Radiola 30A

Rf.U.t.PAT.tfr.

Super-Heterodyne

FIG. 1—RCA RADIOLA 30A

IMPORTANT

READ THE ENTIRE INSTRUCTION BOOK BEFORE ATTEMPTING TO INSTALL OR OPERATE THIS RADIOLA

RCA
Radiola 30A

Super-Heterodyne

INTRODUCTION

Radiola joA is a broadcast receiving instrument utilizing the well-known and efficient Super-Heterodyne principle which provides unusual selectivity, sensitivity and simplicity of operation. The instrument is operated entirely from alternating-current supply, thus eliminating all batteries. The cabinet contains the operating mechanism, a Model IOO-A Loudspeaker and a Power-Amplifier unit. The receiver is designed for reception over the broadcast frequency band, 550 to 1500 kilocycles-(approximately 545 to 200 meters).

EQUIPMENT

The following accessories are furnished with Radiola 3oA in addition to the equipment described above:

7 RCA Radiotrons, Model UX-I99
1 RCA Radiotron, Model UX-171
2 RCA Radiotrons, Model UX-28l
l RCA Radiotron, Model UV-876
1 Mazda Panel Lamp, 15 watt, no-volt, T-8, frosted (candelabra base)
l Instruction Book

NOTE — No batteries are necessary

IMPORTANT NOTICES

Do not attempt to install or make changes in Radiola 30A while the current is ON.

The best procedure before opening the back of the cabinet for any purpose (except the adjustment of the potentiometer) is to disconnect the Power Supply Cord from the house-lighting circuit.

Do not connect this A. C. type of Radiola 30A to any direct-current house-lighting mains, nor to any alternating-current mains other than the proper rating—105 to 125 volts, 50 to 60 cycles.

Observe these precautions or serious damage to Radiola 30A may result. If in doubt about the rating of your house-lighting circuit, consult your Electric Light and Power Company.

First read the instructions carefully so that each step is thoroughly understood. It is advisable to re-read them as each operation is being performed.

FIG. 2 — RCA RADIOLA 30A

INSTALLATION

1. Location—In selecting a location for Radiola 30A some thought should be given to the acoustics of the room in which it is placed, in very much the same way as when locating any musical instrument. A few trials in various positions will indicate the most satisfactory location.

The power supply cord connecting the Radiola to the electric-light socket is eight and one-half feet long, so the set must be placed within this distance from a convenient socket, unless an extension cord is obtained. It would be well to select a place in the room where connections from an outside antenna and the ground can be conveniently run to the terminals at the back of the cabinet.

2. Preliminary Operations-ping •After the Radiola has been removed from its shipping container, proceed as follows:

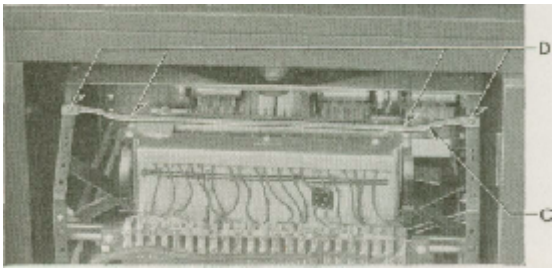

FIG. 3—SHOWING SHIPPING CLAMP

C—Shipping Clamp

D—Four Screws Holding Clamp

(a) The red shipping clamp C, Fig 3, extending across the back of the receiver holding the tube-socket unit rigidly in place, should be removed from the receiver by unscrewing the four round-head screws D. Keep the nuts on the inside from turning to prevent their falling into the set. Inside the envelope containing the Instruction Book will **be** found two shorter round-head screws. After the removal of the shipping clamp, these should replace the two screws removed from the tube-socket unit.

