DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, DS, GS, AND DEPOT MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LISTS OVERSEAS AUTOVON INTERFACE COMPONENTS: DX SIGNALING EQUIPMENT (AUTELCO PART NO. DH-85837-72A) AND REPEATING COILS (AUTELCO PART NO. H-887079-2)

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AUGUST 1969

CHANGE
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, *D.C.,3June 1971*

Operator, Organizational, DS, GS and Depot
Maintenance Manual Including Repair Parts and Special Tools List
OVERSEAS AUTOVON INTERFACE COMPONENTS:
DX SIGNALING EQUIPMENT (AUTELCO PART NO. DH-85837-72A)
AND REPEATING COILS (AUTELCO PART NO. H-887079-2)

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NG: &USAR: None
For explanation of abbreviations used, see AR 310-50.

Change No. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., *14 December 1973*

Operator, Organizational, Direct Support, General Support, and Depot Maintenance Manual
Including Repair Parts and Special Tools List
OVERSEAS AUTOVON INTERFACE COMPONENTS:
DX SIGNALING EQUIPMENT (AUTELCO PART NO. DH-85837-72A)
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ARNG & USAR: None.
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Technical Manual
No. 11-5805-482-15-3

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D. C., *12 August 1969*

Operator, Organizational Direct Support, General Support, and Depot Maintenance Manual
OVERSEAS AUTOVON INTERFACE COMPONENTS: DX SIGNALING EQUIPMENT (AUTELCO PART NO. DH-85837-72A) AND REPEATING COILS (AUTELCO PART NO. H-887079-2)

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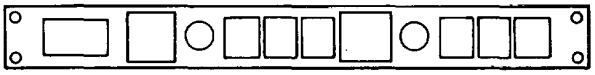
4-2	TM 3805-482-15-31	Dx Signaling Equipment DH-85837-72A and Repeating Coils H-887079-2, simplified schematic diagram
5-1	TM 5.805-482-15-32	Dx Signaling Equipment DH-85837-72A, maintenance instruments
5-2	TM 50805-182-15-33	Repeating Coils H-8870 79-2, parts location diagram
5-3	TM 3805-482-15-34	Dx Signaling Equipment DH-85837-72A, parts location diagram
5-4	TM 5805-482-15-35	Dx Signaling Equipment DH-85837-72A and Repeating Coils H-887079-2, schematic diagram
5-5	TM 5805-482-15-38	Polarized relay (cover removed), adjustment points.
5-6	TM 5805-482-15-37	Test setup for polarized relay testing.

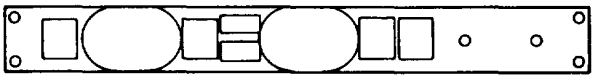
CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. Scope
This manual describes the DX Signaling Equipment DH-85837-72A and Repeating Coils H-887079-2 (dx signaling equipment and repeating coils) (fig. 1-1). The information includes installation, functional description, preventive maintenance, troubleshooting, repair and replacement, and testing.



A. DX SIGNALING EQUIPMENT (TWO CIRCUITS PER ASSEMLY)



B. REPEATING COILS (TWO CIRCUITS PER ASSEMBLY)

TM5805-482-15-29

Figure 1-1. Dx Signaling Equipment DH-85837-72A and Repeating Coils H-887079-2.

1-2. Indexes of Publications
a. Refer to the latest issue of DA Pam 3104 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

b. Refer to the latest issue of DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

1-3. Forms and Records
a. Reports of Maintenance and Unsatisfactory Equipment. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38-750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700-58 (Army)/NAVSUP PUB 378 (Navy)/AFR 71-4 (Air Force)/and MCO P4030.29 (Marine Corps).

c. Discrepancy in Shipment Report (DISREP) (SF 161). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38 (Army)/NAVSUP PUB 459 (Navy)/AFM 75-34 (Air Force)/and MCO P4610.19 (Marine Corps).

1-3.1. Reporting of Errors
The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL-MA-C, Fort Monmouth, NJ 07703.

Section II. DESCRIPTION AND DATA

1-4. Purpose and Use
Dx signaling equipment is used to pass on-hook and off-hook signals over trunk circuits with loop resistance of more than 25 ohms and less than 5000 ohms. It is effective even where differences in ground potentials at the near and far terminals are involved. The dx signaling equipment transmits and receives dc signals to and from trunk circuits in the form of E and M lead controls. The on-hook and off-hook dc signals on the M lead are transmitted to the far terminal through the repeating coil and over the four-wire voice path. At the far terminal, the signal passes through a repeating coil and energizes a polarized relay in the dx signaling equipment in accordance with the signals transmitted on the M lead at the near terminal. Repeating coils are transformers used in conjunction with the dx signaling equipment for impedance matching and dc isolation. Dx signaling equipment can be used when voice and signaling are to appear on the trunk at the same time.

1-5. Technical Characteristics
a. DX Signaling Equipment.

Network circuit resistance wiring option	Loop resistance of line ± 1250 ± 125 ohms
Network circuit capacitance wiring option	Y strap removed; (no capacitance 0 to 15 miles)
Maximum dc earth potential	± 45 volts
Minimum insulation resistance	100,000 ohms

b. Repeating Coil.

Impedance:
Drop.....600
Line.....600 ohms

Impedance ratio.....1:1 at 1000 Hz

Insertion loss maximum .....0.5 db

Frequency response.....300 Hz to 10,000 Hz at

Maximum net ampere turns 280
to retain negligible
degradation of insertion
loss characteristics

Maximum voice frequency.....+ 20 dbm
signal operating level

Maximum operating current.....0 1 amp
in line winding

Maximum longitudinal.....74 db
unbalance in line winding
line signal level

1-6. Dimensions

Item	*Height (in.)*	*Depth (in.)*	*Width (in.)*	*Unit weight*
Dx Signaling equipment	1.72	( )	18.94	( )
Repeating coil	1.72	4.94	18.94	( )

1-7. Description
The dx signaling equipment is comprised of a polarized relay and a resistance and capacitance network. Two dx signaling equipment circuits are secured to a common mounting bracket for installation on 19-inch racks at the PBX or central office. Two repeating coils are required for each dx signaling equipment. The circuit consists of the repeating coil and three capacitors. The two repeating coil circuits are secured to a common mounting bracket.

1-8. Items Comprising an Operable Equipment
DX Signaling Equipment comprises an operable equipment.

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CHAPTER 2

INSTALLATION

2-1. General

Each site is individually engineered. Job drawings and specifications are provided for each site in the peculiar drawing package which is furnished for each PBX interface installation. The installer requires all job drawings and all specifications. Included below is a list of job drawing suffixes with their definition and a list of items which will be found in the equipment specifications for the site.

2-2. Job Drawings

Suffix	Definition
SD	Schematic drawing of office and/or schematic of equipment layouts in office.
F	Floor plan layout.
ARR	Automatic relay rack layout.
MRR	Manual relay rack layout.
PRR	Power relay rack layout.
FR	Switchboard face equipment arrangement.
CDF	Combined distributing frame terminal block layout.
IF	Intermediate distributing frame layout.
IFT	Intermediate distributing frame terminal block assembly.
CRL	Cable running list.

2-3. Equipment Specifications

a. Sections for ordering equipment are referenced by the item number (equipment drawing number and wiring diagram circuit number) and specification number (762, 726, 729 and 792).

b. Cable running list shows cable run numbers as referenced on SD drawings. The running list information includes connections made from and to equipment, such as connections from a relay rack to a distributor frame.

c. Installer notes contain additional information or conditions not pointed out in particular associated drawings.

d. Drawing ordering specification (793) orders drawings associated with a particular site such as job drawings, wiring diagrams, specifications, appendices to specifications and equipment drawings.

e. Where job drawings are not made on a particular site, key sheet information is provided in the specification. Key sheets tabulate various information such as circuit numbers and/or figures and equipment layouts of particular relay racks.

CHAPTER 3

OPERATION

3-1. General

The interface equipments are automatically operational when the components have been wired into the facility. No special operating instructions are required.

