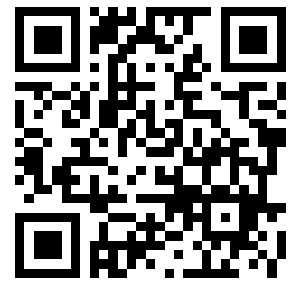

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TM 11-1432

DEPARTMENT TECHNICAL MANUAL

EVENTIVE MAINTENANCE MANUAL

ADIO EQUIPMENT

RC-184

R DEPARTMENT • 18 JUNE 1944

TM 11-1432

WAR DEPARTMENT TECHNICAL MANUAL

PREVENTIVE MAINTENANCE MANUAL

RADIO EQUIPMENT

RC-184

WAR DEPARTMENT • 18 JUNE 1944

RESTRICTED

WAR DEPARTMENT TECHNICAL MANUAL

TM 11-1432 [redacted]

This manual, together with TM 11-1332 and 11-1532 (when published) supersedes TM 11-1132, 6 September 1943, 1 December 1943, and 1 March 1944

PREVENTIVE MAINTENANCE MANUAL

RADIO EQUIPMENT

RC-184

WAR DEPARTMENT • 18 JUNE 1944

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WASHINGTON 25, D. C., 18 June 1944.

TM 11–1432, Preventive Maintenance Manual, Radio Equipment RC–184, is published for the information and guidance of all concerned.

[A. G. 300.7 (15 May 44).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

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

DISTRIBUTION:

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IC 4: T/O 4–68, CA Btry (S/L) (Hd)
IC 11: T/O 11–107, Sig Dep Co; 11–237, Sig Co, Sv Gp; 11–327, Sig Port Sv Co; 11–400, Sig AW Org Radar Rep Plat (c), Radar Operating Team (D); T/O & E 11–500, Sig Sv Orgn, Radar Instl and Maint Team; 11–587, Sig Base Maint Co; 11–592, Hq & Hq Co, Sig Base Dep; 11–597, Sig Base Dep Co; 11–617, Sig Radar Maint Unit.
IC 44: T/O & E 44–17, AAA Gun Btry (Mob); 44–117, AAA Gun Btry (SM); 44–138, AAA S/L Btry (SM).
For explanation of symbols, see FM 21–6.

CONTENTS

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—All tubes, taking special care to completely destroy the two, type 2C26 tubes in the transmitter oscillator. All coil forms, transformers, selsyn motors, and all chassis.
2. Cut—All cables and coil windings.
3. Burn—All parts of the equipment that cannot be completely demolished by other means.
4. Bend—The dipoles and inductor bar in the transmitter-oscillator circuit.
5. Bury or scatter—Nameplates, smashed tubes, and all other parts of the equipment.

DESTROY EVERYTHING

SAFETY NOTICE

Voltages used in this equipment are high enough to endanger life and may be fatal if contacted by operating personnel. Operators must be careful not to contact high-voltage plate circuits or 115-volt a-c input connections while checking or servicing equipment. Make certain that power is turned off when disassembling any part of the equipment.

FIRST AID TREATMENT FOR ELECTRIC SHOCK

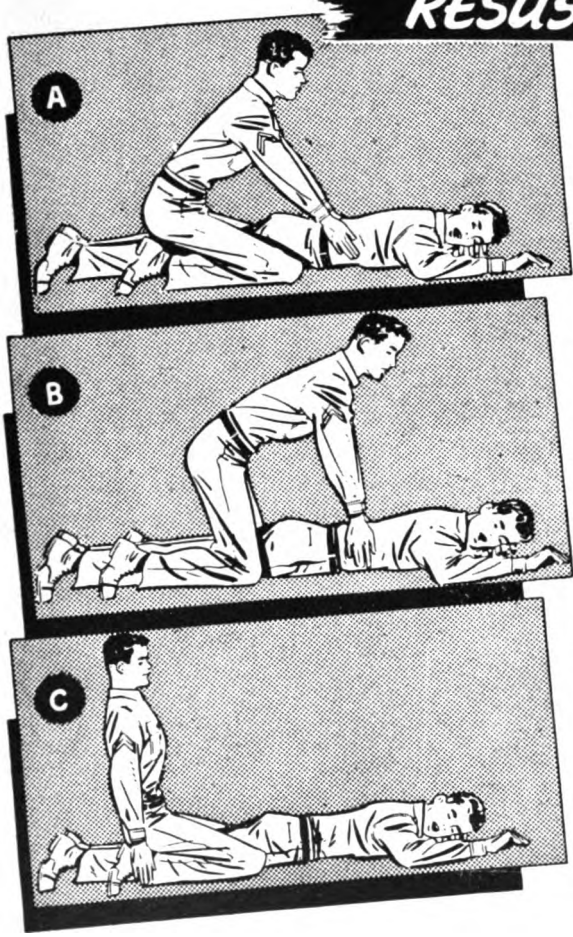
I. FREE THE VICTIM FROM THE CIRCUIT IMMEDIATELY.

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

REFERENCE NOTICE

This is one of three Technical Manuals on Radio Equipment RC–184. The other two are:

TM 11–1332 Radio equipment RC–184, technical operation manual. General description, operating instructions, and equipment performance log (when published).

TM 11–1532 Radio equipment RC–184, service manual. Theory, trouble shooting, and repair (when published).

This manual together with TM 11–1332 and 11–1532 (when published) supersedes TM 11–1132, 6 September 1943, 1 December 1943, and 1 March 1944.

CHAPTER 1

GENERAL PREVENTIVE MAINTENANCE

1. Purpose

This manual, TM 11–1432, describes the preventive maintenance procedures that are to be applied to Radio Equipment RC–184. It covers the maintenance of all electrical equipment comprising the equipment.

2. Scope

The manual is divided into four chapters, as follows:

a. INTRODUCTION. (1) An explanation of the meaning and purpose of general preventive maintenance.

(2) An explanation of the precautions to be taken during the application of preventive maintenance procedures. These safety measures are designed to protect the personnel as well as the equipment.

(3) A description of the six basic maintenance operations: Feel, Inspect, Tighten, Clean, Adjust, and Lubricate.

b. TOOL EQUIPMENT. (1) Identification of all tools supplied with Radio Equipment RC–184.

(2) Construction of special tools.

(3) Care and handling of tools.

c. DESCRIPTION OF MAINTENANCE TECHNIQUES. (1) Detailed instructions for performing maintenance work on the major components and parts of the electrical and mechanical equipment.

(2) Information on the disassembly and reassembly of various units, on the adjustment and handling of special parts, and on procedures which have general applicability.

d. MAINTENANCE ITEMS. (1) The use of the General Preventive Maintenance Schedule.

(2) Specific instructions, subdivided into sections and items.

e. START-STOP PROCEDURE.

3. Purposes of Preventive Maintenance

Preventive maintenance procedures are designed to—

a. Combat the ravages of weather on the equipment.

b. Counteract the detrimental effects of dirt, dust, and water on the operation of the equipment.

c. Keep the radio equipment in good condition to insure uninterrupted operation.

d. Maintain the equipment so that it will always operate at maximum efficiency.

e. Prolong the useful life of the equipment.

4. Meaning of Preventive Maintenance

To appreciate the meaning of the term "preventive maintenance," it is necessary to distinguish between preventive maintenance and trouble shooting and repair. The primary function of preventive maintenance is to prevent break-down thus avoiding the necessity of repair. In sharp contrast, the primary function of trouble shooting and repair is to locate and correct existing defects. Trouble shooting and repair procedures are discussed in TM 11–1532 (when published). This manual is limited to preventive maintenance techniques. To summarize--preventive maintenance may be defined as a systematic series of operations, performed periodically on the equipment. They are designed to maintain top efficiency in performance, to minimize unwanted interruptions in service, and to eliminate major break-downs.

5. Procedure Description

Preventive maintenance procedures consist of two general classes as follows:

a. EQUIPMENT MAINTENANCE WHILE THE STATION IS IN OPERATION. A full discussion of the

many checks that are made systematically, while the equipment is operating, will be included in chapter 6, TM 11–1332 (when published). Also in that manual is a summary of the corrective measures that may be taken to keep the equipment operating.

b. Equipment Maintenance During Normal Shut-down Periods. The bulk of the work for maintaining the radio equipment and keeping it in the best possible condition must be done during regular shut-down periods. The adjustments and minor repairs that can be made while the set is off the air help prevent faults and eliminate them when they first appear.

6. Significance of Preventive Maintenance

a. Preventive maintenance acquires its proper significance when it is examined from the point of view of equipment utility. The equipment must be kept running efficiently if it is to serve its purpose. Equipment will rapidly become useless if it is not maintained.

b. The application of preventive maintenance to radio equipment prolongs the useful life of the equipment and contributes to the success of the entire aircraft warning service. In line with these thoughts it must be recognized that the full benefits of preventive measures cannot be obtained merely by following the general directive ". . . shall be done." The personnel assigned to do the work must be imbued with the spirit and desire to perform their assignments well. They should have a keen appreciation of why the work is required. They should never think of their routine tasks as necessary evils.

c. Every soldier performs preventive maintenance on his pistol, rifle, or carbine, whichever he uses, and has a clear understanding of the part the work plays in his existence as a soldier. He knows that the periodic disassembly, cleaning, and reassembly are done for a definite reason, to keep the piece in working order and to minimize the chances of its jamming when the consequences are great. The weapon may mean the difference between life and death!

d. The same reasoning applies to the maintenance of Radio Equipment RC–184. The association between danger to personnel and failure of the apparatus may not be as clearly defined as in the case of the soldier and his gun, but the same implications are there. The enemy does not state his objective. It may be the immobilization of the station, bombardment of the area covered by the station, or the destruction of an important installation far behind the lines. No matter what his objective, the efficient functioning of the equipment is paramount to the job of preventing the successful completion of the enemy's missions. Inoperative equipment endangers personnel and supplies, and defense of vital zones. The radio equipment can serve its purpose only if it is ready at all times to provide continuous and accurate information on the identity of the approaching aircraft.

7. Preventive Maintenance Program

The program of preventive maintenance, as applied to Radio Equipment RC–184 has the following basic features:

a. The complete equipment is divided into groups of components and miscellaneous accessories.

b. Each group of components and accessories is subdivided into a number of items. Each item consists of specific tasks to be performed.

c. The individual items are listed in the maintenance schedule. The scheduling is on a daily, weekly, monthly, and quarterly basis. Groups of items are assigned to particular days of the week.

d. The preventive maintenance schedule consists of a pad of 14 sheets covering 1 year of operation. The pad is furnished as a supplement to this manual. The maintenance schedule tells what is to be done, and when. Instructions on how each item is performed are described in chapter 4.

8. Precautions During Preventive Maintenance Operations

Special safety precautions must be observed before and during the application of preventive maintenance procedures. These are discussed under two major headings:

a. Safety of personnel.
b. Damage to equipment.

9. Safety of Personnel

a. General. Every effort must be made to avoid injury to personnel and equipment during maintenance work. Familiarity with equipment is apt to breed carelessness. Pay strict attention to every safety measure.

b. HIGH VOLTAGES. High voltages used during the operation of Radio Equipment RC–184 are dangerous. *Death* by electrocution is certain for the operator or repairman who takes chances with high-voltage circuits. Careful operators or repairmen make certain every precaution is taken.

c. SAFETY PRECAUTIONS. (1) Read the safety precautions given in the Preparatory Steps Item for each component before performing any maintenance inside the component. Remove the power cable plug from the receptacle marked "Power" on the data panel (fig. 1) of Radio Set SCR–584 before performing any maintenance inside the lower panel section of Rack FM–80 or on the interconnector plug (fig. 6) inside the power supply compartment.

(2) The Preparatory Steps Item is the first item for each component.

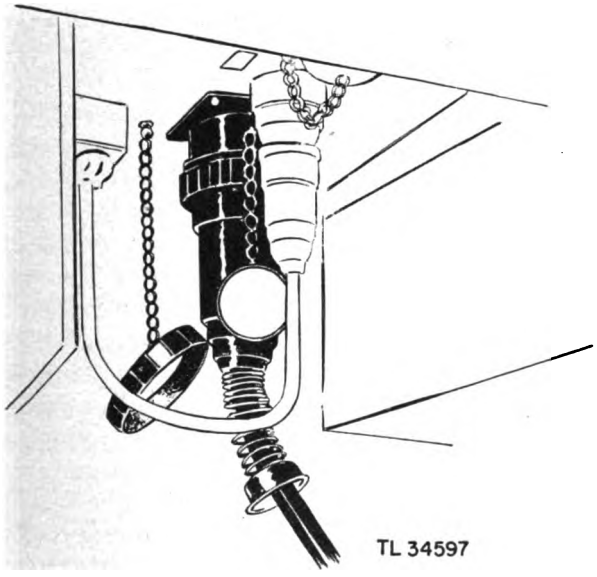


Figure 1. Main power plug.

10. Damage to Equipment

a. Parts such as tube envelopes and resistor bodies, located in the high-power components, remain very hot for several minutes after the power supply switches have been turned off. Some units have a temperature so high that very painful burns will result if the bare skin touches them. A bad burn may cause involuntary movements of the arm or the body which can damage the equipment, especially the tubes. If work is started immediately after the power switches have been turned off, extreme care must be taken.

b. Careful handling of equipment should become a regular habit. Space for working on units partially covered by others should not be made by pushing and tugging and moving parts out of the way. Care should be taken to avoid unnecessary strain on wires, cables, connections, and couplings.

c. Tools used inside the components must be firmly grasped. Special care must be taken to prevent dropping pliers, screw drivers, and similar repair tools on breakable parts. Damage to transformers, capacitors, and jacks is not likely. If a heavy tool is dropped it may fall on a tube and break the glass envelope or shift the position of the internal elements.

11. Basic Preventive Maintenance Operations

The actual work of preventive maintenance consists of the following basic operations:

a. Feel_____ F.
b. Inspect____ I.
c. Tighten___ T.
d. Clean_____ C.
e. Adjust____ A.
f. Lubricate__ L.

12. Necessity for Basic Operations

a. The first two operations establish the need for applying the other four. The selection of particular operations is based on a general knowledge of field requirements. For example: the dust encountered on dirt roads during cross-country travel filters into the equipment no matter how much care is taken to prevent it. Changes in climatic conditions such as heavy rains followed by blistering heat, excessive dampness, snow, and ice all tend to cause deterioration of exposed surfaces and parts. Unless continuous inspection is the rule, and the necessary work of tightening, cleaning, adjusting, and lubricating is done, the equipment will soon become erratic in performance, wholly undependable, and subject to break-down when it is most needed.

b. Each of the basic operations listed in paragraph 11 will be described in two ways. The description given in this chapter states the general nature of the operation and the manner in which it is generally undertaken. The second description, given in chapter 3, states specifically how the opera-

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tion is used in relation to particular parts and components.

13. Meaning of "Feel" Operation

The "Feel" operation is used most often to check rotating machinery, such as blower motors, drive motors, and to determine an overheated connection, resistor, or bushing. The aim is to evaluate the temperature of the bearings, housings, and connections to discover the existence of some defect which requires correction. Normal operating temperature of motors will permit the hand to be held in contact with the motor or bearing case for a period of 5 seconds without discomfort. Many parts other than motors may be felt for signs of overheating. Parts must be felt as soon after shutdown as possible. Detailed instructions on these parts will be found in chapter 3 under the individual items.

14. Meaning of "Inspect" Operation

a. Inspection is probably the most important operation in the preventive maintenance program. Careful observation is required. A careless observer will overlook the obscure evidences of defects and abnormalities. Many slight abnormalities may exist without clearly interfering with the equipment performance. These are the deviations from normal that should be discovered early. Valuable time and effort can be saved if defects are corrected before they lead to a major break-down. The operating personnel must make every effort to become thoroughly familiar with the signs of normal functioning. In this way, they will be able to recognize the signs of malfunctioning.

b. Inspection consists of carefully surveying all parts of the equipment, observing color, placement, and state of cleanliness, and watching for earmarks of possible trouble. Overheating is an undesirable condition that can often be detected early. Signs of overheating are discoloration, blistering or bulging of the part or container, leakage of insulating compounds, and oxidation of contact surfaces. Dirt, corrosion, rust, mildew, and fungus growth are sources of possible trouble and may be detected by diligent inspection. Careful search should be made for loose mounting bolts and screws, and for loose clamping rings and connections. If a connection is believed to be loose, a test can be made by giving the wire a light pull, by feeling the lug or terminal screw, or by determining whether the connection can be tightened further by testing for tightness with a screw driver or wrench. During inspection, wires and cables should be left in their original position or not moved more than a very slight distance. After the equipment has cooled down, the large transmitting tubes may be examined but not removed from their sockets. They can be examined while in their sockets for loose connections and discoloration. Every part of the equipment should be closely observed.

15. Meaning of "Tighten" Operation

a. All mobile units while in transit, are subject to vibration. As a result, loose connections, mounting strips, cables, and tubes, may be found. Every loose connection is a probable source of trouble and will impair the operation of the set. All loose parts, especially if they are large, are definite hazards to associated equipment. If they shift or fall out of place nearby parts may be crushed.

b. The importance of firm mountings and connections cannot be overemphasized, but screws, bolts, and nuts should not be tightened indiscriminately. They should be tightened only when they are definitely known to be loose. When fittings are tightened beyond the pressure for which they were designed, they will be damaged or broken. Excessive force applied to a wrench or screw driver will often snap off the head of a bolt or a screw. Tools of proper size must be used. Otherwise, fittings will be damaged and further adjustments will not be possible until replacement has been made.

16. Meaning of "Adjust" Operation

Adjustment will be made only when inspection indicates that it is required in order to maintain normal operating conditions. The required adjustments vary so greatly that complete instructions are given in chapter 4, as a part of the explanation of specific items of maintenance.

17. Meaning of "Clean" Operation

The correct interpretation of the instruction "clean" is that the equipment is cleaned when it needs cleaning. In normal usage over specified periods, dirt, dust, and other undesirable substances accumulate, which make regular cleaning necessary. Periodic cleanings are more frequent on

exposed parts than on those contained within cabinets. Inspection may indicate the need for cleaning more frequently than is required by the schedule. If so, the work must be done in accordance with the specified cleaning instructions given in chapter 3 in the explanation of the various parts and components.

18. Meaning of "Lubricate" Operation

The word "Lubricate" as used in the manual refers to the application of grease or oil to the bearings of motors or other rotating shafts. The small selsyn transformers of the equipment are prelubricated at the factory and require no further lubrication.

CHAPTER 2

CARE AND HANDLING OF MAINTENANCE TOOLS

19. Contents of Tool Kit

A kit of tools (fig. 2) is furnished as maintenance equipment with Radio Equipment RC–184. The following items are included:

Illustrated code number	Name and description of tool	Part No.
1	Alemite No. 6557 grease gun.	125 X–567
2	Flexible key socket wrench.	125 X–656
3	Box wrench	125 X–382
4	Hammer	125 X–568
5	Screw driver, 6-inch	125 X–493
6	Screw driver, 2½-inch	125 X–492
7	Socket wrench	125 X–495
8	Midget screw driver, No. 2.	125 X–621
9	Insulated screw driver	125 X–670
10	Open-end wrench	125 X–482
11	Open-end wrench	125 X–481
12	Open-end wrench	125 X–669
13	Open-end wrench	125 X–479
14	Open-end wrench	125 X–480
15	Open-end wrench	125 X–478
16	Drift pin	125 X–500
17	Allen wrench, ⅜-inch	125 X–498
18	Allen wrench, 5/16-inch	125 X–497
19	Allen wrench, ¼-inch	125 X–496
20	Allen wrench, No. 8	125 X–667
21	Allen wrench, No. 6	125 X–668
22	Diagonal cutting pliers, 6-inch.	125 X–677
23	Long-nosed pliers, 6-inch.	125 X–676
24	Socket wrench	125 X–494

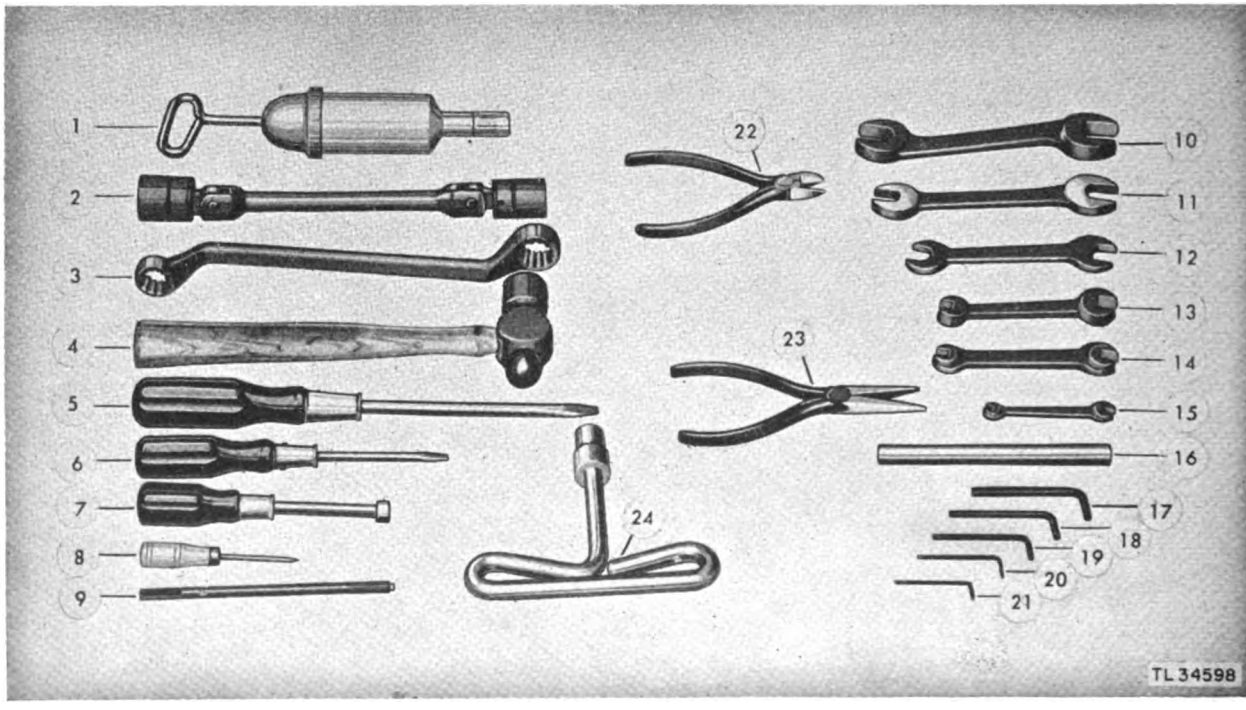

Figure 2. Tools for Radio Equipment RC–184.

20. Purpose and Handling of Tools

The importance of a well-kept tool kit cannot be overemphasized. Since the preventive maintenance program is a regular part of the daily schedule, the required tools must be available, and in satisfactory working condition. Many of the tools provided with the Radio Equipment RC–184 are of special type, and some repairs cannot be made without them. Consequently, too much stress cannot be placed upon the need for careful handling and storing of tools as missing or broken tools cause delays. The use of a substitute tool that is not exactly suitable for the work at hand, may cause unnecessary damage. The proper care of tools is just as important as the proper care of the radio equipment itself. The following information on the use and care of tools is furnished for guidance.

a. Allen Wrenches. These wrenches are used to tighten or loosen the setscrews. They are small and must be kept in the small cloth bag provided for them. After use, they should be wiped with on oily rag, replaced in the bag, and stored in the tool box.

b. Pliers. Several types of pliers are included in the tool kit. Although they have different shapes and sizes, all must be cared for in the same way. They should be kept clean and oiled occasionally to keep the joints free. Excess oil must be removed with a cloth. The pliers should then be stored in the tool box and not in the trouser pockets.

c. Diagonal Pliers. These pliers are used to cut copper wire up to size No. 14. Do not cut iron wire or thick wire with them.

d. Long-Nosed Pliers. These pliers are used to hold and bend small wire, grip very small parts, and service delicate apparatus. They can quickly be damaged if they are used carelessly.

e. Screw Drivers. Screw drivers of different sizes are furnished in the tool kit. They are important tools and must be kept in good condition. In the selection of a screw driver for a particular job, see that the bit is the same width as the head of the screw and fits snugly in the slot. The handle should be large enough to give adequate leverage. Screws and bolts should be fully tightened, but excessive pressure sufficient to break the fitting, should not be used. Never force a screw. Examine the threads for crossed, bent, or damaged spots. If necessary, replace the screw.

f. Socket Wrenches. These wrenches are used to remove nuts of various sizes. Care should be taken in choosing the correct wrench for a certain size nut. Do not use a wrench which will not fit snugly around the nut; otherwise, the corners of the nut will be rounded off and removal will be difficult.

