Optimizing OWON SDS Series

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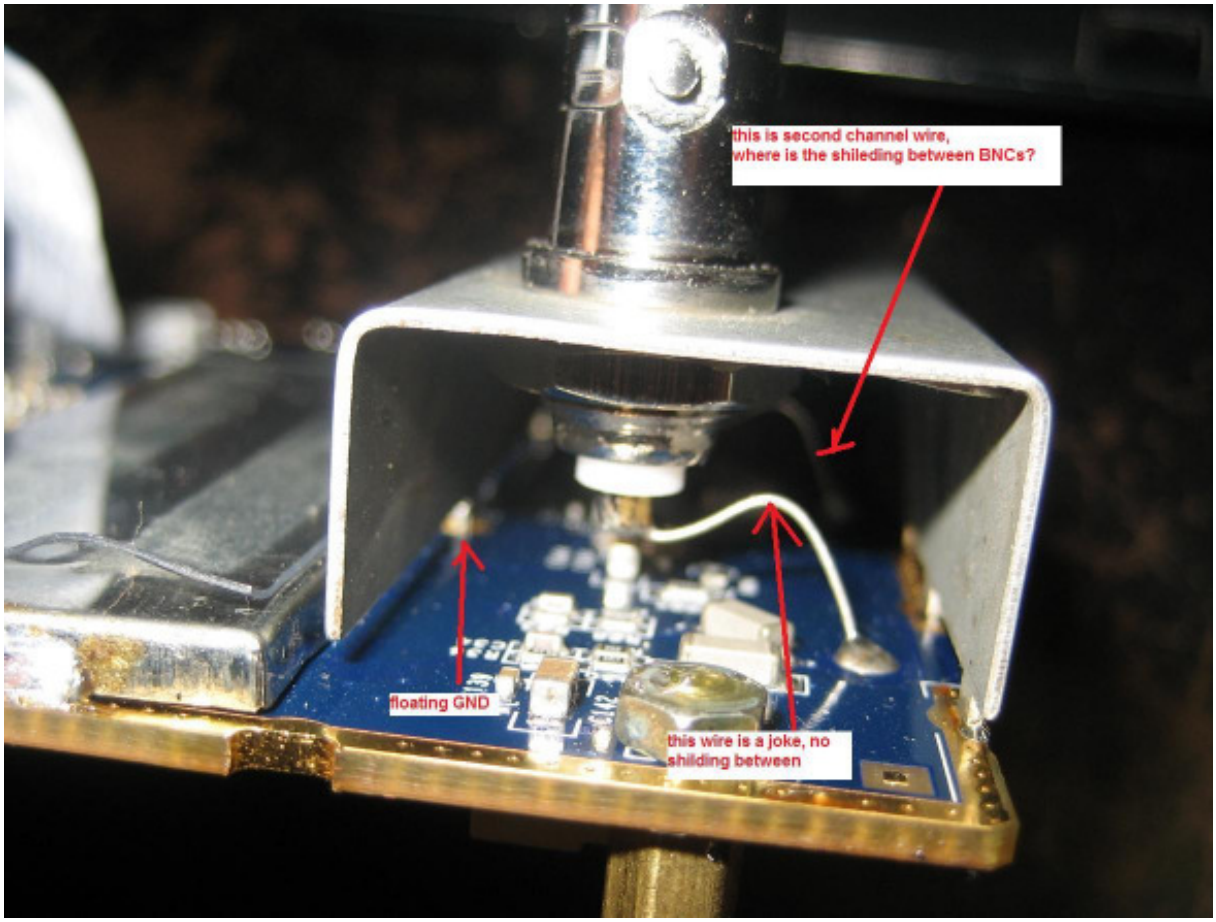
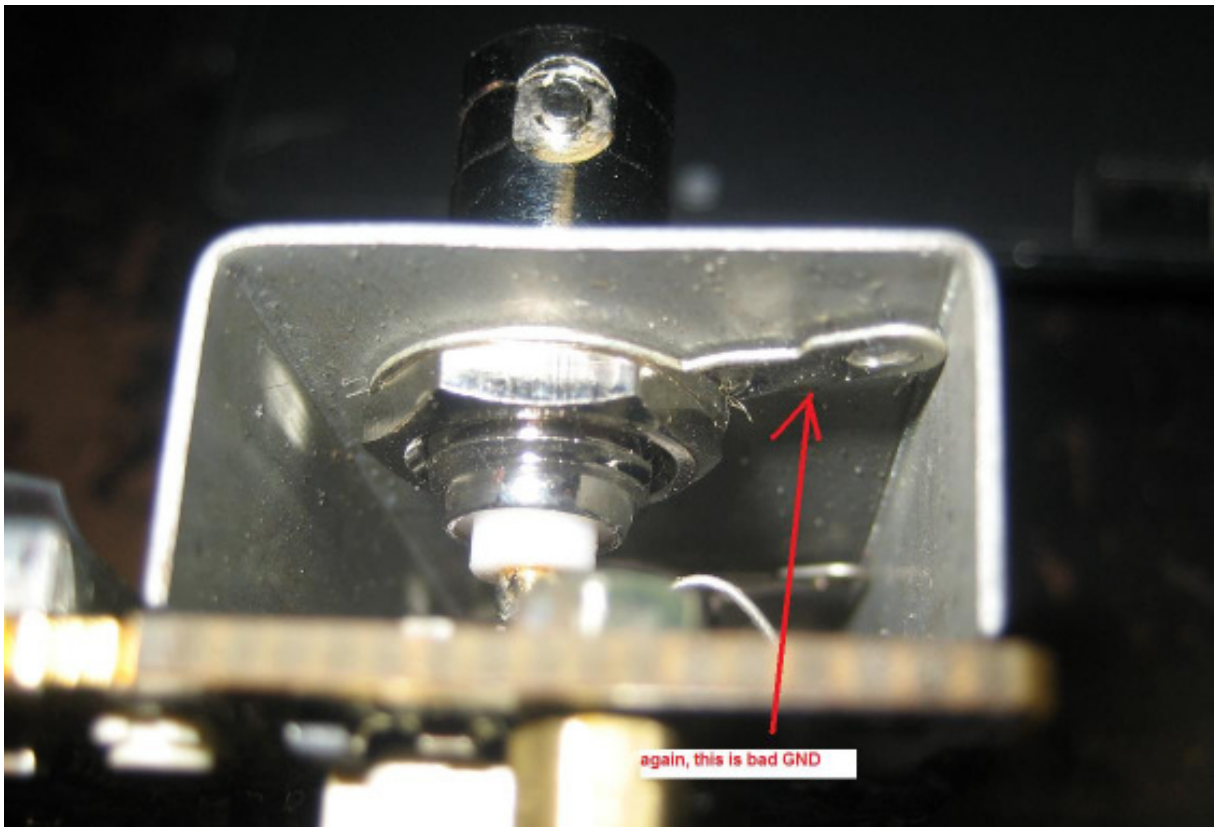
Introduction

