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EQUIPMENT REVIEW

THE KENWOOD R-2000 GENERAL COVERAGE RECEIVER

Having been a happy owner of an R-1000 now for some years I was most interested to see just what the new R-2000 had to offer. I was not disappointed, it has a lot to offer.

No doubt many present owners of the R-1000 will be considering an update to the 2000 so I am sure that a few comparative comments might be of interest. However lets go back one step before this and look at the evolution of the current model. I am sure many readers will recall the TRIO receivers of the early 1960s. They were single conversion four band valve sets with some-what mediocre performance. I well recall the reams of modifications that were published in AR and other magazines around that time to cure frequency drift and provide better sensitivity, mostly to little avail. In spite of this, many hundreds of these receivers must have been sold and a few still seem to pop up on the second-hand market from time to time. These were followed by a couple of similar design but with transistors instead of valves. In those days this was a mixed blessing. Sensitivity and drift characteristics were better but often cross modulation was almost intolerable.

The R-1000 arrived on the scene in 1979 and at last we had a receiver with all required facilities and a completely professional performance. Many thousands of these receivers must be in current use in both amateur and SWL shacks as well as many professional locations. A couple of years ago, Kenwood released the R-600

which was basically an economy version of the R-1000.

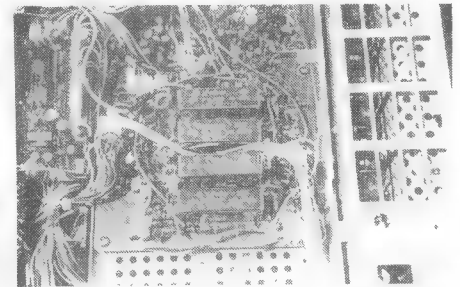
The R-2000 is somewhat larger but the same weight as the 1000. The main difference is in increased width, up by 75 mm. The increased width allows for a good size front facing speaker. The somewhat controversial carry handle come tilt bale of the 1000 has been replaced with a conventional tilt bale and a side mounted carry handle.

Basic specifications remain the same with full coverage from 150 kHz to 30 MHz with reception facilities for SSB, CW and AM plus the added FM mode. But from here on things change somewhat. Band changing is now fully electronic. Band up/down buttons allow for moving in 1 MHz steps either singly or by holding the button down in rapid sequential steps. Ten memories with memory scan or programmed band scan are available with digital readout to indicate memory selection. The digital frequency readout now reads to 100 Hz and also doubles as a clock which can be set for two time zones with a 24 hour readout. Three speed tuning in 50, 500 Hz and 5 kHz steps make for easy tuning across the bands.

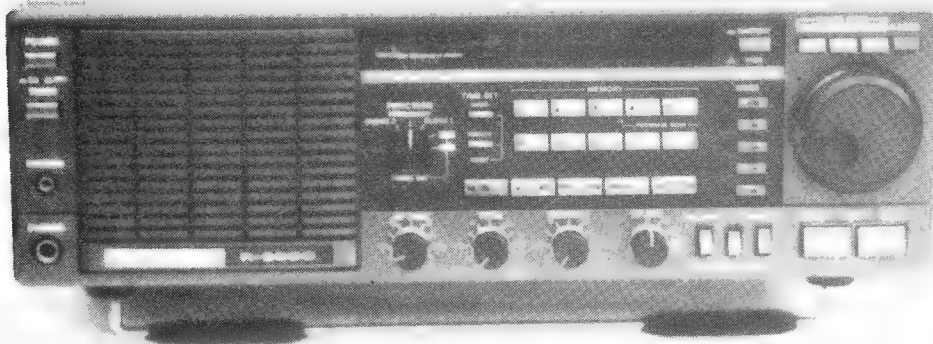
Without doubt the Kenwood design engineers have closely followed the electronic design of the TS-430S transceiver. Even the appearance has quite a family resemblance.

