Subject: Unexpected upgrade
Posted by Barryso on Sun, 08 Sep 2024 17:11:25 GMT
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There was a noticeable change in the sound of the system this week.

It runs a Raspberry Pi as a music server with a PI2AES hat allowing a quality connection to the DAC.

Swapped out the hdd spinner hard drive for an ssd solid state drive. The old drive was getting loud and doing strange things. It was time.

Didn't notice a change in sound going from the hdd to the ssd but I didn't really expect to.

But the hdd had been run through a powered USB hub because the Pi wouldn't provide enough juice to run the old drive properly. So after listening to the new drive for a bit playing through the hub it got plugged directly into the Pi USB. That made a noticeable difference in that it seemed to remove a bit of midrange grunge from the sound.

Further, unplugging the switcher from the power strip also removed more grunge. That wasn't unexpected ... I've noticed that sort of change before when removing switchers.

So there's a good deal less grunge in the sound and it's a fine improvement to the system. To use an audiophile term things got more palpable. It's pretty nice given it was unexpected.

Anyone else run into something that turned into an unexpected upgrade?

Subject: Re: Unexpected upgrade
Posted by Wayne Parham on Mon, 09 Sep 2024 15:44:26 GMT
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Dude, that's awesome!

As an aside, when I find digital source hardware that improves from something like this, I always suspect a ground loop is or was the cause. Where there is no DAC change or anything else that is substantive - just a power supply or cabinet change, something like that - I always suspect the ground connection did it.

I think we sometimes forget about that as we've moved into the digital realm. It was more obvious in the analog world - a ground loop almost always presented as noise at power supply frequencies. Either hum from the fundamental or spikes from diode switching at those frequencies, making a harsher form but still at 60Hz or 120Hz, depending on half-wave or full wave rectified. Ground loops in car setups usually present as alternator noise. In each of those cases, the symptoms were familiar.

In the digital realm, sometimes ground loops make a sort of grungy or hashy "background," just

like you've described. I see this not only in audio but also in control systems, where you won't hear the noise but can see it with a scope. The symptoms there are usually intermittent failures, usually in sensing, communications or control. When I see those symptoms, I almost always find a ground loop that shows digital noise reflected into a sensor input or communication interface. Sometimes, I'll see it go the other way, with a high-current control signal reflected back into the digital circuits, resetting them or otherwise causing mayhem.

Having digital in our audio world has made life much more convenient and quality can be great. But the connection between digital and analog can sometimes be tricky. I tend to prefer isolation - like through opto-isolators - because those remove the problem. It's not unlike using an isolation transformer for the same reason, usually done in purely-analog circuits where long signal lines are required making ground loops more likely.

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Subject: Re: Unexpected upgrade
Posted by Barryso on Tue, 10 Sep 2024 17:32:17 GMT
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Interesting. Never thought about ground loops but it would explain a lot.

Really appreciate the explanation. Sometimes the changes that happen in audio are just baffling and happen with no apparent reason.

Thanks for explaining the ghost in the machine.

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Subject: Re: Unexpected upgrade
Posted by gofar99 on Sat, 21 Sep 2024 02:41:29 GMT
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Hi I'm with Wayne on this. Ground loops of any kind nearly always cause problems. As Wayne mentioned often the only time you can actually see them is on a scope. I recently did a study of USB power sources. Both plug in and ones that actually replaced the outlet. Amazing. All put out some sort of noise. Some really bad some more reasonable. The best showed wide band noise at about -80dbv and asssorted peaks at about -60dbv. The actual frequency of the peaks varied from brand to brand. Some at relatively low frequencies like 1-5KHZ and most in the 8-50KHZ range. One unit (plugtul) was horrible everywhere S/N (if you can call it that) was -55dbv across the board with a large peak at 4KHZ. Since many devices now use the USB as power (instead of the previous 6 and 12 VDC wall warts) this can be a major source of problems. For sensitive audio gear like phono preamps I really like to see numbers in the -90 to -100dbv range for the power side. Something that many folks seem to overlook is that in nearly all audio gear the power source is one half of the device and is the return path for the audio signal. If it is full of crud then there is no hope for having a good S/N in the output.

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Subject: Re: Unexpected upgrade
Posted by Barryso on Fri, 11 Oct 2024 13:40:56 GMT
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Hi gofar99,

The USB hub causing a ground loop is understandable. But wouldn't the issue with the wall wart be about it adding noise into the circuit?

Anyway ...

A friend has been chasing a midrange issue for years. Pulling out the wall warts in his music room seems to have done the trick. He says it's been great sounding for 4 or 5 days so far but he's hesitant to fully commit to admitting the fix worked ... for fear it'll come back.

:)

Subject: Re: Unexpected upgrade
Posted by gofar99 on Sat, 12 Oct 2024 02:22:36 GMT
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Hi, what you encountered is fairly common. The more devices needed to produce the sound the greater the chance they will color the output in some way. The change to a SSD from a spinner probably would not alter anything stored as digits...provided the drive is not faulty and the DAC is able to handle the drive properly. This has not been a real problem though for many years (drive too slow or DAC not responsive). The SMPS can add junk fairly easy. Many are cheaply made and can be really noisy. Another source of junk is with USB powered DACs. The actual amount of residual noise can be a product of the device that it feeds. I had one USB DAC (good brand) that was powered by a now long gone PC I had. Lots of noise via the USB power to the DAC. A fault of both devices really. The one for having noisy USB power the other for not filtering it well. My main DAC now is powered by its own linear PS. The secondary one is USB powered but it is well filtered as the S/N when used as an ADC is over 90db. Plus the PC probably has cleaner USB power. The lesson if you will is that if you experience any grunge or noise in your audio look at the (1) power source and (2) the connections to the PC as it could add noise etc. Thanks for sharing this with the members as I am sure a few never considered the possibility of it.