

DESCRIPTION

A. RECEIVER

The HRO-M Radio Receiver is a high-frequency superhetrodyne suitable for C.W. and M.C.W. reception throughout the frequency range of 50 to 430 Kcs., and 480 to 30,000 Kcs. This range of frequencies is covered in nine bands as follows:

50 - 100 KC. Band.	Type J Coil Set
100 - 200 KC. Band.	Type H Coil Set
180 - 430 KC. Band.	Type G Coil Set
480 - 960 KC. Band.	Type F Coil Set
900 - 2050 KC. Band.	Type E Coil Set
1.7 - 4.0 MC. Band.	Type JD Coil Set
3.5 - 7.3 MC. Band.	Type JC Coil Set
7.0 - 14.4 MC. Band.	Type JB Coil Set
14.0 - 30.0 MC. Band.	Type JA Coil Set

The receiver may be obtained in either table or rack mounting models. Plug-in coil set Types JA, JB, JC, and JD are normally supplied with the receiver, and coil set Types E, F, G, H, and J may be obtained in addition, as desired. The receiver is designed for use with an external power unit capable of supplying 240 volts D. C. at 70 milliamperes and 6.2 volts A. C. at 3.4 amperes, although lower plate supply voltages down to 135 volts may be used with some sacrifice in performance.

The circuit employed on all bands comprises two tuned stages of radio frequency amplification, a tuned first detector stage, a high frequency oscillator employing a tube separate from the first detector tube, a first intermediate frequency amplifier stage employing a crystal filter, a conventional second intermediate frequency amplifier stage operating at 456 kilocycles, a combined second detector - automatic volume control - first audio stage, an audio output stage, and a beat frequency oscillator coupled to the second detector to provide for C.W. reception.

The antenna input circuit is suitable for use with a transmission line, a doublet antenna, or a single wire antenna. The antenna input impedance averages approximately 500 ohms at frequencies higher than 1700 Kc.

Two audio output circuits are provided:

- (1) Loud speaker terminals, in the form of tip jacks, are located at the rear

left-hand side of the receiver. Normally, the plate circuit of the output tube is brought directly to these tip jacks and a separate permanent magnet type loud speaker having a 7000 ohm input impedance is required. The output transformer, in this case, is associated with the loud speaker and carries the 30 milliampere plate current of the output tube. An output transformer can be included within the receiver to provide any specified output impedance from a few ohms to 20,000 ohms.

(2) A phone jack is mounted on the front panel. This jack is wired into the output of the pentode section of the 6B7. When the phones are plugged in, the signal input to the last tube is completely disconnected.

The crystal filter located in the first intermediate amplifier stage provides a convenient means of obtaining adjustable selectivity when receiving any frequency in the tuning range of the receiver. The PHASING control associated with the crystal filter enables the operator to easily suppress interfering signals which may produce objectionable heterodynes. The crystal filter may be used advantageously in either C.W. or M.C.W. reception.

Automatic volume control and an associated signal strength meter are provided for use in M.C.W. reception.

The tubes employed in the HRO-M Radio Receiver are located in the circuit as follows:

First R.F.	6D6
Second R.F.	6D6
First Detector	6C6
High Frequency Oscillator	6C6
First I.F.	6D6
Second I.F.	6D6
Diode Detector, AVC, First Audio	6B7
Second Audio	42
Beat Frequency Oscillator	6C6

Net weights of the various models of the HRO-M Receiver, are as follows:

Table Model Receiver with 9 Coil Sets	51 lbs.
Rack Model Receiver with 9 Coil Sets	53 lbs.
Empty 3 Coil Set Container (wooden)	1-3/4 lbs.
Empty 5 Coil Set Container (wooden)	2-1/4 lbs.

Overall dimensions of the various units of the HRO-M Receiver are as follows:

Table Model:	width	17-1/4 in.
	height	9 in.
	depth	12 in.
Rack Model:	width (panel)	19 in.
	width (cabinet)	17 in.
	height	8-3/4 in.
	depth	12 in.
3 Coil-set Container: (wooden)	width	11-1/4 in.
	depth	8-3/8 in.
	height (empty)	4-3/4 in.
	height (with coil sets)	5-3/4 in.
5 Coil-set Container: (wooden)	width	11-1/4 in.
	depth	13-1/2 in.
	height (empty)	4-3/4 in.
	height (with coil sets)	5-3/4 in.

B. POWER UNIT.

Power units for operation from 230 A.C., 115 volts A.C., 6 volts D.C., or 12 volts D.C., are available for use with the HRO-M Receiver.

These power units may be obtained in either rack or table mounting styles.

Special connections in the vacuum tube heater circuits located within the receiver are required for operation from a 12 volt D.C. source.

In all cases the circuit of the power unit consists of a transformer (with vibrator for D.C. models), a rectifier, and filter circuits.

C. LOUD SPEAKER

Loud Speakers in rack or table mounting styles can be supplied for use with the HRO-M Radio Receiver. Normally the speaker is of the permanent magnet type and the transformer should have an input impedance of 7000 ohms. The speaker transformer carries the plate current of the Receiver output tube. In installations where an output transformer is included within the Receiver, the speaker transformer must of course match the Receiver output impedance. A dynamic speaker may be used, although a means for the speaker field excitation must be provided.