

CAD USB Cables I & II

CAD RE-INVENTS THE USB CABLE, AS ANDREW HARRISON DISCOVERS

ANDREW HARRISON

Beyond optimising for characteristic impedance, there would seem to be little point in making fancy USB cables. The USB protocol doesn't embed clock code within the datastream like S/PDIF, so it doesn't suffer the same problems of data jitter when the cable specification goes adrift. So how can a 1.1 m USB cable costing £600 possibly offer any improvement?

One of CAD's central tenets is to reduce RF pollution in the signal chain. And so it is with the USB cable (now dubbed *Cable I* after the launch of the £990 *Cable II*). Both were developed after long research into ways to 'quieten' the USB line. The invention has been secured by patent, which usefully explains the principles.

One problem is the USB standard's 5V DC capability, provided by such as a PC, and recognised as a messy power rail best avoided for audio purposes. It cannot be ignored, however, as some DACs rely on it to make an initial sync. CAD's Scott Berry investigated a manual cut-off switch, but settled on physically separating the DC line, which now runs as a separate thin cable outside the main sheath.

An RF filter for the data lines comprises a series common-mode-rejection choke, where first and second coils for the two differential signalling wires share a common ferrite core, the windings in different directions. Hence flux generated from RFI by one opposes flux in the other, attenuating noise that's common to both lines. Such chokes are not new, but a CAD innovation is to use higher impedances than textbook, around 2-8kohms, rather than matching the 90ohms characteristic impedance of the USB 2.0 specification.

The outer shield is terminated to ground only at source, to minimise noise. A dedicated wire for DC ground runs parallel to the signal wires within the coaxial braid. Filtering is applied to this ground with a series inductor and resistor. Key filter components are built around a miniature circuit board at the source end (USB Type A plug), then bedded in resin. An equally tidy DAC end has the requisite Type B plug.

Sound Quality

Differences between the CAD's *Cable I* USB cable and a PC-grade USB cable are not subtle – nor indeed against more conventional USB cables I tried from specialists Atlas and The Chord Company.

The CAD USB might soften the sound, but not in the manner of mains conditioning filters that slow timing and smooth sharp edges; more like the sound loses its trace electronic signature, erasing the synthetic, etched quality that still dogs high-end digital. Depth layering is more marked, and the overall soundstage moves conspicuously backward. The separation of sound from the transducers is also noted.

Cable II offers the same, but with differences. This is built upon similar filter principles, adding three prominent bulges visible through its beige woven jacket. The first two (source-end and centre) use RF absorption material to address specific troublesome radio frequencies; the third bulge dampens cable-born vibration, reducing microphony. In addition, the signal cables here are wound with a twist.

Given the clear improvement found with *Cable I*, I was sceptical of the need for any further tuning. But listening proved there was indeed scope for more of the same – perhaps expressible as less of any remaining 'digitalness'. *Cable II* reminded me of a good optical connection, noted for its galvanic isolation of components. Here source and DAC were joined as if by transparent tubes free of coloration, more than hinting at a triode-like clarity, delicacy and smoothness.

Where the *Cable I* was clarifying with silvery precision, majoring on taught timing, *Cable II* had a more organic, golden burnish that further separated each instrument from the other, peeling back more layers of timbre. *Cable II* uncovered more low-level detail, offering concealed audience noise for example, without ever drawing attention to it.

Conclusions

In my experience with audio-grade USB cables small differences in presentation can be found, although none have shown themselves to be clearly 'right'. The CAD USB cables change that, and whether used with a PC or dedicated bridge as source, the improvements were clear as day. Both are superb and deserve Audio Excellence recognition, but *Cable II* nailed the master-tape sound.

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Prices

Cable I	£600
Cable II	£990