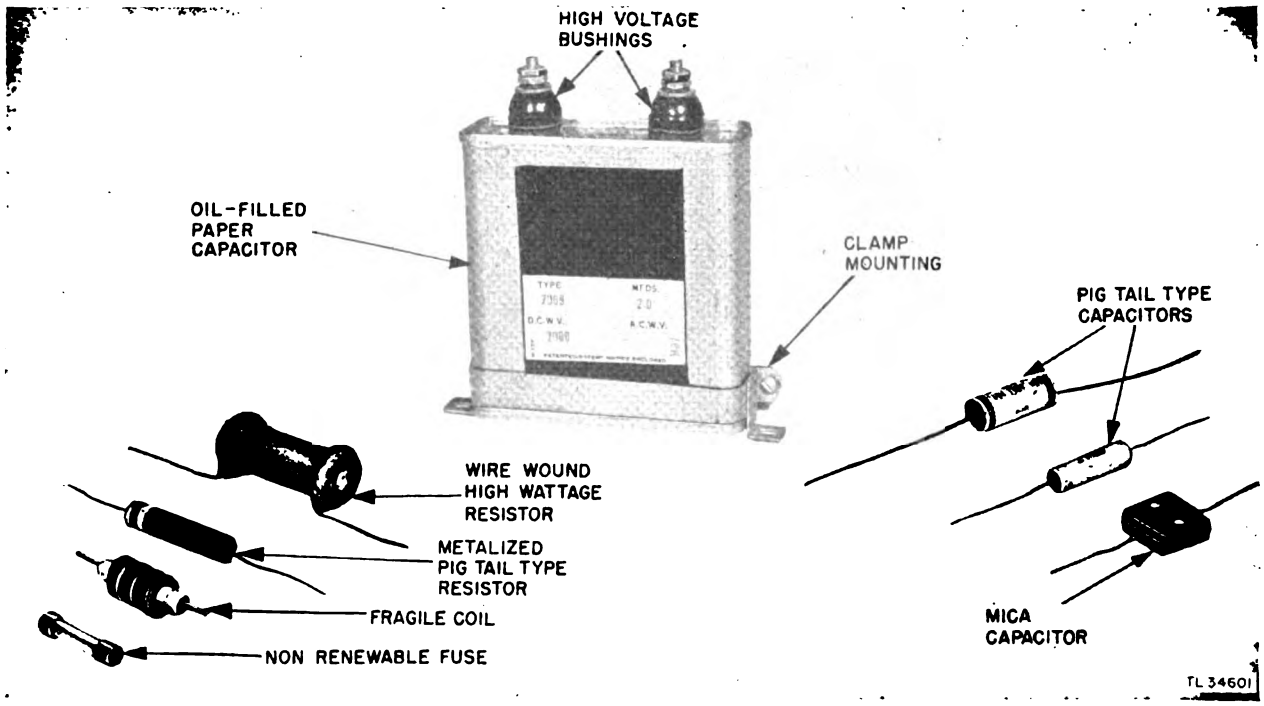

Figure 3. Common maintenance items.

CHAPTER 3
DESCRIPTION OF MAINTENANCE TECHNIQUES

21. General

Radio Equipment RC–184 uses many types of electrical devices and numerous varieties of any one type. (See fig. 3.) Since preventive maintenance operations cannot be applied indiscriminately the content of this section is for the guidance of personnel assigned to carry out the six basic operations, namely, FEEL, INSPECT, TIGHTEN, CLEAN, ADJUST, and LUBRICATE. The instructions contained in this chapter state the exact procedures for applying these operations and the variations introduced by the differences in individual items. Attention is called to the fact that the information presented in this section explains how the operations are to be performed. The maintenance schedule, explained in chapter 4, states the exact time when the various operations are to be performed. Since many of the basic preventive maintenance operations are performed upon all of the items, reference is made to as many operations as are applicable to each item. Items in chapter 4 are often passed over with the statement, "Inspect for general condition." The maintenance man should then refer to chapter 3 for a detailed analysis of the operations included and what is included in the maintenance to be performed on the specific item schedule. Such detailed analysis is presented below and throughout the rest of this chapter.

22. Tubes and Sockets

Preventive maintenance work on vacuum tubes includes inspection and cleaning. Work on tube sockets and mountings involves inspection, tightening, cleaning, and adjusting. Each of these operations is discussed in detail below.

NOTE. Avoid doing any work upon the tubes immediately after shut-down while they are still hot. Severe burns may result from contact with the envelopes of hot tubes.

a. INSPECT (I). (1) Both glass and metal tube envelopes must be inspected for accumulations of dirt and for possible break-away of the envelopes from the tube bases. Examine the tube caps and tube connector clips for dirt, corrosion, and for possible break-away from the cement which attaches them to the glass envelopes. When tubes with loose plate caps or envelopes are found, they should be replaced if suitable replacement is available. If replacement is not available, do not attempt repair. Note the condition on the Work-to-be-Done forms and make the replacement when possible.

(2) The spring clips which make contact with the plate caps must be examined for possible corrosion, loss of tension, and loose connections. The condition of the wires soldered to these spring clips must be checked also. The wires should be free of frayed insulation or broken strands. Stress care in removing a loose spring clip attached to a plate cap which has broken away from its glass envelope. Never turn the clip while it is on a loose cap. Be careful when signs of corrosion exist, as the clip may be bound to the cap.

(3) Firmness of tubes in sockets can be determined by inspection. This should be done by pressing the tubes down in the sockets. Do not partly withdraw the tube and then jiggle it from side to side as such movement tends to weaken the pins attached to the base and spreads the contacts on the socket. This may make trouble where it did not exist before.

(4) It may seem desirable to inspect the sockets of tubes at the same time that the tubes are examined, but this practice is discouraged, except as indicated in the schedule. The sockets for each tube can be conveniently examined when a tube is replaced, but tubes should not be pulled out of the socket each time the tube is examined. If there is good reason to believe the socket is faulty and responsible for improper operation, it then becomes a servicing item and will be discussed in TM 11–1532 (when published).

(5) The modulator tube is held in place by means of a shield held by thumb screws which must be taken out in order to remove the tube; and conversely must be tightened, finger-tight, to hold the tube in proper position.

(6) The small receiver tubes are held in place by shields which have a threaded base. These shields must be removed to obtain access to the tubes.

(7) When inspecting the tube sockets, look for dirt, corroded connections and contact springs, loose mountings, loss of tension in the contact springs, and cracked sockets.

(8) When it is necessary to remove a tube from its socket, especially the high-power tubes, caution must be observed. When a warm tube is being removed from a socket, it should not be jarred. Never remove a tube from its socket without first removing the connection to the plate cap. Properly store tubes after they have been removed from the sockets. Tubes should not be placed on a flat surface without proper precautions to prevent them from rolling off and falling to the floor or ground.

b. TIGHTEN (T). All loose connections on the tube sockets or the connections to the tubes must be tightened. However, if the contacts or connections are dirty or corroded, they should be cleaned first. When tightening locknuts which hold the socket base on the top of the insulated bushing, excessive pressure should not be applied. Too much pressure may crack the bushing. Socket mountings must be tight at all times as they may become loose during transit and the tubes contained within them will be damaged beyond repair.

c. CLEAN (C). (1) The tubes must be cleaned if inspection indicates the need. When judging this condition consider the type of tube involved. Tubes operated at high voltages with exposed plate connections and caps mounted upon the envelopes should be kept free from dirt and dust because of possible leakage between the grid and plate terminals. Tubes which do not operate at high voltages and do not have exposed plate caps are not subject to frequent cleaning. This does not mean that dirt should be permitted to accumulate upon the latter group of tubes, but there is difference in the frequency of required cleaning.

(2) One precaution must always be observed in cleaning vacuum tubes. Tubes that need cleaning should not be removed from their sockets. The danger of breakage is extremely great when tubes are removed and the scarcity of supplies makes it necessary to exercise every precaution. Be very careful when working with high-power tubes which have exposed plate caps.

(3) Cleaning involves removing dust and dirt from the envelopes. Use a clean, lint-free, dry rag, that is free of all substances or objects which may scratch the glass. If proper care is taken, plate caps may be cleaned by using a piece of No. 0000 sandpaper. The paper should be wrapped around the cap and gently slid along the surfaces of the cap. Excessive pressure is unnecessary. Do not grip the cap too tightly.

(4) When sockets are to be cleaned, and the contacts are accessible, fine sandpaper will remove corrosion, rust, or dirt.

23. Capacitors

The capacitors are mounted in various ways. One type of mounting uses two metal clamps which hook over the top of the capacitor case and are fastened to the chassis with screws. This type of mounting requires frequent inspection. Another type of mounting is the flange type. In this case, the capacitor has a flange on the mounting side with holes drilled in the flange and through the chassis upon which the capacitor is mounted by means of bolts or studs.

a. INSPECT (I). (1) The terminals of the capacitor must be inspected for corrosion and loose connections. The mounting assemblies of the capacitors should be carefully inspected to determine any loose mounting screws, studs, or brackets. Also inspect the leads to the capacitors for poor insulation. This condition is characterized by cracks and dry rot. The conductor connections at the terminals should be inspected for breakage and frayed insulation. Correct the frayed insulation by removing the loose strands. If too much bare wire is exposed cover it with friction tape.

(2) The case of each oil-filled capacitor should be thoroughly inspected for leaks, particularly if there are signs of oil. Whenever a capacitor is found to be leaking oil, it should be removed and replaced if replacement is available. Occasionally, a defective capacitor case may be found whose seams are improperly soldered and leaking oil. To leave such a capacitor in the circuit is not wise, but if a replacement is not available, locate the leak and resolder the seam. If the leak is resoldered from the outside, before an appreciable amount of oil has leaked out, the capacitor may be as good as it was originally.

b. TIGHTEN (T). Loose terminals, mountings, and connections on all the capacitors must be tightened. Be careful not to exert too much force in tightening. Avoid possible damage to the bushings.

c. CLEAN (C). The case of the capacitor, the insulating bushings, and the connections should be cleaned whenever they are found to be dirty, rusted, or corroded. The capacitor cases can usually be cleaned with a dry cloth, but if the deposit of dirt on these parts is hard to remove, the cloth may be moistened with some solvent such as carbon tetrachloride. The bushings should be carefully dried with a dry cloth after they are cleaned. Corroded connections should be sanded with fine sandpaper and properly tightened. If necessary, repaint any exposed surfaces of the cases.

24. Resistors

a. TYPES OF RESISTORS. Various types of resistors are used in Radio Equipment RC–184. The more common type used in this equipment is the metalized resistor molded in plastic. They are widely used where the heat dissipation factor is not great. Another type is the wire-wound resistor with a hard coating baked upon the resistance element.

b. CONNECTIONS. The connections to the various resistors are made in the same way. All are of the pigtail type, in which the conducting lead enters the body of the resistor.

c. INSPECT (I). The coating of the wire-wound resistors must be examined for cracks and chipping, especially at the ends. (See fig. 3.) Look for blistering and discoloration which indicates overheating on the bodies of all types of resistors. Look for arc pits. Inspect the leads, and all connections for corrosion, dirt, dust, and looseness. Look for broken strands in the connecting wire. Check for security of mountings. Do not attempt to move resistors with pigtail connections because there is danger of breaking the pigtail connection at the point where it enters the body of the resistor. Such defects cannot be repaired. Inspect the connections of the pigtail resistors for proper soldering.

d. TIGHTEN (T). All loose resistor connections and mountings are to be tightened. If the resistor is allowed to remain loose, vibration may break the connection or damage the body.

e. CLEAN (C). (1) All dirty or corroded connections of resistors should be cleaned with a brush or cloth dipped in carbon tetrachloride. Vitreous resistors must be kept clean to avoid flashover or leakage between the terminals. Resistors should be wiped with a dry cloth, but if a dirt deposit is hard to remove, use carbon tetrachloride on the cloth.

(2) Discolored resistors cannot be cleaned. Slight discoloration of the resistor body at the center is normal. However, excessive discoloration is indicative of overloading at some time prior to the inspection and is probably due to some circuit trouble which requires an analysis. Such analysis will be described in TM 11–1532 (when published).

(3) Resistors with pigtail connections should be cleaned with a small brush.

25. Fuses

a. GENERAL. (1) Fuses are small strips of metal with a low melting point. They are inserted in series with an electrical circuit to open the circuit when the amount of current in the circuit exceeds a prescribed value. (See fig. 3.) Such fuses serve to protect equipment against overload and damage. The type of fuse used in Radio Equipment RC–184 is nonrenewable, and when blown must be replaced in its entirety. Whenever a fuse blows, an effort should be made to discover the reason for the failure and to make corrections, if possible, before a new fuse is installed.

(2) Nonrenewable or one-time fuses (fig. 3) are to be thrown away when blown and replaced with good fuses. The holder and fuse can be unscrewed from its socket. Care must be taken to see that the contact surfaces of the fuse and socket are kept clean and tight.

b. INSPECT (I). The fuse caps are to be examined for evidence of burning, charring, or corrosion. Examine the fuse clips for tension, dirt, or loose connections.

c. TIGHTEN (T). All connections to the fuse clips must be resoldered if they are loose.

d. CLEAN (C). All fuse ends are to be cleaned, when needed, with fine sandpaper and wiped with a clean cloth. If a file is used to remove deep pits in fuse ends or contacts, always polish afterwards with fine sandpaper in order to leave a smooth contact surface. Finish by wiping with a clean cloth.

26. Bushings and Insulators

a. GENERAL. (1) Insulator bushings are used in the high-voltage circuits of the Radio Equipment RC–184, and are constructed of ceramic material with a highly glazed surface. Since an insulator is no better than its surface, deposits of fine substances upon the surface will materially reduce the insulation value of the bushing. It is important that bushings used in high-voltage circuits be inspected frequently.

(2) Insulating bushings are used in various ways; as supports for high-voltage tube sockets, as supports for high-voltage leads, and as supports for the voltage terminals of transformers and capacitors.

b. INSPECT (I). The physical condition of the insulator bushings should be inspected. Each bushing should be clean and without cracks or chips. It is possible for a highly glazed insulator to develop fine hairline surface cracks where moisture and dust accumulate and eventually form a leakage path for high-voltage flashover. Consequently, the surface of the bushings must be inspected to detect such cracks. When a defective bushing is found, replacement is necessary. As a rule, bushings are held in position with a hexagonal nut on a threaded conductor which passes through the bushing and is easily replaced. If replacement is impossible, the insulating bushings must be kept clean with carbon tetrachloride and inspected frequently. If it is difficult to see dust on a glazed surface, check by rubbing the finger across the bushing.

c. TIGHTEN (T). All loose bushings must be tightened. However, one precaution must be observed. Avoid forcing the nuts or screws too tightly. If too much pressure is exerted on the bushings they will be damaged. When a bushing with stud bolts screwed into threaded holes is loose and has stripped threads, replace the entire bushing.

d. CLEAN (C). Insulated bushings are easily cleaned with a clean dry cloth. To prevent destruction of the glazed finish, abrasive material should never be used. However, if a foreign deposit on the surface of the bushing is hard to remove, carbon tetrachloride may be used as a solvent. After the surface has been cleaned with the solvent, it should be carefully polished with a dry cloth. Otherwise the solvent will leave a deposit on the surface of the bushing which will impair the effectiveness of the bushing as a high-voltage insulator.

NOTE. Insulator bushings used in high-voltage systems are always carefully constructed, but sometimes one may be found with sharp points on the surface. This is a defective bushing and should be replaced as soon as possible.

27. Circuit Breakers and Switches

a. GENERAL. A number of switches of various types are used in Radio Equipment RC–184. Two of these are toggle switches and multiple-position switches. Only certain switches require preventive maintenance. The location of each of these switches is established during the discussion of preventive maintenance items explained in chapter 4.

b. INSPECT (I). (1) The mechanical operation of each switch is to be inspected. Look for signs of dirt or corrosion on the exposed elements of the switches during inspection. In some cases, it is necessary to examine visually the elements of the switch. In other cases the action can be checked by flipping the control knob or toggle switches and noting the freedom of movement as well as the amount of spring tension.

(2) Examine the gang switches (fig. 4) to see if they are properly lubricated and the contacts are clean. Since the inspection is visual do not pry the leaves of the switch apart. The contacts are silver-plated and do not easily corrode. The rotary member should make good contact with the stationary member, and as the former slides into the latter, a spreading of the stationary contact leaves should be seen.

c. TIGHTEN (T). Loose mountings and connections should be tightened.

d. CLEAN (C). Dirty switches should be cleaned with a stiff brush moistened in carbon tetrachloride and polished with a piece of cloth. Corroded connections may be cleaned with No. 0000 sandpaper.

e. LUBRICATE (L). The joints of all accessible switches should be oiled with petroleum jelly (vaseline or walscolube), only when necessary.

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28. Motors

a. GENERAL. The motors used in Radio Equipment RC–184 require certain preventive maintenance procedures whether used continuously or intermittently. These procedures must be applied if proper functioning and dependable performance is to be obtained. Three causes which contribute to faulty operation of such equipment are:

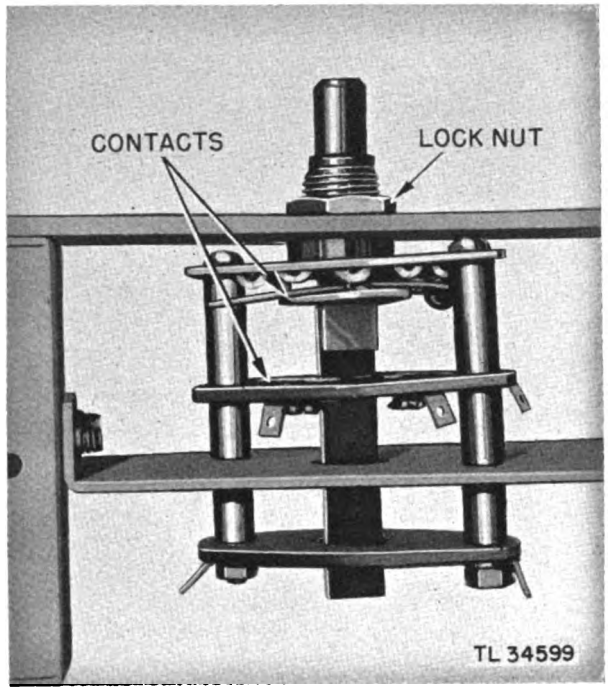

Figure 4. Gang switch.

(1) Accumulation of dirt, dust, or other foreign matter on the moving part of the equipment.

(2) Improper adjustment or imperfect condition of the moving part.

(3) Lack of lubrication on the moving parts requiring lubrication.

b. REASON FOR MAINTENANCE. Given proper care, the motors will give long service, but if neglected, they may fail when they are most needed. The instructions given below are intended to prevent or forestall such unexpected failures. However, it should be understood that the various maintenance techniques are not to be applied at random. They must be performed according to the schedule given, unless inspection indicates the necessity for certain routines before the schedule time.

c. FEEL (F). Feel the motor bearings and the motor housing to determine excessive rise in temperature. Normally the hand should be able to maintain contact with the motor bearing and the motor housing for a period of at least 5 seconds. Overheating of the housing generally indicates an overload of some type, and in most instances is due to mechanical binding or lack of lubrication. If time permits, the motor should be examined to determine the cause and if it cannot be remedied, replacement is necessary. Overheating of a bearing usually indicates the lack of proper lubrication. If this condition has not existed for too long a period, it may be possible to save the bearings by proper lubrication. In any event, when such a condition is found the person in charge should be notified so that the bearings can be lubricated immediately and a test run made to determine whether repair or replacement is necessary.

d. INSPECT (I). The motor exterior and other visible parts must be inspected for dirt and signs of mechanical looseness or defects. Where wires are exposed, inspect to see if all connections are tight, in good condition, and that the insulation is not frayed. Inspect the mounting for loose bolts. Wherever possible feel the coupling to see that it is tight on the shaft.

e. TIGHTEN (T). All loose connections or mountings must be tightened. If wires are out of place, return them to normal positions.

f. CLEAN (C). (1) Clean the exterior and the base of the motor with a clean cloth, but when necessary, moisten with a solvent such as carbon tetrachloride.

(2) Clean all equipment coupled to the motor.

g. LUBRICATE (L). (1) The blower motors in the rack should be oiled but all other motors are of the self-lubricating type.

(2) Lubrication of the blower motors cannot be accomplished without removing the motors from the rack. For this reason the lubrication of the blower motors will be explained in detail in TM 11–1532 (when published).

29. Transformers and Filter Chokes

a. GENERAL. In virtually every case a defective transformer or choke must be replaced, but certain preventive maintenance operations are applicable as measures of protection against failure to operate at inopportune times.

b. INSPECT (I). (1) All transformers and chokes should be checked for general cleanliness. Examine for tightness of connections, connecting lugs or terminals, mounting brackets, and rivets.

Dust, dirt, or moisture present between the terminals of high-voltage transformers or chokes located at high potential points in the circuit may cause flashover.

(2) Wax-impregnated transformers should be inspected for signs of overheating. The presence of insulating compound (wax) on the outside of the seams of the cases is a sign of overheating. Such evidence is indication of trouble and a system analysis must be made and will be explained in TM 11–1532 (when published).

c. CLEAN (C). The cases of the transformers and chokes should be cleaned with a dry cloth. To remove foreign matter it may be necessary to use carbon tetrachloride as a solvent. Corroded contacts or connections can be sandpapered and wiped clean. Corrosion at ground contacts must be removed and the connection resoldered. The transformer and chokes are inclosed and the connections are made on the under side of the chassis. Inspecting and cleaning the connections on these transformers and chokes does not need to be frequent.

d. TIGHTEN (T). All loose mounting screws or connections are to be tightened. The placement of the wires in these units is critical and they must not be disturbed. If it is necessary to remove these wires to tighten the mountings of parts, the positions of the wires must be noted on a tag before they are unsoldered so they can be restored to their original places.

30. Rheostats and Potentiometers

a. INSPECT (I). The mechanical operation of the rheostats and potentiometers must be checked. The arm should be keyed tightly to the shaft and the shaft should turn easily in the bushing which supports it. If the arm is loose on the shaft, inspect the ceramic bushing (in some types of rheostats) which holds the arm on the shaft to see if it is cracked or broken. Poor contact between the arm and the resistor winding is caused by insufficient tension in the arm. If the shaft is positioned by means of a compression spring, the spring should be inspected for breakage. Inspect the assembly and mounting screws, setscrews, and nuts. The insulating body of the rheostat should be examined for the presence of dirt, dust, cracks, or chipped places. All metallic parts should be inspected for dust, dirt, and corrosion.

b. TIGHTEN (T). All loose assembly or mounting screws are to be tightened. If the ceramic bushing is broken the rheostat should be replaced. Make sure the adjustment is reset to its original position.

c. CLEAN (C). The contact surface of wirewound resistance windings should be cleaned. The sliding contact, the body of the rheostat, of potentiometer, and the connections, are to be cleaned when found in a dirty or corroded condition. Remove the lubricant and dirt from the rheostat or potentiometer parts with carbon tetrachloride. Clean corroded surfaces of contacts with crocus cloth. Do this by inserting a strip of crocus cloth between the arm and the winding and draw the cloth back and forth.

d. ADJUST (A). The contact arm should be adjusted if it does not have sufficient tension to insure positive contact. Use a pair of long-nosed pliers to spring it slightly at the center in the direction in which increased tension is desired. Do not make a sharp bend at any one place. Work the pliers along the length of the contact arm and put a slight bow in its adjustment but be very careful not to damage the winding.

e. LUBRICATE (L). If it is difficult to turn the shaft in its bushing, place a drop or two of light machine oil on the shaft at each end of the bushing. After lubrication make sure the surrounding surfaces are cleaned with a dry cloth.

31. Terminal Strips

a. GENERAL. Terminal strips are used as distribution and connecting points for electrical circuits. (See fig. 5.) The simple construction consists of a strip of insulation with screw-type or soldered connections mounted on it.

b. INSPECT (I). The terminal strips must be checked for cracks, breakage, dirt, and loose connectors or mounting screws. Carefully examine the connections for mechanical defects, dirt, or corrosion.

c. TIGHTEN (T). All loose screws, lugs, and mounting bolts must be tightened. When tightening screws be sure to select the proper screw driver and do not exert too much pressure. Do not remove loose connections to clean them unless they are dirty or corroded.

d. CLEAN (C). The terminal strips must be cleaned with a dry brush when they are dusty or dirty. In extreme cases use a cloth moistened with carbon tetrachloride or some other solvent. Following such an operation the board must be thoroughly wiped with a cloth and then brushed to remove the lint.