CHAPTER 4

FUNCTIONING OF EQUIPMENT

4-1. Block Diagram Description

(fig. 4-1)

Dx signaling is a dc system that provides a way of transmitting signals over four-wire facilities beyond the range of loop signaling. All signaling between the line adapter and its associated dx signaling equipment is carried over the E and M leads. An input signal applied to the M lead of the dx signaling equipment at one end of the four-wire trunk results in an output signal on the E lead of the dx signaling equipment at the other end.

a. On-Hook. In the normal state, the M lead is grounded, causing the polarized relay to remain ,in its unoperated position,. Thus the E lead remains ungrounded. With no difference in earth potential between the near and far terminals, no current flows over the T1 and R1 leads.

b. Off-Hook. When the near terminal goes off-hook, ground is removed from the M lead and battery is applied. The current is not sufficient to operate the polarized relay at the near terminal. However, at the dx signaling equipment at the far terminal, the same current causes the polarized relay to operate in accordance with pulses from the loop generated by the local M lead. The relay repeats these pulses to the trunk circuit by closing ground pulses over the E lead. Upon answer at the far terminal, battery is applied to the distant M lead, and current stops flowing over the T and R leads. The result is that the polarized relay in the far terminal dx signaling equipment remains in its operated position. The near terminal polarized relay operates and grounds its associated E lead. If the far terminal goes off-hook with the local terminal on-hook, operation and effect of the circuitry is identical to that described above, but reversed.

c. Both Terminals Off-Hook. If the M leads at both ends of the four-wire facility are transferred from ground to battery (indicating signals are being transmitted from both ends), no current will flow over the T and R leads, since the same potential is applied at both ends. The polarized relays at both ends, however, will operate.

d. Call Completion. When the call is completed, the M leads of the near and far terminals are transferred from battery to ground. This causes the polarized relay of both dx signaling equipment sets to restore and remove ground from their associated E leads.

4-2. Functional Description

(fig. 4-2)

The dx signaling equipment is used on a four-wire facility with signals applied to the transmit voice path (T and R) leads and earth potential compensation on the receive voice path (T1 and R1) leads. The polarized relay used in the dx signaling equipment has four windings of equal resistance and number of turns. A resistance network is strapped to match the conductor loop resistance of the line facility plus 1250 ohms ± 125 ohms. The circuit configuration and windings of the polarized relay and other components, at the two ends of the four-wire facility, are identical. Thus, circuit operation and sequence is identical in both directions.

a. On-Hook. When the four-wire facility is idle, the M leads at each end of the four-wire facility are grounded and there is no current flowing over the A lead or T and R leads. If there is no difference in the earth potential between the two terminals, no current will flow over the B lead or T1 and R1 leads. If there is a difference in earth potential, the direction of current flow over these leads will depend upon the relative polarity of the earth potential at the two terminals. Current flows between the -20 volts dc supplied by the voltage divider and the M lead ground through the No. 2 and 3 windings of the polarized relay. The current flow through these windings is in a direction which acts to keep the polarized relay unoperated and, consequently, no signals are sent or received at either end.

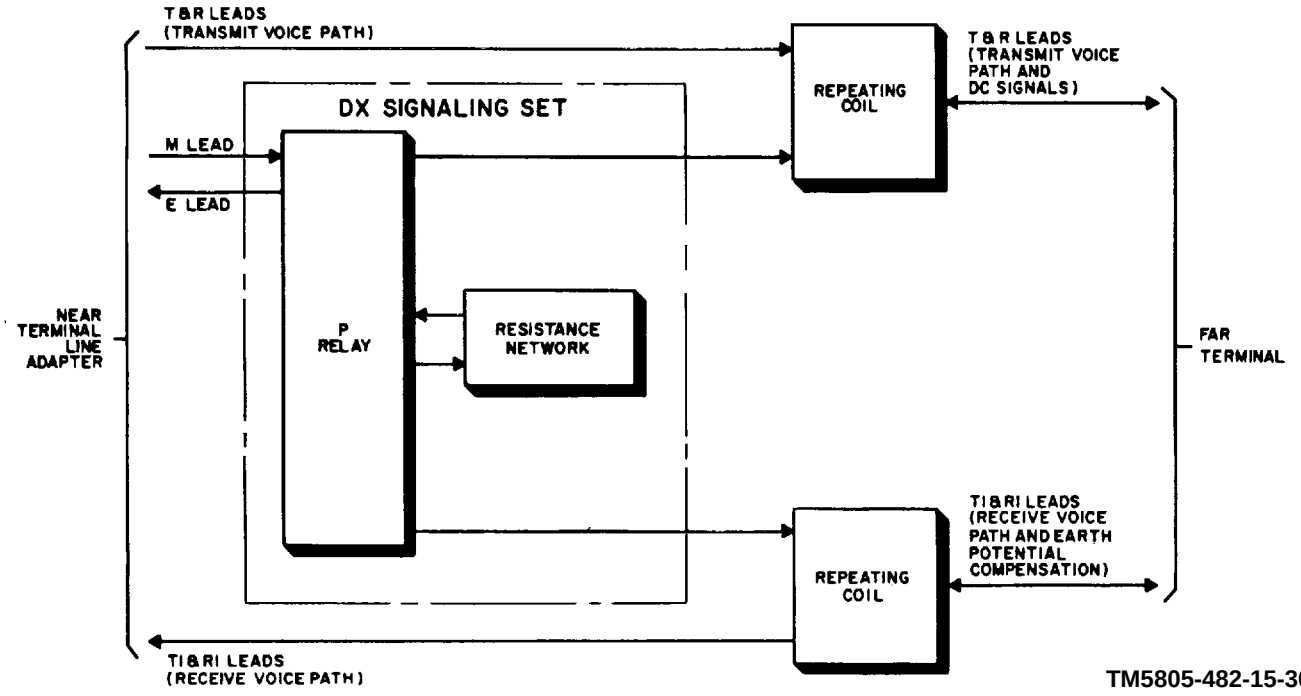

Figure 4-1. Dx Signaling Equipment DH-85837-72A and Repeating Coils H-887079-2, block diagram

b. Off-Hook.

(1) When the near terminal goes off-hook, its associated M lead transfers from ground to battery with the far terminal still in its on-hook mode. Current flows through the No. 1 winding at the near end over the A lead to the transmit repeating coil and out over the T and R leads to the far terminal. The current flowing through the No. 1 winding is also applied through the No. 2 and 3 windings to the -20 volts de supplied by the voltage divider. Although the current through the No. 2 and 3 windings is now flowing in a direction that tends to operate the polarized relay, the current through the No. 1 winding is flowing in a direction to keep it unoperated.

(2) The No. 1 winding of the polarized relay is in series with the No. 1 winding of the polarized relay at the far terminal. The No. 2 and 3 windings of the polarized relay are also in series through the resistance network. However, the potential applied to the No. 1 windings is the full -48 volt dc office battery, and the potential applied to the No. 2 and 3 windings is approximately one-half the office battery (the difference between the half-value voltage divider and the full battery voltage).

(3) The resistance network in series with windings No. 2 and 3 is strapped to a value equal to the loop resistance of the line plus 1250 ± 125 ohms, whereas the No. 1 windings are in series via T and B leads through only one-half the loop resistance. The combined effect of this difference in circuit resistance and the difference in potential applied to the windings, as described in (2) above, is such that the current flow through the No. 1 winding of the polarized relay is approximately four times the current flow through its No. 2 winding and four times the current flow through its No. 3 winding. Since the No. 2 and 3 windings are both acting to energize the relay to its operated position, their combined effect is only equal to approximately one-half the effect of the No. 1 winding which is energized to keep the relay in its unoperated position.

(4) The result is that the polarized relay in the off-hook dx signaling equipment remains unoperated. The battery on its associated M lead, however, causes the polarized relay at the far dx signaling equipment to operate by energizing its No. 1 winding through M lead ground. The flow through the No. 1. winding of the far polarized relay similarly has twice the effect of its No. 2 and 3 windings where current is flowing in a direction which would otherwise keep the relay unoperated. The operation of the relay causes ground to be applied to the far E lead.

