INSTRUCTION BOOK

FOR

TELEPHONE TP-1-T1 (Winch)
and
TELEPHONE TP-2-T1 (Balloon)

RESTRICTED

PUBLISHED BY AUTHORITY
OF
THE CHIEF SIGNAL OFFICER

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INSTRUCTION BOOK
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AND
TELEPHONE TP-2-T1 (Balloon)

SECTION I

GENERAL DESCRIPTION

1. Military Characteristics. Telephone TP-1-T1 and Telephone TP-2-T1 have been designed to conform to the military characteristics approved by the Signal Corps Technical Committee at a meeting (No. 148) held on March 8, 1937 and also to the recommendations set forth in a letter from the Chief Signal Officer to the Chief of the Air Corps, file OCSigO 413.42 (Balloon and Winch Telephone), March 26, 1937, and the first and second indorsements thereon, particularly the directive contained in the second indorsement.

a. The military characteristics of Telephone TP-1-T1 are as follows:

(1) The telephone to provide for two-way communications between Winch and Balloon and between Winch and a distant ground station or switchboard.

(2) To provide means to transmit and receive signals from and to Balloon and distant stations by key-switching selection.

(3) To be equipped with head and chest set and handset with plugs and jack connections similar to those provided for Balloon telephone.

(4) To be provided with neon arrester across cable conductor and sheath.

(5) Provide for ground connection for cable sheath.

(6) To be provided with ring-through talk-through repeating coil between cable and ground circuits as a precaution against dissipation of static charge through equipment or over ground circuits.

(7) Provide compartment for head and chest set and handset.

b. The military characteristics of Telephone TP-2-T1 are as follows:

(1) The telephone to provide two-way communication between balloon and line over a line not to exceed 25 db.

(2) To be equipped with a ringer and hand generator for signaling.

(3) To be equipped with a head and chest set and a handset with plug and jack connections. The head and chest set to be provided with adjustable headband, receivers and transmitter, and all parts to be as light as possible. The head receivers to be capable of being placed over the helmet or worn without the helmet. The transmitter to be supported from a plate and hinged so as to fold back against the plate when not in use.

(4) To be provided with compartment for head and chest set and handset.

c. The recommendations for the design of both Balloon and Winch telephones as set forth by the directive contained in the second indorsement, dated April 1, 1937 to basic communication referred to in paragraph 1 above are as follows:

(1) The use of the standard EE-8 telephone without modification.

(2) The development of the special head and chest set desired.

(3) The development of a separate unit for use in conjunction with the balloon telephone designed for storing the head and chest set and for mounting the neon arrester.

(4) The development of an additional unit for use with the winch telephone designed for storing the head and chest set and ground rod and for mounting the repeating coil, switching key and neon arrester.

2. Use.

a. Telephone TP-1-T1 provides two-way signaling and voice communication from winch to balloon and from winch to distant station (chart room) or switchboard.

b. Telephone TP-2-T1 provides two-way signaling and voice communication from balloon to winch (ground station).

3. Principal Functions.

a. Telephone TP-1-T1 performs the following functions:

(1) Provides two-way communication from winch to balloon and from winch to ground station (chart room) or distant switchboard; the length of the line from winch to the distant ground station is assumed as 5 miles of Wire W-110.

(2) Provides a key-switch to cut off the connection to the chart room or distant switchboard when ringing over the balloon line; to cut off the connection to the balloon when ringing over the line to the chart room or distant switchboard; and to provide a bridged connection of balloon, winch and chart room or distant switchboard when the key is in its normal position.

(3) Provides both a Handset TS-9-A, a Head and Chest Set HS-19 with Plug PL-58, Microphone T-30 (throat), and compartments for storing both the handset, the head and chest set and throat microphone. An extra Plug PL-58 is provided for use with either the handset or throat microphone.

(4) Provides a neon arrester across cable conductor and sheath, and four spare neon arresters.

(5) Provides a ground connection for cable sheath; connection to earth ground being made by means of a ground rod.

(6) Provides a ring-thru, talking-thru repeating coil between balloon cable and ground circuits as a precaution against dissipation of static charge through equipment or over lines.

b. Telephone TP-2-T1 performs the following functions:

(1) Provides two-way communication between balloon and ground station (winch telephone); communication being maintained over cable introducing a 25-db loss between the balloon telephone and the ground station.

(2) Provides a hand generator for signaling the ground station, and a ringer for incoming signals from the ground station.

(3) Provides a neon arrester across cable conductor and sheath, and four spare neon arresters.

(4) Provides for the use of Headset HS-26-T1 in place of or in connection with Handset TS-9-A and Microphone T-30-T1 (throat). The Headset HS-26-T1 provides a small light transmitter and two small light receiver units; the transmitter is supported from a plate and and is hinged so as to be turned out of the way when not in use. The headset may be placed over a helmet, or worn without the helmet. The headset cord is equipped with bail-out plug and terminates in a Plug PL-58. If desired, an additional headset may be employed by connecting the headset cord to the Plug PL-58 of the original headset. An extra Plug PL-58 is provided for use with Handset TS-9-A.

(5) Provides compartments for storing Handset TS-9-A, Headset HS-26-T1, Microphone T-30, four spare neon arresters and one spare set of two Batteries BA-30.

4. Major Components.

a. Telephone TP-1-T1 comprises the following:

(1) A line unit mounted in a leather case which contains a compartment for storing Head and Chest Set HS-19 and Microphone T-30-T1 (throat). This case has two leather straps for attaching a Telephone EE-8 to the case.

(2) Telephone EE-8 complete.

b. The overall dimensions of Telephone TP-1-T1 are approximately 9-3/4 inches high by 7-5/8 inches wide by 8-3/4 inches deep. The weight of the complete telephone is 15.5 pounds.

c. Head and Chest Set HS-19 and Microphone T-30-T1 are used with but are not a part of Telephone TP-1-T1.

d. Telephone TP-2-T1 comprises the following:

(1) A line unit mounted in a leather case which contains a compartment for storing Headset HS-26-T1 and Microphone T-30-T1. This case has a metal mounting plate and a leather strap for attaching a Telephone EE-8 to the case.

(2) Telephone EE-8 complete.

e. The overall dimensions of Telephone TP-2-T1 are approximately 9-3/4 inches high by 7-5/8 inches wide by 7-1/4 inches deep. The weight of the complete telephone is 12 pounds.

f. Headset HS-26-T1 is used with but is not a part of Telephone TP-2-T1. Headset HS-26-T1 complete with cord, bail-out plug and Plug PL-58 weighs approximately 1.3 pounds.

g. Microphone T-30-T1 may be used with but is not a part of Telephone TP-2-T1. Microphone T-30-T1 may be used in place of the microphone of Headset HS-26-T1, as illustrated in photograph SCL-315.

SECTION II

EMPLOYMENT

5 Installation. Both the winch and the balloon telephones should be installed in a manner providing convenient access to the generator handle and handset, head and chest set or headset as the case may be

a. Connecting Telephone TP-1-T1.

(1) Secure a good ground connection by driving a ground rod into the ground and then connect the ground rod to the GRD binding post

of the line unit.

(2) Connect the GRD binding post of the line unit to the sheath of the balloon telephone cable. The sheath of the balloon telephone cable serves as one side of the line between the winch telephone and the balloon telephone.

(3) Connect the LINE binding post of the line unit to the wire in the balloon telephone cable. This wire serves as the other side of the line between the winch telephone and the balloon telephone.

(4) Connect each of the two conductors of the line terminating in a telephone or distant switchboard to the L1 and L2 binding posts of the line unit.

(5) Inspect the line unit to check that a neon arrester is inserted in its holder located between the GRD and LINE binding posts; if not, take one of the spare neon arresters from the carrying rack opposite the above-mentioned binding posts and insert in the holder, making sure that the saw-tooth side of the neon arrester is facing upward, thus making the saw-teeth of the neon arrester visible through the slot in the holder.

