DXPATROL

10 000 000Hz GPSDO Reference from DXPatrol

This is our new issue, a low coast GPSDO developed for the most rigorous and demanding microwave enthusiasts.

The DXpatrol GPSDO uses a internal GPS reference original U-Blox 7N controlling a 10Mhz CTI - OCXO 0,05ppb * pure sine wave Oscillator

Features:

- GPS, Galileu, Glonass receiver
- 3 Outputs 10MHz 1.5vpp ~ 7dBm
- Duty cycle 50%
- Phase Noise @ 1Hz -80dBc/Hz
- Phase Noise @ 10Hz -120dBc/Hz
- Phase Noise @ 1KHz -145dBc/Hz
- Phase Noise @ 10KHz – 150dBc/Hz
- Second harmonic < 51dBs
- Third harmonic < 56dBs
- Turn ON time ~ 5 minutes
- Working Temperature range 0ºC to 75ºC

- Operating Temperature ~50º C (OCXO)
- Supply voltage 8V to 14V
- Current 600mA first minute, 270mA after lock
- Dimensions metal case : 84mm / 71mm / 25mm

How it works.

The U-Blox GPS receiver is programmed internal Flash memory so the internal synthesiser generates a 1000PPS frequency on is output.
Due the very high Jitter this modules produce, the signal sharpness was highly improved with a Schimtt Trigger to get a clean 1kHz square wave.
The OCXO 10Mhz passes through a chain of dividers so we had a 1000Hz to compare on a Phase Lock loop CD4046.

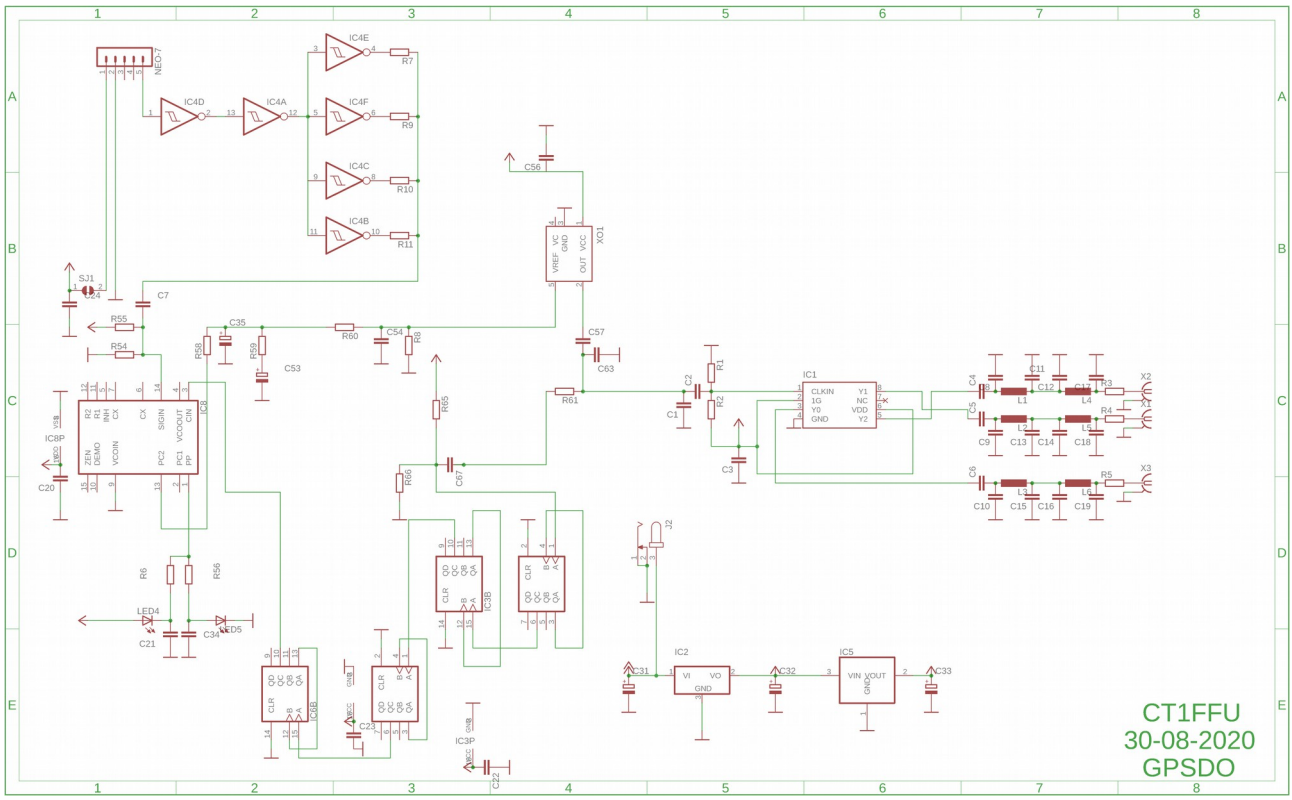

Fig 2 schematic

Operating.

