STROMBERG-CARLSON

A DIVISION OF GENERAL DYNAMICS CORPORATION

FIELD HANDBOOK

1543 SERIES TELEPHONES

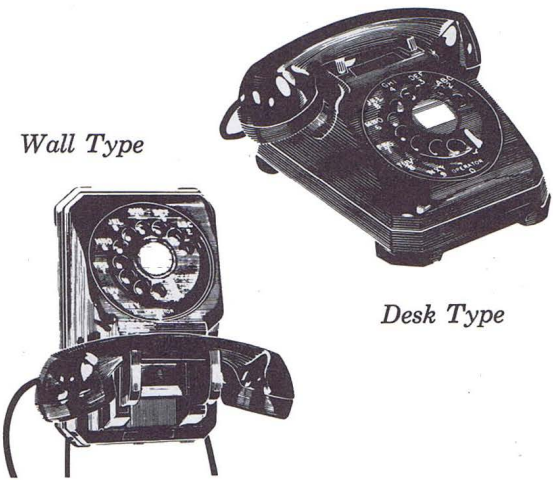

Figure 1. 1543 Telephone.

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The Stromberg-Carlson Company 1500 Series Telephones offer the operating companies the most advance telephone instruments in appearance, in mechanical and electrical design, and in operating efficiency. The 1543 Telephones (fig. 1) are the standart models in the 1500 Series. They are common battery, anti-sidetone telephones that are either manual or dial, and can be desk or wall mounted. The telephones are furnished with the plungers used for desk installations; however, plungers for wall mounting are available in a package assembly (S-C No. 211445-000). Dial blanks and adapters are furnished as standard equipment unless the instruments are ordered equipped with dials. The 1543 Telephones may be equipped with tuned frequency or straight line ringers. The 1543 Telephones are available in black, solid colors, or two-tone colors (housings are colored with a standard black handset and black dial or dial blank).

1543 SERIES TELEPHONES

TABLE OF CONTENTS

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1. DESCRIPTION OF 1543 TELEPHONES.

The 1543 Telephones consist of a base assembly, housing assembly, and handset assembly.

a. *Base Assembly* (fig. 2). This assembly is comprised of a dial or dial blank assembly, a ringer assembly, a hookswitch assembly, and a coil-capacitor assembly all of which are mounted on a metal baseplate.

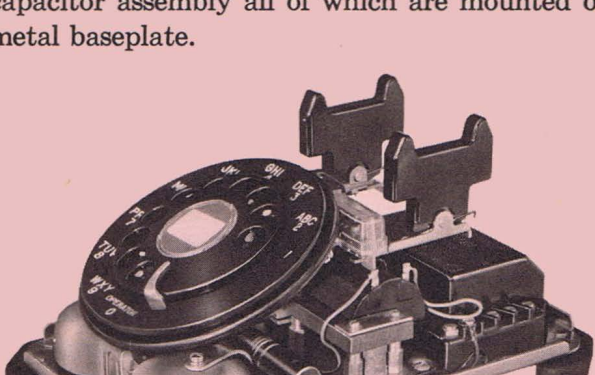

Figure 2. Base Assembly.

(1) *Dial and dial blank assembly* (fig. 3). The dial is equipped with an extended number plate on which the letters and digits (colored white) are located outside the periphery of the finger wheel. A dial mounting bracket, attached to the dial, is hooked onto the pivot shaft of the hookswitch mounting bracket and affixed by means of the two prongs of the dial mounting bracket that are inserted into the baseplate. A dust cover protects the working mechanism of the dial. The dial blank closes the opening reserved for the dial when the telephone is used at a manual station. The same station card fits both the blank and the dial.

Figure 3. Dial and Dial Blank Assembly.

(2) *Ringer assembly* (fig. 4). The 1543 or any of the 1500 Series Telephone uses a single coil, high-impedance ringer which is advantageous on heavily loaded or noisy lines. The ringing capacitor is mounted on the ringer base, providing easy replacement of the capacitor and ringer as a unit. Ringers are available in four groups—Straight line, Harmonic, Synchromonic, Decimonic. Provision is made for including standard Western Electric ringing tubes that are used in superimposed ringing systems. Two large-size gongs are used for full volume signalling. A three-position (high, medium, and low) switch, mounted to the baseplate and protruding through the base of the telephone, is available with straight line ringers to control the volume without distortion or chatter.

(3) *Hookswitch assembly* (fig. 5). The hookswitch assembly in the 1543 or any of the 1500 Series Telephone operates without any complicated linkage and is completely independent of the housing. A metal bracket fastened to the baseplate with four screws provides a mounting for the hookswitch assembly. A transparent cover protects the hookswitch contacts from dust or other foreign matter. A coil spring attached to the hookswitch lever assures proper operation of the hookswitch contacts.

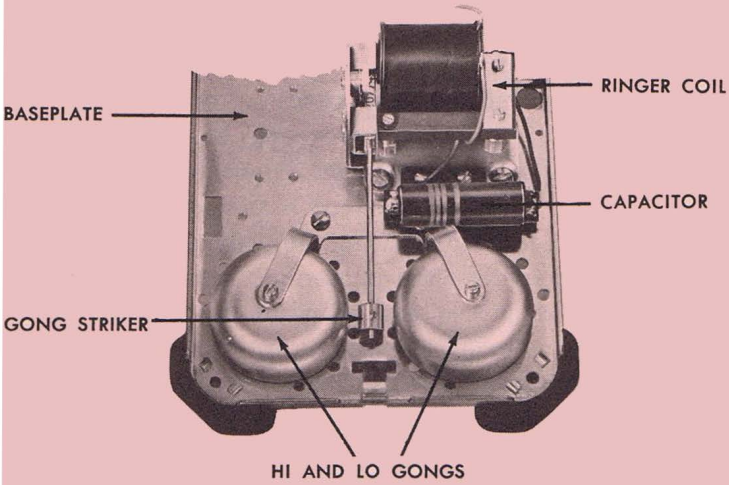

Figure 4. Ringer Assembly.

