

THE HEATHKIT RG-1

COMPACT AND EFFICIENT GENERAL COVERAGE RECEIVER

TEST REPORT

THERE is always a demand for a good general-coverage receiver, and not only by SWL's. Many active amateurs feel rather isolated from the outside world if the only receiver in the shack covers merely the amateur bands. And too often, if there is a stand-by receiver at all, it is an old and inefficient war surplus type which may have been good in its day, but hardly comes up to modern requirements.

The Heathkit RG-1 is a reasonably low-priced general-coverage receiver designed in accordance with today's standards. There is no point in criticising it from the point of view of bandspread in the amateur bands, since the companion RA-1, specifically designed for amateur-band coverage, is excellent in that respect.

The RG-1 ranges from 600 kc to 32 mc in six bands, the only gap being between 1.5 mc and 1.7 mc (the IF used is 1621 kc). The bands are sensibly chosen at 0.6-1.5 mc; 1.7-4 mc; 3.9-8 mc; 7.9-14 mc; 13.9-22 mc; and 21.9-32 mc. The latter range is very suitable for the operation of crystal-controlled VHF converters, tuning the popular 24-26 mc as IF.

Sensitivity and signal-noise ratio are excellent, thanks to the use of frame-grid valves in both RF and IF sections. Selectivity to match is provided by a half-lattice crystal filter—something of an innovation in a receiver in this category. The valve line-up is as follows: RF amp., EF183; Mixer-oscillator, ECH81; first IF, EF183; second IF, ECF82; detector and AVC, OA81's; noise limiter, EB91; first audio and output, ECL86. An EZ81 rectifier and an OA2 stabiliser are also used, and the BFO is derived from the ECF82 in the second IF.

Sensitivity over the HF bands is claimed to be 3 μ V for a 10 dB sig./noise ratio (8 μ V for the medium-wave band). Image rejection is stated to be 40 dB or better, and the input impedance is quoted as a nominal 600 ohms, which enables aerials of indeterminate lengths to be used with fair efficiency

over a wide frequency-range.

The receiver is very compact (roughly 14in. wide, 11½in. deep and 6½in. high) and weighs only 18lb. And remember that it incorporates most of the features that one expects in a true communications receiver.

Layout

The front panel is well designed and pleasing in appearance. The dial aperture gives 9in. of length for each of the six bands, which are very clearly marked and calibrated; to the left of the dial is the small S-meter; and arranged in a row below it are the six main controls. From left to right, these are RF gain, band switch, BFO tuning, main tuning knob, noise-limiter control and audio gain (which is also the on-off switch). Two small slide switches control BFO on/off and AVC on/off. Finally, at the extreme bottom corners are mounted a push-button for the 100 kc calibrator, and the phone jack. A very uncluttered and logical layout of controls has been achieved.

At the rear the only variable control is the S-meter setting; the aerial terminals (and coax socket in parallel) are at one end, and the terminals for a 3-ohm speaker at the other. Between them are two terminals marked "earth" and "mute," normally shorted either directly or by relay. When these terminals are not connected together, the entire HT supply is removed—a rather drastic form of "muting," we felt.

The 100-kc calibrator, supplied as an extra, plugs into an octal valve-holder easily accessible from the rear of the set, and gives very robust "pips" throughout the entire spectrum. The receiver on test was factory-assembled and obviously had been carefully aligned, since WWV (specially marked on the dial at 10, 15, 20 and 25 mc) was practically spot-on in all positions. MSF, the frequency-standard at Rugby, is also marked on the dial at 2.5 and 5 mc, so there is no lack of calibration points.

