

Russell Cook, G3OTH's unsolicited review.

Hi, I received this brand new innovative 2011 Ham Can kit from the states in record time on Monday morning, which I put together on the same afternoon. You can see and download full details at:
<http://www.wa0itp.com/hamcan.html>

I had it running on Monday night hoping that it would be as good as the recordings etc., but wondered whether I would be asking a lot from just two transistors.

I fitted a 7030 KHz Xtal to it instead of the 7122 KHz one supplied as I felt the former was more suitable for us here in the UK. Using a 9 volt battery and utilising my indoor wood burning stove pipe as an antenna and my domestic central heating pipework as a counterpoise earth I copied several amateur CW stations from Europe and the USA including Cuba late on Monday night and in the early hours of Tuesday morning before I retired to bed.

The regeneration control was not at all fiddly, regeneration is maintained throughout about 4 complete midway turns of the multi turn preset pot, before it plops out at each end. The selectivity is very good although the sensitivity in terms of volume is very low, as you might expect from one AF transistor but sufficient nevertheless as all the above signals I might add were heard by putting my ear close to a 4 ohm loudspeaker which was serving as my only listening device at the time. There was a little bit of AM BC breakthrough discernable but it was not too bad. On Tuesday during daylight hours I heard some G stations and the breakthrough had gone.

There is NO sidetone with this circuit BTW, so you have to monitor your CW elsewhere, but the QSK effect is really good, I listened on another RX and there was very little chirp although there is a small backwave present due to the RX regen oscillations but it is of no real consequence. I measured about 350 mW rms output into a 50 ohm dummy load when using 9 volts on transmit and the quiescent current on RX was about 15 mA.

I have since hunted out a pair of mono phones and a hand key to see if I could catch a fish but it has been hard work so far using Xtal control and a far from ideal antenna, although I have heard plenty of signals close to my QRG in the process.

My measured transmitting QRG seems to be about 7029 KHZ BTW with the Xtal I am using at present.

The method used to control the regen and Tx in this Ham Can has me intrigued.

The four diodes seem to be arranged to provide some sort of negative bias DC feedback, the level of which depends on some combination of clipping, pumping and voltage doubling action from the collector swing of the 2N3866, but I have not worked out yet how exactly this works and whether it is there to benefit the RX or TX or both, I will have to investigate later with a scope and try and determine what is going on. I have analysed the performance of the BPF at the output of the 2N3866 using Jim Tonnes W4ENE's Elsie BPF program and the values used in the Ham Can are spot on for 7 MHz and provide a reasonably flat response from 6 to 9 MHz.

I can't see it being a problem to modify them for 80 meters, or 20 meters for that matter. The PCB layout is not critical and if you are on a budget and cant afford to help the Four State Club's fine effort I am sure the whole transceiver could be copied and knocked up on perf board quite easily for about a fiver as the regeneration is EXTREMELY stable and its control very none critical if a small multiturn preset pot is used. Hope to work some of you with it over the weekend.

73 fer nw de Russ G3OTH

Dave Cripe, NMØS's helpful response.

Russ:

Thanks for the great review of the Ham Can. I thought I'd point out a couple things that might not be obvious about its operation.

1. The headphone connector is set up for stereo headphones - standard walkman earbuds work best.

2. The receiver is a mix of regenerative and reflex at Q1. The diode doubler D3, D4, coupled to the collector to Q1 detects the received signal, which is then sent to the base of Q1 through the 1k resistor R1 to further boost the rx gain.

3. The rx pot should be adjusted about 1 to 2 turns counterclockwise past the point of oscillation to maximize rx sensitivity and minimize backwave.

4. On TX, the large RF signal at the doubler forward biases D2, clamping its voltage to -0.65v. The signal at the base of Q1 is clipped on the negative swing by D1, which boosts the bias current to Q1, allowing it to operate at full power.

73 Dave NM0S

Russ's change to conventional stereo headphones improves audio level.

Hi Dave and Terry

Just found a pair of conventionally wired stereo phones that I had here which have individual 32 ohm earpieces and tried them with the Ham Can.

I now have 64 ohm effectively in series and signals sound even better ! Its late here now so going off to bed.

73 Russ