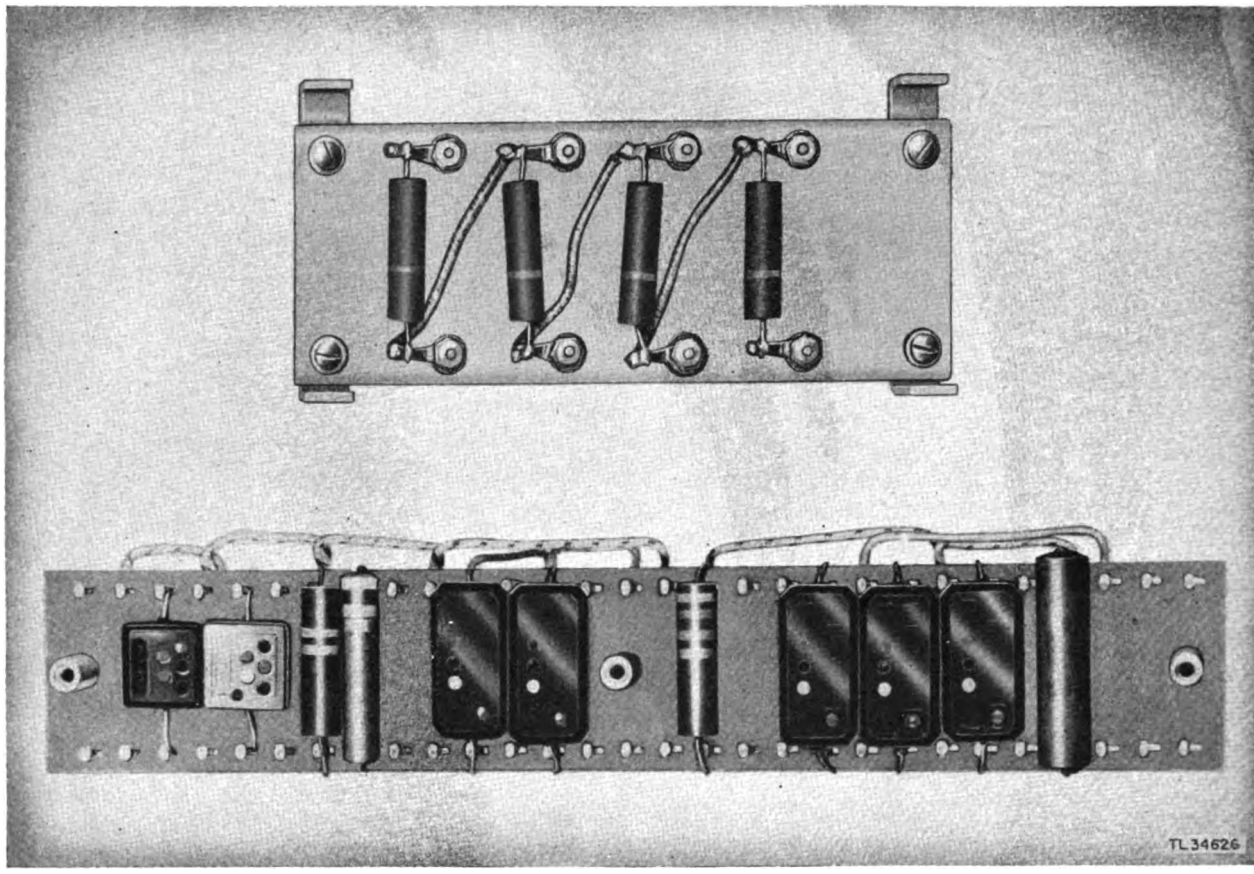

Figure 5. Terminal strips.

32. Cables and Plugs

a. GENERAL. The cables in Radio Equipment RC–184 are considered to be the life lines of the equipment and their condition must be carefully watched. (See fig. 25.)

b. INSPECT (I). (1) The cables are to be inspected for cracked or deteriorated insulation, frayed or cut insulation at the connections or support points, and improper placement which may subject the cables or connections to undue strain. Note the support of the cable. Make sure the cable is not kinked. Do not make sharp bends in the high-voltage cables when they are cold (below 0° F.).

(2) It is recommended that the following check on the cabling system be made periodically. Clamps or brackets that hold or support cables should be inspected for tightness. If they are firm and solid and cannot be moved, no further attention is required. Inspect the condition of conductors at the terminals. Examine the cables to make sure the lacing which supports the cables is not broken.

(3) Inspect the rigid coaxial lines used for transmission to see that they are properly mounted.

(4) Flexible coaxial lines should be inspected only for loose coupling rings and deteriorated insulation. They should be handled as little as possible and unless repairs are indicated by a visual inspection the connections should not be removed from the associated couplings.

c. TIGHTEN (T). All loose cable clamps, coupling rings, and cable connections must be tightened.

d. CLEAN (C). All dirty or corroded connections must be cleaned. The easiest way to clean them is to remove the connection and clean it with a brush dipped in carbon tetrachloride. Make sure that the connection is thoroughly dried with a dry cloth. Corroded connections are cleaned with No. 0000 sandpaper. It is important that the entire surface of the connections be kept clean but no attempt should be made to remove individual prongs from cable plugs.

33. Pilot Lights

a. GENERAL. Pilot lights are miniature lights used to indicate the application of power to a circuit or that a circuit is ready for power to be applied. The construction of pilot lights is simple and they can be removed or replaced easily. The bulb is an ordinary 6- to 8-volt miniature lamp. The maintenance of pilot lights presents no special difficulty but the following general notes are given for guidance.

b. INSPECT (I). The pilot light assemblies are examined for broken or cracked pilot-light shields, loose bulbs, bulbs with loose bases, loose mounting screws, and loose, dirty, or corroded connections.

c. TIGHTEN (T). Tighten loose mounting screws and resolder loose connections. If the connections are dirty or corroded they should be cleaned before soldering. Loose bulbs should be screwed tightly into their base or reseated, but in the case of a bayonet base they should not be twisted hard enough to break the glass bulb loose from the base. Broken or burned out pilot-light bulbs must be replaced as soon as possible. While it may appear difficult to remove the bulb the process is simple. Fold a small piece of friction tape over the top of the bulb and press against the two sides. After the tape is attached the bulb is turned and removed from the socket. Socket connections should be inspected while the bulb is out. A new bulb can be replaced with the fingers but if difficulty is experienced the above procedure may be used to replace it.

d. CLEAN (C). The pilot-light shields, the base assembly, and the glass of the bulb, where accessible, should be cleaned with a dry cloth. If the interior of the base has accumulated dust or dirt it can usually be removed with a small brush. Corroded sockets or connections are cleaned with a piece of cloth. Films of foreign material on the connections or the socket contacts may be removed with a piece of cloth or small brush dipped in carbon tetrachloride, after which, the clean surfaces should be polished with a dry cloth. Clean contacts and connections are important in pilot lights because of the low voltage at which they operate.

34. Chassis and Compartments

The rack which houses the various units of the equipment is an all metal construction. (See figs. 6 and 7.)

a. INSPECT (I). The outside and inside of the cabinet should be examined thoroughly paying strict attention to every detail associated with or mounted upon the shelves of the rack or chassis. Check the panel and door hinges, the ventilator mountings, and all mounting screws. Make sure the meter setting is at zero. Occasionally examine the fit of the pilot-light bulbs in their sockets. Check the pilot-light covers for cracks and breaks. Inspect the panels for loose mounts or switches. Inspect the guide rails for dents, rust, or corrosion.

b. CLEAN (C). The cabinet outside and inside should be cleaned with a clean dry cloth. Clean the glass of the meter and the control mounts with a clean cloth.

c. ADJUST (A). The zero setting of the meter should be adjusted if it is found to be incorrect. Always stand exactly in front of the meter when doing this to avoid any error caused by parallax as explained in TM 11–1332 (when published).

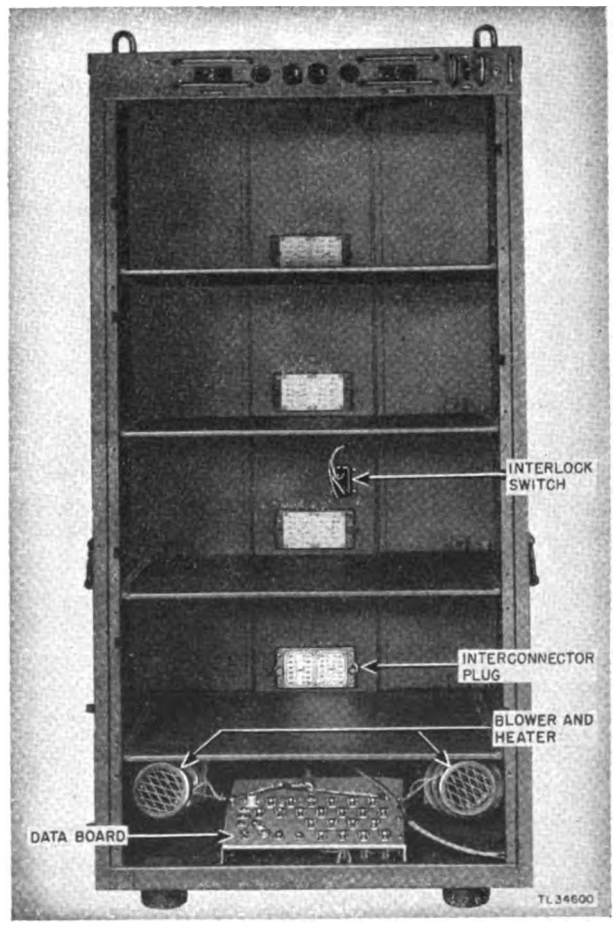

Figure 6. Rack FM–80—chassis removed.

CHAPTER 4

MAINTENANCE ITEMS

Section I. MAINTENANCE SCHEDULE

35. General

This chapter describes the maintenance schedule and presents detailed instructions on the maintenance items. Basically, the schedule indicates the when and what of the maintenance program; the item instructions state the where and the how.

36. Maintenance Schedule

a. The specific information supplied by the maintenance schedule is as follows:

(1) The name of the component on which maintenance work is to be done.

(2) The specific item (in the designated component) on which maintenance is to be completed.

(3) The day of the week the job is to be done.

(4) The number of times the work is done each month.

(5) Code letters (F, I, T, C, A, L) which specify the particular maintenance operations that are to be performed. F—Feel; I—Inspect; T—Tighten; C—Clean; A—Adjust; L—Lubricate.

(6) Code numbers identify the items. Items are numbered 1 to 130 inclusive. The complete maintenance schedule for all work is given on seven schedule sheets—one sheet for each day in the week.

b. Each schedule sheet consists of eight vertical columns. The first column in the schedule for each day gives the item number. The second column gives the code letter (F, I, T, C, A, L) of the maintenance operation to be performed; the third, the item title. Columns 4, 5, 6, 7, and 8 indicate the frequency at which the items are to be performed. For example, blank spaces across all five columns indicate that the particular item is to be performed once a week. Shaded spaces indicate the item that is not performed during the week shaded.

1	2	3	4	5	6	7	8
Item No.	Operations	Items	Maintenance to be done				
			First Thu	Second Thu	Third Thu	Fourth Thu	Fifth Thu
14	.....	Power Supply RA-105-A, preparatory steps					
17	I	Front of power supply chassis					
18	.....	Rack FM-80, preparatory steps					
15	FI	Top of power supply chassis	XXXX		XXXX		
16	I	Underside of power supply chassis	XXXX		XXXX		
19	I	Interior of Rack FM-80	XXXX	XXXX	XXXX	XXXX	

NOTE. Operating conditions, as shown by the Equipment Performance Log or other records, might indicate that certain maintenance operations should be performed more often than specified in the schedule. More frequent scheduling of items is left to the discretion of the person in charge.

37. Summary Schedule

In addition to the seven regular schedules, a summary schedule sheet is provided. This summary sheet shows at a glance the maintenance operations that are to be performed. It also indicates the frequency at which each item is to be completed. Maintenance items are divided into weekly, biweekly, monthly, quarterly, and semiannual groups, and are to be performed at the frequency indicated by this summary sheet. For example, items 4, 9,

13, 17, and 22 are done once a week and are listed on the summary sheet under "Weekly" items. The lubricate operations of items 21, 24, 25 are to be completed twice a year and are listed under "Semiannual" items.

38. Suggested Check Lists

Indicated below are several sample check lists which may be used by personnel at the radar set to keep a record of maintenance work completed. In making up lists of this type, the format indicated should be used. List all daily items in numerical sequence on the daily check sheet, all items on the weekly sheet, etc. The person performing the weekly maintenance places his initials in the space provided after he has completed the scheduled work. If maintenance is not completed when it is scheduled, appropriate remarks should be entered on the reverse side of the check sheet.

SUGGESTED CHECK LISTS

WEEKLY CHECK LIST FOR 1 MONTH

Item No.	Operation	Description of item	Echelon	1st wk.	2nd wk.	3rd wk.	4th wk.	5th wk.
4	I	Front panel of control unit						
9	I	Front panel of indicator unit						
13	ITA	Front panel of transmitter and receiver unit						

BIWEEKLY CHECK LIST FOR 2 MONTHS

Item No.	Operation	Description of item	Echelon	1st wk.	2nd wk.	3rd wk.	4th wk.
2	I	Top of control chassis					
3	I	Under side of control chassis					
7	I	Top of indicator chassis					

MONTHLY CHECK LIST FOR 6 MONTHS

Item No.	Operation	Description of item	Echelon	1st mo.	2nd mo.	3rd mo.	4th mo.	5th mo.	6th mo.
5	I	Range control assembly							
21	IC	Blower motors and heaters							
27	L	Antenna frame and junction box door hinges							

QUARTERLY CHECK LIST FOR 1 YEAR

Item No.	Operation	Description of item	Echelon	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
5	I	Range control assembly					
19	I	Interior of Rack FM–90					
23	I	Wiring channel					

SEMIANNUAL CHECK LIST FOR 2 YEARS

Item No.	Operation	Description of item	Echelon	1st 6 Mo.	2nd 6 Mo.	3rd 6 Mo.	4th 6 Mo.
21	L	Blower motors					
24	L	Operator's chair					
25	L	Signal Generator I–222–A					

SUMMARY SCHEDULE SHEET

1	2	3	4
Item No.	Operations	Description of item	Echelon
		Weekly items	
4	I	Front panel of control unit	
9	I	Front panel of indicator unit	
13	ITA	Front panel of transmitter and receiver unit	
17	I	Front panel of power supply unit	
22	IC	Air filter (varies with climatic conditions)	
		Biweekly items	
2	I	Top of control chassis	
3	I	Under side of control chassis	
7	I	Top of indicator chassis	
8	I	Under side of indicator chassis	
11	I	Top of receiver and transmitter chassis	
12	I	Under side of receiver and transmitter chassis	
15	FI	Top of power supply chassis	
16	I	Under side of power supply chassis	
20	I	Data board	
28	L	Tower azimuth indicator dial fittings	
		Monthly items	
5	I	Range control assembly	
21	IC	Blower motors and heaters	
27	L	Antenna frame and junction box door hinges	
28	FI	Tower TR–24A	
28	L	Gear box	
		Quarterly items	
5	L	Range control assembly	
19	I	Interior of Rack FM–80	
23	I	Wiring channel	
24	I	Cables, foot switch, operator's chair	
25	I	Test equipment	
27	I	Antenna AN–154A	
28	L	All other grease fittings	
		Semiannual items	
21	L	Blower motors	
24	L	Operator's chair	
25	L	Signal Generator I–222–A	

SCHEDULE FOR SUNDAY

1	2	3	4	5	6	7	8
			Maintenance to be done				
Item No.	Operations	Items	First Sun.	Second Sun.	Third Sun.	Fourth Sun.	Fifth Sun.
26	.....	Antenna assembly, preparatory steps	XXXXXX	.....	.....	.....	.....
28	L	Tower azimuth indicator dial fittings	XXXXXX	.....	XXXXXX	.....	.....
28	FI	Tower TR–24–A	XXXXXX	XXXXXX	XXXXXX	.....	XXXXXX
28	L	The gear box	XXXXXX	XXXXXX	XXXXXX	.....	XXXXXX
28	L	Jack screws and jack struts	XXXXXX	XXXXXX	XXXXXX	XXXXXX	.....
28	L	All other grease fittings. (Once every 3 months)	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX

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SCHEDULE FOR MONDAY

1	2	3	4	5	6	7	8
Item No.	Operations	Items	Maintenance to be done				
			First Mon.	Second Mon.	Third Mon.	Fourth Mon.	Fifth Mon.
1	.....	Control Unit BC–1268–A, preparatory steps					
4	I	Front of control unit chassis					
2	I	Top of control unit chassis		XXXXXX		XXXXXX	
3	I	Under side of control unit chassis		XXXXXX		XXXXXX	
5	I	Range control drive mechanism	XXXXXX	XXXXXX		XXXXXX	
5	L	Range control drive mechanism	XXXXXX	XXXXXX	XXXXXX	XXXXXX	

SCHEDULE FOR TUESDAY

1	2	3	4	5	6	7	8
Item No.	Operations	Items	Maintenance to be done				
			First Tues.	Second Tues.	Third Tues.	Fourth Tues.	Fifth Tues.
6	.....	Indicator I–221–A, preparatory steps					
9	I	Front panel of indicator					
7	I	Top of indicator chassis	XXXXXX		XXXXXX		
8	I	Under side of indicator chassis	XXXXXX		XXXXXX		

SCHEDULE FOR WEDNESDAY

1	2	3	4	5	6	7	8
Item No.	Operations	Items	Maintenance to be done				
			First Wed.	Second Wed.	Third Wed.	Fourth Wed.	Fifth Wed.
10	.....	Receiver and Transmitter BC–1267–A, preparatory steps					
13	ITA	Front of receiver and transmitter chassis					
11	I	Top of receiver and transmitter chassis		XXXXXX		XXXXXX	
12	I	Under side of receiver and transmitter chassis		XXXXXX		XXXXXX	

SCHEDULE FOR THURSDAY

1	2	3	4	5	6	7	8
Item No.	Operations	Items	Maintenance to be done				
			First Thu	Second Thu	Third Thu	Fourth Thu	Fifth Thu
14	.....	Power Supply RA–105–A, preparatory steps	.....	.....	.....	.....	.....
17	I	Front of power supply chassis	.....	.....	.....	.....	.....
18	.....	Rack FM–80, preparatory steps	.....	.....	.....	.....	.....
15	FI	Top of power supply chassis	XXXXXX	.....	XXXXXX	.....	.....
16	I	Under side of power supply chassis	XXXXXX	.....	XXXXXX	.....	.....
19	I	Interior of Rack FM–80	XXXXXX	XXXXXX	XXXXXX	XXXXXX	.....

SCHEDULE FOR FRIDAY

1	2	3	4	5	6	7	8
Item No.	Operations	Items	Maintenance to be done				
			First Fri.	Second Fri.	Third Fri.	Fourth Fri.	Fifth Fri.
18	.....	Rack FM–80, preparatory steps	.....	.....	.....	.....	.....
20	I	Data board	.....	XXXXXX	.....	XXXXXX	.....
21	IC	Blower motors and heaters	.....	XXXXXX	XXXXXX	XXXXXX	XXXXXX
23	I	Wiring channel	XXXXXX	XXXXXX	XXXXXX	XXXXXX	.....
21	L	Blower motors. (Once every 6 months)	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
22	IC	Air filter. (Varies with climatic conditions)	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX

SCHEDULE FOR SATURDAY

1	2	3	4	5	6	7	8
Item No.	Operations	Items	Maintenance to be done				
			First Sat.	Second Sat.	Third Sat.	Fourth Sat.	Fifth Sat.
26	.....	Antenna assembly, preparatory steps	XXXXXX	XXXXXX	XXXXXX	.....	.....
27	I	Antenna AN–154–A	XXXXXX	XXXXXX	XXXXXX	XXXXXX	.....
27	L	Antenna frame and junction box door hinge	XXXXXX	XXXXXX	XXXXXX	.....	XXXXXX
24	I	Cables, foot switch, operator's chair	XXXXXX	XXXXXX	XXXXXX	XXXXXX	.....
24	L	Operator's chair. (Once every 6 months)	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
25	I	Test equipment	XXXXXX	XXXXXX	XXXXXX	XXXXXX	.....
25	L	Signal Generator I–222–A. (Once every 6 months)	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX

F I T C A L

FEEL INSPECT TIGHTEN CLEAN ADJUST LUBRICATE

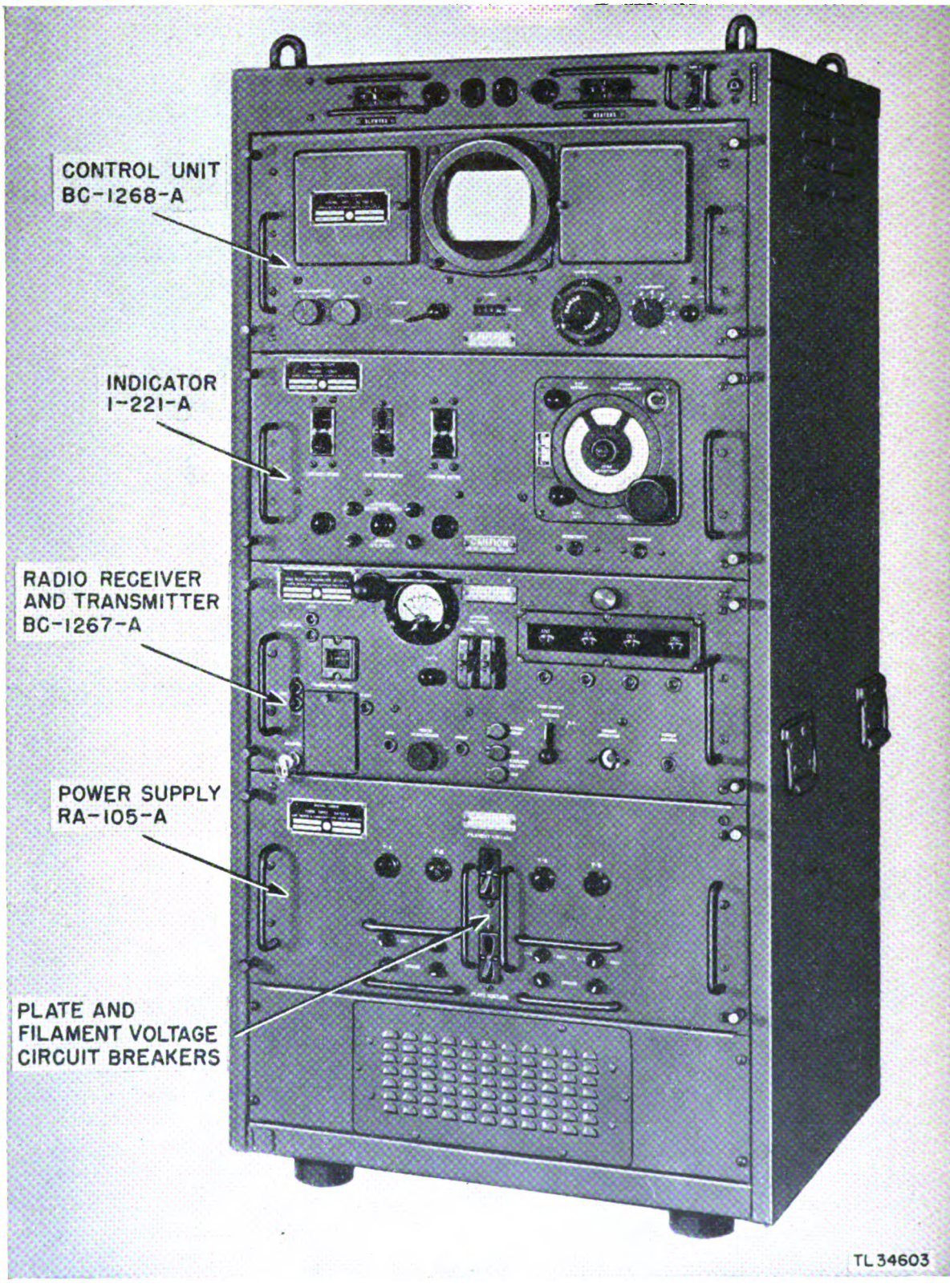

Figure 7. Radio Equipment RC-184—front view.

Section II. CONTROL UNIT BC–1268–A

39. Item 1, Preparatory Steps

a. Tools and Materials Needed.

(1) Cleaning fluid, carbon tetrachloride.

(2) Cloth, dry, clean.

(3) Grease, lubricating special, Specification No. AXS–637.

(4) Lamp and extension cord.

(5) Pliers.

(6) Sandpaper.

(7) Screw driver.

(8) Soldering iron and solder.

(9) Wrench, Allen.

(10) Wrench, open-end.

(11) Wrench, socket.

b. Safety Precautions. FAILURE TO OBSERVE THE FOLLOWING WARNINGS MAY RESULT IN SERIOUS INJURY OR DEATH:

(1) Remove all power from the control unit by throwing the PLATE VOLTAGE and FILAMENT VOLTAGE circuit brakers to their OFF position. (See figs. 7 and 21.)

(2) Be careful not to strike the cathode-ray tube when the escutcheon is removed. This high vacuum tube will shatter easily and may shower glass dangerously.

(3) Avoid contact with the hot glass of the tubes for at least 10 minutes after the power has been turned OFF.

c. Equipment Cautions. (1) Handle the vacuum tubes carefully.

(2) Use the proper tools. The use of the proper tool for each operation will insure optimum results from the tools involved and the parts concerned.

(3) Tag all terminals when removing a part for cleaning, adjustment, repair, or replacement. Tag the terminals of the part as well as each of the cables or wires removed. This operation requires but little time, and serious trouble caused by incorrect reconnections is avoided.

