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WEB Link with Photographs:

<https://www.hollywoodcontrols.com/pdf/HP004OK-kit-assembly.pdf>

Hewlett Packard HP004ATC OCXO Install Instructions

Thank you for purchasing this assembled form of our HP004OK OCXO time base. These install instructions are derived from our kit instructions and include some of the details from that assembly. There are several ways to adjust the OCXO if you feel the need to. (We have adjusted the OCXO in a 5316A using a GPSDO and a 15 sec gate time to obtain a 9 digit 10Mhz stable display. (10.0000000E6)

A word about OCXOs... There are three parameters to consider.

1. Precision – get the same results on every measurement
2. Accuracy – get the expected results on every measurement
3. Stability – get the same results day in and out, month in & out and so on

While the ideal may to have all 3 parameters spot on, for these two meters I would suggest that 1 & 3 are most important with this OCXO. Without a GPSDO at the minimum, you can't determine absolute accuracy (#2) and must trust someone else. Even with a GPSDO, it is known that some designs can have an offset in the 10Mhz output. (We use a Trimble Thunderbolt GPSDO to set oscillators after Lady Heather monitor demonstrates long-term stable operation.) But the precision and stability of the MV85 far exceeds the measurement capabilities of the HP5315/16 meters.

Whether you have an HP5315A/B or 5316A/B frequency Counter, the OCXO works the same. Both mount in horizontal positions. As noted in the following instructions, for best performance you will need a GPS Disciplined Oscillator (GPSDO) as a reference source if you intend to make further adjustments. Even with such a reference, if you adjust the OCXO on a bench in the open and then install it in a HP5315A or HP5316A you can expect a measured change in the frequency once the OCXO stabilizes in the closed meter. On the HP5316 you can both monitor and adjust the OCXO from a closed box. Without modifications, you can't do this with a HP5315A.

Cautions:

First and obvious, un-plug the meter from the mains! **Use reasonable ESD protection methods like mats & wrist bands.** Read all of the instructions first!

Bill of Materials Used in Kit Form

1. LD1085 or LD1086
2. 1 6-pin strip & 1 2-pin strip
3. 2-100 ohm resistors
4. 1-680 ohm resistor
5. 1-560 ohm resistor
6. 2-330uF E-caps
7. 1-10uF E-cap
8. 1 – 1nF leaded capacitor
9. 3 – 0.1uF leaded capacitors
10. 1-20K 25T pot
11. 1 PCB
12. 1 heatsink

13. 1 heatsink insulator
14. 1 #6-32 heatsink screw & washer & nut
15. 2 #6-32 screws & spacers & lock washers
16. 1 optional Morion MV85 OCXO module

Assembly Instructions

1. The original design was made for the HP5316A/B in which connector pins 1 & 6 appear to both connect to un-switched 9-10VDC power. However, on the 5315A/B things are a bit more confusing. The 5315A originally was available with battery power and NO OCXO option. (The 4hr normal battery run time would be severely reduced with OCXO.) On the series numbers below 2XXXA pin 1 is switched and is a separate circuit from the pin 6 10VDC. So in this situation either trim one pin off the header (5-pin) or cut pin 1 off after attaching the 6-pin header. In either case, just don't use pin 1 in a 5315 meter.
2. If you want to make further adjustments of the OCXO outside the meter, attach a scope or counter to pin 2 (10Mhz) & pin 3 (GND), (or on C1-A boards to the dedicated 2-pin header) and a 9-10VDC current limited (~600mA) power supply to pin 6 (+9VDC) & ground and ramp the supply from zero monitoring the current and scope. Initially 500-600mA is needed to heat the module. It should settle down to ~150mA.
3. Using the 20K pot, adjust the frequency to 10Mhz using a trusted 8-10 digit frequency counter or by using a 2-channel oscilloscope to zero the OCXO drift against a GPSDO.
4. If all is well, insert the module into the meter and fasten to the A1 PCB with included fasteners.
5. As noted earlier, you may want to readjust the OCXO once installed in a meter and closed up. But even without this step you should see a vast improvement in the time base temperature stability over the original XO or TCXO.

Please refer to the following photos as guidance.

Feedback on these instructions is always encouraged!

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Figure 1 Assembled Top View Ver B1-B

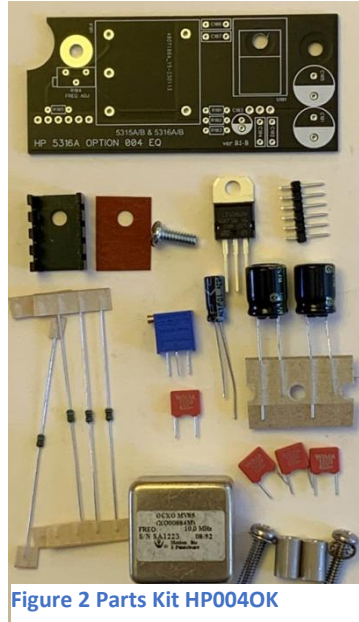


Figure 2 Parts Kit HP004OK



Figure 3 Bottom View

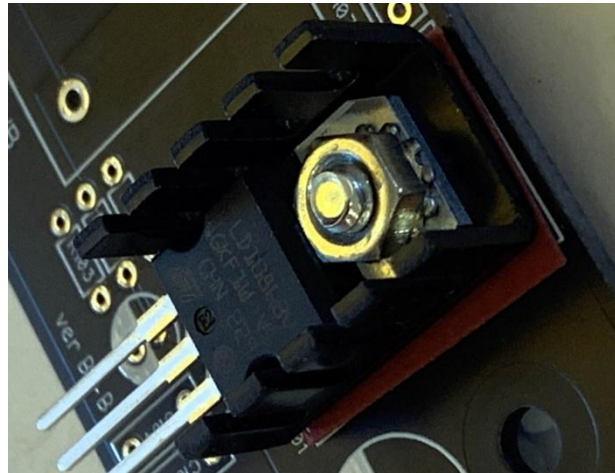


Figure 4 Mounting Regulator

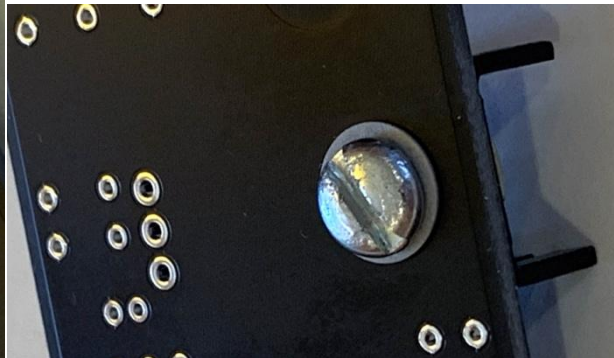


Figure 5 Top Ver C1-A (assembled & bare)