WINDING AND SPRING DESIGNATIONS

APPARATUS CONNECTING POINTS REFERRED TO IN CIRCUIT REQUIREMENT TABLES

STANDARD PRIOR TO 1931

1. GENERAL

1.01 This section describes the method used prior to 1931 of designating the winding and spring terminals of relays and other apparatus specified as connecting points in circuit requirement tables. It also describes the conventions employed to represent the apparatus on circuit drawings.

1.02 This section is reissued to include changes resulting from the separation of material of this nature into individual sections. Since this reissue covers a general revision, the arrows ordinarily used to indicate changes have been omitted.

1.03 The winding and contact spring designations described in this section are used on circuit drawings and in the test clip data columns of the circuit requirement tables to show the points to which connections are to be made for making tests.

1.04 The figures show the winding and spring designations on the conventions employed to represent the apparatus on circuit drawings. The conventions may be shown on the circuit drawings either vertically or horizontally. When relays having two spring combinations are shown vertically, the top combination is shown at the top and the bottom combination is shown at the bottom. Where such relays are shown horizontally, and in some cases where they are shown vertically, the top combination is marked T and the bottom combination B. In some cases the contact springs are not numbered on the circuit drawing.

1.05 Except as covered in part 2, contact springs on relays and other apparatus are numbered from left to right as viewed from the front and also left to right as viewed from the rear. This means that the contact springs (viewed from the front) have a different number from the terminals (viewed from the rear). On many types of relays connections can be made to the front portion of the contact springs. When a connection is to be made from the front, the TEST CLIP DATA columns of the circuit requirement table gives a spring number followed by T or B. When a connection is to be made from the rear, the circuit requirement table shows TER followed by the terminal number and T or B, except as otherwise indicated in part 2. See appropriate section for information or methods of making test connections to apparatus.

1.06 In the circuit requirement tables the contact springs are designated with a terminal number followed by the letter T (top) or B (bottom) to indicate that the terminal is located in the top or bottom row.

1.07 Winding terminals are also designated differently depending upon whether they are viewed from the front or the rear. Winding terminals in the top and bottom rows are designated U (upper) and L (lower) respectively. Where there are three rows of terminals those in the middle row are designated M. When connection is to be made from the rear the circuit requirement table shows TER followed by the terminal number T or B, except as otherwise indicated in part 2.

1.08 On most types of relays and other apparatus connections can be made to the winding terminals from the front. The winding terminal designations shown in the TEST CLIP DATA columns of the circuit requirement tables indicate whether the connections should be made from the front or rear. When connections are to be made from the front, the designations of the winding terminals as viewed from the front are used. Similarly, when rear connections are required, the designations of the terminals as viewed from the rear are used. See appropriate section for information on methods of making test connections to apparatus.

1.09 The inner ends of windings are shown in connection with the terminal arrangements in part 2 by IN. On the circuit conventions, the inner ends of windings are not indicated.

1.10 Armature terminals which are not in alignment with other terminals are designated A.

2. RELAYS

A, E, F, H, R and T Type Relays

2.01 Contact Springs Front View: The contact springs are numbered consecutively from left to right with the affix T(top) or B(bottom) depending on whether the spring is in the top or bottom spring assembly.

Example: 2T indicates the second spring from the left in the top spring assembly on the relay and 4B indicates the fourth spring from the left in the bottom spring assembly on the relay.

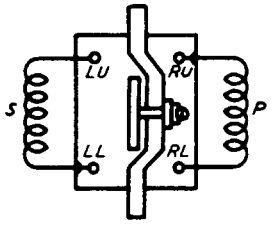


FIG. 1 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE FRONT (CONTACT SIDE) - A, E, F, H, R AND T TYPE RELAYS

2.02 Winding Terminals Front View: The winding terminals are designated LU, RU, LL and RL. The relative locations of these terminals as viewed from the front are illustrated in Fig. 1.

