

# hi-fi news

THE HOME OF REAL HI-FI

& Record Review

Exclusive

## GOING ACTIVE

System building with Kudos and Exposure

Audio Research

REF160S tube power amp

PS Audio

New Stellar Phono preamp

MSB Technology

The Discrete 'modular' DAC

Gold Note

Mediterraneo deck from Tuscany



Classical Companion

Mariss Jansons - Conductor

The Producers Jack Nitzsche

Abyss

AB-1266 Phi TC Flagship planar magnetic headphones



• PLUS 18 pages of music reviews & features • VINYL RE-RELEASE Madonna's third LP, *True Blue*  
• OPINION 12 pages of letters & comment • VINTAGE REVIEW Philips FA860 integrated amplifier  
• SHOW BLOG We visit Hong Kong's 2019 AV Show • READERS' CLASSIFIEDS Hi-Fi bargains galore

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# bel canto

for music that's engaging

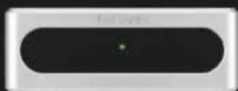
## Bel Canto Music Streamer e.One STREAM



### New Product

The e.One Stream provides easy access to 1000's of albums by connecting your preamp or DAC to Tidal, Qobuz, Vtuner or your personal NAS library. Download the excellent free iOS 'Seek' app to organise your playlists, favourite tunes and internet radio stations so they are readily accessible from your iOS tablet or phone. All that's left is to choose from either the black or silver finish.

"... the e.One Stream has a great deal to commend it." HiFi News (April 2019)



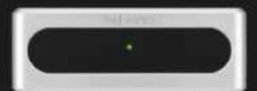
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Preamplifier



C5i  
Integrated amplifier and DAC



DAC2.7  
DAC/Preamplifier



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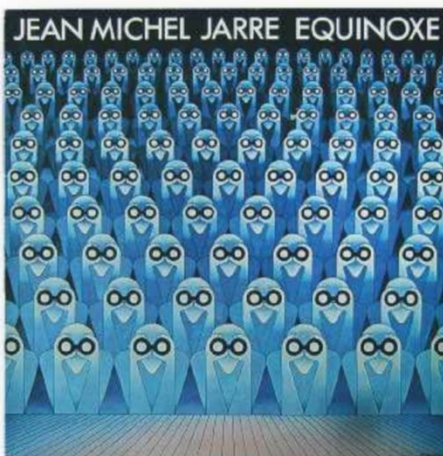
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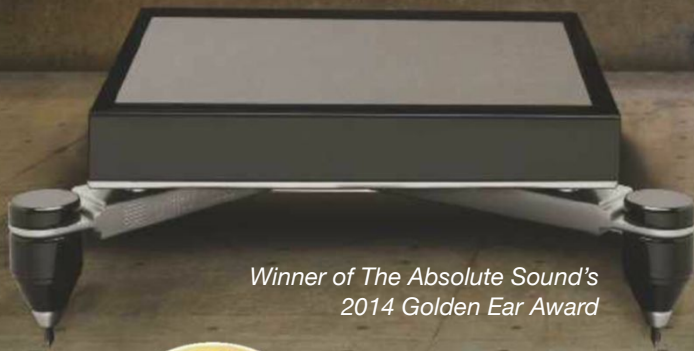
**ABOVE:** From old AM radios to today's cost-no-object amps, capacitors play a crucial role. But how do they affect sound? See p28

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Save 75% on digital with a print subscription See p120

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HIFI News, July 2019







# STUDIODECK+

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HiFi News, January 2020

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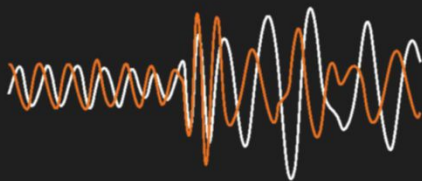
ACTIVATE SAM



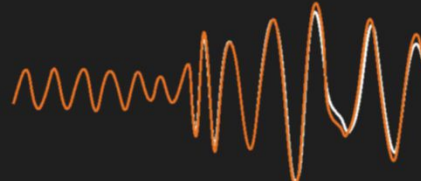
AND GET THE BEST PERFORMANCE FROM YOUR SPEAKERS

SOUND PRESSURE OF ATOHM GT1 HD

Before



After



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INGÉNIERIE ACOUSTIQUE DE FRANCE



**TAP Polarizer**

Method to reduce polarization  
distortion in a signal cable.  
*Patent Pending*

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SHUNYATA RESEARCH: US PATENTS

Method to reduce distortion in an audio cable using ferroelectric substances.

Patent Number:  
US 6,545,213

Method to eliminate RFI, EMI and other interference in a power supply.

Patent Number:  
US 7,196,892

Power conditioner that actively corrects A.C. line harmonic distortion.

Patent Number:  
US 7,256,638

Cable elevator that neutralizes static electric interference.

Patent Number:  
US 7,694,917

Device that reduces AC power line noise using ferroelectric substances.

Patent Number:  
US 8,658,892

Method to reduce dielectric distortion in signal transmission cables.

Patent Number:  
US 8,912,436

Method to improve instantaneous current delivery in an AC to DC power supply.

Patent Number:  
10,031,536



Shunyata Research Inc.  
shunyata.com



DFSS™

Patent Number: US 7,694,917



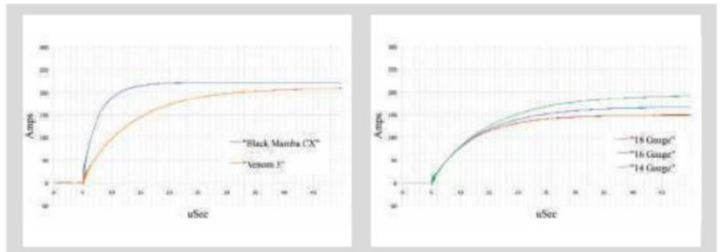
NIC™

Patent Number: US 8,658,892

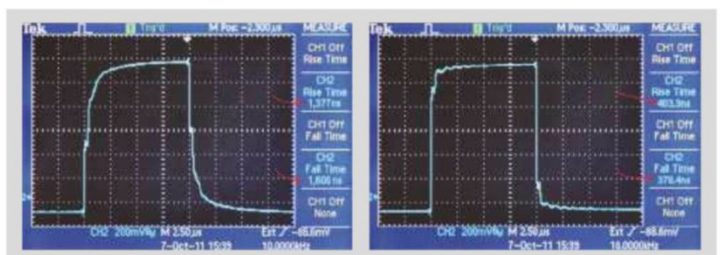


QR/BB™

Patent Number: 10,031,536

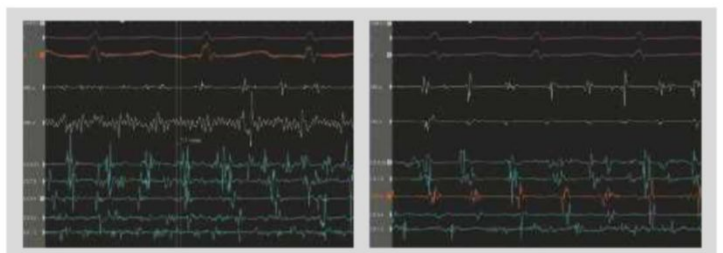


DTCD™ Measurement Comparisons



ETRON™ Measurement Comparisons

(Before & After)



Inter-Cardiac Tracing Comparisons

(Before & After)



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**RIGHT:** Nothing if not purposeful, the Abyss AB-1266 Phi TC headphones make a statement on p68



**ABOVE:** We were bowled over by MSB's Premier DAC [HFN Aug '19], so will the 'entry-level' Discrete also make magical music? See p46



**MUSIC:** Jean-Michel Jarre's defining album, *Equinoxe*, is our Vinyl Icon (p82) while Steve Sutherland recalls a chance meeting with Madonna as *True Blue* is re-released on 180g LP, (p80)

**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

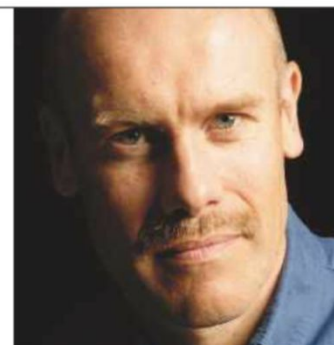


Audiophiles of an age will surely remember seeing and hearing Meridian's first active loudspeaker, the M1, back in the late 1970s. The sloped baffle with its 10in woofer was distinctive, but it was the technology inside – a Meridian 105S power amp with electronic crossover – that represented the true innovation.

The idea spawned a few other active loudspeakers, but Meridian stuck to its guns and developed the concept, right through to its MQA-ready DSP loudspeakers that are available today. Joined by the likes of Linn, Devialet and KEF, these self-sufficient, 'system-in-a-box' loudspeakers are addressing a slightly different scene – not strictly 'old-school audiophile' but one driven by the rapid change in the high-end consumer's 'digital lifestyle'.

While the appeal of these sophisticated, DSP-driven speaker solutions is self-evident, it's also true to say that hard-core hi-fi enthusiasts have never taken to the idea of active loudspeakers *en masse*. The ability to fine-tune our systems by choosing our own pre and power amps, interconnect and speaker cables is core to our shared passion.

Hi-fi is as much about the 'doing' – the journey – as the final destination. For some, one-stop-shop active speakers take



the fun out of fidelity. Ironically, the pro sector has moved entirely the other way. Nowadays speaker manufacturers cannot sell a monitor into a studio environment *unless* it's fully active. Just ask PMC or ATC...

So rather than board the latest bandwagon, our cover star, Kudos Audio, has decided

## 'Hi-fi enthusiasts have not taken to active speakers *en masse*'

to bridge the gap and offer its core audience the flexibility and performance advantages of active operation without ditching control over our choice of amps and cables [see p36].

Replacing the speaker's passive crossover with an active alternative placed between pre and power amps lifts a long-standing barrier, but it does mean a lot more boxes and, potentially, a lot more cables. The opposite, in fact, of the modern system-in-a-speaker!

**PAUL MILLER** GROUP EDITOR

HI-FI NEWS' EXPERT LINE UP: THE FINEST MINDS IN AUDIO JOURNALISM BRING THEIR EXPERIENCE TO BEAR ON ALL AREAS OF HI-FI & MUSIC



**BARRY FOX**  
Investigative journalist supreme, Barry is the first with news of the latest developments in hi-fi and music technologies



**DAVID PRICE**  
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'



**KEITH HOWARD**  
has written about hi-fi for 40 years, and edited *Hi-Fi Answers* for nine. KH performs our speaker and headphone lab tests



**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

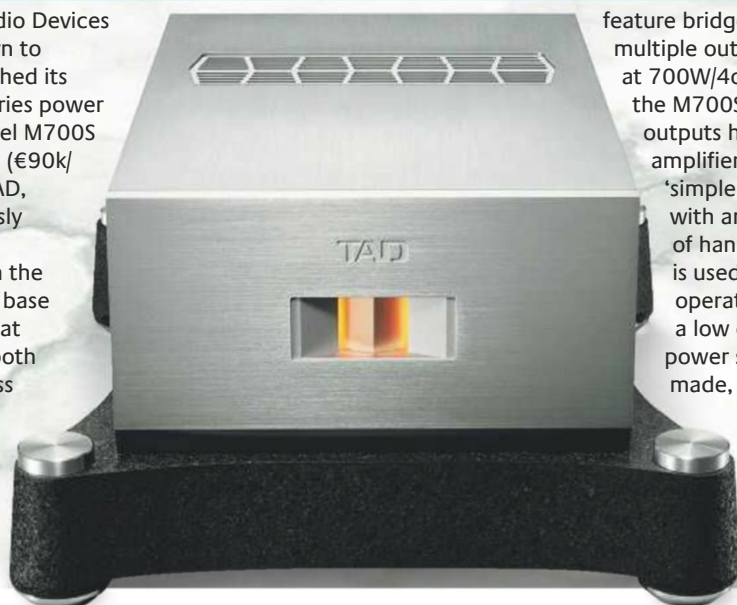


**STEVE SUTHERLAND**  
worked on *Melody Maker* and then edited *NME* from 1992-2000, the Britpop years. Steve brings a unique slant to our Vinyl Release pages

# Totally top TAD

700W MONO AND STEREO POWER AMPLIFIERS ARE TAD'S CROWNING GLORY

Pioneer spin-off Technical Audio Devices Laboratories Inc, better known to audiophiles as TAD, has launched its most ambitious Reference Series power amplifiers yet: the two-channel M700S (€56k) and monoblock M700 (€90k/pair). As you'd expect from TAD, much about these meticulously hand-assembled amplifiers is extraordinary, beginning with the 'wide stance' cast aluminium base – with adjustable spiked feet at the four corners – on which both amplifiers are built to suppress structural resonance within the audible frequency range. First used in the M600, the base has been redesigned to enhance its rigidity. Both models



feature bridged output stages featuring multiple output devices. The M700 is rated at 700W/4ohm with 2x350W/4ohm for the M700S. For both models the rated outputs halve into 8ohm loads. The amplifier circuit espouses a minimalist, 'simple is best' design philosophy, with an input stage featuring a pair of hand-selected FETs. A servo circuit is used to control the amplifier's DC operating conditions and maintain a low output offset voltage. The power supplies incorporate purpose-made, bobbin-less transformers with a 2.8kVA rating, and four of TAD's own 33,000µF electrolytic reservoir capacitors.  
**TAD, 01707 629345;**  
**www.tad-europe.com;**  
**www.harmonyhifi.co.uk**

## More Magico

NEW A5 FLOORSTANDER IS A-SERIES FLAGSHIP



Magico has been busy. Following the recent launch of its compact A1 [*HFN* Jan '20], smallest model in the entry-level A-Series, comes the A5, the new largest model in the range. A five-driver three-way, the A5 features Magico's first 5in midrange driver, and this and the three bass drivers have enhanced 'Graphene Nano-Tec' sandwich cones said to achieve an unprecedented stiffness-to-weight ratio. In common with other models in the A-Series, the A5's tweeter is a 28mm beryllium dome unit with a carefully damped back chamber to dissipate rear radiation. Magico's proprietary Elliptical Symmetry crossovers are employed and for the first time incorporate Mundorf's new M-Resist Ultra foil resistors. Price in the UK is expected to be £24,998 a pair.  
**Magico LLC, 0208 971 3909;**  
**www.magico.net;**  
**www.absolutesounds.com**

## HI-FI NEWS' NUGGETS

### NORDOST CABLE

Nordost has spun off the technology from its Valhalla 2 tonearm cable into four new arm cables in its Blue Heaven, Heimdall 2, Frey 2, and Tyr 2 ranges. Each 'Tonearm +' cable comprises two twisted pairs, one per channel, of silver-plated, solid-core oxygen-free copper which are individually shielded to obviate crosstalk. Prices are £550, £740, £1290 and £2540 for 1.25m lengths. [www.nordost.com](http://www.nordost.com)

### PRO-JECT LP LABEL

Austrian turntable manufacturer Pro-Ject Audio Systems has diversified into making audiophile LPs to play on its products. Its first offering, *Jazzy Zoetrope*, features Austrian musician 7RAY and is an all-analogue recording made at Pro-Ject HQ and Studio Baumgarten in Vienna. Classic tube microphones fed an eight-track Otari recorder, with the tracks downmixed to stereo on Studer tape machines. The 180g vinyl LP costs €39.90, or you can buy a master tape copy for €499. [www.project-audio.com](http://www.project-audio.com)

## Ultimate ARC

VERY LIMITED EDITION REF750SEL AMPLIFIER



When you look at a property and its details say 'price on application', most of us know we can't afford it. Audio Research's improved version of its flagship Reference 750 monoblock power amplifier, the Reference 750 SEL, is similarly labelled – but importer Absolute Sounds says it will be around £75,000 a pair. Ten pairs only will be made, so if the price doesn't daunt you get your skates on. Internally, component and wiring upgrades are said to provide higher resolution, greater transparency, better focus and effortless dynamics. Power output remains 750W into loads from 4 to 16ohm.  
**Audio Research Corp, 0208 971 3909;**  
**www.audioresearch.com;**  
**www.absolutesounds.com**



## Extraordinary Extraudio

TRIODE TUBE/CLASS D HYBRID INTEGRATED FROM HOLLAND

Most audiophiles think of valve amplifiers and Class D amplifiers as occupying opposite ends of the hi-fi spectrum, but Netherlands-based Extraudio has combined them in its X250 integrated amplifier which it refers to as 'Pure Class AD'. Underneath the cover (orange in the standard version) is an XP1 triode-based preamplifier coupled to a Class D power amplifier specified as delivering 180W/2ohm, 250W/4ohm and 200W/8ohm. Extraudio says it

has enhanced the Class D stage to achieve superior sound. Inputs comprise MM phono and three line-level options on RCA plus a balanced input on XLR, with an AV processor input on both. Two fascia finishes are offered – matt silver and matt black – priced at £12,495, with £16,495-£19,495 for the 'Premium' version. **Extraudio BV, Netherlands, 0203 911 5549; www.extraudio.com; www.wholenotedistribution.co.uk**



## Light up your listening

IFI AUDIO'S AURORA ALL-IN-ONE STREAMING SYSTEM

Finished in bamboo and mounted in an angular aluminium frame, the eye-catching £1399 Aurora from iFi Audio is a tabletop all-in-one music system. Lifting it off its mounting surface is important because it has two bass drivers mounted underneath, supplementing six other units distributed around the sides of the casework. Connected to a home network via Wi-Fi or Ethernet, the Aurora supports

sampling rates of up to 192kHz without downsampling, as it also does via USB. Bluetooth connectivity is also included, supporting aptX Adaptive, aptX HD, LDAC and HWA codecs – iFi Audio claims better than usual Bluetooth sound quality as a result of its implementation being 'less lossy'. **iFi-Audio (Abingdon Global Group), Merseyside, 01900 601954; www.ifi-audio.com**



## Bi-amping with a twist

MCINTOSH MC901 AMP

Bi-amping enthusiasts have often used different amplifiers for different frequency ranges, typically a powerful solid-state amplifier for the bass and a valve or Class A transistor amplifier for higher frequencies. With the new McIntosh MC901 dual mono power amplifier, this is all done for you as it's a 300W mono valve amplifier and 600W mono transistor amplifier on a single chassis, and it also has an adjustable integral electronic crossover. The valve stage features eight KT88 output valves and McIntosh's 'Unity Coupled Circuit' transformer. Price is £39,995 for a pair.



**McIntosh Laboratory Inc, 01202 911886; www.mcintoshlabs.com www.jordanacoustics.co.uk**

## HI-FI NEWS? JUST ASK...

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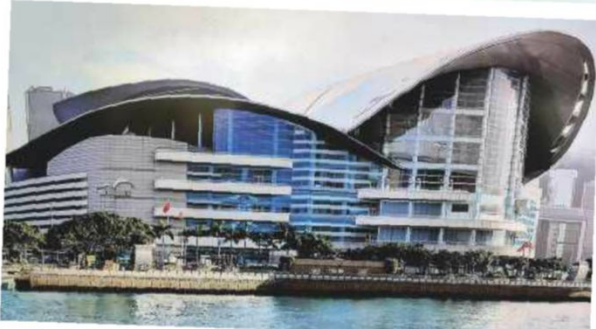
## Upcoming Events

IMPORTANT DATES FOR YOUR HI-FI DIARY

- 16 FEB** Spring Audio Jumble 2020, The Angel Leisure Centre, Tonbridge, Kent; [www.audiojumble.co.uk](http://www.audiojumble.co.uk)
- 21-23 FEB** Bristol Hi-Fi Show, Marriott City Centre Hotel, Bristol; [www.bristolshow.co.uk](http://www.bristolshow.co.uk)
- 14-17 MAY** High End 2020, MOC, Munich; [www.highendsociety.de](http://www.highendsociety.de)
- 20-21 JUN** North West Audio Show, Cranage Hall (De Vere Cranage Estate), Cheshire; <http://audioshow.co.uk>
- 19-20 OCT** The UK Hi-Fi Show Live, Ascot Racecourse Grandstand, Ascot Berkshire SL5 7JX; [www.hifishowlive.com](http://www.hifishowlive.com)

# Hong Kong AV Show 2019

Words & pictures: **Bob Hawkins**



Street demonstrations didn't appear to dampen enthusiasm for Southeast Asia's largest audio event. Rather, the 2019 Hong Kong High End AV Show, which took place over three days at the Conference & Exhibition Centre in Wan Chai District, was a roaring success. With exhibitors from around the globe – many appearing for the first time – plus live performances from local singers, AV demos and dragon drum displays, there was something for everyone, including a much-anticipated unveiling of the TechDAS Air Force Zero turntable.

The EAT Forte is no ordinary turntable. Its oversized platter alone weighs over 20kg and this is driven by two decoupled AC motors in a bid to reduce wow and flutter. What's more, the platter is magnetically suspended thanks to neodymium magnets embedded into its lower half. The deck is completed by EAT's 12in F-Note tonearm. [www.europeanaudioteam.com](http://www.europeanaudioteam.com)



Created in 2014 in order to celebrate Sonus faber's 30th anniversary, the EX3MA was a new gold standard when it came to small monitor loudspeakers. Only 30 were made before the mould was destroyed. It features a passive radiator and 180mm mid-woofer driver with bass frequency adjustment. [www.sonusfaber.com](http://www.sonusfaber.com)



The Wadax Atlantis Transport reads CD, SACD, DVD-Audio and Blu-ray Pure Audio discs. Beneath the sliding lid on the top of the player lies Thor, a proprietary motorised loader that lowers a disc vertically into the machine in an operation said to take 2.5s. Other features include a vibration monitor, inclinometer and the ability to rip SACDs – though this is said to be for academic research purposes only. [www.wadax.eu](http://www.wadax.eu)



Audiovector arrived from Denmark to show its QR1 standmount speakers, which are part of a six-strong range. Each enclosure houses a gold leaf AMT air motion tweeter and dual magnet bass driver plus a fascia plate machined from a single piece of aerospace grade aluminium. [www.audiovector.com](http://www.audiovector.com)

The focus of attention in the room of local importer Fung Ning Audio were the Alecta speakers from Italian company Albedo. These leather-clad floorstanders stand 1.7m tall, each cabinet sporting a 1in tweeter, 5in midrange driver and twin 8in woofers from Accuton's CELL range. The backroom team of electronics comprised Manley's Neo-Classic 300B preamp and eye-catching Manley Neo-Classic all-tube monoblocks. Turntable was the mammoth Clearaudio Statement with its TT1 parallel-tracking tonearm. [www.albedoaudio.it](http://www.albedoaudio.it)



With the Air Force Zero, the project to produce the ultimate reference turntable is now complete and I was able to meet with Hideaki Nishikawa of TechDAS, the deck's designer, who has been accompanying the 330kg system on a limited world tour. Nishikawa-san posed for this exclusive shot, lifting a cover that was protecting the motor pulley before saying 'Give my best wishes to Ken' – whoever that could be. [www.techdas.jp](http://www.techdas.jp)

This single-ended integrated amplifier from Italian company Viva Audio caught my eye. Released in 2005, the Solista measures 430x250x520mm (whd) and comes in a virtually unlimited array of colours. Using eight tubes in total, including four of the fab 845s, it looked superb. It is said to produce 22W per channel, but who cares? I want one. [www.vivaudio.com](http://www.vivaudio.com)



The Andros T ssera is a hand built, dual-chassis vacuum tube MM/MC phono stage capable of accommodating up to four tonearms or turntables. Each channel has independent controls, and selections are saved when switching. All output and inputs are single-ended or balanced with ground on/off switches for moving-coil cartridges. [www.zestoaudio.com](http://www.zestoaudio.com)



Here we see the Airy 3 S cartridge from Japanese company Zyx Audio, fitted to an Origin Live Zephyr tonearm. The MC cartridge is from the three-strong R1000 series, the S on the front of the cartridge shell denoting the use of cryogenically treated 5-N silver wire for the generator coils, while the other two pick-ups in the range use gold or copper. A micro-ridge stylus is used with a boron cantilever. [www.zyx-audio.com](http://www.zyx-audio.com)

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Here are two floorstanders from the Swiss company Piega. The smaller Coax 511 is designed for compact apartments and has four 16cm bass units and a ribbon tweeter. To the right is the Master Line Source 3 dipole speaker. This stands 165cm tall, has four ribbon tweeters and two 180mm woofers. [www.piega.ch/en](http://www.piega.ch/en)



With a price tag of around £85k, you'll need deep pockets for the Acoustic Signature Invictus Jr turntable and TA-9000 gimbal tonearm. The four-motor, two-speed deck offers digital speed control via push buttons on its main chassis. [www.acoustic-signature.com](http://www.acoustic-signature.com)



Hong Kong hosted the world premiere of the Plural Evo loudspeakers from German manufacturer Zellaton, which are said to operate between 100Hz to 8000Hz without a full-range crossover. Kondo's H6 Melius EL34 power amp and M7 Heritage preamp were also on show. [www.zellaton.de](http://www.zellaton.de)



Tiara's Cesare 1 loudspeakers are built in the Italian style yet are packed full of German technology. Weighing in at 85kg, each cabinet stands 122cm tall and sports a 57.6mm diamond tweeter, ceramic midrange driver and 220mm sandwich woofer. Sensitivity is quoted at 92dB. [www.tiara-audiosystem.com](http://www.tiara-audiosystem.com)

