

hi-fi news

& Record Review

Exclusive

MAGIC MUSIC

Wilson's new X-rated Sabrina casts a spell!

**140
pages**



Budget Esoterica
Pro-Ject's Debut Carbon EVO deck

Retro Hi-Fi
Open-reel decks and classic
Yamaha pre/power, p122

Hana Umami Red
Flagship MC pick-up

Grimm Audio MU1
The next-gen music library

Pass Labs INT-25
Class A all the way for
Nelson's super integrated

110th Anniversary



Denon's DCD/PMA-A110
Celebratory SACD/amp combination

• **OPINION** 12 pages of letters & commentary • **VINYL RE-RELEASE** Prince *Sign O' The Times* on 180g
• **INVESTIGATION** Our top 10 'pre-loved' R2Rs • **CLASSICAL COMPANION** Carlos Kleiber, conductor
• **HI-FI@HOME** We revisit *HFN* readers' systems • **READERS' CLASSIFIEDS** Hi-Fi bargains galore

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12

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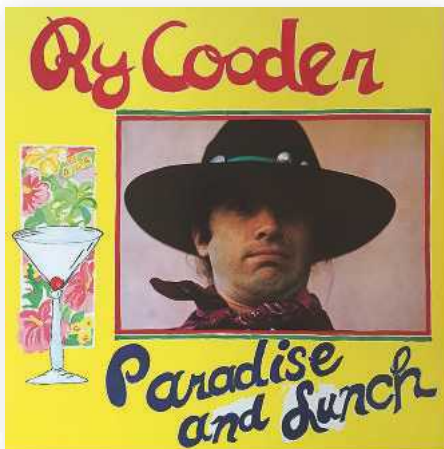
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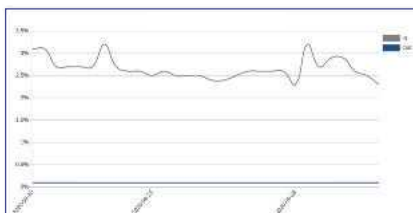
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is a unique feature to our Regenerators that allows you to track in-coming & out-going THD, voltage and wattage, and PowerPlay is now available on our website. **To use, just make sure you're logged into psaudio.com, on the top menu click on My PS, then scroll down to PowerPlay***. *(note: You will need to have registered your PS Audio Regenerator with PS Audio and connected a LAN cable via your wifi-router)

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Total Harmonic Distortion



Wattage



Note in the first two graphs, Voltage and then Total Harmonic Distortion, how the wiggly top line represents the incoming AC wall voltage while the lower straight line shows you how the Power Plant Regenerator corrects what's wrong. You will be able to see the history of your home's incoming power quality and how the Power Plant straightens everything out.



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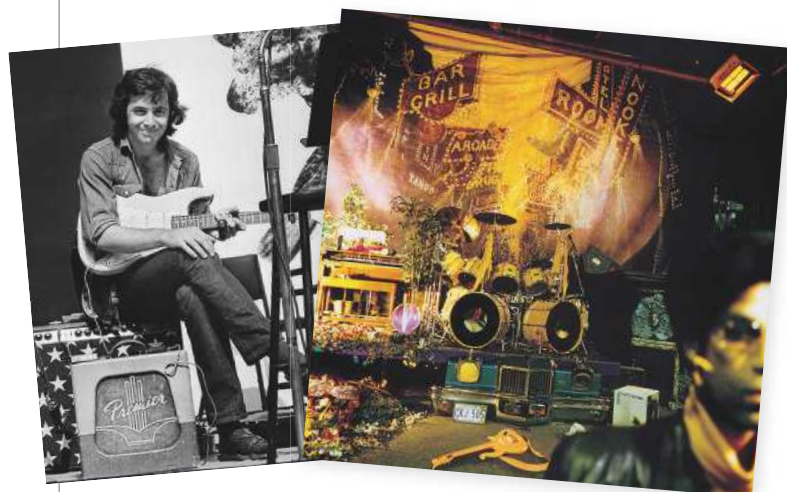
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RIGHT: From Japan comes the Hana Umami Red MC, a flagship pick-up with an Urushi lacquer finish... and mouth-watering sound. See p50



ABOVE: There's nothing gloomy about Grimm Audio's music library/digital server solution. In fact the MU1 might be the brightest yet, p46



MUSIC: Flop to Vinyl Icon – Ry Cooder's *Paradise And Lunch* is celebrated on p84, while Steve Sutherland recalls his evening with Prince as *Sign O' The Times* is re-released on 180g LP (p82)

RIGHT: *Hi-Fi News & RR* is the UK's representative of EISA's Hi-Fi Expert Group. Editor Paul Miller took over as EISA's President in June 2016



As the nights steadily draw in, a somewhat flexible lockdown is imposed and tensions seem on the rise, thank goodness we audiophiles have our 'escape route' of hi-fi and music to keep us in good cheer. Whatever else is happening, I can promise you that *Hi-Fi News* will continue to deliver its unbeatable mix of in-depth product tests, music reviews and features – come rain, shine or pestilence!

In his Opinion piece [p107], reviewer Andrew Everard clearly identifies how the stress of current everyday life is fuelling the passions of online debates. I'd go a step further and suggest it's also manifest in the increasing polarisation of the views expressed. I could be talking about the 2020 US Election (currently hanging in the balance as I type) but, no, this is the world's oldest hi-fi magazine, so I'm referring to the age-old debate of subjective listening versus objective testing.

To my mind, neither is mutually exclusive, for our appreciation of how to extract the very best from any given component or system is informed by a mix of both approaches. This goes to the heart of the reporting that fills our pages – so while we are evidently 'fans' of measurements at *Hi-Fi News*, we are expressly



not captive to the mindlessly performing of tests by rote.

We lab test to offer you a truly independent, and informed, verification (or otherwise) of the specification promised by the manufacturer. Moreover, our lab testing is investigative, the results often leading us to reveal important qualities that you'll simply not discover by reading

'Subjective listening or objective testing? This is an age-old debate...'

any other mag or website [see p49, p53 and p57 for starters...].

What you won't see in *Hi-Fi News* are brand spec. sheets (the parameters changing from product to product) reprinted to fill white space on the review page. If you want to read what the manufacturer thinks, then go straight to the brand's website. But if you value comprehensive, independent and experienced reporting then you'll always find a welcome home at *Hi-Fi News*.

PAUL MILLER GROUP EDITOR

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An avid collector of audio treasures, and life-long hi-fi addict, DP lends his ears and experience from analogue to digital



KEN KESSLER
is a long-serving contributor, luxury goods writer and champion for the renaissance in valves and 'vintage hi-fi'



MARK CRAVEN
Editor of our sister title *Home Cinema Choice*, Mark's passion for music extends from stereo to multichannel and Dolby Atmos



STEVE HARRIS
Former Editor of this very title from 1986 through to 2005. A lifetime in audio and a love of jazz makes Steve a goldmine



ANDREW EVERARD
has reviewed hi-fi for over 30 years and is still effortlessly enthusiastic about new technology, kit and discovering new music



STEVE SUTHERLAND
Editor of *Hi-Fi Choice*, Steve was at the helm of *NME* through the Britpop years. Steve brings a unique slant to our music features

Levinson swells

NEW PRE AND POWER AMPLIFIERS JOIN 5000 SERIES TURNTABLE AND STREAMING PLAYER

Harman's luxury audio brand Mark Levinson continues to add to its 5000 Series. Joining the £6000 N°5105 turntable [reviewed next month] are the N°5206 preamp and N°5302 power amplifier, both priced at £8599 and available this quarter, plus the N°5101 SACD/streaming DAC [pictured opposite], on sale now.

The dual-mono N°5302 boasts a rated 2x135W/8ohm, doubling to 2x270W/4ohm, and increasing still further to 550W in bridged mono mode. A fully discrete, direct-coupled Class AB design, it uses an 'oversized' 1100VA toroidal transformer and a voltage gain stage trickled down from the Mark Levinson N°534 [HFN Jun '18]. Thermally-compensated output devices also guarantee stability regardless of load or temperature. Audio inputs include balanced XLRs and single-ended RCAs, with comprehensive system integration offered via Ethernet, USB, IR, RS-232 and 12V trigger connections.

Designed to partner the N°5302 is Mark Levinson's N°5206 preamplifier. This includes the company's ESS Sabre Pro-powered 'Precision Link II' 32-bit DAC stage (with associated AES, S/PDIF and asynchronous USB inputs) and patented dual



mono line-level preamp section. Trickle-down technology again features in the form of a configurable MM/MC phono stage and 'MainDrive' headphone output derived from the 500 Series.

For silver disc devotees, Mark Levinson's N°5101 combines an SACD/CD transport with onboard high-resolution Wi-Fi/Ethernet network player (with Android and iOS control), plus digital inputs including coaxial and optical S/PDIF and a USB-A port supporting playback from external HDD/flash drives.

**Harman International Ind., CA, USA,
01223 203200; www.marklevinson.com**



The grandest master

DS AUDIO REDEFINES THE 'OPTICAL' PICK-UP

Seven years after launching the world's first optical pick-up, Japanese brand DS Audio has re-engineered the concept for a third generation. Within the machined Duralumin body of its £11,995 Grand Master cartridge are independent L/R channel LEDs and photo-detectors, resulting in a claimed improvement in stereo separation and output voltage (40mV to 70mV here), all without adversely affecting its S/N ratio. The pick-up is also equipped with a diamond cantilever and microridge stylus. It's partnered with the Grand Master phono stage/equaliser (£38,000), a twin-box system with a 'more robust' independent power supply.

**Digital Stream Corporation, Japan, 0118 981 4238;
www.ds-audio-w.biz; www.soundfoundations.co.uk**

A very big Mac

MCINTOSH LAUNCHES ITS LARGEST EVER INTEGRATED

Unrivalled connectivity and enough power to drive any loudspeaker is the promise of the MA12000 (£16,500). Claiming 2x350W – more than any previous McIntosh integrated – this flagship is a tube/transistor hybrid design with a quartet of 12AX7A triodes in the preamp and solid-state amp output featuring the brand's Autoformer speaker-matching technology. Its ten

analogue inputs include MM/MC phono and two balanced XLR connections, while the pre-installed (and upgradeable) DA2 digital audio module allies seven digital inputs, including a proprietary MCT connection for McIntosh's SACD/CD transports, to an eight-channel 32-bit DAC. Styling of this handbuilt 48.9kg heavyweight is straight from the company playbook, with its blue illuminated meters, monogrammed heatsinks and a mirror-finish stainless steel chassis.

**McIntosh
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com; www.
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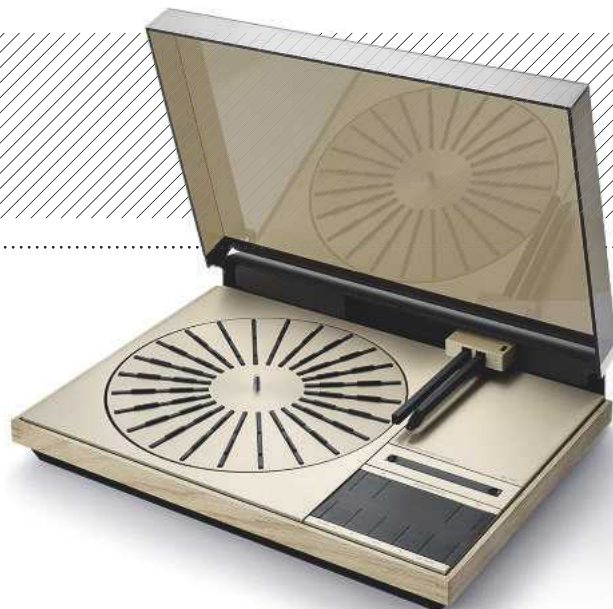
Hi-res on the move

ASTELL&KERN 'BLACK EDITION' A&NORMA SR25 AUDIO PLAYER

Following the debut of its A&norma SR25 high-resolution portable audio player earlier this year, Astell&Kern has announced a 'Black Edition' for the same £650 price tag. Part of the company's most affordable DAP range, it's built around the same Cirrus Logic CS43198 'MasterClass' DAC as the entry-level SR15, albeit augmented here with a quad-core CPU for faster processing, a new PCB design, and Bluetooth LDAC connectivity. Battery life has also been extended to a claimed 20 hours, double



that of the SR15 and longer than any other A&K player. The SR25 supports PCM sample rates up to 384kHz/32-bit, in addition to 2.8/5.6/11.2MHz DSD, and offers internal storage of 64GB with a microSD card slot enabling expansion up to 1TB. Framing its 3.6in touchscreen – which runs a custom Android OS – is an aluminium chassis that Astell&Kern says suppresses noise. For partnering headphones, the player features unbalanced 3.5mm and balanced 2.5mm outputs. **Astell&Kern, 01279 501111; www.astellnkern.com**



Return of a vinyl legend

B&O BEOGRAM 4000C RECREATED LIMITED EDITION

The first model in Bang & Olufsen's new Classics series is the 'Beogram 4000c Recreated Limited Edition', a modern £9000 take on a deck the brand originally released in the early 1970s. Yet this is not a straightforward redesign. Instead, B&O says it 'identified' 95 existing Beogram turntables (to celebrate its 95th anniversary) and brought them to its manufacturing facility in Denmark for a restoration process involving full disassembly, component replacement and fine-tuning, and the addition of an RIAA preamp and new pick-up. The updated design features a solid oak frame, smoked acrylic lid and anodised 'warm champagne' aluminium finish. 'We have applied the same passion, precision, and care to this restoration as you would to any masterpiece', says B&O. **Bang & Olufsen, Denmark; www.bang-olufsen.com**

Flagship of the Empire

MYTEK ANNOUNCES 'COST NO OBJECT' DAC/STREAMER/PREAMPLIFIER, POWERED BY ROON

Pitched at a heady €20,000 when it arrives in December, the Empire DAC/streamer/preamplifier is described as an 'all-out assault on the state-of-the-art' by manufacturer Mytek. This networked one-box solution introduces a new flagship category for the New York-based outfit (it will be followed by Empire monoblock amplifiers in 2021), and combines a

differential analogue preamp, dual mono ESS9038PRO Sabre DAC stage and Roon-powered high-resolution streamer. Mytek has also created a new DAC/preamp platform, dubbed 'MyteKOS', which will accommodate additional functionality and DSP upgrades in the future. Reflecting its system hub status, the Empire features seven analogue inputs

(including MM/MC), plus USB, S/PDIF, AES/EBU and HDMI digital inputs. An 8TB SSD provides internal storage, with playback from USB and network drives supported. Black and silver finishes will be available for the Empire's milled alloy chassis.

Mytek US, New York (EU distributor HEM Sp. z o.o., Poland, +48 22823 7238); www.mytekdigital.com



HI-FI NEWS' NUGGETS

IN-AKUSTIK CABLES

Germany's long-established cable brand, In-Akustik, is now available once again in the UK. The cables are ranged across four quality levels from 'Star' through 'Premium' and 'Excellence' to its flagship 'Reference' class cables which employ silver as well as copper conductors. The metal is refined locally from selected stock while features include helical-winding and good use of both foamed PE dielectrics and 'air' (the ideal dielectric) by the use of internal spacers within its top-end cables. www.in-akustik.de/en/

TINY TORLYTE

Still going strong after the best part of 40 years, Russ Andrews' lightweight but very rigid, cellular-construction Torlyte support solutions have now been 'shrunk' into a series of mini-width platforms. The smallest occupies just 220x50x200mm (whd) for £174 while the 'Medium' £205 platform is 250x50x390mm – ideal for today's smaller components. www.russandrews.com

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www.dynaudio.com/heritage



iFi signs off new DAC

NEW FLAGSHIP BATTERY-POWERED DAC/HEADPHONE AMP

IFi Audio has launched a limited edition version of its Micro iDSD portable/desktop DAC/headphone amp. Available for £650, the Micro iDSD Signature delivers 'a host of improvements to enhance performance and usability', including a Pentaconn 4.4mm balanced headphone output to join its single-ended 6.35mm socket, and upgrades to the 4100mW-rated amplifier circuitry. Inputs are USB-A and 3.5mm S/PDIF (with an adapter supplied for optical connection), while RCA outputs allow hookup to a preamp, integrated or powered speakers. Dual Burr-Brown DACs handle PCM to a claimed 768kHz/32-bit, DSD to DSD512 and MQA decoding is included. IFi Audio has also dressed its flagship portable DAC, which claims up to 12 hours of playing time from its rechargeable battery, in a new 'Space Blue' finish that it says will feature on future Signature versions of its most popular products. **IFi-Audio, 01900 601954; www.ifi-audio.com**

Smaller Spendor

SPENDOR'S S3/5 MINI MONITOR EVOLVES INTO CLASSIC 4/5

The smallest two-way speaker in Spendor's lineup has again been reimagined. The new Classic 4/5 replaces the 2017-era Classic 3/5, and is the latest in a series that traces its heritage back to 1998's BBC-inspired S3/5. Measuring 190mm wide and 308mm high, this sealed bookshelf/standmount uses a 150mm

polymer cone bass/mid driver with new surround and suspension materials, and 22mm 'wide-surround' tweeter, in a revised cabinet that combines a rigid front baffle with thin low-mass side panels. The 4.2kHz crossover has, says

Spendor, been framed to achieve an easy-to-drive (nominal 8ohm) load to partner both solid-state and tube amps. Pricing is



£1600 per pair, in a choice of either cherry or walnut veneers. **Spendor Audio Systems Ltd, 01323 843474; www.spendoraudio.com**



A new Danish trio

SCANSONIC HD'S M-SERIES SPEAKERS HAVE EVOLVED

Comprising the M-10 two-way standmount (£650), M-20 (£1499) and M-40 (pictured, £1999) two-and-a-half-way floorstanders, Scansonic HD's new M Series is described as a 'must-audition for budget-conscious music lovers'. Developed by Benno Baun Meldgård of sister brand GamuT as upgrades on the outgoing M-5, M-6 and M-9 models, and promising 'a more agile, open and three-dimensional midrange' and 'more deeply visceral bass with greater punch', they feature the kapton/aluminium planar tweeters of Scansonic's costlier MB-Series. These are partnered with new 100mm honeycomb-reinforced glass-fibre woofer and midrange drivers in rear-ported, heavily braced cabinets. The speakers' satin black or satin white finishes, plus slender designs – the M-40 tower measures a mere



220mm wide, the compact M-10 just 130mm – contribute to their 'home-friendly' billing. **Dantax Radio A/S, Denmark, 05602 054669; www.scansonic.dk**

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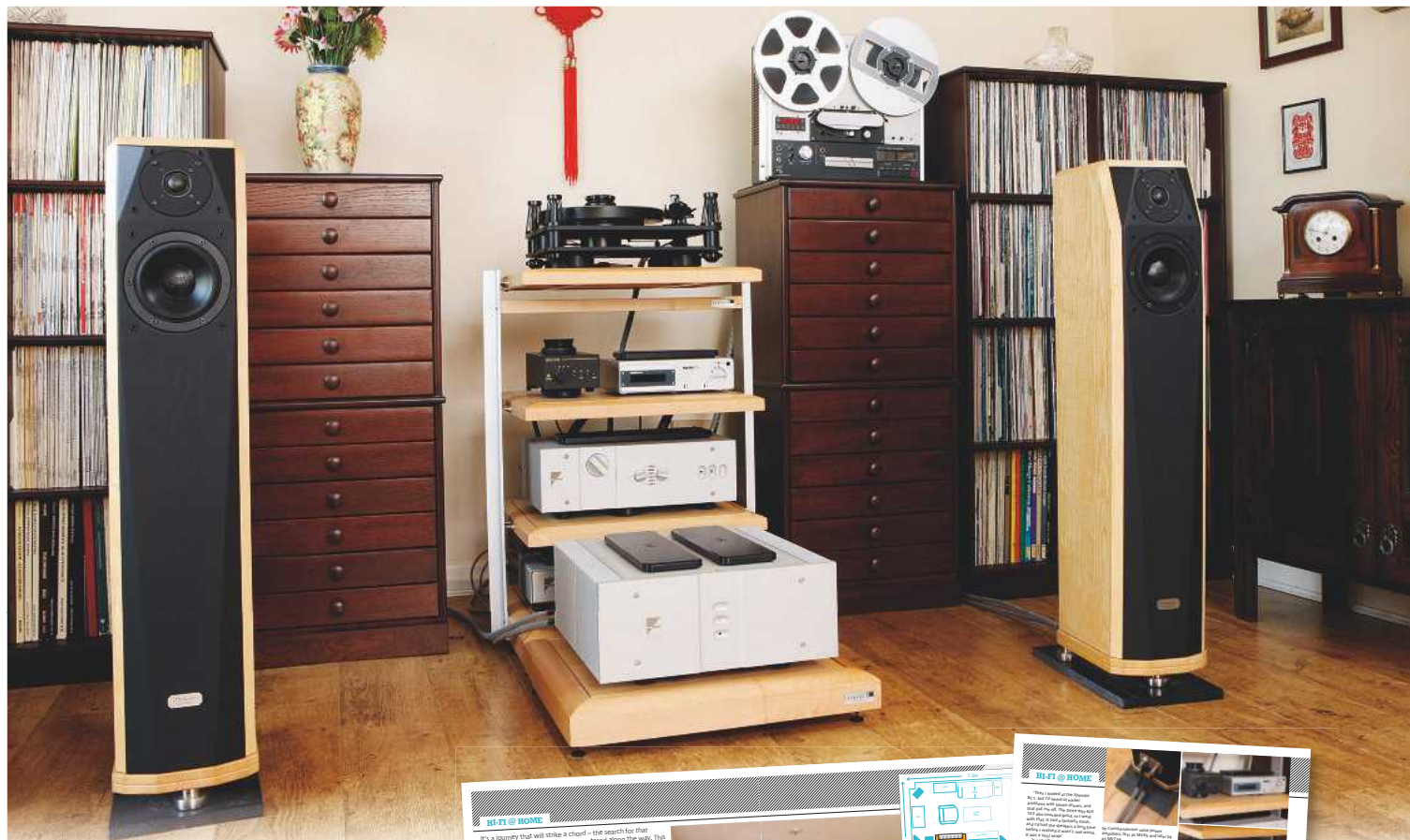


IF YOU DON'T WANT TO MISS AN ISSUE...

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Hi-Fi @ Home revisited

Steve Harris talks to a reader whose system we featured back in 2010. Before we find out what changes he's made, here's how things were...



ABOVE: HFN reader Lawrie pictured back in 2010 when Ayre's K-1x and V-1x amps were at the heart of his system. The open-reel recorder is a Revox pro PR99

An enthusiast all his life, Lawrie has owned so many classic products that there's hardly room to mention them all here.

'It goes back to the 1950s, and AM radio, and the BBC still playing 78s. When the BBC moved over to microgroove records, I thought, "So it can be improved!". And I've been on a steady drive ever since.

'When I started work as an apprentice electronics engineer, I got a Collaro Transcription deck. I built my own amps, the Mullard 5-10 and the Mullard 2 preamp. Then I was lucky enough, for five pounds, to come across a 12in Goodmans Axiom 150 drive unit. I built various

enclosures for it from the Goodmans designs. When I went to stereo in 1961 or 1962, I got a 300, then the current equivalent of the 150.

DREAMS OF DECCA

'By then I had a Quad 22 preamp and a Quad II, with a second coming later. My turntable used the top Collaro crystal cartridge, the TX88.

The cantilever had holes drilled or punched all the way down to it to make it light. But the next step was a Decca Deram cartridge. We added an outrigger counterweight to the arm, as the Deram ran at a fraction of the weight. It tracked quite well.

'It was a couple more years before I could afford the "proper" Decca arm and head. I used to



look at a row of them on the wall at Musicraft in London, and think, "One day I'm going to have one of those". And in 1964, I did. I also got the Decca Professional arm, and a Garrard 301 turntable.

'I stayed with the Decca FFSS cartridges for three generations. When they were working, and the record was good, they were magical. When they weren't, like the little girl with a little curl, they were horrid! In fact, I'm sure I destroyed a lot of records. But when it was good, my goodness there was nothing like it.'

AN EARLY MISTAKE

In 1971, Lawrie changed to a Thorens TD 125 turntable and, less successfully, to a Transcriptors unipivot arm. 'It was at the time when the Transcriptors turntable had appeared in the film *A Clockwork Orange* and I'd read that this was a fantastic arm, fluid-damped and all the rest. But it was a pain to use, all floppy-floppy.'

And not a good match for the Decca, I take it?

'It was awful. I think that was what made me give up on Deccas and go for SME and Shure. When I heard the Shure V15, I didn't think it was anywhere near as good as a Decca at its best, but it was consistent. I could make it track, and I could play my records.'

By then, Lawrie had changed his amplifiers to Quad's transistor pre/power combination, the 33/303.

'I don't say it was better, I don't say it wasn't as good, it was a different presentation. But at the time, I wasn't really getting what I'd now call stereo. I had two-channel with – sometimes – something in the middle! There was no sweep, no soundstage at all.'

'And it was years before I had that. I was always aware of two speakers playing, never heard the speakers disappear. Until one day, I heard Quad electrostatics.'

'That was in Imhofs, near Centre Point in the West End. I thought, "Hello, that's different!". I had

RIGHT: Lawrie's SME Model 20/2 turntable, which is fitted with an SME Series V arm and Transfiguration Spirit 3 cartridge. It sits atop his Finite-Elemente equipment rack

BELOW: The Princess speaker from boutique high-end Danish manufacturer Peak Consult



walked through a soundstage, of sorts. The sound wasn't coming from the speakers, but from behind them. It wasn't in an arc, but it was detached from the speakers. And I thought, "Well, one day..."

'At that time, I'd moved on to Celestion Ditton 25 speakers but they were very disappointing. They had an ABR [Auxiliary Bass Radiator] and what they gave you was loads of woolly bass.'

'The three-way KLH 103 loudspeakers sounded good, so I went with those. They had a fantastic finish. I'd had them a long time before I realised that it

wasn't real wood. It was a vinyl wrap! Eventually I got Spendor SP1s, and now I did have stereo. No depth to talk of, but there was a spread of sound. Like a wall behind the speakers, rather than an open hall, though.

'I'd had the Thorens TD 125 turntable upgraded at Metrosound, and it was working well. But the pressure to go to the Linn Sondek was too great! I felt I must be missing something.'

'So when I'd piled up enough pennies, I got a Linn. I used the Mission 774 arm, which I'd had on the Thorens, the first arm that I'd heard giving thunderous

bass from my Audio-Technica AT32E cartridge. But I thought, when I can afford it, I'll get an Ittok. Which I then did, followed by an Asak cartridge, and later a Karma.'

Lawrie had upgraded the Quad 303 to a 405, but was then seduced by Conrad-Johnson valve power amplifiers, an MV45 then an MV75A.

'It was Jim Dovey, at Acoustic Arts in Watford, who got me interested in the "whole system" approach. I heard the Krell PAM 7 preamp, which he'd put on as a reference while we listened to alternative preamps. At

the end of it, I said "I want the Krell!"

'I also got the SD Acoustics SD1 speakers, with open-baffle mid and ribbon treble. They had a great depth of bass, but you needed to be

a decent distance away from them. Otherwise they didn't integrate.

'And I moved from the Linn to the Oxford Crystelle. It came with a Rega RB250, and I used an Audio-Technica Stilton, a cheap cartridge compared with the Linn Karma. But the whole set-up sounded much better.'

CRACKING ARM

Lawrie's next step was to buy an SME IV. 'I thought it was a cracking arm, but eventually, in about 1998, the turntable bearing packed up – it juddered and jumped around! The manufacturer had gone out of business, so that was the end of it.'

Lawrie replaced that deck with a Michell GyroDec SE, upgrading this with an Orbe platter and DC motor. He found it better-sounding than the Crystelle – lower surface noise too. ☺

"At the end of the demo I said 'I want the Krell!'"





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'Then in 2003 I got an SME 10. I'd heard the SME 30 at a show and thought it the most neutral combination I'd encountered. I couldn't afford the 30, but I was later able to move up to the 20, and equip it with an SME V arm.'

Cartridge changes up to this point had included a Goldring Excel, then an Ortofon MC25 and then an Ortofon Kontrapunkt B.

'I thought that was splendid, until I heard the Glider from Benz Micro! It offered a totally different sound, more spacious, more natural. I ran that until I got the current Transfiguration Spirit 3 – by far the best cartridge I've ever had.'

But we've got behind with the speaker side of the story. Lawrie acquired the SD1s in 1988, and still had them when he eventually moved to his present house some two years later.

A WRONG MOVE

'I placed them where the current speakers are, and it worked because we sat on the settee miles away from them! But I had this old hankering for the sound that was in my mind. And in 1992 I managed to stretch to a pair of Quad ESL-63s. By that time I had moved the room around, with the speakers at the other end. And that was my biggest mistake. It took me years to realise I could never get a good sound with them there.'

So, sadly, Lawrie didn't get the best from the Quad ESL-63s. He replaced them with the Avalon Arcus, from Stephen Harper of Audiophile Consultants. 'I was knocked out by them. But still, they didn't really sound the way they had at Stephen's place. I tried everything. Until, finally, I moved them to the wider end of the room.'

'Suddenly the sound breathed, the bass hump had gone, and it was totally different. Later, I heard the Peak Consult Princess speakers, which I have now. They were even more neutral and open. And again, it was "I've got to have those!"'

When the ESL-63s came in, the Conrad-Johnson MV75 had been replaced by an Exposure XVIII, but

“Moving the speakers was my biggest mistake”

the Krell PAM 7 preamp stayed in Lawrie's system until 2001.

'I eventually went to a Rogue Audio 88 power amp, which had enough grunt. I disconnected the noisy fan and made an Aertex top to keep the valves cool. I went back to

Conrad-Johnson for the preamp, a PV-108 and then a PV-12A, which I found to be particularly good.

'But I heard something better again. Ayre's solid-state amplification

was the first to sound like valves to me. It had the spaciousness, the openness. I have the Ayre K-1x and the V-1x pre/power amps and I still love them, even though, inevitably, I've heard something better still, which is made by Spectral.'

Lawrie hasn't yet heard anything better, though, than his current CD player, the Nagra CDP.

'I started off with the original Marantz CD73, then the Meridian MCD. Then in 1988 I heard a Denon



ABOVE: The SME 20 deck's power supply sits to the left of Lawrie's cherished Nagra CDP CD player

LEFT: Speaker cables are from Canadian-based company Virtual Dynamics

DCD-1500 player. Unfortunately, that died on me and the repair would have cost too much. So I got a Shanling player, which was nice until I heard the Wadia 861! A different league, a whole new world of sound. Suddenly, I really felt that CD was capable of good things.'

TRUE TO THE SOUND

'And then a couple of years ago, I came across the Nagra CDP. With good discs, it can sound truly staggering. And what it doesn't do is make the lesser discs sound dire. It does at least make them sound OK. And this is important to me.'

'I've tried to remain true to the sound I'm aiming for, and once or twice, particularly when buying CD players over the years, I have come unstuck. Looking for audio Nirvana, I realise that there's always going to be something better on the way. But I think now I'm going to stick with this, and I'm quite happy too!'

BELOW: For Lawrie, Ayre's solid-state K-1x pre seen here, along with the V-1x power amp, matched the sound he'd previously had from valves



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HI-FI @ HOME – CATCHING UP TEN YEARS LATER...

Back in 2010, Lawrie was happy with his system, but not with the way it was arranged in the room. Ten years on, though, this long-standing problem has been fixed:

'You remember I had to have everything up at one end of the room because nothing worked the other way – there'd just be far too much bass. I wanted to sit and look out at the conservatory, but I couldn't. I had to sit at the narrow end of the room instead.'

TRAPS 'N' FLAPS

But now the speakers are sited at the other end of the room, along with an array of Acustica Applicata resonators, or bass traps. 'Stephen Harper of Audio Consultants suggested that I try these, and it worked. Stephen brought a load of stuff round, and we solved the problem and more.'

'Over the next year or so I bought quite a lot of it, and I'm very happy with what it's done. I also bought the Acustica Applicata Volcano. This is a clear tube, a tunable trap that you put between the speakers, slightly back. And it really focuses the soundstage in the middle. Now I've got everything how I wanted it, and it sounds pretty good!'

'When I last saw you, I said I'd like to have got Spectral amplifiers. Of course, they'd stopped bringing them into this country. But I did manage to get a mint Spectral DMA-100 power amplifier. It's a more sophisticated sound, but with all the power I got from the Ayre.'

When I first caught up again with Lawrie in the locked-down summer of 2020, he was still happily listening to his Peak Consult Princess speakers. But when we spoke again, just a few weeks later, he said, jokingly: 'You put a jinx on my system!'

'I was playing the soundtrack from *American Beauty*, and it's got one or two fairly deep bass notes, and I thought, that's not right.'



ABOVE: The speakers, now Quad S-5, are at the narrower end of the room where Lawrie always wanted them. A mix of Acustica Applicata 'resonators' are deployed behind by way of bass tuning



ABOVE LEFT: At the wider end of the room can be seen Lawrie's shelves of LPs, and he can now enjoy looking out on the conservatory while listening

Then it got worse and worse, and suddenly all hell broke loose! One of the cones was just flapping around. The surround had gone.

'I looked at the other speaker, and that showed signs of going as well. I couldn't send them back to Denmark for repair – they weigh 50-odd kilos each!'

QUAD SPEED

It certainly would have been difficult and expensive to get the speakers repaired. As for buying new units from the driver manufacturer, this would have cost 'many hundreds', and wouldn't have got him the bespoke version Peak Consult used.

'So I looked around for something else. But of course at that time I couldn't go out for dems and so on. Then I came across Ken Kessler's review of the Quad S-5 [HFN Jan '16].

'This cost about £1500, which was more like the amount I could afford these days. The Peak Consults were about five grand 14 years ago,

and the latest replacement would be more like ten. Ken had stuck the Quads on the end of a pretty decent system, saying that no-one would use them with stuff as good as that – but I have done. And they're absolutely bloody good!'

'I ordered online from a Quad dealer and got them in two days. So within about three days of the old speaker having failed, which was probably about four days after I spoke to you, I was up and running with a new set of speakers.'

'So it all worked out well in the end. When you see Ken, say thank you very much from me!'

RIGHT: The electronics remain largely unchanged except for the switch to a Spectral DMA-100 power amplifier. The cables have been upgraded to GutWire



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Top 10 open-reel decks

Ken Kessler brings you his guide to the best secondhand buys...

While it's true I am obsessed with open-reel tape, I am constantly reminded – not least via our postbag – that 'getting back into tape' is costly for both hardware and software. There are no current decks being produced besides the Ballfinger at £15,000+, brand new pre-recorded tapes start at £200, blanks ain't cheap for those who want to record their own music, and buying vintage pre-recorded tapes requires a sort of fortitude akin to driving in the London-to-Brighton veteran automobile rally.

REALITY CHECK

Having lost myself in open-reel, I was losing touch. A slap upside my head came from reviewing the Quad Vena II Play [HFN May '20] amplifier, EAT's B-Sharp turntable [HFN Jul '20], the MoFi phono stage [HFN Mar '20], and other affordable products this year; they proved to be a much-needed reality-check. It's not as if I am totally divorced from 'real world' gear. We examine our fair share of reasonably-priced kit at HFN, if not quite rock-bottom items like £99-per-pair speakers. Indeed, I pride myself in *not* being unaware of the components which 99.99% of hi-fi users own.

Even more of an opportunity to get back to my reel-to-reel roots has presented itself through the current self-isolation situation. I imagine all of

you are finding yourselves with more time to exploit the joys that our sound systems were created to provide, and to indulge in tweaking and experimenting. Raise your hands, all of you who thought, 'What the heck, let's A/B some Toslink cables'. Either that, or you finally built your Lego Millennium Falcon.

Recently, I've also taken to making imaginary lists, triggered by something external, *eg*, which ten vintage cars would I buy if I won the Lotto. In that case, it was inspired by a show about a guy who buys cars cheap and then flips them after a rebuild. I've also been fielding questions from many of you about what used reel-to-reel deck to buy and – unless you have Ballfinger money – the choices are all secondhand.

MORE AMBITIOUS

Default decks soon emerge, because the world is awash with Akais and Sonys at affordable prices, but I realised that you lot are more ambitious. Here, then, in alphabetical order, are my 'Top 10 Used Open-Reel Tape Decks' [see also 'From The Vault', p128]. The provisos – with one or two exceptions, which I've noted – are that all the machines are of ¼-track format, not ½-track professional stuff.

All of these will play 3¾ips and 7½ips pre-recorded tapes, all can handle 7in spools (or 10in spools if so indicated) and all are domestic or at their most elevated, part of the grey area we call 'semi-pro', like the Otari MX5050 [p35].

AMATEURS RULE!

I purposely avoided ex-studio/broadcast machines, heavy-duty professional gear like 800-Series Studers, because they are either scarily expensive, often worn-out because of true workhorse usage during their lifetimes, or both. And why alphabetical? Because I don't want to start a run on a given machine – eBay gets enough action from me. Here's my list of safe buys for those who want to savour open-reel tape, and what you can expect to pay.

One last thought: I've been assembling this list over the past six months, and – vigilant as I am in following the market – I'm both delighted and concerned about the growth in the 'R2R Revival'. I'm delighted because it might inspire manufacturers mooting the production of new machines to speed up their development. But concerned? That's because prices are escalating like used Rolexes. Well, not *that* bad, but almost. I saw an Akai GX77 for \$7700...

'A working Sony TC-377 can be found for just £80'

AKAI GX-4000D

This is one of the best basic decks I can think of: plentiful, rugged, serviceable and relatively gentle on your tapes. 7in spools-only, from £100 for a beater, to £350 for a near-minter, up to £500 boxed and cherished, or over a grand for one so mint that you'd swear it was new-old-stock. The Akai GX-4000D uses no belts, only idler wheels which are becoming difficult to find, though aftermarket, generic wheels could save a machine.

While certainly easy to use, there is one insufferable quirk in the '4K – to change the speed, you need to screw and unscrew an adapter that changes the diameter of the drive pillar that rotates the pinch roller. When playing without the adapter, it resides on a post under the head cover. Remember to make sure there's one with the machine!





DENON DH-710S

This is the personal favourite of Tim de Paravicini of EAR Yoshino, and for good reason: sound quality is breathtaking. The DH-710S doesn't play 3¾in, but if you can afford one, you can buy a Sony TC-350 [p39] or other beater for slow speed duties. You'd be lucky to find a DH-710S for £1500, so consider its siblings, the DH-510 and DH-610, for less layout.

The handling is superlative thanks to the double-capstan system, but the deck's appeal has escalated of late thanks to external units like the Doshi Audio V3.0 TapeStage tape preamp. The DH-710S is, to my knowledge, the only deck with an umbilical lead straight from the heads, so you can feed it with ease to external high-end preamplifiers.

OTARI MX5050

The all-in-one that does everything: speeds, reel-sizes, formats and EQ. This has the same spec as Technics' RS-1500 [p39 and p131] but built to semi-pro or even pro standards and, unlike the RS-1500, has switchable NAB/CCIR EQ. It's XLR-output-only, not pretty, but what a deck! Well-used from £500-£750, excellent shape from £1200, near perfect for £2-£3k.

