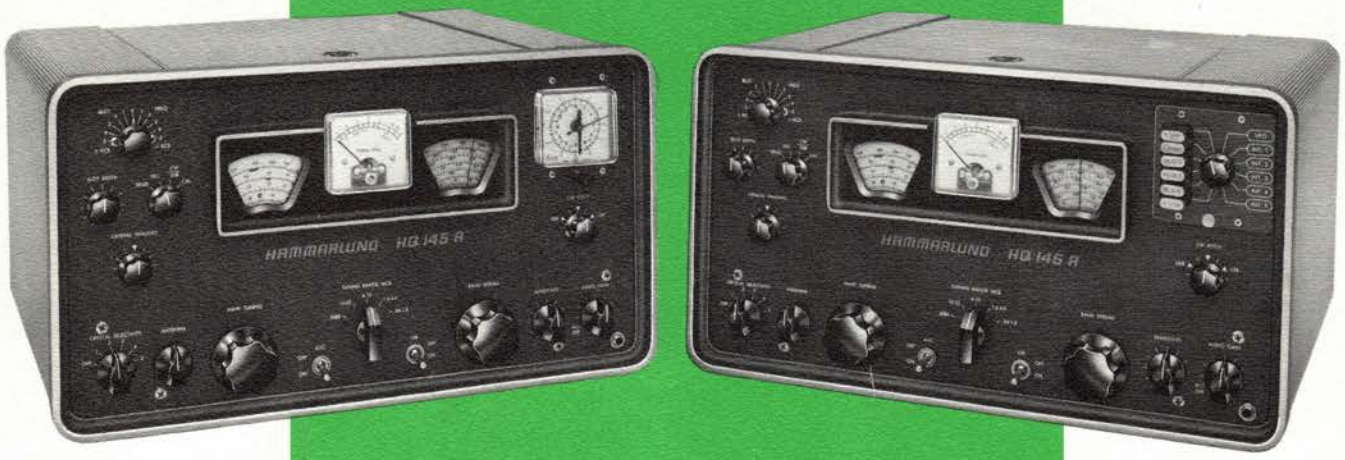
HQ-145A HQ-145AX



DUAL CONVERSION GENERAL COVERAGE RECEIVERS FEATURING CRYSTAL & SLOT FILTER SELECTIVITY

On one side—the new HQ-145A General Coverage Receiver—close kin to the world-famous HQ-145X—but with New Features to provide even better operating versatility.
On the other—the new HQ-145 AX—the **one** modestly priced receiver that adds crystal controlled stability to general coverage versatility.

Identical except for the facility of the eleven crystal controlled channels included with the HQ-145 AX, these new Hammarlund receivers represent a giant step forward toward commercial-quality performance. They offer new standards through the combination of an adjustable 60 db slot filter and the exclusive Hammarlund crystal filter. By manipulation of these two filters, the operator may create endless combinations of peaking and nulling in order to attain solid contact with weak signals in the most crowded bands.

New features include improved electrical and mechanical stability, separate detectors for undistorted SSB CW and AM, silicon rectifiers, and universal 115/230v. 50/60 cycle operation.
The Hammarlund HQ-145A is ideally suited for the amateur who desires a fine quality general coverage receiver at modest cost—or the short wave listener who wants an outstanding receiver for globe-trotting from his easy chair.

The Hammarlund HQ-145AX includes all these advantage **plus** the unusual versatility afforded by 11 fixed-frequency crystal positions (in addition to the VFO). Here is crystal stability for RTTY, MARS, C.A.P. and CD—as well as commercial and industrial services.

