

PIECE-PART DATA AND REPLACEMENT PROCEDURES

TEST SETS NOS. 35C, 35D, AND 35F

1. GENERAL

1.01 This section covers the information necessary for ordering parts to be used in the maintenance of Nos. 35C, 35D, and 35F test sets. It also covers approved procedures for replacing these parts.

1.02 This section is reissued to cover the No. 35F test set. Detailed reasons for reissue will be found at the end of the section. Since this reissue covers a general revision, the arrows ordinarily used to indicate changes have been omitted.

1.03 Part 2 of this section covers the piece-part numbers and the corresponding names of the parts which it is practicable to replace in the field in the maintenance of these test sets. No attempt should be made to replace parts not designated. Part 2 also contains explanatory figures showing the different parts. This information is called Piece-part Data.

1.04 Part 3 of this section covers the approved procedures for the replacement of the parts covered in Part 2. This information is called Replacement Procedures.

2. PIECE-PART DATA

2.01 The figures included in this part show the various parts of the test sets and their piece-part numbers together with the names as listed by the Western Electric Company Merchandise Department. When these names differ from those in general use in the field, the latter names, in some cases, are shown in parentheses.

2.02 When ordering parts for replacement purposes, give both the piece-part number or the ES and associated detail numbers as well as the name of the part; for example, P-213379 Lamp Socket or ES-256450, Assembly Detail 28, Variable Resistor Unit. Coded items should be ordered by the code number, for example, No. 246A Jack. If the part has no number, give the name of the part and the manufacturer and state that the part is for the No. 35C, 35D, or 35F test set; for example, 1/4-inch Phosphor-Bronze Ball, Atlas Ball Co., for the No. 35F Test Set. Order individual parts for the B1DY, B1LP, B1LR, or B14A keys by referring to Section A506.011. Do not refer to the BSP number or any information shown in parentheses following the piece-part number or the ES and associated detail numbers.

SECTION A509.901

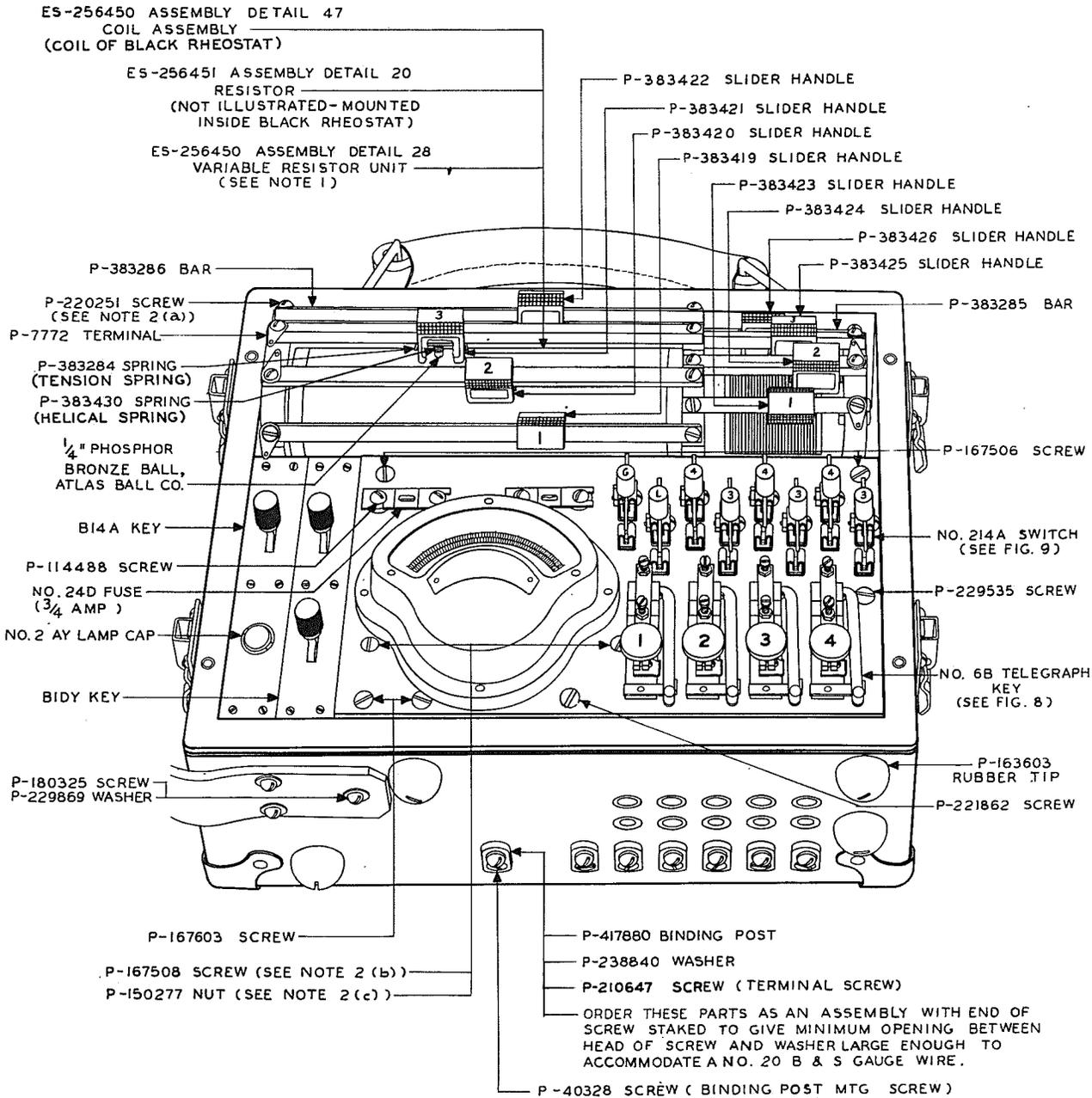


Fig. 1 - No. 35C Test Set - Front View

Notes

1. The variable resistor unit includes the slider handles, bars, high and low resistor units, fixed resistors inside black rheostat, and associated mounting screws.
2. On earlier sets 0.138-40 screws and nuts were supplied where 0.138-32 parts are specified on this figure. Parts having 0.138-40 threads are as follows:
  - (a) P-218265 Screw
  - (b) P-167517 Screw
  - (c) P-156049 Nut

