Radiola
Super-Heterodyne
Second Harmonic

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Instruction Book 86963B

Supersedes 8G9G3A

Radio Corporation of America

233 Broadway, New York City
10 South La Salle Street, Chicago, Illinois
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Radiola Super-Heterodyne

INTRODUCTION

RADIOLA SUPER-HETERODYNE is a radio broadcast receiving instrument, utilizing the Super-Heterodyne principle, which provides unusual simplicity of operation, selectivity and sensitivity. The cabinet contains the operating mechanism and the battery equipment, as well as a loop antenna, making the set self-contained. It is designed for reception over the broadcast wavelength band 220 to 550 meters (approximately 550 to 1350 kilocycles).

ADDITIONAL EQUIPMENT REQUIRED

In addition to the Radiola Super-Heterodyne as described, there will be required the following apparatus:

6 Radiotrons, Model UV-199
1 Loud Speaker, Model UZ-1320 or UZ-1325
1 Telephone Plug, Model UD-824
1 Set of "A," "B," and "C" batteries as follow:

BATTERIES REQUIRED

A—Six standard dry cells, 1 ½ volts each, such as those listed below, for lighting the filaments. These are connected in two groups, each of three cells in series, both groups being connected in parallel by the connections in the sets.

6 Eveready Dry Cell Radio "A" Batteries. ..... 2 ½ by 6 ½ in. or
6 Manhattan Red Seal Dry Cells. ..... 2 ½ by 6 ½ in. or
6 Burges* No. **6 Dry** Cells..... 2 ½ **by 6 in.** **or**
6 Burgess Super Six Dry Cells. ..... 2 ½ by 6 in. **or**
6 Ray-0-Vac No. 1211 Dry Cells. ..... 2 ½ by 6 ½ in. **or**
6 Ace No. 6 Dry Cells. .. .. .2 ½ by 6 ½ in. **or**
6 Columbia Ignitor No. **6 Dry** Cells. ..... 2 ½ by 6 ½ in.

OR EQUIVALENT*

B—Four 22 ½ -volt plate batteries connected in series, such as:

4 Eveready No. 766 Plate Batteries. ..... 6 5/8 by 4 by 3 in. **or**
4 Burgess No. 2156 Plate Batteries..... *6 5/8* by 4 by 3 in. **or**
4 Ray-0-Vac No. 2151 Plate Batteries. .....*6 5/8* by 4 by 3 in. or
4 Kwik-Lite No. 225 Plate Batteries..... 6 ¾ by 4 by 3 in. **or**
4 Ace No. 115 Plate Batteries. ..... 6 5/8 by 4 by 3 in. **or**
4 Yale No. 1512-V Plate Batteries. ..... .6 ½ by 4 by 3 in. **or**
4 Bright Star No. 15-90 Plate Batteries..... 6 ½ by 4 by 3 in. **or**
4 Novo No. 268 Plate Batteries..... *6 ½* by 4 by 3 in.

OR EQUIVALENT

* A 4-volt storage battery, such as Philco Type UD-44, may be used instead of the six dry cells, if desired.

Two 45-volt plate batteries may be used instead of **four** 22 ½-volt blocks if desired, such as:

2 Eveready No. 767 Plate Batteries (45 Volts)... ..... .8 by 65/8 by 3 in. **or**
2 Burgess No. 2800 Plate Batteries (45 Volts)..... ..... 7 7/8 by 6 5/8 by 8 in. or
2 Novo No. 276 **Plate Batteries** (45 Volts)**..... 8 by 6 ½ by 3 in. or**
2 .Kwik-Lite No. 245 **Plate Batteries** (45 Volts)..... .8 ¼ **by** *6 ¾* **by 3 in. or**
2 Yale No. 3045-V Plate Batteries (45 Volts). ..... 8 by 65/8 by 3 in.
OR EQUIVALENT

C—One 4 ½-volt Negative Grid Bias or "C" Battery, such as:

1 Eveready No. 771 Negative Grid Bias **Battery**..... ..4 by 3 by 13/8 **in. or**
1 Ray-0-Lite No. 231-R Negative Grid Bias Battery. .. .4 by 3 by l 7/16 in. or
1 Burgess No. 2370 Negative Grid Bias Battery. ....4 by 3 by *1 3/8* in. or
1 Yale No. 313 Negative Grid Bias Battery. ..... …..4 by 3 by 1 3/8 in. or
1 Bright Star No. B-34-17 Negative Grid Bias Battery...4 by 3 by l 3/8 in or
1 Novo No. 288 Negative Grid Bias Battery. ..... …..4 by 3 by 1% in.
OR EQUIVALENT

INSTALLATION

Installing Batteries. Access to the space provided for the "A" and "B" batteries is secured • by pulling outward and then upward on the knobs of the two small end doors G (Fig. 2) and removing these doors. An envelope containing four short yellow and two long red jumper connectors will be found inside.

