

Radio Frequency Amplifier

MODEL AA-1520

(WAVELENGTH 200-5000 METERS)

GENERAL

THE MODEL AA-1520 three-stage RADIO FREQUENCY AMPLIFIER is especially designed for operation with its companion unit, MODEL AA-1400 DETECTOR-AMPLIFIER for loop reception.

While the AA-1520 unit is primarily for use in connection with an indoor loop, a variable tuning condenser and MODEL AA-1400 DETECTOR-AMPLIFIER (Fig. 2), it may also be used on an outdoor type of antenna by employing one of the two conventional tuning arrangements:

- (1) A single circuit tuner, MODEL AR-1300 (Fig. 4).

NOTE: When this scheme is used, the outdoor antenna should not exceed 40 ft. in length, including the lead-in wire. An indoor antenna may also be used.

- (2) A two-circuit tuner (Fig. 3).

NOTE: With this arrangement, the antenna may consist of a single wire 75 to 150 ft. in length.

USE WITH A LOOP ANTENNA

The following apparatus should be secured and wired up in accordance with Fig. 2:

- 1—Loop antenna, MODEL AG-1380 or equivalent.
- 2—Variable Tuning Condenser, MODEL UC-1820 or equivalent.
- 3—MODEL AA-1520 Three-stage RADIO FREQUENCY AMPLIFIER with three UV-201 Radiotrons.
- 4—MODEL AA-1400 DETECTOR-AMPLIFIER with one UV-200 Radiotron and two UV-201 Radiotrons.
- 5—Head Telephone Receivers with Plug (MODEL UD-824 or UD-825).
- 6—One 6-volt, 80 to 120 ampere-hour storage battery.
- 7—Two 22.5-volt plate batteries (one with 18-volt tap).

When the loop is used, it may consist of the Radio Corporation's MODEL AG-1380 loop or equivalent, for receiving signals of broadcast wavelengths. The loop should be mounted so that it can be rotated on a vertical axis. Connect the R.C.A. variable tuning condenser UC-1820 in parallel with the loop and extend the terminals to the "INPUT" binding posts of the RADIO AMPLIFIER. See Fig. 2.

USE WITH AN ANTENNA

(A) If a single circuit tuner, MODEL AR-1300, is used, the apparatus should be wired in accordance with Fig. 4. The following apparatus will be required:

- 1—Antenna (MODEL AG-788).
- NOTE: See proper length of antenna mentioned under "General."
- 2—MODEL AR-1300 tuner.
 - 3—MODEL AA-1520 RADIO AMPLIFIER with three UV-201 Radiotrons.
 - 4—MODEL AA-1400 DETECTOR-AMPLIFIER with one UV-200 Radiotron and two UV-201 Radiotrons.
 - 5—Head Telephone Receivers with Plug (MODEL UD-824 or UD-825).
 - 6—One 6-volt, 80 to 120 ampere-hour storage battery.
 - 7—Two 22.5-volt plate batteries (one with 18-volt tap).

(B) If a two-circuit tuner is used, the apparatus should be wired in accordance with Fig. 3. The following apparatus will be required:

- 1—Antenna (MODEL AG-788).
- NOTE: See proper length of antenna mentioned under "General."
- 2—A two-circuit tuning arrangement.
 - 3—MODEL AA-1520 RADIO AMPLIFIER with three UV-201 Radiotrons.
 - 4—AA-1400 DETECTOR-AMPLIFIER with one UV-200 Radiotron and two UV-201 Radiotrons.
 - 5—Head Telephone Receivers with Plug (MODEL UD-824 or UD-825).
 - 6—One 6-volt, 80 to 120 ampere-hour storage battery.
 - 7—Two 22.5-volt plate batteries (one with 18-volt tap).

INSTALLATION

Turn all filament control knobs clockwise to the "OFF" position, before starting to wire up the equipment.

When used in conjunction with DETECTOR-AMPLIFIER, MODEL AA-1400, put the DETECTOR-AMPLIFIER at the right and connect the five terminals at the right end of the AA-1520 unit to the corresponding five terminals at the left end of AA-1400 unit, by means of five stiff pieces of wire, such as antenna wire, each about 1¼ inches long. In making these connections, insert the wire into the terminal opening, turn the holding screw until the wire will pass under it, and then tighten the screw down onto the wire. The filament and plate batteries are connected to the AA-1400 DETECTOR-AMPLIFIER in accordance with instructions accompanying that unit. When thus used with the DETECTOR-AMPLIFIER, no other battery connections are necessary.