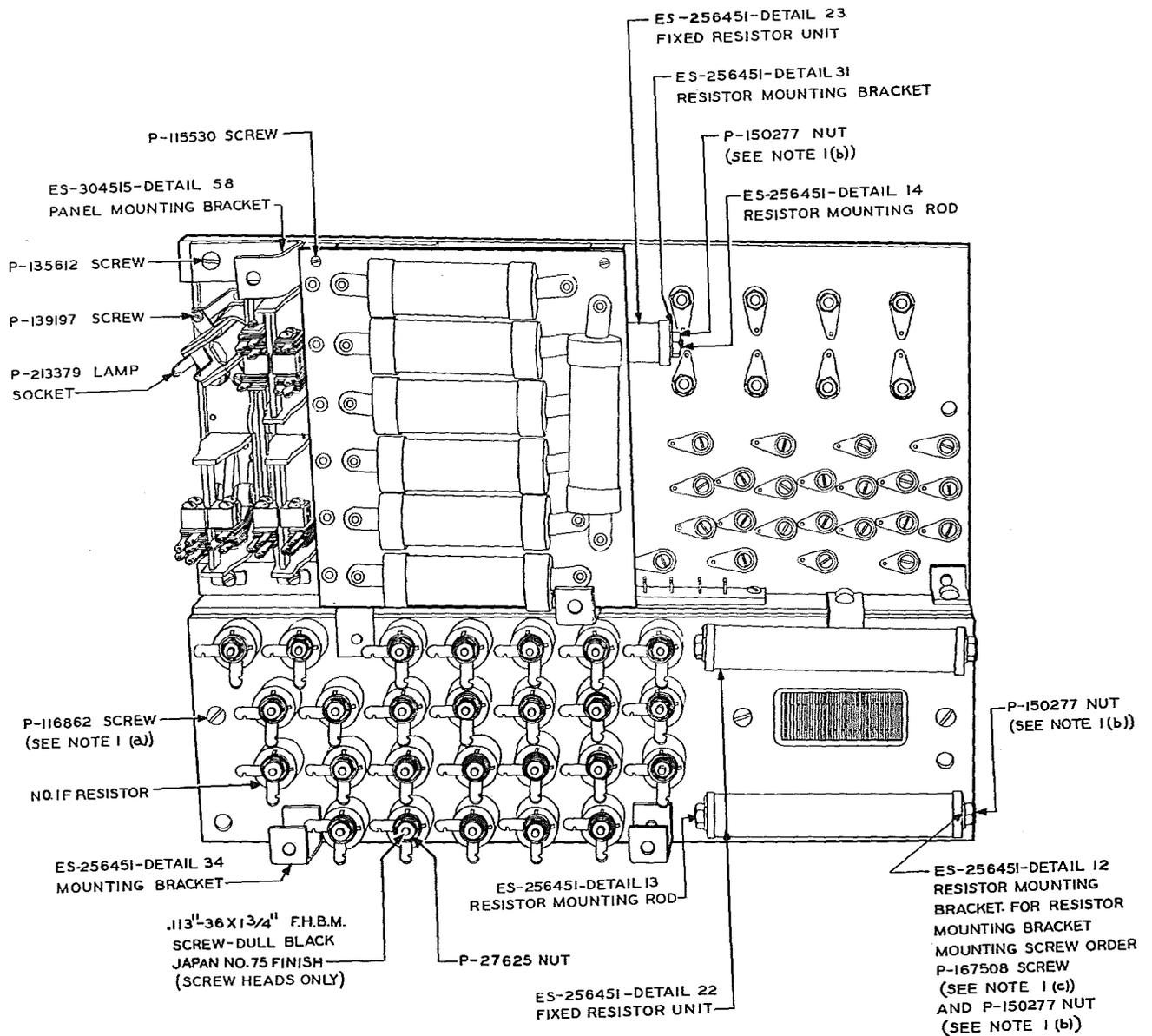


Fig. 2 - No. 35C Test Set - Wiring Side of Panel

Note

1. On earlier sets 0.138-40 screws and nuts were supplied where 0.138-32 parts are specified on this figure. Parts having 0.138-40 threads are as follows:

