DEPARTMENT OF THE ARMY TECHNICAL MANUAL

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TM 11-5805-243-35

TO 31W1-2PT-402

FIELD AND DEPOT MAINTENANCE

TELEPHONE SET TA-1/PT

DEPARTMENTS OF THE ARMY AND THE AIR FORCE

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TECHNICAL MANUAL
No. 11–5805–243–35
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AND THE AIR FORCE

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TELEPHONE SET TA–1/PT

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*** This manual, together with TM 11–5805–243–12/TO 31W1–2 PT–421, 14 September 1959, supersedes TM 11–2153/TO 31W1–2PT–261, 20 June 1956; including C 1, 26 July 1957; C 2, 7 July 1958; and C 3, 17 December 1958.**

CHAPTER 1

THEORY

1. Scope

a. This manual covers field and depot maintenance for Telephone Set TA–1/PT. It includes instructions appropriate to third, fourth, and fifth echelons for troubleshooting, testing, and adjusting the equipment, and replacing maintenance parts. It also lists tools and test equipment for third, fourth, and fifth echelon maintenance. Detailed functions of the equipment are covered in the schematic diagram analysis (par. 3).

b. The complete technical manual for this equipment includes TM 11–5805–243–12, TM 11–5805–243–12P, and TM 11–5805–243–35P

c. Forward comments concerning this manual to the Commanding Officer, U. S. Army Signal Publications Agency, Fort Monmouth, N. J.

Note. For applicable forms and records, see paragraph 2, TM 11–5805–243–12.

2. Differences in Equipment

Internal differences are listed in the chart below; external differences are listed in TM 11–5805–243–12.

Figure No.	Item	Order No.	Comment
7	Lockwasher (3)	24977 – Phila – 55 (serial No. 1 through 5009).	Not used.
4	Lockwashers (7)	19629–Phila–58	Not used.
6	Press-to-talk switch contact assembly S1 (11).	19629–Phila–58	Electrical contact assembly S1 is held together with *one* screw instead of two.
7	Generator contact assembly S2 (8).	19629–Phila–58	Electrical contact assembly S2 is held together with one screw instead of two.
1 and 10	Capacitor C1	24977 – Phila – 55 (serial No. 1 through 209).	Capacitor C1 is connected between transmitter element MK1 and receiver element RE1. On all other equipments, capacitor C1 is connected between transmitter element MK1 and buzzer DS1.

3. Schematic Diagram Analysis (fig. 1)

a. Outgoing Signaling.

(1) When the generator lever (fig. 2) is depressed, its initial motion actuates generator switch S2. The switch opens the circuit between line terminal L1 and buzzer DS1, the transmitting and the receiving circuits, and closes the circuit between line terminal L1 and generator G1. As the generator lever moves downward, it rotates the hand-generator rotor. This rotation generates 20 cycles per second (cps) alternating current (ac) at 65 to 80 volts, which is impressed across line terminals L1 and L2.

(2) When the generator lever is released, the lever, which is spring-loaded, springs back freely without turning the generator rotor. As the generator lever returns to its normal position, the spring contacts of the generator switch open the circuit between line terminal L1 and generator G1, and close the circuit between line terminal

L1 and buzzer DS1, the transmitting, and the receiving circuits.

b. Incoming Signaling.

(1) The incoming signaling current (ac) from the distant telephone or switchboard, passes through the normally closed contacts (A and B) of generator switch S2, and flows through buzzer DS1 and visual indicator DS2. The incoming signaling current is blocked from the receiving and transmitting circuits by capacitor C1, which offers high impedance to 20-cps current, and low impedance to voice-frequency currents.

(2) As the 20-cps signaling current passes through the coil of buzzer DS1, the armature of the buzzer is alternately magnetized. As the armature is magnetized in opposite directions, it vibrates between the poles of a permanent magnet and strikes against the buzzer diaphragm, producing the signaling sound.

(3) The buzzer volume is mechanically controlled by a screw attached to the buzzer volume control knob. The screw moves in or out to vary the distance through which the buzzer armature can vibrate. This action varies the force with which the armature strikes the diaphragm, and thereby determines the loudness of the buzzer sound. When the buzzer volume control knob is in the OFF position, the armature is clamped tight, so that it cannot vibrate; therefore, no sound can be produced.

(4) As the signaling current passes through the coil of visual indicator DS2, a magnetic field is produced. The magnetic field rotates the armature to a position where its markings (fig. 1, TM 11–5805–243–12) can be seen through openings in the top of the visual indicator. The armature is held in the operated position by a small permanent magnet attached to an arm that is linked to the press-to-talk switch. When the press-to-talk switch is pressed, the arm and its permanent magnet are moved away from the armature. The armature, which is spring-loaded, rotates back to the nonoperated position.

c. Voice Transmission.

(1) When press-to-talk switch S1 is depressed, contacts B and C connect to complete the transmitting circuit. Contacts B and A open to insert limiting resistor R1 in series with the receiver element.

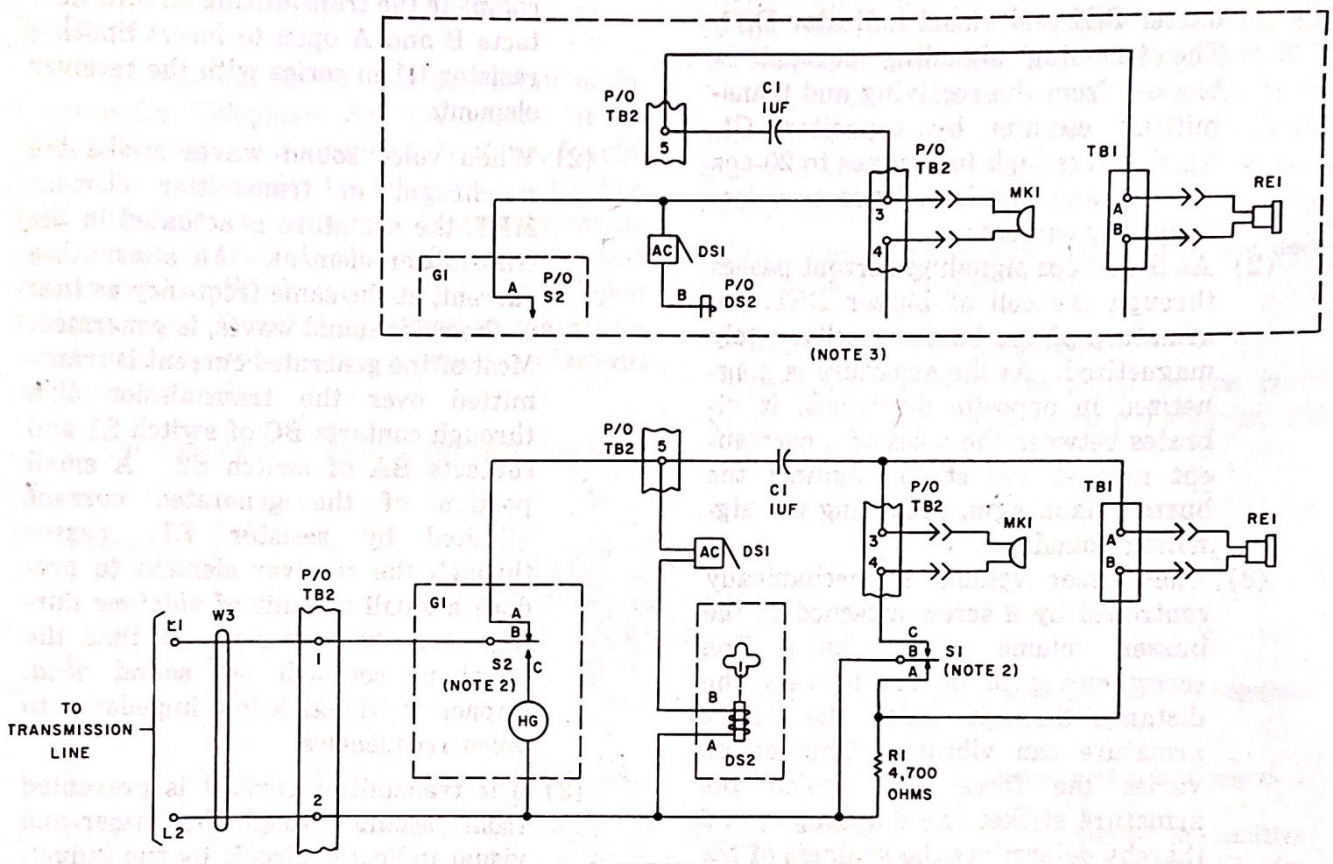
(2) When voice sound waves strike the diaphragm in transmitter element MK1, the armature is actuated in the transmitter element. An alternating current, at the same frequency as that of the voice sound waves, is generated. Most of the generated current is transmitted over the transmission line through contacts BC of switch S1 and contacts BA of switch S2. A small portion of the generated current (limited by resistor R1) passes through the receiver element to produce a small amount of *sidetone* during voice transmission, so that the telephone set will not sound dead. Capacitor C1 has a low impedance to voice frequencies.

(3) The transmitter current is prevented from passing through the buzzer and visual indicator circuit by the inductance of the windings of the buzzer and the visual indicator, which offer a high impedance to voice frequencies.

d. Voice Reception.

(1) The incoming voice signal passes through the normally closed contacts (A and B) of generator switch S2, through capacitor C1, receiver element RE1, and through the normally closed contacts (B and A) of press-to-talk switch S1.

(2) As the incoming voice signal passes through the receiver element, it actuates the receiver armature and, in turn, causes the receiver diaphragm to vibrate, thereby reproducing the voice of the distant party.



NOTES:

1. TERMINAL LETTER OR NUMBER DESIGNATIONS ARE ASSIGNED ARBITRARILY FOR REFERENCE PURPOSES.
2. GENERATOR SWITCH S2 AND PRESS-TO-TALK SWITCH S1 SHOWN IN NONOPERATED POSITION.
3. CAPACITOR C1 IS CONNECTED AS SHOWN ON EQUIPMENTS BEARING ORDER NO. 24977-PHILA-55, SERIAL NUMBERS 1 THROUGH 209.

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Figure 1. Telephone Set TA-1/PT, schematic diagram.

CHAPTER 2

TROUBLESHOOTING

4. General Instructions

Troubleshooting at field and depot maintenance levels includes all the techniques outlined for organizational maintenance (TM 11–5805–243–12) and any special or additional techniques required to isolate a defective part. The field and depot maintenance procedures are not complete in themselves but supplement the procedures described in TM 11–5805–243–12. The systematic troubleshooting procedure, which begins with the checks that can be performed at an organizational level, must be completed by means of localization and isolating techniques.

5. Troubleshooting Procedures

a. General. The first step in servicing a defective telephone set is to localize the fault. Localization means tracing the fault to a defective circuit. Isolation means tracing the fault to the defective part. Some faults, such as a burned-out coil or resistor, can often be located by sight or smell. The majority of faults, however, must be localized by checking resistances.

b. Localization. The telephone set consists of four circuits: the outgoing signaling circuit (par. 3*a*), the incoming signaling circuit (par. 3*b*), the voice transmission circuit (par. 3*c*), and the voice reception circuit (par. 3*d*). The first step in tracing trouble is to locate the circuit at fault by the following methods:

(1) *Visual inspection.* The purpose of visual inspection is to locate faults without testing or measuring circuits. All visual signs should be noted and an attempt made to localize the fault to one of the four circuits.