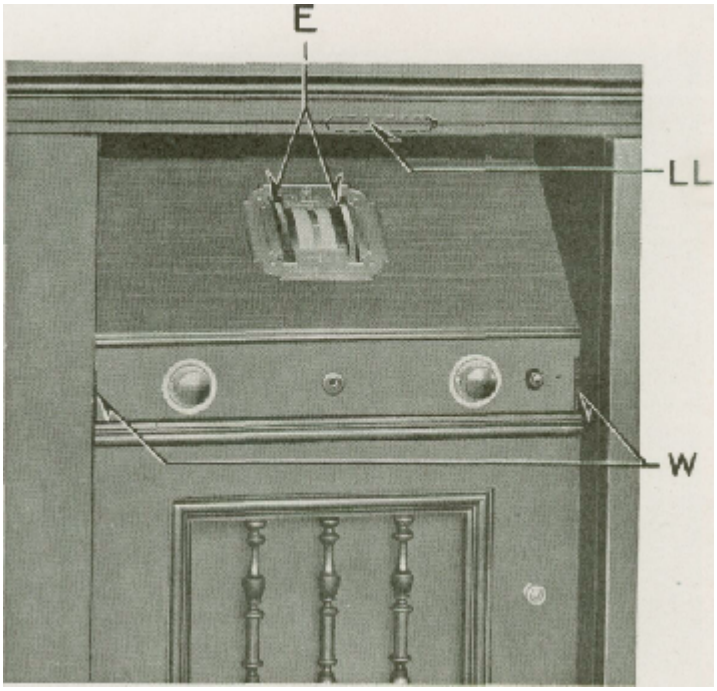

FIG. 4—SHOWING SHIPPING WEDGES

E—Rubber Wedges to be removed W—Shipping Wedges to be removed LL—Location of panel lamp

(b) The front of the cabinet is opened and the two rubber wedges E, Fig. 4, which hold the Selector Drums from turning during shipment, are removed by pulling the rubber wedges and simultaneously rotating the drum downward until the rubber is released from the metal plate.

(c) The shipping wedges W, Fig. 4, which hold the receiver panel securely in the center of its cabinet compartment, should next be removed. At this time see that the receiver panel does not come in physical contact with either side of the cabinet.

The above shipping devices, including clamp, fastening screws and lock washers, should be saved for replacement in the event of the owner desiring to ship the Radiola at a later date.

(d) The package containing the Radiotrons should be removed from the interior of the cabinet and carefully unpacked. Special care should be taken in the handling of these Radiotrons as mechanical injury resulting from dropping or severely jarring will cause displacement of the internal elements or breakage of the filaments.