- (a) P-117063 Screw
- (b) P-156049 Nut
- (c) P-167517 Screw

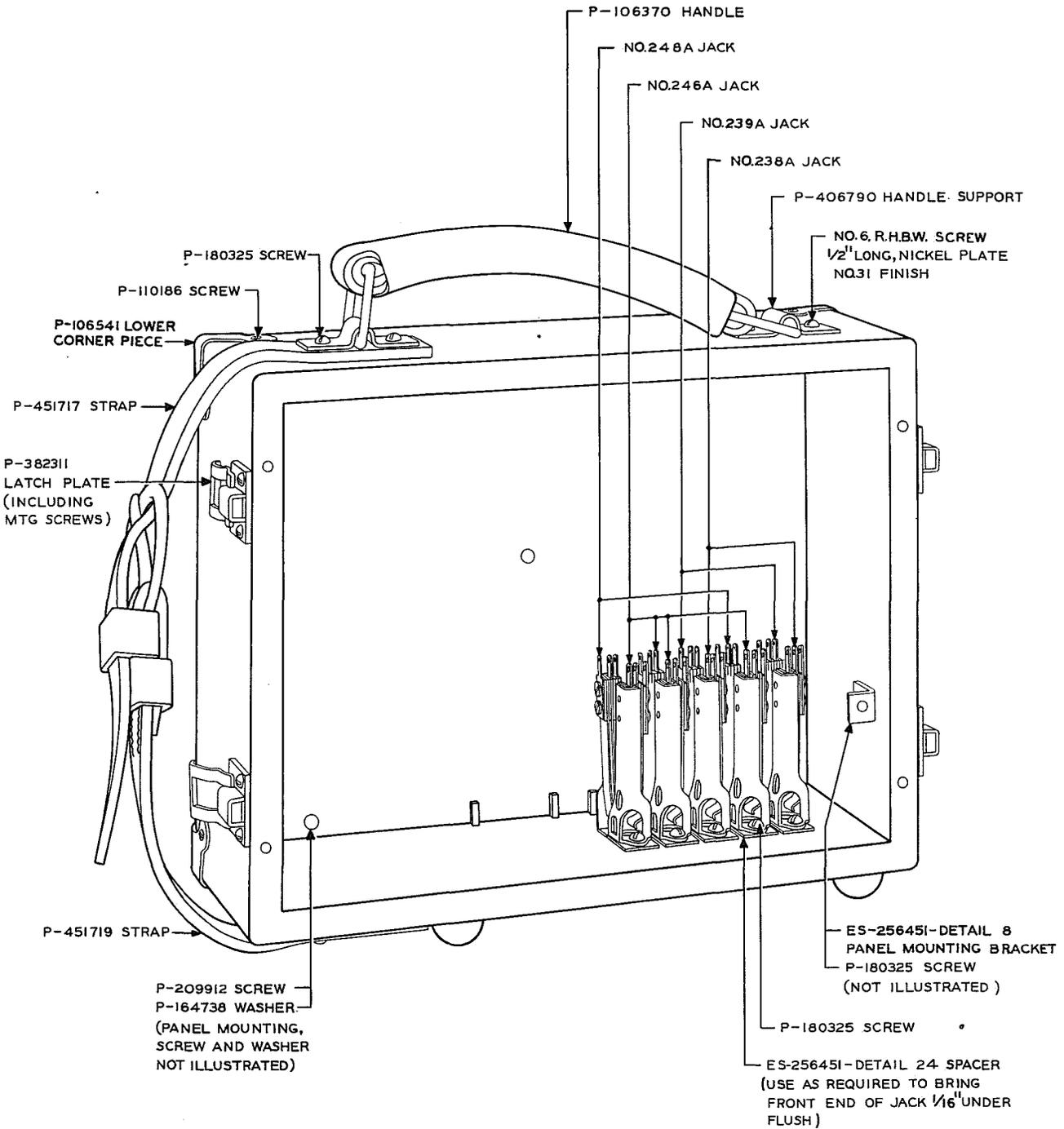


Fig. 3 - No. 350 Test Set - Box Details

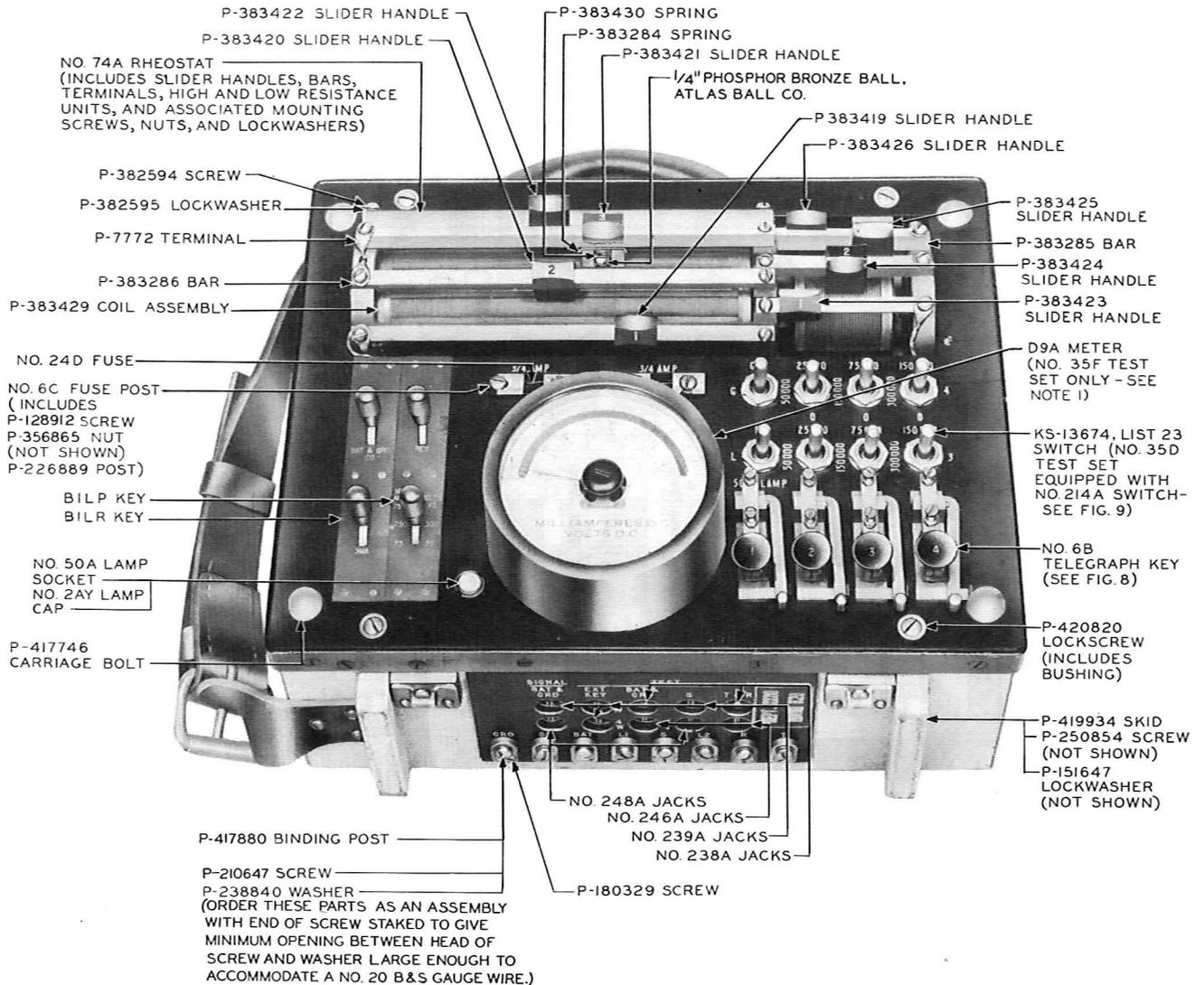


Fig. 4 - No. 35F Test Set - Front View  
 (No. 35D Test Set Same as No. 35F  
 Except Where Noted)

