RCA

RADIOLA 

REO. U.S.PAT. OFF.

Read These Instructions Before Proceeding To Set Up Your Radiola #22

The batteries and fuse receptacle furnished with the Radiola *#22* are to be connected as shown on Page 5, Figure 3, of this book.

The five felt washers you received as part of the set equipment are to provide a cushion between the tubes and the chassis and are to be stuck to the tube base before the tubes are inserted in their sockets. Use one washer with each tube, sticking it to the tube base by passing the prongs through the washer hole.

Be careful to insert the tubes in their proper sockets according to the picture and instructions on Page 8. Make certain that the 171A Tube is in the socket to the right and front of the chassis as shown in the picture. You will harm the tube if inserted in the wrong socket.

The fuse receptacle can be mounted inside the cabinet in a convenient location. Connect it in the battery lead as pictured on Page 5. The fuse *must* then be screwed into the receptacle. If the fuse is burned out at any time, the tubes will not light when the set is turned on. It can be replaced by a Montgomery Ward & Co. #63-4309 6-Ampere Fuse or any 5 to 10-Ampere enclosed type that has been tested and listed by the Underwriters Laboratories.

The guarantee tag mentioned on the last page has beep removed as Ward's 90-Day Guarantee, applying to all Airline Radio Sets, also includes the Radiola *#22.*

MONTGOMERY WARD & CO.

RCA

RADIOLA

RB.G.U.S. PAT. OFF.

BATTERY OPERATED

Instructions

RADIO-VICTOR CORPORATION OF AMERICA

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Fig. 1—RCA Radiola 22

RCA
RADIOLA 22

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BATTERY OPERATED

INTRODUCTION

RCA Radiola 22 is a battery-operated, antenna-type, shielded radio receiver. The receiver and RCA loudspeaker are enclosed in a walnut-veneered cabinet. The circuit used in this Radiola includes two stages of tuned radio-frequency amplification, a detector, and two stages of audio-frequency amplification.

Increased sensitivity is provided by screen-grid Radiotrons UX-222 employed in the radio-frequency stages. Radiotrons UX-112-A are used as the detector and in the first audio stage. Best performance is obtained by the use of power-amplifier Radiotron UX-171-A in the final audio stage. Power-amplifier Radiotron UX-112-A may be substituted in the final audio stage for more economical operation.

Power for the filaments of all the Radiotrons is to be obtained from a storage battery. The plate and grid supply for the Radiotrons is obtained from dry batteries, or from a socket power unit if the latter is properly designed electrically and capable of delivering to the Radiola the required voltages.

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 that the power is on.

This Radiola is of the single-selector type insuring simplicity 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 300 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

1. One complete set of Radiotrons as follows:
   Two **RCA** Radiotrons UX-222
   Two **RCA** Radiotrons **UX-112-A**
   One **RCA** Radiotron UX-171-A, or one additional **RCA** Radiotron UX-112-A
2. Two MAZDA No. 40 pilot lamps (one spare); T-3 bulb, 6 volts, 0.15 ampere (packed in the instruction book envelope).
3. One six-volt storage battery (capacity to be 60 ampere-hours or greater, unless a trickle charger is used, in which case smaller capacity is permissible).
4. Fuse block, equipped with single five or ten-ampere fuse of enclosed type, approved by the Underwriters. (Installation of a fuse in the storage battery lead is specified by the Underwriters.) The fuse block may be a component part of the storage battery or combination battery and charger unit.

"B" and "C" batteries.

(a) Most economical operation is obtained when power amplifier Radiotron **UX-**112-A, with a plate ("B") voltage of 135, is used in the final audio stage (see Fig. 2):

Three extra large (heavy duty) 45-volt **"B" batteries** such as:
Burgess No. 21308, Eveready No. 486, or No. 770, Ray-0-Vac No. 9303, or equivalent.

Two 4^ volt "C" batteries, such as:
Burgess No. 2370, Eveready No. 771, **Ray-0-Vac** No. **231-R, or** equivalent.

