

EQUIPMENT REVIEW

Ron Fisher VK3OM,
3 Fairview Avenue, Glen Waverley, Vic. 3150

The Kenwood AT-250 antenna tuner is designed as a matching accessory for the TS-430/43X but also directly useable with the TS-930 not equipped with an antenna tuner and also the TS-130 series. Automatic band switching of the AT-250 is provided when connected to the 430/43X but not with the other transceivers, although the automatic antenna tuning feature still operates with the other rigs. The AT-250 is useable with any make or model of transceiver that can provide a switching output from its send/receive relay.

The term antenna tuner will no doubt mean many things to many people. But let's put things straight right from the start, the AT-250 is not an antenna tuner. It is better described as a transmission line impedance matcher for use in a mis-matched 50 ohm unbalanced feeder.

The need for a matcher of this type seems to have arrived for a variety of reasons, the first being the solid state broad band final transceiver which requires a 50 ohm load to produce maximum output. Perhaps another reason is the wide spread use of narrow band width tri-band beams and other such antennas. The decision if you need one or not, is up to you, however the AT-250 does have other uses. Read on.

THE AT-250 TECHNICAL DESCRIPTION.

As mentioned above, the AT-250 matches the 430/43X series of transceivers in both size, styling and colour. Overall dimensions are 174mm wide, 96mm high and 257mm deep. Weight is 4.2kg. The unit is most attractively designed.

The antenna tuner section is a relay band switched pi net-work with two motor driven tuning capacitors. The relay band switching is controlled either with information from the 430/43X transceiver or from a manual band switch on the front panel. Two SWR through line sensing networks provide information for the built in power/SWR metering and for the motor driven antenna tuner. The circuitry is quite complex with a total of 13 IC's, 31 transistors, 2 FETs and 77 diodes. The unit has its own built in AC power supply.

The power/SWR meter is a very nice piece of work. Two power ranges of 20 and 200 watts RMS or PEP plus an automatic no set required SWR meter, make a very versatile unit. Manual switching of four antenna inputs adds to the versatility. Connecting cables are supplied for operation with the 430/43X, the TS-130 or other transceivers.

THE AT-250 IN USE.

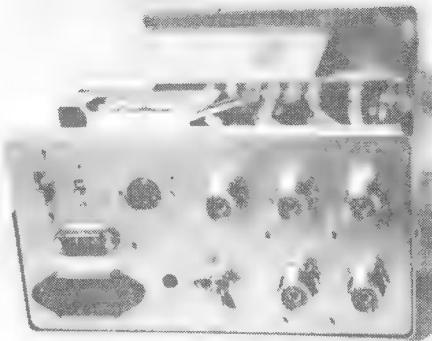
Kenwood were kind enough to supply a new TS-43X so that we could check out the 250 in all respects.

For a test set up, I used a trap vertical antenna which has a fairly narrow band width and a rising SWR either side of resonance, perhaps a typical antenna that the AT-250 would be required to straighten out. However firstly I checked out the power/SWR meter. The system requires about 5 watts of forward power to produce an actual SWR reading and from there up, the SWR reading is entirely automatic. Power was checked against my standard power meter and found to be just 10 per cent high at both 30 and 100 watts (both on the 200 watt scale) and the same percentage at 10 watts on the 20 watt scale. The PEP feature of the meter is most useful. The ballistics of the meter circuit are such that quite accurate readings can be taken on normal speech SSB input. For accurate measurement of the 30 watt novice power level, the meter should peak at about the 20 watt mark.

The trap antenna resonates at 3.6 MHz with the SWR rising rapidly either side. At 3.640 MHz it is up to 2.5 to 1. As with the SWR meter, the auto mechanism requires about 5 to 10 watts of continuous transmitter output to operate. With the 'Tune' button depressed, the motors



THE KENWOOD AT-250 AUTOMATIC ANTENNA TUNER



Rear view.

whir, the SWR meter swings wildly and finally settles at 1.1 to 1. On the 80 metre band I was able to correct for an SWR of about 5 to 1. Of course this does not imply that the antenna is working at anything like peak efficiency. In fact at this point the radiated signal had dropped by around three S points (relative report received) but the transmitter was happily supplying 100 watts to the line.

Loss through the tuner was measured at 10 per cent. This appeared to remain fairly constant regardless of the mis-match being corrected.

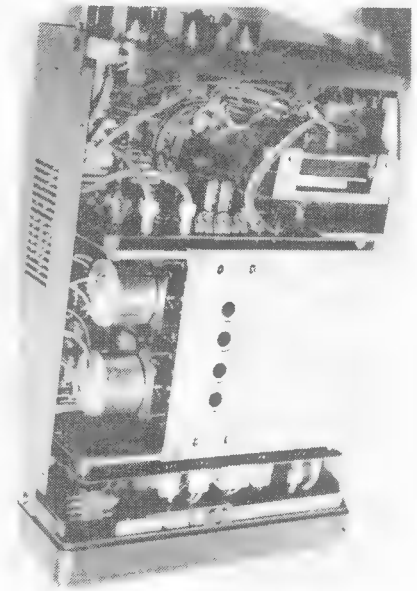
A switch at the rear of the unit allows the tuner to be switched out for receive only operation. Several tests did not show up any detectable difference on receive with the tuner in or out of circuit.

INSTRUCTION BOOK.

The instruction book is actually a fold out sheet. It contains full operating and connecting instructions, including details on using the AT-250 with transceivers

other than the 430/43X. A full circuit diagram is included. All the information is clearly explained, but the specifications refer to the meter switch 100W and 10W positions which of course should be 200 and 20 watt positions.

Thanks to Kenwood Australia for the loan of the AT-250 and the matching TS-43X transceiver. Details of price and availability should be directed to them or one of their local agents.



Internal view.