(6) Install two Batteries BA-30 in the recess of the handset compartment of the attached Telephone EE-8 and turn the screw-driver switch on Telephone EE-8 top plate to L.B. position.

(7) If it is desired to use Microphone T-30-T1 (throat) in place of the transmitter of Handset TS-9-A the two spade terminals attached to one end of the throat-microphone connecting cord are connected to the "T" and "C" terminals of the spare Plug PL-58 and this plug is then inserted in the jack of Telephone EE-8. Microphone T-30-T1 is connected to its connecting cord by inserting the associated two-pronged pin-type plug in the jack at the free end of the connecting cord.

(8) If it is desired to use both Handset TS-9-A and Head and Chest Set HS-19, the Plug PL-58 associated with Head and Chest Set HS-19 is inserted in the jack of Telephone EE-8.

(9) If it is desired to use Head and Chest Set HS-19 exclusively, the Handset TS-9-A cord terminals should be disconnected from the "T & BAT +," "C" and "REC" terminals of Telephone EE-8 and the Plug PL-58 associated with Head and Chest Set HS-19 is inserted in the jack of Telephone EE-8. The disconnection of Handset TS-9-A prevents the devision of some of the energy from the receiver of the head and chest set.

(10) If it is desired to use Microphone T-30-T1 in place of the transmitter of Head and Chest Set HS-19, the two spade terminals attached to one end of the throat-microphone connecting cord are

connected to the "T" and "C" terminals of Plug PL-58 of the Head and Chest Set HS-19, and this plug is then inserted in the jack of Telephone EE-8. Microphone T-30-T1 is connected to its connecting cord by inserting the associated two-pronged pin-type plug in the jack at the free end of the connecting cord.

b. Connecting Telephone TP-2-T1.

(1) Connect the GRD binding post of the line unit to the sheath of the balloon telephone cable. The sheath of the balloon telephone cable serves as one side of the line between the balloon telephone and the winch telephone.

(2) Connect the LINE binding post of the line unit to the wire in the balloon telephone cable. This wire serves as the other side of the line between the balloon telephone and the winch telephone.

(3) Inspect the line unit to check that a neon arrester is inserted in its holder located between the GRD and LINE binding posts; if not, take one of the spare neon arresters from the carrying rack opposite the above-mentioned binding posts and insert in the holder, making sure that the saw-tooth side of the neon arrester is facing upward, thus making the saw-teeth of the neon arrester visible through the slot in the holder.

(4) Install two Batteries BA-30 in the recess of the handset compartment of the attached Telephone EE-8 and turn the screw-driver switch on Telephone EE-8 top plate to the L.B. position. Do not use the two Batteries BA-30 located in the line unit for the initial installation, as these two batteries are provided for replacement purposes only.

(5) If it is desired to use Microphone T-30-T1 (throat) in place of the transmitter of Handset TS-9-A, the two spade terminals attached to one end of the throat-microphone connecting cord are connected to the "T" and "C" terminals of the spare Plug PL-58, and this plug is then inserted in the jack of Telephone EE-8. Microphone T-30-T1 is connected to its connecting cord by inserting the associated two-pronged pin-type plug in the jack at the free end of the connecting cord.

(6) If it is desired to use both Handset TS-9-A and Headset HS-26-T1, the Plug PL-58 associated with Headset HS-26-T1 is inserted in the jack of Telephone EE-8.

(7) If it is desired to use Headset HS-26-T1 exclusively, the Handset terminals should be disconnected from the "T & BAT +," "C" and "REC" terminals of Telephone EE-8, and Plug PL-58 associated with Headset HS-26-T1 is inserted in the jack of Telephone EE-8. The disconnection of Handset TS-9-A prevents diversion of some of the energy from the receivers of the headset.

(8) If it is desired to use a Microphone T-30-T1 in place of the transmitter of Headset HS-26-T1, the plug connecting the head-

set transmitter is removed from the connecting block, and the plug of the throat microphone is inserted in the connecting block at the place where the plug of the headset transmitter was removed and designated by the letter "T" on the connecting block. See photograph SCL-315.

6. Operation.

a. Telephone TP-1-T1 when Connected to Balloon Telephone and Chart Room Telephone or Distant Switchboard

(1) To call Balloon Telephone Only. Operate the key-switch of the line unit to the "BALLOON" position and hold it in that position since the key is nonlocking, then rotate the generator crank, of the attached Telephone EE-8 rapidly in a clockwise direction several revolutions. Repeat if your signal is not answered.

(2) To Call Chart Room or Distant Switchboard. Operate the key-switch of the line unit to the "CHART RM." position and hold it in that position since the key is nonlocking, then rotate the generator crank of the attached Telephone EE-8 rapidly in a clockwise direction several revolutions. Repeat if your signal is not answered.

(3) To Call Both the Balloon Telephone and the Chart Room on Distant Switchboard. Rotate the generator crank of the attached Telephone EE-8 rapidly in a clockwise direction. If only one of the two called stations answers, the other station should be called using the method described in subparagraph 6a(1) and 6a(2) above.

(4) To Listen Only. If Handset TS-9-A is used, place the receiver of the handset on the ear. If Head and Chest Set HS-19 is used, place the head-band receiver on the ear. (The handset switch or the transmitter switch on the breast plate of the head and chest set should not be operated as this would run down the Batteries BA-30 in the attached Telephone EE-8 unnecessarily.)

(5) To Talk and Listen. If Handset TS-9-A is used, operate the handset switch and speak distinctly into the transmitter with the lips close to the mouthpiece, the receiver being held firmly to the ear. If Head and Chest Set HS-19 is used, adjust the neck strap so that the transmitter mouthpiece is close to the lips, place the head-band receiver over either ear, operate the transmitter switch on breast plate to either the locking or non-locking "ON" position and speak distinctly into the transmitter with the lips close to the transmitter mouthpiece.

(6) Use of Throat Microphones. Microphone T-30-T1 may be used with the winch telephone to perform the functions of the transmitter of either Handset TS-9-A or of Head and Chest Set HS-19. To use the throat microphone, the throat-microphone connecting cord is connected to Telephone EE-8 in the manner desired and described in Section II, Paragraph 5a, subparagraphs (7) and (10).

The throat microphone is then strapped around the throat snuggly but not sufficiently tight to cause discomfort in continual use. The bail-out plug at the end of the short cord forming a part of the throat-microphone assembly is inserted in the associated jack of the throat-microphone connecting cord and the throat microphone is now ready for use. Talk in a normal tone, as if talking to someone across a table in a reasonably quiet room, speaking slowly and enunciating distinctly. When the conversation is completed, the throat-microphone bail-out plug should be disconnected from its associated jack in order to prevent the batteries in the associated Telephone EE-8 from running down unnecessarily.

(7) With the key switch of the line unit in its normal position, the winch telephone is bridged across the line and conversation is carried on among the three stations simultaneously; namely, the balloon telephone, the winch telephone and the chart room or distant switchboard. If it is desired to talk to the balloon telephone only, the key switch is operated to the "BALLOON" position and held in that position. If it is desired to talk to the chart room or distant switchboard only, the key switch is operated to the "CHART RM" position and held in that position.

(8) If the winch telephone is connected to the chart room through a distant switchboard and the conversation is completed, the operator of the distant switchboard must be given a disconnect signal. This is accomplished by operating the key switch to the "CHART RM" position and holding it in that position while the generator crank of the attached Telephone EE-8 is rotated rapidly in a clockwise direction.

b. Telephone TP-2-T1.

(1) To Call Winch Telephone. Rotate generator crank of the attached Telephone EE-8 rapidly in a clockwise direction several revolutions. Repeat if your signal is not answered.