2.03 All Terminals (Rear View): Where it is necessary to connect to the winding terminals of relays whose terminals are inaccessible from the front, the terminals are designated TER followed by the terminal number. The terminals are numbered from left to right as shown in Fig. 2. This numbering is specified in the circuit requirement table where winding terminals are inaccessible from the front.

Example: TER 1T indicates the No. 1 terminal in the top row of the relay as viewed from the rear.

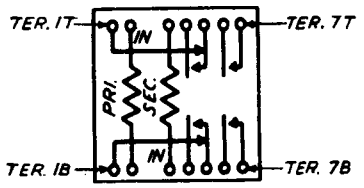


FIG. 2 - WINDING AND SPRING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - A, E, F, H, R AND T TYPE RELAYS

B, G and J Type Relays

2.04 As viewed from the front of the relay, contact springs are numbered from left to right. Armatures are not designated from the front. The winding terminals are located in the middle row of terminals facing the rear and are numbered from left to right as shown in Fig. 3. Where it is required to make contact with the winding terminals the designation WDG is specified after the terminal number.

Example: 2 WDG indicates the second winding terminal from the left on the relay as viewed from the rear.

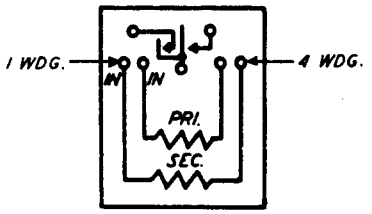


FIG. 3 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - B, G AND J TYPE RELAYS

C Type Relays

2.05 The contacts as viewed from the front of the relay are numbered as covered in 2.04. The winding terminal designations are as shown in Fig. 4.

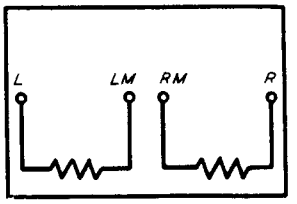


FIG. 4 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) C TYPE RELAY

L, N and S Type Relays

2.06 As viewed from the front of the relay the contact springs are numbered from left to right. The left-hand contact is numbered 1, the armature 2 and the right-hand contact 3 except for relays having a back contact only, in which case the armature is indicated by 1 and the back contact by 2. Where it is required to make contact with the winding or contact terminals from the rear, the designation TER followed by the terminal number is specified. Facing the rear or terminal

side of the relay the terminals are numbered consecutively from left to right as shown in Fig. 5 and the terminal number is affixed by the letter T (top) or B (bottom) to indicate whether the terminal is in the top or bottom row of terminals respectively.

Example: TER 2T indicates a connection to the second terminal from the left in the top row of the relay as viewed from the rear or terminal side.

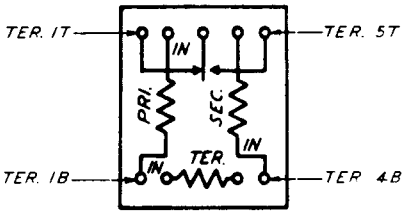


FIG. 5 - WINDING AND SPRING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - L, N AND S TYPE RELAYS

21 Type Telegraph Relays

2.07 As viewed from the front of the relay, the terminals are numbered as shown in Fig. 6.

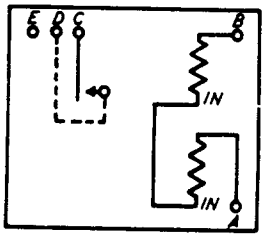


FIG. 6 - WINDING AND SPRING TERMINAL ARRANGEMENT AS VIEWED FROM THE FRONT (CONTACT SIDE) - 21 TYPE TELEGRAPH RELAY

44 Type Relays

2.08 As viewed from the front, the armature (frame terminal) is indicated by 1 and the make contact screw by 2. As viewed from the rear of the relay, the winding terminals are designated as shown in Fig. 7.

85 Type Relays

2.09 As viewed from the front of the relay, the front contact spring (frame terminal) is indicated by 1 and the armature by 2. On those relays having two contact springs, the front contact spring is indicated by 1 and the spring that rests on the armature stud by 2. Fig. 8 shows the winding terminal numbering as viewed from the front of the relay.