Established 1910

HAMMARLUND

Hammarlund Manufacturing Company *A Giannini Scientific Co.*
53 West 23rd Street, New York 10, N. Y.
Export Department: 13 East 40th Street, New York 16, N. Y.

only the HQ-145A *and* HQ-145AX *offer all these* FEATURES

- 11 tube superheterodyne with improved automatic noise limiter.
- Dual conversion on 10.0-30.0 MCS band for superlative image rejection (including 20, 15, and 10 meter amateur bands).
- Frequency range, 540 KCS to 30 MCS in four bands.
- Directly calibrated electrical band-spread on 80, 40, 20, 15 and 10 meter amateur bands.
- Flip-top lid for easy access to top of chassis.
- Crystal filter with six-position switch for additional selectivity — plus adjustable slot filter with up to 60 db attenuation for elimination of adjacent channel interference.
- S-meter for tuning indication and signal strength readings.
- Adjustable high-stability, temperature-compensated BFO for SSB and CW reception.
- Unusually high sensitivity provides an average 10:1 signal to noise ratio with 1 microvolt signal.
- Special 20 meter amateur band position for optimum electrical dial spread.

The HQ-145A is a general-coverage communications receiver. It is entirely self-contained with a regulated power supply for operation on 105-125 or 210-230 volts, 50-60 cps, 80 watts. Complete filtering of the power supply eliminates AC hum from the receiver. Heat dissipation is achieved through the use of a perforated metal cabinet with stand-off legs.

The HQ-145X has a frequency range of 540 KCS to 30 MCS through the use of a 4-band selector switch. The receiver may be operated on either a single wire flat-top, doublet or folded-dipole antenna.

An 11-tube superheterodyne receiver, the HQ-145A uses a separate mixer (6BE6) and oscillator (6C4) for a high degree of stability in the front-end. High gain, with low-noise in the front end, results in excellent signal-to-noise ratio throughout the receiver. Static bursts, automobile ignition and other impulse-type noise is minimized by use of one section of the 6AL5, which is a completely self-adjusting noise limiter with no appreciable effect on the modulation. The other half of the 6AL5 is employed as a second detector and AVC system. Frequency drift of the HQ-145A is less than 0.01% of frequency after warm-up. Low-loss sockets, coil forms and bandswitch wafers, temperature-compensated capacitors, application of regulated power to the oscillator circuit and rugged mechanical assembly are combined to achieve this low-drift factor.

BANDSPREAD Electrical bandspread tuning with direct calibration is provided on five amateur bands: 80; 40; 20; 15; and 10-meter. Two capacitor sections are employed in the bandspread operation for outstanding performance. Operation of the bandspread is simple: The operator sets the main dial at the high end of the desired band, then tunes the bandspread dial over the range desired. An arbitrary 0-100 logging scale is also provided in addition to the above bands.

RF SECTION An antenna trimming capacitor permits optimum match to the particular antenna system employed with the receiver for maximum transfer of signal energy between antenna transmission line and front end. This adjustment is on the front panel. The RF amplifier provides outstanding pre-selection and a high degree of signal level for the IF system.

IF AMPLIFICATION The HQ-145A provides three IF amplification stages on all bands. Dual conversion is employed from 10.0 MCS to 30.0 MCS. As a single conversion receiver, 10 tuned circuits are used at 455 KCS, and as a dual conversion receiver, the first IF stage is utilized as a 2nd converter for optimum image rejection. Iron core permeability-tuned transformers are incorporated to improve performance and retain accuracy of alignment.
Fading and signal strength variations are minimized by a fast, yet smooth Automatic Volume Control circuit which controls the gain of the RF stage and one of the IF stages.

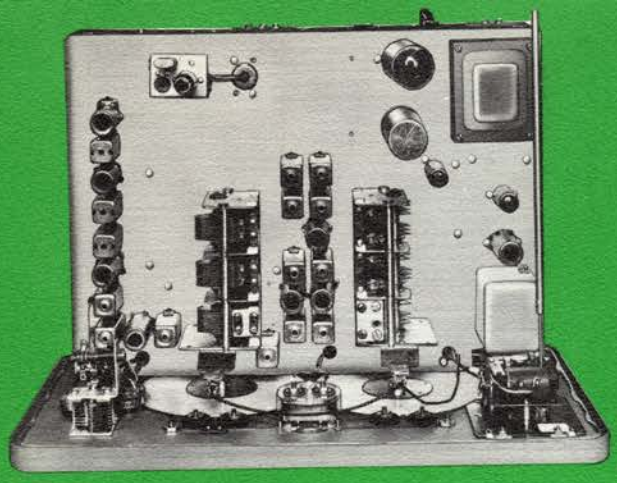
SLOT FILTER A slot filter is provided for attenuation of adjacent, unwanted signals, removal of heterodynes, and rejection of carrier interference on SSB contacts. The slot is adjustable over a range of plus/minus 5 KCS from center frequency of the 455 KCS IF. The slot filter frequency control provides up to 60 db attenuation, obtainable by adjustment of a slot depth control. The 6 db width of the slot is approximately 1.5 KCS. Accurate frequency adjustment of the slot is obtained by means of an 8:1 vernier control.