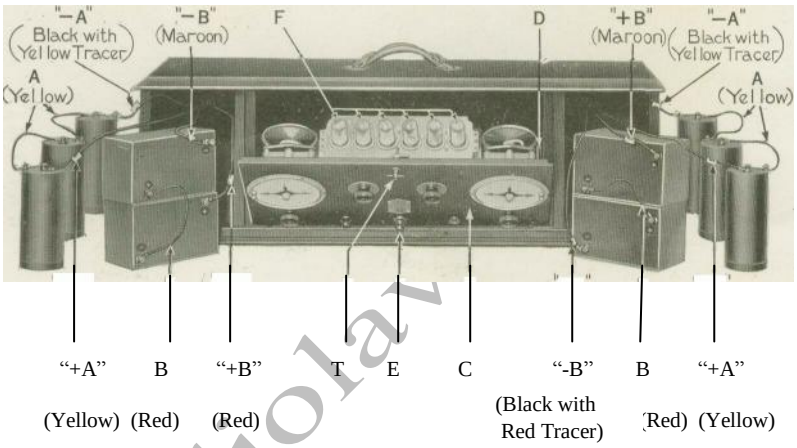

Fig. 1. Front View, Showing Connections of "A" and "B" Batteries

A—Four "A" Battery Connectors (yellow)
B—Two "B" Battery Connectors (red)
C—Control Panel
D—Stay Joint for Control **Panel**
E—Filament Switch
F—Six Radiotrons UV-199 in Socket
T—Latch for Control Panel

Connect two "B" batteries in series, using one of the long red jumper connectors B, fastening one end onto the "+22 ½ V." terminal of one battery; and the other end onto the "—“ terminal of the other battery. (Should the large size 45-volt blocks be used, the two jumper connectors will not be needed.) Connect these batteries to the set, fastening the lead marked **"+B"** (red in left hand compartment, maroon in right hand), coming through the hole in the side of the battery compartment, onto the battery terminal marked "+22 ½ V." as yet unconnected; (or onto the "+45V." terminal of the 45-volt battery, if one is used). Connect the other lead marked "—B" (maroon in left hand compartment, black with red tracer in right hand) onto the "—" terminal of the other battery. Stand the batteries (or battery) on edge and place them in the compartment, pushing them into the corner as near toward the center of the set as possible.

Connect three of the "A" dry cells in series as shown in the figure, using two of the four short yellow jumper connectors A. Connect the lead marked " +A" (yellow) to the center binding post (not yet connected); and connect the lead marked "—A" (black with yellow tracer) onto the outside binding post (not yet connected).

Place the "C" or grid bias battery in the compartment at the rear of the central section of the set (Fig. 2). Connect the lead marked "+C" (green) to the "+" terminal on the

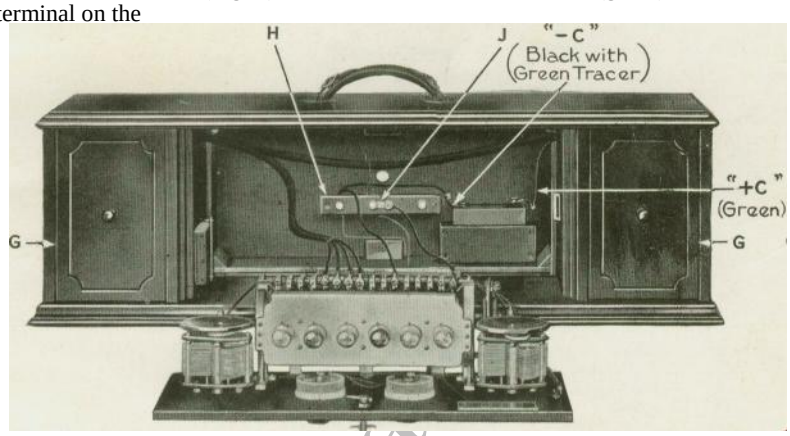

Fig. 2. Front View, Showing Radiotrons and Connection of "C" Battery

G—Two Battery Doors

H—Terminal Board

J—Jumper Connector

battery; and connect the other lead marked "-C" (black with green tracer) to the "-4 ½ V." terminal of the battery.

Location of Set. With the batteries installed and connected. replace the battery doors. Radiola Super-Heterodyne may now be located in any part of the home, convenient and desirable to its owner. It need not usually be located in any particular place or turned in any particular direction with respect to the room or to the received signal.