(4) When removing parts, place every screw, washer, bolt, or small part into a small container to avoid losing them.

(5) Use care in handling the tools and parts within the unit. Be careful not to drop any part in the unit.

(6) Never use water for cleaning anything within the unit. The only cleaning agent to be used is carbon tetrachloride.

(7) Make sure that every terminal disconnected for inspection is properly and carefully reconnected. Tighten all nuts and screws securely. Be careful however, not to exert too much force and strip threads or ruin connections.

(8) Resistors and capacitors with pigtail connections must be handled carefully to avoid breaking off the fragile connections.

d. Location (figs. 7 and 11).

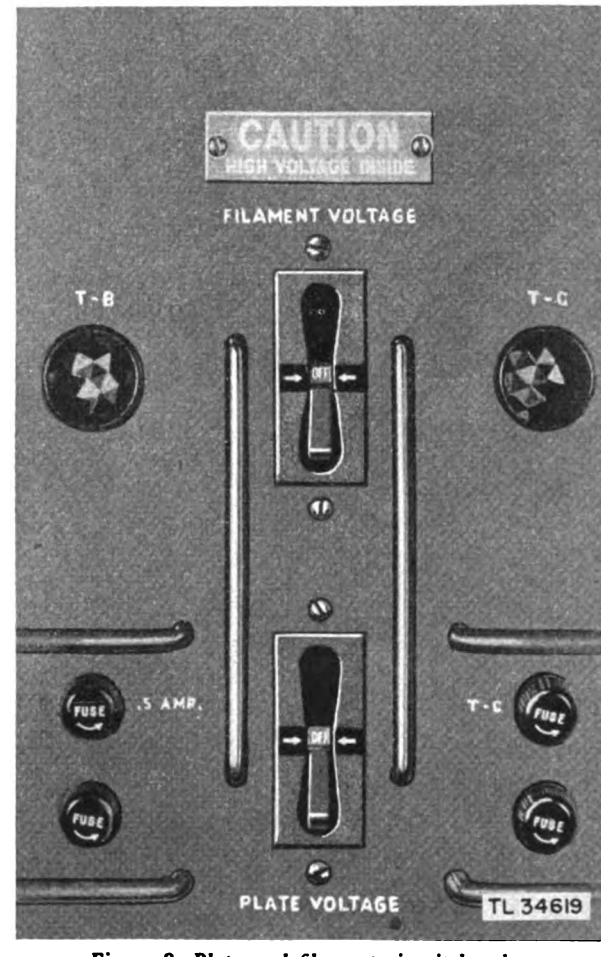

Figure 8. Plate and filament circuit breakers.

e. Maintenance Procedure. To permit access to the control unit chassis:

(1) Remove all plugs from the jacket on the front panel. Close the doors and tighten the captive screws to keep the doors from swinging as the position of the control unit is changed.

(2) Loosen the four captive screws which hold the unit in place, making sure they are free of the rack bushings, but do not remove them from the panel.

(3) Firmly grasp the two handles and pull sharply straight forward to disengage the plug contacts at the rear of the chassis. After a motion of about 1 inch, the contacts are completely disengaged and the unit slides easily from the rack.

(4) Set the control unit on its side. Do not set the unit on its back or the acetate schematic and legend may be damaged.

(5) The various parts within the chassis of the control unit are now accessible for maintenance.

40. Item 2, Top of Control Unit Chassis

a. LOCATION (fig. 9).

b. MAINTENANCE PROCEDURE.

I. INSPECT.

(1) The tube envelopes for cleanliness.

(2) The socket-mounting screws for tightness.

(3) The cathode-ray tube for—

(*a*) Cleanliness of shield.

(*b*) Tightness of shield mountings.

(*c*) Tightness of retaining-ring screws.

(4) The scope socket for tightness of mounting and proper seating of base.

(5) The cases of the capacitors for general condition.

(6) The mounting clamp of capacitors for tightness.

(7) The PHASE control switch for proper soldering of connecting leads.

NOTE. Do not attempt to adjust the screw driver control.

(8) The two SYNCHRONIZING switches for—

(*a*) Mechanical operation of the toggle switches.

(*b*) Proper soldering of connecting leads. If access is difficult, examine visually.

(9) The case of timing coil and blocking-oscillator transformer for cleanliness. The case of timing coil for tightness of mounting nuts.

(10) All potentiometers for—

(*a*) Cleanliness of case.

(*b*) Proper soldering of connecting leads.

(11) The FOCUS control of potentiometer for—

(*a*) Mechanical operation.

(*b*) Cleanliness of coupling and coupling shaft.

(*c*) Tightness of coupling assembly (setscrews).

(*d*) Condition of insulating material of coupling for cracks.

(*e*) Proper soldering of connecting leads.

(*f*) General condition of insulating material of mounting.

(12) RANGE control potentiometer for—

(*a*) Cleanliness of case.

(*b*) Tightness of mounting.

(13) Jacks for—

(*a*) Cleanliness.

(*b*) Proper soldering of connections.

(14) The top and sides of chassis frame for cleanliness and the assembly bolts for tightness.

REFERENCES.

Page	(	)	(	)	(	)	(	)
Paragraph	(	)	(	)	(	)	(	)
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41. Item 3, Under Side of Control Unit Chassis

a. LOCATION (fig. 10).

b. MAINTENANCE PROCEDURE. Remove the high voltage plates.

I. INSPECT.

(1) The tube sockets for—

(*a*) General condition.

(*b*) Proper soldering of connecting leads.

(*c*) Tightness of mountings.

(2) Capacitor 22 for—

(*a*) Cleanliness of case and general condition. Look for cracks.

(*b*) Tightness of mountings.

(*c*) Tightness of connections.

(*d*) Proper soldering of connecting leads to capacitor lugs.

(3) Tuning capacitor 12 for cleanliness—

(*a*) Clean by blowing on it only.

(*b*) Tightness of mounting.

(*c*) Proper soldering of connections.

(4) Oil-filled paper capacitors for—

(*a*) Cleanliness of case.

(*b*) Tightness of mounting.

(*c*) Proper soldering of connections.

(5) The ceramic capacitor for—

(*a*) Cleanliness.

(*b*) Mounting.

(*c*) Proper soldering of connections.

(6) The high-voltage bushing of terminals of the capacitor 23 for—

(*a*) Tightness of mountings.

(*b*) Tightness of connections.

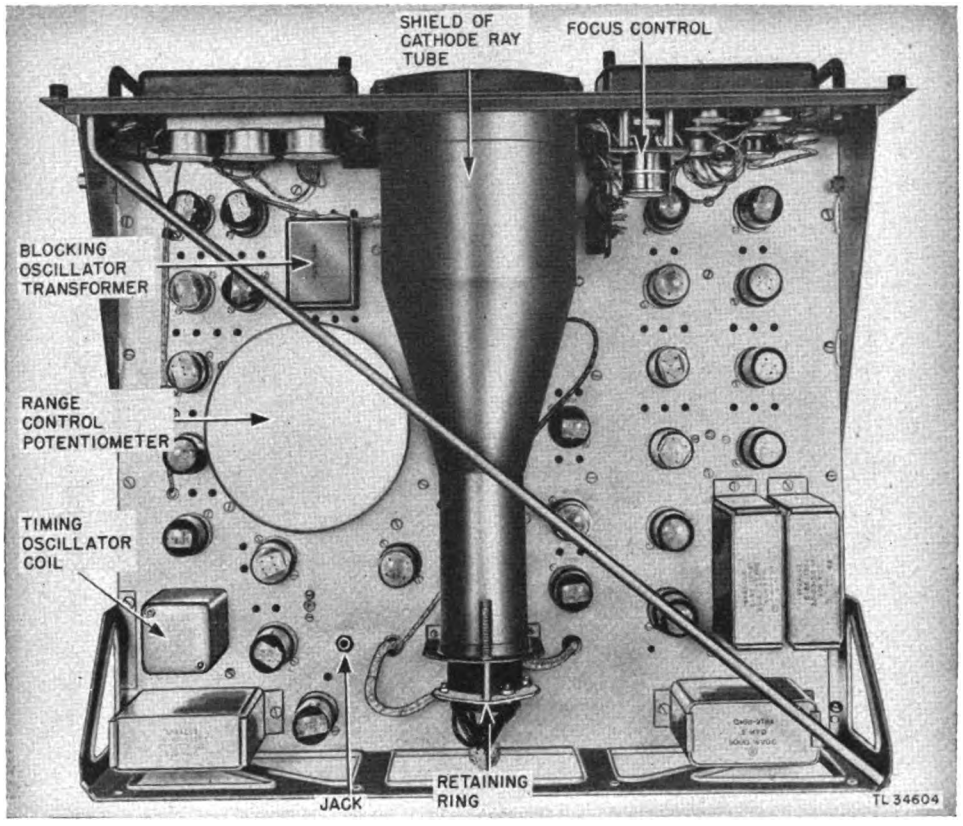

Figure 9. Control unit—top view.

(*c*) Proper soldering of connecting leads to capacitor lugs.

(*d*) High-voltage bushings for general condition.

(7) The resistors and capacitors with pigtail connections for—

(*a*) Cleanliness.

(*b*) Proper soldering of connections.

(8) The high-wattage resistors for—

(*a*) General condition of coating. Where accessible examine for cracks, excessive discoloration, and excessive chipping. Make sure that the windings of the resistors are not exposed.

(*b*) Tightness of mounting screws and brackets.

(*c*) Proper soldering of connecting leads.

(9) The precision resistors for—

(*a*) Tightness of mounting.

(*b*) Excessive discoloration of coating.

(10) The ceramic high-voltage terminal strip and all standoff insulators for general condition. Make sure the mountings are secure.

(11) The STANDBY OPERATE switch and SWEEP RANGE switch for—

(*a*) Mechanical operation.

(*b*) Condition of insulating material.

(*c*) Tightness of mounting locknuts.

(*d*) Proper soldering of connecting leads.

(12) Timing coil and blocking-oscillator transformer.

(*a*) Proper soldering of leads.

(*b*) Tightness of mounting.

(13) All potentiometers for—

(*a*) Mechanical operation.

(*b*) Cleanliness of cases.

(*c*) Tightness of mounting locknuts.

(*d*) Proper soldering of connecting leads.

(14) The terminal strips for—

(*a*) General condition.

(*b*) Secure mounting of parts.

(15) The cables and leads for general condition.

(16) Interconnector plug—

(*a*) For tightness of mounting.

(*b*) Proper soldering.

(*c*) Tightness and soldering of ground straps.

(*d*) Multiple prongs for proper play.

(17) The bottom of chassis frame for cleanliness and the assembly bolts for tightness.

REFERENCES.

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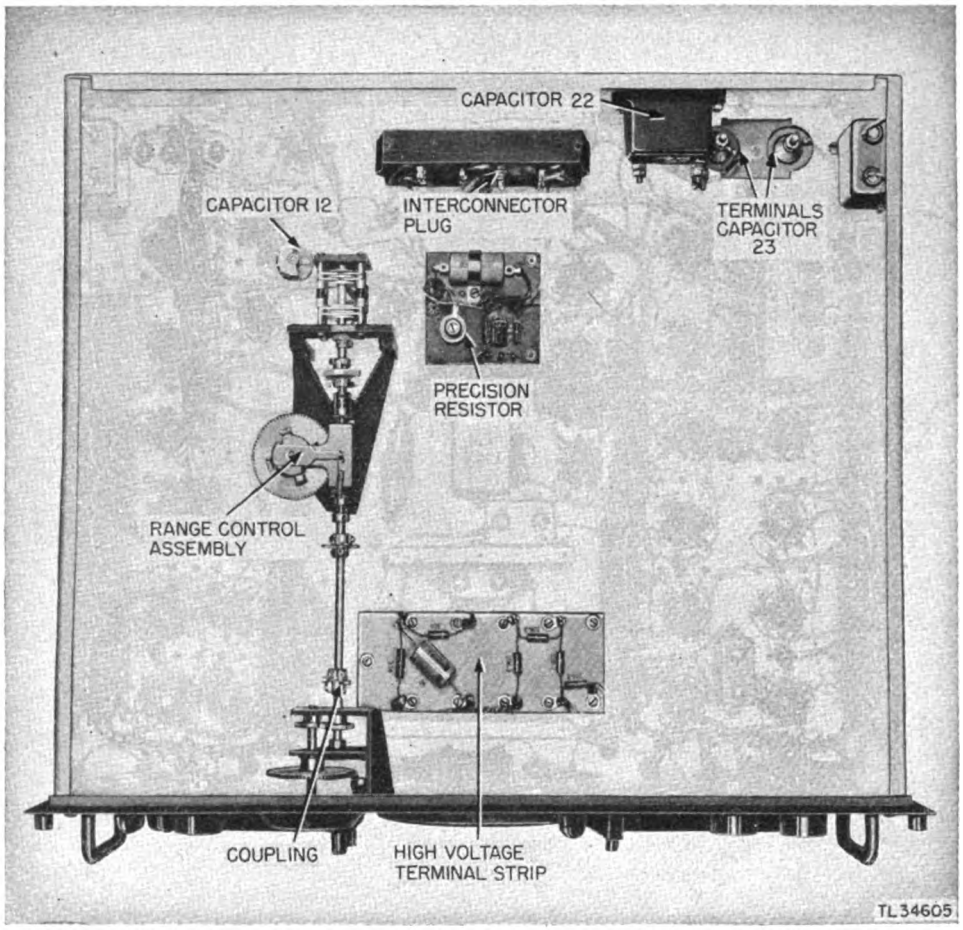

Figure 10. Control unit—bottom view.

42. Item 4, Front Panel of Control Unit

a. LOCATION (fig. 11).

b. MAINTENANCE PROCEDURE.

I. INSPECT.

(1) The plastic crystal faces of the scope for cleanliness. Remove front cover of scope by loosening the knurled knobs.

(2) The setscrews of the potentiometers and switch knobs for tightness.

(3) The locknuts of the adjustment potentiometer for tightness.

(4) The control panels and hinges for cleanliness. Open the panels and make sure the hinges move freely.

(5) The STANDBY OPERATE and SWEEP RANGE switches and all potentiometers with knobs for mechanical operation and tightness of locknut.

REFERENCES.

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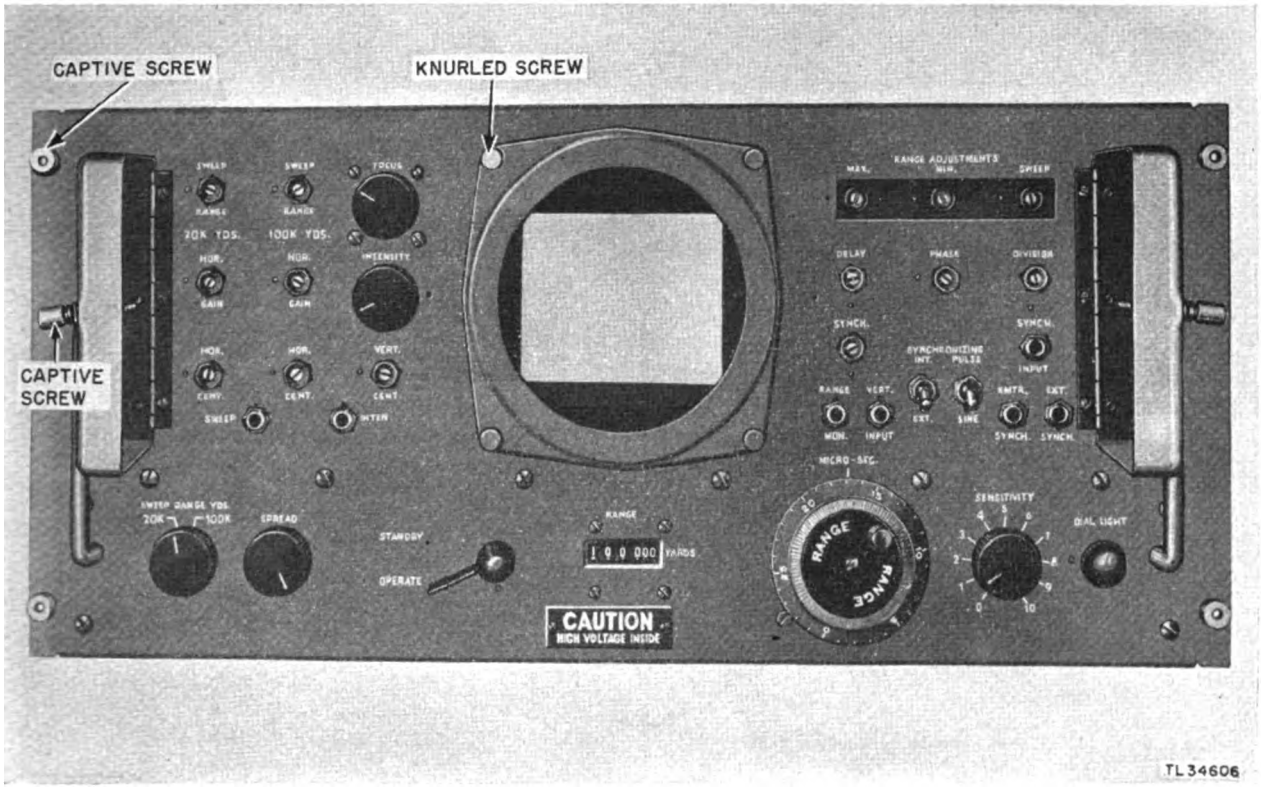

Figure 11. Control unit—front panel.

43. Item 5, Range Control Assembly

a. LOCATION (figs. 10 and 12).

b. MAINTENANCE PROCEDURE.

I. INSPECT.

(1) The gears for—

(*a*) Tightness of setscrews.

(*b*) Proper mounting.

(2) Couplings for—

(*a*) Tightness of setscrews.

(*b*) Cleanliness of shafts and coupling.

(*c*) Insulation. Look for cracks and chipping.

(3) The variable capacitors for—

(*a*) Cleanliness. Blow out only.

(*b*) Proper mounting, tightness of locknut.

(*c*) Proper soldering of connections.

(*d*) General condition of insulating material.

(4) Range control for—

(*a*) Over-all mechanical operation, including the range counter.

(*b*) Tightness of mounting of range counter.

L. LUBRICATE: The range control drive mechanism at the points *G* as indicated in figure 12. Use a small amount of grease, lubricating, special, Specification No. AXS–637.

REFERENCES.

Page	(	)	(	)	(	)	(	)
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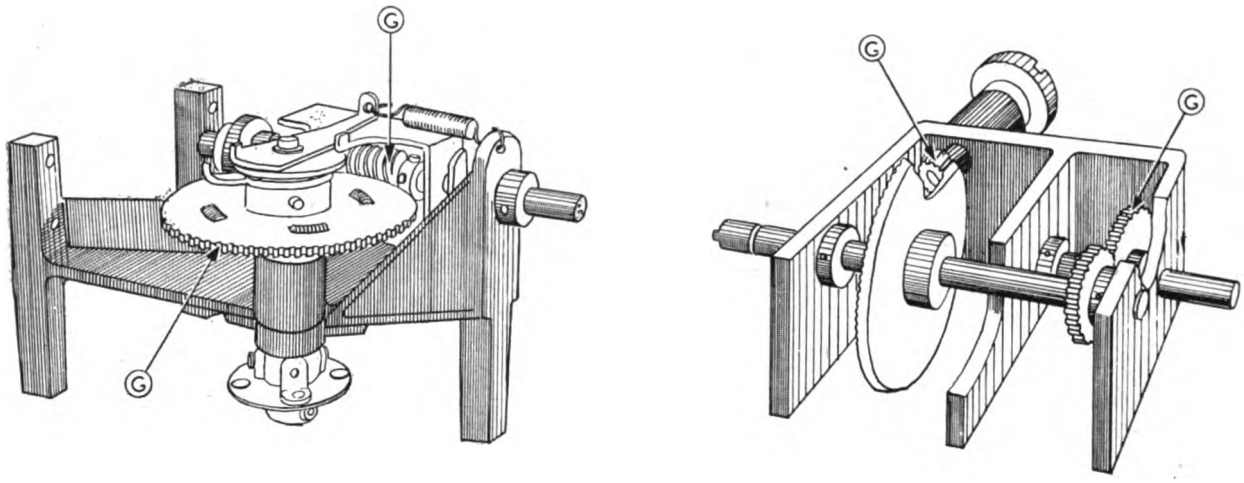

Figure 12. Lubrication points of range control drive mechanism.

Section III. INDICATOR I–221–A

44. Item 6, Preparatory Steps

a. Tools and Materials Needed.

(1) Cleaning fluid, carbon tetrachloride.
(2) Cloth, dry, clean.
(3) Lamp and extension cord.
(4) Pliers.
(5) Sandpaper.
(6) Screw driver.
(7) Soldering iron and solder.
(8) Wrench, Allen.
(9) Wrench, open-end.
(10) Wrench, socket.

b. Safety Precautions. FAILURE TO OBSERVE THE FOLLOWING WARNINGS MAY RESULT IN SERIOUS INJURY OR DEATH.

(1) Be sure that all power is removed from the indicator by throwing the FILAMENT VOLTAGE and PLATE VOLTAGE circuit breaker to their OFF positions. (See figs. 7, 8, and 21.)

(2) After the receiver chassis has been removed to the work bench, short circuit all capacitors whose terminals rest on insulated bushings. Use an insulated screw driver.

(3) Avoid contact with the hot glass of the tubes for at least 10 minutes after the power has been turned off.

(4) Avoid contact with the hot surface of the high-wattage resistor 8 for at least 10 minutes after the power has been turned off. (See fig. 14.)

c. Equipment Cautions. (1) Handle the vacuum tubes carefully.

(2) Use the proper tools. The use of the proper tool for each operation will insure optimum results from the tools involved and the parts concerned.

(3) Tag all terminals when removing a part for cleaning, adjustment, repair, or replacement. Tag the terminals of the part as well as each of the cables or wires removed. This operation requires but little time and serious trouble by incorrect reconnections is avoided.

(4) When removing parts, place every screw, washer, bolt, or small part into a small container to avoid losing them.

(5) Use care in handling the tools and parts within the unit. Be careful not to drop any part in the unit.

(6) Never use water for cleaning anything within the unit. The only cleaning agent which may be used is carbon tetrachloride.

(7) Make sure that every terminal disconnected for inspection is properly and carefully reconnected. Tighten all nuts and screws securely. Be careful however, not to exert too much force and strip threads or ruin the connections.

(8) Handle resistors and capacitors with pigtail connections carefully to avoid breaking off the fragile connections.

d. LOCATION (fig. 7.)

e. MAINTENANCE PROCEDURE. (1) To permit access to the indicator chassis—

(*a*) Loosen the four captive screws which hold the unit in place.

(*b*) Grasp the handles provided.

(*c*) Pull the chassis out by sliding it carefully along its guide rails.

NOTE. The unit weighs 110 pounds. Two men should be employed to remove it.

(*d*) Place unit on work bench.

Warning: Avoid contact with the high-voltage capacitors within the unit until their terminals have been properly short-circuited. Do not stand unit on back end of chassis to avoid breaking acetate plates loose.

(2) The various parts within the chassis of the indicator unit are now accessible for maintenance.

45. Item 7, Top of Indicator Chassis

a. LOCATION (fig. 13).

b. MAINTENANCE PROCEDURE.

I. INSPECT.

(1) The tube envelopes for cleanliness. Tuning eye tube may be removed from clips for cleaning. Check clips for cleanliness.

(2) Check clamps of VT–215 for tightness of mounting.

(3) Tube VT–218 for—

(*a*) Condition of cap and clip.

(*b*) Condition of insulation of cap.

(*c*) Proper soldering of connections within the tube cap and clip.

(*d*) Condition of insulated lead.

(*e*) Cleanliness.

(4) The cases of the capacitors for general condition.

(5) The antenna reversing switch 122 (fig. 13) for mechanical operation and tightness.

