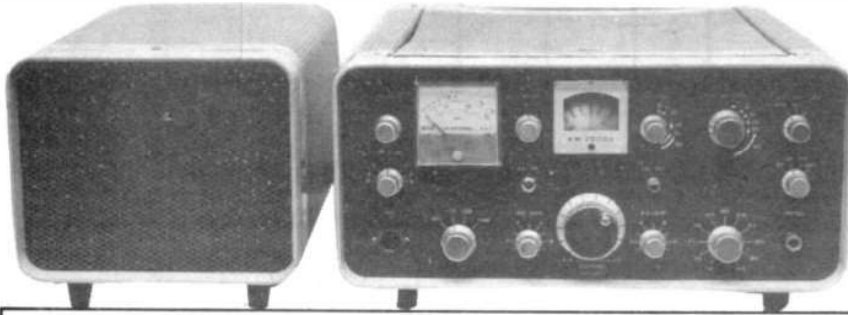


# Upgrading the KW2000 series of transceivers—



## Part 7

*Simple RF attenuator design plus switching circuitry for an 'outboard' receiver and separate 'transmit' and 'receive' aerials.*  
By Malcolm Healey, G3TNO, and R. Charles.

After the foregoing articles in this series, a number of small refinements remained on the list of desirable extras worth incorporating in our KW2000 series of transceivers update. These were (1) To be able to use a separate outboard receiver for split frequency operation; (2) To be able to

use separate aerials on 'receive' and 'transmit'. For example, when operating on 160 metres it is useful to use a loop aerial on 'receive' in order to null out QRM, particularly when chasing DX; (3) To have the facility to switch in an RF attenuator on 'receive' when using large aerials.

This is particularly useful on the lower frequency bands ie 7 and 3.5 MHz where the receiver front end on the KW 2000 has been found to be prone to RF overload on largish arrays such as Vee beams or very long wires.

The above modifications can be achieved very simply. All or part of the modification may be readily incorporated, depending on your own needs.

Fig. 5000 shows the circuit details. Switch 5000 is fitted inside the case of the KW 2000 an approximate 2¼ inches to the left of the IRT/ITT switch and in line with the existing cab/set control. Switch 5000 is the attenuator control switch. The user must select the value of the attenuator to be fitted as this largely depends upon the type and size of aerials in use. Fig. 5000 gives resistor values and attenuation values up to -40dB which, unless you have stolen the aerial system at BBC Daventry, should more than cover most amateur uses!

The switching circuitry for alternative aerials and an outboard receiver has been fitted outside the KW 2000 itself, as this gives greater flexibility. At G3TNO this was incorporated in the station control and switching unit, which also controls the switching of the station aerials. Only the circuitry relevant to the modification is shown (see Fig. 5001).

After incorporation of the above modifications, in particular that of the RF attenuator, it is really amazing to hear the improvement in reception on, say, the extremely crowded 7MHz band after dark. Much DX that just