(2) To Listen Only. If Handset TS-9-A is used, place the receiver handset on the ear. If Headset HS-26-T1 is used, the straps of the headset are adjusted until the two receivers of the headset are comfortably located over the ears. (The handset switch or the transmitter switch on the headset-connecting block should not be operated as this would run down the Batteries BA-30 in the attached Telephone EE-8 unnecessarily.)

(3) To Talk and Listen. If Handset TS-9-A is used, operate the handset switch and speak distinctly into the transmitter with the lips close to the mouthpiece, the receiver being held firmly to the ear. If Headset HS-26-T1 is used, the headset straps are adjusted until the two receivers of the headset are comfortably located over the ears, the headset transmitter arm is rotated in its socket and the transmitter unit assembly turned until the transmitter is located directly in front of the lips; the transmitter switch on the headset-connecting block is operated to either the locking or the nonlocking "ON" position. Speak distinctly with the lips close to the transmitter face.

(4) Use of Throat Microphone. Microphone T-30-T1 may be used with Headset HS-26-T1 or Handset TS-9-A. To use the throat microphone, the throat-microphone connecting cord is connected to Telephone EE-8 in the manner desired and described in Section II, paragraph 5b, subparagraphs (5) and (8). The throat microphone should not be strapped too tightly around the throat so as to prevent discomfort in continual use and to provide the best operating condition. To talk, the switch on the connecting block is operated to either locking or nonlocking "ON" position and conversation is carried on in a normal tone as if talking across the table in a reasonably quiet room, speaking slowly and enunciating distinctly.

SECTION III

DETAILED DESCRIPTION AND FUNCTIONING OF PARTS

7. Telephone TP-1-T1.

a. Case of Line Unit. The case in which the line unit of the winch telephone is housed is similar to the case used for Telephone EE-8, the main difference being that it is deeper. The case is made of leather sewed at the corners, with a hinged cover formed by extending the leather of the back of the case. The cover is held closed by a "Lift-the-Dot" fastener. Two straps are provided for attaching this case to the case of the associated Telephone EE-8. The line-unit set box is held in the case by eight machine screws and placed at the left of the case leaving a compartment to the right for receipt of Head and Chest Set HS-19 with Plug PL-58 and Microphone T-30-T1 with its connecting cord.

b. Frame Chassis of Line Unit. The frame chassis of the line unit is a box-like structure of aluminum alloy upon which and within which all the components of the line unit are mounted. The top of the box-like structure is closed by the terminal panel (subparagraph 7c). The terminal panel on top and the aluminum-alloy side plate are held in place with machine screws and hence are readily removable for repairs or inspection of the equipment. The frame chassis is finished in dull black. A wiring diagram is attached to one of the exterior plates.

c. Terminal Panel of Line Unit. The terminal panel is made of high-strength, laminated and molded phenolic-base compounds. Two binding posts designated L1 and L2 are provided for connection to the line wires which terminate in a telephone in the chart room or in a distant switchboard. A key-shelf type switchboard key is mounted on this panel; this key is of the nonlocking type. When the key is in its normal (central) position, the balloon telephone, the winch telephone and the chart room or distant switchboard are all connected together; when the key is operated to the "BALLOON" position the circuit to the chart-room telephone or distant switchboard is opened; when the key is operated to the "CHART RM" position

the circuit to the balloon telephone is opened. A holder for a neon arrester with spark gap is mounted on this panel. The holder is made of nickel-silver and consists of a righthand and a lefthand bracket, each of which is riveted to a thin laminated phenolic strip in a manner leaving an air gap both at the bottom and at the top of the holder and extending the entire length of the holder. The phenolic strip upon which the neon arrester holder is mounted, screws into the terminal panel. One bracket of the neon-arrester holder is connected to the "GRD" terminal of Coil C-161 (repeating) and the other bracket is connected to the "LINE" terminal of the same repeating coil.

d. Neon Arrester. The neon arrester that mounts in the holder on terminal panel is type CFD-4 as made by Brach Manufacturing Corporation, Newark, N.J. This arrester has saw-tooth gaps for additional protection, and when inserted in its holder the saw-tooth side should face the slot of the holder, otherwise the arrester would short circuit the line to the balloon telephone. The neon-gas filled tube in the arrester will glow whenever static charges in the telephone cable between the winch and balloon telephone build up surges of 400 volts or greater. The glowing of the neon gas indicates that the electric charge on the telephone cable is being dissipated to ground; thus under normal conditions, abnormally high potentials are prevented from building up, thus insuring relative immunity to the winch-telephone and balloon-telephone operators as well as the equipment. In case abnormally high potentials are momentarily built up on the balloon telephone cable, sparking takes place across the saw-tooth gaps of the arrester in addition to the glowing discharge through the neon-gas filled tube; thus the accumulated charge is dissipated to ground at a faster rate. If it should happen that a sudden and exceptionally high charge is built up on the balloon-telephone cable and the neon-gas filled tube of the arrester blows, the arrester should be replaced by taking a new arrester from the container which is attached to the side plates facing the head and chest set compartment of the case; four such spare neon arresters are provided

e. Coil C-161 (repeating). This is a small lightweight repeating coil with balanced line windings and is of the talk-through, ring-through type and has an impedance of approximately 600 ohms. This repeating coil is used to separate physically the circuit of the balloon telephone from the circuit of the winch telephone, thus insuring greater safety to the winch telephone operator. In addition to the physical separation of the two circuits, the winding of the coil connected to the balloon-telephone cable offers a high impedance to the high potential surges induced in the balloon-telephone cable, thereby forcing practically all of the accumulated charge to dissipate to ground through the neon arrester as it offers a relatively much lower resistance path to ground.

f. Varistor and Cord CC-BB. The varistor used is the Western Electric Company's 4A Varistor. It is of the copper-oxide type, totally enclosed. It is connected by means of Cord CC-BB to the "C" and "REC" terminals of the associated Telephone EE-8; thus it is bridged across the receiver terminals to reduce acoustic disturbances caused by static charges on the balloon-telephone cable.

g. Cord CC-AB. This cord serves to connect the balloon telephone and the chart-room telephone or distant switchboard to the associated Telephone EE-8 of the winch telephone under control of the key in the line unit of the winch telephone. The red colored wire and the white colored wire of the cord are connected to the L1 and L2 binding posts respectively of the associated Telephone EE-8.

h. Telephone EE-8. The Telephone EE-8 associated with the winch telephone is used as a local battery telephone; its operation, maintenance, description and functioning of parts are covered in Technical Regulations No. 1225-10.

i. Head and Chest Set HS-19. For description and parts list of this head and chest set refer to paragraphs 12 and 17 of Technical Regulation No. 1225-1 covering Signal Corps Switchboards BD-71 and BD-72.

8. Telephone TP-2-T1.

a. Case of Line Unit. The case in which the line unit of the balloon telephone is housed is similar to the case used for Telephone EE-8, the main difference being in its height which is about two thirds of that of the case of Telephone EE-8. The case is made of leather sewed at the corners, with a hinged cover formed by extending the leather of the back of the case. The cover is held closed by a "Lift-the Dot" fastener. An aluminum-alloy plate with hooks is screwed to the back of the case and is used to attach the line unit to the front of the case of the Telephone EE-8. A strap at the lower part of the case is also used in attaching the line unit to the case of the associated Telephone EE-8. The line-unit set box is held in the case by four machine screws and placed on the right side of the case, leaving a compartment to the left for receipt of Headset HS-26-T1 and Microphone T-30-T1.

b. Frame Chassis of Line Unit. The frame chassis of the line unit is a box-like structure of aluminum alloy upon which and within which all the components of the line unit are mounted. The top of box-like structure is closed by the terminal panel (subparagraph 8c). The terminal panel on top and the aluminum-alloy side plate are held in place with machine screws and hence are readily removable for repairs or inspection of the equipment. The frame chassis is finished in dull black. A wiring diagram is attached to one of the exterior plates. (See photograph SCL-311.)

c. Terminal Panel of Line Unit. The terminal panel is made of high-strength, laminated and molded phenolic-base compounds. Two binding posts are provided for connecting to the balloon end of the balloon-telephone cable. The binding post designated LINE is connected to the central conductor of the balloon-telephone cable; the binding post designated GRD is connected to the sheath of the balloon-telephone cable, as the sheath forms the other side of the balloon-telephone cable circuit.