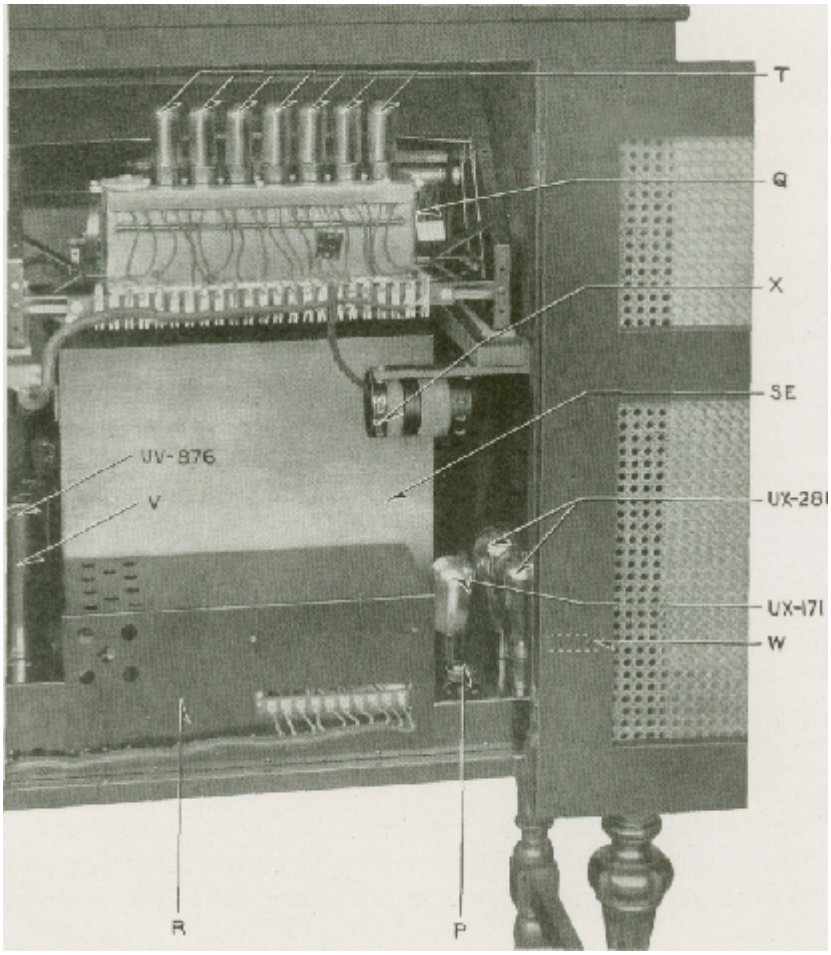

FIG. 5—REAR VIEW, RADIOLA 30A

T—7 UX-199 Radiotrons

Q—Radio Receiver X—Antenna Coil

SE—Loudspeaker Enclosure

P — Potentiometer

R—Power-Amplifier Unit

W—Antenna and Ground Terminals

V—Ventilating Stack

3. Installation of Radiotrons —

(a) The Radiotrons should NOT be inserted or removed from the receiver while the power is ON.

(b) Insert the Radiotrons in the sockets as shown in Fig. 5, handling them with due **care.** Make certain that the two large pins in each tube base are aligned with the two large holes of the socket. If they will not go in without considerable pressure being applied the trouble probably is due to excessive solder on one or more of the prongs. This may be removed with a file or knife. Never use force to seat the Radiotrons, because this may spring the socket contacts out of place.

(c) Seven UX-I99 Radiotrons are inserted in the tube socket unit as shown at **T,** Fig. ?.

(d) The larger tubes are next inserted in the Power-Amplifier Unit, as shown in Fig. c. **The** sockets from left to right should contain the tubes placed in th.e following order:

UV-876	**UX-171**	UX-281
		UX-281

These numbers are stamped on the cover opposite each tube.

Radiotron UV-876 is screwed into its Socket. The other tubes have a bayonet pin in the side of the base. Face this pin toward the front of the cabinet.

Care should be exercised not to drop any foreign object into the socket of the Radiotron UV-876, since this Radiotron might be made inoperative, resulting in serious damage to the receiver.

Over the UV-876 tube is placed the ventilating stack which is found packed with the Radiotrons. This stack is firmly located in place by a slight twist clock-wise after its retaining lugs are properly placed in front of the retaining springs. THIS STACK MUST NEVER BE REMOVED NOR REPLACED WITHOUT FIRST DISCONNECTING RADIOLA 30A **FROM** THE POWER SUPPLY. DO NOT OPERATE WTTH THE STACK REMOVED.

(e) The long, thin Panel Lamp is screwed into the socket found above the receiver panel, along the inside front edge of the cabinet, in the. location LL, indicated by the arrow in Fig. 4.

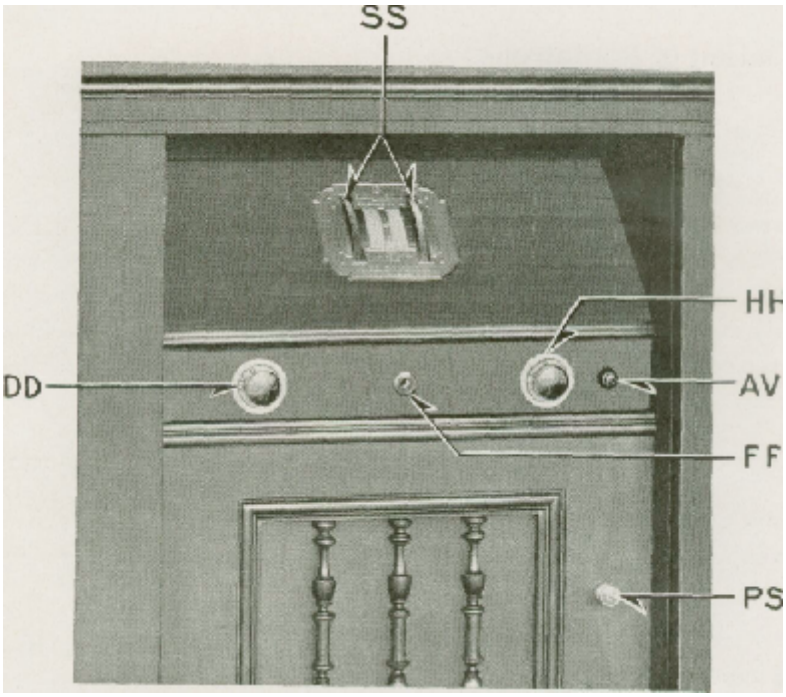

FIG. 6 - LOCATION OF CONTROLS

DD—Filament Control
HH—Volume Control
FF—Head Telephone **Jack**
PS-Power Switch
SS—Station Selectors
AV—Auxiliary Volume Control

CONTROLS

Volume Control —This control, shown at HH, Fig. 6, regulates the volume by controlling the filament current to the UX-I99 Radiotron in the second from the left socket facing the front of the receiver. The greatest volume is secured by turning this knob to the right as far as it will go, to "LOUD."

