



/  Topics (<https://groups.io/g/TekScopes/topics?p=,,,0,0,0,0>)
/  SG503 - low output frequency on 100-250MHz range?




🔊 Mute This Topic (<https://groups.io/g/TekScopes/ft/90545078?csrf=5513314409256117711&mute=1&p=Created%2C%2C%2C20%2C%2C0%2C0>)

SG503 - low output frequency on 100-250MHz range? Date ▼ (<https://groups.io/g/TekScopes/topic/90545078?p=Created%2C%2C%2C20%2C1%2C0%2C0>)



Jared Cabot

1:28am  (<https://groups.io/g/TekScopes/message/193251>)

Just an update to say I got it working. :)

I replaced the metal film resistors I put in positions R145, R150 and R146 with SMD resistors that I soldered tinned copper wire to to make them axial components, and I also found I had put a 130R part in position R150 (I was copying like for like when replacing the carbon composites that were already there) and it helped marginally by increased the maximum frequency by a few MHz. Hmmm.

In the mean time, I got my hands on a late model SG503, so I was able to compare my faulty one to a virgin unit unsullied by human hands... This new unit had the L143 air-cored coil used for the 100-250MHz range adjustment stretched way out compared to my faulty one for less inductance, so I matched it in the faulty unit and found the frequency limit rose by a few more MHz.

Ok, so we have too much inductance, so I checked LR140 (a 47R carbon comp resistor with enamel wire wound around it for 20nH of inductance) in the new unit and saw it has just one and a half turns.

I had previously made my own replacement part for the faulty unit with the same ingredients, as the original was broken by some ham-fisted pokings before I purchased it. However, it was difficult to count the number of turns, so I made a best guess and it turns out I used to many turns.....

I found my last spare 47R 1/8W carbon composite resistor (mil-spec too!) and replicated the one found in the new SG503 with just 1.5 turns and stuck it in.

Bingo! My max frequency is now at 261MHz, perfect! A good bit of headroom to compress the air-core inductor L143 back down for best performance when I get my hands on a spectrum analyzer (planned as my next big purchase).

I assume that a few bits were somehow broken in that area in the past and some were replaced (badly), that 130 ohm R150 must have had an incorrect replacement installed before I got it, and LR140 was broken along with C150 (51pF) which I have already replaced with an NP0/C0G part.

Anyway, now that the parts in the no-longer-faulty unit match the working late model SG503, it's fixed, working well, and ready for me to hold my tongue at the right angle and give the adjustments a tweak.

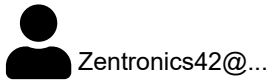
Thanks all for the help. :)

Jared.

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Apr 20 <https://groups.io/g/TekScopes/message/192709>

Metal film resistors do have an inductive property to them and act strange at higher frequencies. And are helical cut so from a construction standpoint would be a resistor with inductive properties or a small inductor with resistive properties. Carbon film as drifty as it is, is still highly desired at high frequencies. 200+Mhz I personally would consider mid to high frequency range of things.

Zen
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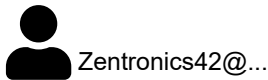


Apr 20 <https://groups.io/g/TekScopes/message/192707>

Today I removed the variable capacitor, disassembled it, cleaned it (including ultrasonic cleaner with isopropyl alcohol to remove all the old flux etc) then reassembled with new grease and a tiny bit of deoxit on the sliding contacts. Testing it out, it feels really smooth now :) BUT, my 100-250MHz range is still outputting 87.2-230MHz, it now stays leveled until 230MHz, but after that it unlevels every time (I can adjust LR40 to get me up to 233MHz maximum).

I just thought actually, I replaced some drifted carbon composite resistors around the place with metal film. Could they be having an effect if they are slightly inductive or capacitive?

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Apr 19 <https://groups.io/g/TekScopes/message/192690>

With the low side being way below expected I would suspect the capacitor it seems like the entire frequency range is shifted. On thing to not in tuning the 503 is some of the ranges are not tuned for frequency range but harmonic suppression as well as making the expected range.

Zen
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Apr 19 <https://groups.io/g/TekScopes/message/192681>

thé varicap may not bé correctly polarisée had this issue with. leaking variable capacitor

Envoyé depuis mon Redmi 4X
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Jared Cabot

Apr 19 (<https://groups.io/g/TekScopes/message/192679>)

Ok, I gave LR140 a tweak, and found that squeezing the coils closer shifts the frequency range down a little (a couple MHz) and spreading the coils apart raises it by the same.

I also found that the unit is flashing the display to say the output is unlevelled above 228MHz. So at the moment I have the inductor set so that the maximum frequency is 228MHz, this means at the moment the 100-250MHz range has a span from 85MHz to 228MHz

So still on the hunt.... I'll have to look deeper to see if some component is out of spec. I might give the variable capacitor a careful teardown and clean too.

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Jared Cabot

Apr 18 (<https://groups.io/g/TekScopes/message/192672>)

On Tue, Apr 19, 2022 at 04:48 AM, David C. Partridge wrote:

Clean the cam switch contacts (isopropyl alcohol and cartridge paper).

D.

I did clean the contacts before but I did so again to no change unfortunately.

On Tue, Apr 19, 2022 at 03:31 AM, Bob Haas wrote:

L143 on the back of the main board is the adjustment for the high range. After tweaking for the high end of the range, check the low end.

--

Bob Haas

I'll give that one a tweak tonight.

Do you know if the position that LR140 is soldered to L143 is critical? I has to replace that part and soldered it as accurately as possible, I'm pretty sure I got it spot-on, but it may require an adjustment for the tolerances of the new part.

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si_emi_01

Apr 18 (<https://groups.io/g/TekScopes/message/192669>)

Oh, okay.

Thanks,
Ross

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David C. Partridge (/g/TekScopes/profile/@perdrix)

Apr 18 (https://groups.io/g/TekScopes/message/192668)

I think you call it typewriter/inkjet printer/laser printer paper - just a two nations divided by a "common" language issue 😊

I say tomato, you say tomayto ...

D.

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si_emi_01

Apr 18 (https://groups.io/g/TekScopes/message/192654)

David,

What is the Cartridge Paper you refer to? Just curious, never heard of that before.

Ross

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David C. Partridge (/g/TekScopes/profile/@perdrix)

Apr 18 (https://groups.io/g/TekScopes/message/192652)

Clean the cam switch contacts (isopropyl alcohol and cartridge paper).

D.

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Bob Haas (/g/TekScopes/profile/1960198)

Apr 18 (https://groups.io/g/TekScopes/message/192648)

L143 on the back of the main board is the adjustment for the high range. After tweeking for the high end of the range, check the low end.

--

Bob Haas

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Jared Cabot

Apr 18 (<https://groups.io/g/TekScopes/message/192645>)

Hi all,

I just finally got my SG503 reassembles after replacing all the horrible TI IC sockets, corroded IC's, drifted carbon composite resistors, a broken 20nH inductor (LR140), scratchy trim pots, an intermittent crystal with a Vectron OCXO on a small daughter-board, and the front panel pieces with NOS parts.

On testing the output frequency ranges, I found I am having an issue where the 100-250MHz range only goes to 236MHz with the dial turned all the way to the right. All the other ranges are within spec.

There doesn't seem to be any adjustment for the frequency range, so does anyone have any experience or ideas I can try to rectify this?

Thanks!
Jared.

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(<https://groups.io/g/TekScopes/topic/91028514?p=,,,20,0,0,0:,,,0,0,0,91028514>)

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