

# RCA

## RADIOLA 47

WEG.U.S-PAT.OFF.



RadiolaVille

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B E Q. U. S. PAT. OFF.

**AC Lighting Circuit Operated**



### Instructions

#### RADIO-VICTOR CORPORATION OF AMERICA

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	235 Montgomery Street	Santa Fe Building, Unit No. 1
	San Francisco, Cal.	Dallas, Texas



Fig. 1. RCA Radiola 47

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AC Lighting Circuit Operated

## INTRODUCTION

**RCA Radiola 47** is a lighting circuit operated, antenna type, shielded radio receiver combined with an electric phonograph. The receiver, phonograph, and RCA electro-dynamic loudspeaker are enclosed in a walnut veneered console cabinet.

The circuit of the receiver includes two stages of radio-frequency amplification, a detector, and one stage of audio-frequency amplification. The two stages of radio-frequency amplification, employing the AC screen grid Radiotrons UY-224 recently introduced by the Radio-victor Corporation of America, give performance equal to that of four tubes used in ordinary tuned radio-frequency receivers. A third Radiotron UY-224 functions as the detector with a consequent increase in the efficiency of the circuit. Fine quality of reproduction and ample volume are insured by the use of the new power-amplifier Radiotron **UX-245** in the single audio stage.

The phonograph system consists of an electric pickup, a volume control, and a two-stage amplifier. The pickup translates the vibrations of the needle into electrical impulses which are then amplified and delivered to the loudspeaker. The first stage of the amplifier employs the detector Radiotron UY-224, and the second stage employs the power-amplifier Radiotron UX-245 of the receiver circuit.

The powerful built-in RCA electro-dynamic loudspeaker, used for both radio receiver and phonograph, furnishes excellent reproduction at either reduced or full volume.

Radiotron UX-280 is used to rectify the AC input for the plate and grid supply of all Radiotrons, also for the loudspeaker field supply.

A pilot lamp serves to project, upon a fixed translucent dial screen, magnified images of the selector scale having both arbitrary graduations and approximate kilocycle (frequency) markings. As the selector is rotated, the images pass by an index pointer on the screen. The illumination of the dial screen also indicates when the power is **on**.

This Radiola has a "two-in-one" selector and volume control, thereby insuring ease of operation. A local-distant switch is provided to retain the maximum high quality operating characteristics of the Radiola for both strong local and weak distant stations. Excellent sensitivity and selectivity are provided over the broadcast range from 550 to 1500 kilocycles (545 to 200 meters).

To make sure that this Radiola is properly installed, to obtain the best reception, and so to gain the fullest pleasure from its performance, it is earnestly recommended that this book be read carefully and that it be retained for future use.

# Part I—Installation and Operation

## EQUIPMENT

### Furnished—Packed with Radiola

1. Two pilot lamps (one spare); Mazda No. 41, T-3 bulb, miniature base, concentrated filament, 2.5 volts, 0.45 ampere (packed in instruction book envelope)
2. One phonograph turntable
3. One cup, with removable cap, for used needles
4. One bottle of RCA Motor Oil
5. One tube of RCA Electric Motor Grease

### To Be Provided

1. One complete set of Radiotrons, as follows:
  - Three RCA Radiotrons UY-224
  - One RCA Radiotron UX-245
  - One RCA Radiotron UX-280
2. Antenna and ground equipment (see **Part II**)

## INSTALLATION

**Preliminary**—After unpacking RCA Radiola 47, take off the rear cover of the cabinet. The packing devices which protect the Radiola and its parts during shipment should be removed, as follows:

1. Remove the wooden skid which is bolted to the bottom of the cabinet.
2. Remove the tape used to secure the electric pickup (Fig. 5).
3. Remove the paper wedges from the turntable motor (Fig. 2) so that the disc will rotate freely.

**WEDGES ALREADY REMOVED.**

4. Open the corrugated paper carton and unpack the accessories contained therein. Save all of the packing materials for use in event of reshipment.