Auxiliary Volume Control—In Fig. 6 a small black switch knob is shown at AV. This control has two positions: IN is "LOUD," OUT is "SOFT."

Filament Control —This control, shown at DD, Fig. 6, regulates the filament current of the seven UX-I99 Radiotrons. Since the effect of this control is slight, it is normally left in .its mid-position.

Station Selectors — By manipulating the two drums called Station Selectors, shown at SS, Fig. 6, the tuning of the receiver to the frequency (or. wavelength) of the desired broadcast station is accomplished.
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Power Switch —To the right of the loudspeaker grille is placed the Operating Switch, PS, Fig. 6, controlling the entire power supply to the Radiola. The closing of the right front door of the cabinet automatically pushes this switch to the OFF position.

INSTALLING THE ANTENNA

The antenna and ground wires are connected to the terminals on the rear of the cabinet marked respectively "A" and "G", shown at W, Fig. 5.

1. Outdoor Antenna—An outdoor antenna usually gives greater signal strength than an indoor antenna, but its installation is more elaborate and it requires protection in the form of a lightning arrester.

The length of the antenna, including the lead-in, should generally not be greater than fifty feet.

The antenna should be supported by insulators, preferably glass or glazed porcelain. The lead-in should enter the wall or window-frame through a porcelain tube. The use of a flat type "window strip" lead-in is not recommended.

All outdoor antennae should be protected from lightning or other sources of high voltage by a lightning arrester approved by the National Board of Fire Underwriters.

A good ground connection is best insured by means of a copper Ground Clamp securely fastened to a cold-water or steam pipe at a point scraped free from all dirt, paint, or rust.

2. Indoor Antenna —If the building does not contain a metal frame work or metal lath, an indoor antenna may be used. This should consist of a single wire approximately 50 feet in length, preferably run in a straight line. Ordinary bell or magnet wire (No. 18 to No. 22 B. & S. Gauge) supported by some such means as push-pins, is recommended.

The same type of ground connection as recommended for an outside antenna should **be** used. Do not run antenna and ground wires close together.

OPERATION

With all the Radiotrons in place and the plug at the end of the power supply cord screwed into an electric light socket, or a convenience outlet supplied by Alternating Current, 105 to 125 volts, 50 to 60 cycles, Radiola 30A is placed in operation by pulling out the operating switch. The small panel light should illuminate the receiver panel. The Radiotrons in the power-amplifier unit and the UX-I99 Radiotrons in the receiver should light. It is rather difficult to see the glow from the filaments of the UX-I99 Radiotrons except when observed near their bases.

Tuning—With the FILAMENT CONTROL in its mid-position and the VOLUME CONTROL at "LOUD" (AUXILIARY VOLUME CONTROL at its normal IN position), the two tuning drums are set so that the numerals on their scales (denoting frequency in kilocycles) match; that is, if one drum is set at 600 the other should be at, or near, 600, etc. It will be noticed that both drums will turn if either is moved, but by holding either of the drums stationary the other may be rotated independently. After matching, the two tuning controls should be slowly rotated until a signal is heard. After hearing the signal, carefully adjust both drums independently for the clearest reproduction. Once the receiver is carefully tuned to a station do not disturb the relation of the two drums to each other, for, after this relation has been determined, it will be approximately the same throughout the frequency range of the receiver. It is possible, therefore, to obtain uni-control tuning by allowing both drums to rotate together.

After the desired station has been located, it may be possible to increase the volume by better tuning if both drums are slightly readjusted. This is done by holding one drum and slowly moving the other drum back and forth until the best reception is obtained. In first becoming familiar with the tuning and volume control of Radiola 3oA, it is suggested that the receiver be tuned to the strong signals of the nearest broadcast station.