(2) *Operational tests.* Operational tests frequently indicate the general location of trouble. In many instances, the tests will help in determining the exact nature of the fault. The equipment performance checklist (TM 11–5805–243–12) is a good operational test.

c. Isolation. The checks listed below will aid in isolating the trouble. After the trouble has been localized to one of the four circuits (*b* above), isolate the trouble within that circuit by inspecting for defective mechanical operation and making resistance and continuity measurements.

(1) *Resistance measurements.* Use the wiring diagram (fig. 10) to locate the resistor and the coils. Use resistance measurements (par. 8) to find the value for normal readings, and compare them with readings taken.

(2) *Troubleshooting chart.* The symptoms listed in the troubleshooting chart (par. 7*c*) will aid in localizing trouble to a component part.

(3) *Intermittent troubles.* In all these tests, the possibility of intermittent troubles should not be overlooked. If present, this type of trouble often may be made to appear by tapping or jarring the equipment. Check the wiring and connections to the telephone set.

6. Tools and Test Equipment Required

Multimeter TS–352/U (multimeter) and Tool Equipment TE–49 are required for troubleshooting the telephone set.

7. Localizing and Isolating Troubles

a. General. In the troubleshooting chart (*c* below), procedures are outlined for localizing troubles in the four circuits of the telephone set. When trouble has been localized to the particular circuit, use resistance measurements (par. 8) to isolate the trouble to a particular part. Parts locations are indicated in figures

2, 3, and 6. Depending on the nature of the operational symptoms, one or more of the localizing procedures (par. 5*b*(1) and (2)) will be necessary.

b. Use of Chart. Use the troubleshooting chart in addition to the equipment performance checklist (TM 11–5805–243–12).

c. Troubleshooting Chart.

Symptom	Probable trouble	Correction
Binding post will not hold line wire firmly.	Defective binding post	Replace binding post (par. 13).
Buzzer volume control knob does not move freely.	Defective buzzer volume control	Replace buzzer volume control (par. 18).
Cannot signal distant party	Defective buzzer	Replace buzzer (par. 19).
	Defective generator switch contact assembly.	Clean contact assembly, and burnish contacts, if necessary.
		Adjust generator switch contact springs (par. 29).
		Replace generator switch contact assembly (par. 22).
	Defective generator	Check resistance (par. 8). Replace generator (par. 20), if necessary.
	Defective generator lever	Replace lever (par. 21).
Generator lever will not return to normal position when released.	Defective generator lever	Replace lever (par. 21).
Buzzer will not sound	Buzzer out of adjustment	Adjust buzzer (par. 30).
	Defective buzzer diaphragm	Replace buzzer diaphragm (par. 19).
	Defective buzzer	Check resistance (par. 8). Replace buzzer (par. 19), if necessary.
Visual indicator will not operate	Defective visual indicator coil	Check resistance (par. 8). Replace visual indicator coil (par. 26), if necessary.
	Defective visual indicator mechanism	Replace visual indicator mechanism (par 25).
Buzzer and visual indicator will not operate.	Defective buzzer coil	Check resistance (par. 8). Replace buzzer (par. 19), if necessary.
	Defective visual indicator coil	Check resistance (par. 8). Replace visual indicator coil (par. 26), if necessary.
Visual indicator will not stay in operated position.	Defective visual indicator mechanism.	Replace visual indicator mechanism (par 25).
Visual indicator will not return to nonoperated position when press-to-talk switch is pressed.	Defective visual indicator mechanism.	Replace visual indicator mechanism (par. 25).
	Defective press-to-talk lever assembly.	Replace lever assembly (par. 23).
Incoming 20-cps signal heard loudly in receiver, visual indicator and buzzer do not operate.	Capacitor C1 shorted	Check resistance (par. 8). Replace capacitor (par. 16).
Cannot hear sidetone in receiver when talking to distant party.	Resistor R1 open	Check resistance (par. 8).
Cannot talk to distant party	Defective transmitter element	Check resistance (par. 8). Replace transmitter element (par. 11) if necessary.
	Defective press-to-talk switch contact assembly.	Clean contact assembly, and burnish contacts, if necessary. Adjust contact springs (par. 28).
	Defective press-to-talk lever assembly.	Replace contact assembly (par. 24). Replace lever assembly (par. 23).

Symptom	Probable trouble	Correction
Press-to-talk switch will not return to listen position when released.	Defective press-to-talk lever assembly.	Replace lever assembly (par. 23).
Cannot hear distant party	Defective receiver element	Check resistance (par. 8). Replace receiver element (par. 12), if necessary.
	Defective press-to-talk switch contact assembly.	Clean contact assembly, and burnish contacts, if necessary. Adjust contact springs (par. 28).
	Defective press-to-talk lever assembly.	Replace contact assembly (par. 24).
		Replace lever assembly (par. 23).
	Capacitor C1 open	Check capacitor C1. Replace capacitor (par. 16), if necessary.
Cannot send or receive 20-cps signaling. Cannot send or receive voice.	Defective handset cord	Check continuity. Replace handset cord (par. 14), if necessary.
	Loose connection of handset cord	Remove the cover from the connector (par. 13*a*(1) and (2)) and check to see that the terminal lugs (4, fig. 4) are properly secured. Replace connector cover.
		Remove the chassis (par. 10*a*) from the handset housing (fig. 2) and check to see that the handset cord terminal lugs (5, fig. 5) are properly secured to the terminal board (6). Replace the chassis (par. 10*b*) in the handset housing.
	Defective generator switch contact assembly.	Clean contact assembly, and burnish contacts if necessary. Adjust contact springs (par. 29).
		Replace contact assembly (par. 22).
Buzzer volume control will not vary buzzer volume from no sound to loud sound.	Buzzer out of adjustment	Adjust buzzer (par. 30).
	Defective buzzer volume control	Replace buzzer volume control (par. 18).

8. Resistance Measurements (figs. 1 and 10)

Use Multimeter TS–352/U to check the telephone set for opens or shorts. Dc resistances of the telephone set are listed in the chart below.

Measurement point	Resistance (ohms)
Between line terminals L1 and L2 (chassis removed from housing (par. 10*a*))	1,520
Between line terminals L1 and L2 (generator lever fully depressed *before* applying test leads).	1,850
Across receiver element RE1 (removed from housing)	65 (click is heard)
Across transmitter element MK1 (removed from housing)	60 (click is heard)
Between terminals A and B of visual indicator coil DS2	720
Across buzzer DS1	800
Between terminals A and B of each generator coil	940 each
Between terminal A of visual indicator coil DS2 and receiver contact prong B (press-to-talk switch depressed).	4,700

CHAPTER 3

REPAIRS AND ADJUSTMENTS

Section I. REMOVAL AND REPLACEMENT OF PARTS

9. General Information

A removal and replacement procedure (pars. 10–26) must be followed when replacing most of the components of the telephone set. The majority of the components are on the chassis (fig. 2).

10. Removal and Replacement of Chassis (fig. 2)

When replacing the handset cord (par. 14) or an internal part of the telephone set, remove the chassis from the handset housing. Follow the step-by-step procedure outlined below to prevent damage to the receiver contact prongs and other internal parts.

a. Removal.

(1) Remove the four screws and the lockwashers from the chassis base.

(2) Press the generator lever in fully, and carefully withdraw the chassis from the handset housing. If the handset housing gasket becomes loosened, remove it carefully.

Caution: **Be extremely careful when withdrawing the chassis from the handset housing to prevent bending or damaging the receiver contact prongs. Bent or damaged prongs will interfere with reassembly.**

b. Replacement.

(1) Remove the receiver element (par. 12*a*) from the handset housing.

(2) Check to see that the handset housing gasket is in place; press the press-to-talk and generator levers in fully, and carefully replace the chassis in the handset housing. Be sure that the belt clip (fig. 5, TM 11–5805–243–12) does not slide inside the handset housing. Be extremely careful to pass the receiver contact prongs through the small holes in the receiver end of the handset housing.

(3) Secure the four screws and lockwashers to the chassis base.

(4) Replace the receiver element (par. 12*b*) in the handset housing.

11. Replacement of Transmitter Element (fig. 3)

a. Removal.

(1) Hold the handset in one hand and unscrew the transmitter cap (2).

Note. The transmitter cushion (1 (if provided)), the transmitter cap (2), and the moisture-preventing diaphragm (3) will separate from the handset as a single unit. Remove the transmitter cap carefully so that the remaining parts do not fall out.

(2) Remove the transmitter resonator (4) and the transmitter resonator support (5).

(3) Remove the transmitter element (6).

(4) Remove the gasket (7) from the transmitter element.

b. Replacement.

(1) Place the gasket (7) on the replacement transmitter element (6).

(2) Hold the handset in one hand and replace the transmitter element and the gasket.

(3) Replace the transmitter resonator support (5) and the transmitter resonator (4).

(4) Position the transmitter cap (2) over the parts already in place, and screw the transmitter cap to the handset.

12. Replacement of Receiver Element (fig. 3)

a. Removal.