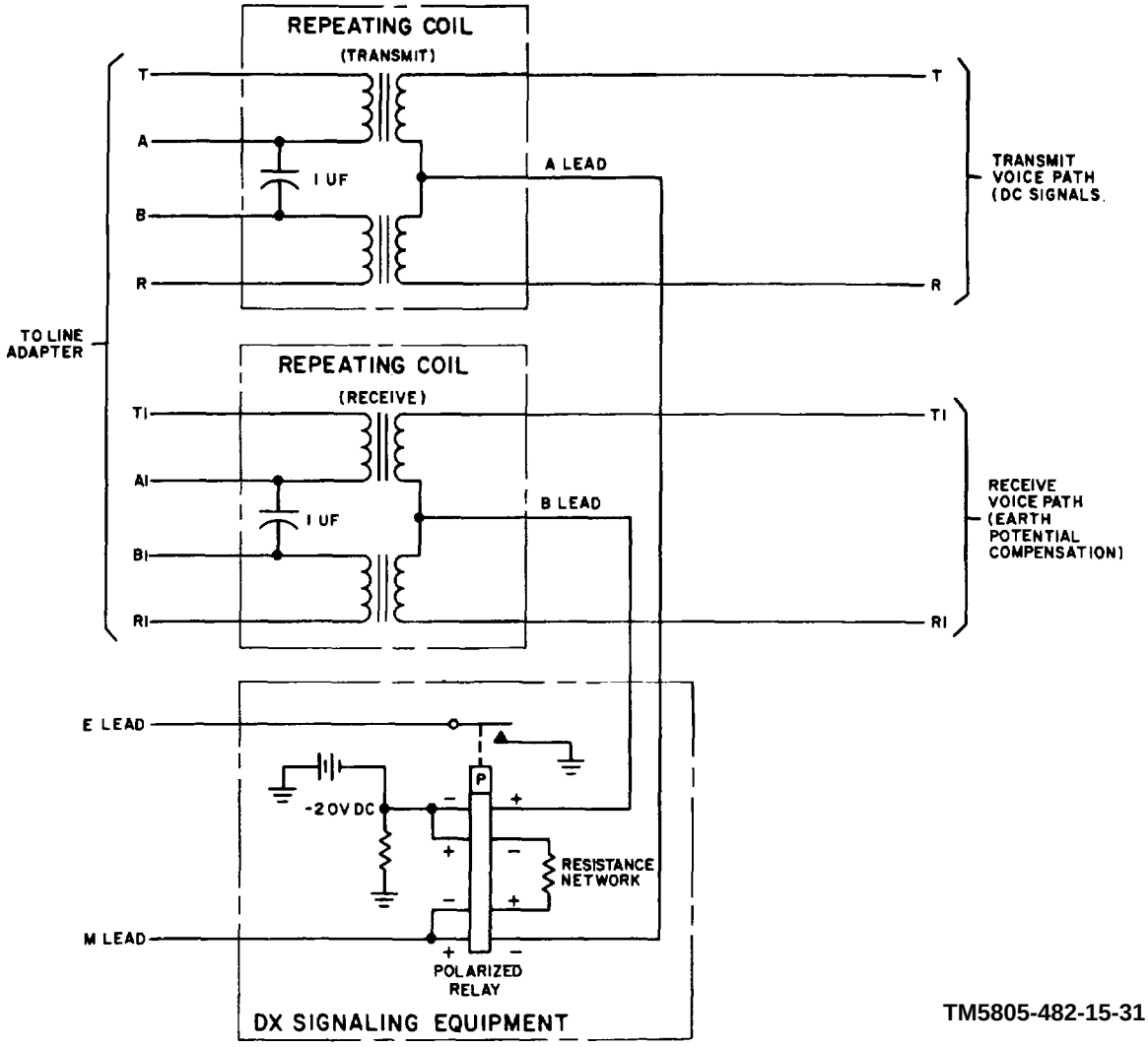

Figure 4-2. Dx Signaling Equipment DH-85837-72A and Repeating Coils H-887079-2, simplified schematic diagram

c. Both Terminals Off-Hook. If the M leads at both ends of the four-wire facility are transferred from ground to battery simultaneously (indicating signals are being transmitted from both ends) no current flows over the T and R leads, since the same potential is applied to the M lead at both ends. However, the negative battery on each M lead causes a flow of current between the M lead, through windings No. 2 and 3, to the -20 volt dc voltage divider. The polarized relays at both ends will operate, since there is no current flowing through the No. 1 windings to energize the relays in the unoperated position. The E leads at both terminals are grounded by operation of the polarized relays indicating an incoming signal at both offices.

d. Dial-Pulsing. After the dx signaling equipment at the far terminal has been seized (by operation of its polarized relay), the terminal originating the call will generate fluctuating battery and ground pulses on the M lead in accordance with the number dialed. This results in the operation of the polarized relay at the far end in accordance with the pulses generated at the originating terminal. The polarized relay at the far dx signaling equipment grounds its associated E lead at the dial-pulse rate.

e. Called Party Answers. When the called party answers (goes off-hook), the M lead at that terminal is transferred from ground to battery, causing the polarized relay at the originating end to operate. The polarized relay in the dx

signaling equipment at the terminating end also remains operated. The circuit operation is identical to the description given in c above.

f. Call Completion. Upon the completion of the call, the parties at both ends go on-hook which causes the M leads at both ends to transfer from battery to ground. The polarized relays in the dx signaling equipment at both ends of the four-wire facility restore. This removes ground from the associated E leads for disconnect supervision and returns the circuits to normal.

g. Earth Potential Compensation. Any differences in the level of earth potential between the terminals at the two ends of the four-wire f*aci*lity will cause current to flow over the T, R, T1 and R1 leads. The current flow over all four conductors will be from the office with the more positive earth potential to the office with the more negative earth potential. This current flows through the No. 1 and 4 windings of both polarized relays. Since the No. 1 and 4 windings of each relay are connected in opposition, the effect of the current flow through one winding is counteracted by the current flow in the other winding. The dx signaling equipment can function properly with great differences in earth potential between the two terminals, because these two windings cancel each other's magnetic force. The differences in earth potential are compensated for either dc or induced ac.

CHAPTER 5
MAINTENANCE

Section I. GENERAL INFORMATION

5-1. Scope

This chapter describes maintenance procedures for dx signaling equipment and repeating cores. Listed below are the various types of information and the paragraphs in which they can be found.

a. Preventive maintenance (para 5-4)
b. Troubleshooting (para 5-11)
c. Adjustment, repair, removal, and replacement (para 5-15)
d. Testing (para 5-20)

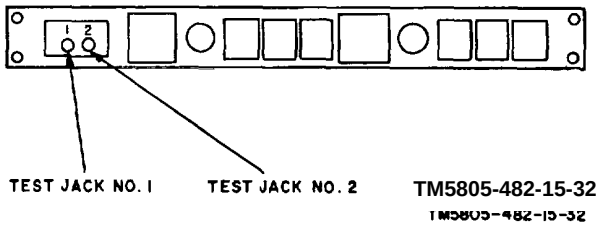

Figure 5-1. DX Signaling Equipment DH-85857-7SA, maintenance instruments.

5-2. Maintenance Instruments

(fig. 5-1)

Instrument	Function
Test jack 1	Provides access for external test equipment for circuit 1.
Test jack 2	Provides access for external test equipment for circuit 2.

Section II. PREVENTIVE MAINTENANCE

5-3. Scope

The preventive maintenance duties are listed below with a reference to the paragraphs covering the specific maintenance functions. These procedures do not require special tools or test equipment.

a. Monthly preventive maintenance checks and services (para 5-7).
b. Quarterly preventive maintenance checks and services (para 5-8).
c. Cleaning (para 5-9).
d. Touchup painting (para 5-10).

5-4. Materials Required

The following materials are required:

a. Cleaning compound, trichloroethane
b. Cleaning cloth.
c. Fine sandpaper No. 000 or 0000.
d. Touchup paint.

5-5. Requirements

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to assure that the equipment is serviceable.

a. Systematic Care. The procedures given in paragraphs 5-6 through 5-10 cover routine systematic care and cleaning essential to proper up-keep and operation of the equipment.

b. Preventive Maintenance Checks and Services. The preventive maintenance checks and services charts (paras 5-7 and 5-8) outline functions to be performed at specific intervals. These checks and services are to maintain equipment in a combat serviceable condition; that is, in good general (physical) condition and in good, operating condition. To assist operators in maintaining combat serviceability, the charts indicate what to check, how to check, and what the conditions are; the references column lists the illustrations or paragraphs that contain additional information. If the defect cannot be remedied by performing the corrective action indicated, higher echelon maintenance or repair is required. Records and reports of these checks and services must be made in accordance with the requirements set forth in TM 38-750.

5-6. Checks and Services Periods

Preventive maintenance checks and services are required on a monthly and quarterly basis. Paragraph

5-7 specifies checks and services that must be performed monthly. Paragraph 5-8 specifies checks and services that must be performed quarterly.

NOTE

If the equipment must be kept in continuous operation, perform only those checks and services that can be accomplished without disturbing operation; make the complete checks and services when the equipment may be taken out of service.

5-7. Monthly Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	Reference
1	Completeness	See that the equipment is complete	.
2	Cleanliness	Exterior of equipment must be clean and dry; free of dirt, dust, grease, and fungus	Para 5-9
3	Cables	Inspect cables and wires for cracked or frayed insulation	None
4	Metal surfaces	Inspect exposed metal surfaces for rust and corrosion. Touch up with paint as required.	TB 74010 and para 5-10.
5	Terminal blocks	Inspect terminal blocks for loose con - nections and cracked or broken - insulation.	None

5-8. Quarterly Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	Reference
1	Publications	See that all publications are complete, serviceable, and current.	DA Pam 110-4
2	Modifications	Check DA Pam 310-7 to determine if new applicable MWO's have been published. All URGENT MWO's must be applied immediately. All NORMAL	TM 38-750 and DA Pam 3110-7
3		MWO's must be scheduled.	

5-9. Cleaning

Inspect the exterior surfaces of the unit. The exterior surfaces shall be clean, free of dust, dirt, grease, and fungus.

a. Remove dust and loose dirt with a clean soft cloth.