Placing Radiotrons in Sockets. Radiola Super-Heterodyne utilizes six Radiotrons, Model UV-199, which should be handled with due care. Pull the radio panel C forward to the half open position shown in Fig. 1, allowing it to rest against the stay joint D.

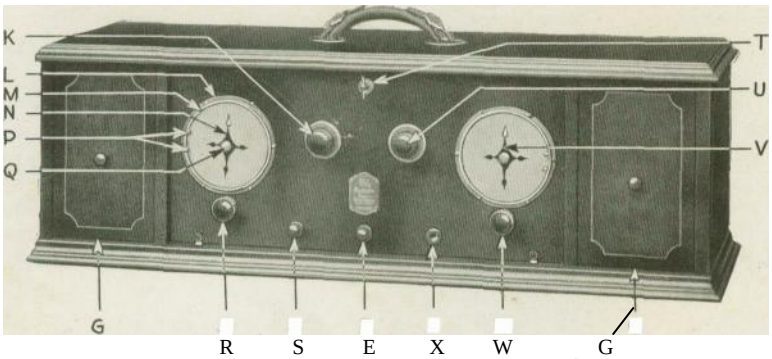

Fig. 3. Front View of Control Panel

E—Filament Switch.

G—Battery Doors.
K——"BATTERY SETTING" **Knob.**
L—Retaining Ring for "STATION SELECTOR" **Dial.**
M—Clamp Wire for "STATION SELECTOR" Dial.
N—"STATION SELECTOR I" Pointer.
P—Knobs on Clamp Wire.
Q—Thumb Nut for Pointer.
R—"STATION SELECTOR **I" Knob.**
S—Amplifier Switch.
T—Latch for Control Panel
U—"VOLUME CONTROL" **Knob.**
V—"STATION SELECTOR II" Pointer.
W—"STATION SELECTOR II" **Knob.**
X—Telephone Jack.

Before inserting the Radiotrons, turn the "BATTERY SETTING" knob to **"OFF,"** or push in the filament switch E in the lower center of the panel. Remove the six Radiotrons from their individual cartons. Insert one in each of the six tube sockets F, by placing it in the socket, turning the tube until the pin in the base drops into the slot, and then turning slightly to the right. Swing the panel back in place and lock it, using the latch T.

OPERATION

Filaments. Pull out the filament switch E. Turn the "VOLUME CONTROL" knob U (Fig. 3) clockwise to 100. Turn the "BATTERY SETTING" knob K clockwise to the arrow mark on the dial. WITH FRESH BATTERIES, DO NOT TURN THE POINTER PAST THE ARROW MARK. THIS IS EXTREMELY IMPORTANT as you will otherwise shorten the useful life of the Radiotrons and batteries, and little will be gained in ease of timing, signal strength or otherwise. As the batteries grow older with use, this setting should be gradually advanced from week to week toward "100." Connect the loud speaker to the telephone plug, and put the plug into the telephone jack X. Push in the amplifier switch S, which gives the full amplification of the receiver.

Tuning. The tuning of Radiola Super-Heterodyne involves only the manipulation of the two "STATION SELECTOR" knobs R and W—a simple operation if the principle described below becomes thoroughly understood.

The two gold tipped pointers have approximately the same settings, i.e., if one is set at 10 or 30, etc., the other is at or near 10 or 30, etc.

When searching for stations, the settings of which are not known, proceed as follows: Set "STATION SELECTOR I" gold-tipped pointer N at, say, 10 (referring to the metal dial scale under the paper scale). Move "STATION SELECTOR II" gold-tipped pointer V slowly over the scale near 10, say from 5 to 15. If no signals are heard, there is no station working on that wavelength. Then set "STATION SELECTOR I" pointer at say 12, and slowly move "STATION SELECTOR II" from about 7 to 17. If again no signals are heard, set "STATION SELECTOR I" gold-tipped pointer at say 14, and move "STATION SELECTOR II" slowly from about 9 to 19. If still no signals, repeat this process, increasing the setting of "STATION SELECTOR I" in small steps until the whole scale has been covered. It will be noted after the first few trials that when "STATION SELECTORS I and II" are in resonance, a slight breathing sound is heard indicating that the set is working properly and in resonance.

After hearing a signal carefully adjust both "STATION SELECTORS I AND II" for the clearest reproduction. To decrease the volume of signal, turn the "VOLUME CONTROL" knob U, toward the "SOFT" position.

If no stations are heard, Radiola Super-Heterodyne should be turned on the table 90 degrees from where it was during the preceding adjustments, and the tuning process just described should be repeated.