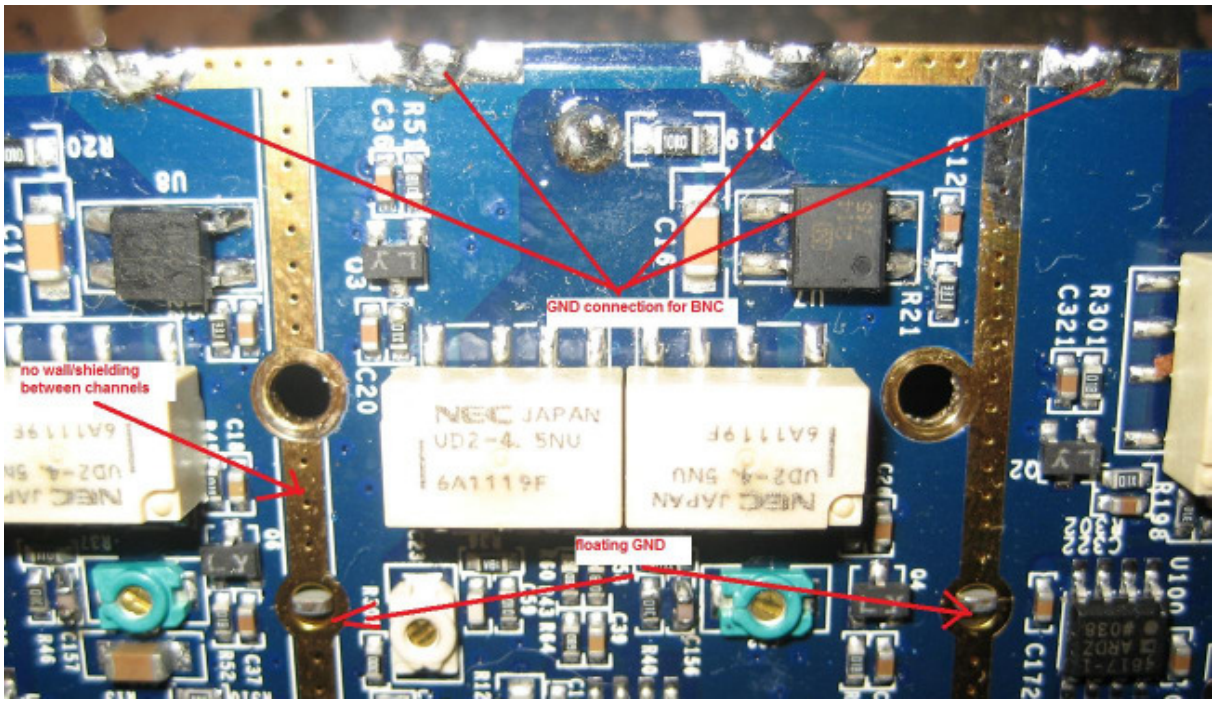
When I searched for information about the new OWON SDS series oszilloscopes I found postings in a german forum:

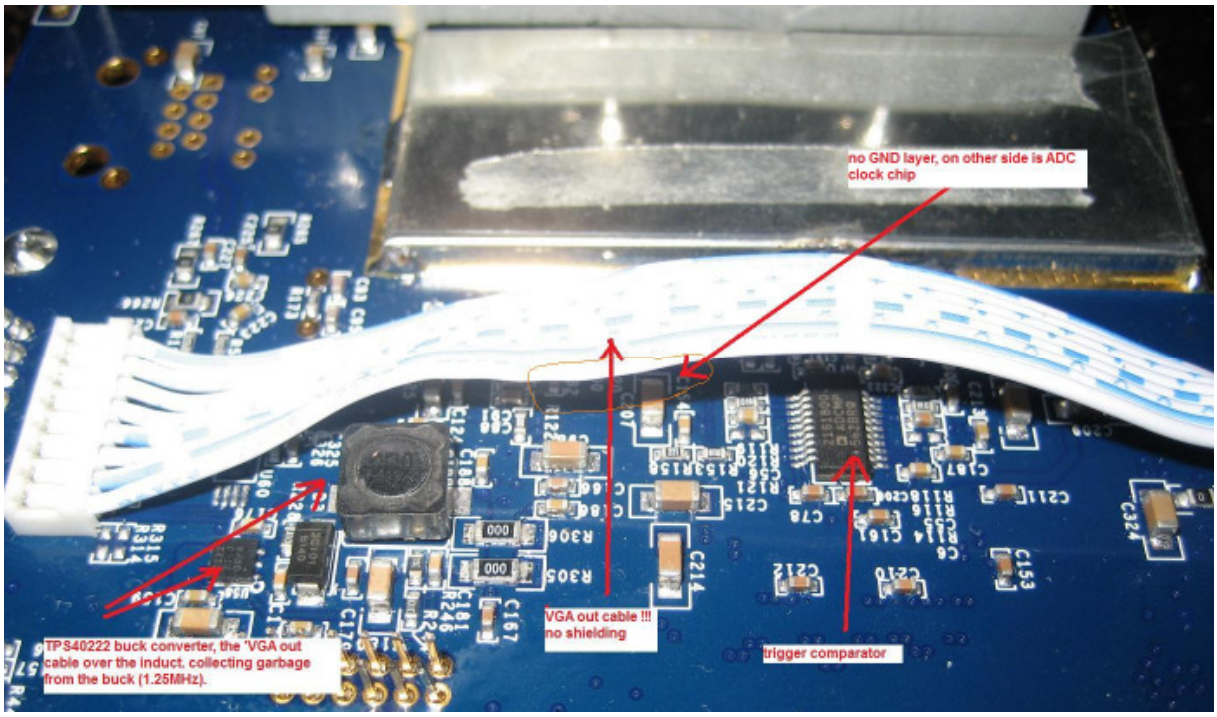
http://www.mikrocontroller.net/topic/220346#2203807