Note

1. Meter of No. 35D test set not to be replaced in field.

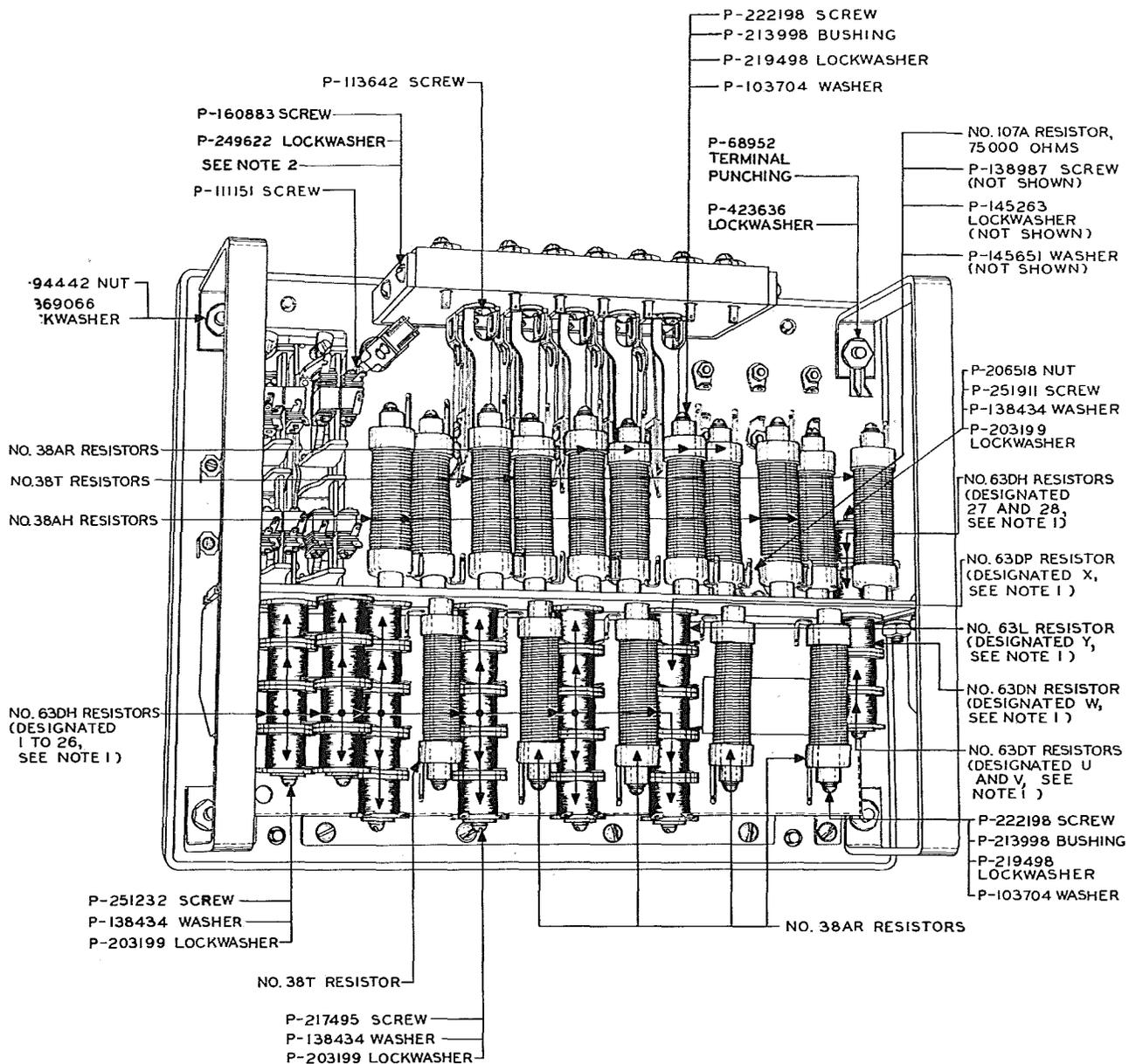


Fig. 5 - No. 35D Test Set - Wiring Side of Panel

Notes

1. Designations of resistors in parentheses are shown on wiring diagram on inside of box.
2. Some sets are equipped with P-113837 screws (wood screws) without lockwashers.

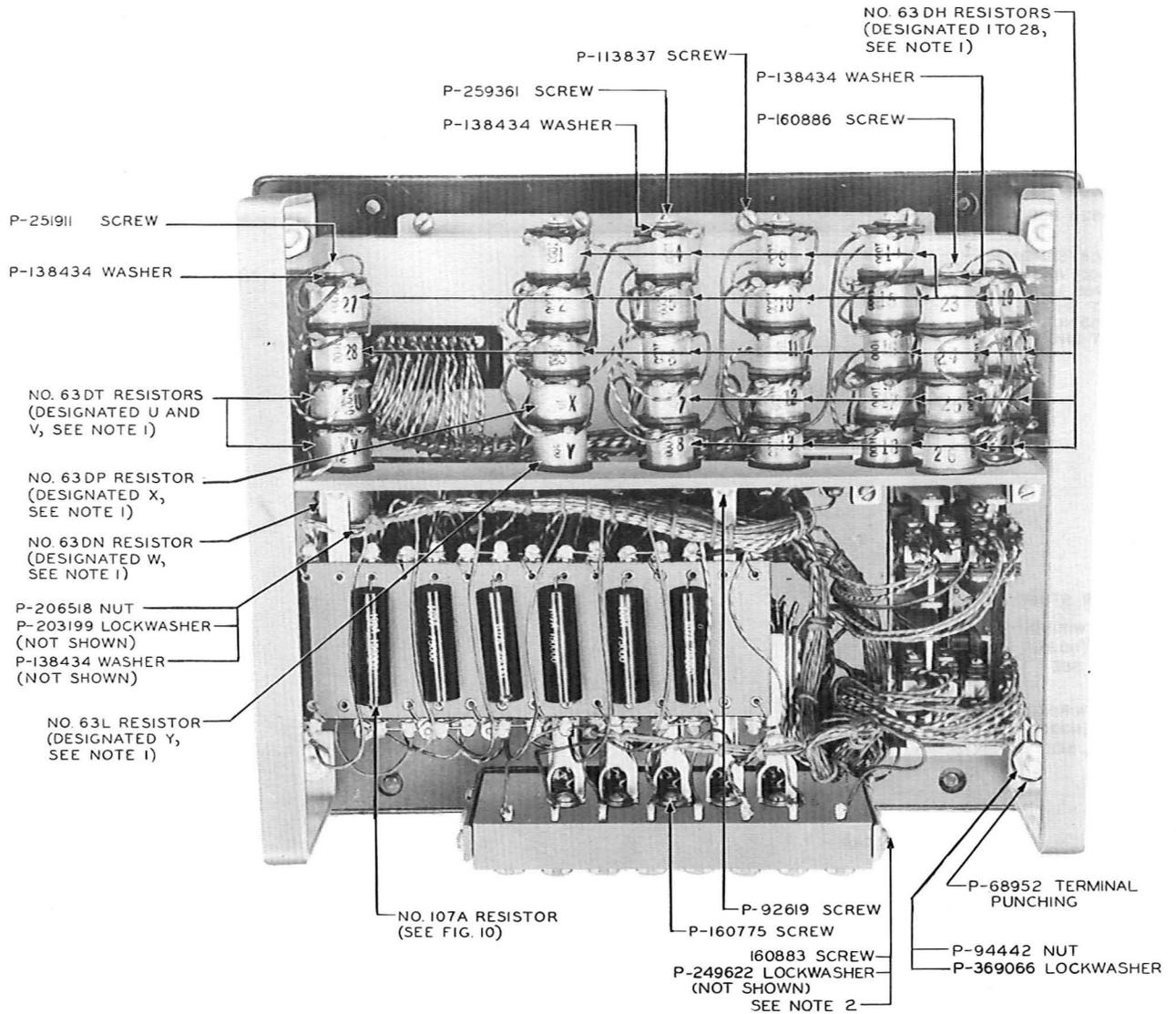


Fig. 6 - No. 35F Test Set - Wiring Side  
of Panel

Notes

1. Designations of resistors in parentheses are shown on wiring diagram on inside of box.
2. Some sets are equipped with P-113837 screws (wood screws) without lockwashers.

