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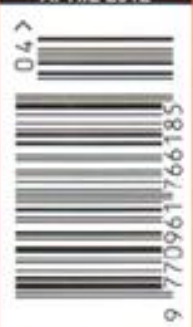


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PAGES OF LETTERS - THE BEST WINS A PAIR OF KEF Q100 LOUDSPEAKERS! (UK ONLY)



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verdicts

●●●●● OUTSTANDING
●●●● EXCELLENT
●●● GOOD
●●●● MEDIOCRE
●● POOR
£ VALUE



Interest in internet audio – audio delivered via the internet – low resolution MP3 or a 24/96 high resolution file – is spiralling upward. A torrent of products are hitting the market, with a bewildering array of latest technologies shoe horned inside. Everyone seems a little baffled, even manufacturers, by the sudden diversity and complexity of product. Our USB-to-S/PDIF group test this month illustrates the issue: three converters needed special Windows driver software to be installed,

but two did not. They just plugged and played. It is surprising that such a large functional gap should exist between rival products, a make or break difference for many buyers perhaps. It's all a matter of writing your own code for a DSP. Manufacturers have my greatest sympathies here – digital audio is cruelly complex.

Next month, to underline this theme of rapid evolution, we will be looking at Media Players you cannot buy yet. It is obvious what the market needs, but few manufacturers worldwide have looked into their crystal ball and seen the future. Hi-Fi World has seen it and will explain all next month.

Long ago, Britain built large loudspeakers. Tannoy still do for those lucky enough to live in Downton Abbey or the stately pile next door. Otherwise, 13in bass units were squeezed out as interest in beautiful homes strode in. But not so fast: Germany did a good job repackaging the Mini and now they're squeezing 13in bass units back in. Just look at the towering Quadral Vulkans we review this month and believe in the old Yorkshire expression "there's nothing like a good big 'un".

With high resolution digital files playing at the one end of your hi-fi and volcanoes at the other end, you can't say hi-fidelity is anywhere close to dead. Far from it: it is frighteningly alive, as this issue shows! I hope you enjoy it.

Noel Keywood

Editor

testing (see www.hi-fiworld.co.uk for full explanations of all our tests)

To ensure the upmost accuracy in our product reviews, Hi-Fi World has extremely comprehensive in-house test facilities, and our test equipment - from big names like Rohde & Schwarz and Hewlett Packard - is amongst the most advanced in the world.

Loudspeakers are measured using a calibrated Brüel & Kjær microphone feeding a Clio-based computer

analyser, using pulsed and gated sinewaves, in a large room to eliminate the room's influence. Pickup arm vibration is measured with a Brüel & Kjær accelerometer.

No other UK hi-fi magazine has in-house testing, and none has access to such advanced tests across all types of equipment. That's why you can depend on Hi-Fi World reviews.



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Religious Conversion

Our review of five USB-to-S/PDIF converters invokes digital religion, Noel Keywood says. Rafael Todes listens in supplication.

Digital can be confusing at the best of times, and this group of unassuming little converters demonstrates the issue. Superficially, they convert USB digital audio, typically from a computer, to S/PDIF digital audio suitable for a hi-fi. Their role then is simply to allow a computer to connect to the hi-fi, so music can be played from Windows Media player or iTunes through a decent sound system.

Somewhere along the line, this simplest of ideas got diverted into arcane digital complexity. The digital conversion process has been configured so what could have been simple definitely is not: these units don't just convert, many of them clean up the digital signal too, in order to lift sound quality. Enter religion!

The group comprises five converters, ranging in price from the Kingrex UC192 at £159 up to an eye watering £825 for the Audiophileo 1 – and more expensive designs are available. Budget converters simply do their stated job, convert from USB to S/PDIF, but as price increases a more sophisticated method of clock control, known as asynchronous operation (see page 25) enters the picture, as well as other interesting ideas such as an external USB power supply and – naturally! – a battery powered external USB power supply.

Yes, it all gets nutty quickly, but that's what happens to digital audio once audiophile religion takes hold. In this review we keep away from the horrors of Phase Locked Loops and suchlike, and keep it simple. In any case, as intelligent as modern digital circuits are now becoming in their attempts to suppress the ills of digital, the local digital signal chain is so complex and behaviourally difficult to predict, that what actually happens in

any one set up cannot be fully known by outside observers.