Tinman/Tinhead was so kind to post very interesting pictures from inside the scope which he analysed in detail. This are the pictures he posted :




again, this is bad GND


GND connection for BNC
no wall/shielding
between channels
floating GND



The problems seemed solvable to me and so I decided to buy a SDS8102V and optimize it.

Disassembling the Device

If You need some help for the disassembling You can get it in this thread of the mikrocontroller forum where I described the whole process:

http://www.mikrocontroller.net/topic/238863?goto=2432320#2425297

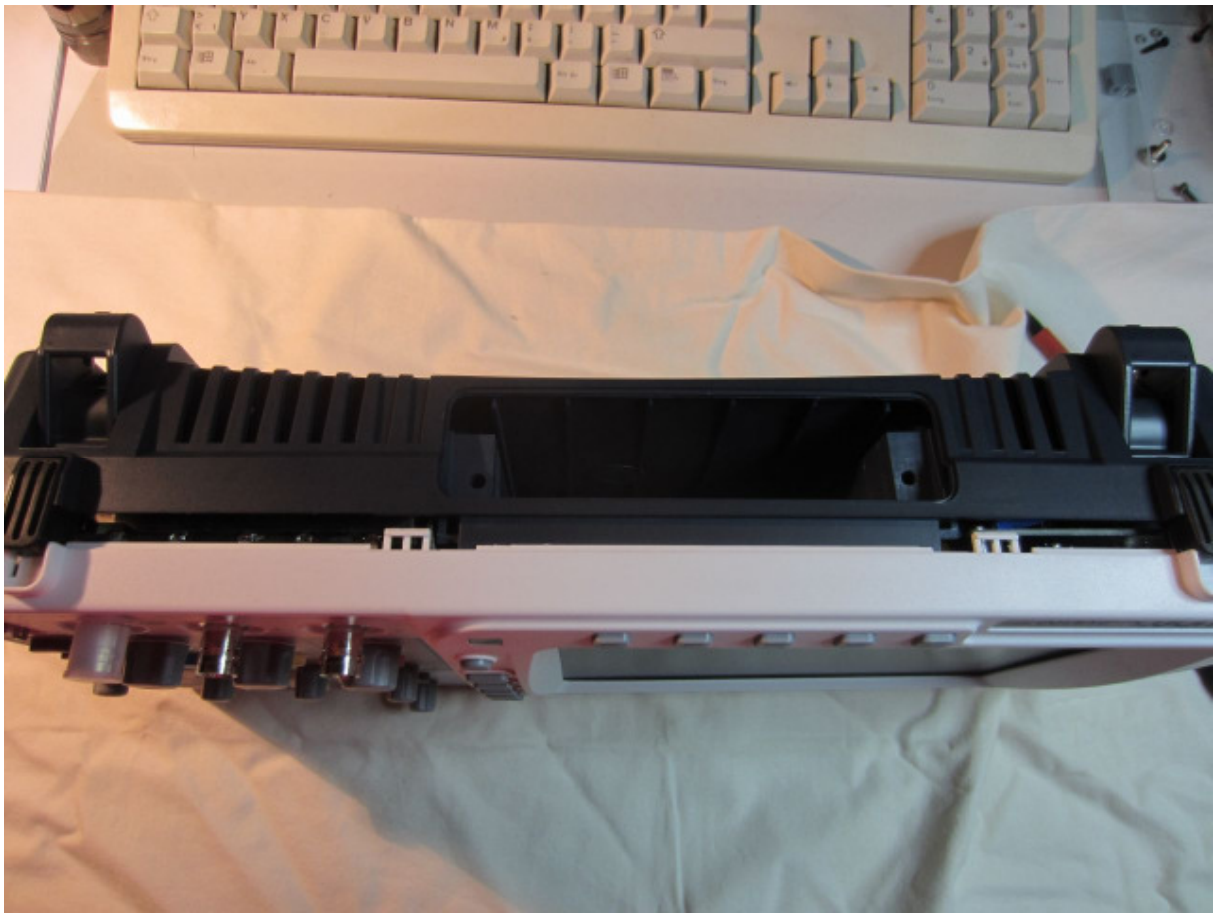
Also available in this thread is the original service manual in english for free download.

Some little hints at this place:

To open the case You have to pull out the power switch on the top with pliers. Cover the switch with some cotton sheet to protect it. After that push the the rest of the switch into the case for it might be damaged when opening the case.

The screws on the left and the right side differ a bit in length, be shure You know afterwards which screw belongs to which side.