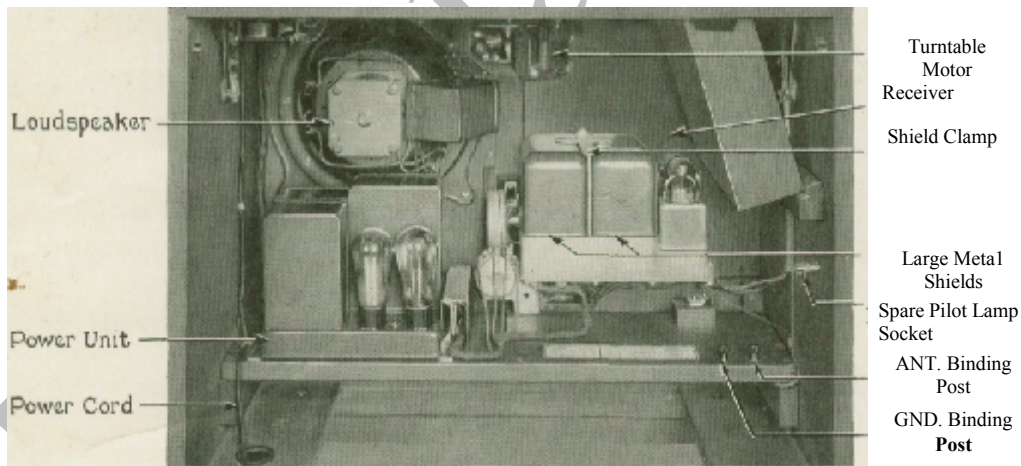


Fig. 2. Rear View of RCA Radiola 47 with Cover Removed

**Turntable**—Swing the electric pickup to the extreme right and pull the Motor Switch Lever forward (see Fig. 5). Hold the turntable in both hands, and carefully lower it over the spindle. Make certain that the pin in the spindle is engaged with the slot in the turntable hub.

**Cup for Used Needles**—Insert the cup for used needles in the hole between the two cups for new needles, and attach the cover (see Fig. 5).

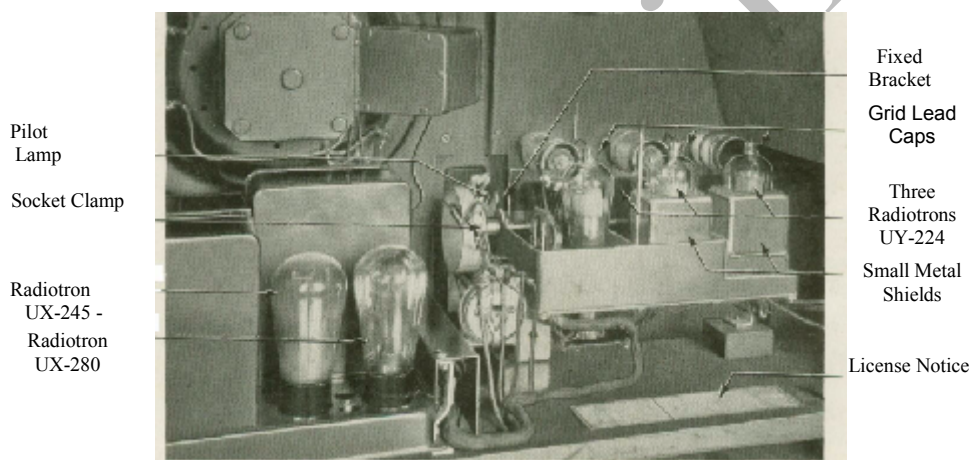
**Power Cord**—Unwrap the power cord and bring it out through the round hole in the bottom of the cabinet, as shown in Fig. 2.

**Location**—Locate the Radiola near an electrical outlet, preferably where the antenna lead-in and ground connections will be as short as practicable.

**Antenna and Ground**—Satisfactory operation is dependent upon proper installation of the antenna and ground (see Part II).

The antenna and ground leads should be of insulated wire, No. 14 gauge or larger. Bring them into the cabinet through the large opening in the bottom. Connect the antenna lead to the "ANT" binding post and the ground lead to the "GND" binding post (see Fig. 2 and 6).

**Loudspeaker**—Make certain that all connections are secure at the loudspeaker terminals (see Fig. 2 and 6).



**Fig. 3. Rear View** with Large Metal Shields Removed—Showing Radiotrons and Pilot Lamp Mounting (Pilot Lamp Socket Clamp Slides over Fixed Bracket)

**Power Supply**—RCA Radiola 47 should never be connected to any circuit supplying other than alternating current, within the rated limits of voltage and frequency (cycles) specified on the license notice (see Fig. 3). Failure to observe this may result in damage to the Radiola. If there is any doubt about the rating of the house lighting circuit, consult the Electric Light and Power Company before connecting the Radiola (see also "AC Line Voltage", Part II).