WARNING

The fumes of trichloroethane are toxic. provide thorough ventilation whenever used. DO NOT use n-ear an, open flame. Trichloroethane is not flammable, but exposure of the fumes to an open flame converts the fumes to highly toxic, dangerous gases.

b. Remove grease, fungus, and ground-in dirt from the exterior of the unit. Use a damp cloth (net wet) with cleaning compound. If dirt is difficult to remove, use mild soap if necessary.

c. Remove dust or dirt from the jack and plugs with a brush.

5-10. Touchup Painting

Remove rust and corrosion from metal surfaces by lightly sanding with fine sandpaper. Brush two thin coats of paint on the bare metal to protect it from further corrosion. Refer to the applicable cleaning and refinishing practices specified in TM 9-213.

Section III. TROUBLESHOOTING

5-11. Scope

This section contains all the necessary information to troubleshoot the dx signaling equipment and/or either one of the two repeating coils. The information consists of: tools and test equipment required for troubleshooting; sectionalization, localization, and isolation instructions; and maintenance aids.

5-12. Tools and Test Equipment

a. Tools.

(1) Soldering iron (25 to 50 watts)

(2) Needle nose pliers
(3) Solder

b. Test equipment. The only item of test required is Multimeter AN/USM-16.

5-13. Sectionalization, Localization, and Isolation

a. Sectionalization. The first step in servicing the dx signaling equipment and repeating coils is to sectionalize the fault to either the dx signaling equipment or to one of the two repeating coils. Trouble, which seldom happens in the repeating coils, can be quickly recognized by making a resistance check of its four windings (para 5-14*d).* After it has been determined that the repeating coils are good and the dx signaling equipment 'is at fault, maintenance personnel should refer to the localization information.

b. Localization. If it has been determined that the dx signaling is at fault, the trouble must be further localized to either the polarized relay or the resistance network within this unit. This can best be accomplished by isolation.

c Isolation. The third step is to isolate the trouble to the defective part responsible for the abnormal condition. Equipment trouble will usually be isolated to dirty contacts, or improper adjustment of the polarized relay (sec IV, para 5-15*d*). Some faults, such as burned out resistors and arcing, can be located by means of sight, sound, or smell. The majority of faults, however, must be isolated by making voltage and resistance checks. Paragraphs (1) through (3) below contain a group of tests that should minimize the amount of work involved in isolating a trouble within a defective unit

(1) *Visual inspection.* The purpose of visual inspection is to quickly locate a fault without testing or measuring circuits. By this approach, maintenance personnel can frequently discover the trouble or determine the circuit in which the trouble exists.

(*2) Testing.* Maintenance personnel should perform the adjustment test located in section V. This test will indicate the general location of the fault and help determine the exact nature of the trouble.

(*3) Intermittent troubles.* In the preceding tests, the possibility exists that intermittent troubles can occur. If present, this type of trouble can often be located by tapping or jarring the equipment. For this type of condition, the wiring and connections to the units must be checked for defects.

5-14. Maintenance Aids

a. Parts Location Drawings. Parts location drawings are provided for the repeating coils (fig. 5-2) and the dx signaling equipment (fig. 5-3) to identify the individual components that will be used during troubleshooting.

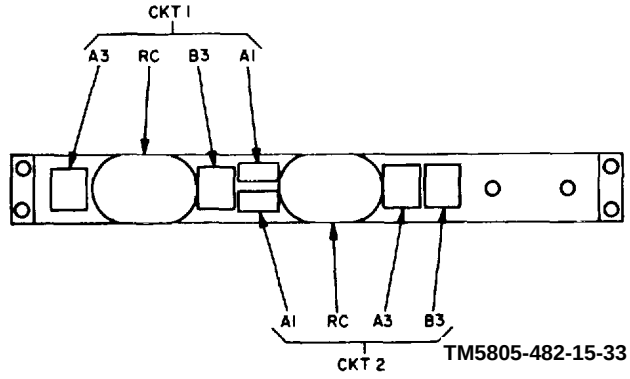

Figure 5-2. Repeating Coils H-887079-2, parts location diagram.

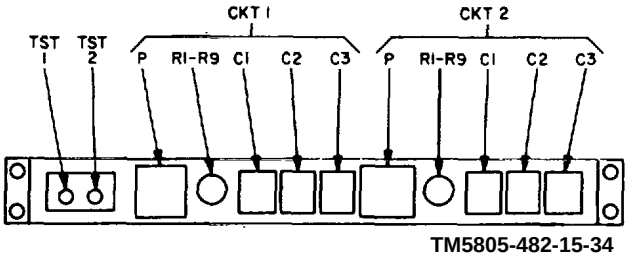

Figure 5-3. Dx Signaling Equipment DH-858S7-72A, ports location diagram.

b. Schematic Diagram. Figure 5-4 is a schematic diagram of the dx signaling equipment and repeating coils.

c. Troubleshooting Chart. A troubleshooting chart for the repeating coils and dx signaling equipment is provided to aid in sectionalizing the fault to the repeating coils or dx signaling equipment. In addition, the troubleshooting chart will help in localizing the trouble to a defective stage within these units. Maintenance personnel should also refer to subparagraph d for resistance measurements of the repeating coil and the polarized relay windings.

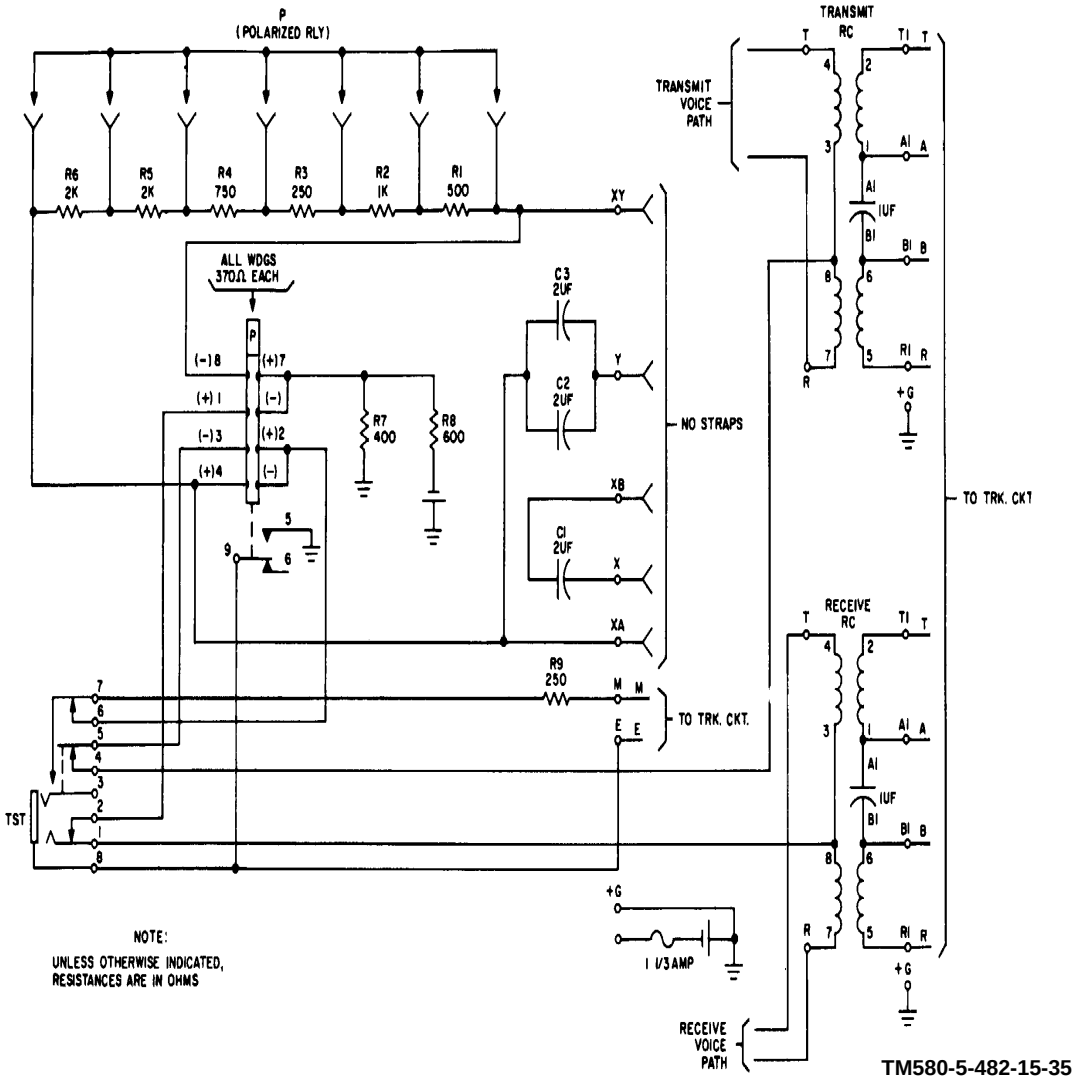

Figure 5-4. Dx Signaling Equipment DH-8587-7MA and Repeating Coils H87079-2, schematic diagram.

