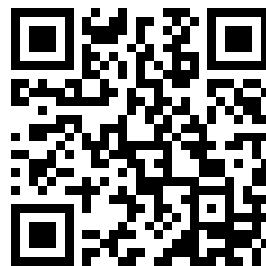

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W1.35:11-1466

TM 11-1466

WAR DEPARTMENT TECHNICAL MANUAL

RADAR SET AN/MPG-1

AND

RADAR SET AN/FPG-1

PREVENTIVE MAINTENANCE MANUAL



RESTRICTED. DISSEMINATION OF RESTRICTED MATTER.

No person is entitled solely by virtue of his grade or position to knowledge or possession of classified matter. Such matter is entrusted only to those individuals whose official duties require such knowledge or possession. (See also paragraph 23b, AR 380-5, 15 March 1944.)

WAR DEPARTMENT

15 MARCH 1945

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TM 11-1466
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TECHNICAL MANUAL
RADAR SET AN/MPG-1 AND RADAR SET AN/FPG-1
PREVENTIVE MAINTENANCE MANUAL

CHANGES
No. 2

WAR DEPARTMENT
WASHINGTON 25, D. C., 16 May 1946

TM 11-1466, 15 March 1945, is changed as follows:

mouth of the horn for a crack or a broken seal between the window and the adjacent plywood. If there is evidence of cracking, reseal with Permatex No. 2 gasket sealing compound (Signal Corps stock No. 6(240.2) or other suitable sealing compound.

4-40. Item 38—Waveguide, Horn, and Reflector

* * * * *

b. MAINTENANCE PROCEDURE.

I. INSPECT:

* * * * *

(8) (Added). The plastic window over the [AG 300.7 (15 Apr 46)]

Note (Added). The seal around the window is particularly liable to break during cold weather because of shrinkage of the plastic.

BY ORDER OF THE SECRETARY OF WAR:

* * * * *

OFFICIAL:
EDWARD F. WITSELL
Major General
The Adjutant General

DWIGHT D. EISENHOWER
Chief of Staff

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Refer to FM 21-6 for explanation of distribution formula.

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The fol
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RESTRICTED

THIS ADDENDA WILL REMAIN IN EFFECT ONLY UNTIL THE INFORMATION IS PUBLISHED IN AN OFFICIAL WAR DEPARTMENT PUBLICATION.

ADDENDA

15 MARCH 1945

ADDENDA TO

TM 11-1466

RADAR SET AN/MPG-1 AND RADAR SET AN/FPG-1 PREVENTIVE MAINTENANCE MANUAL

The following information, published on Order No. 2612-MPD-44, corrects portions of TM 11-1466, 15 March 1945. All serial numbers are covered in this addenda.

Personnel using the equipment and having custody of this technical manual will enter suitable notations beside each affected paragraph and figure in the technical manual to indicate the presence of this supplementary information.

ADDENDA I

ELECTRONIC REGULATOR

I-1. DELETION OF ELECTRONIC REGULATOR.

Radar Set AN/MPG-1 will not be equipped with the electronic regulator (power panel removable chassis). As a result, the following material is to be deleted:

- a. All of subparagraph 2-13c(6) and figure 2-11.
- b. Item No. 27, Electronic Regulator, from paragraph 3-2, biweekly maintenance items.
- c. All of paragraph 4-29, Item 27, Electronic Regulator.
- d. Figures 4-46 and 4-47.

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WAR DEPARTMENT TECHNICAL MANUAL
TM 11-1466

RADAR SET AN/MPG-1
AND
RADAR SET AN/FPG-1
PREVENTIVE MAINTENANCE MANUAL



WAR DEPARTMENT

15 MARCH 1945

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**WAR DEPARTMENT,
WASHINGTON 25, D. C., 15 MARCH 1945.**

TM 11-1466, Radar Set AN/MPG-1 and Radar Set AN/FPG-1, Preventive Maintenance Manual, is published for the information and guidance of all concerned.

[A. G. 300.7 (8 Aug 44).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

J. A. ULIO,
Major General,
The Adjutant General.

DISTRIBUTION:

AAF (5) ; AGF (5) ; ASF (2) ; T of Opn (5) ; Base Comd (5) ; Dept (5) ; Def Comd (2) ; Arm & Sv Bd (2) ; S Div ASF (1) ; SvC (5) ; Area ASvC (2) ; PE (Sig Sec) (2) ; ASF Dep (Sig Sec) (2) ; Dep 11 (Overseas) (10) ; Gen Overseas SOS Dep (Sig Sec) (10) ; Pro Dist 11 (2) ; USMA (2) ; WDGS Lib (2) ; Lab 11 (2) ; Rep Shop 11 (2) ; Inspection Z 11 (2) ; A (5) ; CHQ (5). T/O & E: 11-500; Sig Sv Orgn—(CC) Storage & Issue Sec (3) ; (EC) Radar Instl & Maint Team (3) ; (EG) Radar Rep Sec (3) ; (GQ) Wire Rep Sec (3) ; 11-587 (3) ; 11-597 (3).

(For explanation of symbols see FM 21-6.)

TABLE OF CONTENTS

	<i>Paragraph</i>	<i>Page</i>
CHAPTER 1. Introduction.		
Meaning of preventive maintenance.....	1-1	1-1
Preventive maintenance program.....	1-2	1-1
Meaning of FITCAL.....	1-3	1-1
CHAPTER 2. Preventive maintenance techniques.		
Introduction.....	2-1	2-1
Tubes and sockets.....	2-2	2-1
Capacitors.....	2-3	2-1
Resistors.....	2-4	2-3
Transformers and chokes.....	2-5	2-3
Potentiometers and rheostats.....	2-6	2-4
Powerstat.....	2-7	2-4
Terminal boards and wiring.....	2-8	2-5
Cables and connectors.....	2-9	2-5
Waveguide.....	2-10	2-6
Fuses.....	2-11	2-6
Meters.....	2-12	2-6
Relays.....	2-13	2-6
Switches.....	2-14	2-10
Pilot lights.....	2-15	2-11
Bushings and insulators.....	2-16	2-12
Motors and generators.....	2-17	2-12
Selsyns.....	2-18	2-13
Pedestal slip rings.....	2-19	2-13
Cabinets.....	2-20	2-14
CHAPTER 3. Preventive maintenance schedule and lubrication chart.		
Explanation of schedule.....	3-1	3-1
Preventive maintenance schedule.....	3-2	3-1
Table of lubricants.....	3-3	3-3
Lubrication chart.....	3-4	3-3
CHAPTER 4. Preventive maintenance item instructions.		
SECTION I. General information.		
Introduction.....	4-1	4-1
Standard practices.....	4-2	4-1
II Modulator.		
Item 1, Modulator control panel.....	4-3	4-5
Item 2, Driver.....	4-4	4-5
Item 3, Keyer.....	4-5	4-8
Item 4, Modulator cabinet.....	4-6	4-9
III. Servo assembly and amplidyne.		
Item 5, Servo rack.....	4-7	4-10
Item 6, Feed motor supply.....	4-8	4-10
Item 7, Slew-scan unit.....	4-9	4-12

TABLE OF CONTENTS

	<i>Paragraph</i>	<i>Page</i>
SECTION III. Servo assembly and amplidyne, (Contd).		
Item 8, Antenna servo amplifier	4-10	4-14
Item 9, PPI servo amplifier	4-11	4-15
Item 10, Amplidyne	4-12	4-16
IV. Rectifier assembly.		
Item 11, Rectifier rack	4-13	4-18
Item 12, Rectifier control panel	4-14	4-18
Item 13, 500-volt supply	4-15	4-19
Item 14, -150-volt supply	4-16	4-23
Item 15, 300-volt regulator	4-17	4-23
Item 16, 300-volt supply	4-18	4-23
V. Console.		
Item 17, Console cabinet	4-19	4-26
Item 18, PPI mount	4-20	4-28
Item 19, B-scope mount	4-21	4-30
Item 20, Azimuth tracking unit	4-22	4-30
Item 21, Range tracking unit	4-23	4-32
Item 22, Phase shifter	4-24	4-32
Item 23, STC unit	4-25	4-34
Item 24, Range unit	4-26	4-34
Item 25, 4-kv supply	4-27	4-36
VI. Power panel.		
Item 26, Power panel cabinet	4-28	4-37
Item 27, Electronic regulator	4-29	4-37
Item 28, Power panel, upper and lower sections	4-30	4-40
VII. Remote-B assembly.		
Item 29, Remote-B rack	4-31	4-41
Item 30, Remote-B unit	4-32	4-41
Item 31, Remote 300-volt supply	4-33	4-41
VIII. Antenna.		
Item 32, Antenna control panel	4-34	4-43
Item 33, Transmitter	4-35	4-43
Item 34, Receiver	4-36	4-43
Item 35, Antenna heater	4-37	4-46
Item 36, Rotating feed assembly	4-38	4-47
Item 37, Sweep-mark unit	4-39	4-47
Item 38, Waveguide, horn, and reflector	4-40	4-48
IX. Pedestal and tower.		
Item 39, Pedestal housing	4-41	4-50
Item 40, Antenna drive motor and oil pump	4-42	4-51
Item 41, Selsyn compartment	4-43	4-52
Item 42, Tower	4-44	4-54
X. Cables and telephone box.		
Item 43, Cables	4-45	4-55
Item 44, Telephone box	4-46	4-55

LIST OF ILLUSTRATIONS

<i>Fig. No.</i>	<i>Title</i>	<i>Page</i>
1-1	Radar Set AN/MPG-1.....	x
2-1	Tubes.....	2-2
2-2	Types of capacitors.....	2-2
2-3	Types of resistors.....	2-3
2-4	Types of rheostats and potentiometers.....	2-4
2-5	Modulator powerstat.....	2-5
2-6	Types of relays.....	2-7
2-7	Relay contacts.....	2-8
2-8	Construction of relay-cleaning tool.....	2-8
2-9	Time delay relay.....	2-9
2-10	Modulator overload relay.....	2-10
2-11	Power panel overvoltage relay.....	2-11
2-12	Blower motor.....	2-12
2-13	Selsyns.....	2-14
2-14	Selsyn brushes and slip rings.....	2-14
3-1	Refilling modulator oil tank.....	3-3
4-1	Location of components.....	4-2
4-2	Location of console components.....	4-3
4-3	Location of antenna components.....	4-4
4-4	Modulator relay and meter panel.....	4-5
4-5	Modulator with driver removed.....	4-6
4-6	Modulator driver, bottom view.....	4-7
4-7	Draining oil.....	4-8
4-8	Removing keyer tubes.....	4-8
4-9	Modulator keyer.....	4-9
4-10	Servo assembly.....	4-10
4-11	Feed motor supply, top view.....	4-11
4-12	Feed motor supply, bottom view.....	4-11
4-13	Slew-scan unit, top view.....	4-12
4-14	Slew-scan unit, bottom view.....	4-13
4-15	Slew-scan unit, front view.....	4-14
4-16	Antenna servo amplifier, top view.....	4-15
4-17	Antenna servo amplifier, bottom view.....	4-16
4-18	PPI servo amplifier, top view.....	4-17
4-19	PPI servo amplifier, bottom view.....	4-17
4-20	Amplidyne.....	4-18
4-21	Amplidyne, end view.....	4-18
4-22	Rectifier assembly.....	4-19
4-23	Control panel, top view.....	4-20
4-24	Control panel, bottom view.....	4-20
4-25	500-volt supply, top view.....	4-21
4-26	500-volt supply, bottom view.....	4-21
4-27	-150-volt supply, top view.....	4-22
4-28	-150-volt supply, bottom view.....	4-22
4-29	300-volt regulator, top view.....	4-24
4-30	300-volt regulator, bottom view.....	4-24
4-31	300-volt supply, top view.....	4-25
4-32	300-volt supply, bottom view.....	4-25
4-33	Console, front view.....	4-27

LIST OF ILLUSTRATIONS

<i>Fig. No.</i>	<i>Title</i>	<i>Page</i>
4-34	Console, bottom rear view.....	4-27
4-35	Console panel, rear view.....	4-28
4-36	PPI mount.....	4-29
4-37	Azimuth tracking unit.....	4-31
4-38	Range tracking unit and phase shifter.....	4-33
4-39	Phase shifter, internal view.....	4-34
4-40	STC unit, bottom view.....	4-34
4-41	Range unit, top view.....	4-35
4-42	Range unit, bottom view.....	4-35
4-43	4-kv supply, top view.....	4-36
4-44	4-kv supply, bottom view.....	4-37
4-45	Power panel, front view.....	4-38
4-46	Electronic regulator, top view.....	4-39
4-47	Electronic regulator, bottom view.....	4-39
4-48	Power panel, side view.....	4-40
4-49	Remote-B assembly.....	4-42
4-50	Antenna control panel.....	4-43
4-51	Transmitter.....	4-44
4-52	Receiver, top view.....	4-45
4-53	Receiver, bottom view.....	4-46
4-54	Antenna heater.....	4-47
4-55	Rotating feed assembly.....	4-48
4-56	Sweep-mark unit, side view.....	4-49
4-57	Sweep-mark unit, bottom view.....	4-50
4-58	Pedestal slip-ring compartment.....	4-50
4-59	Underside of the pedestal.....	4-51
4-60	Pedestal antenna drive motor compartment.....	4-52
4-61	Pedestal selsyn compartment.....	4-52
4-62	Tower.....	4-53
4-63	Tower winch.....	4-54
4-64	Elevator and pulley.....	4-54
4-65	Pedestal dolly clamping.....	4-54

REFERENCE NOTICE

TM 11-1466, PREVENTIVE MAINTENANCE MANUAL, is one of three technical manuals on Radar Set AN/MPG-1 which, with certain supplementary information (see note below), also covers Radar Set AN/FPG-1, the fixed version of Radar Set AN/MPG-1. TM 11-1466 is used in conjunction with TM 11-1366, TECHNICAL OPERATION MANUAL, and TM 11-1566, SERVICE MANUAL. TM 11-1466 is written to provide radar personnel with complete and practical instructions on how to perform preventive maintenance on the radar set. This manual is intended to standardize and regulate certain maintenance routines which are necessary for the better operation and longer life of this equipment.

NOTE FOR RADAR SET AN/FPG-1

Radar Set AN/FPG-1 is a fixed version of Radar Set AN/MPG-1. For additional information required to make TM 11-1366, TM 11-1466, and TM 11-1566 cover Radar Set AN/FPG-1, refer to Technical Bulletins which will be packed with Radar Set AN/FPG-1 and listed in FM 21-6.

DESTRUCTION NOTICE

WHY —To prevent the enemy from using or salvaging this equipment for his benefit.

WHEN—When ordered by your commander.

- HOW** —1. Smash — Use sledges, axes, handaxes, pickaxes, hammers, crowbars, heavy tools.
2. Cut — Use axes, handaxes, machetes.
 3. Burn — Use gasoline, kerosene, oil, flame throwers, incendiary grenades.
 4. Explosives — Use firearms, grenades, TNT.
 5. Disposal — Bury in slit trenches, fox holes, other holes. Throw in streams. Scatter.

USE ANYTHING IMMEDIATELY AVAILABLE FOR DESTRUCTION OF THIS EQUIPMENT.

- WHAT**—1. Smash — Magnetrons, waveguide, antenna assembly, transmitter, all tubes, meters, variable capacitors, relays, spare parts, power unit.
2. Cut — All cables, all tires.
 3. Burn — The Equipment Performance Log, the Station Record Book, and all technical manuals.
 4. Bury or Scatter — Remains of magnetrons and all other parts after destroying their usefulness.

DESTROY EVERYTHING

WARNING

HIGH VOLTAGE

is used in the operation
of this equipment.

DEATH ON CONTACT

may result if personnel fail to
observe safety precautions.

Be sure that high-voltage plate circuits and 115-volt a-c input connections are dead before performing preventive maintenance on this equipment.

High-voltage capacitors in power supplies must be discharged manually before performing preventive maintenance operations.

Extremely Dangerous Potentials

exist in the following units:

Modulator MD-36/MPG-1

Radar Transmitter T-92/MPG-1

Console CY-230/MPG-1

Rectifier Cabinet Assembly CY-232/MPG-1

Indicator Cabinet Assembly CY-234/MPG-1

Power Panel SB-25/MPG-1

Radar Receiver R-115/MPG-1

FIRST AID TREATMENT FOR ELECTRIC SHOCK

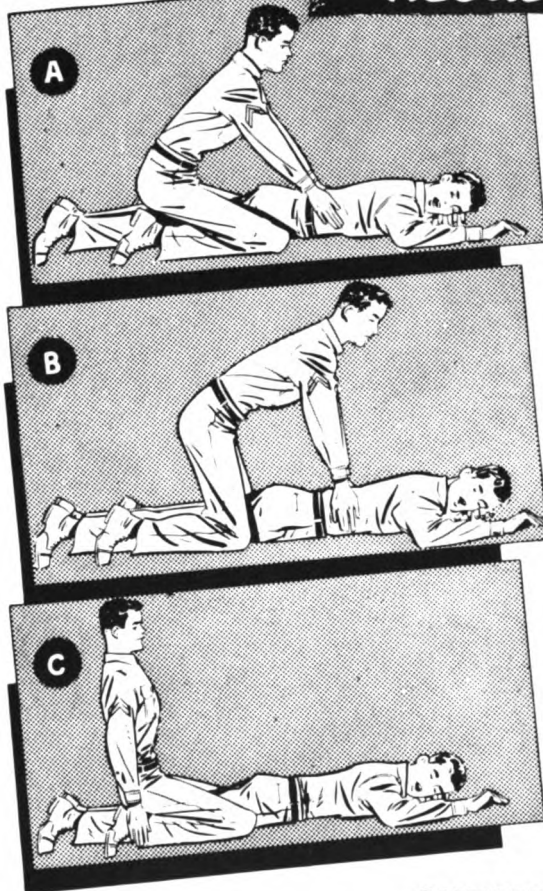
I. FREE THE VICTIM FROM THE CIRCUIT IMMEDIATELY.

Shut off the current. If this is not immediately possible, use a dry nonconductor (rubber gloves, rope, board) to move either the victim or the wire. Avoid contact with the victim. If necessary to cut a live wire, use an axe with a dry wooden handle. Beware of the resulting flash.

II. ATTEND INSTANTLY TO THE VICTIM'S BREATHING.

Begin resuscitation at once on the spot. Do not stop to loosen the victim's clothing. Every moment counts. Keep the patient warm; Wrap him in any covering available. Send for a doctor. Remove false teeth or other obstructions from the victim's mouth.

RESUSCITATION



POSITION

1. Lay the victim on his belly, one arm extended directly overhead, the other arm bent at the elbow, the face turned outward and resting on hand or forearm, so that the nose and mouth are free for breathing (fig. A).
2. Straddle the patient's thighs, or one leg, with your knees placed far enough from his hip bones to allow you to assume the position shown in figure A.
3. Place your hands, with thumbs and fingers in a natural position, so that your palms are on the small of his back, and your little fingers just touch his lowest ribs (fig. A).

FIRST MOVEMENT

4. With arms held straight, swing forward slowly, so that the weight of your body is gradually brought to bear upon the victim. Your shoulders should be directly over the heels of your hands at the end of the forward swing (fig. B). Do not bend your elbows. The first movement should take about 2 seconds.

SECOND MOVEMENT

5. Now immediately swing backward, to remove the pressure completely (fig. C).
6. After 2 seconds, swing forward again. Repeat this pressure-and-release cycle 12 to 15 times a minute. A complete cycle should require 4 or 5 seconds.

CONTINUED TREATMENT

7. Continue treatment until breathing is restored or until there is no hope of the victim's recovery. Do not give up easily. Remember that at times the process must be kept up for hours.
8. During artificial respiration, have someone loosen the victim's clothing. Wrap the victim warmly; apply hot bricks, stones, etc. Do not give the victim liquids until he is fully conscious. If the victim must be moved, keep up treatment while he is being moved.
9. At the first sign of breathing, withhold artificial respiration. If natural breathing does not continue, immediately resume artificial respiration.
10. If operators must be changed, the relief operator kneels behind the person giving artificial respiration. The relief takes the operator's place as the original operator releases the pressure.
11. Do not allow the revived patient to sit or stand. Keep him quiet. Give hot coffee or tea, or other internal stimulants.

HOLD RESUSCITATION DRILLS REGULARLY

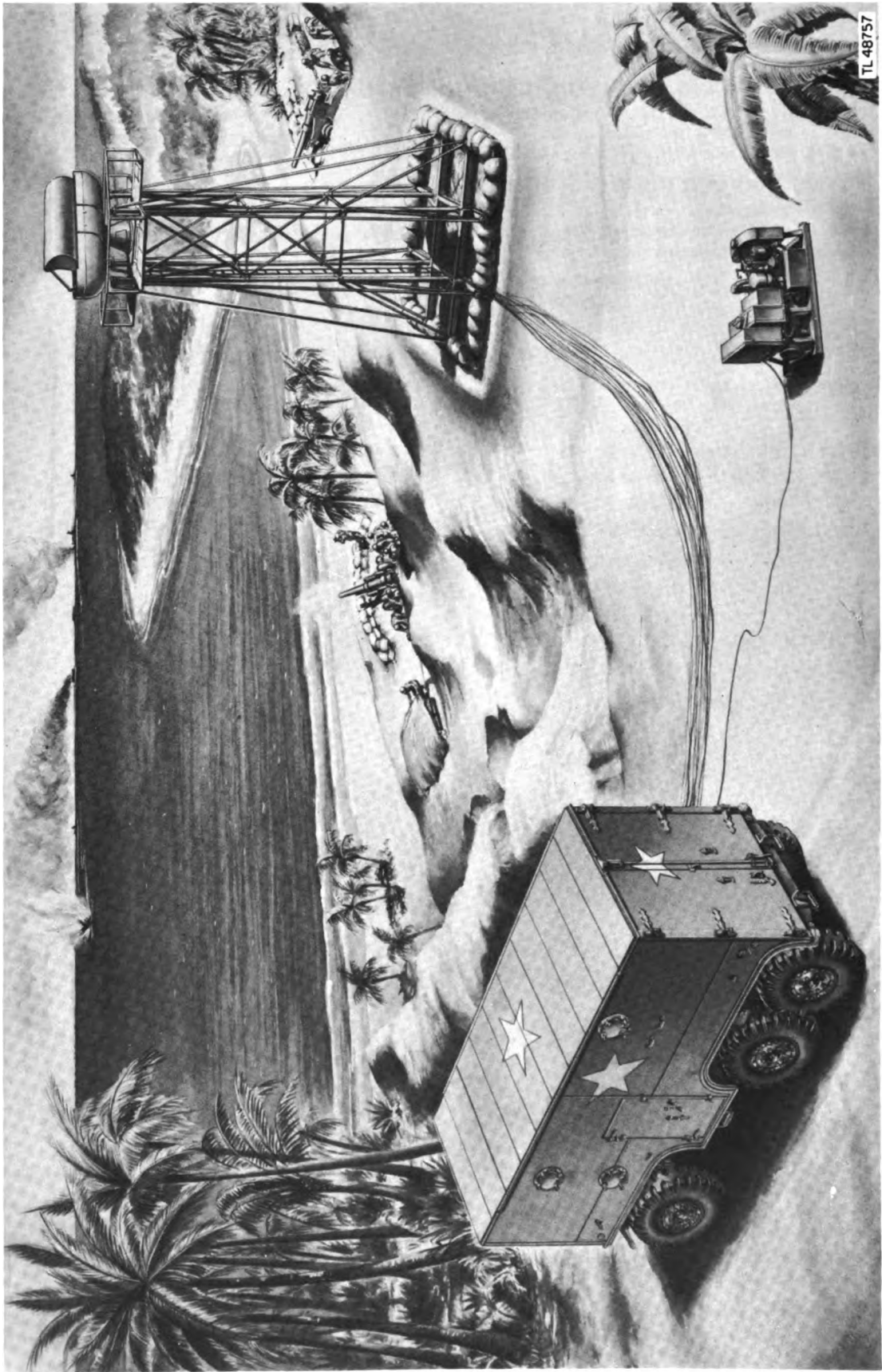


Figure 1-1. Radar Set AN/MPG-1.

CHAPTER 1

INTRODUCTION

1-1. MEANING OF PREVENTIVE MAINTENANCE.

Preventive maintenance may be defined as a systematic series of operations to be performed periodically on equipment in order to maintain top efficiency in performance, to minimize unwanted interruptions in service, and to eliminate major break-downs. The importance of preventive maintenance cannot be overemphasized.

1-2. PREVENTIVE MAINTENANCE PROGRAM.

The many devices used in radar sets differ widely in the amount and type of preventive maintenance required. Preventive maintenance procedures cannot be applied indiscriminately, and specific instructions are necessary. This book has been written to give the specific instructions around which the preventive maintenance program is built.

1-3. MEANING OF FITCAL.

Whenever possible in this book, standard letters have been used to indicate the operations to be performed. These letters are based on the word **FITCAL** in which *F* stands for **FEEL**, *I* for **INSPECT**, *T* for **TIGHTEN**, *C* for **CLEAN**, *A* for **ADJUST**, and *L* for **LUBRICATE**.

a. Feel. This operation is used to check parts for overheating, especially rotating parts such as blower motors, drive motors, and generators. By this means, the need for lubrication, the lack of proper ventilation, or the existence of some defect can be detected

and corrected before trouble develops. The maintenance man should become familiar with operating temperatures in order to recognize deviations from the normal range.

b. Inspect. Inspection is the most important preventive maintenance procedure because it determines the necessity for the others. To carry out the inspection procedure most effectively, make every effort to become thoroughly acquainted with normal operating conditions and thus be able to recognize and identify abnormal conditions readily. Inspection should be aimed to detect:

(1) Overheating, the signs of which are discoloration, blistering, bulging of parts or containers, leakage of insulating compounds, oxidation of contact surfaces, and peculiar odors.

(2) Dirt, corrosion, rust, mildew, and fungus growth.

(3) Loose mounting bolts and screws; loose clamping rings and connections.

c. Tighten. Although this operation is specified in many items, it cannot be overemphasized that screws, bolts, and nuts should not be tightened indiscriminately. When fittings are tightened beyond the pressure for which they are designed, they will be damaged or broken.

d. Clean. Clean parts only when inspection shows that cleaning is required. The parts are best cleaned with solvent, dry-cleaning, Federal Specification P-S-661a. Carbon tetrachloride can be used on the contacts of electrical equipment but will leave

a white film deposit which it is necessary to wipe off with a dry, clean cloth.

NOTE: The use of leaded gasoline for cleaning purposes is prohibited by AR-850-20.

e. Adjust. The correct interpretation of this instruction is that an adjustment will be performed only when inspection indicates

that it is required in order to maintain normal operating conditions.

f. Lubricate. This operation usually means the application of oil or grease to two surfaces to prevent mechanical wear; it sometimes means also the application of a thin film of oil to such items as tools, in order to prevent deterioration by rusting.

CHAPTER 2

PREVENTIVE MAINTENANCE TECHNIQUES

2-1. INTRODUCTION.

This chapter describes *how* the techniques of preventive maintenance are applied to the components and parts of Radar Set AN/MPG-1. The chapter includes a discussion of the preventive maintenance operations for major classes of parts and devices, and also points out the special techniques to be applied to particular units or parts. Refer to this chapter for the best procedures on how to perform the maintenance work scheduled in chapters 3 and 4.

2-2. TUBES AND SOCKETS.

a. **General.** The tubes in Radar Set AN/MPG-1 include special and standard glass and metal types. Several high-voltage types are shown in figure 2-1. Care must be taken in handling vacuum tubes as they are damaged easily. Preventive maintenance work on vacuum tubes and gas-filled tubes is limited to inspection and cleaning. The maintenance of tube sockets and mountings is concerned with inspection, tightening, and cleaning. The tubes should not be removed from their sockets except as directed by the preventive maintenance schedule.

CAUTION: Avoid touching tubes immediately after shut-down. Burns may result from contact with the envelopes of hot tubes.

b. Maintenance Operations.

(1) *Inspect (I).* The envelopes and all metal parts of tubes must be inspected for dirt and dust. Examine all terminals, connections, and tube caps for looseness and signs of corrosion. If a tube is removed from its socket, inspect the base pins and socket

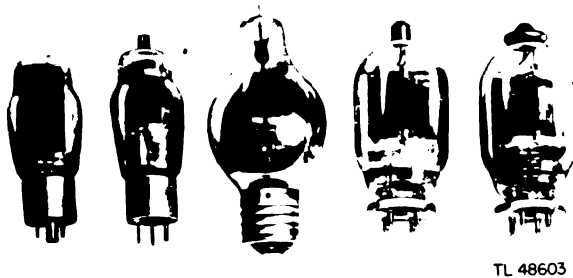
contacts. Check the soldered connections for looseness. The wire leads must be free of frayed insulation and broken strands which might cause short circuits. Examine the tube clamps for proper tension and secure mounting.

(2) *Tighten (T).* Most tube connections are soldered. Tightening is necessary for tubes connected by clamps, for tube caps, and for sockets fastened by screws.

(3) *Clean (C).* Keep high-voltage tubes clean (fig. 2-1). Accumulations of dirt or dust form leakage paths which, at the high voltages used with these tubes, may result in arc-over and break-down. Dust on receiving-type tubes does not interfere with their operation. Wiping with a dry cloth is usually adequate for keeping tubes and surrounding areas clean. When dirt is hard to remove, use a cloth moistened with dry-cleaning solvent. Rusted or corroded surfaces must be cleaned with crocus cloth and polished with a dry cloth.

2-3. CAPACITORS.

a. **General.** There are three general types of capacitors (fig. 2-2) used in Radar Set AN/MPG-1: the variable, the metal-encased, and the pigtail type. Different maintenance operations are performed on these three types. However, maintenance of encased capacitors must not be performed until they have been shorted with a capacitor-shortening tool. To construct a shorting tool, obtain a dry piece of varnished wood or some other material which is a good electrical insulator. The piece should be about 12 inches long and 1 inch in diameter. Securely fasten an 8-inch brass or copper rod or tubing to one end of the piece. Solder



TL 48603

Figure 2-1. Tubes.

a section of heavy flexible hook-up wire, about 18 inches long, to the brass or copper at the point where it is attached to the insulated piece. Fasten a heavy clip to the free end of the wire. When using the capacitor-shortening tool, first attach the clip to the frame of the component, making certain of good electrical contact. Then place the brass or copper against the capacitor terminals to short-circuit the capacitor to ground.

CAUTION: Capacitors may retain dangerous charges for some time. Before touching the capacitor terminals, be sure that they have been shorted with the capacitor-shortening tool.

b. Maintenance Operations for Metal-encased Capacitors.

(1) *Feel (F).* Feel the sides of the capacitors for overheating, which indicates excessive internal leakage and the need for replacement. Make certain before replacing the capacitor that the overheating is not caused by near-by parts such as hot tubes.

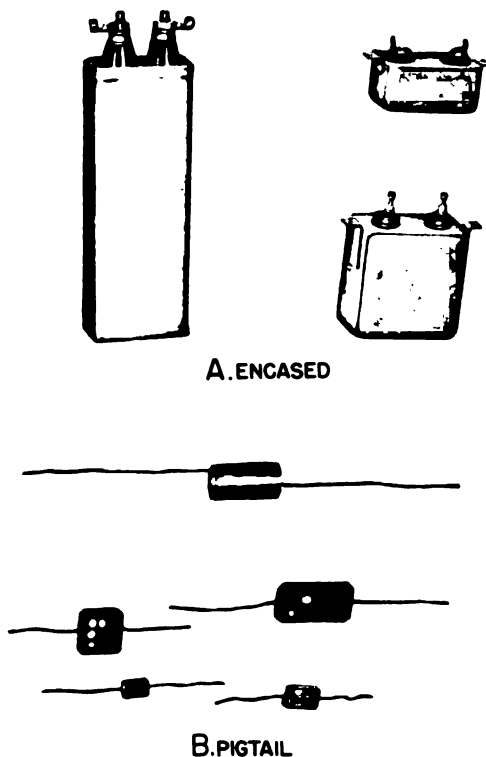
(2) *Inspect (I).* All insulators, terminals, bus-bars, leads, and mounts of high-voltage capacitors must be inspected for looseness, dirt, dust, and signs of moisture. A dirty or damp condition promotes arcing and break-down of insulation. Inspect the cases for bulging and for leaks.

(3) *Tighten (T).* If inspection discloses loose terminals, tighten properly. Particular care must be taken when tightening capacitor terminal nuts because their construction is such that the bolts tend to turn. If the terminals are not sufficiently tight,

grip the lower nut with a pair of pliers while tightening the upper nut with the proper size wrench; otherwise, the internal connections may be damaged. Tighten supporting insulators with care. Use judgment in applying pressure in order to prevent breakage.

(4) *Clean (C).* Clean the cases of the large fixed capacitors, the insulating bushings, and connections that are dirty or corroded. The capacitor cases and bushings can be cleaned usually with a dry cloth, but if the deposit of dirt is hard to remove, moisten the cloth with dry-cleaning solvent. Carefully wipe the bushings with a dry cloth after they are cleaned. Clean corroded connections with crocus cloth or #0000 sandpaper and then tighten.

c. Maintenance of Pigtail Capacitors. The pigtail type of capacitor requires very little preventive maintenance. When a chassis is inspected, examine the pigtail capacitors for signs of overheating as evidenced by bulging



TL 48604

Figure 2-2. Types of capacitors.

of the case or leakage of the insulating compound. Clean the pigtail capacitors with a small brush.

d. Maintenance of Variable Capacitors. Inspect the capacitors for dirt and dust. Particles of foreign matter between the capacitor plates may form leakage paths or shorts. Examine the leads and connections for looseness, corrosion, and frayed insulation of the wiring. Clean the capacitors with a soft brush. Do not change any adjustment.

2-4. RESISTORS.

For the purpose of maintenance, resistors may be divided into two groups. The first group, known as *ferrule* resistors, consists of those resistors which are detached easily. The second group, known as *pigtail* resistors, includes those resistors whose terminals are soldered (fig. 2-3).

a. Ferrule Resistors.

CAUTION: Do not touch ferrule resistors immediately after the power has been shut off. They are usually hot and painful burns may result.

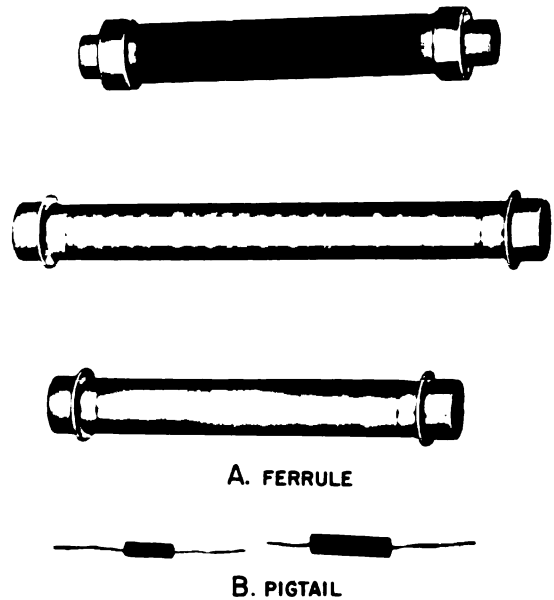
(1) *Feel (F).* The spring tension of ferrule clips may be checked by testing the *pull* of the ferrule resistor. Insufficient *pull* at the clip is an indication of a loose connection, and may result in poor electrical contact.

(2) *Inspect (I).* Inspect the coating of the resistor for dirt, cracks, and chipping. Check for indications of overheating such as blistering and discoloration. Examine the leads, clips, and metallic ends of the resistors and adjacent connections for corrosion, dirt, dust, and loose or broken strands. Check the resistor mounting for secure fastening.

(3) *Tighten (T).* Tighten all loose mountings and connections. If the tension of the ferrule clips is poor, press the clip ends together by hand or with a pair of pliers.

(4) *Clean (C).* Clean resistors with a brush. If dirty condition persists, wipe with a cloth moistened with dry-cleaning solvent. Remove corrosion with crocus cloth.

b. Pigtail Resistors. Pigtail resistors require very little preventive maintenance.



TL 48605

Figure 2-3. Types of resistors.

When the chassis is inspected, examine the pigtail resistors for dirt and for signs of overheating. Discolored, cracked, or chipped resistors indicate possible overload. Check the value of these resistors as a precautionary measure; if found to be beyond the prescribed tolerance, replace them. Clean the pigtail resistors with a small brush.

2-5. TRANSFORMERS AND CHOKES.

a. General. The transformers and chokes in Radar Set AN/MPG-1 have several uses. Generally they can be divided into high-potential and low-potential units. Normally, the transformers and chokes are enclosed in metal housings and are impregnated with an insulating compound. As a result, similar maintenance techniques are applicable to all of them. Defective transformers and chokes must be replaced.

b. Maintenance Operations.

(1) *Feel (F).* The feel operation must be performed very soon after the radar set is shut down. If any transformers or chokes are abnormally hot, notify the person in charge.

(2) *Inspect (I).* Carefully inspect each transformer or choke for dirt, for loose



TL 48609

Figure 2-4. Types of rheostats and potentiometers.

mounting brackets and rivets, for loose terminal connections, and for insecure connecting lugs. The presence of dust, dirt, and moisture between terminals of the high-voltage transformers and chokes may cause flash-overs. In general, overheating in wax-impregnated transformers and chokes, and leaks in oil-filled transformers and chokes are indicated by the presence of the insulating compound around the base of the transformer. If these conditions are encountered, notify the person in charge.

(3) *Tighten (T)*. Tighten loose mounting lugs, terminals, and rivets.

(4) *Clean (C)*. All metal-cased transformers can be cleaned by wiping with a clean cloth. In some instances it may be desirable to use a cloth moistened with dry-cleaning solvent. Corroded contacts or connections are cleaned with crocus cloth and then polished.

2-6. POTENTIOMETERS AND RHEOSTATS.

a. *General*. All the rheostats and potentiometers in Radar Set AN/MPG-1 fall into

two main groups for maintenance purposes: those that are constructed in such a manner that the resistance winding and the sliding contact are accessible, and those constructed so that the winding and contact are totally enclosed (fig. 2-4). In the latter group very little preventive maintenance can be performed, since opening and removing the metal case causes more harm than good.

b. Maintenance Operations.

(1) *Inspect (I)*. Examine the accessible moving parts for wear and the resistance element for signs of overheating. Check the tension of the potentiometer and rheostat wiping arms. The arms should make good contact without being tight enough to damage the resistor element. On wire-wound rheostats see that there are no broken wires or wires crossed over one another. Inspect all metallic parts, mountings, and connections for dirt, corrosion, and looseness. Inspect gearing or other mechanisms associated with the potentiometer or rheostat for binding action, dirt, corrosion, looseness, and need of lubrication.

(2) *Tighten (T)*. Tighten all loose mountings, fastenings, and connections. Tighten loose control knobs.

(3) *Clean (C)*. Clean potentiometers and rheostats with a brush or a clean dry cloth. Use a cloth moistened with dry-cleaning solvent where dirt is hard to remove. If the surfaces are corroded, clean with crocus cloth or #0000 sandpaper.

(4) *Lubricate (L)*. When definite binding is noticed, lubricate the shaft with special preservative lubricating oil (PS). Use the oil sparingly.

