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OUTSTANDING
PRODUCT

"...this is an entirely convincing 'transport' solution, and is capable of sparkling results."

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AUDIO FILE

MUSIC LIBRARY/SERVER

Grimm Audio MU1

The dedicated music server is in the ascendant, and every company has a different twist on the idea. In the case of Dutch company Grimm Audio, the twist is especially unusual
Review: **Andrew Everard** Lab: **Paul Miller**

The continued rise of network audio has created a new game in the hi-fi world, best summed up as 'Yes, but what *is* it?'. You see, all sorts of network-capable devices exist right now, and it seems each of them has a somewhat different approach. For example, perhaps the best-known name in 'audiophile servers' or 'music libraries', Melco, started out by making products designed to feed network players over a network connection, paying close attention to the isolation and optimisation of the Ethernet feed. It then reinvented itself as a maker of network transports, connecting directly to a suitable DAC using a USB output, again with isolation strategies implemented.

At first glance, Grimm Audio, based in what was once one of cradles of digital audio – Eindhoven in The Netherlands, the hometown of Philips – has delivered what seems to be a closed system. The company makes the entire reproduction chain, from the MU1 player we have here – yours from £9495 – through to its active LS1 speakers [*HFN* Mar '11], to which this source component connects using a dedicated link on an RJ45 connector, enabling it to feed a pair of the speakers or a complete multichannel surround set-up.

OUTPUT OPTIONS
Yet while the MU1 would seem to make most sense in an all-Grimm – I avoid the term 'entirely Grimm' for obvious reasons – system, there's rather more to this machine than that. In practice, it can also feed out audio to a DAC using one of its two transformer-balanced AES3 digital feeds, which can also be used in tandem to allow multichannel output to suitable hardware.

There's also the option of using a USB DAC connection from one of two Type A ports provided on the rear panel, but while this option supports the widest range of

file formats, including DSD, this output does not avail itself of Grimm's custom downsampling/re-clocking code – this is the preserve of those AES connections.

However, before we get to all that, it's worth exploring how you get to grips with the MU1. Indeed, some users might struggle even to turn it on, let alone start hunting for any controls. The main power switch is a tiny white recessed pinhead next to the IEC mains inlet, and with that engaged the display will light up, along with a little white light forming the dot on the 'i' of the brandname on the fascia. Only then can you grapple with the single control – that copper-coloured mushroom-like disc set into the swoopy top-panel.

Via a sequence of long and short presses, and twists, for which you really do need to study the manual, you can enter the set-up menu and make detailed adjustments. These include selecting the various input options – digital ins are

available on the aforementioned AES3, plus optical and coaxial, and in a future software release the MU1 will also gain an onboard FM radio tuner. There are also plans for a conventional IR remote – but again, that's in the 'coming soon' file.

PLAYING THE FIELD
Oh well, this being a network device, it'll have an app to access all this stuff, right? Well, sort of… The MU1 is based firmly around the Roon platform, so you'll need a subscription and a means of controlling Roon – computer, or handheld device – in order to operate it. I have Roon running on my system every day and I'm convinced it's the slickest and most flexible software of its kind, not to mention sounding extremely good. So while the set-up here is slightly fiddly, requiring a computer to configure a Grimm Roon extension that enables the MU1's display to show the Roon data, once up and running it's exceptionally simple.
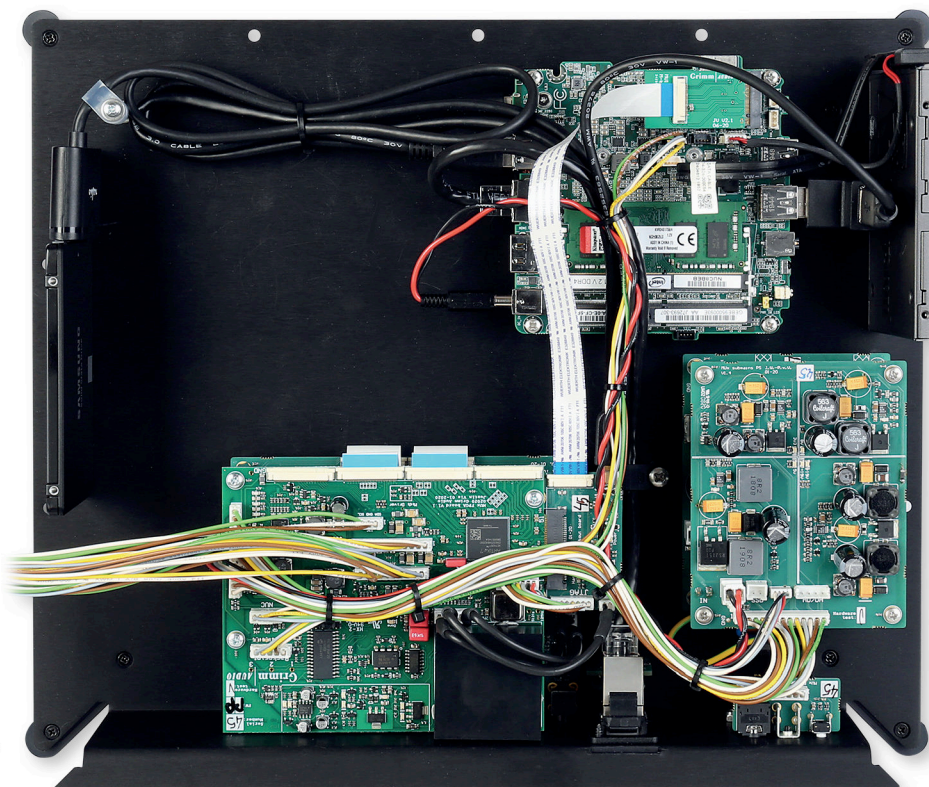
RIGHT: Intel NUC 8i3BE 'mini computer' [top right] with USB connections to a Kingston 120GB SDD [top, far right] for the OS and Samsung 1TB SSD [far left] for music storage. Xilinx Artix-7 FPGA runs Grimm's upsampling code [lower centre]