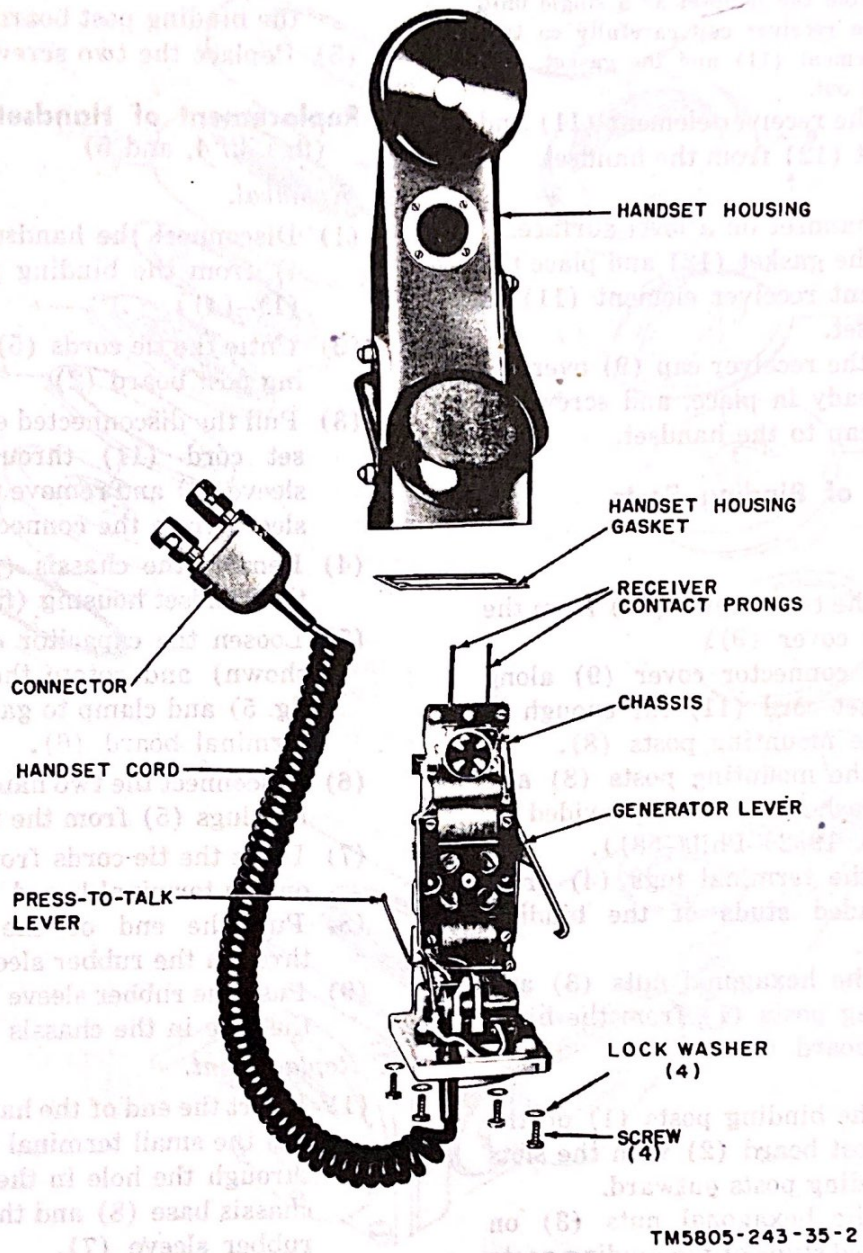


Figure 2. Telephone Set TA-1/PT, chassis removed.

(1) Hold the handset in one hand and unscrew the receiver cap (9).

Note. The receiver cushion (8 (if provided)), the receiver cap (9), and the moisture-preventing diaphragm (10) will separate from the handset as a single unit. Remove the receiver cap carefully so that receiver element (11) and the gasket (12) do not fall out.

(2) Remove the receiver element (11) and the gasket (12) from the handset.

b. Replacement.

(1) Lay the handset on a level surface.

(2) Replace the gasket (12) and place the replacement receiver element (11) in the handset.

(3) Position the receiver cap (9) over the parts already in place, and screw the receiver cap to the handset.

13. Replacement of Binding Posts (fig. 4)

a. Removal.

(1) Remove the two screws (10) from the connector cover (9).

(2) Slide the connector cover (9) along the handset cord (11) far enough to expose the mounting posts (8).

(3) Remove the mounting posts (8) and the lockwashers (7 (not provided on Order No. 19629–Phila–58)).

(4) Remove the terminal lugs (4) from the threaded studs of the binding posts (1).

(5) Remove the hexagonal nuts (3) and the binding posts (1) from the binding post board (2).

b. Replacement.

(1) Replace the binding posts (1) on the binding post board (2) with the slots in the binding posts outward.

(2) Replace the hexagonal nuts (3) on the threaded studs of the binding posts (1).

(3) Place the terminal lugs (4) on the threaded studs of the binding posts, and replace the lockwashers (7 (not provided on Order No. 19629–Phila 58)) and the mounting posts (8).

(4) Slide the connector cover (9) onto the rubber sleeve (6) and pull the rubber sleeve outward until its flange rests against the inside of the connector cover; set the cover against the binding post board (2). Be sure that the tie cord (5) does not stick out between the connector cover (9) and the binding post board (2).

(5) Replace the two screws (10).

14. Replacement of Handset Cord (figs. 2, 4, and 5)

a. Removal.

(1) Disconnect the handset cord (11, fig. 4) from the binding posts (par. 13*a* (1)–(4)).

(2) Untie the tie cords (5) from the binding post board (2).

(3) Pull the disconnected end of the handset cord (11) through the rubber sleeve (6) and remove the cord and the sleeve from the connector cover (9).

(4) Remove the chassis (par. 10*a*) from the handset housing (fig. 2).

(5) Loosen the capacitor clamp nut (not shown) and rotate the capacitor (4, fig. 5) and clamp to gain access to the terminal board (6).

(6) Disconnect the two handset cord terminal lugs (5) from the terminal board.

(7) Untie the tie cords from the stud (1) on the terminal board (6).

(8) Pull the end of the handset cord through the rubber sleeve (7).

(9) Push the rubber sleeve (7) up through the hole in the chassis base (8).

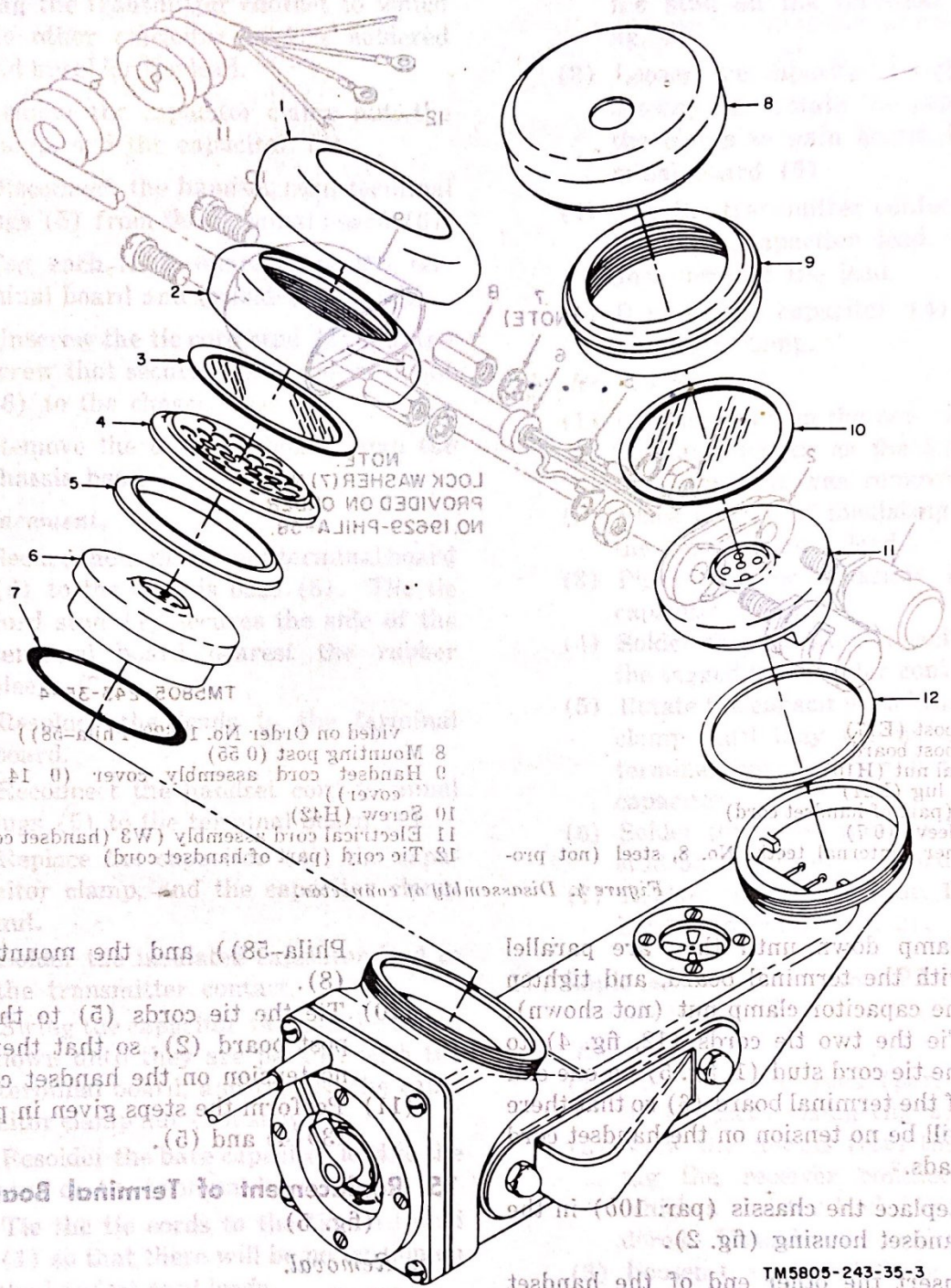
b. Replacement.

(1) Insert the end of the handset cord that has the small terminal lugs (5, fig. 5) through the hole in the bottom of the chassis base (8) and then through the rubber sleeve (7).

(2) Pull the rubber sleeve (7) outward through the hole in the bottom of the chassis until the flange on the sleeve rest firmly against the inside of the bottom of the chassis base.

(3) Reconnect the two handset cord terminal lugs (5) to the terminal board (6).

(4) Swing the capacitor (4) and the



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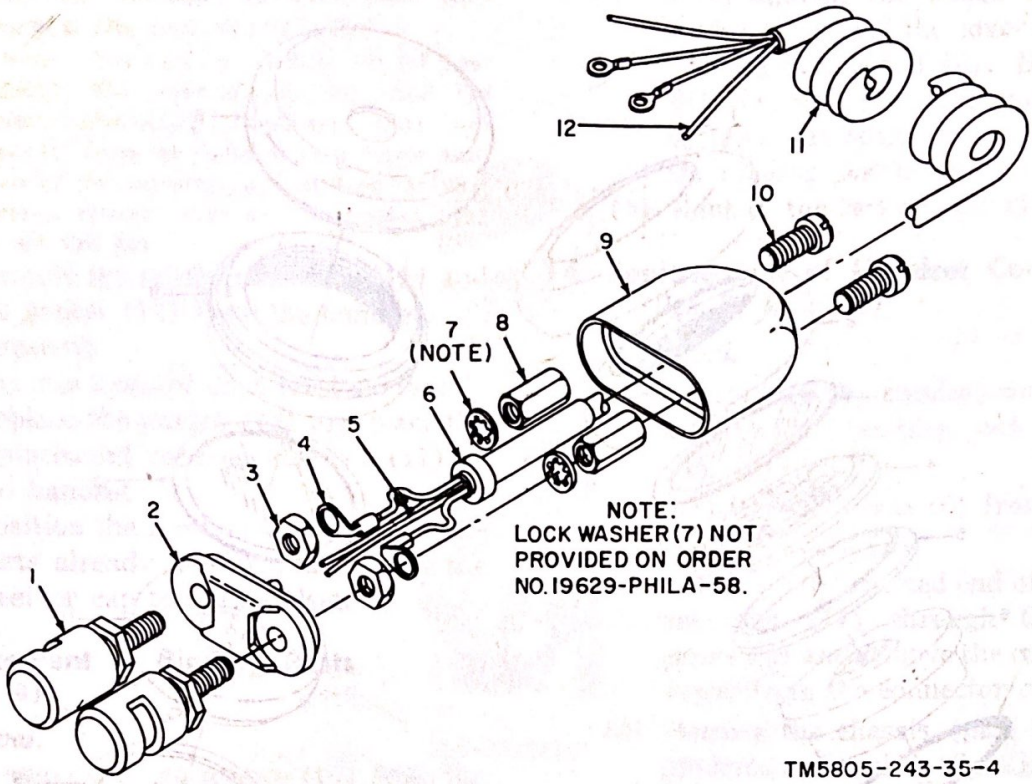
1 Transmitter cushion (E30 (not provided on Order No. 19629–Phila–58))
2 Transmitter cap (0 10 (or 0 77, provided on Order No. 19629–Phila–58))
3 Moisture-preventing diaphragm (DP2)
4 Transmitter resonator (E18)
5 Transmitter resonator support (A 8)
6 Transmitter element (MK1)
7 Gasket (0 28)
8 Receiver cushion (E8 (not provided on Order No. 19629–Phila–58))
9 Receiver cap (0 9 (or 0 76, provided on Order No. 19629–Phila–58))
10 Moisture-preventing diaphragm (DP3)
11 Receiver element (RE1)
12 Gasket (0 32)

Figure 3. Handset, removal of parts.