Item No.	Symptom	Probable trouble	Corrective action
1	No signals received on near terminal E lead but polarized relay operates properly.	Dirty contacts on polarized relay at near terminal.	Replace relay.
2	Near terminal polarized relay does not operate or operates incorrectly (E lead signals are incorrect).	*a.* Polarized relay out of adjustment at near terminal.	*a.* Adjust polarized relay. See paragraph 5-17.
		b. Faulty polarized relay at near terminal.	*b.* See paragraph 5-14 *d* (1). Polarized relay if necessary.
		c. Open windings in transmit repeating coil.	*c.* See paragraph 5-14 *d* (2). Replace repeating coil if necessary.
		d. Open windings in receive repeating coil.	*d.* See paragraph 5-14 *d.* (2). Replace repeating coil if necessary.
		e. Faulty resistance network. 2*b* through 2*e*.	e. Replace any defective components. 2*b* through 2*e.*
3	No signals or incorrect signals received at far terminal.	Refer to items 2*b* through 2*e.*	Refer to items 2*b* through 2*e.*

d. Resistance Value of Coils. Listed in (1) and (2) below are the resistances of relay and repeating coils. The resistance value of the repeating coils must be measured using a multimeter with all parallel paths disconnected.

(1) *Polarized relay*

Pins 2 and 3..... 370 ohms
Pins 2 and 4..... 370 ohms
Pins 7 and 8 .....370 ohms
Pins 1 and 7 .....370 ohms

(2) *Repeating coil (transmit and receive*).

Pins 1 and 2 .....10.2 ohms
Pins 3 and 4 .....6.9 ohms
Pins 5 and 6 .....10.2 ohms
Pins 7 and 8 .....6.9 ohms

Section IV. ADJUSTMENT, REPAIR, REMOVAL, AND REPLACEMENT

5-15. Scope

This section contains the following pertinent maintenance procedures for the dx signaling equipment and repeating coils.

a. Polarized relay adjustment (para 5-17).
b. Repair (para 5-18).
c. Removal and replacement (para 5-19).

Adjustment procedures for the polarized relays should be used along with the relay tests in section V of this chapter. All other component parts, including the repeating coils, can neither be adjusted nor repaired and are replaced if defective.

5-16. Tools, Test Equipment, and Material

a. Tools.
(1) Small soldering iron
(2) Small screwdriver.
(3) Long nose pliers
(4) 0.003-inch nonmagnetic offset thickness gage, Automatic Electric Co., Part No. H-8835961.
(5) Push-pull gage, Automatic Electric Co., Part No. H-881513-1.
(6) Spring adjuster.

b. Test Equipment.
(1) Current flow test set, Automatic Electric Co., Model S
(2) Appliqué meter, Automatic Electric Co., part No. H48406151.
(3) Test cord with telephone plug at one end (test cord).

c. Materials.
(1) Solder.
(2) Resistor, 500-ohm ± 1 percent
(3) Strap wire.

5-17. Polarized Relay Adjustment

(fig. 5-5)

Routine adjustments of the polarized relays are given in the following paragraphs. Unnecessary adjustments that would require complete readjustment of the relay should be avoided since armature, contact, and pole-piece adjustments are interacting. Normally, the adjustment procedures are performed in conjunction with the relay tests in Section V of this chapter. To minimize repeated adjustments, checks and adjustments should be performed in the order given. Adjustment of a polarized relay requires removal of the cover (para 5-19*a).*

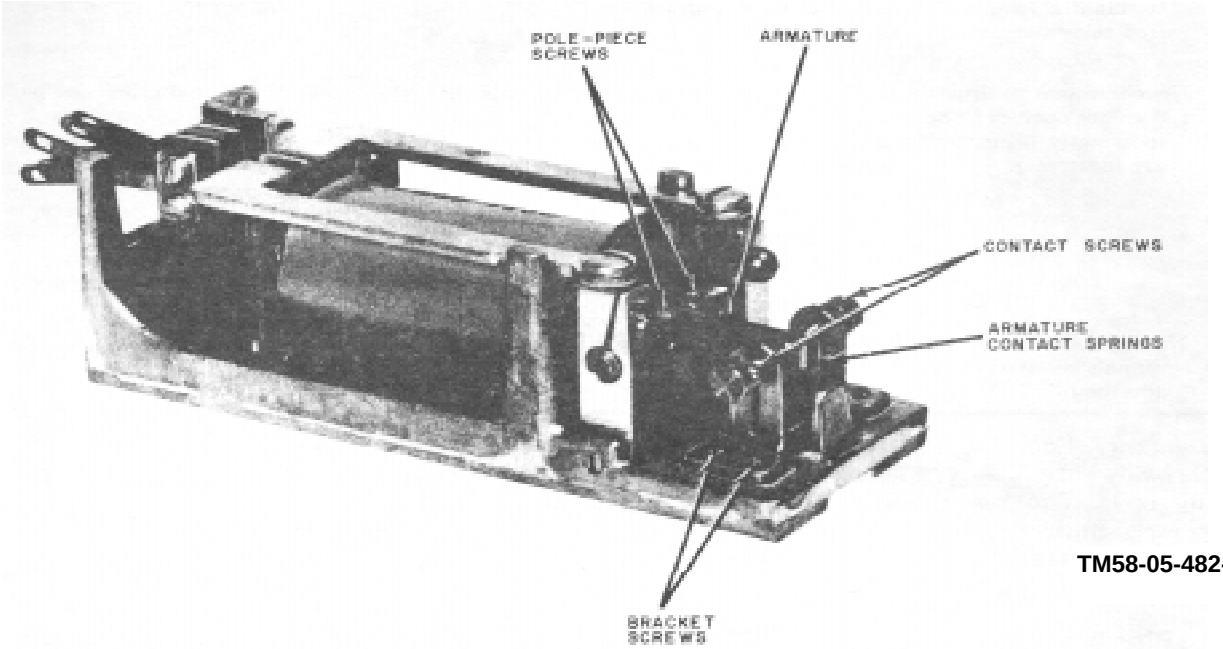

Figure 5-5. Polarized relay (cover removed), adjustment points.

a. Armature. Examine the armature to verify that it has adequate horizontal and vertical clearance. Ensure that the armature does not touch the inside of the spool in any position with the relay either operated or restored. If adjustment is required, proceed as follows:

(1) Remove the relay from its mounted position as described in paragraph 5-19*b*.

(2) Slightly loosen the screws that secure armature to support.

(3) Move the armature up or down, as required, to bring it to approximate central position with respect to coil, noting that the armature contacts are aligned with the stationary contacts.

(4) Repeat step (3) above to align armature contacts from front to rear, shifting armature in or out as required.

(5) Tighten armature screws.

(6) If satisfactory alignment is not obtained in steps (3) and (4) above, loosen the screws holding the contact screw brackets to the base of the relay and then move the brackets until the contacts line up properly.

(7) Set the contact screw brackets so that the contact screws strike the contact as near the armature center as possible.

(8) Tighten the contact screws securely and remount the relay on frame (para 5-19*b*).

b. Contact Springs. Contact springs are the flexible springs on the armature which are used to support armature contacts. Check contact spring alignment and pressure requirements as follows:

(1) Check that the contact springs are aligned with armature and each other.

(2) Using a push-pull gauge, check that the contact springs bear against each other with a pressure of 35 $\pm$ 15 grams. Measure the contact pressure point where springs make contact with one spring held stationary.

(3) Using a thickness gauge, check that gap between the contact springs at any point along front edge is less than 0.002 inch.

(4) Using a spring adjuster, bend and adjust the springs as required to meet requirements of steps (1), (2), and (3) above

c. Pole-Pieces. When armature and contact spring adjustments have been made, the electrical tests in Section V must be performed to verify these adjustments. Prior to testing, a reference setting of the pole-piece screws must be established.

NOTE

Reverse soak and soak procedures (performed in the following paragraphs) are the same, except that the test card connections to the current flow test set negative and ground terminals are reversed.

(1) Apply soak current to relay winding continuously so that the relay armature operates to the left-hand contact.

(2) Move the left-hand pole-piece screw inward until the left-hand contact just opens.

(3) Back off the left-hand pole-piece screw until the left-hand contact just re-closes.

(4) Apply reverse soak current and repeat steps (2) and (3) above for the right-hand pole-piece screw.

(5) Remove reverse soak current from the relay winding.

(6) Make sure that pole-piece screws are tight enough to hold their position but still permit changes in adjustment.

5-18. Repair

There are no repair procedures for the dx signaling equipment and repeating coils. If attempts to adjust the polarized relays fail to resolve a malfunction, the defective relay must be replaced. Burnishing of pitted relay contacts is not recommended since further damage to the contacts might result. All other component parts of the dx signaling equipment are nonreparable items and must be replaced if found to be defective.

5-19. Removal and Replacement

a. Polar Relay Cover.