Ignore the studio variants such as the 8-track decks unless you're opening a studio. You want the ¼in tape model that's got switchable ½-track and ¼-track. By the way, Petronel Butuc at Audiophiles Clinic says Otari produced the last-ever open-reel decks until Ballfinger appeared. This means its 2005-6 units are the 'newest' of used decks.



PIONEER RT-707

The sleeper awakens, for this auto-reverse, 7in spool-only unit, 19in rack-mountable gem has been rediscovered as not merely a pretty unit designed for domestic acceptability, but also as one of the nicest-sounding of them all. Oddly-dimensioned at 12½in deep but standing a mere 9in tall, it is one of the most easily-accommodated in hi-fi equipment stands. Prices are currently escalating vertically, with good examples now commanding £600-£1500. The RT-707 boasts good, durable heads, the auto-reverse system is one of the best, its ease-of-use is second to none, spooling is rapid, and tape-handling excellent.

I use mine for five to six hours on the trot, and it hasn't chewed a single tape. Because demand is so crazy for these machines, not least due to the convenient shape and size, the market where the most were sold is the one to tap: the US, which swallowed plenty of 110V models. You can find these on eBay, hifishark or other online auction sites – when I last checked hifishark, it had over 100. And worry not about the voltage because converters don't break the bank.



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REVOX A77/B77

The solid-state replacements for the G36 [below], and both are plentiful, available in various formats and easy to service. These are truly wonderful machines, but prices are all over the place. I've seen decent ones for £300 but the market seems to be stable at £350-£500 for clean units needing no parts, up to £1200-£1500 for minters, and all points inbetween. Whatever model you choose, whether you go for the A77 or the more slick B77 [see also p129], what's constant is that all offer two speeds. 'Low' means 3¾ips and 7½ips; 'High' gives you 7½ips and 15ips.

If, like me, you're planning on using only vintage pre-recorded tapes, you obviously want the low-speed ¼-track versions, but if you're planning on making high-quality tapes, go for the high-speed machine in ½-track form. The A77 made it to Mk IV status, the B77 to Mk II, and there are cults for all of the various iterations. If you fall under the Revox spell, buy the book *ReVox Reel To Reel Tape Recorders 1949-1993* by Luca Maria Olgati and Paolo Bologna (ISBN no 978-1-36-659060-2). It will save you a fortune, prevent headaches and guide you through the selection of two of the most popular open-reel decks in history.

REVOX G36

For some, this valve unit is the best-sounding playback machine ever made, but it runs hot, it's full of valves and it always needs TLC. They made plenty of them, so prices for good ones are only £350-£750. Also available as a half-track deck and with various speed combinations, but look for the ¼-track with 3¾/7½ips speeds. Without repeating everything I wrote about its solid-state replacements [above], the G36 – which reached Mk III guise and total production of around 43,000 units of all types – is the template for the range of A77/B77 variants, and also begging the purchase of *ReVox Reel To Reel Tape Recorders 1949-1993* before you even consider logging onto eBay.

The issue is this: because the G36 contains so many valves – 21, I believe – and is crammed full of point-to-point wiring, working on it is akin to 'disassembling a sandwich', according to Audiophiles Clinic's Petronel. Another consideration is that G36s can only play in the horizontal, not the vertical, if it's an issue for you. That said, I will forever cherish my Tim de Paravicini-modified G36, which I savour on special occasions.



SONY TC-377

The sloped-front-panel alternative to the Akai GX-4000D [p34], and one of the best-selling reel-to-reel decks of all time. 7in spools-only, feature-laden, affordable, compact – it's hard to choose between this and the GX-4000D. Working machines can be found for just £80, but £250-£300 should secure a gem and £400-£500 a mint example. It's not just ubiquity or price that makes this deck so appealing: it really is something special, not least that it sounded so good for the price. One neat detail is that its preamp signal goes straight to the transistors without a capacitor in the way – a clever Sony invention.

It boasted 'TMS' – or 'Total Mechanism Shut-Off' – which turned off the machine completely when tape play ended; it worked vertically or horizontally; featured 'Ferrite & Ferrite' heads for long life, and offered a panoply of controls, unlike its prosaic sibling, the TC-350 [p39]. If you prefer a rarer version, the Sony TC-377 was an update of the TC-366, while the Japanese market's model was the TC-6360-A. For perspective, when launched in the UK in 1973/4, the TC-377 sold for £105 (£1281 in 2020 pounds), or a third of the price of an A77.



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SONY TC-350

Basic, nay crude, 7in spools-only, devoid of frills, but (I am not kidding) amazing sound! Friction transport, so if a tape breaks, it doesn't stop the tape from unspooling, but hey, I've seen these for £20, so don't grumble. Yes – two tenners. I use my '350 daily. £150-£200 should get you something in perfect condition, or walk away. It must be emphasised that in so many ways this is the ideal machine for those who aren't 100% committed to the idea of delving into the world of reel-to-reel tape, but are at the very least curious. I cannot emphasise what a dirt-cheap way this is to at least try the format.

This is proper Japanese engineering, in a machine that is so user-friendly that no manual is needed if you've used a tape deck before. What's more, it's so light and compact as to be almost portable. Yes, it's so basic that it doesn't even have locking spindles – the spools here are held in place by rubber grips which you'll mistake for the feet of an amplifier. And the TC-350 is clunky. You cannot leave it playing alone (see above about tape unspooling.) But the sound! And all for the cost of four Big Macs! This is a deck that deserves to heard.



TECHNICS RS-1500/1700

This is the 3-speed (3¾, 7½ and 15ips), 7in/10in spool deck *du jour*, the later variants playing ¼- and ½-track [see p131]. The only thing this NAB deck doesn't do that Otari's MX5050 [p35] does is offer CCIR EQ as well. Prices are going crazy, because high-enders adore this deck and it's favoured by the refurbishing companies who are buying up donor machines.

This means allowing at least £1200-£1500 for working samples and then adding £200-£400 for the auto-reverse RS-1700. And if that's daunting, one reseller of completely rebuilt, customised units asks \$8000-\$12,000. And I promise you: prices are rising faster than those of any other deck.

TEAC X-SERIES

The 'pretty ones', eg, the X3 (pictured), X7, etc, because they were plentiful, robust, sound great and remain affordable, unlike the X-1000, X-2000, etc, which shot up in price after a starring role in *Pulp Fiction*. 7in spool-only examples start at £250, 10in spool models from £500. Fabulous decks.



MY ADVICE?

Spend at least a month scouring eBay, try to visit one of the Tonbridge Audiojumbles, when it restarts, contact one of the many companies servicing decks for quotes, stick to a budget and take your time. If you want one machine that does everything, the Otari MX5050 [p35] and Technics RS-1500 [opposite] will never disappoint. If like me you only want to play vintage pre-recorded tapes, you can get away with any machine without 10in spool capability and save a lot. Shop around, budget for a full service and expect problems. But the sound will make it all worthwhile. Happy hunting!

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Wilson Audio SabrinaX

Five years on and Wilson Audio's Sabrina earns its 'X' – an overhaul that raises the bar for compact floorstanders
 Review: **Ken Kessler** Lab: **Paul Miller**

Five years – that's how long ago the Sabrina was launched and five years seems about right before making a new version of any model as good as the original was – and remains [HFN Aug '15]. Rightly, the upgrade is comprehensive, not a mere facelift, which is reassuring if you're wondering why a £15k per pair model is now priced at £21,500-£23,000. As for the price span, it covers three standard or three deluxe 'WilsonGloss' paint finishes, which can be co-ordinated with five grille colours. Our review sample is pictured here in the 'upgraded' gloss Ivory.

The SabrinaX's main change can be found in its name, as the enclosure is now entirely composed of Wilson's X-material, the latest inert substance preferred by the manufacturer over woods or conventional composites. But that's just one aspect of the model change. CEO Daryl Wilson says that the primary difference – sonic, of course – is the gain in refinement achieved 'by incorporating what we've learned since the launch of the original Sabrina' [see PM's boxout, p43].

SPEEDIER BASS

Heady stuff, for that means trickle-down benefits from the Chronosonic XVX and Dave Wilson's swan-song, the majestic WAMM Master Chronosonic. The company has never been shy of pursuing cost-no-object solutions, but now we are entering an area best described as 'unapologetic'. How so? Daryl, like his father Dave, appreciates fine craftsmanship, whether in a pen or a car or a watch or a suitcase, and he 'gets' the luxury sector.

To that end, 'X' means, in addition to the all-X cabinet, improved bracing for better low frequency definition. The new tweeter is the Convergent Synergy MK5 from Wilson's flagship floorstanders, boasting more extension 'with better detail and airiness'. The 146mm mid is that of the original Sabrina, but the 203mm woofer is

now the same as the Sasha DAW's [HFN Mar '19], to provide a 'tauter, speedier bass', I was told.

Further confirming that the changes are non-retrofitable, hardware revisions include a modified woofer port and the mid-port now replaced with a tuned vent, to open up the sound – and this is, for me, the most immediate and impressive initial realisation you will experience. But more about that later.

FINE TUNING

Wilson Audio devised new binding posts with an increased contact area for better coupling – I used 4mm plugs on the Yter cables, but you can use spade lugs or bare wire if you prefer. As expected, the spikes are massive,

fully adjustable and come with discs to prevent damage to non-carpeted floors. You'll find them in the accessories kit with the necessary tools.

In the base of the speaker the crossovers now include AudioCapX capacitors with access provided to specialised resistors through a panel. These offer a modicum of fine-tuning while also adding a measure of safety, because they are designed to blow before taking out a driver, should a problem arise.

For many of you, this will be the best bit, as it was also the *raison d'être* of the original Sabrina. Take an LP sleeve and put it in the floor. Add a three-inch strip along the back edge and you have the footprint of the SabrinaX. Yup, it's only as wide as an LP at the base and barely deeper. Then, hold your hand 1m from the floor and you have the height. Yes, Wilson's smallest floorstander

RIGHT: Stunningly-finished 'X-Material' cabinet is supported on substantial spikes and hosts a 203mm reflex-loaded paper-pulp woofer, 146mm doped-cone midrange and 25mm silk-dome tweeter

'It was the most exhilarating, in-the-room piano sound'



DARYL'S DIRECTION

Evolution, rather than revolution, is the key to understanding Wilson Audio's direction of travel under the very steady hand of heir Daryl, son of founder David Wilson. Having worked with his father for many years, Daryl clearly has an intimate understanding of what makes each and every design 'tick' and how each and every component of those speakers contributes to their performance as a whole. That's certainly the case with the SabrinaX. Here, the dense, mineral-loaded polymer that is X-material has been reformulated to further 'deaden' the cabinet, just as the structure's internal bracing has been refined – courtesy of laser interferometry – to reduce if not entirely eliminate any remaining flexure of the panels.

There's direct trickle-down from costlier stablemates too. So the Convergent Synergy MK5 tweeter, modified for use in the stately WAMM Master Chronosonic floorstander to improve dispersion, extension and reduce distortion, is now incorporated into the SabrinaX. Similarly, the 203mm paper pulp woofer, complete with modifications to the voice coil former and suspension, has been levered from the Sasha DAW into this smaller cabinet. Bass loading is improved with a reduction in port turbulence and the crossover – its topology 'tweaked' to better optimise the revised drivers – now features Wilson's own AudioCapX capacitors. PM

remains dinky. It even looks more svelte, attesting to the detailed refinement of the faceted, nay, sculpted enclosure the company modestly describes as 'slight aesthetic modifications'.

Each loudspeaker weighs 51kg, so set-up, if not by the dealer, requires another member of the household because you don't want to scratch the gorgeous finish, yet you have to move these continually. Positioning is *excruciatingly* critical. I know: every speaker ever made has optimal siting, so that's a truism, but the SabrinaX responds to every millimetre of change.

BY THE BOOK

A Wilson tradition, however, is the inclusion of a comprehensive set-up guide, one of the best in the industry, which you must follow to the letter. Even though this is a single-piece model, less complex to install than those with separate, adjustable mid and/or tweeter enclosures, you don't get off lightly. The speaker's near-to-ideal sloped baffle deals with signal arrival times, but you can tweak it further by playing with the height of the spikes, tuning the slope relative to your hot seat.

I started with the enclosure's underside parallel to the floor, the spikes screwed into their mid-point to allow adjustment, ultimately adding 10mm height at the back via the spikes and lowering the front by 5mm. The degree by which the focus improved was as severe as the way that tiny changes in toe-in alter the soundstage, especially the sound beyond the outer edges.

Even a centimetre too much toe-in narrows the stage width markedly, though you may find an increase in front-to-back depth.

GRAND DESIGN

EAT's E-Glo I integrated amplifier [HFN Oct '20] proved a sublime match for the SabrinaX, delivering a sonic sensation I can only describe as 'majestic'. I know I use that adjective too much, but here it was undeniably apposite, particularly in light of Daryl citing his inspiration as including the 'vistas throughout Utah' (the brand's home town). The Sabrina defied belief with a soundscape that belied its dimensions, encouraging me to write that 'It sounds as "big" as a speaker double its height'. The SabrinaX sounds even more grand.

It caused a listening frenzy that ran, initially, to eight hours, my wife appearing periodically with tea and bemusement. What rocked my world from the outset was the 1962 soundtrack to *Show Boat* [Columbia OQ487; open-reel tape], the overture so massive I thought there could be no more surprises until the chorus arrived. But then such recordings always sound huge.

No, what made the grandeur even more impressive was the air that remained even through quieter sections. I know from the outset this stage show has been ➔



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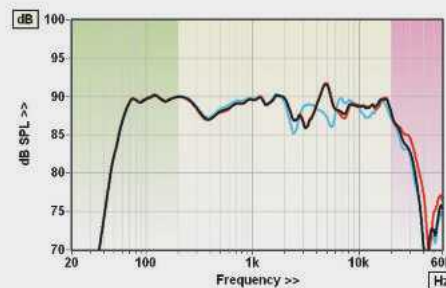


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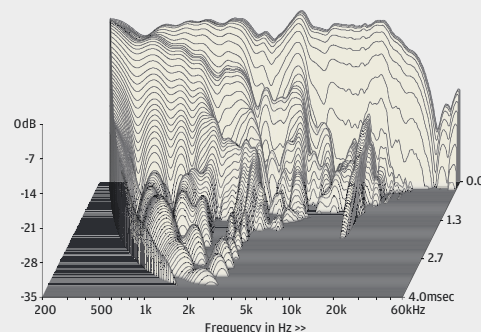
WILSON AUDIO SABRINAX

Although the SabrinaX's drivers are either new or improved, the forward response characteristic of the 'X' clearly inherits the dips at 380Hz, 2.8kHz and subsequent peak at 4.9kHz, plus associated mild driver resonances [see CSD waterfall, Graph 2], that we recorded for the original model [HFN Aug '15]. These account for the modest ± 2.9 dB response variations but the consistency of Wilson's driver QC is revealed in the superb 0.6dB pair matching [black/red traces, Graph 1] even if the press-to-fit grille frame adds its own modification to presence and treble [cyan trace, Graph 1]. Especially impressive is the SabrinaX's low 0.1-0.2% THD through bass and midrange (re. 90dB SPL) – a quality assisted by the enhanced 89.6dB/1kHz sensitivity of these new speakers, a full 2dB higher than Wilson's own conservative specification which is more in line with the mean figures of 88.8dB (500Hz-8kHz) and 86.6dB (200Hz-20kHz).

The diffraction-corrected bass shows a fairly steep 52Hz/-6dB roll-off [re. 200Hz; green shaded area, Graph 1] but this improves with rear-wall reinforcement. Moreover the bass output is clear of significant spurious pipe resonances, the port offering a useful 27Hz-85Hz tuning to support the 60Hz-280Hz passband of the 203mm pulp woofer (all -6dB limits). Nominal impedance is quoted as 4ohm with a specified 2.6ohm/135Hz minimum which is only slightly more optimistic than the 2.4ohm/155Hz measured here. Moreover, with a broad sub-8ohm from 60Hz-8kHz, the SabrinaX represents a reasonably challenging load, particularly through the bass where the boldest swings in phase of $-60^\circ/67$ Hz (5.8ohm) to $+27^\circ/255$ Hz (3.6ohm) are found. PM



ABOVE: Response inc. nearfield summed driver/port [green], freefield corrected to 1m at 2.83V [yellow], ultrasonic [pink]. Left, black; right, red; w. grille, blue



ABOVE: There are mild driver resonances at 2.8kHz, 5kHz and 17kHz coincident with peaks in response

LEFT: Rear view shows Wilson remains committed to single-wired, rather than bi-wired/bi-amped, connections. Note separate, dedicated port for bass and a resistive slot for the midrange driver

the fabulous new release of The Crickets' 1970s canon, *A Long, Long Way From Lubbock* [Rollercoaster RCCD3075]. It contains that lost masterpiece, *Bubblegum, Bop, Ballads & Boogies*, with Glen D Hardin, Elvis' pianist, delivering the finest-ever cover of Huey 'Piano' Smith's 'Rockin' Pneumonia And The Boogie-Woogie Flu'.

FREE KICKS

This boasted the most exhilarating, in-the-room piano sound I could have hoped for, with speed, clarity, attack and – crucially – low-end mass to add richness. Can a system swing? Spare me the 'pace-rhythm-timing' spiel of yore. The SabrinaX simply freed the recording. It was all there, unleashed. I sat stunned, for here was truly a half-pint Sasha DAW, which remains my reference.

But here's where we come to a crisis, as I'm painfully cognisant of 'audiophile neuroses' and those who suffer apoplectic rage when their 25-year-old preamps have been upgraded. If you own the Sabrinas and loved them last Tuesday, you will love them next Tuesday. They are still magnificent loudspeakers. You needn't rush to replace them.

If, however, you have £22k to spare, and you desperately need a floorstander that won't take over your home, while still delivering John Ford-scale panoramas, Daryl Wilson has a speaker for you. ☺

HI-FI NEWS VERDICT

Wilson's Sabrina was, for me, one of the best compact high-end loudspeakers ever – delivering the scale of a behemoth from the form of a wee sprite. The SabrinaX expands the soundstage and extends the bass in ways that shock me, even when played side-by-side with its big sister, the Sasha DAW. So I leave you with an ideal analogy: the SabrinaX is to the Sasha DAW what a 4oz filet mignon is... to an 8oz. Delicious.

Sound Quality: 90%



controversial because of its subject matter, but hearing the depth of the male voice on 'Ol' Man River', followed immediately by a stunning delivery of 'Can't Help Lovin' Dat Man' (one of Jerome Kern's greatest masterpieces) rendered me dazzled.

Surely such less-crowded pieces beg for intimacy? Smallness? Absolutely. And yet there was a feeling of all-embracing atmosphere, of presence, of – yes, air on a colossal scale. It happened again with Nancy Wilson's *Just For Now* [Capitol Y1T 272; open-reel tape]. Her breathless, edgy take on 'That's Life' was made all the more real by details which attested to the Wilson (Audio) bloodline. I wish Dave were alive to hear what Daryl's design did with this 1967 treasure. You could sense the studio's space.

So far, so subtle. But I really needed something that wouldn't tax my tear glands, so I turned to

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 SSD [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-intensive 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'

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'.

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/ ➤

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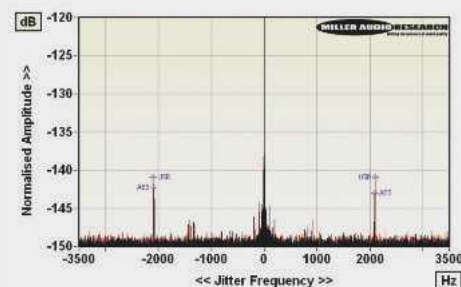
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GRIMM AUDIO MU1

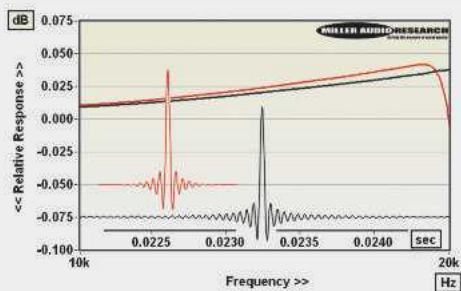
Grimm Audio's innovative MU1 is not only a network-attached music storage device but, like the recent Innuos Statement [HFN Jan '20], Melco N10 [HFN Jun '19] and Roon Nucleus+ [HFN May '18] it also includes proprietary signal conditioning. In this case the 'conditioning' – upsampling and/or downsampling to 2x or 4x the base 44.1kHz/48kHz sample rates – is specific to the balanced AES3 digital outputs. The USB 2.0 output runs directly from the onboard Intel NUC 8i3BE 'mini computer' that hosts the SSDs and provides all the peripheral digital housekeeping. The AES3's proprietary resampling/re-clocking routine is executed separately on a Xilinx Artix-7 FPGA [see picture, p46].

As the music data remains in the digital domain in and out of the MU1, and we are interested in any *differences* between the USB and 'conditioned' AES3 outputs, then this can only be inferred via a third-party DAC. This is complicated by any further jitter suppression/galvanic isolation/re-clocking within the test DAC, so the 'best' may not express a significant difference.

That was certainly the case here as our three AES/USB DACs – dCS Vivaldi One [HFN Feb '18], Mola Mola Tambaqui [HFN Nov '19] and Mytek Brooklyn [HFN Aug '17] – showed no significant difference in either distortion or A-wtd S/N via either USB or AES3 streams – right down to 0.00005-0.00007% (0dBfs to -30dBfs) and 118.5dB, respectively, for the Tambaqui. There were minuscule changes in jitter revealed by each DAC [Tambaqui, Graph 1] amounting to mere psec. The real explanation for the difference in sound between the MU1's USB and AES3 outputs lies in the first-stage 4x upsampling/filtering applied to the latter – a very high tap linear-phase filter revealed by its extended pre/post ripples [black impulse and response, Graph 2]. By contrast the unprocessed USB output invokes the slower roll-off linear phase filter inside the Tambaqui [red impulse and response]. PM



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



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 UICY-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%



Hana Umami Red

From Japan comes an exquisitely finished flagship MC cartridge that's cooking on gas when it comes to serving up full-flavoured sound. Is value for money on the menu too?
 Review: **Adam Smith** Lab: **Paul Miller**

By naming the flagship MC in its Hana pick-up range the Umami Red, Japanese cartridge maker Excel Sound has played a clever stroke. Glance at the £3399 cartridge's exquisitely lacquered body and there are no prizes for guessing why the name includes the word 'Red'. But 'Umami'? In Japanese, 'umami' is one of five tastes, along with sweetness, sourness, bitterness and saltiness. It has been variously translated as 'delicious' and 'savoury', but umami is said to be quite difficult to detect on its own. Rather, it combines with other flavours to give a result that's far greater than the sum of all parts.

CHEF'S SPECIAL

The recipe behind the Umami Red is as complex as an exotic chef's special. A semi-open design, it has at its heart an elegant-looking open generator [see pic, below], carefully clothed in an external body, but not fully encapsulated by it. The cartridge is manufactured in Excel Sound's Japanese factory [see boxout, below], the assembly process a combination of automation and



ABOVE: The Hana Umami Red's 'Auricle' body design features a multi-layered red Urushi lacquer finish and ebony wood inlay at the front

handcrafting. Automation is used where repeatability and speed are necessary, but the more intricate operations are still carried out manually by trained craftsmen.

As for the generator, this is based around a samarium-cobalt magnet and a square Permalloy armature. The generator's

pole piece is cryogenically treated, as are the front and rear yokes along with the 24-carat gold-plated output pins. The company claims this process alters the crystal structure of the various alloys advantageously, continuing the culinary analogies by likening it to 'molecular gastronomy'.

POWDER 'N' POLISH

High-purity copper wire is used for the generator coils and the number of turns is reflected in a coil impedance of 6ohm. Using the general 'rule of ten' multiplication factor for phono stage matching suggests an ideal cartridge load of 60ohm or greater. This, along with the relatively generous output of 0.4mV [see PM's Lab Report, p53], means the Umami Red should work happily into the vast majority of MC phono inputs.

The business end of the Umami Red comprises a solid boron cantilever tipped with a nude 'microline' diamond. Hana says this is cut and polished to mimic the shape of the stylus on the head of a vinyl cutting lathe. The idea is to offer the best fit into the record groove, extracting all the detail, with minimum noise and record wear.

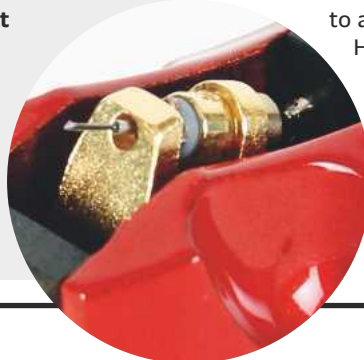
The elegant and stylish body that clothes the Umami Red is no less a work of art. The body itself is made from A7075 aluminium alloy – a modern version of the material originally known as duralumin, which was developed for use in the aircraft industry. Alloys in this category are easily moulded into the shape required while retaining good strength, despite their light weight. In this instance, the gentle curve of the outer body edges is referred to as an Auricle body design by Hana, suggesting the outer shape of the human ear.

The body itself is then coated with an Urushi lacquer finish – a Japanese traditional art that stretches back many centuries. In the case of the Umami Red, the

A BRILLIANT RETURN

Hana is one of the in-house brands of the Excel Sound Corporation, based in Yokohama, Japan. Formed in 1970, the company initially made cartridges under its own Excel brand, before becoming an OEM supplier to many large manufacturers across the world, as well as Japanese companies including Pioneer, Trio, Sansui and Sanyo. It is said it once manufactured up to 50,000 MM cartridges per month during vinyl's heyday. However, as interest in vinyl waned in the '80s, the company diversified into lower-cost audio and video accessories, though it retained a small role as an OEM supplier of cartridges.

In more recent times it was decided that demand was sufficient to re-start production of its own brands once more, and the result was the Hana range of cartridges introduced in 2015. The word Hana means 'Brilliant and Gorgeous' in Japanese, so the company certainly made its intentions clear from the very beginning. All pick-ups in the Hana series are designed by company owner Masao Okada-san, who has been with Excel Sound since the beginning, and has considerable experience in the engineering that goes into the company's products.



work begins with a black Urushi-painted undercoat, followed by another layer that adds the red colour in a process that makes use of fine silver powder. To top this off, the Hana name is printed using a fine gold powder and completed with a final protective lacquer coat. This is then comprehensively buffed for a perfect finish and shine. The overall effect is nothing short of stunning, so much so that my installation of the cartridge was delayed as I spent far too long simply admiring the flawless craftsmanship...

Fitment is aided immensely by two captive screw threads built into the top of the cartridge body. This will come as a relief to an audiophile nervous about damaging the body finish with the slip of a bolt and sharp, hexagonal nut. Do be aware, though, that these threaded holes are not especially deep, so short screws are a must. The cartridge is presented in a simple but elegant wooden box [pictured, p53] that also includes an instruction leaflet and stylus cleaning brush.

The Umami Red tips the scales at 10.5g and has a recommended tracking force of precisely 2g, with no range given. I experimented with different forces only to find that 2g was indeed its sweet spot. Furthermore, the Umami Red also seems very sensitive to azimuth adjustment, so do take the time to set it up correctly – if it doesn't have a big, enveloping soundstage then something's not quite right.

LOVE AT FIRST BITE

With the Umami Red fitted to an SME 309 arm [HFN Sep '19] on my Michell Gyro SE turntable, my mouth almost watered as I anticipated the sonic delights to come. Would I end the evening leaning back with a contented sigh or be searching for the number of a late-night food delivery service due to lack of fulfilment? I needn't have worried as the Umami Red is a compelling companion and, just like the first bite of a fine meal, had me wanting more.

This cartridge slips neatly into the high-end pick-up scene, striking an excellent balance between the rose-tinted lushness of some 'traditional' MCs and the cooler analysis

RIGHT: Fashioned from a high-grade duralumin, the Umami Red's semi-enclosing body includes two M2.6 threaded inserts for locking tight into a headshell. The boron cantilever is fully exposed so cueing is very easy but extra caution is required in general handling



of high-tech groove diggers, blending the depth and detail of the latter with a touch more warmth. Moreover, it succeeds in eliciting crisp detail without the slight hardness that can beset the performance of brighter, typically more brittle-sounding pick-ups. Heck, it even has the feisty *joie de vivre* of the good old Denon DL-103, whose recommended tracking force of 2.5-2.8g some mistakenly fear will lead to premature record wear.

In fact, the Hana Umami Red is not only a jack of all trades, it's a master of most of them. It has an unerring ability to cut through to the heart of a recording and find the very best lurking within. Aided by an ability to track securely, the result is clarity, detail and depth, plus – above all – the boogie factor in spades.

Spin 'Summer Girl' from Haim's *Women In Music Pt III* [Polydor 0250813817], and the Umami Red captures the thump of the drums with aplomb, punching them out with authority. Danielle Haim's vocal is positioned

'Above all, this pick-up has the boogie factor in spades'

beautifully centre-stage and projected superbly into the room, really putting the listener at the heart of the action. Then comes the saxophone solo at the end, which arrives blessed with just the right amount of rasp to sound realistic.

So far so good, then, but the real surprise is in the way the Umami Red can dig out the bass line from deep down within a track. In this instance, the repeated sliding notes from the upright bass came through with impressive weight, but the aspect that tickled me most was the delicious

squeak caused by Este Haim's hand every time she lifted it off the strings. It's this style of delivery that reminds us how some pick-ups will forensically dissect the vinyl yet still lose sight of the overall musical message along the way. Not the Umami Red. It is able to lay an entire mix bare while never forgetting that its purpose is to convey all the joy of the music at hand.

FOOD FOR THOUGHT

What's more, it achieves all this with a pleasing ability to fill the soundstage between the loudspeakers with precision. Its sense of front-to-back perspective is arguably as good as it gets at the price, and ensures vinyl is a true 3D experience.

When it comes to the low end, the Umami Red digs deeply and with confidence. Bass lines are picked up on, brought to the fore and presented with a flourish. Now, that said, there are still times when this cartridge can be a little over-zealous when it comes to the really



LEFT: The pole piece and front and rear yokes of the samarium-cobalt magnet assembly are all cryogenically annealed, as are the rear cartridge pins [see p53]

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CARTRIDGE

RIGHT: The square-cut permalloy armature with its 30µm copper wire coils, extending into a boron cantilever, is visible here in the exposed generator assembly. Output pins are clearly marked

low stuff, particularly with electronic music. Allward's 'Slowburst' from *Chromatophore's Volume 1* EP [Chromatophore CHR 001] boasts some deliciously deep synthesiser action and, while the Umami Red never sounded out of its depth, my regular Clearaudio MC Essence [HFN Aug '17] was just a little bit tighter and more controlled in this area.

However, what was in no doubt was the precision and clarity the Umami Red imparted on the rest of the track. Those deep bass notes are overlaid with some seriously manic electronic percussion and this cartridge gripped hold of them with impressive tenacity. Aided by a good level of air and a pleasing lightness of touch at the top end, the Umami Red was as crisp and open as I could have wished for, but without any artificial sense of upper treble boost.

RIP-ROARING STUFF

One result of this presentation was that during my time with the Umami Red I found myself drawn to recordings featuring more natural instruments. The unwavering level of detail it offers just seemed to suit acoustic music perfectly. Now, don't get me wrong, this pick-up can rock out with the best of them, as proven by a blast of 'Motorcycle Emptiness', a 12in single by The Manic Street Preachers [Columbia 658083 6]. This track thunders along, driven by a solid bass line and some punchy



drum work. The slight break in singer James Dean Bradfield's voice was spot on, and the electric guitar had just the right amount of edge to it during the solo. All rip-roaring stuff.

Yet it is with acoustic material that the cartridge really comes into its own. 'Tarantella' from Antonio Forcione's *Touch Wood* LP [Naim Records LP 097] was a delight, the interplay of acoustic guitars and cello a masterclass in how the textures of instruments and their positioning should be conveyed.

And one thing I kept coming back to on a wide variety of tracks that featured an acoustic guitar was the way in which, when the instrument was strummed, the Umami Red managed to capture each string's individual note, no matter how quickly the pick passed over it. I've heard very few cartridges manage this level of insight before, and it never loses its appeal. ☺

HI-FI NEWS VERDICT

The Hana Umami Red has an ease and effortlessness to the way it approaches music-making that deserves to be heard. It is beautifully detailed and can be particularly enthralling when it comes to acoustic fare, which only serves to make it all the more compelling as a musical companion. And it will rock out too. Umami? Most definitely. At times I was even tempted to describe it as *Saiko* (stunning).

Sound Quality: 84%

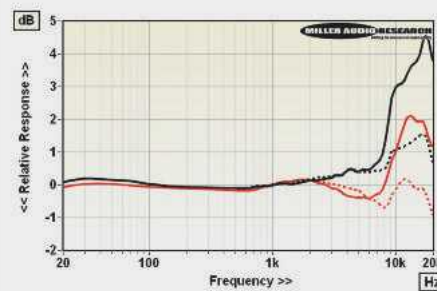


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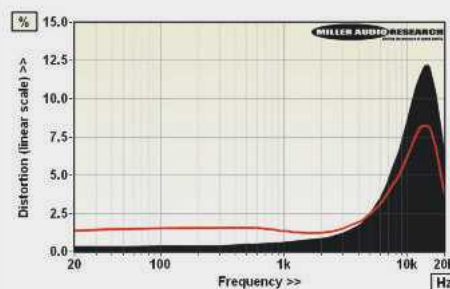
HANA UMAMI RED

Manufactured by the Excel Corp. in Japan, this new flagship MC of the Hana range performs exactly as specified on the tin (or the box in this instance). Output is slightly more generous than expected at 0.46mV (re. 1kHz/5cm/sec) into a 100ohm load and the channel balance is impressively tight at 0.14dB. Stereo separation also meets the 30dB spec. through bass and midrange while the 'Nude Microline' stylus is well polished and precisely mounted on its boron cantilever to achieve a VTA that's impressively close to the ideal 22°. Compliance is low at 9cu and this, combined with the 10.5g bodyweight, renders the Umami Red compatible with today's higher (10-16g) effective mass tonearms. The subsonic arm/cartridge resonance is suitably well damped at ~+10dB by the Umami Red's advanced mechanism but its tracking prowess is just slightly below the very best MM/MCs at its recommended 2.0g, achieving ~70-75µm via the right/left channels, respectively, and keeping hold of a high +15dB groove modulation (re. 315Hz/5cm/sec) at ~1% THD.

Distortion is generally low, the unequalised figure amounting to 1.8% at 1kHz/5cm/sec (0dB) and RIAA equalised from 0.4-12% (lateral) and 1.2-8.5% (vertical) across 20Hz-20kHz at -8dB [see Graph 2]. However, the Umami Red is not alone in exhibiting a slight generator asymmetry [see HFN Oct '20], the right channel having a hotter treble – a kick above 8-9kHz reaching +4dB/18kHz on lateral (L+R) cuts and +2dB/18kHz with vertical (L-R) traces [solid lines, Graph 1, below]. The left channel [dashed traces] has a milder +1.6dB/18kHz (lateral) and +2.0dB/18kHz (vertical) response. Either way, any extra 'bite' or revelation of surface noise will likely reduce as the Umami Red ages. PM



ABOVE: Freq. resp. curves (-8dB re. 5cm/sec) lateral (L+R, black) vs. vertical (L-R, red). L channel dashed



ABOVE: Lateral (L+R, black) and vertical (L-R, red) tracing and generator distortion (2nd-4th harmonics) vs. frequency from 20Hz-20kHz (-8dB re. 5cm/sec)

HI-FI NEWS SPECIFICATIONS

Generator type/weight	Moving-coil / 10.5g
Recommended tracking force	18-22mN (20mN)
Sensitivity/balance (re. 5cm/sec)	465µV / 0.14dB
Compliance (vertical/lateral)	9cu / 10cu
Vertical tracking angle	22 degrees
L/R Tracking ability	75µm / 70µm
L/R Distortion (-8dB, 20Hz-20kHz)	0.41-12.0% / 0.45-11.8%
L/R Frequency resp. (20Hz-20kHz)	-0.25 to +1.5dB / -1.1 to +4.4dB
Stereo separation (1kHz / 20kHz)	31dB / 20dB



ABOVE: The Umami Red comes packaged in what has, for decades, become the default accessory for high-end Japanese MCs – the simple, but elegant, interference-fit wooden box

Pass Labs INT-25

The typically modest, functional styling of this 'entry-level' mostly-Class A integrated amplifier belies its less-than-modest capabilities, with power and sound to spare...

Review: **Mark Craven** Lab: **Paul Miller**

There's something comforting about a product with a singular focus, and Pass Labs' INT-25 fits that bill. A line-only integrated, it steers clear of the digital inputs, network functionality and onboard phono stage offered by many competitors. Instead, it presents itself simply as a conduit between your source(s) and speakers, combining a FET-based preamp and Class A power amp and nothing else. If that sounds somewhat 'basic', Pass Labs' history and the amplifier's £7200 price tag should suggest it's anything but. As does its mastery of music – but I'm getting ahead of myself...

The INT-25's stripped-down specification might put off prospective buyers seeking a one-stop-shop, but such an approach does have clear benefits. For the end user, it brings the freedom to pair the amp with a DAC, network player and phono stage of their choice, avoiding unnecessary duplication. And for designer Nelson Pass, it contributes even more to his simpler-is-better philosophy [see PM's boxout, p55].

BABY CLASS A

California-based Pass Labs has been making amplifiers since 1991, beginning with the 75W monoblock Class A Aleph 0. Its range has since expanded to include stereo and mono Class A and Class AB designs, line and phono preamps, the HPA-1 headphone amplifier, and its INT integrated series. The INT-25 here is that range's entry-level amp, and is rated at 2x25W/8ohm. It's overshadowed by more powerful (Class AB) stablemates – the £8750 INT-60 claims 2x60W, and the £11,495 INT-250 [HFN Nov '17] a robust 2x250W.

All are only available in silver yet have slightly different stylings, and while the INT-25 misses out on the circular blue-lit meter of its brethren, it remains good-looking. It sits on four circular feet and is

reasonably large at 431x152x440 (whd) and heavy (22.2kg) – although compared to the INT-250 it could be considered compact and lightweight. Meanwhile, two side-mounted heatsinks add a slightly industrial feel to an otherwise quite glamorous visage, where bevelled edges on the thick brushed aluminium front-plate frame its asymmetric layout. Controls are minimal – just a 63-step volume, a trio of input selectors, and mute and power buttons. A blue LED window gives a numerical indication of volume level, and smaller LEDs illuminate the chosen input.

With none of the *du jour* mod-con features, the amplifier's back panel is naturally uncluttered [see p57]. Sat between two metal handles are just chunky loudspeaker binding posts for spade,

banana plug or bare-wire connection, and a trio of line-level RCA inputs.

SIMPLY DOES IT

This purity of design carries through to the INT-25's internal architecture. The preamp is a simplified single-ended version of the balanced JFET circuit used in the costlier INT-60 while the Class A FET power amp – a very elegant two-transistor configuration – is culled from Pass Labs' XA-25 model.