No tube protector or line voltage reducer should be used with this Radiola. (See "Tube Protectors", Part II.)

With the On-Off Switch at "OFF", insert the attachment plug of the power cord in an electrical outlet.

**Important**—*Never apply power to RCA Radiola 47 unless all the Radiotrons are in the sockets.*

**Metal Shields and Radiotrons**—Remove the shield clamp (Fig. 2) and lift out the large metal shields. Handle these shields carefully.

Insert the five Radiotrons, which should always be handled carefully, in the proper sockets as shown in Fig. 3. Be sure that the two large pins of the "UX" Radiotrons enter the large holes, and that the base of each Radiotron rests squarely against the socket. After the Radiotrons are inserted, press the grid lead caps (see Fig. 3) firmly down over the grid contacts of the UY-224 Radiotrons.

Set the On-Off Switch (Fig. 4) to the "ON" position, upward. Make sure that the five Radiotrons are lighted. Snap the On-Off Switch to "OFF".

Push down on the small metal shields to make certain that they are firmly in place (see Fig. 3).

Replace the large metal shields carefully. The shield with one large and one small notch must be placed in the compartment to the left (facing the rear of the cabinet) and with the large notch next to the selector dial.

After both shields are firmly seated, replace the shield clamp over the clamp bolts. The knurled nuts should be tightened sufficiently to hold the shields securely, but excessive pressure, which may bend the shields, is to be avoided.

**Pilot Lamp**—Turn the Selector (Fig. 4) counter-clockwise to the extreme position, so that the pilot lamp mounting will be accessible (see Fig. 3). Remove the socket clamp from the fixed bracket and screw one of the pilot lamps firmly into the socket. Replace the socket clamp on its bracket. Insert the extra bulb into the spare pilot lamp socket. Fig. 2.

Set the On-Off Switch to "ON". With the Selector still in the extreme counter-clockwise position, adjust the socket clamp on the fixed bracket until the zero mark of the scale, projected on the translucent dial screen (Fig. 4), is approximately 1/4 inch below the index pointer. Then switch off the power and replace the rear cover.

## RADIO OPERATION

Refer to Fig. 4 and proceed as follows:

1. Set the Radio-Record Switch to "RADIO" (see Fig. 5).
2. Set the On-Off Switch to "ON". The pilot lamp should light. A few seconds are required for Radiotrons UY-224 to heat before satisfactory reception is possible.
3. Set the Local-Distant Switch to "DISTANT".
4. Set the Volume Control in approximately the middle position. Then turn the Selector slowly in either direction. If no station is heard at any point, advance the Volume Control in the clockwise direction slowly, while rotating the Selector, until a station is heard.
5. Adjust the Selector for maximum signal strength.
6. Adjust to the desired volume by means of the Volume Control. Because of the extreme sensitivity of Radiola 47, a more satisfactory adjustment is obtained, when receiving powerful nearby stations, by setting the Local-Distant Switch to "LOCAL".
7. When through operating snap the On-Off Switch to "OFF".

NOTE—If the Volume Control is too far advanced when receiving strong signals, it may occur that the station can be tuned in over a broad continuous range on the selector scale. In general, best reception of any station is obtained if the tuning is done with the Volume Control set at the furthest counter-clockwise position at which the station can be heard. After the correct setting of the Selector is obtained, the volume may be increased as desired with the Volume Control.