Performance

Selectivity is largely derived from a half-lattice filter at the input to the first IF stage (crystals at 1619.7 mc and 1621.4 mc are used); and the right sort of response curve for easy reception of SSB seems to have been obtained. The selectivity is not variable (remember the price of the receiver) but is quite adequate for most of the purposes for which

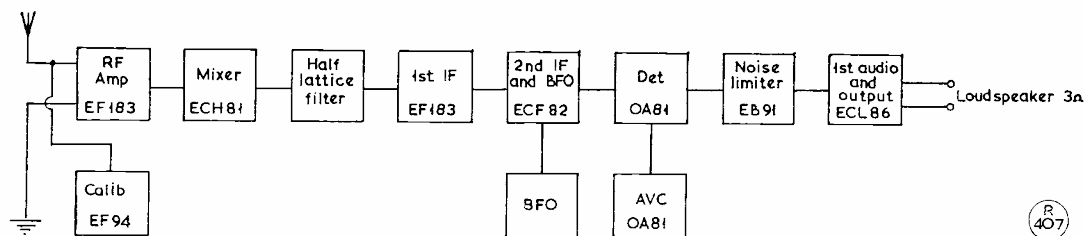
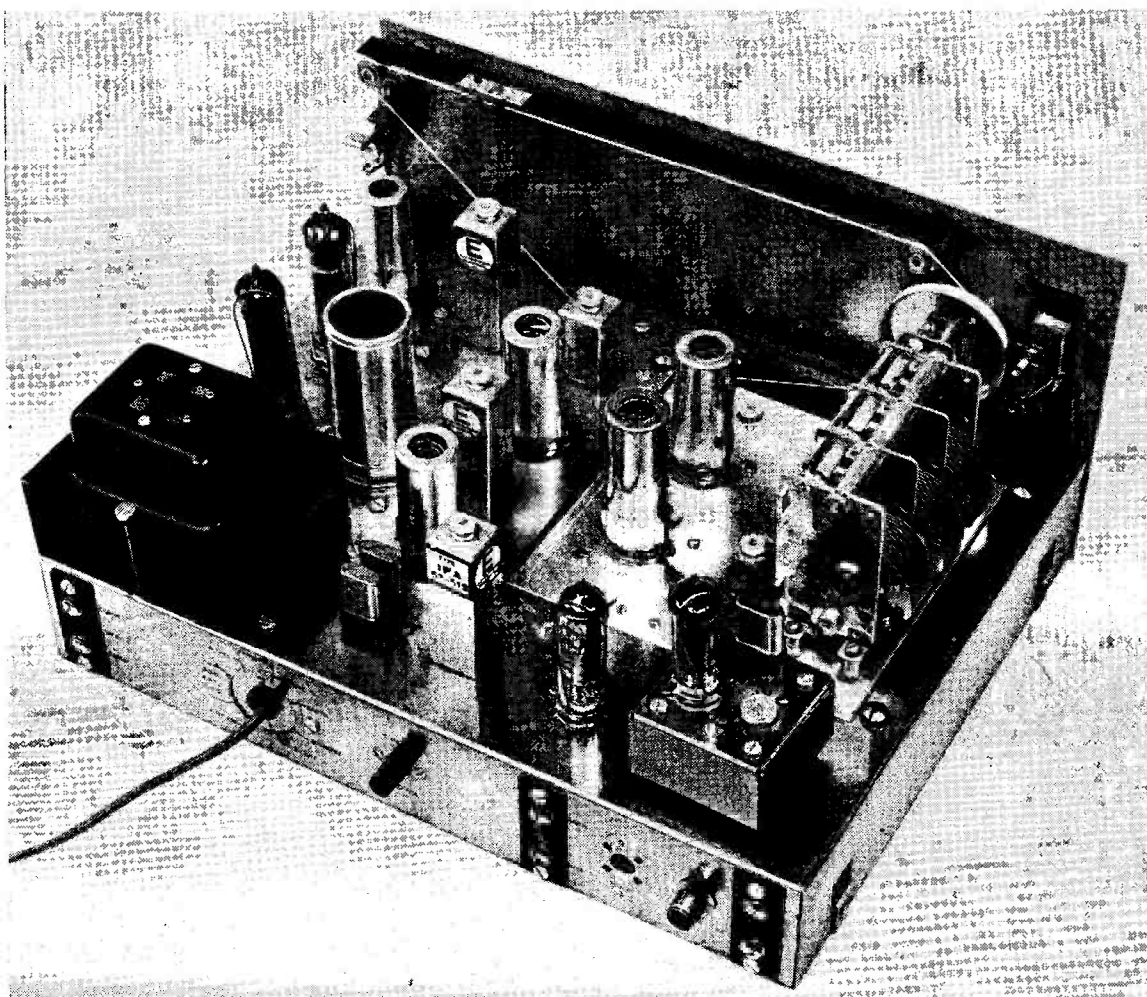


