

# RADIOLA II

## MODEL AR-800

**R**ADIOLA II, when used with an average antenna, constitutes a complete equipment for the reception of radio telephone and telegraph signals of any wavelength between 200 and 600 meters. It includes a regenerative tuning system employing a vacuum tube detector and one stage of audio-frequency amplification. The set is made conveniently portable by the use of Radiotrons, Model UV-199, operated entirely by standard dry batteries. Space is provided in the rear compartment for the batteries, for portable use, and in the front cover for the telephones. The carrying handle can easily be removed when not in use.

Radiola II gives excellent results with head telephones. It can also be used with an amplifier to increase signal intensity, for operating a loud speaker. At short distances from broadcasting stations, an additional amplifier will not always be required for this purpose.

The following parts are packed with the set:

Two Model UV-199 Radiotrons

One Pair of Head Telephones with UD-824 Plug.

For portable use the batteries required for installation in the rear compartment are:

Filament "A" battery—two  $4\frac{1}{2}$  volt, 3 cell flashlight batteries,  $1\frac{1}{8}$  in. in diameter by 7 in. long approximately, such as Eveready Tungsten No. 705, Burgess No. 232, Kwik-lite No. 1301, or equivalent.

Plate "B" battery—two  $22\frac{3}{4}$  volt batteries, 2 in. by  $2\frac{1}{4}$  in. by  $3\frac{3}{4}$  in., such as Burgess No. 4156, Eveready No. 763, or equivalent.

For a permanent installation, larger capacity batteries may be used as follows:

Filament "A" battery—three  $1\frac{1}{2}$  volt dry cells, such as Columbia Ignitor No. 6, Manhattan Red Seal, Burgess "Super-Six," or equivalent.

Plate "B" battery—two or four  $22\frac{3}{4}$  volt dry batteries, such as Eveready No. 768 or No. 766, Burgess No. 5156, No. 5156 BP, or No. 2156, or equivalent.

Grid Bias "C" battery—one  $4\frac{1}{2}$  volt 3-cell flashlight battery, such as Eveready No. 751 or No. 703, Burgess No. 432 or No. 532, or equivalent. (See below under "INSTALLATION.")

For antenna material, use the Model AG-788 Antenna Equipment.

### ANTENNA SYSTEM

The accompanying drawing shows the correct arrangement of the antenna. A span of from 75 to 100 feet is desirable and should be 25 feet or more above the ground. Reception improves with increased height. If the suggested length and height cannot be secured, approach them as nearly as possible. The antenna should be at right angles to electric light, power, and telephone wires and, if practicable, at least 15 feet distant from them. It must not be touched by any object except insulators. The same precautions apply to the lead-in wire, which should be a continuation of the antenna wire without any joints and run as directly as possible to the receiver. In receiving nearby stations, an indoor antenna even as short as 20 to 30 feet will usually give satisfactory results and will have considerable selectivity. The indoor antenna may consist of a wire run the length of the attic or just below the ceiling of an ordinary size living room.

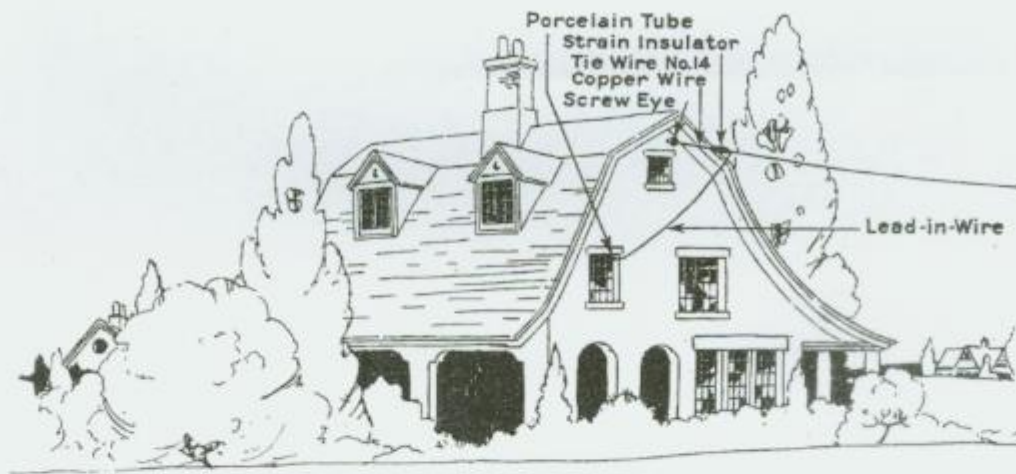
Ground connection is a necessary part of every antenna. The ground wire (rubber covered No. 14 gauge) should be connected as directly as possible to the house water pipes by means of a ground clamp. If water pipes are not available, use a pipe driven deeply into moist ground and as near to the set as practicable. The ground wire and the pipe should be well scraped and cleaned at the point of connection. For a protector, use Model UQ-1310 Lightning Arrester, or some other approved device. Install it where the lead-in wire enters the house and connect as shown in the diagram. The installation shown and described in this diagram is in accordance with National Electric Code standards.