The figures show several inches of space between the AR-1300, AA-1520 and AA-1400 units in order to indicate clearly the connections between adjacent ends. By using connecting wires of a length of about 1¼ inches, the units may be placed quite closely together; but in locating the AR-1300 and AA-1520 units end to end neither the cases nor any projecting screw heads should touch each other.

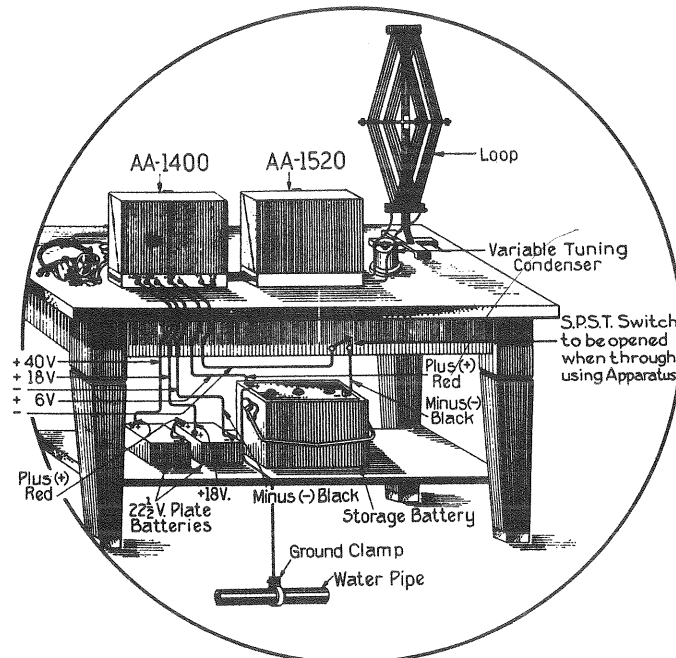
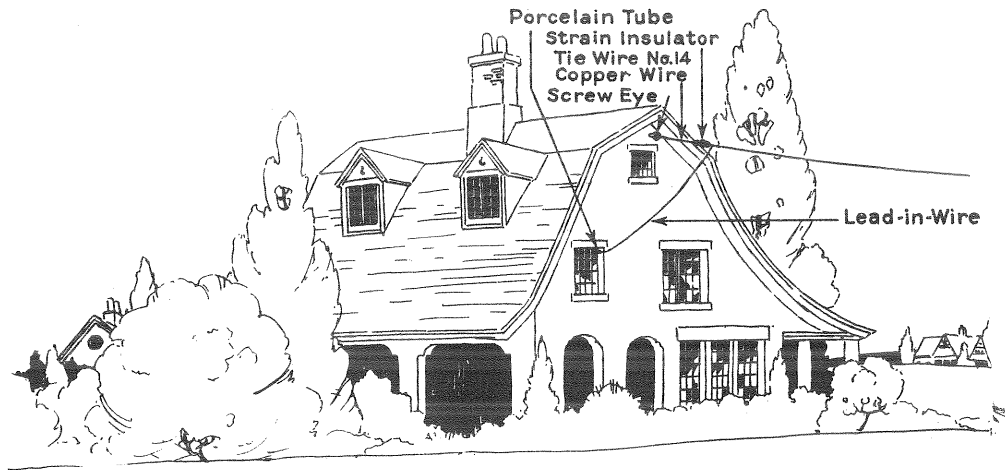


Fig. 2

Be sure to connect together the two terminals T-1 and T-2 on the back of the DETECTOR-AMPLIFIER unit, MODEL AA-1400, and do not connect in a tickler coil at this point, as it will be found that the regenerative coil will not increase the signal audibility very much over what is obtained with Radio Frequency Amplification. The proper operation of a regenerative circuit in conjunction with a RADIO FREQUENCY AMPLIFIER requires an extremely critical adjustment, or the advantages of one will offset the other and poor results will be secured.

If the AA-1520 unit is used in conjunction with a Detector or Detector-Amplifier of a type different than the AA-1400 unit, connect the OUTPUT terminals at the right end to INPUT terminals "F" and "G" of the Detector or the Detector-Amplifier; and connect the battery terminals, also at the right end, to the respective terminals of the batteries. The set is now ready to operate.