A holder for a neon arrester with spark gap is mounted on this panel. The holder is made of nickel-silver and consists of a righthand and a lefthand bracket, each of which is screwed on to the terminal panel in a manner leaving an air gap both at the bottom and at the top of the holder and extending the entire length of the holder. One bracket of the neon-arrester holder is connected to the "LINE" binding post and the other bracket is connected to the "GRD" binding post.

d. Neon Arrester. The neon arrester that mounts in the holder on terminal panel is type CFD-4 as made by the Brach Manufacturing Corporation, Newark, N.J. The construction of this arrester and the functions it performs are the same as described for the "Neon Arrester" of subparagraph 7d.

e. Compartment for Spare Batteries BA-30. The terminal panel has two circular openings into each of which a Battery BA-30 can be accommodated. These two Batteries BA-30 are carried as spares for replacing the batteries in the associated Telephone EE-8 in case the latter batteries become run down or defective while the balloon is aloft.

f. Varistor and Cord CC-BB. The varistor used is the Western Electric Company's 3A Varistor. It is of the copper-oxide type and it is connected by means of Cord CC-BB to the "C" and "REC" terminals of the associated Telephone EE-8; thus it is bridged across the receiver terminals to reduce acoustic disturbances caused by static charges on the balloon-telephone cable.

g. Cord CC-AB. This cord serves to extend the balloon-telephone cable connected to the line-unit terminals "GRD" and "LINE" to the associated Telephone EE-8. The red-colored wire and the white-colored wire are connected to the L1 and L2 binding posts respectively of the associated Telephone EE-8.

h. Telephone EE-8. The Telephone EE-8 associated with the balloon telephone is used as a local-battery telephone; its operation, maintenance, description and functioning of parts are covered in Technical Regulation No. 1225-10.

i. Headset HS-26-T1. The headset is made up of a Western Electric "G" type transmitter unit in a special housing mounted on a swivel bracket; two lightweight receivers D-96931 as made by the Western Electric Company, each receiver being mounted in a special aluminum-alloy holder; an adjustable cotton-webbing headstrap assembly; two receiver Cords CC-CB; one transmitter Cord CC-DB; one connecting block containing a transmitter switch with positions "OFF," "ON" (non-locking), and "ON" (locking); and one eight-foot-long connecting Cord CC-EB equipped with Plug PL-58 for connecting to the Telephone EE-8 associated with the balloon telephone All cords are equipped with the bail-out pin-type plugs and connect to corresponding jacks in the connecting block. The R designation on connecting block indicates that a receiver plug is to be connected to that jack, and the T designation indicates that the transmitter plug is to be connected to that jack.

SECTION IV

REPAIRS

9. General. Both the winch and balloon telephones are sturdily built and with reasonable care should give a maximum of service with a minimum of trouble. Elements not functioning properly or not at all are usually indicated by loose or broken connections. Before attempting to make any repairs on the telephones a check should be made to assure that the line connections to the line unit of each telephone are clean and tight; that the cord connections between the line unit of each telephone and its associated Telephone EE-8 are clean, tight and correctly connected; and that the neon arrester of each line unit is correctly inserted in its holder as previously described in paragraph 7d.

10. Telephone TP-1-T1.

a. Telephone EE-8. Disconnect the terminals of the line-unit-connecting Cords CC-AB and CC-BB from terminals L1, L2, C and REC of the associated Telephone EE-8, then test the Telephone EE-8 in accordance with paragraph 8 of Technical Regulation No. 1225-10.

b. Line Unit. Having made sure that the associated Telephone EE-8 is in working order, test the components of the line unit in the following manner:

(1) Cord CC-BB and Varistor. Connect the line from the chart room or another Telephone EE-8 to the L1 and L2 terminals of the associated Telephone EE-8 and establish communication; if the receiver of the handset ceases to function when the free terminals of Cord CC-BB are connected to the C and REC terminals of the associated Telephone EE-8, it indicates that either the cord or the varistor is short circuited.

(2) Line Unit Key Contacts. When the line-unit key is in its normal (central) position, direct continuity should exist among Terminal L1 of line unit, L1 (red) terminal of Cord CC-AB, and the terminal of Coil C-161 located opposite the GRD terminal of the coil; also direct continuity exists among terminal L2 of the line unit, L2 (white) terminal of Cord CC-AB and the terminal of Coil C-161 located opposite the LINE terminal. When the line-unit key is operated to the BALLOON position, direct continuity should exist only between L1 (red) terminal of Cord CC-AB and the terminal of Coil C-161 located opposite the GRD terminal of the coil; also, direct continuity should exist only between L2 (white) terminal of Cord CC-AB and the terminal of Coil C-161 located opposite the LINE terminal. When the line-unit key is operated to the CHART RM position direct continuity should exist only between L1 terminal of line unit and the L1 (red) terminal of Cord CC-AB; also, direct continuity should exist only between terminal L2 of the line unit and L2 (white) terminal of Cord CC-AB.

(3) Coil C-161. Check neon arrester for proper insertion in its holder by observing that the saw-tooth side of the arrester is facing the slot in the holder; otherwise the neon arrester would short circuit the coil terminals. Connect a Telephone EE-8 to the GRD and LINE terminals of the line unit, connect Cords CC-BB and CC-AB to the associated Telephone EE-8, and operate line-unit key to the BALLOON position. Check for ring-through both outgoing and incoming by sending and receiving ringing current and check for transmission by conversing.

c. Head and Chest Set HS-19. Proper functioning of this head and chest set can be quickly ascertained by inserting the attached Plug PL-58 in the corresponding jack of the associated Telephone EE-8 and using the head and chest set in place of Handset TS-9-A. The performance of the head and chest set should be the same as that of the handset when both sets are connected to Telephone EE-8.

11. Telephone TP-2-T1.

a. Telephone EE-8. Disconnect the terminals of the line-unit-connecting Cords CC-AB and CC-BB from Terminals L1, L2, C and REC of the associated Telephone EE-8; then test Telephone EE-8 in accordance with paragraph 8 of Technical Regulation No. 1225-10.

b. Line Unit. Having made sure that the associated Telephone EE-8 is in working order, test the components of the line unit in the following manner:

(1) Cord CC-BB and Varistor. Connect the L1 and L2 terminals of the associated Telephone EE-8 to another Telephone EE-8 and establish communication, If the receiver of the handset ceases to function when the free terminals of Cord CC-BB are connected to the C and REC terminals of the associated Telephone EE-8, it indicates that either the cord or the varistor is short circuited.

(2) Cord CC-AB and Neon Arrester. Connect the L1 and L2 terminals of the associated Telephone EE-8 to another Telephone EE-8 and establish communication. If communication is interrupted when the tips of Cord CC-AB are connected to the L1 and L2 terminals of the associated Telephone EE-8, it indicates that either the cord or the neon-arrester holder is short circuited. Check the neon arrester for proper insertion in its holder by observing that the saw-tooth side is facing the slot in the holder; otherwise the neon arrester would short circuit the terminals of Cord CC-AB. If communication is not restored when the neon arrester is withdrawn from its holder, it indicates that the cord is short circuited.

c. Headset HS-26-T1. Proper functioning of this headset can be quickly ascertained by inserting the attached Plug PL-58 in the corresponding jack of the associated Telephone EE-8 and using Headset HS-26-T1 in the place of Handset TS-9-A. The performance of the headset should approximate that of the handset. Each receiver can be checked individually by disconnecting the other receiver from the connecting block.

