

CHAPTER 4

REPAIRS

59. Precautions

a. When replacing tubes, use the same type tube as the one that was removed. Be sure the tube is oriented above the socket correctly before attempting to insert it. Insert with a firm but gentle pressure. *Do not force.*

b. When replacing a component that has several leads soldered to it, locate and identify each lead on the component before unsoldering it. This assures that the replacement component will be connected properly.

c. When parts with the same voltage or power rating cannot be obtained, use a part with a higher and not a lower rating. Locate the replacement part in the same position as the original part.

d. When soldering, be careful not to allow the soldering iron to touch adjacent components. Use only a small pencil-type iron. Use the minimum amount of solder necessary to make a good electrical joint.

e. After repairs are completed, field organizations will brush moistureproofing and fungiproofing varnish on exposed surfaces of equipment in accordance with TB SIG 13, Moistureproofing and Fungiproofing Signal Corps Equipment. Moisture and Fungus Proofing Equipment MK-2/GSM may be requisitioned for this purpose. Complete moistureproofing and fungiproofing will be accomplished at depots after repairs have been completed.

60. Removal and Replacement of Control Panel

Caution: Removal of the panel is a complicated operation and should be performed only when repair or maintenance of the radio set makes it absolutely necessary.

a. Removal of Panel.

- (1) Release the catches on the case and remove the receiver-transmitter from its case.

- (2) Turn the TUNING knob counterclockwise until the TUNING capacitor gang plates are meshed fully. Tighten the dial lock to prevent movement of the dial drive mechanism during the removal operation.
- (3) Lift and remove the drum dial pointer and dial pointer spring. This will prevent damage to or loss of these items.
- (4) Apply the spring tension tool (fig. 32) to the gang scissor gear as shown on figure 33. This maintains shear tension on the two sections of the scissor gear.
- (5) Remove the four screws that secure the control panel to the chassis. There are two on each side of the chassis just behind the panel.
- (6) Remove the two inside screws that secure the dial drive mechanism to the chassis. One screw is accessible from the top, and the other from the bottom of the chassis.
- (7) Unsolder and remove both ends of the leads that interconnect the antenna jacks with the chassis. Make a written note of the positions of the leads so that they may be reconnected properly.

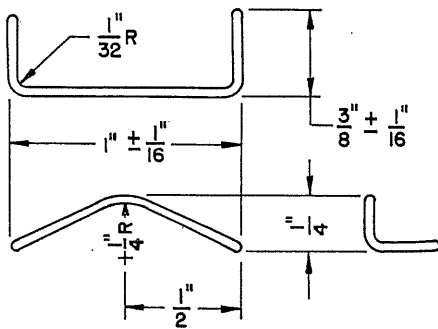
b. Replacement of Panel.

- (1) Replace and solder all the antenna jack No. 24 stranded wire leads in their original positions (fig. 34 or 35).
- (2) Replace and solder No. 24 stranded wire leads interconnecting the control panel and chassis in their original positions (fig. 34 or 35).
- (3) Replace the control panel in its original position and fasten it to the chassis with the original screws and lock washers. If care was taken to keep the TUNING capacitor gang

plates fully meshed, and if the dial gear mechanism was not moved, the gang scissor gear and the pinion will mesh in the same positions in which they were before separation.

- (4) Remove the spring tension clip from the TUNING gang scissor gear.
- (5) Replace the drum dial pointer and dial pointer spring in their original positions.

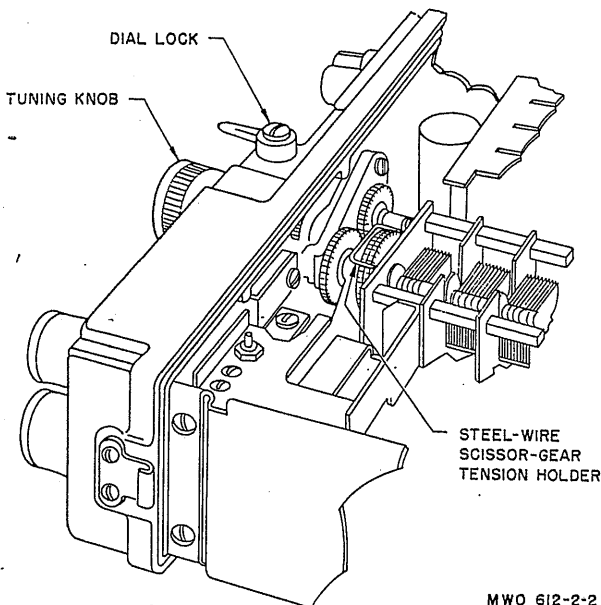
c. Mechanical Alinement of Panel and Chassis Assembly. A jig is required to assure correct mechanical alinement of the panel and chassis assembly so that it fits properly in its case.



