

Modern as this minute!



*The New* **PRO-310**

*communications receivers*

by **HAMMARLUND**



# The last word in communications

## Receivers

### the PRO-310

by

# HAMMARLUND

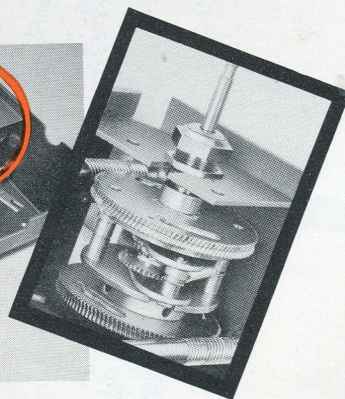
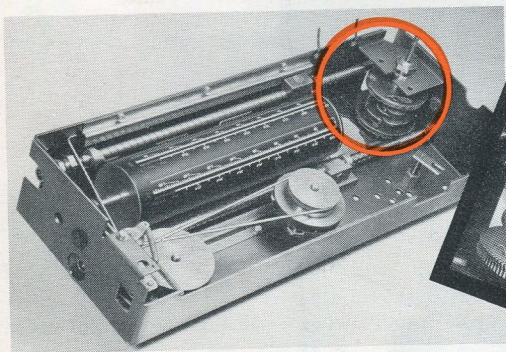
The Hammarlund PRO-310 Series Communications Receiver fulfills the long-existing need for a *modern* communications receiver design incorporating precision components which provide the ultimate in performance — whether the user is an amateur, commercial operator, or merely one who appreciates the finest in short-wave listening.

Hammarlund — the manufacturer whose reputation for the highest quality in electronics and communications equipment is long established — spent three years in engineering and design time to develop this outstanding communications receiver. As a result, the PRO-310 contains the latest in technical achievements and the highest quality components available.

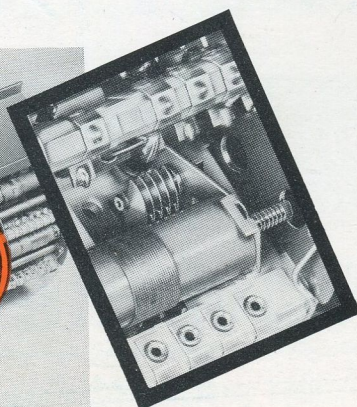
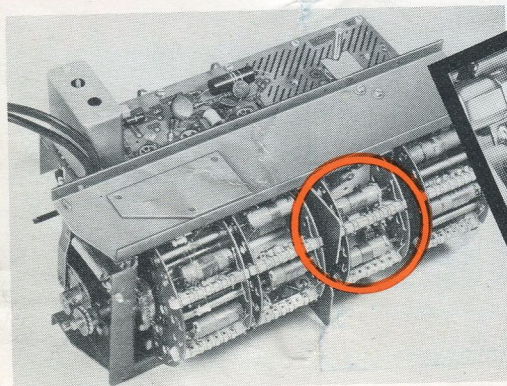
It is patterned to meet, and in some cases exceeds, military requirements.

Among the features of the PRO-310 are clear, readable scales on the tuning dial, with rotary presentation of one scale at a time to eliminate confusion; a signal strength meter; a precision-gear differential transmission which provides direct reading bandspread at all points on every scale; spinner-type knobs for ease in searching and retuning the full length of the scale; built-in 100 KCS crystal calibrator; and coil turret-type bandswitching.

The PRO-310 is one of a series of top-performing communications receivers designed for the *modern* communications equipment user.



Dial drive assembly showing precision gears, differential, and worm-gear dial indicator drive mechanism. The differential drive mechanism (see inset) provides mechanical bandspread which allows the use of one capacitor gang instead of the two normally employed for electrical bandspread. This results in vastly improved overall performance.



Front-end printed wiring board and the associated coil turret. Four tuned circuits are employed, with two ahead of the tuned RF stage for improved selectivity and improved signal-to-noise ratio. Inset shows ceramic coil support and contact assembly and the air trimmer. All components are of the highest quality for maximum stability.



# features .....

- Exceptionally high stability
- Dual conversion with second conversion oscillator crystal-controlled
- Ruggedized-sectionalized construction
- Instrument-type tuning with SCANSREAD\*
- Uniformly high sensitivity and ultra-high signal-to-noise ratio
- Extremely high image rejection on all six bands
- Continuously calibrated bandspread over the entire frequency range†
- Dial readability better than 0.05%
- Built-in crystal calibrator
- Coil turret band switching
- Low frequency IF system (52 KCS) with sharp skirt selectivity and adjustable bandwidth of 500 cps, 2 KCS, and 4 KCS
- Highly effective series-type noise limiter

\*Completely new concept in precision electro-mechanical bandspread.

†Except broadcast band

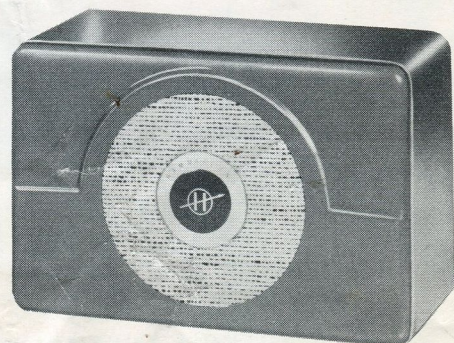


Top view showing front-end unit with shield removed (right), the IF strip (center), and the audio, BFO, crystal calibrator, and power supply unit shown together (left). Chimney-type shield on rectifier provides means of exhausting heat through rear of cabinet.