Digital audio as it comes out of a computer's USB port is in an entirely different format to that concocted for an S/PDIF connection into a hi-fi system. A USB receiver must assemble the computer audio data, retrieve the clock information, and reduce or eliminate blemishes such as jitter and noise. It is possible to clean up a digital signal using a variety of strategies, often one after another in a daisy chain of digital signal processing, before sending it out to the hi-fi, and both the degree and the sophistication of these strategies is what decides cost.

Whilst most converters use function-specific silicon chip building blocks, this has difficulties, especially with computer compatibility. Two models, the Halide Bridge and Audiophileo, use non-function-specific Digital Signal Processors (DSP) in conjunction with an audio framework code, as well as their own custom code, to perform the process and both linked up to Windows Vista (SP2) and Windows 7 immediately in our tests (we did not try XP etc). With the others, a special Windows driver is needed, supplied by the manufacturer. Listening was carried out on Windows 7.

Mac OS-X from 10.6 (Snow Leopard) onward works with its own drivers that can handle asynchronous operation. Tests were carried out using OS-X 10.6, so both Windows and Mac were used to check for compatibility.

LISTENING

The way digital can degrade sound quality is well known to Rafael Todes, as it affects his recordings of the

Alegri String Quartet, in which he plays an Amati violin. In particular, loss of spacial perspectives blurs the placement of players, loss of timbral resolution lessens differences between brass and woodwind, making his Amati sound like a Yamaha synth copy, and digital glare or hardness makes gut strings sound like steel ones. These are all sensitive issues for him so he was keen to listen to these converters, feeding his Weiss DAC202, a Music First Audio passive preamp, and B&W 802D loudspeakers. Recordings were various but included his own of the Alegri. He listened before we measured and the correlation between what he heard and what we measured is surprising.

** see p25 for Conclusion, computer compatibility, asynchronous operation, tests and much more.*



SOTM DX £365

USP: Asynchronous 24/192 converter with supplied Windows driver software and optional battery/mains power supply.



The awkwardly named SOTM is from Korea. It is an asynchronous converter that accommodates 44.1 and 48k sample rates and their multiples all the way up to 192kHz, with up to 24bit resolution, so this convertor ticks all the boxes. It comes with a USB driver disc for Windows (XP/SP3, Vista/SP2, 7), or will work with Mac OS-X 10.6 (Snow Leopard) onward. Data rate must be set in the Advanced tab of the Sound control panel in Windows.

The small SOTM is USB powered but has an outboard power supply option that alternatively will run it from batteries instead of the computer's power supply. The batteries are charged from the mains.

S/PDIF outputs are in balanced AES/EBU form via an XLR socket, unbalanced form via electrical output through a phono socket as usual and – unusually – via an optical TOSLINK option as well. On high quality convertors TOSLINK and its need for a transmitter and receiver – potential sources of jitter – is uncommon.

SOUND QUALITY

This two unit affair also shows the importance of taking power

seriously. The Chesky download of Rimsky-Korsakov's 'Dance of the Tumblers' shows that this link has a good sense of control, with good delicacy for the orchestral effects going on. The tambourine starts and stops well, the strings sound clean, perhaps a bit less present than I have heard on the Weiss playing through FireWire, but a really excellent well-constructed sound with a good solid soundstage. I would put it equal to the Halide Bridge without the extra USB power supply, but not as good

with the upgrade. It doesn't quite have the airiness of the Halide, but seems to do the transients superbly.

This is one of the few convertors to have an optical S/PDIF output. Our measurements showed it worked almost as well as the electrical outputs, including AES/EBU at left.

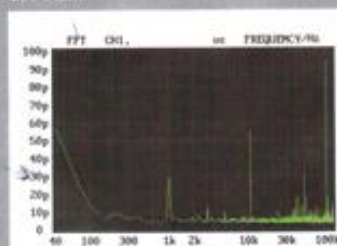


MEASURED PERFORMANCE

The SOTM produced good if not exceptional figures when fed our resampled 48k sample rate test signal. Signal related jitter was low at 30pS and the random jitter noise floor low at 6pS. Low rate clock drift was a little higher than the others at 60pS, but still not high. With the un-resampled 44.1kHz CD test signal, signal related jitter improved as expected to 25pS, with clock drift and random jitter as before. The optical output was no sinner at 38pS signal related jitter but XLR was worse at 50pS: the unbalanced electrical connection was cleanest. With the external power supply, mains or battery mode, results were unaltered.

Recording sample rate 44.1/Output sample rate 48k	
clock drift	60pS
signal related	30pS
random	6pS

JITTER



SOTM DX £365
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