When tuning the receiver to a distant or weak station, the exact frequency (or wave length) of which is unknown, the process consists in first setting the VOLUME CONTROL at "LOUD" to obtain the greatest sensitivity (the AUXILIARY VOLUME CONTROL switch MUST be in the IN position); then, holding the left-hand drum somewhere near the frequency setting of the desired station, say 900, and moving the right-hand drum slowly back and forth around this position of 900, say, from 850 to 950. If no signals are heard, set the left-hand drum at about 910, holding it to prevent turning, and rotate the right-hand drum slowly back and forth around 910. If signals are not heard at this setting, move the left-hand drum to about 920 and repeat the process, increasing the setting of the left-hand drum in small steps. After hearing the station, both drums are independently adjusted for clearest reproduction and the desired volume is regulated by means of the VOLUME CONTROL.

If the assigned frequency (or wave length) of a certain station is known, the drums can be set to approximately the correct position and then varied a few degrees either way in order to bring the receiver into exact tune with the desired signal.

Control of Volume — As the Radiola 30A is a very sensitive receiver, it is seldom necessary to use more than a portion of its power. The loudspeaker output may be reduced by:

1. Turning the VOLUME CONTROL toward "SOFT." This is the usual and normal method.

2. Turning the FILAMENT CONTROL to the left toward "SOFT." This control reduces the volume only slightly by reducing the filament current of the UX-199 Radiotrons, thus prolonging their life.

Auxiliary Volume Control —This AUXILIARY VOLUME CONTROL switch has two positions: IN is LOUD, OUT is SOFT.

When the receiver is tuned to a nearby powerful broadcast transmitter this AUXILIARY VOLUME CONTROL should be pulled to the **OUT** position. For reception from distant stations this switch should be placed in the IN position.

Adjustment for Hum Suppression — Hum from the loudspeaker, if noticeable, can be reduced to a minimum by adjusting the potentiometer knob P (Fig. 5), located on the power-amplifier unit. Set the tuning drums of the receiver to a position where no incoming signal is heard in the loudspeaker. Adjust the potentiometer knob for minimum hum. This position will generally be found near the middle of the range of the potentiometer. Once this adjustment is made it will seldom need attention.

Interference — Signals from an interfering radio station may be eliminated or at least minimized by proceeding as follows:

i. While holding the left-hand selector drum rotate the right-hand drum forward or backward by approximately 10 scale divisions to find another position of this control where the desired station again is heard. The setting of the right-hand drum nearer the 550 end of the scale is technically called the "lower frequency setting," and the other nearer the 1500 end of the scale, the "upper or normal frequency setting." Two settings of this nature will be found for all broadcasting stations, and the separation between them will be approximately the same throughout the range of the scale. It is recommended that the

right-hand drum be consistently set at the "upper setting" in the manipulation **of Radiola 30**A (When this is done, the graduations showing the settings of the right-hand drum will correspond very closely with those of the left-hand drum.) When interference is encountered, try the "lower setting" and use the one which gives minimum interference.

2 Use a short, Indoor antenna, about i$ feet long, to receive local signals when static and other interference temporarily makes the reception of distant stations on a longer antenna difficult.

Head Telephones — In tuning, if it is desired to locate distant stations with a pair of head telephones, the telephone plug may be inserted in the jack FF, located at the center of the control panel (see Fig. 6). When the telephone plug is inserted, the loudspeaker is automatically disconnected.

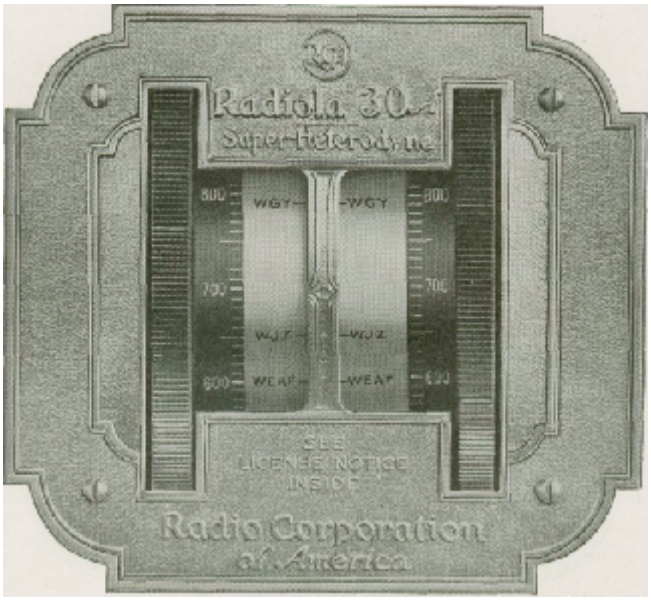

FIG. 7—DRUM CALIBRATION BY "DIRECT" METHOD

To calibrate by the "direct" method, make a short dash on each drum adjacent to the center indicator, then print the station call letters at the end of each dash. (See Fig. 8 for another method of calibrating the drum scales.)