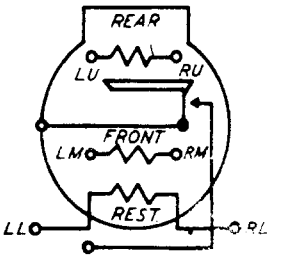


FIG. 7 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 44 TYPE RELAY

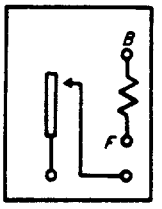


FIG. 8 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE FRONT (CONTACT SIDE) - 85 TYPE RELAY

87 Type Relays

2.10 On those relays having only a front contact, the front contact is indicated by 1 and the armature by 2 as viewed from the front of the relay. On those relays having a front and back contact the top spring is indicated by 1, the spring that is picked up by the armature stud by 2, the armature by 3 and the back contact by 4. The relative positions and designations of the winding terminals as viewed from the rear of the relay are shown in Fig. 9.

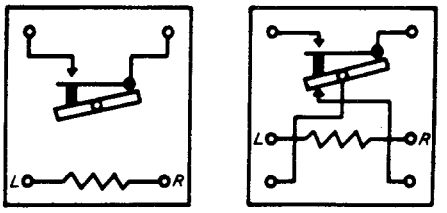


FIG. 9 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 87 TYPE RELAY

89, 101, 105, 108, 118, 172, 189, 190, 196, 208 and 214 Type Relays

2.11 As viewed from the front of the relay, the front contact is indicated by 1, the armature by 2 and the back contact by 3 except on relays having only a back contact in which case the armature is indicated by 1 and the back contact by 2. The winding terminals for these relays are designated as shown in Figs. 10, 11, 12 and 13, as viewed from the rear of the relay. Connection can be made to the winding terminals of the 89, 105, 108, 172 and 196 type relays from the front of the relay.

Note: The terminal designated LM in Fig. 10 was formerly designated L.

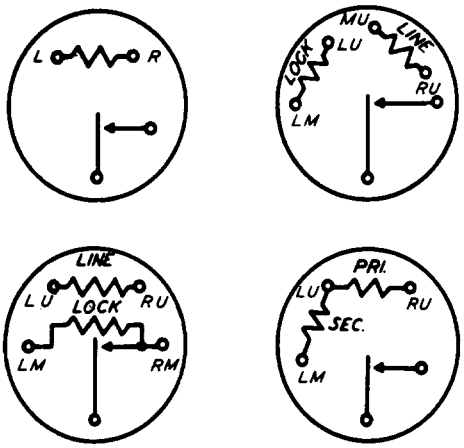


FIG. 10 -WINDING TERMINAL ARRANGEMENT AS VIEWED FROM FROM THE REAR (TERMINAL SIDE) - 89, 101, 105, 108, 118 AND 172 TYPE RELAYS

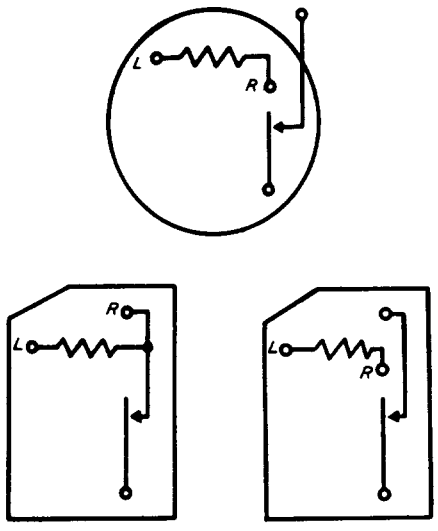


FIG. 11 -WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) -189 TYPE RELAYS

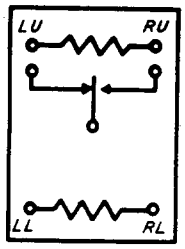


FIG. 12 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 190 AND 196 TYPE RELAYS

