

/ Topics (<https://groups.io/g/HP-Agilent-Keysight-equipment/topics?p=,,,0,0,0,0>)
/ CLIP/Schematics for E4403-60042 Tracking Gen



Mute This Topic (<https://groups.io/g/HP-Agilent-Keysight-equipment/ft/76301656?csrf=5513314409256117711&mute=1&p=Created%2C%2C%2C20%2C1%2C0%2C0>)

CLIP/Schematics Date (<https://groups.io/g/HP-Agilent-Keysight-equipment/topic/76301656?p=Created%2C%2C%2C20%2C1%2C0%2C0>)
for E4403-60042
Tracking Gen



2020-09-24 (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/110356>)

Hi Sandra,

quick addition:
looks like the TG level detector is located directly at the input of the 1GG5-4202.

Regards,
Jürgen

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2020-09-24 (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/110356>)

Hi Sandra,

I just finished collecting your great BITG teardown pictures, thank you for sharing them!
I never dared to teardown the BITG myself.

After studying the signal flow, I would start looking at the HMC346C8 next to the HMC129G8 Mixer, that's the only variable attenuator I was able to spot,
Not sure where the level measurement for the levelling control is happening.

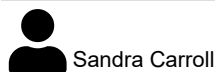
A bit of a question mark is the 1GG5-4202. I found it mentioned here:
<https://community.keysight.com/message/60593?commentID=60593#comment-60593> (<https://community.keysight.com/message/60593?commentID=60593#comment-60593>)
where it was called a limiter.

Regards,
Jürgen

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2020-09-24 (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/110346>)

Hi Jürgen

Thank you for the comments.

I'm just starting the post so far and far from done. I only looked at the FETS and PIN diode on the control board since it looked like some were replaced.

I've disassembled the A2A2 and took pics of it as well and will be posting those shortly.

Sent from my iPhone 7 Plus

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Juergen

2020-09-24  (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/110344>)

Hi Sandra,
I had a close look at your EEVBlog posts - very nice work.

However, I think you might be looking in the wrong place.

AFAIK the TG has two levelling control loops, one on the control board, and one inside the A2A2 module.

The control board is supposed to provide LO with constant level of 13dBm, and you'll see an error like "Source LO unlevel" if unlevelled. To double-check you might want to measure the pin modulator control voltage (labelled "bias" on the board) and whether it reaches its limits (0..-15V)-

In contrast the A2A2 module will provide you a "source unlevel" error.
If you disconnect the LO input you should see both "unlevel" errors (that's what I got).

Since you only see the "Source Unlevel" message, I suspect you'll need to have a look inside the A2A2 module..

Regards,
Jürgen

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Sandra Carroll

2020-09-23  (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/110331>)

Hi Jürgen, All

FWIW, I'm documenting my repair attempt over on eevblog in the repair section
<https://www.eevblog.com/forum/repair/e4407b-tracking-generator-repair/msg3246938/#msg3246938>
(<https://www.eevblog.com/forum/repair/e4407b-tracking-generator-repair/msg3246938/#msg3246938>)

I've post my initial work and a boatload of pic of the control board.

If there is interest I'll be happy to post the pics here as well in the photo section

Thanks
Sandra

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Juergen

2020-09-22  (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/110305>)

Hello Sandra,
that's no special project, just the AYZ (External Mixing) option that came with the unit.

Regards,
Jürgen

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Sandra Carroll

2020-09-22  (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/110280>)

Thank you very much for sharing those.
That routing does not look much like they way they show it in the IDN Installation Guide.
But cool the semi rigid cable is easier to work with. I do see hardline used for the front panel LO. I see you have the connector for the Front Panel IF but no cable in place
Is that a project you're working on?