2-7. POWERSTAT.

a. *General*. The one powerstat (fig. 2-5) used in Radar Set AN/MPG-1 is located behind the upper right-hand panel of the modulator cabinet. The powerstat is of sturdy construction and is protected so that little maintenance other than inspection is required. Perform complete maintenance only when indicated necessary by inspection or when the powerstat is removed for other reasons. Refer to chapter 15, TM 11-1566 for the procedure in removing and disassembling the powerstat.

b. Maintenance Operations.

(1) *Inspect (I).*

(a) Examine for insecure mounting and for loose knob, dial, and connections. Inspect the exterior for dirt and corrosion. Test the shaft for binding. Using a flashlight or a trouble light, check the length of the brush. Replace the brush if it is less than 3/8 inch (see TM 11-1566). Round the edges of the new brush so that it does not dig into the wires.

(b) When the powerstat is disassembled, examine the contact surfaces for corrosion. Make sure there are no raised wires which might catch the brushes. Inspect the wire insulation around the central shaft for fraying and rotting.

(2) *Tighten (T).* Tighten all loose mountings, fastenings, and connections. Increase tension of brush springs if necessary.

(3) *Clean (C).* Clean the powerstat with a clean dry cloth or, if dirt is hard to remove, with a cloth moistened with dry-cleaning solvent. Remove corrosion with crocus cloth or #0000 sandpaper. If the winding surface becomes filled with carbon particles, remove the loose particles with a fine brush and then clean with dry-cleaning solvent.

(4) *Lubricate (L).* If the shaft shows signs of binding, disassemble and service the rear bearing as described in TM 11-1566. A drop or two of special preservative lubricating oil (PS) can be applied to the front bearing. Wipe off all excess oil.

2-8. TERMINAL BOARDS AND WIRING.

a. **General.** The terminal boards used in the radar set are insulating strips with screw-type terminals mounted upon them. Little preventive maintenance is required on terminal boards.

b. Maintenance Operations.

(1) *Inspect (I).* Carefully inspect the terminal boards for cracks, breaks, dirt, loose connections, and loose mounting. Examine each connection for dirt, corrosion, and mechanical defects. Check the wiring for loose or broken lacing and frayed or damaged insulation.

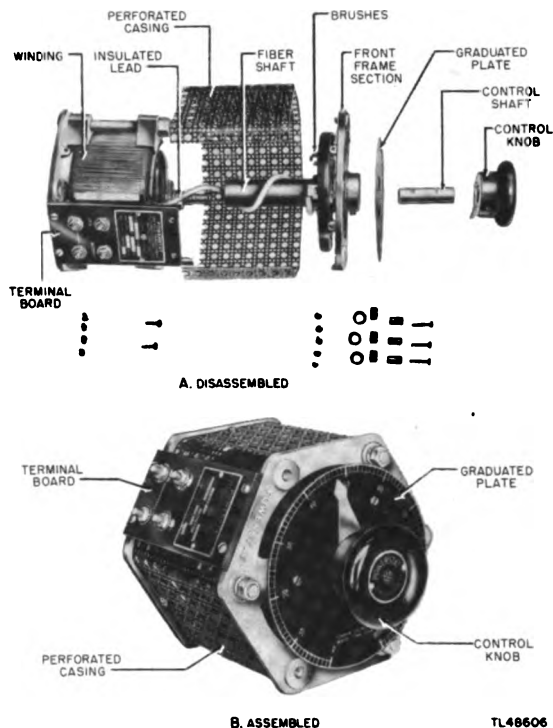


Figure 2-5. Modulator powerstat.

(2) *Tighten (T).* Tighten all loose mountings, connections, and fastenings. Tighten or retie loose or broken lacing. Repair damaged insulation.

(3) *Clean (C).* Clean terminal boards and wiring with a dry brush or cloth, or with a brush moistened with dry-cleaning solvent when dirt persists. If connections are corroded, disconnect and clean the surfaces with crocus cloth. When replacing the connections, make sure that there is good electrical contact.

2-9. CABLES AND CONNECTORS.

a. **General.** The cables in Radar Set AN/MPG-1 can be regarded as the life lines of the equipment. The condition of the cables and the associated connectors must be watched closely.

b. Maintenance Operations.

(1) *Inspect (I).* Inspect the cables for cracked or deteriorated insulation and for frayed or cut insulation at the connecting and supporting points. Examine for loose

cable clamps and connectors. Check for improper placement of the cables or connectors which might subject them to strain. Avoid kinks and improper support. Report damaged cables to the person in charge.

(2) *Tighten (T)*. Tighten loose cable clamps, coupling rings, and connections.

(3) *Clean (C)*. Clean dirty connectors and cables with a brush dipped in dry-cleaning solvent. Dry thoroughly. Corroded connectors are cleaned with crocus cloth or #0000 sandpaper. No attempt should be made to remove individual prongs from cable plugs.

2-10. WAVEGUIDE.

Examine the waveguide for looseness of mounting and connections. Check for insecure waveguide supports. Normally the waveguide should not be taken apart. However, if the waveguide is disassembled for other reasons or to check for indications of arcing, inspect for signs of dirt, pitting, or corrosion. If necessary, clean the waveguide with the vacuum cleaner. Do not use abrasives, as scratches on the waveguide may lead to corrosion. Report to the person in charge if abnormal conditions are discovered.

2-11. FUSES.

a. **General.** Two types of fuses are used in Radar Set AN/MPG-1, the renewable cartridge-type and the nonrenewable cartridge-type. When a fuse blows, an effort should be made to discover the reason for the failure and to correct it before a new fuse is installed.

b. Maintenance Operations.

(1) *Inspect (I)*. Inspect the fuse caps and mountings for charring and corrosion. Examine fuse clips for dirt, improper tension, and loose connections.

(2) *Tighten (T)*. Tighten the end caps on replaceable fuses, the fuse clips, and connections to the clips, if necessary. The tension of the fuse clips may be increased by pressing the clip sides closer together.

(3) *Clean (C)*. Clean fuses and fuse clips with a small brush. Remove corrosion with crocus cloth or #0000 sandpaper. Wipe the surface with a clean cloth.

2-12. METERS.

a. **General.** Meters are very delicate and cannot be repaired in the field. Do not handle or adjust meters unless necessary. A damaged meter should be replaced and returned to the depot for repair.

b. Maintenance Operations.

(1) *Inspect (I)*. Inspect meters for loose, dirty, or corroded mountings and connections. Examine the leads for frayed insulation and broken strands. Check for cracked or broken plastic cases and cover glasses.

(2) *Tighten (T)*. Tighten loose mountings and connections. Since meter cases are usually made of plastic, a special technique must be used. To prevent breakage, hold the retaining nut that makes contact with the meter case while the outer nut is tightened. This procedure permits tightening of the connection without increasing the pressure of the stud head against the inside of the meter case.

(3) *Clean (C)*. Clean meter cases and cover glasses with a dry cloth. If dirty condition persists, use a cloth moistened with dry-cleaning solvent. Remove dirt from mountings and connections with a stiff brush moistened with the cleaning fluid. Remove corrosion from mountings and connections with #0000 sandpaper, and tighten.

(4) *Adjust (A)*. A meter must be zero-adjusted if its needle does not return exactly to zero with the equipment turned off. View the needle from the front and tap lightly with a finger to overcome any slight bearing friction before deciding that adjustment is necessary. If adjustment is necessary, slowly turn the zero adjustment screw below the meter glass until the pointer is at zero.

2-13. RELAYS.

Although there are many different types of relays used in Radar Set AN/MPG-1 the general maintenance operations are the same. However, some relays require particular maintenance procedures. Specific instructions for these relays are included in this paragraph. A few of the relays used in this radar set are shown in fig. 2-6.

a. General Standards. Relays are normal if the following conditions exist:

(1) The relay assembly is mounted securely.

(2) The connecting leads are not frayed and the insulation is not damaged.

(3) The terminal connections are tight and clean.

(4) The moving parts travel freely.

(5) The tension of the springs is correct.

(6) The relay contacts are clean, adjusted properly, and make good contact.

(7) The coils show no signs of overheating.

(8) The parts of the assembly are clean and no corrosion is present.

b. Maintenance Operations.

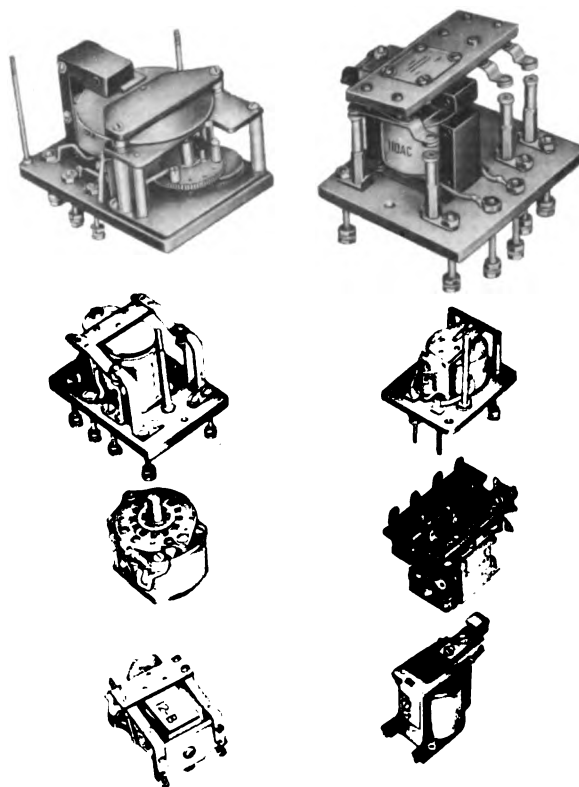
(1) *Inspect (I).* All the relays used in the radar set are provided with covers which must be removed before performing the maintenance operations. Do not disassemble relays to inspect them. Check for the conditions listed in subparagraph a above. The contacts can be examined with the aid of a flashlight and a small mirror. Mechanical operation can be checked by manually depressing the armature.

(2) *Tighten (T).* Tighten all loose connections, terminals, and mounting bolts.

(3) *Clean (C).*

(a) Cleaning is the most important relay maintenance operation. Unless the contacts are clean, electrical contact may be poor. As a result, pitting and corrosion may occur. The relay contacts are of varied shapes. In some instances both contacts are flat; in others, one contact is convex while its mate is flat (fig. 2-7). The original shape of a contact must be retained during cleaning. If burning or pitting has distorted the contact, the original shape must be restored. It is essential that the maintenance personnel familiarize themselves with all of the details of the relays by examining the relays while they are in good condition.

(b) All the relays used in Radar Set AN/MPG-1 have silver contacts on which a



TL48607

Figure 2-6. Types of relays.

brownish coating of silver oxide eventually develops. Do not remove this coating unless pitting or corrosion is noticed, as the coating is a good conductor. In most instances, the contacts can be cleaned with a soft rubber eraser. The surfaces should then be polished with a dry clean cloth. If this method is unsatisfactory, the contacts may be cleaned with a special relay-cleaning tool. Never use emery cloth to clean contacts. To construct the special tool (fig. 2-8), obtain a piece of wood (or suitable substitute) 1/16 inch thick, 3/8 inch wide, and 3-3/4 inches long. Cut a piece of crocus cloth 1 inch wide and 2-1/2 inches long. Glue the crocus cloth to the stick, being sure that both sides of the stick are covered. Place the stick in a vise until the glue hardens. The pieces of crocus cloth which extend over the back edge of the stick may be cut off with a knife.

(4) *Adjust (A).* Observe the contacts to see if they close properly. A slight adjustment of the contact springs may be neces-

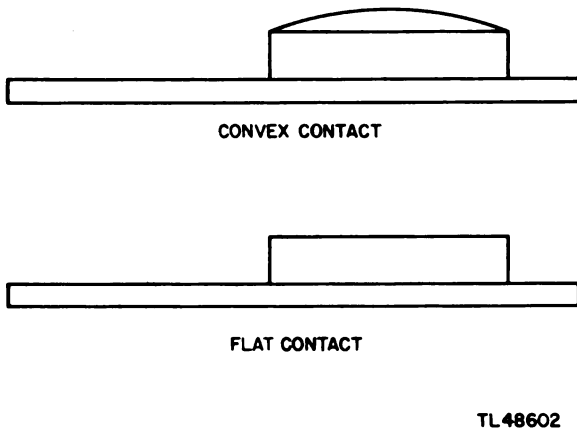


Figure 2-7. Relay contacts.

sary. For adjustment of particular relays, refer to subparagraph c below.

(5) *Lubricate (L)*. Since damage may result from oil on the contacts and from oil falling on near-by equipment, *lubrication of the relays is not recommended*. In extreme cases, where definite binding is noticed, a light lubricant may be used if applied sparingly. Before applying power to the equipment, make sure the lubricated relay is free of excess oil.

c. **Specific Procedures.** The procedures described above apply to all relays in the radar set. Further instructions are necessary to

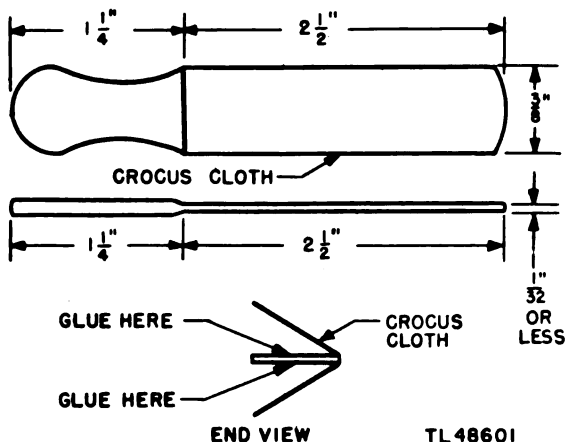


Figure 2-8. Construction of relay-cleaning tool.

perform complete maintenance on the relays given below. These specific procedures are supplementary to the general information and are to be performed only when the inspection operation indicates that they are necessary.

(1) *Time Delay Relays*. The time delay relays (fig. 2-9) used in the modulator (K-404), rectifier control panel (K-3802), and the slew-scan unit (K-2203), may be adjusted by changing the position of the adjusting pin. This adjustment can be made without disassembling the relay. Refer to TM 11-1566, chapter 15, for the method of determining the proper time delay. When necessary, the relays can be disassembled for tightening, cleaning, and adjusting in accordance with the following procedure:

(a) Remove the two bolts from the laminated iron core and slip the core up and out.

(b) Remove the two screws fastening the disk support plate and lift out the plate and the induction disk. Remove the fiber brake from the gear shaft plate.

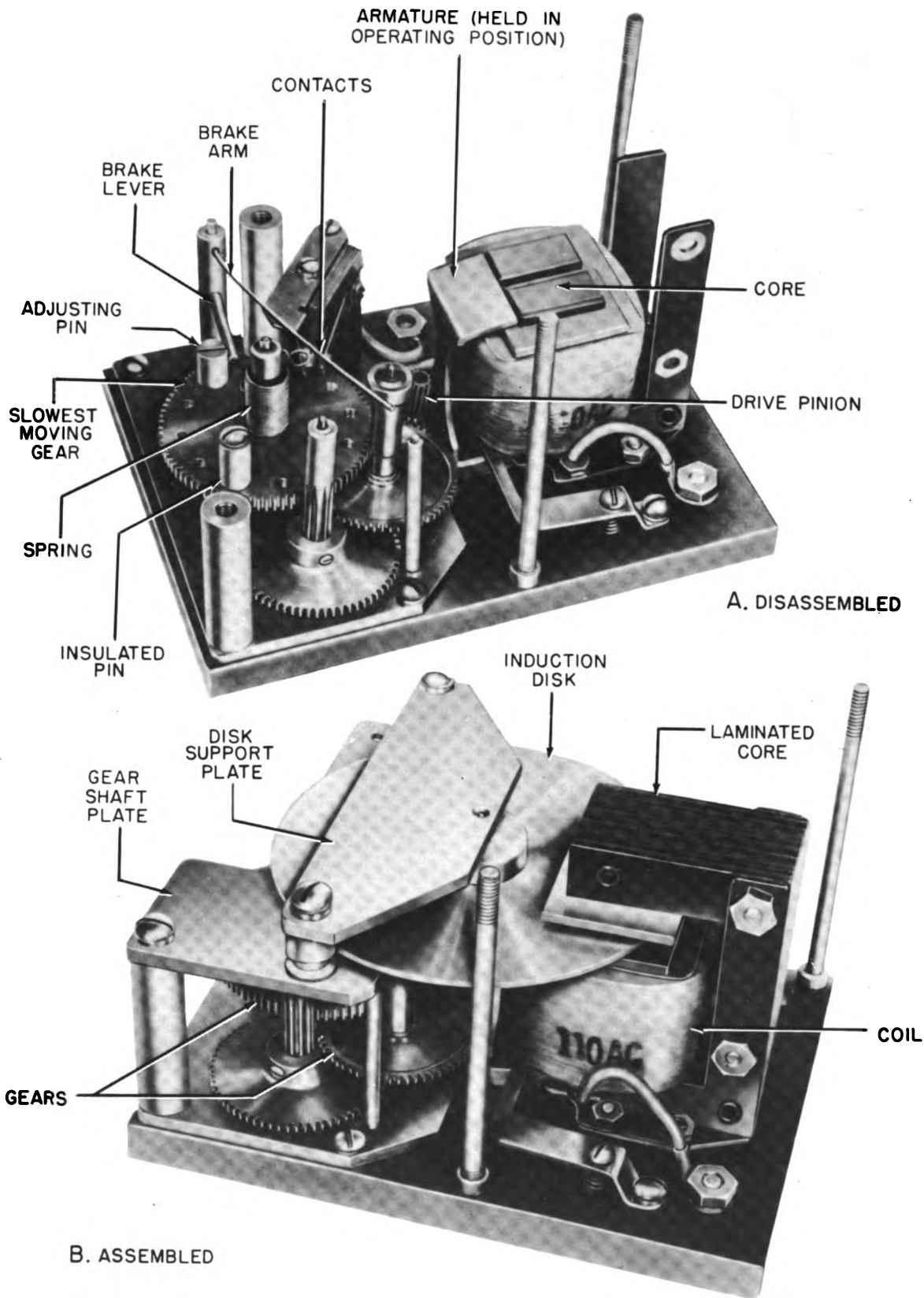
(c) Remove the screw fastening the gear shaft plate and remove the plate.

(d) Reassemble in reverse order.

(2) *Synchronizing Relay*. This relay, K-2301, is located in the antenna servo amplifier. If realignment or more extensive cleaning is necessary, disassemble the contacts of the relay. To disassemble, remove the four screws on the top of the relay which fasten the top relay contacts and the terminal strip. This exposes two small screws which fasten the middle contacts to the armature. Removal of the two screws allows complete separation of the contacts.

(3) *Voltage Sensitive Relay*. This relay, K-3803, located in the rectifier control panel, is adjusted by tightening or loosening the nut on the spring tension screw. See TM 11-1566, chapter 5, for the proper operating points.

(4) *Modulator Overload Relay*. This relay, K-405 (fig. 2-10), is set for normally closed operation, automatic reset, instantaneous tripping, and for a time delay in recovery. The recovery time delay is gov-



TL 48608

Figure 2-9. Time-delay relay.

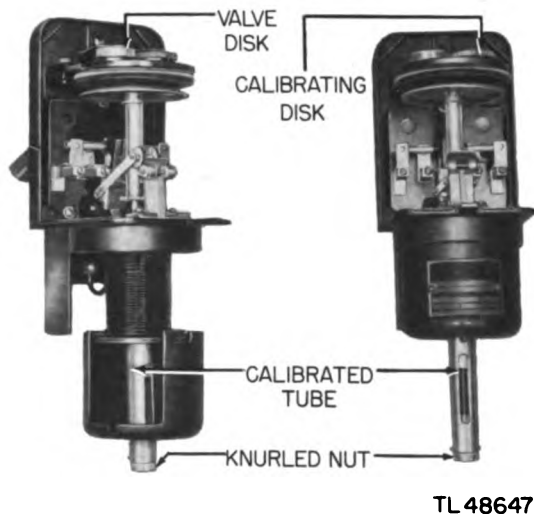


Figure 2-10. Modulator overload relay.

erned by a calibrated disk at the top right side of the relay. The instantaneous tripping is obtained by placing the poppet in the valve on the right-hand side. The valves and poppet are located under the disk on the top left side of the relay. The current at which the plunger operates is predetermined by the height of the plunger in the calibrating tube at the bottom of the relay. The correct setting is obtained by turning the knurled nut at the bottom of the plunger until the plunger groove is opposite the desired tripping current. The tripping currents are indicated on the side of the shaft. Refer to TM 11-1566, chapter 15, for the proper relay setting.

(5) *Magnetron Filament Relay.* This relay, K-407, is designed to open and close at specific values of current. The relay is preset and no adjustment is possible.

(6) *Power Panel Overvoltage Relay.* Remove the glass-faced cover before performing the maintenance operations. The overvoltage relay, K-301, is adjusted by turning the knurled shaft; screwing the shaft up trips the relay at a lower voltage, and screwing the shaft down trips the relay at a higher voltage (fig. 2-11). See TM 11-1566, chapter 15, for the correct setting.

(7) *Rotary Relays.* These relays are used both in the STC unit (K-901) and in

the range unit (K-601-3, 4, and 5). The contacts of the relays are the sliding type and are difficult to reach. When necessary, the relays can be disassembled to perform maintenance operations by removing the two screws which fasten the switch sections and then by gently pulling the switch sections off the shaft.

2-14. SWITCHES.

Radar Set AN/MPG-1 uses many different types of switches including toggle switches, rotary switches, microswitches, interlock switches, gang switches, and push-button switches. These switches can be divided into two general groups for maintenance purposes. One group has nonaccessible contacts on which little maintenance other than inspection and cleaning is possible because of the enclosed construction of the assemblies. This group is composed chiefly of the toggle, interlock, and microswitches. The second group has accessible contacts; hence, the maintenance operations of *inspecting, tightening, cleaning, and lubricating* are applicable.

a. Accessible Contact Switches.

(1) Included in this group are the following switches:

(a) Modulator grid current switch, S-403.

(b) Modulator start switch, S-407.

(c) Modulator stop switch, S-408.

(d) Power panel transformer switch, S-304.

(e) Antenna servo amplifier meter balance switch, S-2301.

(f) PPI servo amplifier meter balance switch, S-2401.

(g) Receiver crystal current switch, S-3001.

(h) Receiver local-remote receiver gain switch, S-3002.

(i) Receiver local-remote receiver tuning switch, S-3004.

(2) The following maintenance operations are to be performed on the above switches:

(a) *Inspect (I)*. Examine for looseness of mounting or connections, dirt, and corrosion. Operate the switch to see that it moves freely and is positive in action. Inspect the contacts for pitting, corrosion, and wear. Examine the gear and spring arm on the power panel transformer switch for mechanical defects.

(b) *Tighten (T)*. Tighten all loose connections and mountings. Adjust the tension of the contacts if necessary.

(c) *Clean (C)*. If inspection shows that any terminal connection, or section of the switch, is dirty or pitted, clean the part with a soft cloth moistened with dry-cleaning solvent. Corroded surfaces are cleaned with crocus cloth or #0000 sandpaper and then polished with a dry cloth. The same maintenance procedures apply to switch contacts as to relay contacts. For complete instructions on cleaning the contacts refer to paragraph 2-13b.

(d) *Lubricate (L)*. If binding is noticed during operation of the switch, apply a drop of special preservative lubricating oil (PS) with a toothpick to the bearing surfaces. Do not allow oil to run upon the electric contacts, as a film of oil may cause serious damage or a poor contact. *Lubrication of switches is not recommended unless serious binding is noticed.*

b. Nonaccessible Contact Switches. Under this heading are included all the switches which were not covered in subparagraph a above. These switches are so designed that it is impossible to reach the contacts without damaging the switch assemblies. Check mechanical operation and tightness of mounting and connections. Test the action of the cheater on the interlock switches. Do not attempt to disassemble any inclosed switches. If an abnormal condition is detected, notify the person in charge. *Do not lubricate these switches under any circumstances.*

2-15. PILOT LIGHTS.

a. General. Pilot lights are used to indicate that power has been applied to a circuit, that a circuit is ready for power to be applied, or as a warning that certain controls are not in their normal setting. The construction and mounting of the lights is sim-

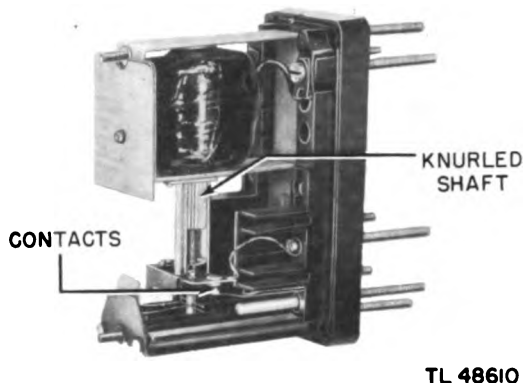


Figure 2-11. Power panel overvoltage relay.

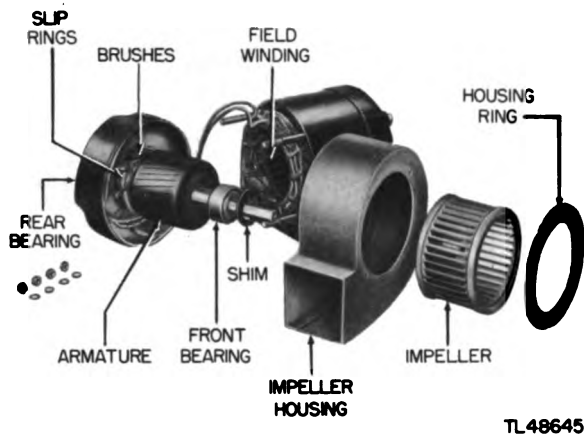
ple, and they are removed and replaced easily.

b. Maintenance Operations.

(1) *Inspect (I)*. Inspect the pilot light assemblies for broken or cracked pilot light jewels, loose bulbs, bulbs with loose bases, loose mounting screws, and loose, dirty, or corroded connections. If necessary, make temporary repairs on broken or cracked jewels by joining the broken pieces with a narrow piece of friction tape. Replace broken or burned-out bulbs as soon as possible. While the removal of a bulb may sometimes be difficult, the process is usually simplified if a small piece of friction tape is folded over the top of the bulb and pressed from opposite sides. After the tape is attached, unscrew the bulb and remove it from the socket.

(2) *Tighten (T)*. Tighten loose mounting screws and resolder loose connections. If the connections are dirty or corroded, clean them before soldering. Screw loose bulbs tightly into their bases.

(3) *Clean (C)*. Clean the pilot light jewels, base assemblies, and glass bulbs with a dry cloth. Use a small brush on the exterior of the base. Corroded socket contacts and connections are cleaned with a fine abrasive. The surfaces are then polished with a dry cloth. Clean contacts and connections are important in pilot lights because of the low operating voltage.



TL49645

Figure 2-12. Blower motor.

2-16. BUSHINGS AND INSULATORS.

a. General. Bushings and insulators are vital elements in high-voltage circuits. They are constructed of ceramic material which has a highly glazed surface. Extreme care must be taken when working with or near bushings and insulators because they are easily chipped or broken.

b. Maintenance Operations.

(1) *Inspect (I).* Carefully inspect all high-voltage bushings and insulators for moisture, dust, and other foreign matter. Unless the bushings and insulators are both clean and dry, leakage or arc-overs may occur and damage them permanently. Check for chipped surfaces, hairline cracks, carbonized arc-over paths, and other surface defects. Report defective insulators to the person in charge for replacement. Examine for loose, dirty, or corroded mountings and fastenings.

(2) *Tighten (T).* Tighten loose mountings and fastenings. Avoid exerting excessive pressure on bushings and insulator mounting screws to prevent damaging the fragile ceramic material.

(3) *Clean (C).* Clean high-voltage porcelain insulators and bushings frequently with a clean dry cloth. If dirt is hard to remove, use a cloth moistened with dry-cleaning solvent. Wipe with a clean dry cloth after using the solvent. Clean corroded mountings with #0000 sandpaper and then tighten.

2-17. MOTORS AND GENERATORS.

a. General. The following motors are used in Radar Set AN/MPG-1: five blower motors, one each in the transmitter, receiver, and console, and two in the antenna heater (fig. 2-12); a drive motor in the rotating feed assembly; an antenna drive motor; a yoke drive motor in the PPI mount; a slew-scan motor in the slew-scan unit; two aided tracking motors in the tracking unit; and an amplidyne with separate motor and generator housings. Certain preventive maintenance procedures must be applied to each of these motors. The three principal causes of faulty operation are: accumulation of dirt, dust, or other foreign matter on the windings and moving parts; lack of sufficient lubrication on bearings and other moving parts; and damaged or improperly adjusted parts. Given proper care, motors will provide long service.

b. Maintenance Operations.

(1) *Feel (F).* Feel the bearing housings with the palm of the hand to determine if an overheated condition exists. Become thoroughly acquainted with the normal operating temperatures of the motors. If a machine is overheating, locate the cause immediately and correct the condition. Damaged bearings and the lack of sufficient lubrication are the most frequent causes of overheating.

(2) *Inspect (I).*

(a) Inspect each motor and the generator for dirt, loose or faulty mountings, loose bearings, worn shaft, and excess oil for grease. Examine the exposed wiring for frayed or worn insulation, and the terminals for loose connections. Inspect the housing ventilating openings to see that they are clean and unobstructed. Check the coupling between the motor and generator of the amplidyne for secure attachment.

(b) Inspect the brushes, slip rings, and commutators at regular intervals. The slip rings and commutators must be clean and smooth. When inspecting a brush, make certain that it is replaced in the same position, with the curve of the contact end parallel to the commutator curve. Brushes

must be long enough to be held firmly in the brush holder and to make good contact with the commutator. The brush springs must press snugly against the brushes; insufficient pressure will lead to sparking between the brushes and commutator. Screw brush caps on tight.

(3) *Tighten (T)*. Loose mountings, parts, and connections must be tightened. However, the person in charge must be notified if an internal part, such as a commutator segment or an armature coil, appears to be loose.

(4) *Clean (C)*.

(a) Wipe exteriors, bases, and mountings of the motors with an oiled cloth in order to leave a thin, protective film of oil on the surface. If the paint on the exterior surfaces has deteriorated, scrape off the paint. Sandpaper the area well and repaint with O.D. Paint TSC-ES-No. 680b.

(b) If inspection of the slip rings, commutators, and brushes indicates that cleaning is necessary, follow the cleaning procedure given below.

1. *Slip Rings*. Wipe slip rings with a cloth moistened with dry-cleaning solvent, and then polish with a dry cloth. Remove corrosion with crocus cloth or #0000 sandpaper and then polish.

2. *Commutator*. Expose the commutator and clean it with a piece of crocus cloth. If the commutator is burned or pitted, use a piece of #0000 sandpaper instead of crocus cloth. Repeat the cleaning until the commutator is clean and smooth.

3. *Brushes*. Clean brushes by gently scraping the contact end with a sharp edge and then wiping the brush with a clean, lintless cloth moistened with dry-cleaning solvent.

(5) *Lubricate (L)*.

(a) All the motors with the exception of the amplidyne have sealed or oilite bearings and require no lubrication. The amplidyne is disassembled for lubrication according to the following procedure:

1. Disconnect the leads.
2. Uncouple the motor and the generator.

3. Unfasten the generator from the mounting frame.

4. Remove the assembly fastening screws and bolts from the motor and from the generator.

5. Remove the end sections of the motor and of the generator from the center section.

(b) The rotating feed assembly is removed by unfastening the four mounting screws and by carefully sliding the assembly out of the antenna. Make sure that the feed arms are not damaged when withdrawing the assembly from the antenna.

2-18. SELSYNS.

a. General. Seven selsyns are used in Radar Set AN/MPG-1. Three selsyns are located in the pedestal, two in the tracking unit, and one each in the PPI mount and the slew-scan unit. The selsyns (fig. 2-13) used in this set are supplied by two different manufacturers so that they differ slightly in physical appearance. However, the same maintenance operations apply to both types.

b. Maintenance Operations.

(1) *Inspect (I)*. Inspect the selsyns for loose mounting and insecure coupling. Examine the exterior for dirt and corrosion. The slip rings and brushes are examined for dirt, pitting, and corrosion by removing the slip-ring housing cover (fig. 2-14). On one type of selsyn the cover is fastened by a single screw, and on the other type the cover is fastened by three screws.

(2) *Tighten (T)*. Tighten all loose mounting bolts and couplers.

(3) *Clean (C)*. When necessary, wipe the selsyns and the slip rings with a cloth moistened with dry-cleaning solvent. Remove corrosion and pitting with crocus cloth or #0000 sandpaper and then polish.

(4) *Lubricate (L)*. The selsyns are constructed with sealed bearings and no lubrication is required.

2-19. PEDESTAL SLIP RINGS.

a. General. The slip rings are reached by removing the screws fastening the pedestal

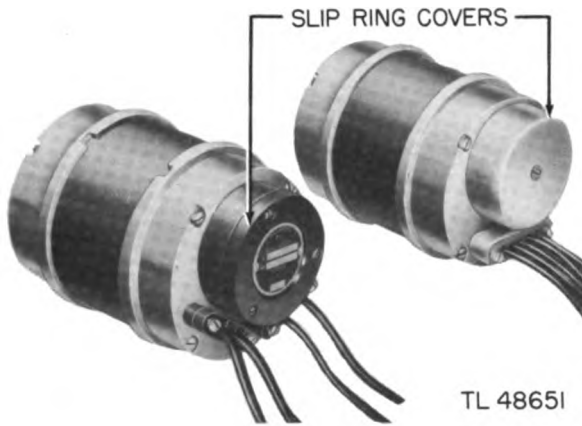


Figure 2-13. Selsyns.

compartment cover and then by removing the slip-ring housing cover.

b. Maintenance Operations.

(1) *Inspect (I)*. Inspect the slip rings for dirt, grease, and corrosion. Check the length of brushes. To replace a brush arm, remove the two screws fastening the connection, the brush spring, and the arm to the terminal board. Replace the brush arm and reassemble. Make sure the brush spring holds the brush firmly against the slip rings.

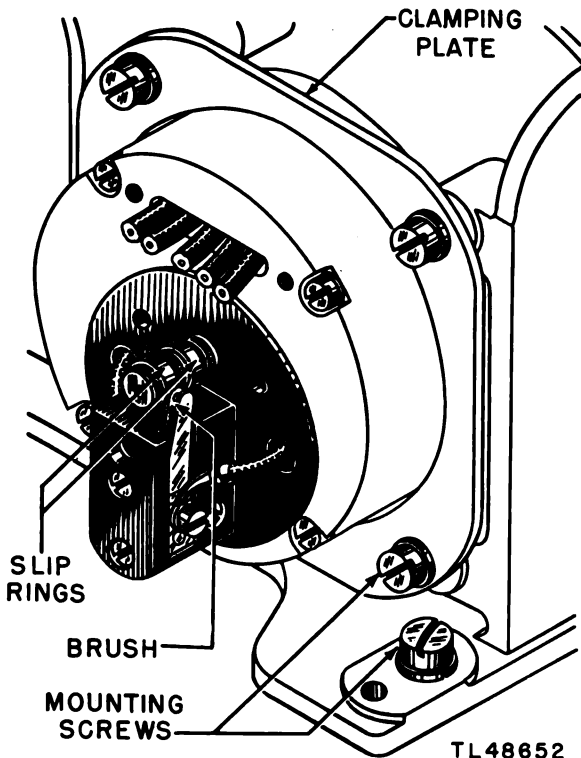


Figure 2-14. Selsyn brushes and slip rings.

(2) *Clean (C)*. Clean the slip rings with a cloth moistened with dry-cleaning solvent and polish with a dry cloth. If corrosion is present, remove with a piece of crocus cloth. Brushes are cleaned by scraping the contact end with a sharp edge and then wiping with a clean, lintless cloth moistened with cleaning fluid.

(3) *Lubricate (L)*. The bearings of the slip ring assembly are packed in grease and sealed. No lubrication is required.

2-20. CABINETS AND EXTERIOR SURFACES.

a. General. This paragraph covers the maintenance operations applied to the component housings and the parts associated with them.

b. Maintenance Operations.

(1) *Inspect (I)*.

(a) Examine the painted parts for cracked, chipped, blistered, or peeling paint. Scrape off damaged paint, and remove any corrosion with an abrasive. Smooth the surfaces with crocus cloth or sandpaper. Clean the areas well with a dry cloth and retouch with O.D. Paint, TSC-ES-No. 680b.

(b) Check for loose mountings, knobs, switches, panel screws, jacks, fuse mountings, pilot light jewels, connectors, and chassis handles. Examine the entire cabinet for dirt and corrosion.

(c) Inspect the hinges for binding. Check the chassis stops for improper operation.

(d) Inspect the screening on the cabinets for corrosion, damage, improper mounting, and dirt. Clean the screens with a brush or a cloth moistened with dry-cleaning solvent.

(2) *Tighten (T)*. Tighten all loose assembly and mounting parts.

(3) *Clean (C)*. Clean the interior and exterior of each cabinet with a brush or a clean cloth. Use dry-cleaning solvent if necessary. Wipe all meter cover glasses and the plastic coverings of the scopes with a clean dry cloth. The wire screens can be cleaned with a stiff brush. Remove corrosion

with crocus cloth or #0000 sandpaper. The vacuum cleaner may be used to remove dirt and dust which has accumulated in the corners or under the cabinets.

(4) Lubricate

(a) When the hinges or cover clamps bind, they are lubricated with engine oil (OE

10). The rollers of the modulator oil tank and the console are lubricated in the same manner.

(b) If it is difficult to remove or replace the chassis in the cabinets, lubricate the chassis rails with special lubricating grease (GL) or with general purpose grease (WB).

CHAPTER 3

PREVENTIVE MAINTENANCE SCHEDULE AND LUBRICATION CHART

3-1. EXPLANATION OF SCHEDULE.

The preventive maintenance schedule shows *when* and *what* maintenance work is to be done. It provides information as to items on which work is to be done, code letters (F, I, T, C, A, L) of the operations to be performed, and how often the maintenance is to be performed. Each schedule sheet consists of four vertical columns.

a. The first column in the schedule sheet gives the item numbers. These numbers correspond to the item numbers in chapter 4, where the specific instructions for an item are given.

b. The second column specifies in terms of the FITCAL code (F for feel, I for inspect, T for tighten, C for clean, A for adjust, and L for lubricate), the operations that are to be performed. The code letter is not used unless the operation is to be performed each time the item is scheduled. The "inspect" operation includes checking for the need of the tighten, clean, adjust, and lubricate operations.

c. The third column identifies the item of maintenance.

d. The fourth column, headed "Echelon," indicates the proper echelon of the maintenance operation.

e. The scheduling of the items is based on the assumption that the radar set is in operation 23 hours a day. The person in charge should designate the exact day on which a particular maintenance item is to be performed. If the set is not in operation 23 hours a day, the basis of maintenance operation should be the hourly equivalents of the weekly, biweekly, monthly, and quarterly periods. The weekly equivalent is 161 hours, the biweekly 322 hours, the monthly 690 hours, and the quarterly 2,070 hours.

3-2. MAINTENANCE SCHEDULE.

The maintenance schedule for Radar Set AN/MPG-1 is given in the following charts:

NOTE: First and second echelon maintenance schedules for the trailer are found in TM 9-884. Higher echelon maintenance schedules are found in TM 9-1884 (when published).