(1) To remove the cover, grasp it with the thumb and forefinger, compress the two spring catches and pull the cover off.

(2) To replace the cover, position it on the relay and press down until the spring catches the two plugs in the relay base.

b. Polarized Relay.

NOTE

To facilitate removal of the polarized relay, the relay cover should be in place.

(1) Unsolder all leads connected to relay terminals; tag leads for future identification;

(2) Grasp the relay cover without depressing the spring catches.

(3) Pull firmly to disengage the four guide pins from the associated detent springs. Note that considerate force may be required to pull the relay.

(4) To replace the relay, insert the four guide pins into the associated detent springs and press the relay into position.

(5) Resolder the leads to the proper relay terminals (in accordance with the identification tags).

c. Parts Replacement. All component parts of the dx signaling equipment, including repeating coils, are easily reached and can be removed without disturbing other parts. Before disconnecting electrical leads, the color coding of the leads and the identification of associated terminals should be noted or each lead tagged to identify the associated terminal. Before removing retaining hardware, the orientation of the part being removed should be noted so that the new part is installed in the same orientation. Careless replacement of parts often makes new faults inevitable. Note the following precautions:

(1) Do not use a large soldering iron when soldering small resistors or capacitors, since overheating of small components can seriously damage them or change their values.

(2) Do not allow drops of solder to fall into parts of the assembly, since they may cause short circuits.

(3) Make well-soldered joints, since a poorly soldered joint is one of the most difficult faults to find.

Section V. TESTING

5-20. Scope

This section describes procedures for testing the dx signaling equipment in order to ensure that the circuit is performing adequately. Except for the test jack used (fig. 5-1), testing is the same for both polarized relays. Testing of the dx signaling equipment is limited to the following:

a. Operate current test and readjustment (para 5-23).

b. Nonoperate current test and readjustment (para 5-24).

c. Contact closure (para 5-25). Test preparation and disconnecting the test setup are described in paragraphs 5-22 and 5-26, respectively.

5-21. Tools, Test Equipment, and Materials

a. Tools.

(1) Soldering iron.

(2) Long nose pliers.

b. Test Equipment.

(1) Current flow test set, Automatic Electric Co., Model S

(2) Applique meter, Automatic Electric Co., Part No. H-884051-1.

(3) Test cord with telephone plug at one end (test cord).

(4) Telephone hand test set, Automatic Electric Co., Model L9066.

c. Materials.

(1) Resistor, 500 ohms ± 1 percent

(2) Strap wire

(3) Solder

5-22. Test Preparation

(fig. 5-6)

After a circuit release is obtained from the maintenance supervisor and prior to interrupting the circuit by patching into the test jack, a telephone hand set should be used to monitor the output of the transmit or receive repeating coils to determine that the circuit is idle. When performing electrical tests of the polarized relays, an applique meter should always be used with the current flow test set in order to permit measurement of extremely small current values.

a. Set all switches on the current flow test set and applique meter to their normal positions.

b. Connect test equipment across 50-volt dc supply (central office battery).

c. Connect a 500-ohm ± 1 percent resistor across the negative and ground terminals of the current flow test set.

d. Remove all leads from terminal 7 of the polarized relay under test relay.

e. Strap terminals 4 and 8 of the polarized

NOTE

The combination of step *d* and *e* puts the four windings of the polarized relay in series.

5-23. Operate Current Test and Readjustment

a. Connect the telephone plug of the current flow test set cord into the test jack (1 or 2) associated with the dx signaling equipment under test.

b. Connect the tip and ring leads of the test cord to the negative and ground terminals, respectively, on the current flow test set.

c. Perform a reverse soak on the polarized relay windings by adjusting the current flow test set meter to indicate 45 milliamperes. Operate the current flow key for at least 1 second to enable the current to flow through the relay windings.

d. Disconnect the test cord tip and ring leads from the current flow test set terminals. Then connect the tip and ring leads to the test set ground and negative terminals, respectively.

NOTE

Steps *c* and *d* must always be performed before step *e.*

e. Adjust the current flow test set so that the applique meter indicates 1.9 milliamperes. Operate the current flow key. If the relay operates, proceed to paragraph 5-24; if the relay does not operate, continue on to step *f* below.

f. Perform steps *b, c,* and *d* above; then adjust the current flow test set so that the applique meter indicates 0.9 milliampere. Operate the current

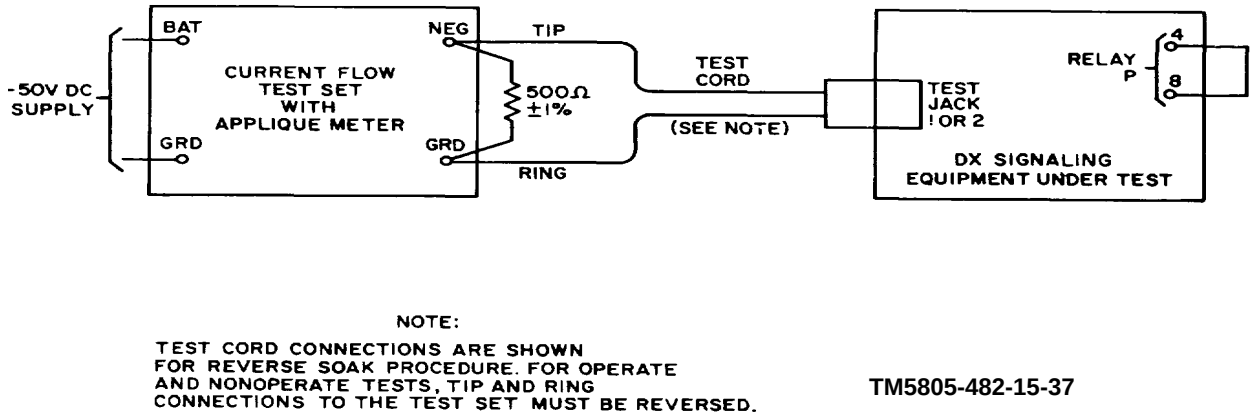

Figure 5-6. Test setup for polarized relay testing.

flow key. Adjust the polarized relay until it just operates. Restore the current flow key to its normal position.

5-24. Nonoperate Current Test and Readjustment

a. Perform the reverse soak operations described in steps 5-23 *b*, *c*, and *d.*

NOTE

Steps 5-23 *b*, *c,* and *d* must always be performed before step b below.

b. Adjust the current flow test set so that the applique meter indicates 0.6 milliampere. Operate the current flow key; the polarized relay should not operate. If the relay operates, repeat the reverse soak operations (steps 5-23*b*, *c*, and *d*; then proceed to step *c* below.

c. Adjust the polarized relay and the current flow test set so that the relay does not operate when the applique meter indicates 0.6 milliampere and the current flow key is operated.

5-25. Contact Closure

a. Connect the tip and ring leads of the test cord to the ground and negative terminals, respectively, of the current flow test set. Insert the telephone plug of the test cord into the appropriate test jack.

b. Insert a 0.003-inch nonmagnetic gage between the pole piece and the armature stop pin on the left side of the armature.

c. Perform step 523*c* with the gage still in place. The armature closes with the contact on the left side of the armature if the relay is properly adjusted.

d. Perform step 5-23*b*.

e. Insert the 0.003-inch nonmagnetic gage between the pole piece and the armature stop pin on the left side of the armature.

f. Repeat step 5-23*c* with the gage still in place. The armature closes with the contact on the right side of the armature if the relay is properly adjusted.

5-26. Disconnecting Test Setup

When electrical testing and readjustment of the polarized relay is completed, dismantle the test setup and return the relay to its operating configuration as follows:

a. Disconnect the test cord from the relay test jack and current flow test set; return test cord to storage.

b. Disconnect test equipment from -50-volt dc supply.

c. Remove 500-ohm resistor from the current flow test set negative and ground terminals.

d. Return all controls on the test set and applique meter to their normal positions; secure the test set and meter.

e. Remove strap from terminals 4 and 8 of the polarized relay.

f. Reconnect all leads (removed in step 5-22*d*) to terminal 7 of the relay.

CHAPTER 6
SHIPMENT, LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE

6-1. Repackaging

Repackaging of the equipment for shipment or limited storage normally will be performed at a packaging facility or by a repackaging team. Should emergency packaging be required, select the materials from those listed in SB 38-100. Package the equipment in accordance with the original packaging, in so far as possible, with the available materials.

6-2. Authority for Demolition

Demolition of the equipment will be accomplished only upon order of the commander. Use the destruction procedures outlined in paragraph 6-3 to prevent further use of the equipment.

6-3. Methods of Destruction

The tactical situation and time available will determine the method to be used when destruction of equipment is ordered. In most cases, it is preferable to demolish completely some portions of the equipment rather than partially destroy all the equipment units.

a. Smash. Use sledges, axes, hammers, crowbars, and any other heavy tools available to smash the interior of the equipment.

b. Cut. Use axes, handaxes, machetes, and similar tools to cut cabling, cording, and Wiring. Use a heavy axe or machete to cut the power cable. Cut all cords and cables in a number of places.