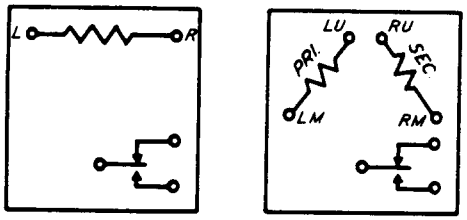


FIG. 13 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 208 AND 214 TYPE RELAYS

114, 124, 126, 174 and 198 Type Relays

2.12 As viewed from the front of the relay, the contacts are numbered from left to right, that is, the front contact is indicated by 1, the armature by 2 and the back contact by 3, except on relays having only a back contact, in which case the armature is indicated by 1 and the back contact by 2. Fig. 14 shows the

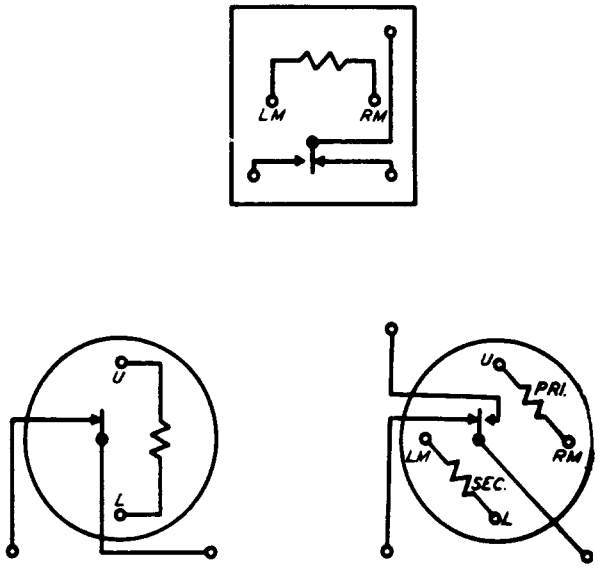


FIG. 14-WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 114, 124, 126, 174 AND 198 TYPE RELAYS

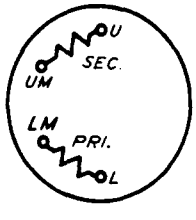
relative location and typical designations of the winding terminals as viewed from the rear or terminal side of the relay. This figure shows the relay mounted with the retractile spring at the left. The test clip data specified on the circuit requirement table is based on this position of mounting. If the relay is mounted with the retractile spring at the top or right, the test clip data should be translated to care for this position of mounting.

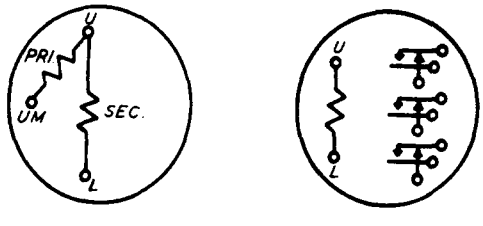
121, 122, 125, 149, 162, 178 and 179 Type Relays

2.13 As viewed from the front of the relay, the contact terminals are numbered from left to right with the affix T, M or B depending on whether the spring is in the T (top), M (middle) or B (bottom) spring assembly.

Example: 2T indicates the second spring from the left in the top spring assembly on the relay; 3M indicates the third spring from the left in the middle spring assembly of the relay and 4B indicates the fourth spring from the left in the bottom spring assembly of the relay. On relays having only one spring assembly the letters T, M and B are not shown; for example, 3 indicates the third spring from the left on the relay. The winding terminals as viewed from the rear of the relay are lettered as shown in Fig. 15. Connection can be made to the winding terminals of these relays from the front of the relay.

Note: The terminal marked UM in Fig. 15 was formerly marked M.





15 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 121, 122, 125, 149, 162, 178 AND 179 TYPE RELAYS

150 Type Relays

2.14 As viewed from the front of the relay the contact spring is indicated by 1 and the armature by 2. The winding terminal designations as viewed from the front of the relay are shown in Fig. 16.