CALIBRATION

To permit easy and rapid tuning to broadcast stations which have once been received by Radiola 30A, the tuning dials should be calibrated, by recording on their scales the call letters of the various stations.

The STATION SELECTOR drums, it will be noticed, have scales graduated in kilocycles, as well as blank spaces in which the call letters of the received stations may be recorded at the proper points. Records on the STATION SELECTOR drums should be made with a *soft* pencil, as they are subject to change on account of reassignment of call letters or frequency. Ink should not be used as it cannot be erased from the drum. It is further recommended that a soft eraser be used to avoid injuring the surface of this calibration scale. The call letters should be printed with small, neat letters.

Either the "direct" method of calibration shown in Fig. 7 or the "frequency" (kilocycle) method shown in Fig. 8 may be used. One method should be chosen and used throughout.

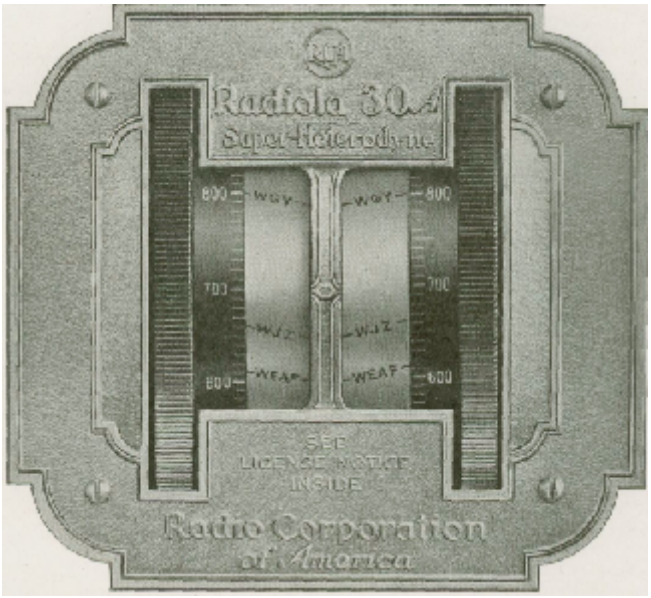

FIG. 8-DRUM CALIBRATION BY "FREQUENCY" (KILOCYCLE) METHOD

To calibrate by the "frequency" (kilocycle) method, place a dot on each of the drums adjacent to the center indicator and another dot on each drum adjacent to the division on the scale corresponding to the assigned frequency of the station. Print the station call letters on the slope between the two dots on each drum, then draw a short line from each dot to the call letters.

The "direct" method is generally preferred because of its simplicity. The "frequency" (kilocycle) method permits use of the drum scales to tune quickly to stations of known frequency which have not previously been heard; also, to determine with considerable accuracy the operating frequency of any station to which the receiver is tuned at random. This is accomplished by glancing across from the Indicator to each drum scale in the direction of adjacent settings previously recorded.

With either method of calibration, records on the right-hand drum should only be made when this drum is set at the "upper frequency setting" (as previously explained under "Interference").

When two or more stations operate on the same assigned frequency, the drum settings will be approximately the same.

Station Log—The log sheets in the back of this book may be used to record stations heard, if it is preferred not to mark on the STATION SELECTOR drums or if a more detailed record is desired.

MAINTENANCE

1. Radiotrons—When not mistreated the Radiotrons should last for many months. However, it is recommended that at least one or two spare Radiotrons of each type be kept on hand for emergency use, as this will insure against interruptions of service and will permit testing to determine whether any Radiotron is defective by substituting for it a Radiotron known to be in good operating condition. Radiotrons may be seriously damaged or their normally long, useful life lessened by mechanical injury resulting from dropping or severely jarring, causing displacement of the internal elements, or breakage of the filament; also, the active material in the filaments may be driven *off* after months of service, especially if the filaments have been operated at too high a voltage. Should it be suspected that the filaments have been so damaged, it is recommended that the Radiotrons be taken to the dealer, from whom the Radiola was purchased, and tested.

