Cable Reviews, Digital Cable Reviews

Computer Audio Design USB I

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CAD now offers two USB cables: CAD USB I and CAD USB II

Compared to the original CAD USB cable the new USB Cable I has the following differences:

- Improved patented filtration on the PCB board that is mounted at the A end of the cable. The new PCB is a redesigned layout with improved parts and shorter signal path lengths.
- Materials used in the assembly of the PCB within the cable are different and reduce electrical noise to a much lower frequency range.
- Both the A & B connectors are made from heavy (10u") gold plated tellurium copper. The insulating material within these connectors is now PTFE (Teflon).
- Ground wire is new.
- +5V wire is new with even higher noise shielding and lower gauge (thicker) conductor.

The new USB II cable has all the above and:

- Different ground wire.
- Different method for assembly of the conductors.
- Two rectangular sections for additional high frequency noise reduction.
- One rectangular section for reducing high frequency vibration within the cable.

You may ask why would vibration matter? The USB interface inside your DAC has two high frequency oscillators running in the MHz range. These are made from a crystal material that is tuned to vibrate at an ***extremely*** accurate frequency when a voltage is applied. So, if you connect a USB cable that is vibrating (even ***very*** small amounts) this will have an effect on the oscillators on the USB interface inside your DAC. One of the ideas of the USB II cable is to try to minimize that.

All CAD USB cables are still hand made by Scott Berry so if you require any customizations (longer length, no +5V line) just ask!

The CAD Audio USB Cables are optimised specifically for audio use in conjunction with a USB Digital to Analogue Converter.

Compared to purely analogue devices (e.g. turntables), digital audio source components produce more high frequency "noise" (EMI/RFI). This is generated within CPUs, chipsets, switch mode power supplies and regulators and so on. Also the basic USB carrier frequency can be in the 200 MHz to 400MHz frequency range. Digital audio interconnects have a range of issues that are significantly different from analogue audio interconnects. During listening

tests we found that when we reduced the amount of this “noise” from reaching the Digital to Analogue Converter (DAC), sound quality dramatically improved in our opinion.

Secondly, it is now widely accepted that the materials and construction of analogue cables can influence the quality of sound that a system produces, and our thesis (which again, is now more widely accepted) is that digital cabling has at least the same impact.

Noise reduction

CAD Cables feature our patented USB filter, which filters noise from the music source (whether a computer or audio server or streamer).

The USB consists of 4 connections:

1) +5V : Only used for powering devices – many DACs use this power source, but not all.

2) DATA+ : Differential signal, very high speed

3) DATA- : Differential signal, very high speed

4) Ground : Reference

Unwanted noise is present on all 4 connections. Our patented filter reduces the noise on the differential signal. +5V and Ground without damaging the signal or power itself.

The +5V line contains exceptionally large amounts of high frequency noise. To minimize the amount of this noise from entering the DATA and Ground connections, the CAD Cable uses a separate highly shielded cable for the +5V line.

Wire materials and construction

CAD sees “Digital Signals” as very high speed analogue square waves. Conductors used for high speed signals use different materials and construction techniques compared to conductors that only operate at lower frequencies. As explained above there are 4 conductors in a USB cable. The requirements for the DATA+ and DATA- conductors are completely different from those for the Ground and +5V conductors.

When we compared conductors made with different materials and/or construction techniques we also noted sound quality differences. We have meticulously researched the best materials and construction techniques for the conductors inside our CAD cable. Our main measurement tool is subjective listening tests, but over time we learned what parameters are technically important.