Control of Volume. As Radiola Super-Heterodyne is a very sensitive receiver, it is often found advisable to reduce the loud speaker volume. This may be accomplished by employing one or all of the following methods:

(1) Turn the "VOLUME CONTROL" knob U away from "100" toward "SOFT."

(2) Pull out the amplifier switch S.

(3) Shift the set on the table, until best position is found.

Interference. Signals from an interfering radio station may be eliminated or at least minimized by either of the following, methods:

(1) Turn "STATION SELECTOR II" pointer V, either to the right or left, by approximately ¾ inch to 1 inch, to find another position of this control, where the desired station will be again heard. The setting of "STATION SELECTOR II" nearer the left end of the scale is technically called the "lower wavelength peak," and the other the "upper wavelength peak." Two settings of this nature will be found for all broadcast stations, and the separation between them becomes greater and greater for the higher end of the scale, i.e., nearer the right hand end. It is recommended that "STATION SELECTOR II" be consistently set on the "lower peak" in the usual manipulation of the set. When interference is encountered, shift to the "upper peak," and use whichever one at which minimum interference occurs.

There are certain wavelengths (greater than 440 meters) where four tuning positions, instead of the usual two positions, can be found on "STATION SELECTOR II," when the receiver is located close to a powerful broadcasting station. This does not, however, interfere with reception either from the local station or from a distant one. In the case of the local station, the user should, under such circumstances, turn "STATION SELECTOR II" to either of the two positions which correspond most nearly to the setting of "STATION SELECTOR I" for the local station. In the case of the distant station, shift "STATION SELECTOR II" to the other "wavelength peak," either "upper" or "lower," as the case may be, where interference (if present) will probably not be encountered.

(2) Rotate the receiver on the table. For every transmitting station, there are two positions at which the signal strength will rise to a maximum, and two others at right angles where it is at a minimum. Place Radiola Super-Heterodyne where best results are secured, trying to locate the position where the interference does not come in, but the desired signals do.

GENERAL INFORMATION

Paper Dials. Four paper dials for each of the "STATION SELECTORS" will be found with the set, three each in the envelope for the Instruction Book, and one each in place on the panel. To put another "STATION SELECTOR I" dial in place, grasp pointer N with the left hand, turn and remove the knurled nut Q which holds it in place. Grasp the two knobs P on the end of the clamp wire M, pinch the knobs together, and pull the clamp wire free from its retaining ring L. Remove the old dial, and place a "STATION SELECTOR I" dial on the panel, taking care to locate properly the central hole and the notch on the left hand side. Replace clamp wire M, pointer N, and knurled nut Q in the order mentioned.

Follow the same process for "STATION SELECTOR II" dial.

Calibration of Set. The paper dials provide a means of recording the settings of the "SELECTORS" for the various stations. Once recorded, the pointers may be reset at any later time to these positions, and if the station is broadcasting, it will be heard. After a station is tuned in as above, mark the positions of one of the tips of each of the "STATION SELECTORS" as well as the call letters of the station. It is suggested that only the "lower peak" of "STATION SELECTOR II" be recorded.

Note that in a few places throughout the country, particularly in the metropolitan areas, there may be two or more stations assigned to the same wavelength or frequency, but apportioned different hours of the day so that they will not be "on the air" at the same time. For example, Philadelphia, Pa., has two stations WOO and WIP working on the same wavelength, but dividing time. Other examples will be found in the "Partial List of Class 'B' Broadcasting Stations" in the rear pages of this booklet. Under such conditions, the "STATION SELECTOR" settings should be the same for both stations.

Each of the "STATION SELECTORS" is provided with four pointers, in order that stations of nearly the same setting may be recorded on the dials without crowding the markings. **It** is