WARNING

Be extremely careful with explosives, and incendiary devices. Use these items only when the need is urgent.

c. Burn. Burn the technical manuals first. Burn as much of the equipment as is flammable; use gasoline, oil, flamethrowers, and similar materials. Pour gasoline on the cut cables and internal wiring, and ignite it. Use a flamethrower to burn spare parts or pour gasoline on the spares and ignite them. Use incendiary grenades to complete the destruction of the equipment.

d. Explode. Use explosives to complete demolition or to cause maximum damage, before burning, when time does not permit complete demolition by other means. Powder charges, fragmentation grenades, or incendiary grenades may be used. Incendiary grenades usually are most effective if destruction of small parts and wiring is desired.

e. Dispose. Bury or scatter destroyed parts or throw them into nearby Waterways. This is particularly important if a number of parts have not been completely destroyed.

6-4. Reporting

The reporting of the destruction of equipment shall be made through command channels.

APPENDIX A
REFERENCES

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (Type 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
DA Pam 310-7	U.S. Army Index of Modification Work Orders.
SB 38-100	Preservation, Packaging, Packing, and Marking Materials, Supplies, and Equipment used by the Army.
TB 746-10	Field Instructions for Painting and Preserving Electronics Command Equipment.
TM 9-213	Painting Instructions for Field Use.
TM 11-5805-482-15-1	Operator, Organizational, DS, GS, and Depot Maintenance Manual, Overseas AUTOVON Interface Components: 600-OHM and 900(OHM two Wire to Four-Wire Telephone Repeater Terminating Units (Wescom Part Nos. FD-W06-AB, FD-6000-AC) and Four Wire to Four Wire Voice Frequency Line amplifiers (WESCOM Part Nos. FD-6000-AG, FD-4000-AH).
TM 11-5805-482-15-2	Operator, Organizational, DS, GS, and Depot Maintenance Manual, Overseas AUTOVON Interface Components: 2600 Cycle Signaling Set with Self-Contained ,Oscillator (Wescom Part No. FD-6000-AA).
TM 11-5806-482-15-4	Operator, Organizational, DS, GS, and Depot Maintenance Manual, Overseas AUTOVON Interface Components: Two-Way PABX Routine Trunk Circuit with Pad Control and Pu1lse Correction (AUTELCO PART NO. DH-75592-A78A); Two-Way PABX Routine Trunk Circuit with Pad Control (AUTELCO Part No. DH-75592,-A710A); Pulse Correction Circuit for Two-Way PABX Routine Trunk Circuit (AUTELCO Part No. DH-75592-A7111A).
TM 11-5805-482-15-5	Operator, Organizational, ,DS, GS, and Depot Maintenance Manual, Overseas AUTOVON Interface Components: Two-Way PABX Preemptible Interface Trunk Circuit with Pad Control and Pulse Correction (AUTELCO Part No. DH-75650-702A); Universal Cord Applique for Two-Way PABX Preemptible Interface Trunk Circuits (AUTELCO Part Nos. DH-7565-A77A and DH-75650-711A); H756650 Trunk Circuit Adapter for AUTELCO Syst 1000/2, M819/427-A1; H75650 Trunk Circuit Adapter for AUTELCO Syst 1000/1, M819/427-A2; H75650 Trunk Circuit Adapter for SIEMENS RP40 SWBD, M819/427-B; H75650 Trunk Circuit Adapter for SIEMENS PABX EMD SWBD, M819/427-H; H75650 Trunk Circuit Adapter for Telenorma SWBD, M819/427-K; H76650 Trunk Circuit Adapter for SIEMENS-EISEN-BAHN System M819/427-N.
TM 11-5805-482-15-6	Operator, Organizational, DS, CS, and Depot Maintenance Manual, Overseas AUTOVON Interface Components: DTMF Keyset and Coupling Unit (AUTELCO Part No. H-887038-1).
TM 11-5805-482-15-7	Operator, Organizational, DS, GS, and Depot Maintenance Manual, Overseas AUTOVON Interface Components: Two-Way AUTOVON Trunk Circuit (Western Electric Co. Part Nos. J61561AN-1, List Nos. L-1, L-2, L-4, L-A, L-B, L-WB, L-WC, L-WE) and Multi-Level Precedence Preemption Adapter for AUTOVON Trunk Circuit (Western, Electric Co. Part No. H-000-525, List No. L-1).

TM 11-5805-482-15-8	Operator, Organizational, DS, GS, and Depot Maintenance Manual, Overseas AUTOVON Interface Components: Preempt Tone Generator (Western Electric Co. Part No. 404G).
TM 11-5805-482-15-9	Operator, Organizational, DS, GS, and Depot Maintenance Manual, Overseas AUTOVON Interface Components: 2/6 MF Tone Supply-Transfer Alarm and Distribution Circuits (AUTELCO Part. No. H-887929-4).
TM 11-5805-482-15-10	Operator, Organizational, ,DS, GS, and Depot Maintenance Manual, Overseas AUTOVON Interface Components: Combination 1-Milliwatt stability Check and Loop-Around Termination with Release Termination (AUTELCO Part No. DH-871918-A70A).
TM 11-5805-482-15-11	Operator, Organizational, DS, GS, and Depot Maintenance Manual, Overseas AUTOVON Interface Components: .Noise and Balance Test Termination (AUTELCO Part No. DH-871918-A72A).
TM 11-5805-482-15-12	Operator, ,Organizational, DS, CS, and Depot Maintenance Manual, Overseas AUTOVON Interface Components: 100HZ, 1 Milliwatt Test-Tone Generator (Northeast Electronics Co. Part No. FD1067AK).
TM 11-5805-482-15-13	Operator, Organizational, DS, CS, and Depot Maintenance Manual, Overseas AUTOVON Interface Components: Preemption Tone Supply, Transfer Alarm, and Distribution Circuits (AUTELCO Part No. H-886957-1).
TM 11-5805-482-15-14	Operator, Organizational, ,DS, GS, and Depot Maintenance Manual, Overseas AUTOVON Interface Components: Battery Charger/Eliminator with 37 Nickel-Cadmium CelIs (AUTELCO Milan Part No. FD (6003-AA).
TM 11-5805-482-15-15	Operator, Organizational, DS, GS, and ,Depot Maintenance Manual, Overseas AUTOVON Interface Components: Battery Charger/Eliminator (AUTELCO Part No. FD-6003-AB).
TM 11-5805-482-15-16	Operator, Organizational, DS, GS, and Depot Maintenance Manual, Overseas AUTOVON Interface Components: Reverse-Battery Test-Line Circuit with varying Supervisory Signals (AUTELCO Part No. DH-610036-71A).
TM 11-5805-482-15-17	Operator, Organizational, DS, GS, and Depot Maintenance Manual, Overseas AUTOVON Interface Components: DC to DC Converter, 60VDC to 48VDC (Lorain Model No. SQG-25B).
TM 11-5805-482-15-18	Operator, Organizational, DS, CS, and Depot Maintenance Manual, Overseas AUTOVON Interface Components: DC to DC Converter, 24VDC to 50VDC (Lorain Model No. QA7B).
TM 11-5805-482-15-19	Operator, Organizational, DS, GS, and Depot Maintenance Manual, Overseas AUTOVON Interface Components: "C" Lead Adapter for Test Termination (AUTELCO-Milan Part No. M819/444A).
TM 38-750	Army Equipment Record Procedures.

APPENDIX C
DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION

C-1. Scope
This appendix lists repair parts and special tools required for the performance of general support and depot maintenance of the H-887079-2 and DH-858-37-72A. No parts authorized for stockage at direct support.

C-2. General
This Repair Parts and Special Tools List is divided into the following sections:

a. Repair Parts for Direct Support, General Support, and Depot Maintenance - Section II and III. A list of repair parts authorized for the performance of maintenance at the general support and depot level. No parts authorized for stockage at direct support.

b. Special Tools, Test, and Support Equipment for Direct Support, General Support, and Depot Maintenance-Section IV. Not applicable.

C-3. Explanation of Columns
The following provides an explanation of columns in the tabular lists:

a. Source, Maintenance, and Recoverability Codes (SMR).