Fig. 1. Block diagram of the Heathkit RG-1 general-coverage receiver, reviewed in the accompanying test report. The crystal calibrator is an optional extra and is coupled to the aerial input terminal through a very small capacity. It gives well-defined marker pips right up to HF range, and would be a very valuable adjunct for serious work since the calibration can be checked continuously. Two valves not shown in this diagram are the stabiliser, an OA2, and the rectifier, an EZ81.



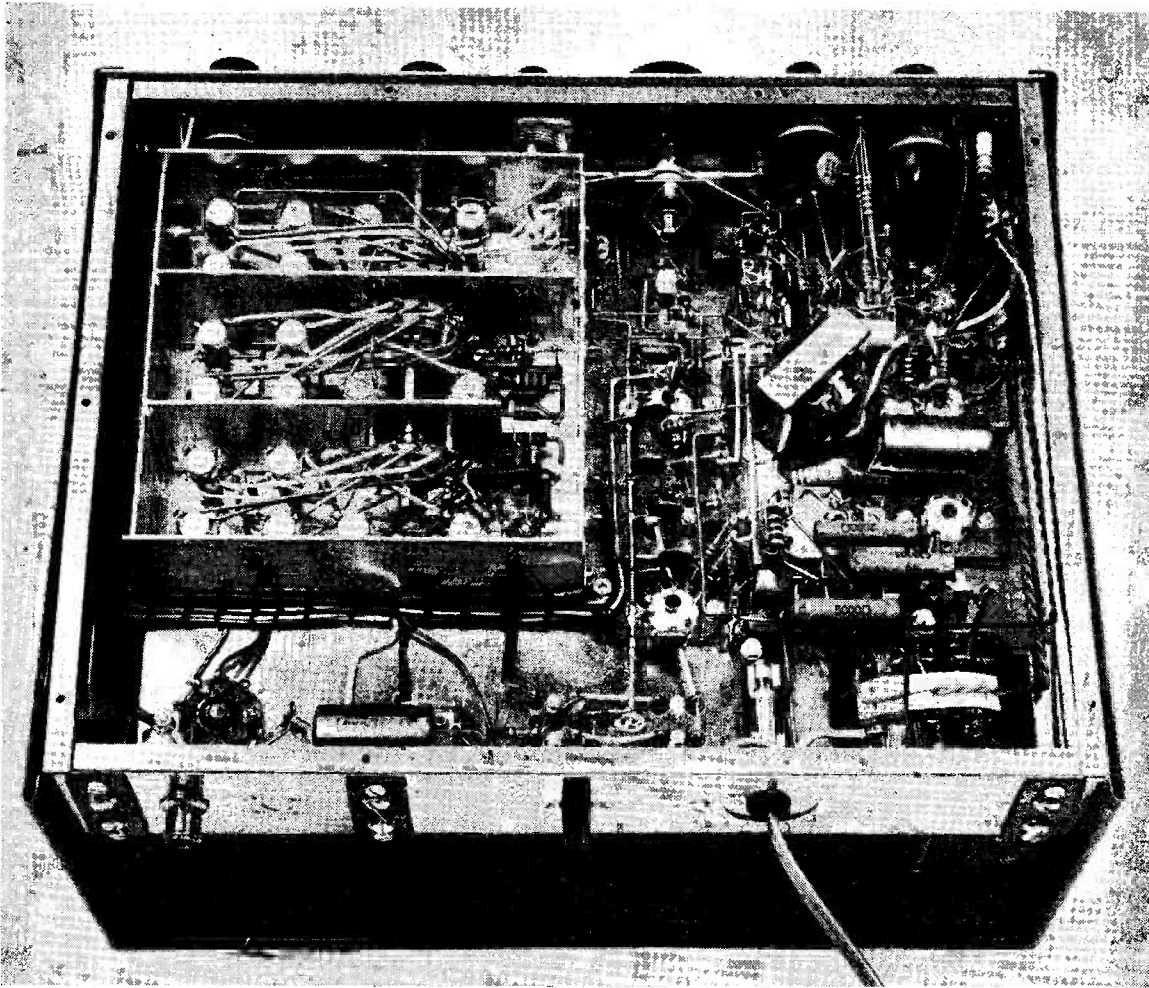
Upper deck view, showing the neat and tidy layout of the Heathkit RG-1 behind the panel. At right is the complete "Electroniques" front-end unit, with an EF183 as RF amplifier and ECH81 as mixer. At bottom right is the crystal calibrator, plugged into an octal valveholder on the chassis. For aerial connection, two terminals and a coax socket, wired in parallel, are provided. The LS sockets are at extreme left, and the third pair are for muting.