A pioneer in the the UK recording industry and winner of a Technical Grammy Award, Rupert Neve has introduced a new range of hi-fi products. Called the Fidelice series, it comprises a DAC (centre), phono preamp and headphone amp. Pictured are the firm's Managing Director Josh Thomas (left) and European Sales Manager Tim Hurrell. [www.rupertneve.com](http://www.rupertneve.com)



Western Electric's 91-E valve integrated amplifier was on static display in Hong Kong. The US company states that it will achieve in excess of 20W per channel – a remarkable performance given that the design uses one 300B triode valve per channel in a single-ended circuit. However, there's no official price so far for this stunning-looking amplifier. [www.westernelectric.com](http://www.westernelectric.com)





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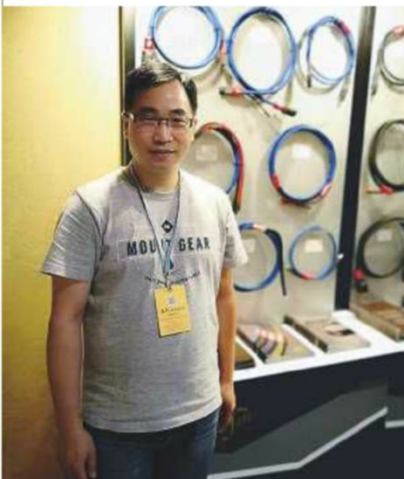
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Cessaro's Firebird Auditor stands almost 2m tall. It's a hybrid speaker comprising a TAD 2002 tweeter, a pair of 8in C235-A midrange drivers made by Cessaro in-house, and six 10in bass units with aluminium diaphragms, each with its own 500W amplifier. According to the company, sensitivity is 101dB. [www.cessaro.de](http://www.cessaro.de)



Calvin Law founded local company CFM (Cables For Music) three years ago and produces hand-made cables in copper or silver. The range covers all cable types, branded 'Classic', 'High-End' and 'Ultra High-End'. He also offers a series of grounding cables for shielding components from interference. [www.cfm-cables.com](http://www.cfm-cables.com)



Live demos of luxury audio played to a packed room of audiophiles are always a show highlight. In the Jadais room we were treated to the Wilson Alexandria XLF speakers [*HFN* Oct '12], TechDAS Air Force Zero turntable and mono power amps from CH powered via German company Stromtank's S5000 'battery pack'. [www.wilsonaudio.com](http://www.wilsonaudio.com)

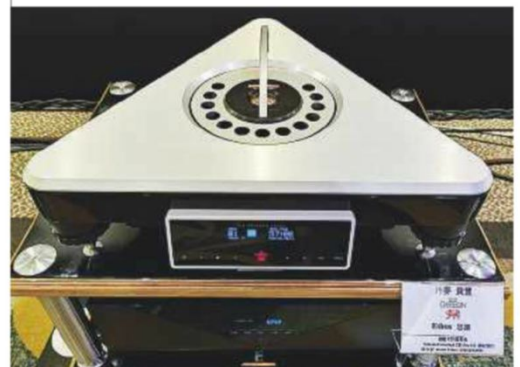
German manufacturer Octave had two valve power amps on show, both single-ended. The Jubilee 300B employs three triodes to produce a selectable output of 20-30W, says Octave. On the other hand, the Jubilee Mono SE utilises ECC82 triode and KT120 pentode tubes to deliver a claimed 400W/4ohm. [www.octave.de](http://www.octave.de)



The Siltech Symphony loudspeaker weighs in at 210kg and comprises three decoupled cabinets. The top houses a 'lower' midrange driver; the middle section eight drivers, including two tweeters switchable between ribbon and domes; while at the bottom are two 18in woofers. [www.siltechcables.com](http://www.siltechcables.com)



This eye-catching disc-spinner from Gryphon is an integrated CD player and DAC. Called the Ethos, it plays Red Book CD only and features a Pro8 transport allied to ESS Sabre ES9038PRO 32-bit DACs. Inputs are AES/EBU on XLR, S/PDIF on coax/BNC, and USB enabling connection with external sources up to 384kHz/32-bit PCM and up to DSD512. [www.gryphon-audio.dk](http://www.gryphon-audio.dk)



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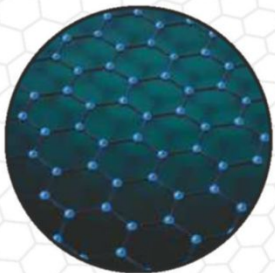
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The UHA Ultima2 open-reel tape deck was introduced in 2017 by US company United Home Audio. It's a two-track, two-speed recorder with a Class A fully discrete preamp on board while power comes from an off-board power supply called the OPS-DC. The deck itself is fitted with RCA and XLR connectors. [www.unitedhomeproducts.com](http://www.unitedhomeproducts.com)



The RS201 is made in Korea by Seoul-based company Rose and it seems there's little this all-in-one network player can't do thanks to its built-in amp, ES9018K2M 32-bit DAC from Sabre and 4K video processor that outputs content via HDMI. [www.hifirose.com](http://www.hifirose.com)

Seven years in development, the 159 Mono Power Amplifier has now been added to Burmester's Signature Line. Hand made at the German company's factory in Berlin, the Class A/B monoblock measures 523x415x660mm (whd) and is rated at 1200W into 4ohm. The control unit is hidden under the aluminium top cover when not in use. [www.burmester.de](http://www.burmester.de)



Here's AVM's Ovation 8.3 integrated amplifier above its 8.2 CD player. The amp is a Class A/AB design rated at 200W per channel into 8ohm and offers Bluetooth 4.2 connectivity. The slot-loading disc player, meanwhile, offers six digital inputs and employs tubes in its analogue output stage filter. [www.avm.audio](http://www.avm.audio)



British audio products are in great demand in Asia, and Quad has enjoyed great success in Hong Kong. The VA One+ integrated is one of the most popular thanks to its affordable price and compact dimensions – ideal for life in smaller apartments. A remote, motorised volume, Bluetooth, headphone socket and USB complete the package. [www.quad-hifi.co.uk](http://www.quad-hifi.co.uk)

The dCS Bartók network DAC [HFN May '19] sees a UPnP streamer combined with the UK company's tried-and-tested Ring DAC technology. What's more, there's the option of a high-quality headphone stage, which is a first for the brand. It plays multi-format audio and offers DXD & DSD conversion. [www.dcsLtd.co.uk](http://www.dcsLtd.co.uk)



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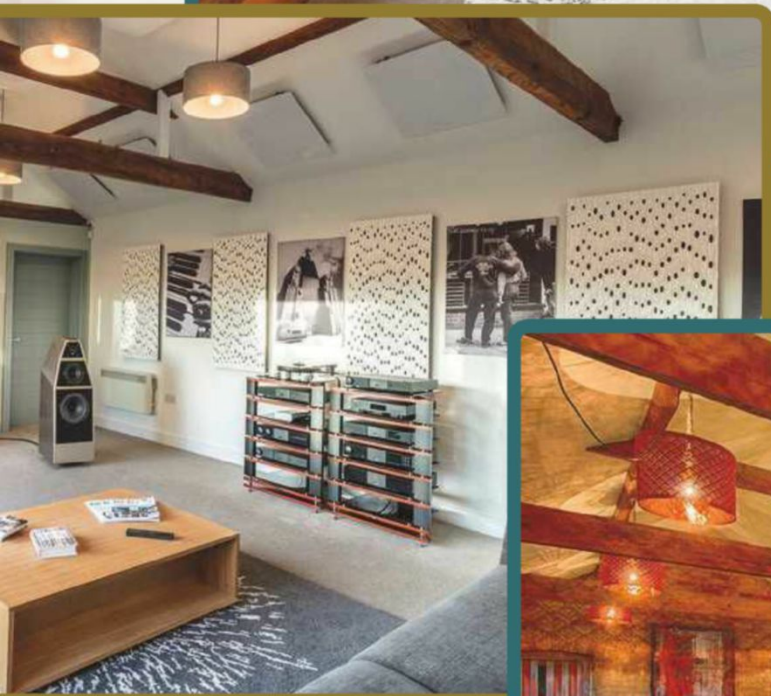
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# Thinking caps...

Keith Howard takes a look at the role capacitors play in audio circuits and explains how they influence sound

Was there a better time to be a hi-fi enthusiast than the late 1970s and early 1980s? It's hard to argue against it because there was so much going on, what with the development of digital audio on one hand and the rise of subjectivism on the other. Suddenly turntables and amplifiers were no longer judged by

wow and flutter, rumble and price tag or power output, total harmonic distortion and price tag, but by listening to them. Shock, horror! And it was possible to talk about the sound of cables without being carted off in a straitjacket. In this new atmosphere, everything once taken for granted in hi-fi became a candidate for reassessment.

One area that came in for close scrutiny was the sonic effect of passive components in electronics: resistors, inductors and capacitors – especially capacitors. Those in the know began to talk about equivalent series resistance and dielectric absorption; electrolytic capacitors were out, film capacitors were in.

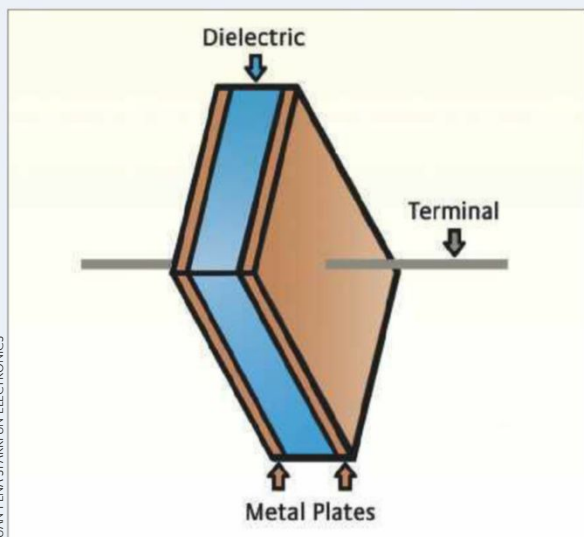
It's a subject we don't hear so much about now but not because the issue has gone away. Rather, most audiophile circuit designers now pay as close attention to the passive components they use as to

the circuits they put them into. So the public furore has died down.

In its simplest form a capacitor comprises two metal plates separated by air (or even better a vacuum) – see Fig 1. Because there is no conductive path between the plates, the capacitor blocks the flow of direct current (eg, from a battery). Indeed, this is one of the classic job descriptions for a capacitor, allowing one part of a circuit to operate at a DC voltage that is different from other parts, or from the outside world – something that's possible because a capacitor does, by contrast, pass non-constant, fluctuating, AC signals such as a music waveform.

## SOLID SOLUTIONS

You don't often encounter air capacitors, although if you've ever peered inside an old AM radio and seen a tuning element comprising interleaved, spaced metal plates, that is an air capacitor: a variable one. Most of the capacitors we encounter in audio and other electronics don't use air as the

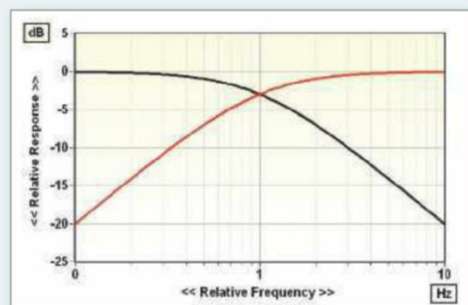


**LEFT:** Fig 1 illustrates the basic components that make up a typical capacitor – two conducting plates separated by a dielectric layer

insulating material (aka dielectric) that separates the plates because air has a low dielectric constant (1.0), which means that air capacitors of large capacitance are too bulky to be practical. So other, mostly solid dielectrics, with higher dielectric constants, are used, including materials such as ceramics and various types of plastic (eg, PVC which has a dielectric constant of 4.0). Which is where the story gets interesting since these dielectrics all have performance trade-offs, whereas air is pretty much perfect.

### SIMPLE FILTERS

That's a tale that must wait a moment, though, because first we need to know more about how capacitors behave and what they are used for. Capacitors block DC

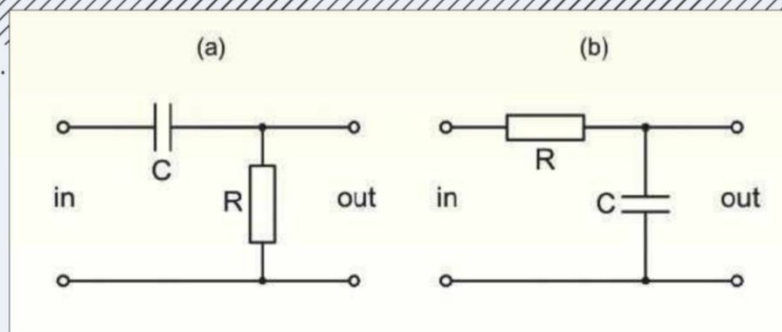


and pass AC, but they don't pass AC of different frequencies with equal facility. Capacitors have reactance, and that reactance decreases as frequency increases. (Inductors have reactance too but it behaves the opposite way, increasing with increasing frequency.)

So capacitors pass higher frequency signals more readily than lower frequency signals, a property which makes them valuable in frequency-selective circuits, ie, filters, and in supply decoupling applications where a capacitor connected to ground provides a low impedance path to remove unwanted AC signals (eg, hum, noise) from a DC supply rail.

Simple resistance-capacitance high-pass and low-pass filters are shown in Fig 2. In the high-pass filter (Fig 2a) a series capacitor is connected to a shunt resistor. At very low frequencies, the reactance of the capacitor is much higher than the resistance of the resistor, so little signal voltage appears across the resistor. Whereas at very high frequencies, the capacitor's

**RIGHT: Fig 2 shows first-order high-pass (Fig 2a) and low-pass (Fig 2b) RC filters. In the high-pass filter a series capacitor is connected to a shunt resistor while in the low-pass filter the positions of the capacitor and resistor are swapped**



reactance is small compared to the resistor's resistance and so the signal is passed with little attenuation.

In the low-pass filter (Fig 2b), the positions of the capacitor and resistor are swapped. Now the high reactance of the capacitor at very low frequencies ensures that the signal is barely attenuated, whereas at very high frequencies its low reactance means that signal attenuation is high.

### ON A ROLL

These simple RC filter circuits are termed first-order filters and have ultimate roll-offs of 6dB per octave. In other words, signal voltage decreases by half for each halving (high-pass) or doubling (low-pass) of signal frequency. Their frequency responses are shown in Fig 3, where the centre value 1 on the frequency scale – where the attenuation is 3dB – is called the corner frequency (or cut-off frequency or break frequency) and corresponds to  $1/(2\pi RC)$ , where R is the resistor's resistance in ohms and C is the capacitor's capacitance in farads.

If we choose example values of 10,000ohm (10kohm) and 1µF (one microfarad), the corner frequency will be at just under 16Hz. Higher-order filters, requiring more components, have ultimate roll-off

rates which are multiples of 6dB per octave, ie, 12dB/octave for a second-order filter, 18dB/octave for a third-order filter, etc.

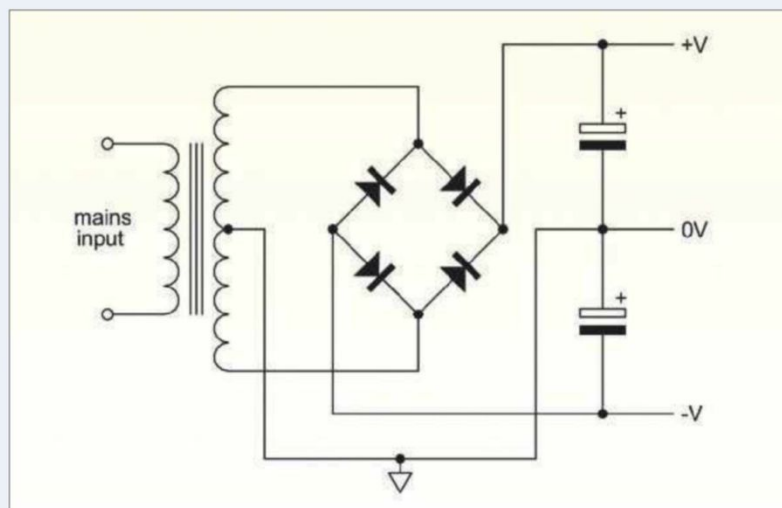
We've seen thus far that capacitors are used for coupling circuits together, for decoupling noise from DC voltage rails, and within frequency-selective circuits (filters). Because capacitors store electric charge, large ones are also used as reservoirs in AC to DC power supplies. Fig 4 shows a basic full-wave rectified power supply comprising a step-down transformer (which reduces the mains voltage), a full-wave bridge rectifier (which converts the stepped-down AC from the transformer into pulsed DC) and twin reservoir capacitors (which prop up the voltage when the rectifier isn't conducting, thereby smoothing the pulsed DC so that it's close to a steady DC voltage).

Circuits of this type are found in many solid-state electronic audio components and similar circuits are used in valve equipment although, due to the high operating voltages required by valves, the transformer normally steps up the mains voltage, and there is typically a single supply rail rather than dual rails.

A reservoir capacitor behaves like a decoupling capacitor in that it bleeds off unwanted AC to earth, ⇨

**ABOVE LEFT: Fig 3 shows the frequency responses for the two filters illustrated in Fig 2 – high pass in red, low-pass in black**

**RIGHT: Fig 4 is a circuit diagram of a full-wave power supply comprising a step-down transformer, full-wave bridge rectifier and twin reservoir capacitors, one used per DC output rail**



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but it does so on a grand scale. The reservoir capacitance used in solid-state power amplifiers can be 50,000µF (0.05F) or more per rail, whereas elsewhere the circuit may use capacitors of 1nF (one-thousandth of a microfarad) or less. So the range of capacitance required in electronic circuits can be huge: nine orders of magnitude or thereabouts. Unsurprisingly, this means that different capacitor types are better adapted to certain roles than are others.

**PRACTICAL NOTE**

Reservoir capacitors, the largest, are usually aluminium electrolytic types because these provide high capacitance in a practicably small volume. Because electrolytic capacitors incorporate an electrolyte (a liquid or gel containing ions) which reacts chemically with the metal foil within the can to form the dielectric layer, they have to be connected the right way round so that the positive terminal is operated at a higher DC voltage than the negative terminal. Such capacitors – and there are other examples, notably tantalum capacitors – are termed polar, and not observing their polarity can result in their catastrophic failure.

Other, nonpolar types of capacitor can be connected either way round. (Bipolar electrolytics, which also connect either way round, have sometimes been used in passive speaker crossovers but their use today is deprecated because film capacitors perform better – although they take up more space.) On a practical note, capacitors also have different arrangements of lead-out wires – axial or radial to suit different applications. Radial electrolytics have an advantage in that they take up less board area, but a drawback is that they add height. Large electrolytic capacitors usually forgo lead-out wires for solder tag or screw terminals instead.

Real capacitors – like real politicians – do not behave perfectly, and it is in the ways they fall short that much of the preoccupation with them as influencers of sound quality resides. The first issue is that

no practical capacitor serves up pure capacitance: it also has finite inductance and resistance. So while the capacitor in a circuit diagram will typically appear as one of the symbols in Fig 5 (all of which make visual reference to two separated plates), the real capacitor

will be a circuit like that shown in Fig 6 – and even this is simplified. The resistor labelled ESR (equivalent series resistance) may not be constant but frequency-dependent. With electrolytic capacitors, ESR usually decreases with frequency.

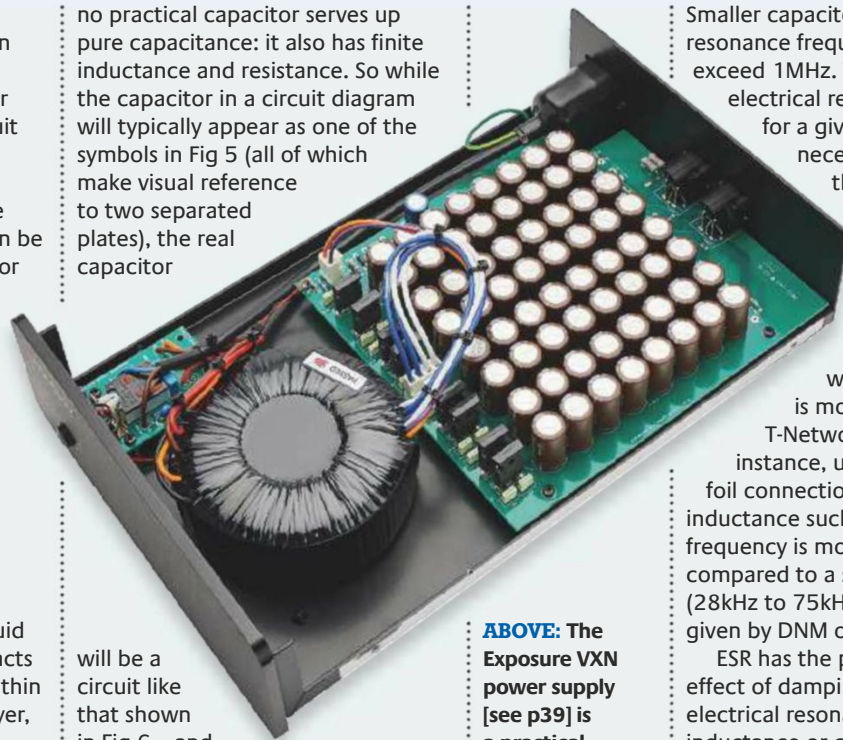
**NETWORK NEWS**

One consequence of capacitors having a finite inductance (ESL, or equivalent series inductance in Fig 6) is that they are inherently resonant electrically. If a capacitor's impedance is plotted against frequency, it doesn't – as it ideally should – continue to reduce as frequency increases. As Fig 7 illustrates, the impedance reaches a minimum (equivalent to the ESR value) at the resonance frequency and then, as frequency increases, it also begins to rise again as a result of ESL.

This behaviour is of particular importance where capacitors are deployed to reduce susceptibility to radio frequency interference, but there are amplifier designers who believe that in-band and out-of-band electrical resonances are one reason why amplifiers sound different.

Large electrolytic capacitors typically have electrical resonance frequencies within the audio band.

'Capacitors are inherently resonant electrically'



**ABOVE:** The Exposure VXN power supply [see p39] is a practical example of Fig 4. Note the use of multiple, smaller-value electrolytic capacitors to achieve a low ESR supply

Smaller capacitors have electrical resonance frequencies that may exceed 1MHz. To increase the electrical resonance frequency for a given capacitance it is necessary to reduce ESL, the series inductance.

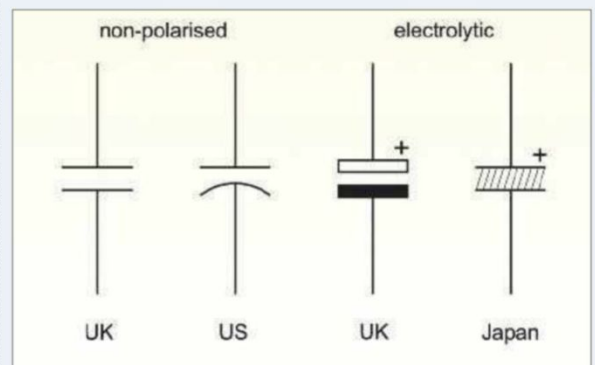
Various methods have been contrived to achieve this in electrolytic capacitors, where the problem is most acute. DNM's T-Network capacitors, for instance, use a T-pattern of foil connections to reduce inductance such that resonance frequency is more than doubled compared to a standard design (28kHz to 75kHz in an example given by DNM on its website).

ESR has the potentially beneficial effect of damping a capacitor's electrical resonance but, unlike inductance or capacitance, resistance generates heat when a current passes through it. In big reservoir capacitors, where currents through the capacitor are high, this internal heating effect sets a limit on safe operating conditions. That said, however, electrolytic capacitors work best when warm.

**AUDIOPHILE FAVES**

Much of the attention paid to capacitors in the late 1970s and early 1980s focused on the behaviour of dielectrics, and those concerns were carried over to cables because they too use insulating materials and behave, in part, like capacitors. Thus PVC cable sheathing came to be vilified, with PTFE (aka Teflon) and polyethylene preferred. Two factors claimed most attention: dissipation factor (DF) and dielectric absorption (DA). DF relates

**BELOW:** Fig 5 shows different capacitor symbols, all of which have a depiction of the two plates



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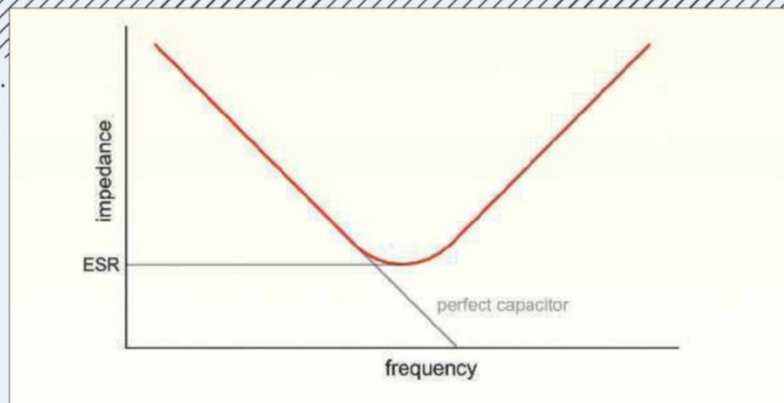
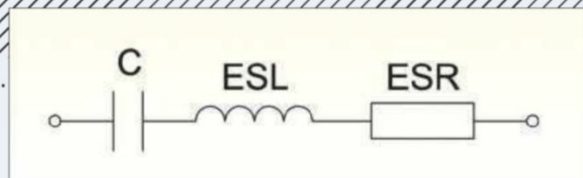
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to the capacitor circuit diagram of Fig 6 and is inversely proportional to the Q (sharpness) of the electric resonance depicted in Fig 7. DA is a measure of how reluctant a capacitor is to surrender charge that it has stored and is sometimes referred to as 'capacitor memory'.

