

Boxed Franklin VFO

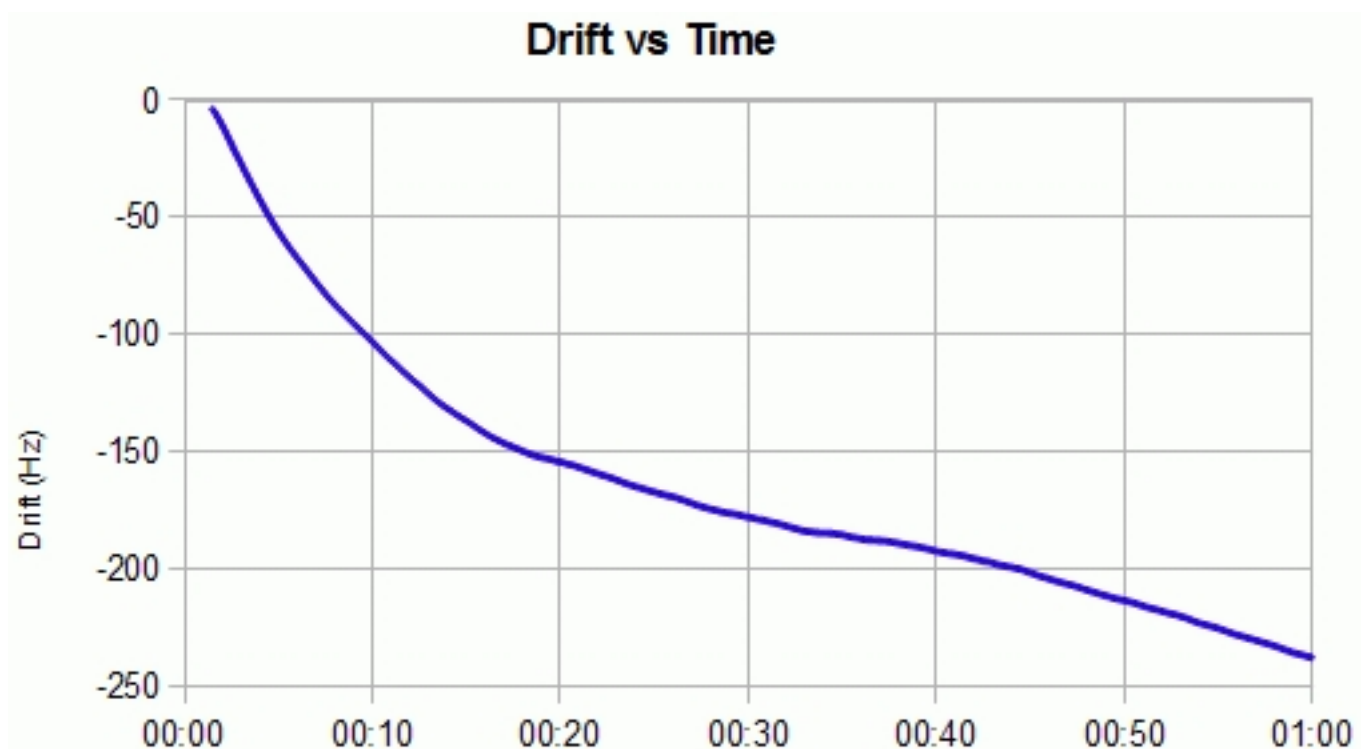
Written by Hans Summers

Saturday, 02 June 2012 07:37 - Last Updated Friday, 20 July 2012 14:05

The final boxed version of my dual-6088 Franklin VFO uses the [BC221 tuning capacitor](#) and includes a DF96 valve as buffer. This VFO is built on a piece of un-etched copper PCB board, and bolted to the back wall of the aluminium/steel box. The tuning capacitor occupies most of the space in the box. There's a BNC socket for the RF output and 7-pin socket for power supply voltages. The power supply requirements are 50V HT, and 1.25V, 1.25V and 1.4V for the valves.

{gallery}tubevfo/9/1{/gallery}

This is the first drift run, using nothing particularly special as capacitors - just ceramic capacitors. Still not bad, 250Hz down in an hour! The oscillator frequency this time is 5.116MHz.



Now to try to improve the drift, and get the oscillator on the wanted frequency range.

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1. Replaced the inductor with a T50-6 with 22 turns of copper wire, as thick as I could fit on the core.

2. Put a 68pF silver mica capacitor in series with the BC221 tuning capacitor, and the series assembly across the inductor.

