

EQUIPMENT REVIEW:

THE KENWOOD R1000 GENERAL COVERAGE RECEIVER

Ron Fisher VK3OM

Trio Kenwood have a long history in the manufacture of general coverage receivers. Many hundreds of 9R59D/DE and DS's are still in use. The later R300 series did not reach the popularity of the earlier receivers. It seems now that Kenwood have produced a receiver that could lead the field for some time to come.

The R1000 is a fully solid state general coverage communications receiver with all required facilities but at the same time offering simple operation. It is obviously aimed at short wave listeners and at the growing market of people interested in overseas reception to keep up with current affairs. It is also the in-thing for amateur operators to have a general coverage receiver handy.

CIRCUITRY AND TECHNICAL DESCRIPTION

The R1000 tunes from 200 kHz to 30 MHz in thirty bands each one MHz wide. An analog dial with 10 kHz calibration divisions is supplemented with a LED digital readout with one kHz resolution. This readout is also switchable to a crystal controlled clock with facilities for preset switching on and off both the receiver and auxiliary equipment such as a cassette recorder. Selectivity is taken care of with three Murata ceramic filters. These provide for wide AM, 12 kHz, narrow AM, 6 kHz and SSB with 2.7 kHz selectivity. A first for this type of receiver is the inclusion of a noise blanker. Other features include an RF attenuator for the receiver front end, a dimmer switch for both the digital display and dial and S meter illumination and an audio tone control.

The R1000 is the first receiver of its type to get away from the Wadley Loop principle and yet still have the advantages of this type of operation. The PLL synthesizer provides a heterodyne signal to the first mixer to up-convert to 48.0 MHz. The second mixer converts to 455 kHz and this is also fed from the synthesizer. Both first and second mixers are balanced. The synthesizer output is also used to switch in appropriate band pass filters for the receiver front end. This of course eliminates the need for separate front end tuning and the need to follow main tuning with the preselector to maintain sensitivity. As if

this was not enough, the synthesizer also drives the digital readout.

The R1000 has a built-in AC power supply designed to operate from 100 to 234V. There is no provision for any in-built battery supply — but a DC connector allows for externally supplied 12 volt DC operation.

APPEARANCE AND IMPRESSIONS

Kenwood have carried through the general appearance of the 120 series transceivers to the R1000, although the front panel dimensions are slightly larger and the cabinet depth slightly less. The R1000 weighs in at 5.5 kg. Overall the appearance would have to be rated as very good and the only criticism possible is the analog dial and 'S' meter. The faces of both are completely opaque and finished in a bright silver. The calibration points are rear illuminated in bright green, but under conditions of high ambient light, reflection from the silver makes the dial and 'S' meter hard to read. With low external light both are very legible.

Controls are in general easy to use. The only exception to this is the tone control which is concentric and to the rear of the volume control. As its diameter is only slightly larger than the volume control it is hard to operate. Perhaps the next model will have a small lever extending from it to help.

The unusual carry handle seems to be either liked or completely disliked, however it does serve a useful dual purpose. As well as being a carry handle it also acts as a variable tilt angle support for the receiver when installed on a desk.

Another feature is the rear panel. This is recessed and set at an upward facing angle, and allows connections to be changed easily with the set in situ. Connections can also be routed into the back panel with the set pushed hard against a wall.



PHOTO 1: Good appearance — the R1000 and a TS520

THE R1000 IN USE

For comparative tests we set up the R1000 alongside a TS820S, with a two position coax switch to feed both from the same antenna. The antenna for low frequency reception was at first a parallel connected 80 metre dipole. It was soon obvious that this was a bit too much. Even with the RF attenuator at the 40 dB point there was quite a bit of cross modulation. We finished up with about 10 metres of wire stretched out on the floor and this gave excellent broadcast and long wave reception. Aircraft NDBs were audible at good strength over distances of 100 km or so. Quality of broadcast reception was outstanding. With a Hi-Fi speaker plugged into the extension speaker output, the high frequency response was superior to my AM/FM Hi-Fi outfit. This was of course using the wide AM mode of the R1000.

However, over to the short wave bands and naturally the first part we checked were the amateur bands. Anything audible on the 820 was equal in every way on the R1000. It was only under the most difficult QRM conditions that the superior selectivity of the 820 made a slight difference. But mark this, the difference was slight and this applied to all bands including ten. The turning rate, although somewhat faster than the TS820S was still good at

50 kHz per knob revolution and a very smooth dial drive made tuning of SSB easy. It should also be noted that SSB resolution is made considerably easier with the 2.7 kHz bandpass as compared with receivers with similar tuning rates but wider selectivity. The calibration of the digital readout proved to be quite accurate in the AM mode and a plus or minus one kilohertz error on SSB depending on the sideband selected. One of the highly rated points of the R1000 is the noise blanker, however we found its action rather disappointing. In fairness, it was no worse than the blanker in the 820S but I have never considered that one very good either. It did reduce ignition noise to some extent and appeared more effective on the higher frequencies above 20 MHz.