(6) The terminal strips for—

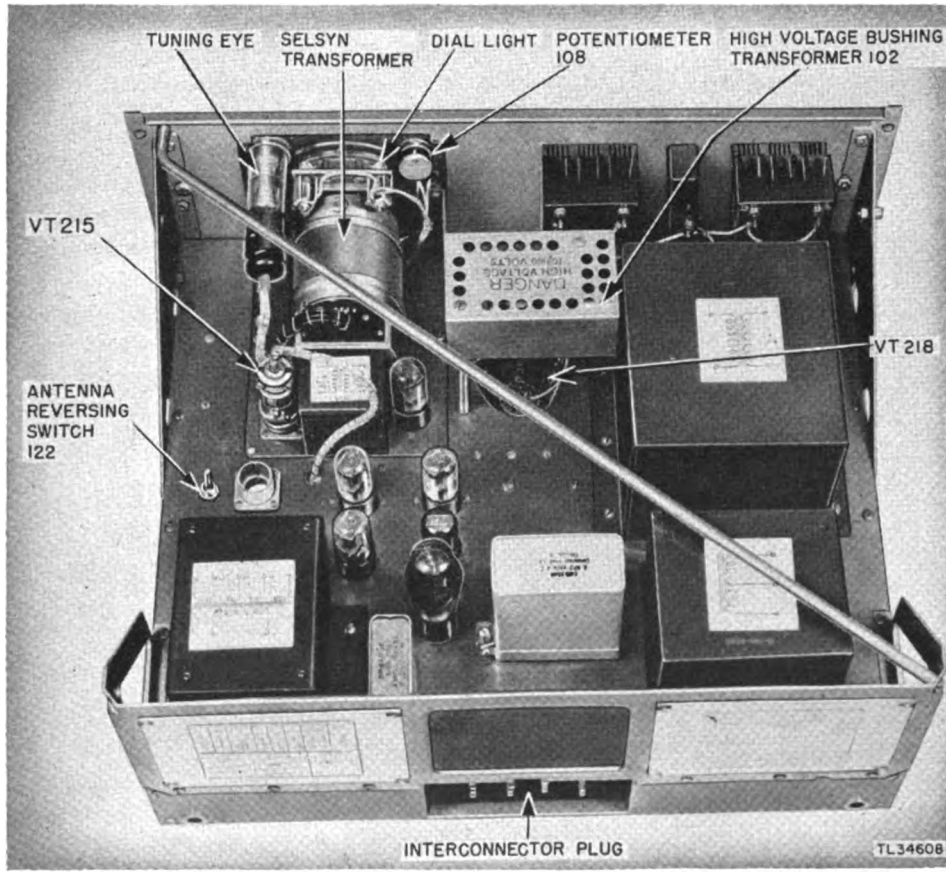

Figure 13. Indicator chassis—top view.

(*a*) General condition.
(*b*) Secure mounting of parts.
(7) The interconnector plug block 111 and 112 (fig. 13) for—
(*a*) Cleanliness of contacts.
(*b*) Tightness of mounting.
(*c*) General condition of insulating material.
(*d*) Condition of connecting plug.
(8) The three circuit breakers for—
(*a*) Condition of cases and mechanical operation.
(*b*) Tightness of connecting leads.
(*c*) Proper soldering of connecting leads to lugs.
(9) The transformer 102 for—
(*a*) Cleanliness of high voltage bushing.
(*b*) Tightness of connecting lead.
(*c*) Cleanliness and proper soldering of connecting leads.
(10) The cases of all transformers for general condition.
(11) Potentiometer 108 for—
(*a*) Tightness of mounting.
(*b*) Cleanliness and proper soldering of connecting leads.
(12) Dial lights 120–1 and 120–2 for—
(*a*) Tightness and cleanliness of connections.
(*b*) Proper soldering of connecting leads.
(13) Selsyn transformer for dust and tightness of mounting.
(14) The cables and leads for general condition.
(15) The top of chassis frame for cleanliness and assembly bolts for tightness.

REFERENCES.

Page	(	)	(	)	(	)	(	)
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46. Item 8, Under Side of Indicator Chassis

a. Location (fig. 14).
b. Maintenance Procedure.

I. INSPECT.
(1) The tube sockets for—
(*a*) General condition.
(*b*) Proper soldering of connecting leads.
(*c*) Tightness of mountings.
(2) The capacitors for—
(*a*) Condition of insulated bushings.
(*b*) Tightness of mounting.
(*c*) Tightness of connections.
(*d*) Proper soldering of connecting leads to capacitor lugs.
(3) The resistors and capacitors with pigtail connections (fig. 3) for—
(*a*) Cleanliness.
(*b*) Proper soldering of connections.
(4) The high-wattage resistor 8 (fig. 14) for—
(*a*) General condition of coating.
(*b*) Proper soldering of connecting leads.
(5) The fuse holders (fig. 14) for—
(*a*) Cleanliness.
(*b*) Tightness of locknut mounting.
(*c*) Proper soldering of connections.
(*d*) Fuses in the spare holders.
(6) The bushings of transformers 101, 102, 103, 104, and capacitor 55 for—
(*a*) Tightness of mounting nuts.
(*b*) Tightness and cleanliness of connecting leads.
(*c*) Proper soldering of connecting leads to the lugs.
(7) The antenna reversing toggle switch 122 (fig. 14) for—
(*a*) Cleanliness of case.
(*b*) Proper soldering of connections.
(8) The SENSITIVITY and CENTERING controls 106 and 107 for—
(*a*) Tightness of mounting.
(*b*) Cleanliness of case.
(*c*) Proper soldering of connecting leads.
(9) Indicator lights for—
(*a*) Tightness of mounting and sockets.
(*b*) Cleanliness and proper soldering of all connecting leads. Gears on azimuth dial knob for tightness.
(10) Reversing relay 110 (fig. 14) for—
(*a*) Tightness of mounting.
(*b*) Proper soldering of all connecting wires.
(11) Remove cover from the interconnecting receptacle and inspect for—
(*a*) Cleanliness of receptacle.
(*b*) Proper soldering of connecting wires.
(*c*) Prongs for dirt and physical condition.
(12) The terminal strips (fig. 5) for—
(*a*) Tightness of mounting.
(*b*) Proper soldering of connections.
(13) The cables and leads for general condition.
(14) The ground connections for security of fastening to chassis.
(15) All connecting leads to the ground connections for proper soldering.

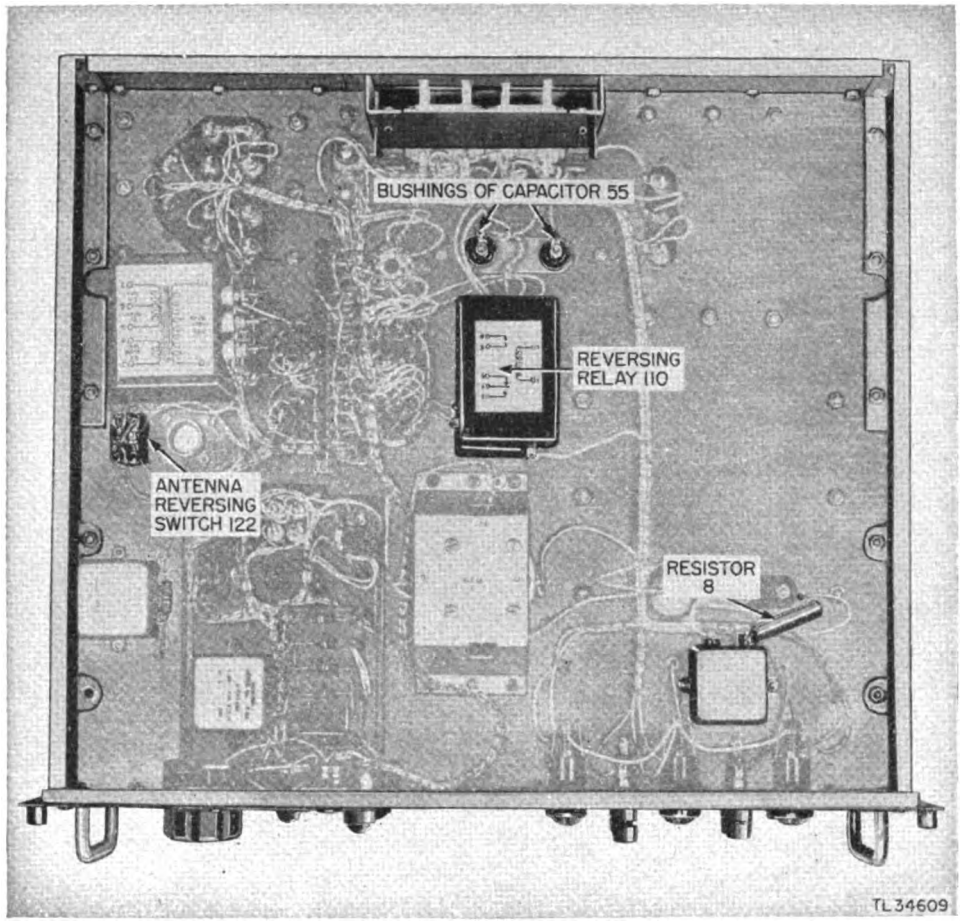

Figure 14. Indicator chassis—bottom view.

(16) The bottom of chassis frame for cleanliness and the assembly bolts for tightness.

REFERENCES.

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47. ITEM 9, Front Panel of Indicator Chassis

a. LOCATION (fig. 15).

b. MAINTENANCE PROCEDURE.

I. INSPECT.

(1) The fuses for general condition.

(2) The setscrews of the potentiometer knobs for tightness.

(3) The assembly screws for tightness. Do not disturb the screw driver adjustments marked.

(4) The jewels of pilot for general condition.

(5) Azimuth dial for cleanliness. Do not disturb the zero adjustment.

(6) The front panel for cleanliness and tightness of assembly.

REFERENCES.

Page ( ) ( ) ( ) ( )
Paragraph ( ) ( ) ( ) ( )
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Section IV. RECEIVER AND TRANSMITTER BC–1267–A

48. Item 10, Preparatory Steps

a. TOOLS AND MATERIALS NEEDED.

(1) Cleaning fluid (carbon tetrachloride).
(2) Cloth, dry, clean.
(3) Lamp and extension cord.
(4) Pliers.
(5) Sandpaper.
(6) Screw driver.
(7) Soldering iron and solder.
(8) Wrench, Allen.

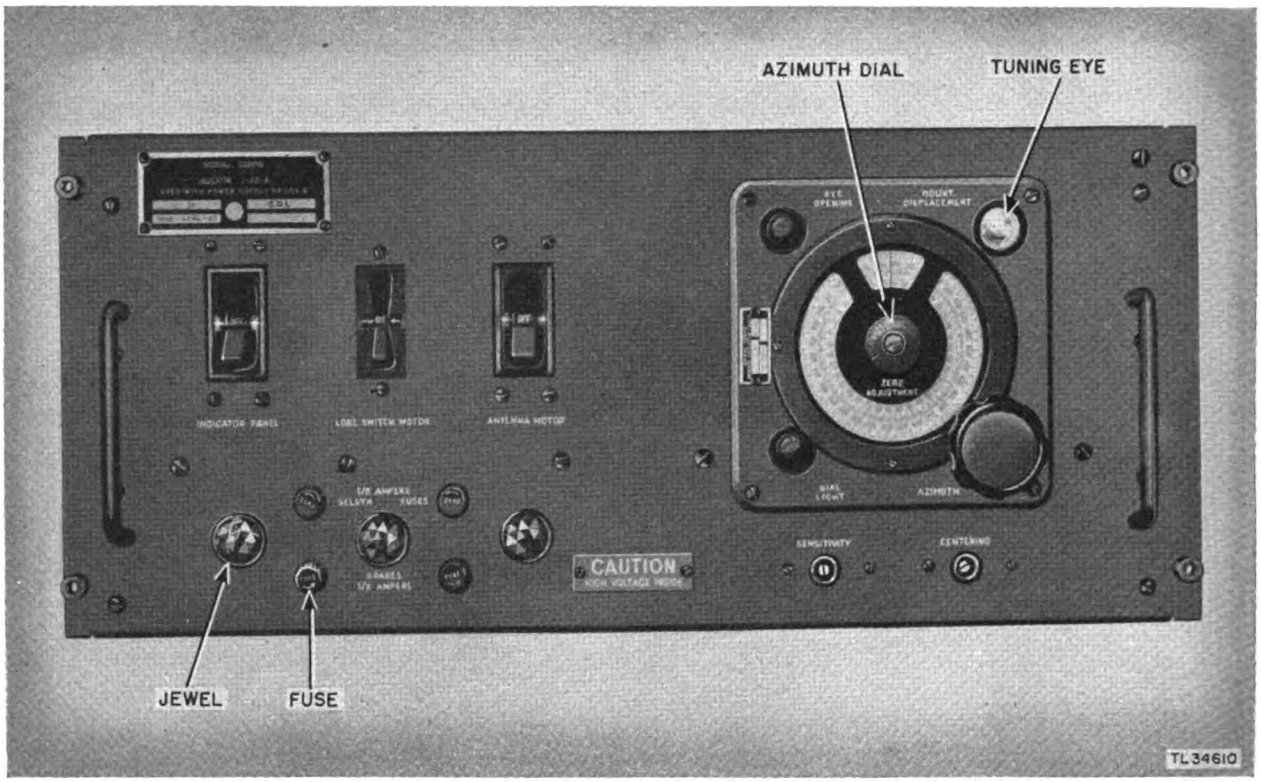

Figure 15. Indicator chassis—front panel.

(9) Wrench, open-end.

(10) Wrench, socket.

b. SAFETY PRECAUTIONS. FAILURE TO OBSERVE THE FOLLOWING WARNINGS MAY RESULT IN SERIOUS INJURY OR DEATH.

(1) Be sure that all power is removed from the receiver by throwing the PLATE VOLTAGE and FILAMENT VOLTAGE circuit breakers to their OFF positions. (See figs. 7, 8, and 21.)

(2) Avoid contact with the hot glass of the tubes for at least 10 minutes after the power has been turned off.

(3) Avoid contact with the hot surface of the high-wattage resistors for at least 10 minutes after the power has been turned off. (See fig. 17.)

c. EQUIPMENT CAUTIONS. (1) Handle the vacuum tubes carefully.

(2) Use the proper tools. The use of the proper tool for each operation will insure optimum results from the tools involved and the parts concerned.

(3) Tag all terminals when removing a part for cleaning, adjustment, repair, or replacement. Tag the terminals of the part as well as each of the cables or wires removed. This operation requires but little time, and serious trouble caused by incorrect reconnections is avoided.

(4) When removing parts, place every screw, washer, bolt, or small part into a small container to avoid losing them.

(5) Use care in handling the tools and parts within the unit. Be careful not to drop any part in the unit.

(6) Never use water for cleaning anything within the unit. The only cleaning agent which may be used is carbon tetrachloride.

(7) Make sure that every terminal disconnected for inspection is properly and carefully reconnected. Tighten all nuts and screws securely. Be careful, however, not to exert too much force and strip threads or ruin the connections.

(8) Handle resistors and capacitors with pigtail connections carefully to avoid breaking off the fragile connections.

d. LOCATION (fig. 7).

e. MAINTENANCE PROCEDURE. To remove radio receiver and transmitter from the rack—

(1) Remove the antenna lead, Cord CD–1008, from the ANTENNA receptacle on the front panel. (See fig. 18.)

(2) Loosen the four thumbscrews. These screws are captive and are not to be removed.

(3) Grasp the unit by the handles and give a sharp firm pull. This will disengage the chassis connector from the rack receptacle and allow the unit to be removed.

(4) Do not set the unit on its back as damage to the acetate schematics will result.

(5) Place unit on workbench.

NOTE. The unit weighs 65 pounds. Be careful to hold it firmly.

49. Item 11, Top of Receiver and Transmitter Chassis

a. LOCATION (fig. 16).

b. MAINTENANCE PROCEDURE. Do not perform maintenance in the inclosed compartments except for access to the r-f compartment. Remove shield by loosening the four captive screws which hold the cover in place.

I. INSPECT.

(1) The tube envelopes for cleanliness.

(2) The shielded i-f tubes for—

(*a*) Condition of the outside of shields.

(*b*) The tightness of shields. Check with shield screw driver.

(*c*) Cleanliness.

(3) The cases of the capacitors for general condition.

(4) The mica capacitor (located across the terminals of the output meter) for—

(*a*) Cleanliness.

(*b*) Proper soldering of connecting leads to the lugs and tightness of connections.

(5) The r-f oscillator unit and assembly (fig. 16) for—

(*a*) Cleanliness of the shorting-bar assembly. The shorting bar is mounted on springs and can be pressed down easily for cleaning.

(*b*) Do not disturb the red-painted bolts and screws.

(*c*) Do not perform maintenance within the unit except for the shorting bar.

(*d*) Cleanliness of exterior of case.

(*e*) Proper soldering of connecting leads.

(6) The case of modulation transformer for general condition. (See fig. 16.)

(7) The shield of the modulator tube for—

(*a*) Cleanliness of case.

(*b*) Tightness of the wingnuts holding shield. Three threads at least should show.

NOTE. Do not perform maintenance within the unit.

(8) The plug-in pulse generator chassis for—

(*a*) Tightness of mounting and assembly.

(*b*) Cleanliness of chassis case.

(*c*) The case of blocking-oscillator transformer for general condition.

NOTE. Do not perform maintenance within the unit.

(9) The i-f transformers for—

(*a*) Cleanliness of cases.

(*b*) Tightness of assembly and mounting.

NOTE. Do not attempt adjustment of these transformers, as they are preset at the factory.

(10) The meter for—

(*a*) Condition of cases.

(*b*) Tightness of connecting leads.

(*c*) Proper soldering of connecting leads to lugs.

(11) The cables and leads for general condition and tightness of clamps, and the coaxial cables and plugs for—

(*a*) Proper insulation.

(*b*) Tightness of plug connections but do not remove plugs.

(12) Tuning assembly for—

(*a*) Cleanliness. Blow out the dust.

(*b*) Gears.

(*c*) Set screws of gear coupling for tightness.

(*d*) Springs for lubrication.

(13) Dial lights for—

(*a*) Proper soldering of connections.

(*b*) Bulb for proper seating in bayonet type socket.

(14) Dial-light potentiometers for—

(*a*) Proper soldering of connections.

(*b*) Tightness of assembly screws and mounting.

(15) Top of chassis frame for cleanliness and the assembly bolts for tightness.

REFERENCES.

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Paragraph	( )	( )	( )	( )
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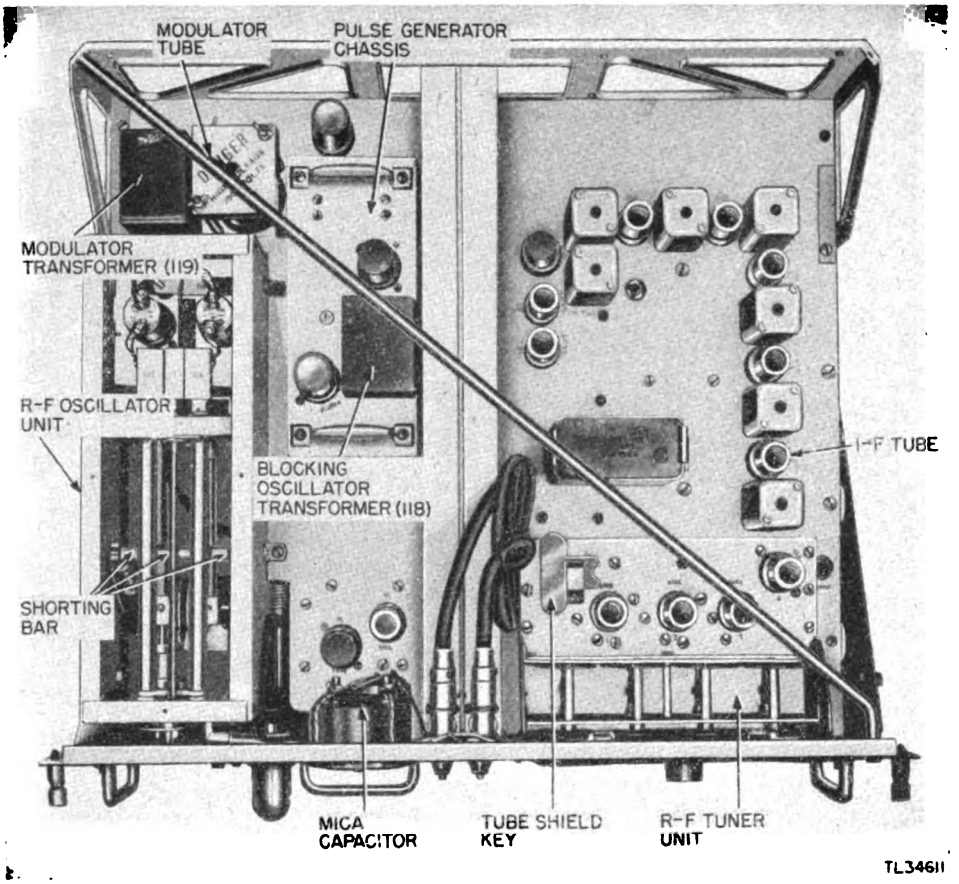

Figure 16. Receiver and transmitter—top view.

50. Item 12, Under Side of Receiver and Transmitter Chassis

a. LOCATION (fig. 17).

b. MAINTENANCE PROCEDURE. Do not perform any maintenance within the inclosed compartments having screws painted red. Remove the covers from the high-voltage compartments.

I. INSPECT.

(1) The tube sockets for—

(*a*) General condition.

(*b*) Proper soldering of connecting leads.

(*c*) Tightness of mountings.

(2) Tube and socket of tuning eye.

(*a*) The tube envelope and base and clamps for cleanliness.

(*b*) Plug and female clamp for tightness.

(*c*) Tuning eye clamp for tightness.

(3) The capacitors for—

(*a*) Condition of insulated bushings.

(*b*) Tightness of mounting.

(*c*) Tightness of connections.

(*d*) Proper soldering of connecting leads to capacitor lugs.

(4) The resistors and capacitors with pigtail connections (fig. 3) for—

(*a*) Cleanliness.

(*b*) Proper soldering of connections.

(*c*) Signs of excessive discoloration of the bodies of the high-voltage resistors.

(5) The precision-type resistor across capacitor 24 for excessive discoloration.

(6) Oil-filled paper capacitors for—

(*a*) Cleanliness of case and bushings.

(*b*) Tightness of mounting.

(*c*) Proper soldering of connections.

(7) All standoff insulators for general condition. Make sure the mountings are secure.

(8) The high-voltage bushings (fig. 3) of oil-filled paper capacitor 25 (fig. 17) for—

(*a*) Tightness of mounting nuts.

(*b*) Tightness of connecting leads.

(*c*) Proper soldering of connecting leads to the lugs.

(9) The TEST SWITCH (fig. 17) for—

(*a*) Mechanical operation. Switch should return to normal central position.

(*b*) Cleanliness of switch by blowing out dust.

(*c*) Proper soldering of connections.

(*d*) General condition of insulation, contact and mounting.

(10) The lower side of the r-f assembly (fig. 17) for cleanliness. Do not disturb the assembly screws.

(11) The modulation transformer terminals (fig. 17) for—

(*a*) Condition of insulated bushings.

(*b*) Tightness of mounting.

(*c*) Tightness of connections.

(*d*) Proper soldering of connecting leads to lugs.

(12) The r-f choke coil on the modulator tube socket (fig. 17) for—

(*a*) General condition of insulation.

(*b*) Cleanliness of windings.

(13) The small r-f heater-choke coil for—

(*a*) Cleanliness of windings.

(*b*) Proper soldering of connecting leads.

(*c*) Handle the fragile coil windings most carefully.

(14) PLATE control gear for—

(*a*) Cleanliness of connecting rods and gears.

(*b*) Tightness of setscrews.

(*c*) Proper lubrication of gears.

(*d*) Tightness of mounting bracket.

(15) All potentiometers for—

(*a*) Mechanical operation. (Do not disturb the ones with screw driver adjustment.)

(*b*) Cleanliness of case.

(*c*) Proper soldering of connecting leads.

(*d*) Proper mounting, tightness of locknuts and mounting brackets.

(16) The terminal strips (fig. 5) for—

(*a*) Tightness of mounting.

(*b*) Proper soldering of connections.

(*c*) General condition of insulating material, ceramic type for chipping.

(17) The cables and leads for general condi-

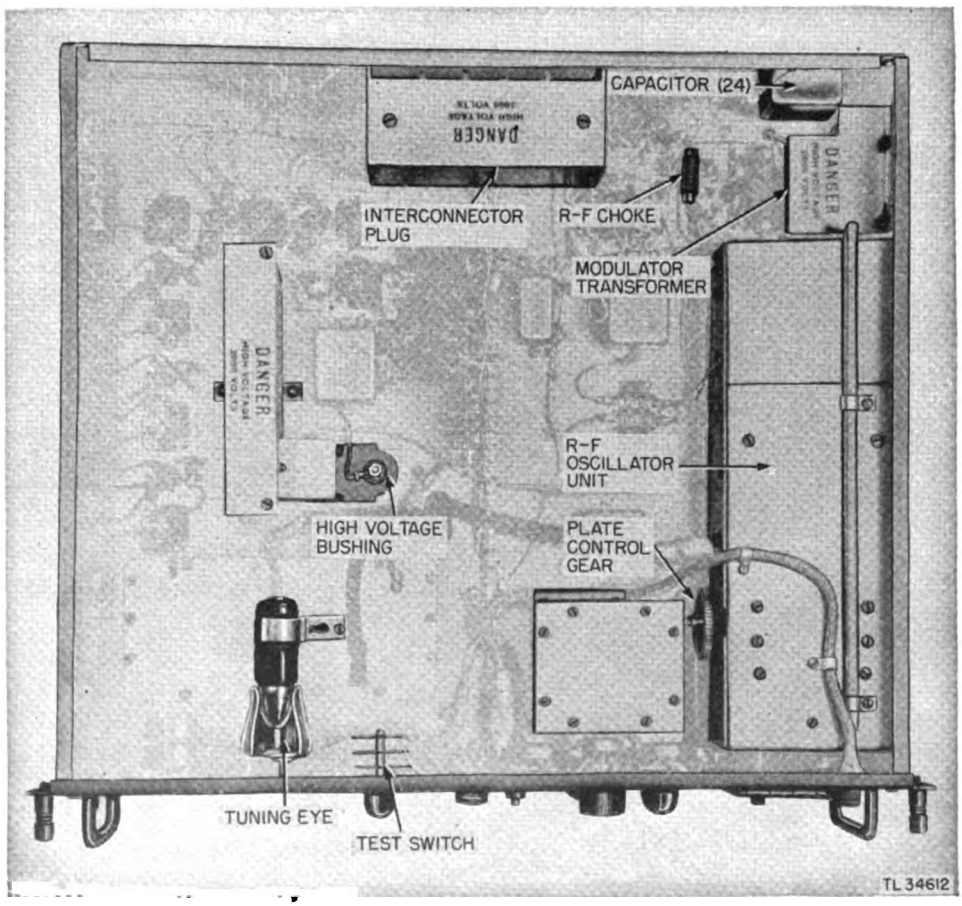

Figure 17. Receiver and transmitter—bottom view.

tion. (Do not remove the coaxial plugs.) Check for tightness of clamps.