### INSTALLATION

Locate the Receiver at a point conveniently near the lead-in and protector. Remove the front cover by pressing the small black button in the upper right-hand corner and then swinging the cover out and lifting it from the hinges.

Before removing the head telephones from the front cover, observe carefully the manner in which they are secured in place by the clips. They must be held thus when they are replaced and the cover is closed. Note also that all knobs must be turned to "0" before the telephones are replaced. The cord is rolled up in a small bundle, a rubber band is placed around the wires, and the cord is then held underneath the clip in the lower left corner of the cover. The telephone plug is held by a clip in the lower right corner. The plug must be pushed into the extreme corner before closing the set.

Run a wire from the antenna terminal of the protector to the lower antenna post (marked "LONG") in the center left side of the receiver panel. This is for wavelengths of from 375 to 600 meters. For wavelengths of from 200 to 375 meters, use the upper post (marked "SHORT"). Connect the "GROUND" post on the receiver panel with the ground terminal of the protective device. The foregoing connections are as shown in the diagram.



The terminal posts marked "PLATE," "FILAMENT," and "GROUND" located on the right side of the panel are provided to permit convenient connections to an additional amplifier, when used. If a loud speaker is used without an additional amplifier, connect the two wires from it to the "PLATE" and "FILAMENT" terminal posts. Make no connections to these posts if neither amplifier nor loud speaker is used.

The location and connection of the batteries in the rear compartment for portable use are shown in Fig. 4. Initial or renewal installations should be made as follows:

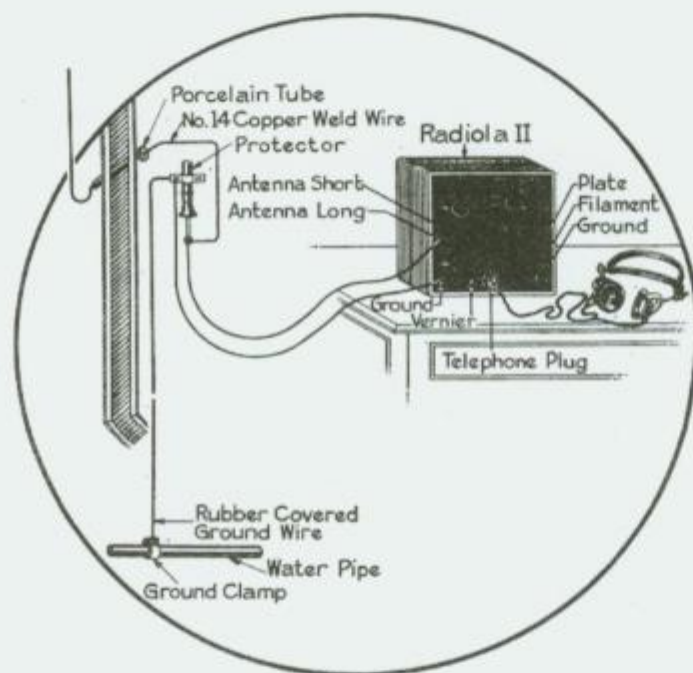


Fig. 2

of the batteries to prevent the center battery post from touching the metal contact strip. The three flexible leads (olive, black and red) are then disconnected from the terminal board of the set, folded back in to the rear compartment and clamped under the spring clamp provided for this purpose. Loosen the terminal nuts on the vertical terminal board and let the two jumper connections drop down to the positions shown in the figure.

The three external dry cells are connected in series, and the negative (outside) terminal is connected by means of an insulated wire passed through the bushing in the bottom of the set, to the post marked "A - 4.5V" on the horizontal terminal board inside the set.

Remove the spring clamp in the center of the battery compartment, but do not disconnect any of the colored flexible leads that connect the compartment to the set. Put the two flashlight batteries in the central space and tighten the thumb screws at the bottom. Place the two midget "B" batteries on the two shelves at the right. Connect them in series, using the double-ended spring clip. Connect the negative (black) lead to the black spring clip, and the positive (red) lead to the red spring clip marked "+4.5V."

The installation and connection of larger capacity external batteries are made as shown in Fig. 3.