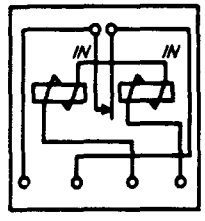


FIG 16 - WINDING AND SPRING TERMINAL ARRANGEMENT AS VIEWED FROM THE FRONT (CONTACT SIDE)-150 TYPE RELAY

177 and 203 Type Relays

2.15 As viewed from the front of the relay the front contacts are indicated by 1 and 4, the travel springs (the springs picked up by the hard rubber bridge) by 2 and 5 and the back contacts by 3 and 6. The winding terminal designations as viewed from the rear of the relay are shown on Fig. 17. The designations + and - illustrated in Fig. 17 indicate which polarity of the battery should be connected to this point.

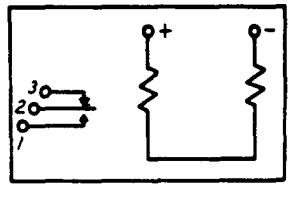


FIG 17-WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE)-177 AND 203 TYPE RELAYS

186 Type Relay

2.16 As viewed from the front of the relay the top contact spring is indicated by 1 and the spring that is picked up by the armature stud by 2. The relative location of the winding terminals as viewed from the rear of the relay are shown on Fig. 18.

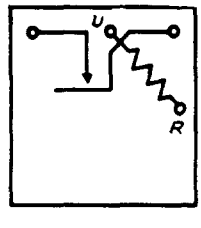


FIG 18 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 186 TYPE RELAY

206, 227 and 231 Type Relays

2.17 As viewed from the front of the relay the contacts are numbered from left to right. The left-hand contact is numbered 1, the armature 2 and the right-hand contact 3 except on relays having a back contact only, in which case the armature is indicated by 1 and the back contact by 2. Where it is required to make contact with the contact or winding terminals from the rear or terminal side, the designation TER followed by the terminal number is specified. Facing the rear of the relay, the terminals are numbered consecutively from left to right as shown in Fig. 19.

Example: TER 2 indicates a connection to the second terminal from the left of the relay as viewed from the terminal side.

Note: The abbreviation WDG was formerly used in place of TER.

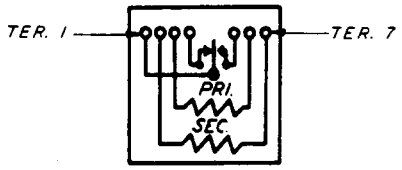


FIG. 19 - WINDING AND SPRING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 206,227 AND 231 TYPE RELAYS

207 and 213 Type Relays

2.18 As viewed from the front, the front contact is indicated by 1 and the armature by 2. The relative location of the winding terminals and typical designations are shown in Fig. 20.

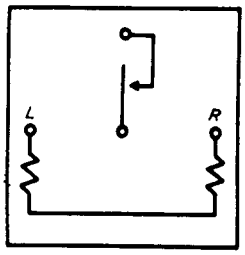


FIG. 20 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 207 AND 213 TYPE RELAYS

209, 215, 218 and 228 Type Relays

2.19 Facing the rear of the relay, the contact and winding terminals are numbered as shown in Figs. 21, 22, 23 and 24. On the 209 type relay, numbers 1, 6 and 11, shown on Fig. 21 are cut in the terminal block. The other terminals are numbered consecutively from top to bottom in each row. Terminal numbers of the 215, 218 and 228 type relays are similarly cut in the terminal block.