Table 1 [see below] – which is derived from part two of the classic article 'Picking Capacitors' by Walter Jung and Richard Marsh, published in the February and March 1980 issues of *Audio* – shows how DF and DA compare for various dielectrics and explains why polypropylene, polystyrene and PTFE capacitors became audiophile favourites.

It also became increasingly common to see reservoir capacitors fitted with much smaller film capacitors in parallel, in an attempt to improve the electrolytics' performance. A high-voltage film capacitor is shown in Fig 8.

### MICROPHONICS

It's perhaps no surprise that valve (tube) equipment is sensitive to vibration. Within the evacuated glass envelope of a valve are thin metal electrodes whose spacing affects the valve's operation. So shake a valve vigorously enough and that shaking will be reflected in its electrical output, an effect known as microphonics because the valve is behaving like a crude microphone.

Solid-state electronics are less obviously susceptible to this effect but – to take an extreme example – the designers of early engine management systems in racing cars soon learnt not to bolt the electronics to the engine, or to incorporate sufficient compliant isolation if they did, otherwise high levels of engine vibration could disturb its operation. The levels of vibration experienced by hi-fi equipment

**ABOVE: Fig 6 – a simplified equivalent circuit of a real capacitor which shows parasitic resistance (ESR) and inductance (ESL)**

**TOP RIGHT: Fig 7 – parasitic inductance results in capacitors having an electrical resonance, sometimes within the audible frequency range**

**BELOW: Fig 8 – a high-voltage polypropylene film capacitor. In the 1980s it became common to see these used in parallel with reservoir capacitors**



in normal use are very much lower, of course, but some manufacturers – Naim Audio is a prime example of this – still go to considerable lengths to minimise the potential effect it has on their products.

Because a capacitor's ability to store charge – its capacitance – is proportional to the area of the plates and inversely proportional to the distance between them, the 'plates' are more normally thin foils with thin layers of dielectric inbetween. In metallised capacitors the plates are thinner still, and are formed by vapour deposition of aluminium on to a plastic film dielectric. The effect of this is to render capacitors inherently prone to microphonics because physical distortion caused by vibration can change plate spacing, and thereby the capacitance value.

So the physical properties of the materials from which a capacitor is built can be as important as the electrical properties. Some capacitors even use dielectrics that are piezoelectric (*ie*, they generate a voltage if physically distorted), which makes vibration sensitivity still worse – a particular problem with some types of multilayer ceramic capacitor.

And external vibration isn't necessary for capacitors to suffer from vibration effects: forces generated by voltages and currents within the capacitor itself can excite

mechanical resonances. Some capacitors can even be heard to emit sound when a signal is passed through them because of this effect. Here, in a passive loudspeaker crossover – where vibration levels, voltages and currents are all high – there's a perfect storm of factors that make capacitor selection particularly critical.

### KEY DECISIONS

While a lot of lip service has been paid over the years to the issue of capacitor microphonics and signal-induced mechanical

resonances, there has been relatively little research on the subject. Little published research, at any rate. But what does exist certainly supports the notion that this is a significant effect with potential consequences for sound quality.

Likewise, there are circumstances when capacitors can give rise to non-trivial levels of nonlinear (*ie*, harmonic and intermodulation) distortion. Understanding how this occurs and where in a given circuit the effect will be most significant allows designers to focus their efforts on key parts of the circuit when selecting components – areas where it will be of most benefit.

*Readers who'd like a list of references for further reading on capacitors in audio applications can access a PDF from my website: [www.audiosignal.co.uk/resindex.html](http://www.audiosignal.co.uk/resindex.html)*

*'There are capacitors that can be heard to emit sound'*

### DIELECTRIC MATERIAL

Parameter	Glass	Mica	Polyester	Metallised Polyester	Polycarbonate	Metallised Polycarbonate	Parylene	Polypropylene	Metallised polypropylene	Polystyrene	PTFE
DF (%)	0.1	0.1	0.3-1.0	0.3-1.0	0.1-0.3	0.1-0.3	0.1	0.01-0.03	0.03-0.1	0.01-0.03	0.01-0.03
DA (%)	~5	~5	0.3-1.0	0.3-1.0	0.1-0.3	0.1-0.3	<0.1	<0.1	<0.1	<0.1	<0.1



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# Kudos Audio Titan 707/Exposure VXN

Active or passive? Exposure's new outboard crossover allows you to experience both with the Kudos Titan 707  
 Review: **Andrew Everard** Lab: **Keith Howard**

As divisive audio issues go, few get the battle lines drawn more steadfastly than the matter of passive versus active loudspeakers. It's not so long ago that we were hearing about tiny monitor speakers with onboard amplification said to be good enough to have dyed-in-the-wool enthusiasts abandoning five-figure systems of conventional amps and speakers. Forget valves vs. solid state, or analogue vs. digital: when it comes to the topic of active speakers, tempers seem to flare among the keyboard warriors.

Of course, any active speaker system requires three components. These are the speaker itself, the external electronic crossover to split the frequency range to suit the speaker's drivers, and sufficient amplification to allocate a separate amp – or at least a separate channel – to each driver. Few companies have the wherewithal to do all that, though many have tried in the past, from Linn and Naim with their stacks of boxes to drive their own speakers to Meridian's big digital speakers with all the electronics onboard.

## BOXING MATCH

Exposure has taken a different approach for its foray into active drive, partnering here with speaker manufacturer Kudos with a VXN-series crossover box tuned to the needs of the speakers, and inserted between preamp and power amps. Kudos is a good choice, as its Titan speakers – including the £13,000 707 – and Cardea Super 10A and 20A models offer the ability

**RIGHT:** The Titan 707 employs a pair of 220mm SEAS/Kudos coated paper bass/mid drivers in isobaric configuration and each with a large aluminium phase plug. The tweeter is a 29mm SEAS/Kudos 'Crescendo K3' fabric dome

to bypass their internal passive crossovers by the removal of jumpers on the rear panel [see p41]. So it's easy to switch them from passive to active-ready status.

## ALWAYS ANALOGUE

Options to take advantage of this are already offered in the form of the Linn Exakt, Devialet Expert and Naim SNAXO active crossovers, but as Exposure's Chief Designer Tony Brady explains [see sidebar, p39], unlike the Devialet and Linn DSP-based solutions, the £2540 VXN active crossover is a simple, all-analogue device out of the 'old school'. It's designed to

mimic – albeit at line-level – the existing passive crossover in the Kudos speakers, rather than tune, improve or otherwise iron-out any wrinkles in the drivers' performance.

Indeed, the idea behind the VXN crossover, which is

entirely dual mono, with separate boards for each channel [see picture p39], and is powered by its own offboard PSU in a matching half-width enclosure, again with separate feeds for each channel, is to provide a one-stop solution that's usable across the Kudos range. That's why it comes in a choice of two- or three-way versions, at £1545 and £1795 respectively, with the power supply at £995. The buyer merely needs to specify the speaker with which it's to be used at the time of order, while internal dip-switches allow the output levels for treble and midrange (where applicable) to be adjusted.

The VXN crossover can, Exposure says, be adapted to other brands and models of speaker, and of course used with other manufacturers' electronics. Its ideal partners are the £2000 5010 preamplifier and a quartet of the matching 5010 mono power amps [*HFN* Nov '18], which sell for £4550 a pair. The 5010 amps are typically



no-nonsense – they come in plain black boxes and deliver 200W apiece while the preamp keeps it simple with no more than a volume control and input selector.

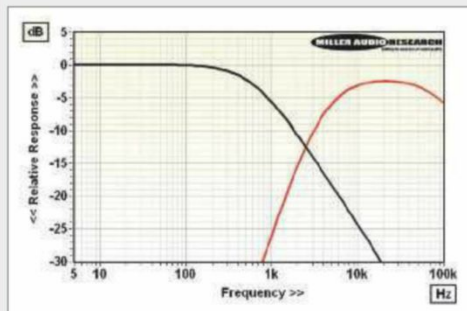
But one question arises when using this all-Exposure set-up with the VXN: why,



when the preamp offers balanced XLR outputs to match similar input sockets on the power amps, is the crossover a single-ended design with RCA phono outputs only? Given that the operation of an active system is likely to involve long interconnect

## GOING ACTIVE

Kudos's crossover specification requires a  $-6\text{dB}$  point at  $3.6\text{kHz}$  ( $12\text{dB/octave}$  slope) and a  $-3\text{dB}$  low-pass at  $750\text{Hz}$  ( $6\text{dB/octave}$ ) to correctly emulate the performance of the passive 707. In practice, the VXN [pic. with PSU, below] hits the  $-6\text{dB}/3.6\text{kHz}$  point on the nail [red trace, inset Graph] although the 2nd-order roll-off bites below  $2\text{kHz}$ . The low pass  $-3\text{dB}$  point is closer to  $620\text{Hz}$  than  $750\text{Hz}$  [black trace] – slightly earlier than specified. The gain of the low-pass section is  $-0.3\text{dB}$ , and the high-pass  $-2.75\text{dB}$ , the  $2.45\text{dB}$  difference reflected in the relative amplitude of the low (black)/high (red) responses. Distortion is  $\sim 0.002\%$  across the linear portion of each passband with an A-wtd S/N of  $93\text{-}97\text{dB}$  and a moderate  $40\text{-}160\text{ohm}$  output impedance. PM



runs somewhere – either preamp to crossover, or crossover to power amps – it would seem sensible to carry balanced connections throughout.

The speakers, meanwhile, from Co Durham-based Kudos Audio, are the middle model in the three-strong Titan floorstander lineup. Standing  $105\text{cm}$  tall in a choice of four wood veneers or satin white, they're a two-way design using drive units developed by Kudos in conjunction with specialists SEAS. The SEAS/Kudos Crescendo K3 tweeter uses a  $29\text{mm}$  fabric dome, and has been customised for use in the Titan loudspeakers, while the mid/bass units have a  $22\text{cm}$  double-coated paper cone driven via a  $39\text{mm}$  voice coil with copper shorting ring and aluminium phase plug.

Yes, that's 'units', for although the 707 seems only to have a single low-frequency driver in fact it's an isobaric (equal pressure) design, with a second driver coupled behind inside the cabinet. This vents through a fixed boundary bass reflex port at the bottom of the speaker, which sits on a plinth complete with high-quality – and very fine-looking – spiked feet.

Faced with an alarming battery of equipment to cover in a single review a decision was taken to simplify things as far

as possible, auditioning the speakers first in passive mode and then switching to active.

## MAGNIFICENT SEVEN

Set up in editor PM's listening room, the front-end was the familiar Melco music library/dCS Vivaldi One combination [HFN Feb '18], here used purely as a line source into the Exposure 5010 preamp. In total we had no fewer than seven (Exposure) boxes between source and speakers, comprising the preamp, crossover and power supply, and four monoblocks. Only two of the power amps were used for the initial passive listening session, with the



  
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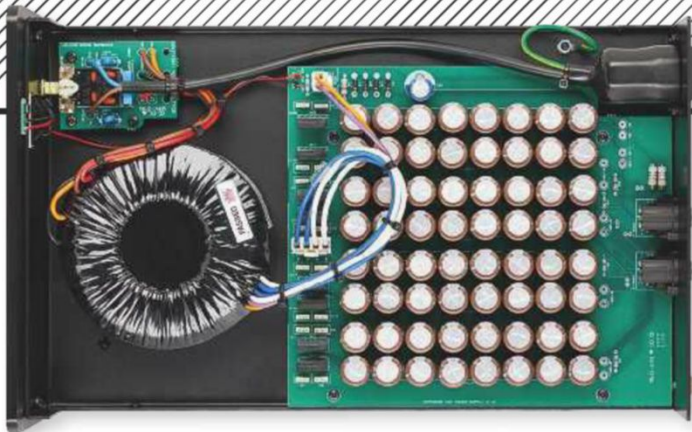
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**LEFT:** Exposure's VXN power supply includes 64x 1000µF reservoir capacitors in a low-ESR configuration with two bridge rectifiers feeding two separate 30V DC outs for the VXN crossover

## TONY BRADY

Tony Brady, Exposure's Chief Designer for over 20 years, has a penchant for active loudspeakers. 'I've been using a custom active system for decades, currently comprising seven separate boxes, including a phono stage', he says. So when Kudos came calling, Tony was ready for the challenge.

'Kudos already had solutions from Linn and Devialet, but these were DSP-based, so they were looking for a more traditional "analogue" approach by way of choice for the enthusiast. Kudos supplied us with the basic acoustic parameters for its range and we developed the electrical crossovers from here.'

In practice, the VXN is designed to emulate the existing passive crossover rather than provide any secondary correction for phase shifts or smaller peaks and dips in amplitude response. 'The VXN is based on my own crossovers that I designed for my Linn Isobarik speakers – it's a solution that's been going strong for 23 years!', says Tony. 'The final design here has more in common with the 5010 preamp while the PSU is also intended to power our new VXN phono stage [not yet released].'

'The VXN crossover is adaptable across the entire Kudos Titan range, with plug-in boards to accommodate everything from the two-way 505 to the three-way 808. For future-proofing, the slopes may be adjusted up to 18dB/octave at the factory to suit the loudspeaker in question. But this is early days and we are certainly looking to work with other loudspeaker manufacturers.'



other two powered up but idling ready for their use in active mode.

Initial impressions when running the system in passive mode were good, with the set-up delivering rather persuasive soundstage focus with Claire Martin's 'tangofied' take on the 'The Man Who Sold The World', from her *Time & Place* album [Linn AKD 423; 192kHz/24-bit]. True, Martin's voice sounded a little brash, and the piano perhaps rather too jangly, but the accompanying cellos and percussion were well delineated and had good attack and drive.

This same 'fine, if not outstanding' impression carried through to ELP's 'Still... You Turn Me On' from *Brain Salad Surgery* [Sanctuary/Universal 5308195; DSD64], which saw the Exposure/Kudos system doing all the hi-fi stuff well enough, but lacking a bit of the rasp of those synths. Winding up passive listening with the exquisite jazz of the Espen Eriksen Trio [*Never Ending January*; Rune Grammophon RCD 2173], it was noticeable that the drums had a slightly ponderous 'playing on plastic barrels' quality to them, and as tracks built there was a hint of a battle going on between

the musicians, making instrumental lines somewhat hard to follow, and the listening experience a bit laborious.

### ON THE MONEY

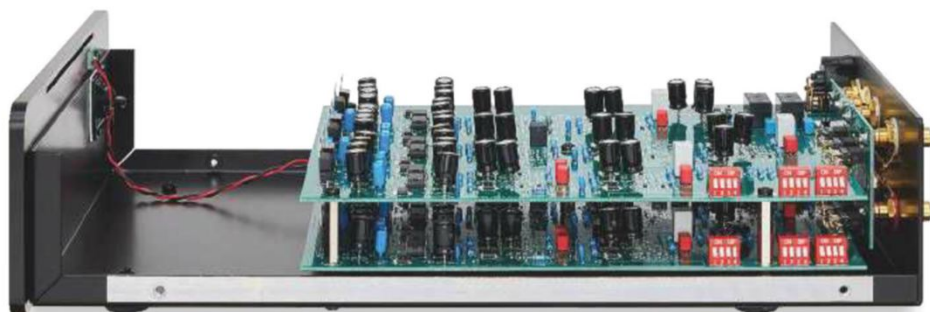
These characteristics were even more pronounced with the recording of Nick Bicât's *Under The Eye Of Heaven* [Virgin Classics LCCOD 1] by the London Chamber Orchestra.

The combination of synthesised percussion and a 1989 digital recording means that while the bass is fast, tight and reasonably extended, driving the music, the top-end – and in particular

that percussion – can sound pretty savage. This in turn gives the whole recording a brash, abrasive edge, which was not soothed when using the Exposure/Kudos system in passive form.

Switching over to active working, the benefits should have been obvious – better drive for each unit, no intermodulation between the drivers and the small matter of having an extra couple of power amps in harness, each of the four now handling a specific frequency band. And you know what? All those gains were up there on the

*All the hoped-for gains were up there on the soundstage'*



**ABOVE & LEFT:** Dual mono crossover boards are configured for two- or three-way operation. DIP switches [red] set the input level matching, not crossover points. Umbilicals carry DC power to two sockets



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## KUDOS AUDIO TITAN 707



**LEFT:** Supported on a spiked 'port optimising plinth' the 707 includes a passive crossover addressed by a single set of 4mm sockets with direct bass/treble inputs above for active operation

gutsy percussion opening the track lost some of its overblown, blurry character, and provided a thrilling impetus behind Eriksen's first piano figures, which is just as it should be.

### EXTRA PUNCH

The same was true with Claire Martin and her cellos, with the inner details of the track revealed, and the interweaving tango rhythms slinking behind her piano and voice to winning effect, helped too by the subtlety with which the minimal percussion is woven into the performance. Keith Emerson's synths gained much better texture on the ELP track – and indeed throughout the whole album – while Carl Palmer's drumming took on some extra punch, sounding faster and leaner, and the movement of Greg Lake's fingers on the guitar strings was also brought out more clearly.

I played the album through, and while I wasn't sure whether the odd errant electronic switching glitch from the synths was characterful or distracting, the fact that they were apparent showed how much more information the Exposure/Kudos system was unearthing in its fully active guise. Indeed, the active ensemble manages to combine much better weight with more control and drive, opening up tracks to reveal more nuance and detail while creating a much easier, more accessible musical experience. 🎧

soundstage, not only grabbing the Titan 707s and whipping them into shape, but making it immediately apparent where all the money was channelled – straight into creating a more convincing performance. The Bicât recording filled out in the low frequencies, while that savage top-end was better controlled, not smoothed out or glossed over, and thus a more engaging listen.

With the Espen Eriksen track, the extra sizzle on the percussion was not only obvious but much more realistic, while the three instruments were much better presented and easier to follow. They were now playing together rather than fighting for attention, while the sense of 'strike and decay' on both piano and bass was delicious. In particular, the

### HI-FI NEWS VERDICT

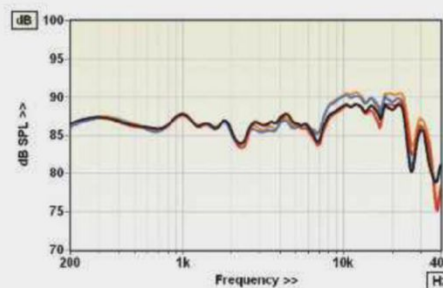
**Crisper, clearer, faster and more detailed: that sums up the gains on offer when taking this Exposure/Kudos system active, the set-up both gaining control and losing some of the restraint heard in passive mode. Best of all, it goes louder cleaner without urging restraint over volume. So it's a win for the active iteration here – provided you have the space, the shelves and the mains sockets for all those black boxes!**

Sound Quality: 86%

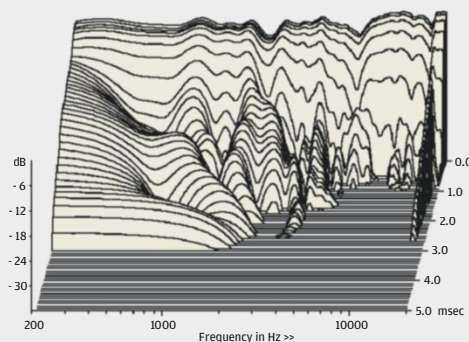


Active loudspeakers don't come much simpler than the Titan 707, in significant part because it provides for operation in either active or passive mode. Indeed, its 'two-pack' active option with Exposure electronics evinces a notably conservative design approach. In passive mode, the 707 is specified as having a sensitivity of 89dB and nominal impedance of 6ohm. Our measured pink noise and music sensitivities of 86.9dB and 86.6dB SPL at 1m for 2.83V input indicate that 87dB is more realistic, and although the passive 707 isn't a notably difficult speaker to drive, the 3.8ohm minimum impedance we recorded means it is better thought of as a 4ohm design. Low-frequency impedance phase angles are well controlled, so the minimum EPDR is 2.1ohm/402Hz – better than the 1.7ohm we typically measure – but dips to 2.4ohm/94Hz and 2.5ohm/36Hz complicate the issue.

Forward frequency responses, measured on the tweeter axis for both passive and active operation, are characterised by a shelved-up treble [see Graph 1]. However, this is more prominent in the active version – so perhaps tweeter gain should be dialled back in the active crossover. Note, though, that active operation lessens the dips at 2.3kHz and 6.9kHz, suggesting improved driver integration. Response errors are  $\pm 2.5$ dB and  $\pm 2.9$ dB in passive mode, rising to  $\pm 3.2$ dB and  $\pm 3.5$ dB in active mode (all 200Hz-20kHz). Pair matching over the same frequency range is  $\pm 1.0$ dB in both modes. Bass extension is fair at 45Hz ( $-6$ dB re. 200Hz), with the CSD waterfall [Graph 2] revealing what are probably bass/mid driver breakup modes in the low treble, these largely undimmed by active operation. KH



ABOVE: The 707's response shows a treble lift above 7kHz – brighter still in active mode [blue/orange traces]



ABOVE: Driver resonances are visible through 3-6kHz and although mild are unchanged in active mode

### HI-FI NEWS SPECIFICATIONS

Sensitivity (SPL/1m/2.83V – Mean/IEC/Music)	87.6dB / 86.9dB / 86.6dB
Impedance modulus: minimum & maximum (20Hz–20kHz)	3.8ohm @ 144Hz 27.5ohm @ 2.4kHz
Impedance phase: minimum & maximum (20Hz–20kHz)	$-34^\circ$ @ 73Hz $54^\circ$ @ 1.2kHz
Pair matching/Resp. error (200Hz–20kHz)	$\pm 1.0$ dB / $\pm 2.5$ dB/ $\pm 2.9$ dB
LF/HF extension ( $-6$ dB ref 200Hz/10kHz)	45Hz / 33.2kHz/34.1kHz
THD 100Hz/1kHz/10kHz (for 90dB SPL/1m)	0.3% / 0.1% / 0.8%
Dimensions (HWD) / Weight (each)	1050x298x370mm / 50kg

# Gold Note Mediterraneo

Inspired by the Florentine Renaissance, this flagship turntable aims to combine avantgarde technological innovation with sumptuous Italian aesthetics

Review: **Jonathan Gorse** Lab: **Paul Miller**

**T**hink of Italy and one pictures a nation blessed with effortless style, eye-catching design and a strong sense of its own history. The Gold Note Mediterraneo boasts all these qualities, sitting atop the company's five-strong turntable range and costing £4990-£5445 (depending on finish) with the B-5.1 tonearm included. As well as the walnut plinth of our review sample, the deck is available in black lacquered MDF, white, and as a truly glorious alternative coated in an exquisitely-textured 24k gold foil. Sleek-looking and superbly crafted, when it comes to the spouse acceptance factor it's on a par with having George Clooney move in as a lodger.

The plinth comprises three layers, the base section being a 60mm-deep, curvaceous laminate of Italian walnut chosen, says Gold Note, for its elasticity, strength and high density. Above this sits a 3mm-thick steel plate, designed both to lower the deck's structural resonance and add reinforcement. Finally, this is capped by a 20mm-deep slab of polished black acrylic that forms the turntable's top plate, while simultaneously acting as a magnet for dust and fingerprints.

The turntable as a whole weighs a considerable 25kg and sits on three inverted black cone feet with three dished brass cups provided to prevent their sharp pointed tips causing damage to your hi-fi furniture. An acrylic lid is also supplied, and this is fully detachable.

## BRONZE 'N' BRASS

As for the platter, this is 45mm thick and, in an effort to dampen unwanted vibrations, is made of a Delrin/POM-type polymer that Gold Note calls Sustarin. On top of the platter sits a good quality felt mat, with records held firm, and minor warps gently teased out, by an unthreaded but heavy LP

weight. The bearing comprises a hardened chrome steel spindle that rotates within a bronze sleeve and is supported on a 5mm tungsten ball-bearing on a brass seat.

Drive is delivered to the platter's periphery via a narrow-section polyvinyl belt from the deck's Swiss-made high torque 12V AC synchronous motor, and this is powered by Gold Note's compact PST-1 off-board supply. It was this configuration that was used for most of the reviewing, although the optional dedicated PST-10 turntable power supply was also pressed into service. Costing £864, this more advanced PSU includes no fewer than four transformers, one of which is used as part of a choke filter, and comes complete with a silver umbilical that connects to the turntable. The PST-10 features a striking milled aluminium case with stylish diagonal cooling vents and is

available in black, silver or gold finishes to suit a variety of decors.

## UP IN ARMS

On the front left of the acrylic top plate are two low-profile silver buttons for selecting 33.33rpm and 45rpm speeds.

These buttons also stop the platter rotating while a further sequence of button presses permits the user to fine-tune the rotational speed [see PM's Lab Report, p45].