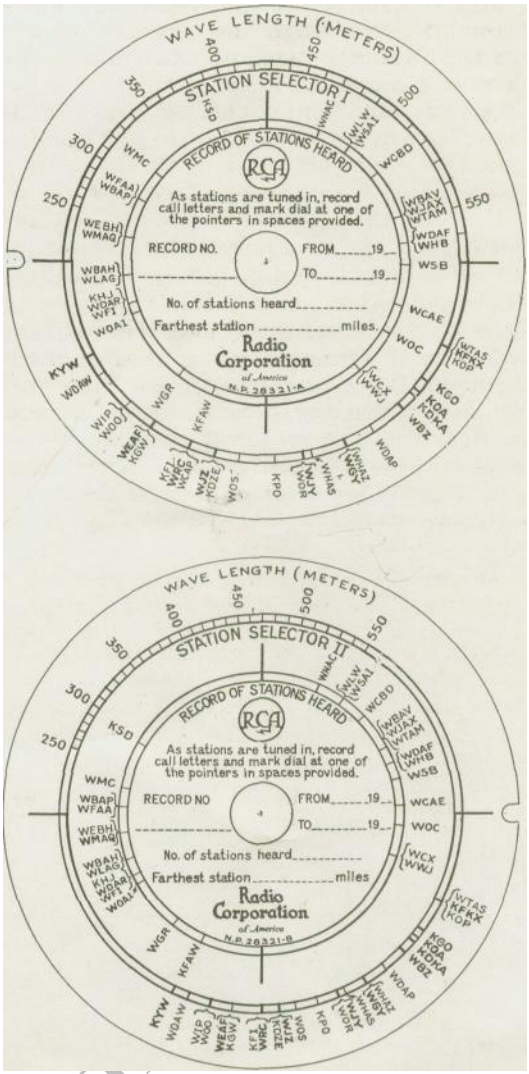

Fig. 4. "STATION SELECTOR" **Dials, Showing Approximate** Markings **of Principal Broadcasting Station***

suggested that the gold-tipped pointers be reserved for wavelength or frequency markings, and that the station settings be recorded on the three remaining pointers in the following order:
long black pointer, right short pointer and left short pointer. Mark as many stations as possible on the long black pointer. When a new station is tuned in, quite close to one already recorded, then use the short pointers for the markings.

The only precaution to be observed when making these markings is to see that the set is not located near any large metal objects, such as a steam radiator, or that it is not near any aerials or electric wiring. Such positions may cause changes in the settings of "STATION SELECTOR I."

In order to facilitate the tuning process, and to give an approximate idea of where stations should come in, Fig. 4 shows a reproduction of both dials, with the average markings of the principal broadcasting stations, marked in accordance with **the** method described.

The Log Sheets. The log sheets in the back of the book will serve as a permanent record of stations heard.

Batteries and Radiotrons. The only parts ordinarily needing replacements will be the batteries and Radiotrons.

It is important to adjust the "BATTERY SETTING" and "VOLUME CONTROL" knobs properly. With fresh batteries, turn ^ the "BATTERY SETTING " knob to the arrow mark on the dial, but no farther. Turn the "VOLUME CONTROL" to 100. Then search for stations as described on page 7. Having located a station, turn the "VOLUME CONTROL" knob to the left, if it is desired to decrease the volume of signal.

The accuracy of the setting of the filament voltage may be checked by a good filament voltmeter (of the high resistance type). Turn the "VOLUME CONTROL" to 100. Turn the "BATTERY SETTING" to the arrow. Touch the positive (+) voltmeter terminal to the case of the tube socket unit which holds the tube sockets **H,** and touch the negative (—) terminal to the movable blade of the "VOLUME CONTROL" on the rear of the panel. **If** the voltmeter reads greater or less than 3 volts, adjust the "BATTERY SETTING" knob until a reading of 3 volts is obtained.

With the filaments burning too brightly ("BATTERY SETTING" knob too close to 100), the active material in the filaments is rapidly driven off, and the useful life of the Radiotrons and batteries is shortened. Should this occur, the Radiotron life may be restored, provided they have not been too seriously abused.

. This process of "reactivation," as it is called, may lie accomplished by turning the "VOLUME CONTROL" knob to 100, and the "BATTERY SETTING" knob to the arrow (or to 3 volts), and by removing either one of the two red "B" battery connectors B in either the left- or right-hand battery compartment, which are shown in Fig. 1. Keep the Radiotrons lighted for about 30 minutes, replace the connector, and then try tuning.

Maintenance. Very little maintenance will be required on Radiola Super-Heterodyne, outside of an occasional oiling of a few of the parts. The oiling operation is important, and should be done about once every six months. To oil the moving parts, turn both "STATION SELECTOR" pointers as far right as possible, and open the panel of the set half way as in Fig. 1. Then place one drop of good grade oil, such as typewriter oil, on each of the following parts of both "STATION SELECTORS":

(1) On the front and rear bearings of the shafts, where the shafts pass through the black moulded sub-panels.

(2) On the bushing's in the panel which hold the "SELECTOR" knobs. . ...

(3) On the universal or ball joint just back of the "SELECTOR" knot) shaft.

(4) On the spring bearing of the slanting knob shaft (which spring bearing presses against the black insulation collar).