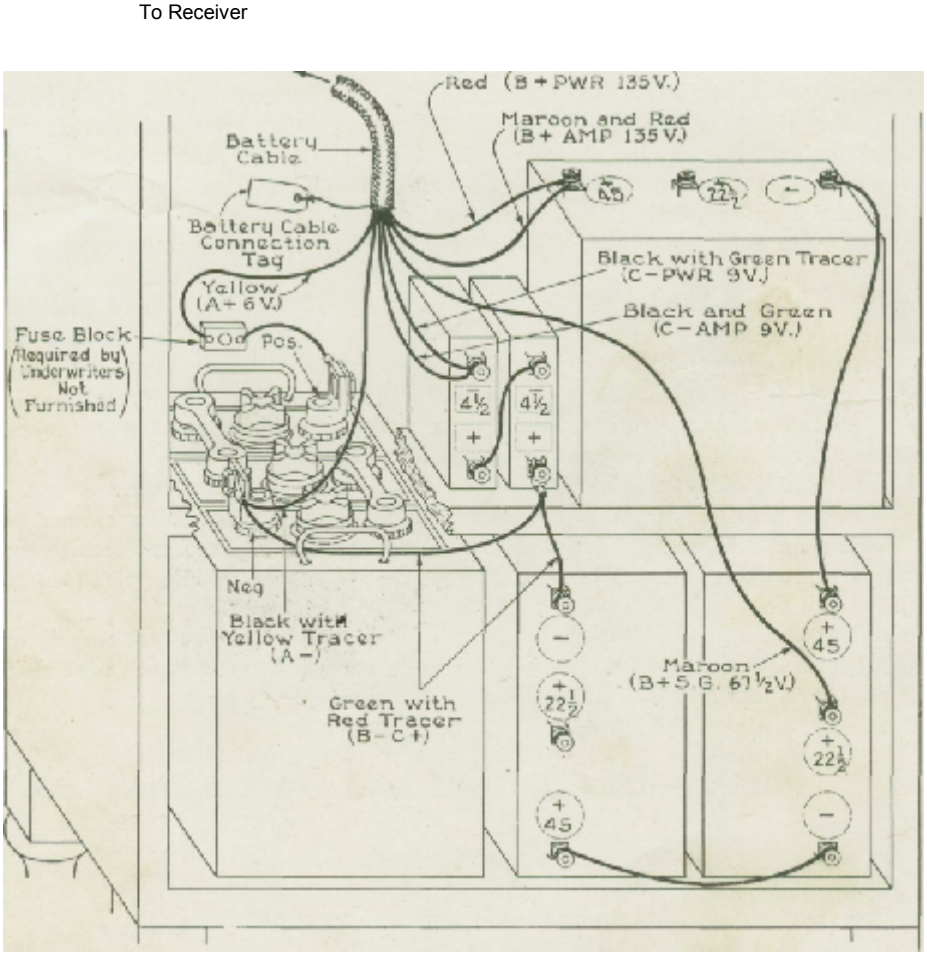

Fig. 2—RCA Radiola 22 -Battery Connections RCA Radiotron UX-112-A, with a Plate ("B") Voltage of 135, in the Final Audio Stage

(b) Better performance is obtainable when power amplifier Radiotron UX-171-A, with a plate ("B") voltage of 135, is used in the final audio stage (see Fig. 3):

Three extra large (heavy duty) 45-volt "B" batteries, such as:

Burgess No. 21308, Eveready No. 486 or No. 770, Ray-0-Vac No. 9303, or equivalent. One 22 ½ -volt "C" battery, such as:

Burgess No. 5156, Eveready No. 768, **Ray-0-Vac** No. 5151, or equivalent. One 4 1/2 volt "C" battery, such as:

Burgess No. 2370, Eveready No. 771, **Ray-0-Vac** No. **231-R,** or equivalent. /