WEEKLY MAINTENANCE ITEMS

1	2	3	4
ITEM No.	OPERATION	ITEM	ECHELON
1	I C	Modulator control panel	2
4	I C	Modulator cabinet	1
10	I	Amplidyne	2
32	I	Antenna control panel	2
40	I C	Waveguide, horn, and reflector	2
42	I	Tower	1
43	I	Cables	1
44	I	Telephone box	2

BIWEEKLY MAINTENANCE ITEMS

1	2	3	4
ITEM No.	OPERATION	ITEM	ECHELON
2	F I	Driver	2
5	I	Servo rack	1
6	F I	Feed motor supply	2
7	F I C	Slew-scan unit	2
8	F I C	Antenna servo amplifier	2
9	F I C	PPI servo amplifier	2
11	I	Rectifier rack	1
12	I C	Rectifier control panel	2
13	F I	500-volt supply	2
14	F I	—150-volt supply (2)	2
15	I	300-volt regulator	2
16	F I	300-volt supply	2
17	F I T C	Console cabinet	2
18	F I C	PPI mount	2
19	I C	B-scope mount	2
24	I	Range unit	2
26	I	Power panel cabinet	2
27	F I	Electronic regulator	2
29	I	Remote-B rack	2
30	I	Remote-B unit	2
31	F I	Remote 300-volt supply	2
33	F I	Transmitter	2
35	F I T	Antenna heater	2
40	F I T	Antenna drive motor and oil pump	2

MONTHLY MAINTENANCE ITEMS

1	2	3	4
ITEM No.	OPERATION	ITEM	ECHELON
7	L (1)	Slew-scan unit (reduction gearing)	2
7	L (2)	Slew-scan unit (shaft bearings)	2
10	L (1)	Amplidyne (oil cups)	2
23	I	STC unit	2
25	F I	4-kv supply (2)	2
28	F I C	Power panel, upper and lower sections	2
30	L	Remote-B unit (cursor mechanism)	2
34	F I C	Receiver	2
36	F I	Rotating feed assembly	2
37	I C	Sweep-mark unit	2
39	I T L	Pedestal housing	2
41	I	Selsyn compartment	2

QUARTERLY MAINTENANCE ITEMS

1	2	3	4
ITEM No.	OPERATION	ITEM	ECHELON
20	F I C L	Azimuth tracking unit	2
21	I C L	Range tracking unit	2
22	I	Phase shifter	2
36	L (1)	Rotating feed assembly (grease fittings)	2
40	L	Antenna drive motor and oil pump	2
41	L	Selsyn compartment	2
42	L (1)	Tower (elevator, pulley, winch, dolly)	2
42	L (2)	Tower (winch gearcase)	2
42	L (3)	Tower (cables, elevator chains, exposed threads)	2

ANNUAL MAINTENANCE ITEMS

1	2	3	4
ITEM No.	OPERATION	ITEM	ECHELON
3	I L	Keyer (draining oil)	2
10	L (2)	Amplidyne (bearings)	2
36	L	Rotating feed assembly (case)	2

3-3. TABLE OF LUBRICANTS.

A table of approved lubrication symbols, standard nomenclature, and specification numbers is shown below.

SYMBOL	STANDARD NOMENCLATURE
OT	Oil, Insulating
OE 10	Oil, Engine
OE 30	Oil, Engine
PS	Oil, Lubricating, Preservative, Special
GL	Grease, Lubricating, Special
WB	Grease, General Purpose No. 2
	Grease, Low Temperature, Lubricating
GO 75	Lubricant, Gear, Universal
CW-1	Lubricant, Exposed Gears, Chains, and Wire Rope, Grade 1
CW-2	Lubricant, Exposed Gears, Chains, and Wire Rope, Grade 2
CW-3	Lubricant, Exposed Gears, Chains, and Wire Rope, Grade 3
SD	Solvent, Dry-cleaning

3-4. LUBRICATION CHART.

a. **General.** The chart below is a compilation of all lubrication information needed for the scheduled lubrication operations. The item write-up merely lists the lubrication operation and refers to the lubrication chart.

The complete lubrication data is thus presented in clear and simplified tabular form. The chart consists of six vertical columns.



Figure 3-1. Refilling modulator oil tank.

TL 48614

(1) The first column in the lubrication chart gives the number of the item in chapter 4 in which the lubrication operation is listed. The item number is the same as that used in the preventive maintenance schedule.

(2) The second column gives a description of the part to be lubricated. This serves to identify the part within the item write-up. Make sure to locate on the chart the specific piece of equipment in order to perform proper lubrication.

(3) The third column makes reference to the applicable illustrations which identify the particular piece of equipment and the lubrication points.

(4) The fourth column specifies the type of lubricant to be used in terms of the symbols. The complete nomenclature and speci-

fications of the indicated lubricants are given in the table of lubricants in paragraph 3-3. When lubricants are included as spare parts, they may be used in place of the specified lubricants.

(5) The fifth column describes the method of application and the quantity of lubricant to be used. In some instances disassembly of the part is necessary before lubrication can be accomplished. In such cases, references are made to the paragraphs in chapter 2 which give the applicable disassembly procedures.

(6) The sixth column states the frequency with which the lubrication is to be performed. The frequency of lubrication is the same as recommended in the maintenance schedule.

b. Lubrication Chart.

ITEM No.	PART DESCRIPTION	FIG. No.	LUBRICANT	METHOD AND QUANTITY	FREQUENCY OF LUBRICATION
3	Oil tank	4-7 3-1	OT (note 1)	Remove hatch cover of oil tank and drain old oil into container. Refill tank through flexible hose to FILL TO HERE mark inside oil tank.	Annually
7	Reduction gearing	4-13	GL	Apply a small amount of grease with a small stick to all gear teeth.	Monthly
7	Shaft bearings	4-13	OE 10 or PS (note 2)	Apply a few drops of oil to bearings at ends of drive shafts. Do not lubricate motor.	Monthly
10	Amplidyne oil cups	4-20 4-21	OE 30	Apply 5 drops of oil to each of the four oil cups.	Monthly
10	Amplidyne bearings	4-20 4-21	WB	Disassemble amplidyne (par. 2-17). Wash bearings with SD. Wipe with cloth. Repack each bearing $\frac{1}{2}$ full with grease. Fill cavity in back of each bearing $\frac{1}{2}$ full.	Annually
20	Azimuth tracking unit gears and bearings	4-37	GL	Apply thin coat of grease to all gear teeth and accessible bearings. Do not remove any bearing retainer plates or disassemble any parts.	Quarterly
21	Range tracking unit gears and bearings	4-38	GL	Apply thin coat of grease to all gear teeth and accessible bearings. Do not remove bearing retainer plates or disassemble parts.	Quarterly
30	Cursor mechanism	4-49	OE 10 or PS (note 2)	Apply oil <i>sparingly</i> to all moving parts. Do not spread oil on other parts of chassis.	Monthly
36	Rotating feed (grease fittings)	4-55	GL (note 3)	Use Alemite grease gun to apply grease to five fittings: fitting 1 (center bearing),	Quarterly

ITEM No.	PART DESCRIPTION	FIG. No.	LUBRICANT	METHOD AND QUANTITY	FREQUENCY OF LUBRICATION
36	Rotating feed (draining)	4-55	GL (note 3)	9 shots ($\frac{1}{8}$ oz); fittings 2 and 3 (side bearings), 4 shots each; fittings 4 and 5 (case), 18 shots ($\frac{1}{4}$ oz). Remove the rotating feed assembly from antenna (par. 2-17). Remove gear covers. Remove drain plugs at bottom. Clean all gears and walls with SD. Wipe gears dry. Make sure all solvent is drained. Replace plugs and refill case $\frac{3}{4}$ full with grease. Lubricate grease fittings as indicated above.	Annually
39	Leveling screws	4-3	CW-1 CW-2 CW-3 (note 4)	Spread a protective coating of grease over the threads of the leveling screws.	Monthly
40	Oil pump reservoir	4-59 4-60	OE 30 OE 10 PS (note 2)	Place a large container under oil pump reservoir. Remove oil-level-and-filler plug and oil drain plug. Drain out all old oil. Replace drain plug and refill until level with filler plug.	Quarterly
41	Selsyn compartment gear train	4-61	GL	Remove the gear train cover plate located behind the clamp handle. Rotate the antenna by hand (par. 4-41). Apply a light coating of grease to teeth of all accessible gears.	Quarterly
42	Tower: Winch Dolly Pulleys Elevator	4-62 4-63 4-64 4-65	WB (note 5)	Apply 4 shots of grease to each of 22 tower fittings: 8 elevator (1 on each roller) 6 pulley (1 on each pulley wheel) 4 winch (2 on each winch drum) 4 dolly (1 on each dolly wheel).	Quarterly
42	Tower: Winch gearcase	4-63	GO 75	Remove top oil plug. Fill container $\frac{3}{8}$ full with oil. Old oil should be drained through lower plugs if excessive sludge is present.	Quarterly
42	Tower: Cables Elevator support chains All exposed threads	4-62 4-63 4-64 4-65	CW-1 CW-2 CW-3 (note 4)	Apply a thin protective grease coating to cables, chains, and all exposed threads. When tower is disassembled, coat exposed threads with grease.	Quarterly

NOTE 1: The oil tank is filled with an oil known as Transil No. 10C, which is similar to OT. Any available supply of Transil 10C may be used as insulating oil (OT). When oil is drained from the oil tank for any reason, care must be taken to keep the oil clean and free from contamination. If clean, the drained oil may be used to refill the tank.

NOTE 2: PS is used for temperatures below zero degrees Fahrenheit. OE 10 is used for all temperatures above zero except when OE 30 is prescribed. OE 30, when recom-

mended, replaces OE 10 for temperatures above 32 degrees.

NOTE 3: Hi-Lo Aero grease, as supplied, is used. When not available, use low temperature lubricating grease or GL.

NOTE 4: Use CW-1 for cold weather, CW-2 for warm weather, and CW-3 for hot weather.

NOTE 5: Any general purpose grease may be substituted for WB. Do not use GL or low temperature lubricating grease.

CHAPTER 4

PREVENTIVE MAINTENANCE ITEM INSTRUCTIONS

SECTION I. GENERAL INFORMATION

4-1. INTRODUCTION.

This chapter explains exactly *what* is to be done in each of the items in the preventive maintenance schedule. Perform an operation on a scheduled item only when the operation is listed in the item instructions. Those operations which are to be performed only when necessary are included in the item instructions as an inspect reference. Specific instructions on how the operations are to be performed are included in chapter 2.

4-2. STANDARD PRACTICES.

Some standard practices to be used in performing the maintenance operations are as follows:

a. Tools and Materials. One-half to one hour before the maintenance period begins, arrange tools and materials in a convenient working place.

b. Power Input. Always remove the power input cable from the equipment upon which maintenance is to be performed.

c. Shorting the Capacitors. All high-voltage capacitors must be shorted with the capacitor-shortening tool before maintenance is begun.

d. Hot Circuit Elements. Avoid touching hot tubes and ferrule resistors because painful burns may result.

e. Disconnecting Cables. When power cables are disconnected, always put the dust cover on the cable plug and on the exposed connector in order to keep out dirt and foreign matter.

f. Gearing. Use care when handling and inspecting the various gear mechanisms used

in this radar set. Most of the gearing is precision built and slight damage would render it useless.

g. Specific Components (fig. 4-1).

(1) Modulator.

(a) Discharge high-voltage capacitors.

(b) Avoid contact with the modulator oil tank until sufficient time for cooling has elapsed.

(2) Servo Assembly and Rectifier Assembly.

(a) The chassis in the assemblies are prepared for maintenance work by uncoupling the connecting cables and removing the chassis from the rack. Unscrew and remove the bottom panels of the chassis and the covers from all relays.

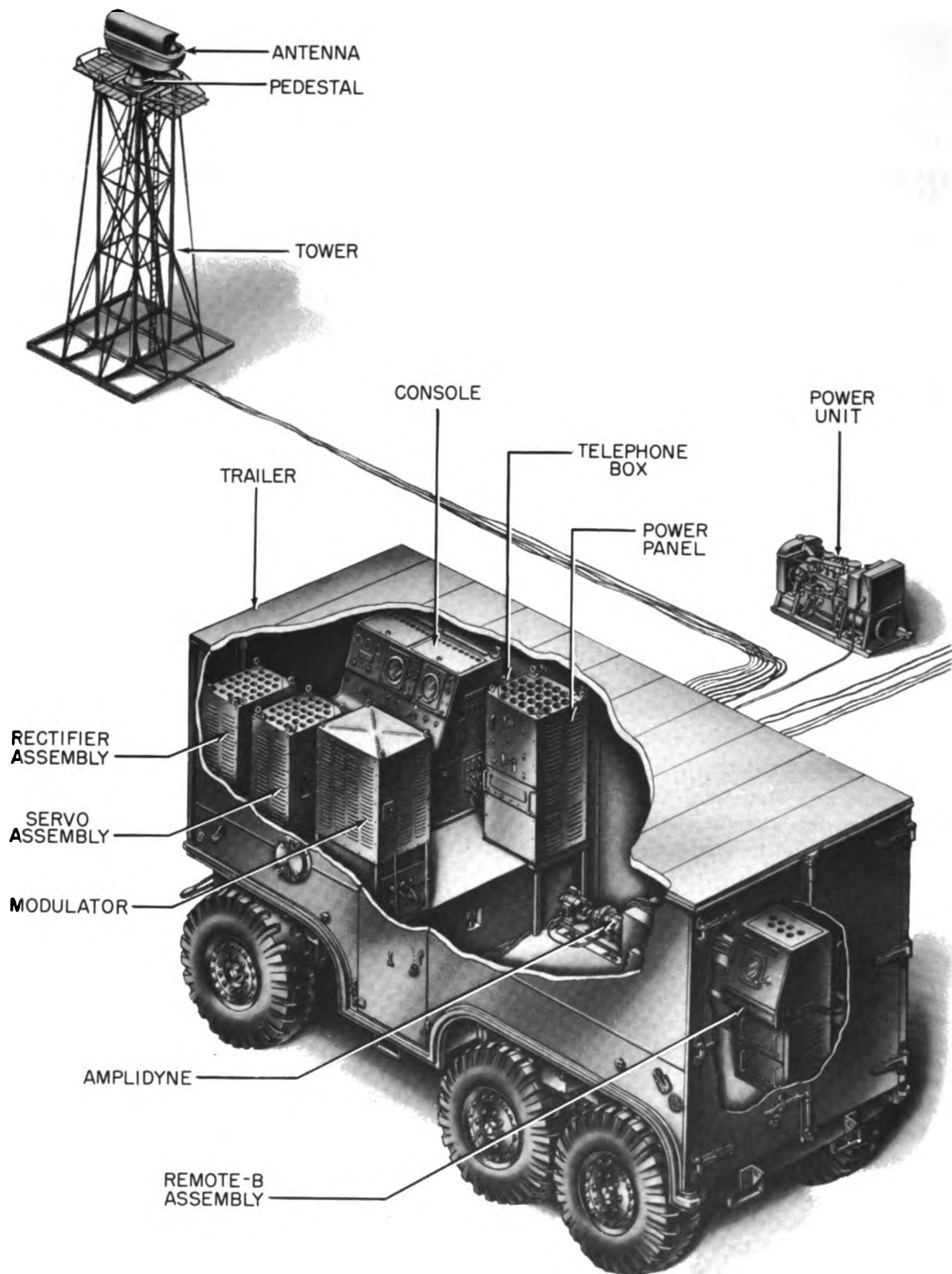
(b) When replacing chassis, make certain that they are locked firmly in the rack.

(3) Console (fig. 4-2).

(a) To gain access to the rear of the console, unfasten the two shockmountings at the top rear of the console, loosen the four bolts holding the console to the trailer floor, and roll the entire assembly forward.

(b) Avoid touching the tungar tubes in the lower rear section of the console. Painful burns may result from contact with these hot tubes.

(c) Remove the cable from the connector labeled POWER PANEL. The cable and connector are located at the lower right side of the console.



TL 48377

Figure 4-1. Location of components.

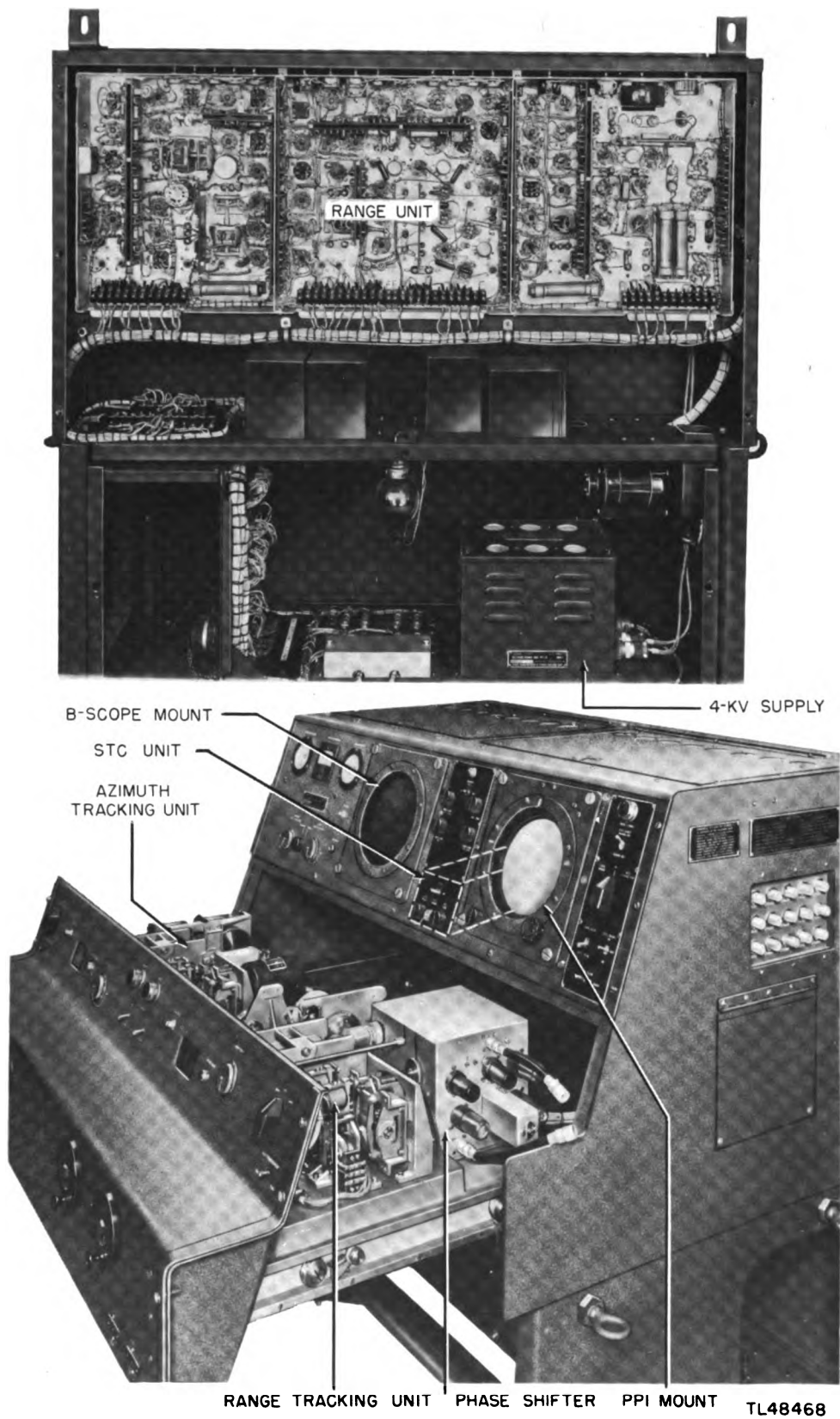
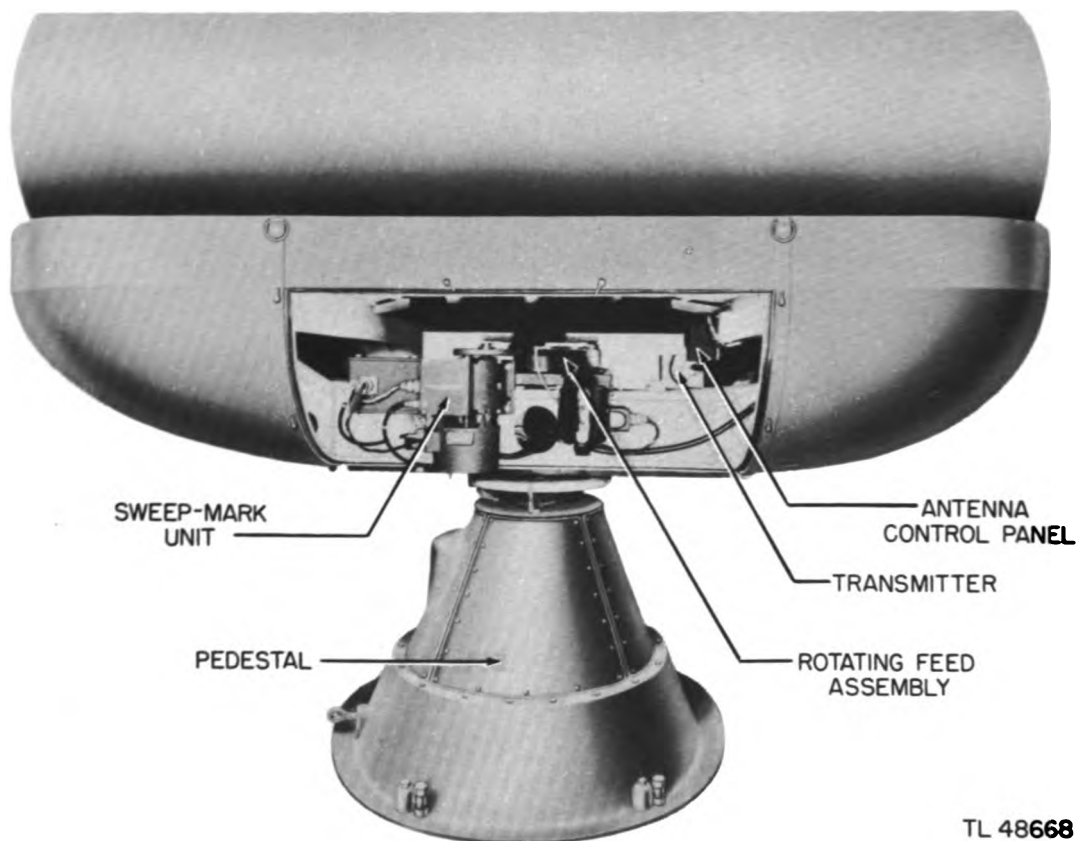
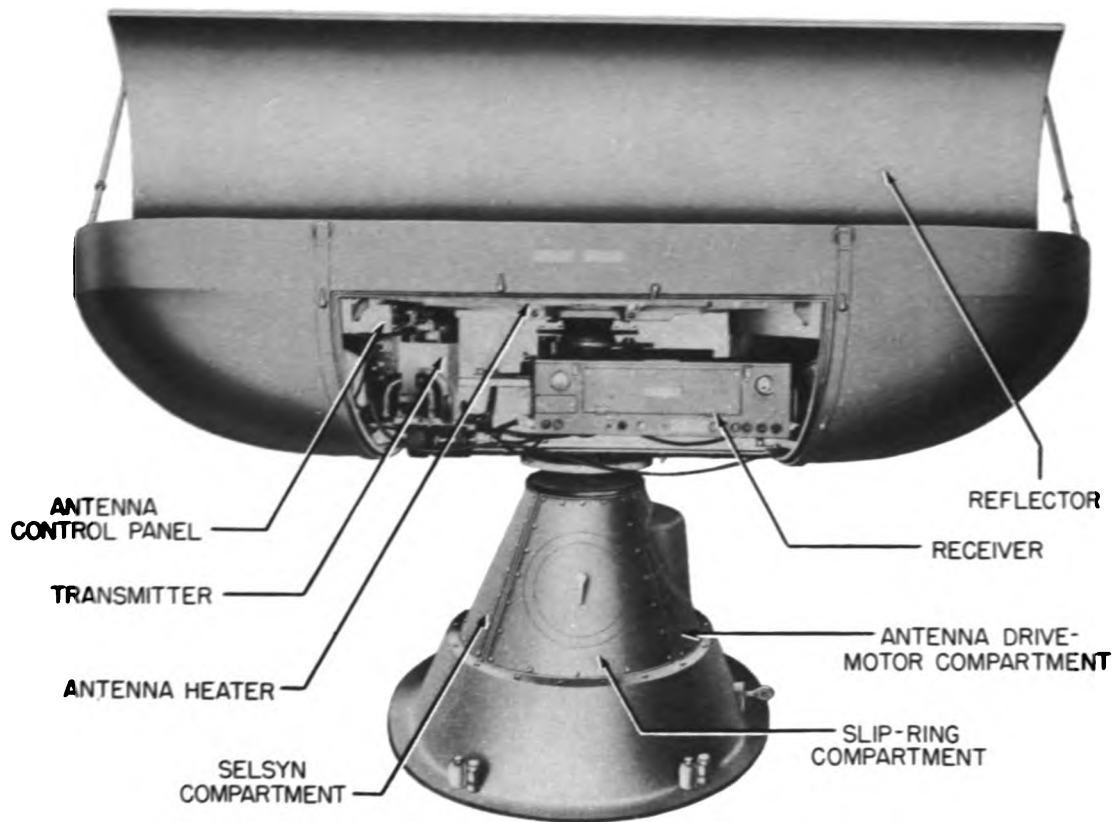


Figure 4-2. Location of console components.



TL 48668

Figure 4-3. Location of antenna components.

(4) Tower, Pedestal, and Antenna (fig. 4-3).

(a) Turn off all the switches on the power panel except the commercial power switch and the lights and IFF power switch.

(b) Climb the tower carefully. Avoid carrying loose tools in pockets because the tools may fall out and drop while the ascent is being made.

(c) Turn the stowing switch OFF.

(d) Remove the antenna covers by unsnapping the catches.

(e) When the covers are removed from the antenna, turn the rotating feed motor switch to the OFF position. This switch is located on the antenna control panel.

SECTION II. MODULATOR

4-3. ITEM 1—MODULATOR CONTROL PANEL.

a. **Preparatory Step.** Remove the eight thumbscrews from the control panel of the modulator (fig. 4-1) and swing the panel forward. Open the modulator doors.

b. **Maintenance Procedure (fig. 4-4).**

I. INSPECT:

(1) The fuses for corrosion, insecure mounting, and poor clip tension (par. 2-11).

(2) The relays for loose mounting, bad contacts, and sluggish action (par. 2-13).

(3) The switches for damage, dirt, and improper mounting. Check the action of the pushbutton and the interlock switches (par. 2-14).

(4) The powerstat (fig. 2-5) for loose mounting, corrosion, and loose knob and calibrated plate (par. 2-7).

(5) The pilot lights for cracked jewels, loose mounting, and dirt (par. 2-15).

(6) The capacitors for signs of dielectric leakage and for bulging of the case (par. 2-3).

(7) The resistors for blistering, discoloration, and other signs of overheating (par. 2-4).

(8) The terminal board for loose connections and corrosion (par. 2-8).

(9) The meters for improper zero setting, dirt, cracked cases or cover glasses, and loose terminal nuts (par. 2-12).

(10) All wiring for frayed insulation, loose lacing, and damage, or for corrosion at the terminals. Check all electrical connections for looseness (par. 2-8).

(11) The hinges and the support arm for binding. When necessary, lubricate the panel and support arm hinges (par. 2-20).

C. CLEAN:

The glass faces of the meters and pilot lights with a soft clean cloth.

4-4. ITEM 2—DRIVER.

a. **Preparatory Steps (par. 4-2).**

(1) Remove the driver chassis from the modulator cabinet (fig. 4-1).

(2) Remove the screws holding the bottom plate on the chassis and remove the plate.

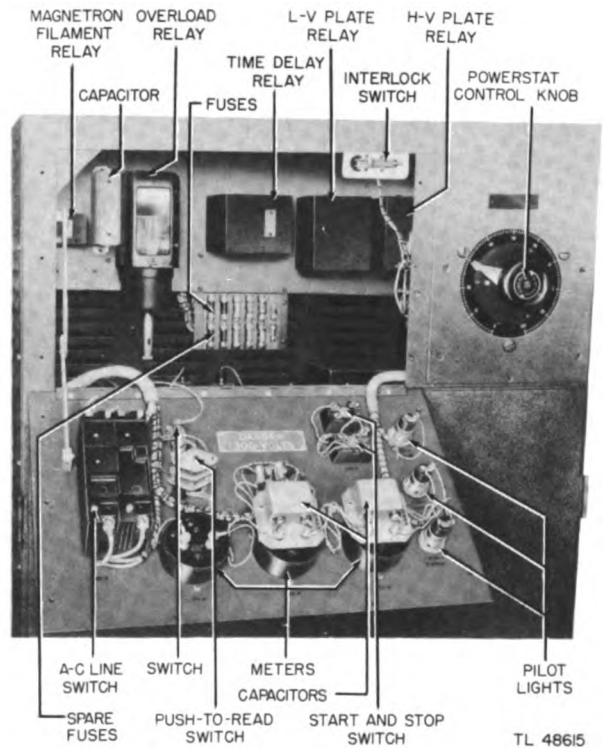
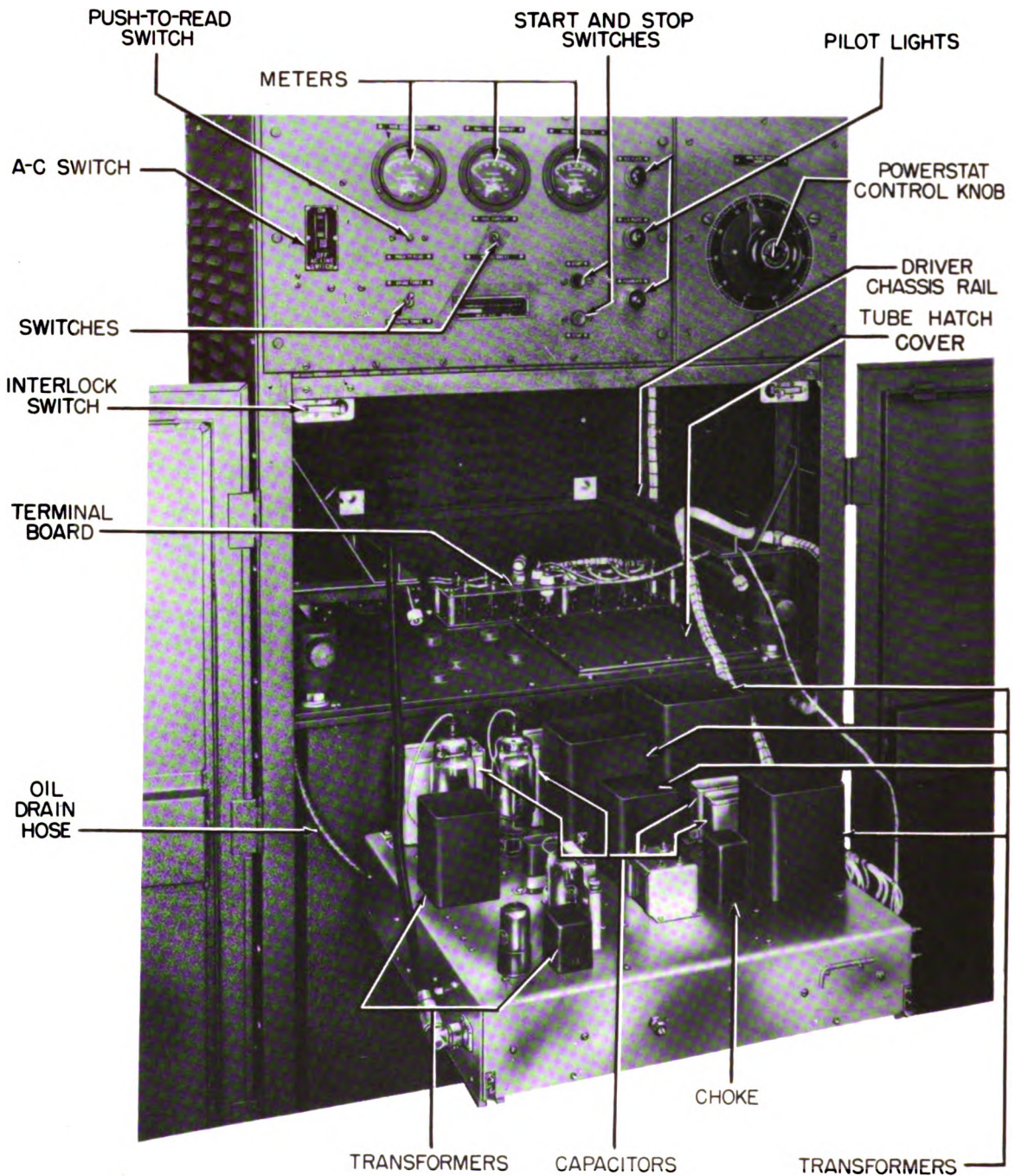
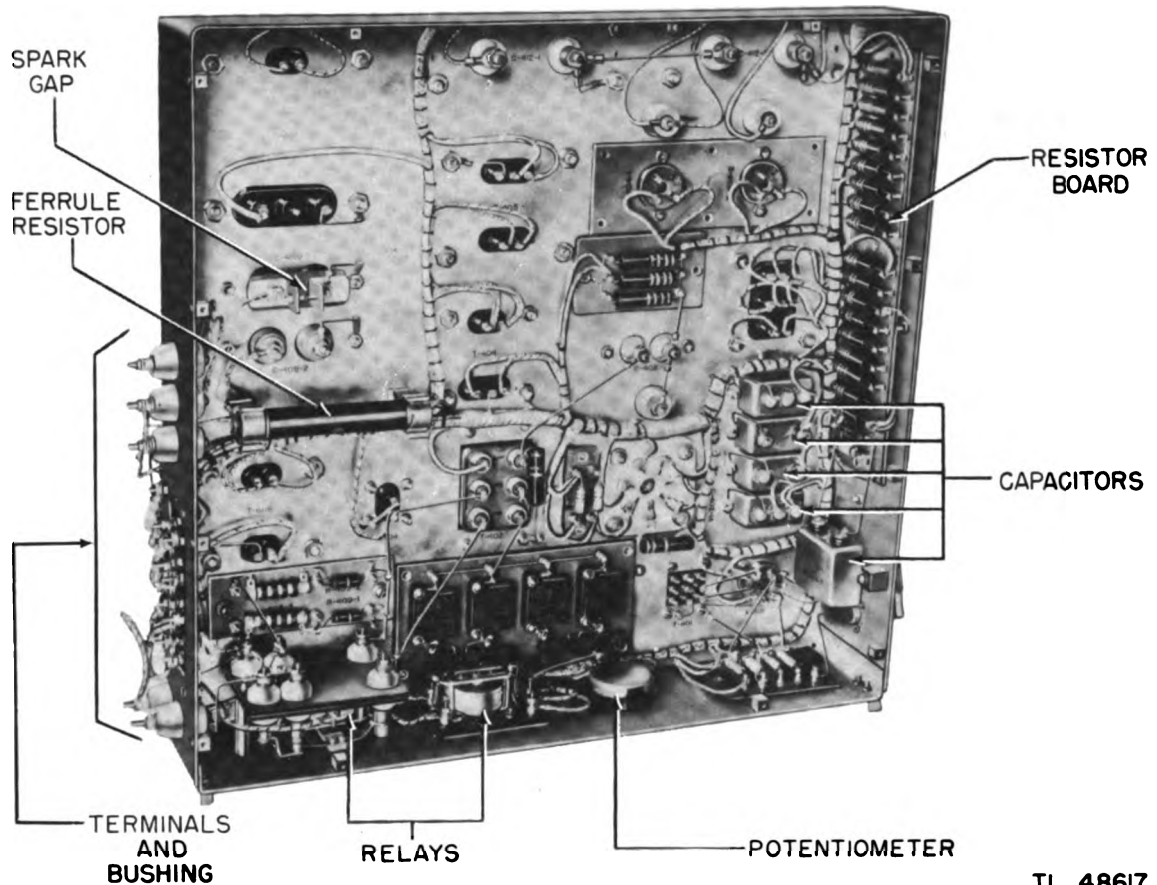


Figure 4-4. Modulator relay and meter panel.



TL 48616

Figure 4-5. Modulator with driver removed.



TL 48617

Figure 4-6. Modulator driver, bottom view.

b. Maintenance Procedure (figs. 4-5 and 4-6).

F. FEEL:

The transformers and chokes for overheating (par. 2-5).

I. INSPECT:

(1) The relays for loose mounting, bad contacts, lack of positive action, poor connections, and corrosion (par. 2-13).

(2) The capacitors for signs of leaking and for bulging. Check the capacitor terminals and the bushings for dirt, looseness, and corrosion (par. 2-3).

(3) The connectors for damage and corrosion (par. 2-9).

(4) The tubes for loose clamps. Check

the tube caps for looseness, damage, and corrosion (par. 2-2).

(5) The resistors for blistering or other signs of overheating (par. 2-4). Check the clips and ends of the ferrule resistors for corrosion and lack of tension.

(6) The potentiometer for insecure mounting and bad connections (par. 2-6).

(7) All wiring for frayed insulation and loose lacing. Check the electrical connections for looseness and corrosion (par. 2-8).

(8) The transformers and chokes for signs of melted insulation and for loose terminals (par. 2-5).

(9) The spark gap for burned, pitted, or corroded contacts.

(10) The entire chassis for dirt and dust.

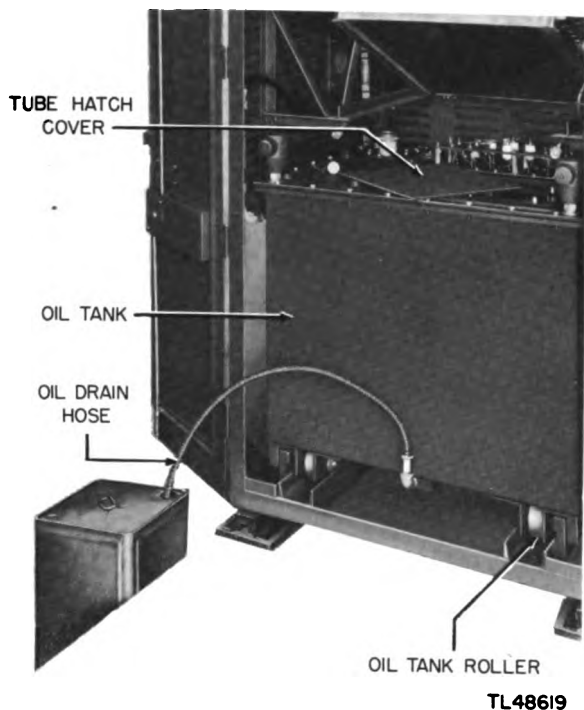


Figure 4-7. Draining oil.

4-5. ITEM 3—KEYER.

a. Preparatory Steps. In addition to the regularly scheduled maintenance, the operations in this item are to be performed whenever the keyer chassis is removed from the modulator (fig. 4-1). The chassis is removed as follows:

(1) Unfasten the tube hatch cover.

(2) Uncouple the flexible metal hose from the breather. Drain the oil through the hose into a clean container placed below the level of the tank (fig. 4-7). The tank holds 32 gallons of oil.

(3) Carefully remove the keyer tube chassis as shown in figure 4-8.

(4) Disconnect the wiring to the terminal board. Mark each cable.

(5) Remove the three bolts and the three bushings from each side of the oil tank. The bolts prevent the tank from moving back and forth and the bushings prevent sidewise motion.

