



## Heathkit HW-32A 20 Meter SSB Transceiver

When Heathkit brought out their single-band transceivers a little over three years ago, they immediately became very popular. They were low in cost, versatile, compact and ideal for the ham who wanted to move up to SSB with a minimum of effort. Now the people out in Benton Harbor have gone one better—they have introduced a new set of single-banders with even more features than the original.

These new single-banders feature upper and lower sideband selection on all models, improved audio and AVC response, automatic level control (ALC) input for external linear amplifiers and improved design and styling. The nicest feature of all is that all these additions are available at no additional cost. In fact, the price is even lower than the original models. With prices increasing everywhere, it's refreshing to see a new piece of amateur equipment offered with a lower price tag.

Heath's famous quality is evident throughout the entire HW-12A, 22A and 32A line. This borne out in on-the-air performance; both the receiver and transmitter have been designed for optimum SSB performance and show it. The  $1\ \mu\text{V}$  sensitivity, 2.7 kHz selectivity and slow AVC action make for very enjoyable SSB operation. The 200 watt PEP of the single-banders isn't going to crack any DX pileups, but all continents can be worked without a great deal of effort. In only a couple of days of part-time operation WAC was made from W1DTY with excellent reports.

For the ham who wants to work mobile, the HW- series is really the ticket. Mobile performance with the HP-13 DC power supply is excellent. A mobile mount is supplied with every unit and the front-panel bias control speeds up conversion from fixed station to mobile use.

In the receiver, the pentode section of a



6EA8 is used as an rf amplifier. The triode section mixes the input signal with the VFO to provide an output at the 2304 kHz *if*. This combination results in a sensitivity of 1  $\mu$ V for a 15 dB signal-plus-noise to noise ratio.

The four-crystal crystal filter following the mixer exhibits 2.7 kHz selectivity at the 6 dB points and 6 kHz selectivity at 50 dB down. Two 6AU6 *if* amplifiers, a 12AT7 product detector and a 6EB8 audio amplifier and power stage complete the tube lineup in the receiver.

A 6EA8 microphone amplifier and cathode follower in the transmitter drive a diode type balanced modulator. The output of the balanced modulator is amplified by a 6EA8 transmitting *if* amplifier before the signal is fed into the crystal filter. From the crystal filter the signal is amplified by another *if* amplifier, a 6AU6, and then mixed with the VFO signal in a 6EA8 mixer stage. In the final a 12BY7 driver stage pushes a pair of 6GE5's to 200 watts PEP input.

The Heath single-band transceivers may be switched from transmit to receive by either push-to-talk or the built-in VOX circuitry. The 6AU6 VOX amplifier is normally operated in a saturated condition, but when audio is applied to the grid, the plate voltage rises and fires a neon bulb, providing positive switching action. The voltage from the NE-2 neon is amplified by the relay amplifier, the triode section of a 6EA8, which operates the transmit/receive relay. The built-in antitrip circuitry and VOX delay result in very smooth VOX operation. The VOX delay and VOX sensitivity controls are located on the rear panel where they are easily accessible during initial VOX adjustments; after that they may be virtually forgotten.

A 6AU6 is used in a Colpitts type VFO circuit and the stability characteristics are excellent. The circuit is completely temperature compensated and after a warmup of 30 minutes, the drift is less than 200 Hz per hour. To a large degree, the stability and drift characteristics of this VFO are directly attributable to its relatively low frequency of operation—1618.3 to 1771.7 kHz. The VFO output is mixed with the output from a crystal controlled heterodyne oscillator to obtain the required mixing signal for 20 meter operation.

The back-lighted dial is very smooth—much smoother than some transceivers I have used costing several times as much. The

two kHz dial calibration is very convenient and when used with the optional crystal calibrator, you know exactly where you're operating without a lot of interpolation. In these new single-banders the crystal calibrator socket is built in and the calibrator is controlled from the front panel—all you have to do is build the calibrator.