With Roon fired up, you can select how the MU1 accesses your music library. A range of internal storage options are available at the time of ordering, from 1TB to 4TB, but the MU1 can also access and index libraries stored on connected USB drives, or network shares (for example on an external NAS unit). Or indeed you could have all three if you wanted. You simply point the Roon Core running on the MU1 to whichever store(s) you have, and all the music will be drawn together into one unified library, as well as bringing in services including Qobuz and Tidal (subject, of course, to the relevant subscriptions), plus Internet radio.

The one part of Roon that Grimm Audio doesn't use is the software handling of various file formats, which usually would allow upsampling and – where relevant – downsampling of the files being played. That's because the MU1, on top of its Linux operating system, has in-house FPGA-based digital signal processing to handle file format conversion and digital filtering.

HEAVY INDUSTRY

The company explains that this 'is done in a single stage, without compromises for the extremes that are required for the signal data path, filter coefficient resolution and filter length'. What this means in practice is that all 1x (44.1 or 48kHz) and 2x (88.2 or 96kHz) digital inputs are upsampled to 4x (and DSD or higher PCM downsampled to 4Fs), relieving the connected, outboard DAC of much 'heavy lifting'. The idea is to reduce errors in the oversampling filters of downstream DACs by replacing their first, most calculation-intense internal oversampling step. In addition to all this processing power, the MU1 also features an extremely low-jitter master clock.

Describing the effect of its custom code and clock as 'regained resolution',

'It was, quite simply, easier to listen deeper into mixes'

ABOVE: The 3.5in TFT display dominates, with the little power light in the 'i' of the brandname. Hands-on controls are on that top-panel disc, via a combination of twists and long/short pushes

Grimm's engineers [see boxout, below] then get a little carried away, saying that 'performance finally falls in line with the quality indicated by measurement and the mathematical laws of digital sampling as posed by Harry Nyquist in 1928. We therefore call it "Pure Nyquist"'.

That exuberance apart, this begins to explain why the data from the AES3 digital outputs, which passes through this proprietary signal processing, can deliver better sound than that from the USB ports, which is derived directly from the Linux motherboard and has little or no advantage over audio from any other computer. That was borne out in our listening, however illogical it may seem to get a better sound from downsampled audio rather than a direct DSD feed into a suitable DAC.

FUSION POWER

Which brings us on to the way the MU1 performs, this somewhat confounding my view that it would be largely defined by the quality of the connected DAC. This was the Tambaqui DAC from fellow Dutch brand Mola Mola [*HFN* Nov '19], the preferred partner according to Grimm and UK distributor SDD. No complaints from us – the Tambaqui is Roon-Ready in its own right and one of the finest DACs to have graced editor PM's listening room.

Using this as a DAC/preamp straight into Constellation Inspiration Mono power amps [*HFN* Oct '19] and the big B&W 800 D3 speakers [*HFN* Oct '16] delivered a wonderfully powerful and expressive sound. Furthermore, with a bit of fiddling with both the Grimm MU1's Roon implementation and the Tambaqui's presets, I was able to switch between the MU1's balanced AES3 and plain-vanilla USB outputs with only a modicum of 'click/ ↪

GRIMM TALES

The leading lights of Grimm Audio are not quite the Brothers Grimm, but founder Eelco Grimm gives the company its name, and is its Creative Director. He lectures and researches at the HKU University of the Arts, Music and Technology in Utrecht, has developed loudness normalisation systems for broadcast, and is the former editor of the Dutch *Pro-Audio* magazine. His co-owner is Guido Tent, who worked on analogue audio, RF and EMC at Philips, and now also runs Tentlabs, which sells a valve amp kit and the b-Audio range of DACs and a Hypex-based Class D amplifier. Grimm Audio works closely with labels such as Channel Classics, whose founder Jared Sacks mixes and edits using a surround system comprising an array of the company's speakers. As strong believers in the design of music systems from end-to-end, the company also makes subwoofers for use with its speakers, and cables, master clocks and converters to build a complete set-up, whether for home use or pro mastering.