CRYSTAL FILTER An exclusive Hammarlund crystal filter is employed for additional control of the IF bandwidth. The 455 KCS crystal filter and phasing network is similar to that used in the finest commercial and military receivers. It is operated from the front panel by a six-position control permitting OFF and five increasingly selective bandwidths. The phasing control is a differential type variable capacitor which permits precise adjustment of the crystal selectivity characteristic for extremely high attenuation of the undesired frequency. Carrier amplitude of the desired signal remains essentially constant regardless of crystal filter settings.

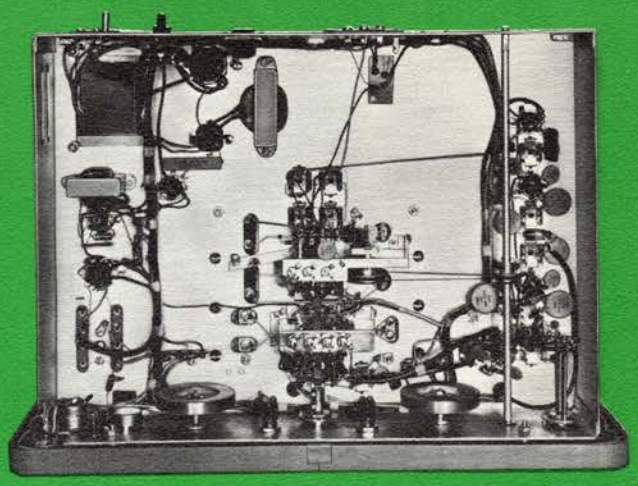
S METER An accurate S-meter is provided for both accuracy of tuning and relative signal strength read-out. The scale is calibrated to 40 db over S-9. Meter calibration is such that 50 microvolts reads S-9. Each S-unit indicates approximately a 6 db increase, equivalent to doubling the signal strength.

AUDIO The HQ-145A features the well-known Hammarlund Auto-Response system that automatically adjusts the audio passband to best suit the signal. Audio output is 1.0 watt (undistorted) or 3.5 watts maximum. The first audio stage is a resistance coupled voltage amplifier using a section of the 12AX7, while the audio output uses a 6AQ5. As the audio gain is increased, a feedback loop narrows the audio bandwidth "crisping" the audio output, and vice versa. On strong signals, with the audio gain control turned approximately one-third up, the frequency response is in the area of 50 to 7500 CPS, resulting in quality approaching high-fidelity standards.

SSB DETECTOR Inclusion of an SSB detector permits optimum reception of AM, CW and SSB without readjustment of the receiver and at full receiver sensitivity. The detector eliminates the necessity of critically balancing the RF input and audio circuit for good SSB reception.