1 Binding post (E17)
2 Binding post board
3 Hexagonal nut (H10)
4 Terminal lug (E21)
5 Tie cord (part of handset cord)
6 Rubber sleeve (0 7)
7 Lockwasher (internal teeth, No. 8, steel (not provided on Order No. 19629–Phila–58))
8 Mounting post (0 55)
9 Handset cord assembly cover (0 14 (connector cover))
10 Screw (H42)
11 Electrical cord assembly (W3 (handset cord))
12 Tie cord (part of handset cord)

Figure 4. Disassembly of connector.

clamp down until they are parallel with the terminal board, and tighten the capacitor clamp nut (not shown).

(5) Tie the two tie cords (12, fig. 4) to the tie cord stud (1, fig. 5) on one end of the terminal board (6) so that there will be no tension on the handset cord leads.

(6) Replace the chassis (par. 10*b*) in the handset housing (fig. 2).

(7) Insert the other end of the handset cord through the center hole in the connector cover (9, fig. 4) and then through the rubber sleeve (6).

(8) Bend the two terminal lugs (4) into right angles as shown in figure 4.

(9) Place the two terminal lugs (4) on the threaded studs of the binding posts (1), and replace the lockwashers (7 (not provided on Order No. 19629–Phila–58)), and the mounting posts (8).

(10) Tie the tie cords (5) to the binding post board (2), so that there will be no tension on the handset cord leads.

(11) Perform the steps given in paragraph 13*b* (4) and (5).

15. Replacement of Terminal Board (fig. 5)

a. Removal.

(1) Remove the chassis (par. 10*a*) from the handset housing (fig. 2).

(2) Untie the tie cords from the tie cord stud (1, fig. 5).

(3) Unsolder the bare capacitor lead from the stud on the terminal board.

(4) Loosen the capacitor clamp nut (not shown) and rotate the capacitor (4) and the clamp to gain access to the terminal board (6).

(5) Tag the transmitter contact to which the other capacitor lead is soldered and unsolder the lead.

(6) Remove the capacitor clamp nut, the clamp, and the capacitor (4).

(7) Disconnect the handset cord terminal lugs (5) from the terminal board (6).

(8) Tag each lead connected to the terminal board and unsolder the leads.

(9) Unscrew the tie cord stud (1) and the screw that secures the terminal board (6) to the chassis base (8).

(10) Remove the terminal board from the chassis base.

b. Replacement.

(1) Secure the replacement terminal board (6) to the chassis base (8). The tie cord stud (1) secures the side of the terminal board nearest the rubber sleeve (7).

(2) Resolder the leads to the terminal board.

(3) Reconnect the handset cord terminal lugs (5) to the terminal board (6).

(4) Replace the capacitor (4), the capacitor clamp, and the capacitor clamp nut.

(5) Solder the insulated capacitor lead to the transmitter contact.

(6) Swing the capacitor (4) and the clamp down until they are parallel with the terminal board, and tighten the capacitor clamp nut (not shown).

(7) Resolder the bare capacitor lead to the stud on the terminal board.

(8) Tie the tie cords to the tie cord stud (1) so that there will be no tension on the handset cord leads.

(9) Replace the chassis (par. 10*b*) in the handset housing (fig. 2).

16. Replacement of Capacitor C1
(fig. 5)

a. Removal.

(1) Remove the chassis (par. 10*a*) from the handset housing (fig. 2).

(2) Unsolder the bare capacitor lead from the stud on the terminal board (6, fig. 5).

(3) Loosen the capacitor clamp nut (not shown) and rotate the capacitor and the clamp to gain access to the terminal board (6).

(4) Tag the transmitter contact to which the other capacitor lead is soldered and unsolder the lead.

(5) Remove the capacitor (4) from the capacitor clamp.

b. Replacement.

(1) Cut the leads on the new capacitor to the same length as the leads on the capacitor that was removed.

(2) Place a piece of insulating tubing on the long capacitor lead.

(3) Place the new capacitor (4) in the capacitor clamp.

(4) Solder the insulated capacitor lead to the tagged transmitter contact.

(5) Rotate the capacitor and the capacitor clamp until they are parallel to the terminal board (6) and tighten the capacitor clamp nut (not shown).

(6) Solder the bare capacitor lead to the stud on the terminal board (6).

(7) Replace the chassis (par. 10*b*) in the handset housing (fig. 2).

17. Replacement of Resistor R1
(figs. 6 and 10)

a. Removal.

(1) Remove the chassis (par. 10*a*) from the handset housing (fig. 2).

(2) View the chassis from the rear, and tag the receiver contact prong to which a resistor lead (fig. 10) is soldered. Unsolder the lead.

(3) Loosen the screw (18, fig. 6).

(4) Move the magnet pole piece (20) away from the core of the visual indicator coil (21). Carefully move the visual indicator coil to gain access to the coil terminals (not shown).

(5) Tag the lead that connects to the same terminal of the visual indicator coil (21) as the resistor.

(6) Unsolder the resistor lead and remove resistor R1.

b. Replacement.

(1) Cut the leads of he new resistor to the same length as the leads of the resistor that was removed.

(2) Place a piece of insulating tubing on the long resistor lead.

(3) Solder the insulated resistor lead to the terminal on the visual indicator coil (21) that is indicated by the tagged lead.

(4) Place the ends of the core of the visual indicator coil (21) in the slots in the magnet pole pieces (20 and 22), and tighten the loosened screw (18).

(5) Solder the other resistor lead to the receiver contact prong that is indicated by the tag.

(6) Replace the chassis (par. 10*b*) in the handset housing (fig. 2).

18. Replacement of Buzzer Volume Control (fig. 5)

a. Removal.

(1) Remove the four screws (19) that secure the buzzer volume control (18) to the chassis base (8).

(2) Remove the buzzer volume control (18) from the chassis base (8).

b. Replacement.

(1) Position the buzzer volume control (18) on the chassis base (8) as shown in figure 5, TM 11–5805–243–12.

(2) Replace and secure the four screws (19).

Note. If the buzzer does not function properly, it may require adjustment (par. 30).

19. Replacement of Buzzer and Handset Buzzer Diaphragm (fig. 5)

a. Removal.

(1) Remove the chassis (par. 10*a*) from the handset housing (fig. 2).

(2) Remove one screw and lockwasher from the belt clip (fig. 5, TM 11–5805–243–12); loosen the other screw and rotate the belt clip to gain access to the rear of the chassis.

(3) Remove the two screws (3, fig. 5) that secure the chassis base (8) to the handset chassis mounting plate (2).

(4) Move the chassis base (8) to gain access to the terminals on the buzzer coil (not shown).

(5) Tag and unsolder the wires connected to the buzzer coil terminals.

(6) Remove the buzzer volume control (par. 18*a*).

(7) Set a small punch against either of the two blind holes (not shown) on the top surface of the externally threaded ring (17), and drive the ring counterclockwise. Be careful not to bend the receiver and transmitter contacts. Remove the ring from the chassis base.

(8) Remove the gasket retainer (16), gasket (15), handset buzzer diaphragm (14), spacing ring (13), and buzzer (12).

b. Replacement.

(1) Replace the buzzer (12), spacing ring (13), handset buzzer diaphragm (14), gasket (15), and the gasket retainer (16).

(2) Replace and tighten the externally threaded ring (17).

(3) Replace the buzzer volume control (par. 18*b*).

(4) Resolder the wires to the buzzer coil terminals (not shown).

(5) Position the chassis base (8) against the handset chassis mounting plate (2) and replace the two screws (3).

(6) Secure the belt clip to the chassis base (8).

(7) Replace the chassis (par. 10*b*) in the handset housing (fig. 2).

20. Replacement of Generator (fig. 6)

a. Removal.

(1) Remove the chassis (par. 10*a*) from the handset housing (fig. 2).

(2) Remove the two screws (27, fig. 6) and the lockwashers (26) that secure the visual indicator (25) to the handset chassis mounting plate (17).

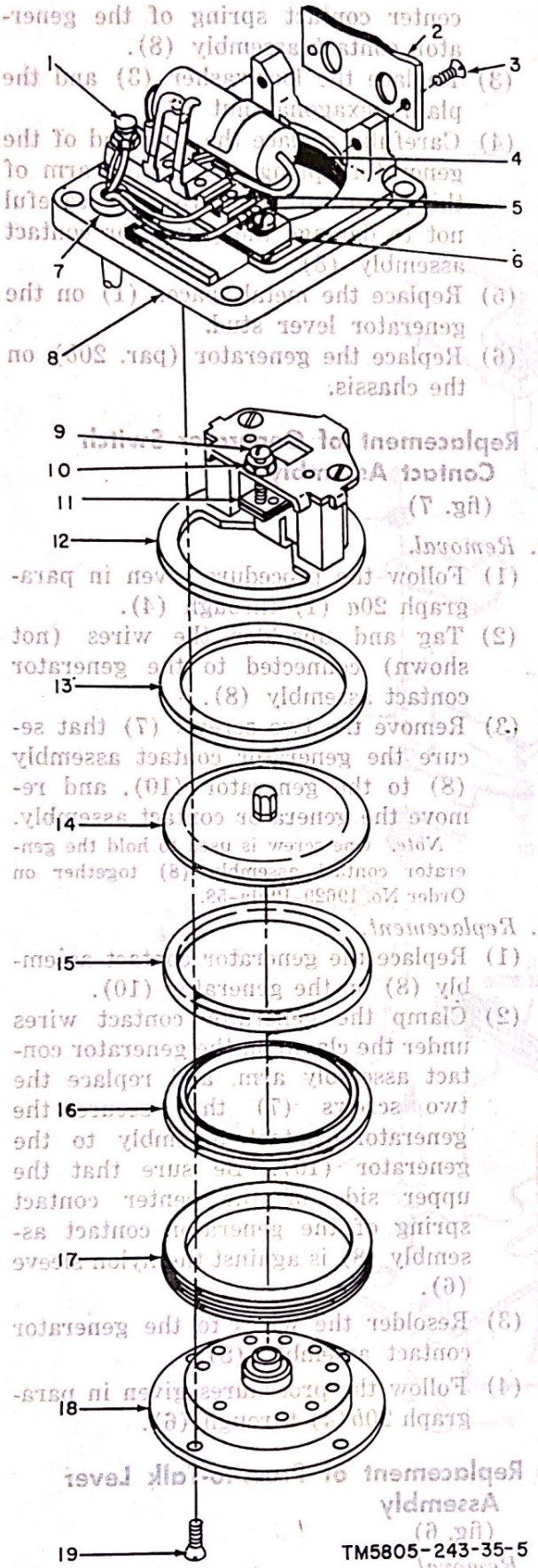


Figure 5. Removal of buzzer.