The supplied 9in B-5.1 tonearm is entirely

handmade in Italy and features 4N OFC Litz-style internal wiring terminated in a 4-pin DIN plug. The armtube and bearing housing are all machined from aluminium, the latter incorporating four high-precision steel bearings made in Germany by GRW. In fact, Gold Note has two tonearms in its catalogue, the B-5.1 sitting below the

*'The streets of Glasgow have never felt so warm or inviting'*



**RIGHT:** Top-down view highlights the 9in B-5.1 tonearm which uses four micro ball-bearings by GRW (Germany). The AC motor is Swiss and drives the 45mm-thick POM platter via a round-section belt. Felt mat is supplied but optional



B-7 Ceramic which, as its name suggests, features ceramic ball bearings also sourced from the specialists at GRW and, of course, offers a possible upgrade path.

Setting up the deck is straightforward – there’s no suspended subchassis to wrestle with here – and it’s also easy to use. The steel counterweight system found on the B-5.1 can accommodate cartridges with a mass up to 15g so the EAT Jo N°5 pick-up [HFN Dec ’18] used for the review was bang on the weight limit for the arm.

Meanwhile, bias compensation is effected by the usual thread and weight system, and adjusted by moving the nylon thread along a horizontal scale at the back of the arm. As for VTA, this is changed by raising or lowering the arm in its mounting plate – easily achieved by loosening a 1.5mm hex bolt on the side of the arm mounting collar. But be warned, the bolt

head is tiny and vulnerable to damage, so audiophiles should resist the temptation to crank up the torque on this occasion!

### **ROCK SOLID**

With the Gold Note Mediterraneo feeding a PS Audio Stellar phono stage [see p46], and Naim NAC82/NAP250 amps driving a pair of ATC SCM40 loudspeakers, it was apparent from the get go that this turntable’s calling card is rock-solid stability. This is not to say it’s strictly neutral in its presentation, because it’s not, instead painting a sonic picture that brought the sun-drenched tones of a Canaletto painting to mind. As such, it conjures up music in a manner that is deeply appealing but, like the famous 18th century Italian painter, draws you into its own vision of the world.

Spinning up Deacon Blue’s second album *When The World Knows Your Name*


**ABOVE:** Seen here with walnut plinth, other options include black lacquered MDF and 24k gold foil. The chassis is a laminate of wood, stainless steel and a polished acrylic top plate

[CBS 463321 1], the train-beat snare rhythm that opens ‘Queen Of The New Year’ showed the deck’s delivery to be warm but powerful, even if the strike of the sticks lacked the sheer staccato attack and impact heard via the very best vinyl spinners. Meanwhile, the bass guitar was appropriately plump and full while the vocals of Ricky Ross were conveyed with a wonderful warmth and richness.

As for the stereo image, this was expansive, the deck setting up a wide and deep soundscape within which instruments were securely defined with a reach-out-and-touch presence. On ‘The World Is Lit By Lightning’, percussive effects and rim-shots careered around the room, drawing the ear right to the edges of the soundstage. Incisive it wasn’t, but bathed in the Florentine glow of the Mediterraneo, the streets of Glasgow described on the album have never felt quite so warm and inviting.

### **SOUNDS SWELL**

The Concertgebouw in Amsterdam is undoubtedly one of the finest concert halls in the world and its resident orchestra performing Beethoven’s Symphony No 6 under Bernard Haitink [Philips 420 541-1] is a recording in which the string section enjoys exceptional sweetness.

The Mediterraneo fully captured the delightful string tones during the quieter sections, while the majestic swells possessed a wonderful acoustic ambience without ever sounding strident or harsh. This recording is notable for its 

## **TUSCAN HERITAGE**

Describing itself as ‘a leading designer, developer and manufacturer of luxury high-end stereo systems’, Italian company Gold Note was founded in 2012 by current CEO Maurizio Aterini, his wife Elena Basciano and business partner Alessio Oronti. Headquartered in Montespertoli, Tuscany, it first made its mark with the Bellagio Conquest turntable, a 1250mm-tall affair boasting a choice of no fewer than 13 different curved plinths and a 270mm-long platter spindle. This was followed in 2016 with the PH-10 phono stage, featuring two inputs, six EQ curves and a TFT colour display. Not a company to rest on its laurels, in the same year it launched a new flagship product in the form of the XS-85 loudspeaker, each cabinet standing 1.28m tall and housing five drivers.

Gold Note’s first integrated amp followed in 2018, the IS-1000, which promised to bridge the gap between a traditional standalone integrated amplifier and an all-in-one music system thanks to its ability to stream music over a home network. Then in 2019 came the DS-10 DAC/streamer/headphone amp and analogue preamp. Now with a 17-strong team, including four designers, the company builds all of its loudspeakers and electronics in-house, with most of the components sourced from local suppliers.



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## TURNTABLE

### GOLD NOTE MEDITERRANEO



**ABOVE:** Supported on three inverted cone feet, the Mediterraneo accepts an 18V feed from a supplied AC/DC unit or from the optional (£864) PST-10 outboard PSU [see below]. Phono leads use a standard DIN connection into the base of the arm

lack of pinpoint imaging, but the orchestra sounded just as I would imagine it in the hall, ranged across a wide concert stage without undue spotlighting of individual instruments. Despite this, a little fine detail was lost to the warm euphony of the deck's presentation.

#### POWER PLAYS

Piano is always a fine test of a turntable's pitch stability and even with the standard PSU in use there was a sense of exemplary control and grip on the 'Living Stereo' release of Rachmaninoff's *Rhapsody On A Theme Of Paganini* with the Chicago Symphony Orchestra [LSC-2430]. Switching from the standard PSU to the company's optional PST-10 brought no immediate benefit to speed stability, but did prompt a little more detail to be revealed in the recording. The sense of hammers hitting piano strings, the sheer mechanical force and impetus of the playing and the rich tonality of the stringed instruments in 'Variation 18' all reached a higher level with the PST-10 at the helm.

Dynamic light and shade improved too, so the gradations and accents in Rubinstein's performance were conveyed with a little greater authority – all the way from *pianissimo* to *fortissimo*. This is one of the most stirring performances in

classical music, and with the PST-10/Mediterraneo/B-5.1 front-end it truly started to come alive.

Van Morrison's 1989 album *Avalon Sunset* [Polydor 839 262-1] also demonstrated the potential of Gold Note's flagship turntable with its power supply upgrade. On the opening track 'Wherever God Shines His Light' Morrison's voice sounded that bit more transparent, or that bit less syrupy, while the punchy drum and percussion sounds were far more crisply delineated. Then came the tympani playing softly in the background of 'Contacting My Angel', all conveyed with wonderful warmth and solidity, while the electric and acoustic guitars enjoyed fine clarity and dynamics.

Finally there was the glorious brass section on 'I'd Love To Write Another Song'... Bold, occasionally strident (just as brass should sound) the fabulous exuberance of its interjections propelled the song along with real swing, making for a memorable listening experience. ☺

#### HI-FI NEWS VERDICT

The Gold Note Mediterraneo is a fine flagship turntable from this Tuscan firm. Unlike some other turntables it doesn't demand learning the black arts of suspension set-up or any other arcane optimisation. It's a fit-and-forget vinyl spinner for those seeking excellent build, elegant looks and sumptuous sound quality. Put your feet up, splash Aperol Spritz on ice and admire the Florentine Renaissance.

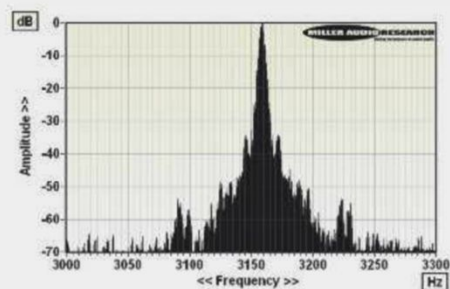
Sound Quality: 83%



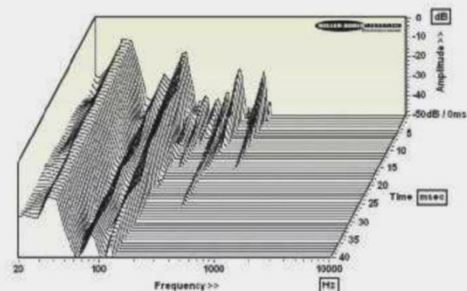
**ABOVE:** Rear of optional PST-10 PSU with 18V, 26V and 34V DC output

Despite the physical size of the 45mm-thick platter, the Sustarin (POM) polymer is not especially dense and so the start-up time remains pleasingly rapid at around 4-5 seconds. As supplied, the deck was running a little fast at +0.25% which is not audible and certainly not atypical of a new AC motor system that will likely slow with age. The W&F spectrum is complex, for while very low rate drift is thankfully avoided (this is not a DC motor, after all) there are low and higher-rate flutter sidebands at  $\pm 13\text{Hz}$ ,  $\pm 58\text{Hz}$  and  $\pm 67\text{Hz}$  [see Graph 1, below] that contribute to a peak-wtd figure of 0.1%. These peaks also appear on the Mediterraneo's rumble spectrum [not shown], but measured with a coupler the  $-68.7\text{dB}$  (DIN B-wtd) figure is a little below average for the best of today's bearings. Nevertheless these vibrations are very effectively attenuated by that POM platter, reducing through-groove rumble and noise to just  $-71.4\text{dB}$  and down slightly further still to  $-71.9\text{dB}$  with the felt mat installed.

Meanwhile the resonant modes of the partnering B-5.1 tonearm are equally well defined but also high Q in nature: sharp, energetic but swiftly damped between 850Hz-1.3kHz where the appendages tend to 'sound off'. Better arm tube damping would certainly benefit the design, but the main bending mode occurs at a high 160Hz which is an indication of the inherent rigidity of the 9in anodised aluminium arm wand. This is followed by higher-Q harmonic/torsional resonances at 280Hz and 375Hz [see Graph 2]. Overall effective mass is in the mid-range at 11g and, with the 108g stainless steel counterweight, suited to cartridges in the 6-15g bracket. The bearings offer low <10mg friction and zero detectable play. PM



**ABOVE:** Wow and flutter re. 3150Hz tone at 5cm/sec (plotted  $\pm 150\text{Hz}$ , 5Hz per minor division)



**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	33.42rpm (+0.25%)
Time to audible stabilisation	5 seconds
Peak Wow/Flutter	0.03% / 0.07%
Rumble (silent groove, DIN B wtd)	-71.4dB (-71.9dB with felt mat)
Rumble (through bearing, DIN B wtd)	-68.7dB
Hum & Noise (unwtd, rel. to 5cm/sec)	-62.4dB
Power Consumption	3-5W (2W idle)
Dimensions (WHD) / Weight	470x210x360mm / 25kg

# MSB Technology Discrete

The best high-end DACs often employ entirely bespoke converter technologies rather than off-the-shelf chipsets. We look at the first rung on MSB's range of 'ladder DACs'  
 Review: **Nick Tate** Lab: **Paul Miller**

**B**ased in Silicon Valley, California, Jonathan Gullman and his brother Daniel have become major players on the international hi-fi scene, courtesy of their fine-sounding and technologically innovative range of MSB digital-to-analogue converters. For 15 years this team has turned out increasingly flexible products, and more recently the range has expanded to satisfy a wider group of potential customers.

The company now offers four models in its product portfolio, each with the option of network and MQA-compatible USB modules that slot into rear-panel bays. As you go up the range you get more functionality and more sophisticated analogue outputs, power supply and clock options. The Discrete DAC you see here is the entry-level model, a single-box solution with the potential for some limited upgrading at a later date.

Costing £9950, it's an attractive product at the price, offering more than a flavour of the costlier £19,500 Premier DAC [*HFN* Aug '19], albeit without its Premier Clock and RCA outputs and one less user-replaceable slot on board.

## ENGINE ROOM

Being the base model, the Discrete DAC doesn't have any special clock upgrade options and comes fitted with two Prime DAC modules, which are MSB's basic digital conversion engine [see PM's boxout, p47]. PCM inputs from 44.1kHz to 3.072MHz/32-bit are accommodated, plus up to DSD512 with DSD via DoP supported on all inputs. These cards sit inside a beautifully anodised, full-width CNC-machined aluminium case, which is fronted by the company's trademark large LED display. This is slaved to the master clock to reduce electrical interference with the audio board. The large volume knob on the right

**RIGHT:** MSB's modular architecture exposed – two 'Prime DACs' [lower right and see boxout, p47], core DSP [lower left] and [right to left] USB interface, network module, electrical/optical S/PDIF inputs, AES/EBU, and analogue preamp

of the fascia offers volume control in 1dB steps, but this can be disabled in the menu – which also offers automatic switch-off for the display and adjustable brightness.

The review sample came with the £1590 galvanically-isolated, quad-rate DSD/768kHz/32-bit USB input module fitted. This was easy to select on my MacBook Pro laptop running the latest version of Audirvana playback software. Also fitted was the 'Renderer module v2', costing £1950 and known to most of us as a network streaming card. Again this worked seamlessly via a wired Ethernet connection, and also functions as a Roon endpoint.

The Discrete DAC has various power supply options. As standard it comes with one Discrete Power Supply box but two can be run simultaneously [see picture, p47], and most of the auditioning was done this way. You can buy a second Discrete Power

Supply for £1450 with the unit when new or simply add it afterwards. If you're only using the one, you need to plug in the supplied jumper block, on the rear panel.

In addition, the unit has a range of fixed digital inputs, comprising one coaxial, two optical Toslinks and one XLR, plus one clock word-sync port. No unbalanced RCA outputs are fitted to this DAC, but the package came supplied with balanced XLR-to-RCA adapters for those who don't have amplifiers with

this option. The DAC itself comes in a choice of silver or black finishes, but the power supplies are only available in black.

*'Its lilting groove was nothing short of hypnotic'*

## QUIRKY ROMANCE

Overall, the Discrete DAC is a very nice package, but it's quite quirky and that may either attract prospective purchasers, or put them off. The 432x51x305mm (whd),





8.2kg aluminium case is a lovely piece of work, and the large dot-matrix display is easily readable across the room – albeit not especially informative. In normal use it defaults to the volume setting, preferring only to tell you the sample rate when initially receiving a new digital input.

The lo-res display also makes menu set-up fiddly because it doesn't have enough space to display words. Many competing DACs will have a more comprehensive display at this price and, more commonly still, an app designed for intuitive access via smartphone and/or tablets. On the plus side, the Discrete does include a decent remote control [see p49].

### MISSION CREEP

This is a top-tier DAC, albeit one with a sound that's quite distinct from that of the other big beasts in the digital converter jungle. In my experience, the pricier these things get, the more impressive they tend to sound – there's a lot of 'revelation' where you suddenly hear things you hadn't

before with lesser designs. However, on first hearing the Discrete DAC, it doesn't quite give you this 'surprise and delight' experience, instead preferring to creep up behind you and beguile you to the point where it's hard to go back to anything else. Its inherently 'musical' sound gently works its way into your affections, rather than giving a definitive 'dem room thrill'.

As I mentioned, my listening was mostly done with two of MSB's PSU boxes attached, as provided by the UK distributor. The good news is that there wasn't a dramatic drop-off in sound quality when going down to the single PSU solution, and adapter, that comes as standard. I found a slight loss of focus and image precision, but it was subtle at best. The addition of the second Discrete Power Supply improves things, but not dramatically.

The Discrete's disarmingly subtle and detailed delivery was most apparent on complex, layered music such as 'Watcher Of The Skies' by Genesis [Foxrot; Virgin

**ABOVE:** 119px white LED dot-matrix display is readable from a distance and dimmable. Incoming bit/sample rates and input are shown along with volume and limited menu items

Japan VJD-28008], in this instance arriving via the coaxial digital input. With many high-end DACs, it's not unusual to be drawn to this recording's arid and 'technical' sound that's typical of early '70s prog rock. Not so here, for instead I found myself relaxing into the track and steadily becoming more immersed in the music.

### CRUNCH TIME

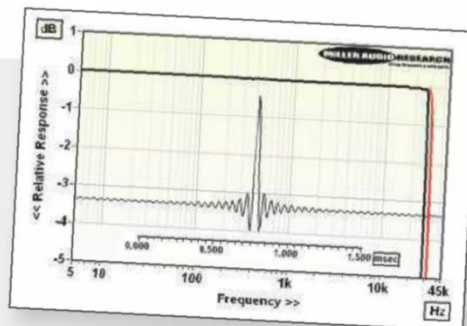
This is largely down to the Discrete DAC's ability to separate out the different strands of a mix so effortlessly. You can lock onto Steve Hackett's guitar work or Peter Gabriel's vocals, and each appears distinct from one another. Yet this is done without spraying detail at the listener or isolating instruments and performers to the point of their interplay or harmony being lost.

The sound is revealing but utterly unforced – absolutely not 'hi-fi' in the parochial sense – so this DAC doesn't push a song's beat especially hard at the listener. In this instance, Genesis' opening drum work isn't forced at you, instead it sits back slightly which, in turn pulls you deeper into the mix. Then you find yourself focusing on the gently percussive way the electric organ is being played, and the great phrasing of the vocals. This is tied to the DAC's adept handling of

### PRIME TIME

MSB's entry-level Discrete DAC employs just two of its gold-anodised 'Prime DAC' modules, unlike the Premier product [HFN Aug '19] that features four in a dual-differential configuration. These sealed modules employ precision-matched resistor ladder networks that convert incoming 'bits' into sequential steps of current. In this R-2R, or ladder-style, DAC the LSB (Least Significant Bit) is represented by the smallest current source, with each subsequent 'bit' requiring twice the output of the last (a ratio of 1:65,536 over 16-bits). The relative 'size' of each resistor must be exact and precise if each step in conversion is to be truly monotonic, otherwise errors will occur and both linearity and distortion will suffer at low (digital) signal levels.

Rising to the challenge, each Prime DAC module includes a discrete ladder DAC that's designed, manufactured and trimmed by MSB's engineers. The partnering digital filter is a high-order linear phase type with unusually long pre/post echoes [see impulse, inset Graph]. It's executed in DSP to deliver a 30kHz cut-off for all sample rates between 88.2kHz and 768kHz, but each rate is handled separately so there are subtle differences in HF response [see inset Graph – 96kHz, black trace; 192kHz, red trace]. PM





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## MODULAR DAC



**ABOVE:** Our Discrete DAC was supplied with two PSUs, the 2x2 DC supplies carried via two umbilicals. Input modules included USB-B (768kHz/32-bit; DSD512), coaxial/optical (S/PDIF) and wired Ethernet (768kHz/32-bit; DSD256 – removed in this picture). Balanced preamp outs may be configured for fixed or variable output

dynamics and its ability to capture the 'light and shade' in the playing, carrying accents well. That crunchy, overdriven lead guitar sound was given great impact, for example.

Even with pop material, and more compressed recordings in general, these qualities remain very much in evidence. The Fun Lovin' Criminals' 'Love Unlimited' [100% Columbia; Chrysalis 7243 4 97056 2 3], has a lovely lilting groove that sounded downright hypnotic though the MSB Discrete DAC, more so than most rivals in fact. Both the bass guitar and snare drum could be heard playing off the rhythm guitar brilliantly, with a lovely floating hi-hat to ice the musical cake.

### SWEET 'N' LOW

Via the network input fed from a Western Digital NAS drive by Ethernet cable, the Discrete DAC didn't change its character one bit. It has a slightly warmer, less 'well lit' tone compared to rivals like the dCS Bartók [HFN May '19], so where modern electronic music such as Moby's 'Honey' [Play; CDStumm 172] can sound quite dry – or strident even – the Discrete DAC offers only musical honey. So here, where the hi-hat sound was smooth and subtle, and the snare drum relatively subdued, my attention was instead drawn to the bass. The looped piano cadence that runs right through the song was tonally fuller than expected,



**LEFT:** The partnering alloy remote offers (rotary) volume control, input selection and far easier access/navigation of the config. menu

with real weight to the bottom end. Its rich timbre was impressively carried too, showing that this DAC is smoother and fuller than many. It's wrong to describe it as being more 'analogue' sounding, but it certainly doesn't have the shiny, processed feel of many digital converters.

Spatially, it proved highly impressive too. Via the USB input from my MacBook Pro, a hi-res PCM version of Chic's 'My Forbidden Lover' [Risqué; Atlantic AMCY-118] was laid out beautifully before my ears. This DAC typically delivers a wonderfully spacious stereo soundstage, with all the instruments located with pin-point precision.

Depth perspective is no less impressive, so while Lonnie Smith's *Think!* [Blue Note CDP 7 84290 2] is a two-track jazz recording from the late-'60s, this DAC made it sound truly three dimensional. Although the solo instruments themselves were pushed quite forward, the sound of the recording venue, with all its resonances and reverberation, was imparted brilliantly. The result, as ever with the MSB Discrete, was a consummately natural sound that was a joy to behold. ☺

### HI-FI NEWS VERDICT

With its vast product portfolio, MSB's model range can seem bewildering, and hard to know where to begin. The entry-level Discrete DAC answers this question elegantly – it's a great first step on this company's own stairway to digital audio heaven. It ticks the boxes that most audiophiles will ever need – excellent sound, upgradability and stylish, beautiful build. Hear it if you possibly can.

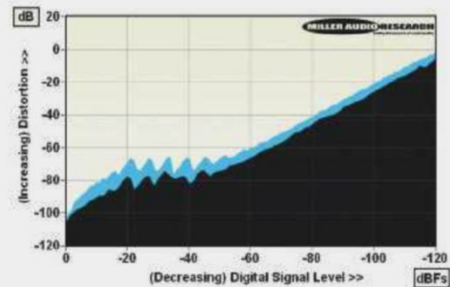
Sound Quality: 89%



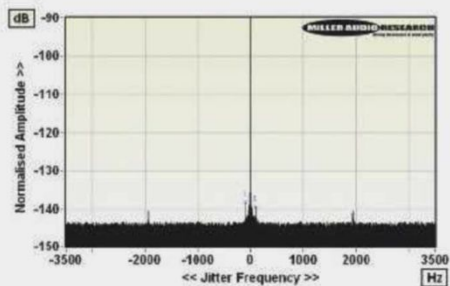
## MSB TECHNOLOGY DISCRETE

Tested in default 'high' output mode, with the volume set to '100', the Discrete delivers a maximum 3.32V from a 142ohm source impedance (balanced XLRs). Although its volume extends to '106', digital clipping occurs at '101' with a full scale 0dBFS input, so '100' is the safe maximum setting. The A-wtd S/N ratio is very generous at 114dB and low-level linearity good to within ±0.2dB over a full 100dB dynamic range regardless of S/PDIF, USB or network input. In this regard, the Discrete mirrors the performance of many top-end DACs, but in others it very specifically mirrors that of the costlier Premier [HFN Aug '19]. There are subtle differences in engineering between the Discrete and Premier but the biggest lies in the number of R-2R DAC modules employed: four in the Premier, two in the Discrete.

Distortion is low enough at 0.0016-0.014% (0dBfs, 20Hz-20kHz) with a minimum of 0.0015-0.006% occurring at -10dBfs but while these figures are identical between the models, the complement of harmonics is very different – almost purely 3rd harmonic in the Premier but spread across 2nd-7th harmonics in the Discrete. However, the distinctive pattern of distortion vs. digital level [Graph 1] once again reveals the unique behaviour of the Prime DAC's R-2R network with its characteristic 'ripples' between -15dBfs and -50dBfs. Jitter rejection [see Graph 2, below] is also world-class in the Discrete which suppresses any sidebands to <10psec. Once again, this is a function both of MSB's custom clocking and linear phase digital filter [see boxout, p47] which also delivers a full >130dB stopband rejection and sets the ultimate freq. response of the various incoming sample rates. Files at 44.1/48kHz extend to -0.03dB/20kHz, 96kHz files reach -1dB/27kHz and 192kHz inputs roll off at -1dB/30kHz. PM



**ABOVE:** Distortion vs. 48kHz/24-bit digital signal level over a 120dB dynamic range (1kHz, black; 20kHz, blue)



**ABOVE:** High resolution 48kHz/24-bit jitter spectrum via S/PDIF/USB/network inputs. Jitter is just 6psec

## HI-FI NEWS SPECIFICATIONS

Maximum output level / Impedance	3.32Vrms / 142ohm (high o/p)
A-wtd S/N ratio (S/PDIF / USB)	114.1dB / 114.2dB
Distortion (1kHz, 0dBfs/-30dBfs)	0.0014% / 0.0078%
Distortion & Noise (20kHz, 0dBfs/-30dBfs)	0.0016% / 0.028%
Freq. resp. (20Hz-20kHz/30kHz)	+0.0 to -0.02dB/-0.8dB
Digital jitter (48kHz / 96kHz)	6psec / 6psec
Resolution (re. -100dBfs / -110dBfs)	±0.2dB / ±0.5dB
Power consumption	14W (1W standby)
Dimensions (WHD) / Weight (+ 2xPSU)	432x51x305mm/8.2kg + 5kg

# Audio Analogue Bellini/ Donizetti Anniversary

While the industrial design is familiar, the Bellini preamp and Donizetti power amp boast entirely reworked internals for this 'Anniversary' guise. And power is prodigious!  
 Review: **Adam Smith** Lab: **Paul Miller**

It was back in 1995 that the Italian brand, Audio Analogue, launched its first product – the Puccini amplifier. A no-nonsense stripped-down integrated, it offered little more than an input selector and a volume knob, yet its no-frills approach won many fans. Subsequently the company has built a well-deserved reputation for providing a range of fine-sounding and stylish-looking amplifiers, and has also taken to the CD player market with models such as the Maestro and Crescendo.