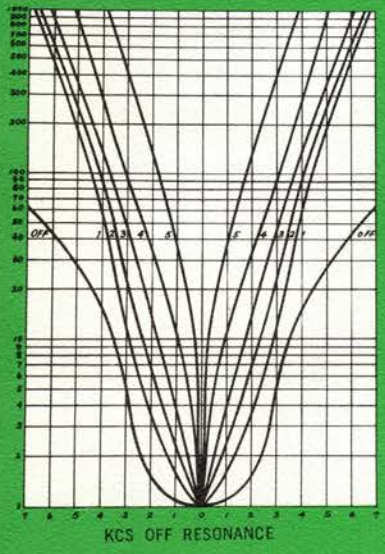


TOP VIEW

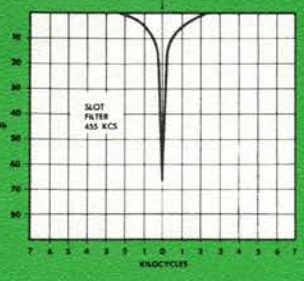


BOTTOM VIEW

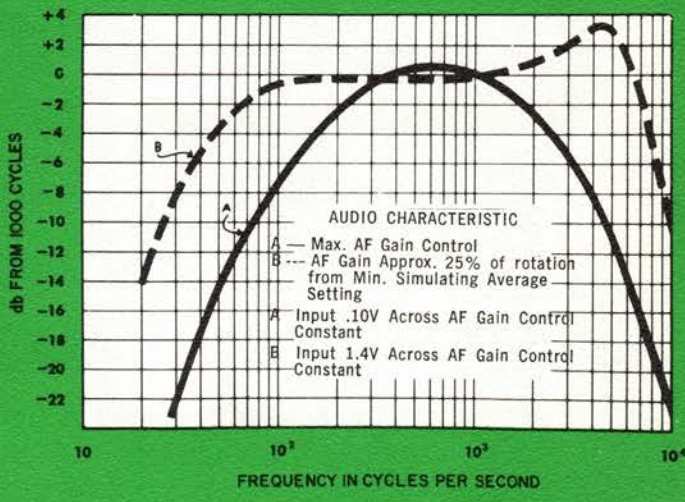
SELECTIVITY CURVES AT THE INDICATED CRYSTAL POSITION



HQ-145X SELECTIVITY CURVES

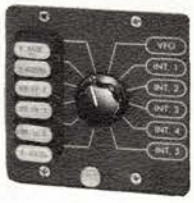


SLOT FILTER



AUTO-RESPONSE CURVE

HQ-145AX



Specifications are the same as for the A model with the exception of 11 switch selected, crystal controlled frequencies (plus VFO). Selector switch and six crystals are mounted on the front panel. An additional five crystals are mounted on the chassis and are accessible from the top (these would be for channels not likely to change such as WWV). Crystal stability incorporated into an all-purpose receiver perfectly satisfies the needs of amateur RTTY, MARS, C.A.P. and CD as well as commercial and industrial services.

To compensate for crystal tolerance and assure precise frequency calibration, a timer control is provided which allows precise adjustment of the crystal frequency. This control is located on the front panel.

Closeup of crystal selector switch on front panel located in the area formerly occupied by the 24 hour clock-timer. Other indicated positions refer to the five in-cabinet crystals which are easily accessible through the trap door design of the HQ-145AX cabinet.

HQ-145A SPECIFICATIONS

FREQUENCY RANGE

540 KCS to 30.0 MCS continuous tuning in 4 bands.

Band 1 0.54 — 1.60 MCS
Band 2 1.60 — 4.0 MCS
Band 3 4.0 — 10.0 MCS
Band 4 10.0 — 30.0 MCS
Band 5 20 Meter Amateur Band

CALIBRATED BANDSPREAD

3.5 — 4.0 MCS
7.0 — 7.3 MCS
14.0 — 14.4 MCS
20.9 — 21.6 MCS
28.0 — 30.0 MCS

Dial Markings every 10 KCS on 80, 40, and 20 meter bands every 20 KCS on 15 meter band; every 50 KCS on 10 meter band. Plus 0-100 logging scale. Citizens band channel markings supplied for use at operator's discretion.

IF FREQUENCY CONVERSIONS

Single conversion on band 1, 2, and 3. Double conversion on bands 4 and 5 including all bandspread ranges covered in band 4.

