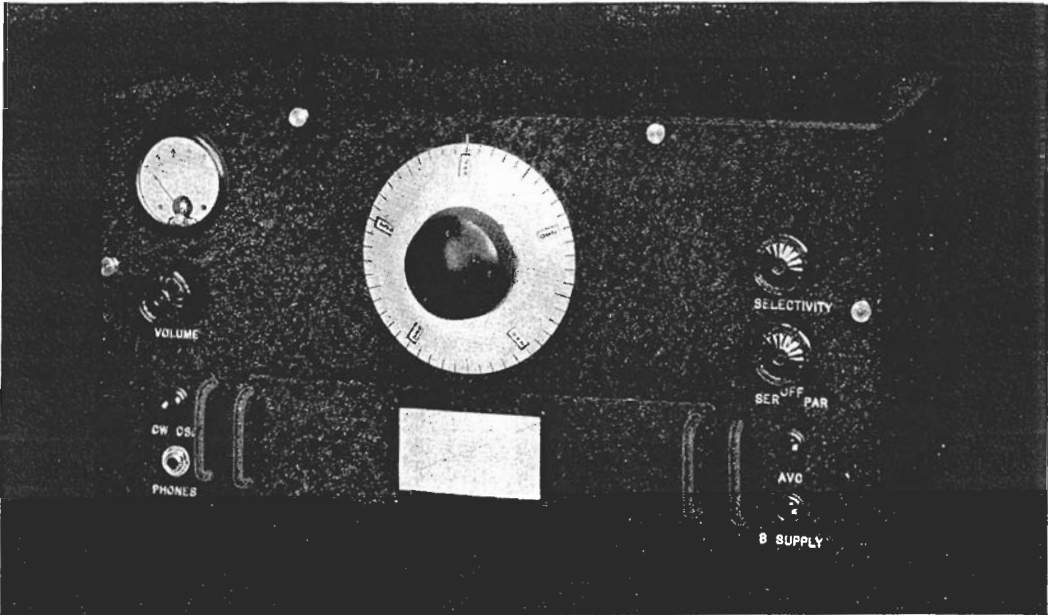


NATIONAL *High Frequency* RECEIVERS



TYPE HRO AMATEUR RECEIVER

In designing this new receiver National has attempted to meet every requirement of the most advanced amateur. It embodies every feature which we have found to be desirable in such a receiver.

Its circuit is notable in the use of two preselector stages, giving remarkable image-frequency suppression, and weak signal response. The first R.F. stage has been designed to provide maximum gain to minimize effects of Thermal Agitation, and provide highest Signal-to-Noise Ratio. The two high-gain I.F. stages employ Litz-wound coils and are tuned with air condensers. As would be expected, the usable sensitivity and selectivity are remarkable.

As a further aid when operating under adverse conditions, a Lamb-Single-Signal crystal filter precedes the I.F. amplifier. All controls are brought out to the front panel.

Other circuit details include automatic or manual volume control (with panel switch), and a vacuum tube voltmeter indicating carrier intensities directly in R. Units. A neon lamp is wired across the input circuit, automatically shunting the terminals whenever excessive voltages are picked up by the antenna, such as may occur during transmission, heavy static, etc. In addition to protecting the receiver, this device eliminates blocking and permits quick come-back when operating on the break-in system. A phone jack is, of course, provided on the front panel, as well as a Send-Receive switch for cutting B Voltages during transmission.

Most notable among the mechanical details is the use of a new precision four-gang condenser with worm drive tuning, providing a ratio of 20-1. Due to preloading of the gears, backlash is entirely absent. The micrometer dial has fifty divisions and revolves ten times in covering the tuning range, thus reading direct to 1 part in 500. Quarter divisions may be easily estimated. Every tenth division is numbered, the figures being changed automatically as the dial is rotated. The condenser and dial are described more fully on Page Two of this catalog.

The HRO Receivers employ plug-in coils rather than coil switching. This is because we have found that, other things being equal, much better performance is obtained with plug-in coils. The principal reason for this is the necessity for crowding coils into a small space, without well-proportioned individual shielding, when the switch is

employed. This increases image frequencies and signal-to-noise ratio, and tends to introduce dead spots. These difficulties are not insuperable of course, and we have designed a new coil switch, as well as a new receiver employing it, which we believe represents the highest development in this type of equipment. This receiver though in many other respects similar to the HRO, is not listed in this catalog, as we consider it a Short Wave Broadcast Set, rather than preferred equipment for amateur use. Our choice of plug-in coils for the HRO Amateur Receivers is based on definite engineering experience with both types of receiver, as well as on the expressed preference of a number of amateurs. A description of the ganged plug-in coils used in the HRO will be found on the opposite page.