To Receiver

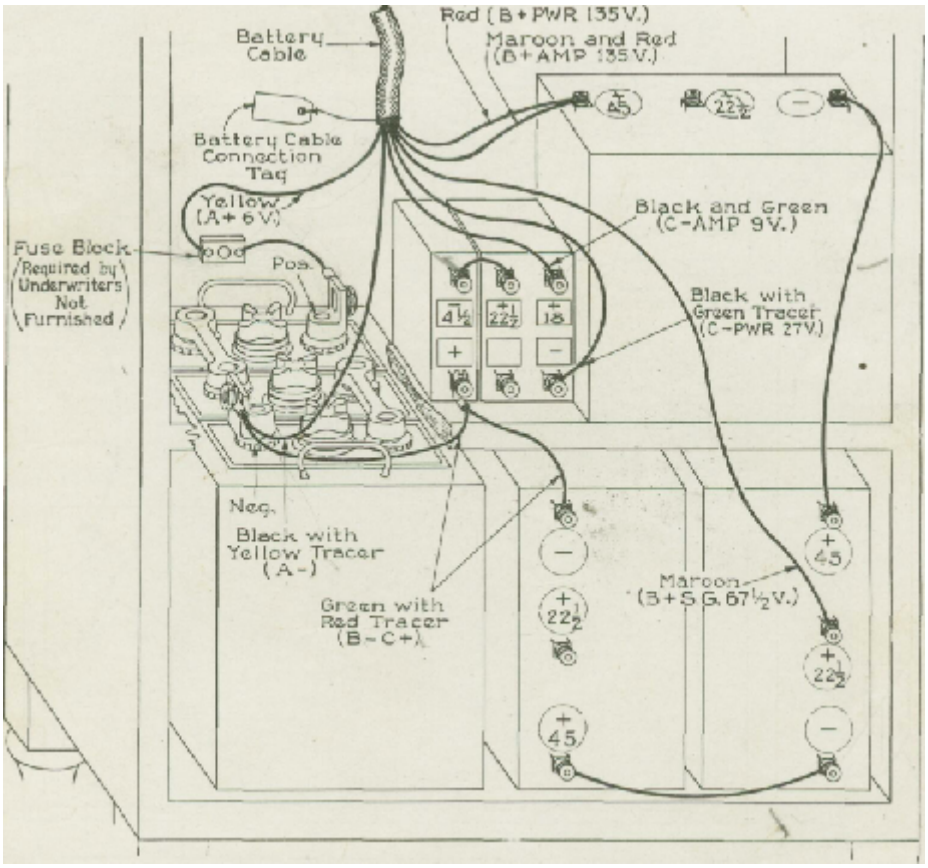

Fig. 3—RCA Radiola 22—Battery Connections—RCA Radiotron UX-171-A, with a Plate ("B") Voltage of 135, in the Final Audio Stage

(c) **Best** performance is obtainable when power amplifier Radiotron UX-171-A, with a plate ("B") voltage of 180, is used in the final audio stage (see Fig. 4):

Four extra large (heavy duty) 45-volt "B" batteries, such as: Burgess No. 21308, Eveready No. 486 or No. 770, **Ray-0-Vac** No. 9305, or equivalent. Two 22 1/2-volt "C" batteries, such as: Burgess No. 5156, Eveready No. **768, Ray-0-VacNo. 5151, or equivalent. One** 4 1/2 volt "C" battery, such as: Burgess No. 2370, Eveready No. 771, Ray-0-Vac No. 231-R, or equivalent.