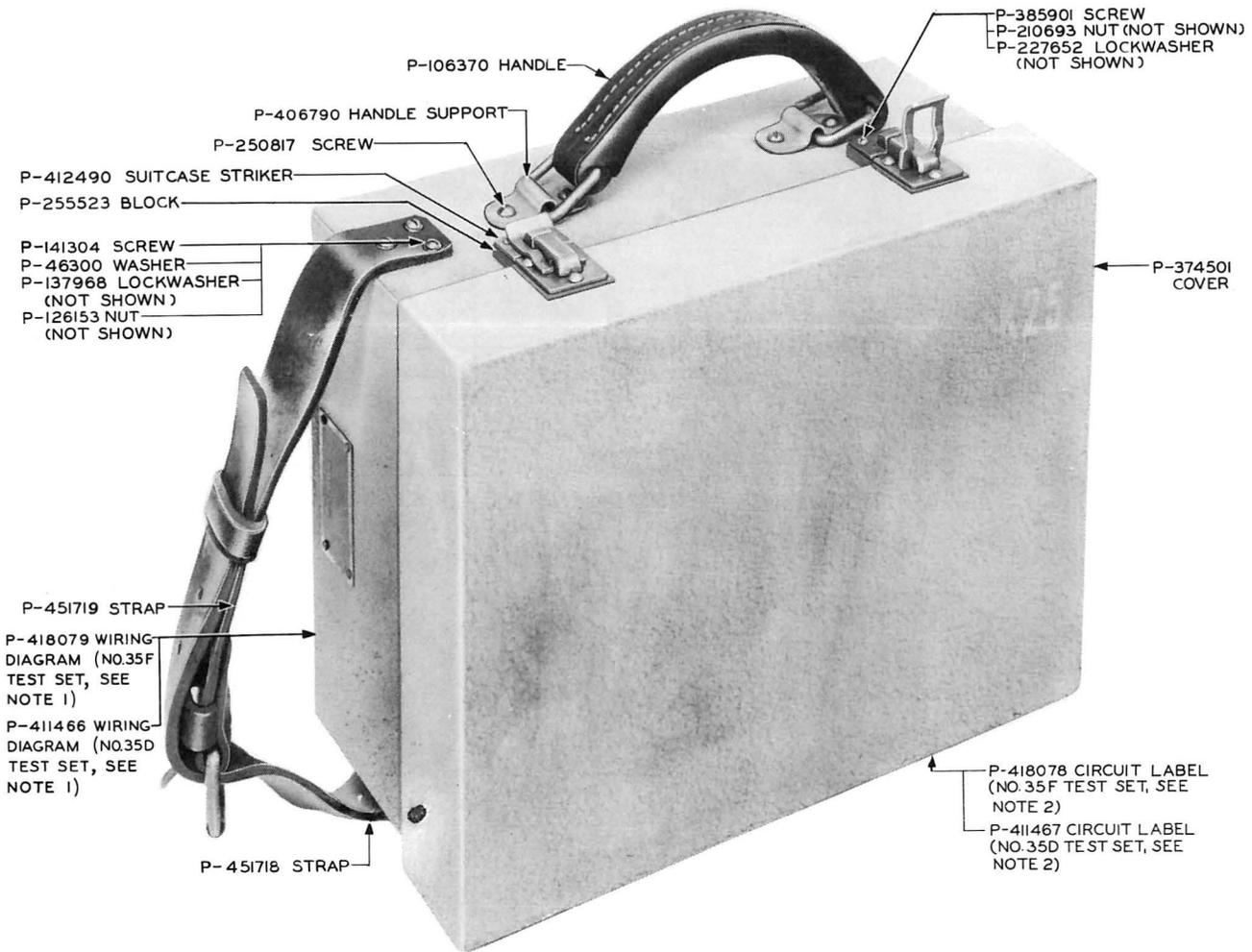


Fig. 7 - Box and Cover for Nos. 35D and 35F Test Sets

Notes

1. Wiring diagram fastened on inside of box with white shellac.
2. Circuit label fastened on inside of cover with white shellac.

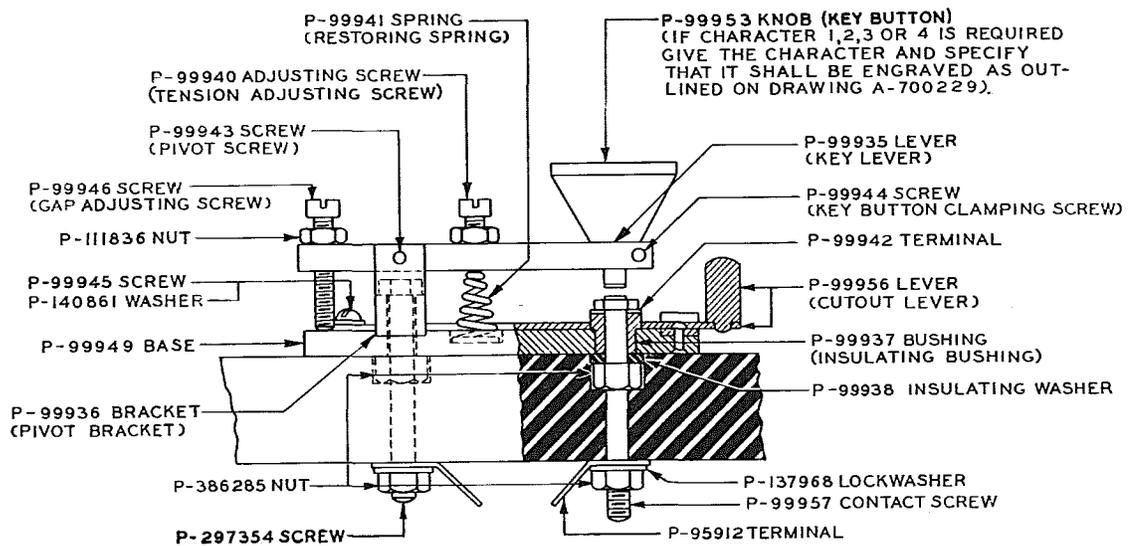


Fig. 8 - No. 6B Telegraph Key

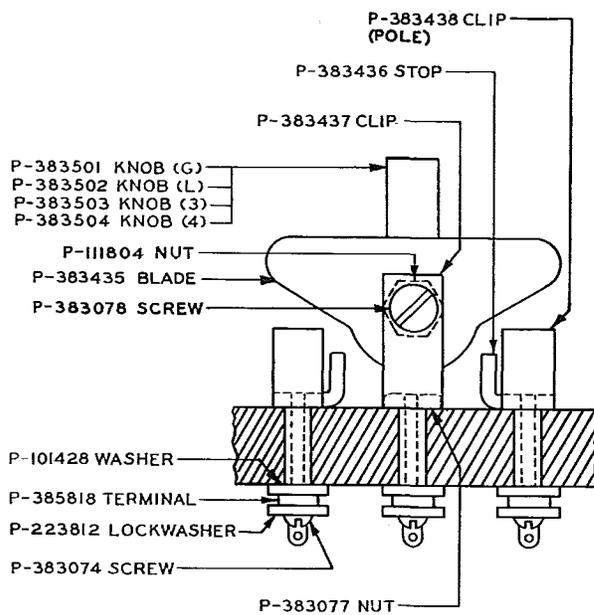


Fig. 9 - No. 214A Switch (Used on Nos. 35C and 35D Test Sets)