Then, to celebrate its 20th anniversary in 2015, Audio Analogue decided to take a fresh look at some of its most noteworthy amps, redesigning them from the ground up to create a new flagship range. The results were the Maestro Anniversary [HFN May '16] and Puccini Anniversary [HFN Jun '16] integrated amps, plus the newer £4999 Bellini and £8999 Donizetti Anniversary pre/power amps we have here.

## CONTROL FREAK

The Bellini Anniversary preamplifier is a line-only design that weighs in at a not inconsiderable 12kg, its front panel a beautifully sculpted block of metal that sports a large central multi-purpose control flanked by no fewer than 22 LEDs. The six to the left of the control indicate which input has been selected or whether the unit is in standby mode, while the 16 to the right show volume level. The master control covers all of the unit's functions, but does take some familiarisation.

The control is pressed briefly to bring the unit out of standby mode, after which it can be rotated to change volume. Press it for three seconds to change between inputs and for five seconds to turn the

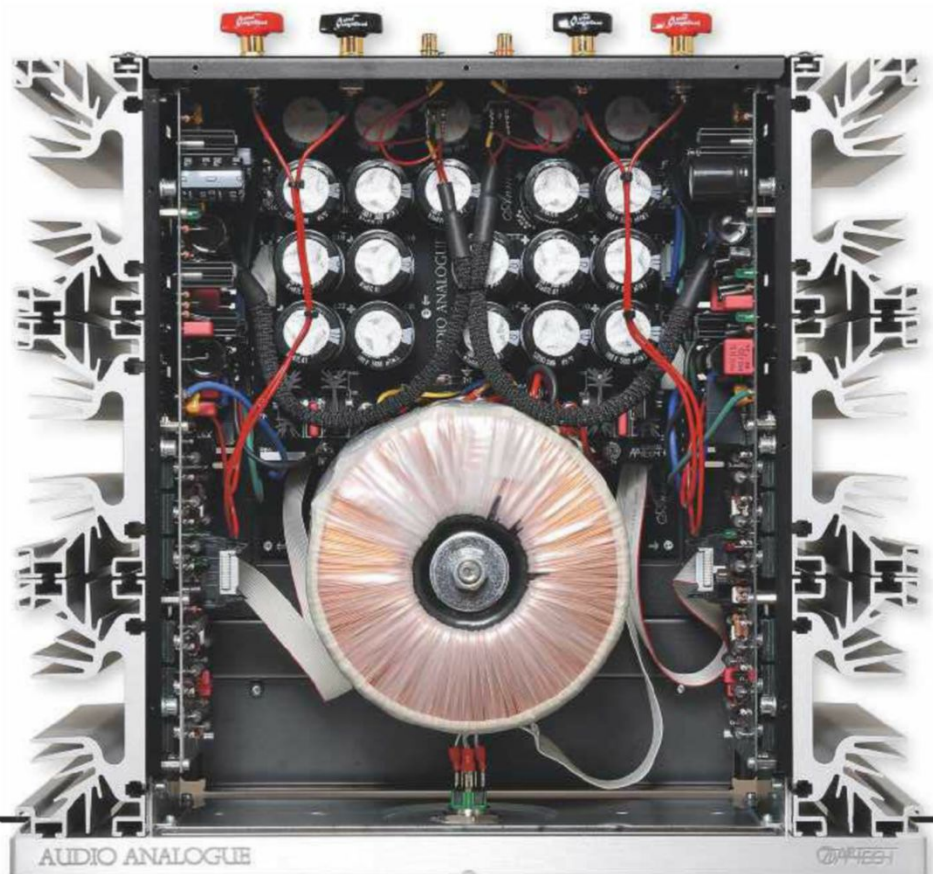
unit off. Even more oddly, the actual input change happens on the control's release, not the push, so it's easy to convince yourself nothing is happening. It is equally easy to press too long and inadvertently switch the unit off, or press too briefly and get nowhere. Even when you have this off pat, you'll discover that the control scrolls through the inputs sequentially, so changing from number one to number five takes 12 frustrating seconds.

Fortunately, the preamplifier's solid-metal remote control sports separate buttons for volume, source selection and power that act instantly – much to my relief!

At the rear, five line-level inputs are provided. Numbers one to three are on single-ended RCA phons, but number four and five are balanced XLR types. There are also two pairs of single-ended (unbalanced) outputs and two pairs of balanced ones, so you could connect the unit to multiple Donizetti Anniversary power amplifiers should you have sufficient money, space, loudspeakers and the desire to entertain your neighbours with the hi-fi high life.

Internally, the preamp is based around a newly-designed power supply equipped with extensive filtering to minimise the

*'Such power will entertain your neighbours with the hi-fi high life'*



**RIGHT:** Two 1.2kVA toroidal transformers feed a 100V PSU with 56,000µF of reservoir capacitance [top]. The fully discrete output stage employs six pairs of bipolar power transistors per channel, supported by a series of (very sharp!) heatsinks



**LEFT:** The Bellini Anniversary's fascia [top] is simplified by the use of one control for on/standby, volume and input selection. Pinhole LEDs to its left show the input chosen, those to the right volume and all are dimmable. The massive Donizetti amp [bottom] features an illuminated power button and matching fascia design

impact of mains noise and RF interference on sound quality. The audio circuitry utilises Audio Analogue's proprietary 'SeGeSTA' (Single Gain Stage Transconductance Amplifier) topology, which is fully balanced and eschews overall, or global, feedback.

### BEAUTY AND THE BEAST

Instead, the unit relies on judiciously applied local feedback to maintain stability and reduce noise [see PM's boxout, below]. The components are assembled onto a

four-layer PCB and include audio-grade capacitors and military-grade, through-hole resistors. The volume control, meanwhile, is a form of rotary encoder that governs output level via a resistor ladder, just as the various inputs are selected/switched locally by high-quality relays.

But what of the partnering Donizetti Anniversary power amplifier? Frankly, this is something of a beast! Its 41.2kg

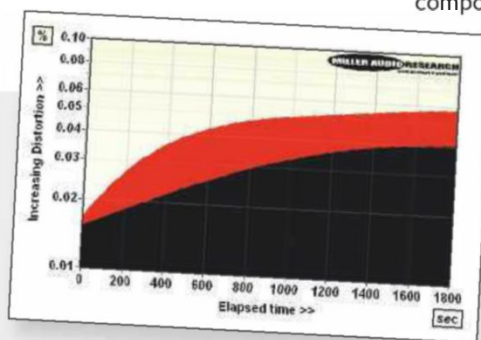
weight strongly suggests a two-person lift, and those persons might want to wear gloves as the edges of the heatsinks are not exactly smooth to the touch. Much of the power amp's weight comes from its two 1200VA transformers and, again, no global feedback is used in the amplification stages. As per the Bellini Anniversary, the circuitry is fully balanced and similar through-hole, military- and audio-grade components are used throughout.

The minimalist front panel is home to only a power switch and associated LED indicator, but things are a little busier round the back. The unit has both balanced XLR and unbalanced RCA inputs plus one set of speaker output terminals using some of the most stylish binding posts I have ever seen. As a plus, their chunky size and decent spacing makes them easy to grip should you wish to use bare-wire connections.

### GIVING FEEDBACK

In common with Audio Analogue's recent top-line products, the design of its Anniversary amplifiers has been given over to 'AirTech Labs' – a sub-brand dedicated to AA's product development [see interview, p53]. This team is responsible for the evolution in AA's amplifier circuit design already witnessed in the Anniversary series of Puccini [HFN Jun '16] and Maestro [HFN May '17] models. Indeed, aside from the retention of the Bellini and Donizetti names, and distinctive casework, AA says these are both ground-up redesigns. Nevertheless, while the use of transconductance gain stages is new here, the over-arching principles of minimum local compensation (feedback), a fully-balanced architecture, a massive and very tightly-regulated PSU, and the ability to drive very difficult loudspeaker loads, is all very familiar.

While 'zero feedback' is seen as an aspirational badge of honour by more than a few audiophile brands, some form of stabilising compensation is required to determine gain (+26dB here), bandwidth and distortion, particularly when tackling the thermal drift of a high-power output stage. AA uses 'relay switches to minimise non-linearity and oversized military resistors to minimise thermal distortion' but whatever the purported subjective benefits of minimal feedback, distortion in the Donizetti is still clearly influenced by output level and temperature [Graph, 1kHz/10W/8ohm; black = left, red = right channel]. PM



### WARM LOVE

After carefully heaving the amps into my Atacama Equinox equipment rack, they were hooked up to a Naim CD5 XS CD player with FlatCap XS power supply and PMC Twenty5.24 speakers [HFN May '17].

The Donizetti Anniversary's thermally-induced changes in distortion [see PM's boxout, opposite, and Lab Report, p55], means that it's more important than usual to allow an adequate warm-up period after switch-on before settling down to any critical listening. Drive the amplifier hard, ☺

# NOVAFIDELITY

## HA500H



Hybrid Preamplifier, Headphone Amplifier & DAC



The HA500H is a premium hybrid preamplifier with multiple inputs and dual ES9018K2M DAC chips, featuring a powerful, highly specified headphone amplifier.

Equipped with two ECC82 vacuum tubes along with a switchable transistor OP amp circuit, the HA500H enables users to select a valve or solidstate sound depending on musical material, mood, or personal preference.

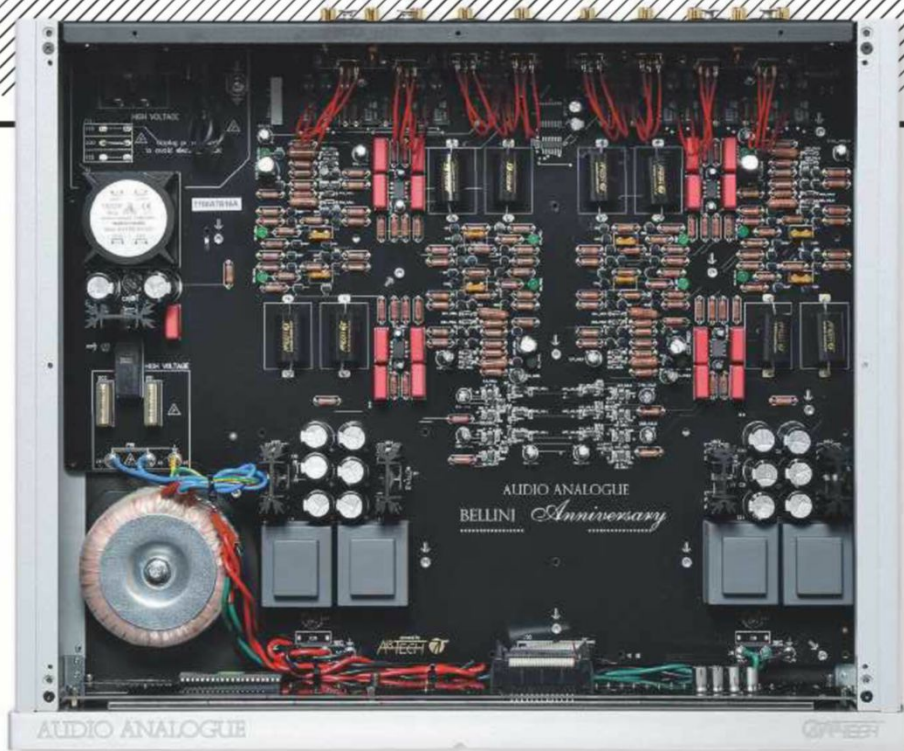


From the renowned manufacturer of the **X14**, **X35** and **X50D** streamers



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**ABOVE:** The fully balanced, dual-mono preamp is an enhanced version of that first seen in the Maestro Anniversary integrated amp [HFN May '17]. A rotary encoder governs the stepwise volume

especially into lower impedance speakers, and it will continue to heat up with the possibility of further subjective change. Nevertheless, as a rule, as the Donizetti warms it also becomes markedly more smooth and insightful, even if the overall presentation of this pairing is not quite so easy to sum up in just a sentence or two.

### STARK RELIEF

In many ways, this duo is exceptional. The first thing likely to strike you is the remarkable midband lucidity, and the expansiveness of the soundstage. These amps have an uncanny ability to place both instruments and vocalists in their own space without the presentation as a whole feeling crowded or compressed. What's more, a virtual absence of background noise means that central performers stand out in stark relief, apparently on an otherwise empty stage, with musical accompaniment arranged carefully behind them.

A perfect example of this was American singer/songwriter Norah Jones on the track 'Feelin' The Same Way' [Come Away With Me; Parlophone 7243 538609 2 9]. Heard through the Bellini and Donizetti Anniversary she was seemingly standing in the centre of my room, with backing instruments slightly behind the plane of the loudspeakers. Everything was gloriously well defined and easy to follow. The three-dimensional sense of imagery set up by these amps could astonish at times, and this track showed off this ability perfectly.

'Strikes on the metalwork arrived with real force'

This Anniversary pre/power also serves up an impeccable performance when it comes to the top-end – the sheer level of clarity and purity in the treble region is again, first-class, enabling you to hear the tinkle of a pin drop in even the busiest of mixes. Cymbals in general possessed a delicious metallic sheen while more vigorous strikes on the metalwork arrived with real force before shimmering away into the distance. Equally, delicately struck hi-hats were as vivid-sounding as I have

heard them, and not once did they disappear into the back of the mix.

One point to note here was that while the amplifiers' performance was tonally similar through both balanced and unbalanced connections, the balanced

provided just that extra hint of insight. If you buy this pairing, then going balanced is definitely worthwhile.

### FIRE BELOW

My initial puzzlement over this Audio Analogue duo's general character stemmed from the way in which they dealt with the lower musical octaves. Naturally, with the available power on tap from the Donizetti Anniversary, bass was prodigiously extended, solid and taut. Even better, it remained composed even with the amp wound up to thoroughly anti-social levels. However, while one minute the pairing would be pounding out a dance beat or a rip-roaring jazz double-bass line with precision and fire, the next would find it

## GIUSEPPE BLANDA

Audio Analogue, as we quickly discovered when talking with current owner and co-founder Giuseppe Blanda, is one of a trio of companies under a parent organisation called the AF Group SRL. A sister brand, Pegaso, focuses purely on valve-based products, launching the P50A integrated amplifier in 2018. AirTech Labs is the third sub-brand, controlled by Audio Analogue's Claudio Bertini, who also owns the Oasi Audio dealership in San Giuliano Terme, Pisa province.

'Audio Analogue's Anniversary edition hi-fi components were all conceived and engineered with input from AirTech designers,' says Giuseppe, 'the Puccini amplifier launched in 2016, was built around a genuine zero feedback design developed by AirTech's R&D department, led by AirTech designer Andrea Puccini, who acted as technical manager on the project'.

While Audio Analogue and AirTech are technical collaborators, the latter also looks like creating an identity of its own. 'We have some exciting news', reveals Giuseppe 'to partner the AirTech range of hi-fi cables, we will also be launching the first AirTech-branded amp in 2020'.

Does this mean that AirTech is going head-to-head with Audio Analogue as competitors? 'Not at all', replies Giuseppe 'our relationship will continue as ever. For example, we are already working on the new Audio Analogue ABsolute integrated amplifier which is tasked to offer 40W in pure Class A or 100W in Class AB, switchable by the user'. Watch this space...



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# LAB REPORT

## AUDIO AN. BELLINI/DONIZETTI ANN.



**ABOVE:** The preamp [top] offers five line ins (three on RCAs and two on XLRs), two tape ins (on RCAs), and four sets of main outputs (on RCAs and XLRs). The power amp [below] has inputs on RCAs and XLRs plus 'wing nut' 4mm cable binding posts

shrinking slightly, and in doing so leaving a well-recorded bass guitar line feeling a little withdrawn.

Nevertheless, the likes of Underworld's 'Jumbo' [*Beaucoup Fish*; JBO 1005438] showed the amps at their bass-pumping best, the track being delivered with a punch that was absolutely spot-on. The swirling keyboard arrangements and main loping synth-loop remained clearly discernible in the mix after the four-to-the-floor beat kicked in and pummelled my sofa. All in all, the Bellini and Donizetti Anniversary sounded glorious here.

### PURE INSTINCT

Then, as if to illustrate the Donizetti's slight unpredictability, Steely Dan's 'Jack Of Speed' [*Two Against Nature*; Giant Records 9 247 19-2] found Walter Becker's bassline sounding just slightly too big and perhaps just a little less distinct than I am accustomed to. Usually, each note is well defined, making the underlying rhythm easy to follow even if, on this occasion, I could sense some slight hesitation.

**LEFT:** Compact but heavy IR handset governs volume, mute, input selection and 'set-up' (LED dimming)



Where the Audio Analogue duo definitely came out on top was with its handling of recordings that varied in their quality. The Corrs' 'Only When I Sleep' from their 1997 album *Talk On Corners* [Atlantic Recordings 7567-83051-2] is something of a sonic mess, sounding steely at best and clearly mixed to make it radio-friendly. Yet never have I heard it sound better than when played via the Bellini and Donizetti Anniversary pre/power. The amps simply cut through the nastiness, managing to impart a sense of order to the proceedings and even bring a hint of purity to the ragged top end.

They repeated this trick again and again, with all sorts of sonic disasters. So if you're seeking a pre/power pairing that is not only kind to less-than-well-produced recordings but also able to serve them up with sweetness and not a little polish, then look no further. ☺

### HI-FI NEWS VERDICT

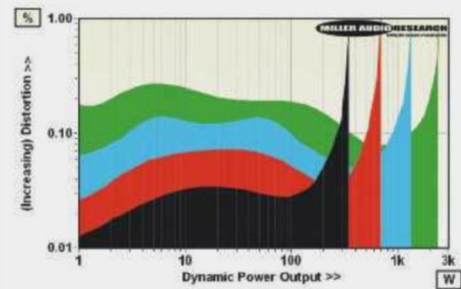
The Audio Analogue Bellini and Donizetti Anniversary offer a combination of magnificent sound quality with a brute-force styling that I thoroughly enjoyed. They typically make a great job of poor recordings, too. That said, I can think of few other products I've reviewed in recent times where I'd say an extended audition was mandatory, simply because their brilliance can be a touch unpredictable.

Sound Quality: 83%

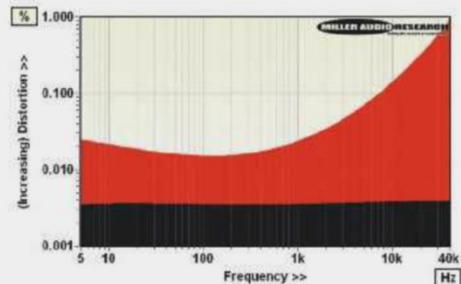


Power output, and the Donizetti Anniversary's ability to drive low impedance loads, is deeply impressive thanks to its 49A dynamic current capacity (<1% THD/10msec) and exceptionally 'stiff' power supply regulation. In practice the rated 250W/8ohm output is beaten with power to spare at 2x350W/8ohm and a very solid 2x680W/4ohm (this +2.9dB uplift is very close to the theoretical ideal of +3.0dB). Stiff PSU regulation also means there's limited headroom under dynamic conditions, but with 350W, 690W, 1.35kW and 2.40kW available into 8, 4, 2 and 1ohm loads [see Graph 1] the Donizetti will surely drive any likely partnering speaker with ease. The 'zero (global) feedback' topology [see boxout, p51] sees distortion increasing quite markedly at HF (from 0.03%/1kHz to 0.35%/20kHz at 10W/8ohm) along with a moderate 0.14-0.15ohm source impedance and merely 'average' 86dB A-wtd S/N ratio (re. OdBW).

Into a non-reactive 8ohm load the response falls by -0.28dB/20kHz and -3.8dB/100kHz while the matching Bellini preamp is flat to within ±0.02dB out to 100kHz but shows a broad but subtle uplift in bass of +0.06dB/100Hz, +0.08dB/20Hz and +1.0dB/5Hz. The Bellini Anniversary also incurs markedly lower levels of distortion than the Donizetti [black vs. red infills, Graph 2 below]. Distortion is much more consistent too, almost purely 2nd/3rd harmonic and a 'flat' 0.0035-0.0039% right across the 20Hz-20kHz audioband (re. OdBW) with a minimum of 0.00065% at 600mV output. The maximum balanced output is 13.5V from a 72-73ohm source impedance and overall gain is a sensible +10.9dB (balanced in/out), bringing the total pre/power gain to +37.1dB. Noise is low, yielding a wide 99dB A-wtd S/N ratio. PM



**ABOVE:** Dynamic power output versus distortion into 8ohm (black trace), 4ohm (red), 2ohm (blue) and 1ohm (green) speaker loads. Max. current is 49.0A



**ABOVE:** THD versus extended freq. for Bellini pre (1V out, black trace) versus Donizetti (10W/8ohm, red)

### HI-FI NEWS SPECIFICATIONS

Continuous power (<1% THD, 8/4ohm)	350W / 680W
Dynamic power (<1% THD, 8/4/2/1ohm)	350W / 690W / 1.35kW / 2.40kW
Output imp. (20Hz-20kHz, pre/power)	73ohm / 0.138-0.154ohm
Freq. resp. (20Hz-100kHz, pre/power)	+0.1 to -0.10dB / +0.0 to -3.5dB
Input sensitivity (for OdBV/OdBW)	285mV (pre) / 139mV (power)
A-wtd S/N ratio (re. OdBV/OdBW)	98.6dB (pre) / 85.7dB (power)
Distortion (20Hz-20kHz, 1V/10W)	0.0035-0.0039%/0.015-0.33%
Power consumption (Idle/Rated o/p)	101W/945W (18W, Preamp)
Dimensions (WHD, Pre/Power)	450x140x380/450x221x428mm

# PS Audio Stellar Phono

Forty-five years after the launch of its inaugural phono preamp, PS Audio launches another, this time in Stellar guise, and with the emphasis on flexibility with convenience  
Review **Jonathan Gorse & Lab: Paul Miller**

**L**arge by phono preamp standards, PS Audio's Stellar Phono is built into the same full-width silver grey or black chassis as its partners in the new Stellar range [*HFN* Jan '20]. Nevertheless, it's also considerably heavier at a full 10kg because the casework here is steel, not alloy, perhaps in an effort to improve screening. Having asked PS Audio, it seems likely that all Stellars will move from alloy to steel enclosures in time.

According to the company, the Stellar range has been designed to provide a taste of the 'high end' without the price tags associated with its more costly offerings. Nevertheless, as this is the only phono stage that PS Audio offers, it is clearly intended for use with both its flagship and Stellar components.

Regardless of casework, the £2500 Stellar Phono with its separate MM and MC inputs and versatile loading and gain options is geared less towards the casual vinyl listener who is merely dabbling because vinyl is hip and cool again. This product is for those who are heavily committed to the black stuff, whose life has been spent collecting it, loving it, indexing it and playing it. So if that sounds like you, but neither are you willing to forgo flexibility, then the Stellar Phono may well tick all your boxes.

## FUN ON THE FLY

Across the front of the two-piece case runs a recessed groove that widens as it nears the right of the fascia to house a panel populated with LEDs. These indicate a variety of parameters, all user-configurable, with the selections displayed by LEDs located beside four white legends that cover the basics: Mute, Input, Gain and Loading [pictured, p57]. No physical controls are to be found on the fascia apart from the power/standby switch, which

**RIGHT:** Entirely discrete (FET-based) active stages include a +26dB MC headamp [top left] and LEDs used to bias the constant-current sources. The RIAA eq is fully balanced [centre] and fed from a linear PSU [lower right]

illuminates in blue with the PS Audio logo when the Stellar Phono is powered up.

Connectivity is comprehensive, the rear panel offering two sets of L/R outputs – one balanced via XLR sockets, and a second on conventional gold-plated RCA phonos. The inputs, meanwhile, comprise two sets of L/R phono sockets, one each for MM and MC cartridges. As for the phono stage parameters, these are all selectable via the remote control and, for the audiophile, this is where the fun really starts.

To begin with, while MM cartridges are accommodated at the standard 47kohm setting, the Stellar Phono also allows the user to change MC cartridge loading between 47, 60, 100 and 200ohm. Then there are six gain settings, designed to suit pick-ups from low-output MCs to high output MMs [see PM's Lab Report, p59]. For MM, settings of +44/50/56dB are provided while +60/66/72dB options are available for MC. Given that a change in cartridge loading often produces subtle changes in sound, the benefit of remote control is that you can make adjustments on the fly while

listening to music from the hot seat. What's more, the remote handset also permits switching between the MM and MC inputs. So if you're a vinylista with two decks, or have one deck with two arms, you can switch between them in real time.