Incidentally, if that 2x25W seems rather parsimonious, especially for owners of insensitive speakers, then do not despair because that conservative spec. only denotes the amp's Class A reach, determined by its standing bias current. In practice, and ably assisted by a very substantial power supply, it'll deliver a lot



RIGHT: An Avel Lindberg toroid feeds linear PSUs for the single-ended preamp stage [top] and Pass Lab's favoured current feedback power amp based on a single pair of industrial (40A) IXYS FETs per channel [on heatsinks, left/right]



more as the INT-25 ventures out into Class AB [see PM's Lab Report, p57].

Set-up is as straightforward as it gets, although be aware this warm-running amplifier needs sufficient ventilation – Pass Labs recommends a minimum of 6in clearance. There's a remote control as minimalist as the amp itself, with small-scale buttons lost amid a desert of brushed metal. Note this is the same handset used across the company's better-specified designs, so it offers controls for features – including balance and pass through – that are redundant here. But you can use the remote to dim the LED display if desired.

VELVET UNDERGROUND

Pass Labs' claim that this amp 'breathes new life into the music' is, of course, what hi-fi brands say about even the most

prosaic of products, but here it really doesn't feel like hyperbole. The INT-25 is an effortless, unfatiguing listen, but there's no feeling of details being glossed over or thrown away in favour of reassuring warmth. The sound is succinct and

'Sweet strings
faced off
against a deep,
surging bass'

clean, resolving musical minutiae with finesse. Just as importantly, this notionally 25W amp behaves like something beefier, powering through percussion and bouncing along with the most robust of basslines. There's a rich, velvet quality to its low-end that's as appetising as its upper-band acrobatics and tonal nuance. In short, it's rather special.

Take Moby's 'God Moving Over The Face Of The Waters' [*Everything Is Wrong*; Tidal MQA] – a sweeping synthetic piece used to close Michael Mann's epic crime drama *Heat*. With the INT-25 in charge, this track

ABOVE: Custom heatsinks are a little sharp but are not for show as the INT-25 gets 'comfortably warm' in use. No-nonsense volume, input select and display also indicate it's 'built for business'

swelled from my three-way floorstanders, creating a soundstage that combined light and dark as sweet-sounding strings faced off against deep, surging bass. There's nothing particularly inventive about Moby's mix, yet through this amp it still managed to sound layered and involving.

DEFT AT DYNAMICS

This was just an *amuse-bouche*. A greater appreciation of the amp's musical quality and soundstaging came from Johannes Pramsohler and Ensemble Diderot's Audax recording of Montanari Violin Concertos [ADX13704; 96kHz/24-bit FLAC]. Right from the start of No 6(i) the INT-25 exhibited a seductive liveliness, which helped emphasise the piece's overt jollity ☺

ON THE THRESHOLD

Designer Nelson Pass, known affectionately as 'Papa' within the online/DIY audio community [see www.passdiy.com], has been innovating for over 45 years. 'I see myself as primarily a circuit topologist', he says. 'I like very simple topologies, so the simpler you can make an amplifier, the more likely there is to be good correspondence between the sonic performance and what you measure on a bench.' Over the years, Nelson's designs have typically utilised FET power devices and featured the minimum number (but no fewer) components, implemented with the absolute minimum corrective feedback.

However, before Nelson had developed his 'Super-Symmetry' circuit, used in some high-power Pass Labs amps [*HFN* Apr '10] and, by way of contrast, his very low-power single-ended Class A 'First Watt' [*HFN* May '12], he had already caught the audiophile's eye, and ears, with 'Stasis' – the core technology of Threshold Electronics, founded in 1974. The S500 and monoblock S1000 Stasis power amps [pictured right] were the flagships of the range – imported into the UK by Absolute Sounds in the early '80s before Krell's Class A behemoths distracted our attention. Replacing Nelson's earlier 'Dynamic Bias' designs, the Stasis amps employed a limited-gain stage operating with as near constant-voltage/constant-current conditions as possible. This defined the linearity – the low distortion – of the amplifier while a current-mirror bootstrap did the 'work' driving the loudspeaker load. They sounded... fabulous! PM



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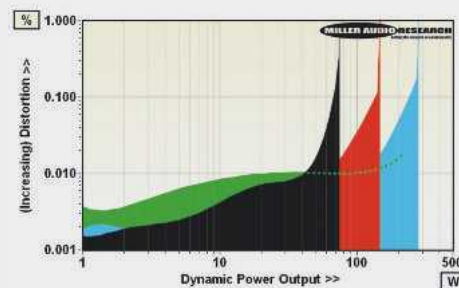
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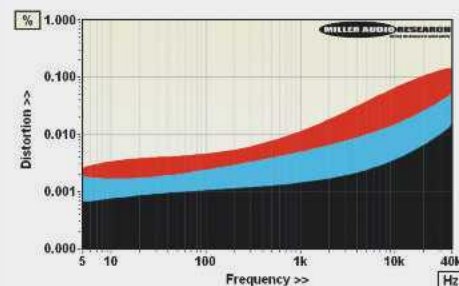
PASS LABS INT-25

In common with Pass Lab's previous-generation INT-30A amplifier [HFN Dec '10], this latest 'entry-level' integrated vastly exceeds its rated output power, the 25W specification bested to the tune of 2x65W/8ohm and 2x120W/4ohm, and with headroom to accommodate 75W, 147W and 281W into 8, 4 and 2ohm loads up to 1% THD under dynamic conditions. The 16A current limit is reflected in its maximum 255W/1ohm delivery [Graph 1, below]. In practice the 25W specification better reflects the envelope of its claimed Class A operation – and with an idle power draw of 180W and ambient heatsink temperature of 45°C this is not unrealistic. Nevertheless, and in common with earlier Pass Labs' amps, the INT-25's bass/mid distortion trend increases gently with power output from 0.001%/1W to 0.004%/10W and up to 0.009% at the rated 25W, subsequently increasing to 0.01%/30W, 0.016%/40W, 0.03%/50W and 0.05%/60W (all re. 1kHz). Versus frequency there's a gentle increase in THD with proportionally higher distortion at higher outputs [Graph 2] – a hallmark of Nelson Pass's complementary, current feedback power amp that employs just one pair of 500V/40A industrial FETs.

The 63-step volume control operates in accurate 1dB steps (there is an error of just ± 0.15 dB over the last 5dB of its range) while the A-wtd S/N ratio is a generous 90dB (re. 0dBW). There's some slight variation in response with volume position (not level) but at the full, and sensibly low, +25.5dB gain the INT-25 reaches out from a near-DC bass extension to -0.10dB/20kHz and -1.25dB/100kHz into 8ohm. Output impedance is a moderate 0.01ohm but this is flat from 5Hz-10kHz, increasing gently thereafter to 0.015ohm/20kHz and 0.08ohm/100kHz. PM



ABOVE: Dynamic power output versus distortion into 8ohm (black trace), 4ohm (red), 2ohm (blue) and 1ohm (green) speaker loads. Max. current is 16.0A



ABOVE: Distortion versus extended freq. at 1W/8ohm (black), 10W/8ohm (blue) and 30W/8ohm (red)

HI-FI NEWS SPECIFICATIONS

Power output (<1% THD, 8/4ohm)	68W / 120W
Dynamic power (<1% THD, 8/4/2/1ohm)	75W / 147W / 281W / 255W
Output imp. (20Hz-20kHz/100kHz)	0.010-0.015ohm / 0.081ohm
Freq. resp. (20Hz-20kHz/100kHz)	+0.0dB to -0.10dB/-1.25dB
Input sensitivity (for 0dBW/25W)	151mV / 770mV
A-wtd S/N ratio (re. 0dBW/25W)	89.6dB / 103.5dB
Distortion (20Hz-20kHz, 10W/8ohm)	0.0017-0.025%
Power consumption (Idle/Rated o/p)	180W / 298W (2W standby)
Dimensions (WHD) / Weight	432x153x454mm / 22.2kg



ABOVE: As simple as it gets – just three single-ended line inputs on RCAs and substantial 4mm speaker cable binding posts. The handles are largely decorative!

and had violin and harpsichord notes dancing from my speakers. I wouldn't really describe it as an up-and-at-'em performance, for this integrated is too even-handed to ever be considered rowdy. Yet nor is it frustratingly polite. The dynamic peaks and troughs of Pramsöhler's playing demand an amp with a deft touch and transient ability – and, via the INT-25, that's what they got.

NATURAL GROOVE

I like to think that really great hi-fi experiences have a 'wow' moment. My 'wow' moment with Pass Labs' integrated came from a replay of 'Albert's Shuffle', the 1968 blues instrumental from Al Kooper and Mike Bloomfield [Tidal 44.1kHz/16-bit]. This superb recording dovetailed with the INT-25's abundant expression and sheer believability, leaving me imagining myself sat in a smoke-filled backroom bar, tapping my foot while watching virtuosos at work.

The track starts with a walking blues bassline, brushed hi-hats and a vibrato-filled guitar solo. The tone of the latter was startling, Kooper's picked notes given a piercing leading edge followed by textured highs. Then came the wider instrumentation, including

Hammond organ, ondioline, horn and tenor sax. Each had its own distinct sound, was afforded its own space and was staged with precision amid a pleasingly deep soundstage. Best of all it came across as a gang of musicians

having a thoroughly good time, locked into a natural groove.

The scale this 'smaller' Pass Labs amp can engineer from a range of recordings is exceptional. Pantera's 'Domination' [Cowboys From Hell; Atco Records 7567-91372-2] gained a stature that its reverb-heavy mix had always suggested, yet I'd never previously heard or fully enjoyed. The pounding kick drums that signal its coda hit hard and sounded huge. Heading further down the dark and dirty rabbit hole, I ended up at Dillinja's drum 'n' bass track 'Hard Noise' [Tidal 44.1kHz/16-bit] where the INT-25 again enjoyed the challenge. It gripped my speakers' woofers with authority, finding the sub-bass beneath the bass.

Regards power, the INT-25 had the subjective grunt to never sound like it was straining with my floorstanders. Swapping them for some Q Acoustics standmounts, and ignoring the price difference between amp and speakers, it made the compact cabinets sound substantially bigger than they are. The amp's character – energetic but not aggressive, musical and deliciously detailed – still shone through, so it's hard to imagine it not forming a formidable partnership with anything but the most needy of loudspeakers. ☺

HI-FI NEWS VERDICT

If your test for an integrated amp is one that sounds extremely musical without lacking muscle, then the INT-25 passes – if you'll excuse the pun – with flying colours. That a product at this price should ooze no-nonsense build quality, if not style, is almost a given. But sublime sound? Here, yes. So Pass Labs' spec. may hint at a back-to-basics approach, but when the basics are this good, who needs the extra frills?

Sound Quality: 88%



LEFT: Not all buttons on Pass Labs' system remote are in use for the INT-25 – just '1, 2, 3' for input selection, up/down volume, mute and power on

Denon DCD-A110/PMA-A110

A 110-year history makes Denon a record-holder in the hi-fi industry – and it's marking that landmark with an Anniversary series that includes this very fine disc player and amp
 Review: **Andrew Everard** Lab: **Paul Miller**

Hi-fi companies marking anniversaries is nothing new – indeed, it seems something crops up almost every month to mark some celebration, from 25 years of the Bowers & Wilkins 600 Series upwards. However, few brands have the history to warrant an anniversary as significant as Denon, for this year the Japanese company marks not merely its centenary, but a full 110 years in business.

It's doing so with a range of products, all carrying '110' model numbers, from an AV amplifier and a phono cartridge to the £2799 DCD-A110 SACD/CD player and £3199 PMA-A110 stereo amp we have here. Incidentally, the £499 DL-A110 moving-coil can trace its lineage all the way back to the DL-103 of the 1960s!

APPROVAL RATING

The specially 'tuned' 110th anniversary series draws on existing models, notably the DCD-2500NE [*HFN* Jul '16] and PMA-2500NE [*HFN* Aug '16] – and some items made for the Japanese domestic market, in the form of the DCD/PMA-SX11 and DCD/PMA-SX1 'Limited' models. The premium silver-grey graphite finish sets them apart from the mainstream lineup, as does the '110 Anniversary' logo, and each unit comes with a certificate of authenticity stamped with the approval of Denon's head engineer [see PM's interview, p61]. Made in Denon's factory in Shirakawa, Japan, these are not 'limited edition' models, but are available for a limited time.

Unlike stablemate Marantz, which believes in having all the digital work done by its disc players at this level, leaving its amplifiers as purely analogue devices, Denon's DCD-A110 player is just that – a player – with outputs on analogue RCAs and optical/coax digital. There's no sign of any digital inputs here, let alone streaming

capability, as there is on the Marantz SACD 30n [review in *HFN* Jan '21]. What you get is a player able to handle either SACDs or CDs, plus CD-R/RW discs carrying files up to 48kHz, or DVD±R/RW media with files up to 192kHz, and DSD64/128.

Beyond that, there's not much to using the DCD-A110 player, aside from its 'Pure Direct' mode which switches off the digital outputs and display in the quest for better sound via less interference. However, there's a lot of heavyweight engineering under the bonnet here.

The player uses Denon's SVH (Suppress Vibration Hybrid) transport mechanism, mounted low in the player, featuring a die-cast aluminium loader, hefty mounting brackets and an additional copper top plate to add rigidity. There are separate power supplies too, deployed for the

digital and analogue stages, all the way back to dual transformers.

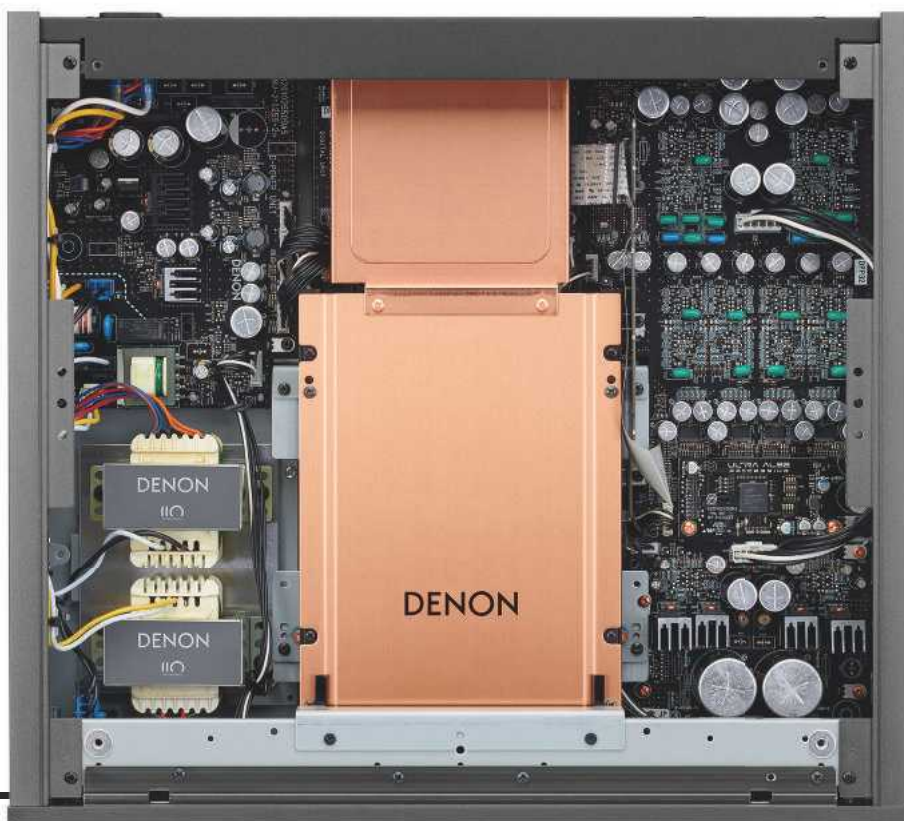
TALKING CLOCKS

Meanwhile, conversion is in the hands of four Burr-Brown/TI PCM1795 DAC chips, with two per channel operating in differential mode, fed by the latest version of the company's sophisticated Ultra AL32 digital processing [see PM's Lab Report, p63], interpolating and upsampling incoming PCM up to 32x. The

player also uses separate clock oscillators for 44.1kHz and 48kHz-centric inputs to suppress jitter, and dispenses with the DACs' onboard analogue filtering in favour of a fully-discrete stage of in-house design.

Like the player, the PMA-A110 amplifier also uses Ultra AL32 processing and the

'The premium silver-grey graphite finish sets them apart'



RIGHT: DCD-A110's mech [centre] plays CD, SACD and DVD-ROM discs. Intel Cyclone 10 DSP hosts Denon's 'Ultra AL32' upsampling, feeding two TI PCM1795 DACs per channel [far right]. Filtering/analogue stage is all-discrete [top right]



LEFT: DCD-A110 [top] keeps its fascia simple, and not because it's 'just' a disc player, albeit one built on grand scale. PMA-A110 offers defeatable tone controls, and both the digital inputs and the small display can be switched off

power amp sections, with two large capacitors mounted to the rear of the chassis and the power amp being of symmetrical dual mono construction. It follows Denon's familiar Ultra-High Current design, using just a pair of push/pull devices

quad-DAC configuration, though here it supports digital inputs running to three optical and one coaxial, plus a galvanically-isolated USB-B port through which it can handle data at up to 384kHz/32-bit PCM, or DSD256/11.2MHz. There's a MM/MC phono input too plus three sets of line-ins, and a direct connection to the power amp for an external preamp or AV processor.

Outputs run to just a single set of speaker sockets and a line output for – well, whatever 'record out' is for these days – plus a front-panel headphone

socket. Tone/balance controls are also provided, with a novel two-stage system to deliver the shortest possible signal paths and reduce interference. 'Source Direct' bypasses the tone and balance settings, while 'Analogue Mode' allows the digital section to be powered down, as well as the small front-panel display if required.

DUAL MONO

The interior of the amplifier is dominated by two transformers [see pic, p61], also feeding separate PSUs for the preamp and

in place of the multiple power transistors more common in amps of this kind, and is derived from the SX-series amplifiers.

The power output here is quoted as 80W/8ohm, rising to 160W/4ohm, which may not seem massive in the great scheme of things, but it certainly proves more than adequate in use. Meanwhile the design avoids running audio signals through the front panel control circuitboard. Rather, the PMA-A110's preamp section is located down the righthand side of the chassis, directly behind the input sockets on the rear panel, with control signals sent to it remotely from the fascia.

In common with other recent products released by Sound United stable, the Denon PMA-A110 also uses a two-stage preamp design, with the volume control directionally governing the gain of the first stage instead of merely attenuating the signal. The result is a huge reduction in noise and a boost to the S/N ratio when the amplifier is compared to the company's PMA-2500NE [see PM's Lab Report, p63].

PERFECT PAIR

Completing the set-up is a system remote supplied with both units, giving one-handset operation of the two together. And they are clearly designed to be used together, not least because the 110th Anniversary finish is going to stick out in a rack of either black or silver components. Fortunately, the two components here are not just impressive in their own right, but make a very convincing pairing. What they're not is another 'me too' of the ☞

110 YEARS AND COUNTING

Denon's 110-year history began in 1910, when American entrepreneur Frederick Whitney Horn, in association with Japanese partners, founded Nippon Denki Onkyō Kabushikigaisha (the Japan Electric Sound Company) to make single-sided discs and gramophones for voice recording. Disc records were the mainstay of Denon, as the company became known in the 1930s, for several decades, and its first professional recorder, the transportable twin-deck DR-148, was delivered to Japanese broadcaster NHK in 1939 in time for the ill-fated 1940 Tokyo Olympics.

But a Denon recorder made a very different kind of history when its DP-17K was used to capture Emperor Hirohito's speech ending WWII. After two takes – the Emperor initially spoke too softly, to the consternation of NHK's technicians – the discs were smuggled out of the Imperial Palace, in the face of army opposition. They were broadcast the next day, the first time the Japanese people had heard the Emperor's voice.

By the late 1950s, as the tape and LP era dawned, Denon started making tape recorders, and in 1964 delivered its DL-103 cartridge to NHK. At that stage the focus was still on professional equipment, and the first Denon turntables – and later its inaugural CD player – were designed for studio use. Only in 1970 did Denon begin to make consumer products, and its first integrated amplifier, the PMA-500, arrived two years later. In the same era, it heralded the digital audio age with the world's first eight-track digital recorder. The size of several filing cabinets the machine was, of course, delivered to long-term client NHK.



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with TPE
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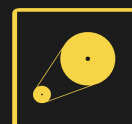
Height-
adjustable
metal feet



Gold
plated RCA
connectors



8,6" one-
piece carbon
tonearm



Electronically
regulated
belt drive
system



Pre-adjusted
Ortofon 2M
Red cartridge





ABOVE: Transformers [centre] and 71V/ 12,000µF reservoir caps [top] form the core of the PSU that feeds a very low-noise preamp [far right] and dual-mono FET power amps [on heatsinks]. The innards look like those of the PMA-2500NE, but the two-stage single-ended amp is inspired by the PMA-SX11

recent upmarket Marantz pairings to pass through these pages [*HFN* Nov '20]. The two may share common ownership, be made at the same plant and even have some technology overlap, but the two companies maintain their own sound.

LIVE AND DIRECT

That's clear as soon as one listens to the DCD/PMA-A110, for while the balance may lack a little of the rich warmth of stablemates such as the Marantz 12SE and Series 30 products, it has both a directness of communication and level of detail certain to grab the attention while the amp has more than enough power and grip to drive loudspeakers with real conviction. And while the sound is crisp and bright, it's in no way overly brash or harsh, even when one plays recordings that are outside the brand-new, audiophile approved canon, whether sourced digitally or via the amp's analogue inputs.

Indeed, playing the early '50s mono recording of 'Take The A Train' from Duke Ellington's *Hi-Fi Ellington Uptown* [SME Records SRGS4547] shows not only the player's ability to extract maximum detail from this SACD release (in this case in DSD64 on a DVD-R disc), but also the speed and deftness of the amplifier here as the


young Louie Bellson pushes the band hard on his 'Skin Deep' opener. If you thought twin bass drums started with '70s rock, then he has news for you!

Come bang up to date with actress/singer Susie Vanner's *In These Shoes* [Dolce Vanner, N/A cat no], and the Denon pairing gets to grips with the big, lush production job, which is pure showbiz, features the world's least threatening versions of 'Every

Breath You Take' and 'Walk On The Wild Side' and is crammed with detail in a glorious campfest. The music may not be to every taste, though fans of showtunes will surely love it, but there's no denying the amount of information

'The 'A110 has enough under the bonnet to power through'

Denon's 110th Anniversary combination is extracting and delivering here. Hmmmm...

We're on much safer ground with the Labèque sisters' recording of Philip Glass's opera *Les Enfants Terribles*, arranged for piano duet [DG 4855097], where the DCD/PMA-A110 pairing not only brings out the subtlety of the performances, but also shows a clean, taut rendition of those intricate Glass rhythms. Separating the player from the amplifier shows that the digital end of the equation is playing a major part in all this information, but it's the amplifier's ruthless control over the loudspeakers that develops the full magic. 

TAKASHI ARAI

Design Centre Manager, Takashi Arai, is very clear about his concept of the 'perfect amplifier'. 'My goal is to make an amplifier with a high speaker driving force – I think that's all there is to it', he explains modestly. Takashi-san expands, 'For that purpose, the amplifier's output stage and power supply are critical, not only capable of supplying high levels of current but also clean and free of distortion and interference'.

In practice the PMA-A110 can trace its roots right back to the top-of-the-line S1 series from 1993. 'These were the first amplifiers to use UHC-MOS (Ultra High Current-MOS) devices – single FETs that could carry a large current. Initially we had to use industrial rather than audio semiconductors – my colleague spent six months alone in a dormitory in Kawasaki looking for high-capacity UHC-MOS devices and doing research on how we might use them for audio.'

The PMA-A110 employs 2SJ555 / 2SK3307 FETs, as used in the PMA-SX11 and '2500 amplifiers. 'Yes, but it's the driver stage for these power transistors that's been worked on most, derived from our work on the 'SX11. While the PMA-2500 used a three-stage circuit with resistors to set the operation point, the 'SX11 and 'A110 use a more elegant two-stage solution with the constant current source defined by diodes and transistors.

'I believe our pursuit of "Subtlety and Power" and Denon's new sound philosophy of "Vivid and Spacious" will carry us into the future.' PM



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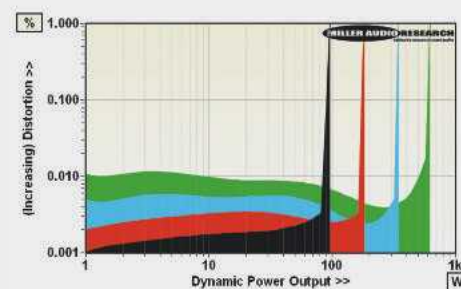
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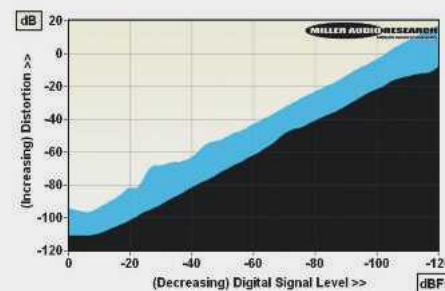
DENON PMA-A110/DCD-A110

Denon's PMA-A110 is no ordinary 80W integrated. Its unique technical 'fingerprint' begins with a very high – too high for modern line sources – overall gain of +45.5dB, but with its novel volume circuit still achieves a phenomenally wide 95dB A-wtd S/N ratio (re. 0dBW). Load tolerance is exceptional too, with its 80W/160W 8/4ohm power rating being met at 2x93W and 2x180W into 8 and 4ohm loads. This 'stiff' PSU means that while there's little additional headroom under dynamic conditions there is the current available (24.9A for 10msec at <1% THD) to support a full 95W, 184W, 346W and 618W into 8, 4, 2 and 1ohm loads, respectively. So tough speaker loads will be driven with comparative ease [see Graph 1, below]. Finally there's its unusual distortion behaviour – stepping up from a very low 0.0009% below 5W/8ohm (the 100W idle draw suggests a Class A bias) to a higher 0.025-0.033% from 10W-80W/8ohm (all at 1kHz). Only under *dynamic* conditions is distortion uniformly low up to the point of clipping [as illustrated in Graph 1].

Denon's partnering DCD-A110 player offers a 2.34V output (a lower 2.07V with SACD) coupled with a deeply impressive 111dB A-wtd S/N ratio, ± 0.5 dB resolution over a 120dB range and distortion that's just 0.0001-0.0019% with CD and 0.00009-0.045% with SACD (20Hz-20kHz). Once again, the latest version of Denon's 'Ultra AL32 processing' reveals itself as an adaptive upsampling/filter algorithm – with entirely transient signals it eliminates any pre/post ringing but trades this against an early treble roll-off (-1.6dB/10kHz to -6.7dB/20kHz with CD/48kHz media), while with continuous music signals the filter adopts a steep roll-off (± 0.0 dB/10kHz to -2.2dB/20kHz). PM



ABOVE: Dynamic power output versus distortion into 8ohm (black trace), 4ohm (red), 2ohm (blue) and 1ohm (green) speaker loads. Max. current is 24.9A



ABOVE: DCD-A110 THD versus digital signal level over a 120dB dynamic range (1kHz, black; 20kHz, blue)

HI-FI NEWS SPECIFICATIONS

Continuous power (<1% THD, 8/4ohm)	93W / 180W
Dynamic power (<1% THD, 8/4/2/1ohm)	95W / 184W / 346W / 618W
Amp freq. resp. (20Hz-20kHz/100kHz)	+0.0 to -0.18dB/-2.1dB
Freq. resp. (20Hz-20kHz / 100kHz)	+0.0 to -2.3dB (CD)/-14dB (SACD)
Digital jitter (CD / SACD)	116psec / 22psec
A-wtd S/N ratio (Player/Amp)	111.1dB (0dBFS) / 94.5dB (0dBW)
Distortion (20Hz-20kHz; Player/Amp)	0.00012-0.002%/0.0004-0.014%
Power consumption (Player/Amp)	32W / 398W (100W idle)
Dimensions (WHD, Player/Amp)	434x138x405/434x182x450mm



ABOVE: CD/SACD player [top] has optical/coaxial digital outs and analogue outs on RCAs. Amp [below] has MM/MC, a processor and three line ins, a power amp input, three optical, coax and USB digital inputs plus one set of 4mm speaker binding posts

That's very much the case with Springsteen's latest set, *Letter To You* [Columbia 19439811582], whether played on the DCD-A110 in CD quality or fed into the amp as 96kHz/24-bit files from the trusty Mac: yes, there may be quite a lot of the 'Stranger On The Edge Of Town' stuff going on, but the revelation here is the immediacy of these 'recorded as live' sessions. With the meaty Denon amp in the driving seat, this album sounds big, mature and pretty damn magnificent, which is just as it should be.

DRIVING BEATS

And that marriage of speed, weight and insight, allied to surefooted imaging and soundstaging, provided a great foundation for everything I tried. From the latest Faithless

album, *All Blessed* [BMG 538627982], which fills its shockingly short 28 minutes with close-up vocals and driving beats, to John Wilson's glorious second volume of orchestral music by Eric Coates [Chandos CHAN 20148], in which he coaxes the BBC Phil into exuberant yet

thoughtful playing. Similarly for the stirring 'London Bridge' and 'Calling All Workers' to the more reflective ballet score for 'The Enchanted Garden'. The sheer textural detail the Denon duo delivers is lovely, as is the effortless sonic picture it casts, the PMA-A110 having enough under the bonnet to power through the dynamics of the music with ease.

Make no mistake, both elements of this pairing are exceptional, and I can see the DCD-A110 having appeal to those wanting a final disc player with minimal frills – it certainly has a simplicity of purpose to match the solidity of its build. But it's the PMA-A110 amp that's the star turn here, whether you use its analogue inputs (including the fine phono stage) or digital connections.

Denon's engineers have again kept things simple, concentrating their efforts where they will have maximal impact on the sound. It's this thinking that's so apparent in the way these products perform. ☺

HI-FI NEWS VERDICT

The A110 player and amp are pitched short of high-end prices, not to mention the Japan-only stablemates informing their design, but Denon's engineers have come up with something very special by focusing almost exclusively on sound-critical technology. The unique finish means they'll probably be bought together, but if you're only going to buy one, make it the remarkable PMA-A110 amplifier.

Sound Quality: 87%



LEFT: System remote control governs both '110 components, providing access to all CD/SACD disc playing, amp input select, direct mode, volume, mute, etc, functions

Supravox Vouvray

This famous French brand was launched in 1956 – the very same year as *Hi-Fi News* – and continues to cut a very distinctive path. We test its latest tube/hybrid integrated
 Review: **Tom Anderson** Lab: **Paul Miller**

When your brand has been around for over 60 years, designing a new integrated amplifier becomes a matter of balance. You need to weigh up the company's rich heritage with electronics that compete with the best new kids on the block. Perhaps something to caress the ears with valve warmth and character, combined with the grunt of a transistor output to drive even the most reticent of speakers? Enter the Supravox Vouvray.

This hybrid integrated amplifier blends a 12AU7 triode-based preamp stage with a Class AB power amp based on rugged Toshiba devices. It is not a revolutionary approach to blending the strengths of tubes and transistors, but there is a certain elegance to the architecture that is reflected in the neat internal layout and screening [see pic, below right].

GOOD AS GOLD

Inputs and outputs are stoically analogue across a trio of line-level RCAs, a moving-magnetic phono stage with grounding post and a single suite of speaker binding posts at the rear. Your output options are doubled thanks to a headphone socket up front. All terminals are extremely robust, gold-plated for key signal connections and leave plenty of space for the most outrageously chunky interconnects and speaker cables. There's nothing 'digital' to see here and certainly no Wi-Fi passwords or Bluetooth pairing required!

The front fascia is nostalgia realised in aluminium. Smooth-turning aluminium knobs sit below slots in the robust face plate, affording the triodes a window to show off their mellow glow – a golden hue neatly replicated by the VU meter illumination. The fascia's legends are inked with an italicised serif font straight out of the 1960s and, to my eyes at least, only

the over-sized Supravox logo detracts from what is otherwise a sophisticated retro-cosmetic. It's a bit of a looker, then.

COOL HAND

Yet the industrial design here is not all sepia-filtered imagery from circa 1956. The absence of retro lever switches, and addition of an obvious IR eye and orange LEDs for power and volume, bring the overall design a little more up to date, and the heavily machined aluminium remote handset would look just as cool with a 21st century Class D integrated. Better in many cases, even if the handset's only features are volume adjustment, mute and the ability to withstand small nuclear strikes.

And then there is that sumptuous casework. It comprises a lacquered MDF shell that wraps completely around the top, sides and underneath, hinting at the wood-cheeked audio components of

old. Yet, even here the Vouvray delivers contemporary flair with a rich black piano lacquer finish, buffed to an orange-peel free mirror that would leave several high-end loudspeaker manufacturers blushing. The visual depth of the paint is eclipsed only by the surface's truly class-leading ability to attract dust from every corner of the room and possibly beyond...

REAL KEEPER

Despite the lack of traditional top vents, cooling seems not to be an issue. In practice, its combination of heatsink, front fascia slots, rear panel ventilation and a small vent on the underside manage to keep the rig no toastier than 'mildly warm' even through a fairly adventurous evening of Amsterdam Trance Radio via a streamer.

Which brings us neatly on to the elephant in the music room. In an age when stored and streamed content is



RIGHT: Shielded transformer and PSU [left] occupy a large portion of the enclosure. Triode line stage [lower right] feeds power amp with pairs of devices on heatsink [top]. MM phono stage sits right behind the RCAs [top right]



replacing physical music media, the Vouvray's shunning of all things digital could be perceived as a bit of a howler. Yet, I'm not sure it is. The whole ethos and design of this gorgeous hybrid makes it a timeless 'keeper' against an ever-evolving digital landscape. Simply get a good streamer and hook it up to the Vouvray's line level input. In a few years' time, when the streamer will be looking long of tooth and lacking current features, this amp will serve you just as well for the next gen of digital player and quite possibly a few generations beyond.

*'I was dealt
yellow cards
from the spousal
noise police'*

STRIKING IT RICH

Thankfully none of that really mattered as I carefully placed Kate Bush's *Hounds Of Love* [EMI 062-24 0384 1] on my Michell Orbe turntable [HFN Mar '03] and lowered the SME/Goldring combination into place. Bypassing the Vouvray's on-board phono

stage with a Primare R32 [HFN Jan '12], the character of the French fancy shone through with an immediately engaging sound free from overt character or bias. Given the tubes on show I was expecting something altogether more colourful, yet

Kate's pitch and timbre on 'And Dream Of Sheep' was natural and accurate with a rich, breathy quality that effortlessly scaled with her high notes on the track.

Imaging in the centre of the soundstage

was particularly strong, with pin-point positioning of instruments and vocals between the speakers. While I have heard wider and more spacious presentations, the rock-solid central presence and enviable front-back depth more than made up for any limitations in sheer airy scale.

The multitrack vocal and distinct right/left channel separation of 'Under Ice' can easily sound a little thin, but with the

ABOVE: The polished wooden cabinet is a blast from the past but sets off the illuminated 'VU' meters, partially exposed triode tubes and chunky rotaries to grand 'retro' effect

Vouvray it only served to solidify Kate's voice, lending it a believable three-dimensional quality, albeit constrained between the left and right speakers.

Importantly, the Vouvray's phono stage does not disappoint, with the amp's even-handed and musical presentation remaining intact. Sure, my costlier outboard R32 offered a little more sparkle at the top and a more dynamic midband against the Vouvray's weightier and slightly thicker presentation, but even comparing the two favourably is a nod to the quality of the built-in eq stage. You'll have to dig deeper in the purse to make an effective MM upgrade, but those with a penchant for MCs will need extra kit from the outset.

SOLID PUNCH

There was some irony in that my streamer needed a firmware update and the fickle Antelope Audio Zodiac DAC [HFN Feb '15] needed rebooting before I could get either to work. Yet the combination of components here is far from a sonic culture clash. From the outset, the Vouvray does a superb job of turning streamed hi-res audio into the same eminently enjoyable, musically engaging and foot-tapping experience that it does with vinyl.

There's no hint of sluggishness, with plenty of dynamic power and a rather lush top end that manages to dance the fine line of extension and clarity without becoming brittle. This is one of those amplifiers that makes it easy to stop analysing and, instead, lets you immerse yourself in the tune rather than the sonic machinations of the system as a whole. ➔

FRENCH CONNECTION

Supravox is one of France's most venerable audio brands with members of the founding Dorliac family developing drivers for radios in the 1930s and full-range AlNiCo transducers in the 1940s. The Supravox brand was formally registered in 1956 by Madame Dorliac when the company began supplying drivers for the growing TV market. That led to RTF (Radio Télévision Française) commissioning Supravox to develop drivers for its recording studios, and in 1964 the 215mm RTF64 was born. This found favour with DIY'ers of the day and was also used in Elipson's famous spherical BS50 speaker with its shell-like acoustic reflectors.

After a change of ownership in the late 1970s, the brand produced its own audiophile loudspeakers while continuing to advance its portfolio of full-range drivers. However, as the hi-fi market moved firmly into two-way and three-way designs, Supravox fell into a fallow period. Fast forward to 2017 when a cash injection from new owners Akylis Capital reinvigorated the brand, resulting in Supravox's current lineup of loudspeakers, drivers, speaker kits and its first foray into electronics, the Vouvray integrated amplifier.

MERASON

DAC1 AND FRÉROT PRECISION DACS



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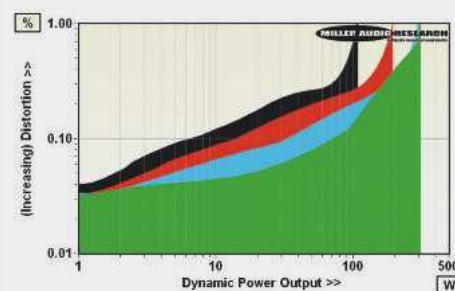
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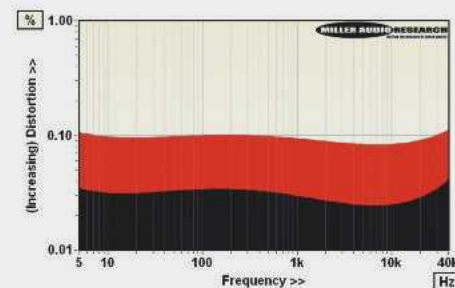
SUPRAVOX VOUVRAY

'The VU meters', says Supradox 'indicate the peak power output of each channel'. As ever these are largely decorative with a 1W/8ohm output indicated by the number '20' on the display's lower scale, increasing to the maximum '140' at just 10W/8ohm. The amplifier's *real* maximum output is higher than the rated 70W/8ohm at 2x85W/8ohm but the 120W/4ohm specification is not met simply because the Vouvrays protection activates above 85W/4ohm. Under dynamic conditions, however, the amplifier's full capability is revealed at 110W, 195W and 300W into 8, 4 and 2ohm loads and 310W/1ohm (or 17.6A at 10msec/1% THD). This is illustrated in Graph 1, below, alongside the steady increase in distortion with output from 0.04%/1W to 0.12%/10W and 0.3% at the rated 70W/8ohm. However, and in marked contrast with almost all other amplifiers, this classic application of Toshiba 2SC5200/2SA1943 output devices sees a *reduction* in distortion with decreasing load impedance, falling to 0.03%/1W, 0.04%/10W and 0.1%/70W into 1ohm. This atypical THD vs. load behaviour is nonetheless consistent with frequency [see Graph 2, below] which, from a subjective standpoint, is likely to be very positive.