Construction of the HW-series single-banders is simplified by the use of a printed circuit board and a factory-prepared wiring harness. In fact, over 90% of the components are mounted on the printed circuit board. With this type of construction, assembly time is drastically reduced and wiring errors are almost non-existent. With the extensive directions and pictorial layouts provided in the assembly manual, wiring proceeds smoothly and rapidly. Even the alignment is no problem—all you need is a broadcast receiver, a VTVM with an rf probe and a

#### Heathkit HW-32A Specifications

<b>Frequency coverage:</b>	14.2 to 14.35 MHz.
<b>Sensitivity:</b>	1 $\mu$ V for 15 dB signal-plus-noise to noise.
<b>Selectivity:</b>	2.7 kHz at 6 dB; 6 kHz at 50 dB.
<b>Spurious responses:</b>	Image rejection, 60 dB; <i>if</i> rejection, 65 dB.
<b>Carrier suppression:</b>	45 dB below peak output (minimum).
<b>Sideband suppression:</b>	45 dB below peak output with 1000 Hz modulation (minimum).
<b>RF power input:</b>	200 watts PEP.
<b>Antenna impedance:</b>	50 ohms nominal.
<b>Frequency stability:</b>	Less than 200 Hz per hour after warmup.
<b>Features:</b>	Selectable upper or lower sideband, external automatic level control (ALC), VOX, improved audio and AVC circuitry.
<b>Tube lineup:</b>	6EA8 microphone amplifier and cathode follower, transmitter <i>if</i> amplifier and relay amplifier, and rf amplifier and receiver mixer; 6AU6 VFO, VOX amplifier, <i>if</i> amplifiers, and transmitter mixer; 6BE6 VFO cathode follower, 12AT7 product detector and carrier oscillator, 6EB8 audio amplifier and audio output, 12BY7 driver and 6GE5 (2) rf power amplifier.
<b>Accessories:</b>	HP-13 DC power supply, HP-23 AC power supply, HS-24 mobile speaker and HRA-10-1 100 kHz crystal calibrator.
<b>Power requirements:</b>	12.6 volts at 3.75 amps, 800 Vdc at 100 mA, 250 Vdc at 100 mA and -130 Vdc at 5 mA.
<b>Size and weight:</b>	6 $\frac{1}{4}$ " x 12 $\frac{1}{4}$ " x 10". 12 lbs.
<b>Price:</b>	\$104.95.



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dummy load. All the tuned circuits are pre-aligned at Benton Harbor, so it only takes a few minutes to get everything tweaked up.

Operating voltage for these transceivers are furnished by an external supply—either the HP-23 for fixed station use from 117 volt lines or the HP-13 for mobile use. The supplies are wired internally so they may be turned on and off with the function switch located on the front panel of the transceiver. The filament wiring is a series-parallel arrangement which balances the filament voltage without power-robbing dropping resistors.

I have used the HW-32A on 20 meters for several months now, and the audio and carrier suppression reports are always excellent. During a recent DX test the HW-32A with a linear amplifier added a couple of new countries to my WTW list. Whether you are an AM'er still procrastinating against SSB or are simply looking for a new mobile rig, the Heathkit HW- single-band transceivers are the most economical units available. They are dependable, compact and versatile—a tremendous value on today's market.

... WIDTY

## Mobile Mike Holder

Many times the new owner of a mobile mike finds himself without a mike holder. If you are in this predicament, and your mike is the type with the button mounting as used by Shure and others, here is a possible solution.

The only material required will be a short length of rectangular extruded aluminum (or waveguide). This is available in many different sizes and most metal supply houses and surplus metal stores will be able to furnish the extrusion. The dimensions are not at all critical. A recommended stock size would be 1/2 x 1 with a .125 wall thickness. The maximum length required is 4".

On one side of the extrusion drill and file a 1/2" wide slot that will accommodate the button hangar on the rear of the mike. The slot should be about 2-3" long. On the opposite side drill clearance holes for two sheet metal screws that will be used to secure the holder to the automobile.

The appearance may be enhanced by anodizing or painting.

... Larry Kinner K6VNT