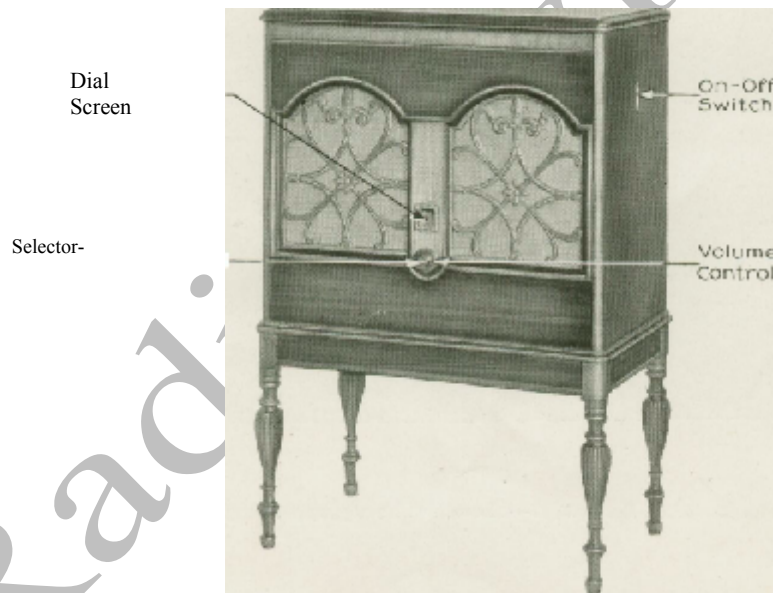


Fig. 4. RCA Radiola 47—Showing Radio Controls  
(Local-Distant Switch on Side Opposite On-Off Switch)



## PHONOGRAPH OPERATION

Refer to Fig. 5 and proceed as follows:

1. Set the Radio-Record Switch to "RECORD."
2. Set the On-Off Switch to "ON". A few seconds are required for the Radiotron **UY-224** to heat before reproduction is possible.
3. Insert a needle in the pickup as far as it will go, tighten the needle screw, and swing the pickup to the extreme right.
4. Place a record on the turntable.
5. Pull the Motor Switch Lever forward. After the turntable has acquired speed, lower the pickup gently onto the record.
6. Adjust to the desired volume by means of the Phonograph Volume Control.
7. Close the lid while the phonograph is playing.
8. When through playing a record, lift the pickup and swing it to the extreme right, thereby tripping the  $\bigcirc$  automatic stop switch. In order to stop the motor at or near the start of a record, it is necessary to push the Motor Switch Lever to the rear. The motor will stop automatically at the end of Victor records having the eccentric groove.

NOTE—The pin attached to the under side of the pickup suspension arm should always be engaged in the slotted lever extending from under the turntable.

9. When through operating snap the On-Off Switch to "OFF".

NOTE—The electric pickup should never be left resting on the record (except when playing) or on the turntable.

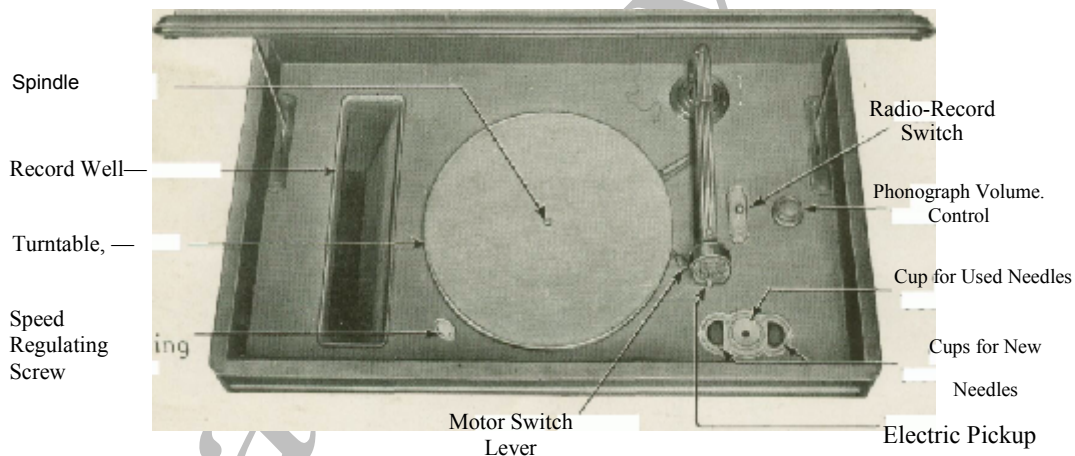


Fig. 5. RCA Radiola 47—Showing Phonograph Compartment

## Part II—General Information

### RADIO RECEIVER

**AC Line Voltage**—The 105/125-volt models (both 50/60 and 25/40 cycles) of Radiola 47 are originally connected for normal operation on voltages above 115, and the 200/250-volt, 50/60-cycle model for voltages above 225. The original connection should be left unchanged unless it is definitely determined, by consulting the RCA Radiola Dealer or the Electric Light and Power Company, that the supply voltage is normally below this value. Provision is made for adapting the Radiola to voltages below 115 (or 225), by a simple wiring change within the Radiola. When such a change is required, it should be performed by the RCA Radiola Dealer.