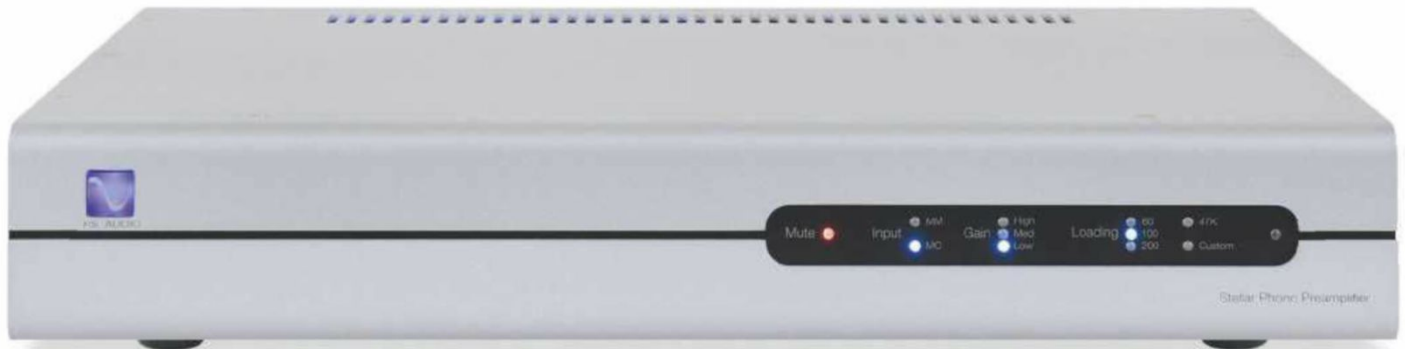
## TIME TO KILL

The final, and largest, button on the remote handset is marked 'Mute' which, unsurprisingly, kills the sound when pressed. This proves useful when cueing tracks mid-disc, as your ears won't be assaulted with a sudden and unwanted blast of sound should you lower the pick-up too far along the groove from the beginning of a piece of music. Or accidentally drop it with a thump...

In addition to the standard settings, there is a facility on the rear of the Stellar Phono to dial-up a custom MC load value between 1-1000ohm via two small, roughly calibrated trim pots (for left and right channels). While this extra flexibility is most welcome, it is difficult to reach the trim pots when the unit is sited in







a component rack. Also, to balance the loading on each channel accurately, one would need to employ a multimeter on the MC inputs. Perhaps PS Audio felt that rotaries on the unit's front would detract from the minimalist design aesthetic.

The turntable used for the review was a Michell GyroDec with Gyropower QC supply and SME Series IV tonearm. This was equipped in turn with a selection of cartridges, including an Audio-Technica AT-OC9 ML/II and EAT Jo N°5 [*HFN* Dec '18] – both MCs – and the Pro-Ject Pick-it S2 MM [*HFN* Aug '19]. The rest of the system comprised Naim NAC82/HiCap/NAP250 amplification driving a pair of ATC SCM40 Series II loudspeakers.

### COMING CLEAN

The PS Audio Stellar Phono is a supremely transparent performer with a cool tonal balance. Frankly, the gains in clarity and detail compared with music heard via my NAC82 preamp's phono stage were little short of startling. In some ways the Stellar Phono was reminiscent of digital sources in its presentation, sounding unswervingly

*'The explosive opening to the song rocked the room'*

clean and precise with little of the euphonic warmth that some phono stages are seemingly engineered to create.

With the AT-OC9 ML/II loaded at 100ohm, the Stellar Phono ensured the explosive opening of 'Kiss This Thing Goodbye' from Del Amitri's 1989 album *Waking Hours* [A&M Records, AMA9006] rocked the room, the band enjoying a presence that was palpable. Iain Harvie's stabbing interjections on his Les Paul guitar had real slam while even the piano, and the mandolin that picks its way above the heavy shuffling beat,

enjoyed a precision and articulation I had not experienced before. As the song motored to its climax, countless sounds and textures buried deep in the dense mix were revealed to my ears for the first time.

When time came to experiment with the MC loading, switching to 60ohm thickened the sound of vocals and guitars at the expense of detail and the slightly stark top-end. The higher 200ohm setting

**ABOVE:** Sharing the same two-piece case as the other 'Stellars' the Phono is functionally stylish but also surprisingly heavy. LEDs indicate MM/MC, gain and loading with a red LED for the mute function (useful when cueing)

resulted in a sound similar to that at 100ohm albeit with a slightly airy and insubstantial quality, which reduced the scale of piano. Clearly the 100ohm loading was the sweetspot for my A-T.

### GOING BALLISTIC

Despite the EAT Jo N°5's recommended loading of >20ohm the lowest 60ohm option afforded by the Stellar Phono served it just fine. On the track 'Telegraph Road' from Dire Straits' *Love Over Gold* [Vertigo 109159] the leading edges of plucked guitars, snare rim shots and piano were conveyed with astonishing speed and dexterity, particularly when it came to the rocking finale – so much so that I couldn't resist gunning my system to approach live levels! The Stellar Phono responded with ballistic speed, delivering all the instruments' transient attack. It was

this, along with its ability to retrieve exquisite levels of detail in the busiest of mixes that were the Stellar Phono's key strengths – seemingly irrespective of the

cartridge used or music played. If there was a downside it was that, despite its inherently low noise floor, the Stellar Phono does not disguise vinyl in poor condition. As a result, surface noise can be a little more apparent.

All of this comes to nought if a component cannot bind the various musical strands together to immerse the listener in the mood of a song. Chris Rea's *Road To Hell* [WEA WX317] opens with the singer pondering life while stuck in traffic and the sound of the rain and windscreen-wiper effects were so realistic that I too began to feel damp and despondent. But



### VINYL HERITAGE

Boulder Colorado nestles in the foothills of the Rocky Mountains, albeit at over 5000ft elevation, and is home to PS Audio among other high-end audio brands. In 1975 when flares were cool, ELO ruled the airwaves and ABBA were recording 'Dancing Queen', the firm created its first product – a phono preamplifier [pictured above]. PS Audio (named after its founders Paul McGowan and Stan Warren) sold its phono preamp direct for \$59.95 and its success led to the company expanding into preamplifiers which it referred to as 'Linear Control Centres' and, by the late 1970s, into power amplifiers too. PS Audio claims to have been the first US company to introduce a dedicated line of external PSUs to power its preamps, much as Naim was doing in the UK. Today, and despite creating a stir with its digital offerings, PS Audio is arguably still best known for its range of AC mains regenerators from the flagship DirectStream Power Plant P20 with its 13 outlets [*HFN* Apr '19] to the Stellar PP3 [*HFN* Jan '20]. The phono preamp reviewed here is part of that same, comprehensive Stellar range and, some 44 years after the brand burst onto the scene, is touted to be the best it can make at any price.

# Xtension 10

**Pro-Ject**  
AUDIO SYSTEMS



Satin Burl finish

Available finishes:



## HIGH-END HI-FI AT ITS BEST

The Xtension 10 is a record player built to exacting audiophile standards. Employing both the “mass-loaded” and “floating turntable” design principles, it features a heavy wooden plinth and metal platter alongside some clever magnetic decoupling to produce a turntable that’s resonance-free. The 10CC Evolution Tonearm, made from a one-piece carbon fibre tube ensures the mounted cartridge tracks impeccably, while the sophisticated speed control system and low-noise motor guarantees optimal speed stability.

### Better Than Ever!

The Xtension 10 is now sold with a high-quality linear power supply totally free of charge (worth £399.00 SRP). UK distributor Henley Audio also offer a variety of cartridge bundle options from Ortofon and Pro-Ject Audio Systems. The Xtension 10 is available in a variety of luxurious finishes, and new for 2020 there are two walnut burl finishes joining your list of options (high-gloss burl finish shown), so more than ever the Xtension 10 is designed to fit into any home system.



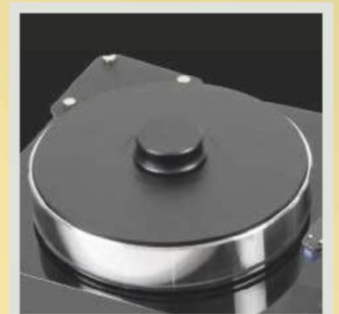
Dedicated electronic speed controls



10CC Evolution tonearm pre-installed



Cartridge fitting options available



Low resonance main platter with TPE damping

## PHONO PREAMPLIFIER



**ABOVE:** Separate MM and MC inputs will support two tonearms simultaneously while the MC input also includes continuously variable loading (10ohm-1kohm). RIAA eq'd outputs are offered on RCAs and balanced XLRs

there were thrills in store as the drums powered in to propel the music along with real snap, aided by a clear and highly delineated bass guitar. The character of Rea's bourbon-drizzled voice was also wonderfully conveyed, which only reinforced how great audio brings the music one loves to life.

### TASTE OF HEAVEN

Vivaldi's 'Four Seasons' with the Academy of Ancient Music under Christopher Hogwood [L'Oiseau-Lyre 410 126-1] is an absolutely searing performance on authentic instruments. Stunningly recorded, it captures world class players at the peak of their powers. Right from the start, subtle ambient cues were laid bare – the creak of chairs, the sense of space in the Kingsway Hall – all creating a real sense of being in a live performance setting.

As the Academy began to play, not only was the rich tonal palette of this magnificent orchestra conveyed with remarkable clarity but there was a feeling of boundless extension at both ends of the frequency spectrum – without a

hint of harshness to be heard. Cellos enjoyed a wonderful woody warmth while violins and violas spiralled ever upwards in heavenly interplay. What's more, all of the instruments were positioned across a soundstage

**LEFT:** Plastic remote offers armchair control over MM/MC selection, six levels of gain, five loads (inc. variable) and muting



that extended far beyond the confines of my ATC loudspeakers. The PS Audio Stellar didn't miss a single inflexion in the playing or nuance in the interpretation. Quite simply, it sounded sublime, and the experience of hearing it so beautifully reproduced will stay with me long after the Stellar Phono has been returned.

The highly affordable Pro-Ject Pick-it S2 cartridge struggled to match the purity of either of the two moving-coils I had to hand, particularly as its top-end was simply less open and extended. Yet the essential musical message and emotion of the 'Four Seasons' performance remained intact and I was impressed not only by the detail on offer but by the fact that the stereo placement and imaging of instruments remained rock solid.

The Stellar Phono is a sizeable investment for sure. But when you consider that its flexibility will ensure any cartridges you might purchase in the future can be accommodated and optimised with ease, the outlay begins to look very reasonable. By way of 'future-proofing' a lifetime of top-flight musical pleasure, the PS Audio Stellar Phono is a winner. ☺

### HI-FI NEWS VERDICT

PS Audio's Stellar Phono is just the ticket if information retrieval, speed and transparency are your priorities. It's not always kind to surface noise, but with a first-rate turntable can still bring you closer than most of its contemporaries to the thrill of a live performance. Indeed, it's grist to the mill for those who maintain that 40 years of 'digital' still falls short of a diamond dancing through a spiral groove of the black stuff.

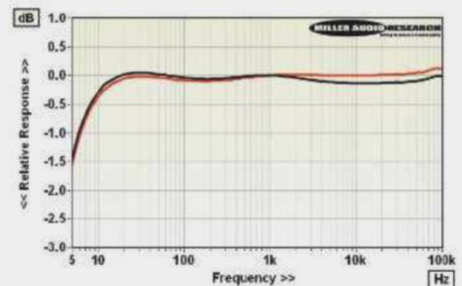
Sound Quality: 87%



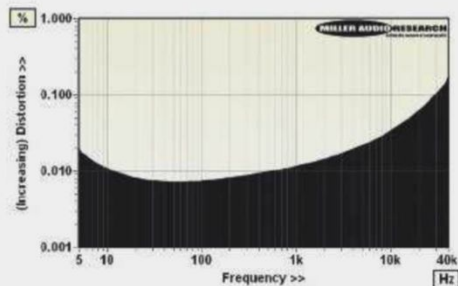
## PS AUDIO STELLAR PHONO

Phono stages with multiple gain and/or loading options often trade versatility for ease-of-use, employing fiddly DIP switches to select between the various options. Not so here – full remote control over MM and MC gain and loading (ok – the variable MC loading is achieved via two analogue pots) is achievable via remote making 'tuning-on-the-fly' so much easier. PS Audio claims +44dB, +50dB and 56dB gain for its MM input and +60dB, +66dB and +72dB for MC, values that are closely matched on test at +43.9dB, +49.3dB and +54.8dB for MM and +59.9dB, +65.4dB and +70.9dB, respectively, for MC (all single-ended in/balanced out). These are well chosen steps, the lowest MM gain offering a 6.4mV sensitivity with the highest MC gain representing 0.29mV (286µV). Moreover, each step is engineered with a generous +25dB input overload margin, sufficient to accommodate the 'hottest' +18dB groove modulation (re. 11.2µm/300Hz), of 166mV, 86mV and 40mV (MM), and 27mV, 14mV and 6.5mV (MC), respectively.

The active/passive RIAA equalisation is also very flat and extended out to 100kHz, with two broad but mild -0.1dB dips either side of 1kHz and a subsonic filter amounting to -6dB/2Hz [black trace, Graph 1]. The RIAA-eq'd distortion [see Graph 2] is not vanishingly low, but with a minimum of 0.0055%/40Hz and a maximum of just 0.071%/20kHz (re. 0dBV) it is still a couple of orders of magnitude lower than the best MM/MCs. Noise is also just below the threshold of most vinyl systems, the 76-80dB A-wtd S/N ratio (MM/MC) more than adequate for the task. The 26V maximum (balanced) output is arguably overkill, but if the Stellar Phono had a volume control it could surely drive any partnering power amplifier directly... PM



**ABOVE:** RIAA-corrected frequency response over an extended 5Hz-100kHz at 0dBV via MM



**ABOVE:** Distortion extended frequency (5Hz-40kHz) via MM input re. 0dBV (1Vrms) output

### HI-FI NEWS SPECIFICATIONS

Input loading (MM/MC)	47kohm / 60ohm-1kohm
Input sensitivity (re. 0dBV)	6.4mV-286µV
Input overload (re. 1% THD)	166mV/86/40/27/14/6.5mV
Max. output (re. 1% THD) / Impedance	26.0V / 140-145ohm
A-wtd S/N ratio (re. 0dBV)	80.1dB / 76.0dB
Frequency resp. (20Hz-20kHz/100kHz)	-0.05dB to +0.0dB / +0.11dB
Distortion (20Hz-20kHz, re. 0dBV)	0.0055-0.071%
Power consumption	28W (27W standby)
Dimensions (WHD) / Weight	430x83x330mm / 10kg

# Falcon Acoustics Reference GC6500R

Two-dimensional wonder-material, Graphene, is making its way into driver cones, including Falcon's flagship  
 Review: **Andrew Everard** Lab: **Keith Howard**

Oxfordshire-based Falcon Acoustics is perhaps best-known for two aspects of its business: first, it's a major supplier of drive units, both its own designs and those of partner companies; and second, it's the manufacturer of its own version of the classic LS3/5a speaker design [HFN Jan '19]. The Falcon Acoustics Classic 15ohm LS3/5a is fully BBC-licensed, hand-assembled in Oxford and 'the only LS3/5a in production that faithfully replicates the original BBC design published in Oct 1976'.

That's hardly surprising, given that the speaker uses the company's T27 tweeter and B110 bass unit, both designed by Falcon founder Malcolm Jones, who was responsible for the original KEF T27 and B110 drivers when he was with that company. But the LS3/5a isn't the only string to Falcon's bow, for at the other end of the spectrum sits the 1.2m-tall, 70kg-apiece Reference GC6500R floorstanding speaker, available in a range of high-gloss colours or deep real wood veneers, and selling for a fiver short of £20,000 per pair.

## LUTED OBJECTS

Big and bold-looking, though hardly the most humungous speakers to pass through these doors in recent times, the GC6500R exudes an air of luxury thanks to those veneers, a smoked glass top panel and Alcantara (high quality synthetic suede) on the front baffle. The purposeful solidity and sheer heft of the cabinets is made all the more elegant by their lute-like shaping while the substantial cast alloy outriggers are fitted with some seriously heavy-duty spikes for rock-solid stability.

The enclosures themselves are made in Italy, the source of some of the best furniture-grade cabinets in the business, and are built from 25mm-thick laminated

MDF with an extra 9mm of internal damping, over which those exotic – but not too frivolous – finishes are laid. The front baffle is even thicker, at 38mm, and is profiled for minimal diffraction (for which that microfibre suede covering also helps) with chamfered cut-outs for the drive units to optimise dispersion.

## GLAM METAL

The 18mm rear panel is reinforced with a custom metal tooling that also provides heatsinking for the attached crossover and a location for the single set of custom-made nickel-plated terminals. All the metalwork found here is machined from top-quality MIC6 cast aluminium plate by what the company describes as 'F1 ultra-precision engineers'.

So there's clearly a lot going on in this speaker, and that's before we even get to the drive units, the most striking feature of which is the use of ultra-

strong, ultra-light Graphene in the mid/bass drivers [see PM's boxout, p61]. The twin 18cm bass drivers are described as 'Sonaweave Graphene Enhanced Nano-Platelet Composite Cone' woofers, the Graphene 'coating' allowing them to be made 60% lighter and thinner than conventional cones, yet with superior rigidity and damping. They're reflex-loaded using a hidden, downward-venting port working into the space created by the plinth-and-spike assembly.

Above the bass units sits the 5cm dome midrange driver, mounted in a hypocycloid (think Spirograph-drawn

**RIGHT:** A pair of custom 180mm 'Sonaweave' Graphene-enhanced bass drivers are loaded via a large downward-firing port and joined by a 50mm dome mid unit and ribbon tweeter. Four spiked alloy outriggers maintain stability



'Big amps and bombproof power will be your best bet'



## CARBON NEUTRAL

Graphene is a one atom-thick lattice of carbon, a two-dimensional structure that's claimed to be the toughest material yet discovered – its 130 gigapascal tensile strength outstripping 0.4GPa for high tensile steel and 0.38GPa for Kevlar. Graphene is also very light at 0.77mg/m<sup>2</sup>, so a single 'sheet' covering the area of a football pitch would still weigh less than 1g. Consequently, alongside its remarkable electrical and optical properties, Graphene's combination of exceptional rigidity and light weight makes it the ideal candidate for reinforcing a loudspeaker cone (a pure Graphene cone is impractical). The material was first isolated in 2004 by two researchers at The University of Manchester, Professors Andre Geim and Kostya Novoselov, by stripping a one-atom thick layer from a graphite substrate. The material takes the form of a carbon 'sheet' with groups of atoms arranged in a hexagonal 'chicken wire' pattern [see inset picture]. PM

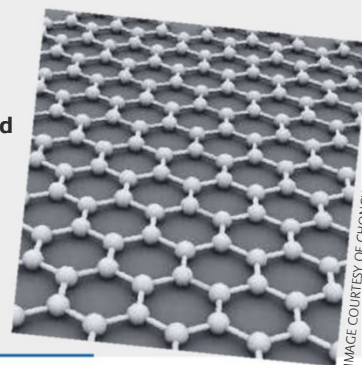


IMAGE COURTESY OF CHONGWU ZHOU AND JIA LIU

circles within circles) wave guide designed after extensive computer modelling. This mid unit was seen in the R.A.M Studio 30 floorstander [HFN Apr '19], modified here to lower distortion and yield a smoother sound. The ribbon tweeter has also been 'tweaked', all in the quest for a smooth response. The faceplate apparently plays a major part in this while the heavyweight crossover PCB uses gold-plated copper tracks, close tolerance air core inductors and polypropylene capacitors.

It all adds up to a speaker that's impressive-looking rather than what you might call 'pretty', but there's no denying the sense of solidity and decent engineering about the GC6500R, even if I'd prefer the speaker terminals to be lower. If you're using hefty cables, there'll be quite a lot of wire dangling from your bananas or spades, which is perhaps not great for durability over the long term.

## EASY RIDER

The speakers benefited from a position that offered good breathing space from the side and rear walls, and with a bit of toe-in – just enough to see the outer faces of the cabinets from the listening position. Moreover, while Falcon's specification suggest these are a fairly sensitive speaker, after KH's lab work revealed a somewhat challenging impedance [see p63] I was pretty glad to have amplification befitting speakers at this price level. This took the form of Constellation Inspiration monoblocks [HFN Oct '19], which are capable of a useful 400W/8ohm without breaking too much of a sweat.


These amplifiers proved capable of managing – or at least masking – some of the electrical foibles KH noted, but it

would be prudent to urge purchasers to choose amplifiers in the upper limit of the 25-300W power-handling range Falcon suggests for the GC6500R. Certainly my brief attempts at pushing the speakers really hard, even with the heavyweight Constellation Monos, suggest that using these speakers with relatively low-powered amps might well be testing your luck. Solid, bombproof power is the best bet.

That said, the GC6500Rs sounded very easygoing from the off, with a warm, measured sound unlikely to cause any upset among listeners. Playing Iiro Rantala's *My History Of Jazz* [ACT 9531-2], which combines some of Bach's *Goldberg Variations* with Rantala's take on jazz standards, the Falcon GC6500Rs responded well to the crisp, wide-open recording.

Everything from the piano to the way brushes pitter-patter on drum-skins was clearly laid out, even if the focus of the soundstage and the positioning of the performers within it could have been more precisely delineated. The trade-off for the smooth, no-shocks sound is a loss of some crispness and air in the treble, which can make imaging less than pin-point on occasions while diminishing the sense of space around the performers.

## SPEED READING

Perhaps more surprising is that while the bass here has excellent speed and attack, making bass lines easy to follow, and high-speed playing such as Mark King's characteristic technique on Level 42's *Remixes* set [Polydor 513 085-2] very much toe-tapping, it soon dawns that this is as a result of the bass being lean and taut rather than fulsome. Or at least not possessing the kind of rich, deep extension 

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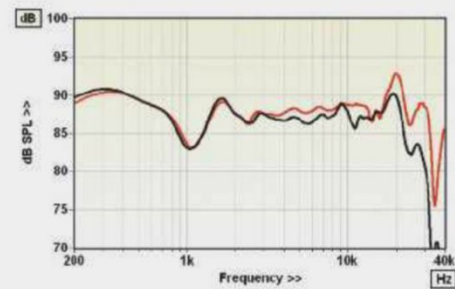
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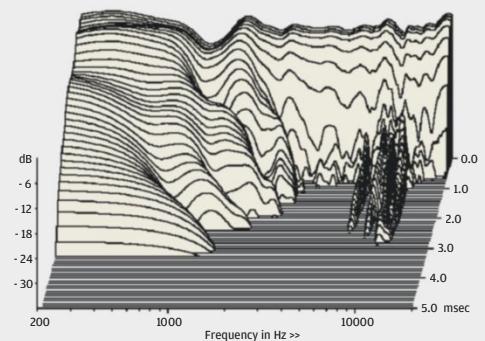
## FALCON ACOUSTICS REF GC6500R

You'd expect a reflex-loaded speaker of this bulk to have high sensitivity but Falcon's claim of 91dB was not substantiated by our measurements. Our pink noise and music results of 88.3dB and 87.7dB at 1m for 2.83V input suggest that 88dB SPL is a more realistic figure. As is often in modern speakers, this is bought in part through low impedance. Falcon is more honest than some in claiming a 4ohm nominal but our measured minimum of 2.8ohm at 136Hz is a little low even for that specification. Impedance phase angles are large at low frequencies resulting in a challenging minimum EPDR of 1.2ohm at 96Hz, so the GC6500R needs partnering with an amplifier well capable of driving low impedances.

Forward frequency responses [Graph 1, below] were measured at 95cm mic height, with the grille removed. The responses are rather odd, with a pronounced switchback centred on 1.3kHz and treble peaking at around 20kHz. As a result response errors are on the high side for such a loudspeaker at  $\pm 3.9$ dB and  $\pm 4.9$ dB, respectively, while pair matching error is disappointing at  $\pm 2.0$ dB, principally due to narrowband tweeter disparities above 10kHz. Ribbon tweeters often measure poorly for distortion but the Reference's unit is especially high, recording 5.6% and 4.6% THD for 90dB SPL at 10kHz in the two speakers. Moreover, an odd modulation effect was heard at the start of the test tone with the first tweeter, and non-harmonic spurs were seen in the distortion spectrum. Bass extension is a little disappointing at 56Hz (-6dB re. 200Hz), and the CSD waterfall [see Graph 2, below] shows high-Q tweeter resonances clustered around 9kHz. KH



ABOVE: Forward response shows a broad notch at 1.3kHz, a flat mid/presence and a peak at 20kHz



ABOVE: Cabinet modes are well damped but the ribbon tweeter shows breakup modes around 9kHz

## HI-FI NEWS SPECIFICATIONS

<b>Sensitivity</b> (SPL/1m/2.83V – Mean/IEC/Music)	88.3dB / 88.3dB / 87.7dB
<b>Impedance modulus: minimum &amp; maximum</b> (20Hz–20kHz)	2.8ohm @ 136Hz 34.5ohm @ 53Hz
<b>Impedance phase: minimum &amp; maximum</b> (20Hz–20kHz)	-69° @ 65Hz 47° @ 21Hz
<b>Pair matching/Resp. error</b> (200Hz–20kHz)	$\pm 2.0$ dB / $\pm 3.9$ dB/ $\pm 4.9$ dB
<b>LF/HF extension</b> (-6dB ref 200Hz/10kHz)	56Hz / 29.1kHz/33.7kHz
<b>THD 100Hz/1kHz/10kHz</b> (for 90dB SPL/1m)	1.8% / 0.2% / 5.2%
<b>Dimensions</b> (HWD) / <b>Weight</b> (each)	1200x255x400mm / 65kg

**LEFT:** As with its R.A.M Studio 30 [HFN Apr '19] Falcon keeps its single 4mm terminals up close with the internal crossover, so speaker cables 'hang' higher than with typical floorstanders

I was still left feeling that these recordings had more to give, both in terms of power and impact, and openness and expression.