INTERMEDIATE FREQUENCIES

455 KCS on all bands. 3035 KCS and 455 KCS on bands 4 and 5.

MAXIMUM AUDIO OUTPUT

1.0 Watt (Undistorted).

OUTPUT IMPEDANCE

3.2 ohms (Standard) and 500 ohms (for match to phone patch)

ADJUSTABLE SELECTIVITY

Six positions of selectivity: 0 for xtal filter disconnected, 1,2,3, for AM; 2,3,4,5, for SSB; 4 or 5 for CW reception.

SENSITIVITY

1.0 microvolt signal at antenna terminals produces a 10;1 signal-to-noise ratio.

DETECTORS

Detector for AM and for undistorted SSB and CW reception.

ANTENNA INPUT

Nominal impedance 100 ohms. Provides for use of single wire antenna or balanced transmission line.

ANTENNA COMPENSATOR

Permits compensation for loading effects of various type antennas or balanced transmission lines.

BEAT FREQUENCY OSCILLATOR

Variable from zero beat to plus/minus 2 KCS.

QUARTZ CRYSTALS

Second conversion oscillator crystal-controlled. Two other crystals (100 KC calibrator and crystal-controlled channel) optional.

SLOT FILTER

Range plus/minus 5 KCS of center frequency. Attenuation over plus/minus 5 KCS range provides over 40 db rejection. Calibrations every 1 KCS. Maximum attenuation using slot depth control is 60 db. 8:1 vernier tuning ratio.

TUBES

Tube Complement

6BZ6	RF Amplifier.
6BE6	1st Converter.
6C4	HF Oscillator.
6BE6	2nd Mixer-Crystal Osc. or IF Amplifier.
6BA6	1st, IF Amplifier (455 KCS).
6BA6	2nd IM Amplifier (455 KCS).
6AL5	Detector, Series Noise Limiter.
12AX7	First AF Amplifier and BFO
6AQ5	Audio Power Output
OB2	Voltage regular.
6BZ6	100 KCS Crystal Calibrator (Optional extra).

SEMICONDUCTORS

Rectifiers — two, 800 PIV at ½ amp.

POWER REQUIREMENT

105-125 or 210-230 VAC at 80 watts; 50-60 cps.

"S" METER

Calibrated 1 to 9 in steps approximately 6 db. Also includes db scale above S-9 to +40 db.

NOISE LIMITER

New series type which provides better limiting action with minimum effect on modulation.

FRONT PANEL EQUIPMENT

Main Tuning.
Bandspread Tuning.
Sensitivity (RF Gain).
Audio Gain: Power ON/OFF Switch.
Crystal Selectivity: OFF-1-2-3-4-5 Positions.
Crystal Phasing Capacitor
Antenna Compensator.
Tuning Range (Band Selector).
Function Switch: Send-Receive SSB/CW Calibrate. (100 KCS)
Chasis punched to accept coaxial connector.
(crystal calibrator is optional extra-accessory.)
Slot Frequency Adjust.
Slot Depth-noise Limiter Switch.
CW Tone (BFO Pitch).
AVC: ON/OFF Switch.
"S" Meter.
Phone Jack.
Dial Scale Reset (Bandspread Scale Only).

DIMENSIONS

10½" H x 19" W x 13" D.
Wt. 35 lbs. Shipping Weight: 42 lbs.

OPTIONAL ACCESSORIES

SPEAKER

S-200 speaker matching HQ-145A electrically and mechanically. Extended range 6" x 9". 8 watt capacity. House in attractive metal cabinet.

24 HOUR CLOCK-TIMER

Combination clock and automatic timer. Aids in meeting pre-arranged schedules. Optional accessory. Space in front panel provided.

PLUG-IN CRYSTAL CALIBRATOR

Plug-in Type Crystal Calibrator. Provides markers every 100 KCS. New design requires no soldering, no fuss, no muss. Plug-in electrical and mechanical connections.

HAMMARLUND NOISE IMMUNIZER

An IF device that cuts noise out of the signal with amazing effectiveness.

SEPARATE OSCILLATOR FILAMENT TRANSFORMER

Keeps critical oscillators at proper temperature and minimizes warm-up drift.

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