Battery Cable Connection Tag

To Receivcr

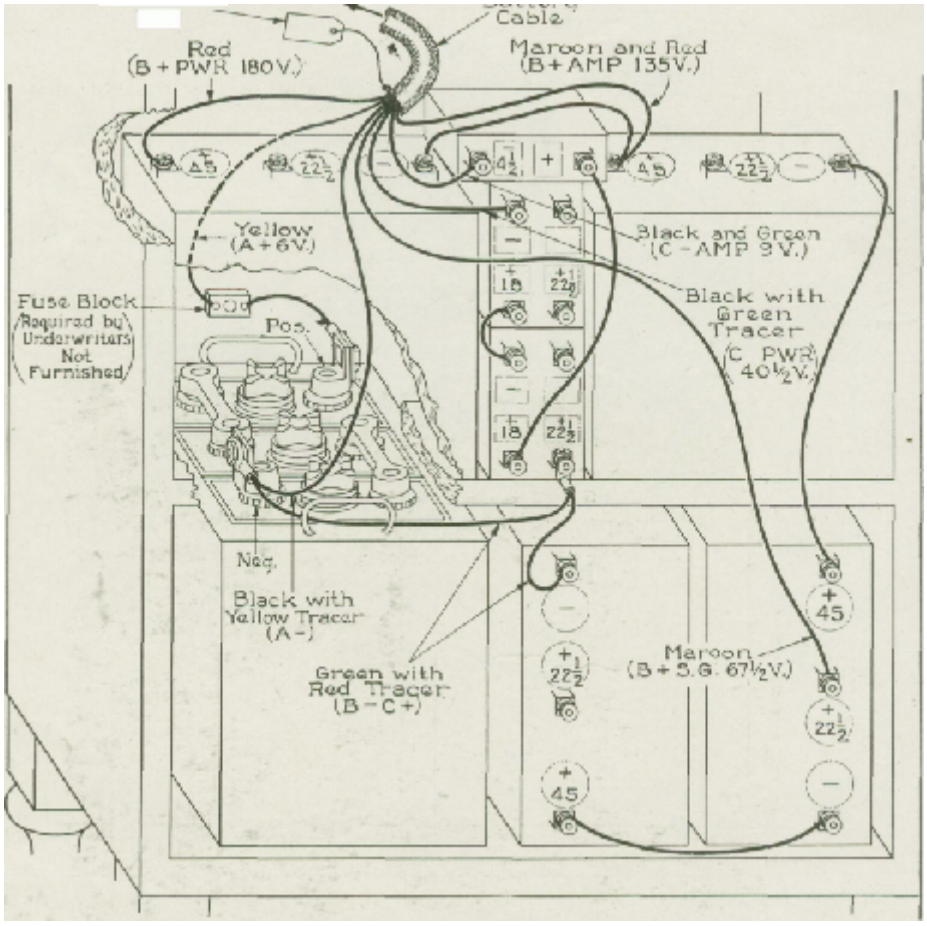

Fig. 4—RCA Radiola 22—Battery Connections RCA Radiotron UX-171-A, with a Plate Voltage of 180, in the Final Audio Stage

Note—Most economical operation is obtainable by the use of the sizes of "B" batteries recommended. The fact that Radio-victor Corporation of America does not list batteries of all manufacturers is not intended as a reflection on the product of any battery manufacturers not mentioned. Any battery having capabilities and satisfactory terminal connections similar to those listed in Item 5 may be used.

Approximately 4 ft. of insulated wire for battery connectors (see Figs. 2 to 4). Antenna and ground equipment (see Part II).

6.

7.

INSTALLATION

Preliminary—After unpacking RCA Radiola 22, remove the rear cover. Remove the two red round-head screws, one in each side of the loudspeaker (see Fig. 5). Save these screws for use in the event of reshipment. Unwrap the battery cable and the antenna and ground leads.

Locate the Radiola 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).

Connect the antenna lead (blue) of the Radiola to the lead-in wire, and the ground lead (black with blue tracer) to the ground wire (see Figs. 5 and 8). Both connections should be soldered and insulated.

Loudspeaker—Make certain that all connections are secure at the loudspeaker terminals (see Fig. 5).

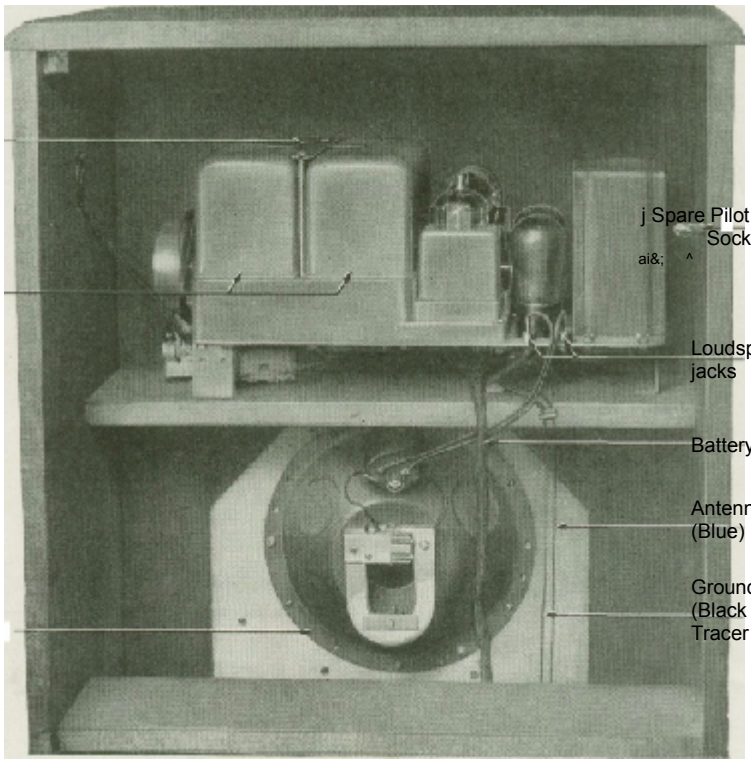

Fig. 5—Rear View of RCA Radiola 22 with Cover Removed

Battery Cable Connections—Before installing or renewing batteries set the On-Off Switch (Fig. 7) to the "OFF" position, downward, and make sure that no Radiotrons are in the sockets.