The HRO has been designed to employ an external power supply, as many amateurs already possess suitable power supplies. However, an HRO Receiver with built-in power supply is also available and listed below, for those who prefer to sacrifice performance to convenience.

Tubes required for 2 volt HRO: Four 58, Three 57, One 2B7, One 2A5. Power Supply requires 1 Type 280.

Tubes required for 6 volt HRO: Four 6D6, Three 6C6, One 6B7, One 4Z. Power Supply (for AC operation) requires 1 Type 280.

HRO Receiver, 2 volt or 6 volt A.C. model, complete with coils, as described above, but without tubes, speaker or power supply.

List Price, \$233.00

HRO-S Receiver (2 volt), with built-in power supply, 115v. 60 cycle, complete with coils, as described above, but without tubes, or speaker.

List Price, \$257.50

HRO-P Panel for Relay Rack Mounting, leatherette finish, engraved and machined to fit over the regular front panel of the HRO.

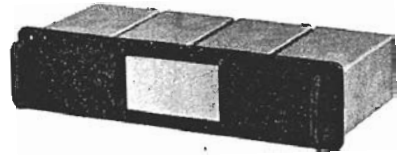
List Price, \$20.00

NATIONAL COMPANY, INC., MALDEN, MASS.

NATIONAL *High Frequency* RECEIVERS

OUTSTANDING FEATURES:

- Nine Tubes, not including rectifier.
- Two Preselector Stages.
- Single Signal (Crystal Filter) standard equipment.
- Ganged Plug-in Coils, with each coil individually shielded.
- Strictly single-control Tuning.
- Calibration for each range mounted on coil.
- Four gang Precision Condenser, with preloaded worm-drive tuning, 20-1 ratio.
- Micrometer Dial, spreading tuning over 500 divisions, numbered every 10 divisions, direct reading.
- Automatic or Manual Volume Control.
- Vacuum Tube Voltmeter with Instrument calibrated in R scale of carrier intensity.
- Electron Coupled, air padded oscillators.
- Two I.F. stages with Litz-wound coils, air condenser tuned.
- Beat Frequency Oscillator for "Offset" C.W. Tuning.
- Phone Jack on Panel.
- 2½ Volt AC and 6 Volt AC or Battery models.
- Relay Rack Mounting available.
- Built-in Power Supply available.



GANGED PLUG-IN COILS

Each of four coil units in the HRO ganged plug-in assembly has an individual aluminum shield, and is mounted on an aluminum panel, on which is framed the calibration curve for the range covered. The assembly is illustrated above.

Due to special features in the design of both the tuning condenser and the coils, it has been found possible to combine Calibrated full band-spreading on the 20, 40, 80 and 160 meter amateur bands with continuous coverage of all frequencies from 1.7 M.C. to 30 M.C. Special band-spread coils are not required.

A complete set of coils for the range from 1.7 M.C. to 30 M.C. is supplied as standard equipment with each receiver.

Two additional sets of coils covering the broadcast band (550-900 K.C. and 900-1700 K.C., respectively) are available at extra cost.

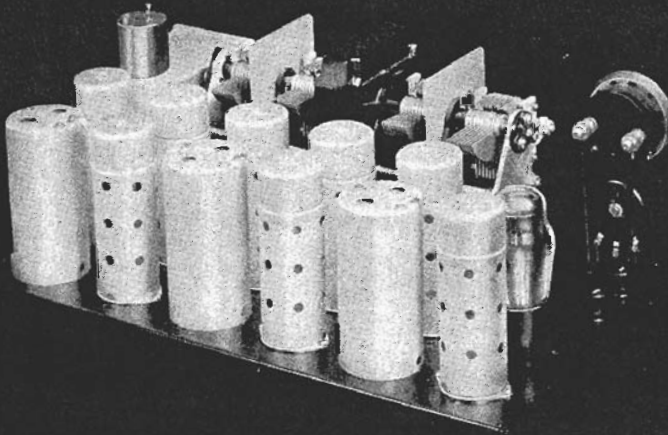
List Price, each \$20.00

POWER SUPPLY

The 2 volt HRO Receiver is designed to operate from the FB-7 power supply, Type 5897. Similarly, the 6 volt HRO operates from the AGS Power Supply, or from the Type 5886 (SRR Power unit). Amateurs already owning any of these power supplies may employ them without alteration. Types 5887 and 5880 may also be used if available, but are not recommended. For general description of National Power supplies, see Page 14.

Power Supply Unit, Type 5897, for 2½ Volt HRO Receiver, 115v, 60 cycle, less tubes, **List price, \$26.50**

Power Supply Unit, Type 5886, for 6 Volt HRO Receiver, 115v, 60 cycle, less tubes, **List price, \$34.50**



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