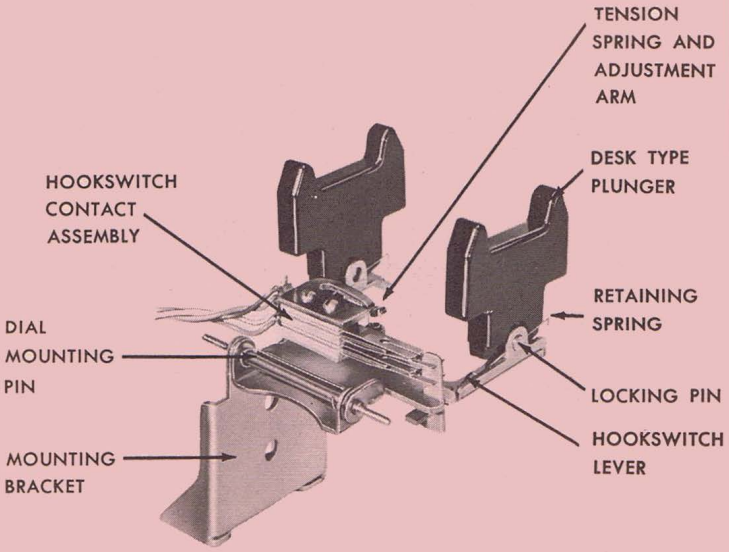

Figure 5. Hookswitch Assembly.

(4) *Coil-capacitor assembly* (fig. 6). The coil-capacitor unit in the 1543 or any of the 1500 Series Telephone consists of an induction coil, resistor, and talking capacitors housed in a plastic case and held in place on the baseplate by three screws. Screw terminals on either side of the case are clearly marked, showing proper connections for the line and handset cords as well as the hookswitch, ringer, and dial.

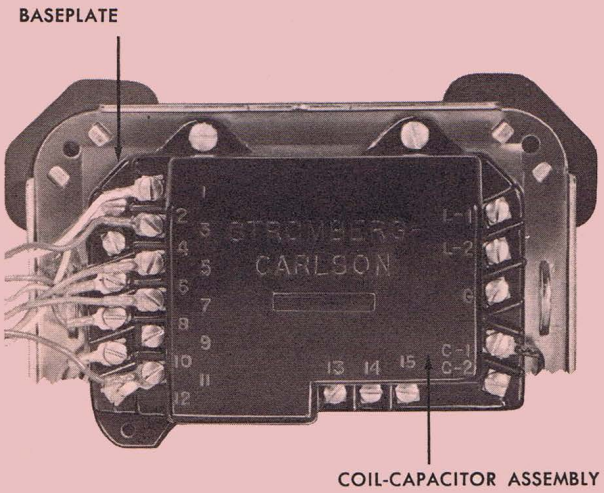

Figure 6. Coil-Capacitor Assembly.

b. *Housing Assembly* (fig. 7). The housing is made of a tough molded thermoplastic, tenite II, in either the standard black or one of the eight colors offered. A metal clip, located on the inside front portion, attaches to a hook lug on the baseplate; a captive screw on the back portion of the housing fastens the housing to the baseplate. All operating components are mounted on the baseplate, thereby allowing the housing to serve its proper function—that of a cover only.

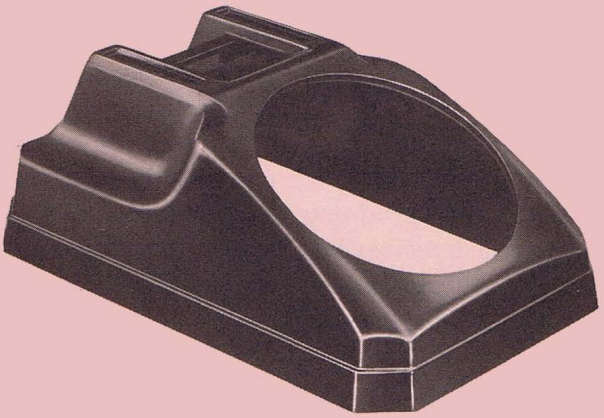

Figure 7. Housing Assembly.

c. *Handset Assembly* (fig. 8). The handset assembly of the 1543 or any of the 1500 Series Telephone consists of the handset, transmitter and receiver elements, the transmitter and receiver caps, and handset cord. The handset is so designed that the transmitter is brought closer to the subscriber's lips, thus improving transmission. The transmitter element is of the carbon type and is non-positional. Its connections are made through the metal spring contacts in the handset and held in place by the transmitter cap. The receiver element is connected by two screws to the spade terminals of the wires running through the handle of the handset and is held in place by the receiver cap. The handset cord, either standard or retractile, is secured to the stay-post of the handset by a screw. The three wires of the cord are terminated with spade terminals and secured to their correct positions by screws.

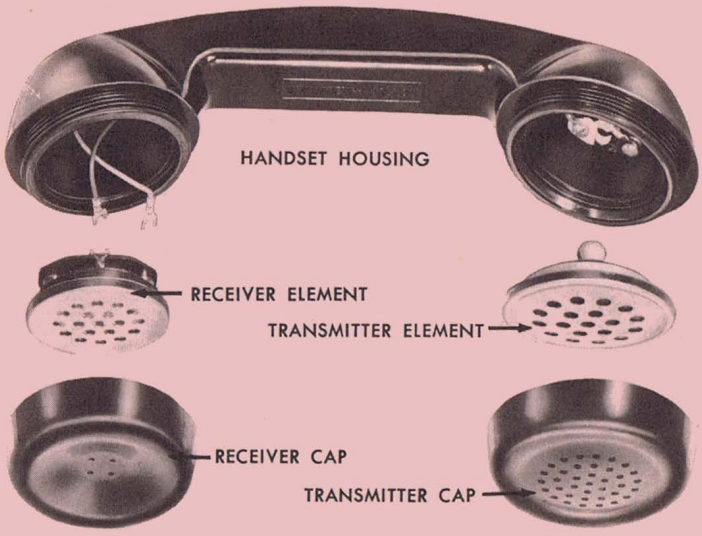

Figure 8. Handset Assembly.

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2. THE 1543 TELEPHONE—TYPES OF SERVICE.

The 1543 telephone is of the manual type; for telephones requiring dials, add the phrase "*with dial*" to the code designation when ordering.

a. *Straight Line.*

(1) 1543—for individual or party line stations without ringers.

(2) 1543A—for use at stations on individual lines, P.B.X. extensions, common battery code ringing lines and in connection with wiring plans not requiring special wired sets. The ringer circuit is bridged across the line and is equipped with a No. 74A high impedance biased ringer and a 0.47 mf capacitor.

