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Topic: **HP 58503A EFC error wont lock [FIXED]** (Read 3454 times)

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Samogon
 Frequent Contributor



Posts: 457
 Country:

HP 58503A EFC error wont lock [FIXED]

« on: May 05, 2017, 02:35:04 am »

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Hi,
 I have GPS standard HP 58503A which in past had broken power supply i have fixed it and unit started to work, but fails to lock, it can track birds and even syncs time, but reports health error EFC err (see print of system:status?)
 Also diagnostic shows no errors.
 It had problems with +15V being out of tolerance ~19V.
 I wonder if it could affect some componets that now it has this EFC error.
 Can someone point me where to dig with this error?
 Thanks

```

----- Receiver Status -----
SYNCHRONIZATION ..... [ Outputs Invalid ]
SmartClock Mode _____ Reference Outputs _____
  Locked                TFOM   9          FFOM   3
  Recovery              1PPS TI  --
  Holdover              HOLD THR 1.000 us
>> Power-up: coarse freq adj [TI +162.0 ns]  Holdover Uncertainty _____
                          Predict  --
    
```

```

ACQUISITION ..... [ GPS 1PPS Valid ]
Tracking: 7 _____ Not Tracking: 3 _____ Time _____
PRN  EI  Az  SS  PRN  EI  Az          LOCAL  08:17:16 [?] 18 Sep 1997
    
```

```

10 26 158 30 1 12 273      GPS 1PPS Synchronized to UTC
14 56 39 99 3 17 319      ANT DLY 0 ns
16 26 191 20 *25 20 41     Position _____
22 42 304 114              MODE Hold
26 55 176 38
31 59 358 129              LAT N bla-bla-bla
32 46 76 135               LON W bla-bla-bla
                               HGT +20.50 m (MSL)

```

ELEV MASK 10 deg *attempting to track
HEALTH MONITOR [ERROR]
Self Test: OK Int Pwr: OK Oven Pwr: OK OCXO: OK **EFC: Err** GPS Rcv: OK
E-113> DIAG:LOG:READ:ALL?
Log status: 3 entries

Log 001:20001016.16:16:27: Log cleared
Log 002:20001016.16:22:00: GPS reference valid at 19970918.03:27:55
Log 003:20001016.20:37:02: Position hold mode started

« Last Edit: May 06, 2017, 01:46:17 pm by Samogon »

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TheSteve

Supporter



Posts: 3490

Country:

Living the Dream



Re: HP 58503A EFC error wont lock

« Reply #1 on: May 05, 2017, 03:47:49 am »

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Have you monitored the adjust voltage to the OCXO as it warms up and tries to lock?

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VE7FM

edpalmer42

Super Contributor



Posts: 2060

Country:



Re: HP 58503A EFC error wont lock

« Reply #2 on: May 05, 2017, 04:22:06 am »

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What's the response to the :DIAG:ROSC:EFC:REL? command? If its near 100 or zero then either your OCXO has drifted with age to the point where its frequency can't be corrected or maybe it has a fault with the oven. Replacement or major surgery is required.

Which oscillator is in yours?

Ed

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Samogon

Frequent Contributor



Posts: 457

Country:



Re: HP 58503A EFC error wont lock

« Reply #3 on: May 05, 2017, 05:28:43 am »

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Thank you guys, will check it tomorrow.
When i was measuring 10MHz output without antenna it was 9999840Hz compared with well known rubidium source used as reference frequency for agilent 53150A.

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edpalmer42

Super Contributor



Posts: 2060

Country:

Re: HP 58503A EFC error wont lock

« Reply #4 on: May 05, 2017, 05:43:27 am »

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Quote from: Samogon on May 05, 2017, 05:28:43 am

Thank you guys, will check it tomorrow.
When i was measuring 10MHz output without antenna it was 9999840Hz compared with well known rubidium source used as reference frequency for agilent 53150A.