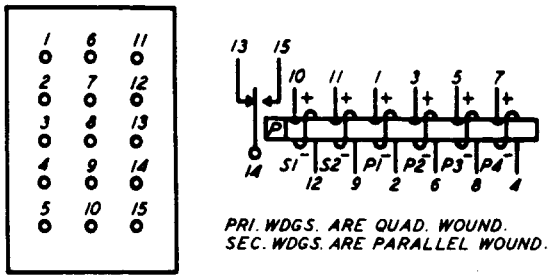


FIG. 21 - WINDING AND SPRING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 209 TYPE RELAYS

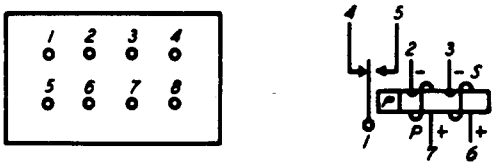


FIG. 22 - WINDING AND SPRING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 215 TYPE RELAYS

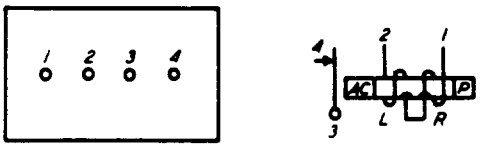


FIG. 23-WINDING AND SPRING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 218 TYPE RELAYS

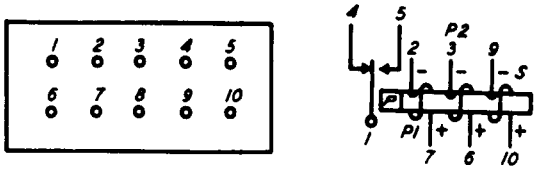


FIG. 24 - WINDING AND SPRING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 228 TYPE RELAYS

221, 222, 223 and 224 Type Relays and Similar A.E.Co. Type Relays

2.20 The spring numbering for these relays is the same as that covered in Section 005-120-103. The winding terminal numbering used prior to 1931 is as illustrated in Fig. 25. The abbreviation WDG

is placed just after the winding terminal designation in designating relay winding terminals.

Example: RM WDG (A) means the right middle winding terminal of the (A) relay. Upper and lower winding terminals are designated U and L respectively.

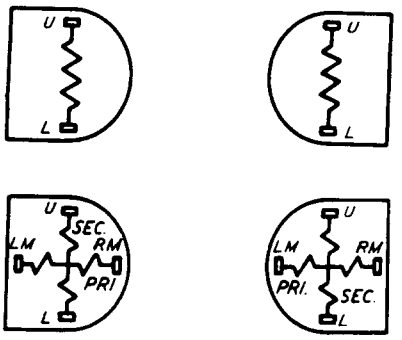


FIG. 25 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 221, 222, 223 AND 224 TYPE AND SIMILAR A. E. CO. RELAYS

225 Type and A.E.Co. Pivot Type Relays

2.21 The winding terminals are indicated by U (upper) and L (lower) facing the rear of the relay with the spring combination uppermost as shown in Fig. 26.

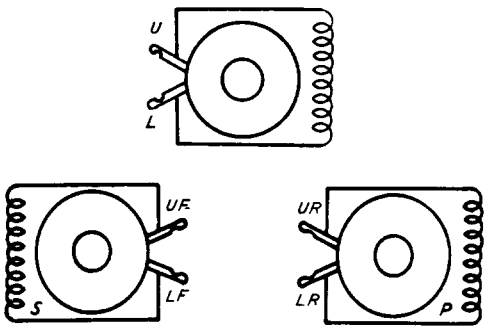


FIG. 26 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR - 225 TYPE AND A.E. CO. PIVOT TYPE RELAYS

On relays with more than two winding terminals, the letters F (front) and R (rear) are suffixed to the letters U and L, the armature end of the relay being considered the front and the mounting end the rear.

229 and 230 Type Relays

2.22 As viewed from the front of the relay the contacts in each assembly (top and bottom) are numbered consecutively from left to right. The springs in the top and bottom spring assemblies are indicated on the schematic by the upper and lower rows of springs respectively. In the case of the 230 type relay, which has two individual magnets and spring assemblies, the contacts are numbered consecutively from the left-hand magnet to the right-hand magnet. The relative location of the winding terminals and typical designations are shown on Figs. 27 and 28.