It is well to keep the 6-volt "A" battery (80 to 120 ampere-hours) well charged at all times, keeping the specific gravity between 1,250 and 1,275.

The directional properties of the loop may possibly be improved by omitting the ground connection in Fig. 2.

OPERATION

Insert the three UV-201 vacuum tubes in the sockets of the RADIO AMPLIFIER by matching pin on the side of the tube base with slot in socket, pressing down and turning into place. Three stages are always to be used, never one or two.

Insert the UV-200 detector tube in the left-hand socket of the DETECTOR-AMPLIFIER unit, and the two UV-201 tubes in the other sockets.

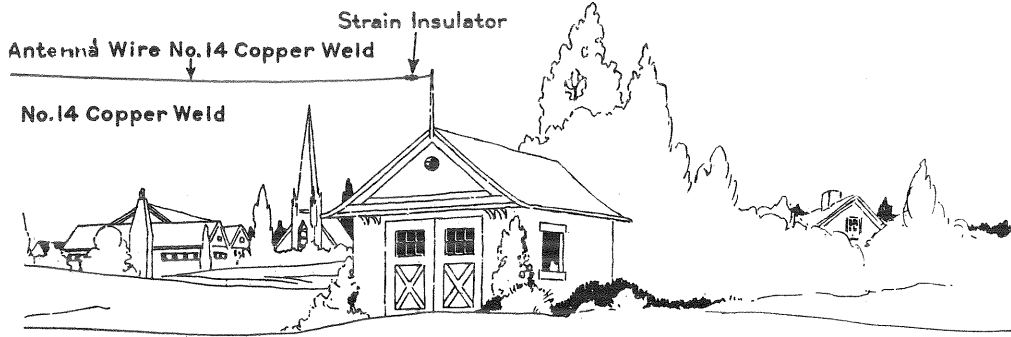


Fig. 1

Turn all the FILAMENT control knobs almost all the way around counter-clockwise, or in the direction of the arrow. It is not always necessary to use the two stages of audio or tone amplification, and these may be left unlighted when not used. The filaments of Radiotrons UV-200 and UV-201 should be somewhat less bright than the ordinary incandescent lamp.

Adjust the telephones snugly to the ears and insert the plug in the left-hand jack of the DETECTOR-AMPLIFIER. A click should be heard in the head telephones when the plug is inserted or removed.

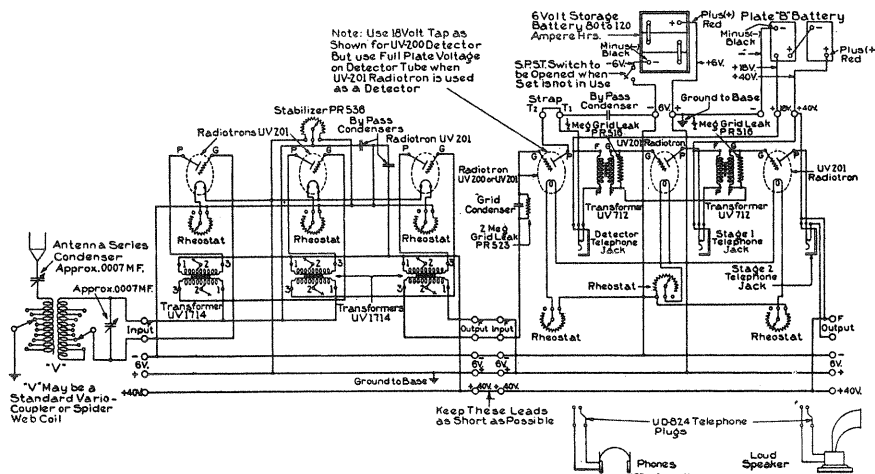


Fig. 3

Turn the "STABILIZER" knob half way around from "o", counter-clockwise.

Note position of the wavelength switch knob in the lower left-hand corner of the RADIO AMPLIFIER panel. For wavelengths below 500 meters the knob should be pulled out, while for wavelengths above 500 meters the knob should be pushed in.

The set is now ready for tuning. If the AA-1520 AMPLIFIER is used with an outdoor antenna in accordance with Fig. 3 or 4, the desired signals should be tuned in by the usual means. If the set is used in connection with an indoor loop (Fig. 2), the desired station can be tuned in by means of the variable condenser connected directly across the terminals of the loop.

If a loop is used it should be set for maximum signal strength by rotating it slowly about its vertical axis. Signals will be strongest when the plane of the loop is pointing in the direction from which the signals are coming.