160 Hz doesn't sound like drift. It's about the right error for a dead oven on an SC-cut oscillator.

Ed



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Samogon

Frequent Contributor



Posts: 457

Country:



Re: HP 58503A EFC error wont lock
« Reply #5 on: May 05, 2017, 06:38:11 am »

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Is it repairable or needs to be changed?

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Samogon

Frequent Contributor



Posts: 457

Country:



Re: HP 58503A EFC error wont lock
« Reply #6 on: May 05, 2017, 02:30:58 pm »

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Quote from: edpalmer42 on May 05, 2017, 04:22:06 am

What's the response to the :DIAG:ROSC:EFC:REL? command? If its near 100 or zero then either your OCXO has drifted with age to the point where its frequency can't be corrected or maybe it has a fault with the oven. Replacement or major surgery is required.

Which oscillator is in yours?

Ed

Here is what it reports +9.99969E+001

Oscillator is: hp 10811-60159

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edpalmer42

Super Contributor



Posts: 2060

Country:



Re: HP 58503A EFC error wont lock
« Reply #7 on: May 05, 2017, 03:20:13 pm »

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Almost anything can be repaired if you work hard enough at it.

There's lots of info online on the 10811 oscillator, including full schematics, so repair is possible. The 60159 version is a bit rare, though. I see that one is for sale on ebay. It looks like the unit is soldered shut. That will make repair a pain. Unsoldering oscillators is a bit of an art. Do it wrong and you overheat the interior.

The first step is to pull the oscillator and power it up on the bench so you can do some testing. Check obvious things like current draw, frequency while warming up, response to EFC voltage, etc. Confirm that the fault is in the oscillator rather than the 58503A. You mentioned power supply problems with the 58503A. Maybe the oven isn't getting any power.

Ed

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Samogon

Frequent Contributor



Posts: 457

Country:



Re: HP 58503A EFC error wont lock [FIXED]
« Reply #8 on: May 06, 2017, 06:55:58 am »

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There was +12V regulator dead on main board which was supplying power to oven with conjunction of -12V they were supplying 24V of OCXO.
Thank you guys



hp-58503A.JPG (84.43 kB, 640x480 - viewed 192 times.)

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edpalmer42

Super Contributor



Re: HP 58503A EFC error wont lock
« Reply #9 on: May 06, 2017, 07:57:45 am »

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Posts: 2060

Country:



Samogon

Frequent Contributor



Posts: 457

Country:



edpalmer42

Super Contributor



Posts: 2060

Country:



Samogon

Frequent Contributor



Posts: 457

Country:



edpalmer42

Super Contributor



Posts: 2060

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That looks more like it! What's the :DIAG:ROSC:EFC:REL? command give now? You can expect it to move rather quickly for a few weeks and then gradually slow down over the coming months.

Ed

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Re: HP 58503A EFC error wont lock [FIXED]

« Reply #10 on: May 06, 2017, 05:50:21 pm »

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It is +8.68492E+001

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Re: HP 58503A EFC error wont lock [FIXED]

« Reply #11 on: May 06, 2017, 06:28:07 pm »

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So that's 86.8%. Watch it to see which way it goes.

My Z3801A (a cousin to your 58503A) started in Oct. 2012 at about 51.2%. It's now about 55.5%. The numbers aren't directly comparable to yours because mine has a different OCXO, but you should be good for a long time. If your oscillator happens to age down instead of up, you'll never have to worry about it.

Another piece of data you might want to record is the response to the :DIAG:LIF:COUNT? command. This tells you how long your receiver has been running since it came out of the factory. Each count = 3 hours of runtime.

Ed

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Re: HP 58503A EFC error wont lock [FIXED]

« Reply #12 on: May 06, 2017, 06:46:32 pm »

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30864 hours.
+8.67462E+001 going down 😞

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Re: HP 58503A EFC error wont lock [FIXED]

« Reply #13 on: May 06, 2017, 07:05:05 pm »

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Only 3.5 years of runtime? Barely broken in!

👍😄 We're done! 👍😄

Ed

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