(1) Source code indicates the selection status and source for the listed item. Source codes are–

Code	*Explanation*
P	Repair parts which are stocked in or supplied from the GSA/DSA, or Army supply system and authorized for use at indicated maintenance categories.
P2–	Repair parts which are procured and stocked for insurance purposes because the combat or military essentially of the end item dictates that a minimum quantity be available in the supply system.
P9-	Assigned to items which are NSA design controlled: unique repair parts, special tools, test, measuring and diagnostic equipment, which are stocked and supplied by the Army COMSEC logistic system, and which are not subject to the provisions of AR 380-41.
P10-	Assigned to items which are NSA design controlled: special tools, test, measuring and diagnostic equipment for COMSEC support, which are accountable under the provisions of AR 380-41, and which are stocked and supplied by the Army COMSEC logistic system.
M-	Repair parts which are not procured or stocked, but are to be manufactured in indicated maintenance levels.
A-	Assemblies which are not procured or stocked as such, but are made up of two or more units. Such component units carry individual stock numbers and descriptions,
B-	*Code* *Explanation* are procured and stocked separately and can be assembled to form the required assembly at indicated maintenance categories.
X-	Parts and assemblies which are not procured or stocked and the mortality of which normally is below that of the applicable end item or component. The failure of such part or assembly should result in retirement of the end item from the supply system.
X1-	Repair parts which are not procured or stocked. The requirement for such items will be filled by use of the next higher assembly or component.
X2 -	Repair parts which are not stocked. The indicated maintenance category requiring such repair parts will attempt to obtain same through cannibalization. Where such repair parts are not obtainable through cannibalization, requirements will be requisitioned, with accompanying justification, through normal supply channels.
G-	Major assemblies that are procured with PEMA funds for initial issue only as exchange assemblies at DSU and GSU level These assemblies will not be stocked above DS and GS level or returned to depot supply level.

(2) Maintenance code indicates the lowest category of maintenance authorized to install the listed item. The maintenance level codes are -

Code	*Explanation*
C	Operator/crew
O	Organizational maintenance
F	Direct support maintenance
H	General support maintenance
D	Depot maintenance

(3) Recoverability code indicates whether unserviceable items should be returned for recovery or salvage. Items not coded are expendable. Recoverability codes are -

Code	*Explanation*
R-	Repair parts and assemblies that are economically reparable at DSU and GSU activities and normally are furnished by supply on an exchange basis.
S-	Repair parts and assemblies which are economically reparable at DSU and GSU activities and which normally are furnished by supply on an exchange basis. When items are determined by a GSU to be uneconomically reparable, they will be evacuated to a depot for evaluation and analysis before final disposition.
T-	High dollar value recoverable repair parts which are subject to special handling and are issued on an exchange basis. Such repair parts normally are repaired or overhauled at depot maintenance activities.
U-	Repair parts specifically selected for salvage by

Code	*Explanation*
	reclamation units because of precious metal content, critical materials, or high dollar value reusable casings or castings

b. Federal Stock Number. Indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Description. Indicates the Federal item name and any additional description of the item required. A part number or other reference number is followed by the applicable five-digit Federal supply code for manufacturers in parentheses.

d. Unit of Measure (U/M). A two character alphabetic abbreviation indicating the amount or quantity of the item upon which the allowances are based; e.g., ft, ea, pr, etc.

e. Quantity Incorporated in Unit. Indicates the quantity of the item used in the H-887079-2 and DH-85837-72A.

f. 3O-Day DS/GS Maintenance Allowances.

NOTE

Allowances in GS column are for GS maintenance only.

(1) The allowance columns are divided into three subcolumns. Indicated in each subcolumn is the total quantity of items authorized for the number of equipments supported. Items authorized for use as required, but not for initial stockage, are identified with an asterisk in the allowance column.

(2) The quantitative allowances for GS level of maintenance will represent initial stockage for a 30-day period for the number of equipments supported.

(3) Determination of the total quantity of parts required for maintenance of more than 100 of these equipments can be accomplished by converting the equipment quantity to a decimal factor by placing a decimal point before the next to last digit of the number to indicate hundredths, and multiplying the decimal factor by the parts quantity authorized in the 51-100 allowance column. Example, authorized allowance for 51-100 equipments is 40; for 150 equipments multiply 40 by 1.50 or 60 parts required.

g. 1-Year Allowances Per 100 Equipments/Contingency Planning Purposes. Indicates the total quantity required for distribution and contingency planning purposes. The range of items indicates total quantities of all authorized items required to provide for adequate support of 100 equipments for one year.

h. Depot Maintenance Allowance Per 100 equipments. Indicates the total quantity authorized for depot maintenance of 100 equipments.

i. Illustrations.

(1) Figure number. Indicates the figure number of the illustration in which the item is shown.

(2) Item number or reference designation. Indicates the reference designation used to identify the item in the illustration.

C-4. Special Information

Repair parts mortality is computed from failure rates derived from experience factors with the individual parts in a variety of equipments. Variations in the specific application and periods of use of electronics equipment, the fragility of electronic piece parts, plus intangible material and quality factors intrinsic to the manufacture of electronic parts, do not permit mortality to be based on hours of end item use. However, long periods of continuous use under adverse conditions are likely to increase repair parts mortality.

C-5. Location of Repair Parts

This appendix does not contain any cross-reference indexes. To locate a repair part, scrutinize the repair parts list until the part is located.

C-6. Federal Supply Codes for Manufacturers

Code	*Manufacturers name*
04773	Automatic Electric Co.

SECTION II. REPAIR PARTS FOR DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE

(H-887079-2)

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION / REF. NUMBER & MFR CODE / USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30 DAY DS MAINT ALLOWANCE (A) 1-20	(B) 21-50	(C) 51-100	(7) 30 DAY DS MAINT ALLOWANCE (A) 1-20	(B) 21-50	(C) 51-100	(8) 1-YR ALW PER 100 EQUIP CTGY	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUSTRATIONS (A) FIG. NO.	(B) ITEM NO. OR REFERENCE. DESIGNATION
		REPEATING COILS (CKT1 AND CKT2) AUTELCO PART No. H-887079-2												
P-H	5910-170-8813	CAPACITOR, FIXED, PAPER: D-68563-A (04773)	EA	2				*	*	1	8	3	5-2	A1
P-H	5910-127-1630	CAPACITOR, FIXED, PAPER: D-68564-A (04773)	EA	4				*	*	1	13	6	5-2	A3, B3
P-H		COIL, REPEAT: D-284131-A (047730	EA	2				*	*	1	8	3	5-2	RC

SECTION III. REPAIR PARTS FOR DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE

(DH-85837-72A)

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION / REF. NUMBER & MFR CODE / USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30 DAY DS MAINT ALLOWANCE (A) 1-20	(B) 21-50	(C) 51-100	(7) 30 DAY DS MAINT ALLOWANCE (A) 1-20	(B) 21-50	(C) 51-100	(8) 1-YR ALW PER 100 EQUIP CTGY	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUSTRATIONS (A) FIG. NO.	(B) ITEM NO. OR REFERENCE. DESIGNATION
		DX SIGNALING EQUIPMENT, TWO CIRCUITS PER STRIP (CKT1 AND CKT2) (AUTELCO PART NO. DH-85837-72A)												
P-H	5905-828-6932	RESISTOR, FIXED, WIREWOUND: D-281301-A (04773)	EA	2				*	*	1	18	9	5-4	R4
P-H	5905-828-6928	RESISTOR, FIXED, WIREWOUND: D-282951-A (04773)	EA	4				*	1	1	19	10	5-4	R3, R9
P-H	5905-806-7150	RESISTOR, FIXED, WIREWOUND: D-284052-A (04773)	EA	4				*	1	1	19	10	5-4	R5, R6
P-H	5905-828-6929	RESISTOR, FIXED, WIREWOUND: D-284400-A (04773)	EA	2				*	*	1	13	6	5-4	R8
P-H	5905-828-6931	RESISTOR, FIXED, WIREWOUND D-284431-A (04773)	EA	2				*	*	1	13	6	5-4	R7
P-H	5945-631-3560	RELAY ARMATURE: D-55022-DP (04773)	EA	2				*	*	1	13	6	5-3	P
P-H	5910-127-1630	CAPACITOR, FIXED, PAPER: D-68564-A (04773)	EA	6				*	1	1	33	20	5-3	C1, C2, C3
P-H	5905-186-3475	RESISTOR, FIXED, WIREWOUND: H-78761-8 (04773)	EA	2				*	*	1	13	6	5-4	R1
P-H	5905-186-3472	RESISTOR, FIXED, WIREWOUND H-78761-10 (04773)	EA	2				*	*	1	13	6	5-4	R2

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USAIS (2)
USAES (2)
USAINTS (3)
USASTC (2)
Ft Huachuca (10)
Ft. Carson (10)
Army Dep (1) except
- LBAD (14)
- SAAD (30)
- TOAD (14)
- LEAD (7)
- ATAD (10)

Gen Dep (2)
Sig Sec, Gen Dep (5)
Sig Dep (12)
MAAG (1)
USARMIS (1)
WRAMC (1)
ARMY PIC CEN (2)
SIG FLDMS
UNITS ORG UNDER FOL TOE: 2 EA
- 11-155
- 11-157
- 11-158
- 11-587
- 11-592
- 11-597

ARNG: None

USAR: None.

For explanation of abbreviations used, see AR 320-50.

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