.032" DIA STEEL SPRING WIRE

MWO 612-2-1

Figure 32. Scissor-gear tension clip.



MWO 612-2-2

Figure 33. Application of wire clip to gang scissor gear.

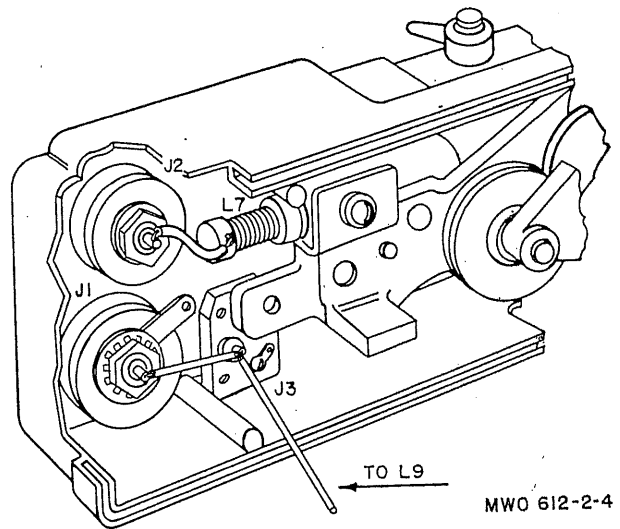


Figure 34. Antenna lead connections for RT-174/PRC-8.

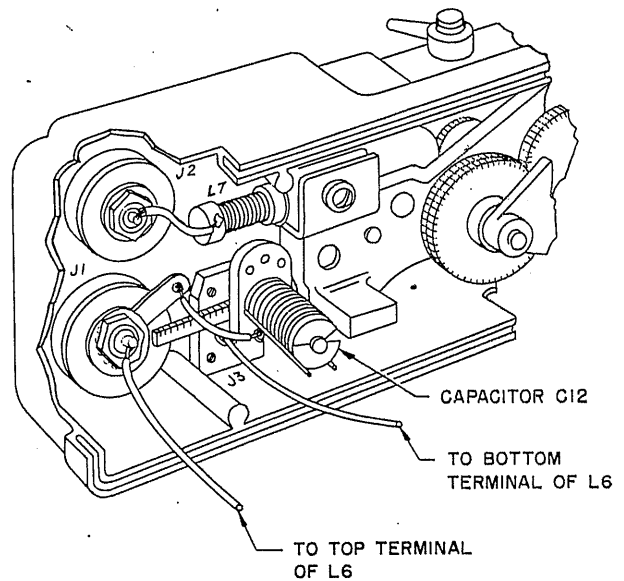


Figure 35. Antenna lead connections for RT-175/PRC-9 and RT-176/PRC-10.

- (1) *Fabrication of jig.*
 - (a) The jig is made from the case of a receiver-transmitter which is non-repairable.
 - (b) Remove the eight-pin male battery plug and flexible cord from the bottom of the case, leaving the female receptacle intact.
 - (c) Remove the two catches located one on each side near the back of the case.

- (d) Drill four $\frac{3}{8}$ -inch diameter holes, two on each side of the case, near the front, as shown on figure 36.

(2) Use of jig.

- (a) Loosen the four 6-32 by $\frac{1}{4}$ -inch long binder-head machine screws that fasten the panel to the chassis. These screws are located two on each side of the chassis and just behind the edge of the panel.
- (b) Secure the jig in a vertical position in some convenient location. Insert the chassis in the jig and fasten the holddown catches.
- (c) Tighten the four 6-32 screws that fasten the panel to the chassis. These screws are accessible through the four $\frac{3}{8}$ -inch holes in the jig.
- (d) The panel and chassis assembly is now correctly aligned. Remove it from the jig and install it in its proper case.