(6) Roll the tank slowly forward. Since the tank is extremely heavy, it is recommended that four men lift it out of the cabinet.

(7) Remove the screws which fasten the keyer chassis to the oil tank. Lift the keyer chassis out of the tank and place the keyer in a suitable working space.

CAUTION: Short all high-voltage capacitors with the capacitor-shortening tool (par. 2-3).

b. Maintenance Procedure (fig. 4-9).

I. INSPECT:

(1) The tubes and sockets for loose mountings. Check the tube caps for poor contact (par. 2-2).

(2) All chassis mounting nuts, screws, and bolts for looseness.

(3) All electrical connections for poor contact. Examine the wiring for frayed or deteriorated insulation and loose lacing (par. 2-8).

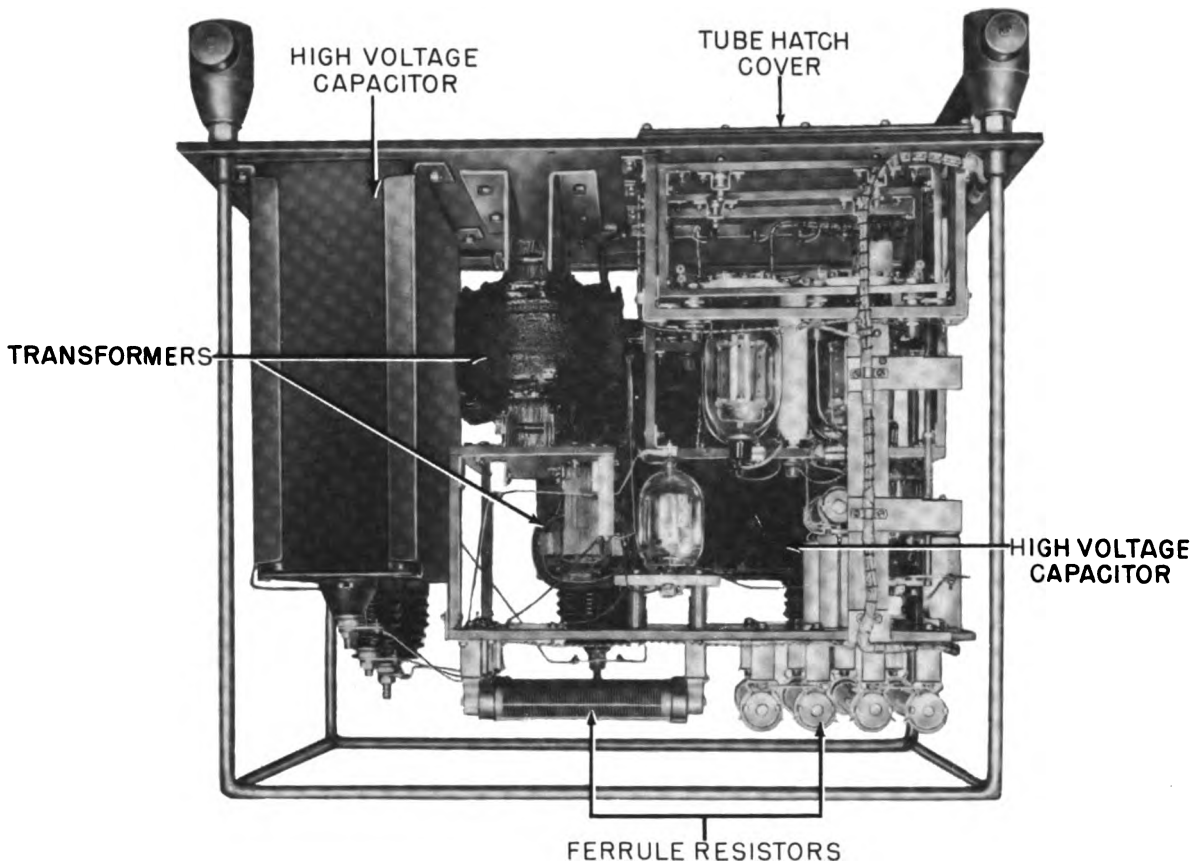
(4) Resistors for discoloration, blistering, and cracks (par. 2-4). Examine the clips and ends of the ferrule resistors for corrosion and lack of tension.

(5) Capacitors for leakage of dielectric and for bulging of case (par. 2-3).

(6) High-voltage insulators, bushings,



Figure 4-8. Removing keyer tubes.



TL48620

Figure 4-9. Modulator keyer.

and terminals for cracks, chips, or other surface defects (par. 2-16).

(7) Transformers for deterioration (par. 2-5).

(8) The terminal board at the top of the keyer for loose connections, insecure mounting, and corrosion (par. 2-8).

(9) The large cable connector for dirt, damaged insulation, and corrosion.

(10) The oil tank exterior for chipped, cracked, and peeling paint. Examine the interior for defects and for sludge left from the oil draining. If sludge is present, clean and dry the tank thoroughly before refilling.

(11) The gasket for tearing, hardening, or cracking.

(12) The oil tank rollers for corrosion and binding. If necessary, lubricate the bearings of the rollers (par. 2-20).

L. LUBRICATE:

The oil tank (see lubrication chart, par. 3-4).

4-6. ITEM 4—MODULATOR CABINET.

a. Preparatory Steps.

(1) Unscrew the thumbscrews fastening the meter panel on the modulator (fig. 4-1).

(2) Open the modulator cabinet doors.

b. Maintenance Procedure (fig. 4-4).

I. INSPECT:

(1) The surface for corrosion and for chipped, cracked, or peeling paint (par. 2-20).

(2) The panel and mounting screws for looseness.

(3) The powerstat control knob for looseness.

(4) The connectors for corrosion, defects, and looseness.

(5) The oil tank retaining bushings and bolts for insecure fastening.

(6) The oil drain hose for loose connection to the breather.

(7) The hinges of the meter panel and of the cabinet doors for binding. Examine the meter panel supporting arm for sluggish action (par. 2-20).

(8) The cabinet door locking mechanism for faulty operation. Check the doors for inadequate closing. If necessary, remove

the cover plate from the lock mechanism and apply a few drops of engine oil (OE 30). Corrosion can be removed with crocus cloth or #0000 sandpaper. Replace defective springs.

(9) The safety mountings for loose attachment to the floor and side wall.

(10) The entire chassis for dirt. Examine the ventilating screens for holes, loose fastenings, corrosion, and dirt (par. 2-20).

C. CLEAN:

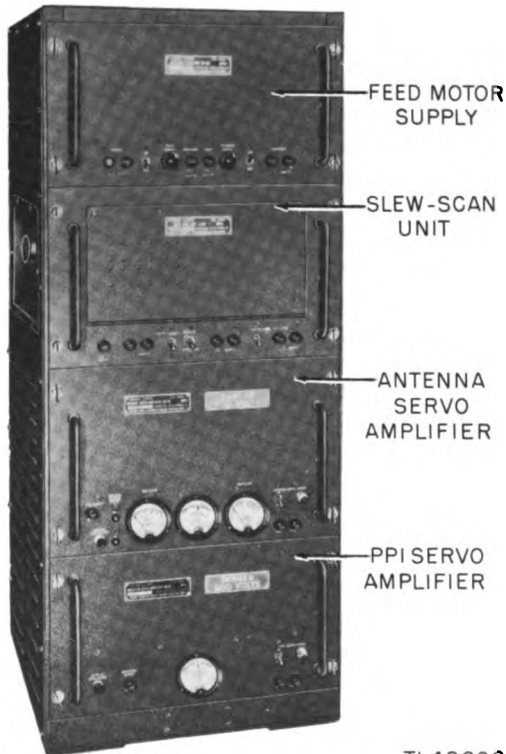
The glass covers of the meters and the pilot light jewels with a soft clean cloth.

SECTION III. SERVO ASSEMBLY AND AMPLIDYNE

4-7. ITEM 5—SERVO RACK.

a. Preparatory Step (fig. 4-1). Refer to paragraph 4-2.

b. Maintenance Procedure (fig. 4-10).



TL48622

Figure 4-10. Servo assembly.

I. INSPECT:

(1) The cabinet for damage, loose knobs, loose mounting of parts, and broken meter glasses (par. 2-20).

(2) The mountings of the individual chassis. Check the screw fasteners, the wing fasteners, and chassis stops for defects.

(3) The connectors at the side of the rack for damage and corrosion.

(4) The rack safety mountings for insecure attachment to the floor and the side wall.

(5) The ventilating screens for holes, loose fastening, dirt, and corrosion.

4-8. ITEM 6—FEED MOTOR SUPPLY.

a. Preparatory Step. Remove the feed motor supply from the servo assembly (fig. 4-10).

b. Maintenance Procedure (figs. 4-11 and 4-12).

CAUTION: The four tubes on the feed motor supply chassis are extremely hot. Contact with bare hands or arms may result in painful burns.

F. FEEL:

The transformers for excessive heat (par. 2-5).

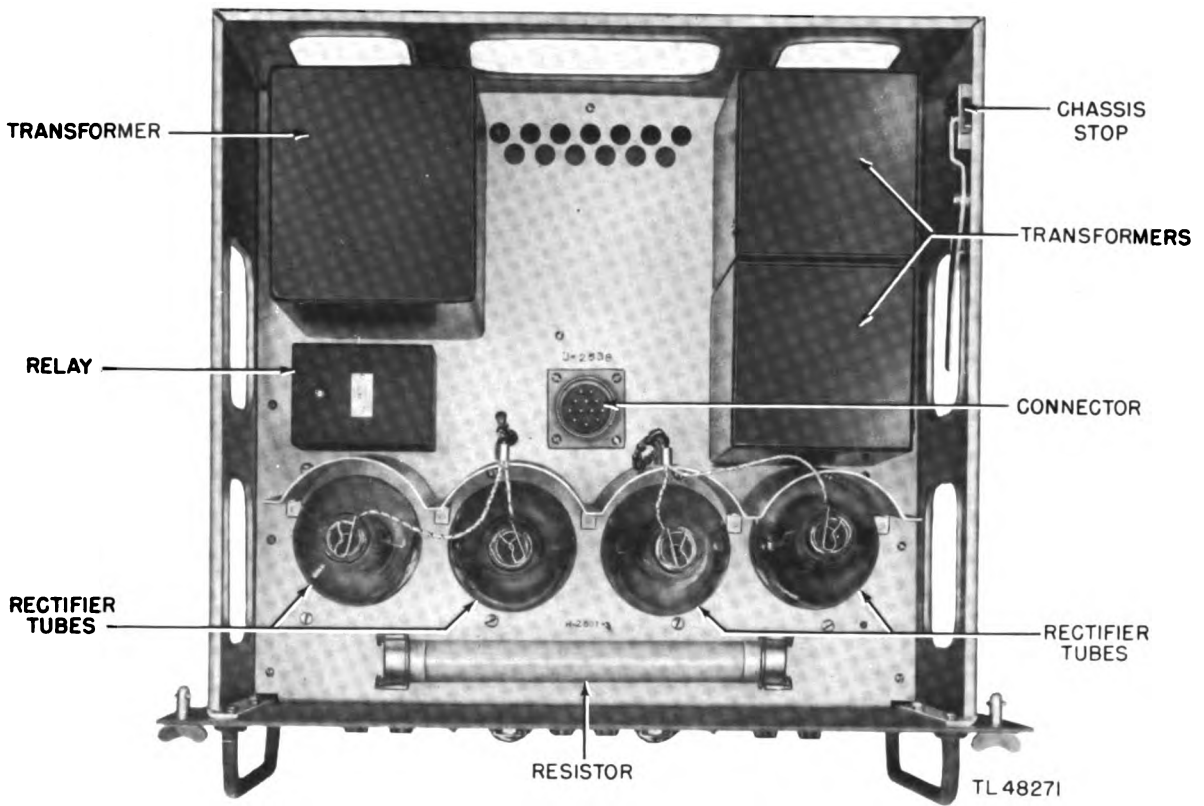


Figure 4-11. Feed motor supply, top view.

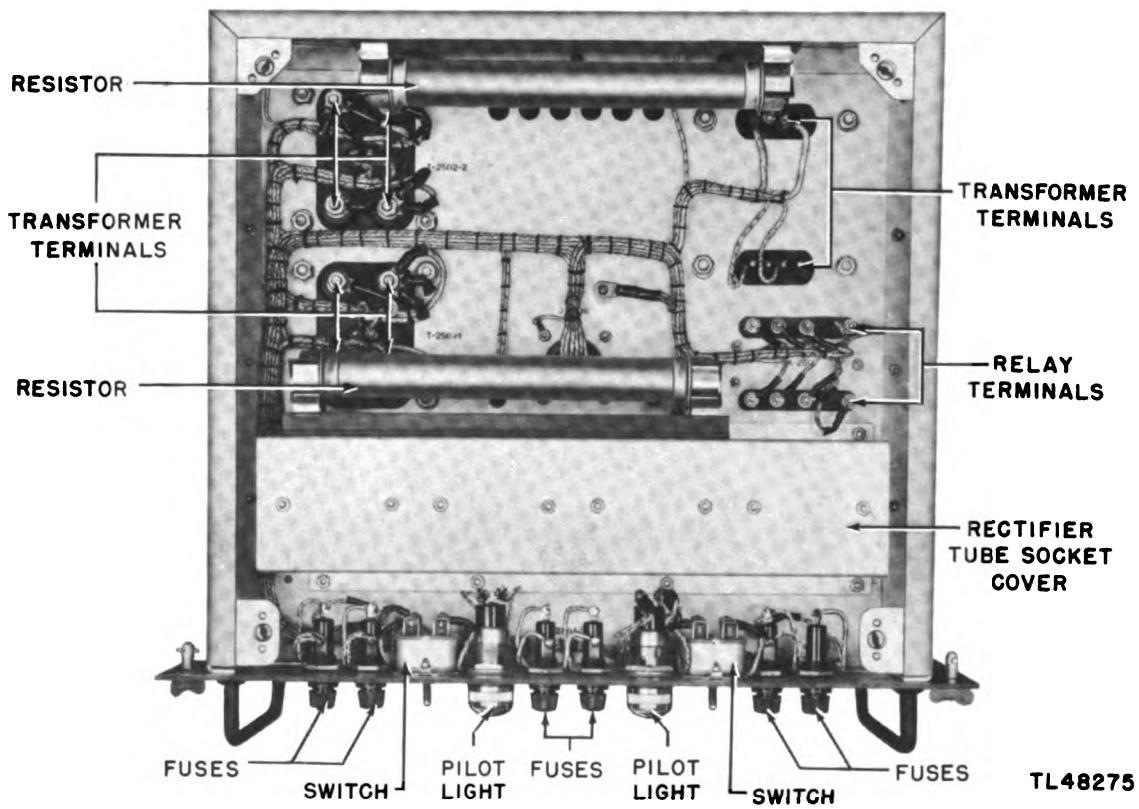


Figure 4-12. Feed motor supply, bottom view.

I. INSPECT:

(1) The transformer terminals for loose connection, corrosion, and dirt.

(2) The relay for insecure mounting, bad contacts, and faulty operation (par. 2-13). Check the relay terminals for dirt and corrosion.

(3) The connector for looseness and corrosion* (par. 2-9).

(4) The three ferrule resistors for defects and signs of overheating. Examine the clips and metallic ends of the resistors for corrosion and poor tension (par. 2-4).

(5) The fuses and fuse clips for bad contact, improper tension, and corrosion (par. 2-11).

(6) The two pilot lights for looseness, cracked jewels, and dirt (par. 2-15).

(7) All electrical connections for loose-

ness and corrosion. Examine the wiring for frayed insulation and loose lacing (par. 2-8).

(8) The tube clips on the top of the tubes for loose contact and corrosion (par. 2-2). Examine the leads for frayed insulation and broken strands of wire.

(9) The two switches for dirt, loose mountings, and poor connections (par. 2-14).

(10) The cabinet for dirt and damage. Check the operation of the chassis stop. If it is difficult to slide the chassis in and out of the rack, lubricate the rails (par. 2-20).

4-9. ITEM 7—SLEW-SCAN UNIT.

a. **Preparatory Step.** Remove the slew-scan unit from the servo assembly (fig. 4-10).

b. **Maintenance Procedure** (figs. 4-13, 4-14, and 4-15).

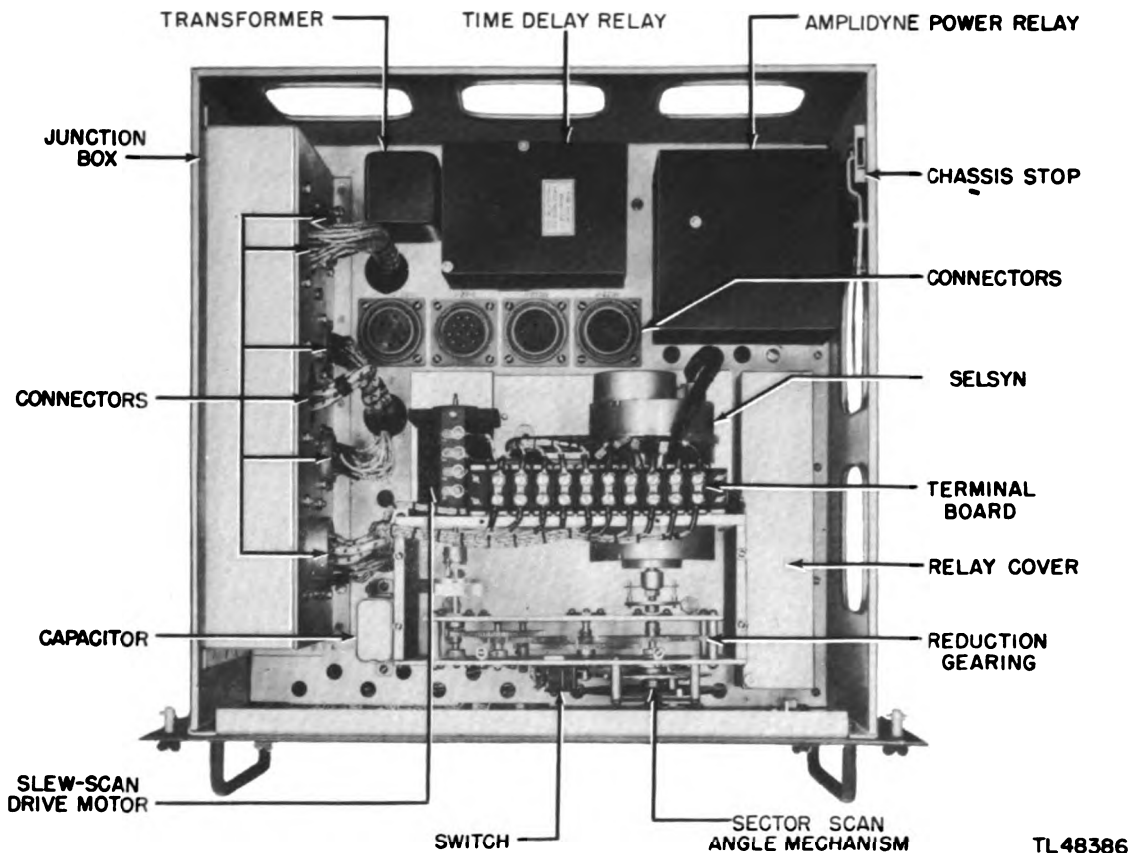
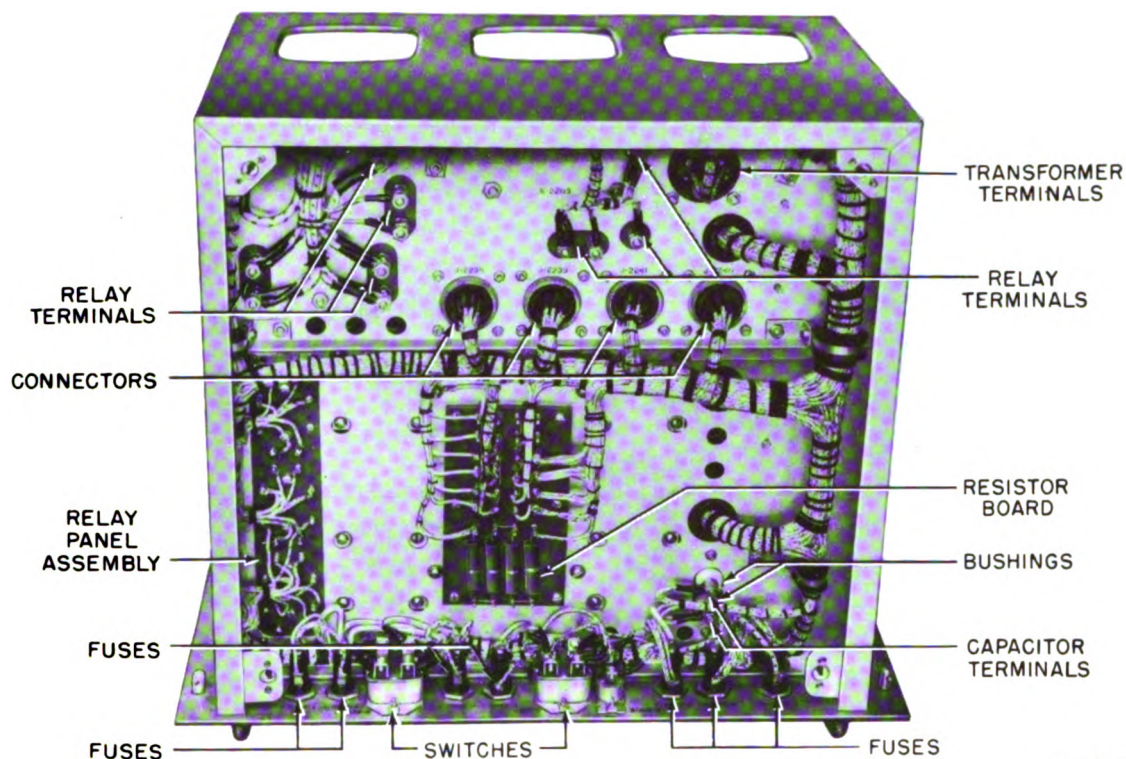


Figure 4-13. Slew-scan unit, top view.



TL48285

Figure 4-14. Slew-scan unit, bottom view.

F. FEEL:

The transformer (par. 2-5) and the slew-scan drive motor for overheating (par. 2-17).

I. INSPECT:

(1) The five relays for insecure mounting, bad contacts, and faulty operation (par. 2-13).

(2) The connectors for looseness, corrosion, and damage (par. 2-9).

(3) The spare fuses (mounted on the front cover) for loose mounting and corrosion (par. 2-11).

(4) The sector-scan disk and the indicator plate for damage, improper mounting, and dirt. Check the reduction gearing for damage.

(5) The microswitch for insecure mounting. Check the roller for sluggish action (par. 2-14).

(6) All terminal boards for loose mounting and connections, and for corrosion (par. 2-8).

(7) All wiring for frayed insulation and

loose lacing. Check all electrical connections for looseness and corrosion (par. 2-8).

(8) The three switches for dirt and loose mounting (par. 2-14).

(9) The fuses and fuse clips for corrosion, loose connections, insecure mounting, and lack of proper tension (par. 2-11).

(10) The resistors for blistering, discoloration, or other signs of overheating (par. 2-4).

(11) The capacitors for leaking of dielectric and for bulging of case (par. 2-3). Check the capacitor terminals and bushings for poor connections, dirt, and corrosion.

(12) The selsyn and the motor for damage, insecure mounting, and loose coupling. No lubrication is required (pars. 2-17 and 2-18). Remove the screw fastening the slipping cover of the selsyn. Examine for loose connections, improper brush tension, and for dirt and corrosion of the brushes and slip rings.

(13) The shock mounting under the reduction gear assembly for looseness and lack of elasticity.

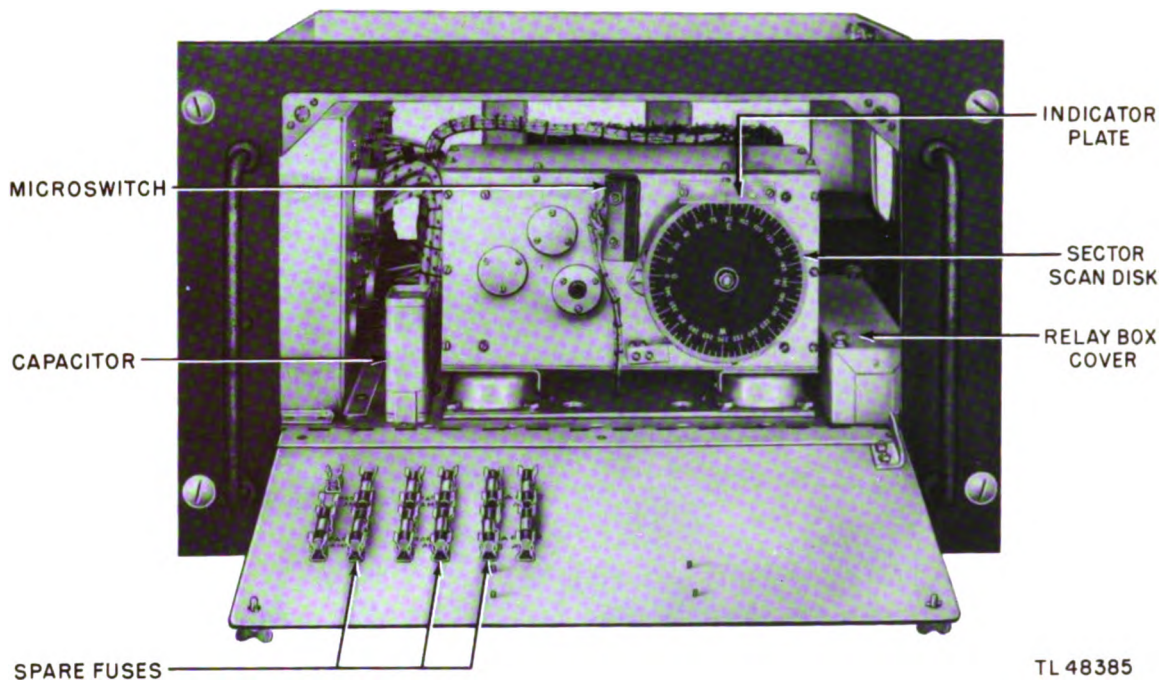


Figure 4-15. Slew-scan unit, front view.

(14) The cabinet for dirt and damage. Check the operation of the chassis stop and the hinges. When necessary, lubricate the hinges (par. 2-20). If it is difficult to slide the chassis in and out of the rack, lubricate the rails (par. 2-20).

C. CLEAN:

The sector-scan disk and the indicator plate with a soft cloth moistened with dry-cleaning solvent.

L. LUBRICATE:

(1) The reduction gearing (see lubrication chart par. 3-4).

(2) The shaft bearings (see lubrication chart par. 3-4).

4-10. ITEM 8—ANTENNA SERVO AMPLIFIER.

a. Preparatory Step. Remove the antenna servo amplifier from the servo assembly (fig. 4-10).

b. Maintenance Procedure (figs. 4-16 and 4-17).

F. FEEL:

The transformers and the choke for overheating (par. 2-5).

I. INSPECT:

(1) The tubes for loose clamps (par. 2-2).

(2) The connectors for damage, corrosion, and looseness (par. 2-9).

(3) The relay for insecure mounting, bad contacts, and faulty operation (par. 2-13).

(4) The capacitors for bulging of the case and for leakage of dielectric (par. 2-3).

(5) The meters for improper zero setting, cracked cases or cover glasses, and loose terminal nuts (par. 2-12).

(6) The potentiometers for defects and loose mounting (par. 2-6).

(7) All resistors for blistering, discoloration, or other signs of overheating (par. 2-4). Check the clips and metallic ends of the ferrule resistors for corrosion and lack of tension.

(8) All electrical connections for looseness and corrosion. Examine the wiring for frayed insulation and loose lacing (par. 2-8).

(9) The pilot light for cracked glass, looseness, and dirt (par. 2-15).

(10) The fuses and fuse clips for bad contacts, corrosion, and lack of proper tension (par. 2-11).

(11) The ON-OFF and push-button switches for faulty operation, dirt, poor connections, and loose mounting. Examine the contacts of the push-button switch for pitting and corrosion (par. 2-14).

(12) The cabinet for damage and dirt. Check the chassis stop for improper operation. If it is difficult to slide the chassis in and out of the cabinet, lubricate the rails (par. 2-20).

C. CLEAN:

The glass faces of the meters with a soft clean cloth.

4-11. ITEM 9—PPI SERVO AMPLIFIER.

a. Preparatory Step. Remove the PPI servo amplifier from the servo assembly (fig. 4-10).

b. Maintenance Procedure (figs. 4-18 and 4-19).

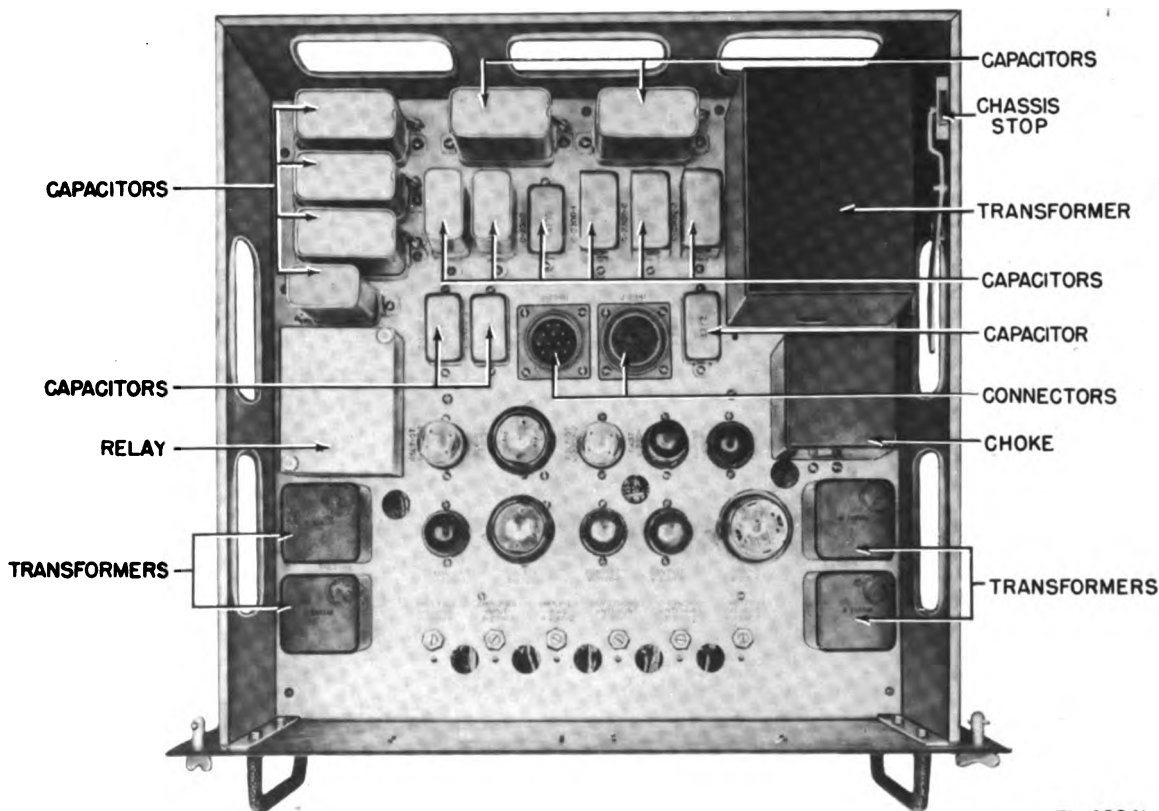
F. FEEL:

The transformers, saturable reactors, and chokes for overheating (par. 2-5).

I. INSPECT:

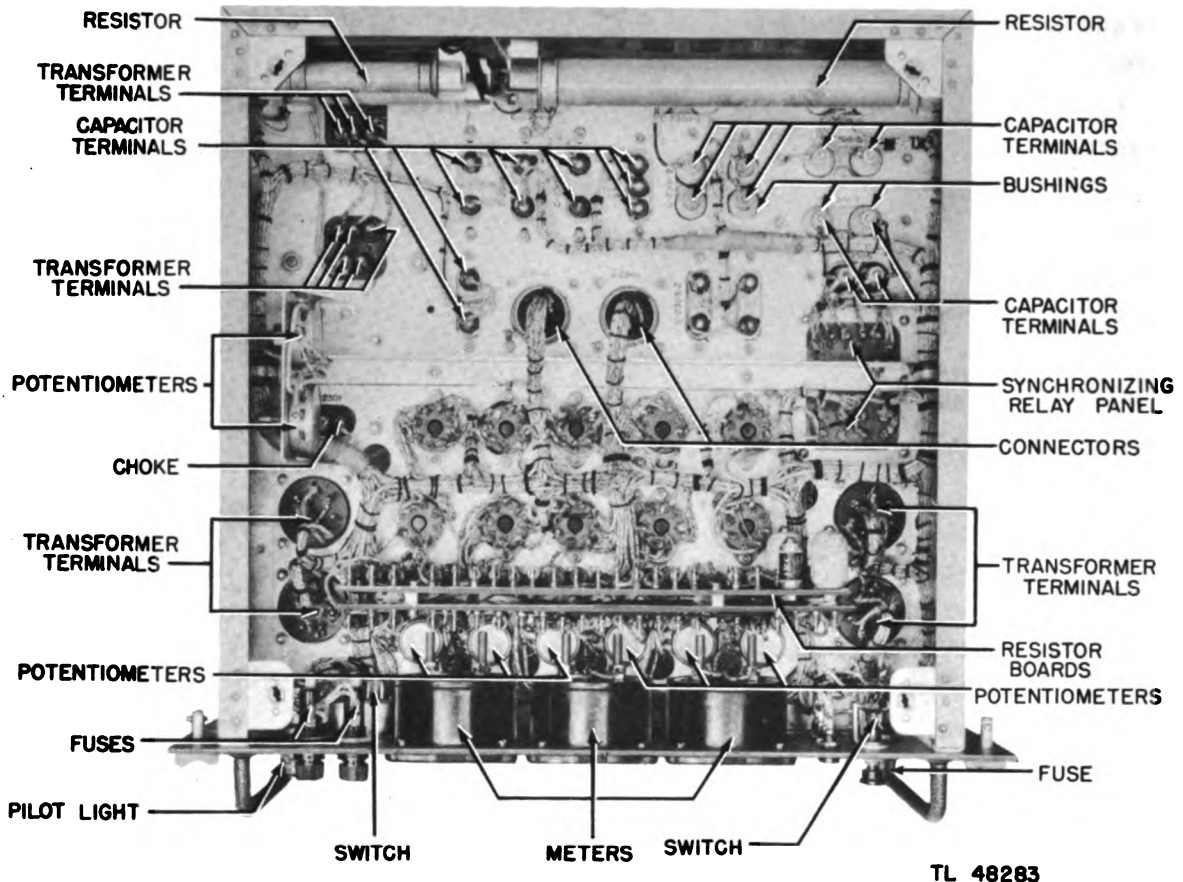
(1) The connectors for corrosion and looseness (par. 2-9).

(2) The tubes for loose clamps (par. 2-2).



TL 4824i

Figure 4-16. Antenna servo amplifier, top view.



TL 48283

Figure 4-17. Antenna servo amplifier, bottom view.

(3) The capacitors for bulging of the case and for leakage of dielectric. Check the capacitor terminals and bushings for corrosion and dirt (par. 2-3).

(4) The potentiometers for loose mounting and loose control knobs (par. 2-6).

(5) The resistors for blistering, discoloration, or other signs of overheating (par. 2-4).

(6) The meter for dirt, improper zero setting, cracked case or cover glass, and loose terminal nuts (par. 2-12).

(7) The switches for faulty operation, dirt, loose mounting, and poor connections (par. 2-14).

(8) The pilot light for loose mounting, dirt, and broken glass (par. 2-15).

(9) The fuses and fuse clips for poor contact, corrosion, and improper tension (par. 2-11).

(10) The cabinet for damage and dirt. Check the operation of the chassis stop. If it is difficult to slide the chassis in and out of the rack, lubricate the rails (par. 2-20).

C. CLEAN:

The glass face of the meter with a soft clean cloth.

4-12. ITEM 10—AMPLIDYNE.

a. **Preparatory Step.** Disconnect the cables from the amplidyne (fig. 4-1).

b. **Maintenance Procedure** (figs. 4-20 and 4-21).

F. FEEL:

Feel the motor and the generator housings for overheating (par. 2-17).

I. INSPECT:

(1) The motor and the generator for insecure mounting to the trailer floor. Examine the assembly bolts for looseness.

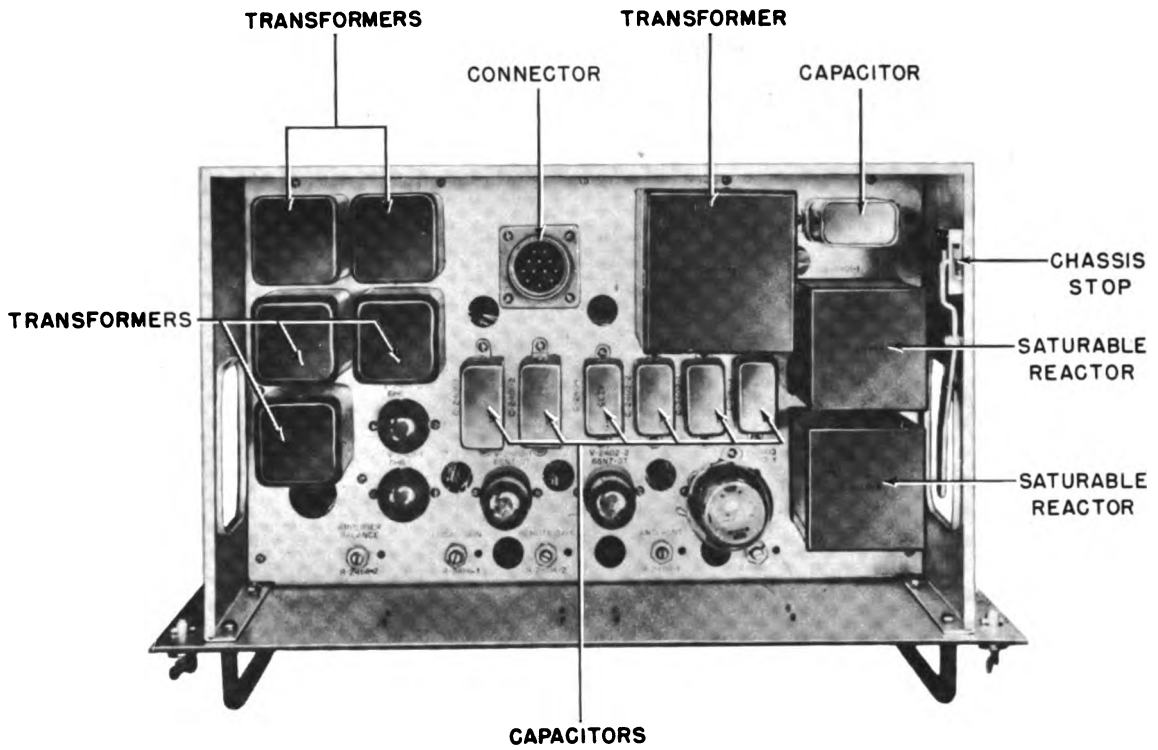


Figure 4-18. PPI servo amplifier, top view.

