Test Report

The Minimitter M.R. 44/II Communications Receiver

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THE Minimitter M.R.44/II communications receiver covers the amateur bands only from 1·8 to 30 Mc/s and was found on test to be a first-class performer on a.m., c.w. or s.s.b. Although the cost, £65, is well below that of any instrument with a comparable specification on the market at the present time, there is no evidence of compromise having been necessary between performance and price, and it would be an outstanding receiver indeed which gave all-round better results.

The Minimitter Communications Receiver type M.R. 44/II with its matching loudspeaker.

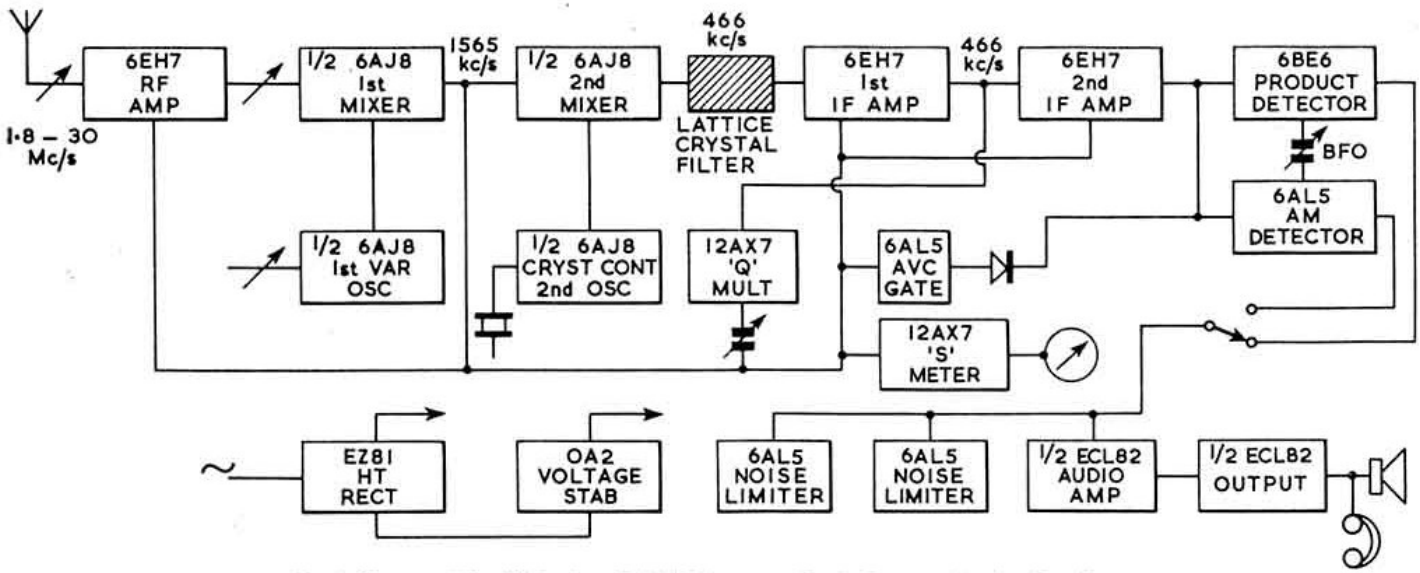
Circuit

The circuit is a double superhet, with intermediate frequencies of 1565 and 466 kc/s and the use of 6EH7/EF183 frame-grid valves of very high mutual conductance in the r.f. and both of the second i.f. stages undoubtedly contributes considerably towards the high overall gain and the extremely good signal-to-noise ratio.

The two frequency changers are 6AJ8/ECH81 triode-hexodes, the oscillator section of the second one being crystal controlled. Preceding the two-stage i.f. amplifier is a half-lattice crystal filter which makes a substantial contribution to the claimed response of 3 kc/s bandwidth at 6db down and 6 kc/s at 60db down and permits clean and crisp reproduction of a.m. and s.s.b. signals. As a further aid to selectivity a *Q* multiplier is provided, and although the full potentialities of this device are realized on c.w. reception, where it is possible literally to lift a weak c.w. signal out of the noise, it proved a useful adjunct on both a.m. and s.s.b. reception when extra selectivity was required. Minimitter pioneered the use of the *Q* multiplier in this country in their Model 37 and in the M.R. 44/II there is evidence that much further development has been carried out in this section. It was found that a measured increase of up to 15db in the strength of c.w. signal could be obtained *without any detectable increase in noise.* At first sight this may seem an impossibility, but it must be remembered that noise is dependent upon bandwidth, and if this is decreased at the same time as the gain is increased the performance noted may be obtained.

Separate demodulators are employed for a.m. (diode) and for c.w. and s.s.b. (product detector). A double-diode noise limiter with variable " cut " operating on both positive and negative peaks of noise is provided together with a crystal diode a.v.c. rectifier working in conjunction with a series gate thermionic diode, the a.v.c. constants being varied to suit a.m. or s.s.b. signals. A.v.c. is applied to the r.f. and both i.f. stages and although this is somewhat unconventional, the choice is amply justified by the excellent control obtained.