This GPSDO is programmed in Hotstart mode. This means, even without antenna or any GPS signal received, the GPSDO will yet have a fair and accurate 10Mhz signal on it´s outputs.
However, as we are using a internal OCXO, Oven Controlled Oscillator, the internal heater will take about 5 minutes to achieve the operating temperature – 50ºC (this means you will feel the box a bit warm. That is normal)
After connect the supply, the 2 Leds, Green and Red will lit.
Green Led means GPS signal and OCXO signal are detected.
Red Led means Wait. Hold on a few minutes so Red led dims completely.

fig 4 Front view

Fig 5 Back View

Fig 5 GPS-Glonass antenna 4m long cable.

Some tests made by Miguel, CT1BYM

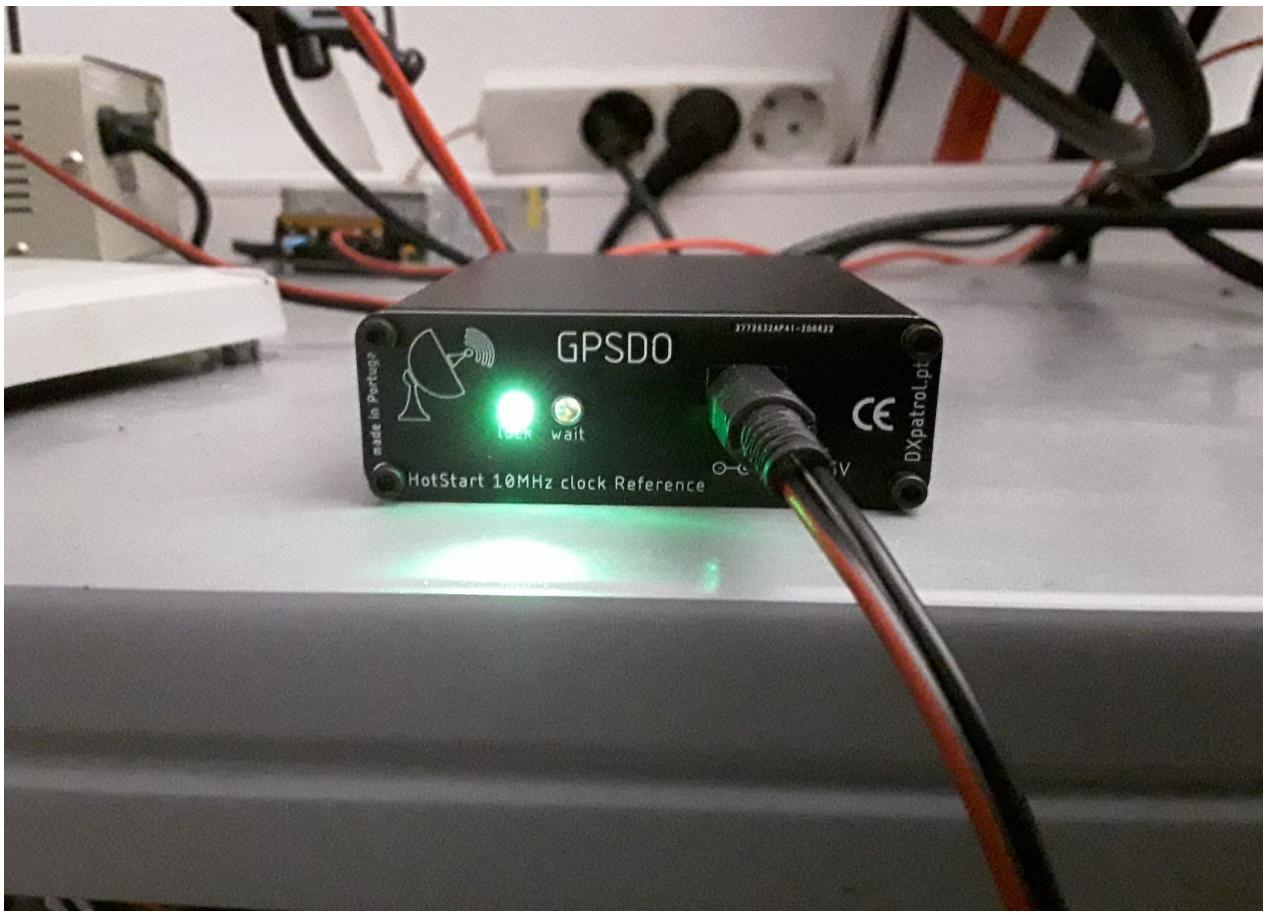

Fig 7 CT1BYM lab test begin.

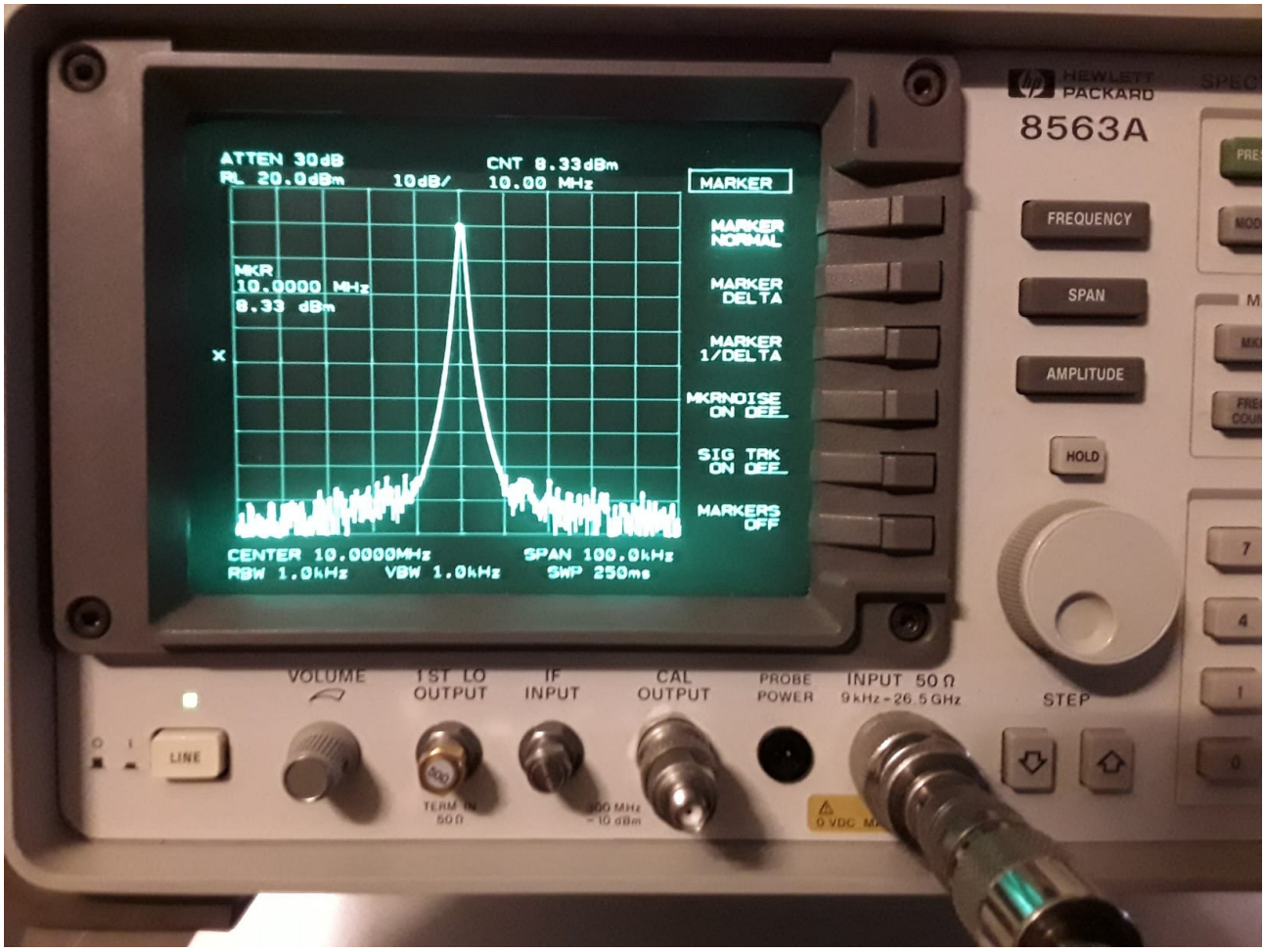

Fig 9 SA signal reading @ 100Khz span.