THE R-2000 TECHNICAL FEATURES

As is unfortunately typical these days, no circuit description or details are covered by the instruction manual. However a block diagram is included and a few details from this will be of interest. Six band pass filters are fed from the antenna input via a 10 dB per step front end attenuator. The band pass filters cover two to one frequency ranges with the exception of the low band which covers from 150 kHz to 1 MHz. The RF stage is single dual gate FET followed by a buffer stage into a balanced mixer the first IF of 45.9 MHz. Second conversion is to 9.9 MHz and the third to 455 kHz. Balanced mixers are used throughout. Provision is made for four filters of which three are supplied, a 2.7 kHz for SSB, a 6 kHz for AM and a 15 kHz for FM. The option is a 500 Hz CW filter. Three detectors are switched for SSB/CW, AM or FM. The frequency selection, memory and scanning modes are controlled by the CPU which is powered by a lithium battery when the primary supply either AC or optional DC is removed. This battery has an estimated life of five years.



The Filter Section.

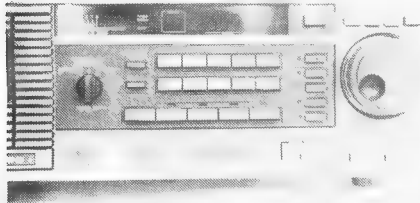


THE R-2000 IN USE.

On initial switch on the 2000 really looks superb. The digital readout is bright and clear enough to read right across the room. The selected memory channel is identified with a bright yellow readout to the left of the frequency readout. A nice feature noted when the receiver was set on my desk where the rubber buffers on the tilt bale, no possibility of scratching my desk this time. Firstly the two clocks were set, one on UTC, the other on local. The clock

also has a timer function that allows the receiver to be automatically switched on at any pre set time along with a tape recorder if required. It was noted that the SSB BFO frequencies were well out of adjustment as received with LSB signals sounding very high pitched. USB was acceptable but perhaps a little the other way — a bit bassy. Naturally the instruction book contains no information on correcting this, so it was left as was.

The ten memories were programmed for our favourite operating frequencies and a few short wave broadcast channels. As received from the distributor, our R-2000 did not operate below 2 MHz. The instruction manual refers to this as an 'X' model. A note included from Kenwood says that the receiver is capable of receiving 150 kHz to 30 MHz by cutting D59 on the printed circuit board behind the function switch. I was unable to locate D59 during a quick search of the main printed circuit board. During the setting up process, I was rather disappointed to see that Kenwood have done away with the recessed, upward facing rear panel which was quite an innovation on the R-1000.



Close-up of Switches.

The tuning system is now fully electronic with three push button selected rates. These are 50 Hz, 500 Hz and 5 kHz steps which give an actual tuning rate of 10, 100 kHz and 1 MHz per knob revolution. These speeds also apply when band scanning is in progress. I feel that Kenwood have not chosen these speeds as well as they might. They are all too fast. I feel that 10, 100 Hz and 1 kHz would have been a better choice. The 1 MHz per tuning knob revolution is after all taken care of with the up/down button. However I must admit that tuning SSB signals is a very simple process, but the next step up, I found a little too fast for AM stations. I wonder if there is a simple modification to change this.

Perhaps the best thing on the R-2000 is the memory system. It is, in fact, almost identical to the TS-430 transceiver. The ten memories are programmed with both frequency and mode. So you can have an USB channel on 20, a LSB memory on say 40 and 80 plus a few AM broadcast stations. It is then possible to select any one by a push of the appropriate memory button or to scan around them sequentially. The system will pause long enough at each memory so that the operator can decide if a stop is required. If so, a push of the hold button will stop the scanning sequence.

The programmed band scan using memories nine and ten can be used to tune automatically between any frequencies entered in them. The scan speed is selected by the tuning rate buttons.

AM reception with the R-2000 is excellent. Kenwood have dropped the wide selectivity

position of the R-1000 and now provide selection between 6 kHz at the -6 dB points or the SSB filter of 2.7 kHz. The narrow/wide button that allows this selection also selects the narrow CW filter or SSB selectivity when the CW mode is in use. Unfortunately during the course of our tests, I was unable to hear any FM transmissions on 10 metres, but a socket at the rear of the 2000 is labelled VHF converter, so maybe Kenwood have something in mind here. Time will no doubt tell.