61. Tube Replacement

All accessible tubes and the if. and discriminator cans are shown on figures 30 and 31.

a. If. Tubes. Turn the if. can in for repair. Each if. tube is located in an if. can that is

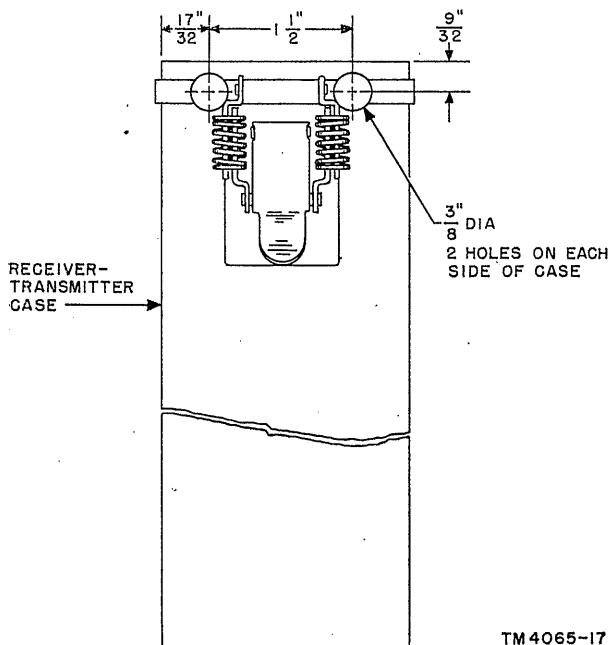


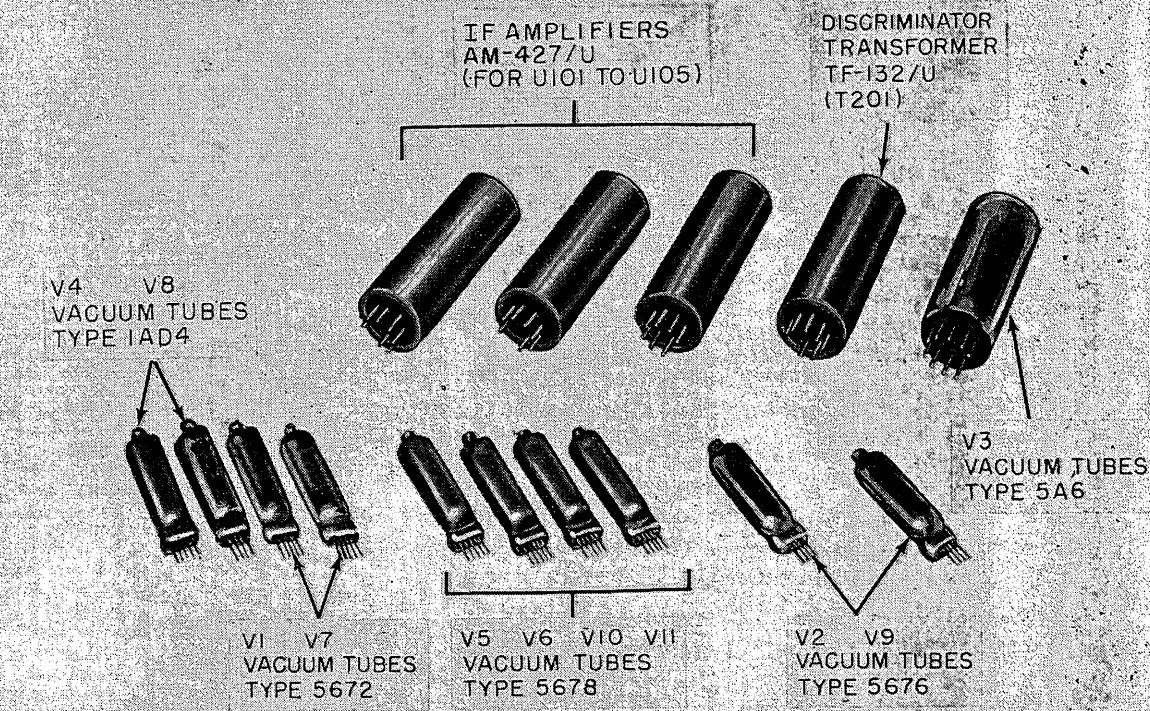
Figure 36. Holes in jig used for panel and chassis alignment.

hermetically sealed. The tube, therefore, is not accessible.

b. Audio, Squelch, and Calibration Tubes. To remove the audio (V7), the squelch (V11), or one of the calibration oscillators (V9 and V10), it is necessary first to remove the tube clamp for these tubes. Remove the two securing screws and then remove the tube clamp. Remove the desired tube by pulling straight up on it. When replacing these tubes, be sure the red mark on the tube corresponds to the pimple on the socket. After tubes are in place, replace the tube clamp and tighten the two screws which secure this clamp.

c. Tubes Mounted on Box Assemblies. Tubes V2, V4, V5, V6, V8, and V1 are mounted on the box assemblies (fig. 30).