Polishing the Exterior. **If** finger marks result from handling the cabinet, a little rubbing or polishing with furniture polish will restore the finish. The polish chosen should be of a grade which will leave the cabinet free from an oily appearance. Use a soft piece of cotton cloth or cheesecloth, free from lint. Saturate the rag lightly with a small quantity of the polish and nil) it on the surface to be restored. Wipe thoroughly dry with clean dry cheesecloth, making sure that all crevices are dry and clean. The surface should be rubbed until the finish is restored to a dull gloss.

Storage Battery. If the user desires to use a 4-volt storage battery, such as that recommended on page 3, it should be located in the left-hand battery compartment, in place of the three dry cells shown in Fig. 1. Connect the " + A." lead (yellow) to the " + " battery terminal (red), and connect the " —A" lead (black with yellow tracer) to the " — " battery terminal (black). Wrap both the "+A" and "—A" terminals in the right-hand battery compartment with some insulating tape. When operating the set with storage batteries, turn the "BATTERY SETTING" knob to 65 but no farther. It will be possible to leave this knob

set at this point when operating the receiver. The battery should he kept well charged, but it is recommended that it be removed from the cabinet during this process, to prevent damage to the set.

POSSIBLE DIFFICULTIES

Should any trouble develop in the use of Radiola Super-Heterodyne, it will in all probability be due to loss of life of the Radiotrons or to the exhaustion of the batteries. As the batteries grow old, they decrease in voltage, and increase in resistance. After the Radiotrons have been used for a long time, their filaments tend to lose emission. If the difficulty appears to be elsewhere, it is recommended that the services of the dealer from whom the set was purchased, be enlisted.

If the set becomes inoperative, try interchanging the Radiotrons. The second tube from the right (when facing the front of the set) is the important one and it is well to determine first whether this tube is working properly. This may be done by touching the moistened finger to the stationary condenser plates of "STATION SELECTOR n," on the rear of the panel. A sharp click should be heard in the loud speaker. If none is heard, try interchanging this tube with either the third, fourth, or fifth Radiotrons, applying the click test each time. Use for the second Radiotron from the right (when facing the front of the set), the one which gives the sharpest click in the loud speaker. If the set is still not operative, push in the amplifier switch S, and remove the Radiotron on the extreme left-hand end, from its socket. Try substituting this tube for the first, third, fourth and fifth Radiotrons, operating the set each time, to ascertain if the reception has been improved. If no improvement is noted an examination of the batteries and their connections should be made. It is of advantage to keep a spare Radiotron UV-199 on hand, to meet emergencies.

There are several indications by which the user may determine that the filament or "A" batteries are becoming exhausted. These are low filament brilliancy, weak signals, and distortion, the signals becoming less and less recognizable. When it is found necessary to turn the "BATTERY SETTING" knob up to "100," and the operation of the set is still unsatisfactory (or when it is necessary to turn the "BATTERY SETTING" knob to 100 to get *3* volts on the filament, if a voltmeter is used), it is a definite indication that the filament batteries are exhausted.

When fresh batteries are installed for the first time, listen to the loud speaker, while pushing the amplifier switch in and

out. Sharp "clicks" will be heard in the loud speaker. Do this sufficiently to learn just how loud the click should be. If the "B" batteries have become fairly well exhausted, these clicks will become practically imperceptible—an indication that they need replenishing. A better method of test is, of course, to use a voltmeter of suitable range (100 to 150 volts scale, preferably of the high resistance type), for measuring the "B" battery voltage. Connect the positive (+) voltmeter terminal to the "+B" lead (red) in the left-hand battery compartment (Fig. 1), and the negative (—) terminal to the "—B" lead (black with red tracer) in the right-hand battery compartment. When the voltage has dropped to 68 volts total, or to 17 volts per battery, the batteries should be replaced.

An indication of exhausted "C" batteries may be had by listening to the loud speaker with no stations tuned in. If the loud speaker gives forth a continuous noise, the battery needs renewal. The noise may be either a light pitched whistle, a high cackling sound or a low gurgling murmur. Frequently the whistle is so high as to be above the range of audibility for some persons, but, in any case, the noise becomes more audible as the batteries age.

USE **OF** AN **INDOOR** ANTENNA

Radiola Super-Heterodyne is sufficiently sensitive for all ordinary radio reception, giving loud speaker signals over great distances even on its self-enclosed loop. Those desirous of reaching greater distances may try one of the following methods (see Fig. 5):

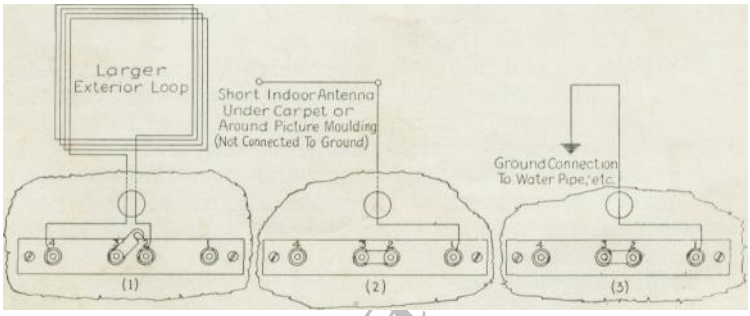

Fig. 6. Connection of Exterior Loop, Indoor Antenna, etc.