(3) Remove the visual indicator (25) from the handset chassis mounting plate (17).

(4) Remove the pin (24) that secures the metal band (23) to the visual indicator (25); move the metal band (23) away from the side of the generator (3).

(5) Remove the screw (1) and the cable clamp (2) from the generator (3).

(6) Remove the three screws (16) that hold the generator (3) to the handset chassis mounting plate (17).

(7) Carefully move the generator (3) away from the handset chassis mounting plate (17) to gain access to the rear of the generator. The metal spacer (1, fig. 7) may fall off the generator lever stud. Do not misplace it.

(8) Tag, unsolder, and remove the two leads connected to the generator contact assembly (8) and the lead that connects one of the generator coils (not shown) to the terminal board.

(9) Remove the generator (3, fig. 6) from the handset chassis mounting plate (17).

b. Replacement.

(1) Position the generator (3) on the handset chassis mounting plate (17) and resolder the leads previously removed (*a*(8) above).

1 Tie cord stud
2 Handset chassis mounting plate (A 7)
3 Screw (slot drive No. 4-40, flat head, steel, 5/16 inch long)
4 Capacitor (C1)
5 Handset cord terminal lugs
6 Terminal board (TB2)
7 Rubber sleeve (0 7)
8 Handset handle cover (0 18 (chassis base))
9 Screw (H37)
10 Plain hexagonal nut (H8)
11 Buzzer armature (part of buzzer (DS1))
12 Buzzer (DS1)
13 Spacing ring (0 60)
14 Handset buzzer diphragm (DP1)
15 Gasket (0 31)
16 Gasket retainer (0 58)
17 Externally threaded ring (0 59)
18 Handset handle cover (0 17 (buzzer volume control))
19 Screw (H23)

Figure 5—Continued.

(2) Replace the three screws (16) that secure the generator to the handset chassis mounting plate. Be sure that the metal spacer (1, fig. 7) is in place.

(3) Place the clamp (2, fig. 6) over the cabling on the side of the generator, and screw the clamp (2) to the generator (3).

(4) Replace the metal band (23) on the visual indicator (25) and replace the pin (24). Be sure that the pin is inserted, so that the head of the pin will be next to the handset chassis mounting plate (17) when the visual indicator (25) is replaced.

(5) Replace the visual indicator (25 on the handset chassis mounting plate (17) and replace the two lockwashers (26) and the two screws (27).

(6) Replace the chassis (par. 10*b*) in the handset housing (fig. 2).

21. Replacement of Generator Lever
(fig. 7)

a. Removal.

(1) Remove the generator (par. 20*a*) from the chassis.

(2) Remove the metal spacer (1, fig. 7) from the generator lever stud.

(3) Carefully remove the end of the generator spring (4) from the arm of the generator lever (5); use extreme care to prevent damage to the generator contact assembly (8).

(4) Remove the plain hexagonal nut (2) and the lockwasher (3).

Note. The lockwasher (3) is not provided on equipments bearing Order No. 24977–Phila–55, serial numbers 1 through 5009.

(5) Carefully remove the generator lever (5) and the generator spring (4) from the generator (10).

b. Replacement.

(1) Replace the generator lever (5) and the generator spring (4) on the generator (10).

(2) Replace the short end of the generator spring (4) in the generator spring hole (9) in the generator frame. Be sure that the nylon sleeve (6) is against the upper side of the center contact spring of the generator contact assembly (8).

(3) Replace the lockwasher (3) and the plain hexagonal nut (2).

(4) Carefully replace the long end of the generator spring (4) on the arm of the generator lever (5); be careful not to damage the generator contact assembly (8).

(5) Replace the metal spacer (1) on the generator lever stud.

(6) Replace the generator (par. 20*b*) on the chassis.

22. Replacement of Generator Switch Contact Assembly
(fig. 7)

a. Removal.

(1) Follow the procedure given in paragraph 20*a* (1) through (4).

(2) Tag and unsolder the wires (not shown) connected to the generator contact assembly (8).

(3) Remove the two screws (7) that secure the generator contact assembly (8) to the generator (10), and remove the generator contact assembly.

Note. One screw is used to hold the generator contact assembly (8) together on Order No. 19629–Phila–58.

b. Replacement.

(1) Replace the generator contact assembly (8) on the generator (10).

(2) Clamp the generator contact wires under the clamp on the generator contact assembly arm, and replace the two screws (7) that secure the generator contact assembly to the generator (10). Be sure that the upper side of the center contact spring of the generator contact assembly (8) is against the nylon sleeve (6).

(3) Resolder the wires to the generator contact assembly (8).

(4) Follow the procedures given in paragraph 20*b* (4) through (6).

23. Replacement of Press-to-Talk Lever Assembly
(fig. 6)

a. Removal.

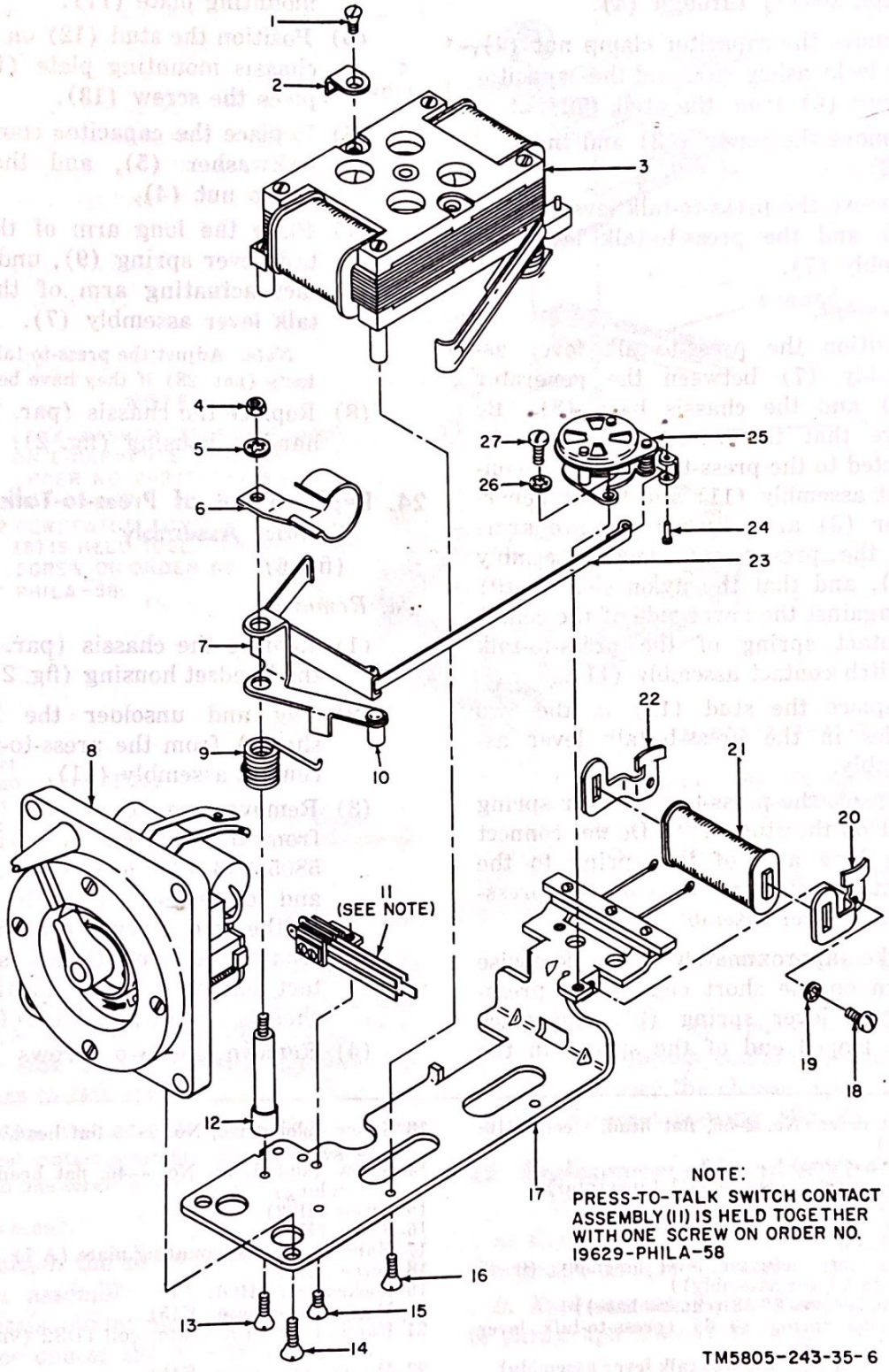


Figure 6. Disassembly of chassis.

(1) Follow the procedures given in paragraph 20*a*(1) through (4).

(2) Remove the capacitor clamp nut (4), the lockwasher (5), and the capacitor clamp (6) from the stud (12).

(3) Remove the screw (13) and the stud (12).

(4) Remove the press-to-talk lever spring (9) and the press-to-talk lever assembly (7).

b. Replacement.

(1) Position the press-to-talk lever assembly (7) between the generator (3) and the chassis base (8). Be sure that the wires that are connected to the press-to-talk switch contact assembly (11) and to the generator (3) are between the two arms of the press-to-talk lever assembly (7), and that the nylon sleeve (10) is against the lower side of the center contact spring of the press-to-talk switch contact assembly (11).

(2) Replace the stud (12) in the two holes in the press-to-talk lever assembly.

(3) Replace the press-to-talk lever spring (9) on the stud (12). Do *not* connect the long arm of the spring to the contact actuating arm of the press-to-talk lever assembly (7).

(4) Take approximately one clockwise turn on the short end of the press-to-talk lever spring (9), and place the looped end of the spring in the spring slot on the handset chassis mounting plate (17).

(5) Position the stud (12) on the handset chassis mounting plate (17) and replace the screw (13).

(6) Replace the capacitor clamp (6), the lockwasher (5), and the capacitor clamp nut (4).

(7) Place the long arm of the press-to-talk lever spring (9), under the contact actuating arm of the press-to-talk lever assembly (7).

Note. Adjust the press-to-talk switch contacts (par. 28) if they have been bent.

(8) Replace the chassis (par. 10*b*) in the handset housing (fig. 2).

24. Replacement of Press-to-Talk Switch Contact Assembly

(fig. 6)

a. Removal.

(1) Remove the chassis (par. 10*a*) from the handset housing (fig. 2).

(2) Tag and unsolder the leads (not shown) from the press-to-talk switch contact assembly (11).