Make connections to batteries and fuse block in accordance with Figs. 2 to 4. Be sure that all connections are tight.

It will be observed that the leads of the battery cables are of different colors. Colors of leads, also circuit and voltage designations, are marked on a tag attached to the battery cable.

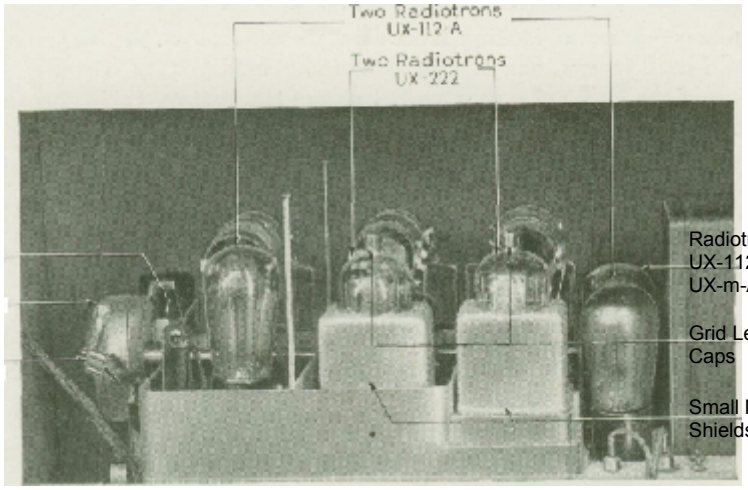

Fig. 6—Rear View with Large Metal Shields Removed—Showing Radiotrons and Pilot Lamp Mounting

(Pilot **Lamp** Socket Clamp Slides **over Fixed** Bracket)

Metal Shields and Radiotrons—Press down on the shield clamp (Fig. 5) and pull the rear clamp bolt toward the rear of the cabinet far enough to free the clamp. Withdraw the shield clamp from the front clamp bolt and lift out the large metal shields. Handle the shields carefully.

The Radiotrons should be handled carefully. Insert them in the proper sockets, as shown in Fig. 6. Be sure that the two large pins 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 (Fig. 6) firmly down over the grid contacts of the UX-222 Radiotrons.

Set the On-Off Switch (Fig. 7) to "ON", upward. Make sure that the five Radiotrons are lighted. Switch off the power.

Push down on the small metal shields to make certain that they are firmly in place (see Fig. 6).

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 in place, replace the shield clamp.

Pilot Lamp—Turn the Selector (Fig. 7) counter-clockwise to the extreme position, so that the pilot lamp mounting will be accessible. Remove the socket clamp from the fixed bracket and screw one of the pilot lamps firmly into the socket. (See Fig. 6.) Replace the socket clamp on its bracket. Insert the extra bulb into the spare pilot lamp socket (Fig. 5).

Set the On-Off Switch to "ON". With the Selector 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. 7) is approximately % inch below the index pointer. Then switch off the power and replace the rear cover, bringing the antenna and ground leads out through the semi-circular notch on the right side of the cover (facing the rear of the cabinet).

OPERATION

Refer to Fig. 7 and **proceed as follows:**

1. Set the On-Off Switch to "ON". The pilot lamp should light.
2. Set the Local-Distant Switch to "DISTANT".
8. 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.
4. Adjust the Selector for maximum signal strength.
5. Adjust to the desired volume by means of the Volume Control. Because of the extreme sensitivity of Radiola 22, a more satisfactory adjustment is obtained, when receiving powerful nearby stations, by setting the Local-Distant Switch to "LOCAL".
6. 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 dial. 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.