The squelch control is useable on all modes and works quite well if you happen to like squelch on HF. With fading signals I can never pick the right level to set the control.

My comments on the TS-430S 'S' meter equally apply to the R-2000. It looks great until you try to use it, then you cannot see it. The noise blanker is both good and not so good. Not so good on the Woodpecker, in fact no effect at all, but quite good on ignition and general electrical hash. The 'Record' output has a constant level output, unaffected by the AF gain. A great idea, but why only on receivers. How about one on transceiver.

THE R-2000 ON TEST

The following test equipment was used to produce these figures. Daven audio power output meter. AWA F242A noise and distortion meter. A 100 kHz crystal calibrator with multi vibrator output. Sensitivity tests are subjective and are checked by comparative tests with other equipment.

Audio output was taken from the external speaker socket into the power meter terminated in 8 ohms. The crystal calibrator was fed into the antenna input and the tuning set to produce a 1000 Hz tone. Audio output checks were based on this. Maximum power output was 3 watts but with very high distortion. At 2 watts distortion was 3.2% and at 1.5 watts 1.9%. With the audio gain control set at zero, system noise was -65 dBm, a very acceptable figure.

The tone control was checked in the fully on position. At 2.5 kHz the response was down 12 dB. At 2 kHz -9 dB, 1.5 kHz -7 dB, 1.0 kHz -4.5 dB and at 700 Hz -3 dB. This is quite acceptable performance and was useful lopping off some of the excess highs in the LSB position. AGC action was checked by listening to a variety of strong and weak signals. There was no pumping or popping on strong signals and in general SSB reception sounded very smooth. AGC decay is selectable for slow or fast with a front panel switch, but is not automatically selected with a change of mode. Next the crystal calibrator was fed into the antenna input to give an 'S' meter reading of S1. The audio output level was checked and then the RF input was increased to give a reading of S9+30 dB. The audio output increased by 2 dB. This was a quite reasonable figure.

The response of the SSB filter was checked by feeding a weak signal (below the AGC threshold) into the front end and measuring the audio output level while tuning across the signal. The USB setting

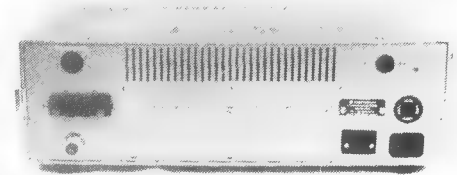
was used as this appeared to be reasonably normal compared to the very off frequency LSB. The -6 dB points were 400 Hz and 2.8 kHz with 3 kHz -12 dB. Overall SSB selectivity appeared to be fairly good but perhaps a little wide at the -60 dB points. The R-2000 has no IF shift or band pass tuning to help separate wanted signals from interference.

The optional CW filter was not fitted to our review receiver. From 2 MHz up the performance of the R-2000 was very acceptable. The stability was excellent with little shift over a half hour period from a cold switch on. Pity I was unable to check the low frequency performance. This is where many current receivers fall down badly. While looking around for the elusive D59, I noted that it is possible to have either open scan or scanning that will stop on signal. To arrange this, a jumper is changed on the circuit board accessible with the bottom cover removed. Further details are on page 11 of the instruction manual.

INSTRUCTION MANUAL

The R-2000 instruction manual is completely disappointing. It is a four language thing with English as the first part. So far as operating procedure and installation goes, it is quite good. Various types of antennas are discussed in relation to their use with the R-2000. However apart from a block diagram and circuit diagram, there is no technical information at all. A short section on short wave propagation is interesting.

The last page discusses the options available for the receiver. These are two different headphones, a CW filter and the very excellent Kenwood World Clock. Installation instructions are provided for the CW filter.



Rear View.