(1) Use a larger loop, such as Radiola Loop Antenna, Model AG-814, which gives the set the advantage of directional effect without the necessity of turning the complete receiver. Greater signal strength will also be obtained in this manner. Connect the loop between terminals 2 and 4, disconnecting the metal strap usually connected between terminals 2 and 3, on the terminal board, in the rear of the set.

(2) Use an indoor antenna connected to terminal 1**. Do** not tune the antenna. The antenna may be 20 to 30 feet long and may be located wherever convenient, say under the carpet or around the picture molding. Leave jumper J connected between terminals 2 and 3.

(3) Use a ground wire connected to terminal 1. Leave jumper J connected between terminals 2 and 8. In connection with these schemes, it will usually be found that if the set is located on the ground floor of the home, method (2) will be the better of the two; while if the set is on an upper floor, method (3) will be better. It is recommended that no attempts be made to tune the antenna connected to the set.

(4) Head telephones may be plugged into the jack X (Fig. 3), if desired.

When using any one of these methods, the settings of "STATION SELECTOR I" will change from those found when using the enclosed loop.

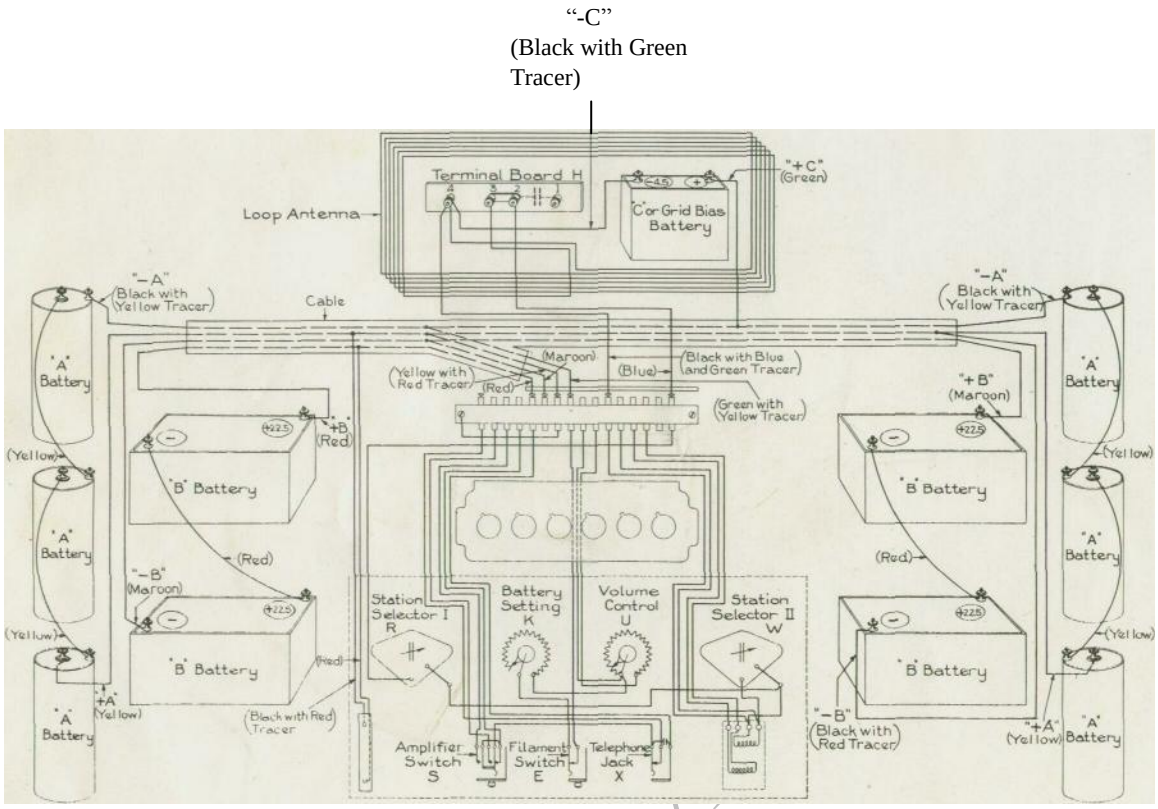

Fig. 6. Connection Diagram of Radiola Super-Heterodyne

NOTICE

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RADIO CORPORATION OF AMERICA