- (1) Remove the two screws that secure the cover plate, and remove the cover plate.
- (2) Loosen but do not remove the two screws that secure the tube clamp for the six tubes, and remove the tube clamp by sliding it away from the tubes.
- (3) When replacing each tube, be sure that the red mark on the tube corresponds to the red mark on the tube socket.
- (4) When replacing V2 in the tube socket on the TRANS OSC box, insert the pin nearest to the red mark on the tube into the second pin socket on the red mark on the tube socket.
- (5) Before installing a new V6 (mixer) or V8 (receiver oscillator), break the electrical connection between the external tube coating and pin 3 of the tube. (An ohmmeter check should indicate a reading of infinity between pin 3 and the metallic tube coating.) When replacing V8, remove the insulating sleeve from the old tube and place it around the new tube. If the old tube does not have an insulating sleeve, obtain some form of spaghetti insulation and slip it around the tube. This is required to insulate the metallic coating of this tube from the cover plate.



NOTE:
RECEIVER OSCILLATOR V8 IS A TYPE 5676 IN THE
FOLLOWING MODELS OF RADIO SET AN/PRC-10:

ORDER NO.	SERIAL NOS.
1758-PHILA-51	BELOW 6500
3374-PHILA-52	21562 THRU 22286

TM 4065-18

Figure 37. Vacuum tubes and if. and discriminator cans.

- (6) When all six tubes have been inserted into the sockets on the boxes, install the tube clamp and tighten the two holding screws.
- (7) Install the cover plate and tighten its two holding screws.

62. Replacement of If. and Discriminator Cans

a. Removal. Remove the four screws that hold the cover plate in place on the back of the chassis (fig. 30) and remove the plate. Remove the individual cans by pulling straight out. If necessary, pry under the base with a small screwdriver. The if. shelf with shield removed is shown on figure 38.

b. Replacement. Aline the pins on the back of the can with the holes in the socket and push the can in place. Be sure the cans are placed in the correct sockets by referring to the designa-

tions on the cans and chassis. Replace the cover plate and the four screws that hold it in place.

63. Replacement of Box Assemblies

a. Removal. Remove the tube that is mounted on the box assembly as directed in paragraph 61c. Unsolder the leads on the terminal board of the box. If the transmitter tube is in the way, first remove the shield by taking out the two screws that hold it to the chassis. Then pull the tube straight out from the socket. Remove the top and two side screws of the box, one right and one left. The box can now be lifted out of the chassis. Inside views of the boxes are shown on figures 39 through 44.

b. Replacement. Place the box in position, start the three screws, and then screw tight. Replace the leads on the terminal board, being careful to use a minimum of solder. Apply