The quartz controlled clock was extremely accurate for the duration of our test. It is of course independent of the mains, so that even when the R1000 is run from a battery supply the clock will still operate. On a personal point, I would have preferred a 24 hour type to the 12 hour one. AM and PM indicators however overcome this to some extent.

Output to a cassette recorder is made via a 3.5 mm phone socket and audio level proved excellent for the aux. socket on my AIWA recorder. This output is at a constant level and is not affected by

the setting of either the volume or tone control.

While on the subject of the tone control, I thought that its effect was too small and more top cut would have been useful in many cases.

However, most criticism would have to be mild in view of the overall superb performance of the receiver. The R1000 is well ahead of any other comparable receiver on the market at the present time.

Overall stability proved most impressive with total drift not exceeding one kilohertz over several hours of operation.

INSTRUCTION BOOK

The receiver tested was an early sample and did not come with an instruction book and in fact it was to be several weeks before one came to hand. When it did, I was delighted until I opened it and found not one, but several instruction books all in different languages. This means that instead of one large (at first sight) book, there is one rather small book. The information contained is completely directed at a non-technical user. Apart from the block diagram and the circuit diagram there is no technical description at all.

It seems a pity in this age when equipment is getting better all the time, general instruction books are steadily getting worse.

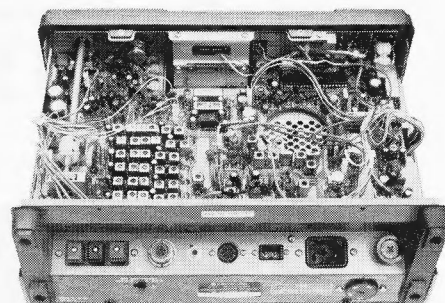
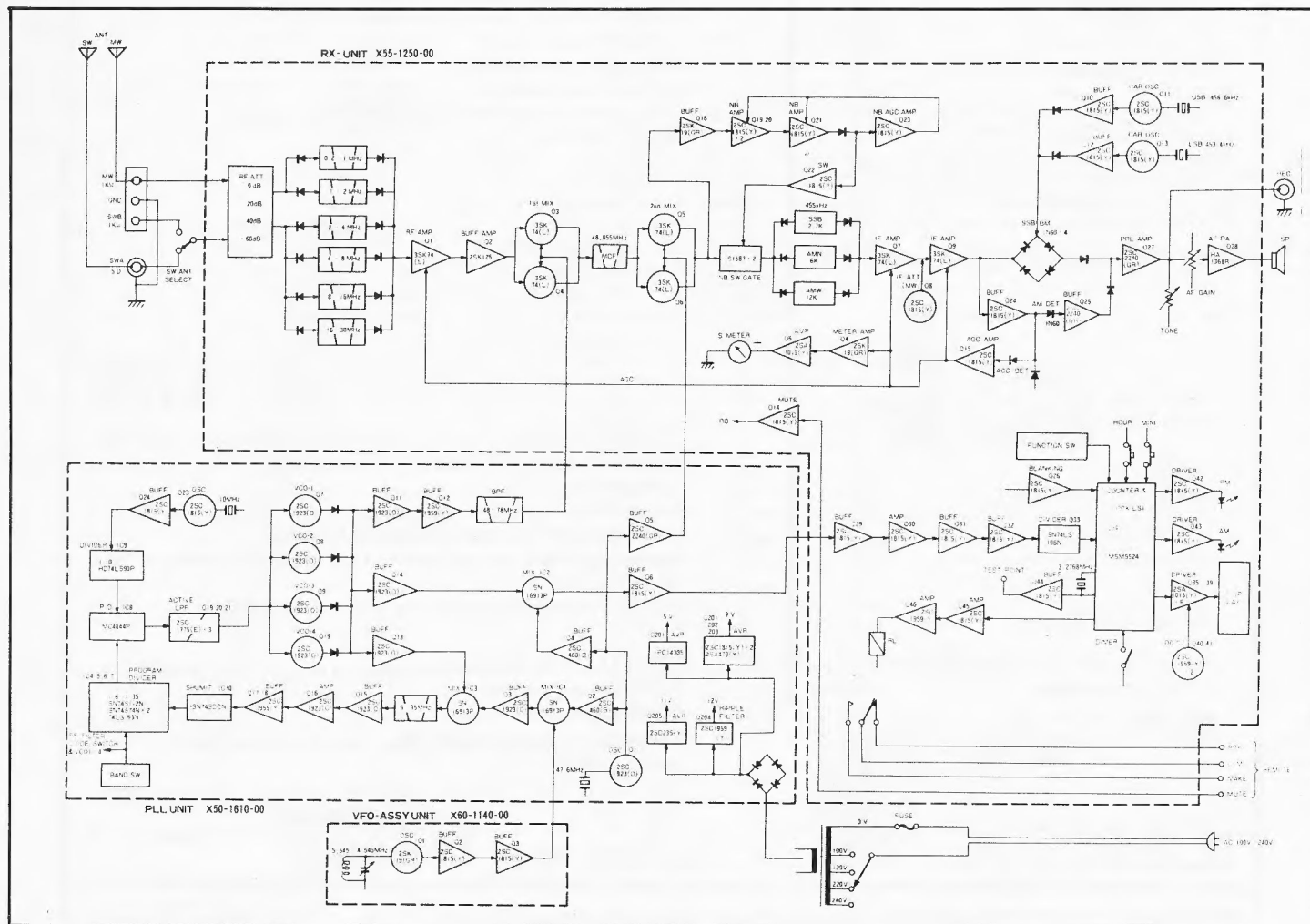


PHOTO 2: Rear view of the R1000. Note easy access to connections.