PARTIAL LIST OF CLASS -B" BROADCASTING STATIONS

WAVE-I-ENGTH (METERS)	FREQUENCY KILOCYCLE	CALL LETTERS	LOCATION	OWNER
		WLW	Cincinnati..... Ohio	Crosley Mfg. Co.
309	970	WSAI	Cincinnati..... Ohio	United States Playing Card Co.
312	960	KGO	Oakland.. ..... .Calif.	General Electric Co.
319	940	WGR	Buffalo..... .N.Y.	Federal Telephone & Telegraph Co.
328	930	KOA	Denver..... . Colo.	General Electric Co.
326	920	KDKA WBZ	East Pittsburgh. Pa. Springfield.....	Westinghouse Elec. & Mfg. Co. Westinghouse Elec. &
337	890		.Mass.	Mfg. Co.
345	870	WCBD	Zion..... ... .111. .	Wilbur G. Voliva
360	833	WDAP	Chicago.. ..... .III.	Drake Hotel
380	790	WGY WHAZ	Schenectady.... .N. Y. Trov... .....N.Y.	General Electric Co. Rensselaer Polytechnic Institute
385	780	WOAI f WJAX	San Antonio..... Texas Cleveland..... Ohio	Southern Equipment Co. Union Trust Co.
390	770	WTAM	Cleveland..... . Ohio	Willard Storage Battery Co.
		WBAV	Columbus..... . Ohio	Erner & Hopkins Co.
395	760	WDAR	Philadelphia..... Pa.	Lit Brothers Strawbridge & Clothier Times Mirror Co.
400	750	WFI KHJ	Philadelphia..... Pa. Los Angeles..... Calif. Louisville..... Ky.	Courier Journal & Times
		WJY	New York.. .. . .N. Y.	Radio Corporation of America
405	740	WOR	Newark..... N. J.	L. Bamberger Co.
411	730	WDAF WHB	Kansas City..... Mo. Kansas City..... Mo.	Kansas City Star Sweeney School Co.
		WLAG	Minneapolis..... Minn.	Cutting & Washington Radio Corp.
417	720	WBAH	Minneapolis..... Minn.	The Dayton Co.

428	710	KPO	San Francisco Calif.	Hale Brothers
429	700	WSB	Atlanta .Ga.	Atlanta Journal
441	680	WOS	Jefferson City Mo	Missouri State Market Bureau
		WEBH	Chicago 111.	Edgewater Beach Hotel
448	670	WMAQ	Chicago 111	Chicago Daily News
		WJZ	New York..... N. Y.	Radio Corporation of America
455	660	\KDZE	Seattle .Wash.	Rhodes Co.
		WCAE	Pittsburgh .Pa	Kaufman & Baer Co
		WCAP	Washington .D. C.	. Chesapeake & Potomac Telephone Co
462	650	WRC	Washington D. C.	. Radio Corporation of America
		KFI	Los Angeles Calif	E. C. Anthony News & Journal
469	640	WFAA	Dallas Texas	Star-Telegram
		WBAP	Forth Worth Texas	Palmer School of Chiropractic
476	630	WOC	Davenport Iowa	State University of Iowa
484	620	WHAA	Iowa City Iowa	American Telephone & Telegraph Co
		WEAF	New York N.Y	. Western Electric Co.
492	610	WBAY	New York N. Y.	Oregonian Publishing Co
		KGW	Portland .Ore	. Commercial Appeal
		WMC	Memphis . Tenn.	Gimbel Brothers
500	600	WIP	Philadelphia..Pa	John Wanamaker
509	590	WOO	Philadelphia . Pa	Detroit Free Press
517	580	WCX	Detroit Mich.	Detroit News
		WWJ	Detroit.. Mich.	Woodmen of the World
526	570	WOAW	Omaha.. Neb.	Westinghouse Elec. & Mfg. Co.
536	560	KYW	Chicago . 111.	Post Dispatch
546	550	KSD	St. Louis . Mo.	

Wavelengtha S16, 330, 333, 341, 375 and 435 not yet assigned.

RECORD OF STATIONS HEARD				
DATE AND TIME	CALL UITTEBS	LOCATION	DISTANCE (MILES)	KEMARKB
		... .	.	

^//'f(3 RECORD OF STATIONS HEARD				
DATE AND TIME	CALL LETTEB8	LOCATION	DISTANCE (MILES)	BEMARKB