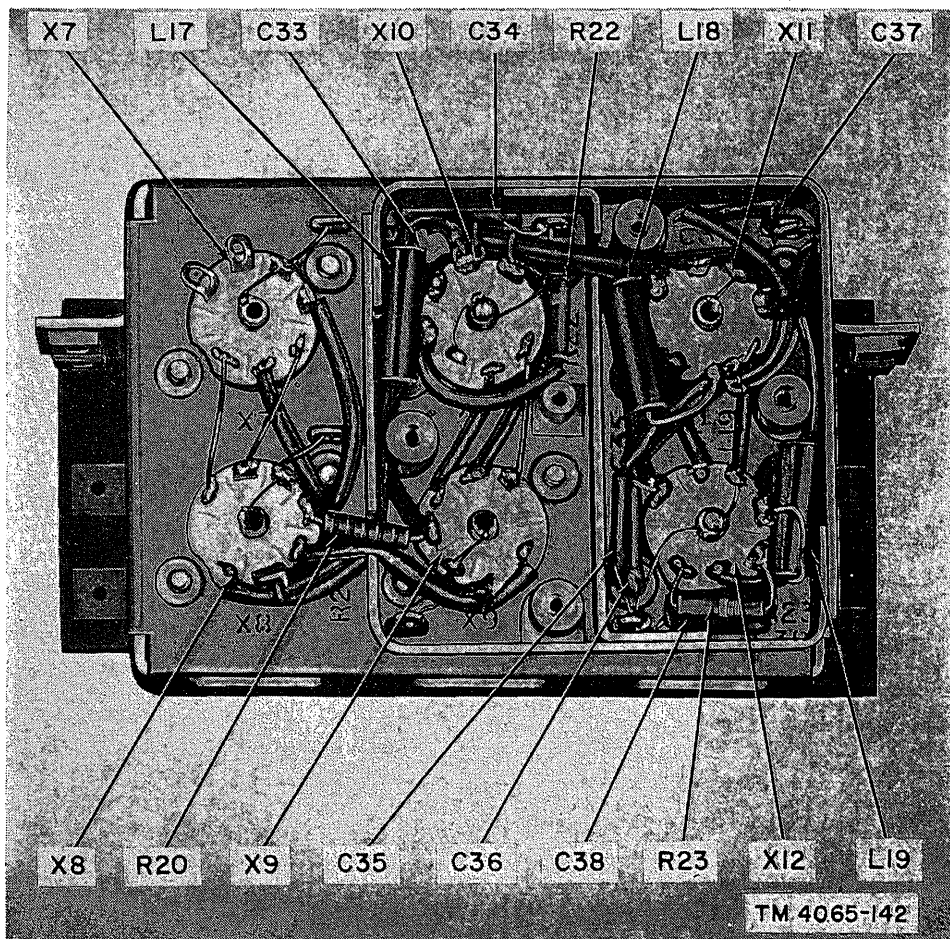


Figure 38. If. shelf with shield removed.

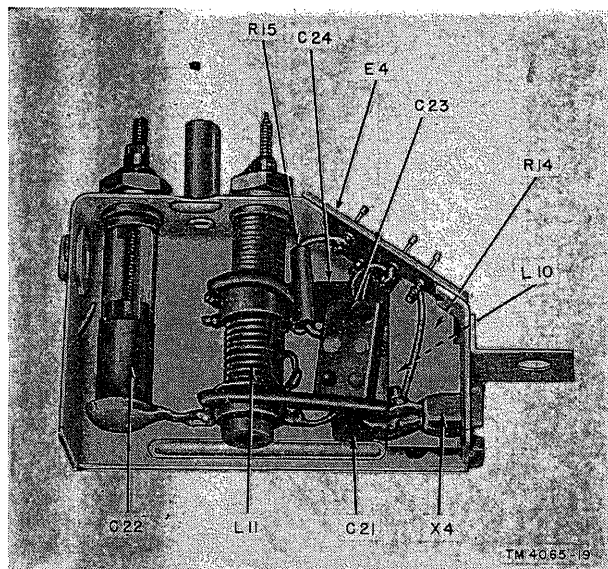


Figure 39. First rf box, inside view.

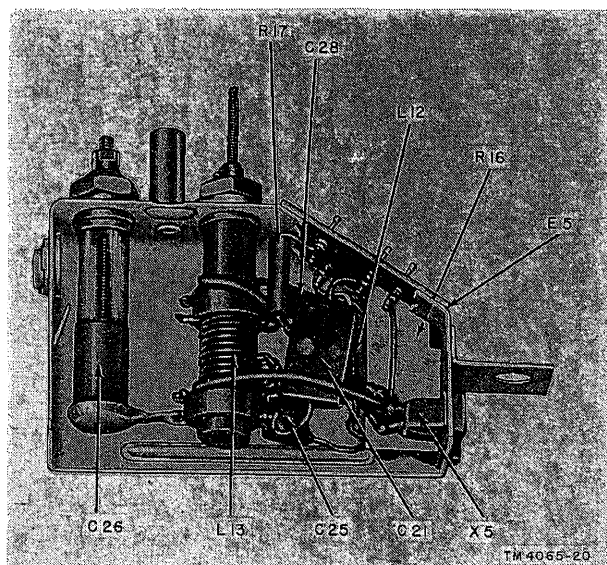


Figure 40. Second rf box, inside view.

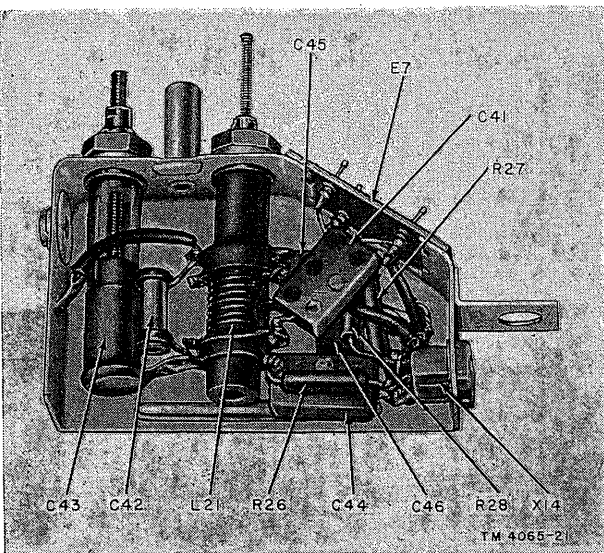


Figure 41. Receiver oscillator box, inside view.