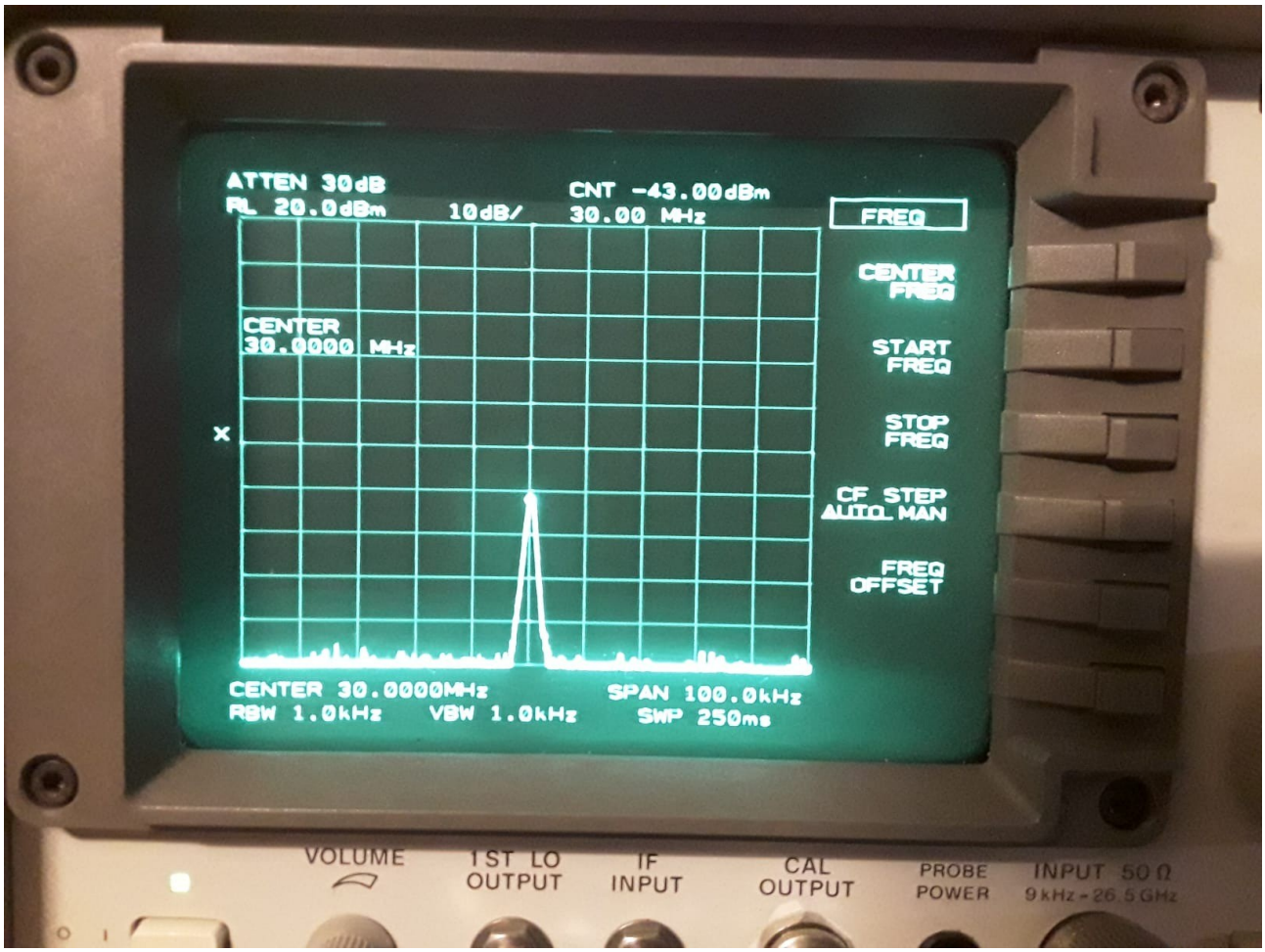

Fig 10 Second harmonic -43dBm

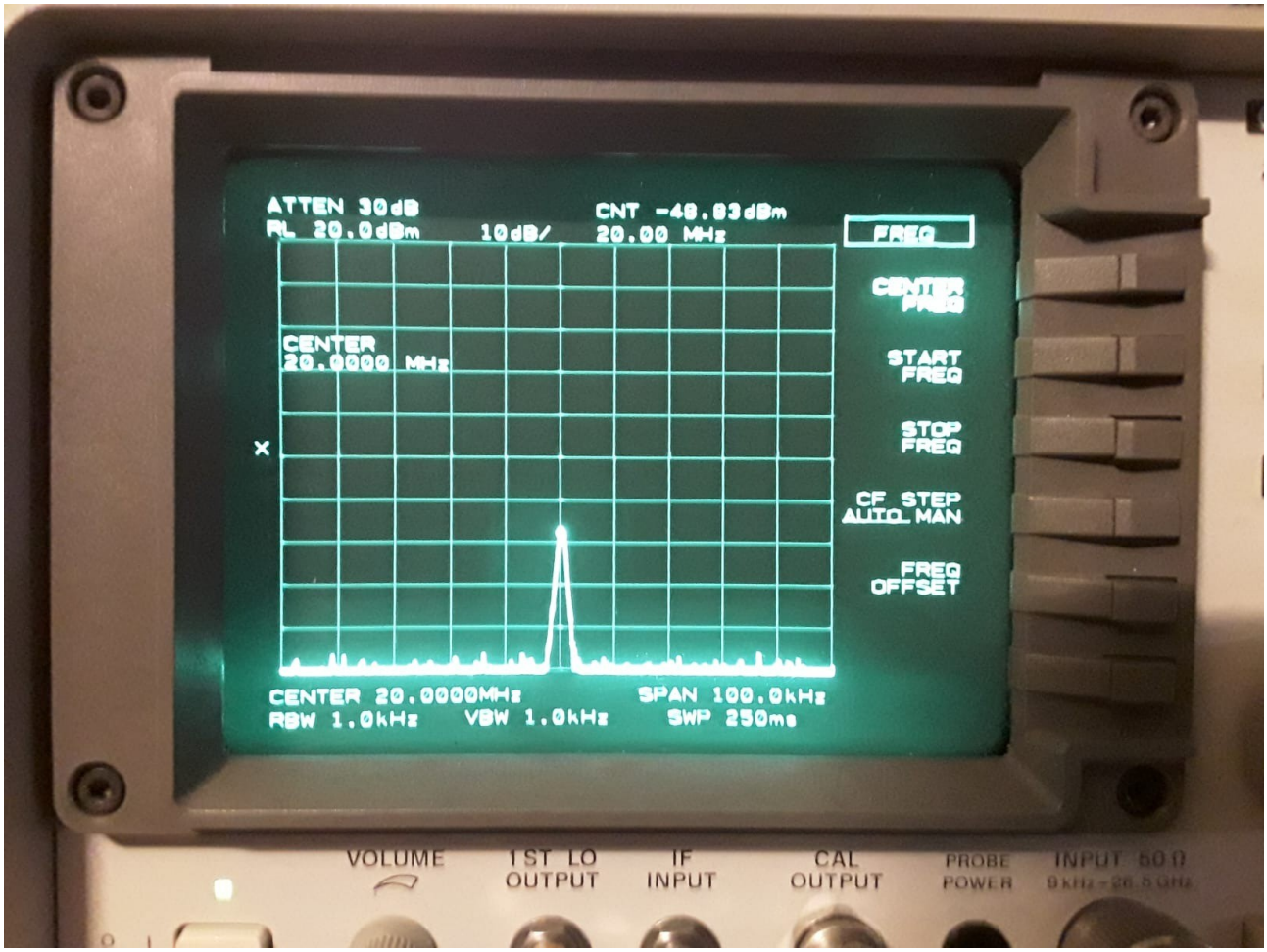