Sandra

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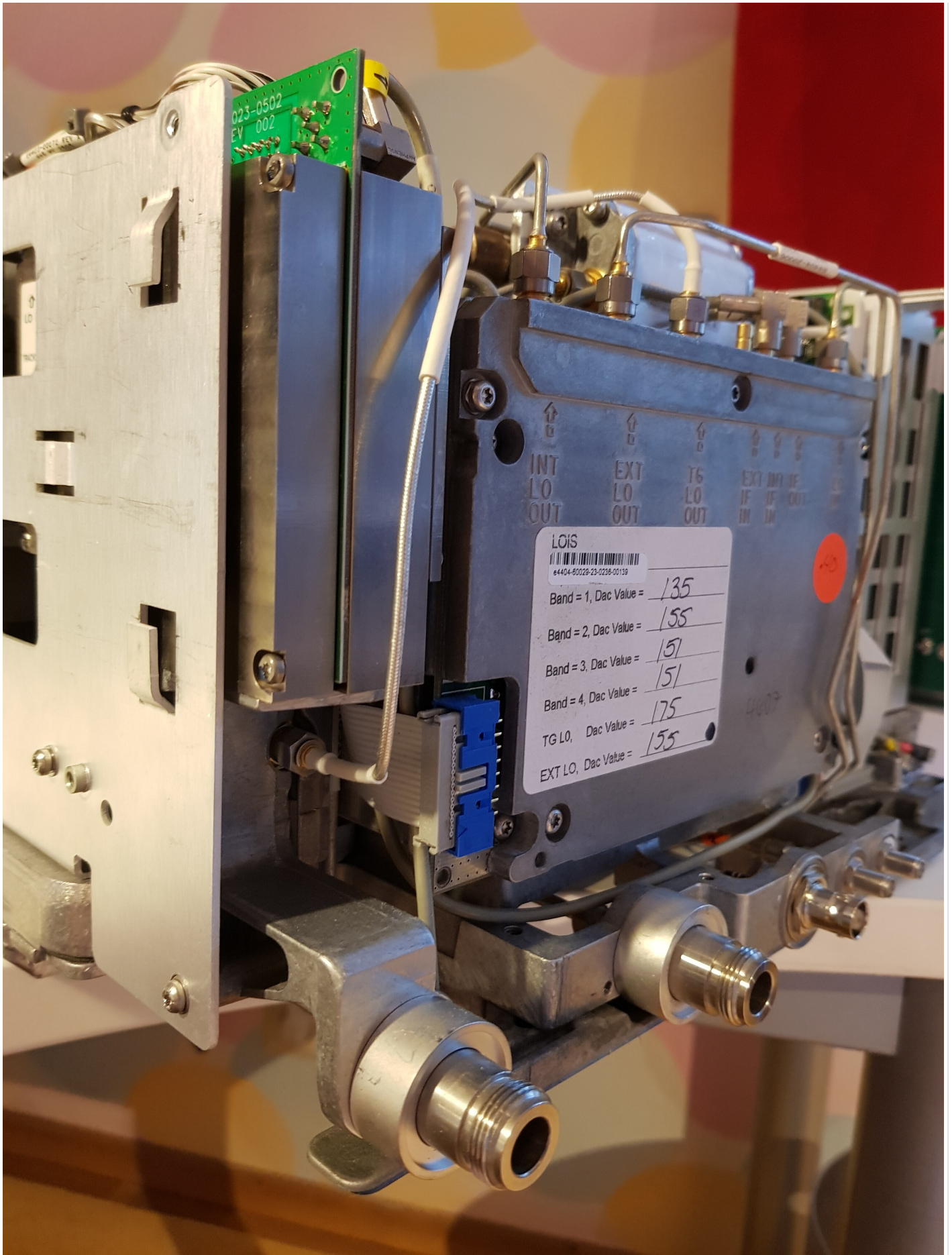
Juergen

2020-09-22  (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/110279>)