If those for portable use are installed in the rear compartment, they should be entirely removed or disconnected. To disconnect them, the (+) red lead is disconnected from the red clip marked "+4.5V" and thrust back into the compartment; the thumb screws clamping the flashlight batteries are loosened, and a small piece of dry paper is folded and placed on top

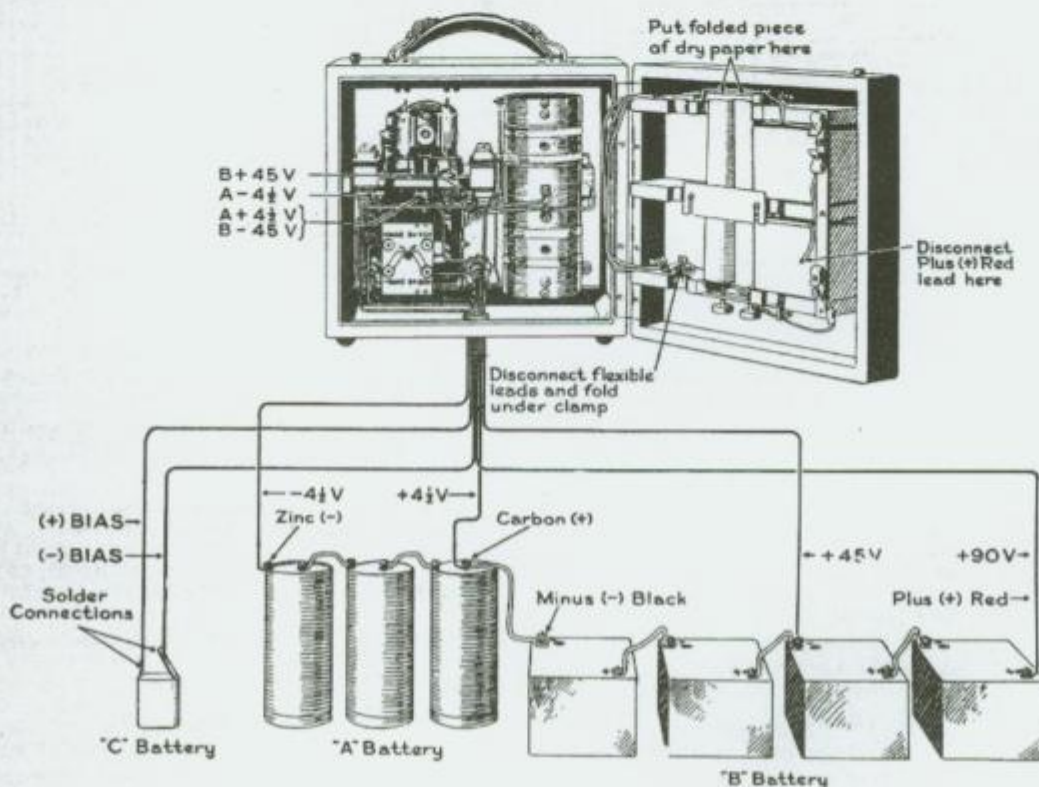
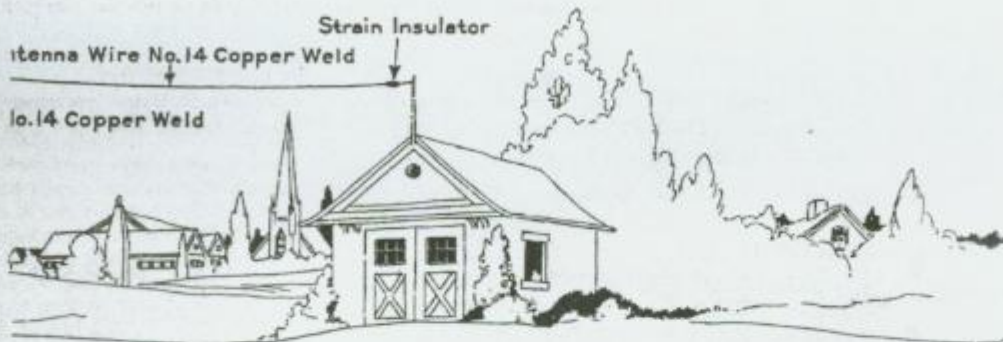


Fig. 3

The four  $22\frac{1}{2}$  volt "B" batteries are connected in series. The negative (black) lead is connected to the positive (center) terminal of the "A" battery and this point connected to the post marked "A +  $4\frac{1}{2}$  V B - 45 V" on the terminal board. The positive (red) lead is connected to the "B + 90V" post on the vertical terminal board; and the negative (black) lead of the third "B" battery is connected to the "B + 45 V" post on the horizontal terminal board.

The negative (long contact strip) of the grid bias battery is connected to the "-BIAS" terminal on the vertical terminal board, and the positive (short contact strip) to the "+BIAS" terminal. Both connections should be soldered to the grid bias battery.