(18) The ground connections for security of fastening to chassis.

(19) All connecting leads to the ground connections for proper soldering.

(20) Jacks for—

(*a*) Proper soldering of connections.

(*b*) Check mounting.

(*c*) Be sure of the opening type making contact.

(21) Interconnector plug for—

(*a*) Remove cover.

1. Check terminals for proper soldering.

2. Proper mounting.

3. Tightness of grounding screws.

4. Prongs for proper plug.

(*b*) Replace cover.

(22) Bottom of chassis frame for cleanliness and the assembly bolts for tightness.

REFERENCES.

Page	( )	( )	( )	( )
Paragraph	( )	( )	( )	( )
TM 11–	( )	( )	( )	( )

51. Item 13, Front Panel of Receiver and Transmitter

a. Location (fig. 18).

b. Maintenance Procedure.

I. INSPECT.

(1) The meter for—

(*a*) Cleanliness of case and glass.

(*b*) Tightness of mounting.

(*c*) Glass for cracks. Broken glass can be taped with transparent tape until replacement is possible. Moisture within the meter will ruin it.

(2) The dials for—

(*a*) Cleanliness of dial and glass.

(*b*) Tightness of glass mounting.

(*c*) General condition of glass. Broken glass can be taped with transparent tape until replacement is possible.

(3) The pilot light for correct seating.

(4) The calibration plate for—

(*a*) Tightness of assembly screws.

(*b*) Closed position. Be sure captive screw is tight.

(5) The cover of antenna plug. Be sure it is in place when dummy antenna or regular antenna is not in use.

(6) The TEST SWITCH and POWER MEASUREMENT potentiometer for—

(*a*) Tightness of setscrews.

(*b*) Proper operation of the test switch. Should have proper spring tension.

(7) The three jacks for—

(*a*) Tightness of the locknuts.

(*b*) Proper spring tension of the cover plates.

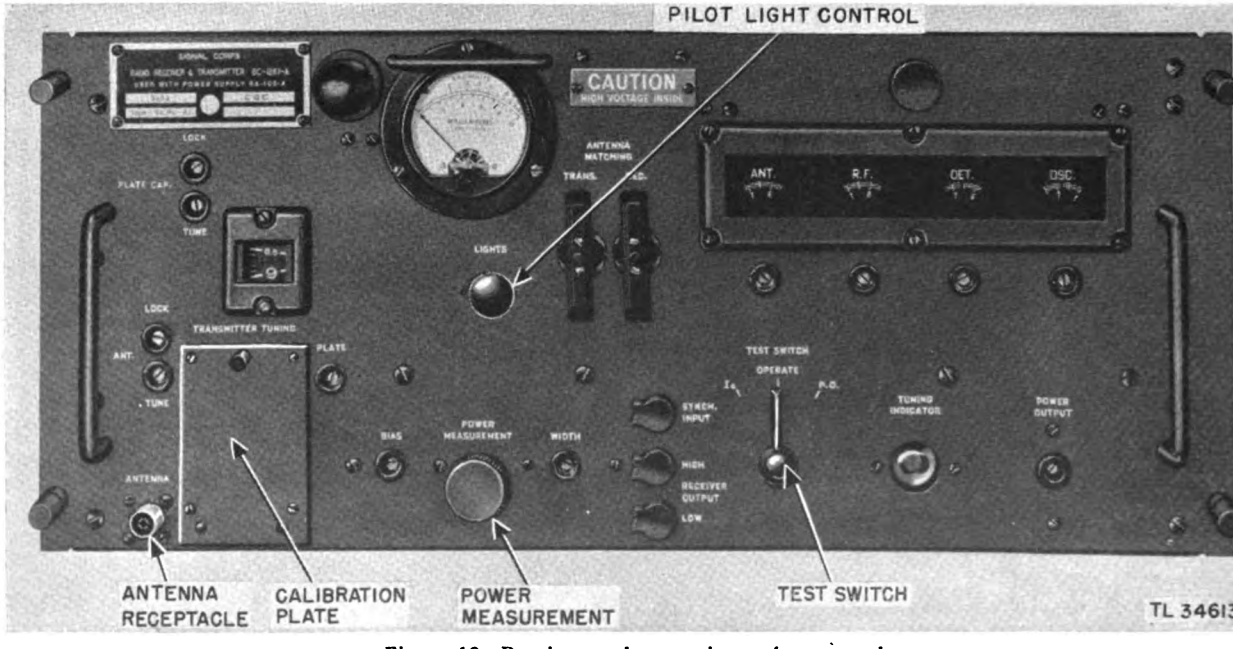

Figure 18. Receiver and transmitter—front panel.

(8) The antenna matching stubs for—
(*a*) Tightness of assembly screws.
(*b*) Be sure rods are pushed in all the way.
(9) Lights control for—
(*a*) Tightness of setscrews and locknut.
(*b*) Ease of operation.
(10) The front panel for cleanliness and tightness of assembly. Do not disturb screw driver adjustments.

T. TIGHTEN: The meter terminals. The tightening of meter connections requires special techniques, as careless handling can easily crack a meter case. To prevent such an occurrence, the proper wrench or some other appropriate tool should be used to hold the hexagonal retaining nut which makes contact with the meter case, while the outside nut is being tightened with another tool. This permits the tightening of the connection without increasing the pressure of the head of the stud against the inside of the meter case.

A. ADJUST: The meter for zero setting. Before deciding that a meter needs readjusting, tap the meter case lightly with the tip of one finger. If adjustment is needed, read TM 11–1332 (when published). Avoid turning the screw too far, because the needle may be bent or the hairspring damaged. Zero adjustments should not be made for several minutes after shut-downs.

REFERENCES.

Page	( )	( )	( )	( )
Paragraph	( )	( )	( )	( )
TM 11–	( )	( )	( )	( )

Section V. POWER SUPPLY RA–105–A

52. Item 14, Preparatory Steps

a. Tools and Materials Needed.
(1) Cleaning fluid, carbon tetrachloride.
(2) Cloth, dry, clean.
(3) Lamp and extension cord.
(4) Pliers.
(5) Sandpaper.
(6) Screwdriver.
(7) Soldering iron and solder.
(8) Wrench, open-end.
(9) Wrench, socket.

b. Safety Precaution. (1) Be sure that all power is off. Throw the FILAMENT VOLTAGE and PLATE VOLTAGE circuit breakers to the OFF position. (See figs. 7, 8, and 21.)

(2) Avoid contact with the hot glass of the tubes for at least 10 minutes after the power has been turned off.

c. Equipment Cautions. (1) Handle the vacuum tubes carefully.

(2) Use the proper tools. The use of the proper tool for each operation will insure optimum results from the tools involved and the parts concerned.

(3) Tag all terminals when removing a part for cleaning, adjustment, repair, or replacement. Tag the terminals of the part as well as each of the cables or wires removed. This operation requires but little time, and serious trouble caused by incorrect reconnections is avoided.

(4) When removing parts, place every screw, washer, bolt, or small part into a small container to avoid losing them.

(5) Use care in handling the tools and parts within the unit. Be careful not to drop any part in the unit.

(6) Never use water for cleaning anything within the unit. The only cleaning agent to be used is carbon tetrachloride.

(7) Make sure that every terminal disconnected for inspection is properly and carefully reconnected. Tighten all nuts and screws securely. Be careful however, not to exert too much force and strip threads or ruin connections.

(8) Handle resistors and capacitors with pigtail connections carefully to avoid breaking off the fragile connections.

d. Location (fig. 7).

e. Maintenance Procedure. To permit access to the power supply chassis:

(1) Loosen the four thumb screws, which hold the panel.

(2) Grasp the handles.

(3) Pull the chassis out by sliding it carefully along its guide rails.

Note. The unit weighs 120 pounds. Two men will be required to remove the chassis from the rack.

(4) Place unit on workbench.

(5) The various parts within the chassis of the power supply are now accessible for maintenance.

53. Item 15, Top of Power Supply Chassis

a. Location (fig. 19).
b. Maintenance Procedure.

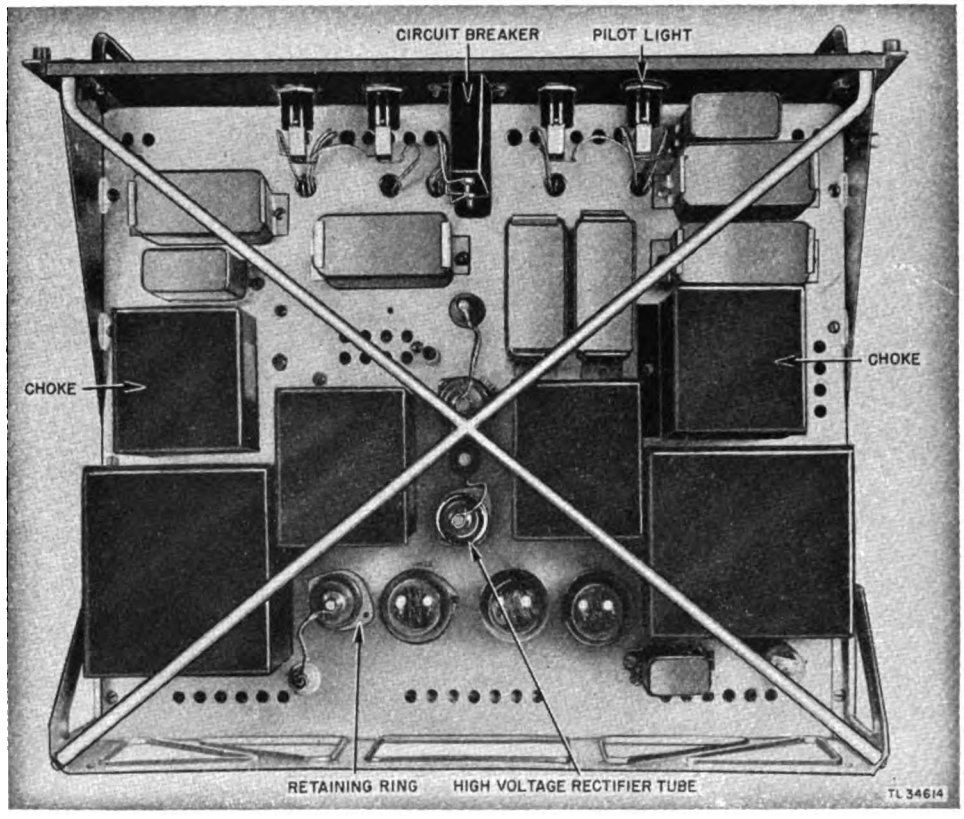

Figure 19. Power supply chassis—top view.

F. FEEL: The transformer cases for abnormal temperature. These cases must be inspected for excessive heat as soon as possible after shut-down.

I. INSPECT.

(1) The tube envelopes for cleanliness.
(2) The socket-mounting screws for tightness.
(3) The retaining-ring screws for tightness.
(4) The high-voltage rectifiers for—
(*a*) Cleanliness of envelopes.
(*b*) Condition of plate caps.
(*c*) Tension of plate clips.
(*d*) Proper soldering of plate connections.
(*e*) Cleanliness of insulating bushings.
(5) The cases of the capacitors for general condition.
(6) The mounting clamps of the capacitors for tightness of mounting.
(7) The FILAMENT VOLTAGE circuit breaker for—
(*a*) Mechanical operation.
(*b*) Condition of the case.
(*c*) Condition of connector terminals.
(*d*) Proper soldering of leads to the terminal lugs.
(*e*) Proper mounting.
(8) The pilot lamps for—
(*a*) Proper mounting.
(*b*) Proper soldering of connecting leads.
(9) The transformers and choke cases for general condition.
(10) The transformers and chokes for proper mounting.
(11) All connecting leads for general condition.
(12) The top of the chassis frame for cleanliness and the assembly bolts for tightness.

REFERENCES.

Page	(	)	(	)	(	)	(	)
Paragraph	(	)	(	)	(	)	(	)
TM 11–	(	)	(	)	(	)	(	)

54. Item 16, Under Side of Power Supply Chassis

a. Location (fig. 20).
b. Maintenance Procedure.

I. INSPECT.

(1) The tube sockets for—
(*a*) General condition.

(*b*) Proper soldering of connecting leads.
(*c*) Tightness of mounting.
(2) The high-voltage rectifier sockets (fig. 20) for—
(*a*) Proper soldering of the connections.
(*b*) Condition of insulating material.
(*c*) Condition of socket pins.
(*d*) Tightness of mounting.
(3) The fuses for—
(*a*) Proper mounting.
(*b*) Condition of case.
(*c*) Proper soldering of connections.
(4) Capacitors 5 and 7 (fig. 20) for—
(*a*) Cleanliness of case.
(*b*) Tightness of mounting.
(*c*) Proper soldering of connections.
(5) The terminals of the capacitors for—
(*a*) Cleanliness of insulating bushings.
(*b*) Tightness of mounting.
(*c*) Tightness of connection to insulating bushings.
(*d*) Proper soldering of connections to capacitor lugs.
(6) The resistors for—
(*a*) Cleanliness.
(*b*) Proper soldering of connections.
(7) The transformer-insulator bushings for—
(*a*) General condition.
(*b*) Tightness of connector terminals.
(*c*) Proper soldering of connections to terminal lugs.
(8) The terminal strips for—
(*a*) Condition of mounting.
(*b*) Condition of insulating material.
(*c*) Proper soldering of connections to lugs.
(*d*) Firmness of lug mounting.
(9) The PLATE VOLTAGE circuit breaker 43 for—
(*a*) Mechanical operation.

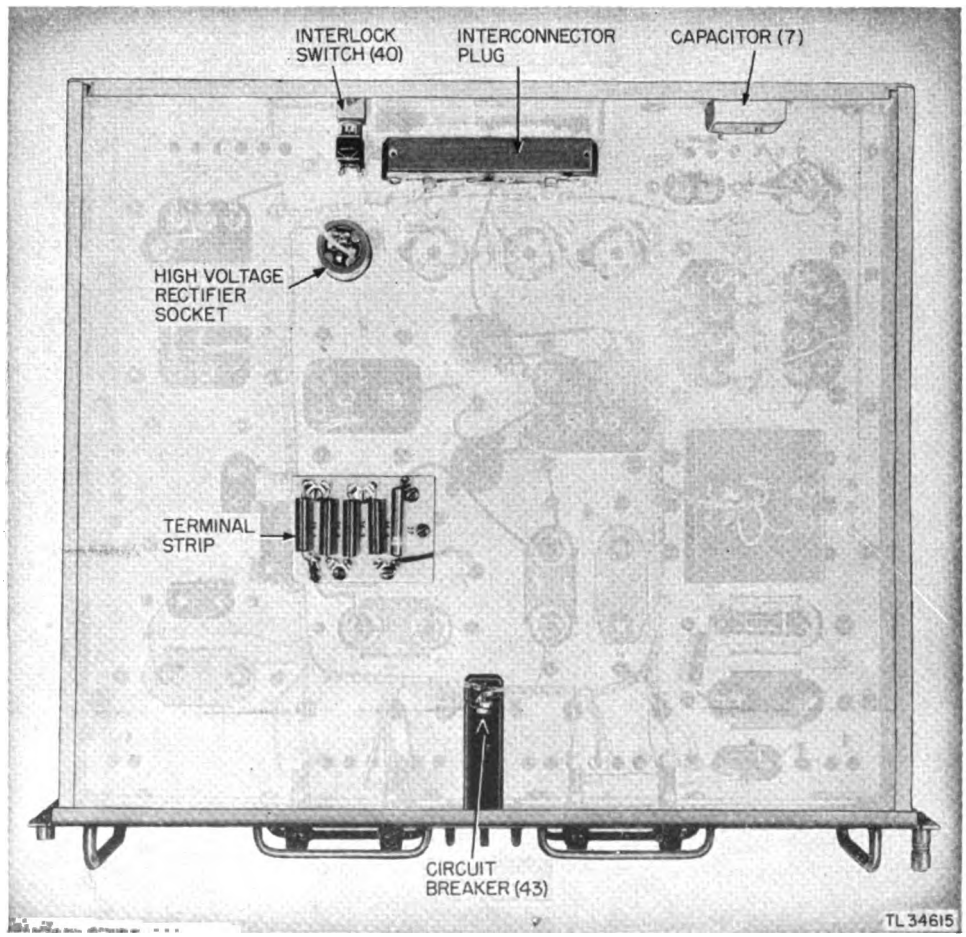

Figure 20. Power supply chassis—bottom view.

(*b*) Condition of case.
(*c*) Tightness of mounting.
(*d*) Condition of connector terminals.
(*e*) Proper soldering of connections to terminal lugs.

(10) The high-voltage interlock switch 40 for—
(*a*) Proper mounting.
(*b*) Mechanical operation.
(*c*) Proper soldering of connections.

(11) All stand-off insulators for general condition. Make sure the mountings are secure.

(12) The rubber insulation of all the high-voltage leads for general condition.

(13) The interconnector plug for—
(*a*) Tightness of mounting.
(*b*) Condition of insulating material.
(*c*) Proper soldering of all connections.
(*d*) Condition of connector prongs.

(14) The connecting leads for general condition.

(15) The bottom of the chassis frame and the assembly bolts for tightness.

REFERENCES.

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55. Item 17, Front Panel of Power Supply Chassis

a. Location (fig. 21).

b. Maintenance Procedure.

I. INSPECT.

(1) The pilot-light jewels for general condition.

(2) The fuse holders for—
(*a*) General condition.
(*b*) Proper seating of fuse.
(*c*) Cleanliness of cap contact.

(3) The FILAMENT VOLTAGE and PLATE VOLTAGE circuit breakers for—
(*a*) General condition.
(*b*) Firmness of mounting.
(*c*) Mechanical operation.

(4) The assembly screws for tightness.

(5) The front panel for cleanliness and tightness of assembly.

REFERENCES.

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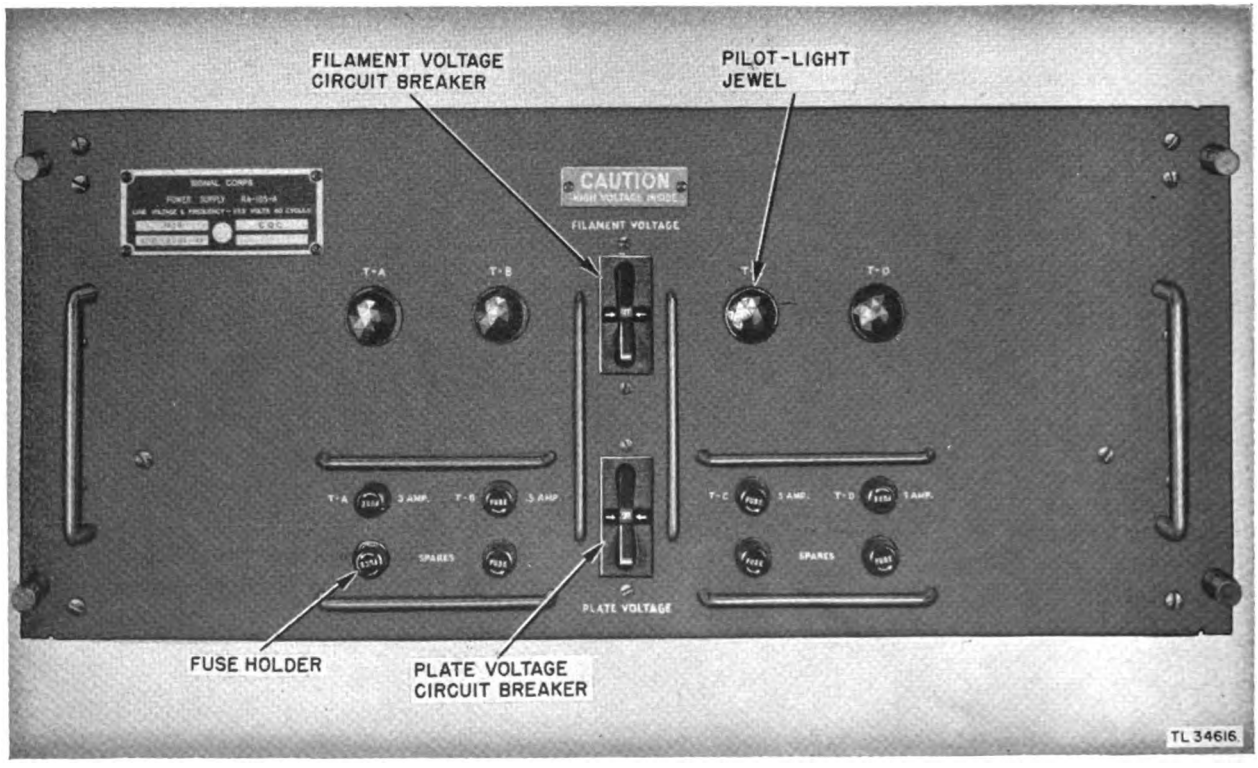

Figure 21. Power supply chassis—front panel.

Section VI. RACK FM–80

56. Item 18, Preparatory Steps

a. Tools and Materials Needed.

(1) Cleaning fluid, carbon tetrachloride.
(2) Cloth, dry, clean.
(3) Lamp and extension cord.
(4) Pliers.
(5) Sandpaper.
(6) Screw driver.
(7) Soldering iron and solder.
(8) Wrench, open-end.
(9) Wrench, socket.
(10) Oil.
(11) Oilcan.

b. Safety Precautions. The data board (fig. 22) at the base of the rack carries line voltages. Disconnect Cord CD–1006 from the a-c data box of Radio Set SCR–584 (fig. 1) before working on the Rack FM–80.

c. Equipment Cautions. (1) It is necessary to remove the blower motors from the rack in order to oil them as described in TM 11–1532 (when published).

(2) Use the proper tools. The use of the proper tool for each operation will insure optimum results from the tools involved and the parts concerned.

(3) Tag all terminals when removing a part for cleaning, adjustment, repair, or replacement. Tag the terminals of the part as well as each of cables or wires removed. This operation requires but little time, and serious trouble caused by incorrect reconnection is avoided.

(4) When removing parts, place every screw, washer, bolt, or small part into a small container to avoid losing them.

(5) Use care in handling the tools and parts within the unit. Be careful not to drop any part in the unit.

(6) Never use water for cleaning anything within the unit. The only cleaning agent to be used is carbon tetrachloride.

(7) Make sure that every terminal disconnected for inspection is properly and carefully reconnected. Tighten all nuts and screws securely. Be careful however, not to exert too much force and strip threads or ruin connections.

d. Location (figs. 6 and 7).

e. Maintenance Procedure. To permit access to all parts of Rack FM–80:

(1) Remove the chassis of the control unit, indicator, receiver and transmitter, and power supply (items 1, 6, 10, and 14), and the lower panel at the base of the rack. (See figs. 7 and 22.)

(2) Remove the trough panel at the rear of the rack (fig. 23) for access to the cables and terminal blocks. Remove the screws that hold the panel in place.

57. Item 19, Interior of Rack FM–80

a. Location (fig. 6).

b. Maintenance Procedure. This item refers to all but the lower panel compartment.

I. INSPECT.

(1) The interior of Rack FM–80 frame for cleanliness and the assembly bolts for tightness.
(2) The interconnector plugs for—
(*a*) Cleanliness of ceramic and prongs.
(*b*) The prongs for sufficient play.
(*c*) Tightness of mounting.
(3) The interlock switch for—
(*a*) Cleanliness.
(*b*) Proper soldering of connections.
(4) The blower and heater for mechanical operation and cleanliness.

REFERENCES.

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58. Item 20, Data Board

a. Location (fig. 22).

b. Maintenance Procedure. For access remove the four screws that hold the lower panel in place.

I. INSPECT.

(1) The data board for—
(*a*) Cleanliness of terminals.
(*b*) Tightness of connections and links.
(*c*) Tightness of mounting.
(2) The shock mounts for excessive wear and tightness of mounting.
(3) The lower compartment for general cleanliness and tightness of assembly bolts.