CONCLUSIONS

The R-2000 receiver is, without doubt, a very advanced piece of equipment. Not only that, but the overall performance is very good in most wanted respects. Some might consider the appearance to be a bit over styled and the S meter is certainly not up to the overall standard of design. The R-2000 will however put Kenwood right out front in the popular general coverage receiver market for some time to come.

Our review model was supplied by KENWOOD AUSTRALIA and all enquiries regarding the R-2000 should be directed to them or one of their local agents.

AM

A Review of the C8900E coming next month.

EVALUATION AND ON AIR TEST OF THE R-2000 RECEIVER

Serial No 3070643

Category	Rating	Comments
Packaging	***	Double carton with foam inserts.
Size	**	Larger than preceding model.
Weight	***	Same as preceding model.
External finish	***	Well finished but slightly over styled.
Construction quality	***	Good quality boards and internal wiring.
FRONT PANEL		
Location of controls	***	No concentric controls. All well laid out.
Size of knobs	***	All very good.
Labelling	***	Clear labelling.
Meter	*	Very over styled. Hard to read.
VFO knob action	**	Very smooth, but tuning rates not ideal.
Dial readout		
Analogue	NA	
Digital	***	Bright and easy to read. Accurate resolution to 100 Hz.
Status indicators	****	One of the best yet.
REAR PANEL		
RECEIVER OPERATION		Not nearly as good as the R-1000.
VFO stability	****	Hard to fault, see test section.
Digital dial accuracy	****	Spot on.
Memories	****	Recalls both frequency and mode. Best yet seen.
Shift/width	NA	No shift or width controls provided.
Notch filter	NA	No notch filter.
Spurious responses		
S meter	***	Realistic response. Smooth action.
AGC performance	***	Very adequate AGC performance.
Signal handling	***	No problems with strong signals.
RF attenuator	***	10 dB steps. Better chosen than R-1000.
RF gain	NA	No RF gain control.
Sensitivity	***	On subjective test, very good.
Selectivity	***	Good choice offered — adequate selectivity for most purposes.
NOISE BLANKER		
Woodpecker	*	No effect on Woodpecker.
Electrical & ignition noise	***	Worked well on this type of noise.
QUALITY OF RECEIVED SIGNAL		
Internal speaker	**	Front facing speaker. Satisfactory quality.
External speaker	NA	No optional speaker offered.
Headphone output	***	Stereo compatible. Output level good.
Tone control	***	Very useful top cut.
MANUAL (owner's handbook)	**	Satisfactory as operator manual. No technical information.

Rating Code: Poor * Satisfactory ** Very Good *** Excellent ****

WHO IS THIS AMATEUR?



He first obtained his licence on 18th September 1936 and immediately began operating from 90 Prince Street, Thompson Estate, Brisbane. In the space of twelve months he had made over 1000 contacts on CW, including DXCC — something few OT amateurs accomplished in their first year of operation. The all-homebrew station was extremely neat and efficient, with the transmitter using a pair of 45s in parallel in the final stage to a half watt vertical on 20 metres and the receiver a three tube TRF.

A WIA Queensland member since pre-war days, he served on executive on more than one occasion, being QSL Officer twice (a duty he discharged with considerable efficiency) and Morse code instructor when the meetings were held in the Celtic Chambers.

During WWII he served as a W/O in the Navy for the full five years of its duration, then commenced working with the PMG as a

technician and moved to Dalby. He later returned to Camp Hill, Brisbane and spent a considerable time at the Frequency Measuring Station at Capalaba until his retirement in 1979. As a 'DXer par excellence' and a member of FOC and RSGB he became known as 'Brisbane's Mr DX', having over 300 countries confirmed to his credit.

The beautiful bushland setting of Loganlea, south-east Queensland is now his chosen place of abode where he has an extensive garden — but still finds time to put his snappy fist or clear voice on the air almost every day. One can best describe him as an amateur who puts in a high key performance in a low key easy manner. His callsign fits in nicely with the work he performed in the PMG — viz Radio Frequency measuring — maybe you've already guessed. Yes, its VK4RF (Romeo Foxtrot or Radio Frequency) and his name is Fred J Lubach.

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