

30m receiver

Written by Hans Summers
Saturday, 20 June 2009 16:02 -

This simple receiver was originally intended to check the transmission of my [30m QRSS beacon](#) . By tuning the 30m receiver to Russia's RWM timesignal on exactly 9996kHz I was able to calibrate my frequency counter, which I could then use to measure the output of the QRSS beacon and adjust the reading for a very high precision. Later, I modified my [1-valve ECL82 CW transmitter](#) for 30m operation and enjoyed several QSO's on 30m CW.

The receiver is extremely simple. It is a Direct Conversion design consisting of a 30m bandpass filter, SA602 mixer and audio pre-amplifier. Rather than use the internal oscillator of the SA602, I wanted to use a 74LS04 hex-inverter gate IC. In my experience this produces a nice stable oscillator, but mainly it produces a TTL-level output which is eminently suitable for driving the frequency counter in my [HF Receiver](#) . In order to accomplish the same with the SA602 internal oscillator I would have had to use buffer amplifiers which would probably have been much more effort than the separate oscillator.

I fed the audio output of this 30m receiver back into my [HF Receiver](#) via a special new socket which I added to the back of the HF receiver. Essentially then the HF Receiver acts as frequency counter and audio filtering / amplification, for this 30m receiver. It's not an ideal arrangement but it was an interesting experiment and good enough to enable me to have my first ever QSO's on 30m.

The 74LS04 VFO was very stable, after a short initial warm-up period it was perfectly satisfactory for CW QSO's on 30m. The performance of the mixer was found to be somewhat inadequate, in terms of broadcast breakthrough: several SW broadcast stations were usually audible on top of the wanted signals. The receiver also turned out to be very susceptible to power supply noise from the ex-PC computer PSU I was using at that time. At first I thought the band was empty except for a few signals. Making QSO's was very difficult. When I replaced the computer power supply with a homemade [linear PSU](#) , the level of background noise dropped about 5 S-points! There was then a 50Hz mains hum problem, which was easily solved by the addition of inductor and capacitor filtering. Ultimately I built a new [radio-friendly PSU](#)

The variable capacitor for this project came from an old tuner unit recovered from the scrap metal container at the local rubbish dump! The entire variable capacitor and VFO circuit was

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enclosed in a box hastily soldered together from scrap PCB, for screening purposes.

The circuit diagram and some photographs are shown below (click for larger images):

{gallery}30m{/gallery}