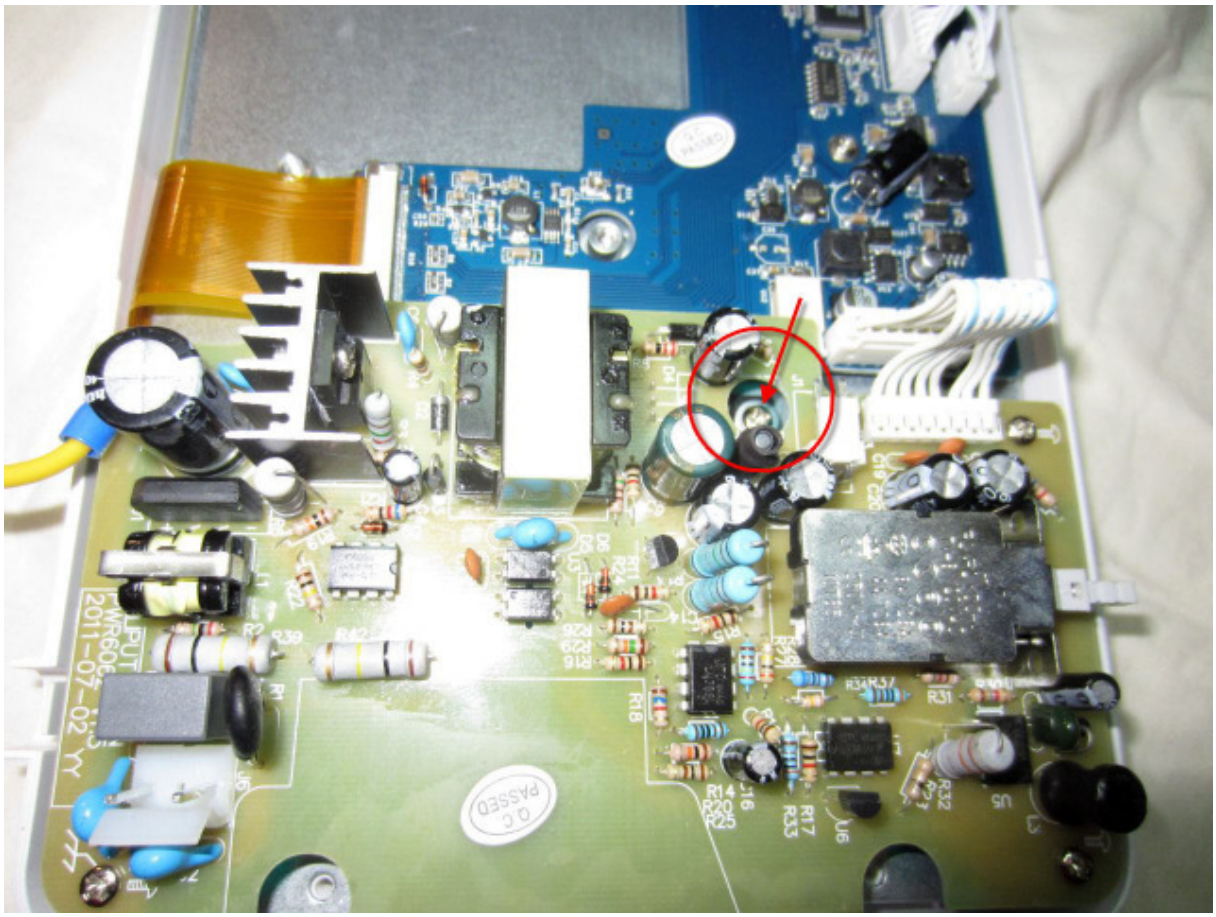
After removing the four screws there are additional snappers inside the case. One on the upper side und two on the down side.

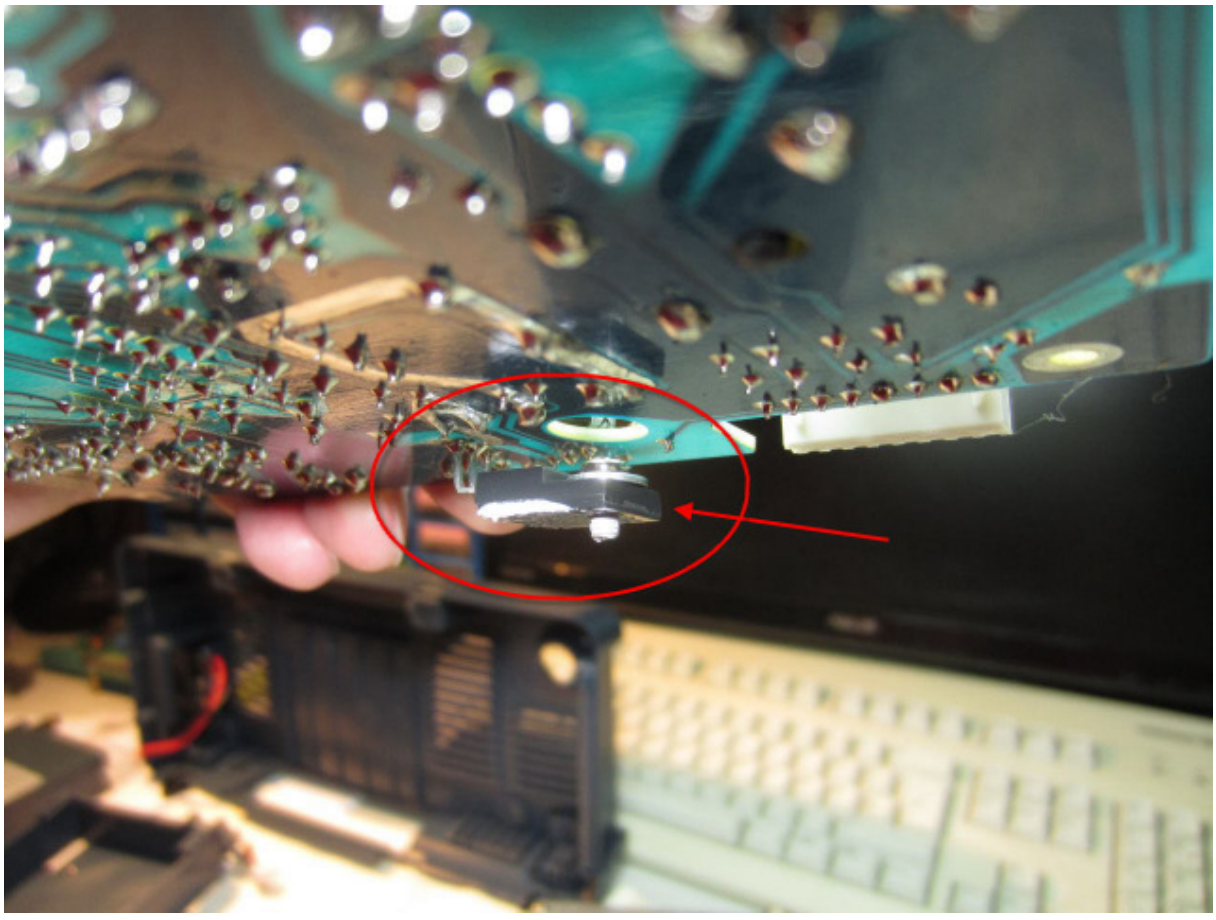


After opening the case You have to remove the switching supply. There is a difference between the service manual and my device.