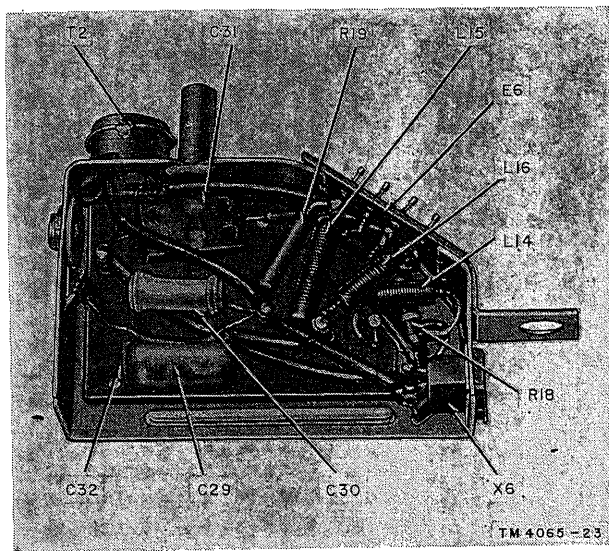


Figure 43. Mixer box, inside view.

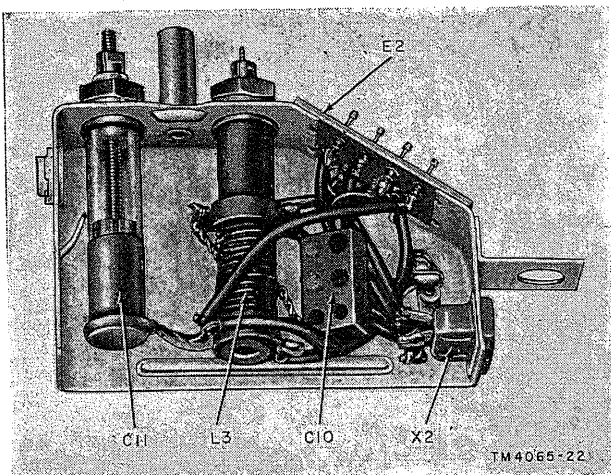


Figure 42. Transmitter oscillator box, inside view.

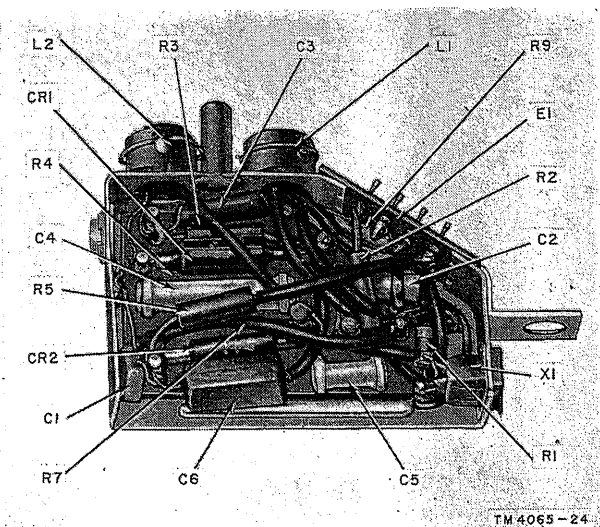


Figure 44. Afc box, inside view.

solder only at the point where the wire touches the terminal.

64. Replacement of Dial Lamp

a. Unscrew the cap marked LITE CAP (located on the front panel) using a screwdriver if necessary.

b. Hold a hand under the opening, turn the receiver-transmitter so that the control panel faces down, and shake slightly until the dial lamp drops out.

c. To insert a new lamp, hold the control panel face up and drop a lamp into the opening, bulb first.

d. Screw on the LITE CAP.

65. Replacement of Calibration Crystals (fig. 31)

Crystal Y1 consists of a 1-mc Crystal Unit CR-18/U. Crystal Y2 consists of a 4.3-mc Crystal Unit CR-18/U.

a. Push back the spring clamp and lift the crystal out of its socket.

b. To insert a new crystal, push the spring clamp to the side and insert the crystal in the socket. No polarity need be observed when inserting the crystal.

c. Push the spring clamp over the crystal to keep it securely in its socket.