(3) 1543BT—for use at stations on four-party selective and eight-party semi-selective lines in superimposed ringing dial central office areas and on two- and four-party selective lines in superimposed ringing manual central office areas. The ringer, a No. 71B biased type, is used in conjunction with the W.E. No. 372A, 333A, or 426A vacuum tube.

b. *Harmonic Ringing*. These telephones are for use at stations on two- and four-party lines in harmonic ringing central office areas when the ringer circuit is bridged across the line; however, when the ringer is connected from one side of the line to ground, it is used at stations on eight-party selective lines, harmonic ringing to ground. These telephones are available in the following frequencies:

(1) *Standard harmonic.*

(*a*) 1543E—16⅔ cyc. w/No. 73E Ringer.

(*b*) 1543N—25 cyc. w/No. 73N Ringer.

(*c*) 1543F—33⅓ cyc. w/No. 73F Ringer.

(*d*) 1543G—50 cyc. w/No. 73G Ringer.

(*e*) 1543H—66⅔ cyc. w/No. 73H Ringer.

(2) *Synchromonic.*

(*a*) 1543R—16 cyc. w/No. 73R Ringer.

(*b*) 1543K—30 cyc. w/No. 73K Ringer.

(*c*) 1543L—42 cyc. w/No. 73L Ringer.

(*d*) 1543M—54 cyc. w/No. 73M Ringer.

(*e*) 1543P—66 cyc. w/No. 73P Ringer.

(3) *Decimonic.*

(*a*) 1543I—20 cyc. w/No. 73I Ringer.

(*b*) 1543K—30 cyc. w/No. 73K Ringer.

(*c*) 1543Q—40 cyc. w/No. 73Q Ringer.

(*d*) 1543G—50 cyc. w/No. 73G Ringer.

(*e*) 1543J—60 cyc. w/No. 73J Ringer.

c. *1543 Two-step Telephone.* The 1543 two-step telephone incorporates a two-step hookswitch arrangement which allows a subscriber to monitor his own line to determine if it is busy without connecting his transmitter to the line. This has a further advantage in dial systems of permitting a party line subscriber to determine if the line is free without mutilating the dial pulses of a call already in progress. The 1543 two-step telephone can be ordered with either straight line, standard harmonic, synchromonic, or decimonic ringers.

d. *1543W Telephone.* The 1543W telephone incorporates a self compensating network with a higher efficiency transmitter and receiver that provides better operation on extended loops. The 1543W telephones are available in dial, manual, or two-step with either straight line, standard harmonic, synchromonic, or decimonic ringers.

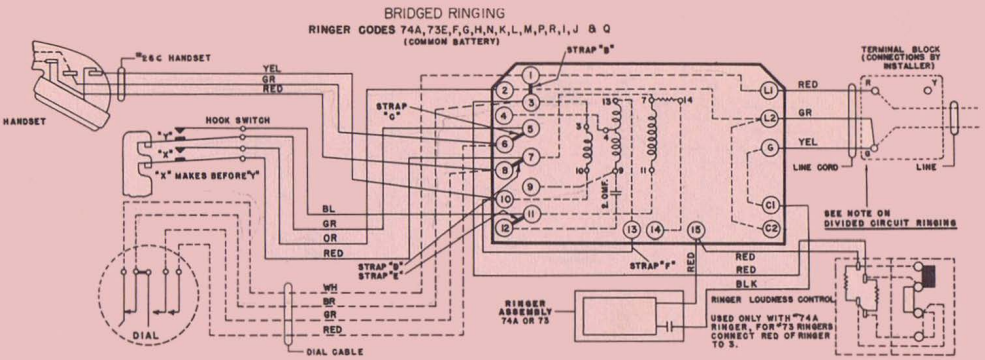


Figure 9. Wiring Diagram for 1543 Telephone.

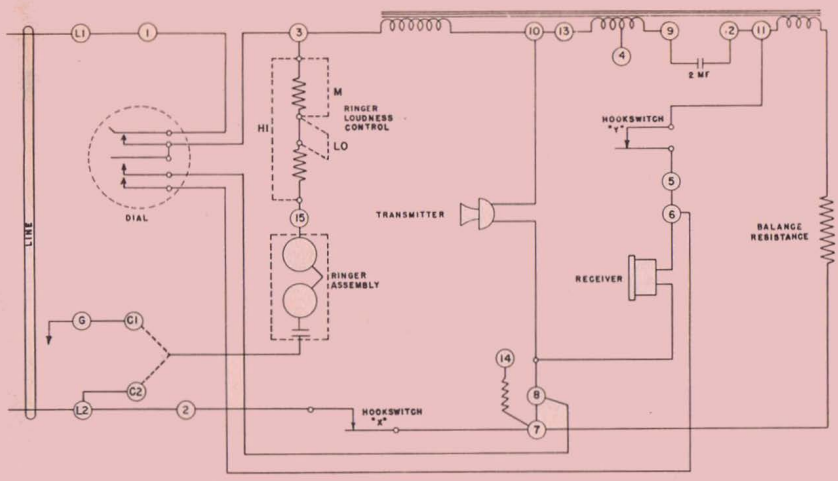
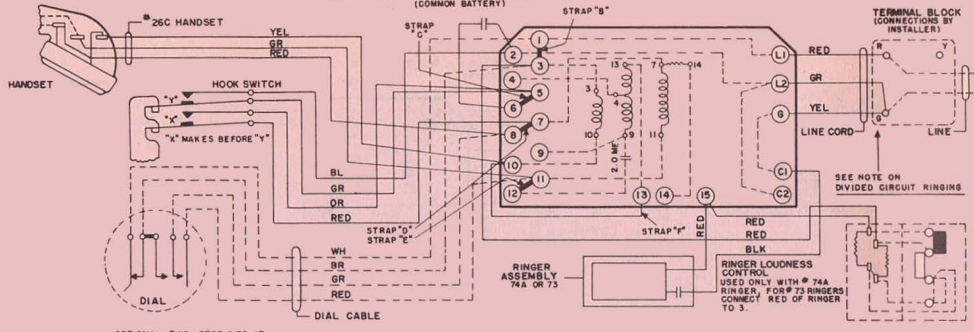


Figure 10. Schematic Diagram for 1543 Telephone.