59. Item 21, Blower Motors and Heaters

a. Location (fig. 22).

b. Maintenance Procedure. For access remove the four screws that hold the lower panel in

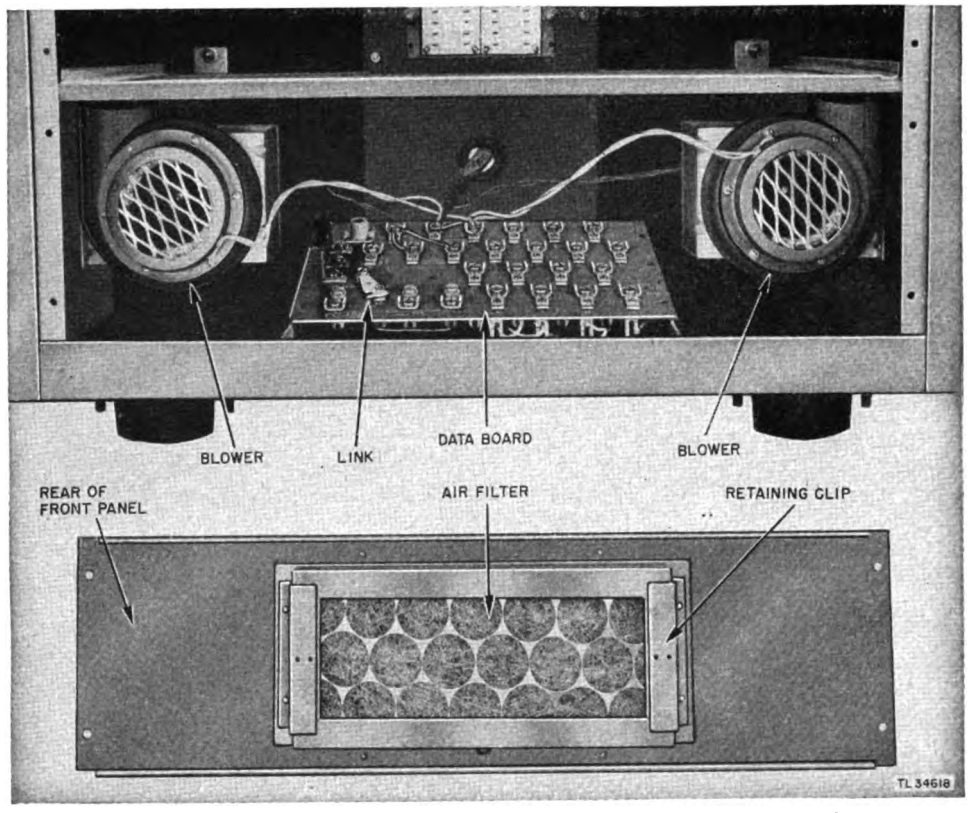

Figure 22. Lower compartment of Rack FM–80—panel removed.

place. In order to oil the blowers, it is necessary to remove them from the rack. (See TM 11–1532 (when published).)

I. INSPECT.

(1) The assembly bolts for tightness.

(2) The setscrew of the coupling for tightness.

(3) The heater, blower, and motor cases for cleanliness.

C. CLEAN.

(1) The heater and blower by blowing out the dust with the air blower.

(2) The lower compartment when blowers are removed.

L. LUBRICATE: The blower motors every 6 months. Two oil cups are provided on each motor. Use the oil from the oilcan. Remove blowers from rack for lubrication. (See TM 11–1532 (when published).)

REFERENCES.

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60. Item 22, Air Filter

a. EQUIPMENT CAUTION. Mark the intake side of the filter and replace it so that air will enter through that side.

b. LOCATION (figs. 7 and 22). Access to the air filter is gained by removing the four screws holding the lower front panel in place.

c. MAINTENANCE PROCEDURE.

I. INSPECT.

(1) The air filter (fig. 22) for an excessive accumulation of dirt. Note whether the filter is mounted correctly and whether the retaining clips are in place. Improperly assembled filter elements or warped frames will allow unfiltered air to leak around the edges and thus permit dust to enter the ventilating system.

(2) The retaining clips for tightness.

C. CLEAN.

(1) The filter. It may be taken out after the removal of the lower panel. Mark the outside of the filter before removing it from the panel. Tap its edge against the wall or on the ground to remove as much dirt as possible.

(2) If it is excessively dirty, replace with a new filter unit.

REFERENCES.

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Paragraph ( ) ( ) ( ) ( )
TM 11– ( ) ( ) ( ) ( )

61. Item 23, Wiring Channel

a. Location (fig. 23).

b. Maintenance Procedure.

I. INSPECT.

(1) The interconnector plugs for—
(*a*) Proper soldering of connections.
(*b*) Cracks on insulator blocks.
(*c*) Tightness of mounting.
(2) The interlock for mechanical operation.
(3) Cables:
(*a*) Clamps for tightness.
(*b*) Proper insulation and lacing.
(*c* Ground connections for tightness and soldering.
(4) Assembly bolts of trough for tightness.
(5) Panel and wiring channel for cleanliness.

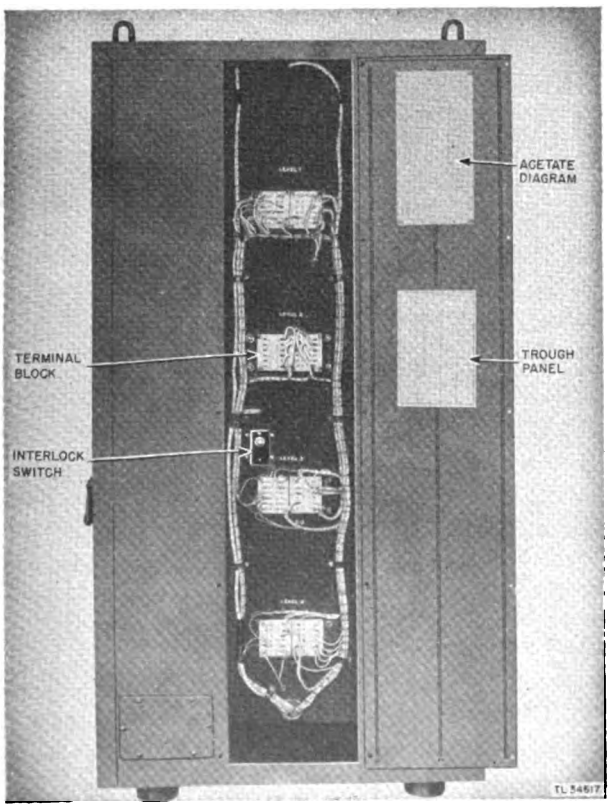

Figure 23. Wiring channel of Rack FM–80.

(6) The ventilation passage for freedom from obstruction.

(7) The general condition of the acetate wiring diagram. The clamps for tightness.

REFERENCES.

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Paragraph ( ) ( ) ( ) ( )
TM 11– ( ) ( ) ( ) ( )

Section VII. ACCESSORIES

62. Item 24, Cables, Foot Switch, and Operator's Chair

a. Tools and Materials Needed.

(1) Cleaning fluid, carbon tetrachloride.
(2) Cloth, dry, clean.
(3) Pliers.
(4) Screw driver.

b. Location (figs. 24, 25, and 26).

c. Maintenance Procedure.

I. INSPECT.

(1) The cables (figs. 24 and 25) for—
(*a*) General condition.
(*b*) Condition of connectors.
(*c*) Proper placement.
(2) The foot switch (fig. 26) for—
(*a*) Cleanliness.
(*b*) Mechanical operation.
(*c*) Condition of ON-OFF toggle switch.
(*d*) Condition of cable insulation.
(*e*) Loose assembly.
(3) The operator's chair for general condition.

L. LUBRICATE: The operator's chair. Use the oil from the oilcan supplied with Radio Set SCR–584.

REFERENCES.

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Section VIII. TEST EQUIPMENT

63. Item 25, Signal Generator I–222–A and Range Calibrator I–223–A

a. Tools and Materials Needed.

(1) Soldering iron and solder.
(2) Tape, friction.

b. Equipment Cautions. Maintenance is not to be performed within the test equipment cases.

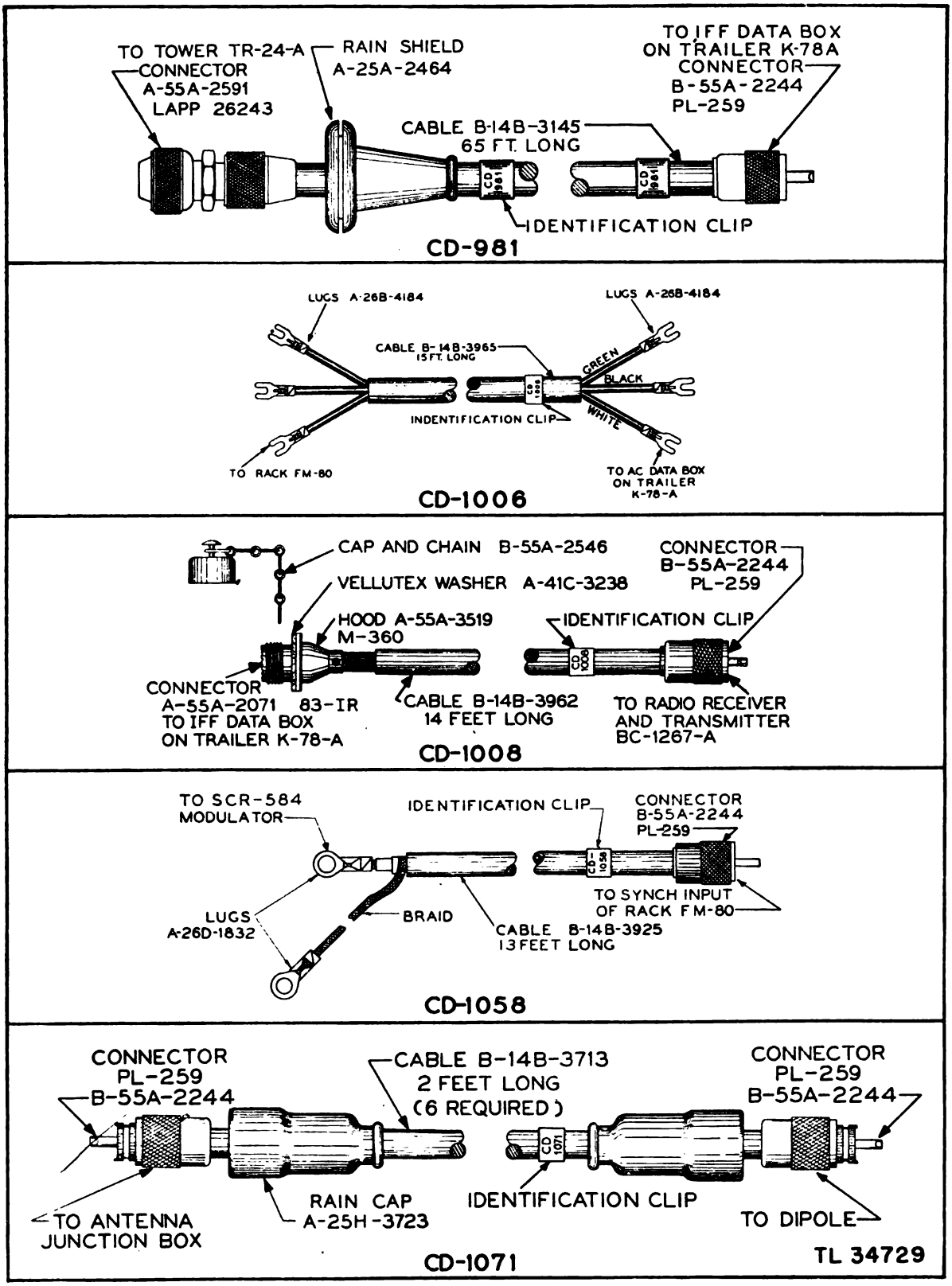
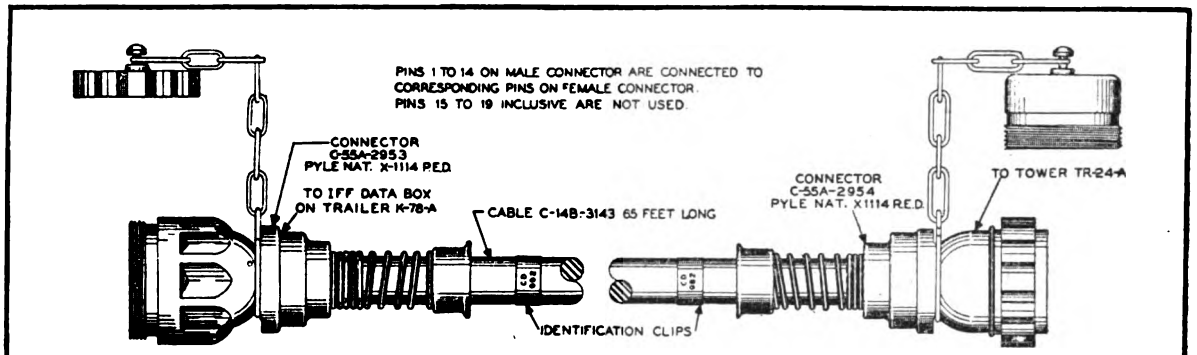
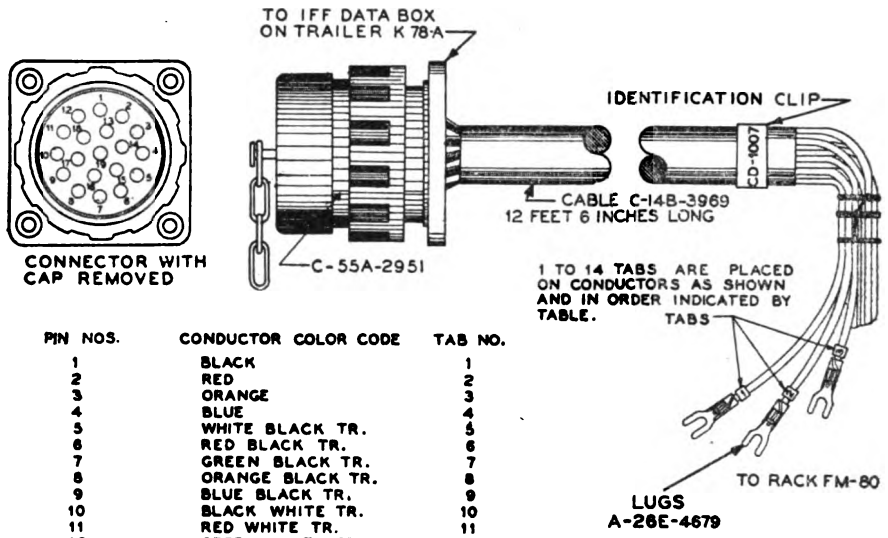


Figure 24. Interconnecting cables.

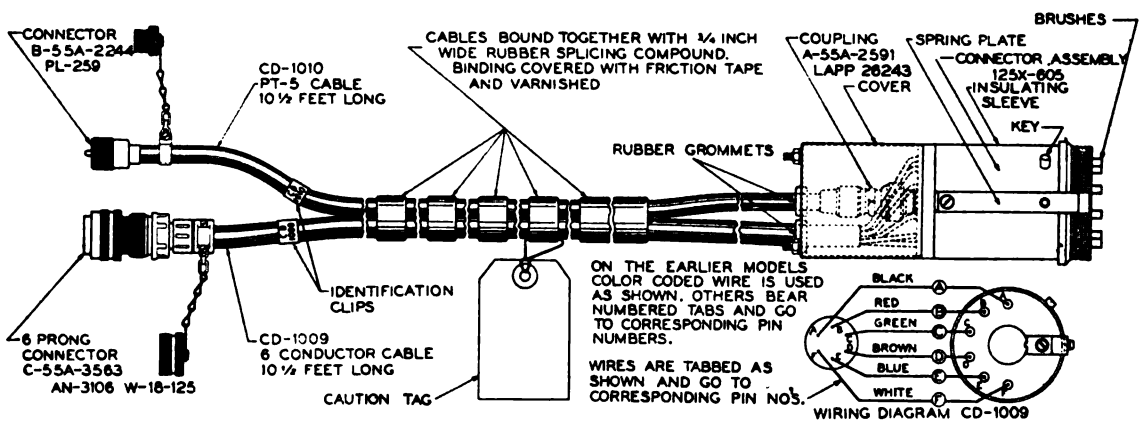


CD-982



PIN NOS.	CONDUCTOR COLOR CODE	TAB NO.
1	BLACK	1
2	RED	2
3	ORANGE	3
4	BLUE	4
5	WHITE BLACK TR.	5
6	RED BLACK TR.	6
7	GREEN BLACK TR.	7
8	ORANGE BLACK TR.	8
9	BLUE BLACK TR.	9
10	BLACK WHITE TR.	10
11	RED WHITE TR.	11
12	GREEN WHITE TR.	12
13	WHITE	13
14	GREEN	14

CD-1007



CD-1009 & CD-1010

TL 34730

Figure 25. Interconnecting cables.

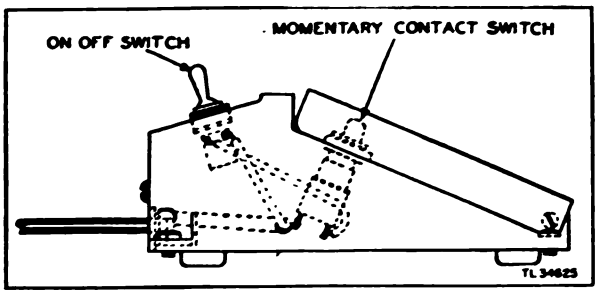


Figure 26. Foot switch.

c. LOCATION (figs. 27, 28, 29, and 30).

d. MAINTENANCE PROCEDURE.

I. INSPECT.

(1) The test cables leads (fig. 29) for—

(*a*) Condition of insulation.

(*b*) Cleanliness of clips.

(2) The test instruments (fig. 27) for—

(*a*) Cleanliness of case.

(*b*) Tightness of assembly.

(3) The supplementary patch cords (fig. 28) for—

(*a*) Condition of insulation of cable and plugs.

(*b*) Cleanliness of clips.

Figure 27. Test instruments.

L. LUBRICATE (once every 6 months).

(1) The Signal Generator I–222–A. See TM 11–1532 (when published) for disassembly. Apply a small amount of grease to the two shaft journals and to the roller bearing of the coil turret. Apply a small amount of grease to the rear rotor bearing of capacitor 63. Assemble the coil turret.

(2) The dial mechanism, tuning dial, and band switch shaft. Apply a small amount of grease to the moving parts of the dial mechanism as shown at *G* in figure 30. Apply a small amount of grease to the tuning dial and the band switch shaft where the shafts go through the panel. Reassemble the signal generator.

REFERENCES.

Page	(	)	(	)	(	)	(	)
Paragraph	(	)	(	)	(	)	(	)
TM 11–	(	)	(	)	(	)	(	)

Section IX. ANTENNA ASSEMBLY

64. Item 26, Preparatory Steps

a. Tools and Materials Needed.

(1) Brush.
(2) Cleaning fluid, carbon tetrachloride.
(3) Cloth, dry, clean.
(4) Cloth, oily.
(5) Grease, lubricating special, Specifications No. AXS–637.
(6) Grease gun.
(7) Ladder.
(8) Oil can.
(9) Oil, engine, SAE 10 U. S. Army 2–104B or oil, lubricating, preservative, special, Specification AXS–777.
(10) Pliers.
(11) Sandpaper.
(12) Screw driver.

b. Safety Precautions. (1) Be sure that all power is removed from the antenna assembly by throwing the PLATE VOLTAGE, ANTENNA MOTOR and LOBE SWITCH MOTOR circuit breaker, to their OFF position. (See figs. 7 and 15.)

(2) Be very careful when performing maintenance above the ground level. Make sure the ladder used is secure.

c. Equipment Cautions. Handle the inner conductors of the coaxial transmission line carefully.

d. Location (fig. 31).

e. Maintenance Procedure. See TM 11–1532 (when published) for detailed instructions on removal and replacement of parts for inspection, servicing, or lubrication.

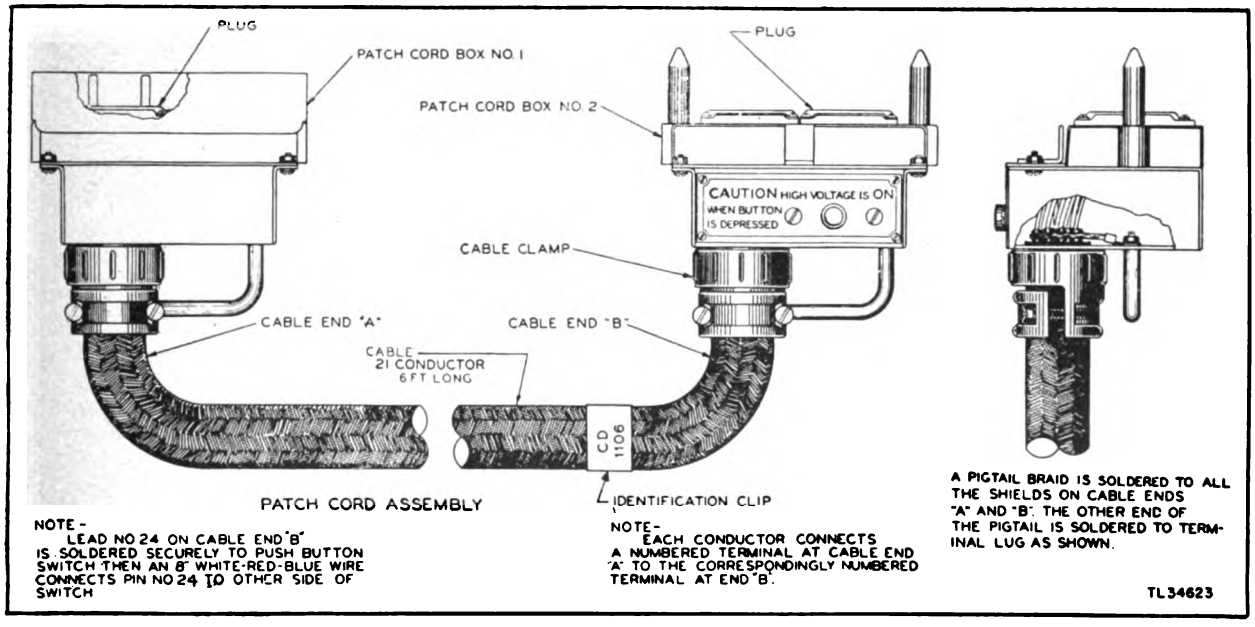


Figure 28. Patch cord assembly.

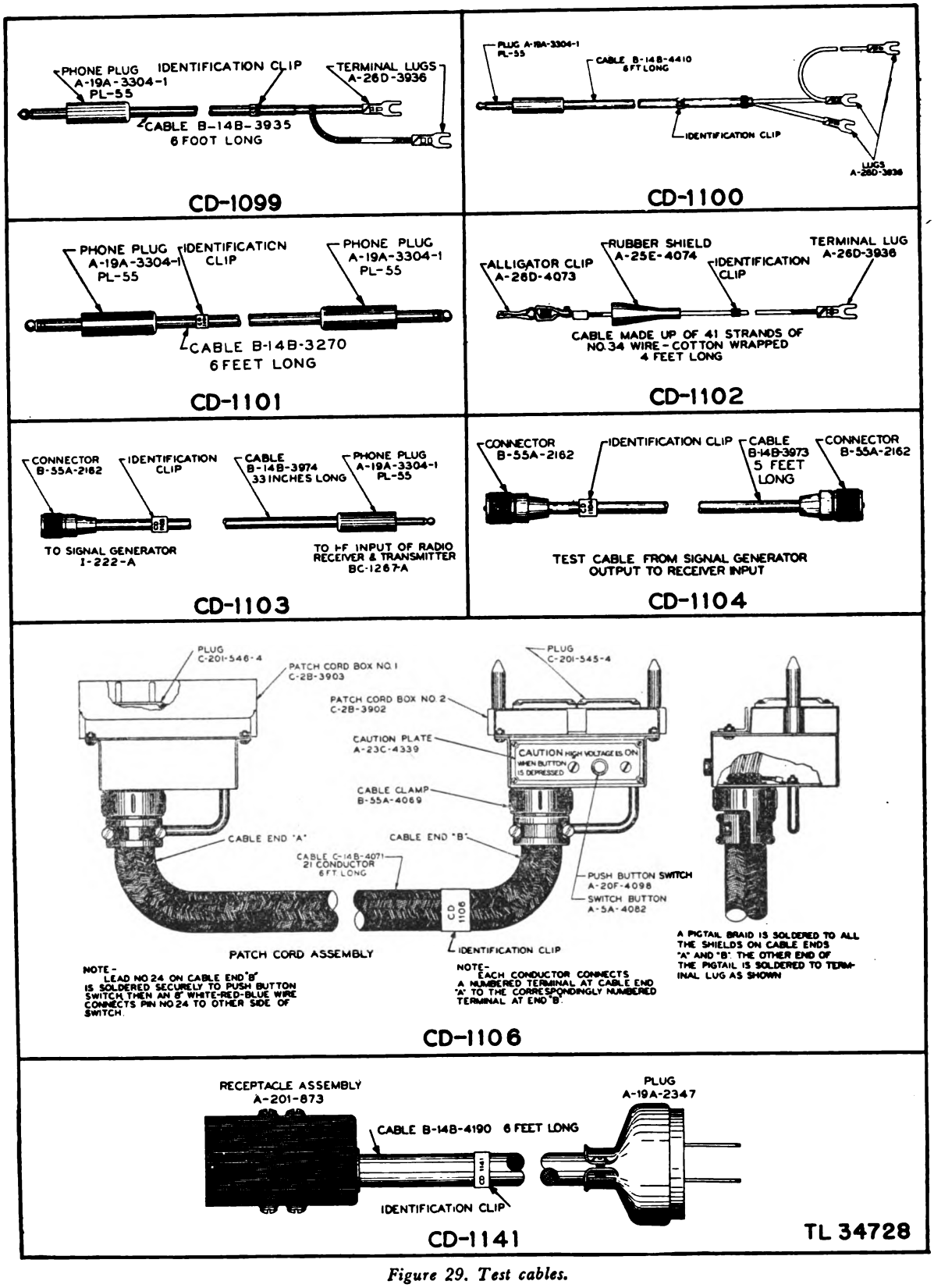


Figure 29. Test cables.