TL 48284

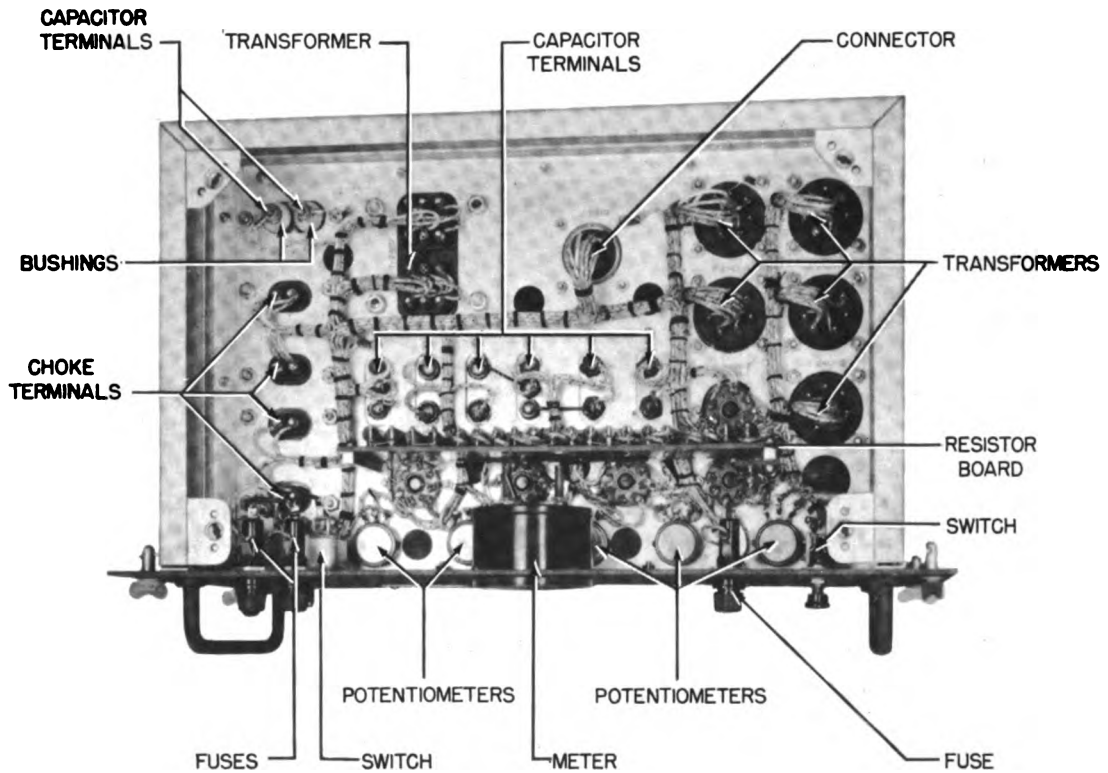


Figure 4-19. PPI servo amplifier, bottom view.

TL 48281

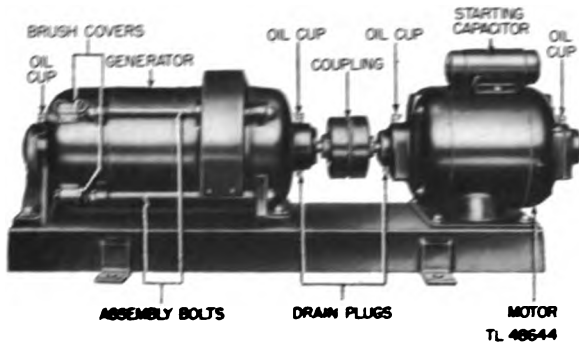


Figure 4-20. Amplidyne.

- (2) The starting capacitor for loose mounting.
- (3) The coupling for loose attachment.
- (4) The motor and generator housings for excess oil, and for dirt and corrosion.
- (5) The brushes. Remove the dust covers and examine the brushes for excessive wear and the commutators for burned, pitted, and dirty segments (par. 2-17).
- (6) The connectors for damage, dirt, and corrosion. Check the connectors for insecure mounting (par. 2-9).

L. LUBRICATE:

- (1) The amplidyne oil cups (see lubrication chart, par. 3-4).

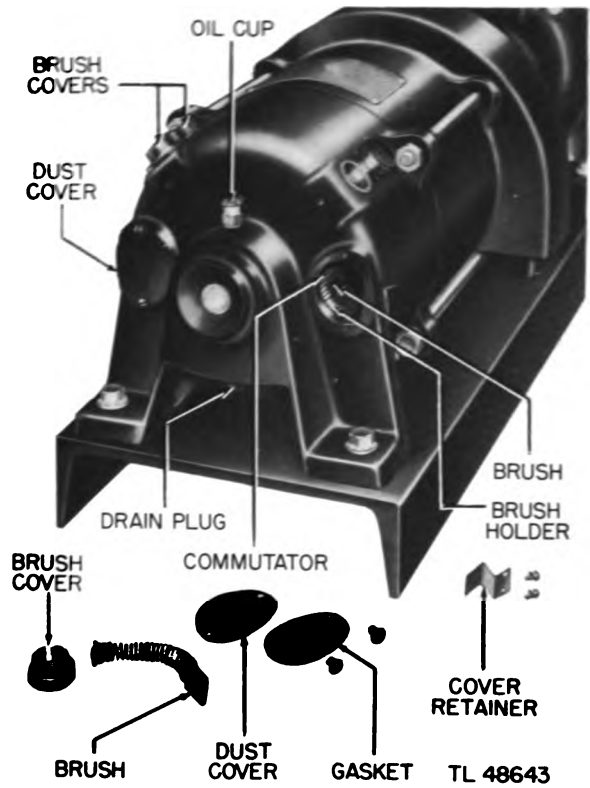


Figure 4-21. Amplidyne, end view.

- (2) The amplidyne bearings (see lubrication chart, par. 3-4).

SECTION IV. RECTIFIER ASSEMBLY

4-13. ITEM 11—RECTIFIER RACK.

a. Preparatory Step (fig. 4-1). Refer to paragraph 4-2.

b. Maintenance Procedure (fig. 4-22).

I. INSPECT:

- (1) The outside of the cabinet for damage, deteriorated paint surfaces, and dirt (par. 2-20).
- (2) The mountings of the chassis. Check the screw fasteners and the wing fasteners for looseness.
- (3) The safety mounting at the top and bottom of the rack for looseness.
- (4) The connectors for damage, corrosion, and loose mounting (par. 2-9).

(5) The ventilating screens for damage, loose mounting, and dirt.

(6) The control knobs and fuse holders for looseness.

4-14. ITEM 12—RECTIFIER CONTROL PANEL.

a. Preparatory Step. Remove the rectifier control panel from the rectifier assembly (fig. 4-22).

b. Maintenance Procedure (figs. 4-23 and 4-24).

I. INSPECT:

- (1) The three relays for insecure mounting, bad contacts, and lack of positive action. Check the relay terminals for dirt and corrosion (par. 2-13).

(2) The fuse clips and the metallic ends of the fuses for poor contacts, pitting, corrosion, and lack of proper tension (par. 2-11).

(3) The meter for loose mounting, dirt, improper zero setting, cracked case or cover glass, and loose terminal nuts (par. 2-12).

(4) The connectors for looseness and corrosion (par. 2-9).

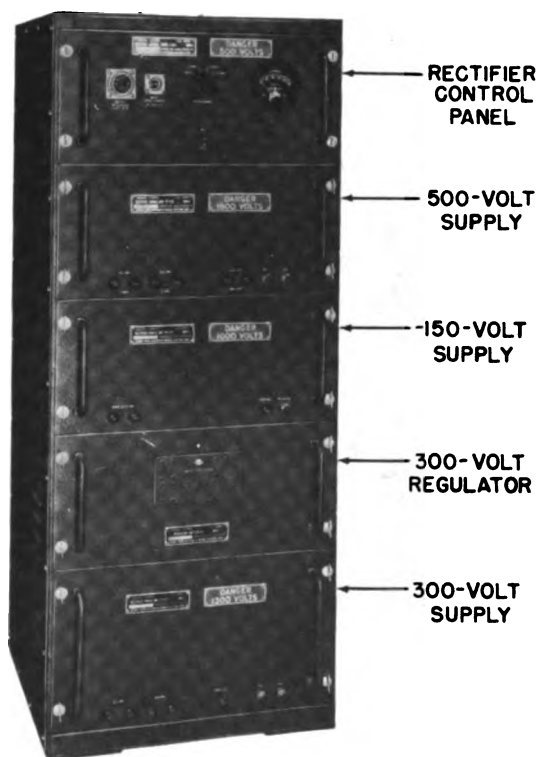
(5) The METER RANGE (tandem) switch for dirt, bad contacts, and loose mounting. Check the switch for poor operation (par. 2-14).

(6) The resistors for blistering and discoloration (par. 2-4).

(7) The ON-OFF switch for dirt and loose mounting (par. 2-14).

(8) All electrical connections for looseness and corrosion. Examine the wiring for frayed insulation and loose lacing (par. 2-8).

(9) The cabinet for dirt and corrosion, and the chassis stop for poor action. Lubricate the rails when necessary as stated in paragraph 2-20. Examine the ventilating



TL 48621

Figure 4-22. Rectifier assembly.

screens for holes, insecure mounting, and dirt.

C. CLEAN:

The glass face of the meter with a soft cloth.

4-15. ITEM 13—500-VOLT SUPPLY.

The 500-volt supply in the rectifier assembly and in the remote-B assembly are identical. The maintenance operations listed below apply to both supplies.

a. Preparatory Step. Remove the 500-volt supply (fig. 4-22) from the rectifier assembly (or the remote-B rack).

b. Maintenance Procedure (figs. 4-25 and 4-26).

F. FEEL:

The transformers and the chokes for overheating (par. 2-5).

I. INSPECT:

(1) The tubes for dirt and loose clamps (par. 2-2).

(2) The connector for looseness and corrosion (par. 2-9).

(3) The capacitors for leaking of dielectric and for bulging of case (par. 2-3). Check the capacitor terminals for dirt and corrosion.

(4) Resistors for blistering, discoloration, or other signs of overheating. Examine the clips and metallic ends of the two ferrule resistors for corrosion and lack of tension (par. 2-4).

(5) The transformer terminals for dirt and corrosion (par. 2-5).

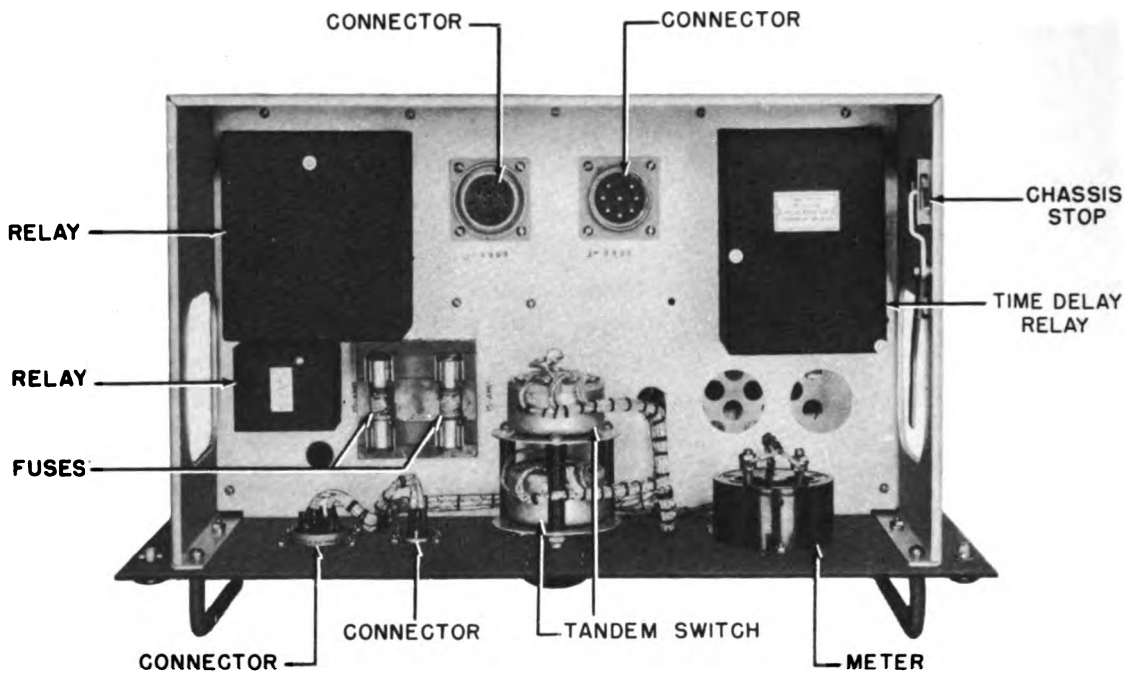
(6) The fuses and fuse clips for poor contacts, improper tension, and corrosion (par. 2-11).

(7) The two pilot lights for looseness, broken glasses, and dirt (par. 2-15).

(8) The potentiometer for damage and loose mounting (par. 2-6).

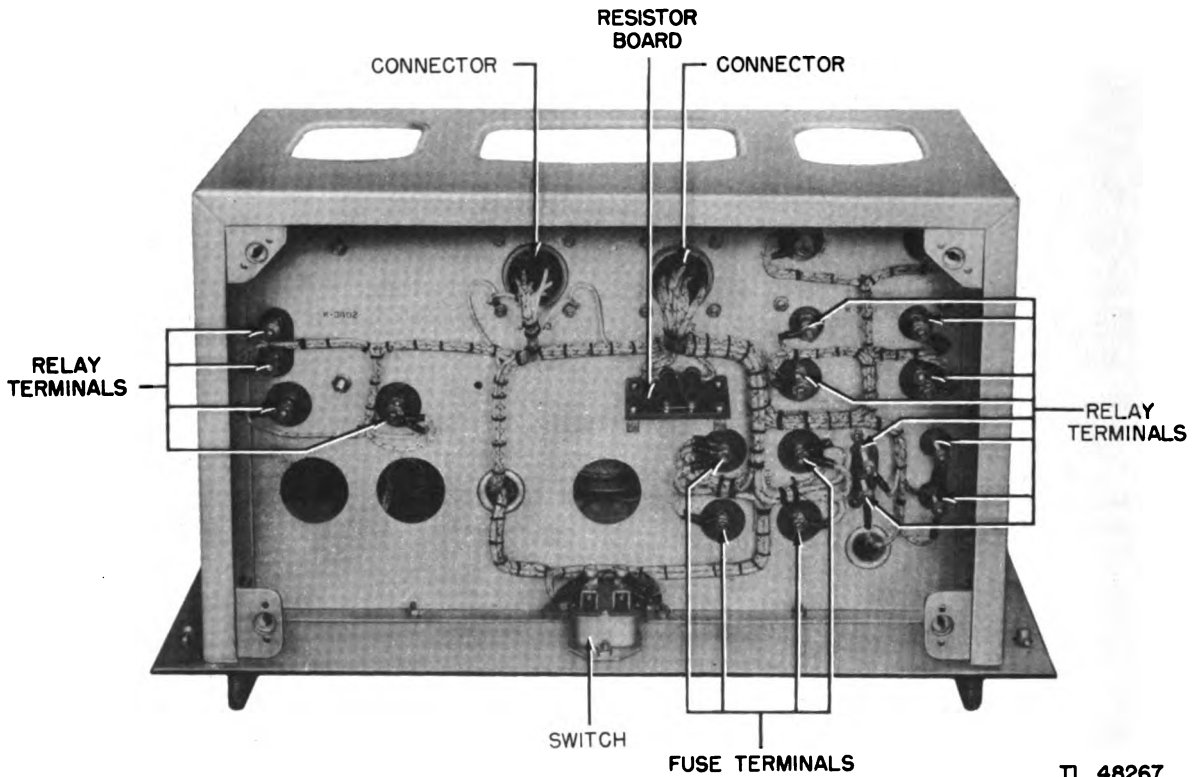
(9) All electrical connections for looseness and corrosion. Examine the wiring for frayed insulation and loose lacing (par. 2-8).

(10) The chassis for dirt and defective wing fasteners. Examine the chassis stop



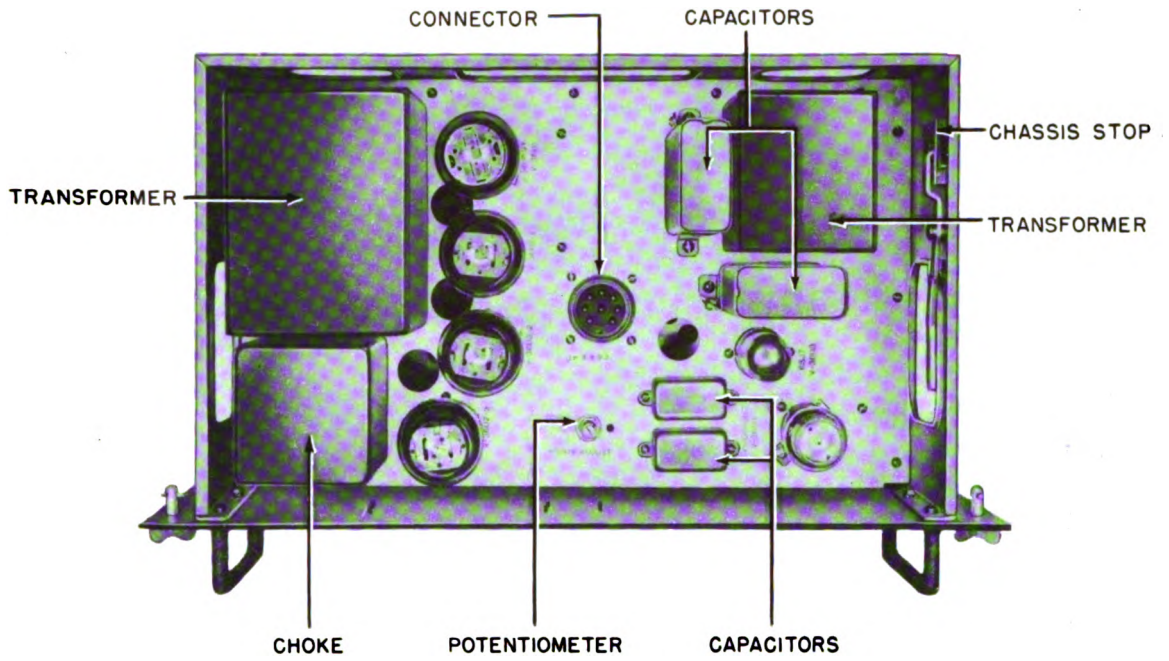
TL48263

Figure 4-23. Control panel, top view.



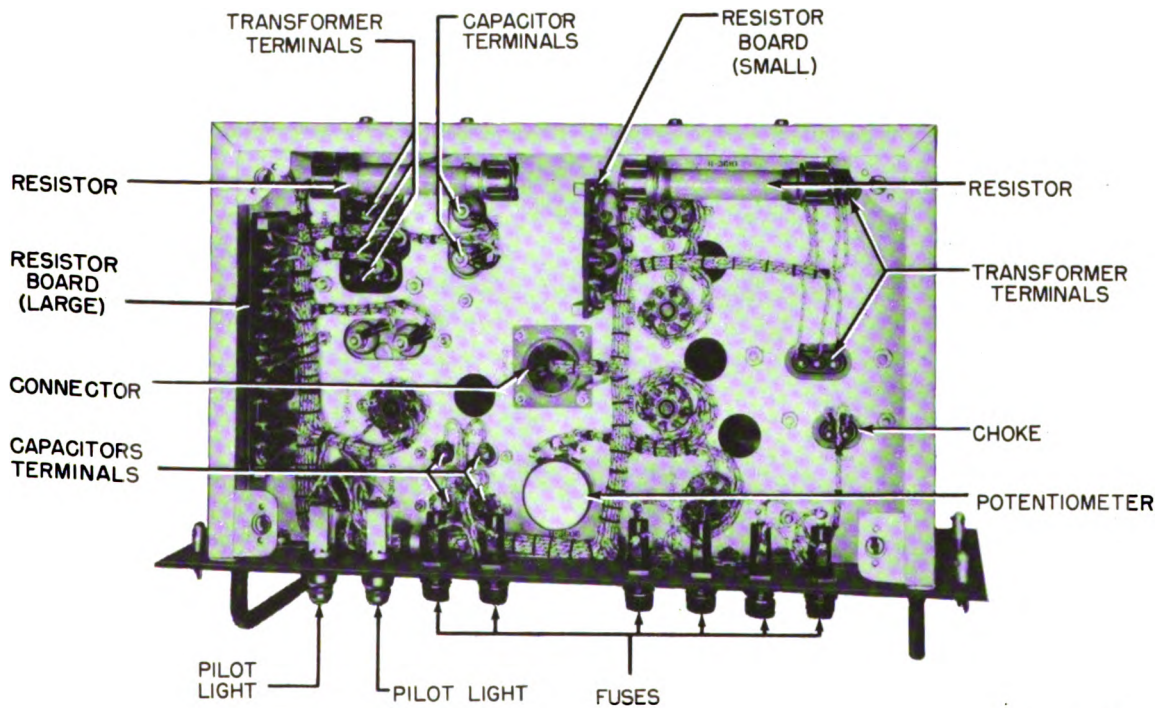
TL 48267

Figure 4-24. Control panel, bottom view.



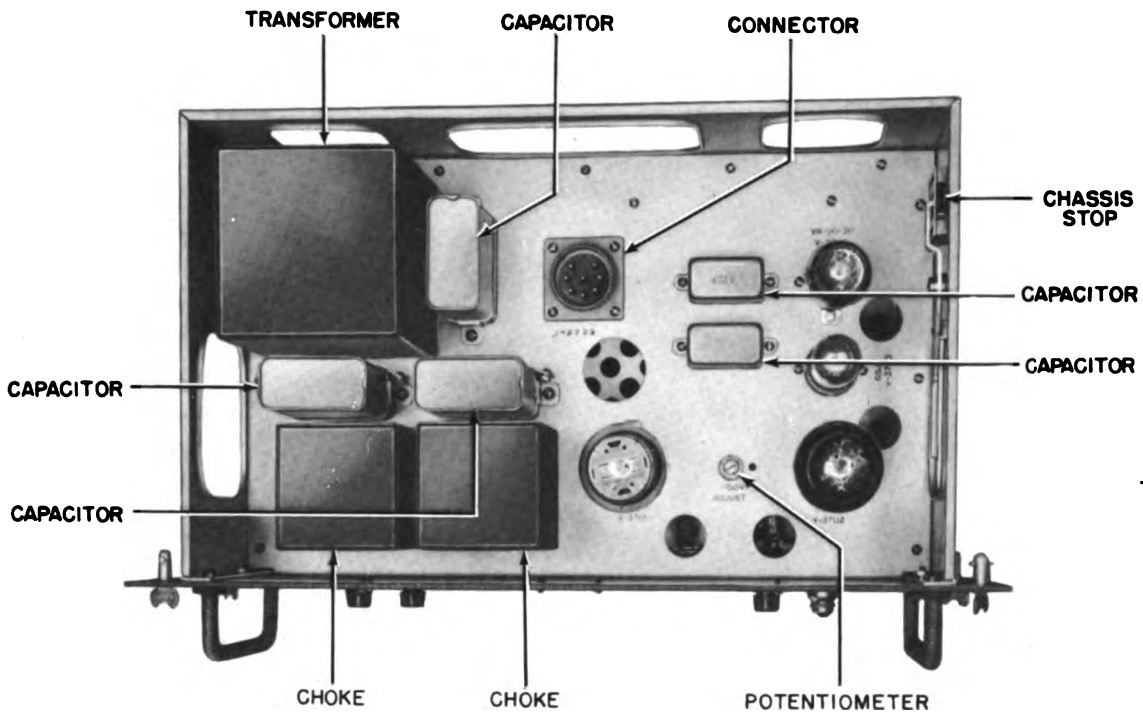
TL 48259

Figure 4-25. 500-volt supply, top view.



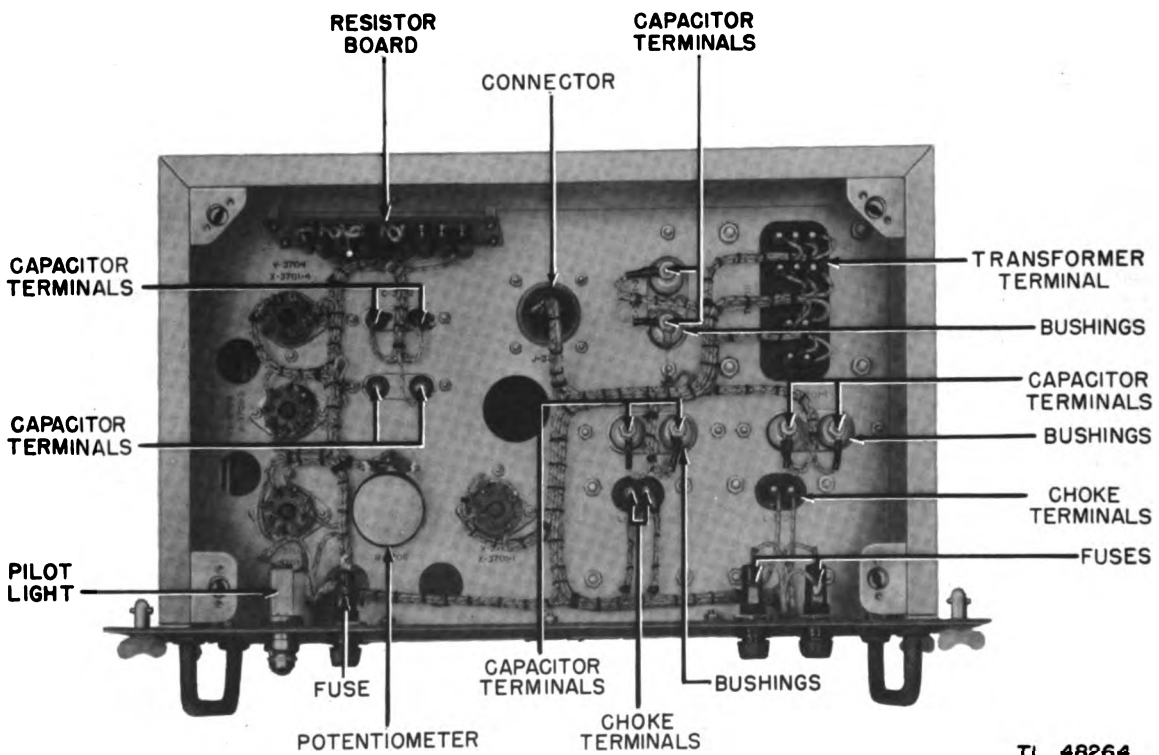
TL 48261

Figure 4-26. 500-volt supply, bottom view.



TL 48255

Figure 4-27. -150-volt supply, top view.



TL 48264

Figure 4-28. -150-volt supply, bottom view.

for faulty operation. If it is difficult to slide the chassis in and out of the rack, lubricate the rails (par. 2-20).

4-16. ITEM 14— -150-VOLT SUPPLY.

a. **Preparatory Step.** Remove the -150-volt supply from the rectifier assembly (fig. 4-22).

b. **Maintenance Procedure** (figs. 4-27 and 4-28).

F. FEEL:

The transformer and the chokes for overheating (par. 2-5).

I. INSPECT:

(1) The tubes for loose clamps (par. 2-2).

(2) The connector for corrosion and loose mounting (par. 2-9).

(3) The capacitors for poor connections, leaking of dielectric, and bulging of case (par. 2-3).

(4) Resistors for blistering, discoloration, or other signs of overheating (par. 2-4).

(5) The fuses and fuse clips for improper tension, poor contact, and corrosion (par. 2-11).

(6) The pilot light for looseness, cracked jewel, and dirt (par. 2-15).

(7) The potentiometer for defects and loose mounting (par. 2-6).

(8) All electrical connections for looseness and corrosion. Examine the wiring for frayed insulation and loose lacing (par. 2-8).

(9) The chassis for dirt, corrosion, and defective chassis stop. Examine the ventilating screen for damage, insecure mounting, dirt, and corrosion. If necessary, lubricate the chassis rails according to instructions in paragraph 2-20.

4-17. ITEM 15—300-VOLT REGULATOR.

a. **Preparatory Step.** Remove the regulator from the rectifier assembly (fig. 4-22).

b. **Maintenance Procedure** (figs. 4-29 and 4-30).

I. INSPECT:

(1) The tubes for loose clamps and dirt (par. 2-2).

(2) The connector for loose mounting and corrosion (par. 2-9).

(3) The capacitors for loose connections, leaking of dielectric, and bulging of case (par. 2-3). Examine the bushings for dirt and moisture (par. 2-16).

(4) Resistors for blistering, discoloration, and other signs of overheating (par. 2-4).

(5) The spare fuses for loose mounting and for corroded ends and clips (par. 2-11).

(6) The potentiometer for defects and loose mounting (par. 2-6).

(7) All electrical connections for looseness and corrosion. Examine the wiring for frayed insulation and loose lacing (par. 2-8).

(8) The chassis for dirt, corrosion, and defective chassis stops. If it is difficult to slide the chassis in and out of the rack, lubricate the rails (par. 2-20).

4-18. ITEM 16—300-VOLT SUPPLY.

a. **Preparatory Step.** Remove the 300-volt supply from the rectifier assembly (fig. 4-22).

b. **Maintenance Procedure** (figs. 4-31 and 4-32).

F. FEEL:

The transformers and the filter chokes for overheating (par. 2-5).

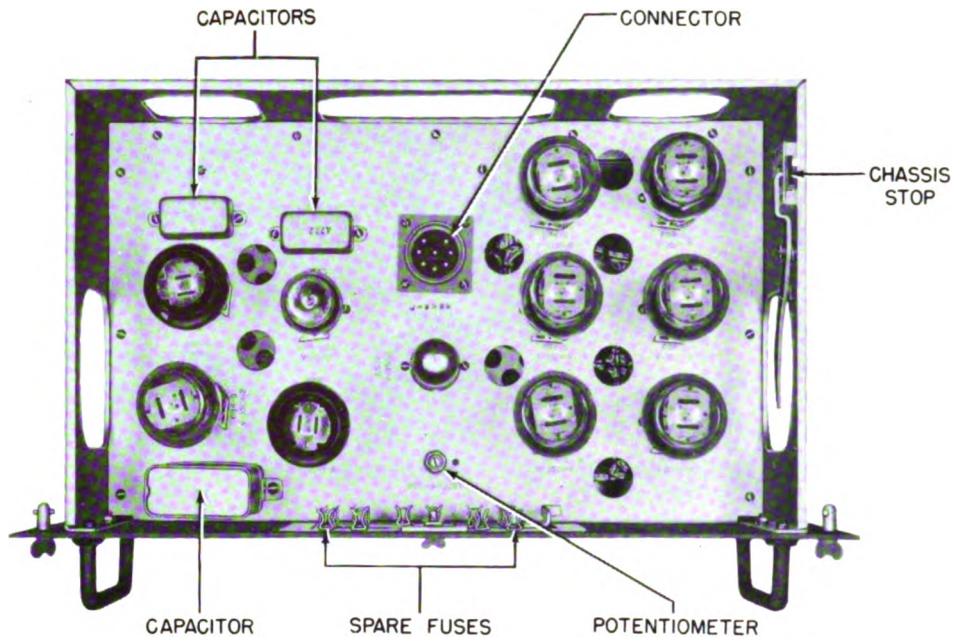
I. INSPECT:

(1) The tubes for loose clamps (par. 2-2).

(2) The capacitors for leaking of dielectric and for bulging of case. Check the capacitor terminals for corrosion and poor connections (par. 2-3).

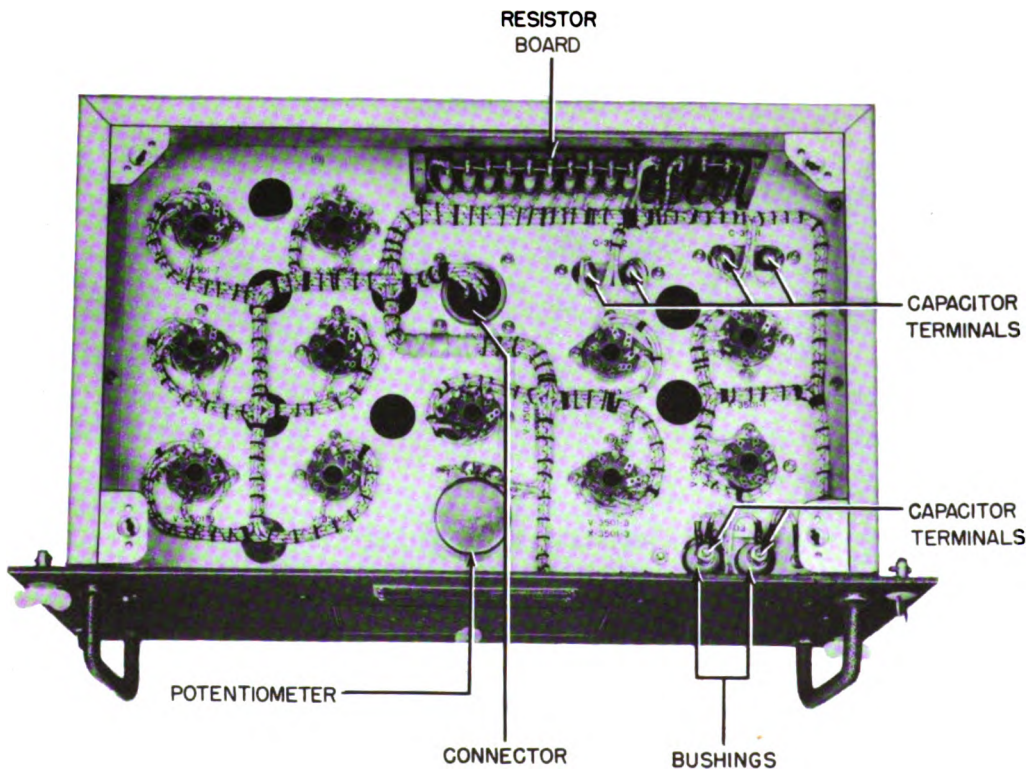
(3) The connector for looseness and corrosion (par. 2-9).

(4) The ferrule resistor for signs of overheating. Examine the clips and ends of the resistor for corrosion and lack of tension (par. 2-4).



TL 48278

Figure 4-29. 300-volt regulator, top view.



TL48276

Figure 4-30. 300-volt regulator, bottom view.

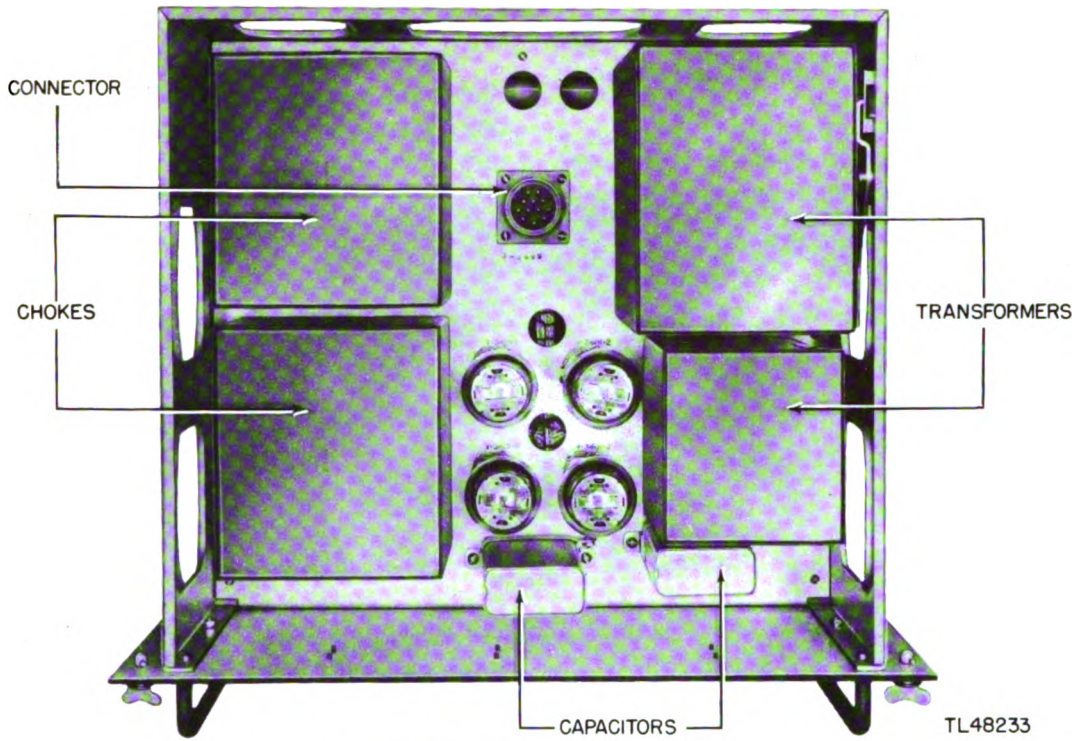


Figure 4-31. 300-volt supply, top view.

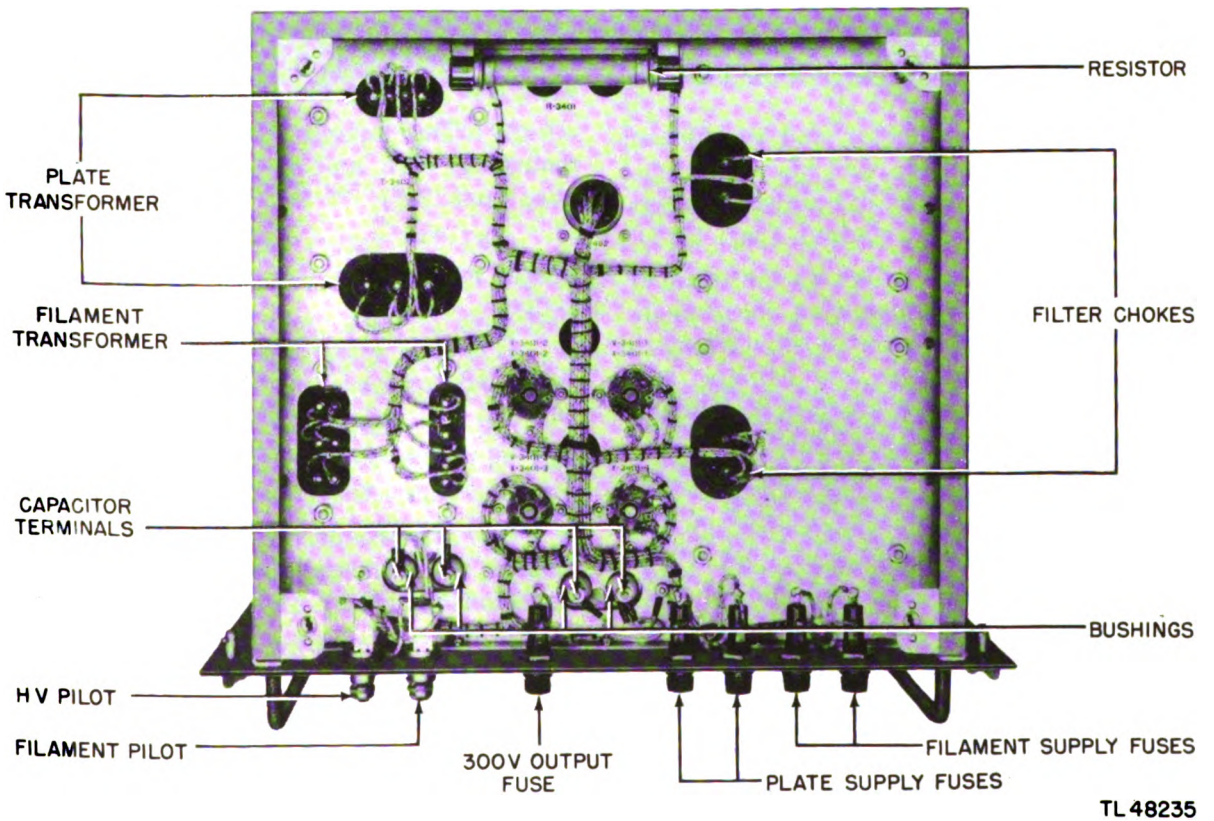


Figure 4-32. 300-volt supply, bottom view.