If the transmitter fails to function, check the transmitter plug for proper insertion in the connecting-block jack designated by the letter T; then check the transmitter switch on the connecting block for proper operation by trying both the ON positions. If the switch is suspected of being defective, unscrew the clamping nut on the center of the connecting block, and then remove the connecting-block cover thereby exposing the switch terminals; shorting the switch terminals is equivalent to operating the switch to the ON position.

RESTRICTED

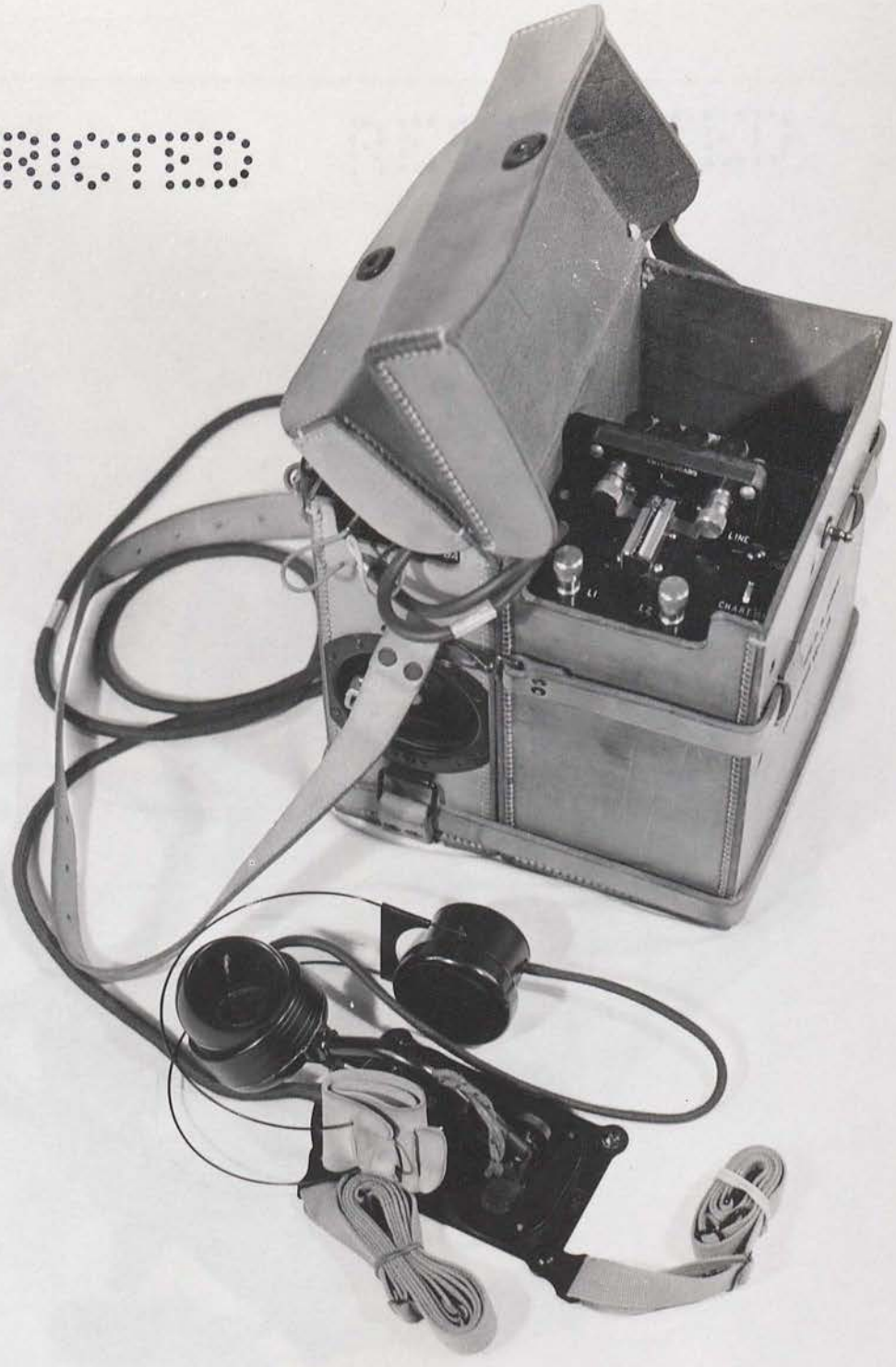
RESTRICTED

SL 271

SIGNAL CORPS LABORATORIES, FORT MONMOUTH, N. J.

TELEPHONE TP-1-T1
3/4 FRONT VIEW

RESTRICTED



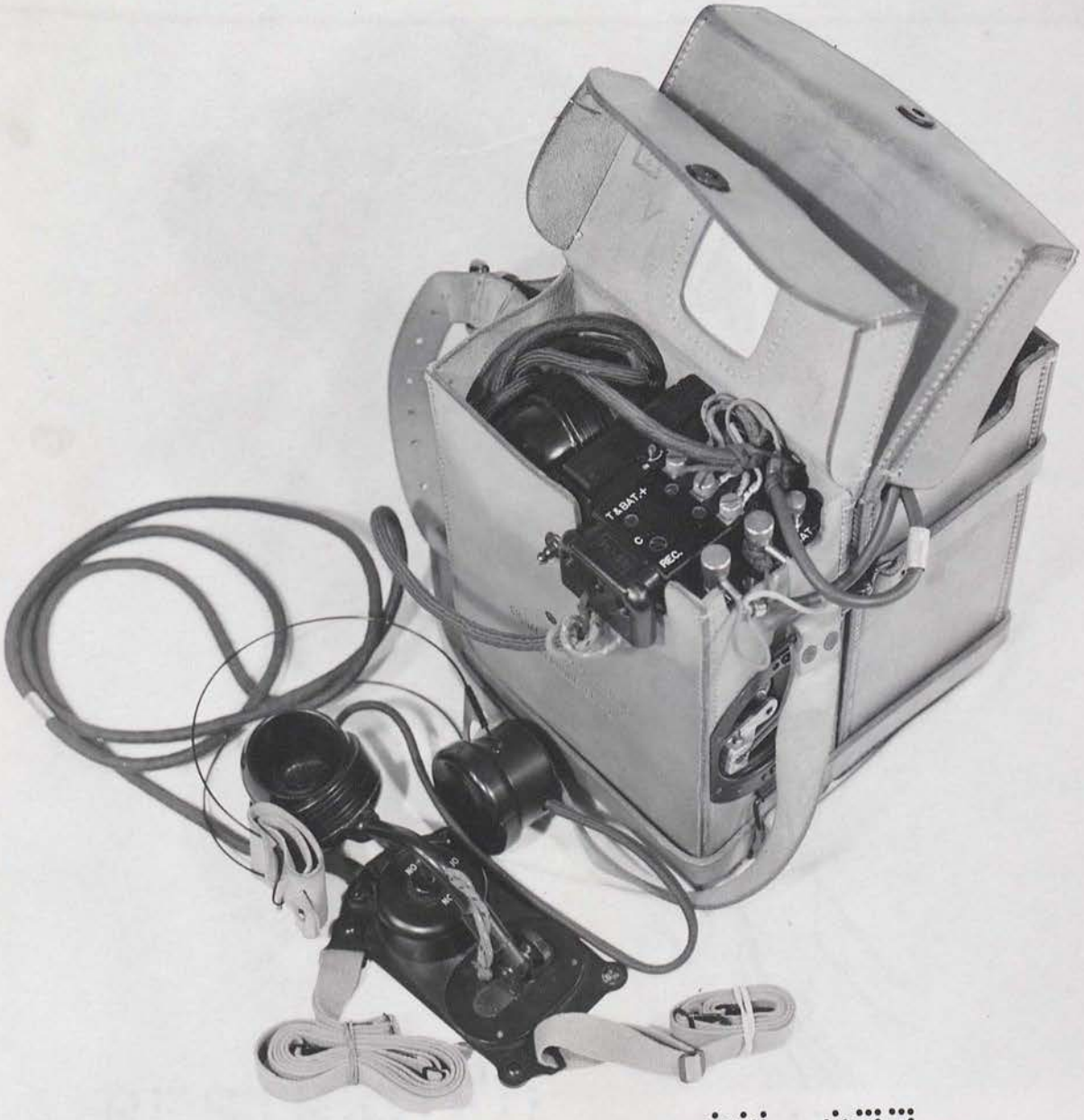
RESTRICTED

SL 272

SIGNAL CORPS LABORATORIES, FORT MONMOUTH, N. J.