Noise, on the other hand, is a little higher than average – a mix of hum and midband noise rather than HF hiss – and the A-wtd S/N ratio is necessarily compromised at 77dB (re. 0dBW). The response rolls away below 20Hz to a sensible -3dB/3Hz and reaches out above -0.17dB/20kHz to -2.8dB/100kHz – figures that will see only mild modification with low/variable impedance speaker loads courtesy of the amplifier's moderate ~0.09ohm source impedance. Finally, overall gain is quite high at +42.9dB (just 20mV required for 1W/8ohm). PM



ABOVE: Dynamic power output versus distortion into 8ohm (black trace), 4ohm (red), 2ohm (blue) and 1ohm (green) speaker loads. Max. current is 17.6A



ABOVE: Distortion versus frequency over an extended 5Hz-40kHz range (1W/8ohm, black; 10W/8ohm, red)

HI-FI NEWS SPECIFICATIONS

Continuous power (<1% THD, 8/4ohm)	85W / 85W
Dynamic power (<1% THD, 8/4/2/1ohm)	110W / 195W / 300W / 310W
Input sensitivity (re. 0dBW/70W)	20mV / 174mV
Output impedance (20Hz-20kHz)	0.084-0.100ohm
Freq. response (20Hz-20kHz/100kHz)	-0.08 to -0.16dB/-2.8dB
A-wtd S/N ratio (re. 0dBW/70W)	77.1dB / 95.6dB
Distortion (20Hz-20kHz; 0dBW)	0.027-0.040%
Power consumption (idle/rated o/p)	41W / 270W
Dimensions (WHD) / Weight	430x188x358mm / 19.5kg



ABOVE: No 'digital' here – just one MM phono and three line inputs on RCAs with single sets of switched speaker outputs on 4mm sockets/binding posts

The super-taut beat at the beginning of David Bowie's 'Dollar Days' from the album *Blackstar* [ISO/Columbia; 96kHz/24-bit] hits home with a solid punch and surprisingly robust LF extension. As the track progresses, the bass develops a more complex character, with a loping tempo that's presented without congestion. If this track can sound muddled through amps with less control, or underwhelming and cool via amps with excessive damping, then the Vouvrays strikes a happy balance of weight and textural detail throughout the bass.

DOUBLE DOWN

Nevertheless, I did discover some subtle differences in perceived bass reproduction depending on the partnering speaker. While my large Tannoys would normally out-bass any standmount, the Vouvrays really gelled with Fyne Audio's diminutive F1-8 at the low end, the pairing plumbing greater depths than the floorstanders could reach.

We are not talking scuba-gear deep either way, but this amp certainly has a snorkel and decent free diving range when it comes to exploring the lows. As the volume

increases, there appears to be plenty of grip and control on the driver cones with no overt boom or overhang too – not a comment you would likely level at any

amplifier running purely tube-power I'd wager. Moreover, the Vouvrays' sweet balance encourages that very behaviour, egging me on to generous volume levels that put a significant dent in my weekly allowance of yellow cards from the spousal noise police.

Mind you, raising the volume significantly isn't a quick process if you use the remote control as there is no acceleration to the volume knob's fairly sedate rotational pace. Yet give the chunky knob a few seconds to reach 12 o'clock or beyond and you are rewarded with wildly swinging VU meters and sound that packs serious enough power for ASBO level SPLs with all but the most insensitive speakers [see PM's Lab Report, opposite].

With even modestly efficient speakers the Vouvrays is more than happy to indulge party-level sound pressures and it didn't hold back on the dancefloor when I spun up the anthemic 'We Come 1' from Faithless's seminal *Outrospective* [Cheeky 74321 86555244/16]. If an amp can make me leap off the chair to thrust a pointed finger in the air and belt out the chorus like I am at Glastonbury, it's a good 'un in my opinion. Job done, Supradox. ☺

HI-FI NEWS VERDICT

Rarely have my prejudices been so comprehensively dispelled by audition. For all its triode glow and retro looks, the Vouvrays is a rich, powerful, and articulate amplifier that forgoes clinical detailing and ultrawide imaging in favour of an infectious musicality that'll get you bobbing and rocking to the widest variety of music. The Vouvrays may buck the digital trend, but it is arguably all the better for it.

Sound Quality: 80%



LEFT: Plus/minus buttons on Vouvrays remote govern the motorised volume knob while mute switches off the speaker outlets

Lu Kang Audio Spoey230

Designed and handcrafted by the father and son team at Lu Kang Audio, the Spoey230 is the heavyweight flagship standmount of this artisan range from Taiwan's Taipei City
 Review: **Mark Craven** Lab: **Paul Miller**

The last time you bought a television you probably came across no more than five or six different brands. But what about the last time you bought loudspeakers? It's one of the joyful aspects of hi-fi: the industry is very broad here, supporting a diverse range of manufacturers with different design ideals, resulting in an equally diverse choice for enthusiasts. Lu Kang Audio, freshly arrived in the UK via Whole Note Distribution, is a perfect example, being a homespun Taiwanese loudspeaker brand perhaps as far removed from the likes of Bowers & Wilkins and KEF as you might get.

A family business rather than a corporate behemoth [see boxout, p69], Lu Kang Audio currently builds only one range of speakers, the Spoey series (*aka* the SP series). This comprises just three models, all standmounts and all very much cut from the same cloth. Or, more accurately, wood.

CLASSICAL CABINETS

Available as standard in cherry, walnut or black walnut finishes (plus special order RAL colours), the Spoey230 (£6495 per pair) is the largest model in the series. Like its smaller stablemates – the Spoey200 (£5495) and Spoey155 (£4255) – it has the look of a 'classic' speaker, with a boxy aesthetic that'll surely find approval with devotees of classic BBC/Spendor marques. And while others might wish for a more modern style, few will quibble about the build quality and finish. Using a handcrafted cabinet made from braced 1in-thick MDF, beneath a real-wood veneer, and treated internally with 'acoustic foam', it feels exceptionally well put together and reassuringly heavy at 23kg. It's only the use of push-fix attachments for the supplied full-length black grilles, rather than magnets, that raised my eyebrows.

All models can be partnered with optional (heavyweight) wood stands, with the same veneer/RAL finishes available.

'The cabinets lock in step to paint an artful, musical picture'

Priced £995, these come pre-assembled and are probably one of the finest examples of 'matching' hi-fi furniture that I can remember. Much of their top surface is open, a design that Lu Kang Audio says 'significantly reduces reflections when compared to a solid-surface base'. Coupled with their open sides, these stands are somewhat reminiscent of the work of graphic artist M C Escher. Three bronze

isolator feet are supplied to sit between speaker and stand – one placed centrally at the front and two at the rear corners, as pictured here.

The Spoey230 measures 635x322x305mm (hwd), but once installed on its

stand reaches a shade over 1m, putting its tweeter likely at ear height. The stands for the smaller speakers are taller, to once again position the speaker at the optimum listening height.

TWO TO TANGO

Lu Kang Audio says its flagship is 'designed to offer modern floorstanding speaker performance in a monitor package'. To that end, it's a two-way model in a larger-than-usual cabinet. Making good use of the available baffle space is a bass/mid driver that's claimed to be 230mm (hence the speaker's name) – but this measurement actually includes the alloy chassis, so a more accurate figure would be 180mm including the roll surround.

This is partnered with a 19mm dome tweeter, where you might reasonably expect a bigger unit to better meet the woofer through the midrange [see PM's Lab Report, p71]. The simple first-order crossover – one air-cored inductor and one capacitor – is designed by Lu Kang Audio's Rox Shih and is notionally set at 2.3kHz.

RIGHT: Braced, 25mm-thick MDF cabinets are finished in real walnut, cherry, black walnut or RAL colours with matching, heavyweight SP230ST stands. The loudspeakers are each supplied with three, two-part bronze 'isolators'



A FAMILY BUSINESS

Lu Kang Audio is new this year to the UK market, but the company – based in Tapei City, Taiwan – isn't a fresh-as-a-daisy startup. It was founded over 30 years ago by Frank Shi, beginning as an importer of 'high-end' audio brands. This is an aspect of the business that lives on – it currently distributes Comet DACs from US marque Exogal, amplifiers from Hong Kong's JE Audio, and Odiosis cables via French company Omerin – but the decision was made in the 1990s to begin developing its own loudspeakers. More recently the baton has been passed from Frank Shi to his son, Rox, who is responsible for the design of the Spoey models, its first to be sold outside of Taiwan and its international calling card. Described as 'a gift to music and all who listen,' the speakers are, we're told, the result of a lengthy driver selection and tuning process.

Both drivers are sourced from Denmark, a nation whose GDP seems successfully based on the audio industry and Carlsberg lager. The high-frequency unit is from tweeter specialist Hiquphon, while the bass/mid is a 'custom' version of an AudioTechnology driver, the company launched by Ejvind Skaaning (also the founder of both Dynaudio and ScanSpeak).

The Hiquphon tweeter is its premium OW4 model, which features a six-step platinum-colour coating and multi-layer internal damping claimed to extend its response down to 2kHz, and up to 22kHz, with dispersion controlled via its shallow waveguide. For the woofer, Lu Kang's Rox Shi has combined AudioTechnology's C-Quenze 231 driver design with the company's Flexi series polypropylene cone. This driver is reflex-loaded via a central front-facing port, as is the case with the step-down Spoey200, although the entry-level Spoey155 has a sealed-box alignment.

The speakers, says Lu Kang Audio, have been 'designed to work within any environment (within reason)', although Whole Note Distribution suggests a 50cm clearance from rear and side walls as a minimum. Following this guidance, and with the cabinets approximately 2.5m apart, I didn't even get into toe-in experimentation – the imaging was thrillingly on point from the get-go.

ARTISAN AUDIO

These artisan speakers deliver an insightful, expansive performance without a trace of a rough edge. They have obvious immediate strengths – low frequencies, as one might expect given the cabinet size and ported bass/mid unit staring you in the face, have extravagant depth coupled with a purity of output, while the resolution and sense of space at the other end of the frequency band is captivating. As said earlier, they seem to image without effort, too, building a soundstage with depth and width that lets you visualise instrument placement

with precision. But against these positive traits there's a laidback feel to the sound that renders it suited to some musical genres more than others. Never is the Spoey230 inclined to go on the attack – a subjective viewpoint borne out by PM's Lab Report [p71], suggesting the performance of this top-of-the-range standmount is more fine wine than fizzy pop...

IN THE SPOTLIGHT

The Cult's *Electric* album [CD; Sire 9 25555-2] found the post-punk act transformed into a UK version of AC/DC, by way of a stripped-back production from Rick Rubin. Standout track 'Lil Devil' is about as sparse as it gets, giving the Lu Kang Audio pair little to do. It had no trouble unpicking detail, such as the sparkling tambourine that occupies stage right, or the grit in Ian Astbury's vocal. Furthermore, the simplistic drum accompaniment sounded tightly timed, intertwining with the eighth-note bassline.

Yet while the riffing guitar should be the star of the show here, biting and snarling, via the heavyweight Spoey230s it sounded curiously polite. Raising the volume helped, pushing the speakers to be more aggressive, but only to a point – I still wanted a little more midband energy to accompany my 1980s rock 'n' roll.

Naturally, I found other tracks to be more in the speaker's comfort zone, and began to appreciate its astute handling of complex, nuanced material. The varied percussion of 'Graceland', from the 25th Anniversary Edition release of the eponymous album [via Tidal HD] benefited from the clarity, detail and snap of the speaker's far-reaching tweeter just as Donna Summer's disco anthem 'Hot Stuff' [Tidal HD] was funky and infectious.

PORTRAIT OF SOUND

It's the Spoey230's lavish imaging that is its calling card, however, the cabinets locking in step to paint an artful picture of



ABOVE: A soft-dome 'platinum coloured' 20mm Hiquphon 3/4 OW4 tweeter is paired with a 230mm C-Quenze driver from AudioTechnology, reflex-loaded through a large, front-facing port

the music. In Led Zeppelin's 'Heartbreaker' [Led Zeppelin II; Atlantic 28930313], when everything stops to make way for Jimmy Page's one-take guitar solo, he was placed dead-centre on a wide stage, notes reverberating left and right. 'Rock ➞

33 Revelations Per Minute



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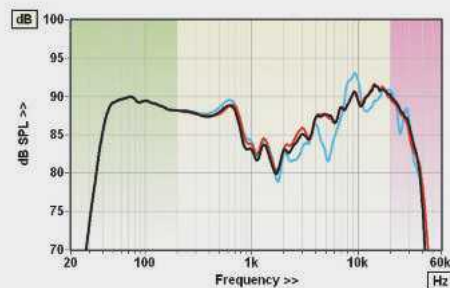
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LU KANG AUDIO SPOEY230

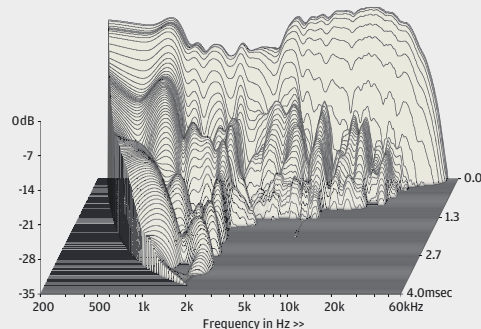
A cursory glance at the Spoey230's on-axis response [see Graph 1, below] indicates the output of the '230mm subwoofer' rolls steeply away above 800Hz (-3dB) following a peak at 620Hz that's coincident with a driver/box mode [see CSD waterfall, Graph 2]. While AudioTechnology's specification for the native driver indicates a far more extended midband response, here the 5-10dB drop in mid/presence output is inescapable before the 20mm soft-dome Hiquphon tweeter builds above 4kHz and restores output >8kHz. Lu Kang suggests a notional 2.3kHz crossover but our measurements indicate this is a lower 1.9kHz.

This broad trough is responsible for the high $\pm 5.8\text{dB}$ and $\pm 5.7\text{dB}$ response errors – increasing to $\pm 7.1\text{dB}$ with the grille in place [blue trace, Graph 1] – but the two speakers are otherwise impressively matched to within 1.2dB. Bass is also thoughtfully tuned with the LF driver offering a broad 60Hz-345Hz (-3dB) output, reinforced at 44Hz by the reflex port to deliver a very useful, diffraction-corrected bass extension of 37Hz (-6dB) [green shaded area, Graph 1].

Lu Kang specifies a modest 86.5dB sensitivity and 8ohm impedance for the Spoey230, the former reduced in practice by the attenuated middle octaves to yield 84.1dB/1kHz and, rather closer, 85.9dB as an average across 500Hz-8kHz. But the Spoey 230 really is a genuine 8ohm speaker – a rarity these days – as its impedance drops to a mere 7.9ohm/165Hz with two other minima of 8.15ohm at 43Hz and 10.2kHz. Swings in phase angle are a symmetrical $\pm 50^\circ$ with the modulus never dropping below 17ohm here, so this will be a doddle for any amp to drive. PM



ABOVE: Response inc. nearfield summed driver/port [green], freefield corrected to 1m at 2.83V [yellow], ultrasonic [pink]. Left, black; right, red; w. grille, blue



ABOVE: Resonances are coincident with the peak in response at 690Hz and 3kHz, plus other modes >5kHz

LEFT: Even the rear face of the Spoey230's cabinet is finished in real wood, though the single set of 4mm speaker cable terminals eschew support for bi-wiring or bi-amping

features interplay between strings, woodwind and brass, which all sounded tonally delicious and distinct, particularly the violin that soared higher and higher without becoming thin. A run-through of James Horner's 'For The Love Of A Princess' [*Braveheart OST*; Tidal HD] seemed even more in tune with the Spoey230's voicing, conveying both the layered nature of the LSO's performance and its depth and weight.

ALL ABOUT THE BASS

Speaking of depth, Lu Kang's promise of a 'thunderous bass' both oversells the Spoey230's dynamic ability (it's refined rather than rambunctious) and undersells its deft handling of the low-end. True, the deliberately voluminous low-frequency swells on Nelly's hip-hop title track [*Country Grammar*; Tidal HD] benefited too much from the speaker's port-assisted reach – there's no sense of distortion, or of a driver and cabinet not in sync, but it rather dominated the mix.

Elsewhere, the Spoey230's bass output is to be cherished. It presented basslines with notable nuance while giving body to drums, and in tandem with the sensitive treble brought considerable scale to Pink Floyd's 'Comfortably Numb' [*The Wall*; Harvest, CDS 7 46036 8], which only served to make its slick imaging seem slicker still. ☺

HI-FI NEWS VERDICT

A lover of rich sonic tapestries, emboldened by a bass output that's as big as the cabinet itself, the Spoey230 is a welcome addition to the loudspeaker landscape. Its size, particularly when the robust stands are in use, won't make it a natural upgrade from a conventional standmount, but its easygoing nature as regards amplification and positioning is a deal-sweetener. Rock 'n' rollers need not apply, though.

Sound Quality: 80%



On', from David Essex's 1973 album of the same name [Tidal HD], has a more overt stereo mix that the Spoey230's slid into, delivering details beyond the speakers' boundaries and drum fills that rolled from one to the other. The large cabinets seemed entirely disconnected from the soundscape I was enjoying, a recurring theme throughout my listening – and vocals stood out as a result.

This track also highlighted the system's natural handling of orchestral instruments. Jeff Wayne's arrangement for 'Rock On'

HI-FI NEWS SPECIFICATIONS

Sensitivity (SPL/1m/2.83V – 1kHz/Mean/IEC)	84.1dB / 85.9dB / 84.2dB
Impedance modulus: minimum & maximum (20Hz–20kHz)	7.9ohm @ 165Hz 54ohm @ 65Hz
Impedance phase: minimum & maximum (20Hz–20kHz)	-50° @ 80Hz +50° @ 21Hz
Pair matching/Resp. error (200Hz–20kHz)	1.2dB / $\pm 5.8\text{dB}$ / $\pm 5.7\text{dB}$
LF/HF extension (-6dB ref 200Hz/10kHz)	37Hz / 33.4kHz/31.5kHz
THD 100Hz/1kHz/10kHz (for 90dB SPL/1m)	0.25% / 0.45% / 0.3%
Dimensions (HWD) / Weight (each)	635x322x305mm / 23kg



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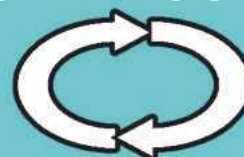
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AudioQuest William Tell Zero

Hero of Swiss independence, and a dab hand with the crossbow, William Tell is now the inspiration for a speaker cable. Review & Lab: **Paul Miller**



One of the founding fathers of the audiophile cable scene, California-based AudioQuest has been developing its conductor technology for no less than four decades. The William Tell Zero featured here is part of the 'Folk Hero' series – prices range from £2340 (2m pair), £2910 (3m) to £3480 for a 4m pair, with £570 per extra metre. This ranks as affordable when compared to the flagship 'Mythical Creatures' series that tops out at £20k for a 2m set of the Dragon Zero...

The materials and geometry of the cable derive from AQ's understanding of skin-effect and its efforts to minimise non-linear conduction between adjacent strands. In this instance, three dissimilar-diameter strands are employed per leg of the cable, AQ specifying its PSC+ copper (an OCC copper subject to additional annealing), and each individually insulated with a thick PE dielectric.

The 2.62mm² (12 gauge) cross-section ensures a low 14.3mohm/m resistance while the combination of strand spacing and gentle twisting results in a moderate capacitance (203pF/m) and inductance (0.79µH/m). I would probably not advise lengths over 5m or so. Otherwise, the thickness, and stiffness, of the cable is largely accounted for by the multiple braid, foil and conductive carbon screens that envelop each trio of conductors, providing comprehensive EM and RF shielding. A choice of spade and banana



LEFT: Deep within the William Tell Zero's outer braided jacket and carbon/foil screens are three SST (Spread Spectrum Technology) PSC+ (Perfect Surface Copper) conductors...

my Constellation Inspiration/B&W 800 D3 [HFN Oct '19/'16] amp/speaker combo cut straight to the chase. There was an immediacy here, reflected in the tangible, edge-of-your-seat threat posed by the electric cello and string section underpinning 'Why So Serious (The Dark Knight)' [Hans Zimmer – *Definitive Collection*; Silva SILCD 1453]. And yet, despite this sense of urgency, attack and power, the system would also convey the finest subtleties with what I might best describe as a 'considered delicacy', free of any grit or grain.

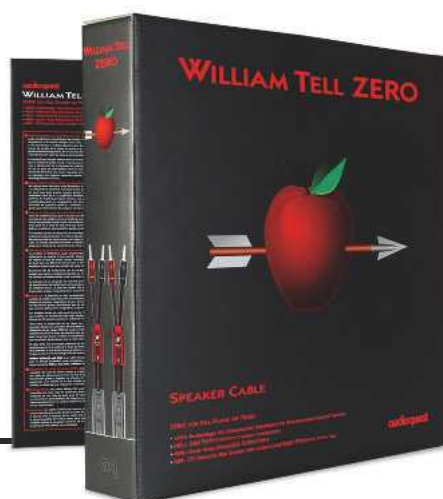
A challenging listen on some systems, the acoustic jazz of Craig Taborn Trio's *Chants* [ECM 2326, 88.2kHz/24-bit] possessed a little extra velvet with the AQ cables in tow, the composition's intriguing melody still weaving its typically hypnotic patterns but without the edginess that I've heard before. This cable is certainly no 'Zero'. ☺

plug terminations is offered, all heavily silver-plated, and 'cold-welded' to the strands using miniature grub screws.

You'll also notice a 72V DC power pack velcroed to the destination end of this directional cable. This is AQ's DBS (Dielectric Bias System), wired between the drain and shield to impress a polarising voltage across the internal dielectric. AQ postulates that this fixed electrostatic field rapidly 'forms' the dielectric and hastens the 'run-in' time of its cables. If you have a good few hours burning a hole in your diary then you can discover more here – <https://patents.google.com/patent/US7126055B1/en>.

STRAIGHT AS AN ARROW

Whatever the rhetoric – and AQ does produce a *lot* of literature – the impact of these William Tell Zero cables between



LEFT: Packaging fit for a Folk Hero – hard shell cable case comes in a lavishly-illustrated box

HI-FI NEWS VERDICT

While clearly not an 'entry level' cable, AQ's William Tell Zero still offers plenty of bang (or should that be 'slam'?) for your bucks, but you'll need very robust sockets on the rear of your speakers and amp to manage the bulk and tension of its 'Y-shaped' terminations [see picture]. Securely fastened, this cable squeezes as authoritative a sound as possible from your system, with a smoothness and freedom from 'hash' that'll soothe the most furrowed of brows.

Sound Quality: 80%



Pro-Ject Debut Carbon EVO

Launched in 1999, the original Debut turntable set the bar for starter vinyl packages. Twenty-one years later and the 'Carbon EVO' raises it to pole-vault standards...

Review: **Ken Kessler** Lab: **Paul Miller**

Deck/arm/cartridge/dustcover: check. Price £449: check. A choice of nine finishes including wood veneer, or gloss or satin colours: check. Everything included in the package readying it for connection to a phono stage: check. That list tells you Pro-Ject's best-seller remains, after two decades, the go-to 'turnkey' record deck for newcomers (or seasoned audiophiles on a budget). The basic recipe is unchanged but refined, which is why it has sold over 1,000,000 units. Rest assured, however, that this latest incarnation, the Debut Carbon EVO, is far more than a merely cosmetic upgrade.

Before describing the improvements, a reminder of the basics. The Pro-Ject Debut Carbon EVO is, like the original Rega Planar which pretty much established the look and genre, an unadorned, rectangular slab, oozing functionality and the kind of minimalist look which evokes a certain German styling school of the pre-WWII era. There is – literally – nothing above the plinth save for platter, arm/cartridge and hinged dustcover. The lone control, an on/off switch that also chooses between 33rpm and 45rpm, is under the plinth's left front corner [see picture, p75].

UP TO SPEED

This is ostensibly a two-speed deck – you simply flick the on/off switch to the left for 33 and to the right for 45. But there's a bonus. In addition to the flat belt supplied for 33 and 45, Pro-Ject supplies a second, round cross-section belt [see PM's Lab Report, p77] which, when fitted around the larger pulley and with the turntable switched to '45rpm', will play 78s!

Continuing the basic recipe, the carbon-fibre arm is an 8.6in single-piece model pre-fitted with an evergreen Ortofon 2M Red MM cartridge [*HFN* Oct '08]. It's a honey and worth nearly £100 as a separate

purchase. Oh, and Ortofon offers a 78rpm stylus for it, so that spare belt might come in handy for some of you.

Blessedly, Pro-Ject follows the fashion of fitting its deck with phono sockets at the back instead of a captive lead from the arm, and a really nice cable with earthing wire comes in the kit. The arm is not changeable, but it's a sweet performer, so will not hold back owners from upgrades.

While there are many improvements that earn this deck its 'EVO' suffix, arguably the most important is the heavier metal platter, which has circumferential damping applied underneath. The motor suspension also enjoys improved damping, while the height-adjustable metal feet provide some decoupling. The two-speed switch is new, as is the plethora of colour choices. Traditional types are served by wood veneer, or satin or gloss black or

white, but the demographic of vinyl users has changed over the past decade, so style-conscious urbanites may be drawn to gloss red or satin blue, green or yellow, as here.

WEIGHT GAIN

What this colour palette has to do with performance is irrelevant. What it has to do

with spreading the word about vinyl is everything. There is also, of course, the aforesaid, often-vexing issue of an upgrade path. Yes, this arm can handle lightweight MC cartridges, and you can change cables.

This is the prerogative of

every insatiable audiophile. But there's one upgrade I advise you to consider from the get-go, and that's either a screw-down clamp or a record weight.

Whichever you prefer, both will audibly tighten up the bass and add a frisson of crispness to treble attack and transients.

'This EVO has enough élan to exorcise any snobbery'



RIGHT: With platter (and tonearm's thread-and-weight bias) removed the sub-platter, peripheral belt and AC motor are all revealed. 78rpm is also accommodated by the stepped pulley



I tried an LP weight and a universal, lightweight, screw-down clamp, and found both more rewarding than changing the supplied felt record mat. I preferred the clamp to the weight (better for the bearing, too) and as most consumers shopping at this price point need to look after every pound, Amazon can supply something for as little as a tenner.

Thanks to the pre-fitted cartridge and a set of digital stylus scales, I had this making music in under 15 minutes. The only info I needed from the owner's guide was which notch to use for the anti-skating.

MELLOW YELLOW

Imagine the 'culture shock', so to speak, of reviewing a £449 front-end after living with one that costs four times that (the EAT

B-Sharp deck [HFN Jul '20] plus Jo N°5 MC cartridge [HFN Dec '18]) – to say nothing of following a TechDAS/Graham set-up worth £60k. I'd like to think a similar jolt affects a wine critic going from Petrus to something from a supermarket for £3.99, or a car reviewer following a Ferrari with a Dacia. But it wasn't that extreme.

Ah, you're thinking, here come the back-handed compliments because Kessler is working from a negative, nay, apologetic standpoint. Not so. Aside from two immediate impressions on the downside – losses in ultimate refinement and absolute scale of the soundstage – any drop in performance was far from intolerable.

Fleetwood Mac's remastered LPs from the pre-Buckingham/Nicks era box-set, *Fleetwood Mac 1973-1974* [Reprise R1

ABOVE: Seen here in its 'golden yellow' finish, the machined MDF plinth is available in no fewer than nine gloss/satin/real wood colourways. The 8.6in tonearm is fitted with an Ortofon 2M Red

596007/603497851294] were handy, so I went straight in with *Penguin*. As first impressions often deliver 80% of the final judgment, I was delighted to be distracted swiftly from the previously-cited negatives by a rich, solid, extended bass and utterly dazzling percussion. The snap, the solidity and the impact, allied to John McVie's virtuoso bass guitar playing, delivered enough authority to elevate the Debut Carbon EVO above its like-priced rivals and certainly above its progenitors.

Amusingly, it wasn't an original composition which had me sit up and take notice, but the deliriously funky interpretation of '(I'm A) Road Runner', that classic first gifted to us by Jr Walker & The All Stars. It was enough that the rhythm section had this usually sedentary excuse for a three-toed sloth boogieing along, but the harmonica solo was the deal-maker. This little sucker cooks.

DREAM DECK

Next was Dire Straits' eponymous debut [Mobile Fidelity MFSL2-466] on two 45rpm LPs. Knopfler's slithery, twangy guitar demands fluidity from a system, while his voice has its own unique rasp. The Debut Carbon EVO handled both with enough élan to exorcise any snobbery. It forced me to listen to the strains of 'Sultans Of Swing' with an open mind. This deck, to use the inexact, irrational parlance of the non-discriminating vinyl worshipper, is truly 'musical' and therefore absolved of any sins such as absolute refinement. ➔

THE VINYL PROJECT

In February 1990, when most people thought that vinyl was in its twilight years, a successful Austrian retailer and distributor took an exploratory trip across the Czech border to visit a factory in Litovel, near Prague. Heinz Lichtenegger was looking for a decent turntable for his customers, but it had to be very affordable. While the mass-market players currently offered by this once-state-owned factory weren't suitable, Heinz looked through the archives and identified a well-made single-play turntable designed back in the 1970s. This, he realised, was the basis for his own deck and within a year he'd set up a collaborative venture to produce the 'Pro-Ject 1'. This was a reworked version of the 'Gramofon Tesla NC 500', a two-speed belt-driven deck with an AC motor mounted, as with so many of Pro-Ject's subsequent models, using a rubber suspension at 10.30 o'clock at the back of the plinth [see www.vinylio.cz/tesla/tesla-nc-500-stereofonni-gramofonovy-pristroj-cerveny-prospekt]. What followed, as every audiophile knows, is arguably the biggest success story in hi-fi history. Pro-Ject Audio Systems' new headquarters is based in Mistelbach, Austria [see HFN Sep '18] and pictured here is its latest 'Debut' player in real wood veneer, complete with acrylic lid. PM





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TURNTABLE



ABOVE: Stereo phono sockets are mounted beneath the far left of the plinth with Pro-Ject's 'Connect-it E' RCA cables supplied as part of the turntable package

But absolutes there are, as editor PM points out in his Lab Report about the exactness of the Debut Carbon EVO's speed [see opposite]. Armed with a chronograph, I compared assorted 33rpm and 45rpm LPs' and singles' playing times and even dug out a strobe disc and found this turntable to be the budget-constrained perfect-pitch-fanatic's dream deck.

LITMUS TEST

Vocals, however, remain my final arbiter of everything, so the possibly-too-familiar strains of Carly Simon's album *No Secrets* [Speakers Corner ELEKTRA75049] served as my initial foray into the deck's midband capabilities. For those who value emotional content above all other aspects of sound reproduction, whether soundstage or bass extension or transient snap, this LP offers the contrasting feelings expressed in the heartbreak of the 'The Carter Family' and the arch contempt in 'You're So Vain'.

A system conveying both with equal grace, finesse and conviction is what many of you strive for in your quest for audio satisfaction. Ms Simon is hardly Aretha Franklin, and could be accused of a certain coolness akin to Sade's aloofness, yet both tracks elicited in this listener the same response as if hearing them with a honeyed Koetsu MC at the front. Which is to say that the Debut Carbon EVO is greater than the sum of its parts.

Here we witness the genius of a company that can do this for a sane price, giving you a made-in-Europe turntable/arm/cartridge with pedigree and performance so far beyond its market category as to embarrass the rest. Recall that the cartridge alone is worth more than 20% of the entire purchase price. Whoever combined and 'voiced'

the three elements of turntable, tonearm and cartridge has displayed system-assembly genius.

This raises the subject, which is too often neglected, of synergy and compatibility. We assume too much, imagining that any combination of three high-end components will work together blissfully. We've been lulled into this state, afraid to argue that £20,000 Amp A actually sucks when used with Speaker B, or that Cartridge X simply cannot mate perfectly with Phono Stage Y.

In the Pro-Ject Debut Carbon EVO, the pain of a front-end mismatch has been removed, the sole potential for such a calamity lurking only in the future for those who choose to upset the balance with an arbitrary upgrade. So I picked as the litmus test another 2x45rpm, high-cost LP, Janis Joplin's *Pearl* [Mobile Fidelity MFSL2-454] and that most revealing of tracks, the *a cappella* 'Mercedes-Benz'.

Suffice it to say, my reservations about absolute refinement were rendered meaningless, for the resultant sound was in-the-room/in-your-face, as-real-as-you-need presence. And that's magic. ☺

HI-FI NEWS VERDICT

Not only was this sub-£500 analogue package a joy for the money, it also provided a reality check. While the Pro-Ject Debut Carbon EVO is entry-to-mid-level, its performance through a system 200x its price revealed it to be punching *wa-a-y* above its weight. So while long-term readers may have moved beyond such budget esoterica, if asked by one of the 'new generation' then we can recommend this unreservedly.

Sound Quality: 86%

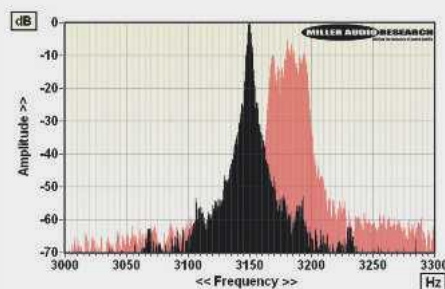


LAB REPORT

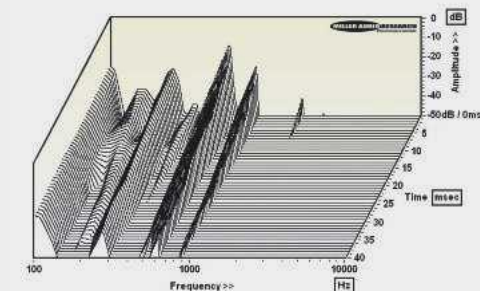
PRO-JECT DEBUT CARBON EVO

My lab report for the original Debut Carbon deck [HFN May '12], noted 'the enlarged 12in metal platter might benefit from some damping'. Pro-Ject has now added TPE damping to the (heavier) 1.7kg steel platter, so while the lightweight injection-moulded sub-platter and stainless steel/bronze bearing are unchanged, the increase in loading only results in a 1dB hike in through-bearing noise (from -68.8dB to -67.7dB here). More importantly, the improved platter damping has reduced through-groove rumble from -66.8dB to -69.1dB in the EVO [all DIN-B wtd, 20Hz-20kHz, re. 1kHz/5cm/sec]. The mechanical stability of the AC motor is also improved now the suspension resonance identified in the X2 [HFN Nov '19] has been addressed by Pro-Ject. *Absolute* speed accuracy is bang-on target and W&F reduced to a very fine 0.05% peak-wtd figure [black spectrum, Graph 1]. A component at ± 41 Hz visible in the rumble spectra is also manifest in the W&F spectrum but this is insignificant compared to the palpable deterioration in W&F and rumble caused by the use of Pro-Ject's glued, round-section belt option [shaded red spectrum, Graph 1]. Always use the flat-section belt for 33/45rpm!

Pro-Ject's 8.6in arm with its lightweight, rigid carbon fibre tube and headshell is a familiar choice – its low 7g effective mass ideally suited to the compliant 2M Red pick-up. The (sapphire) bearing friction is low at ~ 15 mg in both planes while the short, stiff armtube shows its principal resonance at 260Hz with higher-Q harmonic/twisting modes at 590Hz and 880Hz [see Graph 2]. This arm is a little 'livelier' than the alloy/carbon tubes fitted to Pro-Ject's 'The Classic' [HFN Aug '16] and X2 decks. PM



ABOVE: Wow and flutter re. 3150Hz tone at 5cm/sec (plotted ± 150 Hz, 5Hz per minor division; red trace, round-section belt vs. black trace, flat belt)



ABOVE: Cumulative tonearm resonant decay spectrum, illustrating various bearing, pillar and 'tube' vibration modes spanning 100Hz-10kHz over 40msec

HI-FI NEWS SPECIFICATIONS

Turntable speed error at 33.33rpm	33.32rpm (-0.03%)
Time to audible stabilisation	4sec
Peak Wow/Flutter (Peak wtd)	0.02% / 0.03% (flat belt)
Rumble (silent groove, DIN B wtd)	-69.1dB
Rumble (through bearing, DIN B wtd)	-67.7dB
Hum & Noise (unwtd, rel. to 5cm/sec)	-58.7dB
Power Consumption	4W (<1W standby)
Dimensions (WHD) / Weight	415x113x320mm / 5.6kg

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BEHIND THE MUSIC WITH HI-FI NEWS & RECORD REVIEW

Carlos Kleiber Conductor

Admired by his colleagues yet unpredictable for managers, he was a perfectionist who lived in his father's shadow. **Christopher Breunig** looks back at this reclusive genius

I am very slow on the uptake. But now I know what's wrong: the quavers are too low on nicotine. They need a little bit more tar – they have to be a bit more venomous... And: 'the side-drum has to edge its way in. It has to be very conspiratorial, a schizophrenic back and forth between sentimental and rumbustious'. Not the sort of rehearsal instructions orchestral players would be used to – but then, Carlos Kleiber was different.

When he first told his father, the great Austrian conductor Erich Kleiber, that he too wanted to conduct he was bluntly told 'One Kleiber is enough!', and was packed off to study chemistry in Zurich. But as his sister remarked, in the EuroArts documentary *Traces To Nowhere* [to be found on YouTube], Carlos at one time worked under an alias. And later, Erich Kleiber did acknowledge his son's huge talent.

➔ Like father like son: Erich Kleiber's enduring Beethoven Symphony No 5 from 1953

⬅ Carlos Kleiber became reclusive and conducted his last concert in 1999 with the Bavarian RSO



Born Karl Ludwig, in 1930, his name was changed when the family moved from Germany to Buenos Aires in 1935. As a 'modernist' – conducting Janáček, Krenek, Milhaud, *et al*, he'd premiered Berg's *Wozzeck*: a work which the Nazis deemed 'degenerate' – Erich Kleiber had felt impelled to resign his post at the Berlin State Opera.

Wozzeck was later one of Carlos Kleiber's key successes at Stuttgart and he brought the work, and the Staatsoper to the Edinburgh Festival in 1966 (his first UK appearance). As so often, he was using his father's marked scores – it has been claimed that he only conducted works with

this precedent (Henze's *Ondine* is one obvious exception, with 27 performances given from 1961-66).

He was 'a dictator, but very human and supportive with it,' says mezzo Brigitte Faessbender – although she remembers him sending a little note 'How could you do this to me?', after a couple of minor fluffs during a *Rosenkavalier* performance with him.

You can see a short clip from a Stuttgart *Der Rosenkavalier* online showing Kleiber's extraordinary

fluidity of arm and body movements, while film of Wagner's *Tristan und Isolde* (see Georg Wübbolt's documentary *I Am Lost To The World*) shows the utter intensity he conveyed in the opera house. There's also a split-screen comparison of father and son in the same Johann Strauss piece.