In conclusion, I am collecting all the old bottles I can find to rake up a down payment on an R1000. Our test model was supplied by VICOM International of Melbourne and all enquiries regarding price and delivery should be directed to them.

FIGURE 1 (below): Schematic diagram of the R1000. Of special interest is the PLL synthesiser unit.



Further Thoughts on the Kenwood R1000

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Since writing the review on the R1000 receiver published in the February issue of Amateur Radio, I have now obtained my own receiver and, with several weeks use, I have come up with a few points perhaps of interest to both owners and prospective owners of these excellent units.

One point noted in the original R1000 but not mentioned in the review was the extraordinarily long decay time on the AGC when in the AM mode. This had the effect of blocking the receiver for several seconds when tuning off a strong broadcast signal. In fact with a signal reading $S9 + 40$ dB it took 15 seconds for the receiver to fully recover. In the SSB mode by contrast the AGC recovery was only about five seconds. This effect was mentioned to the distributors who claimed that this particular receiver was set up for the European market where the long AM AGC recovery was required for some particular reason. They stated that receivers imported for Australia would have a more suitable AM AGC. This does not appear to be so.

A look at the circuit shows an additional 4.7 mF capacitor is switched into the AGC line in the AM wide and narrow functions. The solution to the problem is to simply remove this. For those reluctant to attack their new R1000 with the soldering iron let me explain further. Perhaps Kenwood had an idea that the long AGC delay would not suit everyone, thus conveniently connecting the capacitor back to the main printed circuit board via two pin plastic encased plug. Just pull out the plug. To help you find it, refer to the internal view in photo 1. It is the only two pin connector in the area and it should be noted that apart from the AGC time constant, now the same for SSB and AM, there is no other change to receiver performance.

Last point is the noise blanker. As readers would no doubt have noted, I did not rate the blanker as over effective. However since using my own R1000 I have found it to be rather better than the blanker in the review receiver. In fact it is even effective on many electrical appliance noises that seem to plague suburban locations.

In conclusion, I can see that many modifications and adaptations will be thought out for the R1000. If you have any thoughts let us know. ■



PHOTO 1:
The latest in the Kenwood line of receivers — the R1000 features digital readout and coverage from 200 kc to 30 MHz.

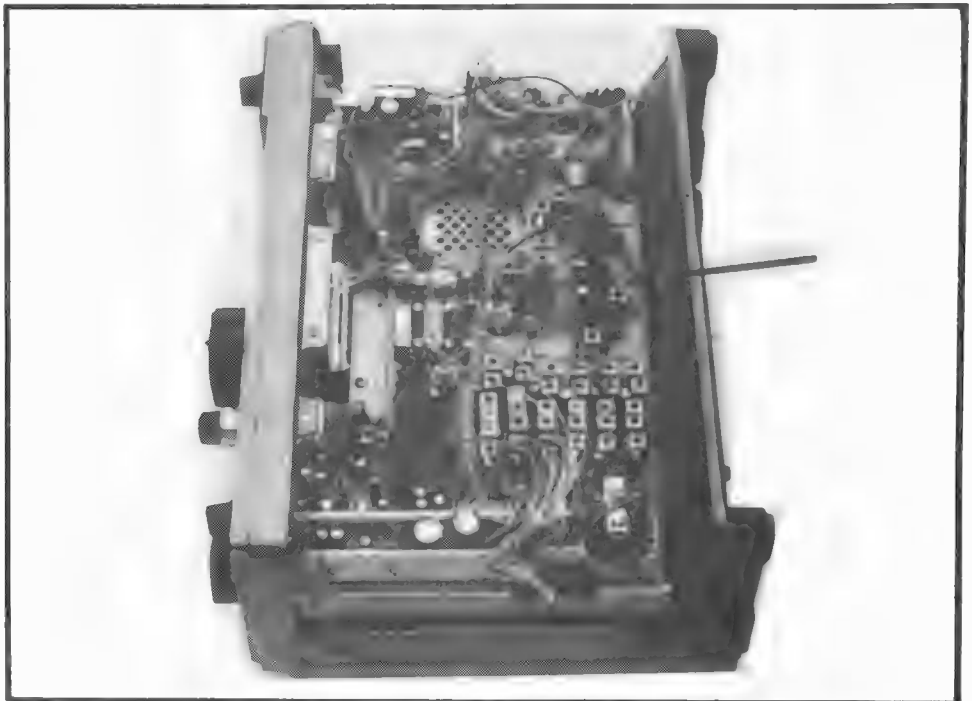


PHOTO 2:
Internal view of the R1000. The two pin plug referred to in the text is arrowed.