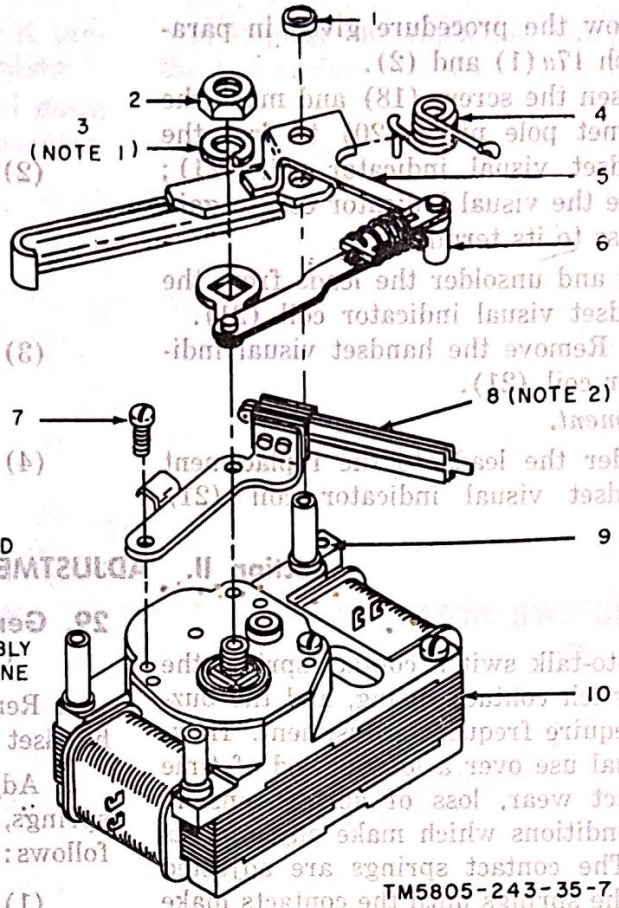
(3) Remove one screw and lockwasher from the belt clip (fig. 5, TM 11–5805–243–12); loosen the other screw and rotate the belt clip to gain access to the two screws (15, fig. 6) that secure the press-to-talk switch contact assembly (11) to the handset chassis mounting plate (17).

(4) Remove the two screws (15)

---

1 Screw (slot drive, No. 2–56, flat head, steel, 3/16-inch long)
2 Clamp (cable clamp)
3 Telephone handset generator (G1 (generator))
4 Nut (capacitor clamp nut)
5 Lockwasher (capacitor clamp lockwasher)
6 Capacitor clamp
7 Contact assembly actuator level assembly (0 45 (press-to-talk lever assembly))
8 Handset handle cover (0 18 (chassis base))
9 Helical torsion spring (0 65 (press-to-talk lever spring)
10 Nylon sleeve (part of press-to-talk lever assembly)
11 Electrical contact assembly (S1 (press-to-talk switch contact assembly)). On Order No. 19629–Phila–58, only one screw is used to hold the assembly together.
12 Stud (H45)
13 Screw (slot drive, No. 2–56 flat head, steel, ¼-inch long)
14 Screw (slot drive, No. 4–40, flat head, steel, 5/16-inch long)
15 Screw (H22)
16 Screw (H28)
17 Handset chassis mounting plate (A 7)
18 Screw (H18)
19 Lockwasher (H50)
20 Magnet pole piece (E15)
21 Handset visual indicator coil (DS2 (visual indicator coil))
22 Magnet pole piece (E16)
23 Metal band (part of press-to-talk lever assembly)
24 Pin (H12)
25 Handset visual indicator (I2 (visual indicator))
26 Lockwasher (H52)
27 Screw (H17)

Figure 6—Continued.



NOTES:

1. LOCK WASHER (3) IS NOT USED ON EQUIPMENTS BEARING ORDER NO. 24977-PHILA-55, SERIAL NO. 1 THROUGH 5009.
2. GENERATOR CONTACT ASSEMBLY (8) IS HELD TOGETHER WITH ONE SCREW ON ORDER NO. 19629-PHILA-58.

1 Metal spacer
2 Plain hexagonal nut (H11)
3 Lockwasher
4 Helical torsion spring (0 64 (generator spring)
5 Generator cranking lever assembly (0 46 (generator lever))
6 Nylon sleeve (part of generator lever)
7 Screw (H25)
8 Electrical contact assembly (S2 (generator contact assembly)). On Order No. 19629-Phila-58, only one screw is used to hold the assembly together.
9 Generator spring hole
10 Telephone handset generator (G1 (generator))

Figure 7. Disassembly of generator.

(5) Press the press-to-talk lever in fully and remove the press-to-talk switch contact assembly (11) from the side of the chassis opposite the press-to-talk lever.

Note. On Order No. 19629-Phila-58, electrical contact assembly (S1) is held together with one screw instead of two.

b. Replacement.

(1) Position the press-to-talk switch contact assembly (11) on the handset chassis mounting plate (17) and replace one of the screws (15).

(2) Press the press-to-talk lever in fully, position the press-to-talk switch contact assembly on the handset chassis mounting plate, and replace the other screw (15).

(3) Secure the belt clip to the chassis base (8).

(4) Resolder the leads to the press-to-talk switch contact assembly (11).

(5) Replace the chassis (par. 10*b*) in the handset housing (fig. 2).

25. Replacement of Handset Visual Indicator (fig. 6)

a. Removal. Follow the procedures given in paragraph 20*a*(1) through (4).

b. Replacement. Follow the procedures given in paragraph 20*b*(4) through (6).

26. Replacement of Handset Visual Indicator Coil (fig. 6)

a. Removal.

(1) Follow the procedure given in paragraph 17*a*(1) and (2).

(2) Loosen the screw (18) and move the magnet pole piece (20) to free the handset visual indicator coil (21); move the visual indicator coil to gain access to its terminals.

(3) Tag and unsolder the leads from the handset visual indicator coil (21).

(4) Remove the handset visual indicator coil (21).

b. Replacement.

(1) Solder the leads to the replacement handset visual indicator coil (21) terminals; be sure that the long insulated lead of the resistor (not shown) is soldered to the proper terminals.

(2) Place the ends of the core of the handset visual indicator coil (21) in the slots in the magnet pole pieces (20 and 22), and tighten the loosened screw (18).

(3) Solder the resistor lead to the receiver contact prong from which it was unsoldered.

(4) Replace the chassis (par. 10*b*) in the handset (fig. 2).

Section II. ADJUSTMENTS

27. General

The press-to-talk switch contact spring, the generator switch contact spring, and the buzzer do not require frequent adjustment. However, continual use over a long period of time causes contact wear, loss of spring tension, and other conditions which make adjustments necessary. The contact springs are adjusted by bending the springs until the contacts make properly. No special tools are required. Be sure that the contacts are clean before adjusting the contact springs. Burnish the contacts if necessary. The handset should be checked for proper operation after any adjustment is completed. Improper operation indicates the need for readjustment.

28. Press-to-Talk Switch Contact Spring (fig. 8)

a. Remove the chassis (par. 10*a*) from the handset housing (fig. 2).

b. Adjust the press-to-talk switch contact springs, so that the contacts will operate as follows:

(1) When the press-to-talk lever is depressed, the center contact must break from the upper contact and make with the lower contact (A, fig. 8).

(2) When the press-to-talk lever is released, the center contact must break from the lower contact and make with the upper contact (B, fig. 8).

c. Replace the chassis (par. 10*b*) in the handset housing.

29. Generator Switch Contact Springs (fig. 8)

a. Remove the chassis (par. 10*a*) from the handset housing (fig. 2).

b. Adjust the generator switch contact springs, so that the contacts will operate as follows:

(1) When the generator lever is depressed, the center contact must break from the lower contact and make with the upper contact (C, fig. 8).

(2) When the generator lever is released, the center contact must break from the upper contact and make with the lower contact (D, fig. 8).

c. Replace the chassis (par. 10*b*) in the handset housing.

30. Buzzer (figs. 5 and 6)

a. Remove the chassis (par. 10*a*) from the handset housing (fig. 2).

b. Remove the nut (4, fig. 6), the lockwasher (5), and the capacitor clamp (6).

c. Loosen the plain hexagonal nut (10, fig. 5), and unscrew the screw (9) until there is a place of about 1/8 inch between the end of the screw and the buzzer armature (11).

d. Rotate the buzzer volume control knob to the OFF (extreme clockwise) position.

e. Screw the screw (9) down until it prevents the buzzer armature from vibrating.

f. Screw the plain hexagonal nut (10) down until it secures the screw (9) firmly in position.

g. Replace the capacitor clamp (6, fig. 6), the lockwasher (5), and the nut (4).

h. Replace the chassis (par. 10b) in the handset housing.

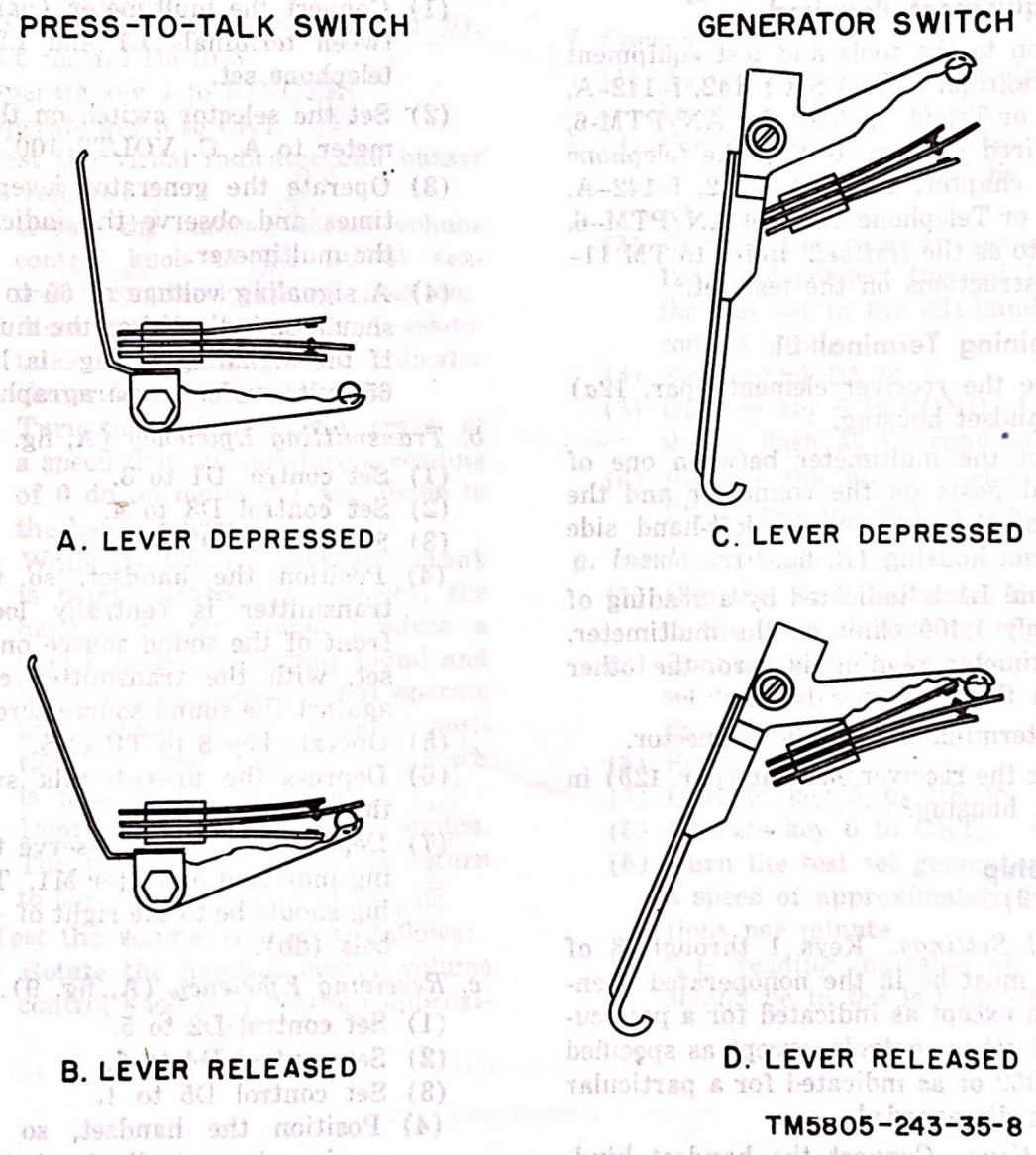


Figure 8. Adjustment of switch contact springs.