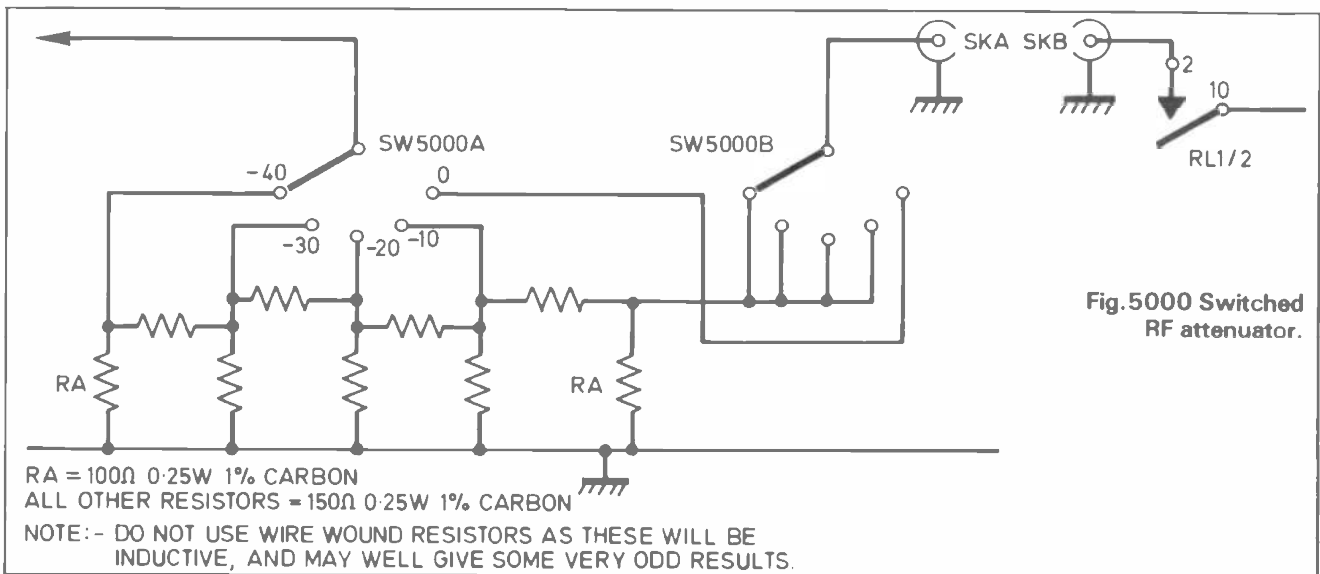


Fig. 5000 Switched RF attenuator.

could not have been resolved before the above modification was now easily readable, with much reduced interference, because of the reduction in RF 'cross-modulation' of the KW 2000.

### Extra CW Selectivity

Extra selectivity has been added to the KW 2000 A in use at G3TNO and has been found worth while in *very* heavy QRM conditions. This was made up as a 'plug in' extra and generally used only during contests. A shorting link replaces the extra xtal (see Fig. 5002) for less heavily occupied band conditions.

### A Few Conclusions

Since the start of this series of articles a number of people have contacted the writers and asked for practical help in getting their defunct KW 2000s going. So far, in most cases, the problems have been rapidly resolved. We have usually found that a step in the procedure of checking through the KW 2000 has been missed; sometimes a voltage has not been checked, or an alignment stage incorrectly carried out or even not done at all!

However, a few rather more obscure problems have arisen and are well worth a mention in these pages. Two cases of severe instability, on both 'transmit' and 'receive' were found to be due to the owners of the rigs concerned having used rather obscure (!) manufacturers equivalents to the valve types listed. In both cases although the correct type number was on the envelope of the valve, there was actually no manufacturers name. At a guess the valves probably came from eastern Europe. Replacement with the correct types from well known manufacturers (Brimar and Mullard) cured the problem. So, be careful of the pedigree of your replacement components! The second problem encountered was slight chirp on CW, even after the CW note modification, combined with FM on SSB at full drive levels on 80-10 meters. This was found to be due to a non-standard mains transformer being fitted in the PSU and in one case was with a 'home brew' PSU. In both cases the problem was essentially a lack of HT 'stiffness' and two actions have been taken to effect a 100 per cent cure. Firstly, the

