SHORT WAVE RADIO RECEIVER

MODEL AR-1496-D

RADIOMARINE CORPORATION OF AMERICA

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THIS set was designed to fill the need for a good commercial high frequency receiver at a moderate price. Such a receiver must have good sensitivity, be easy of operation, be reasonably free from interaction between controls and be almost entirely free from effects due to body capacity or a swinging antenna.

The AR-1496-D receiver fully meets these requirements. The sensitivity is sufficient to reach the noise level under average conditions in most locations. The circuits and controls are so arranged that operation is very smooth. Changes external to the set have practically no effect on the beat note frequency, the detector tuning or the regeneration setting. The frequency range covered by three sets of plug-in coils is 3,750 to 25,000 KC (12-80 meters). An additional set of coils can be supplied to cover 2,000 to 3,750 KC (80-150 meters). This receiver is suitable for the reception of continuous wave telegraph signals or radio telephony.

The following tubes may be used:

1—UX-222 Radiotron as a radio frequency amplifier.
1—UX-240 Radiotron as a detector tube.
2—UX-201-A Radiotrons as audio amplifiers.

With the above tubes, the voltages and currents required for plate supply are 45 volts—1 ma; 90 volts—2 ma; 135 volts—8 ma. A 9-volt bias battery is used. A 6-volt filament heating battery is required to furnish 0.9 amperes.

If high plate voltages are available, the following tube complement is recommended:

1—UX-222 Radiotron as a radio frequency amplifier.
1—UX-841 Radiotron as a detector tube.
2—UX-210 Radiotrons as audio amplifiers.

The larger tubes will give longer life, slightly smoother operation and about 25% increase in signal strength over the smaller tubes.

With these tubes the voltages and currents required for plate supply are 45 volts—1 ma; 90 volts—2 ma; 135 volts—3 ma; 250 volts—25 ma. An 18-volt bias battery is used and an 8-volt filament heating battery is required to furnish 4 amperes.

The circuit arrangement consists of a tuned radio frequency amplifier stage, a regenerative detector and a two stage audio frequency amplifier. A Screen grid four element tube (Radiotron UX-222) is used in the radio frequency amplifier. A shielded and balanced input transformer is used for the input to this tube. The arrangement used practically eliminates any effect on beat note frequency, detector tuning or regeneration setting due to changing antenna constants. Considerable radio frequency gain is secured due to the high amplification factor of the UX-222 tube. The use of this tube also eliminates the need for neutralization. The balanced input transformer permits operation from a radio frequency transmission line, if desired. The detector functions on the grid rectification principle. Regeneration is secured by use of a fixed tickler and controlled by a variable bypass condenser. The detector regeneration circuit is so adjusted that oscillations start and stop smoothly at all frequencies within the range. A two stage audio frequency amplifier completes the circuit.

Plug-in coils are used for changing the frequency band. The antenna coupling coil is not changed over the entire range. The radio frequency plate coupling coil, the detector grid tuning coil and the tickler coil are constructed as a single unit.

Vernier drives are supplied on the three tuning controls. The antenna coupling can be varied.

The output of the two stage audio amplifier can be taken directly from the plate circuit or through an output transformer. The output transformer normally supplied in the set matches an output impedance of about 3000 ohms when used with a 201-A tube and 1200 ohms when used with a 210 tube (load impedances at 800 cycles). This load impedance matching is not critical. Jacks are provided so that two output circuits can be used in parallel on the output transformer. This transformer is arranged so that it can be plugged into the output of the detector, the first audio or the second audio amplifier.

A rheostat and voltmeter are provided to adjust the voltage on the UX-222 tube. The other tubes receive the correct voltage when connected directly to the filament battery recommended. A variable filament rheostat is neither necessary or desirable for these tubes.

The set is enclosed in a shielding case and the coupling tube is further shielded from the rest of the set. All battery leads are provided with radio frequency filters to prevent radiation from the batteries or pick-up on them. Condensers are placed on the secondary of the output transformer for the same purpose. This arrangement gives entire freedom from body capacity effects. An on-off switch is provided which controls the filaments of all the tubes.

The metal cabinet in which the receiver is enclosed has the following dimensions:

Length	27 inches
Height	8¼ inches
Depth	8⅛ inches

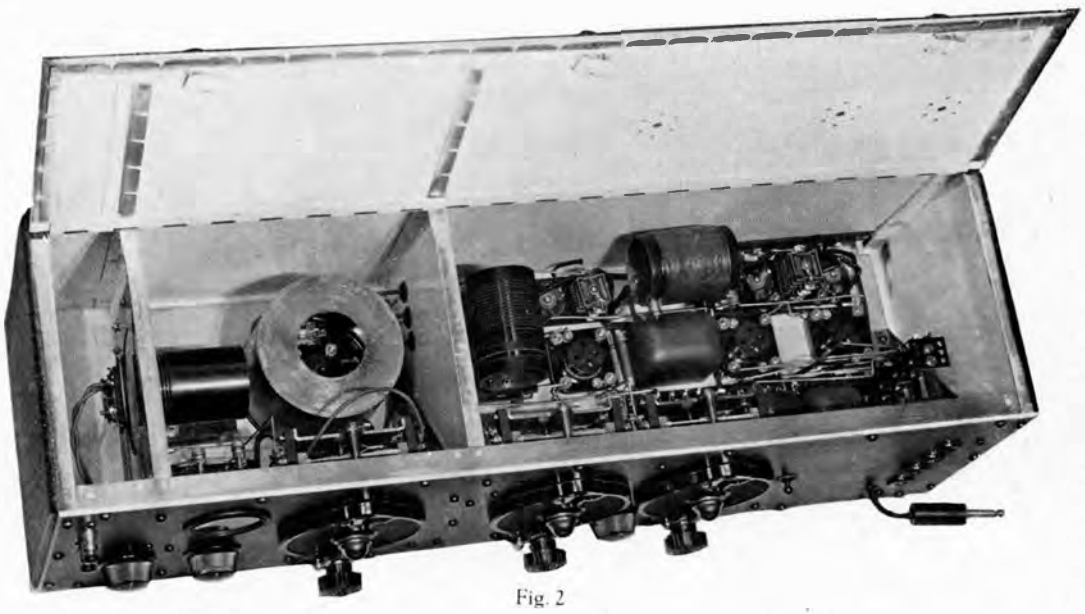

Fig. 2

The cabinet has two shields dividing it into three compartments. In the first compartment (on the left end) is the input coupling coil, variable with respect to the R. F. grid coil and coupled to it thru an electro-static shield. In the second compartment are the meter, rheostat, variable condenser, R. F. grid coil and the screen grid tube with its associated bypass condenser. This tube is further enclosed in a copper can. In the third compartment are the detector and audio stages.

All parts of the receiver are mounted either on the metal panel or the insulation sub-bases, which are fastened together, forming a complete assembly of all working parts. This unit fits into the cabinet from the front. The top of the cabinet is hinged so that the tubes and coils are readily accessible.

On the front panel the following instruments and controls are mounted:

Antenna and Ground Binding Posts

Filament Volt Meter	Detector Tuning Control	Detector Jack
Coupling Control	Vernier Tuning Control	First Audio Jack
Filament Rheostat	Regeneration Control	Second Audio Jack
Input Tuning Control	Filament Switch	Two Output Jacks

All power input binding posts are located on the back of the receiver.

The net weight of the AR-1496-D Receiver is twenty-eight pounds and the gross weight packed for domestic shipment is seventy-seven pounds.


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