IF TWO-STEP OPERATION IS TO BE USED WITHOUT DIVIDED CIRCUIT TUNED RINGING, HIGHER LEVELS IN FIRST STEP (LISTENING POSITION) MAY BE OBTAINED AS FOLLOWS:

A- DISCONNECT & REMOVE CAPACITOR ASSEMBLY.
B- DISCONNECT YELLOW OF HANDSET FROM 10. BLUE OF HOOKSWITCH FROM 2. ORANGE OF HOOKSWITCH FROM 5.
C- RECONNECT YELLOW OF HANDSET TO 5. BLUE OF HOOKSWITCH TO 10. ORANGE OF HOOKSWITCH TO 2.
D- WITH CONNECTIONS AS IN C, ON SHORT LOOPS FOR REDUCED SIDETONE, FOLLOW INSTRUCTIONS ABOVE. ALSO MOVE GREEN OF HANDSET & RED OF DIAL FROM 11 TO 4.

Figure 11. Wiring Diagram for 1543 Two-Step Telephone.

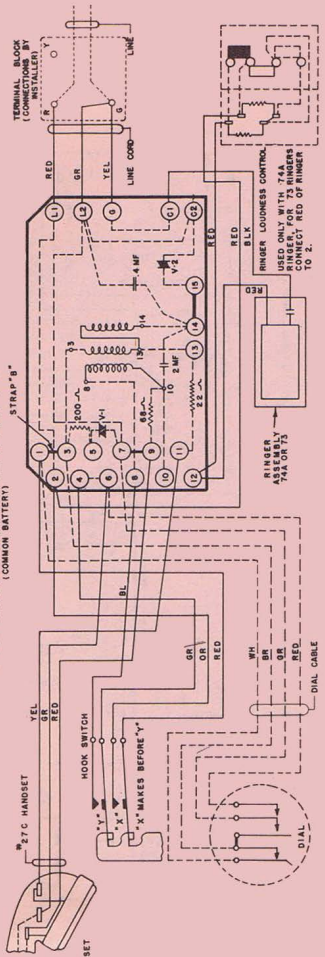


Figure 12. Wiring Diagram for 1543W Telephone.

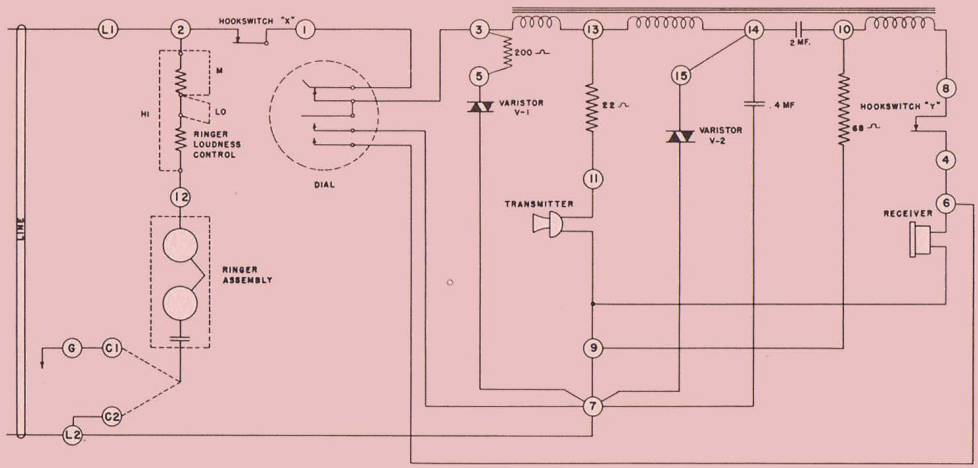


Figure 13. Schematic Diagram for 1543W Telephone.

3. INSTALLATION OF 1543 TELEPHONES.

The 1543 telephone, as it is received from the factory, is ready for installation. The installer after removing the instrument from the carton and inspecting it shall install the instrument as shown in figures 14 and 15. The line cord is connected to the terminal block as follows:

a. *Bridged Ringing* (fig. 14).

(1) Connect the tip lead of the line to terminal G and the ring lead to terminal R.

(2) Connect the line cord from the telephone instrument to the terminal block as follows: Red lead to terminal R and green and yellow leads to terminal G

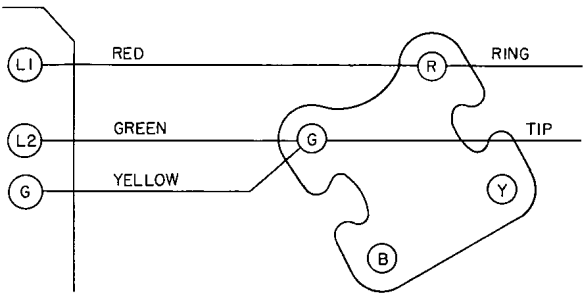
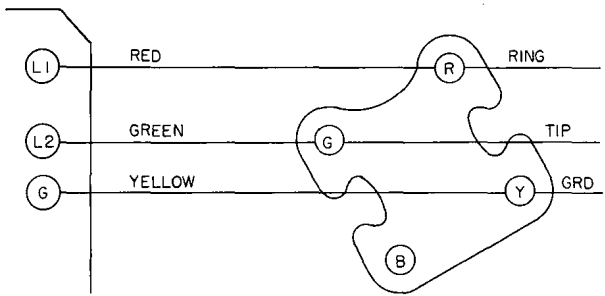


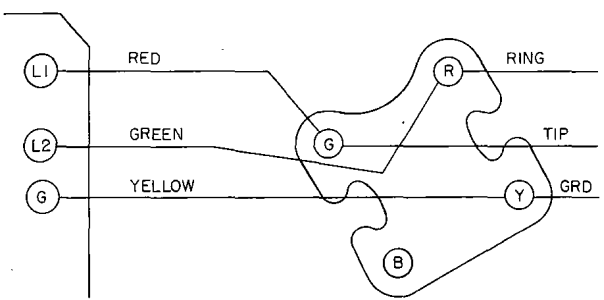
Figure 14. Bridged Ringing.

b. *Divided Ringing* (fig. 15).

(1) Connect the tip lead of the line to terminal G, the ring lead to terminal R, and the GRD lead to terminal Y.