**Tube Protectors**—The power unit in this Radiola is designed to supply correct voltages to the Radiotrons, without the addition of a tube protector or line voltage reducer. A tube protective device of any kind, used in series with the power supply, will reduce the voltage supplied to the Radiola so that the Radiotrons will not receive their proper voltages and therefore will not operate at highest efficiency. For this reason it is recommended that no line voltage reducing device be used with this Radiola.

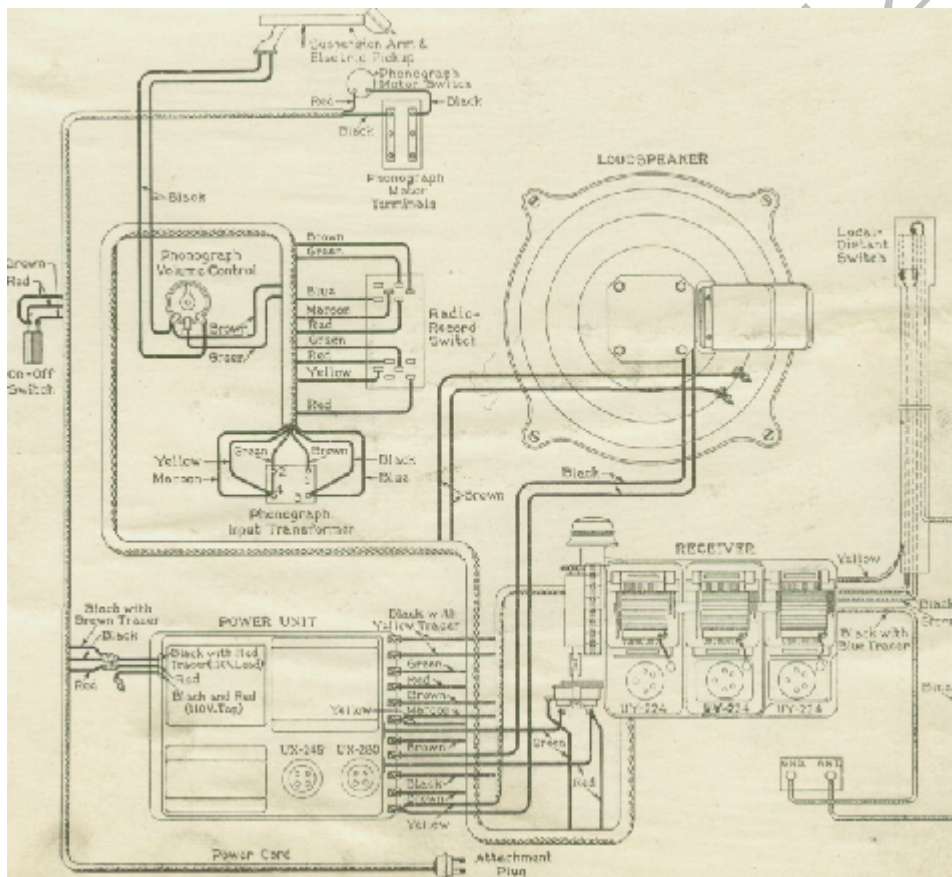


Fig. 6. RCA Radiola 47 Cabinet Wiring

**Power Supply**—Reception may possibly be improved by reversing the attachment plug (Fig. 6) at the electrical outlet.

**Metal Shields**—Be sure that the metal shields are always firmly in place.

**Radiotrons**—Improved results may sometimes be obtained by rearranging the UY-224 Radiotrons, all other Radiotrons remaining in their respective sockets. Before interchanging Radiotrons, switch off the power. (See "Important," Part I.)

The characteristics of the circuits connected with the UY-224 socket, adjacent to the selector dial on the receiver unit (see Fig. 3), are such that they have an important bearing on the operation of the Radiola. It is recommended, therefore, that the UY-224 Radiotron in this socket be interchanged with the other UY-224 Radiotrons, using the arrangement which gives the best reception. This arrangement once made, should not be changed.