(5) The fuses for poor contact, improper tension, and corrosion (par. 2-11).

(6) The two pilot lights for looseness, cracked glasses, and dirt (par. 2-15).

(7) All electrical connections for loose-

ness and corrosion. Examine the wiring for frayed insulation and loose lacing (par. 2-8).

(8) The cabinet for dirt and damage. Check the chassis stop for improper operation. Lubricate the chassis rails when necessary (par. 2-20).

SECTION V. CONSOLE

4-19. ITEM 17—CONSOLE CABINET.

a. Preparatory Step (fig. 4-1 and par. 4-2). Remove the lower rear panel and the two top lids from the console.

b. Maintenance Procedure (figs. 4-2, 4-33, 4-34, and 4-35).

CAUTION: The tungar tubes retain heat for a long time after shut-down. Painful burns may result from contact with these tubes.

F. FEEL:

(1) The blower motor for overheating (par. 2-17).

(2) The transformers for overheating (par. 2-5).

I. INSPECT:

(1) The blower motor and the blower for dirt, loose mounting, and mechanical defects. The blower motor has sealed bearings and no lubrication is required (par. 2-17).

(2) The selector switch on the front of the console for loose mounting, loose knob, corrosion, and dirt. Check all connections to the switch for looseness and damage, and check the switch operation in each position (par. 2-14).

(3) The 16 remaining switches (including the three push-button switches) on the front panel of the console. Check the operation of each switch in all positions. Check the mounting and the knob of each switch for looseness. Check the connections and contacts of the switches for looseness, dirt, and corrosion (par. 2-14).

(4) The potentiometers mounted on the console panel for corrosion and for poor wiping arm contact. Check the potentiometer knobs for looseness. Rotate each knob

slightly to test for lack of tension and for irregular operation of the contact arm (par. 2-6). Return the knobs to their original settings. Do not vary any screwdriver controls.

(5) All six lights on the front of the console for loose jewels, cracked glasses, and corroded connections (par. 2-15).

(6) The phone jacks at the front of the console for cracked insulation and loose mounting.

(7) The meters for cracked cases or cover glasses, loose mounting, and corroded terminals. Check the servo error meter for improper zero adjustment (par. 2-12).

(8) The interlock switches for damage, corrosion, and faulty operation in both the open and shorted positions (par. 2-14).

(9) The tungar tubes for improper mounting, dirt, and loose or corroded tube clips (par. 2-2).

(10) The relays for poor contact, improper mounting, and faulty operation (par. 2-13).

(11) The fuses for corroded clips and ends, and for loose mounting (par. 2-11).

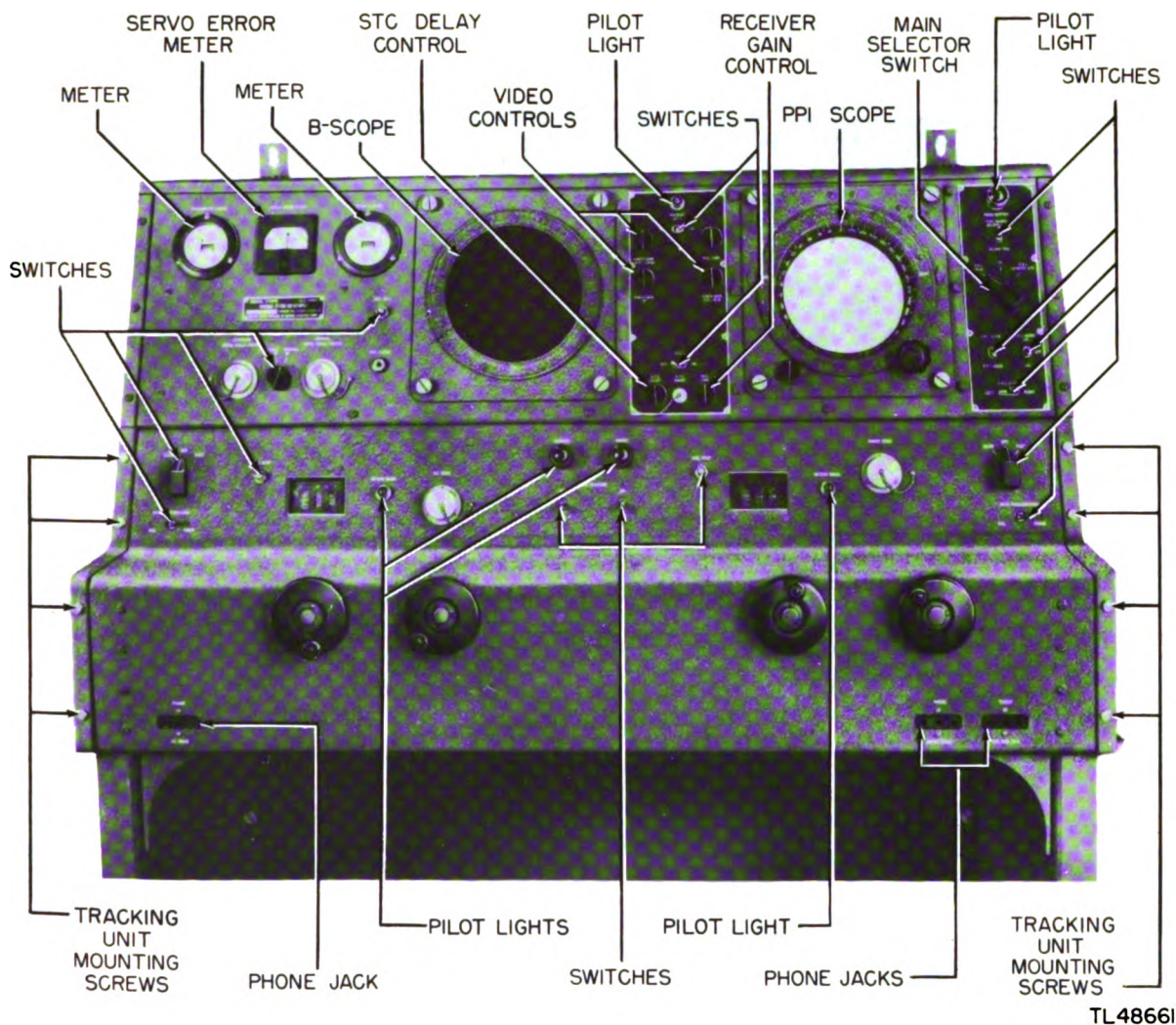
(12) The capacitor for loose mounting, bulging of the case, leaking of dielectric, and corroded connections (par. 2-3).

(13) The connectors and cables in the console for damage, loose mounting, and corrosion (par. 2-9).

(14) The resistors for corrosion and discoloration.

(15) The bell for loose mounting, corrosion, and damage.

(16) All wiring in the console for frayed insulation and loose lacing. Check all connections and terminal boards for loose-



TL4866I

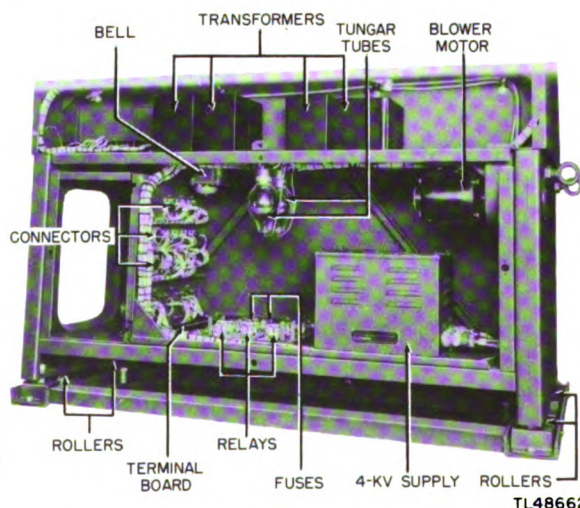
Figure 4-33. Console, front view.

ness, corrosion, and dirt. Tighten loose terminal board connections (par. 2-8).

(17) The console cabinet for chipped paint, loose mounting screws, and loose or damaged panel locks. Examine the rollers under the console for faulty operation (par. 2-20). Inspect the screening on the console for holes and damage. Check the lifting rings around the console for looseness and bending.

T. TIGHTEN:

The floor and wall mounting bolts of the console.



TL48662

Figure 4-34. Console, bottom rear view.

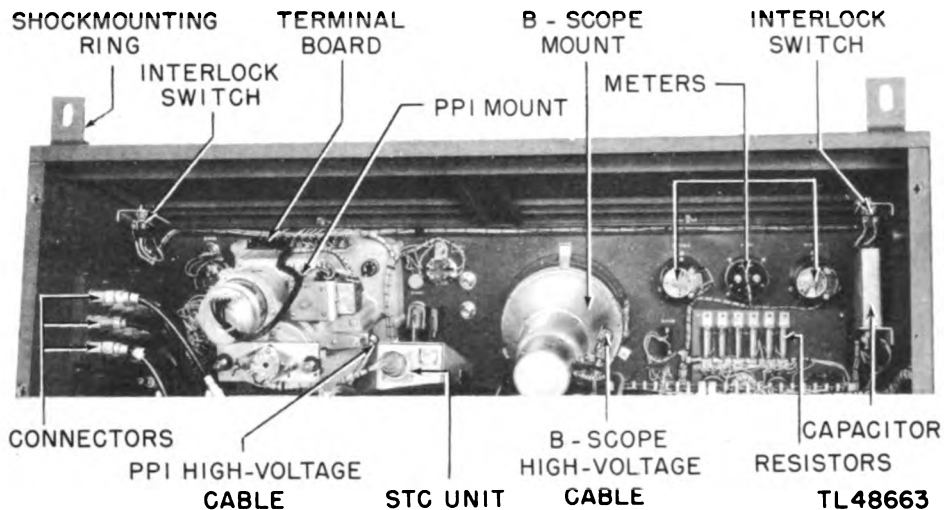


Figure 4-35. Console panel, rear view.

C. CLEAN:

(1) All lights on the front of the console with a soft clean cloth.

(2) The glass faces of the three meters with a cloth moistened with dry-cleaning solvent.

4-20. ITEM 18—PPI MOUNT.

Maintenance on the PPI mount normally is performed with the cathode-ray tube in place. When the cathode-ray tube is removed from the console, however, complete maintenance is performed. Do not change any adjustment.

CAUTION: Use care when handling the cathode-ray tube. This highly evacuated tube shatters easily and can cause serious injuries.

a. Preparatory Steps (fig. 4-2).

(1) Refer to paragraph 4-2.

(2) For usual maintenance operations, the PPI mount is reached by removing the lid on the top right side of the console. Disconnect the 4-kv supply cable on the lower left side of the mount.

(3) When necessary, the tube is removed from the mount by removing the panel in front of the PPI tube and gently pulling the cathode-ray tube from the mount. Set the tube in a safe place.

b. Maintenance Procedure with Tube in Mount (fig. 4-35).

F. FEEL:

The yoke drive motor for overheating (par. 2-17).

I. INSPECT:

(1) The screws, bolts, and nuts fastening the mount to the console and all of the part-mounting screws, nuts, and bolts for looseness.

(2) The entire mount for dirt and corrosion.

(3) The capacitors for bulging of case and leaking of dielectric (par. 2-3).

(4) The terminal boards (par. 2-8) and tube socket (par. 2-2) for loose connections, dirt, and corrosion.

(5) The wiring for frayed ends and insulation, and for loose lacing (par. 2-8).

(6) The plastic scope window for cracks and dirt.

(7) The yoke brushes on the underside of the PPI mount. Remove the brush holders and lift the brushes out. Examine them for excessive wear and for poor spring tension. When replacing the brushes make certain that the curved ends of the brushes are against the curve of the deflection coil slip rings. Tighten the brush caps (par. 2-17).

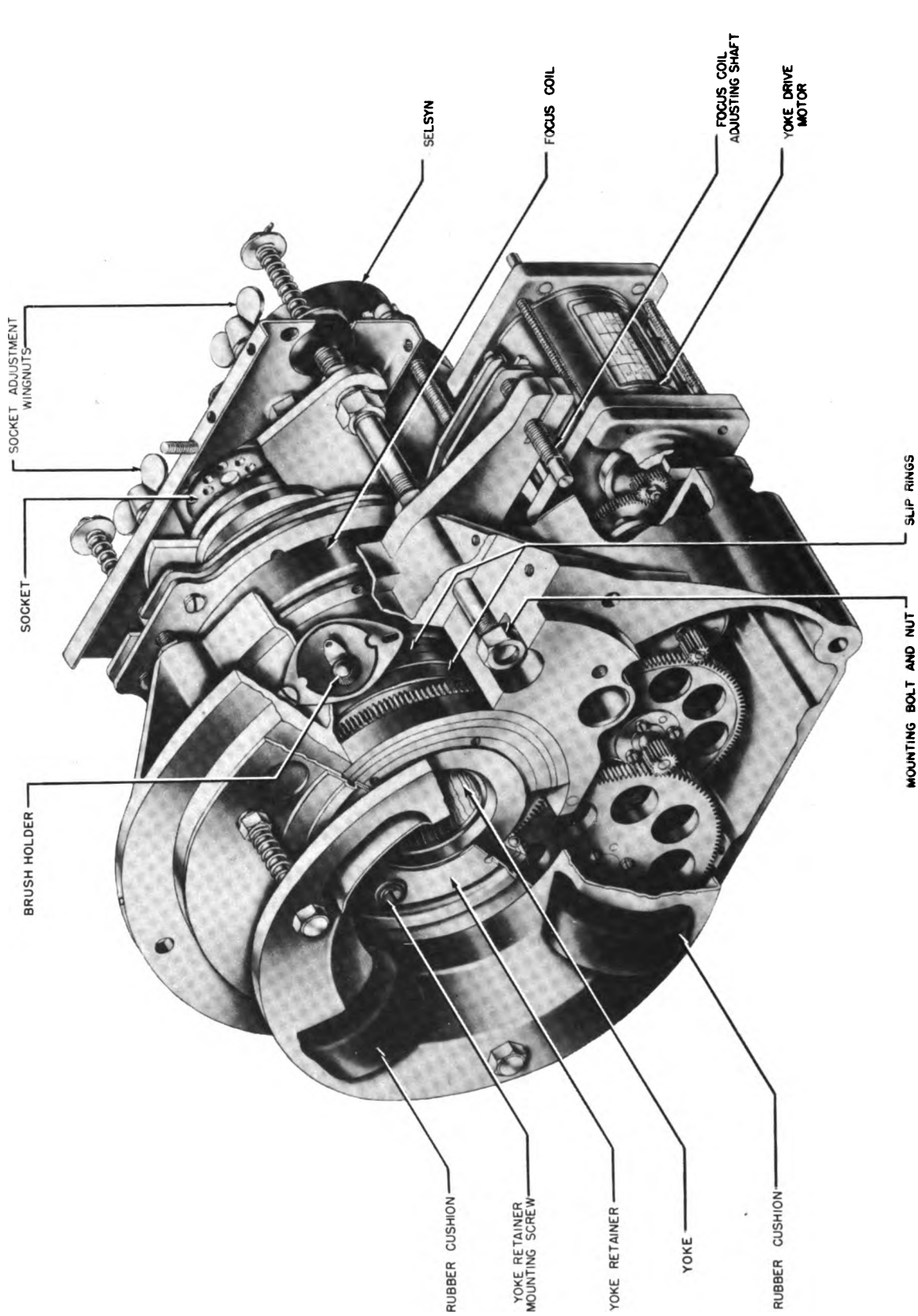


Figure 4-36. PPI mount.

(8) The mounting and connections of the selsyn and yoke drive motor for looseness. No lubrication of either the selsyn or the motor is required (pars. 2-18 and 2-17).

C. CLEAN:

The plastic scope window.

c. Maintenance Procedure with Tube Removed from PPI Mount (fig. 4-36). In addition to the operations listed in subparagraph b, the following operations are to be performed:

I. INSPECT:

(1) The rubber cushions for deterioration, hardening, cracks, and loose mounting.

(2) The yoke retainer shockmounting for poor elasticity and looseness.

(3) The interior surfaces for loose screws and bolts, and for dirt and corrosion.

(4) The pilot light for dirt and looseness (par. 2-15).

C. CLEAN:

The cathode-ray tube with a soft clean cloth.

4-21. ITEM 19—B-SCOPE MOUNT.

Normally, the cathode-ray tube is not removed from the B-scope mount for maintenance work. However, when the tube must be removed from the mount for other reasons, complete maintenance is performed.

CAUTION: Use care when handling the cathode-ray tube. This highly evacuated tube shatters easily and can cause serious injuries.

a. Preparatory Steps (fig. 4-2).

(1) Refer to paragraph 4-2.

(2) For maintenance in the console, the B-scope mount is made available by removing the two top lids on the console. Disconnect the 4-kv supply cable.

(3) When required, the cathode-ray tube can be removed from the mount by removing the panel in front of the mount and by gently pulling the tube out. Set the tube carefully in a safe place.

b. Maintenance Procedure with Tube in Mount (fig. 4-35).

I. INSPECT:

(1) All mounting bolts, screws, and nuts for looseness.

(2) The entire mount for dirt and corrosion.

(3) The terminal boards (par. 2-8) and the tube socket (par. 2-2) for loose connections.

(4) The wiring for frayed ends, damaged insulation, and loose lacing (par. 2-8).

(5) The plastic scope window for cracks and dirt.

C. CLEAN:

The plastic scope window.

c. Maintenance Procedures with Tube Removed from Mount. In addition to the operations listed in subparagraph b the following operations are to be performed:

I. INSPECT:

(1) The rubber gaskets and cushions for deterioration, hardening, cracks, and loose mounting.

(2) The interior surfaces of the mount for loose bolts and screws, and for dirt and corrosion.

C. CLEAN:

The cathode-ray tube with a soft clean cloth.

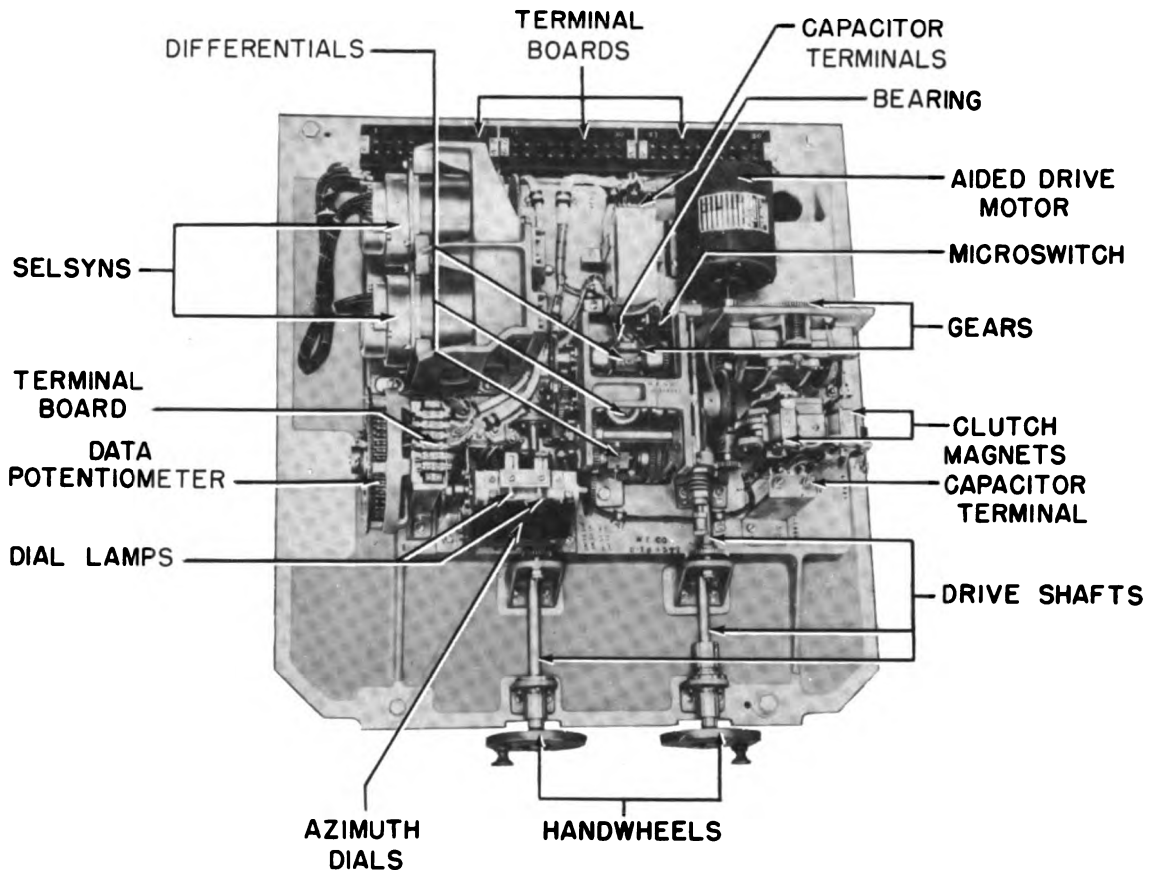
4-22. ITEM 20—AZIMUTH TRACKING UNIT.

a. Preparatory Steps (fig. 4-2 and par. 4-2).

(1) Open the side door of the console. Remove the two cables attached to the phase shifter.

(2) Remove the four tracking unit mounting screws from each side of the console (fig. 4-33) and pull the lower console section forward so that both tracking units are accessible.

b. Maintenance Procedure (fig. 4-37).



TL 48664

Figure 4-37. Azimuth tracking unit.

F. FEEL:

The aided-drive motor for overheating (par. 2-17).

I. INSPECT:

(1) The aided-drive motor for improper mounting, loose or corroded connections, and improper mesh of the coupling gears (par. 2-17). No lubrication is required for the motor.

(2) The selsyns for loose mounting, poor connections, and dirt. Remove the rear cover of the selsyns by removing the single screw at the center of each. Examine the brushes for corrosion and excessive wear. Check the slip rings for dirt and corrosion (par. 2-18). The selsyns need no lubrication.

(3) The clutch magnets for improper mounting, damage, corrosion, and faulty operation.

(4) The capacitor terminals for corrosion and poor connections. Check each capacitor for leaking of dielectric and bulging of case (par. 2-3).

(5) The two handwheels and drive shafts for defective mounting. Examine the handwheel handles for looseness.

(6) The differentials and all of the associated gears for damage to teeth, dirt, and lack of lubrication.

(7) The data potentiometer for improper mounting, poor contact, and corrosion (par. 2-6). Examine the resistors (par. 2-4) in the potentiometer for blistering and discoloration.

(8) The microswitches for loose mounting, corrosion, bad connections, and faulty operation. Examine the microswitch rollers for stiffness and defective mounting (par. 2-14).

(9) The azimuth dials for improper mounting, dirt, and damage.

(10) The dial lamp for loose mounting, corroded connections, and dirt (par. 2-15).

(11) The connectors for corrosion, damage, and loose mounting (par. 2-9).

(12) The terminal boards for loose mounting and loose or corroded connections. Examine the wiring in the azimuth tracking unit for loose lacing and frayed insulation. Check the electrical connections for looseness and corrosion (par. 2-8).

(13) The rollers on which the tracking unit rests for binding or sluggish action. For lubrication instructions refer to paragraph 2-20.

C. CLEAN:

The azimuth dial glass with a soft clean cloth.

L. LUBRICATE:

The gears and bearings in the tracking unit (refer to the lubrication chart, par. 3-4).

4-23. ITEM 21—RANGE TRACKING UNIT.

a. Preparatory Steps (fig. 4-2).

(1) Refer to paragraph 4-2.

(2) Open the side door of the console. Remove the two cables attached to the phase shifter.

(3) Remove the four tracking unit mounting screws from each side of the console (fig. 4-33) and pull the lower console section forward so that both tracking units are accessible.

b. Maintenance Procedure (fig. 4-38).

NOTE: Perform no maintenance on the phase shifter when applying maintenance to the range unit. Maintenance of the phase shifter is scheduled in a separate item (par. 2-24).

I. INSPECT:

(1) The clutch magnets for improper mounting, damage, corrosion, and lack of positive action.

(2) The capacitor terminals for corrosion and bad connections. Examine the

capacitors for leaking of dielectric and for bulging of case (par. 2-3).

(3) The two handwheels and the drive shafts for defective mounting. Examine the handwheel handles for looseness.

(4) The differentials and all the associated gears for damage to teeth, dirt, and lack of lubrication.

(5) The data potentiometer for poor connections and lack of tension in the wiping arm. Check the B-expansion potentiometer and the range potentiometer for improper mounting and corrosion (par. 2-6). Examine the resistors (par. 2-4) in the data potentiometer for blistering and discoloration.

(6) The microswitches for loose mounting, corrosion, bad connections, and faulty operation. Check each microswitch roller for improper mounting and for stiffness (par. 2-14).

(7) The connectors for damage, corrosion, and loose mounting (par. 2-9).

(8) The range dials for improper mounting, dirt, and damage.

(9) The dial lamp for loose mounting, corroded connections, and dirt (par. 2-15).

(10) The terminal boards for loose mounting and loose or corroded connections. Examine all wiring in the range tracking unit for frayed insulation and loose lacing. Check the electrical connections for looseness and corrosion (par. 2-8).

(11) The rollers on which the tracking unit rests for binding or sluggish action. For lubrication instructions refer to paragraph 2-20.

C. CLEAN:

The range dial glass with a soft clean cloth.

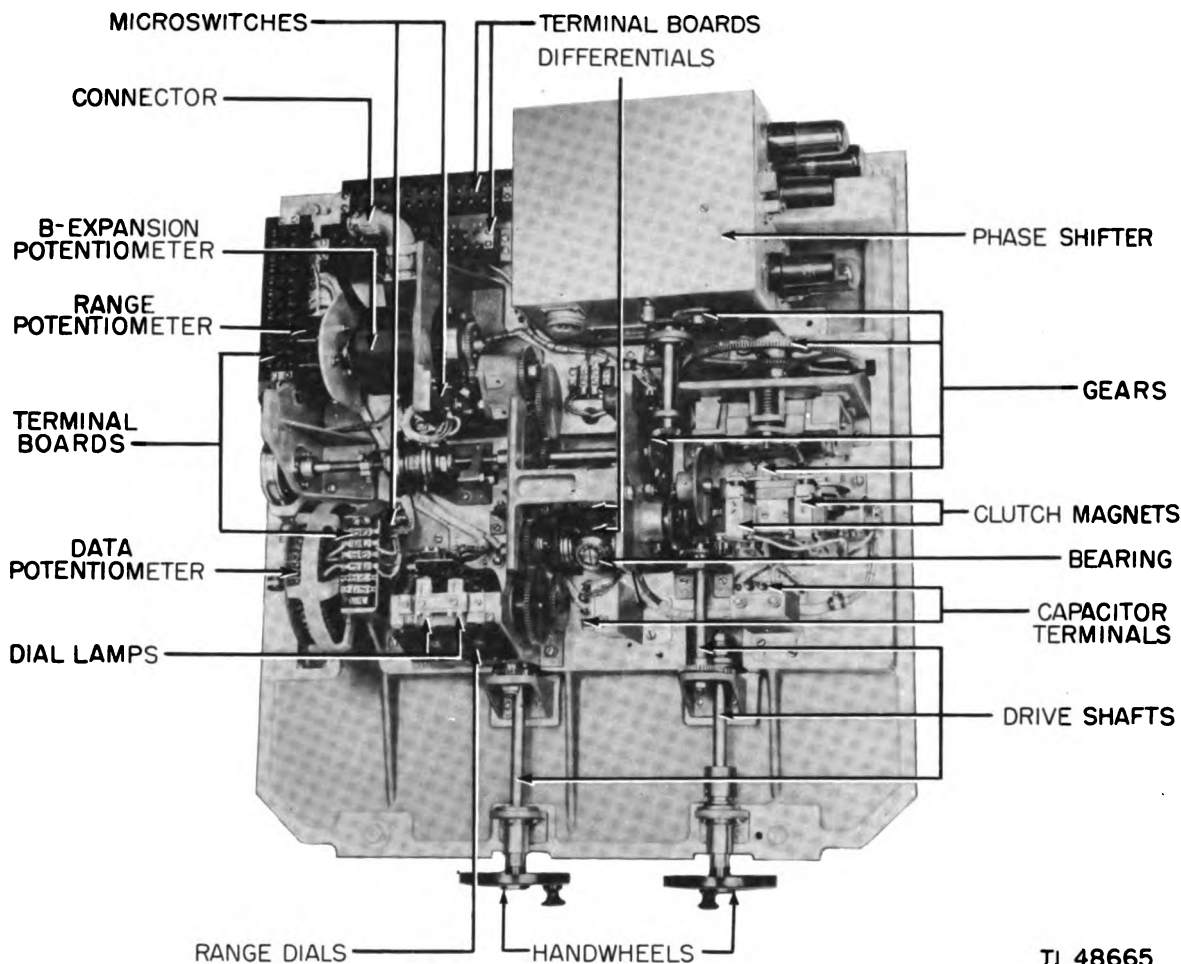
L. LUBRICATE:

The gears and bearings in the tracking unit (see the lubrication chart, par. 3-4).

4-24. ITEM 22—PHASE SHIFTER.

a. Preparatory Steps (fig. 4-2 and par. 4-2).

(1) Open the side door of the console.



TL 48665

Figure 4-38. Range tracking unit and phase shifter.

Remove the two cables attached to the phase shifter.

(2) Remove the four tracking unit mounting screws on each side of the slanted portion at the front of the console (fig. 4-33) and pull the lower console section forward.

(3) Remove the L-shaped cover from the phase-shifter unit by removing the assembly screws around the side and the supporting screws in the center.

b. Maintenance Procedure (fig. 4-39).

I. INSPECT:

(1) The tubes for dirt and loose mounting (par. 2-2).

(2) The connectors for loose mounting and corrosion (par. 2-9).

(3) The gears in the phase-shifter unit for damage, dirt, and corrosion. Clean with a brush. Do not lubricate the gears. Check the mesh of the phase shifter and range unit gearing.

(4) The potentiometers for loose connections, improper mounting, and corrosion (par. 2-6).

(5) The capacitors for leaking of dielectric and for bulging of case. Inspect the capacitor terminals for corrosion and poor connection. Remove dirt from the plates of the variable capacitor with a brush (par. 2-3).

(6) The resistors for blistering, cracking, and discoloration (par. 2-4).

(7) All wiring for frayed insulation and loose lacing. Check all electrical con-

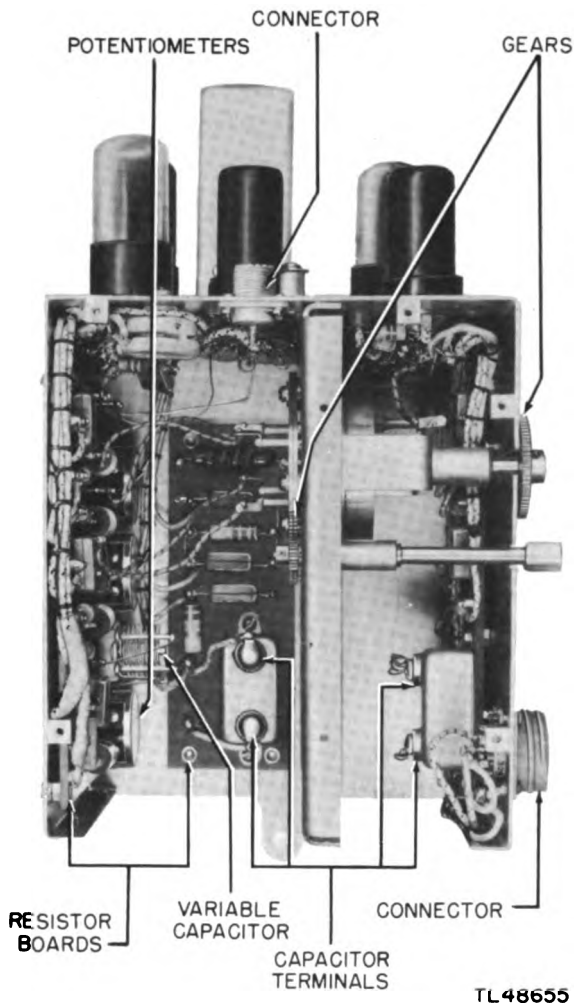


Figure 4-39. Phase shifter, internal view.

nections for looseness, corrosion, and dirt (par. 2-8).

4-25. ITEM 23—STC UNIT.

a. Preparatory Steps (fig. 4-2 and par. 4-2).

(1) Remove the two top lids of the console.

(2) Remove the knobs from the STC DELAY and the REC. GAIN controls on the front of the console (fig. 4-33).

(3) Remove the six mounting screws around the side of the STC unit and lift it from the console.

(4) Remove the bottom cover from the STC unit.

b. Maintenance Procedure (fig. 4-40).

I. INSPECT:

(1) The tubes for dirt and loose mounting (par. 2-2).

(2) The switch for improper mounting and faulty operation (par. 2-14).

(3) The potentiometers for improper mounting, corrosion, and bad connections (par. 2-6).

(4) The relay for corrosion, bad contacts, and faulty operation (par. 2-13).

(5) The connectors for damage, corrosion, and loose mounting (par. 2-9).

(6) The resistors for cracks, blistering, and discoloration (par. 2-4).

(7) All wiring for loose lacing and frayed insulation. Check all electrical connections for looseness and corrosion (par. 2-8).

4-26. ITEM 24—RANGE UNIT.

a. Preparatory Steps (fig. 4-2 and par. 4-2).

(1) Remove the upper rear panel from the console.

(2) Remove the top lids of the console.

b. Maintenance Procedure (figs. 4-41 and 4-42).

I. INSPECT:

(1) All tubes for dirt and loose mounting (par. 2-2). Check the tube clamps and the tube caps of the two high-voltage tubes for looseness and corrosion.

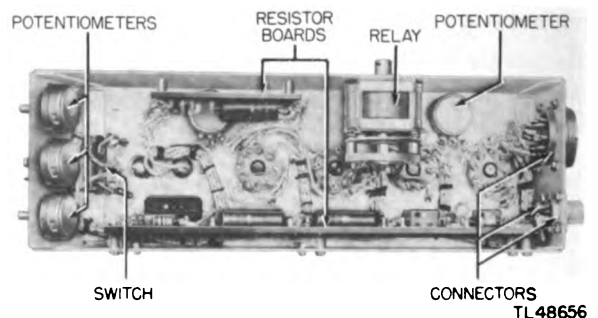


Figure 4-40. STC unit, bottom view.

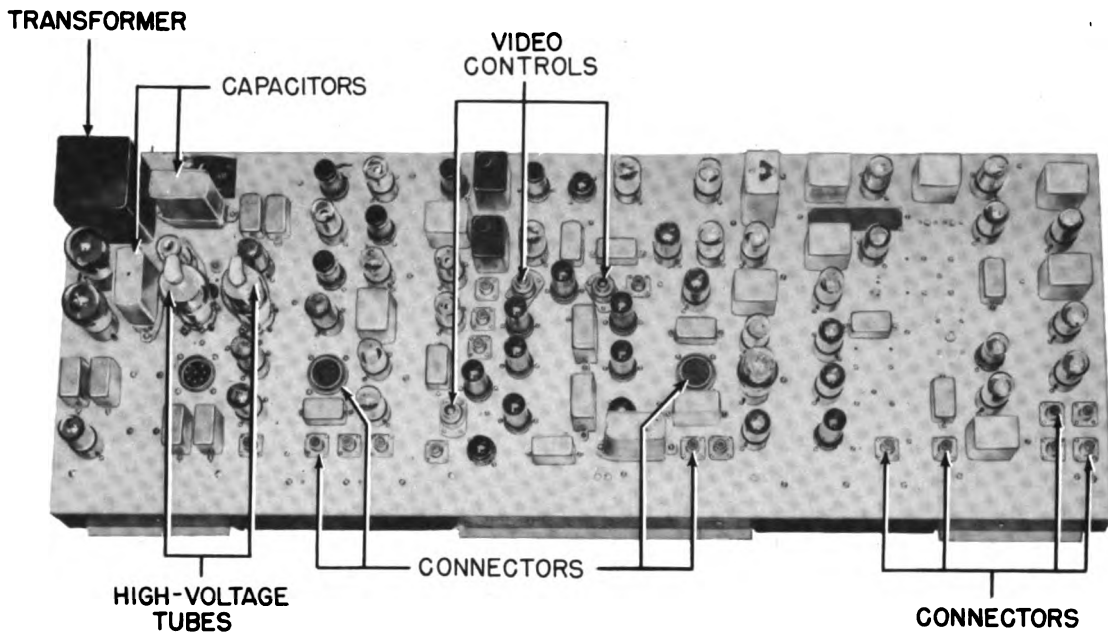


Figure 4-41. Range unit, top view.

TL48659

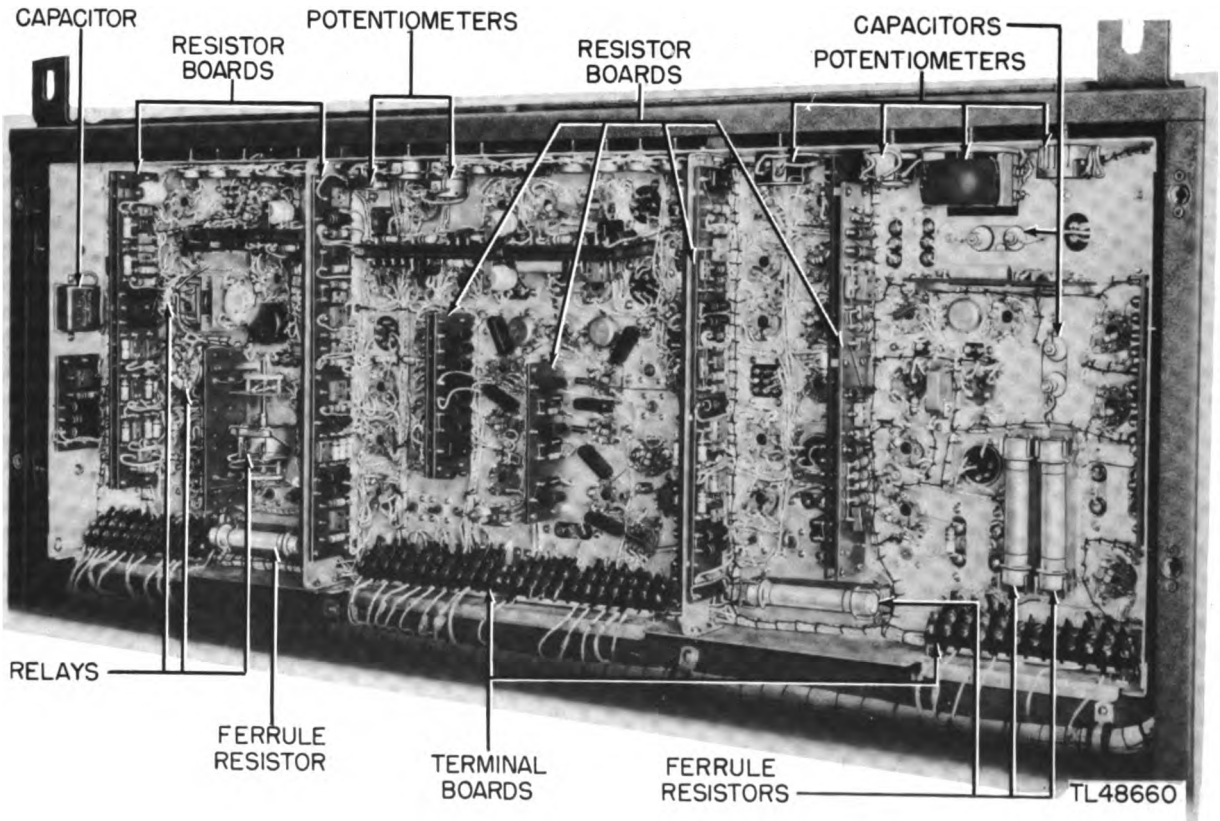


Figure 4-42. Range unit, bottom view.