Readjust the "STABILIZER" knob to the position of best signal intensity. The signal strength will be increased with clockwise rotation of the knob. 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 "STABILIZER" KNOB BACKWARD UNTIL THE SIGNAL CLEARS UP.

Slight readjustments of the filament rheostats may improve the signal strength, but it is not necessary to make especially fine adjustments on the RADIO AMPLIFIER.

The tube filaments are disconnected by turning the filament control knobs to the "OFF" position, but when the set is not used for any length of time one side of the storage battery should be disconnected by opening the single-throw switch. This removes the potentiometer current which, although small, would be a constant drain on the battery.

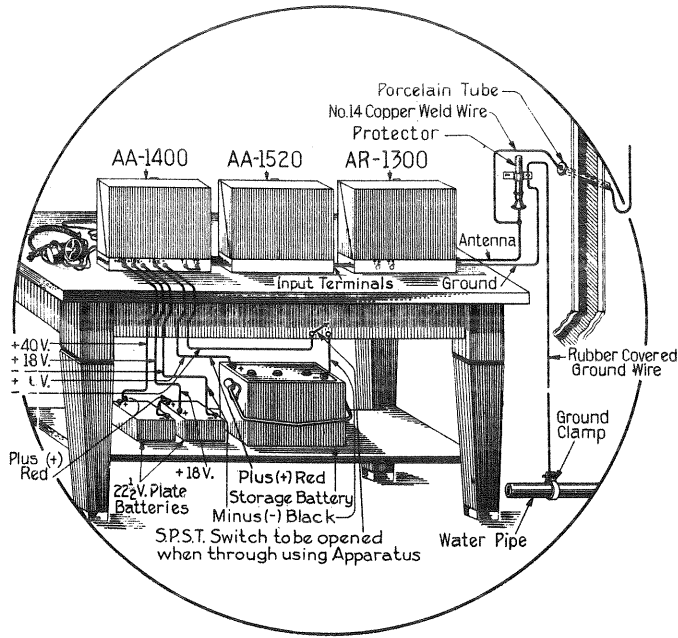


Fig. 4

CAUSES OF FAULTY OPERATION

1. Poor connections in antenna or ground wires or in loop wires or defective insulation of either.
2. Filament rheostats not properly adjusted.
3. Batteries exhausted (indicated by low filament brilliancy or weak signals and noisy operation).
4. Battery connections improperly made, poor, or broken.
5. Stabilizer improperly adjusted.
6. Poor or broken connections in telephone cord or plug.
7. Inoperative vacuum tubes.
8. Transformer wavelength switch in wrong position.

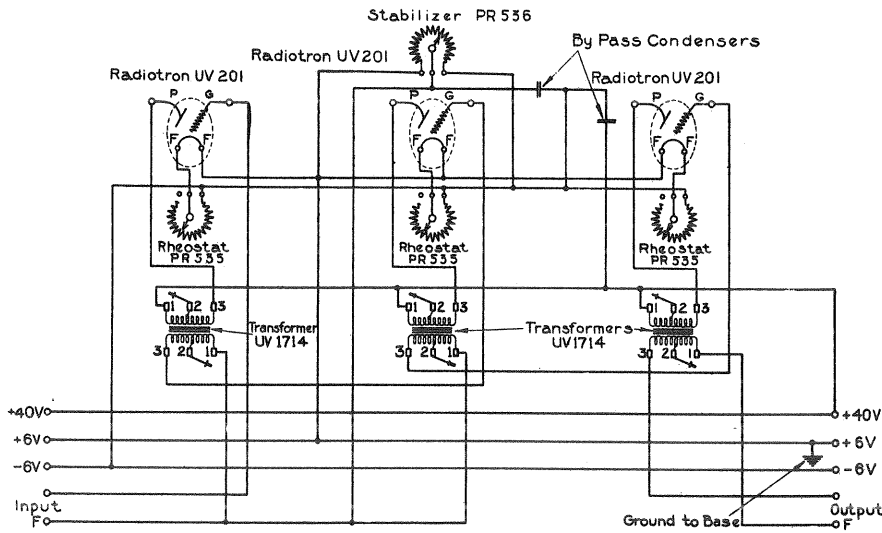


Fig. 5

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GENERAL ELECTRIC COMPANY, U. S. A.

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Radio Corporation
of America
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