### BUILT TO SCALE

On the plus side, the Reference GC6500R floorstanders never sound forced or overblown, and there's none of that forwardness some find a risk with speakers trying too hard to be 'hi-fi'. So brightness and brashness never enter the equation, and even the most abrasive rock mixes – along with some early classical digital content – is toned down and warmed up. That's both a good thing and, depending on your viewpoint, something of a compromise because the one word I found appearing most frequently in my notes was 'inoffensive'.

So the big wash of sound is certainly room-filling, but it doesn't always draw the listener into the heart of the music. It's too 'of a piece' for that, with some of the detail of both recording and performance glossed over in favour of sheer scale and presence. Crank things up – we are back to the need for a big amp again here – and the GC6500Rs do breathe that bit more freely, with instruments and voices separating a little more convincingly within that enveloping pool of sound. These big, impressive-looking speakers certainly put subtlety ahead of shocks! ☺

### HI-FI NEWS VERDICT

The Reference GC6500R speakers sound smooth, controlled and inoffensive on first encounter, and typically stay that way, their unflappable civility largely in keeping with their high-quality build and finish, weight and price. The lush, room-filling wash of sound is readily accessible but, for some listeners, this will be perceived as a trade-off against incisive detail, dynamics and compelling involvement.

Sound Quality: 80%



one might expect from speakers of this size, weight and price.

True, the speakers cover their tracks reasonably well, thanks to that low-end agility, but there's little sign of that satisfying growl and rumble delivered by some rival designs. For all that the GC6500R's balance sounds smooth and warm with the majority of tracks played, from the Brodsky Quartet's *Petits Fours* album [Chandos CHAN 10708] to the scale of the Royal Festival Hall organ opening ELP's 'The Three Fates', from the band's eponymous first album [Atlantic 781 519-2],

# Audio Research REF160S

The REF160M monoblocks were a radical change for the venerable Reference Series, and now they have been ‘cut ’n pasted’ into a single, spectacular stereo chassis  
 Review: **Ken Kessler** Lab: **Paul Miller**

**T**his should have been the simplest, swiftest review for me to undertake: I would simply drop the stereo version of the Audio Research Reference 160M [HFN Aug '18] into my system in place of the Reference 75SE. Double the number of KT150s and double the power, a price tag of two quid shy of twenty grand, fond memories of the monoblocks still tugging at me after 18 months: the Audio Research Reference 160S should have been a doddle, easy to anticipate. But it wasn't.

It has been Audio Research's practice to deliver stereo versions of its monoblocks after a suitable passing of time. In theory, the differences should relate solely to general monoblock-vs-stereo amp arguments: total isolation of left-and-right channels and separate AC sources for both, versus shared elements in the stereo edition. But here it's not straightforward because the new model – hitherto called the REF160S – is almost *too* good.

## DANDY TRIODE

At first glance, this looks to be exactly what a stereo version should be: same rating, but a single chassis and a massive cost saving – roughly 30%. Otherwise, it's the same in operation and practice, again with the pain of valve housekeeping reduced thanks to auto-bias and the delicious user option of switchable Ultralinear and Triode operation on the fly.

But this calls for a moment's digression, as I champion the KT150. Over the years, I have been drawn to a handful of output valves, including the KT77, 211, 845, and I am no more ashamed than those who worship the 300B triode. But just as the 6550/KT88 became the *de facto* tube for most makers, as did the EL34 decades before, the KT150 has become a modern classic. Moreover, Audio Research truly

**RIGHT:** Cover removed reveals the two 6H30 driver triodes and quad set of KT150 output tubes per channel. Auto-biasing will also accommodate lower output 6550, KT88, and KT120 tubes, should you wish...

knows how to apply it – as I found when moving from the REF75 [HFN Nov '12] to REF75SE. With REF160M or S, we find it also makes a dandy triode.

As editor PM counselled me, 'Triode mode offers half the power and fractionally less distortion here, but how does it sound?'. Once again, I wish there was armchair remote selection available here, but I still found the choosing of Ultralinear-vs-Triode to be source-, genre-, system- and political-bias-dependent, but that's simplifying it too much. As I said, my initial thoughts that this review would prove to be a doddle were swiftly crushed.

It was gonna be a breeze – dig out my notes for the 160M review, same music. But in the interim, I had changed from Wilson Yvettes [HFN Feb '17] to Sasha DAWs [HFN Mar '19], acquired the TechDAS

Air Force III Premium turntable [HFN Jun '19] and changed all wiring to Transparent. So I had to approach this with fresh ears.

## TWO INTO ONE WILL GO

Installation was utterly straightforward. The rear of the amp is fitted with stout 4mm binding posts with nominal 16, 8 and 4ohm taps and an array of toggles to select single-ended or balanced inputs, fan speed and auto-shut off. Tube hours are indicated on the back.

Initially, I didn't even bother to check whether

I was in Triode or Ultralinear mode, the power differences between the two never an issue for me as I'm no headbanger. I couldn't wait to hear the thing but impatience is an ugly trait, and switch-on involved the usual waiting for the unit to settle down and come out of its mute

*I immediately thought about selling my wine cellar'*







condition. I was chomping at the bit. Those two minutes or so seemed an eternity...

It was worth it, for what issued forth was so extreme a jump in performance that I immediately thought about selling my wine cellar so I could acquire a REF160S of my own. As there had been so many changes to my system since I reviewed the monoblocks, I threw out the notion of using the same LPs and CDs in an attempt at repeating precisely the same test. Instead, I trusted my ears (and hundreds of hours with the rest of the system) to decipher the charms and merits of the REF160S. And it started with the bass.

Anyone who's heard the remastered, 50th anniversary edition of The Beatles' *Abbey Road* [Apple 02508 00744] knows that opening track, 'Come Together', is an exercise in bass quality, extension and

expressiveness. Again, without looking at the colour of the LED to tell me which mode I was in, I wallowed in lower octaves I have never heard from this album. I even dug out an original copy to determine how much of it was the amplifier and how much was the remastering.

### PEERLESS POWER

Suffice it to say, the REF160S amp will immediately gain recognition for obviating any arguments about solid-state versus valve bass. It was extended, taut and fast-sounding, but most of all it proved to be rich with detail in a way that elevates one's respect for Paul McCartney's playing to an even higher level. (*Bass Player* magazine places him N°3 among the world's best.)

This amp creates a foundation for weighty material that I can only liken to

**ABOVE:** Like the REF160M monos, this stereo unit provides four buttons for power on, meter light on/off, tube monitoring and Ultralinear or Triode mode, the LED changing blue to green

moving from an 8in to a 12in woofer. And, that had nothing to do with power, because – once I had revealed in both versions – I checked the illumination to find I was in Triode mode. So I replayed both, this time in Ultralinear, and heard only a minuscule gain in impact and tautness.

Before passing judgement on one versus the other, I slipped ZZ Top's 'Gimme All Your Lovin'' [*Coin* '50; Warner Brothers R2 591567] into my treasured Marantz CD12/DA12 CD player. It was the first time I had the strength to switch it on after the passing of Marantz's brand ambassador, Ken Ishiwata [see p138], knowing that he'd have preferred Julie London, but would have gotten a kick out of this peerless power trio. I wanted to hear that track both for the utter perfection of its percussive opening, and the raunch of Billy Gibbons' guitar playing.

Blow me down, for while I expected the Triode setting to be flabbier, the Ultralinear punchier, the difference was so subtle that it became a matter of personal preference. For me, the midband is king/queen, the extreme treble the trickiest bit if sibilance or edginess is to be avoided, and bass is something that usually reminds me of Goldilocks' porridge choices. And so it was here – the Triode setting favoured the guitar and vocals, while Ultralinear suggested an erg or two more power. But this needs clarification, because we are talking minute differences so barely ☞

## NEW GENERATION

ARC's REF160M monoblocks [*HFN* Aug '18] might have shared the same prefix as earlier classics including the REF75 [*HFN* Nov '12], REF150 [*HFN* Feb '12] and REF150SE [*HFN* Dec '15] but its design and technical performance was clearly influenced by more recent models, including the KT150-equipped GS150 [*HFN* Jan '15] and inaugural autobias model, the VT80 [*HFN* Oct '17]. Warren Gehl, responsible for the amplifier's 'voicing', together with the late Chief Engineer Ward Feibiger, navigated the move to the beefy KT150 output tubes that are now seemingly *de rigueur* for all 100W+ valve amps with audiophile pretension.

Noise aside, the new REF160S really does offer everything that the REF160M monoblocks deliver [see Lab Report, p67] but at two-thirds the price. Moreover, the pair of large power meters are now more accurate than those we tested on the REF160M. Perhaps Audio Research reads *HFN's* Lab Reports after all, because where the 160M's meter read 0.015W for a true 1W/8ohm (8ohm tap) output, and 10W read 0.15W, and 100W read 1.5W on the 'Ultralinear' scale, the REF160S's meters are calibrated to read 1.5W for a 2.2W/8ohm output and 15W for 12W/8ohm output. So these meters are no longer purely decorative! PM

# [master]

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## AUDIO RESEARCH REF160S



**ABOVE:** Small toggles switch between single-ended (RCA) and balanced (XLR) inputs, fan speed and auto-shut off (signal sensing). Tube hours are indicated beneath while 4mm speaker binding posts offer 16ohm, 8ohm and 4ohm-tapped outputs

significant that they almost gave me a headache trying to identify their strengths and weaknesses.

This is, I hasten to emphasise, not to suggest they are inconsequential. I prefer to stress vehemently that the two offer preferential choices, not absolutes. In practice as most bombastic music will mask the variances, personal taste will always win (the Triode mode is generally sweeter and less aggressive), one's partnering speakers will play a part, and you'll probably hear wider variations between, say, a standard LP and a 180g pressing.

### BLASTS OF BRASS

Why, then, am I going on about it? Simply put, anyone investing this kind of money and commitment to a piece of hi-fi equipment – no, make that anyone who cares enough about sound to read this magazine, regardless of their fiscal standing – will deem this important. But I do not want to mislead because, whichever setting you use, the REF160S belongs in that category of amplifier that defines the uppermost calibre of performance. And it proved to be breathtaking when fed half-track, 15ips tapes on a recently-refurbished Otari 5050 reel-to-reel.

Chasing the Dragon's *Big Band Spectacular* [no catalogue number] featuring the Syd Lawrence Orchestra is one of the most natural, powerful recordings I've heard in years, with transient attack, blasts of brass and eye-watering dynamic swings that elevate it to reference standard levels – it's the kind of album that shows off a system the way our 1950s forebears used steam railway recordings.

Again, the choice of mode was down to user preference (a whisper more air and scale in Triode, a tad

more incisive punch in Ultralinear) but the overall sensation – and ultimately that's what matters most – was one of an iron fist in a silken glove. The sheer scale and presence of a big band is something to behold, reason enough to account for the preponderance of LPs and tapes produced by the genre in the early days of stereo, and the REF160S delivered it with the needles rarely passing the midpoint, unless a crescendo so demanded it.

More telling were the massed voices in Mahalia Jackson's version of 'Go Tell It On The Mountain' from *Home For Christmas* [Columbia House DT3 5610, 3¼ips tape], which were spread across the room in a proscenium arch of clearly-defined shape and dimensions. Vocal textures? As lifelike as I hoped. Handily, the next track was the acoustic guitar version of 'The First Noel' by Charlie Byrd, and it was this solo instrument that revealed even more about both the amplifier in general and its choice of modes in particular. Simply put: it shimmered. In every way. ☺

### HI-FI NEWS VERDICT

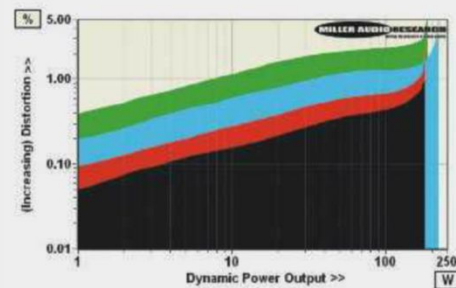
Even if I didn't have to think about cost/space considerations, Audio Research's Reference 160S has shot to the top of my Fantasy Sound System League Table. It does everything I want, with style, grace and – like a pussy cat suddenly discovering its inner lion – power to spare. It's not often I feel a gnawing tug when a review unit is collected, but waving goodbye to the REF160S was a wrench I didn't anticipate.

Sound Quality: 90%

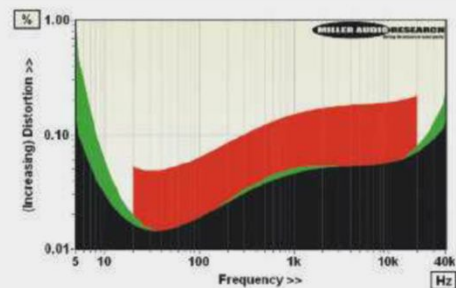


With differences between the original REF160M [*HFN* Aug '18] and this stereo version boiling down to necessary changes in PCB layout, one less filter capacitor and positioning of two fans under the chassis, comparisons are intriguing. Is the REF160S really equivalent to two REF160Ms? Let's start by looking at power output: both amps have the same 140W rating and this is met into 8 and 4ohm with 2x169W (160S) and 165W (160M) being delivered at up to 1% THD via the 8ohm and 4ohm taps. This improves very slightly under dynamic conditions to 180W into 8/4ohm with 215W/2ohm (<2% THD) and 185W/1ohm (<3% THD) all in the REF160S's 'Ultralinear' configuration [see Graph 1, below] and just a few watts ahead of the REF160M. In 'Triode' mode the output from both 160S and 160M falls to 82W/8ohm and 85W/4ohm with a very marginal reduction in distortion at the frequency extremes [black vs. green trace, Graph 2 below].

The 'shaped' frequency response with its mild +0.1dB bass boost from 300Hz down to 10Hz allied to a gentle mid/presence roll-off of -0.25dB/5kHz is retained in the REF160S but the HF roll-off is less exaggerated. Here it is just -0.25dB/20kHz down to -4.0dB/100kHz, as opposed to -0.7dB/20kHz and -7.1dB/100kHz in the REF160M (Ultralinear mode, 1W/8ohm), although the 0.7-1.5ohm output impedance (20Hz-20kHz) is unchanged via the 8ohm tap. Once again, distortion increases gently with output level from 0.05%/1W to 0.15%/10W and 0.6%/100W (all 1kHz/8ohm). Versus frequency, the minimum is at 40Hz (0.05% at 10W), increasing to 0.22%/20kHz. Noise is very low, but not as low as in the REF160M which achieved an A-wtd S/N ratio of 100.5dB (re. 0dBW). For the REF160S, the figure is 94dB. PM



**ABOVE:** Dynamic power output versus distortion into 8ohm (black trace), 4ohm (red), 2ohm (blue) and 1ohm (green) speaker loads. Max. current is 13.6A



**ABOVE:** Distortion vs. frequency (20Hz-20kHz, 10W, red; 5Hz-40kHz, 1W Ultralinear, green; Triode, black)

### HI-FI NEWS SPECIFICATIONS

Power output (<1% THD, 8/4ohm)	169W / 170W
Dynamic power (<5% THD, 8/4/2/1ohm)	180W / 181W / 215W / 185W
Output impedance (20Hz-20kHz)	0.687-1.48ohm
Freq. response (20Hz-20kHz/100kHz)	+0.1dB to -0.25dB/-4.0dB
Input sensitivity (for 0dBW/140W)	179mV / 2105mV (balanced)
A-wtd S/N ratio (re. 0dBW/140W)	93.6dB / 115.1dB
Distortion (20Hz-20kHz, 10W/8ohm)	0.06-0.19%
Power consumption (Idle/Rated o/p)	420W / 740W
Dimensions (WHD) / Weight	483x260x546mm / 45kg

# Abyss AB-1266 Phi TC

While their eye-catching aesthetics have been unkindly compared with 'Eastern Bloc, Cold War era' industrial design, these flagship cans still aim to please both head and ears  
 Review: **Keith Howard & Christopher Breunig** & Lab: **Keith Howard**

**I**s conventional headphone design an example of what biologists call convergent evolution – adoption of a common design solution because it's optimal – or something more akin to herd behaviour: doing it a particular way because we always have?

It's a question that thinking audiophiles will inevitably ask when presented with a product like the Abyss AB-1266 Phi TC, the more so given that this rejection of headphone design convention comes with a price tag of £4950. While Abyss's top model is not as iconoclastic as the Mysphere 3.2 [HFN Jan '20], nevertheless its unusual headband design begs an obvious question: has everyone else got it wrong or is Abyss the only boy in step?

## CYBERMAN STYLE

Conventionally, headbands accommodate heads of various sizes by being curved springs, at either end of which the capsules slide in or out and rotate to fit around or on the ears. The AB-1266's headband, by contrast, is a U-shaped alloy section joined rigidly to the capsules. A wide, flat, black strap suspended between the two upright parts of the headband is attached via elastomer loops and supports the headphone on the scalp, with the flat top section of the headband above it. As our photographer pointed out, you look like a Cyberman from *Doctor Who* when wearing this!

The alloy headband is adjustable via a sliding joint at its centre. This allows capsule spacing to be adjusted over a range of 20mm, and permits the

**RIGHT:** The position of the soft lambskin earpads – attached magnetically to Abyss's low-carbon steel baffle – may be rotated for personal comfort and 'desired acoustics'. Cables connect via lockable 3-pin XLR sockets

headband to be angled at up to 55° either way (my measurements), tilting the fixed capsules forwards or backwards.

The circumaural earpads have elliptical recesses for the ears and a wedge profile that's thicker behind the ear. Held to the inner faces of the capsules by magnets, they are located by circumferential notches (18 in total) in a thin backing plate. These engage with six stainless steel screws

which hold the driver within the CNC-machined, black anodised aluminium capsule. (A further six interspersed fasteners attach the capsule back plate.) This arrangement allows the earpads to be rotated in 20° steps.

But given that anthropometric studies, informing the design of the KEMAR artificial ear, record the standard deviation of ear angles as 2.8°, it's difficult to see how this can be the least bit useful in practice.

Abyss's aim in all this has been to provide a strong, vibration-free foundation for its planar magnetic (PM) drive units that's utterly devoid of flimsy plastic parts. But this raises the issue of whether it is truly free from resonance.

'The moment the stylus was lowered, I was hooked!'



Abyss makes reference to 'integrated resonance control' in its description but the metal headband is quite resonant if you tap it when wearing the headset. Moreover, the frequency response traces feature a large glitch at something over 400Hz that cumulative spectral decay analysis shows to be caused by a strong high-Q resonance – almost certainly a structural resonance. And however stiff the structure, like many PM drivers, the AB-1266 shows other high-Q modes through the treble, so it cannot be considered a substantially resonance-free headphone.

## PACKAGE DEALS

Also unusual is the connecting cable. We were sent the 'Lite package' with the base cable set, but two other packages are available – the £5850 Deluxe and £7800 Complete – which include further accessories and superior cables. Still, the base cables are novel for having separate left/right channel runs, probably to reduce overall stiffness. If you find this arrangement awkward, a few cable ties can be used to bind the two together.

The cables are 2.5m in length, 4.5mm in diameter, have smooth sheaths to minimise mechanical noise generated by them rubbing against clothing, and are terminated with a 4-pin XLR plug for balanced operation. A 27cm adapter cable, terminated in a 6.35mm jack socket, provides for unbalanced drive. No provision is made for use with mini-jack outlets. Curiously, all connector pins are gold-plated with the exception of the 3-pin mini-XLR sockets in the base of each capsule.

Given that Abyss was an early adopter of new-generation planar magnetic drive units, it has very little to say about its drivers on the website. So I looked up the patent (US 2015/0326974 if you'd like to check it out yourself). Its principal innovation is that rather than using an array of bar magnets for the stator element, as



**LEFT:** CNC-machined alloy frame is finished in a durable two-tone black 'polymer ceramic coating'. The AB-1266s are designed to rest on the head rather than apply a clamping force

the AB-1266s somewhat cumbersome to wear, and the rigidity of its metal band can make removal awkward, but the long twin cable with locking adapter and 6.35mm jack is mercifully free of microphony.

My first impression of their sound was also less than stellar as I arbitrarily grabbed Dave Brubeck's *Time Out* CD [Columbia Legacy CH 65 122] and tried 'Blue Rondo À La Turk'. Ok, the soundstaging was decent but the cymbal was very reticent – just the faintest of sounds in the left channel. I left the track on 'repeat' and, returning many hours later, was pleased to discover some of the bass had cleaned up even though the cymbals still offered the vaguest of washes in the background to Paul Desmond's big sax solo.

#### STRICTLY STRAUSS

One reviewer has suggested the AB-1266s distort on triangles, so I played a recent Eloquence CD reissue of Strauss pieces conducted by Josef Krips [484 0692] and 'Pizzicato Polka' where a triangle answers some of the string phrases. It was recorded in stereo with the Vienna Philharmonic in the Sofiensaal back in 1957 – Erik Smith and John Culshaw producing – but the sound is quite remarkable for string tone accuracy and hall ambience.

No fizziness or distortion with our review sample, and this track showed some of its virtues – a clean separation so you could clearly hear secondary string parts; a soundstage that you could hear as open and picture in front of you; and a bloom added to the sound which seemed reasonably natural.

I also listened to a rip of this track and the two following ones with the delectable Viennese soprano Hilde Gueden, switching from my Series 6 DNM preamp to the more capable Benchmark HPA4 [HFN Oct '18], with a Macbook Pro/Audirvana 3.5 feeding a Benchmark DAC3 B [HFN May '17]. The slow decay of the triangle's notes was more accurately rendered with this set-up even if the singer was just a little muted, lacking in some presence and charm.

Turning to rock, and with the rat-tat-tat of Jeff Beck's 'Shapes Of Things' [Truth; EMI 8 73748 2 8] you could catch most of the lyrics even though his voice, anchored centre-stage, was mildly recessed against the accompaniments. Yet the gutsy sound of the track was never less than engaging. ☺

is conventionally the case in PM drive units, a one-piece slotted neodymium magnet structure is deployed instead. The transducer arrangement is single-sided rather than double-sided, which opens up the possibility that distortion will increase at high output levels more than with other PM headphones. Nevertheless, at 90dB SPL, our tests showed distortion to be very low.

#### BATTLESHIP BUILD

Seemingly a world apart from the comfort and aesthetics of HiFiMan's rather more expensive Susvaras [HFN Dec '19], writes Christopher Breunig, the Abyss AB-1266 Phi TC's squarish metal frame still allows

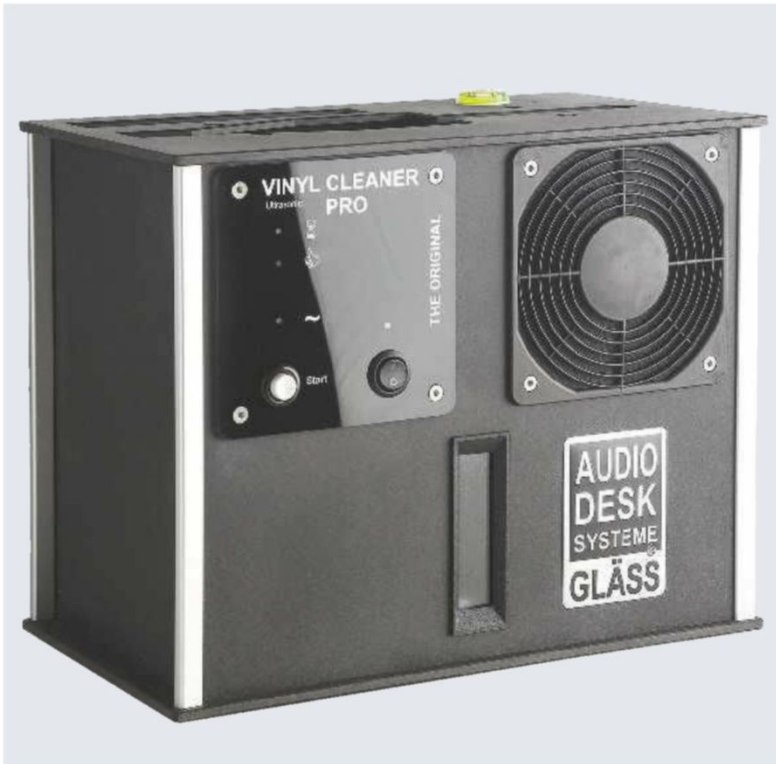
for customisation, angling and opening out for comfort, yielding a uniform head pressure around the soft, magnetically-afixed earcups.

As Abyss claims, they are not meant to make a tight fit to the head – it suggests you can change soundstage presentation and low bass to taste. I'll admit to finding

#### JPS LABS INC.

JPS Labs is based in Lancaster, New York, some 14 miles from Buffalo. Since 1990 it has been producing interconnect, speaker and mains cables including USB and S/PDIF digital types. But its first product was a line-level 'bass alignment filter' called the 'Golden Flute', intended to match specific speakers including B&W's 801. It also produced interconnects with aluminium core 'superconductors' – designer Joe Skubinski declaring that aluminium offers more 'neutrality' than either copper or silver [you can see foamed aluminium sitting behind the grilles of the headphones in the photo above]. JPS also offers a range of Stackzilla aluminium equipment stands and isolation platforms, all CNC-machined in house like the metalwork of the AB-1266. The planar drivers are also made entirely at the Lancaster plant. It took almost five years of research to finalise these drive units and their robust support structure: the goal was to match the finest of room loudspeakers and create an entirely maintenance-free headphone. In 2018 the company introduced its 'thinnest boutique headphone' the trickle-down and more portable £2995 Diana, supplied with 1.5m cable and carrying bag.