Built-in crystal calibrator provides check points every 100 KCS on all six bands. Calibrator employs stable, low-drift 100 KCS quartz crystal and 6BZ6 pentode. Trimmer capacitor provides adjustment for zero beat against primary frequency standard (WWV).



PRO-310 styled, 6-ohm voice coil permanent magnet 6½" speaker with power rating of 3 watts. Speaker cabinet available in either gray or black to match corresponding model receiver. Acoustically-treated loaded baffle provides optimum performance.





# PRO-310 *specifications*

## Tuning Range

## Calibrated Bandsread Bandsread Range

## Tube Complement

## Antenna Input Antenna Compensator S-Meter

## Variable Selectivity Sensitivity IF Stages Second Conversion Oscillator

## Image Rejection

## Spurious Response

## Single Sideband Delayed AGC Noise Limiter Audio Output Power Consumption Power Supply

## Front Panel Controls

## Rear Panel Connections and Fuses

## Dimensions and Color

## Rack Model

## Built-in Crystal Calibrator Matching Speaker

## 6 B A N D S

|                            |                              |
|----------------------------|------------------------------|
| Band 1.....0.55 — 1.11 MCS | Band 4.....4.40 — 8.88 MCS   |
| Band 2.....1.10 — 2.22 MCS | Band 5.....8.80 — 17.76 MCS  |
| Band 3.....2.20 — 4.44 MCS | Band 6.....17.60 — 35.52 MCS |

Continuous throughout the short-wave range.

| Band | Bandsread Range | Band | Bandsread Range | Band | Bandsread Range |
|------|-----------------|------|-----------------|------|-----------------|
| 1    | —               | 3    | 0.22 MC         | 5    | 0.88 MC         |
| 2    | 0.11 MC         | 4    | 0.44 MC         | 6    | 1.76 MCS        |

6BA6 RF amplifier  
6BE6 1st mixer  
6C4 oscillator  
6BE6 2nd mixer  
6C4 2nd crystal controlled oscillator

6BZ6 1st IF amplifier  
6BZ6 2nd IF amplifier  
6AL5 detector, limiter  
12AX7 1st AF amplifier and AGC

6AN8 BFO and buffer  
6V6GT/G audio power output  
5U4GB full-wave rectifier  
6AL5 bias rectifier  
0B2 voltage regulator

75-300 ohms impedance — provides for use of coaxial transmission line.

Permits compensation for loading effects of various types of antennas and improves image ratio.

Calibrated 1 to 9 in steps of approximately 6 db — also includes db scale above S-9.

Three positions, two for phone reception and one for cw reception: 500 cps, 2.0 KCS and 4.0 KCS.

Maximum of 1  $\mu$ v cw signal produces a 10-to-1 signal-to-noise ratio.

Double conversion — IF frequencies at 1802 KCS and 52 KCS.

Crystal-controlled at 1750 KCS.

For the range 2.2 — 17.6 MCS, better than 70 db below signal.

For broadcast band and above 17.6 MCS, better than 50 db below signal.

Equal to or better than Image Rejection.

Stability excellent — ideal for SSB.

Operates on RF and IF stages — provides smooth, fast action.

Series-type to provide improved limiting and less effect on modulation.

2 watts undistorted; 6 ohms output impedance.

110 watts.

Filtered to provide hum-free reception — standard model 105-125 V, 50-60 cps ac.

Band Selector

Main Tuning

Bandsread Tuning

Audio Gain, On-Off Switch

Sensitivity (RF Gain)

Speaker Connection

Antenna and Ground Connection by means of twinax connector — Plug PL-284 supplied

Terminals Provided for external relay, Send-

Receive Control

Standard Cabinet Model — 8 15/16" H x 17 7/8" W x 15 1/2" D

Net Weight (less speaker) — 65 lbs.

Cabinet finish — black with gold trim  
gray with silver trim

Selectivity

Antenna Compensator

CW Tone (BFO Pitch)

Stand-by — Receive Switch

Crystal Calibrator Switch

AM-CW/SSB Switch

Noise Limiter Switch

AGC Switch

"S" Meter

Phone Jack

Phono Input

IF Output

Power Line and B+ Fuses

*Specifications subject to change without notice.*



# HAMMARLUND

ESTABLISHED 1910

**HAMMARLUND MANUFACTURING COMPANY, INC.,** 460 West 34th Street, New York 1, New York

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International Division: 13 East 40th Street, New York 16, New York

Bulletin APD-189







# Beauty...

## More Than Skin Deep!

A beauty — all around!

But — that's only a *small* part of these two beautiful Model PRO-310 Communications Receivers by Hammarlund.

Lift the top of the cabinet and look inside. The PRO-310 has clean, sectionalized construction using specially designed components — no make-shift broadcast components of other flimsy assemblies. Take a good look at that turret tuner! It's the heart of the PRO-310.

Now switch it on. You've never operated anything like it! It's the clearest, sharpest, and most sensitive reception you've ever heard on a communications receiver anywhere.

And the Price? Only \$595 at your Hammarlund distributor today! Matching speaker available.

Write for descriptive literature.

HAMMARLUND MANUFACTURING CO., INC.

460 W. 34th ST., NEW YORK 1, N. Y.