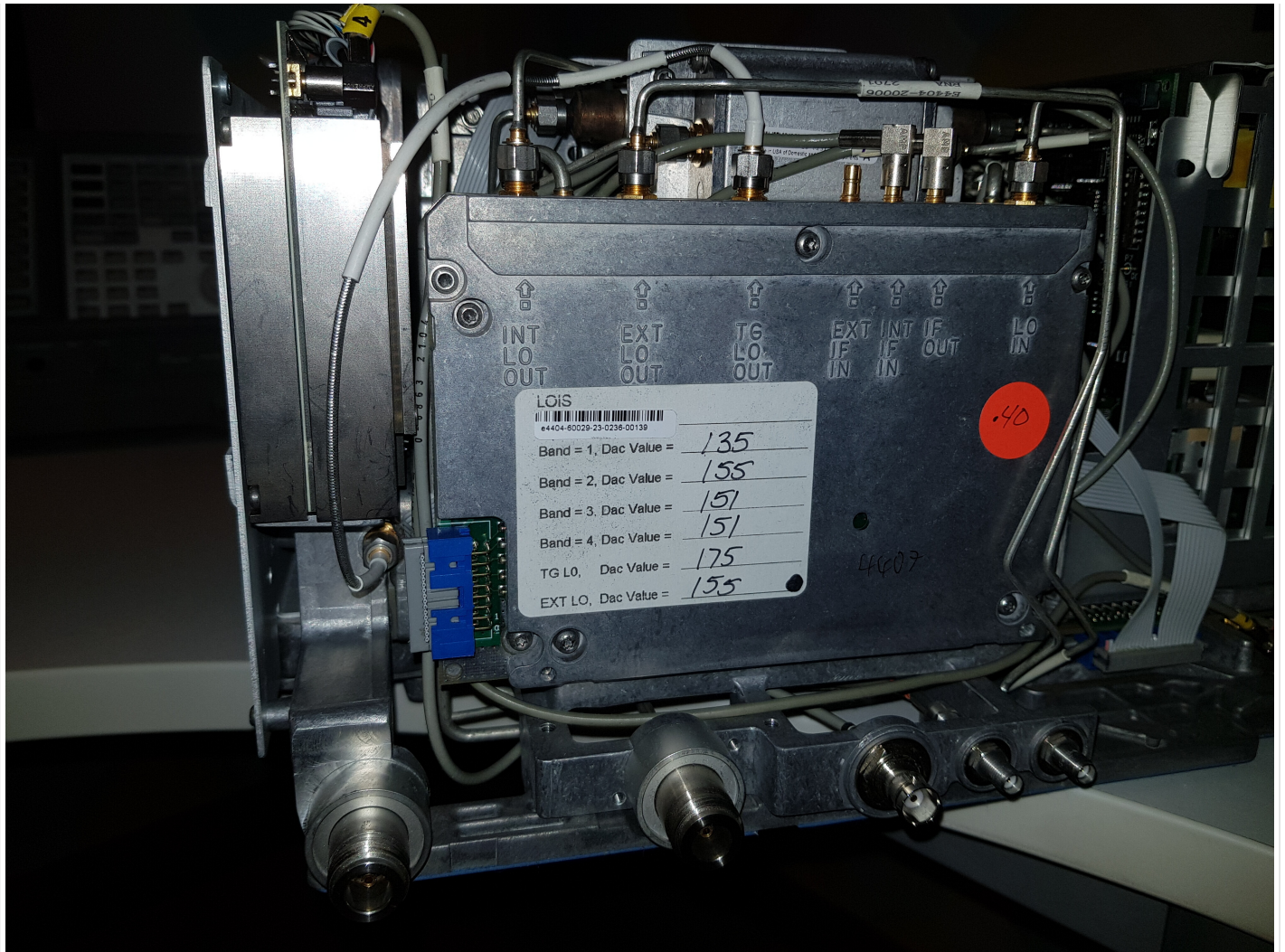
Hello Sandra,
as promised, you can find attached two pictures of the TG wiring.

Good Luck,
Jürgen





(https://groups.io/g/HP-Agilent-Keysight-equipment/attachment/110279/0/20200922_185153.jpg)



(https://groups.io/g/HP-Agilent-Keysight-equipment/attachment/110279/1/20200922_185459.jpg)

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Juergen

2020-09-21 (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/110269>)