DIVIDED RINGING — ON RING



DIVIDED RINGING — ON TIP

Figure 15. Divided Ringing, Ring on Tip, Ring on Ring.

(2) Connect the line cord from the telephone instrument to the terminal block as follows: Green lead to terminal G, red lead to terminal R, and yellow lead to terminal Y for *ringing on ring;* or green lead to terminal R, red lead to terminal G, and yellow lead to terminal Y for *ringing on tip.*

c. *Divided Ringing, Plus or Minus Ringer Selection, Using 372A, 333A, or 426A Tubes.* All 1543BT telephones are shipped from the factory wired for −tip station (figs. 16 and 18). For a −ring, +tip, or a +ring station, make the following wiring changes:

(1) *−ring station* (figs. 16 and 18). The internal wiring of the telephone instrument remains the same; however, the ring of the line is connected to terminal L2, and the tip of the line is connected to terminal L1 (1543, 1543 two-step, and 1543W).

(2) *+tip station* (figs. 17 and 19).

(*a*) Connect the red lead from the ringer to terminal C2 (1543, 1543 two-step, and 1543W).

(*b*) Connect the black lead from the ringer to terminal 15 for 1543 and 1543 two-step telephones, and to terminal 12 for 1543W telephones.

(*c*) Connect the black lead from the tube to the tube terminal block (1543, 1543 two-step, and 1543W).

(*d*) Connect the yellow lead from the tube to terminal C1 (1543, 1543 two-step, and 1543W).

(*e*) Connect the red lead from the resistor on the tube to terminal C2 (1543, 1543 two-step, and 1543W).

(*f*) Connect one of the two black leads from the ringer loudness control to the black lead on the tube terminal block, and the other black lead to terminal 15 (1543 and 1543 two-step). However, for 1543W telephones, connect the second black lead from the loudness control to terminal 12.

(3) *+ring station* (figs. 17 and 19). The internal wiring of the telephone instrument remains the same; however, the ring of the line is connected to terminal L2, and the tip of the line is connected to terminal L1 (1543, 1543 two-step, and 1543W).

d. *Ringer Loudness Control.* All straight line telephones are shipped with ringer loudness control wired in, unless otherwise specified. If the ringer loudness control is to be wired out after installation, proceed as follows:

(1) Remove the black ringer lead from terminal 15 and connect it to the black tube lead on the tube terminal block.

(2) Disconnect the ringer loudness leads from terminal C15 and the tube terminal block.

(3) Remove the ringer loudness control from the telephone base by removing the metal screw.

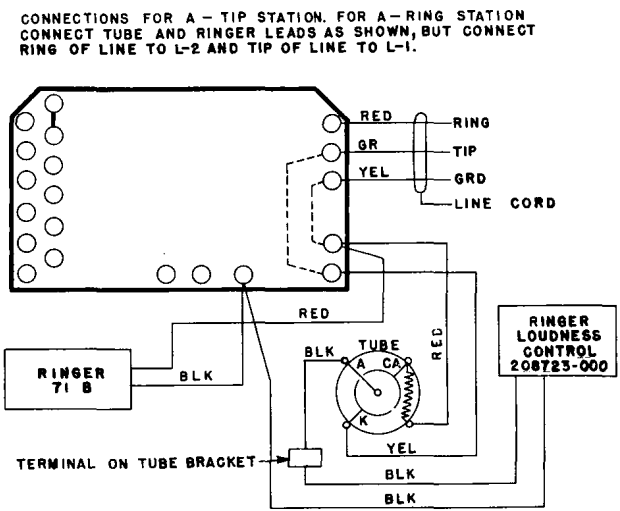


Figure 16. Wiring Diagram for –Tip and –Ring Station, Using 1543 or 1543 Two-Step Telephone.

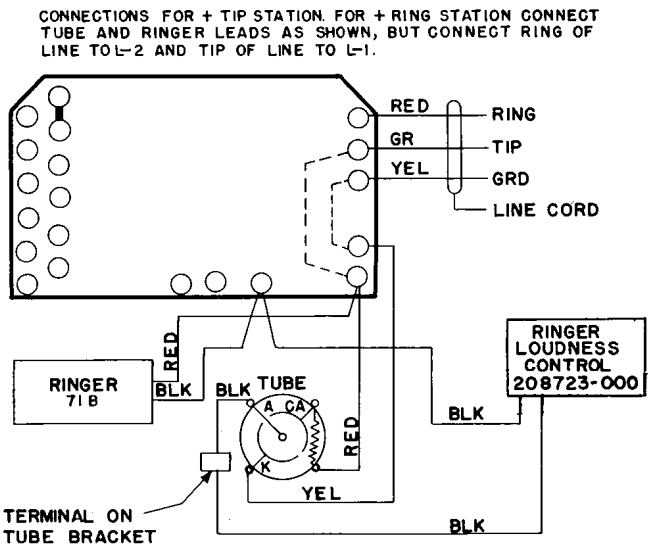


Figure 17. Wiring Diagram for +Tip and +Ring Station, Using 1543 or 1543 Two-Step Telephone.

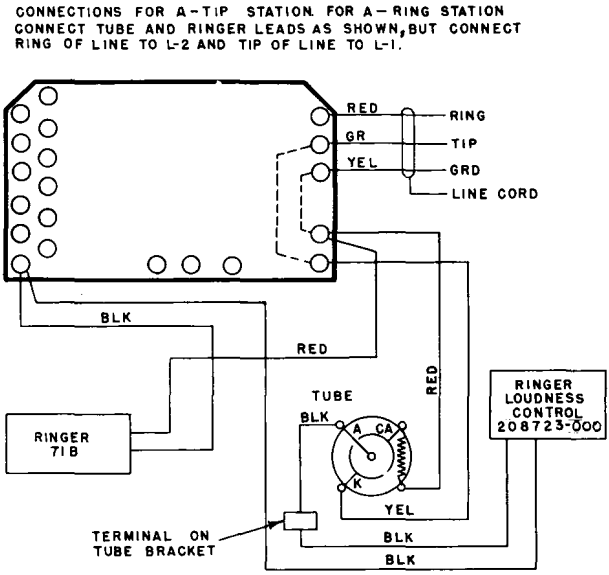


Figure 18. Wiring Diagram for −Tip and −Ring Station, Using 1543W Telephone.