Four  $22\frac{1}{2}$  volt batteries providing a plate supply of 90 volts and a grid bias battery as specified, are recommended if a loud speaker is used. For head telephone reception only, two  $22\frac{1}{2}$  volt batteries providing a plate supply of 45 volts will be sufficient. In this case, the grid bias battery should be omitted, and both jumpers should be connected in accordance with Fig. 4.

The grid resistance, a 7 to 9 megohm unit, is held in position by spring clips under the tube socket.

Remember that vacuum tubes must be handled carefully.

Before inserting the tubes in the sockets, be sure that the filament knob is in the "OFF" position. Place the brass base of the tube in the socket and turn until the base pin drops into the slot; then press down gently on the tube and turn it to the right into position.

Radiola II is now ready to operate.

#### OPERATION

Set the "INTENSITY" knob at "0." Light the tube filaments to a brilliancy explained in the instructions accompanying the tube, by turning the "FILAMENT" knob from "0" toward "10." With new batteries, from 1 to 4 is an average setting, but this will increase as the batteries are used.

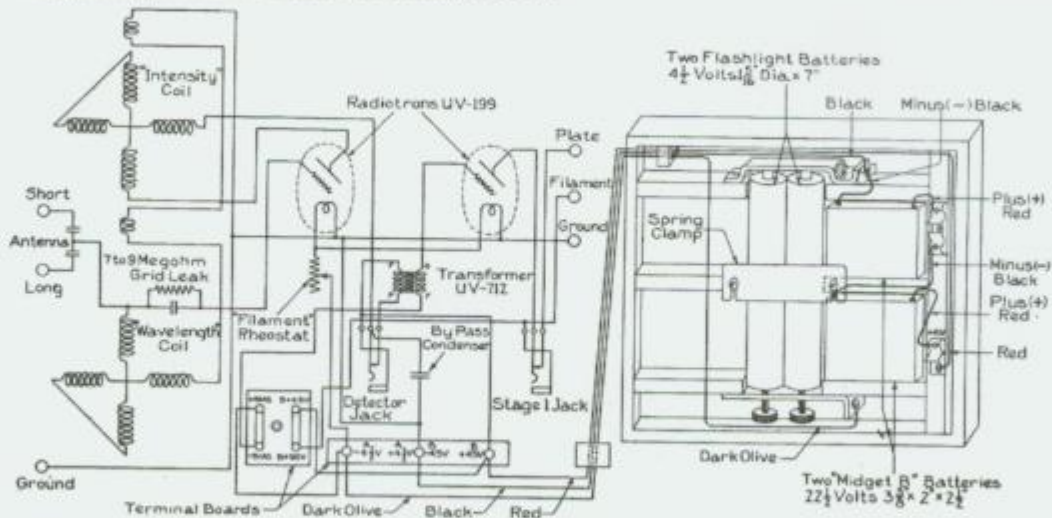


Fig. 4

Adjust the telephones snugly to the ears and insert the plug attached to the telephone cord in the jack marked "DETECTOR." A click should be heard on insertion or removal of the plug.

Turn the "WAVELENGTH" knob slowly until a signal is heard, and set it at the point where the signal is loudest. If no signals are heard or if they are very weak, slowly turn the "INTENSITY" knob clockwise, still searching for signals with the "WAVELENGTH" knob.

When signals are heard, turn the "INTENSITY" knob still farther, thus increasing the signal strength. Should it be advanced too far, a click will be heard in the telephones and then all signals will have a "mushy" sound. AT THIS POINT THE RECEIVER BECOMES A TRANSMITTER AND SERIOUSLY INTERFERES WITH NEIGHBORING RADIO RECEIVERS. THIS CONDITION OF OSCILLATION MUST BE AVOIDED, BUT IF IT DOES OCCUR, IMMEDIATELY TURN THE "INTENSITY" CONTROL BACKWARD SLIGHTLY UNTIL THE SIGNAL CLEARS UP.

To increase the signal strength still further, insert the telephone plug in "STAGE 1." This may require a slight readjustment of the "INTENSITY" knob.

The "VERNIER" knob provides a fine adjustment of the wavelength.

When the telephone plug is withdrawn, the amplifier or loud speaker, if either is connected, will be in circuit.

When the receiver is not in use, be sure to cut off the tube current by turning the "FILAMENT" knob to the "OFF" position.

#### POSSIBLE CAUSES OF FAULTY OPERATION

1. Poor or broken connections in antenna or ground wires, or defective insulation of antenna.
2. "FILAMENT" control improperly adjusted.
3. Improper adjustment of "INTENSITY," "WAVELENGTH," and "VERNIER" controls.
4. Batteries exhausted (indicated by low filament brilliancy or weak signals and noisy operation).
5. Battery connections improperly made, or broken.
6. Poor or broken connections in telephone cord or plug.
7. Grid leak omitted.
8. Inoperative vacuum tubes.