Kleiber would never beat time in a conventional manner, but his expressive body language was all the players needed. In the famous New Year Day concerts in the Vienna Musikverein (1989/92), and in classical pieces too, sometimes he'd drop the baton to one side and just briefly leave the players alone – once he set up a metronome in rehearsal, claiming he could do no better!

AN AUDI, THANK YOU

For his scant later appearances he asked for huge remuneration – the conductor Michael Gielen reckoned that his fees for taking *Der Rosenkavalier* to Japan would have set him up for life; and for one

concert he requested a fully customised Audi. But as his sister Veronika said 'For him the money side was like a gauge of his importance'. He seemingly felt he never reached the

same level attained by his father.

Fassbaender found him, at times 'given to outbursts of hilarity, almost like an adolescent'. His sense of play extended – in one performance of his much-loved *Die Fledermaus*, after the Act 2 interval – to dressing as Boris Becker, wig and all, conducting using a racquet and tennis ball.

Kleiber used to recommend the old Clemens Kraus recording [Decca] while his own [DG 457 7652] proved controversial in the casting of Ivan Rebroff – a 'falsetto' Orlovsky.

“The money side was a gauge of his importance”



PHOTO: UNIVERSAL

Two important works (both on CDs with technical deterrents) he only conducted once were Mahler's *Song Of The Earth* and Beethoven's 'Pastoral' Symphony. He agreed to stand in for Josef Krips to conduct the Mahler composition with the Vienna Symphony Orchestra on June the 7th 1967. Preparing the work, he met with Otto Klemperer in Zurich to discuss Mahler's score in detail. A much-pirated tape copy was finally remastered for the VSO's own label [WS007]. It proved to be Christa Ludwig's night (Waldemar Kmennt, the tenor, was far too close-mic'd), so worth hearing for her.

But given the technical problems with the sound I'd suggest listening to the YouTube upload rather than spending money. And after the success of his live Symphony No 4 [Orfeo C100841B] the 'Pastoral' was rather disappointing – it was transferred from a Nov '83 cassette recording made by Kleiber's son [Orfeo C600031B]. These are both with the Bavarian State Opera Orch.



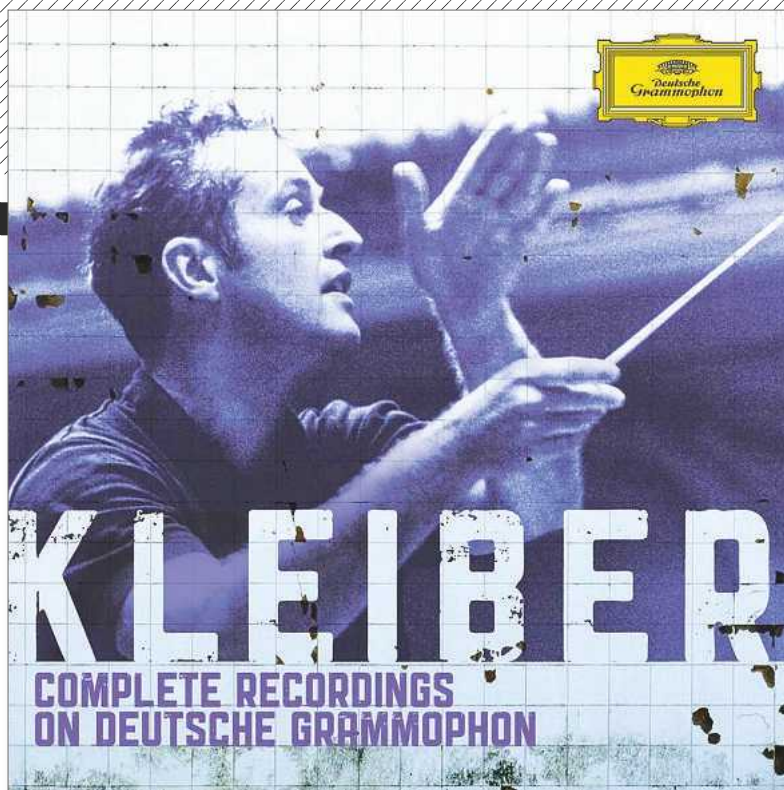
PHOTO: YOUTUBE

One recording that was much anticipated, we never had. Kleiber was to record R Strauss's *Ein Heldenleben* with the Vienna Philharmonic for Sony, but either walked away or refused to allow publication (YouTube has a 1993 VPO concert version). And we might never have had his Dresden *Tristan und Isolde*, which some sources say he declined to approve, although *Gramophone* says he assisted in the digital remix for CD [DG 477 5355].

He was a constant source of bewilderment and frustration. Conductor Manfred Honeck (then in the VPO): 'Time and again he first said yes, then called the next morning to say he'd changed his mind. A short note "I'm off into the blue" and that was it'.

Kleiber liked nothing more than to drive back to the Slovenia home

➔ The complete orchestral and opera recordings Kleiber made for DG [477 8826; 10CDs]



that he had built, in Konjšica – as Karajan put it 'he only came out when his freezer was empty'. Diagnosed with untreatable prostate cancer, he died seven months after his wife Stanislava, a former ballet dancer, in July 2004. The two had met when he was conducting at Düsseldorf in the early '60s.

OPEN APOLOGY

Shortly after the success of his Beethoven 7th and Schubert No 3 LPs he gave two concerts with the LSO including these symphonies, in June 1981, Milan then London. But the critics here were hostile and the *Observer's* Peter Heyworth wrote an open apology on their behalf. Needless to say, Kleiber never returned to the Festival Hall.

Music-lovers who regularly watched the TV transmissions from Vienna on the 1st of January will remember the shock of this elegant new figure patently enjoying the sounds he choreographed in 1989 [see 'Essential Recordings' boxout, below] and again three years later. A rehearsal clip shows how hard he worked even in the VPO's core Strauss repertory.

Violinist and former VPO Director Clemens Hellsberg said 'In art there are no upward limits. Yet each generation needs at least one artist who exemplifies this. Carlos Kleiber reached to the stars for us; even when he broke down in his efforts, he still proved that they exist'. Kleiber himself said, enigmatically, 'One shouldn't leave traces in life'. ☺

➔ Kleiber conducted the VPO's 'New Year Day' concerts in 1989 and 1992

ESSENTIAL RECORDINGS

Beethoven: Symphonies Nos 5 & 7

DG 471 6302 (SACD)
Kleiber's unmissable VPO coupling from 1975/6 – one of the few SACDs to remain in DG's catalogue. Orfeo has a 1982 live Seventh.

Schubert: Symphonies Nos 3 & 8

DG 449 7452
Kleiber's 1978 VPO recordings with a superb 'Unfinished' and with No 3 especially thrilling in the final *Presto*.

Verdi: *La Traviata*

DG 479 7287 (2CDs + Blu-ray audio)
Cotrubas as Violetta – 'an ideal heroine' – Domingo (Alfredo), Milnes (Germont) and the Bayerischer Staatsoper.

Brahms: Symphony No 4

DG 457 7062; also 479 2687 (3CDs + Blu-ray)
Kleiber's 1961 VPO version 'blends intellectual rigour, passion and perfectionism' [BBC *Music*]. De-Luxe set also has the two Schubert and Beethoven Symphonies remastered.

VPO New Year Day Concerts 1989/92

DG 0734014 (DVD)/Sony G010001399438J; Philips E701529 (DVD)/Sony COLSK48376.
An odd mish-mash of labels for these two historic events, on DVDs or CDs.

Carlos Kleiber: *I Am Lost To The World*

C major 705608 (DVD)
Musicians define the art and personality, German original film with UK subtitles.

Vinyl Release

BEHIND THE MUSIC WITH HI-FI NEWS & RECORD REVIEW

Prince *Sign O' The Times*

As this 1987 LP appears on 180g vinyl **Steve Sutherland** recalls his interview with Prince back in 1981. Did their meeting influence the singer's signature behaviour?

Maybe I should shoulder some of the blame. It was me, after all, who declared in a *Melody Maker* review of his previous album, *Parade*, that Prince was God's gift to music or some such nonsense.

Prince then appeared to have taken my praise – and many, many, many others' – at face value and begun to behave accordingly. 'If the Creator took a mere seven days to put the world together,' his thought process seemed to be, 'then the very least I can do is bash out an album in a week – maybe every week.'

FACE TO FACE

However, let's not jump the gun into that full-blown megalomania just yet... Pray allow me to reel you back through the years a little. I was one of the first UK journos to spot Prince's talent and, as such, one of the few to be granted a face-to-face interview. This was in 1981, and at the London Embassy Club where I had taken Prince, as my guest, to an early evening launch

party for something to do with Steve Strange and Visage. After our interview, it became apparent Prince had nothing to do that evening and knew no-one in town.

So I hailed a cab and took him along to the do where he spent the whole night standing in the corner, talking to no-one, refusing my offers of drinks and generally looking shy and lost. Eventually he left me to hobnob with the Spandau and their primped-up like. Later, when Prince became the sartorial peacock we all swooned over, I used to joke that it was me that first turned him on to the New Romantic style.

But, anyway, back to my article which, incidentally, began: 'The quiet little man with bovine, brown eyes and a whisper of a 'tache stares absent-mindedly out of the hotel window across London's rainswept rooftops. "Actually," he decides finally with pronounced hesitation, "I think it's much more embarrassing talking about these things than doing them. I mean, I find it a lot easier to sing swear words than to say them and when I first had a girl, I found it really hard to tell my mother

STEVE SUTHERLAND

Steve edited NME from 1992-2000, the Britpop years, launching NME.com and reviving the NME Awards. Previously he was Assistant Editor on *Melody Maker*. Among his many adventures he has been physically threatened by Axl Rose, hung out awhile with Jerry Garcia and had a drink or two with Keith Richards...



but, Lord knows, I didn't feel embarrassed while I was doing it to her."

This was around the release of his third LP, *Dirty Mind*, and Prince was over here in London from Minneapolis for a one-off show at the Lyceum, which he performed wearing a studded leather coat, Y-Fronts and black thigh-length tights...

A LOTTA TROUBLE

'To me it's not outrageous, it's comfortable. I've always dressed the way I've wanted to and if it goes with the music, it's only

because the music is part of me and so is the way I dress. I don't try to do anything to shock or to make money – that would make me a hooker...

'I saw an analyst once because I was wondering why it was that I was so

sexual-minded and why I wanted to go against the grain so much because it got me into a lotta trouble a lotta times. He asked me to talk about my childhood – y'know, when you first experienced this and first experienced that, sort of thing.

'More than my songs have to do with sex, they have to do with one human's love for another which goes deeper than anything political that anybody could possibly write about. The need for love, the need for sexuality, basic freedom, equality – I'm afraid these things don't necessarily come out. I think my problem is that my attitude's so sexual it overshadows anything else, that I might not be mature enough as a writer to bring it all out yet.'

As the interview wound down, he unleashed this whopper: 'I'm gonna stop this soon. I don't expect to make many more records, for the simple reason that I wanna see my life change. I wanna be there when it does, I don't wanna be doing what's expected of me'.

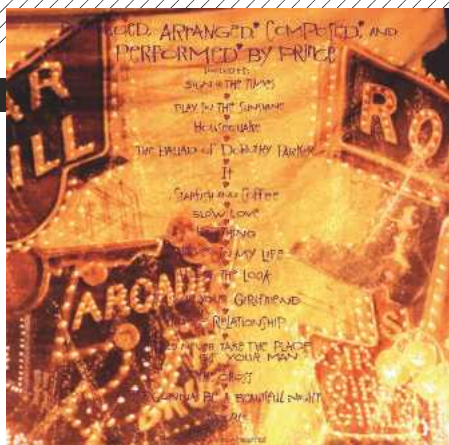
In actuality, Prince made 28 more albums after *Dirty Mind*, a good 20 of which I'll warrant very few people

'Then alarm bells started to ring at Warner Brothers HQ'



THE PRINCE ESTATE / JEFF KATZ

Prince photographed in 1987 (left) during a shoot at Paisley Park, his home and studio in Minnesota, and (right) label for Side 1 of the original 2LP album release



➔ The remastered *Sign O' The Times* on 180g vinyl is available to order online at www.roughtrade.com at £39.99

remember. *Sign O' The Times*, though, was his zenith. His ninth overall, it was released as a double in 1987, perilously balanced between his absolute genius and the crazy self-confidence that finally overwhelmed his talent and opened the floodgates to a string of releases that, in refusing to self-edit and assuming everything he did was wonderful, proved that you definitely can have too much of a good thing.

ENTER CAMILLE

The project began with Prince recording with his backing band The Revolution for what was to be something called *Dream Factory*. With several tracks in the can, Prince fell out with beloved confederates Wendy & Lisa and became disillusioned or bored, or both, and sacked the band, whereupon the songs already recorded were incorporated into *Crystal Ball* with the band's contributions downplayed. *Crystal Ball* was planned as a triple album – seldom a good idea and already a bad sign of a rampant ego – and here's where it tips over into the Twilight Zone.

One of the first new tracks to be put down on tape was something called 'Housequake' in which Prince decided to



➔ Prince pictured at the Paisley Park complex by photographer Jeff Katz



speed up his vocals. Intrigued with the result and fascinated by the fact that it made him sound female, he continued the process throughout the whole album and decided to release the complete shebang under the pseudonym Camille.

Another stipulation was that it was to feature no picture of him on the cover so the public would have no clue as to the artist's identity. It would be designed to be a true test of the great man's pulling power and commercial clout.

EVIL INFLUENCE

Not surprisingly, alarm bells started to ring at Warner Brothers HQ and, after a period of, shall we say, heated debates, a compromise was reached whereupon Prince backed down a bit and agreed to cull some material, add a little to leaven the Camille stuff and release it as a double called *Sign O' The Times*.

Before we wave her bye-bye, it might be fun to note that Prince later invoked Camille as the guiding force responsible for his next project, *The Black Album*, also shelved shortly before its intended release after the artist experienced a spiritual epiphany, became convinced the record was 'evil' and had been created under the influence of Spooky Electric, a demonic alter-ego induced by Camille.

OK then. Anyway, as it turned out, *Sign O' The Times* worked out just fine as

a grab bag of supreme Princeness. The stand-out songs are the electro funky social documentary title track, the poppy 'U Got The Look' (with Sheena Easton), the saucy sweet soul of 'If I Was Your Girlfriend' and 'I Could Never Take The Place Of Your Man' and the religio-epic 'The Cross'.

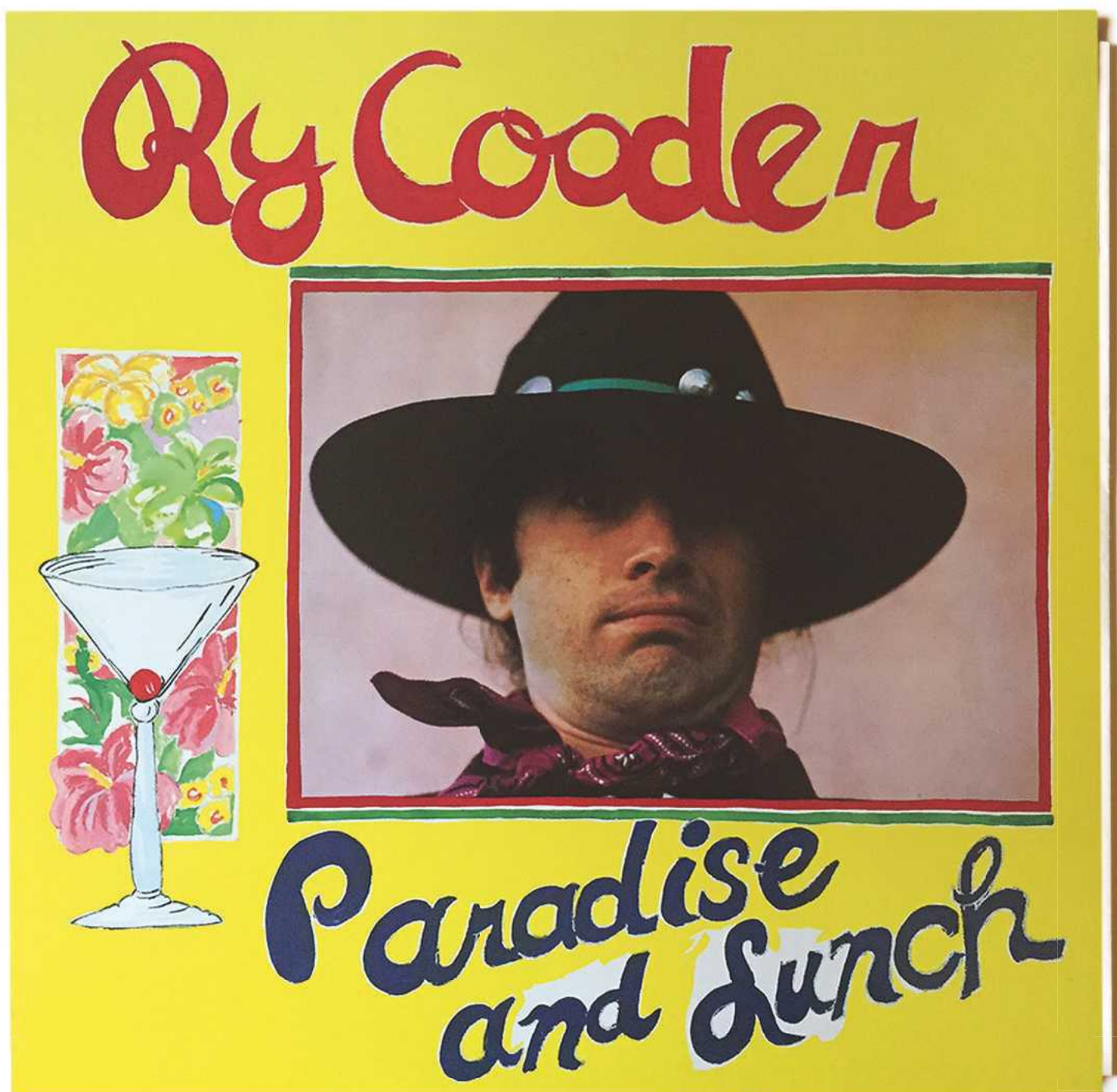
Artistically, it was all freewheeling downhill from here. More record company struggles, becoming 'The Artist Formerly Known As...', then scrawling 'Slave' on his face... In essence, after *Sign O' The Times* Prince was kinda done, stuck on thematic repeat and musical recycle. ☺

RE-RELEASE VERDICT

Sign O' The Times was first released as a 2LP set in Europe in 1987 on the Paisley Park label. Working with the Prince Estate, Warner has recently issued a Super Deluxe set which includes more than 60 previously unreleased tracks, and two complete concert recordings (including Prince's only on-stage collaboration with Miles Davis). But the basic 16-track album is also available on 180g vinyl [Cat No: 0603497846528]. Remastering is by Bernie Grundman. **HFN**

Sound Quality: 90%

0 - - - - - 100



Ry Cooder *Paradise And Lunch*

Session guitarist, composer of film scores and here, on his fourth album, the roots-rock multi-instrumentalist reached into his musical bag to breathe new life into a diverse selection of obscure songs. It was a commercial failure, but it's no less compelling...

Words: **Johnny Black**

Rated among the finest of Cooder's 17 solo albums, *Paradise And Lunch*, his fourth release, is easily deserving of Vinyl Icon status.

Ryland Peter Cooder first achieved wide recognition as an in-demand axe-slinger who worked with The Rolling Stones, Little Feat, Van Morrison and countless other artists. But to think of him simply as a superbly tasteful guitarist does not do him full justice.

He's not a great songwriter, or a fantastic vocalist, but from the outset of his career he demonstrated an uncanny knack for unearthing relatively obscure songs that were not only unjustly overlooked gems, but were also ideal for him to perform.

GORGEOUS GOSPEL

From 1974, *Paradise And Lunch* amply demonstrates all of his gifts from the opening twangs of the first track, the traditional work song 'Tamp 'Em Up Solid'. Cooder sets it to a lively shuffle beat, and colours it with gorgeous gospel-like male backing vocals, while his guitar sparkles and dances throughout. It's hardly an earth-shatteringly original arrangement, but Cooder and his crew deliver exactly what it needs.

'That's an old railroad song I heard from Josh White', he has explained. 'One of the gospel singers on the record, Bill Johnson, knew it.'



↑ Label for the original LP on Reprise Records

↗ Cooder poses for a promo shot in 2018

↗ The rear of the LP sleeve – a cocktail of sounds, perhaps?

↓ Cooder caught on camera in the mid '70s



JOACHIM COODER

I wondered how we ought to do it, so he just said, "You do it like this, then you play this, so and so sings that, and that's how it's done".

'All of a sudden you find you're learning a whole great big thing about arrangements which stays with you, although it doesn't happen very often.' As with all Cooder albums, *Paradise And Lunch* is about a well-ordered sequence of perfectly arranged performances rather than overwrought emotional impact, high-end production or gasp-inducing instrumental virtuosity.

SHIMMERING GUITAR

The 1929 composition 'You Can't Stop A Tattler' by the Texan gospel-blues performer Washington Phillips And His Manzarene Dreams is next up for transformation. Cooder takes what was a simple moral tale accompanied by nothing more than a lightly plucked zither and elevates it to another realm with yet more gospel vocals, a deliciously understated

Nick De Caro string arrangement, and his own shimmering guitar lines.

Cooder has always employed unusual tunings in his arrangements, and 'The Tattler' is one of the finest examples of this. 'The overall sound of "The Tattler",' Cooder told *Guitar Player* magazine in 1980, 'is strictly on account of playing D position in G tuning. You just can't get those passing chords in standard, and you can't get the bass notes.'

"I can't stand girl singers, though not personally"



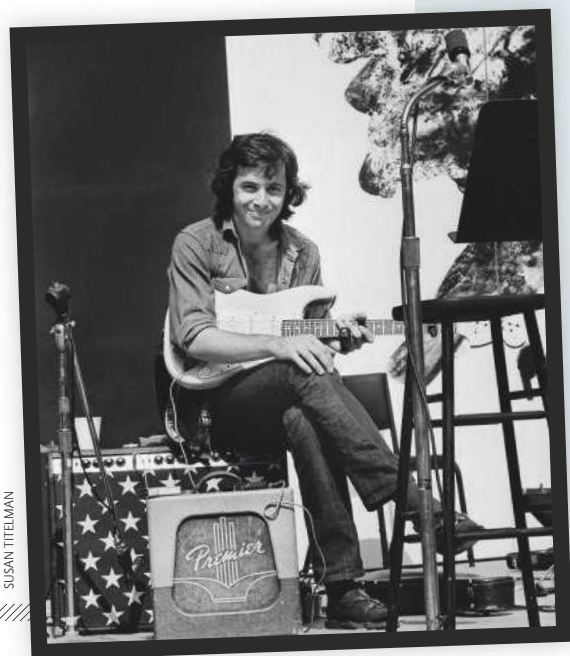
Cooder takes a rare co-writing credit on this song, because, 'There were a lot of verses I didn't include, church verses about people who go to church on Sunday, raise hell on Monday. People who don't put any money in the collection box. People making dates with their

neighbour's wife in church'. Feeling that such preachy lyrics wouldn't work for a hip 1970s audience, Cooder simply went and left them out.

His rearrangement resulted in a song

that was certainly more accessible to contemporary listeners, as was confirmed when Linda Ronstadt covered Cooder's arrangement on her 1976 Grammy-winning album *Hasten Down The Wind*.

'I figured somebody would cut that song,' Cooder later revealed. 'I didn't know who but I think it's nice that she did. I certainly appreciate it. I'll make some money.' Even by this point in his acclaimed career, ➔



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VINYL ICONS

PRODUCTION NOTES

The sleeve notes to *Paradise And Lunch* declare that it was mostly 'Recorded, mixed and originally mastered at Warner Bros Studios, N. Hollywood'. For many years, Warner didn't actually have its own recording facility until in 1971 it bought Amigo Studios, which had been founded by producer Snuff Garrett about four years earlier.

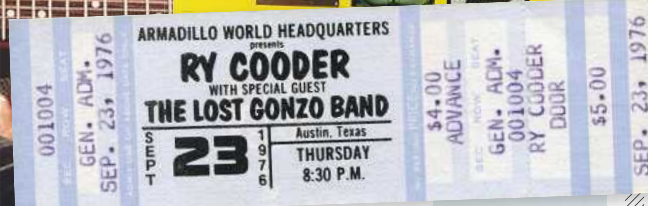
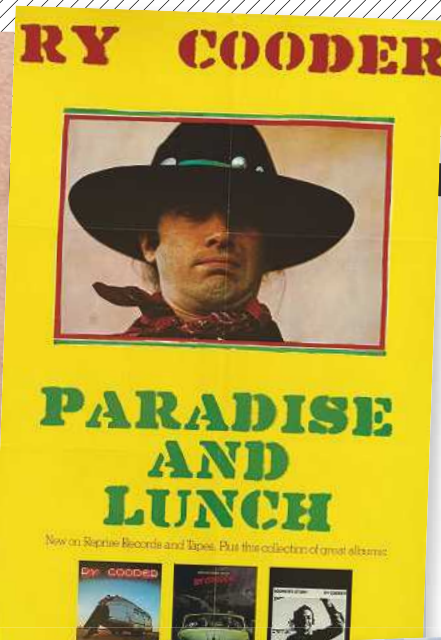
Later, Amigo was routinely listed on album covers as 'Warner Bros. Studios, N. Hollywood'. So it's fair to assume that the album was recorded at Amigo by acclaimed producer Lenny Waronker and his close associate Russ Titelman.

Waronker had first encountered Ry Cooder during The Everly Brothers' sessions for their 1968 album *Roots*, and was immediately impressed. He'd never heard anyone play bottleneck guitar before, but rated Cooder, 'an amazing character – you knew that when he walked in the room. You could tell this guy was so special'.

Waronker was ideally suited to working with Cooder because, as the child of a music biz family, he had grown up with Randy Newman, and the pair not only played ball games together, they also played artist and producer. 'We'd take an old standard, and I'd say, "Why don't you do it like The Drifters would?"'. It was great fun for me. We used to know every song on the charts – who published it, who wrote it, how cool it was.'



Thus, even though he found his temperamental nature awkward, he understood Cooder's approach of discovering old, lost songs and rearranging them for a new audience. Indeed, in his first A&R role at Warner Bros, in 1967 Waronker had produced The Mojo Men's 'Sit Down, I Think I Love You' and Harpers Bizarre's 'The 59th Street Bridge Song (Feelin' Groovy)', both remakes of other acts' songs.



Cooder's albums weren't big sellers, so extra cash was always welcome.

For Blind Willie McTell's 'Married Man's A Fool', Cooder simply fleshes out the acoustic blues accompaniment of the original, giving it more of a rock song bed, and emphasising the comedy of the lyric. He then returns to upfront gospel vocalising for 'Jesus On The Mainline', enhanced by some tasty Salvation Army band horn parts arranged by Motown's go-to brass player George Bohanon.

Much of the set's gospel feel derives from the involvement of The Golden Gate Quartet, a group Cooder had known for a while. 'At a certain point,' he told *Zigzag* magazine, 'I had worked up enough of a relationship with those singers to where we could go in a studio and attempt to capture some of that sound in a very minor way.'

MEN ONLY

'We're not doing gospel music, and we're not really approaching any of the achievements of those quartets and quintets, but it's still a useful thing and it sounds good. That kind of singing has a lot of applications and it's fun besides.'

Cooder expanded on those thoughts during a later interview with British rock journalist John Huguen Tobler in which he said, 'That

was the album where I used some (male) singers for the first time, and I really began to realise that that was one of the main handles to put on all this stuff. It was to get that background singing to work.

'I'd used girl singers before, but unsuccessfully – I can't stand girl singers, though not personally, but black male voices on that kind of material are still strongest and most appropriate for me, and they also

do a lot for a tune rhythmically.'

Asked how he had set about choosing which songs to record for *Paradise And Lunch*, Cooder made it sound simple. 'Those songs

were just the ones which came up. "Jesus On The Mainline" is an ancient fundamentalist hymn. It goes back. It's in everybody's baptist tradition. "Ditty Wah Ditty" is '20s. "Tattler" is '20s. "Married Man's A Fool" is '20s.' But then he continued, saying, 'I get so sick and tired of people saying, "He does old tunes".'

Side 1 of the album closes with Cooder's reinterpretation of 'It's All Over Now', a Bobby and Shirley Womack song which provided a minor hit for The Valentinos in 1964 before The Rolling Stones revved it up and took it to No 1 in the UK. Cooder injected a loping Caribbean feel into the track, later saying, 'I'd known "It's All Over Now" for a long

"He makes a virtue of his wobbly vocal on the track"

Original poster from 1974 advertising the release of the *Paradise And Lunch* album and (above) ticket for a 1976 concert in Austin, Texas

The guitarist poses for a portrait shot at the beginning of the '70s, a decade in which he released a series of albums for Warner Bros, initially on the Reprise label

Cooder takes time out to relax backstage after opening for Captain Beefheart in 1971



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Alternate Format Discography



STEVE PROCTOR

➔ Cooder onstage at the McGlohon Theater, Charlotte, North Carolina in 2015 and (below) jazz pianist Earl Hines pictured in 1947

time, but I loved The Valentinos' version so much that I wouldn't touch it until I realised that it was almost like a reggae song, so that was my excuse for doing that'.

SLIPPERY SOLO

Side 2 opens with the medley 'Fool For A Cigarette/Feelin' Good', which artfully combines a track by Memphis cabdriver-cum-songwriter Sidney Bailey with a feelgood mid '60s song by bluesman JB Lenoir, which leads in to another feelgood vibe in 'If Walls Could Talk', with a slippery, spiky solo – a standout even by Cooder's standards.

As if to prove that nothing is beyond his scope, Cooder next tackles 'Mexican Divorce', a Burt Bacharach-Bob Hilliard composition first recorded in 1962 by The Drifters. The Drifters rendered the song in their smooth soul-pop style, but Cooder's interpretation

makes a virtue of his distinctive wobbly vocal, here inserted into a radically more 'South Of The Border' treatment, where it's heard dripping with sentimentality.

The album's big finish comes with the ragtimey stride of 'Ditty Wah Ditty', featuring revered jazz pianist Earl 'Fatha' Hines perfectly complementing Cooder's bouncy string work. This happy combination came about by chance, as Cooder revealed in 1983.

'I heard he was in town, and I thought "How can I lose?", so I called him up. He wasn't doing anything that day so, although he didn't know me, I

asked him to come down, and he said he had a song we could play, which was "Ditty Wah Ditty". He was fine, an agreeable guy, and it was just one of those crazy things – we never did hardly any more recording, but that was lucky, it was correct and a good idea, which you have every now and again.'

Released by Reprise Records on June the 8th, 1974, the album limped to a rather unimpressive No 167 on the Billboard 200 Albums Chart in the US, and made no impact whatsoever in the UK.

Luckily, chart success alone has never been the barometer by which Cooder is measured. Discerning music critics 'got' *Paradise And Lunch* immediately and praised it, and despite its poor showing on the charts, it went on to become his most successful album up to that time, going gold in Holland, and earning a Grammy in Germany. 🎵

'Discerning music critics "got" the album immediately'

From its first vinyl issue in 1974, *Paradise And Lunch* has been a terrific-sounding piece of work. With the dynamic duo of Lanny Waronker and Russ Titelman behind the desk, that's hardly surprising. Happily, every successive incarnation seems to have maintained and, in some cases, enhanced that original high standard.

ORIGINAL VINYL (1974)

Cooder famously was the first rock artist to record a digital album with 1979's *Bop Til You Drop*, which was laid down on a 3M digital machine, but he was equally famously not a fan of digital recording, which he



felt lacked warmth. Happily, the original vinyl *Paradise And Lunch* [Reprise MS 2179] displays warmth aplenty, as well as admirable sonic clarity, definition and stereo placement. It was also released on cassette [M5 2179].

FIRST CD (1987)

The album first popped up on CD in Japan, in 1987 on the Reprise imprint [32XD-792]. It was considered by some to have been just a shade on the 'dull' side. The first US CD edition [Reprise 2179-2], pressed by the Specialty Records Corp, Pennsylvania, was not significantly better in terms of sonic quality. Subsequent reissues have been better received however.

REMASTERED CD (2007)

Once again the land of the rising sun stole a march on the US, with this paper-sleeved mini album replica, remastered by Warner-Pioneer's widely



respected Isao Kikuchi [Reprise WPCR-12693]. Coming a full 20 years after the first Japanese CD edition, it does represent a noticeable improvement in the sound, particularly in bass response and soundstaging.

SPEAKERS CORNER LP (2016)

Remastered by Kevin Gray at Pallas in Germany, this 180g reissue on Speakers Corner [Reprise MS 2179] was enthusiastically received by reviewers who praised it as a superb job with crisp, warm and realistic instrumental sounds without any noticeable technological interference.

MOFI LP (2017)

In 2017, hot on the heels of the Speakers Corner LP came this much anticipated MoFi limited edition remaster [MFSL 1-449]. This was remastered from the original master tapes by Krieg Wunderlich and came in a special static and dust free inner and heavy duty sleeve. It too garnered ecstatic reviews



with fulsome praise for its 'dead-quiet surfaces, superb transient response, front-to-back soundstaging', etc.

MOFI SACD (2017)

Simultaneous with the MFSL 180g vinyl came the label's SACD version [UDSACD 2159], which has been hailed as 'vibrant' by Cooder fans.



WILLIAM COTTELLER

Meet the Producers

BEHIND THE MUSIC WITH HI-FI NEWS & RECORD REVIEW

The Bomb Squad

In the last of our series celebrating the work of those masters behind the mixing desk, **Steve Sutherland** tells the story of not one producer but a hip-hop production team whose looping and layering of samples revolutionised the way records were made

On this particular point, Chuck D is unequivocal. 'Our sole intention was to destroy music'. The record he's talking about, released in June 1988, is hip-hop giants Public Enemy's second LP, *It Takes A Nation Of Millions To Hold Us Back*.

The 'we', as in 'our', is The Bomb Squad, Public Enemy's production team: headed up by Mr Hank Shocklee and aided and abetted by his brother Keith, Chuck D himself (sometimes credited as Carl Ryder), Eric 'Vietnam' Sadler and Gary G-Wiz. With *It Takes A Nation...* The Bomb Squad revolutionised hip-hop and the art of record production itself.

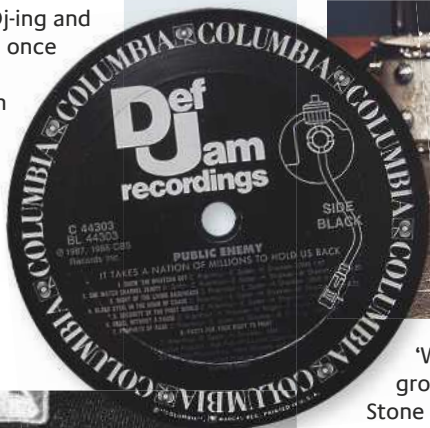
ON MESSAGE

Hank's background was in Dj-ing and radio around New York and, once Chuck D and his college pal Flavor Flav formed Spectrum City, which morphed into Public Enemy upon their signing to Def Jam records, Hank fell into working with them natural as breathing.

'I've always been an avid listener of music that had a message', he says.

➔ Public Enemy co-founder and Grammy-nominated producer Mr Hank Shocklee in 2016

↓ Promo shot of Chuck D from 2000 and (inset) Public Enemy's *It Takes A Nation Of Millions...*



'When you're listening to groups like Sly And The Family Stone and Bob Marley And The Wailers and... Gil Scott Heron, you're listening to Marvin Gaye, you're listening to Stevie Wonder. Those are records that were more than just records – they were soundtracks of our lives. They were also statements of social issues and concerns.

'That's why I fell in love with hip-hop, because I was always interested in cutting-edge music. I saw the emergence of this street music and it was teen-oriented.'

What Mr Shocklee did with his passion was in a different state from ordinary once he hooked up with Chuck D and co. 'Everybody has a soundtrack in their head. When you talk to Chuck, he's going to have a soundtrack in his head. If you

talk to Flav, he's got a soundtrack in his head. But for me, it was a combination of things because, when I'm looking at music, I'm looking at it not in terms of what one particular song gives me but what many songs have in common.'

PIECE WORK

'So I would have to say that *It Takes A Nation...* is *Rastaman Vibration*. That it's Gil-Scott Heron's *Winter In America*. It's Sly And The Family Stone's *There's A Riot Going On*. It's also Pink Floyd's *The Wall*.

'It's so many records and pieces woven into each other in order to make that statement. And keep in mind, that statement was made without real instruments. It was one of the first records that was made strictly from other records.'



JULIO ENRIQUEZ

Mr Shocklee owned more than 10,000 records and when it came to creating *It Takes A Nation...* his collection was painstakingly scoured for samples from drum beats to speeches, to feedback and distortion. Back in '88, sampling records was still in its infancy, with most hip-hop producers taking snippets from one or two records at most to snaffle the odd beat.

The Bomb Squad went wholesale gung-ho, creating dense layers of sound using countless samples and experimental processing techniques. They were collages no less.

BIN THE BASS

'The way we did it was like a band, Shocklee explains. 'Like in "Rebel Without A Pause", Flav played the snare portions, because Flavor had the kind of feel that was good for that. Eric might play the kick and hi-hat, I would play the horn, and Norman would put the scratch on it. So when you get all these different feels together, it's a band and that's what we wanted to get.'

The process was exhausting but fruitful and the Squad grew braver and braver, pushing the envelope to the extent that they even ditched traditional basslines. 'None of the productions have basslines', admits Shocklee. 'That's because basslines represent melody. If it doesn't have melody no-one perceives it as musical. It just becomes a low-frequency hum.'