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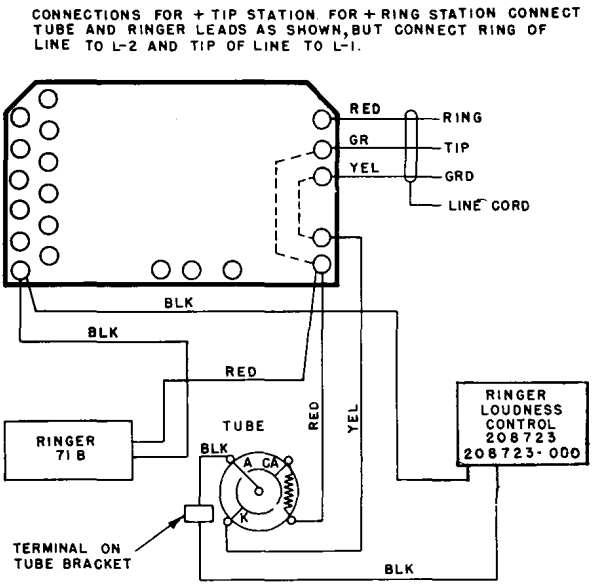

Figure 19. Wiring Diagram for +Tip and +Ring Station, Using 1543W Telephone.

e. *Tapping of Gongs.* In bridged ringing where it is necessary to prevent tapping of gongs on biased ringers while dialing, connect positive battery to terminal L2 and adjust the bias spring tension as required.

f. *Bias Spring Adjustment.* Adjust the bias spring tension (fig. 20) to the maximum value that will yield a satisfactory ring. To adjust this spring, use a pair of duck-billed pliers. Move the adjusting arm toward or away from the coil, depending upon the tension required.

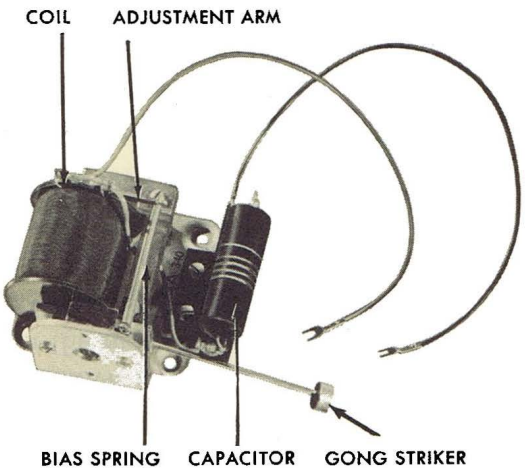

Figure 20. Biased Ringer.

4. CONVERSION PROCEDURES.

a. *Manual to Dial Conversion.* The conversion of the 1500 Series Telephone is accomplished in the following manner:

(1) Remove the housing by loosening the lock screw in the rear clip of the housing and lifting up and forward (fig. 22).

(2) Remove the dial bracket by disengaging the twin prongs of bracket from the baseplate and by lifting the assembly up and back.

(3) Remove the dial blank cover from the bracket by removing the self tapping screws.

(4) Place the dial bracket, with the prongs downward, on the back of the dial (being sure to line the holes up). Place a cable clamp (203052-000) on one mounting screw and insert it into the right mounting hole. The second screw is then inserted into the other mounting hole, securing the bracket to the dial assembly.

(5) Remove strap B between terminals 1 and 3 of the coil-capacitor assembly.

(6) Dial cable connections (fig. 9) for the 1543 Telephone are as follows:

(*a*) White wire, one end to terminal W on dial, other end to terminal 1 of the coil-capacitor assembly.

(*b*) Brown wire, one end to terminal B on dial, other end to terminal 3 of the coil-capacitor assembly.

(*c*) Green wire, one end to terminal GN on dial, other end to terminal 8 of the coil-capacitor assembly.

(*d*) Red wire, one end to terminal R on dial, other end to terminal 6 of the coil-capacitor assembly.

(7) Dial cable connections (fig. 12) for the 1543W Telephone are as follows:

(*a*) White wire, one end to terminal W on dial, other end to terminal 1 of the coil-capacitor assembly.

(*b*) Brown wire, one end to terminal B on dial, other end to terminal 3 of the coil-capacitor assembly.

(*c*) Green wire, one end to terminal GN on dial, other end to terminal 7 of the coil-capacitor assembly.

(*d*) Red wire, one end to terminal R on dial, other end to terminal 6 of the coil-capacitor assembly.

(8) Dial cable connections (fig. 11) for the 1543 Two-Step Telephone are as follows:

(*a*) White wire, one end to terminal W on dial, other end to terminal 1 of the coil-capacitor assembly.

(*b*) Brown wire, one end to terminal B on dial, other end to terminal 3 of the coil-capacitor assembly.

(*c*) Green wire, one end to terminal GN on dial, other end to terminal 8 of the coil-capacitor assembly.

(*d*) Red wire, one end to terminal R on dial, other end to terminal 11 of the coil-capacitor assembly.

b. *Desk to Wall Conversion.* Desk to wall conversion of the 1500 Series Telephone is accomplished in the following manner, using the No. 211445-000 conversion kit (fig. 21).

(1) Remove the housing by loosening the lock screw in the rear clip of the housing and lifting up and forward (fig. 22).

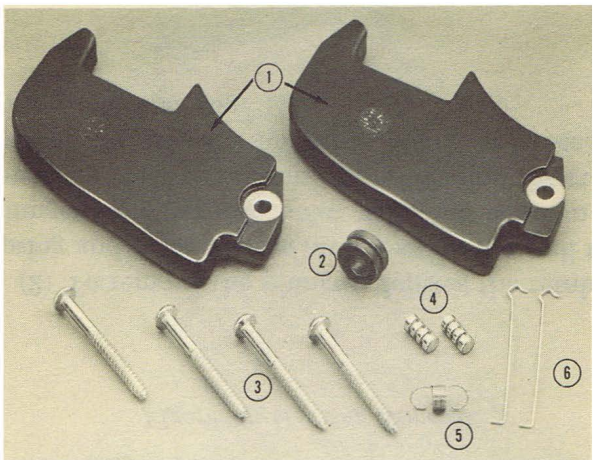

Figure 21. Conversion Kit, Wall Mounting.