**Volume**—Adequate control of volume can be obtained with the Volume Control and the Local-Distant Switch. Reduction of volume should never be accomplished by adjustment of the Selector. The Local-Distant Switch should be set to "LOCAL" and the Volume Control advanced whenever, by so doing, the desired volume can be obtained.

**Selector Scale**—The selector scale is arbitrarily graduated from "0" to "100." Approximate kilocycle (frequency) values are indicated on the left side of the scale.

**Antenna—**

(a) *Outdoor Type*—A single-wire (No. 14 bare copper is recommended) outdoor antenna 30 to 50 feet long will usually provide good reception. The shorter antenna is preferable in a locality near high-power broadcast stations. A longer antenna may give improved results in a locality distant from broadcast stations.

The antenna should be isolated from other objects. It should be erected as high as possible and at right angles to all electric light and power lines and must not cross either above or below such lines. The antenna and lead-in should be supported by high-grade glass or glazed porcelain insulators, and the lead-in should be spaced a foot or more from the building. All splices should be soldered.

The lead-in and ground connections should be separated from one another and be as short and direct as practicable. It is preferable that the lead-in wire be a continuation of the antenna itself, and where brought through the wall or window frame it should be insulated therefrom by some means, such as a porcelain tube.

An outdoor antenna should be protected by an approved lightning arrester, in accordance with the requirements of the National Board of Fire Underwriters.

(b) *Indoor Type*—An indoor antenna is not as effective for distant reception as a properly installed outdoor antenna. Where installation of an outdoor antenna is not practicable, satisfactory results may be obtained by using 30 to 50 feet of insulated wire inside the building. The size of the wire is not particularly important, though No. 18 bell wire is suggested. In buildings with metal lath, satisfactory results are not always possible with this type of antenna. Under such conditions, various arrangements of the indoor antenna may be tried.

**Ground**—A good connection to ground is as important as a well constructed antenna. Definite instructions cannot be given, as conditions vary in different locations. Water pipes or steam pipes generally make good grounds. The use of gas pipes should be avoided. The ground lead should be connected by means of an approved ground clamp to a section of the pipe that has been scraped thoroughly clean. If water or steam pipes are not available, a pipe or metal rod may be driven into the ground to a depth of several feet. The success of this type of ground depends upon the presence of moisture in the soil.

## PHONOGRAPH

**Electric Pickup**—The electric pickup should be handled carefully and lowered onto the record gently. Dropping of the pickup on the record may result in damage to both.

**Needles**—If steel needles are used, a new needle should be inserted before playing each record. The Victor Tungs-tone needle can be used until reproduction becomes imperfect. The Victor full-tone steel or full-tone Tungs-tone needle gives best reproduction.

The needle screw should always be tightened securely, as a loose needle may cause noisy reproduction.

**Record a**—The records should usually be kept in the envelopes. Those in constant use, up to 30, may be stored (without the envelopes) in the record well which is provided in the cabinet (see Fig. 5).

Dust should be removed from the records before playing, by brushing with a felt or plush pad. Cracked or badly scratched records should be destroyed, as playing them may result in damage to the electric pickup.

The records should not be exposed to severe heat, as warping may result. A warped record may be straightened, however, by allowing it to rest on a flat horizontal surface in a warm place, weighted with a book or other flat object.

## Part III—Maintenance

**Radiotrons**—Before inserting or removing Radiotrons always be sure that the current is switched off.

The contact pins of all Radiotrons, also the grid contacts at **the top of the** UY-224 Radiotrons, should be inspected periodically and kept clean.

It is a good plan to have available at least one new RCA Radiotron of each type. Occasionally, the condition of each Radiotron in use should be checked by substituting a new one and comparing results in reception, both local and distant.

**Power Supply**—Should the pilot lamp and Radiotrons fail to light with the **On-Off** Switch in the "ON" position, it is probable that the Radiola is not properly connected to the power supply. Make sure that the attachment plug is properly inserted in the electrical outlet and that the current is not switched off at any point.