In place of basslines, The Bomb Squad opted for 808 drums with pitch changes – not the drums themselves mind you, but samples of the drums from other records. 'We were using

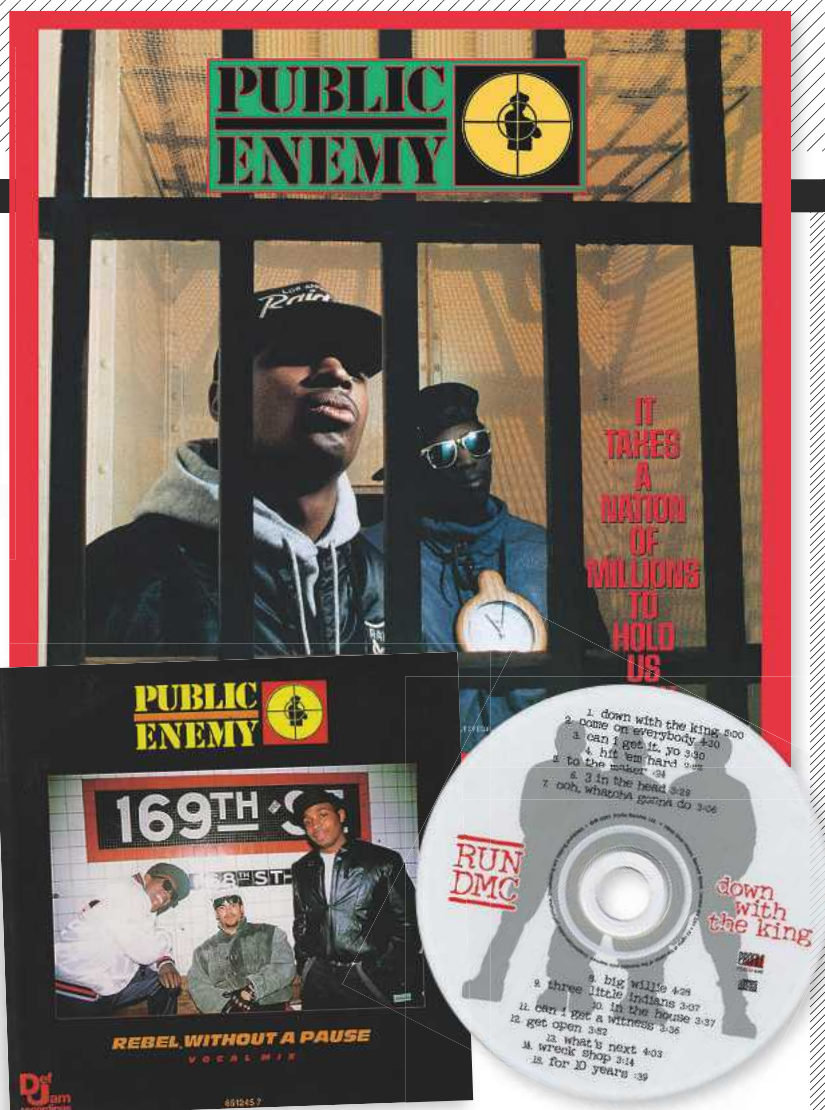
Ice Cube worked with The Bomb Squad after leaving NWA in 1989

The 1988 album *It Takes A Nation Of Millions...* with Chuck D (left) and Flavor Flav on the cover

'Rebel Without A Pause' was released as a single in 1987

Run DMC's *Down With The King*

Flavor Fav live in concert in 2008



the 808 as the front note', says Shocklee. 'We would go and get a record that had recorded it already and take that 808. It's a texture thing. You get all the extra grittiness so it doesn't come across clean.

'Part of the sound was in the dirt that we would get from the samples, whether it be hiss from the record or a crackle on top of the kick. [Other sound engineers] would zero in on that frequency and try to figure out a way to get rid of it. I'd be sitting there, saying, "No, you need to boost that..."'

'It was about that extra funk which I'd want to feel, that extra dirtiness which would make fans of Public Enemy feel like we're from the gutter. This was the street, this was not processed.'

'Shocklee owned more than 10,000 records'

There were other innovations, as Mr Shocklee explains. 'Most rap records at the time were about 107 beats-per-minute, 108. We pushed "Bring The Noise" to about 109, almost 110. Not only did we push the tempo, but we also pushed the energy as well. So now, instead of the samples being long, maybe

two bars or four-bar loop phrases, they are more like 16th notes. They were eighth notes. The samples were coming faster. And it gave the impact of the energy being higher and

higher and higher. That's what we were going for, pure adrenaline.'

THE SCREAM

There were production trademarks too: 'What made James Brown great was his screams. James Brown was the only artist that was pushing you with the scream, using the scream as an instrument. Everything that Public Enemy was doing was paying homage to the scream that James Brown used. But we didn't use a

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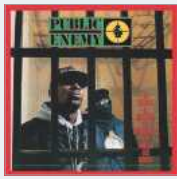
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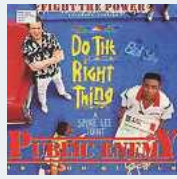
MEET THE PRODUCERS

BEHIND THE MUSIC WITH HI-FI NEWS & RECORD REVIEW



1988

The Bomb Squad begin stitching together their mix of samples and beats with the result that Public Enemy's *It Takes A Nation Of Millions...* is a watershed in rap



1989

Requested by director Spike Lee for his 1989 film *Do The Right Thing*, 'Fight The Power' is hailed a masterpiece and is now Public Enemy's best known song



1990

The Bomb Squad man the boards for the Son of Bazerk single 'Change The Style'. A head-on collision of beats and samples with a catchy melody ensure it's a hit



1990

Ice Cube works with The Bomb Squad on his debut solo LP, *AmeriKKKa's Most Wanted* - a defining hip-hop album of the '90s



1992

Created for the abandoned US release of Lisa Stansfield's 'Time To Make You Mine', the Bomb Squad remix appears in 2014



1992

The Squad bring a fun and funky twist to Peter Gabriel's hit 'Steam' with three remixes that appear on a 12in vinyl single



1993

Run DMC benefit from The Bomb Squad's work on their LP *Down With The King* with the single 'Ooh, Whatcha Gonna Do' a hit in the US on the *Billboard* 100

human voice scream. We found other sounds that would replicate that. So when you listen to "Rebel Without A Pause", you're [in effect] listening to James Brown screaming.'

CRED WITH EDGE

The stunning impact of *It Takes A Nation Of Millions...* and Public Enemy's following LPs like *Fear Of A Black Planet*, made The Bomb Squad the go-to production destination for anyone seeking credibility with that crucial edge. Artists ranging from Ice Cube, and Run DMC with *Down With The King*, to Lisa Stansfield, and Peter Gabriel came a knocking and got the benefit of The Bomb Squad treatment.

'I'm interested in being the first at doing things,' says Mr Shocklee. 'I don't like being second or third. That's why I don't redo or repeat projects... I always looked at what we did as more being a tailor as opposed to going to buying your clothes off the racks in a store.'

'You have to know the personality of the artist and where the artist is trying to go. And the idea is to be able to take them on a journey where they want to go but do something that they wouldn't normally have done without you.'

The Bomb Squad are also famous for creating their Sample Packs, collections of sounds you can access royalty-free to avoid the lawsuits that, since the late 1980s, have tended to arrive in your inbox if you

lift samples from other people's recordings.

Hank also likes to talk about his multimedia projects, which he calls 'The Future Frequency'.

'We're in our laboratories and our offices, our studios and our meeting places, the streets, and our homes.'

'We're online, offline, seen and unseen, crafting new works, creating new formulas, and composing future classics... We're thinking new thoughts, challenging

the status quo, fine-tuning skills, questioning systems, communicating ideas... We're all acknowledging the past, preparing for the future and living in the present... As

human beings our creativity is the thing that's going to save us from decay. The future is what's going to make us stronger. We don't have to look at the past and try to repeat those things. We could do some new things today.'

CAN YOU FEEL IT?

'In this digital age, performance is more important than ever. Anyone can make a record but the difference between the records now and those that were being made in the '60s and '70s is that there was a performance that made connection with people. You're making people vibrate to your own frequency.'



'I call it humanism because the thing that's being lost today is human feel - everything has become so pre-programmed. It's the strainer approach in that

everything is going through the strainer to strain

out anything that has any life in it. So when it comes across the desk to you, it's food with no nutrients.'

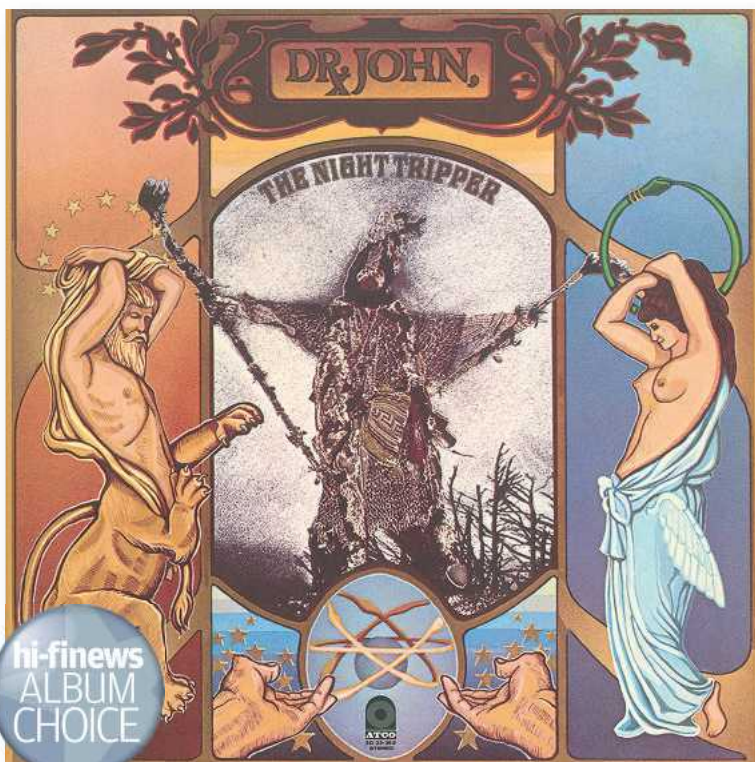
'My mission now is to bring artists and songs and people expressing themselves the way they need to... I've never been a mainstream artist. Hip-hop was alternative - it's not alternative anymore. So, now the thing that excites me is what is underground and not getting the light of day because people don't know where to classify it. The future is going to be genre-less.' ☺

Public Enemy's 1999 album *Fear Of A Black Planet* went on to sell over two million copies

Chuck D pictured on stage with Public Enemy in Sweden in June 1991



"Records in the '60s and '70s made a connection"



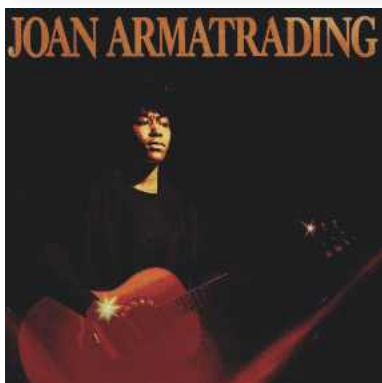
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The Sun Moon & Herbs

Speakers Corner ATCO SD33-362 (180g vinyl)

Dr John's passing in 2019 had inspired a binge as I worked through much of his canon, and this reissue, serves as a fine memorial. Dating from 1971 and technically his fourth solo LP as 'Dr John' rather than 'Mac Rebennack', it has guests including Eric Clapton, Mick Jagger, Graham Bond and enough five-star studio musicians to let you know that by this time, he was an A-list, if mainly considered a 'genre' musician. He was still caught up in his weird funk voodoo shtick, but the compositions are more akin to listener-friendly New Orleans R&B. Gripping throughout, the playing alone merits this month's main honour, but the sound seals the deal: the bass is monumental. **KK**

Sound Quality: 95%



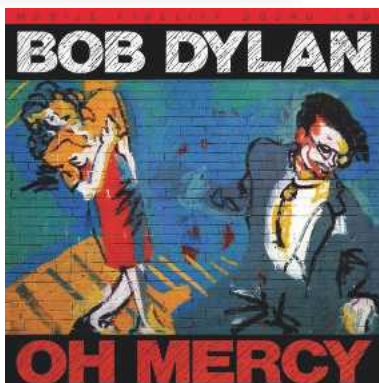
JOAN ARMATRADING

Joan Armatrading

Intervention Records IR-029 (180g vinyl)

Is there a hi-fi enthusiast over 60 who doesn't own this 1976 album? Like *Breakfast In America*, it was played to death at shows and in stores, but for good reason: Armatrading's intense delivery was captured perfectly by Glyn Johns, and she became – having proven as inimitable as Kate Bush or Joni Mitchell – a genre unto herself. Certainly not easy to shoehorn into any category, Armatrading melded singer-songwriter artistry with a hybrid Caribbean/British attitude, seasoned with hints of jazz and folk, and earned herself a Top 10 hit with 'Love And Affection'. Intervention has, as usual, produced a breathtaking reissue, right down to the quality of the sleeve. **KK**

Sound Quality: 90%



BOB DYLAN

Oh Mercy

Mobile Fidelity MFSL2-488 (two 45rpm LPs)

Reviewed in May 2019 on SACD, the album – then celebrating its 30th anniversary – surprised this listener as I'm one of those whose interest in Dylan tapered after 1970. It is, in hindsight, regarded as a return to form after a run of less-than-awe-inspiring releases, and I described it last year as 'dark, moody, atmospheric and redolent of the era, shaped by Dylan's inescapable political position of the time'. One of those Dylan albums that grows on you, *Oh Mercy* on vinyl is more pertinent in the context of this magazine, as the sound is astonishingly good. The SACD was an ear-opener, but this 45rpm LP version is even better, especially in those bottom octaves. **KK**

Sound Quality: 90%



ORIGINAL SOUNDTRACK

Psychedelic Sex Kicks

Modern Harmonic MH-8233 (white vinyl LP + DVD)

Unless you are an unreconstructed hippie, who still uses terms like 'Groovy!' and 'Far out!' and smokes enough grass to keep Mexico solvent, this will baffle you. It's the soundtrack to a long-forgotten exploitation flick from 1967, containing a mix of dialogue segments, poetry and sitar. Not hypnotic, Ravi Shankar-grade playing, but the wannabee twanging of the era with slithery tabla accompaniment. This is a curio for hard-core cineastes, and it deserves to be available, so again Modern Harmonic performs a service. The white vinyl pressing is clean, quiet and space-y (in the groovy sense), but I still haven't mustered the nerve to watch the DVD. **KK**

Sound Quality: 80%



AUDIOPHILE: DIGITAL



COMPACT DISC



SUPRAAUDIO



DVD



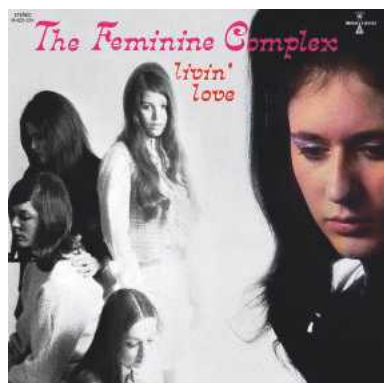
BLU-RAY



VINYL



DOWNLOAD



THE FEMININE COMPLEX

Livin' Love

Modern Harmonic MHCD-204

As The Go-Go's continue to perpetuate the myth that they were the first all-girl band to play their own instruments, write their own songs and misuse apostrophes, Modern Harmonic finds more killer distaff outfits which predate them. This is from the late 1960s, with a pedigree based on the band's Nashville origins, though the cult status is due more to the original LP's rarity than any hoped-for proto-Runaways punkishness. Reissued a few times, and augmented by unreleased tracks, it's soft rock in The Carpenters vein and could have been overseen by Burt Bacharach. What surprises is the sound quality, though you don't have to be a musicologist to guess the era. *KK*

Sound Quality: 85%



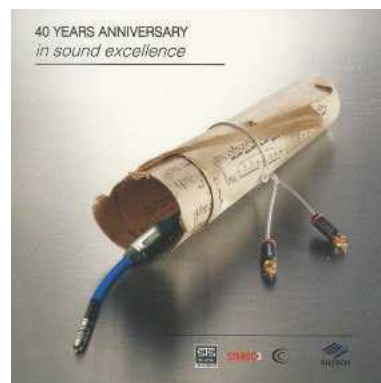
HELEN REDDY

I Am Woman & Long Hard Climb

Vocalion CDLK4627

Dating from 1972/3 and continuing Vocalion's crusade to make available via SACD those long-inaccessible quadraphonic recordings of the era, the late Helen Reddy's hit-filled third and fourth albums represent her commercial peak and they've acquired new relevance. The title track of the first of the pair says it all, a feminist anthem that – while almost restrained by today's protest methodology – reminds us that *'plus ça change'*. She was a great belter as well as a crooner, and here her taste was both impeccable and catholic, covering songs by Mann/Weil, Don McLean, Percy Mayfield, John Sebastian and others of note. And the production is superb. *KK*

Sound Quality: 90%



VARIOUS ARTISTS

STS 40th Anniversary In Sound Excellence

STS Digital 6195 CD111

What I love about label samplers is that they afford audiophiles, who moan louder than anyone about prices, to get a taste of a company's output without buying some £50 release which turns out to be a musical void. This 15-track collection contains vocals and instrumentals, jazz and classical material, taken mainly from STS's back catalogue. Unique to it and thus adding value are five classical selections recorded at Amsterdam's Concertgebouw by pianist Gabriella Rynveld-Käfer, better known to audiophiles as Gaby of Crystal Cable. The sound throughout is, of course, to high-end standards, so consider this a handy demo CD to carry with you shop-to-shop. *KK*

Sound Quality: 90%



DON GRUSIN

Out Of Thin Air

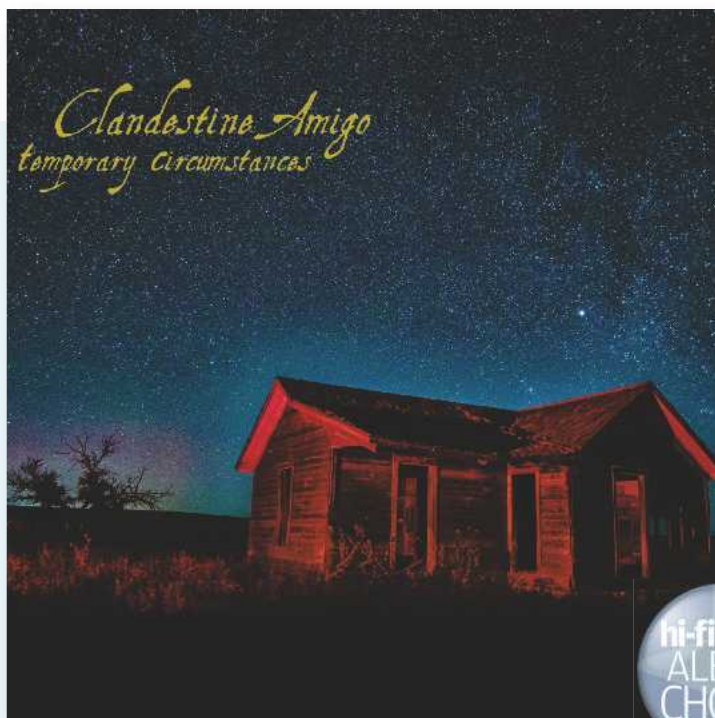
Octave Records OCT-0001 (SACD + DVD)

PS Audio's new label is unashamedly 'audiophile' in every way, ticking all the boxes that entice the enthusiast. How so? This inaugural release is 1) a double-disc affair, containing an SACD and a DVD so you can do your own comparisons, 2) the music itself is superbly-recorded solo piano, all the better to judge without distraction, 3) all the studio kit is itemised and 4) the player is a jazz hero (whose brother Dave is responsible for early audiophile LPs). OK, maybe I just described a throwback to the late 1970s, but this is a vibrant recording that will make you sit up in your chair, so real is the experience. It may not get played to death in your system, but trust me: you will use it to dazzle like-minded visitors. *KK*

Sound Quality: 95%



hi-finews
ALBUM
CHOICE



CLANDESTINE AMIGO

Temporary Circumstances
(44.1kHz-192kHz/24-bit, FLAC; DSD64)

www.psaudio.com; Octave Records OCT 002

The idea of a hi-fi company having its own record label is nothing new: Linn's has won multiple awards, and many other firms from high-end to mass-market have had a go from time to time. But Octave, an offshoot of PS Audio, is rather different: yes, it too is committed to paying its artists fairly and recording them in the highest possible quality, but it also makes its releases available in strictly limited editions [see also p95]. This album, the debut by singer/songwriter

Jessica Carson and her band, is offered in a run of just 1300 SACDs, 500 45rpm 2LP sets, plus this DSD/PCM download bundle. Recorded using a stack of high-end studio equipment, it's musically interesting in a small-scale way, but most impressive for its extraordinary sound, with the kind of presence that redefines the word 'intimate'. If you like that sense of a band being in the room with you, then you'll love this! **AE**

Sound Quality: 95%



BERLINER PHILHARMONIKER/ KIRILL PETRENKO

Symphonies by Beethoven (Nos 7 & 9), Schmidt (No 4) and Tchaikovsky (Nos 5 & 6); Stephan: Music for Orchestra in One Movement (96Hz/24-bit, FLAC)*

www.hi-resaudio.com; Berliner Philharmoniker BPHR200351

A substantial saving over the 'Deluxe' physical presentation, the downloads still come with one of the most elaborate of PDFs – inordinately long musicological essays, a foreword by Petrenko and colour photos. The music section reflects a new Berlin start under Petrenko, with composers he wants to promote: Franz Schmidt and Rudi Stephan. Readers will remember the thrilling Proms Beethoven Seventh: the one here is similar – the finale too fast in parts – but a respectful 'Choral' is marred by a poor bass and even worse soprano soloist. The *Pathétique* was our 2019 Yearbook Album Choice, and No 5 is no less fine. Petrenko does tend to exaggerate – rests, *pianissimi*, etc – but on the whole a recommended set (particularly for the Schmidt). **CB**

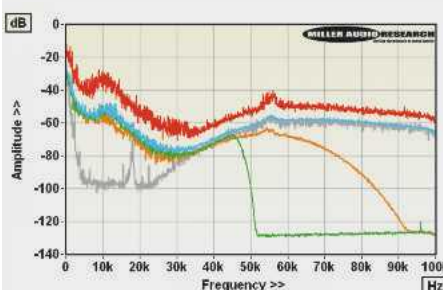
Sound Quality: 85%



OUR PROMISE

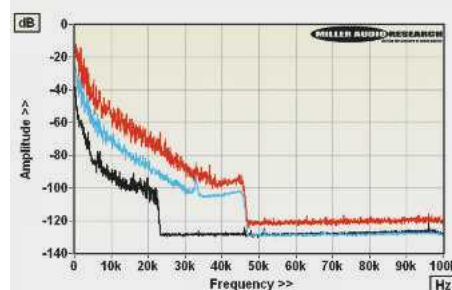
Following our Investigation feature [HFN, Jun '11] in which we examined the claimed quality of high-resolution downloads, *Hi-Fi News & Record Review* is now measuring the true sample rate and bit-depth of the HD music downloads reviewed on these pages. These unique reviews will be a regular source of information for those seeking new and re-mastered recordings offered at high sample rates and with the promise of delivering the very best sound quality. (Note: asterisk in headings denotes technical reservation explained below.) **PM**

LAB REPORT

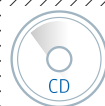


Best auditioned as the native DSD64 file [RMS, blue; Peak, red] which shows a good dynamic range <30kHz. The 192kHz [orange] and 96kHz [green] downsamples filter out much DSD noise. Note spurious 18kHz tone on the vocal feed [grey]. **PM**

LAB REPORT



There are short sequences in trk 2 [black] (No 7, II. Allegretto) and trk 9 (No. 9, IVb. Presto) where the 96kHz sample rate collapses to 48kHz. Some spurious too at 33kHz, but otherwise this offers a fine bandwidth and dynamic range. **PM**



COMPACT DISC



SUPRAAUDIO



DVD



BLU-RAY



VINYL



DOWNLOAD



LADY A

On This Winter's Night (Deluxe) (96kHz/24-bit)

www.hdttracks.com; Capitol Records Nashville 509994 04818 2 1

With a title like that, one might expect a cosy, huddled round the fire album like the many festive offerings to have appeared in recent years, complete with folksy instrumentation and ethereal vocals seemingly designed for a John Lewis ad. But that's not what you get here from the outfit formerly known as Lady Antebellum – latterly rebranded despite the existence of a blues singer of the same name. Lady A's take on a seasonal album, originally released in 2012 as an expansion of an earlier six-track EP, is big, blowsy and bold. This good-time country take on familiar tunes, with lush arrangements and instrumentation, sounds suitably punchy and dynamic in its 'Deluxe' guise. The saving grace in this good ol' sentimentfest is the quality of the harmonies the trio produce, at least when they manage to soar above the glossy production. **AE**

Sound Quality: 80%



FRANCESCO PIEMONTESE, SCO/ ANDREW MANZE

Mozart: Piano Concertos Nos 19 and 27, Rondo K386 (192kHz/24-bit, FLAC)

www.linnrecords.com; Linn CKD622

Mozart's K459 (No 19) is a wholly extrovert work well suited to this young Swiss pianist's manner, whereas K595, the composer's last piano concerto, brings one or two doubts. Whether or not you feel this is an 'autumnal' piece (and the booklet note suggests Mozart was just looking for a new approach) there is an underlying inwardness. The little flourishes Piemontesi gives the finale add exuberance, but in the *Larghetto* he cannot leave the writing alone, and I do find his interventionist decorations – however justified in historical terms – excessive. In these clean, well-balanced recordings the Scottish winds really shine, Manze's bold accompaniments keeping pace with the soloist yet rather lacking individuality. The cadenzas all have an improvisatory feel: excellent. **CB**

Sound Quality: 80%



OLIVE BROWN

Empress Of The Blues (DSD64/128/256/512/DXD)

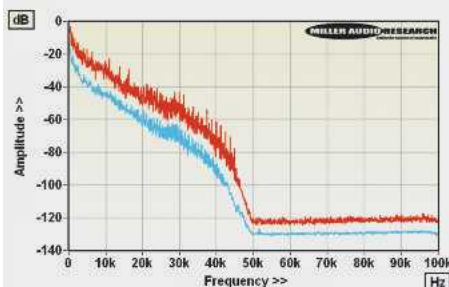
www.nativedsd.com; 2xHD JA1184

No, me neither – but not having discovered Olive Brown until now is definitely my loss, as is clear from a listen to this latest restoration project from the wonderful 2xHD label. Drawing on three of Brown's 1970s albums for the Jazzology label, this compilation has been put together by converting the original analogue tapes via a custom-tubed Nagra and the label's in-house-designed ADC, and pretty special it sounds. Yes, the tracks are definitely period pieces, but it's clear that Brown, who died almost 40 years ago at just 60, both had serious pipes on her and could make even familiar music by the blues greats her own. She's aided here by a band made up of old-school battle-hardened jazzers – listen to them delivering 'How Come You Do Me Like You Do', and I defy you not to smile. However, be aware that there's some confusion in the track-listing here. **AE**

Sound Quality: 80%

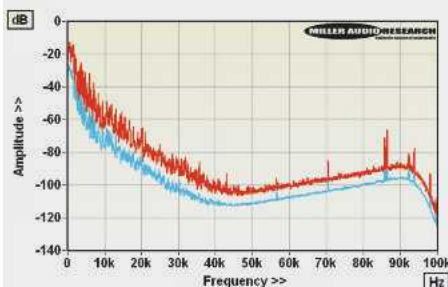


LAB REPORT



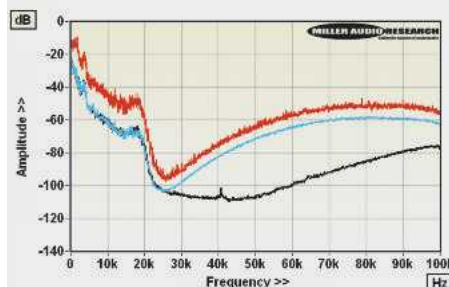
Recorded *loud* – every track peaks within just 0.1dB of digital clipping (0dBfs) – the effective dynamic range of this seasonal blast is limited to the top 1-2 of its 24-bits. But, no doubt, every 'Hz' of its ~48kHz bandwidth is filled with song! **PM**

LAB REPORT



Another Philip Hobbs production for Linn, this 192kHz file shows the slight rise in ultrasonic noise and spurious at 86-94kHz seen before [*HFN* Jun '20] but the bandwidth is well used (strings to 40kHz) and peaks do not exceed -0.2dBfs. **PM**

LAB REPORT



Brown's '70s tapes are captured in DXD and resampled to DSD64-512. Encoding leaves the MSB untouched so peaks are -6dBfs or lower. Limited ~20kHz range means there's no difference in content from DSD64 to DSD128 [black]. **PM**

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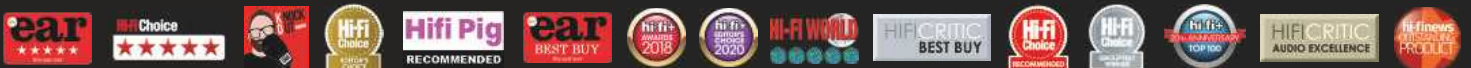
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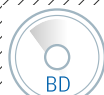
COMPACT DISC



SUPRAUDIO



DVD



BLU-RAY



VINYL



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ALBUM
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JACK CHESHIRE

Future Fractal Plays

Loose Tongue GN200004; LP: GN200003

Jack Cheshire has always shown himself adept at writing folk-tinged, acoustic guitar-based tunes in the singer-songwriter tradition. But while 'Ocean Floor' falls into that category, he also looks beyond such stylistic limitations and *Future Fractal Plays* finds him venturing further out into landscapes of strings and spacey synths. On 'Tunnel Vision', in precise yet curiously rounded tones, Cheshire exhorts us to 'move into the light' over the busy drums and spangly electric guitar. Meanwhile, on the title track, he ponders the multiverse and advises the listener to 'pack your psychic bags and vacate inner space', shifting musical and lyrical perspectives in a way that's typical of this brilliant, enigmatic collection. **MB**

Sound Quality: 90%



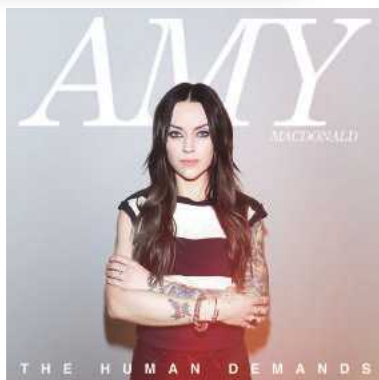
THE CRIBS

Night Network

Sonic Blew COOP804CD; LP: COOP804LP1

When The Cribs emerged in the early 2000s, their stropky neo-punk saw them likened to The Libertines, but their continuing success stems from their love of vintage British pop. The sibling empathy of the three Jarman brothers is evident in the tight playing and vocal harmonies, and their songwriting looks back to Ash, The La's, even The Hollies on 'Never Thought I'd Feel Again', but with overdriven guitars bedded into the mix. Produced by Steve Albini, 2017's *24-7 Rock Star Sh*t* was a more feral beast but they took over desk duties themselves for *Night Network* at Foo Fighters' Studio 606 in LA, and their eighth album has both heft and clarity. **MB**

Sound Quality: 80%



AMY MacDONALD

The Human Demands

BMG 4050538641035; LP: 4050538641011

On Amy MacDonald's fifth album the acknowledged influence of bands like Travis and The Killers on her dramatic, Celtic-tinged music comes across strongly, and is amplified by the big production sound of Jim Abbiss, who has worked with Kasabian and Adele. With her powerful voice driving the songs, the effect can be a tad blustering, but is balanced out by her emotionally articulate lyrics. The title track finds her riven with existential doubt and on 'The Hudson' she tries to stop her dreams turning sour, as the song climbs into a Bruce Springsteen-like chorus. By contrast, she muses on the pitfalls of attraction on the acoustic 'Young Fire, Old Flame'. **MB**

Sound Quality: 85%



BLUE ÖYSTER CULT

The Symbol Remains

Frontiers Records FRCD1060; LP: FRLP1060

Back in the early '70s Blue Öyster Cult were referred to as the heavy metal band for people who don't like heavy metal, and with their tongue-in-cheek occult, sci-fi and fantasy lyrics, and penchant for strong tunes, they helped create the genre while lampooning its pretensions. After a 19-year break, original vocalist/guitarists Buck Dharma and Eric Bloom lead a revamped, remarkably fresh-sounding lineup, who deliver songs about alien abduction ('Edge Of The World'), forlorn vampires ('Tainted Blood') and cyborg love ('The Machine'). They avoid metal and classic rock clichés and 'Box In My Head' shows that they have retained their knack for pop melody. **MB**

Sound Quality: 85%





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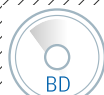
COMPACT DISC



SUPRAUDIO



DVD



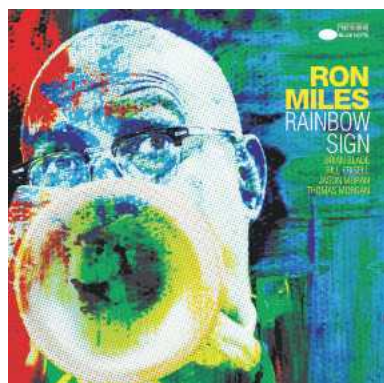
BLU-RAY



VINYL



DOWNLOAD



RON MILES

Rainbow Sign

Blue Note 0731333; 2LPs: 0731334

Denver-based trumpeter and composer Ron Miles holds a senior teaching position but has also recorded many albums, including one with Ginger Baker and half-a-dozen with guitarist Bill Frisell. Most recently, Frisell appeared on Miles's three albums for the German label Yellowbird. For the last of these, *I Am Man*, pianist Jason Moran, bassist Thomas Morgan and drummer Brian Blade completed the quintet that also appears here on Miles's Blue Note debut. It's music that sounds fractured at first, but with an almost supernatural rapport between Miles and Frisell. They play the unexpected and yet it all fits, just as Miles's pieces are intricate and yet direct. *SH*

Sound Quality: 85%



JOHN COLTRANE

Giant Steps (60th Anniversary Deluxe Edition)

Atlantic Records/Rhino 0349784839 (two discs); 2LPs: 0349784834

Just weeks after he'd played on *Kind Of Blue* with Miles Davis, Coltrane recorded this epochal album. His composition 'Giant Steps' modulates constantly with the 'Coltrane changes' that have challenged generations of players and are the subject of many a learned treatise. But you also get the beautiful 'Naima', the fast and fiery 'Mr PC', and four other fine tracks, while this new edition adds a second disc containing eight selected out-takes. Completists will already have the remaining 20 out-takes, which were in the 1995 *Heavyweight Champion* CD box set, but for streaming or download these are now included in a 35-track Super Deluxe Edition. Whew! *SH*

Sound Quality: 85%



THELONIOUS MONK

Palo Alto

Impulse! 0711285; LP: 0711284

Thankfully now available, this stunning album captures Monk live in Oct '68, when he was under contract to Columbia. After a short postponement of its July 31 issue date, Impulse! announced that the digital release would be via Sony Music. The music was recorded at Palo Alto High School thanks to the efforts of 16-year old student Danny Scher, who'd precociously booked the Monk quartet for an afternoon benefit concert. It's full of a joyous, unstrained feeling, and is such a vibrant, atmospheric recording that you forgive imperfect balance and the creaking piano bench. Whether you've a shelf-full of Monk albums or none at all, you must have this one. *SH*

Sound Quality: 80%



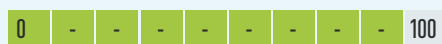
ALLISON NEALE

Quietly There

Ubuntu Music UB0062

This Seattle-born, UK-based alto saxophonist can if she chooses sound exactly like Desmond or, as on the title track here, a little like Getz. Following a long musical partnership with guitarist Dave Cliff, who sadly retired due to illness, Neale led a great quartet with pianist Leon Greening. But for her fifth album, her first for Ubuntu, Neale revisits the 'space and openness' of a guitar-based quartet, as Peter Bernstein joins her favoured bass and drum team of Dave Green and Steve Brown. They bring sprightly life to a tune that often drags, 'Midnight Sun', they dig happily into John Lewis's cool blues 'Two Degrees East, Three Degrees West', and cheer up some songbook standards too. Carefree, melodic, delightful. *SH*

Sound Quality: 90%



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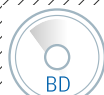
COMPACT DISC



SUPRAUDIO



DVD



BLU-RAY



VINYL



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HALLÉ ORCHESTRA/SIR MARK ELDER

Debussy: Images; Prélude à l'après-midi d'un faune; La plus que lente, etc

Hallé CDHLL7554 (downloads to 44.1kHz/24-bit resolution)

A fine addition to the Hallé Debussy series where, for me, the standout tracks are the composer's atypical transcription including cymbalom, *La Plus Que Lente*, and with flautist Katherine Baker, *L'Après-midi* – one of the most satisfying accounts we have had on records. There is also a bonus item: Colin Matthews' orchestration of the *Image* for piano 'Et la lune descend...'. The five movements making up the orchestral set were well done by the San Francisco Symphony in the 2016 Tilson Thomas remake, but the British players have the edge, and there's more warmth and depth in Sir Mark Elder's interpretation, with a winningly colourful evocation of Spain in 'Iberia'. **CB**

Sound Quality: 90%



AKADEMIE FÜR ALTE MUSIK BERLIN/ BERNHARD FORCK

Beethoven: Symphonies Nos 1 & 2; CPE Bach: Symphonies Wq175 & 183/4

Harmonia Mundi HMM902420 (downloads to 96kHz/24-bit res)

The two early Beethoven Symphonies here are each prefaced by short three-movement ones by CPE Bach, which prove far less conventional and extremely adventurous (for which they were disliked by Frederick the Great, to whom Bach's son was in service). Beautifully balanced by the engineers in this Sept '18 Teldex Studio production, Forck's measured accounts of the Beethoven place them firmly in 'classical' territory, *ie*, they don't suggest a new musical force emerging, but they are wholly engaging and satisfying and utterly free of eccentricities. **CB**

Sound Quality: 90%



SINFONIA OF LONDON/JOHN WILSON

Respighi: Fontani di Roma, Pini di Roma, Feste Romane

Chandos CHSA5261 (SACD; downloads to 96kHz/24-bit resolution)

Key recordings of *Fountains/Pines* date back to Toscanini and the NBC, with Reiner's and Karajan's in the stereo era. Aptly recorded in the generous acoustic of St Augustine's, Kilburn, John Wilson's coupling – prefaced by the blockbuster *Feste Romane* – is another Sinfonia winner. It's the quiet playing that impresses most. In the most beautiful *Pines* movement, 'I pini del Gianicolo' the recording used for the nightingale is unusually distant (a minor disappointment?) and the clarinetist really deserved a credit. The following trudge of the Roman soldiers sets the pulse racing... Well researched booklet notes too. **CB**

Sound Quality: 90%



CLEVELAND ORCHESTRA/FRANZ WELSER-MÖST

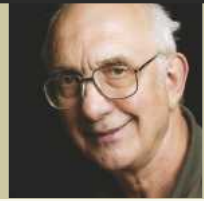
Schubert: Symphony No 9/Krenek: Static and Ecstatic

Cleveland Orchestra TCO0002 (downloads to 48kHz/24-bit res)

A Paul Sacher commission, *Static and Ecstatic* by the serial composer Ernst Krenek was written for chamber orchestra with piano and a large assortment of percussion instruments popping up across the soundstage. It has ten short movements (19½m overall) and ends like a kick in the teeth with barely a pause before the utterly poised horn solo in Schubert's 'Great C major'. Both pieces were recorded live with a minimal Severance Hall audience just as the pandemic limitations began in March. An odd but repeatable coupling: my one reservation is that the Schubert *Scherzo* has one or two quirky underlinings. **CB**

Sound Quality: 85%





Barry Fox Technology journalist

Barry Fox trained in electronics with the RAF and worked as a patent agent, but he gave that up to enter journalism. He is one of the world's top technology writers

Power of five

Conspiracy theories abound when it comes to 5G technology but, says **Barry Fox**, provided it's properly and fully implemented there will be real benefits for listening to streamed music

The music industry has done an efficient job (note, I do not say 'good' job) of pushing us into buying our music – and video – online. As anyone who has suffered freezing pictures and stuttering sound well knows, the current broadband infrastructure is not always up to it.