LEGEND FOR FIGURE 21

No.	*Part Name*
1	Wall Type Plungers
2	Rubber Grommet
3	Mounting Screws
4	Locking Pins
5	Tension Spring
6	Retaining Springs

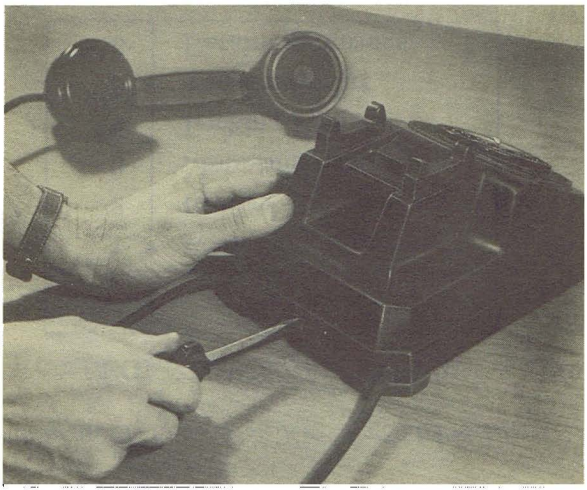

Figure 22. Housing Removal.

(2) To remove the plunger, depress the retainir spring and push out the pin. Position the wall type plunger, aligning the holes with the holes in the lever. Depress the retaining springs and insert the locking pin. Release the spring and check to see that pins are locked (fig. 23).

Figure 23. Plunger Replacement.

(3) Remove the dial bracket mounting screws, rotate the dial 180 degrees, and replace the dial mounting bracket on dial assembly (fig. 24).

(4) Insert the rubber grommet into the 3/8 in. hole in the right side of baseplate. Remove the line cord from terminals L1, L2, and G of the coil-capacitor assembly and insert the line cord through the 3/8 in. hole. Reconnect the line cord to terminals L1, L2, and G. *Note. This step in conversion is not necessary, but makes for a neater installation.*

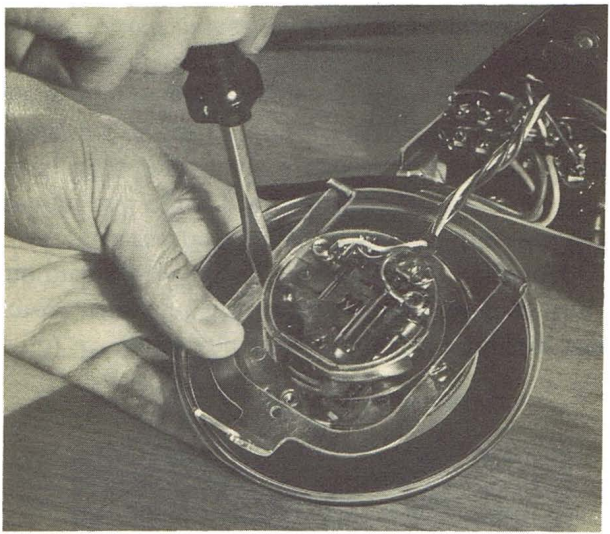

Figure 24. Dial Rotation.

(5) Secure the baseplate to the wall with the four wood screws provided (fig. 25).

(6) Replace the housing and tighten the locking screw.

(7) Early models of the 1543 telephone were equipped with a plunger which straddled the retaining spring. When replacing this type, use the new retaining springs provided.

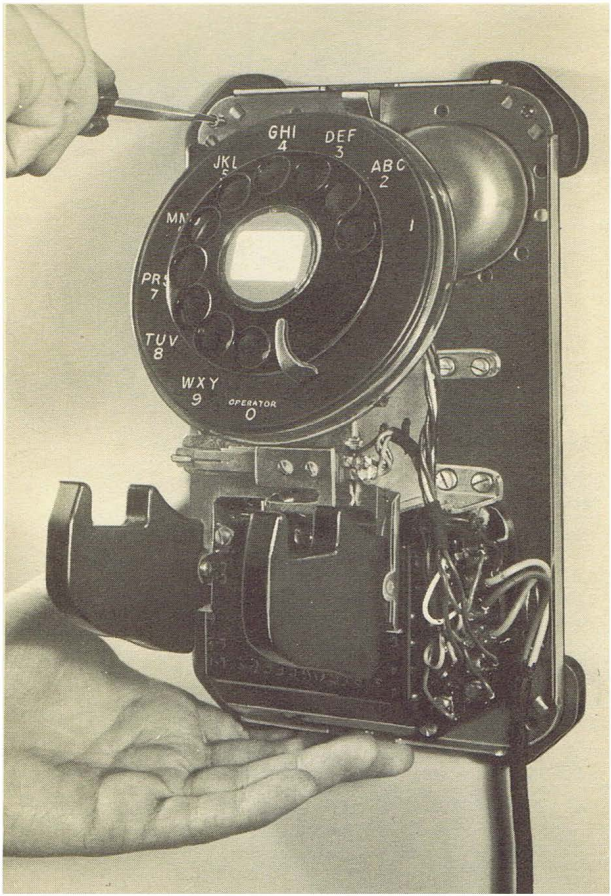

Figure 25. Mounting, Wall Type Telephone.

5. LINE POLARITY TEST.

a. To test the polarity of the line (fig. 26), connect one lead of a hand test telephone (such as Stromberg-Carlson No. 203685-000) to ground (yellow lead). With the "C" button depressed, touch the other lead of the test phone to each line wire, L1 (red) and L2 (green). Upon contact with the negative line wire, a loud click will be heard.

b. As mentioned in subparagraph *a*, a loud click will be heard; however, upon contact with the other lead, a low click may be heard due to the potential of the earth. The depression of the "C" button on the test phone is to prevent the operation of the LR relay in the control office, thus tying up equipment.

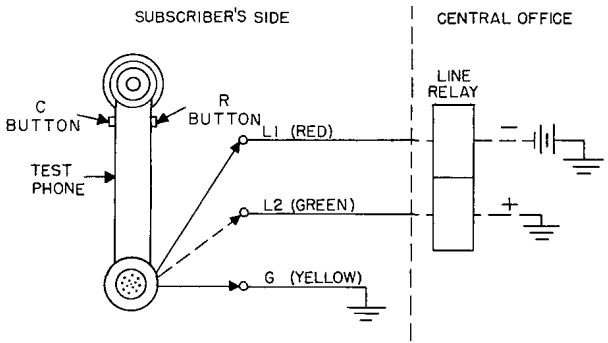

Figure 26. Line Polarity Identification.