Fig 11 Third harmonic -49dBm

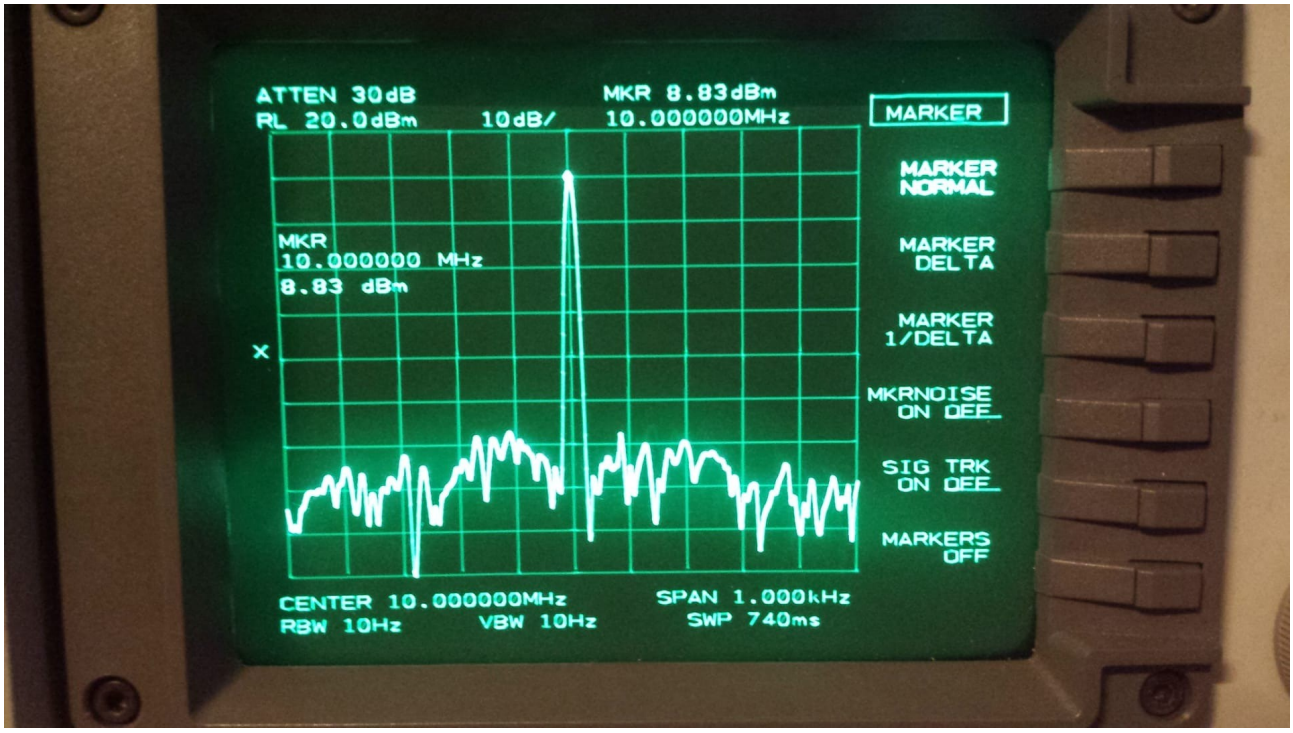

Fig 12 Frequency accurate

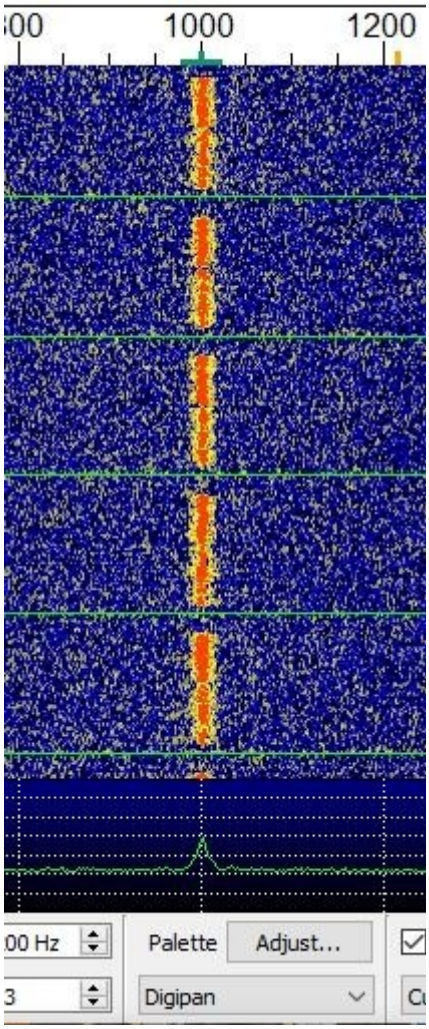

FIG 13 ON0EME reception using Dxpatrol GPSDO as reference.

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