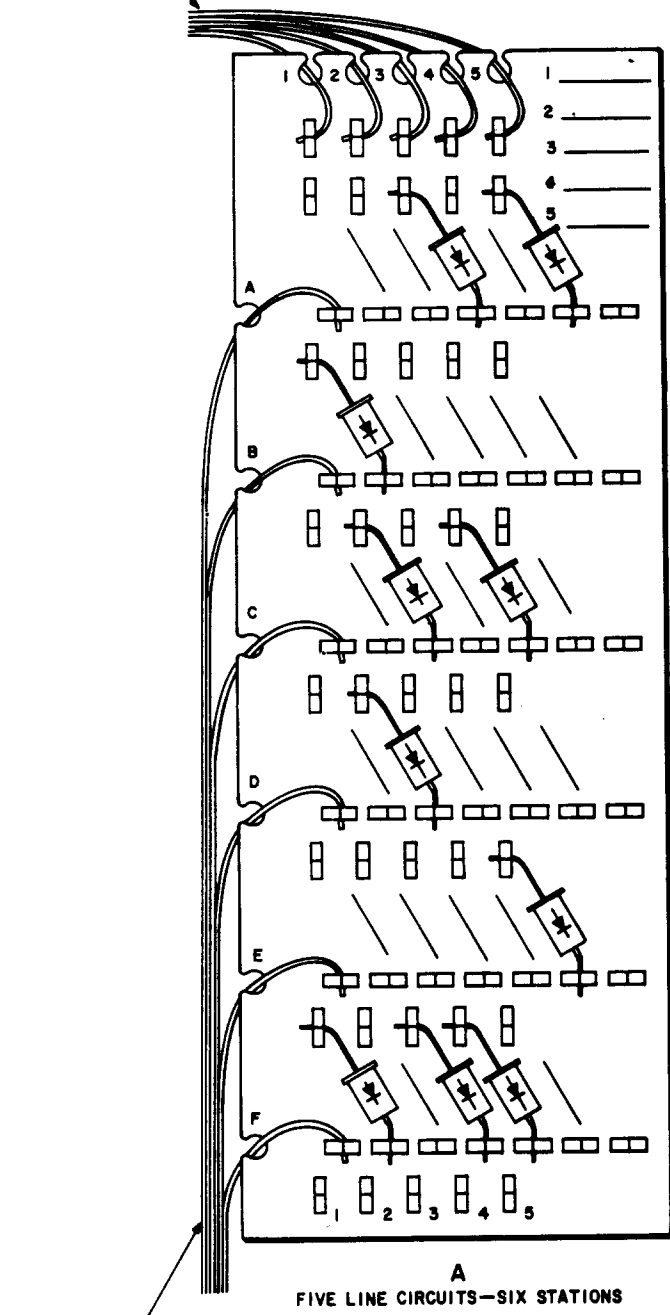
RC = RINGING CONTROL LEAD  
 CA = COMMON AUDIBLE CONTROL LEAD  
 B1 = GROUNDED SIDE, STATION RINGER  
 R1 = RINGER OPERATING POTENTIAL

NOTE:  
 FOR 1A1 KTS: B RELAY SYMBOL  
 BECOMES (R); RC BECOMES (R1).  
 COMPARABLE DESIGNATIONS  
 APPLY WHEN ASSOCIATED WITH  
 OTHER SIMILAR CIRCUITS.

Fig. 7—Block Diagram Layout

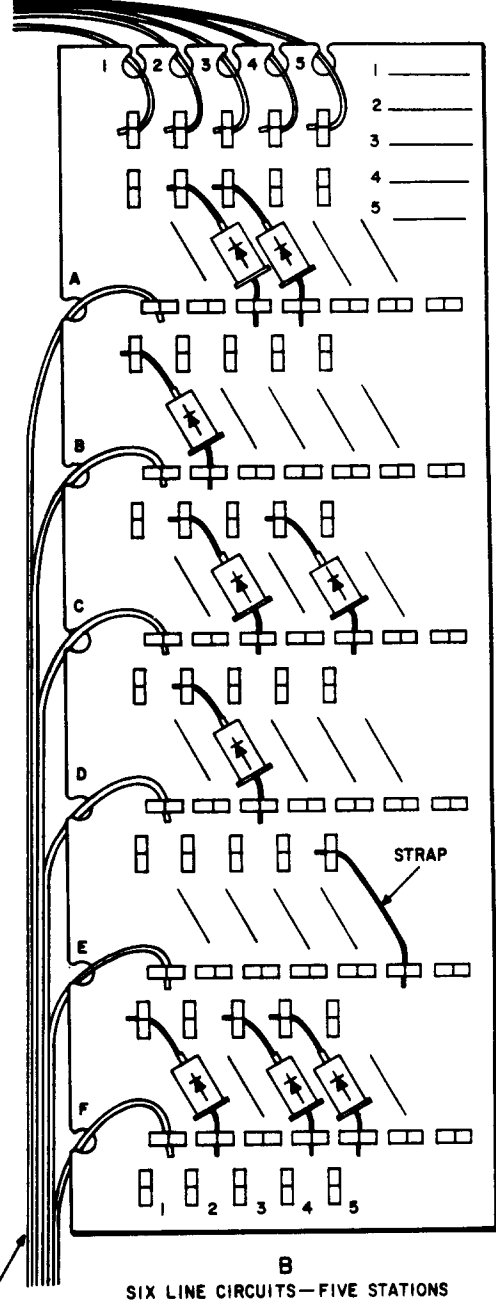
RINGING CONTROL LEADS (5)

COMMON AUDIBLE LEADS (5)  
(TO STATIONS)



A  
FIVE LINE CIRCUITS—SIX STATIONS

COMMON AUDIBLE LEADS (6)  
(TO STATIONS)



B  
SIX LINE CIRCUITS—FIVE STATIONS

RINGING CONTROL LEADS (6)

Fig. 8—Wiring Arrangement and Diode Orientation