6. HOOKSWITCH CONTACT SPRING ADJUSTMENT.

a. The hookswitch consists of two sets of twin contacts springs, with the lower set operating before the upper set.

b. The position of the contact springs both in the operated and unoperated position is shown in figure 27.

c. The springs are generally parallel, but have a slight curve and the upper springs of the combination should have a slight follow when operating. In adjusting these springs, be sure that the bar contacts on the lower spring of the combination engage the bar contacts of the upper spring simultaneously.

7. HOOKSWITCH OPERATING LEVER AND TENSION SPRING ADJUSTMENT.

a. To check the spring tension, remove the housing and replace the handset on cradle. The hookswitch lever should rest on either the coil-capacitor assembly or the mounting bracket. To increase the tension of the spring (fig. 5), bend the adjustment arm upward and, to decrease the tension, bend the arm downward.

b. In the off-hook position, the hookswitch lever should contact the lever stop. The lever stop is located on the hookswitch mounting bracket directly below the tension spring adjustment arm. To adjust the hookswitch travel, adjust the lever stop up or down.

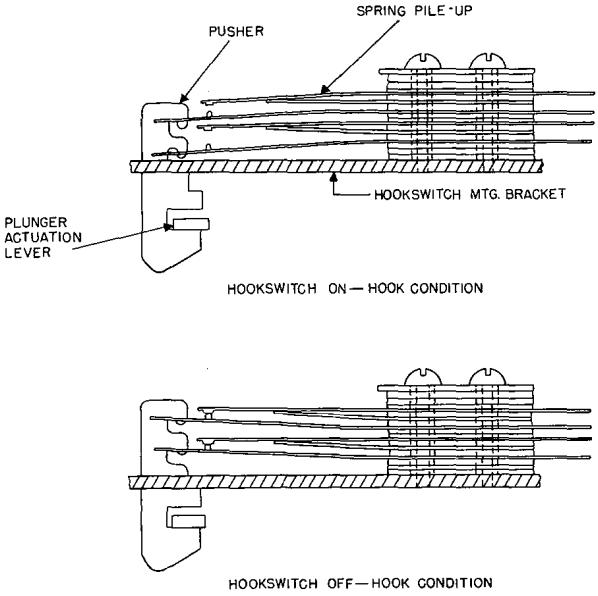

Figure 27. Hookswitch, Operated and Unoperated.

8. HANDSET CRADLE PLUNGER REPLACEMENT.

Replacement of plunger is covered in paragraph 4**b.**

9. DIAL.

The dial, its parts and maintenance, is covered in Stromberg-Carlson Engineering Bulletin, Construction and Maintenance of Stromberg-Carlson Tele-

10. REPLACEMENT OF RINGER.

a. Disconnect and tag the two wires from the ringer assembly.

b. Remove the three screws that secure the ringer to the baseplate. On the BT type telephone, remove the tube first by removing the two securing screws from the bottom of baseplate (removal of the tube bracket is necessary only when the Stromberg-Carlson No. 208282-000 mounting bracket assembly is used).

c. Remove the ringer assembly and replace with a new assembly. Replace the mounting screws and reconnect the leads as tagged.

11. REPLACEMENT OF HOOKSWITCH ASSEMBLY.

Replacement of the hookswitch assembly is the same on all models, and is accomplished as follows:

a. Disconnect and tag all leads from the hookswitch.

b. Remove the four mounting screws from the baseplate.

c. Remove the hookswitch assembly and replace with new assembly. Replace the mounting screws and reconnect the leads as tagged.

12. REPLACEMENT OF COIL-CAPACITOR ASSEMBLY.

Replacement of the coil-capacitor assembly is the same on all models, and is accomplished as follows:

a. Disconnect and tag all leads to the coil-capacitor assembly.

b. Remove the three screws that secure the coil-capacitor assembly to the baseplate.

c. Remove the coil-capacitor assembly and replace with new assembly. Replace the mounting screws and reconnect the leads as tagged.

13. REPLACEMENT OF TUBE, BT TYPE TELEPHONES ONLY.

The removal and replacement of the tube is as follows:

a. Remove the tube and bakelite bracket from the metal bracket by removing the one securing screw on the right-hand side of the tube mounting bracket.

b. Disconnect the black lead from the tube terminal block and the yellow and red leads from the coil-capacitor assembly (tag all leads before disconnecting).

c. Replace with new tube assembly and secure to mounting bracket.

d. Replace all wires.

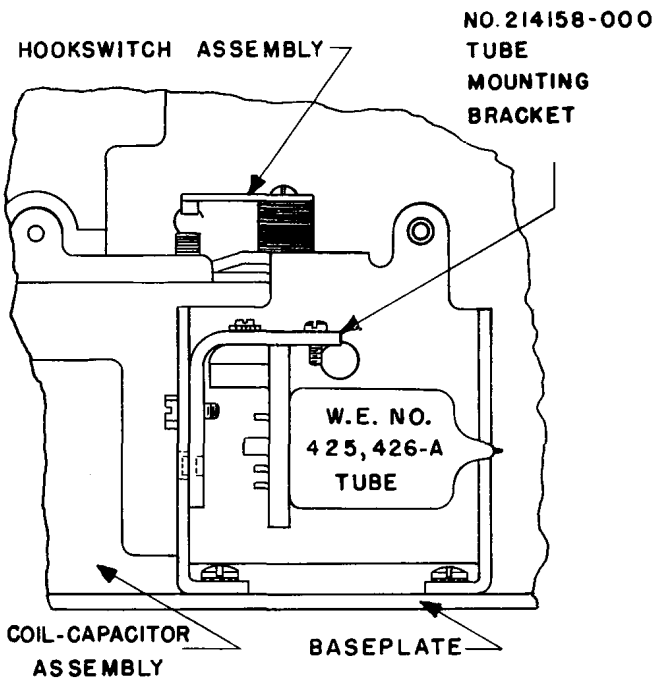

Figure 28. Installation of S.C. No. 214158-000 Tube Mounting Bracket.