The a.f. section consists of an ECL82 triode-pentode the coupling values obviously having been chosen with some



Block diagram of the Minimitter MR44/II Amateur Bands Communication Receiver.

care to ensure an optimum audio response from the separate elliptical loudspeaker.

An EZ81 rectifier supplied from a transformer tapped for both 105/115 and 200/250 volt mains, provides the high-tension supply which is stabilized by an OA2 for the two local oscillators and the product detector/b.f.o. With the send-receive switch in the "send" position these three stages remain energized together with the a.f. section, h.t. being removed from the remaining stages.

The stability of the receiver is good and after warm-up c.w. signals on the 21 Mc/s band could be held for long periods right on the peak of the *Q* multiplier at maximum selectivity.

Tuning Mechanism

With the very high selectivity available in this receiver and the specific provision for s.s.b. reception, it is essential that a really good tuning control be provided and this is indeed the case. Each band is spread over the 8 in. wide slide-rule type dial and the tuning control, flywheel assisted, has a ratio of approximately 120 : 1 by means of a cord drive, which gives a light but positive action with an entire absence of backlash. The tuning knob is attached to a 0 to 100 degree dial and it is felt that if an index for this were provided together with an additional logging scale below the frequency calibrations on the main dial it would be an advantage in returning to a known frequency. The only other criticism of the receiver concerns the S-meter which is connected in the cathode circuit of a triode, the grid of which is fed from the a.v.c. line. On the model tested the meter was exceedingly sluggish, showing only S1 on signals of good strength, and requiring a really colossal input before the needle reached S9 at the top of the scale. We were pleased to note, however, that no provision was made for the "S9 plus 40db" type of report: after all, the official S scale does only go to S9!

The panel of the receiver is covered with a substantial Perspex sheet which gives protection to the panel markings and the well-ventilated case is finished in grey hammer-tone enamel with white plastic trim. A special feature of the receiver is the use of concentric controls for the i.f. and a.f. gain, *Q* multiplier selection switch and regeneration and the system-switch and b.f.o. tuning. As well as reducing the number of knobs to be accommodated on the front panel, it groups conveniently those controls which are normally operated together and was found convenient in operation. The remainder of the controls on the front panel include noise limiter adjustment, send/receive switch, band switch, *Q* multiplier tuning and headphone jack (which mutes the loudspeaker) while at the back of the chassis are found the calibration setting for the lower band edges, S-meter adjustment, co-axial aerial socket and sockets for tape recorder input, external relay control (spare contacts on the send/receive switch), send/receive switch contacts and a socket to which an external source of h.t. and l.t. may be connected. Also on this panel is situated an adjustment for the i.f. trap, which appeared to be quite effective as no interference or spurious responses were noticed although, in all fairness, it must be said that only a modest aerial was used during the tests.

Learning to use a Selective Receiver

With a highly selective receiver such as this it is more than usually necessary to learn how to use it to best advantage. Accurate setting of the b.f.o. tuning is essential for the reception of s.s.b. signals and attention should be paid to the clear instructions in the operating manual on this subject For optimum results on c.w., particularly when the *Q* multiplier is in use, the b.f.o. setting is again important and time spent in mastering the various controls will prove well worth while.

We have no hesitation in recommending this receiver and would congratulate the designers in producing an excellent instrument at a competitive price.

The Station behind the Call—G3BZU

THE Headquarters Amateur Radio Station, G3BZU, of the Royal Naval Amateur Radio Society is situated in *H.M.S. Mercury*, the Royal Naval Signal School, near Petersfield in Hampshire. The photograph shows the present layout at G3BZU.

The main transmitter is a K.W. Vanguard running 50 watts on both c.w. and phone. For Top Band a Marconi CNY2, shown on the right of the picture, is used. A choice of two receivers is available, either an Eddystone S.640 or a National HRO, both of which are fed via an RF24 unit (seen between the S.640 and the HRO speaker).

Other equipment visible in the photograph includes a Class D wavemeter and a field strength meter. Several other items of test equipment are available for use by members of the society. A large amount of electronic surplus is also available to members to use for constructional purposes.

Aerials at G3BZU, which is situated about 700 ft. a.s.l. on the South Downs, are a three band cubical quad, a 40m dipole running E/W, a 20m dipole running N/S, a half-sized G5RV type and an 80 ft. end fed wire.

In addition to maintaining the R.N.A.R.S. schedules on 7 Mc/s daily, the station is kept active on the DX bands and the DXCC total stands at 98: the last two are eagerly being sought! The society already holds the W.B.E. and W.A.C. certificates and others are being applied for.

The R.N. Amateur Radio Society, of which the membership is 90 including 5 overseas, is affiliated to the R.S.G.B.