In the service manual the transistor below the supply is connected via plug on the upper side to the voltage supply.

In my device the transistor was soldered directly on the backside of the pcb. So I had to unscrew it through the hole in the pcb. All other steps are as described in the service manual.



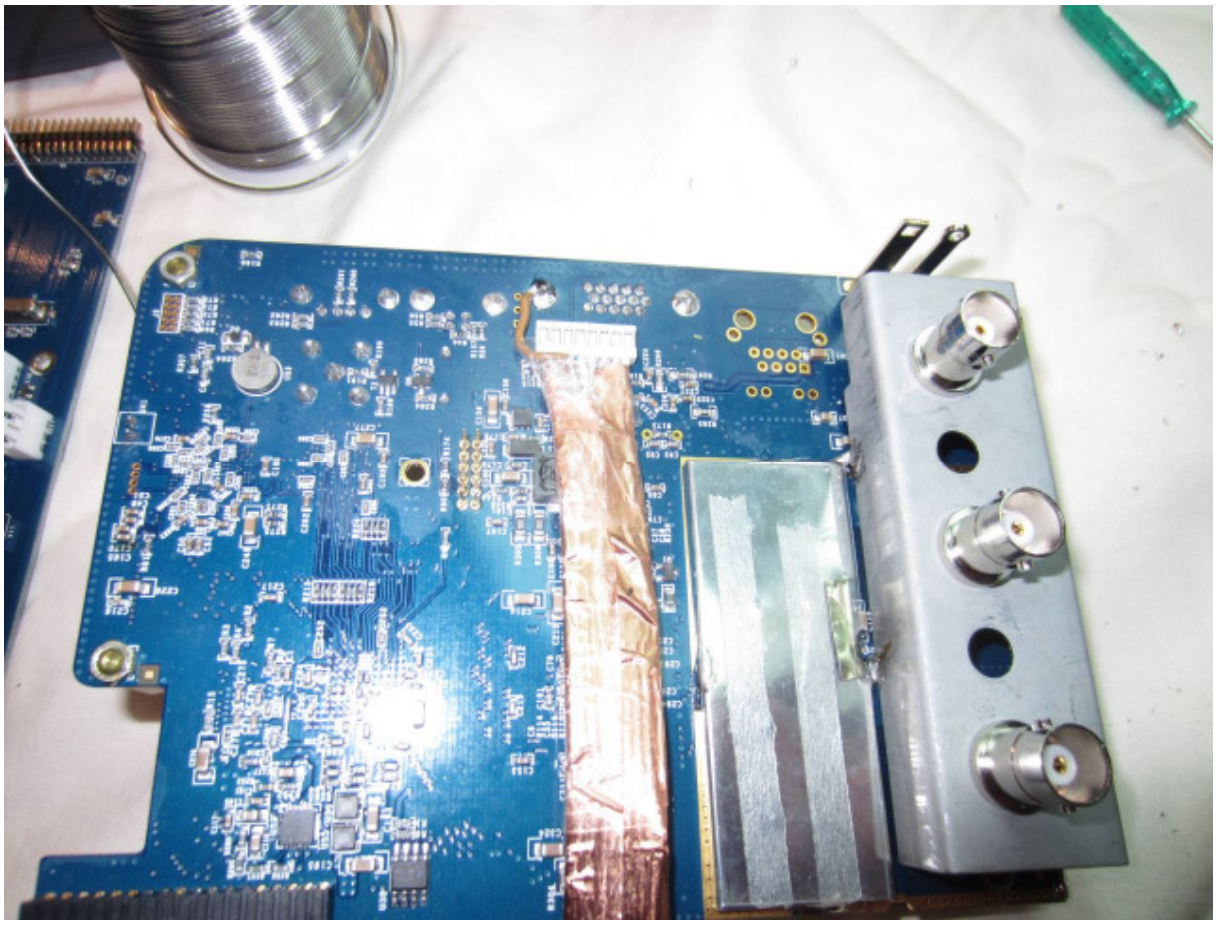


Shielding for the VGA Connection Wire

The wire for the VGA connector takes its way from the adapter board strait through the HF-area of the mainboard. Although I couldn't detect disturbances from that when I tested the signal integrity I decided to make a shield around the wire. I took some self adhesive copper foil which is normally used to make additional ground areas on pcbs. To avoid electrical contact with any other parts I coated it with sticky tape.