Digging up roads and pavements and driveways to lay more wire and fibre is one solution, but it's positively Victorian. The far better option is to use new 5G mobile and fixed-link wireless links to deliver our broadband. And it's do-able because 5G was designed from the ground up to deliver higher speeds, increased bandwidth and lower latency.

STEERING BY

Greater bandwidth means less risk of congestion when the whole street is online at the same time. High speeds mean live streaming of hi-res sound without buffering glitches or forced quality downgrades. New aerial designs, meanwhile, should be able to steer 5G beams past buildings that once acted as obstacles. And low latency means there's less risk of sync loss between sound and pictures (some of the live music streams that have been available during the lockdown have suffered from syncing problems).

Low latency also means smaller, cheaper intelligent home devices which rely on computing power 'in the cloud' rather than in home hardware. Voice control will continue getting better at recognising commands and handling more complicated tasks – like room EQ.

The end of wires and fibre would also mean no need for home visits from men with shovels or engineers to fiddle with junction boxes. We'd just get a receiver-router delivered to the door to plug in – as with the existing into-the-home 4G

RIGHT: Ofcom has said that winning bidders for 5G bandwidth in the UK must prioritise residences when serving up the service while the BBC has been trialling broadcasts of live radio via 5G as part of the 5G RuralFirst initiative (see <https://www.5gruralfirst.org> for more)



service offered by broadband provider Relish. But better. Yet the real rollout of 5G (not just the hyped-up limited services so far available) is already at risk.

RABID OPPOSITION

Everyone loves a conspiracy theory. Aliens have landed and been kept locked up in a desert hangar, London tap-water is poisonous, the Barbican Centre was

designed as a fortress for military use in a national emergency... 'They' would deny it, wouldn't 'they'? And no-one can ever disprove a negative.

The latest theory is that 5G technology is a health risk, so building new transmitter masts

must be stopped. If this should happen 5G black spots will blight the roll-out of the service. In my neck of North West London, rabid opposition to both 3G and 4G mast builds has already left some networks suffering from patchy cover.

So far the 5G industry has done a remarkably rotten job of disseminating hard facts about 5G technology. So here are a few to bear in mind. Into-the-home

delivery of 5G from local masts currently uses frequencies between 3.4GHz and 3.6GHz. Next year Ofcom will auction off further 5G frequencies at 3.6-3.8GHz and 700MHz. These slots have been agreed internationally as the primary 5G bands because they represent a workable compromise between good cover over reasonable distances and high data rates.

LIVING DANGEROUSLY

Current cellphone services variously use frequencies of 800MHz, 900MHz, 1800MHz, 2100MHz, 2300MHz and 2600MHz. Some of these services began as far back as the mid 1980s. Which means that ever since then we have been bathed in signals from masts.

For many years people – including young children with thin skulls – talked by holding powerful transceivers close to their heads. Meanwhile, texting and messaging is often done on the lap.

So far well over 30 years we have been guinea-pigs, with no hard evidence yet that cellphone signals are ionising and shredding our body cells. And 5G works with similar powers at around 1GHz higher. Is that 1GHz hike really likely to be a health-risk game-changer? ☹

'The latest theory is that 5G technology is a health risk'



Barry Willis

Journalist for top American audio-video publications

While his main interest is high-end audio, Barry Willis also writes about the culinary industry, visual art and theatre for a huge variety of US newspapers and magazines

Cult status debunked

Barry Willis struggles to mend a friend's classic valve amplifier, but after everything he tries leads to a dead end he can only conclude that its poor design is an insult to the trusting audiophile

Sometimes I just can't say no, especially to an industry friend. A glaring grammatical error on the 20-year-old amp's engraved nameplate should have been sufficient warning, but instead of politely declining, I took the bait, and a few days later the amplifier went on my work bench.

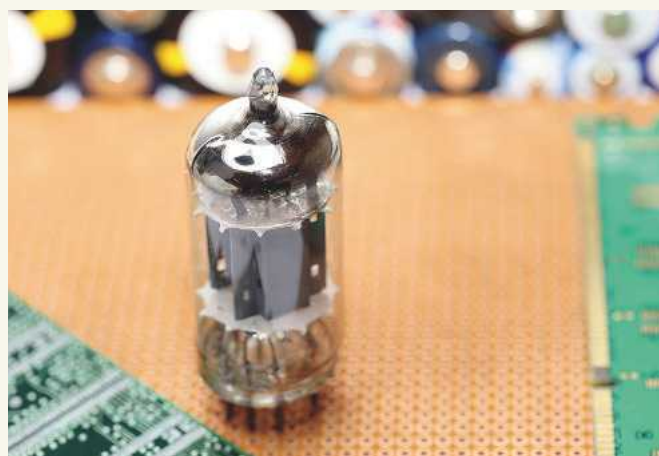
The problem? Its 2A mains fuse blew instantly when the power switch was engaged. On the bench, the amp drew a full 2A from my Variac at less than 5VAC, indicative of a dead short. The likely culprits: shorted rectifier or filter capacitor in the power supply, a shorted output device, a bad driver, or a shorted mains transformer – this last possibility so remote that in four decades of technical work I've seen only two or three such.

INTERNAL TANGLE

The logical first-step approach was to remove the output valves one at a time, to find a bad one or to eliminate that as a cause. The fun began when I tugged on the tube cages and discovered that they weren't removable. Popping off the bottom plate – no problem with that – revealed a combination of modern circuit board design and old-fashioned point-to-point wiring, done with wires which were so short there was no way to separate the amp's various functional elements from each other while keeping them electrically connected.

This is the kind of stuff that makes me want to strangle both the designer and the production manager! Then I found that the tube cages were held fast from inside with non-removable theft-prevention screws, requiring a special tool. With a few mumbled curses I was able to force them out with pliers, only to discover that there was another secret to removing the cages: one that I could not comprehend. It was

RIGHT: Why do we persevere with outdated technologies such as valve amplification when it reached maturity decades ago and has since been eclipsed by other, more efficient solutions?



as if the designer was totally obsessed that someone, somewhere, might try to experiment with output valves of a different variety – an experiment popular among some audiophiles. Or he thought that there was something so special about the installed devices that he didn't want anyone to know what they were, although it's not as if such knowledge were a matter of national security.

There was also a mystery about the way the power transformer was wired. The primary winding appeared to be intentionally cross-wired to the secondary windings, a configuration that made no sense.

Without a roadmap, and cautious about causing further damage, I was reluctant to start snipping wires. And so after a couple of very frustrating hours, I gave up, reattached the bottom cover, and called my friend with the bad news that he would have to talk to the manufacturer about getting his amp repaired.

That will most likely be a frozen-solid day in hell, as there is only one person in the United States who still deals with this particular brand. Plus, the always

statistically insignificant population of skilled analogue audio technicians has shrunk to near extinction.

The amplifier in question is the brainchild of a designer well known for both his expertise and his eccentricity. It's a really pretty piece that was never produced or distributed in large numbers – its relative rarity a likely factor in the cult status it enjoys – but so far as I could determine it's just another high-priced mid-power valve amplifier.

TIMED OUT

Most baffling about this particular item and others like it is why designers and audiophiles alike are so enamoured with antique technology. Valve amplification reached maturity many decades ago.

All practical knowledge about it has already been discovered and exploited. So why pretend that your iteration is anything special, or that you've uncovered some previously hidden capabilities? More important is a universal principle: devices fail. It's simply a matter of time. Why build products that don't take this into account?

The short-sighted manufacturers who do so not only besmirch their own reputations, they insult those gullible enough to buy their products. ☹

'That will most likely be a frozen-solid day in hell'

Amplifiers with elegance and finesse



Integrated amplifiers clockwise from top left: Hegel H590, Luxman L-507UXII, Hegel H390, Audio Analogue Maestro Anniversary, Luxman L-509X

Three amplifier manufacturers that offer a more refined sound than many. Their common aim is to produce a more natural sound, with accurate tonal balance, large holographic sound pictures, and fast dynamics, recreating music of all genres as honestly as the artists intended.

Audio Analogue have recently redesigned several of their long-standing products with new dual mono circuitry, using higher grade components and stylish cabinets. This new Anniversary range consists of two integrated stereo amplifiers called Puccini and Maestro, which have a more refined, detailed sound producing exceptionally large sound pictures.

Hegel Music Systems are known for manufacturing high-end quality electronics at realistic prices. Their unique SoundEngine technology reduces the noise floor and distortions, producing a clean organic sound. A very focused range of products which include five integrated amplifiers and two pre-power amplifier combinations. All their integrated amplifiers include sophisticated DAC designs to support streaming.

Luxman is a legendary Japanese brand renowned for their high-end audio products. Exceptional build quality of reference standard, with a recognisable retro aesthetic, but with a modern sound from state-of-the-art electronics. A range of amplifiers including Pure Class A, Class A/B with a high Class A content, and pure valve designs. All offer an elegant, natural presentation, allowing the listener to get closer to the music through emotional involvement.



Andrew Everard Reviewer/writer

Andrew Everard has reviewed consumer electronics for over 30 years and is still effortlessly enthusiastic about new developments, discovering new kit – and music

On objectivity

Yes, measurements will tell you how a product is performing, and help predict how it's going to sound – but **Andrew Everard** says our emotional reaction to a system is a different matter

Want to keep your blood pressure in check? One simple piece of advice – steer clear of Internet forums. From cars to fishing, from hi-fi to railway modelling, if there's a fight to be picked, you'll find it online somewhere. Even the most innocuous exchanges seem to have the ability to become blazing rows at a moment's notice, and what's more, it appears to be getting worse.

A plausible explanation was given in a radio discussion the other day, suggesting we're all so frustrated and restrained at the moment that we're always on the lookout for ways to let off steam, either consciously or less so: we challenge others, we drive more aggressively, etc.

MEASURING UP

That may be true – in my limited ventures forth behind the wheel of late, I have seen more aggression than usual, from the cyclist deliberately weaving to thwart motorists trying to overtake, to the zoom up the side of queueing traffic followed by trying to push to the head of the line.

Anyway, a good row was being had online the other day about one of the old chestnuts of the hi-fi world: the relative merits of subjective and objective assessments.

In the blue corner, the 'All that matters is how it sounds to you' camp, pooh-poohed by the 'Only measurements give the true picture' brigade, prompting a rejoinder that 'measurements can only tell you part of the story'. And so it went on. Suddenly, I was brought up short by the comment that all reviews in hi-fi mags are subjective – said like it was a bad thing, of course [see also p21 and p115].

Trouble is, 'subjective' is actually a good thing, as I realised the other day when listening to a pair of speakers for a forthcoming issue of *HFN*. Playing a

RIGHT: As debates rage online between the objective and subjective camps, most are missing the point that this is not a binary argument. What's for sure is that music remains an emotional entity that all hi-fi systems must surely strive to convey [see Welcome, p21]



familiar recording, and one I've always enjoyed, I was struck by the fact that it sounded sort of uninteresting. Yes, it was an orchestra, and yes it sounded suitably big and weighty, but also dense and lacking in internal detail and impact.

Intrigued, I cued up an alternative recording – different orchestra/conductor/label/era – and, as soon it started to play, that feeling of relief swept over me. Ah, that was better: a thrilling performance

of the music, rather than a reviewing chore, allowing me to sit back and just immerse myself in the performance.

That's about as subjective as it gets, and that's also what's exciting about listening to as much audio

equipment as I do on a day-to-day basis. It's not the technical superiority of one unit over another, but the level of enjoyment it delivers. That old idea of a system communicating the spirit of a recording – of musicality, if you like – is much derided in objectivist circles, but experience has taught me that the components I like are those getting me the most involved in what's being played.

Indeed, I've encountered too many review items I feel are trying too hard to

deliver all the hi-fi stuff, so I'm listening to the equipment, not the music. While it can be fun to hear that squeak of a chair, a clip of baton on podium, once, on repeated listening such things can become a distraction. That old saw of being able to hear the tube trains rumbling under a concert hall, once held up as the *sine qua non* of a system's resolution, is more an irritant than any addition to the musical experience.

FOND MEMORIES

Now we are deprived of the joy of experiencing live performances, I presently seem to have a heightened sense of the importance of feeling what the artists were trying to communicate, and more appreciation of systems that get closest to delivering that.

I well remember playing, on what at the time was considered a very good system, and after digitising and cleaning up the files, a recording of a well-known stage performer, the audience comprising the performer's son and daughter-in-law. 'Very nice,' they said, after the last notes died away, 'but it makes it sound so old and scratchy – we think we'll stick to playing it on our old record player.' They knew how they wanted it to sound, and had memories of it sounding like that – who was I to argue? ☺

The background of the advertisement is a close-up, high-contrast photograph of a car's rear light assembly. The car is dark, possibly black or dark grey, and the light housing is illuminated with a vibrant red glow. A black cable with a red band and connectors is draped over the light assembly. The Black Rhodium logo, featuring a stylized 'B' and 'R' symbol, is positioned at the top left, with the words 'Black' and 'Rhodium' in a bold, white, sans-serif font to its right.

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Jim Lesurf Science Journalist

Jim Lesurf has spent a lifetime in audio, both as an engineer at UK hi-fi company Armstrong and reader in Physics and Electronics at St Andrew's University

Beecham's pills

Jim Lesurf spots a familiar Armstrong amp duo going for more than a song, and recounts his personal Golden Age for music, difficulties with modernism and making fresh new discoveries

Isaac Asimov, the writer of many volumes of both Science Fiction and science fact, was once asked, 'When was the Golden Age of SF?'. His reply was '14'! By which he meant it was whenever someone had been aged 14. For them, that was the 'Golden Age'.

This recollection was prompted by my seeing a pair of old Armstrong 730/732 amplifiers sold via the Internet for over £1000, which was more than the price about 40 years ago when new. As suggested by feedback in response to *HFN's* monthly Vintage Review features, interest in 'classic kit' is growing.

A TURNOFF

The choice between new and old, though, seems to be largely a matter of taste. For example, if someone loves the old Quad ESL57 electrostatics then nothing else will hit the spot for them.

For me the 1970s was the centre of my personal 'Golden Age' of hi-fi. But when it comes to *music* the situation is more complicated, because music tends to range over so many different categories and types. Hence for pop music I remain a child of the '60s and perhaps a little into the '70s.

But when it comes to Classical and other non-pop music my preferences have continued to expand and develop. My intro into this was hearing works by composers such as Beethoven, Brahms,



ABOVE: American Grammy Award-winning composer and conductor Eric Whitacre



ABOVE: Armstrong's 730 preamp (top) and 730 power amp, of which only 40 sets were made. The power amplifier was said to deliver 200W/8ohm and was reviewed in *HFN* Jul '82

and Mozart when at secondary school and during music lessons. This then inevitably extended to more modern composers and also earlier ones. My interests eventually ranged from pre-Bach to works by composers such as Vaughan Williams, Shostakovich, *et al.*

However, I ran into difficulties with other 'contemporary' works composed in the '60s and '70s. I think it was Sir Thomas Beecham who described some of the modern works he'd encountered as 'bursts of wind, orchestrated' – only his words were more earthy. I would often say to myself 'First – and Last – Performance' when hearing the introductory announcements given on Radio 3 when some of these 'new' items were performed. I found them lacking in a musical sense, seeming just to be technical exercises... or even, possibly, a matter of simply seeing what the composer could get away with while keeping a straight face.

However, more recently modern 'classical' music has emerged from that phase and I am discovering more new compositions that are for me, at least, genuinely musical. Two quite different examples may indicate what I mean.

'I used to say to myself "First – and Last – Performance"'

The first was during a Prom that took place a few years ago which featured the music of Eric Whitacre. I found this both fascinating and very enjoyable, although until then I'd not even heard of him.

A NEW DAWN

The second was also from a Prom programme, this time from one of the few live ones of 2020, with music by Anoushka Shankar and Jules Buckley. OK, I have enjoyed traditional Indian music for many years. But this struck me as being a

sign of a new and different vigour making it way into 'Western' classical music.

Just as African music has influenced and shaped pop and jazz over the decades, so I think we can now expect a new future for 'Classical' music as other forms and traditions from

around the world are absorbed into the mix, from which then are created works that build on, but differ from, their roots.

To me this seems like a welcome refreshment of music and an end to the 'slide rule' approach of the past. It also may serve well how we are now, at long last, recognising many Black composers and musicians of the past ignored or neglected for no good reason. ☺

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Steve Harris Contributor

Steve Harris edited *Hi-Fi News* between 1986 and 2005. He loves jazz, blues music, vinyl and vintage hi-fi and anything that makes good music come to life

Speakers cornered

The 2010 encounter with the Lowther speaker set-up in a former *Hi-Fi News* editor's old house was a memorable one for **Steve Harris**, who recalls the company's history and personalities

How well I remember the first time, in the mid 1980s, that I heard a Lowther speaker. Then, horn-loaded loudspeakers seemed mostly a quirky anachronism – appropriate, to earlier times when amplifier power was limited, but irrelevant now that you could have as many watts as you needed. And the work of audio pioneer Paul Voigt, which was the foundation of the Lowther speaker concept, had been all but forgotten.

In the 1930s, Voigt collaborated with OP Lowther to offer Voigt speakers with Lowther's amplifiers. After World War 2, Donald Chave, who'd been Lowther's chief engineer, took over the Lowther company, while Voigt, in poor health and fed up with conditions in the UK, emigrated to Canada in 1950.

REVELATORY SOUNDS

There was then an agreement that Lowther could continue to sell Voigt's Domestic corner horn as well as building drive units under Voigt's patents. But inevitably, Chave developed his own Lowther speaker models and the Voigt horn was all but forgotten.

I first had a chance to listen at length to the Domestic corner horn when I met the late David Khan [*'Hi-Fi @ Home'*, *HFN* Jun '10]. This was a revelatory experience compared with my first Lowther encounters.

It was David who, in 1978, bought ex-*HFN* editor John Crabbe's house, complete with a pair of built-in bass horns, running from ceiling to floor. Later, with the help of John Howes, organiser of the Audiojumble, he successfully utilised those Crabbe horns as bass extenders for a pair of Quad ESL63 loudspeakers.

At the other end of the room, though, he still had his Voigt corner horns. He'd first heard one by chance on a visit to

'He utilised John Crabbe's horns as bass extenders'



ABOVE: John Howes stands next to an original Voigt corner horn (left) and one of the vintage Voigt corner horns in the home of the late David Khan, who bought the house from John Crabbe

Lowther in the mid-1950s, when it was still being used as a testbed for drivers, and went on to acquire several.

In 1969, he'd got Voigt's address in Canada from Companies House, and had written to him. 'It was a bit of a fan letter,' David said, 'I explained that I'd collected three of his loudspeakers, and how wonderful I found them.'

Voigt replied and the correspondence continued. 'I would write him fairly short letters, begging answers to questions. And he would reply, page after page of detailed accounts of his experiences, and his new ideas about *gravity*. Which were what was now preoccupying him! I was asking him about the latest developments in audio, but he'd given up audio.

'He explained the circumstances of his ill-health, his emigration to Canada and the problems that he had there, which completely changed his plans. The original drive units and horns that he had planned for Canada, I think, were still in their packing cases when he was

writing to me. He concluded one of his letters, in which the "i" had broken off his typewriter, by soldiering on and filling them all in by hand...'

TWO AND SIX

David's experience seems to echo that of the American horn speaker expert Bruce Edgar. In early 1981, having corresponded with Voigt and tried to set up an interview for the DIY quarterly *Speaker Builder*, Edgar received a letter from Ida Voigt informing him that her husband had died suddenly. But Edgar already had enough material to put together the 'pseudo interview' that ran in the magazine's last two issues of 1981.

Here in the UK, Voigt's work is much more known and appreciated than it was then, thanks in great part to John Howes and his Lowther Voigt museum. Meanwhile, the Lowther brand is active again, thanks to its new owner Martin Thornton in Northamptonshire.

And things have certainly changed since that far-off day when a schoolboy David Khan trekked to Bromley and paid half-a-crown for a set of plans to build his first Lowther Acousta. ☺



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Sound Off!

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NEW AMPS FOR OLD? EXPLORING OPTIONS FOR VINYL-BASED SET-UP

My EAR Yoshino 834P phono stage has gone away to be serviced after 14 years' use and this has led me to think about perhaps changing my amplification as a whole. My set-up is 100% vinyl based and I use a 35-year-old Linn Sondek LP12 turntable with an Ittok arm of the same generation. This is currently equipped with an ART9 cartridge from Audio-Technica.

The deck is an old friend and is going nowhere, as is the pick-up, but the tonearm is showing its age (failing bias) and is likely to be replaced soon with an Audiomods Series 6 arm – if this sounds as good as it looks. This combination feeds a pair of Quad II-eighty monoblocks via the 834P with Harbeth 30.1 speakers at the front.

My challenge is that I would like a preamp with a balance control, and a vintage or classic model at that. Candidates include a Hovland HP100 in-line model, perhaps fed by a solid-state Pathos InTheGroove MkII phono stage [*HFN* Nov '12]. How would a mix of valves and solid-state sound?

Also in the frame could be the Quad QC24 preamp and 24P phono stage [*HFN* Jul '10]. Or do I just save up my money and buy a EAR Yoshino 868PL preamp and

ignore the balance control issue? After all, I am very much a fan of Tim de Paravicini and his products. My musical tastes have not moved much since the '70s, so think Steely Dan and early Van Morrison and you won't go far wrong. Keep up the good work everyone!

Ian Pickering, via email

Ken Kessler replies: As most readers will know, I'm an avid Audio Research user and have depended on the company's 'REF' series preamps for years. So, if I were in Mr Pickering's position, I would opt for the line-level REF 5 [*HFN* Jan '10] or 5SE, which has depreciated to less than half its original retail price, with used examples now increasingly plentiful thanks to the recent launch of the REF 6SE [full review next month].

I would also stick with the serviced EAR 834P, which remains a gem of a phono stage. He should consider, too, any of the Audio Research LS series models, EAR's magnificent 912, the Luxman CL-series preamps, and the reissued McIntosh C22.

Whether or not the preamps he considers also have built-in phono stages is secondary, as the 834P is a keeper, and it gives him the option of changing phono stages or running two turntables. And I'd stick with valves!



ABOVE: The Audio Research Reference 5 all-valve line level preamplifier

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Gaining ground

HELP SOUGHT WITH ERADICATING TONEARM HUM

I have a Roksan Xerxes 20 Plus turntable and when I use a Rega RB2000 arm I hear a terrible hum. I did use a Roksan Tabriz Zi tonearm, but I couldn't get on with the counterbalance, finding it 'wobbly'. It had a grounding lead, though, which I connected to my Acoustic Masterpiece AM-201 amplifier. The Rega has no such lead. So from 'where to where' should I ground the Rega?

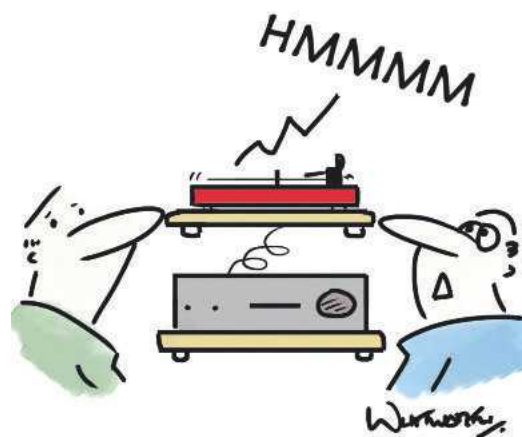
Dr Raz Shankar, via email

Steve Harris replies: Rega arms are grounded via the lefthand signal connector, and don't have or need a separate ground wire. If the cartridge is connected correctly, there shouldn't be any hum. If there is, it may mean the turntable needs grounding but if this creates a ground loop this will make the hum worse. The Xerxes 20 Plus is mainly made of wood but there is an earthing strip underneath which connects the main bearing to the arm mounting point. But as the newer Rega arms use a three-point fixing instead of the old large thread and nut, this may not be making contact.

Says Simon Webster of Rega: 'On the rare occasion we come across this scenario it is usually caused by an amplifier with an unusual design or a phono stage that has its earth on the righthand channel or a floating earth. We can provide a custom arm lead with a separate earth which can solve such issues.'

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HOWEVER HARD I
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OUT THE TUNE."

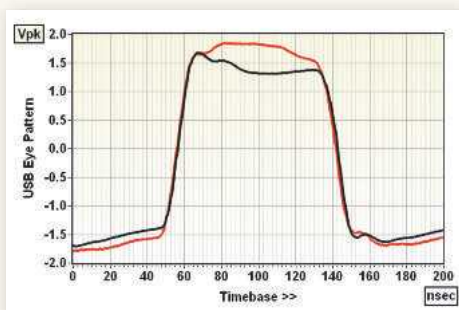
Digital cable matters

QUESTIONS OVER AUDIBLE DIFFERENCES BETWEEN USB INTERCONNECTS

I'm not one to adhere to the 'bits are bits' dogma when it comes to digital audio sound quality because I can imagine that some changes can impact a signal when it is involved in some form of conversion, such as digital-to-analogue. But I am less convinced in the case of purely digital-to-digital, as is the case with USB cables.

While reviewing Chord's Epic USB cable [HFN Sep '20] editor Paul Miller describes audible differences when using the cable in his system. Yet the purpose of the USB cable is simply to convey an electric signal that pulses between 0 and +5V representing the serial output from a source component's parallel-to-serial conversion. This signal is then presented to the destination component which in turn takes the signal and, via serial-to-parallel conversion, reconstitutes the original digital word in a shift register that's then sent for further processing.

I find it hard to understand how the USB cable could degrade the signal so much that it causes errors to be introduced into this chain of events. The serial-to-parallel circuitry uses either the rising or falling edge of the signal voltage combined with a clocking mechanism to determine which value to load into the shift register. For this to fail in some way, and thus lead ultimately to changes in the sound quality, would require



ABOVE: USB data pattern measured via a 90ohm host USB sink and comparing 1m (black) with 5m (red) of Chord Epic USB cable

significant degrading of the signal, which does not seem evident in the USB data pattern that accompanied editor PM's review. Surely there must be some other contributing factor responsible for the change in sound quality that PM describes?

Paul Radford, via email

Paul Miller replies: No argument from me, Paul, but you offer a clue to the answer in your opening paragraph – the key to understanding how digital interconnects (whether carrying USB, S/PDIF, AES, I²S, etc) may influence sound quality lies in the analogue, not the digital domain. Indeed, our group tests [HFN Jul '13/ Jul '14] were the first to demonstrate that USB – a synchronised, packet-based digital interconnect standard – was also cable-sensitive. Clear differences in the 'shape' of the data waveform arriving at the USB 'sink' were illustrated, just as the Graph [reprinted above] accompanying my review of Chord's Epic USB also showed differences with the *length* of the cable.

The shape of the waveform is indicative of response and characteristic impedance which, in turn, tells us something about the bandwidth of circulating interference that might occur. This is just one factor among many (unknowns) that have no impact on the description of the data in the *digital* domain but, along with differences in jitter, do influence the types of noise and distortion that arise during D/A conversion. Computers and the DSP in every outboard USB DAC operate in the digital realm, but we audiophiles process our 'data' in the analogue world...



ABOVE Chord's Epic USB cable sports bespoke silver-plated A- and B-type plugs

JITTERBUG

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Can a £39 insect make all your CD files sound better than Hi-Res?

Yes and no: Using the same equipment and a quality DAC, a 24/96 file (for example) will always sound better than a CD 16/44.1 file ... but, even a single JitterBug will often allow a CD file to be more musical and more emotionally stimulating than a Hi-Res file without the benefit of a JitterBug.

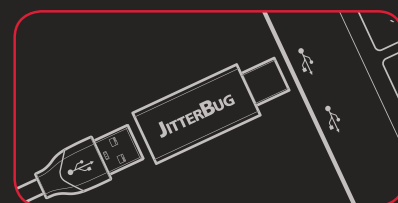
Noise is the problem. Real noise—the kind you can't hear directly. Most often, the word "noise" is used to describe tape hiss or a scratch on a record, but these sounds aren't noise; they are properly reproduced sounds that we wish weren't there.

Problem noise is essentially random, resonant or parasitic energy, which has no meaning. It can't be turned into discrete sounds, but it does compromise signal integrity and the performance of everything it touches.

JitterBug's dual-function line-conditioning circuitry greatly reduces the noise and ringing that plague *both* the data and power lines of USB ports, whether on a computer, streamer, home stereo or car audio front-panel USB input.

A single JitterBug is used in between devices (i.e., in series) as shown below. For an **additional "wow" experience**, try a second JitterBug into another USB port on the same device (such as a computer). Whether the second port is vacant, or is feeding a printer or charging a phone, JitterBug's noise-reduction ability is likely to surprise you. No, the printer won't be affected—only the audio!

While a JitterBug helps MP3s sound a lot more like music, high-sample-rate files have the most noise vulnerability. Try a JitterBug or two on all your equipment, but never more than two per USB bus. There is such a thing as too much of a good thing.



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Generation gap

THE STREAMING PLATFORMS PLAYING CATCH-UP WITH GAPLESS MUSIC

The review of the Quad Vena II Play amplifier/DAC [HFN May '20] made no mention of whether or not DTS Play-Fi supports gapless playback. I decided to check the current state of play (no pun intended) for myself and went to the Play-Fi website. The latest update says that as yet, gapless playback is not available. It is somewhere on the agenda with no timeline or date for implementation.

Perhaps even more extraordinary, a 'bonus' feature is being offered in beta form to allow BubbleUPnP to be used – albeit with limitations – so that the streamer can be operated as a renderer without streaming through a phone or tablet. So the DTS idea of a bonus feature is to allow the use of a third-party app to overcome the limitations of its own software.

Scarcely able to believe what I was reading, I contacted Quad and the engineer to whom I spoke confirmed this was the case. He suggested that I phone back in a month or so. This I did, to be told that nothing had changed. As an aside, I believe that Play-Fi is not Roon compatible.

I suspect that much of the current trouble with Play-Fi is that it was designed for consumers having multiple devices dotted around the home, with multiple tablets or phones in use by a number of different family members at the same time. As a purist hi-fi application, in my opinion at least, it fails. The other solutions I have tried run rings around it.

While on the subject of reviews, you have not mentioned in your recent tests of Primare products incorporating Prisma that this

platform has no native support for services like Qobuz. The only way you would be able to access it would be by using Chromecast, which also does not support gapless playback unless, of course, you are using it via Roon. I checked with Primare itself, and the company confirmed this.

Paul Regeli, via email

Andrew Everard replies: I find it amazing that this long-running problem hasn't been sorted by now. As a classical music listener, I find the gaps between sections of an opera or oratorio, which should flow into each other, to be intensely irritating. The old excuse is that such systems are mainly listened to by those who play 'songs', and not whole classical works, but that really doesn't hold up either. After all, try listening to a dance mix, and those gaps render it just as annoying too.

No, DTS Play-Fi still doesn't support gapless playback, not even in its latest 'Quality of Life Improvements', but there's perhaps better news regarding Primare. While at the moment Qobuz gapless is supported in AirPlay, but not Chromecast, the company points out that 'We are currently in discussion with Qobuz regarding the adoption of their Connect platform, in part to provide gapless and resolution up to 192kHz/24-bit', but cautions that it 'can't be sure when we might be able to offer that (maybe around the time Qobuz is available in Sweden)'.

It adds that 'with Roon, either using Chromecast built-in as endpoint (again 96kHz/24-bit) or soon with the pending Roon Ready update (192kHz/24-bit), you will be able to play Qobuz gapless, along with the many other features Roon media management software provides'.



ABOVE: Quad's Vena II Play supports hi-res streaming over a home network via DTS Play-Fi

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Audio for young ears '60s style

MORE MUSINGS ON MULLARD, CIRCUITS IN PRINT AND MEMORIES OF A LEAK LEGEND

The letter from reader Nick Willans in the September issue on Mullard valves brought back many memories for me. As a schoolboy radio amateur in the 1960s with an interest in audio, financial constraints necessitated that most of my equipment was either home-built or sourced secondhand, the latter often from the plentiful stocks of government surplus equipment to be found in the shops of London's Lisle Street.

Almost all of this equipment used valves; indeed for many years the only solid-state device in my set-up was a UHF converter employed as the 'front end' for an ex-US forces HRO receiver. Home-build projects relied on designs from the RSGB *Amateur Radio Handbook* and the excellent *Mullard Circuits For Audio Amplifiers* publication (eight shillings and six pence) which, of course, I still have.

Regarding the latter, Mr Willans refers to a '5-30' design using EL34 valves in the output stage. I have not heard of this one. The design detailed in the Mullard publication is for a 20W amp (ie, a 5-20) using EL34s. I built two of these amps, but not for use in an audio set-up. Rather, I used them as AM modulators for my transmitters – output transformers for that application were readily available in those days, and there was no way I could afford an audio output transformer of suitable quality.

In the VHF/UHF bands one could (just about) get away with the 'antisocial' high bandwidth signal resulting from



ABOVE: Leak's 'Plus' version of its Stereo 30 amp used silicon rather than germanium transistors

'hi-fi' AM modulation! I used KT66 output valves instead of EL34s as I found their shape more aesthetically pleasing...

For audio purposes I used a Mullard 5-10 design. This was fed from a Decca Deram ceramic pick-up mounted on a Garrard SP25 turntable. The speaker (only one of course, these were all mono designs) was a large Goodmans housed in a plywood box of dimensions sized to fit in my shed – no science involved, but it sounded great to my young ears!

This set-up saw me through student years, after which, although still an impoverished postgraduate, I was able to buy a Thorens deck with a Shure M75ED cartridge. I also built a Linsley-Hood 75W amplifier to the *HFV* design.

I was also fascinated to see the *Vintage Review* of the Leak Stereo 30 Plus amplifier in the same issue. Another friend in North London had, I believe, worked for Leak and he had a complete system – amplifier, Troughline tuner and Leak Sandwich speakers, with a Garrard 301 turntable. I was in awe and could only dream that one day I might be able to afford such components!

I have been reading *HFV* for the past 55 years and have found the contributions of Chris Breunig, Jim Lesurf and Ken Kessler of particular value. May they continue!

Dr Alan Craggs, via email

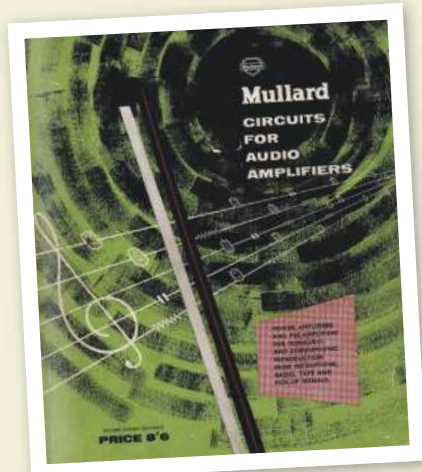
I'd like to add some clarifications to the letter from Nick Willans published in the September issue. Firstly Mullard did not 'devise its own nomenclature' as Mr Willans says. Although Mullard was founded in 1920 by a British ex-army

captain, Stanley Mullard, it went into partnership with Philips of Eindhoven in 1924 and was wholly taken over by Philips in 1927. The letters and numbers nomenclature was invented by Philips and adopted by all its subsidiaries, including Mullard. Most other British companies, like M-O Valve and Brimar, carried on using their own schemes.

The EL34, introduced by Philips in 1949 ($gm = 11mA/V$) did indeed have a higher transconductance than the M-O Valves KT66, introduced in 1939 ($gm = 6.3mA/V$) but not more than the M-O Valves KT88, introduced in 1957 ($gm = 12mA/V$) or the KT77, M-O Valves' beam tetrode equivalent of the EL34. Another valve in the KT series, the KT55, had a transconductance of $19mA/V$. Incidentally the Mullard design for push-pull EL34 amps was the 5-20, not 5-30.

David Mansell, via email

Steve Harris replies: Thanks to David Mansell for the comparison of the EL34 and the various competing 'KT' tubes. Invented in 1926 and patented by Philips, the pentode added a fifth electrode, the suppressor grid, to overcome the kink in the characteristic performance curve of a tetrode. In the early 1930s engineers at the recently-formed EMI proposed another solution, using beaming plates instead to create a 'kinkless tetrode'. This was then developed by RCA, which had a big stake in EMI, rather than the associated M-OV company in the UK, as the American giant had far greater resources. So it first came to fruition as the 6L6 in 1936. Incidentally, Stanley R Mullard served with the RNVR during World War I, working on valve design for the Admiralty.



ABOVE: *Mullard Circuits For Audio Amplifiers* was first published by Mullard Ltd in 1959

Transports of delight

MY TIME SPENT IN ISOLATION WITH TWO CLASSIC TEAC VRDS SPINNERS

During this difficult lockdown period, not only have I enjoyed a lot of music but have added a Teac VRDS-25X CD player to my second system. It has proved to be a very rewarding experience. I have always been impressed by Teac and, of course, the Esoteric VRDS mechanism. The VRDS-25X is reliable and uses a good quality motor and optical lens. I bought it secondhand for £450, which is not so expensive given that it is a sturdy piece of engineering made of aluminium, copper and steel.

The VRDS-25X uses four 18-bit DACs and the sound is really true to life when it comes to both dynamics and detail. Yet surprisingly, despite its warm sound, it is capable of pin-point imaging between the speakers.

I also use a Teac P-30 transport and a Topping D70 DAC, as well as a Cambridge Audio CXC transport, which is a nice bit of kit in itself. Yet when I swap out the CXC for the Teac VRDS-25X in my primary system I hear a more organic sound and greater detail through my Dynaudio Focus XD 400 speakers while the soundstage increases in depth.

Remi Balestie, via email

David Price replies: I certainly found the early generation of Teac VRDS CD players and transports to be really



ABOVE: Close-up of the Topping D70 DAC atop reader Remi's Teac P-30 transport

impressive – that VRDS mechanism itself being the star of the show. I have extended experience of all the early incarnations, including the VRDS-10 and 20, and found them to be the class leaders in their field in the 1990s, aside perhaps from the Linn Karik 3 CD player.

The thing that dates them now is the built-in DAC, though the higher-end Teac/Esoteric P-30 transport didn't have this, and neither did the more affordable VRDS-T1. Indeed, I remember achieving excellent results from both the P-30 and VRDS-T1. There was a smooth, spacious, master tape-like quality to the sound while disc operation was both swift and quiet. They were definitely desirable and reliable in their day, although it has to be said that there's now a question mark over the availability of parts. But then that holds true for pretty much any CD transport that's now some 25 years old.



ABOVE: On the floor are the Teac P30 (left) and VRDS-25X; speakers are Pioneer RM-07

A large, vertical graphic on the right side of the page. It features a white Apple logo on a dark, rounded rectangular shape. In the foreground, a stack of audio cables with various connectors (XLR, RCA, etc.) is shown, with the top cable having a black and silver braided jacket.

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Yamaha C-2a/M-2

With VFETs costing top dollar and facing stiff competition from other semiconductors, the late '70s saw Yamaha unveil a new pre/power amp duo. How does it sound today?
Review: **Adam Smith** Lab: **Paul Miller**

It's always intriguing to see how a company reacts to the realisation that a technology it has championed is reaching its sell-by date. This was the situation faced by Yamaha in the late 1970s. Since the middle of that decade, its top-end products had made use of Jun-ichi Nishizawa's Static Induction Transistor – more commonly known as the VFET – to great effect. This led to the development of designs such as the B-1 and B-2 power amplifiers, and C-1 preamplifier, all of which are still held in high regard.