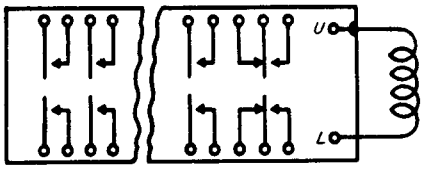


FIG. 27 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 229 TYPE RELAY

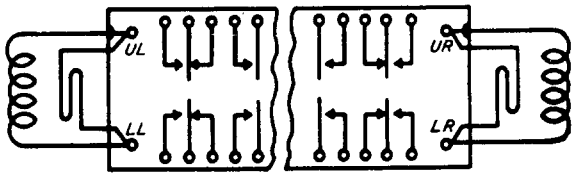


FIG. 28 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 230 TYPE RELAY

3. SWITCHES

3.01 The contact spring and winding terminal numbering for switches is the same as described in Section 005-120-103 (See Index 005-120-102).

4. OTHER APPARATUS

4.01 Except as described in the following paragraphs, the contact spring and winding terminal numbering for apparatus other than relays is the same as that described in Section 005-120-103 (See Index 005-120-102).

Drops

4.02 The winding terminal designations of drops as viewed from the rear (terminal side) are shown on Figs. 29, 30 and 31.

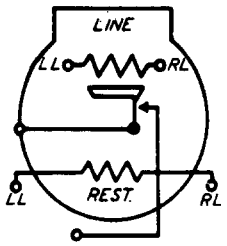


FIG. 29 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 22 TYPE DROP

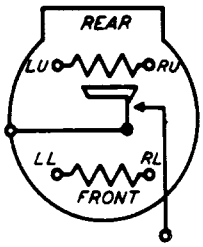


FIG. 30 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 35 TYPE DROP

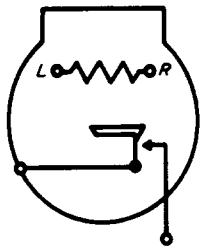


FIG. 31 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 56 TYPE DROP

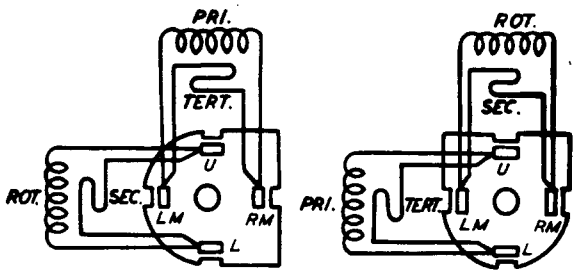
5 Type Message Registers

4.03 Fig. 32 shows the winding terminal designations for this register as viewed from the rear of the register. Connections to the frame of this register are indicated by FR.

FIG. 32 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 5 TYPE MESSAGE REGISTERS

Previous Standard Information

4.04 Connections to 204 Type Selectors: Facing the front or adjusting end of the selectors the springs are numbered consecutively from 1 up from front to rear. The winding terminals are designated as shown in Fig. 33 viewing the selector from the rear.



SWITCH MOUNTED HORIZONTALLY

SWITCH MOUNTED VERTICALLY BANK DOWN

FIG. 33 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 204 TYPE SELECTORS

Signals

4.05 The winding terminal designations o signals as viewed from the rear are shown in Figs. 34, 35 and 36.

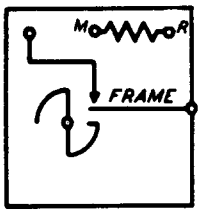


FIG. 34 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 34 TYPE SIGNAL

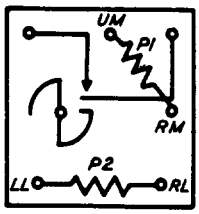


FIG. 35 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 41 TYPE SIGNAL

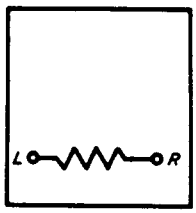


FIG. 36 - WINDING TERMINAL ARRANGEMENT AS VIEWED FROM THE REAR (TERMINAL SIDE) - 42 TYPE SIGNAL