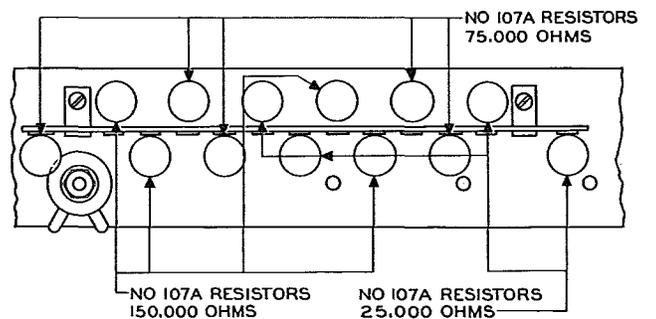


Fig. 10 - No. 107A Resistor Mounting Arrangement in No. 35F Test Set

3. REPLACEMENT PROCEDURES3.01 List of Tools

<u>Code or Spec. No.</u>	<u>Description</u>
45B	5/16-inch Hex. Single-end Socket Wrench
48	7/32-inch and 1/4-inch Hex. Double-end Socket Wrench and Screwdriver
206	30-degree Offset Screwdriver
207	90-degree Offset Screwdriver
220	3/16-inch Hex. Single-end Socket Wrench
319B	Lamp Cap and Number Plate Extractor
417A	1/4-inch and 3/8-inch Hex. Open Double-end Flat Wrench
418A (2 Required)	5/16-inch and 7/32-inch Hex. Open Double-end Flat Wrench
553A	Lamp Extractor
KS-6854	Screwdriver
KS-8097	7/16-inch and 5/8-inch 12-point Offset Box Wrench
-	3-inch Cabinet Screwdriver
-	5-inch Diagonal Pliers
-	6-1/2-inch P-Long-nose Pliers
-	Combination Pliers

3.02 The replacement procedures specified herein cover the parts for the Nos. 35C, 35D, and 35F test sets in the following order:

- (a) Telegraph Key
- (b) B1- and B14-type Keys
- (c) Switches
- (d) Lamp Socket
- (e) Fixed Resistors
- (f) Variable Resistor Units
- (g) Jacks
- (h) Meter

3.03 No replacement procedures are specified for screws and other parts where

the replacement procedure consists of a simple operation.

Removing Panel and Associated Apparatus From Box

3.04 No. 35C Test Set: When necessary to remove the panel and associated apparatus from the box in order to replace parts, proceed as follows. Remove the round head screws from the bottom of the box with the 3-inch cabinet screwdriver. Remove the screw adjacent to the rear of telegraph key No. 4 with the screwdriver. With the right hand, grasp the right end of the black rheostat (rheostat having black sliders), placing the thumb on the No. 1 slider bar and the fingers on the No. 4 slider bar near the point where the red and black rheostats join. Grasp the lever handle of the MIL AMPS key with the left hand and lift the panel and associated apparatus vertically until it is clear of the box. Then turn the panel over the right end of the box and place it so that the wiring side of the associated apparatus is on top, taking care not to place any strain on the cabling.

3.05 Nos. 35D and 35F Test Sets: To remove the panel and associated apparatus from the box, loosen the screw near each corner of the panel, with the 3-inch cabinet screwdriver. Lift the panel and associated apparatus from the box and place it face up or on its side, whichever will facilitate replacement of parts.

3.06 Mounting Panel and Associated Apparatus: After replacements have been made as required, remount the panel and associated apparatus in the box by reversing the procedures covered in 3.04 or 3.05

No. 6B Telegraph Key

3.07 Key Button: Loosen the key button clamping screw with the KS-6854 screwdriver. Remove the key button from the key lever, place the new key button in position, and fasten the clamping screw securely.

3.08 Tension or Gap Adjusting Screw: Loosen the locknut on the screw with the No. 220 wrench and remove the screw and locknut with the fingers or with the KS-6854 screwdriver. Place the new screw and locknut in position, and while holding the locknut with the No. 220 wrench, turn the screw with the KS-6854 screwdriver until the desired gap or tension is obtained. Tighten the locknut securely, holding the screw in position with the KS-6854 screwdriver.

3.09 Key Lever: Remove the pivot screw from the pivot bracket with the KS-6854 screwdriver and remove the lever. Remove the key button and adjusting screws from the lever as covered in 3.07 and 3.08

and mount them on the new lever. Place the new lever in position, insert the pivot screw, and tighten it securely.

3.10 Restoring Spring: Remove the lever as described in 3.09 and lift the restoring spring from the socket. Place the new spring in position and replace the lever, adjusting for tension as desired.

3.11 Cutout Lever: Remove the lever mounting screw with the KS-6854 screwdriver. Place the new lever in position and tighten the mounting screw securely.

3.12 Key Assembly: Remove the panel from the box as covered in 3.04 or 3.05. From the underside of the panel, remove the nuts from the contact and pivot bracket mounting screws using the wrench portion of the No. 48 combination wrench and screwdriver. Remove the lockwashers and terminals from the screws, taking care not to damage the leads. Remove the key from the panel. Remove the outer nuts, lockwashers, and terminals from the contact and pivot bracket mounting screws on the new key. Position the key on the panel and place the old terminals with attached leads on the proper screws. Then place a lockwasher on each screw and securely tighten the nuts.

3.13 Contact and Pivot Bracket Mounting Screws: Remove the key from the panel as covered in 3.12. Remove the key lever by removing the pivot screw with the KS-6854 screwdriver. With the wrench portion of the No. 48 combination wrench and screwdriver remove the nut, at the base of the key, from the screw being replaced. Withdraw the screw from the key base. When replacing the contact screw, note that the insulating washer and bushing are properly located and in good condition. If either is defective, replace it. Insert the new screw and securely tighten the nut against the key base. Remount the key on the panel. Place the terminals and lockwashers on the proper screws and tighten the nuts securely.

3.14 Pivot Bracket: Remove the pivot bracket mounting screw as covered in 3.13. Place the new pivot bracket in position and replace the pivot bracket mounting screw, fasten it securely in position, and remount the key on the panel.

#### B1- and B14-type Keys

3.15 Replace parts of these keys as covered in Section A506.011.

#### No. 214A Switch - Nos. 35C and 35D Test Sets

3.16 Remove the panel from the box as covered in 3.04 or 3.05. Using the 3-inch cabinet screwdriver or the Nos. 206 and 207 offset screwdrivers, remove the

screw which mounts the pole or switch blade assembly of the switch on which a replacement is to be made. Take care not to damage the terminal connections if the terminal is not to be replaced. Substitute new parts as required. Mount the parts in the reverse order of removal, taking care that the switch blade and poles are in proper alignment.

#### KS-13674, List 23 Switch - No. 35F Test Set

3.17 Remove the panel and associated apparatus from the box as covered in 3.05. Using the 3-inch cabinet screwdriver, remove the screws which mount the brackets of the No. 107A resistor panel and move the panel out of the way, taking care not to damage the leads. Unsolder and tag the leads of the switch to be replaced. Using the combination pliers, remove the nut and the lockwasher from the switch at the front of the test set panel. Remove the switch from the rear of the panel. Mount the new switch and lockwasher and securely tighten the nut, using the pliers with the jaws held in the wide position. Solder the leads to the proper terminals of the switch. Remount the No. 107A resistor panel, tightening the mounting screws securely.

