

4 Transistor Super Regen Receiver

This is a pocket sized receiver I built in 1994. The idea was to make a simple but useable receiver running off 3V. My previous 6 transistor receiver was more bulky, requiring 12V. This meant 10 x AA cells. I designed and made a PCB, and constructed a small aluminium case to keep the receiver as compact as possible.

There is nothing unusual with this design. The detector uses a simple Colpitts oscillator and is of a type commonly used in other super regen receivers. Of course it is self quenched. Sensitivity with this type of detector is relatively low, but it's simple and easy to get working. As always, I provided a regeneration control to set the optimum operating point; ie. max sensitivity and minimum SCA/stereo subcarrier beat.

The aerial feeds the emitter via a 3.9pF condenser. This sort of connection causes less tuning drift and loading problems than if fed directly to the aerial coil. The aerial coil is the usual 4 turns of 18B&S TCW on an air cored 3/8" former. The 150uH choke is a commercially made item. In case you notice it, the condenser in series with the tuning condenser is 43pF. This was 10pF//33pF and was necessary to get the correct tuning range.

To further simplify this receiver, a volume control was not fitted. Instead, the regeneration control is used for that function. As the regeneration is advanced past where the detector just starts oscillating, gain drops off and so does volume. It is not an ideal method of volume control, but works to a useable degree.

I used a three transistor amplifier to drive low impedance stereo headphones. Various condensers are used to filter the quench sufficiently. Although this audio amp works well, I'm not keen on DC flowing through the headphones. Again, this was done for simplicity, but if I was to redesign the circuit again, I would incorporate an output transformer.

The first two transistors provide voltage gain, with the third being an emitter follower providing current gain and impedance matching to drive the headphones. Yes, a speaker can be used but the volume isn't particularly high. Current consumption at 3V is about 30mA.

Performance isn't bad for what it is, but sensitivity is less than other receivers. However, at my home 80km from Sydney, all the mainstream stations are receivable without any problem. Even so, it is not recommended for DX use. Ideally, the aerial should have been 75cm long, but again, size considerations meant that a shorter one was used.