TELEPHONE TP-1-T1
WITH HEAD AND CHEST SET HS-19
3/4 FRONT VIEW, COVERS OPEN

RESTRICTED



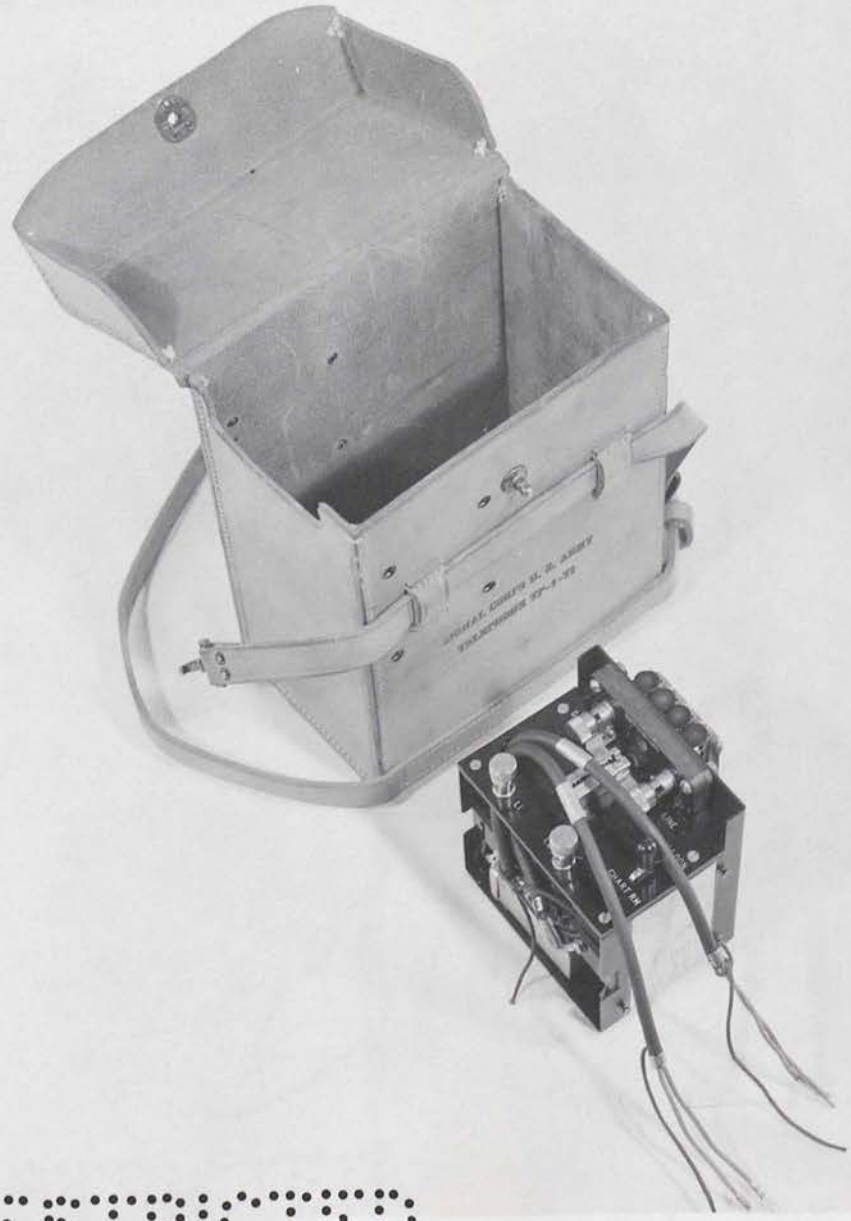
SL 273

SIGNAL CORPS LABORATORIES, FORT MONMOUTH, N. J.

TELEPHONE TP-1-T1
WITH HEAD AND CHEST SET HS-19
3/4 REAR VIEW, COVERS OPEN

RESTRICTED

RESTRICTED



RESTRICTED

SL 274

SIGNAL CORPS LABORATORIES, FORT MONMOUTH, N. J.

TELEPHONE TP-1-T1
(LESS TELEPHONE EE-8)
3/4 FRONT VIEW, CHASSIS REMOVED

RESTRICTED

RESTRICTED

SL 275

SIGNAL CORPS LABORATORIES, FORT MONMOUTH, N. J.