SWITCH IN TIME

The problem was that only Yamaha and Sony ever leveraged this technology extensively, companies such as JVC and Sansui merely dabbling before moving on. As the end of the '70s approached, Yamaha had to deal with the fact that its amps were becoming relatively expensive to manufacture and proving troublesome in the hands of unwary service personnel.

There was a further issue too, which was that advances in silicon technology meant that the MOSFET was not only becoming more reliable but cheaper and easier to make. New iterations of these transistors boasting increasingly high switching frequencies made their use as audio output devices an obvious step, and all of



ABOVE: As the '80s beckoned, silver fascias gave way to black ones and colourful LEDs took the place of analogue power meters

the top Japanese manufacturers had now embraced this improved technology.

Come 1979, interest in Yamaha's mighty B-1 and B-2 VFET power amplifier models was fading. 'VFET' was no longer the big buzzword, having been replaced by 'high f_T '. These new MOSFETs boasted an impressive 80MHz switching with dissipation up to 150W. So it was that these formed the basis of Yamaha's two new range-topping power amplifiers – the M-4 and the 200W-per-channel M-2 tested here [see PM's Lab Report, p127].

In the case of the M-2's output stage, Yamaha made use of three parallel-connected Toshiba 2SC2461 n-channel devices and three 2SA1051 p-channel types. The use of three pairs of power devices offered,

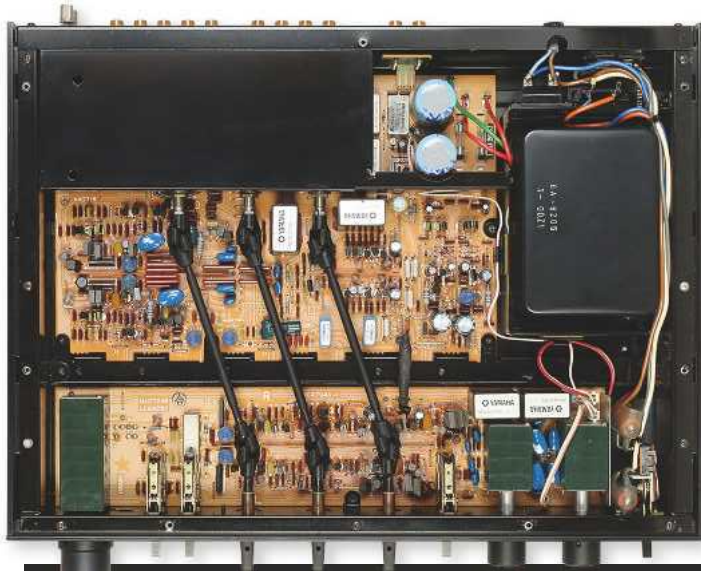
according to the company, improved linearity and distortion at low signal levels. In addition, their ultrasonic bandwidth promised improved linearity in the 'lower frequency' audio band.

GLAM METAL

Power was provided to this output stage via a large toroidal transformer and a hefty discrete power supply. This utilised 44,000µF of capacitance and two regulated voltage supplies for each amplification stage. Meanwhile, the input amplifiers were also FET-based and saw a dual-stage topology used, the aim here being high stability and low distortion.

Apart from the two large electrolytics in the PSU, all other capacitors were either Mylar or polystyrene. Meanwhile, the amp's internal earthing bar was pure copper, giving an ultra-low impedance connection that promised 'reduced intermodulation distortion, improved separation and absolutely stable operation'.

LEFT: Inside the C-2a can be seen the chunky mains transformer, selector switches located near the input sockets to minimise signal path length, and the sealed control potentiometers





Physically, the M-2 power amp is an imposing beast. Weighing in at 21kg, each side comprises a dedicated heatsink for the output devices while the upper third of the case features a perforated metal cover, which the company hoped would recall the appearance of a classic tube amplifier.

The front panel is fitted with one LED power meter for each channel, the power on/off switch, and selectors for two pairs of loudspeakers. All the switches are illuminated – power being amber and the loudspeaker selectors lighting up green.

Naturally, a suitable matching preamp was required and this came in the form of the C-2a. With vinyl still the audiophile's

source of choice, Yamaha spared no expense when it came to the phono stage here, utilising a dual-FET circuit with multiple stages in a bid to minimise DC drift while promising reduced distortion and an extended frequency response. In fact two phono inputs are provided, with options selected via a dedicated front panel control.

Phono 2 is a fixed MM input with a standard 47kohm load, but Phono 1 could be configured for MM or MC operation. For MM, loads of 47kohm, 68kohm or 100kohm were available, while the standard MC input offered a 50ohm

ABOVE: Pictured stacked for illustration only – the M-2 power amp [below] produces a considerable amount of heat and its perforated top cover needs to be kept clear for ventilation

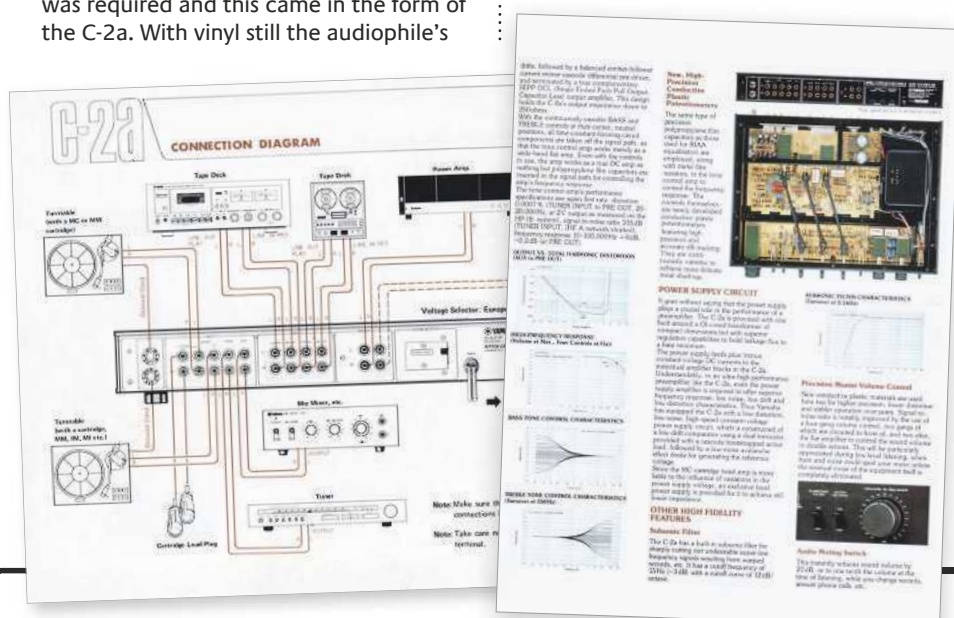
load. What's more, the C-2a's Phono 1 selector had a fourth option, offering a 2.5mV MM input sensitivity combined with 100ohm loading. This was intended for use with the new breed of high-output/low-ish impedance MC cartridges.

ADDED VALUE

In addition, a pair of sockets on the rear of the C-2a gave capacitive loading options for the MM Phono 1 input. With nothing connected, the load was 220pF and plugs were provided to alter this to 330pF or 470pF. The manual also gave the appropriate calculation for the user wanting to make up plugs for other values.

The rest of the C-2a was equally well specified. Both Tuner and Auxiliary inputs were offered, plus two tape loops with a separate record output control. High-precision metal film resistors and polypropylene capacitors were employed throughout while the amp's volume control was a four-gang unit unique to the model. Two of these gangs were used on the input to the amplification circuitry and two on a subsequent gain stage, with the intention that hum and noise be minimised at lower volumes [see PM's Lab Report, p127].

LEFT: The C-2a's user manual (left) gives good guidance on connectivity while the brochure (right) digs deep into the hidden technology



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Power to the C-2a came from a high quality, fully regulated power supply with separate sections for each amplification block within the unit. A dedicated supply was also provided for the MC head amp to minimise the effect of general power fluctuations on its sensitive circuitry.

The M-2 and M-4 power amplifiers remained in the Yamaha catalogue until 1983 when the more conventionally styled M-50 and M-70 models arrived, along with the matching C-50 and C-70 preamps.

ADAM LISTENS

Those expecting a cossetting and smooth performance similar to that of Yamaha's contemporary A-1 integrated amplifier [HFN Aug '17] will be in for a surprise. If the A-1 were a big, sensible luxury Mercedes S-Class saloon, the C-2a and M-2 would be the model fitted with a twin-turbo V8.

The first thing that grabs you is the seemingly limitless reserves of power on tap, served up with a sense of precision and control that is hugely appealing. Seldom have I heard a vintage amp able to keep my PMC Twenty5.24 loudspeakers [HFN May '17] under such tight control as this duo.

As a result, should you wish the Yamaha pairing to rattle your fillings, then they will cheerfully oblige. The thunderous bass on 'The Day That Never Comes' from Metallica's *S&M2* [Blackened Recordings BLCKND043-1C] powered through my room with such impact that when the track came to a close I felt slightly out of breath – always a good sign!

Fortunately, the C-2a and M-2 are not one-trick party animals with all brawn and no brain. Their formidable sense of grip and

'The impact of the bass left me feeling out of breath'

control at the very low-end is accompanied by a surprising lightness of touch in the upper bass and effortless abilities in terms of detail retrieval. As a result, the walking bass line on Simply Red's 'Sad Old Red' from their *Picture Book* LP [WEA 960452.1]

was as vivid and detailed as I have heard it. Each note was strong and deep, while Tony Bowers' finger movements up and down the fretboard were distinct and well to the fore.

At the top end, the company's work on the

units' circuitry clearly pays dividends, there being a sweetness and delicacy to the treble that is far from guaranteed with a 40-year-old design. The phono section is particularly capable in this area. There is never a hint of grain or hardness; rather, this pairing can pummel your ribs one

ABOVE: Inside the M-2 power amp the large mains transformer takes centre stage while the copper-plated bar used to earth the power supply can be seen behind the fascia plate

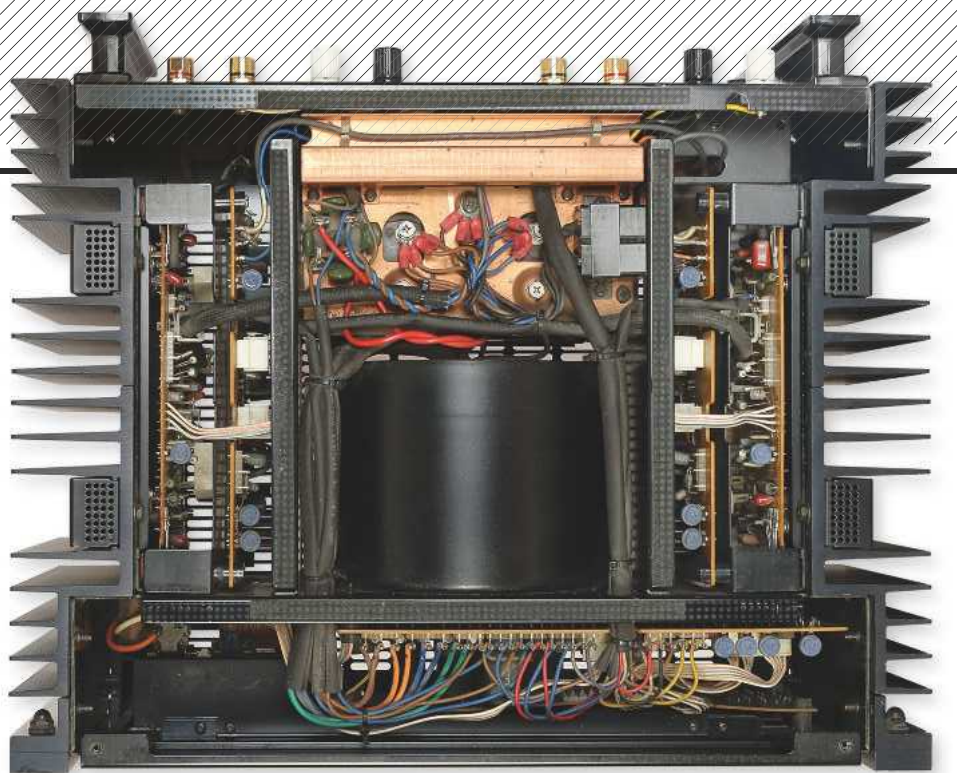
minute then whisper the subtlety of a softly-played flute the next. Cymbals rang out confidently and the duo made a fine job of ensuring that percussion strikes started promptly before shimmering away into the background gracefully.

ALL IN ORDER

Where I felt the units did show their age a little, however, was across the midband. Playing Mozart's *Eine Kleine Nachtmusik* [BPO/Karajan; DG 139 004] I was swept along by the way the Yamaha pairing projected the performance into my listening room and shone a light on the different instruments. However, the best amplifiers also capture the richness of the violin strings. Heard through the C-2a and M-2 they sounded a little 'flat', there being a slight sense of opaqueness. And I found similar issues on occasion with simpler material based around acoustic guitars.

What was never in any doubt, however, was the superb soundstaging set up by these Yamaha amps and the manner in which they enabled background effects to fade into the distance – often in an uncanny way. Lateral imagery was expansive too, stretching well beyond the speakers' physical limits, but superbly ordered. Some '70s designs can be vague in spatial terms, but not the C-2a and M-2, which sound precise and do so with ease. ➞

LEFT: Side view of the M-2 and three paralleled pairs of output MOSFETS per channel are visible through the amplifier's perforated metal cover. These promised a healthy power output



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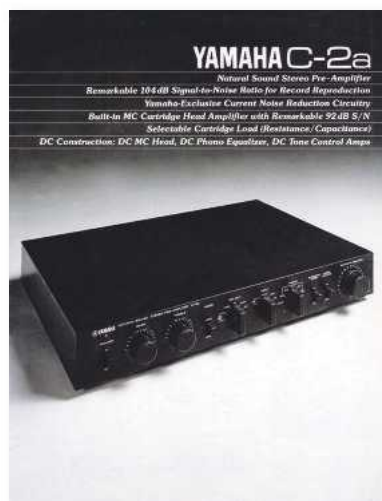


ABOVE: There's no shortage of inputs on the C-2a while the M-2 [below] has two sets of speaker outputs. The C-2a's leftmost RCAs are for Phono 1 capacitance loading plugs, and the M-2 offers variable input sensitivity plus AC and DC coupled inputs

Finally, swapping in my Naim Supernait amplifier with the C-2a and M-2 in turn revealed that, as rewarding as they both are, the real star of the show is the C-2a preamp. It turned out that the M-2 was responsible for that slight veil across the midband, the C-2a sounding as open and insightful as anyone could wish for. The trouble is, when used with a different partner, the C-2a can feel a little lost without the magnificent grip, control and impact of its stablemate, the M-2.

BUYING SECONDHAND

The real enemy of the M-2 and C-2a is heat. Both amps run very warm and this can shorten the life of major components. Blanket capacitor replacement is unnecessary, but some of the semiconductor devices can fail if they overheat. The best step to ensure longevity is to not stack these amps, and allow plenty of ventilation around them. Also, make sure that the idle current and DC offset of both units are correctly adjusted as per the service manuals.



ABOVE: Original brochure for Yamaha's 'Natural Sound' C-2a preamplifier

In the case of the C-2a, the panels act as heatsinks for the transistors inside, so do not be tempted to drill any ventilation holes to help with cooling (as has been done on our review sample!). As long as the heatsink compound between transistors and panels is in good order there should be no issue. It does dry out, becoming less effective with age, so replacement as part of a service is sensible.

Internally, neither unit contains any semiconductors that can't be replaced with new ones, with the exception of the 2SK-101 dual-FET module in the phono stage of the C-2a. However, suitable single replacements are available for this.

The bigger issue is that the function selector switches and rotary controls are unique to the C-2a and are fully sealed. Consequently, as they age and grow noisy, there is no way to spray switch-cleaner inside. If you're buying a unit secondhand, make sure that these controls work correctly and, if you own one, give all the controls a run from end to end with the power off every now and again to wipe the contacts. ⚡

HI-FI NEWS VERDICT

Abandoning VFET technology was a big step for Yamaha in the 1970s, but the C-2a and M-2 show that the company never lost its touch when it came to building premium pre/power amps. The M-2 is powerful, dynamic and fun while the C-2a is crisp, insightful and joyously detailed. Together they make a formidable combination and one that the vintage hi-fi enthusiast would do well to seek out.

Sound Quality: 86%

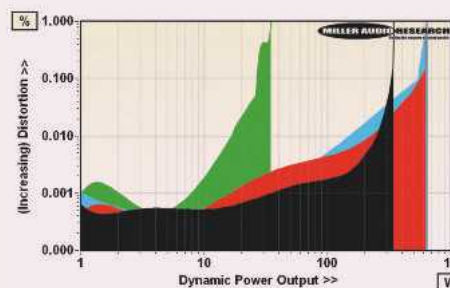


LAB REPORT

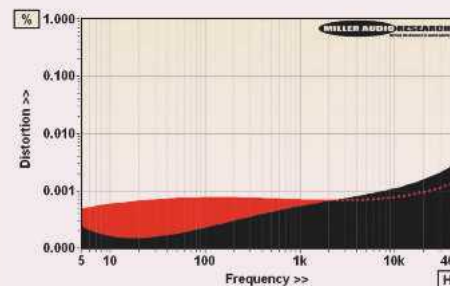
YAMAHA C-2A/M-2 (Vintage)

As our inside shot illustrates [see p125], the M-2 is both densely packed and dominated by a huge power supply, the latter conferring a substantial 2x290W/8ohm and 2x490W/4ohm output that's comfortably in excess of its 240W/8ohm rating. There's headroom too, sufficient to support 342W, 635W and 655W into 8, 4 and 2ohm loads under dynamic conditions while current-limiting/protection restricts the figure to just 35W/1ohm [see Graph 1, below]. Even in the 1970s, and despite the compact layout, Yamaha's trademark low-noise amplification was reflected in the M-2's 96dB, and the C-2a's 97dB, A-wtd S/N ratio(s) (re. 0dBW and 0dBV, respectively). Distortion was very low indeed too, just 0.0002-0.001% across the 20Hz-20kHz audioband at 0dBW [see Graph 2, below], increasing with power to 0.0004%/10W, 0.0017%/100W and 0.0023% at the rated 240W/8ohm (all at 1kHz). The C-2a preamp's distortion varies with gain rather than level, falling as low as 0.0005%/1kHz at full gain (+22.5dB), 0.0009% at +12dB gain, 0.007% at +6dB gain and 0.027% at 0dB (unity) gain – all measured at the same 0dBV preamp output. Incidentally, the C-2a's maximum output is a high 18.5V (unbalanced).

Frequency responses are very flat and extended, the C-2a reaching out to within ± 0.3 dB from 7Hz-100kHz (the subsonic filter acts below 20Hz to -6.7dB/10Hz and -20dB/5Hz) and the M-2 from 1Hz/0dB to 100kHz/-1.3dB via its DC-coupled inputs. The output impedance(s) are respectably flat at 0.05ohm from 20Hz-20kHz via the M-2 (rising to 0.22ohm/100kHz) and 175ohm from 200Hz-100kHz via the C-2a (rising to 390ohm/25Hz). DC offsets are low and stereo separation >60dB midband. PM



ABOVE: Dynamic power output vs. distortion up to 1% THD into 8ohm (black trace), 4ohm (red), 2ohm (cyan) and 1ohm (green) speaker loads. Max current is 18.1A



ABOVE: Distortion versus extended frequency from 5Hz-40kHz (black, 0dBV preamp; red, 0dBW power)

HI-FI NEWS SPECIFICATIONS

Power output (<1% THD, 8/4ohm)	290W / 490W
Dynamic power (<1% THD, 8/4/2/1ohm)	342W / 635W / 655W / 35W
Output imp. (20Hz-20kHz/100kHz)	0.050-0.053ohm / 175ohm
Freq. resp. (20Hz-20kHz/100kHz, 0dBV)	+0dB to -0.0dB/-0.3dB (C-2a)
Freq. resp. (20Hz-20kHz/100kHz, 0dBW)	+0dB to -0.1dB/-1.3dB (M-2)
A-wtd S/N ratio (re. 0dBV/0dBW)	96.7dB (C-2a) / 95.5dB (M-2)
Dist. (20Hz-20kHz, 0dBV Pre/0dBW Pow.)	0.0001-0.002%/0.0002-0.001%
Power consumption (Idle/rated output)	95W / 825W (31W, C-2a)
Dimensions (WHD) / Weight	435x183x362mm / 21kg

FROM THE VAULT

RIGHT: The lineup (clockwise l-r) – the Pioneer RT2022, Revox B77, Sony TC766-2 and the Technics RS-1500 US



Reel-to-reel recorders

Martin Colloms hears four top-quality open-spool decks

Hi-Fi News
Jun 1978

Each month *HFN* will bring you an article from our vast archive of features and reviews from yesteryear

The last year or so has seen the emergence of a new generation of high-quality open-reel tape decks, of which four are investigated here. As the price span ranges from £500-£600 for the Sony and Revox models

to £850 for the Technics and £950 for the basic Pioneer assembly, these units are not strictly comparable, although their relative performances are nonetheless interesting.

All four recorders subscribe to the 'professional' format, namely a 26.5cm diameter maximum reel capacity with at least two high speeds (19 and 38cm/sec), and a two-channel half-track format on 6.25mm (¼in) tape. However, strictly speaking they should be called 'semi-professional', as although they are essentially capable of master quality recordings, they do differ from true studio machines in several respects. For example, the input and output connections of professional machines are generally balanced-line with Cannon or similar type sockets. In contrast, the review models are all unbalanced, with phono and DIN-type inputs and outputs, plus lower line levels.

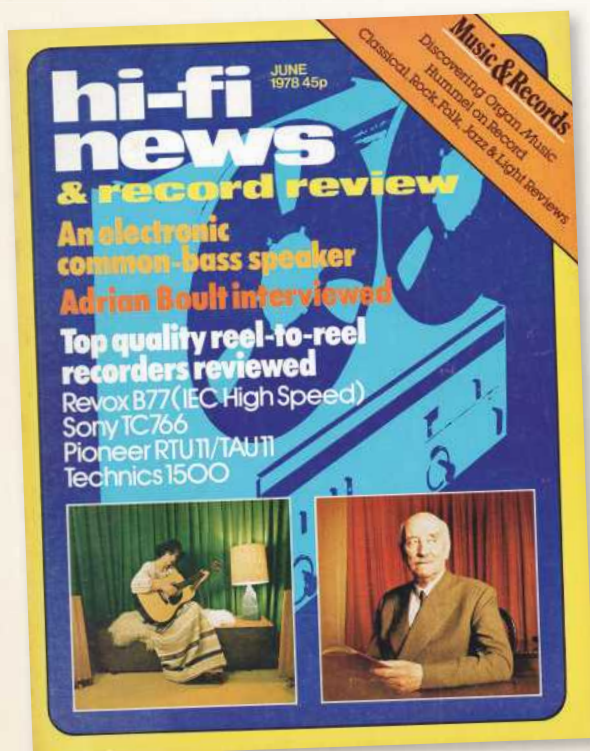
The Revox B77 reviewed is the 'high speed' version with IEC equalisation, while the Pioneer deck may be switched to operate in either IEC or NAB record/playback EQ standards at the higher speed. The Technics and Sony are both fixed in NAB. (IEC equalisation allows a little more treble boost on record than

NAB, while the consequent relative reduced treble on replay endows the IEC machine with a couple of decibels less replay hiss.)

Both Technics and Sony decks have a second built-in replay head which allows the replay of ¼-track stereo tapes, which is an important point for the purchaser with an established tape library. The Pioneer will also play ¼-track tapes, but less conveniently via the interchange of complete head-block assemblies. But this substitution also allows the deck to *record* in the ¼-track format and, indeed, if a second preamp/control unit is employed, full four-track, four-channel working is possible with the Pioneer model. Versatility is clearly the keynote of this unusual recorder.

REMOTE CONTROL

All the decks have solid-state or full relay control of transport functions, with the required modes selected by light-action buttons that are duplicated, if required, by cable-connected remote control units. The delayed logic systems incorporated also allow sequential and random actuation of any function except 'record' (for which the usual interlocks are provided), without confusion or any tape mishandling.



Other common features include a basic system design for vertical operation, although the decks can be used horizontally. However, the controls, tape paths and meter systems are all most accessible to hand and eye if the machines are vertically positioned on a rack or shelf of convenient height.

Other points common to all four machines are features now taken for granted with high-quality decks. For example, a three-motor transport, one for each reel in addition to the capstan. Three magnetic heads are also employed – erase, optimum record and an optimum replay. Good tape handling goes almost without saying, and all have tape back-tension switches to allow for small-core reels; the exception to this is the Technics deck, whose special tensioning will accommodate these.

PIONEER RT2022 (RT2044 – FOUR CHANNEL)

Designated individually as the RTU11 tape transport and TAU11 amplifier units, together this dual combination is called the RT2022. Without factory modification or lab alignment this deck can, with an additional head-block and control amplifier, perform in stereo/mono record or playback modes, 1/2- or 1/4-track format; four-channel play/record with 1/4-track; NAB equalisation at 19cm/sec and 38cm/sec speeds; IEC equalisation at 38cm/sec, with cross-dubbing, echo, multi-track and sound-on-sound.

To aid multi-tracking, the record heads may also be used for monitoring to allow accurate synchronisation of the second track. Furthermore, several self-correction features are built into the transport section. A test oscillator with 1kHz and 10kHz tones allows selection of optimum tape equalisation and bias settings, this oscillator together with the bias settings being adjustable from the front panel, protected by a removable smoked Perspex cover.

For four-channel operation the second TAU11 unit clips beneath the first by means of tensioned latches, with recesses provided in the top panels to stow the interconnecting cables. Almost every input and output socket is duplicated, and when the four-channel system is fully assembled the rear resembles a telephone exchange! However,

Pioneer has thoughtfully supplied colour-coded cables so that links may readily be traced. What's more, several inputs and outputs are also brought forward to the front panel by means of jack cables, in order that supplied signals may be quickly routed from one track to another.

Mechanically, the deck is robustly constructed with a die-cast frame and a 5mm-thick machine alloy main bed-plate. Two eddy/induction hybrid reel motors are used, plus a hysteresis synchronous capstan motor driving the flywheel via a resilient belt. Damped tension arms smooth the tape transport and the heads maintain contact with the tape by back-tension alone. A flutter roller

is also incorporated. Finally, the deck's side panels are finished in black leatherette though their appearance, reinforced by the massive carrying handle and chrome latch fittings, visually suggests location recording rather than a domestic hi-fi installation.

REVOX B77

The successor to the A77, the B77 represents a development of the older model rather than an entirely new design. A number of changes have been made, significant enough

to say at the outset, that while I had considerable respect for the A77, I did not personally favour certain aspects of its performance, notably poor level matching, premature overload of electronics and poor control ergonomics. However, all these have been resolved in the new model, as well as refinements made.

For example, the capstan motor – the famous direct-drive tachogenerator design – has been further developed and is now closer to that of the Revox A700. The deck

'All the decks are capable of master-quality recordings'

will also accept an accessory that allows fine control of capstan speed and hence of musical pitch, when required. Improvements to head quality have resulted in

increased life as well as a more uniform frequency response, and the transport section has now eliminated those occasionally troublesome relays, with their function now carried out by semiconductors, bringing an expected increase in reliability.

In addition to all the basic features, certain more specialised functions are included in this deck, their use facilitated by a clear instruction manual and internal switch connections. For instance, as well as the edit button, which ➤

BELOW: The Pioneer RT2022 comprised two units – the RTU11 tape transport and TAU11 amplifier. A second TAU11 unit could be clipped beneath the first by means of tensioned latches to give four-channel operation



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FROM THE VAULT

allows the tape to be brought into contact with the heads for manual and powered location of edit points, a splicer is also built into the front deck plate. Very comprehensive input and monitor source selections are also possible, such as those permitting switched transfer of the replay of one channel onto record of the next, with simultaneous mixing of flutter-echo effects, sound-on-sound, and overdub material from other inputs, including microphone.

Meanwhile, two headphone sockets are provided, with adequate levels to drive high impedance 'orthodynamic' types as well as the more sensitive moving-coil varieties. A headphone volume control (monitor level) is present, although the line outputs are semi-fixed (preset controls can be found on the rear panel). Finally, the level meters sensibly indicate the modulation depth going onto or coming off the tape, and are not affected by replay level adjustment.

SONY TC766-2

A substantial machine of excellent finish and with a 'solid' feel, the TC766-2 employs the company's established dual-capstan tape transport which isolates the section of tape passing over the heads from most reel tension irregularities. The tape path itself is complex, with damped tension arms, rollers and

fixed guides, and some practice is required for quick threading. The latter is also impaired to some degree by the high static back-tension. The two capstans have individual flywheels, both belt-driven from one AC-powered servo-controlled motor using a tachogenerator. The feed spool motor is also servo-controlled to maintain optimum back-tension.

One further change is that the latching transport switches on earlier Sony models have here been replaced by illuminated touch buttons, with full logic control, and a minimum of relays, with AC motor

switching, etc, now being accomplished by way of bridge-linked transistor controls.

Sony's own ferrite magnetic heads are used on the TC766-2, these carrying the 'Symphase' label which

indicates that special attention has been paid to phase balance at high frequencies between tracks. This is vital to matrixed programmes but also important in stereo. The low wear rate of these heads means that theoretically they could last out the life of the machine.

One final point is that with a large in-house tape manufacturing plant in Japan as well as the USA, it is perhaps not surprising that the TC766-2 is compatible with Sony's latest open-reel tape FeCr or 'Dual', and while this has yet to be fully

'The Sony heads could last the life of the deck'



ABOVE: The Revox B77 introduced a number of improvements over its A77 predecessor, most notably to the head block, motor and electronics. It would go on to be produced in over 50 variants

investigated, it would appear to offer extended dynamic range not to mention low distortion.

TECHNICS RS-1500 US

This award-winning recorder demonstrates Technics' expertise in the field of direct-drive motors. In fact, the transport is reminiscent of an established '3M' professional deck, with a looped 'U' tape path over the heads isolated from the feed and take-up reels by a large capstan as well as a dual pinch-wheel system. The motors of course differ, the Technics capstan being a quartz frequency controlled unit with a massive integral flywheel. This is the tape deck equivalent of the SP10 Mk II motor used in the turntable of the same name.

The precise speed control plus minimal tape slip allows this deck to be fitted with an elapsed-time-indicator scaled in minutes and seconds – a marked improvement over the arbitrarily scaled tape position counters usually employed. In addition, a variable pitch option is included on the front panel.

The Technics RS-1500 US is also equipped for direct DC operation from an external 24V supply – for example, two car batteries or a 24V NiCad pack – although some limitation on excessive fast winding is apparent in this mode, and the panel lamps are also disconnected to conserve energy.

As with the Sony deck, the reel motors are servo-controlled, and in addition the RS-1500 US roller bearing tension arms are air-piston damped. In consequence, the deck attains a stable operating speed in under one second from start-up. The closed tape-loop also allows a relatively low tension value (80g), which minimises scrape flutter ➔



LEFT: The Sony TC766-2 boasted the company's tried-and-tested dual-capstan tape transport along with its own ferrite magnetic heads. The tape path was complex, with damped tension arms and rollers guiding the tape along its way

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LEFT: Technics' RS-1500 US abandoned the conventional tape path in favour of an isolated loop or 'isoloop'. The deck used a servo reel control system allied to dual pinch rollers on a single capstan in order to maintain constant tension on the tape

(mechanical modulation noise) at the same time serving to maintain excellent tape/head contact.

CONCLUSION

All four machines in this group performed very well so the decision to purchase must be based on a dual consideration of price, plus facilities offered. At approximately £500, the Sony TC766-2 is undoubtedly good value. The points to note are fine performance at both speeds, facilities for FeCr tape plus NAB equalisation. The deck was also accurately calibrated in all respects and showed minimal response irregularities at low frequencies. However, some mechanical noise was apparent.

At a higher price (£600) the Revox B77 represents equally good value, with excellent responses, particularly at low frequencies. It is also comparatively quiet. With IEC equalisation it offers the best dynamic range at 38cm/sec, and the peak modulation indicators are useful. Build quality is high, with excellent accessibility for servicing.

The Technics RS-1500 US sells for around £850. As well as its excellent all-round performance, its outstanding transport offers a superlative tape-head contact and gentle tape handling. A 9.5cm/sec speed is included for less demanding applications, and ¼-track replay is also part of the package. NAB equalisation and a Varispeed capstan are standard, as is the quartz lock which makes a genuine elapsed-time tape meter possible, and the option for DC operation is also unique here.

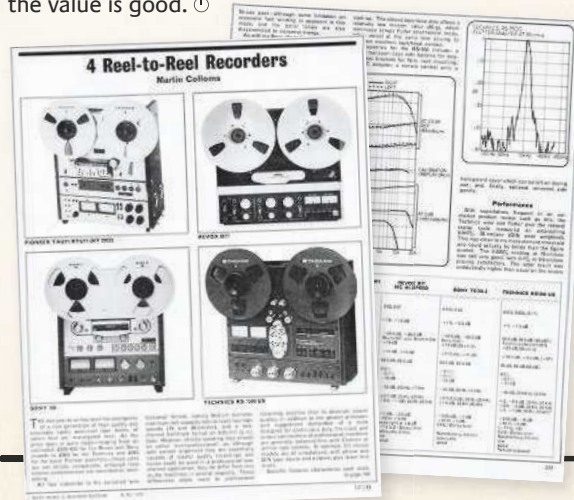
In two-channel form, the Pioneer RT2022 costs £900, with an extra £250 bringing you the second four-channel head-block along with the additional record amplifier control unit. As a system it has no contemporary parallel and would suit a serious amateur music enthusiast, while the RTU11 on its own (which costs around £800) could be used alone as a replay/

calibration transport with IEC and NAB equalisation available at 38cm/sec.

In addition to the system's sheer versatility and fine overall performance, special features

include its in-built calibration oscillators, wide-range metering and a rugged but straightforward mechanical construction. Used exhaustively for a number of recent large group tests as a master tape replay source, this deck has proved dependable. At around £1150 in four-channel form, and taking into account all the facilities offered, the value is good. ☺

'As a system the Pioneer deck has no parallel'



BELOW: Original pages from the Jun 1978 issue of *HFN* which saw Martin Colloms compare four open-reel tape recorders priced £500-£950. As well as a rendition of an 'imaginary' open-reel tape recorder, the cover carries pictures of Trevor Attewell's updated Bassett loudspeaker, and Sir Adrian Boult



Also in *HFN* this month in 1978

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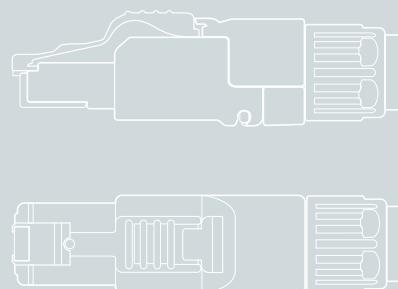
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LAST WORD

OFF THE LEASH!

KEN KESSLER TELLS IT LIKE IT IS...

Ken Kessler suggests that we collectors are all too happy to reinvest in music we already have



Recent data from the RIAA shows that vinyl LPs outsold CDs in the USA for the first time in decades. Might this suggest the possible hastening of the latter format's demise?

I am not so sure. For a format which some will argue is moribund at best, there's still an awful lot of activity on that front. And you can be sure it's not Gen-Xers and Millennials who are buying the newest CDs, for they are the demographic that, along with those born more recently, migrated seamlessly to streaming, or, more likely, never used physical formats for their listening pleasure.

LAVISH LURES

If there's an irony (rather than desperation on the part of the record companies) in the plethora of new CD box sets coming out, it's that they are aimed at the apocryphal 'Fifty Quid Man' who, 15 years ago, revived the music retailing biz by dropping into HMV on a weekly basis to buy a CD or LP, perhaps even two or three, thus earning that moniker.

Only now it's 'Hundred Quid Man', because the CD sets to which I am referring arrive as hugely expensive, multi-disc packages augmented by previously unreleased material, lavish books and facsimile memorabilia like reprinted posters, replicas of 7in singles, badges and the like. Sadly, this milking of Hundred Quid Man is not so ironic: it's a tad cynical

because the only hold-outs for CD are the remaining Baby Boomers.

They are now pensioners, arguably retired, perhaps with empty nests and a bit of disposable dosh. Financial status aside, they are the ones who tend to be the collectors of physical media, not downloads, and among them are sufficient completists who are prepared to drop loads-a-money on albums *they already have*.

THE RIGHT ROUTE

Rubbing their hands with glee at these customers (and I am unapologetically one of them), the record labels tempt us with either better sound quality via remastering, or the aforementioned unissued tracks. Better sound and/or more material? Count me in!

What John Lennon fan can resist an expanded, multi-disc *Imagine*? Can any Marillion buff not be seduced by a 4-disc

Clutching At Straws? Which Jethro Tull addict isn't blown away by the expanded 40th anniversary *Aqualung*?

Fortunately, to counter the most brazen greed (McCartney's deluxe *Flaming Pie* takes the biscuit at a few hundred quid for what was a

mediocre album to begin with), the majority of the anniversary sets *are* worthy additions to the catalogues of the respective artists rather than desperate cash-ins.

In nearly every case, the right expert is chosen to curate the project, and the artists

– if still alive – ensure that the end results are of sufficient merit so as not to discredit the performer or the original album.

These sets have to deliver the goods to justify the prices, so the norm is something like this... 1) You get the original album on two or more formats, often CD and vinyl, with some including the album on Blu-ray audio. 2) A remastered or remixed version of the original album on another disc. 3) A 5.1 surround version if it dates from the era of quadraphony. 4) A purist PCM stereo disc. 5) One or more CDs containing leftover material, such as outtakes. 6) Other stuff related specifically to that album, including singles of the period. 7) An unreleased live performance. 8) And finally, if available, a video DVD or Blu-ray, usually containing one of those previously-broadcast 'making of the album' documentaries.

Enabling all of these box sets are the marketing man's dream: anniversaries. These are one of the passage of time's few gifts to us, naturally-occurring markers to celebrate past achievements, and they present opportunities for reissuing classics not just of music albums, but also wines, wristwatches, cars, handbags and anything else with true history. It works because, even after 50 years, there are enough survivors from first time around who want to recall their youth.

TICKING CLOCK

How else do you explain the 38CD, £700+ box of all the Woodstock performances selling out, such that it now commands £1000-£3000 on eBay? Simple: nostalgia is probably, after perceived prestige/ego reinforcement or imagined sex appeal, the biggest inducement to get someone to part with silly sums. And I speak as one who has been caught so many times that I am reluctant to admit it.

There is, however, a ticking clock, which is where we came in. Just as the demise of CD seems inevitable and within the near future, so are the Baby Boomers who are buying box sets (forgive the alliteration) looking at their inevitable shuffling off this mortal coil. So let these elderly music lovers indulge in lavish CD packages, for it's only a matter of time before they purchase the last boxes they'll ever need. ☺

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