**Volume Control**—If the operation of the Volume Control should at times produce a grating sound in the loudspeaker, this may be remedied by turning the control back and forth between the extreme positions a few times in order to remove any foreign material which may have collected on the control resistance.

**Antenna and Ground**—A decrease in receiving range and volume may be caused by loose or corroded connections in the antenna and ground circuit, or by an accumulation of dirt or soot on the antenna insulators.

**Pilot Lamp**—Renewal bulbs (see "Equipment", Part I) may be purchased from any RCA Radiola Dealer. Before removing the pilot lamp from its bracket (see "Pilot Lamp," Part I) always switch off the power.

In order that station settings will not be changed when a new bulb is inserted, the socket clamp should be adjusted so that any one station (the previous setting for which is accurately known) is received at the same scale reading as before.

**Turntable Motor**—The motor should be kept clean and should be lubricated at least once every six months, by applying RCA Motor Oil and RCA Electric Motor Grease at the parts shown in Fig. 7.

Before handling the motor, the power cord of the Radiola should be disconnected from the lighting circuit. To gain access to the motor parts, remove the turntable; also the rear cover of the cabinet.

**Electric Pickup**—If noisy phonograph reproduction should develop, and tightening or renewing the needle or changing the record does not eliminate the condition, it is possible that the electric pickup may be damaged or out of adjustment. Arrange with the RCA Radiola Dealer for necessary adjustment or repair.

**RCA Radiola Dealer**—The RCA Radiola Dealer is required to test this Radiola and assure himself that it is in satisfactory operating condition when installed.

This Radiola is guaranteed to be free from defects as outlined on the Guarantee Tag

Oil Upper Spindle Bearing and Governor Shaft Bearing with RCA Motor Oil.

accompanying the instrument. Should any part become defective within the guarantee period, the RCA Radio Dealer will furnish a new part to replace the defective one. A reasonable charge may be made for installing such parts.

If any service on this Radiola is needed, either before or after expiration of the 90-day guarantee, the RCA Radiola Dealer from whom it was purchased should be consulted. If this Dealer cannot be reached because of change in location, or other reasons, the nearest RCA Radiola Dealer should be consulted. RCA Radiola Dealers are organized to handle customers' service needs either by their own service departments or by arrangement with their distributors.

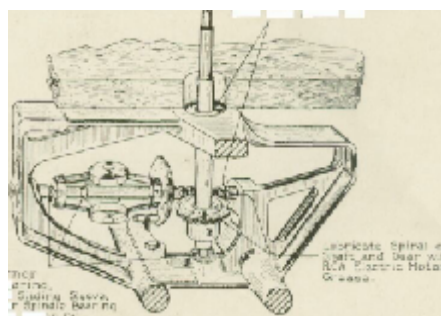


Fig. 7. Turntable Motor Oiling Diagram

### IMPORTANT

The RCA 90-day guarantee on this Radiola is not effective unless the RCA Guarantee Tag is countersigned and dated at the time of sale by the RCA Radiola Dealer from whom it was purchased. If you have not received the signed Guarantee Tag, be sure to have the RCA Radiola Dealer give it to you immediately.

### NOTICE

The apparatus and devices which, or the use of which, are covered by patents are sold only under certain specified licenses set forth in a notice attached permanently to the said apparatus and devices, or if this is impracticable on account of size, then on tags or wrappers attached to the said apparatus and devices or on the cartons containing the same. This license notice is as follows:

"In connection with devices it sells, Radio-victor Corporation of America has rights under patents having claims (a) on the devices themselves and (b) on combinations of the devices with other devices or elements, as for example in various circuits and hook-ups.

"The sale of this device carries a license under the patent claims of (a), but only for (1) talking machine uses, (2) radio amateur uses, (3) radio experimental uses and (4) radio broadcast reception; and only where no business features are involved.

"The sale does not carry a license under patent claims of (b) except only (1) for legitimate renewals and repairs in apparatus and systems already licensed for use under such patent claims on combinations, (2) for assembling by amateurs and experimenters, and not by others, with other licensed parts or devices, or with parts or devices made by themselves, but only for their own amateur and experimental radio uses where no business features are involved, and not for sale to or for use by others, and (3) for use with licensed talking machines and licensed radio broadcast receiving devices; and only where no business features are involved."

RADIO-VICTOR CORPORATION OF AMERICA

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