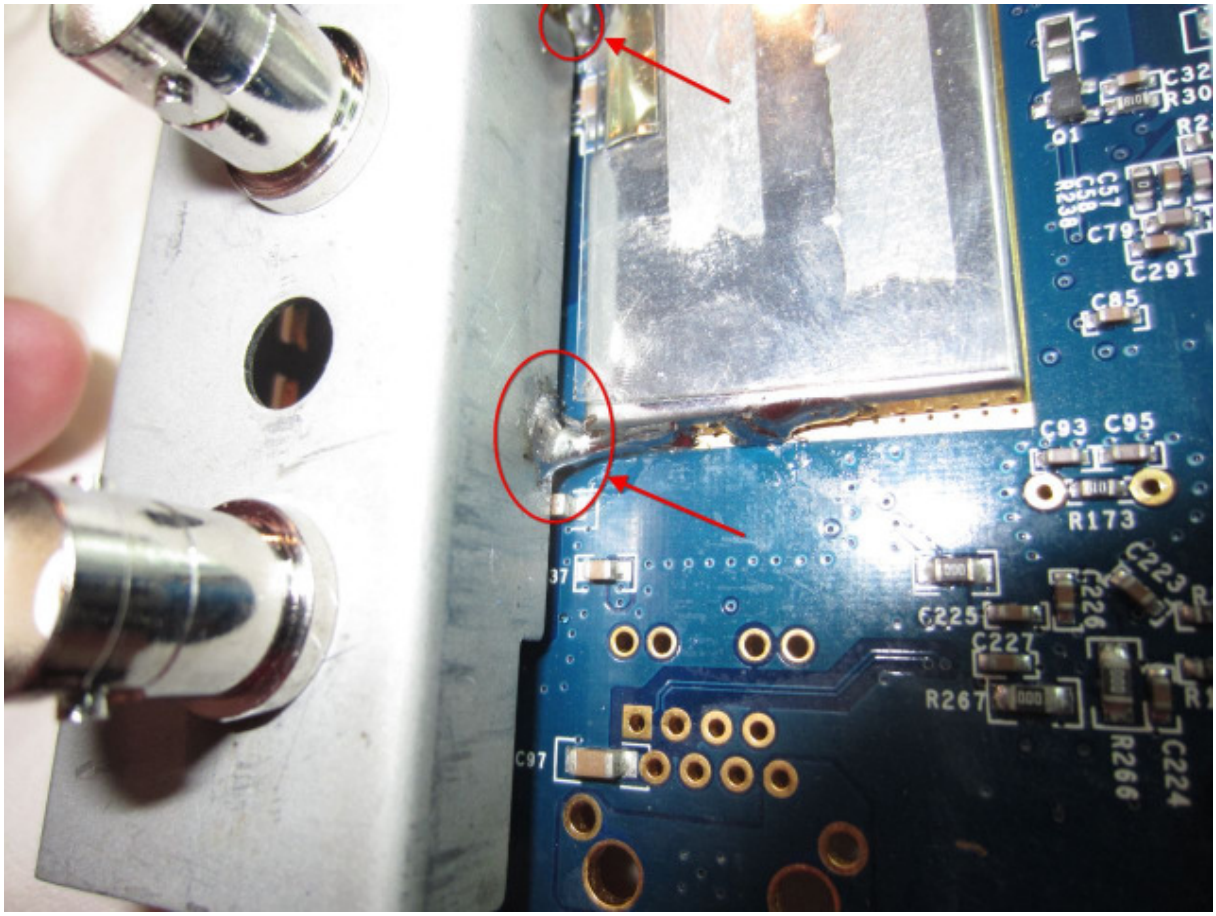
For the ground connection we have to solder a wire in one of the corners. After that we wrap the shielding around the VGA wire. The GND wire must be near the VGA out connector. I tied around the shield some stripes of tape to avoid later opening of the shield.

At last we have to solder the ground connection to the VGA connector ground.