#### Lamp Socket

3.18 Remove the lamp cap with the No. 319B lamp cap extractor and remove the lamp with the No. 553A lamp extractor. Remove the panel from the box as covered in 3.04 or 3.05. Unsolder the leads to the lamp socket terminals. Remove the lamp socket mounting screws with the KS-6854 screwdriver and remove the lamp socket. Fasten the new socket in position and resolder the leads. Remount the lamp and the lamp cap.

#### Fixed Resistors

##### No. 35C Test Set

3.19 No. 1F Resistor: Remove the panel and associated apparatus from the box as covered in 3.04. Unsolder the leads to the resistor being replaced. Loosen and remove the nuts from the terminal end of the resistor with the wrench portion of the No. 48 combination wrench and screwdriver. Remove the resistor from the mounting screw and place the new resistor on the screw. Tighten the mounting nuts securely and resolder the leads. If it is necessary to replace the resistor mounting screw, it may be necessary to loosen and remove the screws which attach the variable resistor unit to the panel, using the 3-inch cabinet screwdriver, in order that the variable resistor may be moved sufficiently to permit the resistor mounting screw to be withdrawn.

**3.20 Resistor Units, Other Than No. 1F**

**Resistors:** Remove the panel and associated apparatus from the box as covered in 3.04. To replace either resistor unit adjacent to the No. 1F resistors, unsolder the leads of the resistor to be replaced. With the No. 418A wrench, remove the nuts which mount the unit to the brackets. Withdraw the rod from the unit and remove the unit. Place the new unit in position and insert the rod. Securely tighten the mounting nuts and resolder the leads. To replace the resistor unit adjacent to the BLDY key, hold the resistor unit nut adjacent to the key with a No. 418A wrench and remove the other nut using a second No. 418A wrench. Push the end of the resistor unit rod toward the key until it clears the mounting bracket. Raise the end of the resistor above the bracket. Partially remove the unit from the rod, unsolder the leads, and then slide the unit off the rod. Slide the new resistor unit part way on the rod. Connect and solder the test set leads to the proper leads on the unit and slide the unit fully on the rod. Push the rod through the hole in the bracket. While holding the nut adjacent to the key with a wrench, securely tighten the other nut with the second wrench.

**No. 35D Test Set**

**3.21 No. 107A Resistor:** Remove the panel and associated apparatus from the box as covered in 3.05. Unscrew the mounting screws of the 38-type resistors which prevent access to the No. 107A resistor and remove the insulating bushings from the bottom of these resistors. Move these resistors out of the way, taking care not to damage the leads. Unsolder the No. 107A resistor terminals from the lugs on the resistor mounting panel. Substitute the new resistor and solder the terminals to the lugs. Remount the resistors which were removed, taking care that the insulating bushings are properly positioned on each resistor.

**3.22 38- and 63-type Resistors:** Remove the panel and associated apparatus from the box as covered in 3.05. Unsolder the leads from the resistor to be replaced. Remove the resistor mounting screw with the 3-inch cabinet screwdriver or the Nos. 206 and 207 offset screwdrivers. If the resistor is held on the screw with a nut, remove the nut using the No. 417A wrench. Substitute the new resistor. In the case of 63-type resistors, make sure that all washers and other resistors mounted on the same screw are properly positioned. In the case of 38-type resistors, make sure that bushings are properly positioned at each end of the resistor. Tighten the screw or nut securely.

**No. 35F Test Set**

**3.23 No. 107A Resistor:** Remove the panel and associated apparatus from the box as covered in 3.05. Remove the resistor panel bracket mounting screws with the 3-inch cabinet screwdriver. Using the 5-inch diagonal pliers, clip the terminals of the resistor to be replaced close to the resistor and remove the resistor from the panel. Pull the clipped terminals through the holes in the panel with the P-long-nose pliers and unsolder them from the lugs on the panel. Substitute the new resistor, making sure that its resistance value is the same as that of the resistor being replaced and that the resistor is positioned on the panel so that the stamped resistance value is visible. Solder the resistor terminals to the proper lugs on the panel.

**3.24 63-type Resistor:** Remove the panel and associated apparatus from the box as covered in 3.05. Unsolder the leads from the resistor to be replaced. Remove the resistor mounting screw with the 3-inch cabinet screwdriver or the Nos. 206 and 207 offset screwdrivers. If the resistor is held on the screw with a nut, remove the nut using the No. 417A wrench. Substitute the new resistor. Make sure that all washers and other resistors mounted on the same screw are properly positioned, then tighten the screw or nut securely.

**Variable Resistor Unit - No. 35C Test Set**

**3.25 Slider Handle, Slider Ball, Helical Spring, Tension Spring, and Slider Bar:** In replacing any of these parts use a strip of bond paper, as described below, to prevent the ball from dropping out of the slider handle. Place the strip of bond paper around the slider bar and move the slider handle so that the paper is between the ball in the handle and the winding of the rheostat. Using the 3-inch cabinet screwdriver, remove the slider bar mounting screws while holding the slider handle firmly against the winding. Then grasp the ends of the paper to hold the slider ball in place and lift the slider handle and bar from the unit. Remove the paper, taking care not to lose the slider ball. Substitute new parts as required. If the helical spring is to be replaced, remove it from the slider handle with the P-long-nose pliers. Mount the parts by reversing the procedures described above.

**3.26 Complete Variable Resistor Unit**

- (a) **Removing Unit From Panel:** Tag and disconnect the leads at the ends of the slider bars as follows. If the lead to a slider bar terminal is brought out

through a hole in one of the slider bar mountings, unsolder the lead at the terminal. Otherwise, remove the terminal from the screw, using the 3-inch cabinet screwdriver, and remount the screw, tightening it securely before unscrewing the next screw. When all slider bar leads have been disconnected, remove the panel from the box as described in 3.04. Unsolder the four black leads at the terminal block mounted below the panel. These leads connect to the fixed resistors inside the black rheostat (rheostat with black sliders). Tag and unsolder the lead at the terminal near the bottom of the black rheostat. Tag and unsolder the leads at the terminals of the red rheostat projecting below the panel. Remove the three screws which mount the unit to the panel using the 3-inch cabinet screwdriver. Lift the resistor unit from the panel, withdrawing through the hole in the panel the four black leads to the fixed resistors inside the black rheostat.

(b) Mounting Unit on Panel: Insert the four black leads, from the fixed resistors inside the black rheostat, through the hole in the panel. If there are holes for slider bar leads in the slider bar mountings, insert the leads (without terminals) through the holes for connection to the proper slider bars. With the resistor unit in position on the panel, tighten the mounting screws securely. Solder the leads to the proper terminals of the red rheostat. Test the four black leads, from the fixed resistors inside the black rheostat, with battery and a headset and determine each pair of leads which connects to a resistor. Solder one pair to terminals 1 and 2 and the other pair to terminals 3 and 4 of the terminal block mounted below the panel. Solder the proper lead to the terminal near the bottom of the black rheostat. Connect the leads to the proper slider bars, either soldering the lead to the slider bar terminal or mounting the old terminal to which the lead is connected on the slider bar.