66. Lubrication of Dial-Drive Mechanism

a. The dial-drive mechanism is the only assembly in the radio set that requires lubrication. No Department of the Army lubrication order has been issued for Radio Sets AN/PRC-8, -9, and -10.

b. It is expected that the dial-drive mechanism will not require lubrication for the life of the radio set. If, however, the chassis has been exposed to moisture or dirt, and there is corrosion or dirt on the gears, cleaning and lubrication will be necessary. To clean and lubricate the dial-drive mechanism, remove the control panel from the chassis of the receiver-transmitter. *This is a very difficult operation and should be performed only when absolutely necessary.*

c. Remove the control panel from the receiver-transmitter chassis as directed in paragraph 60.

d. Clean the dial-drive mechanism with solvent (SD), being careful not to get it on parts other than those being cleaned. Dry with a

cloth while turning the mechanism so that all portions are clean and dry.

e. Using a small toothpick or No. 20 AWG bare wire, apply 1 drop of lubricating oil to all bearings and shafts except the gears. Use Oil, Lubricating, Preservative, Special (PL Special) in accordance with MIL-L-644A specification. Keep oil away from O-ring seals to prevent damage to the seals.

f. Apply grease sparingly to all gears, pinions, and racks, as shown in figures 45 and 46. Use grease in accordance with MIL-G-3278 specification. Work the grease in and spread it by turning the dial knob from one end of travel to the other. Wipe off the excess lubricant from the sides of gears, pinions, and racks.

67. Refinishing

a. When the finish on the cases has been badly scarred or damaged, touch up the bared surfaces with No. 00 or No. 000 sandpaper to prevent rust and corrosion. Clean the surface

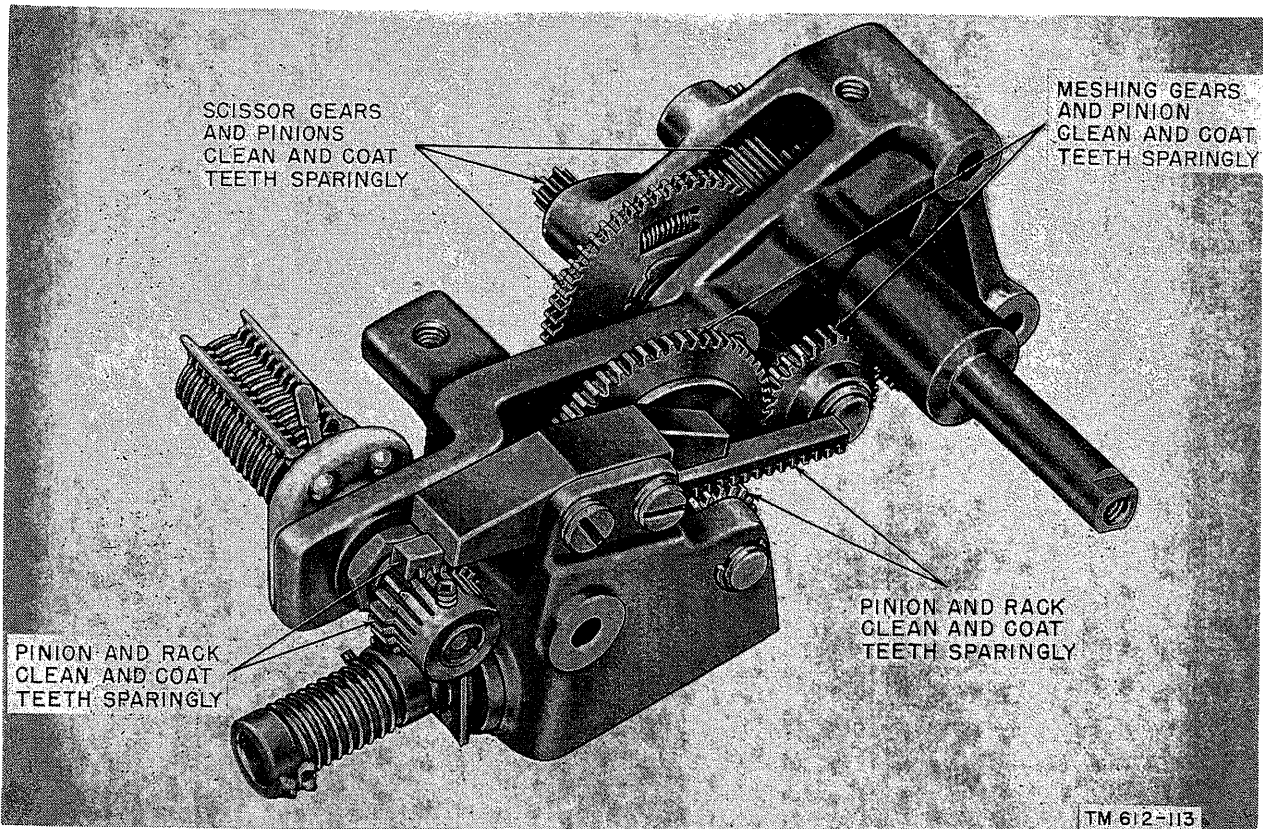


Figure 45. Top view of dial-drive mechanism.