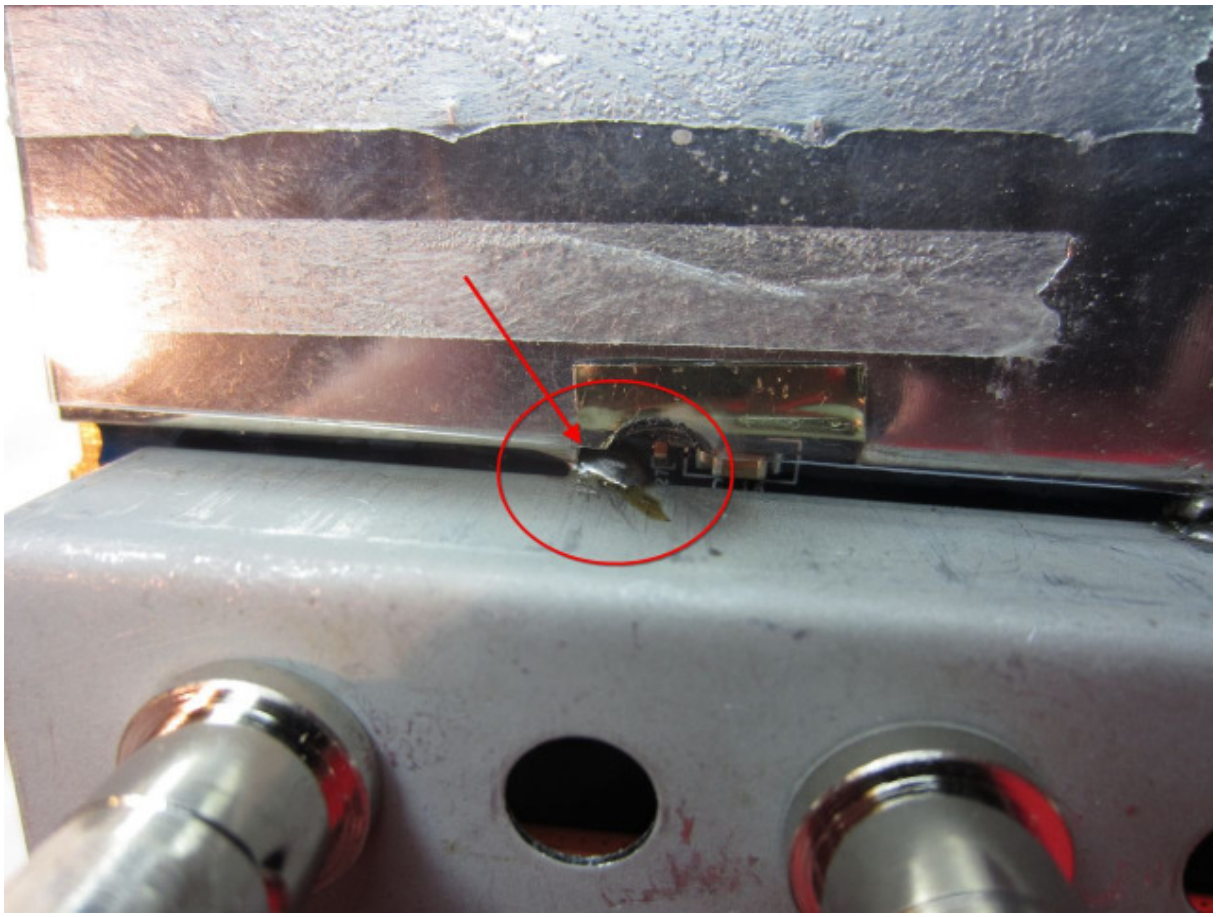


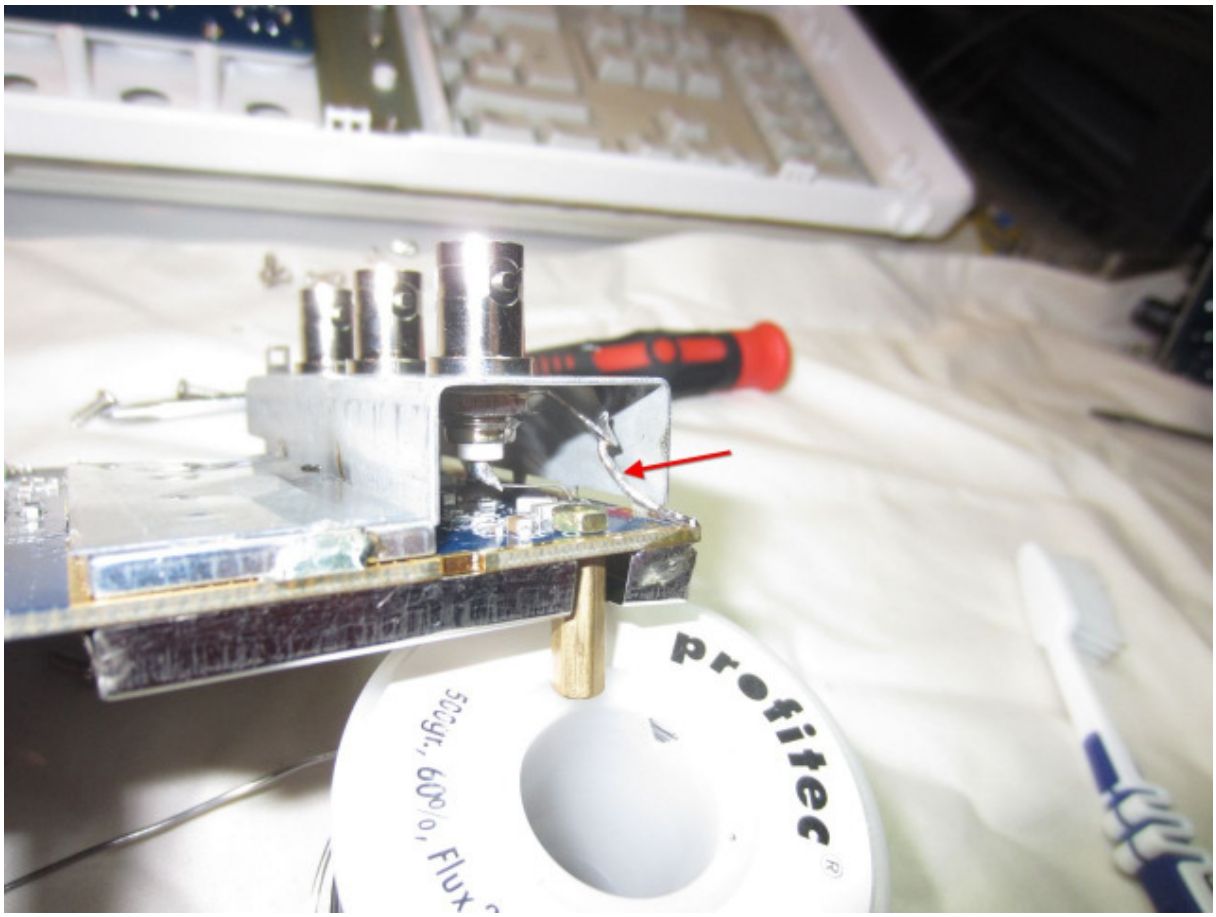
Optimizing Ground Connection

In the next step I fixed the floating ground problem of the BNC carrier.
The soldering areas on the metal have to be scratched carefully to get a good result.



Also Your soldering station should have enough power to warm up the metal, otherwise the connection will not be reliable.