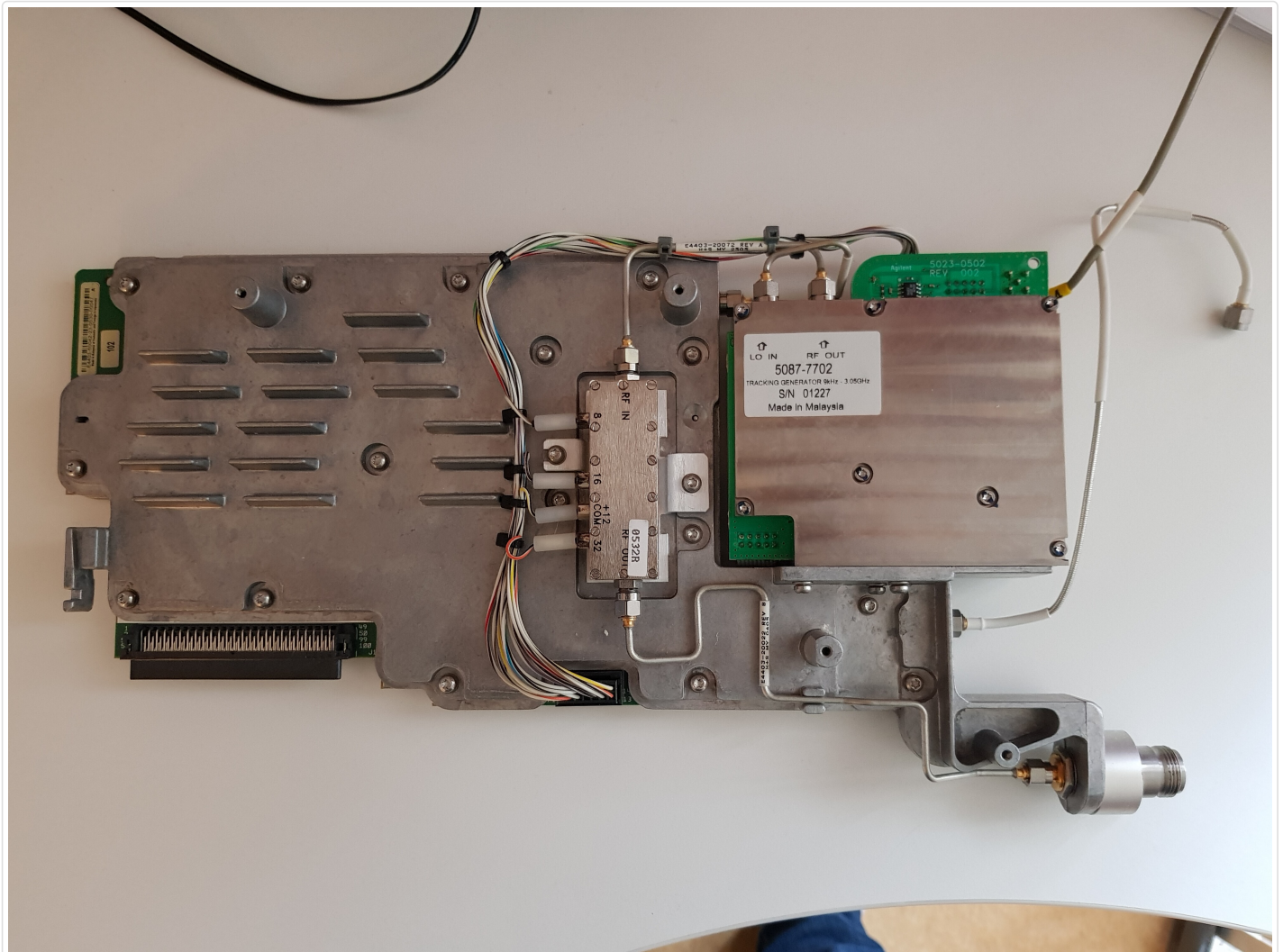
Hi Carol,
I only had troubles when I removed the front panel the very first time since I then forgot to remove the screws on the bottom side of the panel :(

I presume you created a real semi rigid cable for the TG-LOIS connection? The original cable is much more flexible, and is called conformable cable, according to Wikipedia.

I took lots of pictures when I repaired my TG, but alas, no one shows the connection to LOIS.
I append a picture of the TG alone which clearly shows the original cable.
When I have some time, I can open my unit and take a few more pictures, but this cannot happen before today evening (CET).

About the mysterious "source unlevel" errors, I would recommend to remove the connection to the output step attenuator and instead add a termination for testing.
Maybe one of the attenuators is damaged and causes an open or short output? If that's the case, the messages should vanish with a terminator.
Otherwise I fear that the problem lies inside the magic and entirely undocumented 5087-7702 box.