2. Interchanging Positions of Radiotrons.

Often improved operation may be obtained by interchanging the UX-199 Radiotrons. This may be the case even when the Radiotrons are new.

The Radiotron fifth from the right, when facing the rear of the receiver, occupies an important position and in case of complete failure to hear any signals it is well to test this Radiotron for proper operation. This may be done by interchanging positions of this Radiotron with those in sockets i to 4.

If there is a tendency for a steady "howl" this can usually be eliminated by:

(1) Interchanging the Radiotron in the sixth socket from the RIGHT when facing the rear of the receiver, with any Radiotron except that in socket 5. To determine whether the Radiotron in this socket is working properly, tap it gently. A ringing sound should be heard from the loudspeaker and should die out rapidly. If this ringing continues more than a few seconds, try interchanging the Radiotrons, applying the tapping test each time. Select the one with which the ringing dies out most rapidly. Should no ringing occur upon tapping the sixth Radiotron, either this Radiotron or the one in socket 7 is defective. Replace these one at -a time, until the defective one is located.

(2) Slight readjustments of the VOLUME CONTROL or of the STATION SELECTOR, or placing the AUXILIARY VOLUME CONTROL in the "OUT" position, may overcome "howling."

(3) It is important that the receiver panel rests only upon its resilient mounting and does not come in physical contact with the sides of the cabinet. The tube-socket unit, mounted on metal springs, should be suspended freely and not touching the receiver frame.

IMPORTANT

Should trouble develop in the operation of Radiola 30A, determine first if power is being supplied by noting whether the lights in the house will light. If the power is on, then observe if all the Radiotrons in both units are lighted, remembering, however, that the Radiotron in socket 2 will not be as bright as the other UX-I99 Radiotrons unless the VOLUME CONTROL is turned to "LOUD." The glow from UX-I99 Radiotrons in the receiver usually is visible near the base of the tubes.

In the power-amplifier unit the filaments of the two UX-281 Radiotrons burn at a cherry red. The glow from the UX-171 is about the same as from the UX-I99 Radiotrons;

The slight glow of the Ballast Tube UV-876 usually cannot be seen.

BEFORE REMOVING OR REPLACING RADIOTRONS THE POWER SWITCH SHOULD BE OFF AND THE POWER SUPPLY CORD DISCONNECTED. .

If none of the Radiotrons light. Look for trouble at the following points:

(a) Operating switch turned off, attachment cord plug out, current turned off at socket or lighting switch.

(b) Attachment cord plug not making proper contact in socket or outlet, broken cord connections at plug, defective cord.

(c) If panel lamp lights but the Radiotrons do not, look for disconnected plug at Power-Amplifier Unit or a defective UV-876 Ballast Tube.

If the Radiotrons appear to light but no signals are heard. Look for loose connections to receiver terminal strip, loudspeaker or terminal board of Power-Amplifier (see Fig. 5).

(a) Poor or dirty contacts in tube sockets. Clean the tube contact pins with fine sandpaper or by scraping with a knife, then push the tube in the socket several times.

(b) Tubes damaged, broken or burned out. Have an Authorized R. C. A. dealer test them.

(c) Radiotrons not firmly placed in their sockets or not in the proper sockets. 18

(d) Receiver not properly tuned or adjusted, VOLUME CONTROL at "SOFT" position, AUXILIARY VOLUME CONTROL switch pulled out to "SOFT" position.

(e) Improperly installed antenna system, loose or open antenna and ground connections, a grounded antenna or broken leads.

If the difficulty cannot be located from the above instructions, it is recommended that the services of the dealer from whom Radiola 30A was purchased be enlisted.

Distant Reception — In general, the user should understand that conditions for distant reception vary greatly from night to night, the variation often being more than 500 to 1. Therefore, there may be quite large variations in distant reception from night to night, or week to week, not due to any fault of the Radiola. The same is true in regard to the "fading" or short-interval variations of distant signals.

Polishing the Cabinet— Finger marks resulting from handling the cabinet may be removed by an application of furniture polish and the finish thus restored. The polish chosen should be of a grade which will leave the cabinet free from an oily appearance. Rub to a dull gloss finish, using a piece of cheese cloth or other soft material free from lint.