(2) The capacitors for leaking of dielectric and bulging of case. Examine the capacitor terminals and bushings for dirt and corrosion. Inspect the variable capacitors for dust, dirt, and corrosion (par. 2-3).

(3) The relays for insecure mounting and faulty operations. Check the switch sections for loose mounting and the contacts for damage, dirt, and corrosion (par. 2-13).

(4) The potentiometer for loose connections and damage (par. 2-6). Do not change the setting of screwdriver controls on the range unit. Vary the three video controls at the front of the console (fig. 4-33) to check for stiffness or binding. If the operation of a control is not smooth, lubricate the flexible shaft with a small amount of special lubricating grease (GL). To do this, uncouple the flexible shaft at both ends. Gently pull the spline coupler out of the tubing. Apply the lubricant and twirl the coupler to distribute the grease along the shaft. Recouple the flexible shaft, making sure that the two spline ends mesh properly.

(5) The resistors for blistering and discoloration. Check the ends and the mounting clips of the ferrule resistors for corrosion and lack of tension (par. 2-4).

(6) The connectors for corrosion and loose mounting (par. 2-9).

(7) All the resistor boards for loose mounting and corrosion.

(8) All wiring for frayed insulation and loose lacing (par. 2-8). Check all connections for looseness and corrosion.

(9) The range unit chassis for loose mounting, dirt, and corrosion.

4-27. ITEM 25—4-KV SUPPLY.

The 4-kv supply in the console and the 4-kv supply in the remote-B assembly are identical. The maintenance operations listed below apply to both supplies.

a. Preparatory Steps for 4-kv Supply in Console (fig. 4-2 and par. 4-2).

(1) Roll the console forward and remove the lower rear panel.

(2) Remove the three cables from the 4-kv supply chassis.

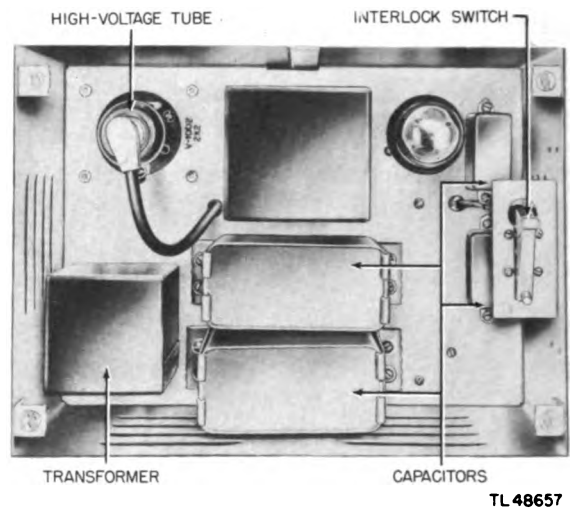


Figure 4-43. 4-kv supply, top view.

(3) Remove the six mounting screws around the base of the 4-kv supply. Remove the top cover and lift the chassis from the console.

(4) Unfasten the bottom cover.

b. Preparatory Steps for 4-kv Supply in Remote-B Assembly (fig. 4-49).

(1) Remove the remote-B unit from the remote-B assembly.

(2) Remove the three cables from the 4-kv supply.

(3) Remove the six mounting screws around the base of the 4-kv supply. Take off the top cover and lift the chassis from the remote-B unit.

(4) Unfasten the bottom cover.

c. Maintenance Procedure (figs. 4-43 and 4-44).

CAUTION: Short the high-voltage capacitors with the capacitor-shortening tool.

F. FEEL:

The transformers for excessive heat (par. 2-5).

I. INSPECT:

(1) The tubes for dirt and loose mounting (par. 2-2). Examine the cap and base of the high-voltage tube for corrosion and for signs of arcing.

(2) The capacitors for improper mounting, leaking of dielectric, and bulging of case. Examine the capacitor terminals and bushing for dirt and corrosion (par. 2-3).

(3) The interlock switch for corrosion and loose connections. Check the switch for faulty operation (par. 2-14).

(4) The connectors for loose mounting and corrosion (par. 2-9).

(5) The resistors for cracking, blistering, and discoloration (par. 2-4). Examine the clips and the ends of the ferrule resistor for corrosion and lack of tension.

(6) All wiring for loose lacing and frayed insulation. Check all electrical connections for looseness and corrosion (par. 2-8).

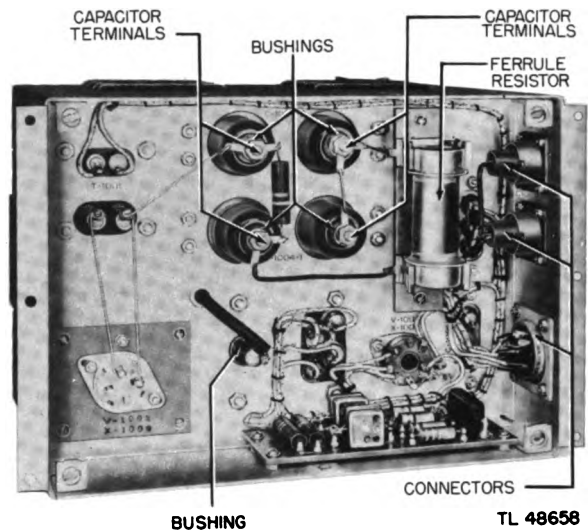


Figure 4-44. 4-kv supply, bottom view.

SECTION VI. POWER PANEL

4-28. ITEM 26—POWER PANEL CABINET.

a. Preparatory Step (fig. 4-1). Refer to paragraph 4-2.

b. Maintenance Procedure (fig. 4-45).

I. INSPECT:

(1) The outside of the cabinet for damage and dirt (par. 2-20).

(2) The assembly screws around the sides of the chassis for looseness.

(3) The safety mountings at the bottom and top of the rack for looseness.

(4) The connectors for loose mounting, damage, and corrosion (par. 2-9).

(5) The ventilating screens for corrosion, dirt, and insecure mounting (par. 2-20).

(6) The control knobs for looseness.

4-29. ITEM 27—ELECTRONIC REGULATOR.

a. Preparatory Steps.

(1) Remove the three large cables near the bottom of the power panel cabinet before working on the regulator (fig. 4-45).

(2) Remove the electronic regulator chassis from the power panel.

b. Maintenance Procedure (figs. 4-46 and 4-47).

F. FEEL:

The transformers and the choke for overheating (par. 2-5).

I. INSPECT:

(1) The relays for insecure mounting, poor contact, and faulty operation (par. 2-13).

(2) The ends of the ferrule resistors and the clips for corrosion and lack of tension (par. 2-4).

(3) The fuses and fuse clips for corroded ends, insecure mounting, and lack of tension (par. 2-11).

(4) The spare fuses for loose mounting and corrosion (par. 2-11).

(5) The tubes for dirt and loose mounting. Check the tube caps for looseness and corrosion (par. 2-2).

(6) The connector for looseness, corrosion, and damage (par. 2-9).

(7) The interlock switch for improper mounting and faulty operation (par. 2-14).

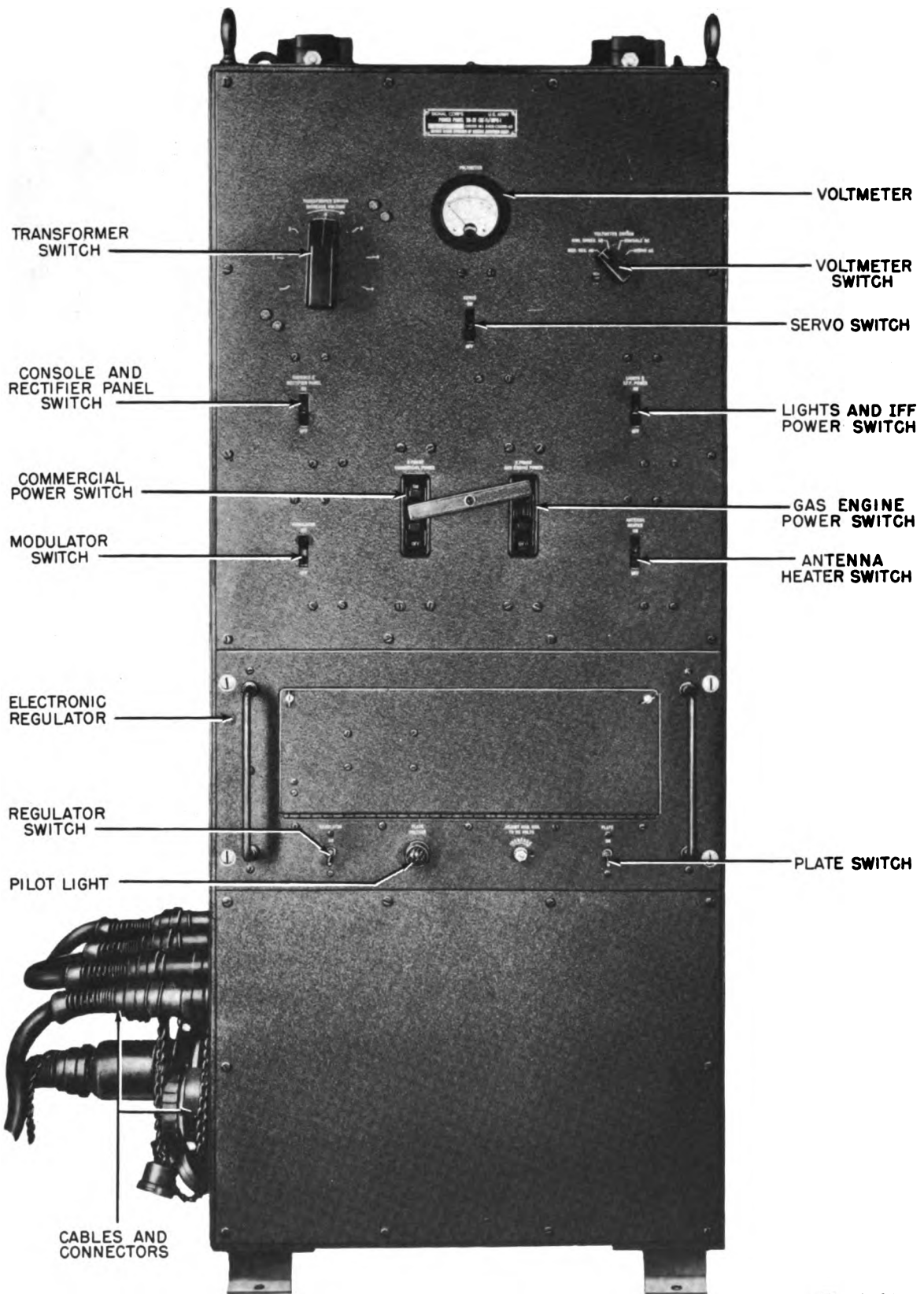


Figure 4-45. Power panel, front view.

TL 48389

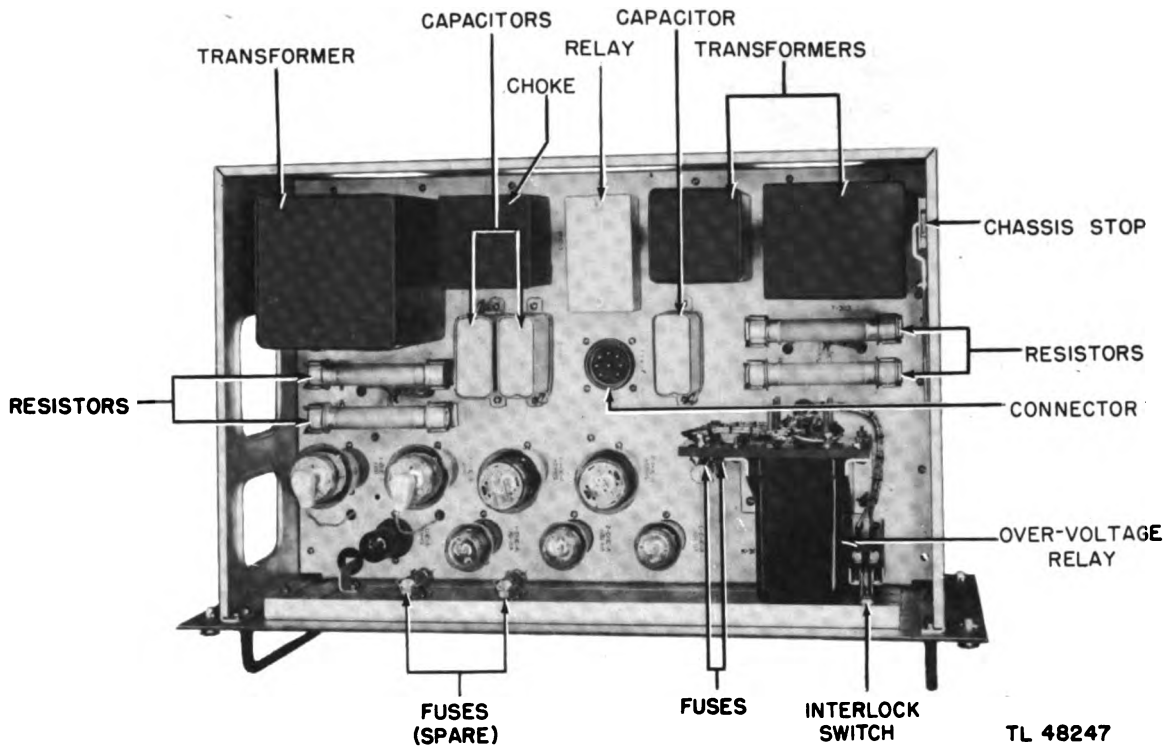


Figure 4-46. Electronic regulator, top view.

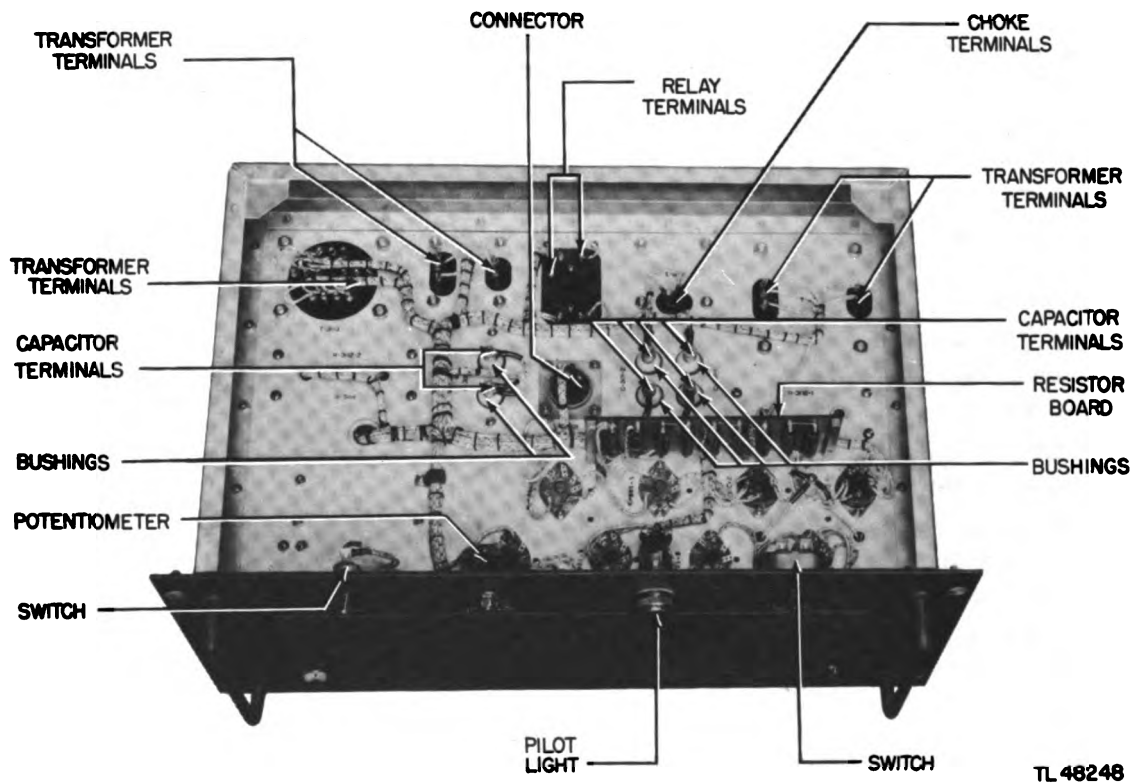
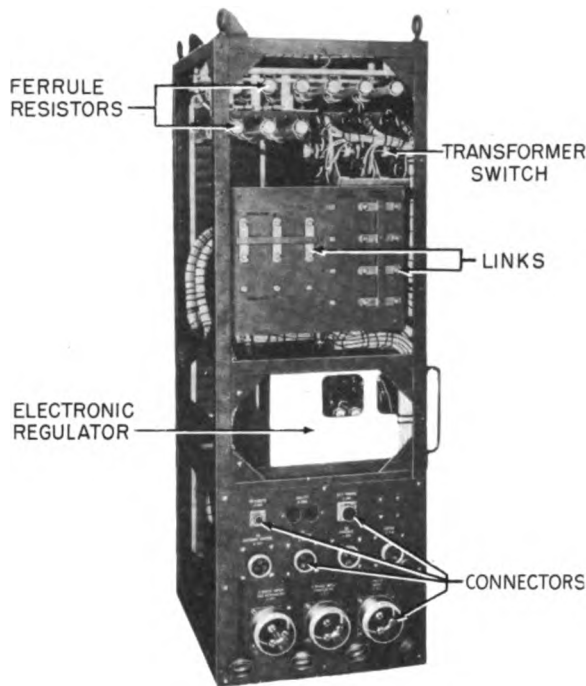


Figure 4-47. Electronic regulator, bottom view.



TL48411

Figure 4-48. Power panel, side view.

(8) The switches for loose mounting, bad connections, and corrosion (par. 2-14).

(9) The pilot light for cracked jewel, loose mounting, and dirt (par. 2-15).

(10) The capacitors for leaking of dielectric and bulging of case. Check the capacitor, transformer, and choke terminals for looseness, dirt, and corrosion (par. 2-3).

(11) The potentiometer for dirt and poor connections (par. 2-6).

(12) The resistors mounted on the resistor board for blistering, discoloration, and other signs of overheating (par. 2-4).

(13) All electrical connections for looseness and corrosion. Check the wiring for frayed insulation and loose lacing (par. 2-8).

(14) The regulator cabinet for damage to the screw fasteners and the wing fasteners on the chassis door. Check the chassis stop and the hinges for improper binding action (par. 2-20). When necessary, lubricate the hinges and the chassis rails (par. 2-20).

4-30. ITEM 28—POWER PANEL, UPPER AND LOWER SECTIONS.

a. Preparatory Steps.

(1) Remove the three large cables near the bottom of the power panel before working inside the chassis (fig. 4-45).

(2) Remove the side panel above the cables.

b. Maintenance Procedure (fig. 4-48).

F. FEEL:

The transformers for overheating (par. 2-5).

I. INSPECT:

(1) The transformer switch for damage, dirt, and improper mounting (par. 2-14). Check the operation of the switch in all positions, and be sure that the handle is attached securely to the shaft. Examine the contacts for pitting and corrosion.

(2) The remaining switches for dirt, loose mountings, poor contacts, and bad connections (par. 2-14).

(3) The ferrule resistors at the top of the power panel for damage and for signs of overheating. Check the metallic ends of the resistors and the clips for corrosion and lack of tension (par. 2-4).

(4) The voltmeter for incorrect zero setting, dirt, cracked case or cover glass, and loose terminal nuts (par. 2-12).

(5) The links and the link mounting board for damage, dirt, and corrosion. Check the tightness of the link connections and the unused terminal lugs. If necessary, clean the board with a soft cloth moistened with dry-cleaning solvent.

(6) All wiring for frayed insulation, loose lacing, and corrosion at the terminals. Check all electrical connections for looseness (par. 2-8).

(7) The inside of the power panel for dirt and corrosion.

(8) The transformer housings for dirt and damage. Clean with a soft dry cloth.

(9) The connectors for damage and corrosion (par. 2-9).

SECTION VII. REMOTE-B ASSEMBLY

4-31. ITEM 29—REMOTE-B RACK.

a. **Preparatory Step** (fig. 4-1). Refer to paragraph 4-2.

b. **Maintenance Procedure** (fig. 4-49).

I. INSPECT:

(1) The outside of the cabinet for deteriorated paint, damaged surfaces, and dirt (par. 2-2).

(2) The mounting of the individual chassis. Check the screw fasteners to see that they are tight.

(3) The safety mountings at the bottom of the rack for looseness.

(4) The lifting rings for looseness.

(5) The ventilating screens for holes, loose mounting, corrosion, and dirt.

(6) The connectors for damage, loose mounting, and corrosion (par. 2-9).

4-32. ITEM 30—REMOTE-B UNIT.

a. **Preparatory Steps** (par. 4-2).

(1) Loosen the thumbscrews at the front of the remote B-scope unit and pull it forward in the remote-B rack.

(2) Remove all cables, release the chassis stop, and lift the chassis out of its mounting on the rack.

b. **Maintenance Procedure** (fig. 4-49).

I. INSPECT:

(1) The tubes for dirt and loose mounting. Examine the two high-voltage tubes and their caps for corrosion and loose clips (par. 2-2).

(2) The capacitors for bulging of case and leaking of dielectric. Examine the capacitor terminals for dirt and corrosion (par. 2-3).

(3) The switches for loose mounting, corrosion, and faulty operation (par. 2-14).

(4) The resistors for blistering and discoloration. Examine the ends and the mounting clips of the ferrule resistors for corrosion and lack of tension (par. 2-4).

(5) The potentiometers for loose mounting, corrosion, and loose contacts or connections (par. 2-6).

(6) The connectors and internal cabling for corrosion, dirt, and looseness (par. 2-9).

(7) The cursor control mechanism for loose mounting, damage, and for binding operation.

(8) The phone jacks for cracked insulation and loose connections.

(9) All wiring for loose lacing and frayed insulation. Examine the electrical connections for corrosion and looseness (par. 2-8).

L. LUBRICATE:

The cursor control mechanism (see the lubrication chart, par. 3-4).

4-33. ITEM 31—REMOTE 300-VOLT SUPPLY.

a. **Preparatory Step.** Remove the 300-volt supply from the remote-B rack (fig. 4-49).

b. **Maintenance Procedure.**

F. FEEL:

The transformers and the chokes for overheating (par. 2-5).

I. INSPECT:

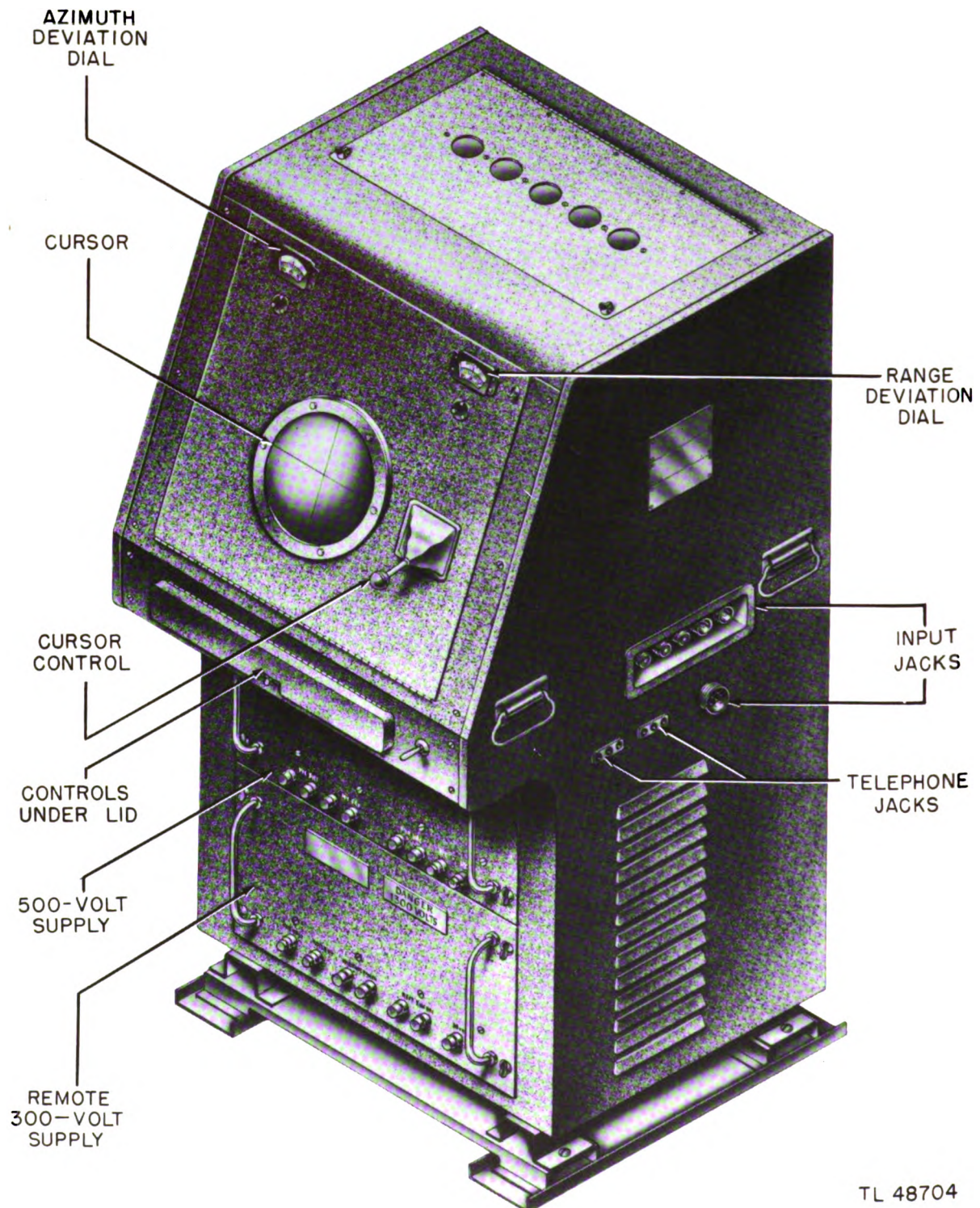
(1) The capacitors for bulging of case and leaking of dielectric. After shorting the capacitor terminals with the shorting tool, check the terminals for corrosion and loose connections (par. 2-3).

(2) The resistors for blistering and discoloration. Examine the clips and the ends of the ferrule resistors for corrosion and lack of tension (par. 2-4).

(3) The tubes for loose mounting and dirt (par. 2-2).

(4) The connectors for corrosion and looseness (par. 2-9).

(5) All wiring for loose lacing and frayed insulation. Examine the electrical connections for looseness and corrosion (par. 2-8).



TL 48704

Figure 4-49. Remote-B assembly.

(6) The fuses for poor contact, improper tension, and corrosion (par. 2-11).

(7) The pilot lights for looseness, cracked jewels, dirt, and corrosion (par. 2-15).

(8) The cabinet for dirt and damage. If the chassis slides in and out of the rack with difficulty, lubricate the rails as stated in paragraph 2-20.

SECTION VIII. ANTENNA

4-34. ITEM 32—ANTENNA CONTROL PANEL.

a. Preparatory Step (fig. 4-3 and par. 4-2).
Remove the side panel from the antenna.

b. Maintenance Procedure (fig. 4-50).

I. INSPECT:

(1) The switches for corrosion and loose mounting (par. 2-14).

(2) The relay for bad contacts, corrosion, loose mounting, and faulty operation (par. 2-13).

(3) The bell for loose mounting, corrosion, and damage.

(4) The connector and the jack for corrosion and loose mounting (par. 2-9).

(5) The wiring to the panel for loose lacing and frayed insulation. Check the electrical connections and the terminal board for looseness and corrosion (par. 2-8).

(6) The control panel for loose mounting.

4-35. ITEM 33—TRANSMITTER.

a. Preparatory Steps.

(1) Refer to paragraph 4-2.

(2) Disconnect the pulse cable from the transmitter (fig. 4-3).

(3) Remove the cover plate from the junction box.

b. Maintenance Procedure (fig. 4-51).

F. FEEL:

(1) The blower motor for overheating (par. 2-17).

(2) The transformer in the junction box for overheating (par. 2-5).

I. INSPECT:

(1) The transmitter for insecure attachment.

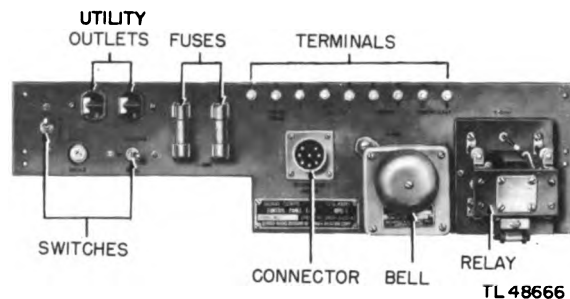


Figure 4-50. Antenna control panel.

(2) The magnet mounting bolts for looseness.

(3) The mounting screws and bolts for looseness.

(4) The chassis and metal parts for corrosion and dirt.

(5) Capacitor for leaking of dielectric and for bulging of case. Examine the terminals for dirt, loose connections, and corrosion (par. 2-3).

(6) The resistors for cracks, blistering, and discoloration (par. 2-4).

(7) The electrical connections for looseness.

(8) The wiring for frayed insulation and loose lacing (par. 2-8).

(9) The blower motor for dirt and frayed leads (par. 2-17). The motor has sealed bearings and no lubrication is required.

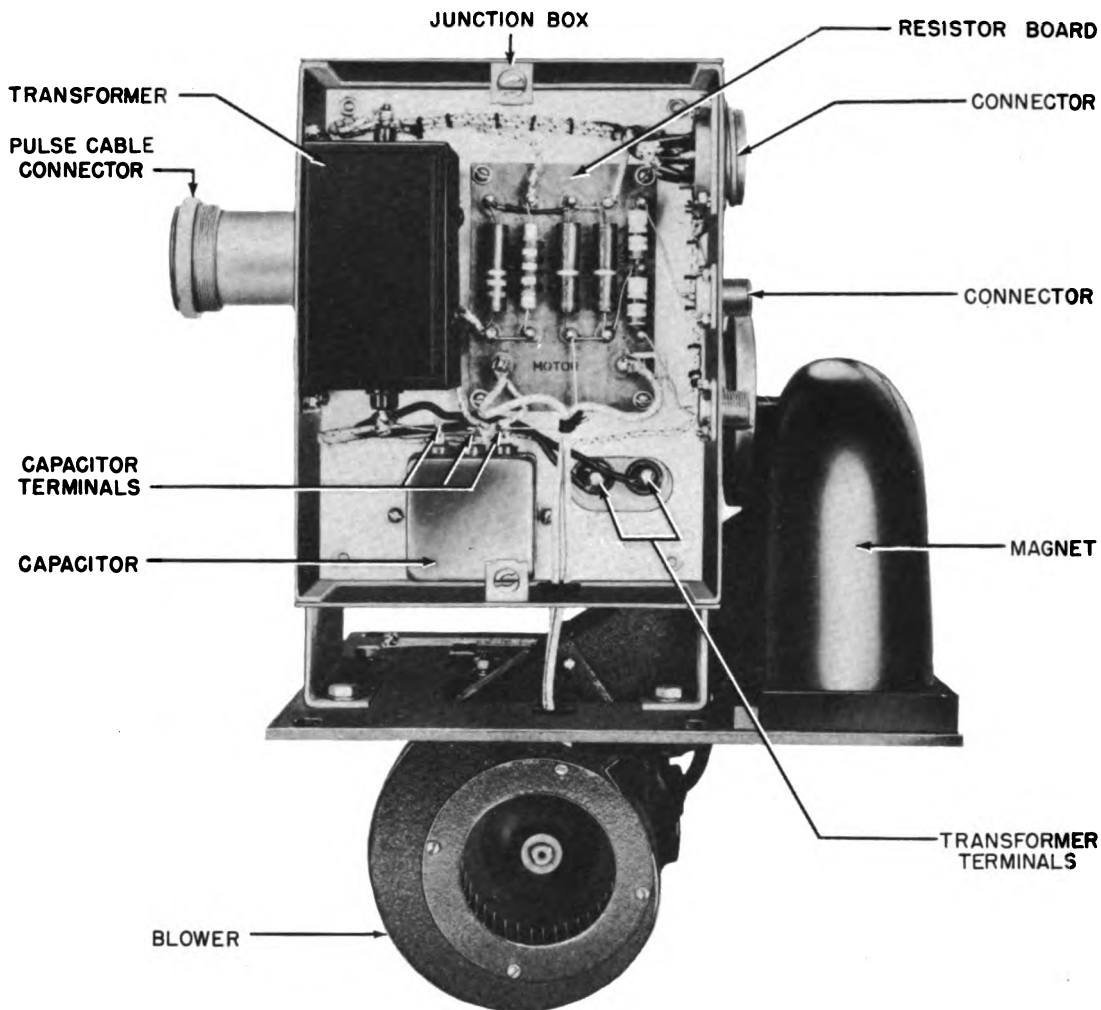
4-36. ITEM 34—RECEIVER.

a. Preparatory Steps (par. 4-2).

(1) Remove the top cover of the receiver (fig. 4-3).

(2) Remove the POWER IN cable from the left side of the receiver.

(3) Remove the plate from the bottom of the receiver.



TL 48648

Figure 4-51. Transmitter.

b. Maintenance Procedure (figs. 4-52 and 4-53).

F. FEEL:

(1) The transformers and chokes for overheating (par. 2-5).

(2) The blower motor for overheating.

I. INSPECT:

(1) The capacitors for leaking of dielectric and for bulging of case. Inspect the two variable capacitors for dirt and corrosion. If necessary clean with a small brush (par. 2-3).

(2) The tubes for dirt and loose clamping (par. 2-2).

(3) The interlock switches for dirt and corrosion. Check for faulty operation (par. 2-14).

(4) The crystal current switch for dirt, corrosion, poor contact, and faulty operation (par. 2-14).

(5) The meter for cracked or dirty case or glass, loose terminals and mounting, and for incorrect zero setting (par. 2-12).

(6) The connectors for dirt, looseness, and corrosion (par. 2-9).

(7) The waveguide sections for damage and loose mounting (par. 2-10).

CAUTION: The adjustments for the klystron and the T-R section of the

receiver are very critical. Do not change any of the adjustments.

(8) The cathode-ray tube assembly for loose mounting or dirt. Be sure the clamp is tight around the base of the tube, and that the socket is not loose. Check the shield in front of the tube for damage.

(9) The switch located under the cathode-ray tube for loose mounting and faulty operation (par. 2-14).

(10) The pilot light for cracked jewel, dirt, and looseness (par. 2-15.)

(11) The potentiometers for loose control knobs and connections and for insecure mounting (par. 2-6).

(12) The switches for loose connections, loose mounting, corrosion, and faulty operation (par. 2-14).

(13) The resistors for discoloration and

blistering. Examine the clips and ends of the ferrule resistor for dirty contacts, corrosion, and lack of proper tension (par. 2-4).

(14) The relay for poor contact, corrosion, and faulty operation (par. 2-13).

(15) The capacitor terminals for corrosion and leaking of dielectric (par. 2-3).

(16) All wiring for frayed insulation and loose lacing. Check the terminal board and soldered connections for corrosion and looseness (par. 2-8).

(17) The receiver cabinet for loose mounting, dirt, and corrosion. Check the cover fasteners and handles for damage and binding. When necessary, lubricate the handles and the hinges (par. 2-20).

(18) The blower motor for insecure mounting. This motor requires no lubrication.

