



The QRP movement is all about achieving more for less, for example working the world with 5 watts. Then about this for a challenge? The aim is to build a simple, non-Superhet short wave receiver to achieve HAC (Heard All Continents) with only a 14" telescopic antenna.

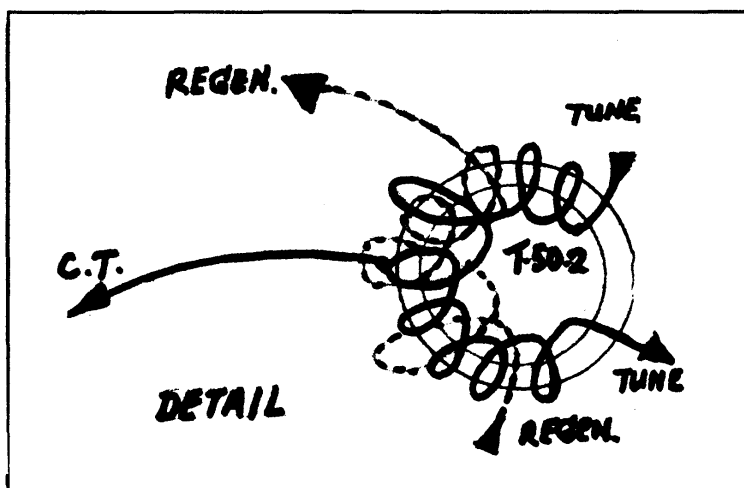
It was an expected, encouraging telephone call from a fellow club member that sparked off the idea. He said, "I built two MB4 receivers in one weekend for the design in SPRAT 97. What amazed me was hearing DL on 40 at S9 using only 6" of wire." The circuit here takes things much further. It has a more powerful front end than the MB4 and has received stations from thousands of miles away with the telescopic whip retracted to only 5 inches.

Many simple receivers, especially Direct Conversion ones, suffer from a relatively "deaf" front end for which AF amplification cannot compensate. This simple TRF design is different. This is how it works. The first RF stage, using a high gain BC109C, makes the receiver see its poor telescopic aerial as much longer. This is the active antenna principle. The greatly improved input signal is then fed via a tri-functional 5K variable resistor (about which, more later) to a second RF stage, this time based on a 2N2222A transistor. By the time the amateur signals reach the 2N3819 Detector stage, they compare favourably with those delivered by a much more efficient antenna.

The operational heartland of this unusual but powerful little receiver is its three 5K variable resistor controls. The first separating the two RF stages can do three things. Once you gain some experience in using it, you will realise its versatility. It can attenuate the strongest signals, amplify the weak ones and act as a clarifier of SSB signals. If SSB signals are roughly tuned in using the receiver's 10pF bandspread control, a slight forward or reverse movement of this 5k resistor knob will give clear speech resolution. The long suffering XYL does not deny this but took exception to an ear splitting S9++ SSB signal from an EU station. It was not worth pointing out that the whip was fully retracted to 5" at the time! Please note that because of the high RF gain needed to deliver the DX, the detector may complain of overload at certain frequencies. If so, simply back off the gain a little.

The second 5K variable at the detector stage controls the regeneration. Both CW and SSB signals are received with the Detector gently oscillating - AM signals just short of this point. The third 5K control is for AF gain and will often need to be held well back. The reason is that AF gain and room filling volume from the speaker is provided by another high gain BC109C and an LM386 chip. The receiver can be powered from a 12v PSU or for portability, a PP9 battery. The prototype uses a 12v PSU with almost no hum problems.

Few difficulties should be encountered with the construction and operation of this receiver. A wiring diagram is not provided, but observe keeping the RF and AF wiring well part to prevent unwanted



feedback. Tuning and regeneration coils are wired over each other on the T50-2 core and in the opposite sense - the tuning coil centre tapped and approximately a third of the number of turns for the regenerative windings. "cut and try" methods must be used to secure exact frequency coverage. Three coils and a rotary switch can give all 9 HF bands. Mine cover: [1] 32/10MHz, [2] 10/3MHz, [3] 1.5MHz/MW (to follow the fortunes of Ipswich Town Football Club on Radio 5!). For starters, try 24 turns for the tuning coil, centre tapped at 12, with 6 - 8 turns for the

regeneration, see what is covered and take it from there. A little experimentation will give you what you want. The 24 turns will probably get you the 14 and 10MHz amateur bands, although coverage could be

as high as 21MHz or as low as 7MHz, depending on stray capacitance and the tuning capacitor used. *If with the coils wound and inserted, the Detector FET will not oscillate when the 5K regeneration control is rotated clockwise, reverse the connections of the regenerative winding - this should solve the problem.*

Your aim is HAC with a home-built simple receiver. Let me know how you get on !