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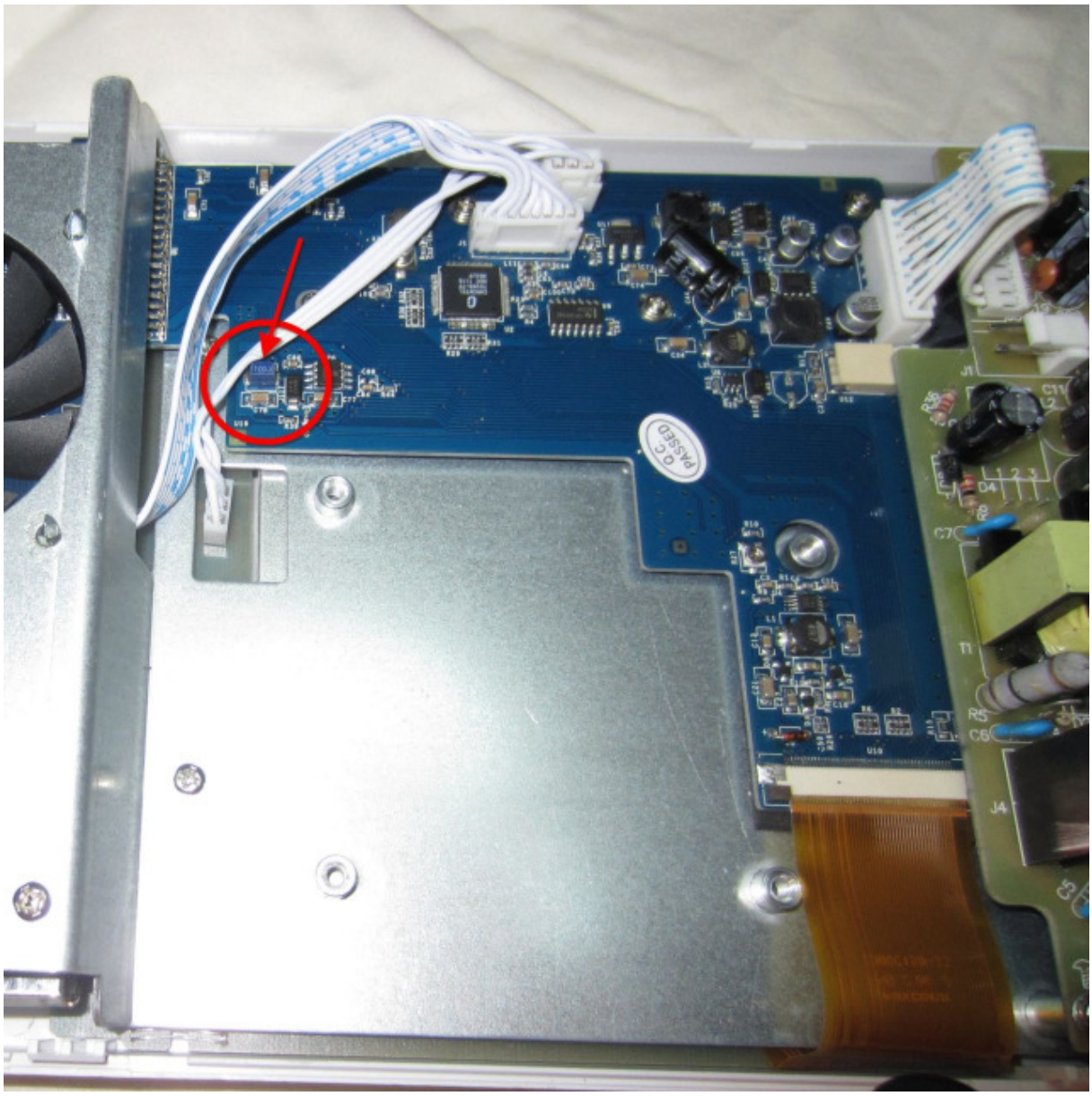
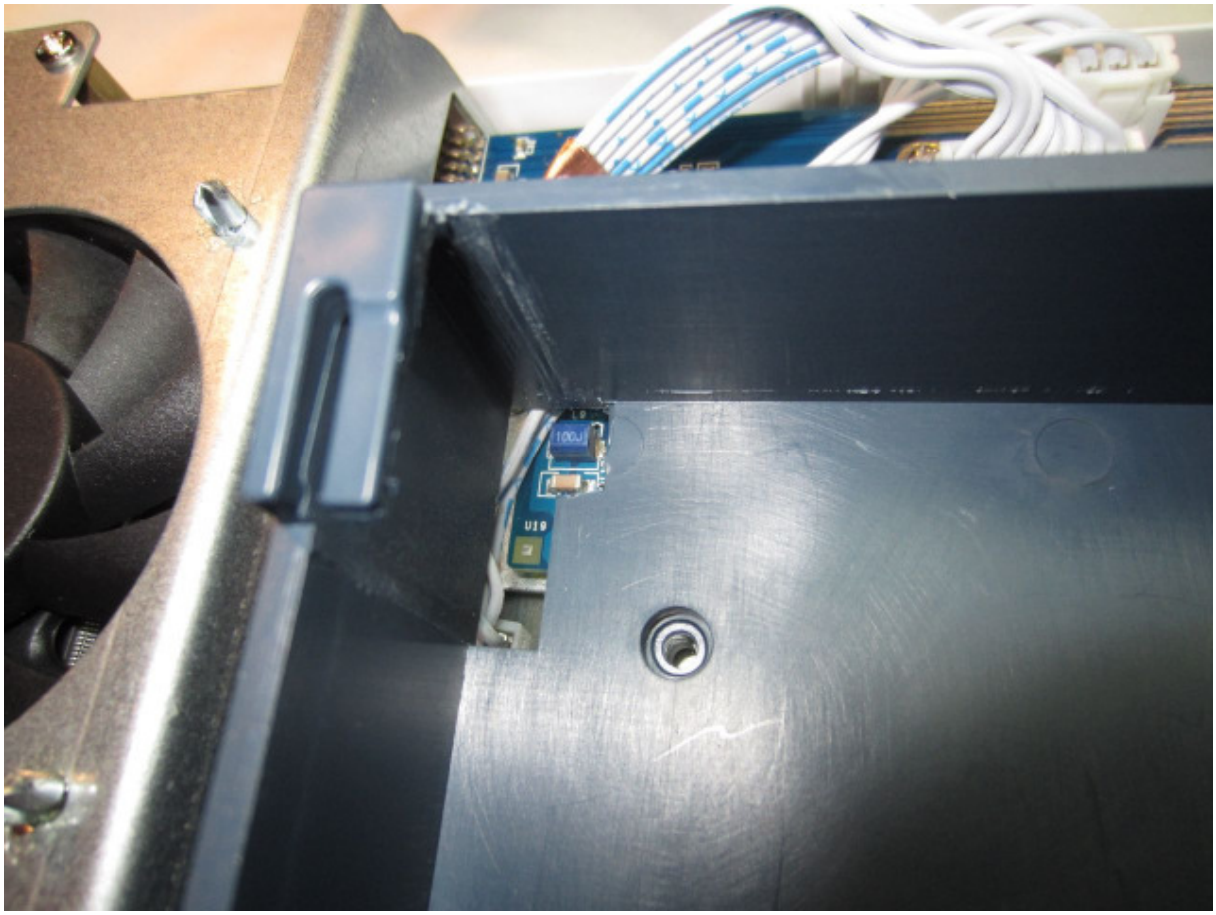
The next point is the BNC ground connection which is not optimal for HF purposes. I bend down the soldering strap of the channel 1 BNC for it is the only one which is simply reachable. Then I took 1mm copper wire and soldered it on the pcb ground and the strap.

Correcting Battery Compartment

When I assembled the device I noticed that the the battery compartment pushes on one of the electronical components placed on the adapter board. This may lead to problems with the adapter board caused by mechanical tensions.



The solution is to widen the slot in the corner of the battery compartment with a file. After that the battery compartment can be installed without any problems.



Conclusion

So that's it guys. Put together the case and start your DSO. If You did it allright Your DSO is now a better one as before. Thanks to Tinman for the very helpful analysis and the photos.

Best regards

BlueFlash