

A 10 MHz Reference Oscillator (Update)



This is an update on what I did in 2016 on this high stability 10 MHz reference oscillator. Here is a [link](#) to the original. Basically the internal 12 Volt regulator that was originally installed in the power supply was revised to 15 Volts. Also a couple of new calibrations methods were tried.

The Hewlett Packard crystal controlled reference oscillator used is very stable. I was using WWV on 10 or 15 MHz for a calibration source and I wanted to try some new calibration methods. One method tried was calibrating an RSP-1A SDR receiver using a signal from WWV as the calibration source. The reference oscillator was then substituted and then comparing the difference in PPM. The Software used, SDRUNO, has the ability to display this difference 3 digits past the decimal point. This calibration method relied on the short term stability of the RSP-1A. Another method used was with the FLdigi software. This also relied on the short term stability of the RSP-1A. This is my preferred method. Once again the signal substitution method was used as above. I am not going to go into detail how each method was done but just state my opinion on the outcome. The main problem with using WWV as a reference source is the inaccuracy of the received signal caused by Doppler shift. I spent a good amount of time trying to get the calibration as accurate as possible.

My conclusion is using the preferred calibration method I used I am fairly confident that the calibrated accuracy can be within 1 Hz at 10 MHz. Getting it to .1 Hz at 10 MHz is a challenge and would be by luck. There are others that may have difference opinions on this.

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