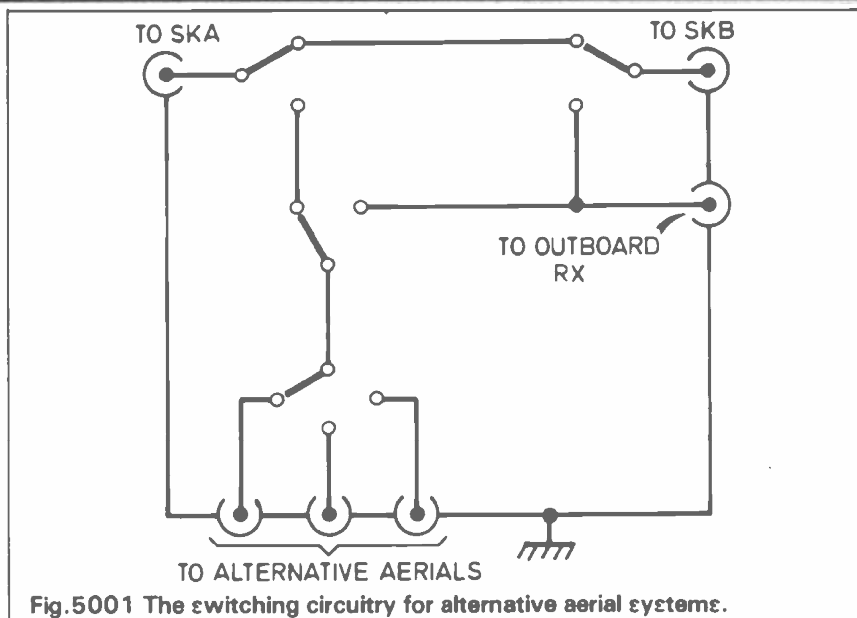


Fig. 5001 The switching circuitry for alternative aerial systems.

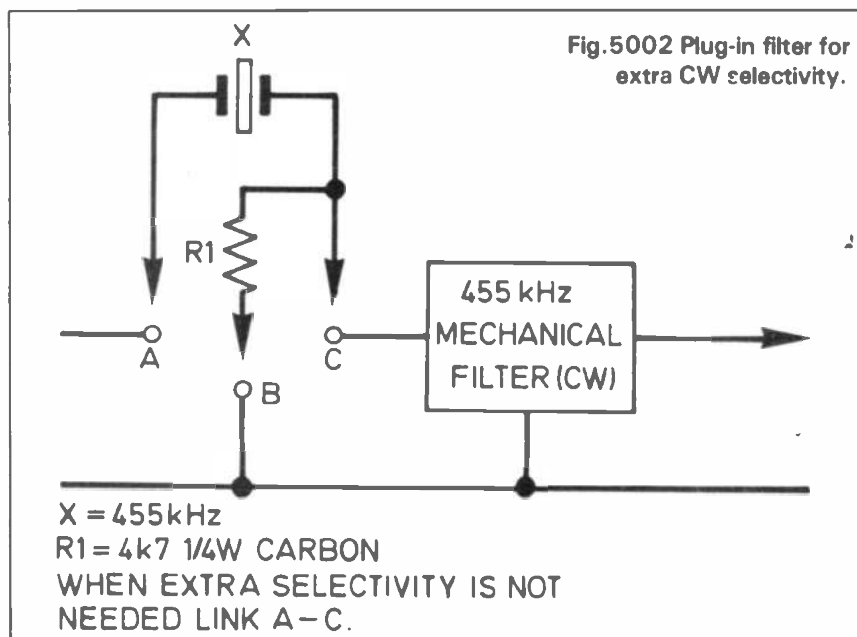


Fig. 5002 Plug-in filter for extra CW selectivity.

250V HT decoupling in the PSU was increased in value to 250uF, and then a 32uF capacitor was fitted across the thermionic (valve) voltage stabiliser in the KW 2000 itself. These modifications completely cured the chirp and FM on SSB and I believe are worth fitting to apparently trouble free KW 2000s.

Whilst the modifications described in this series are by no means the ultimate as to what can be done with an original KW 2000 it is hoped that the articles will encourage a few to be brought out of those dusty corners, re-vamped, and used on the bands instead of rotting away. I must say that judging from your letters this appears to have happened. As a final thought

from the writers: how about making the VFO solid state? and also adding a digital read-out of frequency? Well, you write the articles and we will give them a try! (How about this?)

The writers would like to thank the countless number of people who have given reports on our signals both before and after our modifications.

*Some correspondence has been received at HRT regarding various aspects of the KW 2000 update series. Malcolm has kindly written answers to these and they will be published along with the original correspondence in the 'Letters' section of the February dated issue.*