TELEPHONE TP-1-T1
(LESS TELEPHONE EE-8)
SIDE VIEW, CHASSIS REMOVED

RESTRICTED

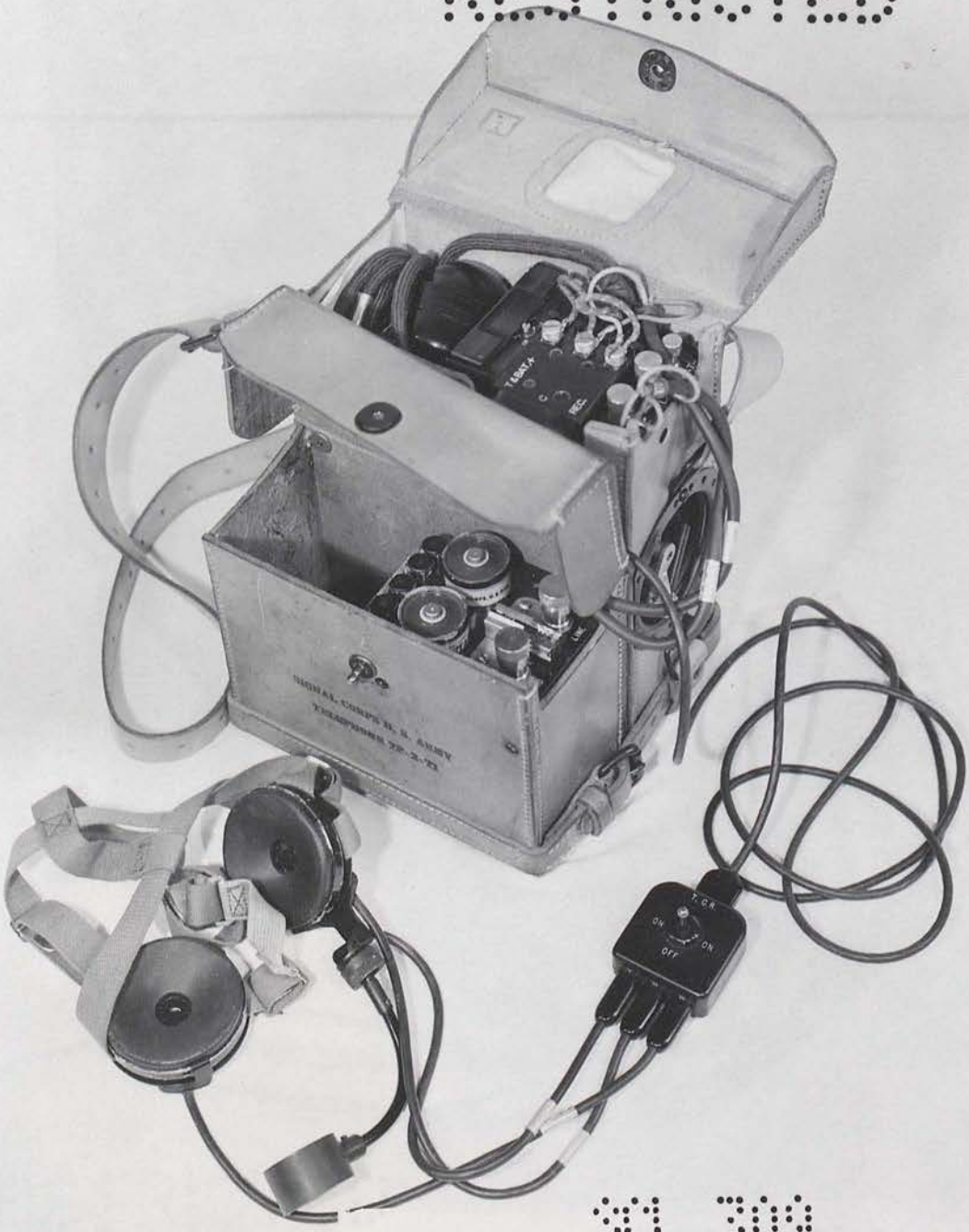
RESTRICTED

91 306

SIGNAL CORPS LABORATORIES, FORT MONMOUTH, N. J.

TELEPHONE TP-2-T1
3/4 FRONT VIEW

RESTRICTED

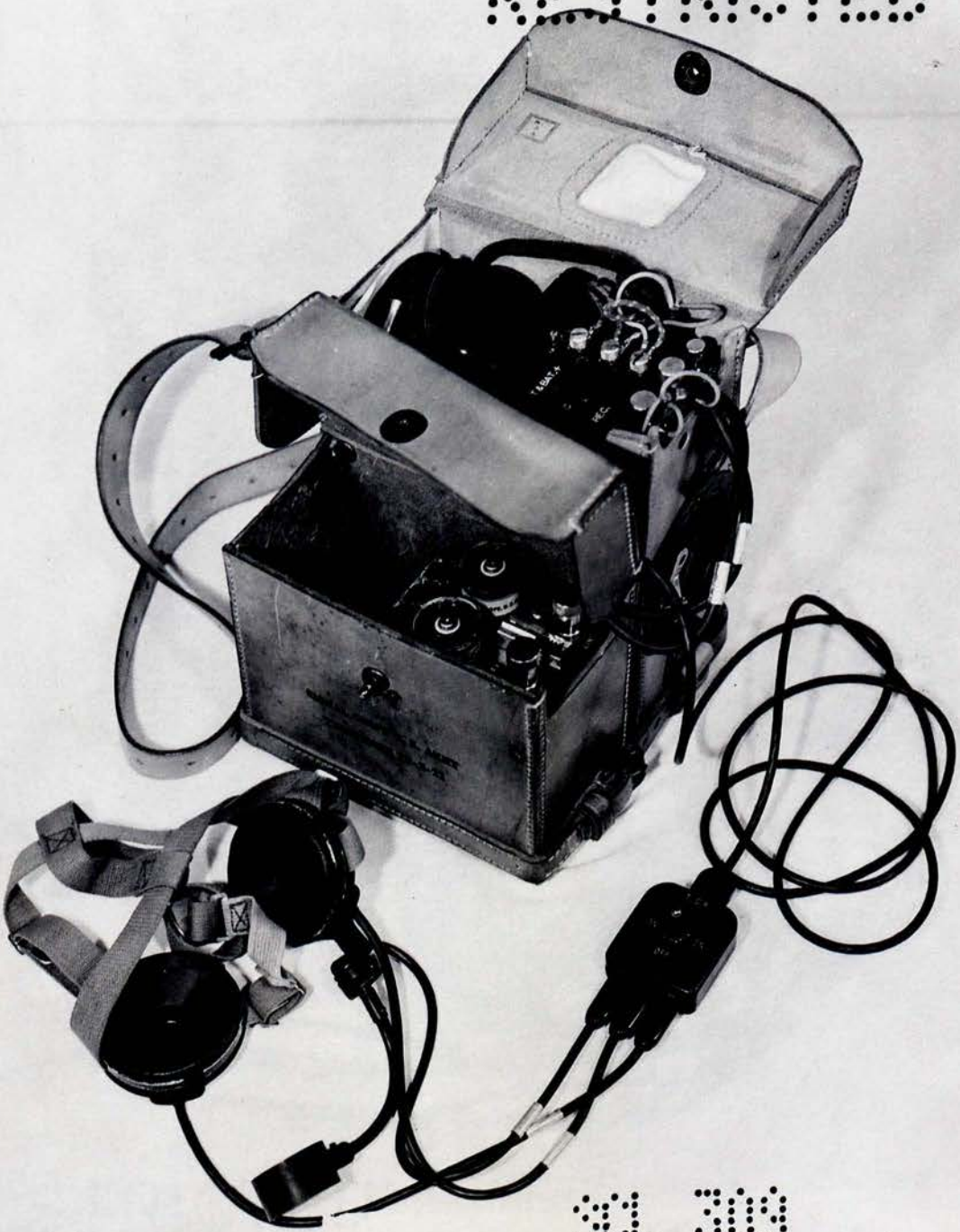


RESTRICTED

SIGNAL CORPS LABORATORIES, FORT MONMOUTH, N. J.

TELEPHONE TP-2-T1
WITH HEADSET HS-26-T1
3/4 FRONT VIEW, COVERS OPEN

RESTRICTED



SL 309

SIGNAL CORPS LABORATORIES, FORT MONMOUTH, N. J.

TELEPHONE TP-2-T1
WITH HEADSET HS-26-T1
3/4 FRONT VIEW, COVERS OPEN

RESTRICTED

RESTRICTED

RESTRICTED

SL 310

SIGNAL CORPS LABORATORIES, FORT MONMOUTH, N.J.

TELEPHONE TP-2-T1
(LESS TELEPHONE EE-8)
3/4 FRONT VIEW, CHASSIS REMOVED

RESTRICTED

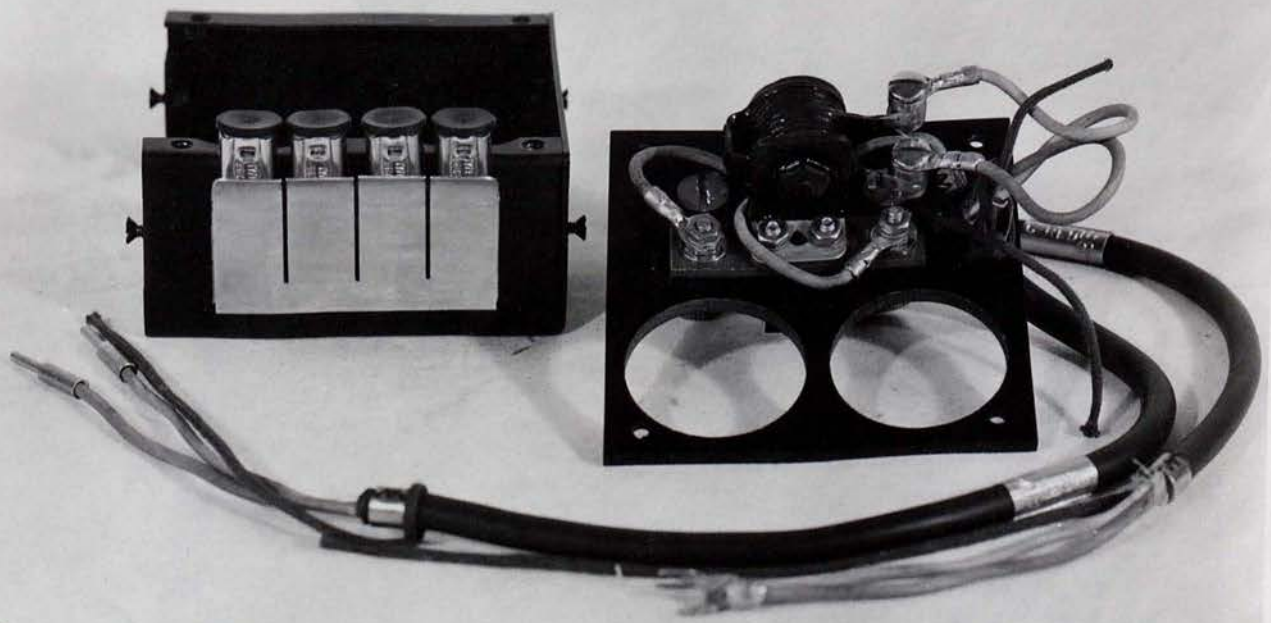
RESTRICTED

SL 311

SIGNAL CORPS LABORATORIES, FORT MONMOUTH, N. J.