STATION LOG

rKEQUENCY IN KILOCYCLES	STATION SELECTORS	
	LEFT HAND	RIGHT HAND

STATION LOG

STATION SELECTORS

FREQUENCY IN KILOCYCLES

LEFT HAND RIGHT HAND

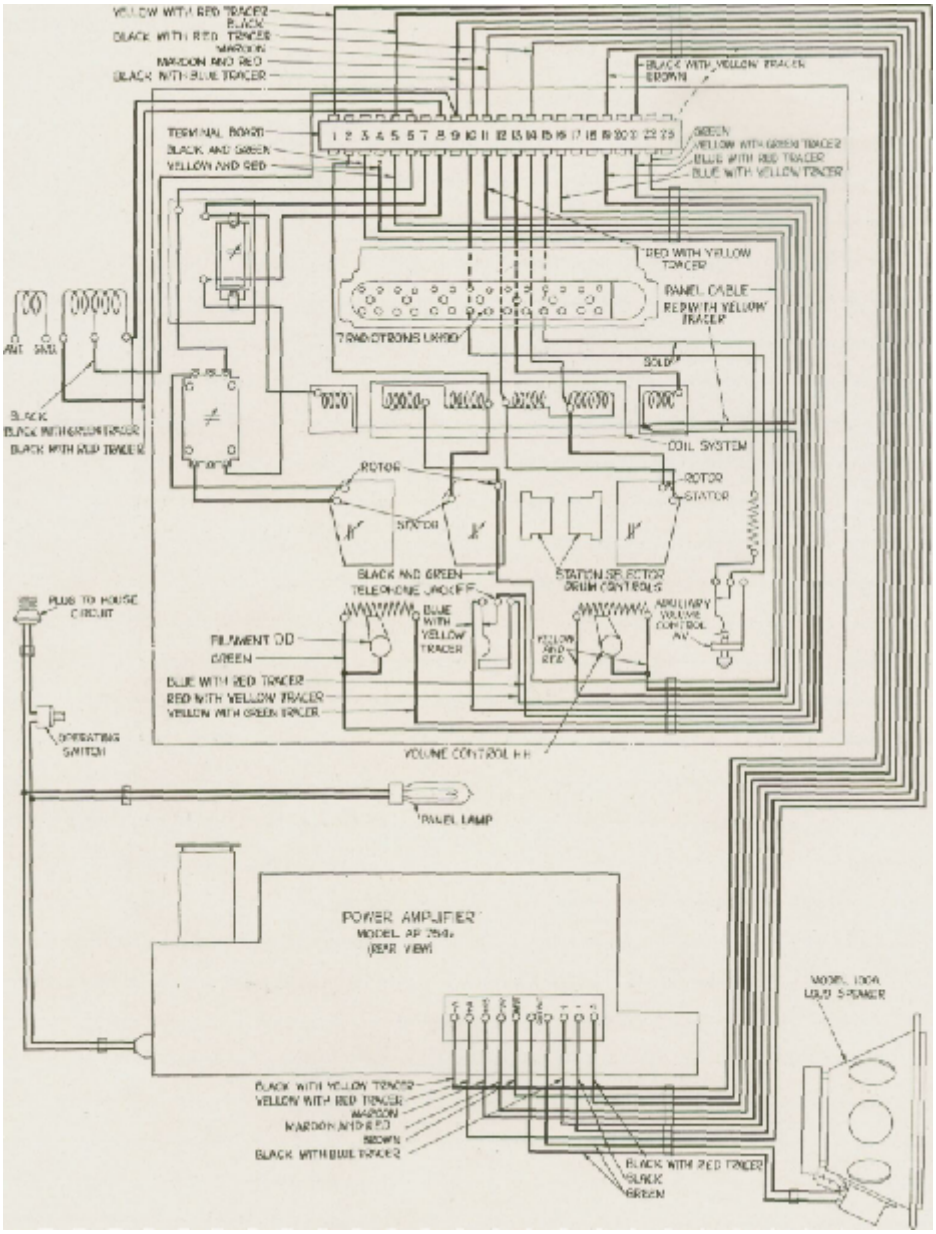

FIG. 9—WIRING DIAGRAM

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 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 Corporation of America