The MU1 is based around the well-established Roon platform, in order to deliver user-convenience: as Eelco Grimm says of the MU1, 'media players often make me feel nervous. They sound different, depending on the processor jobs, *etc*... I don't want that. I want a music player to be stable and reliable. And always be confident that it runs smoothly'.

MUSIC LIBRARY/SERVER

ABOVE: Digital only, as the MU1 offers a network control/streaming input, coax/optical S/PDIF and AES inputs. USB-As cater for storage and DAC connections, with dig outs on single/dual-AES XLRs and a proprietary RJ45 link for Grimm's LS1 loudspeaker

swipe/switch app' on my iPad. The results were certainly illuminating, even (or perhaps especially) when comparing DSD files passed through the two signal paths.

If the Mola Mola DAC impressed us in 2019 then now, fed from the MU1, it really came into its own. It was, quite simply, easier to listen deeper into mixes, with detail previously obscured made explicit and easy to discern. This was as true with the finer nuances of the percussion on 'Six Blade Knife' from Dire Straits' debut album [Vertigo UIGY-9032] as the textures of the instruments captured on the Andrew Manze/Rachel Podger/Academy of Ancient Music recording of Bach's concertos for solo and double violins [Harmonia Mundi HMM807155].

CLOCK THIS...
The focus, space and the three-dimensional soundstaging proved as breathtaking as it was involving – with a track such as The Dodge Brothers' 'Mr Jones' [*The Sun*; Weeping Angel DB1003], it was thrilling to hear the sound build from the stamps and handclaps of the opening, with each instrument joining in with superb character, all wrapped in the warm ambience of Sun Studios, Memphis.

Even with a dense mix such as ZZ Top's 'La Grange' [*Tres Hombres*; Warner Bros download, n/a cat. no.], the combination does a masterful job of maintaining information in each instrumental line, bringing the listener even closer to the performances. The same is true with a complex orchestral recording such as the Bernstein/NYPO reading of Holst's 'Jupiter' [*The Planets*; Sony Classical SS 87981], in which the rich textures of the instruments combine with the finest details of the percussion to winning effect.

And the USB output? Well, albums such as the Holst and the Bach afforded an opportunity to compare the direct DSD feed via USB with Grimm's proprietary PCM downsampling and reclocking via AES3 where, as already suggested, the company's approach seems entirely justified. So, whereas the resampled/reclocked output via the AES3 connection has all the characteristics mentioned above, the direct DSD feed to the DAC sounded rather thin and papery by comparison, with less fullness and body to instruments and vocals.

It may seem counter-intuitive that a downsampled version should sound better, but it's testament to the quality and undoubted innovation of the code and clock that ultimately feeds the MU1's balanced AES3 digital output.

Hearing it makes clear just what the engineers were trying to achieve. That the design has managed so much more, not only justifies the existence of the MU1 as a digital source, but also proves that a DAC is only as 'good' as its partnering digital front-end. ⏻

HI-FI NEWS VERDICT

Tempting though it may be to think 'but it's just a computer and some storage', Grimm Audio's MU1 is all about delivering the best possible digital data to your DAC. To that end, this is an entirely convincing 'transport' solution, and is capable of sparkling results. The 'analogue/digital' thing may be a blind alley, but the MU1 still delivers one of the most *musical* sounds I've heard from digital to date.

Sound Quality: 89%

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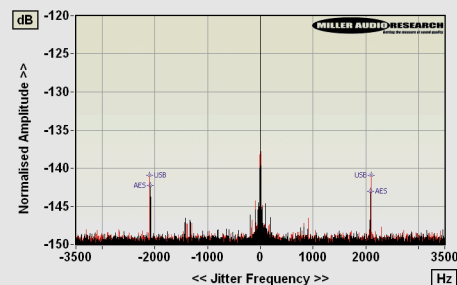
ABOVE: 48kHz/24-bit jitter spectra from Mola Mola Tambaqui DAC via Grimm Audio MU1 (balanced AES3 connection, black; unprocessed USB, red)
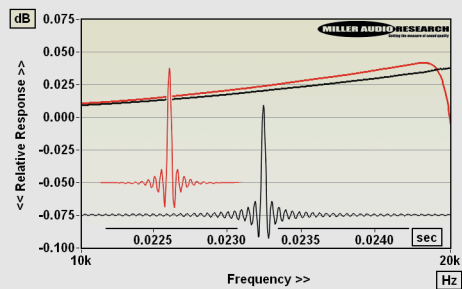
ABOVE: Treble (zoomed, 10kHz-20kHz) and impulse responses for the Tambaqui DAC via Grimm Audio MU1 (balanced AES3 connection, black; USB, red)

HI-FI NEWS SPECIFICATIONS

Digital inputs	Ethernet; USB 2.0; AES3; 2xS/PDIF
Digital outputs	2x USB 2.0; 2xAES3; RJ45 (for LS1)
Digital jitter (dCS Vivaldi One)	40psec (AES) / 50psec (USB)
Digital jitter (Mola Tambaqui)	6psec (AES) / 9psec (USB)
Digital jitter (Mytek Brooklyn)	4psec (AES) / 6psec (USB)
Power consumption	13W
Dimensions (WHD) / **Weight**	355x100x295mm / 4.5kg