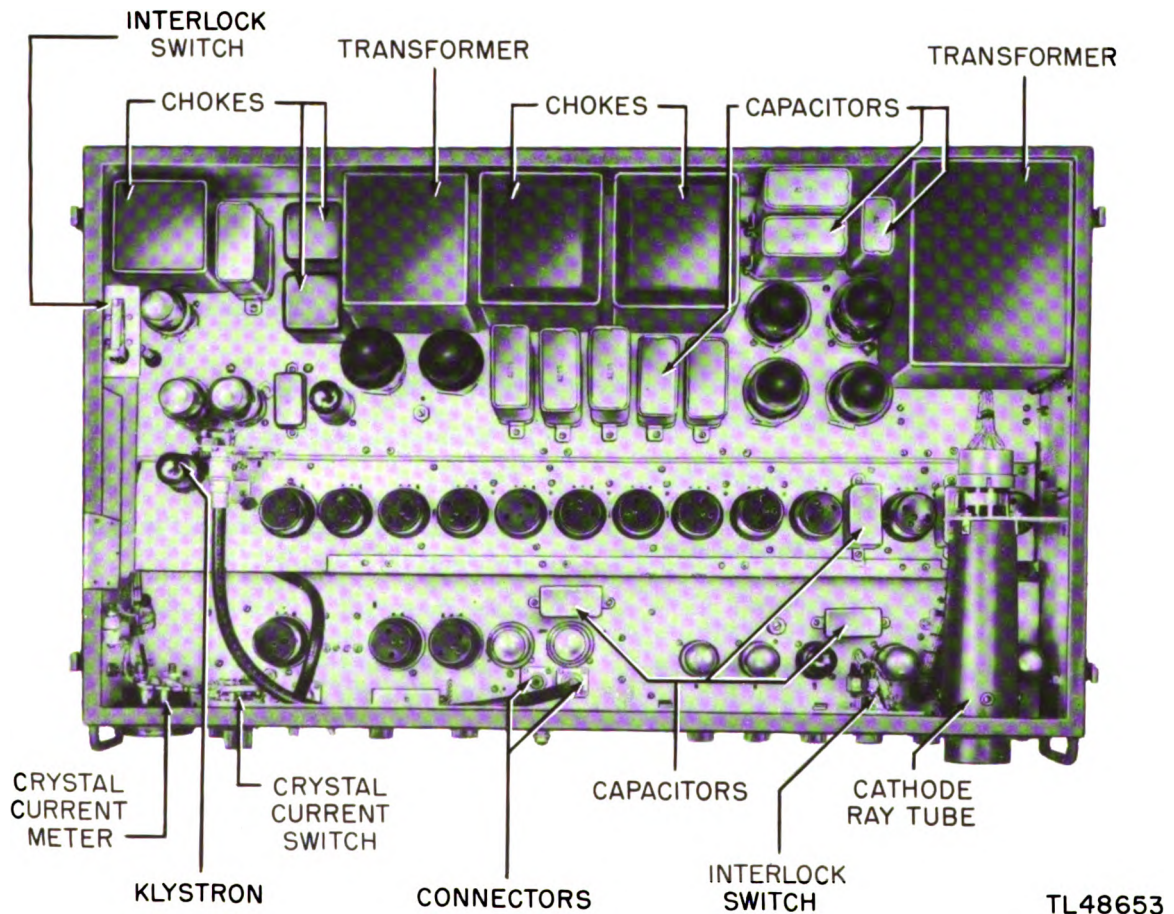
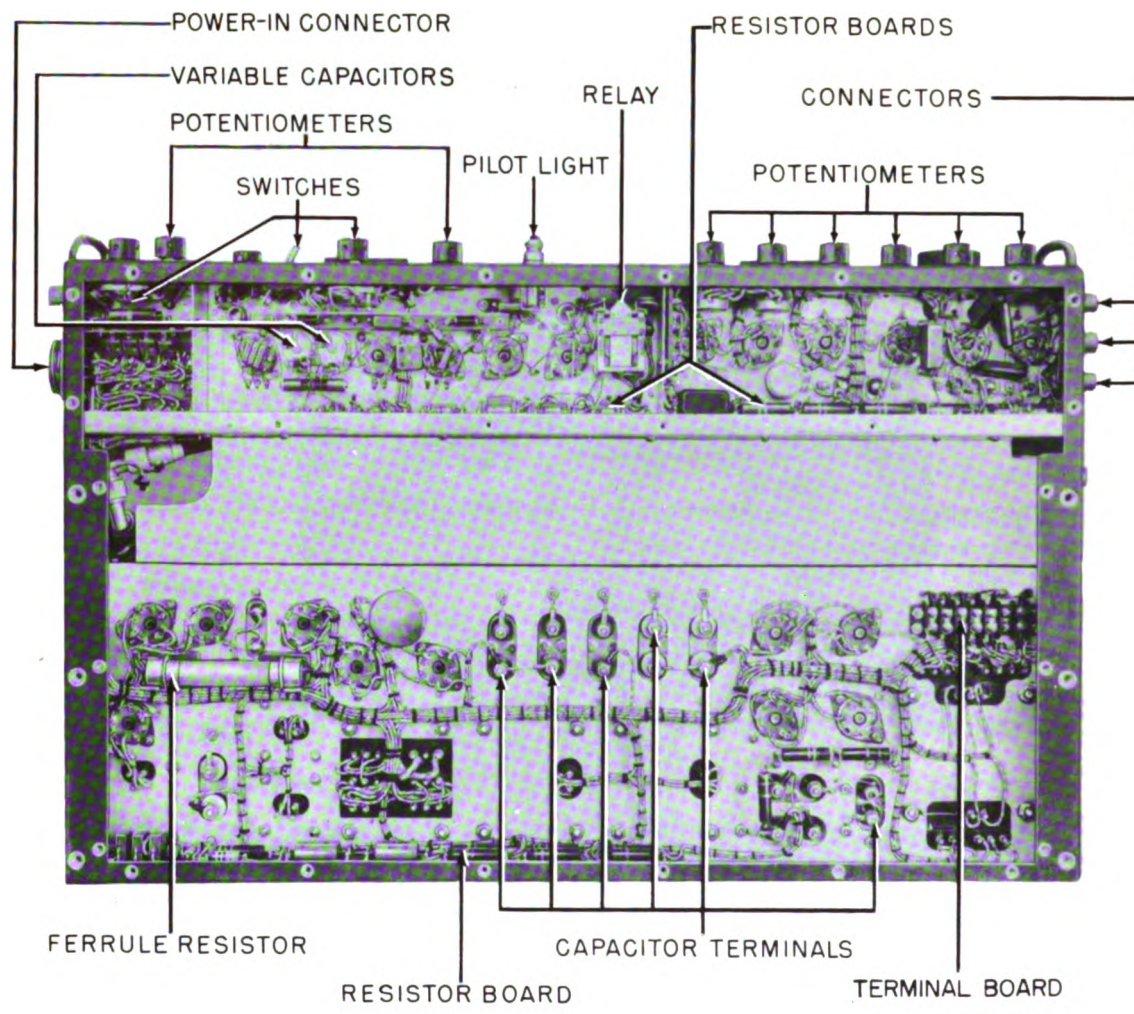


Figure 4-52. Receiver, top view.



TL48654

Figure 4-53. Receiver, bottom view.

C. CLEAN:

- (1) The glass face of the meter with a soft clean cloth.
- (2) The screen of the cathode-ray tube with a soft clean cloth.

4-37. ITEM 35—ANTENNA HEATER.

a. Preparatory Step (par. 4-2). Unfasten the four screws which hold the heating unit into the asbestos housing of the antenna heater (fig. 4-3) and gently slide the heating unit out of the covering.

CAUTION: Painful burns may result from contact with the heating elements. Allow sufficient time for cooling before starting the maintenance procedure.

b. Maintenance Procedure (fig. 4-54).

F. FEEL:

The two blower motors for indications of overheating (par. 2-17).

I. INSPECT:

- (1) The antenna heater for insecure mounting.
- (2) The motors for loose mounting and for loose coupling to the heating unit. The motors have sealed bearings and do not require lubrication (par. 2-17).
- (3) The thermostat switch for improper mounting, loose connections, and corrosion (par. 2-14). Check the wiring for frayed or charred insulation.

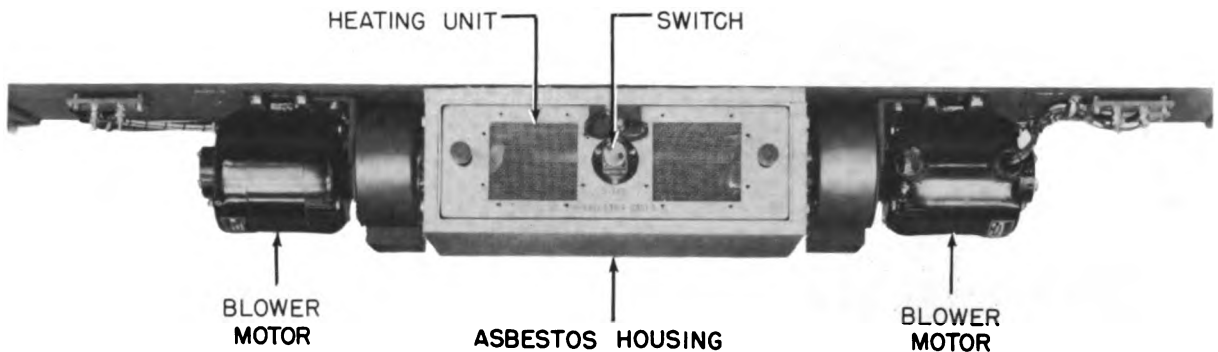


Figure 4-54. Antenna heater.

TL48650

(4) The heating elements and the heating unit chassis for damage and corrosion.

(5) The asbestos housing for damage.

T. TIGHTEN:

The screws fastening the heater element to the asbestos housing.

4-38. ITEM 36—ROTATING FEED ASSEMBLY.

a. **Preparatory Step (fig. 4-3).** Refer to paragraph 4-2.

b. **Maintenance Procedure (fig. 4-55).**

F. FEEL:

The rotating feed drive motor for overheating (par. 2-17).

I. INSPECT:

(1) The mounting of the motor to the gear box.

(2) The mounting of the gear box and the sweep-mark unit to the antenna.

(3) The fastening of the gear-box coverings.

(4) The entire rotating feed assembly for exuding grease. Wipe up all excess grease and check the gasket for deterioration.

(5) The rotating feed assembly for surface defects, damaged paint surfaces, dirt, and corrosion.

L. LUBRICATE:

(1) The rotating feed assembly grease fittings (see lubrication chart, par. 3-4).

(2) The inside of the rotating feed assembly case (see lubrication chart, par. 3-4).

4-39. ITEM 37—SWEEP-MARK UNIT.

a. **Preparatory Steps (par. 4-2).**

(1) Remove the side cover from the tube chassis on the sweep-mark unit (fig. 4-3). Lift the tube chassis from its mounting by releasing the four thumbscrews which fasten it to the frame.

(2) Remove the brush cover from the side of the unit.

(3) Remove the panel from the bottom of the sweep-mark unit.

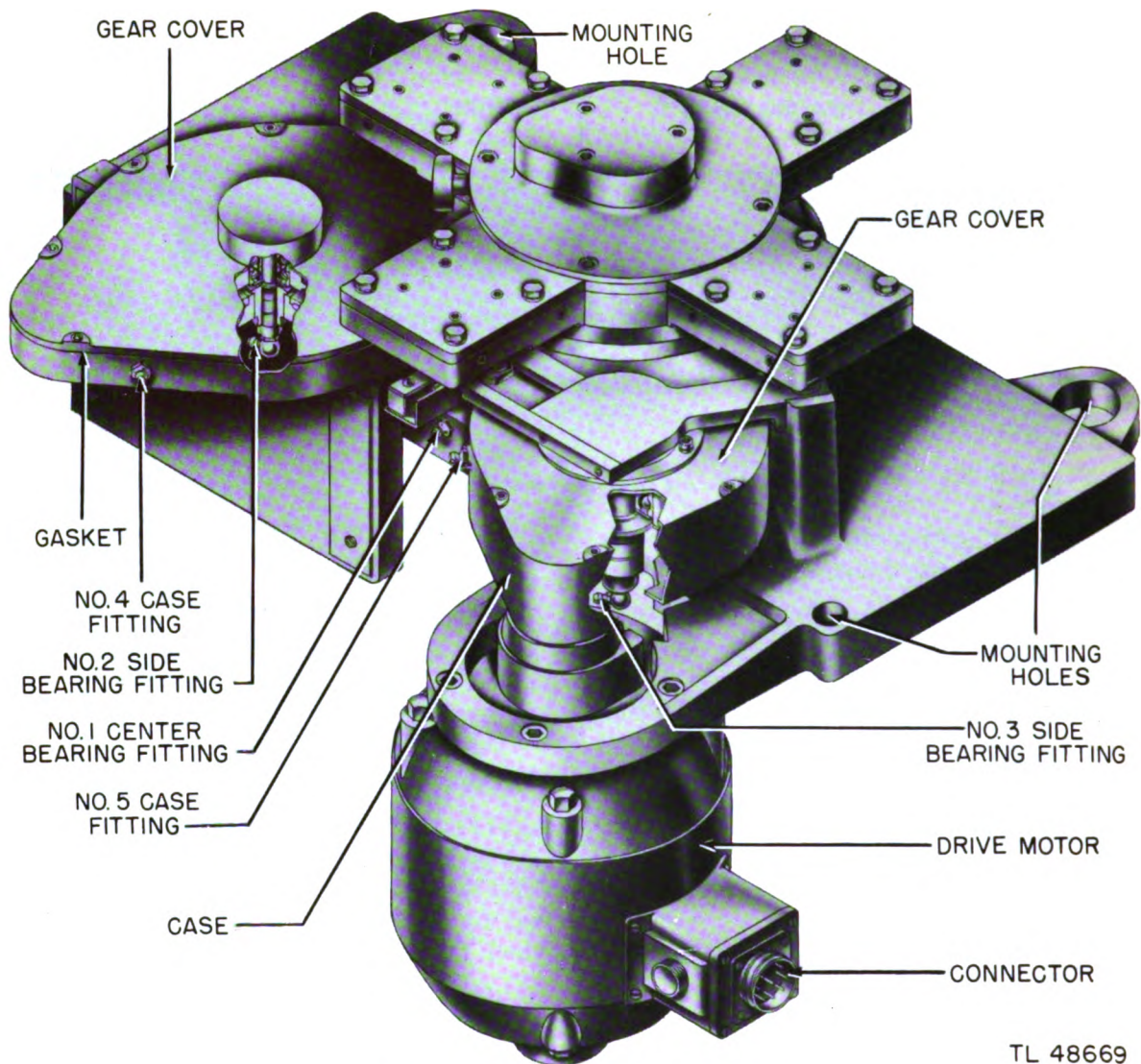
b. **Maintenance Procedure (figs. 4-56 and 4-57).**

I. INSPECT:

(1) The brushes for corrosion and excessive wear. To do this, loosen the center captivated screw in the brush assembly and lift the assembly out of the small opening at the side of the unit. When replacing the brush assembly, do not bend it or force it into place (par. 2-17).

(2) The tubes for loose mounting (par. 2-2).

(3) The capacitors for loose connections, bulging of case, and leaking of dielectric (par. 2-3).



TL 48669

Figure 4-55. Rotating feed assembly.

(4) The resistors for blistering and discoloration (par. 2-4).

(5) The coil for dirt and corrosion. If necessary, clean with a soft cloth.

(6) The coupling for looseness and corrosion.

(7) All wiring for loose lacing and frayed insulation. Check all electrical connections for looseness and corrosion (par. 2-8).

C. CLEAN:

(1) The three small tubes with a clean dry cloth.

(2) The slits and the tube cavities with a small brush.

4-40. ITEM 38—WAVEGUIDE, HORN, AND REFLECTOR.

a. Preparatory Steps (par. 4-2).

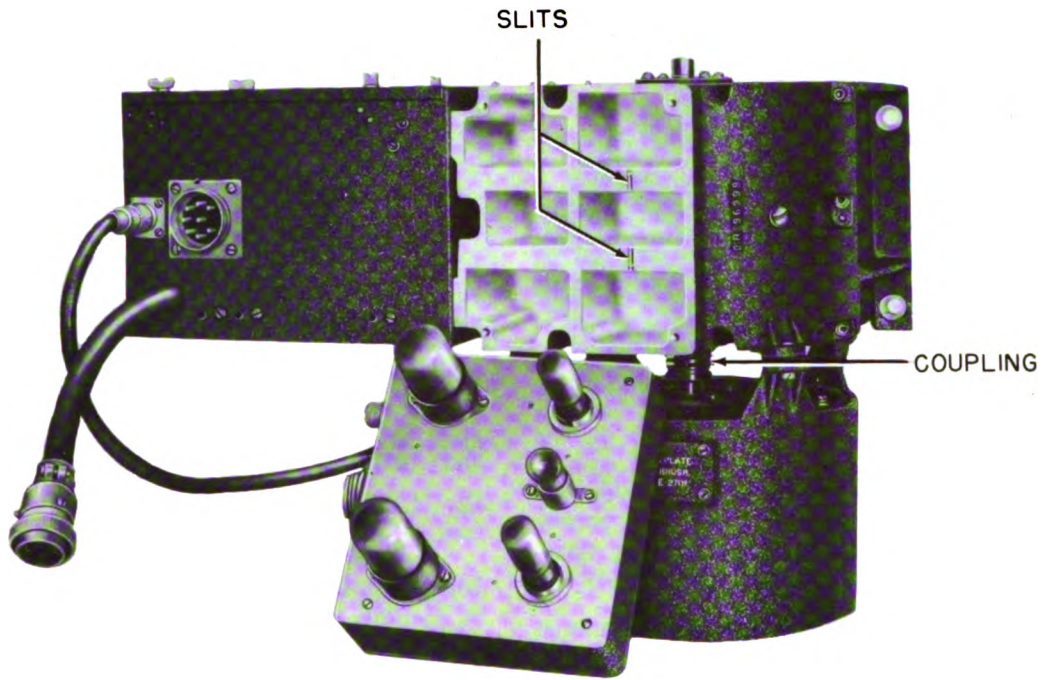
(1) Plug the vacuum cleaner into one of the 115-volt receptacles of the antenna control panel (fig. 4-50).

(2) Turn on the antenna heater switch at the power panel (fig. 4-45). All other power panel switches must be off.

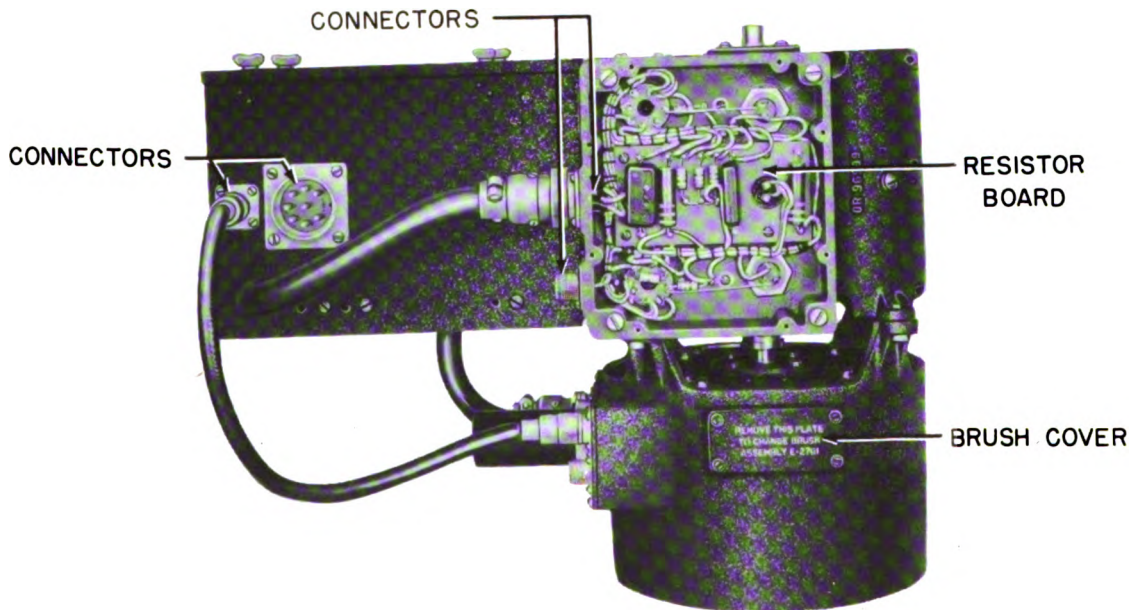
b. Maintenance Procedure.

I. INSPECT:

(1) The rotating feed arms for dirt, bending, and corrosion. Do not attempt to



A. TUBE CHASSIS REMOVED



B. TUBE CHASSIS, COVER REMOVED

TL48639

Figure 4-56. Sweep-mark unit, side view.

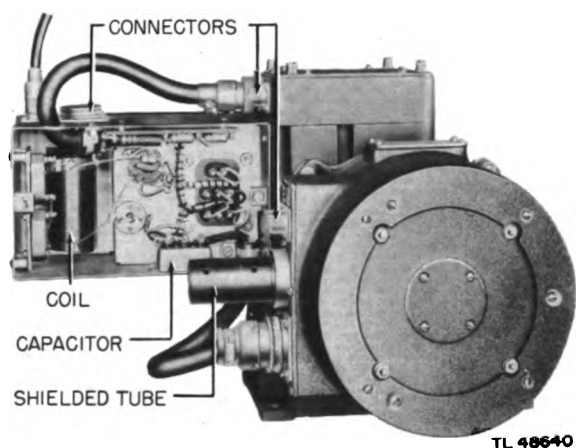


Figure 4-57. Sweep-mark unit, bottom view.

straighten bent arms, but report the damage to the person in charge (par. 2-10).

(2) All waveguide sections for damage and corrosion (par. 2-10). Do not change any adjustments.

(3) The throat of the antenna horn for dirt, corrosion, and bending. Report unusual conditions to the person in charge.

(4) The plywood braces inside the antenna assembly for dirt and damage. Remove dirt with a brush.

(5) The outside of the antenna assembly and the reflector for chipped paint and dirt (par. 2-20).

(6) The reflector support arms for damage and corrosion. When necessary, apply a thin coating of special lubricating grease (GL) to the arms to prevent corrosion.

(7) The hinges of the antenna and reflector for loose pins, loose mounting, corrosion, and lack of lubrication (par. 2-20).

C. CLEAN:

(1) The throat of the antenna horn with the vacuum cleaner. Use the vacuum cleaner to remove dirt from the corners inside the antenna assembly.

(2) The plastic window with a clean cloth moistened with dry-cleaning solvent. Remove all dirt and stains from the window and from the mounting around the window.

SECTION IX. PEDESTAL AND TOWER

4-41. ITEM 39—PEDESTAL HOUSING.

a. Preparatory Steps (par. 4-2).

(1) Remove the motor, slip-ring, and selsyn compartment covers (fig. 4-3).

(2) Throw the RUN-SAFE switch to the SAFE position.

(3) Remove the cover plate from the slip-ring housing.

b. Maintenance Procedure (figs. 4-58 and 4-59).

I. INSPECT:

(1) The painted surface for deterioration, peeling, cracking, and chipping. Examine the entire pedestal for dirt and corrosion (par. 2-20).

(2) The pedestal for loose mounting. If the pedestal is not level, notify the person in charge.

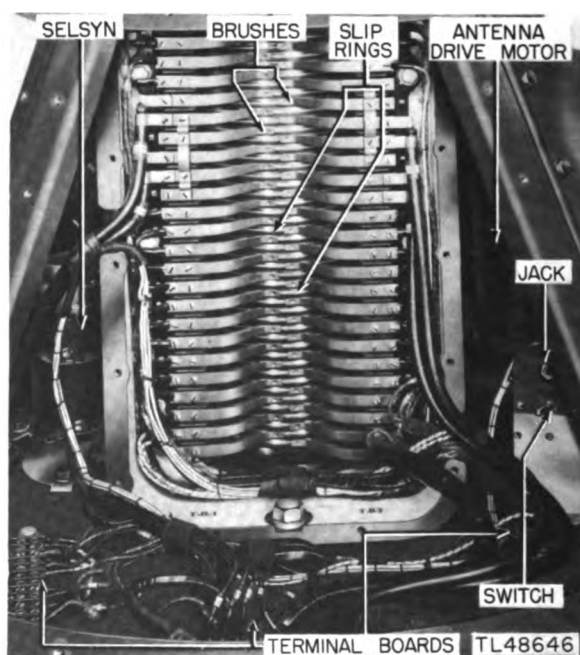


Figure 4-58. Pedestal slip-ring compartment.

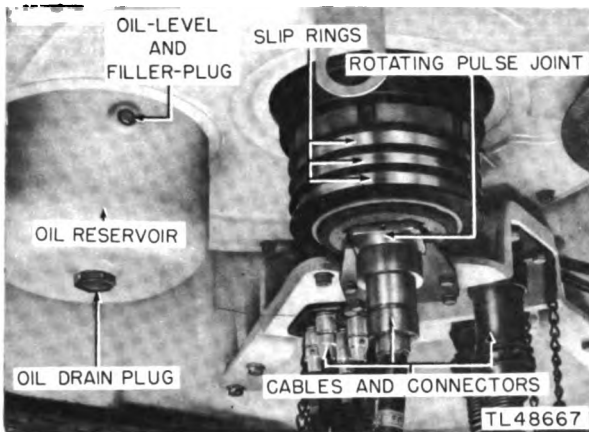


Figure 4-59. Underside of the pedestal.

(3) All mounting bolts, screws, and nuts for looseness.

(4) The connectors for defects and corrosion (par. 2-9).

(5) The terminal boards for loose mounting, poor connections, chipped or cracked insulation, and corrosion (par. 2-8).

(6) The wiring for loose lacing, broken binding tape, and frayed and deteriorated insulation. Examine the wire clamps for looseness (par. 2-8).

(7) The toggle switches for faulty operation (par. 2-14).

(8) The jack for damage and corrosion.

(9) The slip rings for dirt, corrosion, uneven surfaces, and cracked or chipped partitions between slip rings (par. 2-19). Examine the entire circumference of each slip ring by rotating the antenna. To rotate the antenna by hand, the five screws and the nut fastening the gear reduction box to the pedestal base must be loosened. *Do not remove the motor and gearbox.* When inspection is complete, tighten the screws and the nut.

(10) The slip-ring brushes for loose connections, loose mounting, excessive wear, dirt, corrosion, and improper spring tension. Pull on the brush arm lightly to determine if there is sufficient tension (par. 2-19).

(11) The gaskets on the slip-ring and compartment covers for damage or deterioration (par. 2-20).

(12) The compartment door mechanism for faulty operation. If the catch mechanism

binds, apply a few drops of special preservative lubricating oil (PS).

(13) The azimuth indicating scales for damage, loose mounting, dirt, and corrosion.

(14) The antenna stowing switch for defective action (par. 2-14).

(15) The cables on the underside of the pedestal for kinks and strains due to improper placement. Examine for loose connector coupling (par. 2-9).

(16) The oil pan and reservoir on the underside of the pedestal for leaks. Notify the person in charge if leaking is observed.

T. TIGHTEN:

Tighten all the compartment-cover fastening screws.

L. LUBRICATE:

The leveling screws (see lubrication chart, par. 3-4).

4-42. ITEM 40—ANTENNA DRIVE MOTOR AND OIL PUMP.

a. Preparatory Steps (par. 4-2).

(1) Remove the drive motor compartment cover (fig. 4-3).

(2) Remove the terminal box cover from the azimuth drive motor.

b. Maintenance Procedure (figs. 4-59 and 4-60).

F. FEEL:

The drive motor for overheating (par. 2-17).

I. INSPECT:

(1) The motor housing for dirt, excess oil, and loose assembly bolts. The motor has sealed bearings and no lubrication is required (par. 2-17).

(2) The brushes for excessive wear. Replace if necessary. Check for poor spring tension (par. 2-17).

(3) The terminal box for loose terminal boards and connections. Examine the wiring for frayed or rotted insulation and loose lacing. Check for dirt and corrosion (par. 2-8).

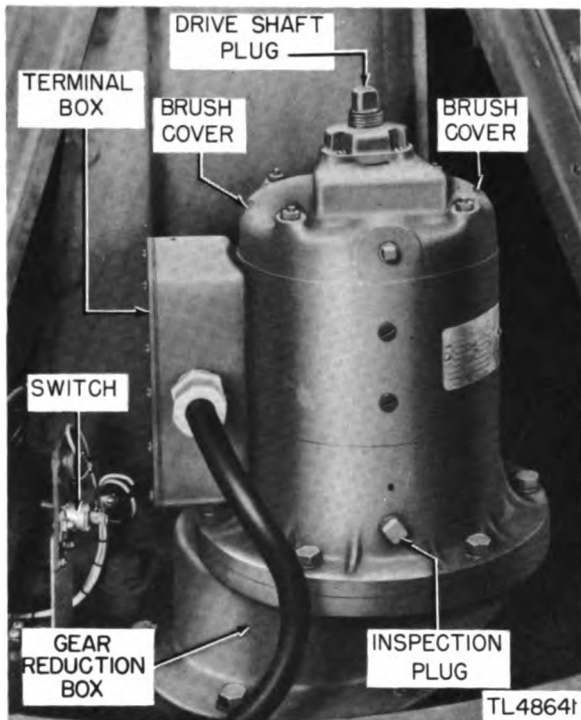


Figure 4-60. Pedestal antenna drive motor compartment.

(4) The azimuth oil pump for faulty operation. Remove the inspection plug, located just above the mounting flange of the azimuth drive motor. Drive the antenna electrically. The flow of oil may be observed through the 1/2-inch aperture with the aid of a flashlight. Approximately eight spurts to a full revolution of the antenna indicates that the oil pump is functioning properly. Notify the person in charge when the pump is not working correctly.

(5) The oil in the azimuth drive oil reservoir for incorrect level and poor condition.

(a) Remove the oil-level-and-filler plug. The oil level should be even with the opening of the plug.

(b) If the unit is operating in a dusty area, feel the oil to determine if it is dirty. If necessary, drain and refill as stated in the lubricate operation below.

(6) The entire motor compartment for excess oil, dirt, dust, and corrosion.

L. LUBRICATE:

The oil pump (see lubrication chart, par. 3-4).

4-43. ITEM 41—SELSYN COMPARTMENT.

a. Preparatory Steps (par. 4-2).

(1) Remove the selsyn compartment cover (fig. 4-3).

(2) Throw the RUN-SAFE switch to the SAFE position.

(3) Do not change the positions of the CLAMP handle and the ADJUST handle.

b. Maintenance Procedure (fig. 4-61).

I. INSPECT:

(1) The selsyns for loose mounting clamps. If necessary, tighten the bolts that fasten the clamps in place. Examine for dirt, corrosion, and loose terminal connections. Remove the screws fastening the three slip-ring covers. Inspect for improper brush tension, for dirt and corrosion of brushes and slip rings, and for loose connections (par. 2-18). Replace the slip-ring covers.

(2) All wiring for frayed or rotting insulation and for broken binding tape. Examine the cable clamps for loose mounting and poor clamping (par. 2-8).

(3) The terminal boards for loose mounting, poor connections, and corroded parts. Check for dirt and dust (par. 2-8).

(4) The toggle switch for faulty operation. Examine the connections for looseness and corrosion (par. 2-14).

(5) The interior of the selsyn compart-

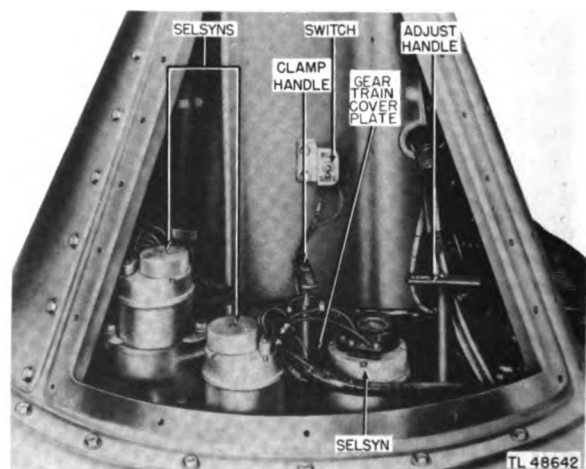


Figure 4-61. Pedestal selsyn compartment.

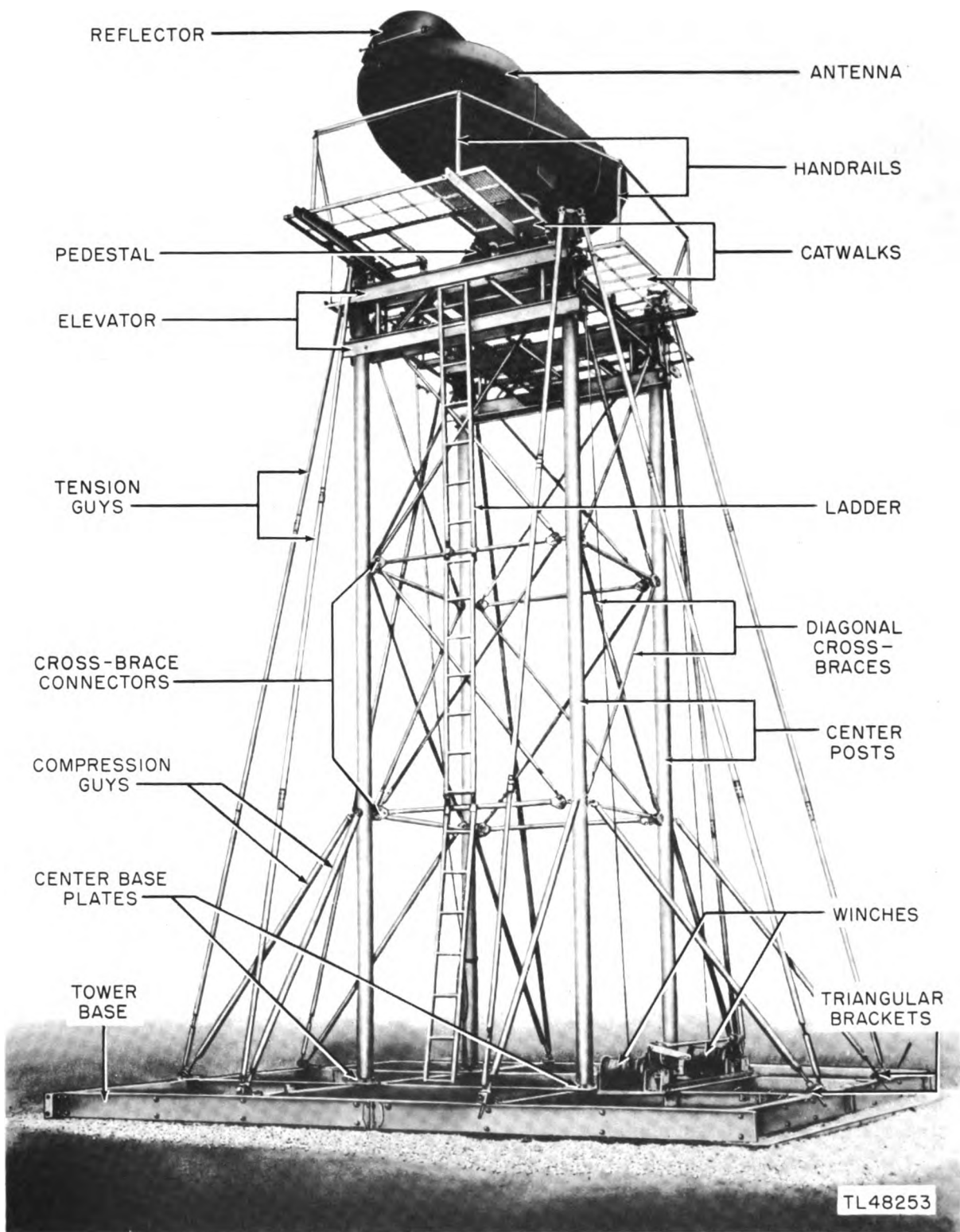


Figure 4-62. Tower.

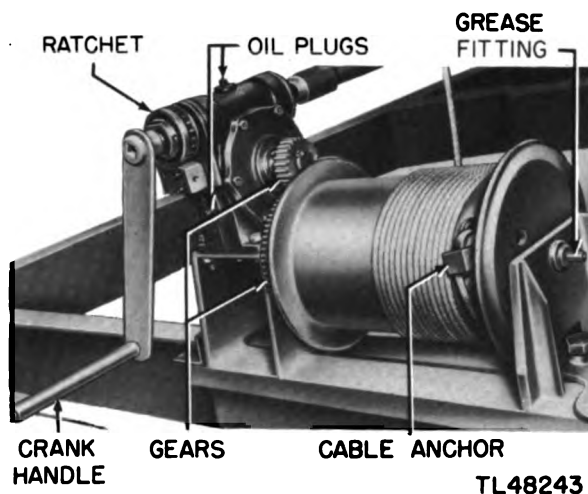


Figure 4-63. Tower winch.

ment for dirt, dust, excess oil, and corrosion (par. 2-20).

4-44. ITEM 42—TOWER.

a. Preparatory Step. Refer to paragraph 4-2.

b. Maintenance Procedure (figs. 4-62 through 4-65).

I. INSPECT:

(1) The tower for signs of settling. If this condition is encountered, notify the person in charge.

(2) The tower base for inadequate support.

(3) The assembly bolts, screws, and nuts for looseness and damage. Check the bolts which fasten the center posts to the balls on the center base plate, the eyebolts, and the cross-brace connectors.

(4) The tension guys and the diagonal cross braces for looseness. When necessary, tighten the turnbuckles.

(5) The compression guys for looseness. The compression guys are tightened by tightening the nut on the triangular bracket.

(6) The winches for insecure mounting, damaged gears, defective ratchet, excess oil, and corrosion. If parts are damaged or defective, notify the person in charge.

(7) The cable anchor for looseness and

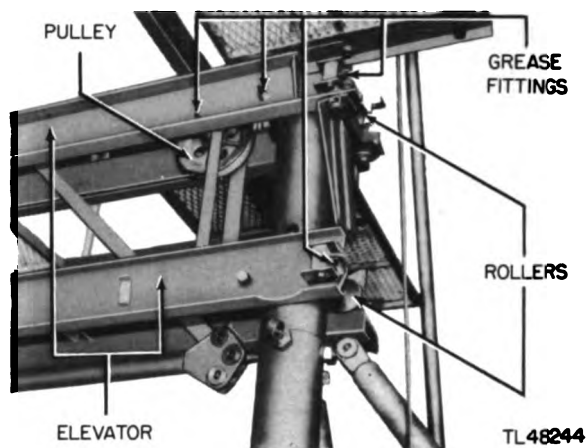


Figure 4-64. Elevator and pulley.

corrosion. Check the cabling for fraying and corrosion.

(8) The ladder for breaks, cracks, looseness of mounting, and corrosion.

(9) The elevator for loose mounting to the vertical shafts. Check the rollers for loose mounting. Examine the elevator support assemblies for loose nuts, defective chains, and loose eyebolts.

(10) The elevator for improper leveling. If the elevator is not level, refer to TM 11-1366 for the leveling procedure.

(11) The six pulleys for damage, loose mounting, and corrosion.

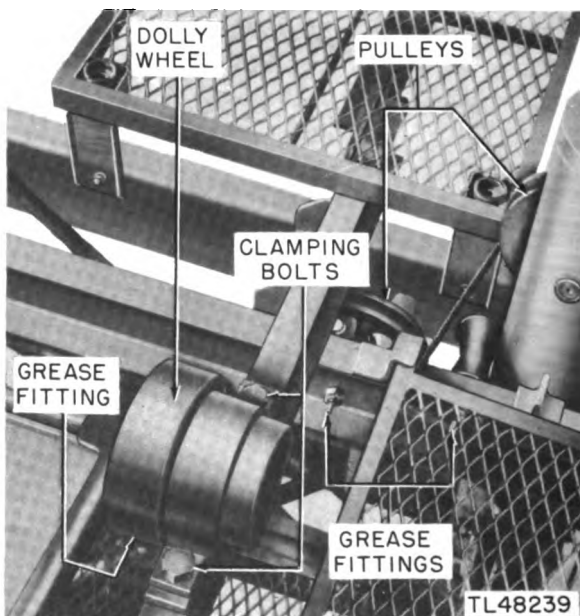


Figure 4-65. Pedestal dolly clamping.

(12) The wire catwalks for insecure mounting, weak points, bends, and corrosion.

(13) The dolly for insecure clamping.

(14) The entire tower assembly for corrosion.

L. LUBRICATE:

(1) All grease fittings on the pulleys,

elevator rollers, dolly, and winches (see lubrication chart, par. 3-4).

(2) The winch gearcase (see lubrication chart, par. 3-4).

(3) The tower cables (see lubrication chart, par. 3-4).

SECTION X. CABLES AND TELEPHONE BOX

4-45. ITEM 43—CABLES.

a. Preparatory Step. Be sure that the power unit is turned off before starting the maintenance procedure.

b. Maintenance Procedure (par. 2-9).

I. INSPECT:

(1) The cords and cables for damaged, frayed, or deteriorated insulation.

(2) The connectors and jacks for dirt, corrosion, bent pins, and improper mounting.

(3) The cable clamps for loose mounting and improper insertion of cables.

(4) The placing of cables. Cords and cables must not be strained, kinked, or forced against a sharp edge or corner. Never make sharp bends in cords and cables.

4-46. ITEM 44—TELEPHONE BOX.

a. Preparatory Step. Remove the cover of the telephone box (fig. 4-1).

b. Maintenance Procedure.

I. INSPECT:

(1) The transformers for corroded terminals and improper mounting (par. 2-5).

(2) The capacitors for leaking of dielectric and bulging of case (par. 2-3).

(3) The four telephone assemblies for corroded or loose connections and insecure mounting.

(4) The terminal boards for corrosion and loose connections (par. 2-8).

(5) All wiring for frayed insulation and loose lacing (par. 2-8).

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