TELEPHONE TP-2-T1
3/4 FRONT VIEW, CHASSIS ONLY

RESTRICTED



RESTRICTED

30L 312

SIGNAL CORPS LABORATORIES, FORT MONMOUTH, N. J.

TELEPHONE TP-2-T1
CHASSIS SHOWING COVER
REMOVED AND CORD CONNECTIONS

SIGNAL CORPS LABORATORIES, FORT MONMOUTH, N.J.

HEADSET HS-26-T1
ON SOLDIER, LEFT SIDE VIEW

RESTRICTED

RESTRICTED

SIGNAL CORPS LABORATORIES, FORT MONMOUTH, N. J.

HEADSET HS-26-T1
ON SOLDIER, REAR VIEW

RESTRICTED

SCL 315

RESTRICTED

SIGNAL CORPS LABORATORIES, FORT MONMOUTH, N. J.

HEADSET HS-26-T1
ON SOLDIER, WITH
MICROPHONE T-30 (THROAT)

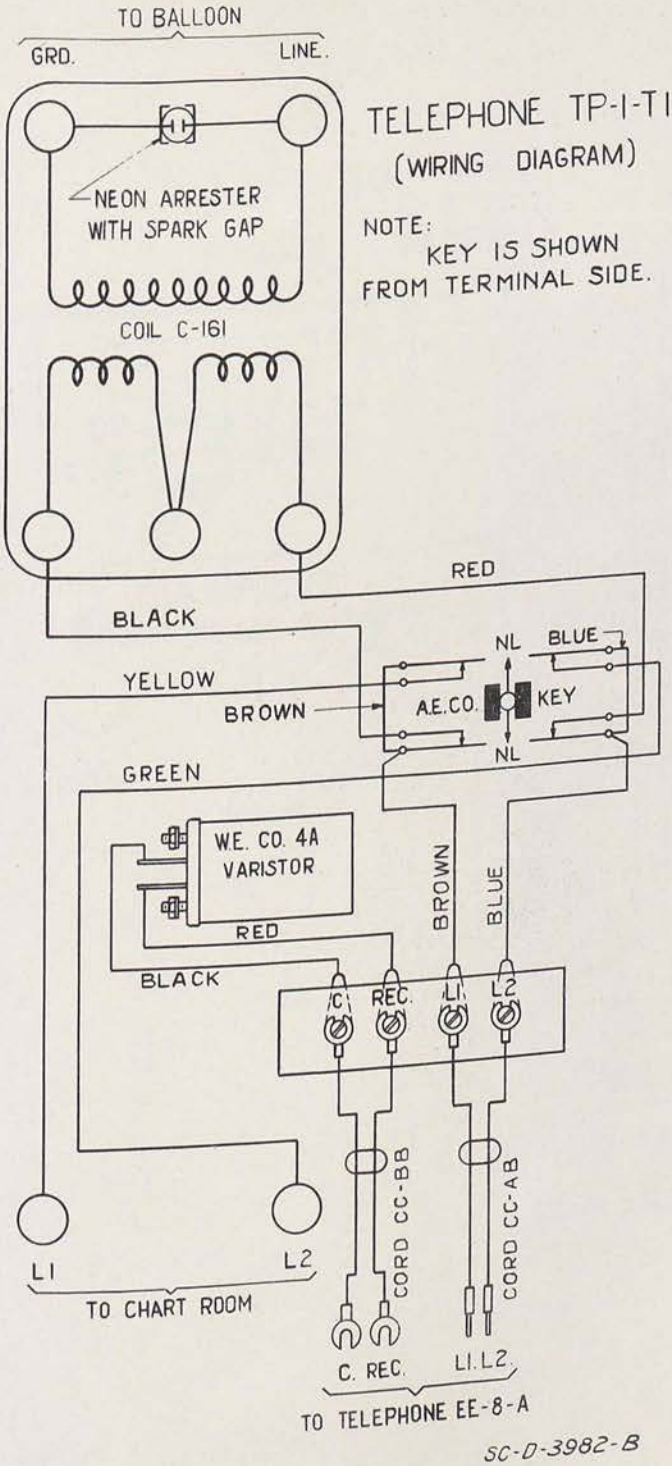
RESTRICTED

SIGNAL CORPS LABORATORIES, FORT MONMOUTH, N. J.

HEADSET HS-26-T1
(LESS CANVAS HEADBANDS)
PARTIALLY DISASSEMBLED

SL 316

RESTRICTED



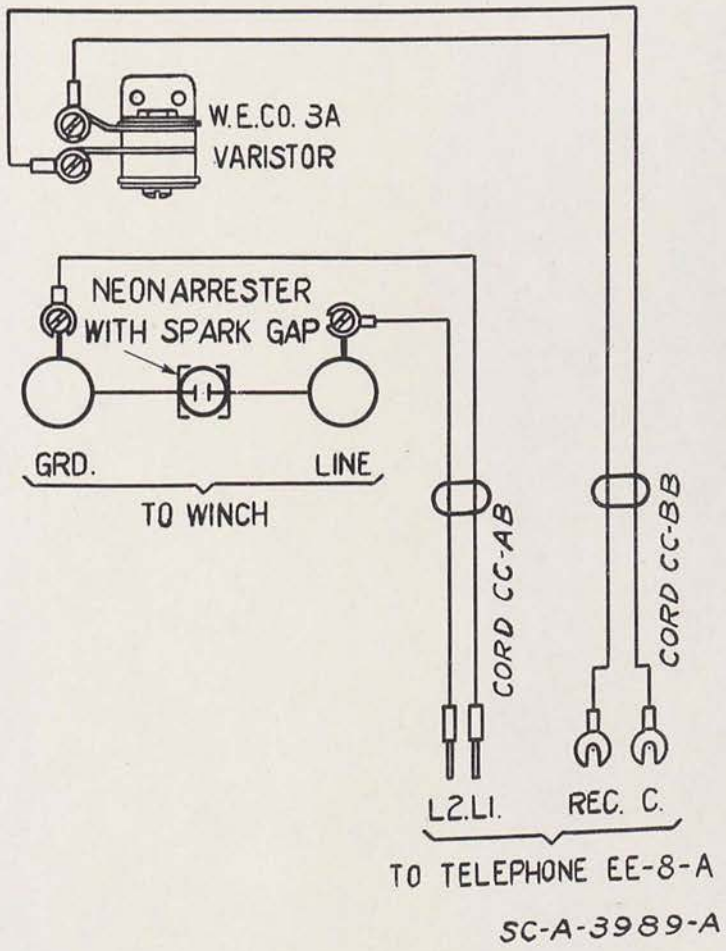
TELEPHONE TP-1-T1
(WIRING DIAGRAM)

NOTE:
KEY IS SHOWN FROM TERMINAL SIDE.

SC-D-3982-B

TELEPHONE TP-2-T1

(WIRING DIAGRAM)



SC-A-3989-A