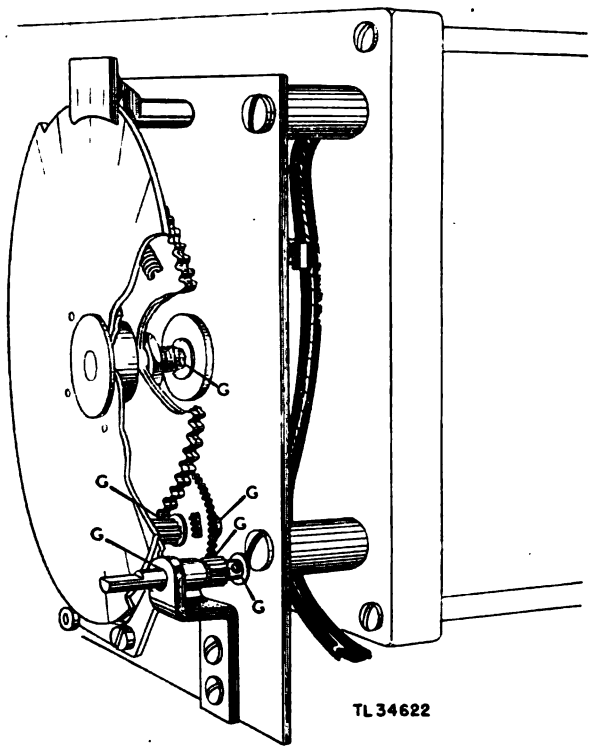


Figure 30. Lubrication of Signal Generator I–222–A, dial mechanism.

65. Item 27, Antenna AN–154–A

a. LOCATION (fig. 31).

b. MAINTENANCE PROCEDURE.

I. INSPECT.

(1) For chipped paint on antenna.

(2) The assembly bolts and screws for tightness.

(3) The mountings for tightness.

(4) The reflector wires of the antenna for cleanliness.

L. LUBRICATE: The antenna-frame hinges and the junction-box door hinges once every month. Use the oil from the oilcan supplied with Radio Set SCR–584.

66. Item 28, Tower TR–24–A

a. LOCATION (figs. 31 and 32).

b. MAINTENANCE PROCEDURE.

F. FEEL: The antenna drive motor for excessive temperature.

I. INSPECT.

(1) Azimuth dial and the level indicator for cleanliness. (See fig. 32.)

(2) For chipped paint on tower.

(3) The assembly bolts and screws for tightness.

(4) The drive motor for general condition. (See fig. 32.)

(5) The rotary coupling for cleanliness of contacts and proper cable connection. TM 11–1532 (when published) will give details for removing and inspecting the coupling.

L. LUBRICATE. (1) (Every 2 weeks). The tower-azimuth-indicator dial fittings (fig. 32) with the grease in the grease gun. Use grease, lubricating, special, Specification No. AXS–637.

(2) (Every month.) The gear box. (See fig. 32.) Remove the inspection plug on the small worm gear box on the gear case of the tower. If the grease is not up to the level of the plug, replenish by using the grease gun applied to the right-angle extension fitting located in the bottom cover plate. Use the grease in the grease gun as provided.

Caution: Always remove the inspection plug (fig. 32) when using the grease gun so as to vent the air trapped in the gear box and prevent building up excessive pressure.

(3) (Every 3 months.) The jack screws and jack struts. (See fig. 31.) Brush or wash the screw threads on the jack screws and jack struts. Lubricate with oil from the oilcan. Wipe off all excessive lubricant.

(4) (Every 3 months.) The grease fittings of Tower TR–24–A (figs. 31 and 32) located at—

(*a*) Bottom of tripod center bearing. (See fig. 32.)

(*b*) Side of gear case to the left of the nameplate.

(*c*) Above antenna motor end cap. Use the grease in the grease gun supplied.

NOTE. For temperatures below 0° F., in place of oil, engine, SAE 10 U. S. Army 2–104B, use oil, lubricating, preservative, special, Specification No. AXS–777.

REFERENCES.

Page	(	)	(	)	(	)	(	)
Paragraph	(	)	(	)	(	)	(	)
TM 11–	(	)	(	)	(	)	(	)

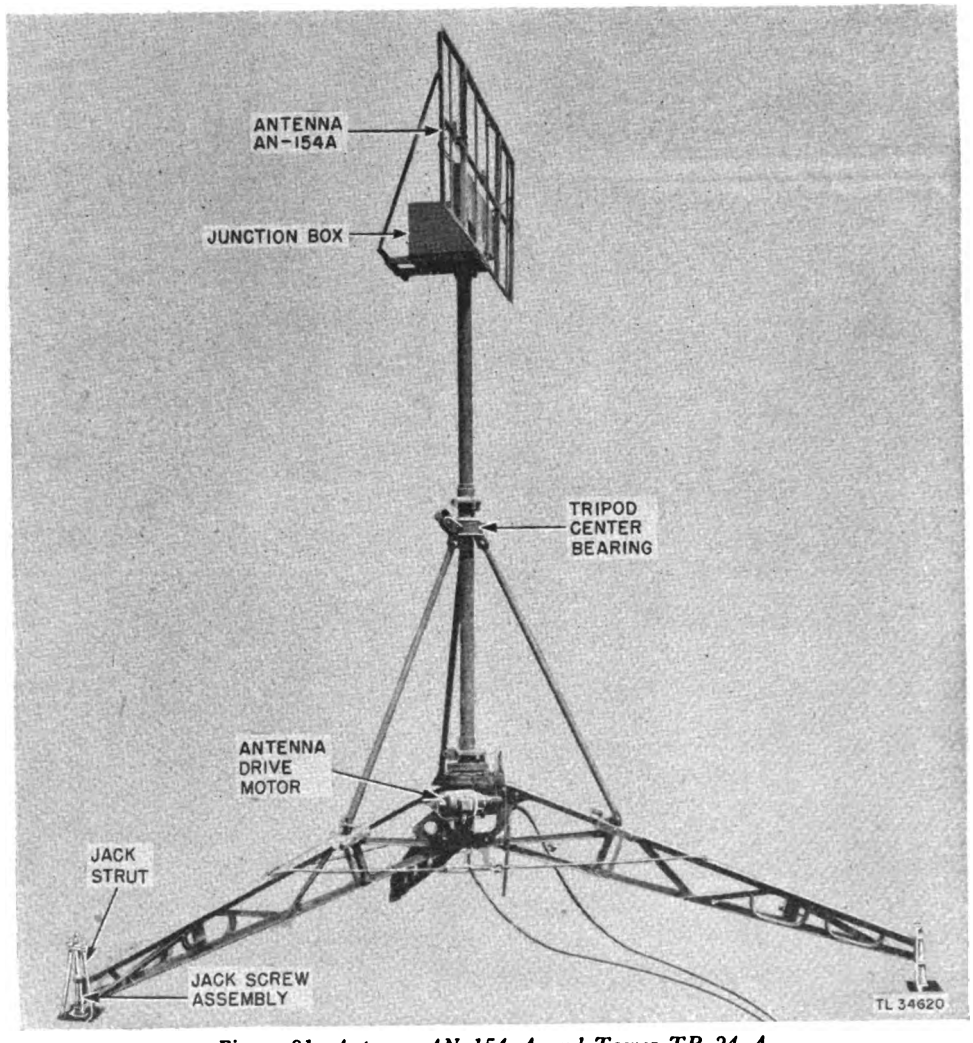


Figure 31. Antenna AN–154–A and Tower TR–24–A.

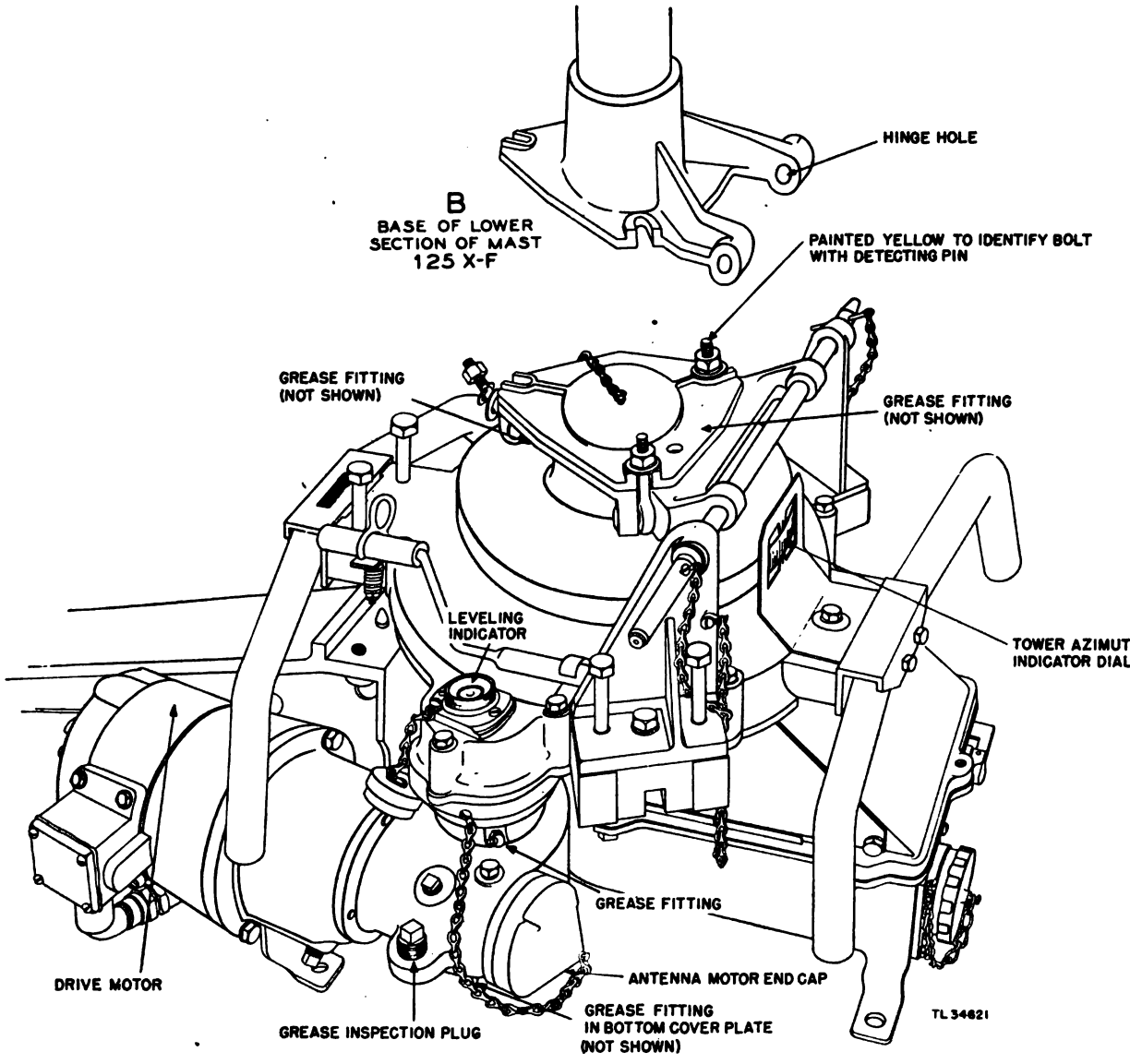


Figure 32. Gear case of Tower TR–24–A.

APPENDIX A

MOISTUREPROOFING AND FUNGIPROOFING

a. GENERAL. Communication failures commonly occur when Signal Corps equipment is operated in tropical areas where temperature and relative humidity are extremely high. The following problems are typical:

(1) Resistors and capacitors fail.

(2) Electrolytic action takes place in coils, chokes, transformer windings, etc., causing eventual break-down.

(3) Hook-up wire and cable insulation breakdown. Fungus growth accelerates deterioration.

(4) Moisture forms electrical leakage paths on terminal boards and insulating strips causing flashovers and crosstalk.

(5) Moisture provides leakage paths between battery terminals.

b. TREATMENT. A moistureproofing and fungiproofing treatment has been devised which, if properly applied, provides a reasonable degree of protection against fungus growth, insects, corrosion, salt spray, and moisture. The treatment involves the use of a moisture-resistant and fungi-resistant varnish applied by means of a spray gun. A brief description of the method of application follows:

(1) All repairs and adjustments necessary for the proper operation of the equipment are made.

(2) Equipment to be processed is thoroughly cleaned of all dirt, dust, rust, fungus, oil, grease, etc.

(3) Equipment is partially dissassembled and certain points, such as relay contacts, open switches, air capacitors, sockets, bearings, etc., are covered with masking tape.

(4) Equipment is thoroughly dried by heat to expel moisture which the circuit elements have absorbed.

(5) All circuit elements and all parts of the equipment are sprayed or painted with three coats of moistureproofing and fungiproofing varnish.

(6) The equipment is given a final operational check; radio sets receiving a 24- to 36-hour aging period, when time permits, before alignment.

c. STEP-BY-STEP INSTRUCTIONS FOR CONTROL UNIT BC–1268–A. (1) *Disassembly.* (*a*) Loosen the four knurled knobs on the front panel and pull the chassis out of the rack.

(*b*) Remove the two nuts from the top of the metal can, which covers timing coil 146, and remove the can.

(*c*) Remove the three screws from the mountings of each terminal strip under the sides of the chassis.

(*d*) Remove Tubes VT–231–3 and VT–231–4.

(2) *Masking.* (*a*) With masking tape, mask switches 142 and 143, the ceramic bushings on capacitor 23, all jacks, and the sockets of Tubes VT–231–3 and VT–231–4.

(*b*) With paper and masking tape, mask trimmer capacitor 12, the range mechanism (shafts, gears, etc.), capacitor 19 (air, gang), and the shaft and coupling of potentiometer 132.

(3) *Drying.* Dry for 2 to 3 hours at 160° F.

(4) *Varnishing.* (*a*) Apply three coats of moistureproofing and fungiproofing varnish.

(*b*) On the top of the chassis, spray the wiring, circuit elements, soldered terminals and insulating materials behind the front panel. Spray the wiring for the cathode-ray tube and the socket, and coil 146. Brush-coat the wiring on the top right side of the chassis, but keep the coating material off the vacuum-tube envelopes as much as possible.

(*c*) On the right side of the chassis, spray the Voltage Reference Chart.

(*d*) On the under side of the chassis, spray all unmasked, visible surfaces and objects, and both sides of the dismounted terminal strips.

(5) *Reassembly.* Reassemble and test operation.

(6) *Marking.* Mark MFP and date of treatment. *Example:* MFP–2/28/44.

d. STEP-BY-STEP INSTRUCTIONS FOR INDICATOR I–221–A. (1) *Disassembly.* Loosen the four

knurled knobs on the front panel and pull the chassis out of the rack.

(2) *Masking.* (*a*) With masking tape, mask the azimuth gear mechanism, the connector bushing adjacent to the antenna-reversing switch, the ceramic bushing on terminal 3 of transformer 102, the holes in the shield on top of the high-voltage rectifier tube, the toggle arm of the antenna-reversing switch, the slits in the top front edges of circuit breakers 116 and 118, and plug and receptacle 112.

(*b*) With paper and masking tape, mask the high-voltage rectifier Tube VT–218 and its socket on the under side of the chassis, and the envelope of Tube VT–215.

(3) *Drying.* Dry the unit for 2 to 3 hours at 160° F.

(4) *Varnishing.* (*a*) Apply three coats of moistureproofing and fungiproofing varnish.

(*b*) On the top of the chassis, spray the wiring, the cases of the circuit-breaker switches, selsyn motor 115, and transformer labels, keeping the coating material off the vacuum tubes as much as possible.

(*c*) On the right side of the chassis, spray all visible unmasked surfaces and objects.

(*d*) On the right side of the chassis, spray the Voltage Reference Chart.

(*e*) Brush-coat the wiring associated with the high-voltage rectifier Tube VT–218.

(5) *Assembly.* Reassemble and test operation.

(6) *Marking.* Mark MFP and date of treatment. *Example:* MFP–2/28/44.

e. Step-by-Step Instructions for Radio Receiver and Transmitter BC–1267–A. (1) *Disassembly.* (*a*) Loosen the four knurled knobs in the front of the panel and pull out the chassis.

(*b*) Remove the nuts from the top of the cans covering transformer assemblies 106 to 112, inclusive, and remove these cans.

(*c*) Remove the leads from meter 160, then take out the meter.

(*d*) Remove the thumbscrew holding Tube VT–215 socket-mounting bracket in place. Remove the six nuts and two screws holding the shield under the r-f section of the receiver, and then remove this shield.

(*e*) Loosen the four thumbnuts on the cover of the transmitter section and remove this cover.

(*f*) Remove the wires from the milliammeter and take out the meter.

(2) *Masking.* (*a*) With masking tape, mask the terminals of the meter leads, all jacks, and the holes in the ends of the coil forms of the movable core chokes in the r-f receiver section.

(*b*) With paper and masking tape, mask all gears and shafts of the under side of the chassis, the envelope of Tube VT–215, switch 140, the under side of the socket of Tube 3E29, and the inside of the Anchor plugs.

(3) *Drying.* Dry for 2 to 3 hours at 160° F.

(4) *Varnishing.* (*a*) Apply three coats of moistureproofing and fungiproofing varnish.

(*b*) Brush-coat all wire and cable insulation and soldered connections on the top of the chassis.

(*c*) Spray transformer assemblies 106 to 112 inclusive.

(*d*) Brush-coat the tuning shaft, coil 113 and supporting laminate strip, and resistor 62–1 in the transmitter section.

(*e*) Spray all unmasked visible surfaces and objects on the under side of the chassis and the under side of the r-f receiver chassis.

(*f*) Spray the Voltage Reference Chart on the right side of the chassis.

(*g*) After removing the masking, touch up with a brush the wiring and terminals on the inside of the Anchor plugs, the wiring, circuit elements, and laminated material under the socket of the 3E29 tube.

(*h*) After remounting the meter 160, touch up the terminals by brush.

(*i*) Using a full brush, seal the following portions of the milliammeter:

1. The joint between the backplate and the meter shell.
2. All screw holes.
3. The joint between the meter glass and the case.
4. The zero-set adjusting screw.

(5) *Assembly.* Reassemble and test operation.

(6) *Marking.* Mark MFP and date of treatment. *Example:* MFP–2/28/44.

f. Step-by-Step Instructions for Power Supply RA–105–A. (1) *Disassembly.* Loosen the four knurled knobs on the front of the chassis and pull out the chassis.

(2) *Masking.* With masking tape, mask the moving parts of the interlock switch, the ceramic bushings of capacitors 6–1 and 6–2, and a 1-inch radius of the ceramic surface around pins 11 and 15 of the Lapp receptacles.

(3) *Drying.* Dry for 2 to 3 hours at 160° F.

(4) *Varnishing.* (*a*) Apply three coats of moistureproofing and fungiproofing varnish.

(*b*) Brush-coat the wiring to the plate connections on the three Tubes VT–119.

(*c*) Spray all other wiring on the top of the chassis and the case of the circuit-breaker switch.

(*d*) Spray the transformer and choke labels.

(*e*) Spray the Voltage Reference Chart on the right side of the chassis.

(*f*) Spray all unmasked visible surfaces and objects on the under side of the chassis.

(5) *Assembly.* Reassemble and check operation.

(6) *Marking.* Mark MFP and date of treatment. *Example:* MFP–2/28/44.

g. STEP-BY-STEP INSTRUCTIONS FOR RACK FM–80. (1) *Disassembly.* (*a*) Remove the four screws from the cover to the blower compartment and take off this cover.

(*b*) Remove chassis of Control Unit BC–1268–A, Indicator I–221–A, Radio Receiver and Transmitter BC–1267–A, and Power Supply RA–105–A from the rack.

(*c*) Disconnect all external connections.

(2) *Masking.* No masking is required.

(3) *Drying.* Dry 2 to 3 hours at 160° F.

(4) *Varnishing.* (*a*) Apply three coats of moistureproofing and fungiproofing varnish.

(*b*) Brush or spray all visible wiring and bakelite materials. (Do not coat rubber-covered wiring.)

(5) *Assembly.* Reassemble and check operation.

(6) *Marking.* Mark MFP and date of treatment. *Example:* MFP–2/28/44.

h. STEP-BY-STEP INSTRUCTIONS FOR RANGE CALIBRATOR I–223. (1) *Disassembly.* (*a*) Remove the 24 screws from around the edge of the top and bottom covers.

(*b*) Remove the crystal holder and replace it after drying.

(2) *Masking.* (*a*) With masking tape, mask jacks 114–1, 114–2, and 114–3.

(*b*) With paper and masking tape, mask resistor 57.

(3) *Drying.* (*a*) Dry the unit at 160° F., for 2 to 3 hours.

(*b*) Do not heat the crystal.

(4) *Varnishing.* (*a*) Apply three coats of moistureproofing and fungiproofing varnish.

(*b*) Spray all visible unmasked surfaces and objects on the under side of the chassis.

(*c*) Spray the transformer and choke labels on the top side of the chassis.

(5) *Assembly.* Reassemble and test operation.

(6) *Marking.* Mark MFP and date of treatment. *Example:* MFP–2/28/44.

i. STEP-BY-STEP INSTRUCTIONS FOR SIGNAL GENERATOR I–222–A. (1) *Disassembly.* (*a*) Remove the phone plug, disconnect the r-f output cable, and take out the power receptacle from the rear of the unit.

(*b*) Remove the 18 screws from the front panel and pull the chassis out of the case.

(*c*) Take out the two screws and remove the cover from the shielded section-housing switch 105–A–B, etc.

(*d*) Remove the eight screws and the shield cover of the subchassis on the top left of the unit.

(*e*) Remove the four thumbnuts from the corners of the large shield covering the tuning section and remove this shield.

(*f*) Remove the crystal holders and replace them after the drying operation.

(*g*) Disassemble the turret containing coils 100 and 101 and remove one end cap.

(2) *Masking.* (*a*) On the subchassis on the top left of the unit, mask the variable air capacitor 61 and switch 106 with paper and masking tape; then mask the contacts on part 109, switch 106, the hole in the case of potentiometer 4, and jack 107 with masking tape.

(*b*) With masking tape, mask any portions of the antenna pick-up rod likely to be coated by spraying or brushing as described below.

(3) *Drying.* (*a*) Dry the unit at 160° F., for 2 to 3 hours.

(*b*) Do not heat the crystals.

(4) *Varnishing.* (*a*) Apply three coats of moistureproofing and fungiproofing varnish.

(*b*) Spray all unmasked visible objects and surfaces inside the case of the subchassis on the top left of the unit. After removing masking, touch up brush capacitor 66, the insulation of switch 106, and the uncoated wiring.

(*c*) Brush-coat wiring, resistors, and switch insulation in the section where switch 105–A–B is located.

(*d*) Spray all visible surfaces and objects on the under side of the power subchassis.

(*e*) In the tuning section, spray coils 102–1, 102–2, and the wiring, circuit elements, and phe-

nolic materials in the immediate vicinity of these coils. Brush-coat all other phenolic materials, wiring (except rubber-covered), small circuit elements under the socket of the RC–9002 Tube VT–202, and the phenolic stand-off insulators.

(*f*) Spray coils 100 and 101, capacitor 64, and the insulating material inside the turret which houses these articles. Brush-coat the insulation visible from the exterior of the turret, keeping the coating material off the contacts.

(5) *Assembly.* Reassemble and test operation.

(6) *Marking.* Mark MFP and date of treatment. *Example:* MFP–2/28/44.

j. REFERENCE. For a full description of the varnish-spray method of moistureproofing and fungiproofing refer to TB SIG 13.

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