



The Heathkit HR-1680 Receiver.

#### HEATHKIT HR-1680 RECEIVER

With the advent of the HR-1680, the folks at Heath have again surpassed themselves by making available to the newcomer as well as the seasoned operator an inexpensive yet very versatile ham band receiver. It is difficult to believe that a receiver with such sensitivity and design can still be purchased for as little as \$199.95.

The cabinet, which measures 12 $\frac{3}{4}$ " x 6 $\frac{3}{4}$ " x 12", is in the traditional Heathkit green to blend with your existing station. The dial and S-meter are behind the newer style red dial window so they can only be seen when the receiver is turned on. The knobs are traditional Heath except for the main tuning knob, which includes a convenient finger spinner for fast frequency changes.

Going into the receiver, the construction is completely of solid state design. Four printed circuit boards make up the entire unit and each is inserted into its own socket. These can easily be removed for servicing and during initial tune-up.

Construction progressed in the normal Heathkit style with simple straightforward instructions and easy to understand diagrams. The entire building of the receiver, including tune-up, took approximately four nights of work or a total of about 16 hours. Tune-up is as easy as it could possibly be — no external equipment is necessary. However, the use of a VTVM and rf generator may improve the sensitivity to some extent. I did not notice any appreciable difference in the two methods of alignment.

The receiver covers the following frequencies: 3.5-4.0 MHz, 7.0-7.5 MHz, 14.0-14.5 MHz, 21.0-21.5 MHz, 28.0-28.5 MHz, and 28.5-29.0 MHz. Upper sideband, lower sideband, and CW modes are selected through the use of a front panel slide switch. A 100 kHz crystal calibrator is included for instant calibration of the receiver on any band.

A four pole crystal filter is provided

for SSB reception, while audio filters narrow the audio response to either 2100 Hz minimum at 6 dB down for SSB or 250 Hz minimum at 6 dB down for CW. The maximum filter response is 7 kHz at 60 dB down for the wide position and 2.5 kHz at 60 dB down for the narrow position.

The sensitivity is claimed to be less than .5 microvolts for a 10 dB signal-plus-noise ratio for SSB operation. I compared the receiver to the receiver in the popular Heathkit HW-101 transceiver and found the sensitivity to be much greater in the HR-1680 while using the same antenna and switching it from one receiver to the other. The dynamic range is listed at 120 dB or greater.

Operation of the receiver is very simple. Front panel controls include af gain/power on/off, preselector tuning, rf gain, main tuning, band-switch, function switch (narrow and wide filter and calibrate), and a mode switch (LSB-USB-CW).

The back panel includes jacks for a 4 Ohm speaker, a sidetone input from your transmitter, muting, antenna, and 13.8 volts should the receiver be run from a car battery or external power supply.

The possibilities for a receiver such as this are almost unlimited. Besides its obvious use as a primary station receiver for both the novice and the advanced amateur, it can be used as an auxiliary receiver with a transceiver for split operation. A little ingenuity on the part of the purchaser will also find many other uses for a receiver such as this around the shack.

Also available is a matching speaker, HS-1661. The speaker has an impedance of 4 Ohms and its response is tailored to SSB reception. For the additional cost of \$19.95, the speaker is an excellent value to round out your HR-1680. *Heath Company, Benton Harbor MI 49022.*

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The Kenwood R-300 general coverage receiver.

#### KENWOOD R-300 RECEIVER

The parade is on! After a long drought, the electronics marketplace is being provided with an excellent choice of moderately priced communications receivers. For the past few months 73 has been reviewing this new crop of receivers, and this month I had the pleasure of checking out the R-300 by Kenwood.

The R-300 is of "classic" design, as there are no phase locked loops or other devices employed in the tuning scheme. The Kenwood tunes continuously from 170 kHz to 30 MHz, with the exception of a small gap from 410 kHz to 525 kHz. Bandsread tuning is provided for three of the six ranges, starting at 3.0 MHz. Both of the tuning dials are of the drum variety, controlled by large knobs with "rapid-twirl" indentations. A six position bandswitch controls the range, which is indicated by a green semaphore that appears next to the selected range. A combination of push-button and rotary controls round out the available operator functions. Two-position buttons control power, crystal calibrator, and panel lamp, as well as mode, noise limiter, and tone selection. The antenna trimmer, audio and rf gain, and BFO are conventional rotary controls. All functions operate smoothly, and the tuning and bandsread are without whiplash. Back panel options consist of speaker jack, antenna connections, external battery jack, and i-f module adjustments. An S-meter zero control is also provided.

This receiver functioned well on the test bench. A longwire antenna as well as the Kenwood-provided random wire were used during the test. Sensitivity is good on all bands; however, a preamp would be required for serious work on ten meters. On the other end of the dial, the sub-broadcast range was interesting. VLF enthusiasts will be pleased by the R-300, as any number of code, weather, and information stations were copied in the 170 kHz band. The crystal calibrator was most useful when calibrating the main tuning and bandsread. The main tuning can be roughly set to allow bandsread tuning, then tweaked exactly on frequency by listening for zero beat after the 'spread frequency is set.

Bandsread scale increments are 20 kHz, and can be easily subdivided by eye. The BFO is stable, and it was easy to tune SSB signals accurately. My impression is that the R-300 could serve as a backup receiver for the advanced ham or Novice operator.

The Kenwood R-300 is priced at \$239, a price that should interest serious SWLs and the amateur in need of a second receiver. The battery option makes it a natural for the summer season that is finally arriving. The receiver is a good value, as it is unusual to find a calibrator and full complement of controls on a rig so reasonably priced!

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#### A GUIDE TO 2M SYNTHESIZERS

When the first repeaters were developed, they were few and far between. Any given area had only one repeater and only the more enthusiastic amateurs modified their converted commercial FM transceivers to provide for a simplex channel as well as the local repeater channel. The first transistorized transceivers designed specifically for the two meter band had provisions for three channels, deemed generous in the early days. Soon, however, the availability of relatively inexpensive transceivers and the multiplication of repeater installations created a demand for 6, 12, and even 22 channels in the transceivers.

With 22 channels (some areas support 22 or more repeaters), the cost of crystals becomes a major factor. At \$5.00 a crystal it could cost over \$200 just to fill all the positions in the transceiver, and even then you would not have the flexibility needed in some areas of the country. To move to another area could be a financial disaster.

More and more amateurs are turning to synthesizers to solve this crystal problem. The manufacturers have come out with a variety of adaptors and complete rigs which eliminate any need to buy lots of crystals, and which will access almost all repeaters and all simplex channels.

This article is designed to summarize the important characteristics of most of the synthesizers available for two meter FM. Only FM (and not the allmode) rigs are considered here.