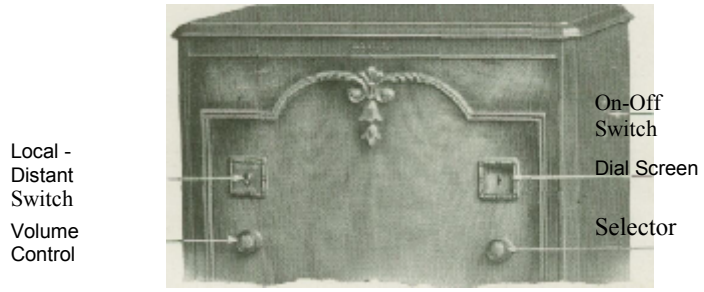

Fig. 7- -RCA Radiola 22—Showing Controls

Part II—General Information

., The following suggestions are offered to assist the user.

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

Rad**iotrons**—Improved results may sometimes be obtained by rearranging the UX-222 Radiotrons, also the UX-112-A. Radiotrons. Before interchanging these Radiotrons switch off the power. ' .

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 Dial—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 localities near high-power broadcast stations. A longer antenna may give improved results in localities 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 should 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 for ground connections 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 n(5t available, a pipe or metal rod driven into the ground to a depth of several feet may be used. The success of this type of ground depends upon the presence of moisture in the soil.

Part III—Maintenance

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

When installing or renewing batteries, or when battery connections are to be disturbed in any way, first remove all the Radiotrons.

The contact pins of all Radiotrons, also the grid contacts at the tops of the UX-222 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.

Storage Battery—The storage battery should be kept well charged. This is best insured by the use of a trickle charger. The trickle charge rate, if controllable, should be adjusted to the lowest value which will allow the battery, under average use, to recover its charge while the Radiola is idle.

If a trickle charger is not used, the battery should be charged in accordance with instructions accompanying the battery. The state of charge of the battery may best be determined by the use of a hydrometer.

The battery solution should never be allowed to fall below the top of the plates. Only distilled water (never acid) should be used to replenish the solution.

Be sure that connections are clean. Vaseline on the terminals will tend to prevent corrosion.

"B" and "C" Batteries—Weak signals, distortion, or noisy operation may indicate run-down batteries. Each 45-volt "B" battery should be replaced when its voltage drops to 34 volts. Measurements should be made with a high-grade high-resistance voltmeter while the receiver is operating. It is recommended that the "C" batteries be renewed with the "B" batteries.

Battery Connections—Battery connections should be kept clean and tight.

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.

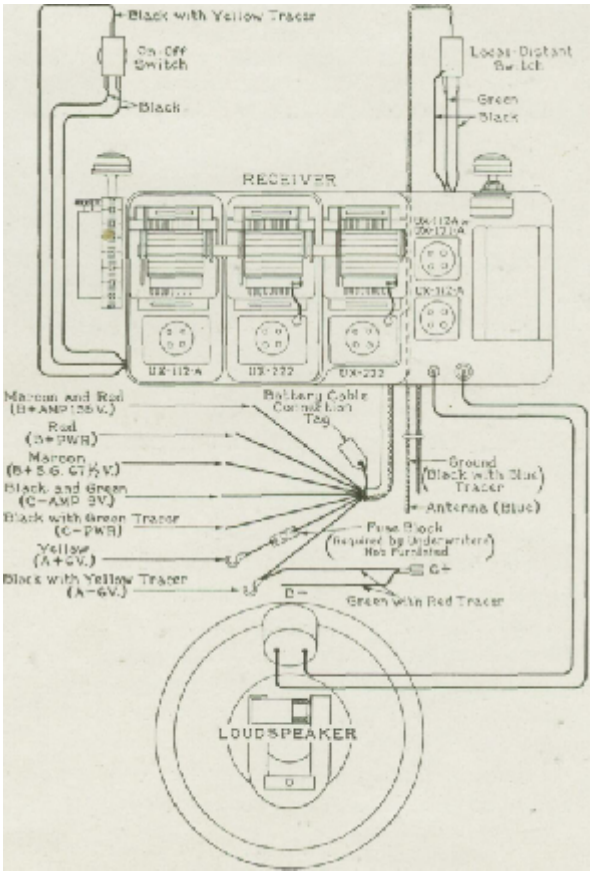

Fig. 8—RCA Radiola 22 Cabinet Wiring

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.

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.

The Radiola is guaranteed to be free from defects as outlined on the guarantee tag accompanying the instrument. Should any part become defective within the guarantee period, the RCA Radiola 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.

IMPORTANT

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

"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) tor 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 COBPOBATION OF AMERICA

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