Regards,
Jürgen



(https://groups.io/g/HP-Agilent-Keysight-equipment/attachment/110269/0/20200514_163121.jpg)

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Sandra Carroll

2020-09-21  (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/110268>)

Jürgen

I've started my repair of the TG on my E4407B and have a question to get to the FETS/PIN Diodes

I'm having one hell of a time removing the front/read covers. I've removed all the screws. but it does not want to budge. before I use more brute force (which is usually not a good idea) did you have difficulties removing them as well? do you need to remove the Attenuator? I have not remove it as it does not look like its' screwed thru to the back plate

also if you're able/willing. I would love to see a pic showing the cabling from the TG to LO on the LOIS. I don't have that cable, I've made one up but would love to see how its supposed to be routed vs my interpretation from the installation guide. I realize you have to open up the SA and remove the front panel but if possible would you do me that favor???

I have what I find unusual symptoms since I started playing with it
3db to -6fb I have source unlevel
then 6db to -9.5 is good, signal is leveled
the -10 to -14 is unlevelled
-14 to -17 is good
This pattern repeats down to -66db
so at certain ranges its unlevelled.

This make sense its' still a FET or Pin Diode?

Thank you
Sandra

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Sandra Carroll

2020-08-26  (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/109512>)

Just a quick update

I had reason to question the cable from the LOIS LO to the TG LO so I replaced it today (also one of the first times I used induction soldering to do the SMA connector to the RG405 semi-rigid cable)
in doing so I now have this symptom
the Source LO Unlevel is gone
I now have a Source Unlevel but only above 2.212Ghz, it becomes unstable there then by 2.213 its consistently got the Source Unlevel.

I know this is a long shot but I'm wonder that while yes a bad fet or pin diode is still suspect, what about a cold solder joint.
I'm going to have to pull the board soon and check but found that out today about the LO cable.

Sandra

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Sandra Carroll

2020-08-22  (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/109424>)

Hi Jürgen

Thank you for the reply.
I will check those out as well.

Sandra

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Juergen

2020-08-22  (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/109402>)

Hi Sandra,

I had exactly the same error messages with my E4407, and it turned out that all the FETs were Ok, but one of the 4 pin diodes in the "LO PIN Modulator" was open.

This pin modulator is also located in the 3GHz Tracking generator driver, and the schematics are included in the CLIP from ArtekManuals.

Since those diodes turned out to be difficult to source, I just shorted out the open diode as an quick interim solution, and the instrument works fine with only 3 pin diodes.

Regards,

Jürgen

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Sandra Carroll

2020-08-21  (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/109397>)

Hi John

I did see that in the ArtekManual CLIP but didn't think it was the one I had, I'll take another look.

the ATF 13484 i can find but whew, 20 each, but at least I can find those.

Heres what the service note "E4407B-07" states btw

If the error message is "**Source L.O. Unlevel**", the 3.0 GHz Tracking Generator Control board assembly can be the cause. This only relates to instruments with option 1DN, Tracking Generator. NOTE: Assemblies should ONLY be changed if one of the two error messages is displayed on the analyzer screen. The RF assembly has (4) 1855-1096 F.E.T.'s loaded on it. The L.O. Amp/I.F. Switch has (6) F.E.T.'s loaded on it. **The 3 GHz T.G. Control board assembly has (8) F.E.T.'s loaded on it.**

I'd like to look at the output of the LOIS but the E4407B is the only SA I have that goes above 2.7ghz.

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John Gord

2020-08-19 (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/109346>)

Sandra,

The E4401 CLIP from ArtekManuals includes the 3GHz TG control and TG LO amplifier schematics, but not the 3GHz TG RF output. I think that the LO amplifier schematics include the 8 FETS you mention. The part number is 1855-1096 on the part list, but 1855-1022 (ATF 13484) on the schematic.

--John Gord

On Wed, Aug 19, 2020 at 08:47 PM, Sandra Carroll wrote:

I'm looking for any schematics of the 3Ghz Tracking Gen for the E4407B
 Mine is giving a Source LO Unlevel/Source Unlevel
 This does match a service note where is says the 1855-1096 FETS of which there are 8 in the TG may be defective.
 asside from these are a Agilent part which is not order-able.
 I would like a schematic of the unit to understand it better.

BTW, this the the one posted over at EEVBLOG with the processor problem which turned out it was basically bricked if anyone followed that thread.

TIA
 Sandra

Sandra,

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--John Gord

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Sandra Carroll

2020-08-19 (<https://groups.io/g/HP-Agilent-Keysight-equipment/message/109343>)

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TIA

Sandra

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