the set will be used. The noise-limiter is very effective on sharp peaky noise such as ignition QRM; slightly less so on general *sharsh*.

Even without any bandspread facility, and with the 14 mc amateur band occupying a bare half-inch of dial length, it is possible to tune in weak SSB transmissions and to hold them, since stability is extremely good after the initial warm-up period of about five minutes. The correct BFO settings must be found first, and should then be marked on the panel. (In passing, it might be mentioned that on the receiver supplied for test it was impossible to swing the BFO tuning through zero-beat, which came at the maximum setting of the condenser—thus attempts at switching sidebands merely resulted in finding the same one twice . . . but this was soon rectified with

a trimming tool. It might, however, mislead a novice into thinking that the receiver would not cope with certain SSB signals.)

The front-end, ready wired, and the IF transformers and BFO coil are all made by *Electroniques Ltd.*, and the other components are also of comparably high quality. The dial is of the two-speed variety, giving quite a good range at "crawl" speed before going into overdrive, which enables one to traverse the wide expanses of the scale without laborious knob-twiddling. The pointer is commendably rigid, although it was found that after several hours of running it tended to bind against the perspex scale. (However, it is recommended in the instructions that a simple readjustment be made after an initial period of use, to counteract possible



In this under-chassis picture of the RG-1, the wiring is seen to be straightforward when carried out strictly to the instructions — and as is usual with all Heathkit home-constructor equipments, these are explicit and meticulously set out. The front-end unit is supplied complete, its connections emerging through feed-through condensers, visible down the centre line of the photograph. A bottom plate provides effective screening.

expansion and curving of the scale.)

General

As an all-purpose short-wave receiver, intended to cover everything from broadcasting to the reception of amateur CW, AM or SSB within the crowded bands, and to take a VHF converter for any of the usual IF ranges, we feel that an admirable compromise has been achieved. The average SWL, using converted war-surplus gear, would find himself in quite a different listening category with the RG-1; the experienced listener with a more ambitious receiver would not find anything to criticise in the performance; and the amateur transmitter who wants general-coverage standing by on his table-top could

hardly do better in the way of a combination of performance and compactness.

Particularly good points are the clear, open scales on the dial; the easy resolution of SSB; the suitability of the pass-band for all types of signal, including CW; and the frequency stability. Points worth criticising are the S-meter (which could not be made to read higher than S5 on even the strongest commercial signals); the relatively low performance on the highest-frequency band; a rather pervading AC hum with the audio gain fully up; and (a personal criticism) the lack of an aerial trimmer.

Taken in all, an intriguing receiver, and excellent value for money.

“Short Wave Magazine” is independent and unsubsidised