CHAPTER 4

FINAL TESTING

31. Purpose of Final Testing

The tests described in this chapter are designed to measure the performance capability of a repaired equipment. Equipment that meets the minimum standards stated in the tests will furnish satisfactory operation equivalent to that of new equipment.

32. Test Equipment Required

In addition to the tools and test equipment listed in paragraph 6, Test Set I–142, I–142–A, or I–142–B, or Telephone Test Set AN/PTM-6, is also required for final testing the telephone set. In this chapter, Test Set I–142, I–142–A, or I–142–B, or Telephone Test Set AN/PTM–6, is referred to as the *test set.* Refer to TM 11–2062 for instructions on the test set.

33. Determining Terminal L1

a. Remove the receiver element (par. 12*a*) from the handset housing.

b. Connect the multimeter between one of the terminal posts on the connector and the receiver contact prong on the left-hand side of the handset housing (B, fig. 9).

c. Terminal L1 is indicated by a reading of approximately 1,400 ohms on the multimeter. If the multimeter reading is zero, the other terminal on the connector is L1.

d. Mark terminal L1 on the connector.

e. Replace the receiver element (par. 12*b*) in the handset housing.

34. Test Setup
(fig. 9)

a. Control Settings. Keys 1 through 8 of the test set must be in the nonoperated (center) position except as indicated for a particular test. All other controls, except as specified in TM 11–2062 or as indicated for a particular test, may be disregarded.

b. Connections. Connect the handset binding posts to jack L1–L2 on the test set unless otherwise specified; use the test cord.

35. Tests

Turn the test set on at least 5 minutes before performing the tests indicated in *b* through *g* below.

a. Signaling Voltage.

(1) Connect the multimeter (par. 6) between terminals L1 and L2 of the telephone set.

(2) Set the selector switch on the multimeter to A. C. VOLTS 100.

(3) Operate the generator lever several times and observe the indication on the multimeter.

(4) A signaling voltage of 65 to 80 volts should be indicated on the multimeter. If the signaling voltage is less than 65 volts, refer to paragraph 7*c*.

b. Transmitting Efficiency (A, fig. 9).

(1) Set control D1 to 3.
(2) Set control D3 to 4.
(3) Set control D5 to 1.
(4) Position the handset, so that the transmitter is centrally located in front of the sound source on the test set, with the transmitter cap flush against the sound source screen.
(5) Operate key 8 to TRANS.
(6) Depress the press-to-talk switch on the telephone set.
(7) Depress key 9 and observe the reading indicated on meter M1. The reading should be to the right of −10 decibels (db).

c. Receiving Efficiency (A, fig. 9).

(1) Set control D2 to 5.
(2) Set control D4 to 5.
(3) Set control D5 to 1.
(4) Position the handset, so that the receiver is centrally located in front

of the sound source on the test set, with the receiver ear cushion flush against the sound source screen.

(5) Operate key 8 to REC.

(6) Depress key 9 and observe the reading indicated on meter M1. The reading should be to the right of −7 db.

d. Generator (A, fig. 9).

(1) Set control D5 to 1.

(2) Operate key 4 to GEN.

(3) Operate key 6 to CKT.

(4) Press the generator lever in several times in rapid succession, keeping the generator armature rotating at normal speed, and observe the reading indicated on meter M1. The reading should be to the right of −10 db.

e. Buzzer and Visual Indicator (A, fig. 9).

(1) Set control D5 to 3.

(2) Operate key 4 to RINGER.

(3) Operate key 6 to CKT.

(4) Test the visual indicator and buzzer as follows:

(*a*) Rotate the handset buzzer volume control knob to the LOUD (extreme counterclockwise) position.

(*b*) Momentarily depress the press-to-talk switch, if the visual indicator shows four white markings.

(*c*) Turn the test generator crank at a speed that will produce a reading of 0 db on meter M1 and listen to the handset buzzer.

(*d*) While the test set generator crank is being turned ((*c*) above), the handset buzzer should produce a loud continuous buzzing sound and the visual indicator should operate and remain in the operated position until the press-to-talk switch is depressed ((*e*) below).

(*e*) Depress the press-to-talk switch. The visual indicator should return to the nonoperated position.

(5) Test the volume control as follows:

(*a*) Rotate the handset buzzer volume control knob to a position approximately halfway between the LOUD (extreme counterclockwise) position and the OFF (extreme clockwise) position.

(*b*) Repeat the procedure given in (4) (*c*) above. While the crank is being turned, the handset buzzer should produce a continuous buzzing sound of medium loudness.

(*c*) Rotate the handset buzzer volume control knob to the OFF (extreme clockwise) position.

(*d*) Repeat the procedure given in (4) (*c*) above. The handset buzzer should produce no sound if the buzzer is properly adjusted (par. 30).

f. Capacitor C1 (B, fig. 9).

(1) Adjust the capacitor test circuit (TM 11–2062) of the test set.

(2) Connect the black lead from the test set to terminal L1 on the telephone set.

(3) Remove the receiver element (par. 12*a*) and connect the red lead from the test set to the left-hand receiver contact prong.

(4) Set control D5 to 1.

(5) Operate key 6 to COND. Lamp LP2 should flash at 1-second intervals.

(6) Replace the receiver element (par. 12*b*) when the test is completed.

g. Insulation Resistance (C, fig. 9).

(1) Clip the black lead from the test set to the handset housing (fig. 2).

(2) Connect the red lead from the test set to terminal L2 (fig. 1 or 10) of the telephone set.

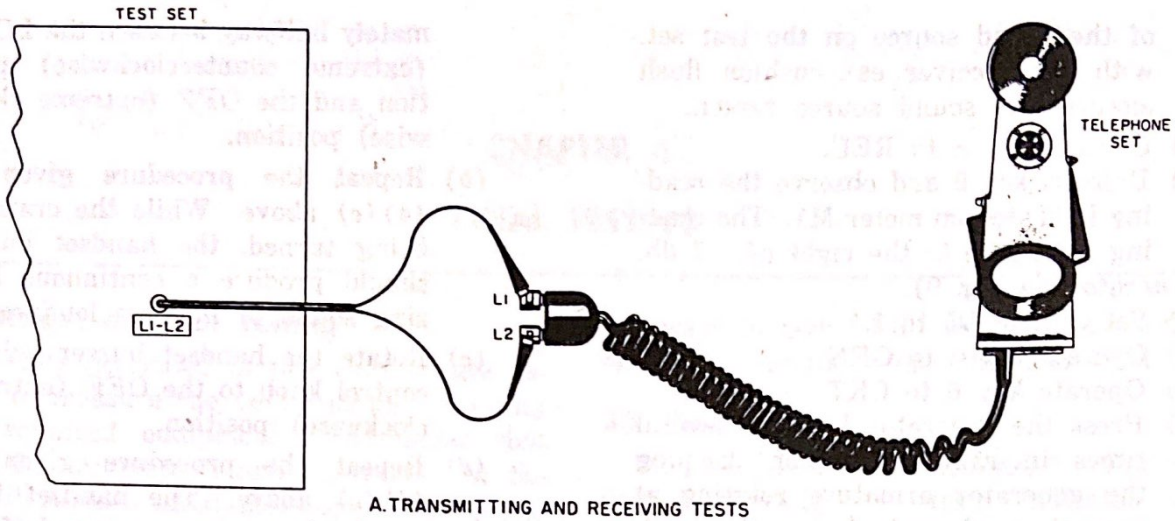
(3) Set control D5 to 1.

(4) Operate key 5 to BKDN.

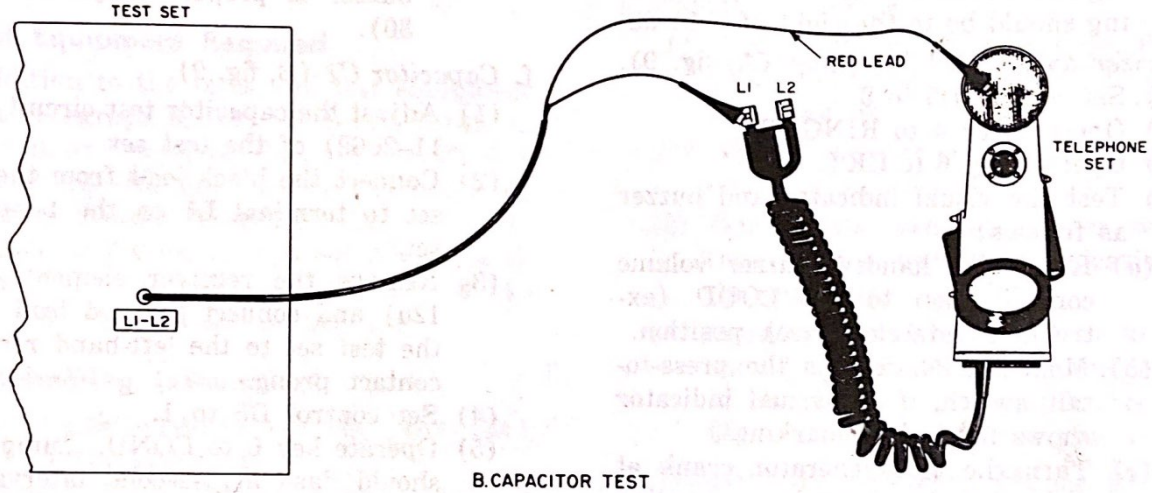
(5) Operate key 6 to CKT.

(6) Turn the test set generator crank at a speed of approximately 200 revolutions per minute.