3. Put fixed 100pF and 150pF polystyrene capacitors (negative temperature coefficient) in parallel with the inductor.

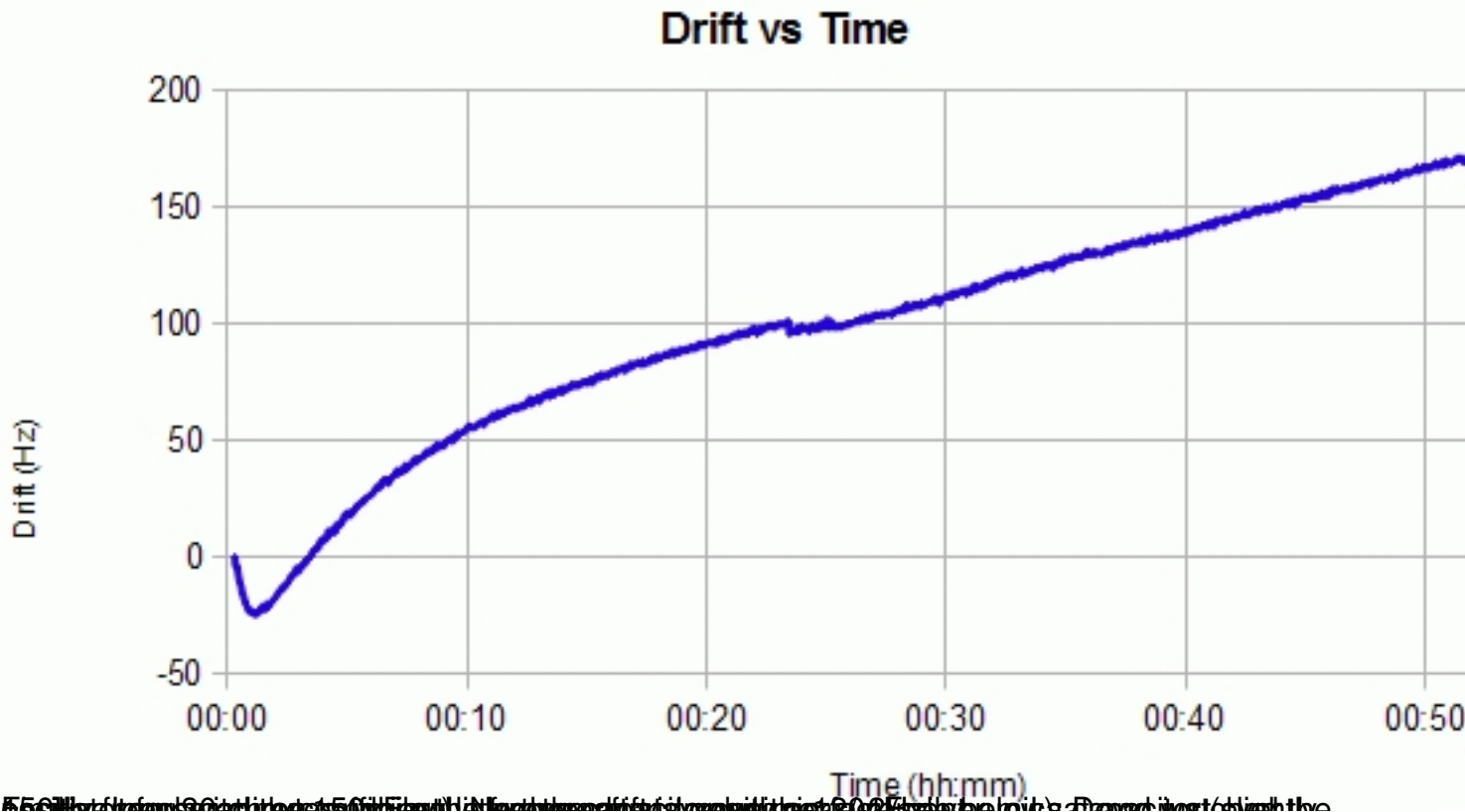
Using this combination: the oscillator tunes from approximately 6.0-6.5MHz with 50 turns of the tuning capacitor, with approximately 7kHz/turn at the bottom end and 12kHz/turn at the top end. Pretty ideal :-)

The drift however, shows too much upward drift. The polystyrene capacitors have a negative temperature coefficient, to cancel the +35ppm temperature coefficient of the T50-6 inductor. But clearly they are over-cancelling, resulting in a drift upwards:

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~~5500 Hz from 00:00 to 00:05, 5600 Hz from 00:05 to 00:10, 5700 Hz from 00:10 to 00:15, 5800 Hz from 00:15 to 00:20, 5900 Hz from 00:20 to 00:25, 6000 Hz from 00:25 to 00:30, 6100 Hz from 00:30 to 00:35, 6200 Hz from 00:35 to 00:40, 6300 Hz from 00:40 to 00:45, 6400 Hz from 00:45 to 00:50~~