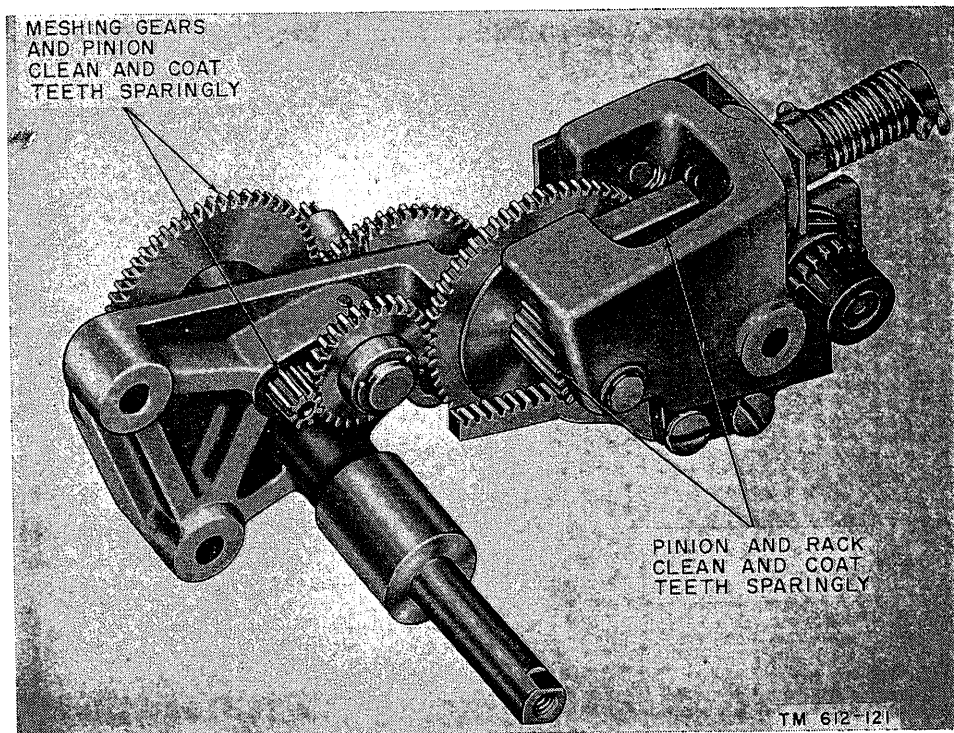


Figure 46. Bottom view of dial-drive mechanism.

down to the bare metal; obtain a bright smooth finish.

Caution: Do not use steel wool. Minute particles frequently enter the case and cause harmful internal shorting or grounding of circuits.

b. When a touch up job is necessary, apply paint with a small brush. Remove corrosion from the case by cleaning corroded metal with solvent (SD). In severe cases it may be necessary to use solvent (SD) to soften corrosion and to use sandpaper to complete the preparation for painting. Paint used will be authorized and consistent with existing regulations. Instructions for refinishing badly marred panels are contained in TM 9-2851, Painting Instructions for Field Use. Refer to these instructions as necessary.

68. Dial-Drum Adjustment after Replacement.

a. Turn the TUNING capacitor exactly to its fully meshed position. This brings the low-frequency end of the dial scale opposite the dial window.

b. Turn the POINTER ADJUST knob and center the pointer midway between its two extremes of travel.

c. Position the dial drum so that the full-width line, located just below the lowest frequency mark on the dial, is aligned with the pointer. Tighten the Allen screw in the center of the tuning dial drum with the wrench and spanner (Sig C stock No. 6R5701-3).

Caution: If the wrench and spanner are not used to hold the bevel gear during tightening and loosening of the Allen screw, damage to the bevel gear will result.

69. Relay Repairs

Repairs or adjustments to relays rarely will be necessary. When hermetically sealed relays are used, replace a defective relay with a new one. In those units in which open relays are used, some adjustment and cleaning can be performed.

a. *Adjustments of K1.* Bend the spring contact or contacts that appear to be defective until satisfactory operation is obtained.

b. *Adjustment of K2.* Adjust the spring-locked screw contacts of K2 with a small wrench until satisfactory operation is obtained.

c. *Contact Cleaning.* Use a small amount of carbon tetrachloride on the relay contacts and wipe dry and clean with a soft cloth.