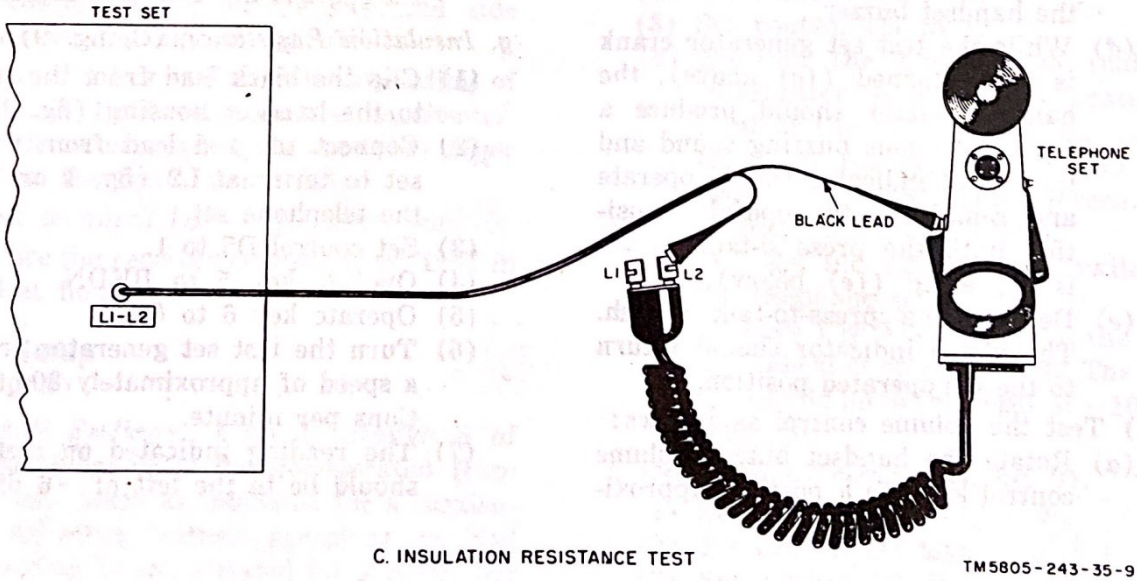
(7) The reading indicated on meter M1 should be to the left of −6 db.



A. TRANSMITTING AND RECEIVING TESTS



B. CAPACITOR TEST



C. INSULATION RESISTANCE TEST

TM5805-243-35-9

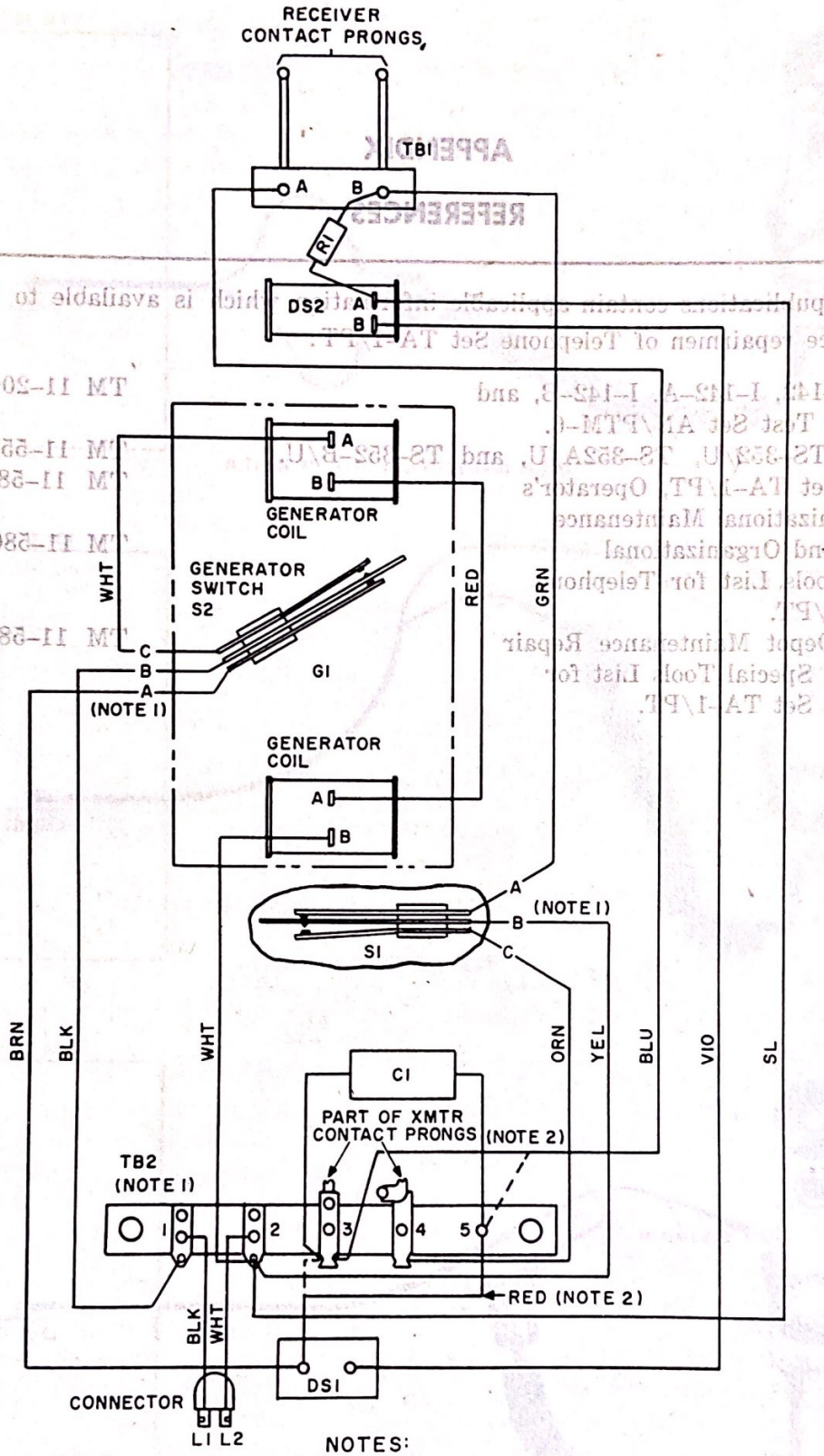
Figure 9. Connections for final tests.

APPENDIX

REFERENCES

The following publications contain applicable information which is available to the field and depot maintenance repairmen of Telephone Set TA–1/PT:

Test Sets I–142, I–142–A, I–142–B, and Telephone Test Set AN/PTM–6.	TM 11–2062
Multimeter TS–352/U, TS–352A/U, and TS–352–B/U.	TM 11–5527
Telephone Set TA–1/PT, Operator's and Organizational Maintenance	TM 11–5805–243–12
Operator's and Organizational Special Tools List for Telephone Set TE–1/PT.	TM 11–5805–243–12P
Field and Depot Maintenance Repair Parts and Special Tools List for Telephone Set TA–1/PT.	TM 11–5805–243–35P



NOTES:

1. TERMINAL LETTER AND NUMBER DESIGNATIONS ARE ASSIGNED ARBITRARILY FOR REFERENCE PURPOSES.
2. ON EQUIPMENTS BEARING ORDER NO. 24977-PHILA-55, SERIAL NUMBERS 1 THROUGH 209, BLUE AND RED WIRES ARE CONNECTED AS SHOWN BY DASHED LINES.

TM5805-243-35-10

Figure 10. Telephone Set TA–1/PT, wiring diagram.

[AG 413.42 (25 Sep 59)]

BY ORDER OF THE SECRETARIES OF THE ARMY AND THE AIR FORCE:

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NG: State AG (3); units—same as Active Army except allowance is one copy to each unit.
USAR: None.
For explanation of abbreviations used, see AR 320-50.

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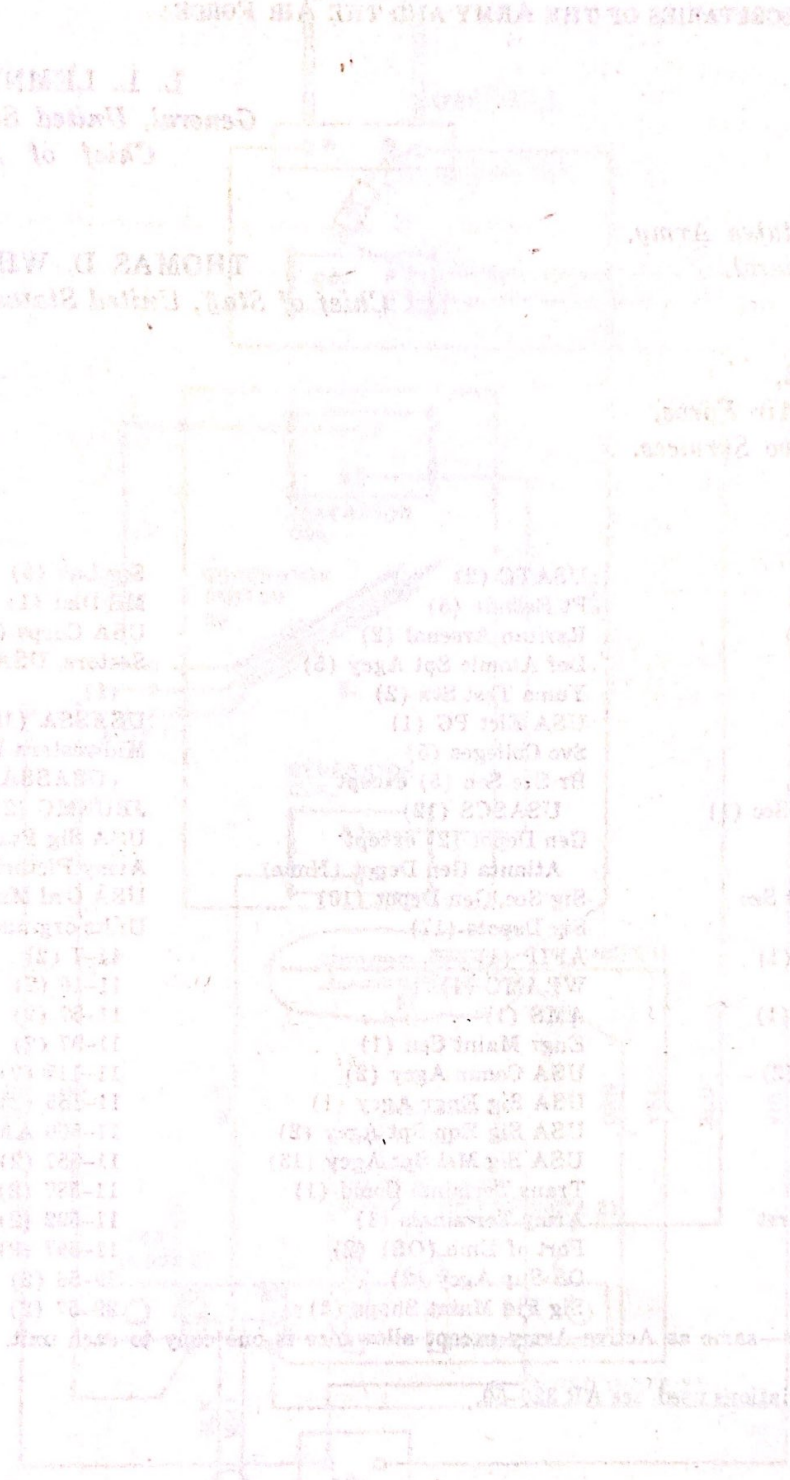

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