3.27 Coil of Black Rheostat and Resistors Inside Black Rheostat: First remove the variable resistor unit as covered in 3.26(a). Then, using the 3-inch cabinet screwdriver, remove the screws which fasten the four slider bars of the black rheostat at the common slider bar mounting between the two rheostats. Separate the two rheostats and remove the slider handles from the bars of the black rheostat taking care not to lose the slider balls. If a resistor mounted inside the black rheostat is to be replaced, remove the resistor nuts and mounting plate using the No. 45B wrench. Remove the resistor. Place the new resistor on the rod and insert the

resistor terminals through the holes in the common slider bar mounting. Position the resistor mounting plate on the rods and securely tighten the nuts. If the coil of the black rheostat is to be replaced, remove the slider bars from the slider bar mounting using the 3-inch cabinet screwdriver. Pull the slider bar mounting off the coil and properly position it on the new coil. Mount the slider bars on the slider bar mounting and tighten the mounting screws securely. Remount the slider handles with the slider balls in place. Position the coil in the common slider bar mounting and tighten the slider bar mounting screws securely. Mount the variable resistor unit as described in 3.26(b).

No. 74A Rheostat - Nos. 35D and 35F Test Sets

3.28 Slider Handle, Slider Ball, Helical Spring, Tension Spring, and Slider Bar: To replace any of these parts, proceed as covered in 3.25.

3.29 Complete Rheostat

(a) Removing Rheostat From Panel: Tag and disconnect the leads at the ends of the slider bars as follows. In the case of a lead that is brought out through a hole in one of the slider bar mountings, unsolder the lead at the terminal. Otherwise, remove the terminal from the screw using the 3-inch cabinet screwdriver, and remount the screw tightening it securely before unscrewing the next screw. When all slider bar leads have been disconnected, remove the panel from the box as covered in 3.05. Tag and unsolder the leads at the terminals of the red rheostat (rheostat with red sliders) projecting below the panel. Remove the three screws which mount the rheostat to the panel, using the 3-inch cabinet screwdriver and the Nos. 206 and 207 offset screwdrivers. Carefully lift the rheostat from the panel and tag and unsolder the lead at the terminal near the bottom of the black rheostat.

(b) Mounting Rheostat on Panel: Solder the proper lead to the terminal near the bottom of the black rheostat. Insert the leads without terminals through the holes in the slider bar mountings for connection to the proper slider bar terminals. Position the rheostat on the panel and tighten the mounting screws securely. Solder the leads to the proper terminals of the red rheostat. Connect the leads to the proper slider bars, either soldering the lead to the slider bar terminal or mounting the old terminal to which the lead is connected on the slider bar.

**3.30 Low Resistance Unit (Coil of Black Rheostat):** Remove the rheostat from the panel as covered in 3.29(a). Then, using the 3-inch cabinet screwdriver, remove the screws which fasten the four slider bars of the black rheostat at the common slider bar mounting between the two rheostats. Separate the two rheostats and remove the slider handles from the bars of the black rheostat, taking care not to lose the slider balls. Remove the slider bars from the other slider bar mounting, using the screwdriver. Pull the slider bar mounting off the coil and properly position it on the new coil. Mount the slider bars on the slider bar mounting and tighten the mounting screws securely. Remount the slider handles with the slider balls in place. Position the coil in the common slider bar mounting and tighten the slider bar mounting screws securely. Mount the rheostat as described in 3.29(b).

#### Jacks

**3.31 No. 35C Test Set:** Remove the panel and associated apparatus from the box as covered in 3.04. Unsolder and tag the leads to the jack to be replaced. Remove the jack mounting screw with the 3-inch cabinet screwdriver and remove the jack. Place the new jack in position, inserting a sufficient number of spacers between the jack and the box to insure that the front end of the jack is 1/16 inch under flush. Tighten the mounting screw securely and solder the leads to the jack terminals.

**3.32 Nos. 35D and 35F Test Sets:** Remove the panel and associated apparatus from the box as covered in 3.05. Remove the jack panel mounting screws with the 3-inch cabinet screwdriver and move the panel to gain access to the jacks, taking care not to damage the leads. Tag and unsolder the leads to the jack to be replaced. Remove the jack mounting screw with the 3-inch cabinet screwdriver and remove the jack. Mount the new jack and tighten the mounting screw securely. Solder the leads to the jack terminals. Remount the jack panel and tighten the mounting screws securely, making sure that the lockwashers, if provided, are under the heads of the screws.

#### D9A Meter - No. 35F Test Set

**3.33** Remove the panel and associated apparatus from the box as covered in 3.05. Remove the jack panel mounting screws using the 3-inch cabinet screwdriver, and move the jack panel to gain access to the terminal posts on the meter, taking care not to damage the jack leads. Using the KS-8097 wrench, remove the nuts and washers which hold the lead terminals on the terminal posts of the meter. Tag and

remove the leads and also remove the washers under them. Using the wrench, remove the two meter mounting nuts and the remaining washers on each of the terminal posts. Remove the meter from the front of the panel and mount the new meter in its place. Remount the parts in the reverse order of their removal, securely tightening all nuts and screws.

#### REASONS FOR REISSUE

1. To revise piece-part information for the slider handles and bars of the variable resistor unit and the binding posts and associated terminal screws on the No. 35C test set (Fig. 1).
2. To delete piece-part information for the meter on the No. 35C test set (Fig. 1).
3. To revise piece-part information for the straps, latch plates, and handle supports and to add piece-part information for the lower corner piece on the No. 35C test set box (Fig. 3).
4. To add Figs. 4, 6, 7, and 10 covering piece-part information on the Nos. 35D and 35F test sets.
5. To add the resistance value for the No. 107A resistor, and piece-part information for the terminal punching, and to revise piece-part information for the jack panel mounting screws on the No. 35D test set (Fig. 5).
6. To add notes to Fig. 5 referring to resistor designations and jack panel mounting screws on the 35D test set.
7. To revise piece-part information for the No. 214A switch (Fig. 9).
8. To revise the list of tools (3.01).
9. To add reference to replacement procedures for parts of B14-type keys (3.15).
10. To amplify the paragraph covering replacement of parts of the No. 214A switch (3.16).
11. To amplify the paragraph covering replacement of fixed resistors other than No. 1F resistors on the No. 35C test set (3.20).
12. To add a paragraph covering replacement of No. 107A resistor in the No. 35D test set (3.21).

13. To revise the paragraph covering replacement of the complete variable resistor unit [3.26 (a) and (b)].
  14. To revise the paragraph covering replacement of coil of black rheostat
  15. To delete the paragraphs covering meter replacement procedures for the Nos. 35C and 35D test sets (3.29 and 3.30 of Addendum to previous issue).
- and resistors inside black rheostat (3.27).