

FIXING THE GROUND LOOP

The building I live in has very old electrical wiring and doesn't have safety grounds in the wall sockets. When I moved in I connected all ground pins of Schuko sockets to the neutral wire. My computer is powered from such a socket as well as anything electrically connected to it, so all devices share a common ground point. This ground however is above the real ground potential because of the voltage drop on the neutral line from all the electrical appliances in the building.

I also have a TV receiver connected via HDMI to the computer and that is connected to a coaxial cable from the cable TV system. The cable system as it turns out has a different grounding point, which means that current flows between the TV antenna connector ground and the Schuko ground pin.

This is annoying since it causes mains hum in my speakers and makes it possible to hear my neighbor's washing machine ramping up RPMs from the interference it causes on the ground line.

Today I finally found time to make an end to all of this and made a galvanic isolator for the antenna. I took the coaxial cable, cut away the original connector and replaced it with this hand-crafted thing:



I isolated the ground ring from the connector's metal body via strip of insulating tape and bridged the gap with capacitors. I didn't have 10 nF 500 V capacitors handy, so I used two 5.6 nF in parallel. The only problem I had was that the shield of this coaxial cable is from an alloy that can't be soldered, so I just tightened the clamp around the exposed braiding. The core wire was made out of copper though, so there were no problems soldering that to the central pin through another pair of capacitors.

If you have similar problems, there is a nice web page that explains all the different approaches you can make when isolating an antenna connection.

Source:

https://www.tablix.org/~avian/blog/archives/2012/05/fixing_the_ground_loop/