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Paul Rigby – The Audiophile Man, October 2019

## HEADPHONES



**ABOVE:** The centre bolt is pre-tensioned (do not loosen/tighten) permitting the frame angle and width – and thus headband tension – to be adjusted for head size

However, listening to the cellist Jean-Guihen Queyras in his new Harmonia Mundi collection *Complices* [HMM902274] I didn't quite get all the magic of the Saint-Saens 'Le Cygne'. In the John Coltrane 'Improvisation on Bach: Alabama' Queyras is partnered by tenor saxophonist Raphaël Imbert and you hear occasional sharp spitty noises, but these became merely buzzy 'noises off' with the AB-1266.

The upper strings from Vladimir Jurowski's live Moscow recording of Tchaikovsky's *Nutcracker* ballet [Pentatone PTC5 18676 1; 96kHz/24-bit] aren't that well reproduced – or not that good in reality – so track 2, more low register and winds, was more enjoyable than the Overture with these 'phones. Overall their clarity within the soundstage kept my attention over a longer tract, and they do capture subsidiary details well – as with the Johann Strauss II. And the flow of the music is engaging – toe-tapping or head-nodding, if you like.

This month's featured Vinyl Icon (p78) reminded me of Walter Carlos as a pioneer of electronic

music in the classical field and his two *Switched On Bach* LPs. After an enjoyable few minutes with 'Oxygene 2' downloaded in MP4 from the Internet, with its gurgling space-age effects, background choir and steady pulse, I listened to Carlos's recreation of Bach's *Brandenburg Concerto No 5* [CBS 65974]. The moment the stylus was lowered, I was hooked!

### VINTAGE ELECTRONICA

In 2004 EMI issued a Michael Nyman series of remastered CDs, including *The Draughtsman's Contract* [5 98442 2 0]. With the strutting 'Chasing Sheep Is Best Left To The Shepherds' the Abyss headphones brought out what little 'music' there is to listen to in this minimalist, repetitive track with its electronically reworked sounds from the ten-person Michael Nyman Band. With the crudely raspy 'A Watery Death' I was compelled to listen, mainly because the brass players are very good. So with electronic music these headphones really come into their own. ☺

### HI-FI NEWS VERDICT

Even for those able to afford these US-made planar magnetics, there's a price to pay in terms of physical comfort and adjustment, as these cans are relatively heavy and inflexible. However, the long microphony-free cable is a bonus, and there's a balanced option too. With some reservations about soprano voices in classical recordings, these specialised PMs really give off their best with electronic music and heavy rock.

Sound Quality: 80%



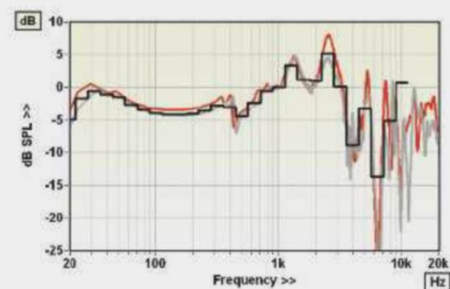
**ABOVE:** Hand-crafted two-tone felt lined wooden box comes as standard but an alloy headphone stand and superior cables are optional extras

## ABYSS AB-1266 PHI TC

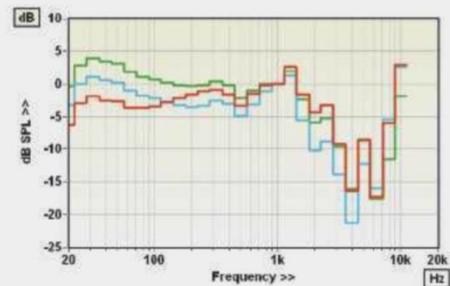
The current crop of planar magnetic headphones typically have below average sensitivity, a flat impedance trend, well-extended bass and recessed lower treble. In every particular, the AB-1266 Phi TC fits the mould. At a measured 98.4dB SPL for 1V input at 1kHz, the sensitivity of this Abyss model is far from being the lowest we've recorded for a planar magnetic headphone but is lower than typical of even high-impedance moving-coil models and much lower – to the tune of 16.8dB – than posted by the Audeze EL-8 open-back [HFN Oct '15]. Nevertheless, the AB-1266 Phi TC is relatively easy to drive with an almost constant impedance of 42ohm across the 20Hz-20kHz audioband. The variation of just ±0.1ohm means that the overall frequency response will not be significantly affected by the different headphone amp output impedances it is likely to encounter.

The uncorrected frequency response traces – derived from an average of ten separate measurements between which the headphone is removed from the artificial ear and then re-seated – look slightly 'rough', particularly between 1kHz and 5kHz [see Graph 1, below]. This is not due to noise but the presence of multiple diaphragm resonances, another feature commonly seen in PM headphones and confirmed by a 'grassy' cumulative spectral decay waterfall (not shown here).

Some PM designs achieve an almost flat response down to 20Hz but although the Abyss AB-1266 Phi TC doesn't quite manage that, very few listeners are likely to notice. Potentially more noticeable is the curtailed peaking around 3kHz and generally reticent treble output, which may well impart a warm tonal balance and reduced presence. This is reflected in the corrected responses [Graph 2, below], all of which indicate a large hole in perceived treble output centred on 5kHz, whereas below 1kHz the corrected responses are commendably flat with at worst only mild shelving up of the bass. KH



**ABOVE:** Reduced peaking around 3kHz in uncorrected responses suggests a reticent presence/treble [see below]. Diaphragm resonances are revealed at 1-5kHz



**ABOVE:** Third-octave freq. resp. (red = Harman corrected; cyan = FF corrected; green = DF corrected)

## HI-FI NEWS SPECIFICATIONS

Sensitivity (SPL at 1kHz for 1Vrms input)	98.4dB
Impedance modulus min/max (20Hz-20kHz)	42.0ohm @ 15.5kHz 42.1ohm @ 20Hz
Capsule matching (40Hz-10kHz)	±11.1dB
LF extension (-6dB ref. 200Hz)	<20Hz
Distortion 100Hz/1kHz (for 90dB SPL)	<0.1% / 0.1%
Weight (inc. cable and 0.25in connector)	646g

# Pro-Ject Classic Evo

Keeping up with progress in Pro-Ject's Mistelbach headquarters is enough to make anyone's head spin. The latest deck to be updated is the Classic, four years after launch  
 Review: **David Price** Lab: **Paul Miller**

**A**s the undisputed juggernaut of the vinyl world, Pro-Ject's progress has been dizzying, particularly in recent years, and the brand now even has its own record label [see News, p16]. So there's clearly a lot to celebrate as the company reaches its 30th anniversary this year [see PM's boxout, p73]. It all started with the Pro-Ject 1 – a cheap, no-nonsense, 'plug 'n play' record player launched when the received wisdom held that vinyl as a format was dying. Since then, the company has produced a huge array of different models – broadening its design strategy to ensure it can offer a turntable for every taste and budget.

Whereas rivals, including Rega, might painstakingly apply one single philosophical approach across all its turntables, Pro-Ject has shown itself to be far less doctrinaire. The Classic [HFN Aug '16] for example, was a nod to the designs of the '70s – in styling if not entirely in construction. It channelled the mid-price, suspended-chassis belt-drives of that era such as the Thorens TD160BC and Ariston RD 40, aiming to offer a sound that was substantially better than entry-level products but without breaking the bank.

## POETIC LICENCE

You might say it cheated a bit, because that fussy sprung suspension of the oldies was done away with, and in its place Pro-Ject fitted six Thermo Plastic Elastomer (TPE) balls between the wood plinth and main chassis plate. As we shall see, the new Classic Evo continues with this approach, but adds some tweaks along the way...

The first upgrade is to the optional pick-up cartridge. As per its predecessor, the Evo can be purchased as a package with a bundled cartridge already fitted. The original Classic came with an Ortofon 2M Silver MM for £799, but the new Evo comes with the superior and considerably more

expensive Quintet Red MC fitted for £1250. Of course, the Classic Evo is also available without a cartridge for £1050.

With its attractive real wood plinth – available in a choice of walnut and eucalyptus – and brushed metal top plate, this deck feels very well made for the money. It has a look and feel that many more traditional vinyl fans will find attractive, strongly resembling the classic designs that dominated the 1960s-70s turntable market before more minimalist and/or skeletal designs emerged in the '80s. In use the Classic Evo feels fairly slick, and is relatively quiet when you tap its plinth while playing – showing a decent degree of vibration damping.

In addition to the new cartridge option, there are two more key tweaks to the design of the original Classic that make up this new Evo version. Rather than the original's plastic sub-platter, the new deck

uses a substantial metal affair that's said to be diamond-cut from the same aluminium alloy as the main platter. The latter, a hefty 300mm diameter affair, sits atop and is lined with a thick ring of TPE damping on the underside. Together, the inner and outer platter assembly is necessarily

heavier than before, and seems impressively inert.

The inner platter sits on a steel/bronze/Teflon main bearing, apparently inspired by that fitted to the Vienna Philharmonic Recordplayer [HFN Jan '18], and is turned by an

electronically-governed AC motor. The two-button speed selection works logically and gives easy switching between 33.33 and 45rpm, with 78rpm also supported.

## STRONG ARM TACTICS

The Evo's second upgrade concerns Pro-Ject's latest 9in tonearm, which retains the carbon-fibre wrapped aluminium

*'The kick drum was served up with some serious heft'*



**RIGHT:** The Evo version of the Classic features a heavier sub-platter, machined from the same grade of aluminium alloy as the main platter. Speed control – 33.33/45/78rpm – is electronic





one-piece tube of the original Classic, but gets a larger, beefed-up bearing housing. The counterweight is finished in bright nickel and, again, damped with TPE, and fits – slightly less tightly than I expected, it should be said – to the rear of the armtube. This arm has a quoted effective length of 230mm and effective mass of 13.5g, and offers both azimuth and height adjustment in addition to an equally ‘classic’ thread-and-weight bias correction. Its magnetic armrest is a nice idea, but the review deck’s rest assembly was slightly wobbly, rather spoiling the slickness of the system.

At 462x131x351mm (whd) the plinth is a little larger than average, the deck weighing a total of 10.5kg. A clear dustcover is supplied that mates up to friction hinges fitted directly to the plinth, though I found that as with most turntables, the sound was better with it removed. Three TPE-damped alloy feet screw into the underside of the deck and offer height adjustment.

The package comes complete with the company’s Connect-IT E phono RCA cables, which hook up easily at the back. The Classic Evo took me about 20 minutes to unpack and set up, but do remember to remove the three transit screws from the top plate before fitting the platter...

### SCHOOL'S OUT

These ‘old school’ looks may hint at the sound of Pro-Ject’s Classic Evo, but they don’t quite tell the whole truth. Yes, this record deck is a little less tight and focused-sounding than modern market rivals from Rega and Technics, for example, yet it certainly doesn’t deliver the warm sonic ‘comfort blanket’ you got from classic designs from Thorens and Ariston back in the day. It really seems that the Classic Evo has been ‘voiced’ as a halfway house between old and new, giving a pleasantly sweet rendition of the records it spins, without sounding obviously coloured.

**ABOVE:** Seen here in its satin walnut finish, the machined MDF plinth also comes in a eucalyptus veneer. The alloy/MDF top plate rests on six TPE balls inside the plinth, affording added isolation

For most listeners, what defines the deck will be its smooth tone. Although clearly not in the super-sumptuous territory, the Classic Evo takes hold of UB40’s reggae classic ‘Don’t Let It Pass You By’ [*Signing Off*; Graduate Records GRADLP 2] and delivers it with a fulsome and thick bass. The kick drum comes over with lots of energy and thump, and backed by a pile-driving bass guitar line that pushes the song along with gusto.

The Classic Evo served up serious amounts of heft here, giving a more rounded account of the instrument than expected. However, this turntable’s sheer low-end grunt can make things seem a little leaden if there’s already a lot of bass energy packed into those grooves. For example, it didn’t sound quite as fleet of foot with Dire Straits ‘Private Investigations’ [*Love Over Gold*; Vertigo 6359 109] as perhaps it might.

### GOING ORGANIC

Despite this, the Classic Evo’s performance was never less than enjoyable, and typically underscored by a detailed and communicative midband. It has a naturally open and organic sound that’s fairly transparent yet doesn’t ‘machine gun’ detail at the listener.

I could easily discern the keyboard part playing right through the song; this can often get subsumed into the overall mix, but it remained clearly audible here.

At the same time, the deck threw out lots of little percussive flourishes from the rhythm guitar and tomtoms that kept my interest. I wouldn’t claim it approaches ➔

## THE VINYL PHOENIX

This year will see the 30th anniversary of ‘vinyl evangelist’ Heinz Lichtenegger persuading the owners of the Tesla factory (SEV Litovel s.r.o) in the Czech Republic to continue manufacturing turntables. With his unshakable belief in vinyl eventually rising phoenix-like from the shadow of CD, he set about launching the Pro-Ject brand. Heinz’s mantra ‘to offer the best analogue experience for a very reasonable price’ has now expanded beyond any reasonable expectation – UK importer Henley Audio’s website revealing over 40 turntable solutions from the £175 Elemental to the £8000+ flagship Signature 12. A tour of Pro-Ject’s new Mistelbach headquarters in 2018 also revealed its ability to ship any turntable direct from stock [see inset picture]. Export sales manager Günter Rathhammer has claimed that ‘more than 40% of all turntables sold in the world over €200 are made by Pro-Ject.’ If we include the OEM/rebranded models in this calculation then more than 50% of the world’s ‘real hi-fi’ decks now seemingly originate from this one supplier. **PM**



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## TURNTABLE



**ABOVE:** The Classic Evo's tonearm leads terminate in a connection box at the rear of the unit with an earthing post between. The supplied lid fits over the hinges shown – these are friction types that will hold it open at any desired angle

an etched or forensic sound, but there's still a decent degree of clarity on offer here that's more than commensurate with the price.

This detailed midband certainly complements the turntable's admirably spacious nature. So while the Dire Straits recording is famously open and expansive, the Classic Evo wasn't shy about expressing this. It set up a big recorded acoustic with that delicate classical guitar work on one side and the piano panned far across to the other, while Mark Knopfler's vocals were set securely at centre stage.

I feel confident in declaring this infusion of air and space to the sound, and good stage depth, is rather better than you'd expect from a turntable of this price. For my part, it was all underlined by the Evo's treatment of 'Arabian Knights' by Siouxsie And The Banshees [*Once Upon A Time*; Polydor POLS 1056], which sounded more spacious than expected, with an airy ambience that gave the song a compelling, almost ethereal feel.

### PERFECT PARTNER

This track also confirmed my suspicions that the Ortofon Quintet Red MC cartridge is a very good match for this deck. It is naturally balanced, albeit with a gentle touch of brightness in the upper midband that accents percussion and vocals. This lends the Classic Evo a slight fillip, perking its rhythmic performance up a notch.

Perhaps as a result, the Evo is particularly entertaining with electronica, old and new. For example, while The Pet Shop Boys' 'I'm Not Scared' [*Introspective*; Parlophone PCS 7325] has a complex and compressed mix with some deep, powerful bass, this still sounded lively and energetic as

the deck took a skillful swipe at the densely-packed musical layers.

Otherwise, I also found the Classic Evo happy playing lower paced, and perhaps slightly 'sparser' recordings such as Randy Crawford's 'Rio De Janeiro Blue' [*Secret Combination*; Warner Bros Records BSK 3541]. Here its charms really came to the fore – the deck/cartridge combination proving itself with an attractive and open sound, typically stepping out of the way and beckoning the listener into the performance at hand.

### SWEET AND CREAMY

Meanwhile, the Classic Evo's resolution of dynamic light and shade also helped with the backing instrumentalists, contrasting the gently brushed snare with hard-hit bass drum on this occasion. So this classic jazz/soul song was conveyed with some sensitivity, the deck doing a fine job of rendering the singer's soaring vocals. Her voice came over as enjoyably sweet and creamy, yet still had all the tension of a coiled spring – able to surge from quiet and tender to all out thunder in a flash. ☺

### HI-FI NEWS VERDICT

Pro-Ject's new Classic Evo does what it says on the tin. It isn't a forensic retriever of detail, nor is it an ultra-grippy, taut and tight renderer of bass. Instead, it's aimed at mainstream buyers wanting something that sounds smooth, spacious and enjoyable – and in this it clearly succeeds. Factor in the fine build quality, ease of set-up and excellent bundled cartridge option, and it's an impressive package.

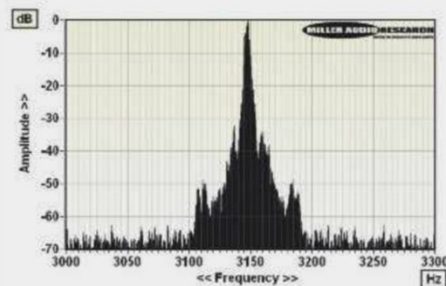
Sound Quality: 85%



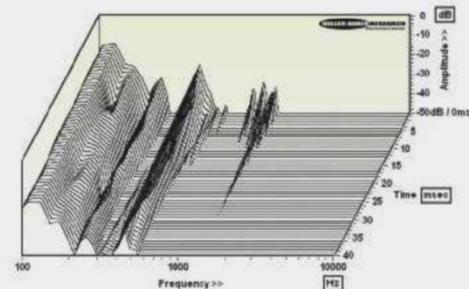
## PRO-JECT CLASSIC EVO

Measured directly through its latest stainless steel/bronze/Teflon bearing, rumble is a little higher than measured with Pro-Ject's inaugural Classic [*HFN Aug '16*] at  $-68.7\text{dB}$  (DIN-B wtd), a figure that improves substantially to  $-72.3\text{dB}$  (through groove) thanks to the isolation afforded by the felt mat. We saw a similar trade-off between the X1 [*HFN Aug '19*] and X2 decks [*HFN Nov '19*] where a heavier sub-platter/platter was also employed. The Evo's start-up time is just a fraction of a second slower too but absolute speed is more accurate at  $-0.07\%$  and drift and low-rate wow are reduced to just  $0.02\%$  [see Graph 1, below]. Flutter is a modest  $0.05\%$  with mild sidebands at  $\pm 12\text{Hz}$  and  $\pm 41\text{Hz}$ , the latter also appearing as a very well-defined peak on the unwt'd rumble spectrum ( $-60\text{dB}$  re.  $1\text{kHz}/5\text{cm}/\text{sec}$ ).

The tonearm fitted to Pro-Ject's original Classic deck was its answer to earlier *HFN* lab reports that revealed the high-Q resonances inherent in carbon tubes. Its solution was an alloy tube with an outer layer of carbon fibre, combining the stiffness of the latter with the improved damping of the former. A very similar 9in tube is used in the Evo, albeit mounted into a more substantial bearing block. The moderate 13g effective mass is unchanged but is better suited to the Ortofon Quintet Red MC than the higher compliance 2M Silver MM packaged with the Classic. The resonant modes of the tube and integral headshell are better defined in this version of the arm, the sub-100Hz bending of the original now lifted to 120Hz with the harmonic/torsional mode up from 165Hz to 175Hz, along with distinct resonances at 245Hz and 450Hz [see Graph 2]. The 'Evo' Carbon arm is, from a resonance standpoint, simply less 'cluttered'. PM



**ABOVE:** Wow and flutter re. 3150Hz tone at 5cm/sec (plotted  $\pm 150\text{Hz}$ , 5Hz per minor division)



**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	33.31rpm ( $-0.065\%$ )
Time to audible stabilisation	5sec
Peak Wow/Flutter (Peak wtd)	0.02% / 0.05%
Rumble (silent groove, DIN B wtd)	$-72.3\text{dB}$
Rumble (through bearing, DIN B wtd)	$-68.6\text{dB}$
Hum & Noise (unwt'd, rel. to 5cm/sec)	$-60.6\text{dB}$
Power Consumption	6W (1W standby)
Dimensions (WHD) / Weight	462x131x351mm / 10.5kg

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# Classical Companion

BEHIND THE MUSIC WITH HI-FI NEWS & RECORD REVIEW

## Mariss Jansons Conductor

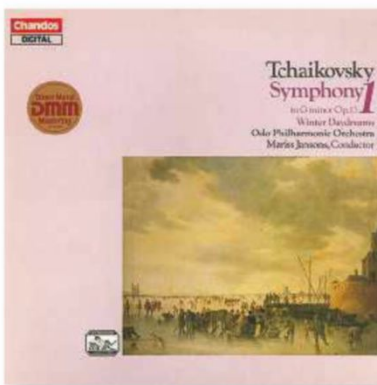
Training complete, he followed in his father's footsteps working with the Leningrad Philharmonic but his final years were in Munich. **Christopher Breunig** tells the story

When Herbert von Karajan took the Berlin Philharmonic to Moscow and Leningrad in 1969 he also gave a conducting masterclass for 12 students, where he was impressed most by the young Latvian Mariss Jansons, then 26. Jansons sat in on rehearsals where he said the orchestra 'played at two-hundred per cent capacity. It was unbelievable'. (Melodiya briefly issued on CD the Shostakovich Tenth from the Karajan concert.)

In fact, Karajan wanted Jansons to assist him back in Berlin, but the Soviet authorities declined to pass on the offer. Later, they relented and Mariss Jansons was mentored by Karajan at Salzburg: 'He was like a bird flying in the air while the rest of us were on the ground,' he said. Jansons was a recipient of the Karajan conducting prize given in 1971 – placed second to Gabriel

→ The first LP in Chandos Records' Oslo PO/Jansons Tchaikovsky Symphony cycle appeared in 1984

← Mariss Jansons, who was chief conductor of the Bavarian Radio Symphony Orchestra since 2003, seen speaking in a 2018 interview



Chmura, of whom we now hear hardly at all. And last year, at the Salzburg Festival, he was awarded the €50,000 Herbert von Karajan prize, endowed by Eliette, the conductor's widow.

### LENINGRAD APPOINTMENT

Jansons was born in Riga in January 1943; his mother was a singer, his father Arvīd, a conductor. Arvīd Jansons died of a heart attack while guest conducting the Hallé Orchestra in 1984. And 13 years later, during the last act of *La Bohème*, Mariss Jansons too suffered a heart attack, while working in Oslo.

'I knew immediately it was very serious. But stopping was not an option,' he thought.

'I had no strength and I said to the orchestra leader I feel very bad. Then I don't remember anything.' The players later told him that even after his collapse, his hands were still seen to be 'conducting'. After a further attack he was fitted with a defibrillator by a Pittsburg team. Sadly, Mariss Jansons died of heart failure last December.

Inevitably, his early childhood had been spent largely backstage in the Riga Opera House where

both parents worked. At home he directed a make-believe orchestra made up with bits and pieces, and played an imaginary violin with two sticks. Then at the Leningrad Conservatory he studied piano and conducting, and after the 1971 Karajan prize Mariss Jansons was offered a position with the Leningrad (now St Petersburg) Philharmonic Orchestra. His father had held a secondary appointment there from 1952.

But it was a move to work with the Oslo PO in 1979 that started his recording career. He made three Grieg LPs for a Norwegian label but Chandos set up an acclaimed Tchaikovsky Symphony cycle (including *Manfred*) in 1984, Brian Couzens producing in the orchestra's concert hall. The first instalment, No 5, the *Penguin Guide* declared to be 'no less electrifying than Yevgeny Mravinsky's'.

EMI published Jansons' first Shostakovich Symphony recording, No 5, in 1987 on digital LP and CD – now replaced by a disappointing 1997 VPO remake, while a 2005 concert performance with the Bavarian RSO is on YouTube. EMI then made the first of his three accounts of No 7, the 'Leningrad': Leningrad PO,

Concertgebouw, Bavarian RSO. The *Jazz Suites* were done in Philadelphia. 'His music speaks to me in a very particular and important way' he told *The Guardian* in 2010.

Mariss Jansons considerably raised the standards of the Oslo Philharmonic but resigned in 2000 unhappy with the Konserthus acoustics. In the '90s he guest conducted with the LPO and became music director at Pittsburgh, and 2002/3 brought appointments

'The move to Oslo started his recording career'



PHOTO: BERLINER PHILHARMONIKER

with both the Amsterdam Concertgebouw and Bavarian RSO – his Munich contract had been extended until 2024. His later discography, on BR Klassik, shows a range from Haydn to Varèse.

Asked 'what does this orchestra sound like?' Jansons replied 'Quite good, I think [laughs]. We have a very full sound, very emotional, brilliant *and* dark, the full spectrum.

'What pleases me most is our *pianissimo*: it's easy to play soft, but extremely hard to sound vibrant and expressive at the same time. This orchestra can do it.'

### A SOUR NOTE

But a piece in the *Münchner Abendzeitung* last summer suggested it was time for Jansons to quit – complaining of cancellations due to illness and suggesting possibly Daniel Harding or Susanna Mälkki as replacements. Others had noticed a loss in energy while conceding Jansons' *non-pareil* Shostakovich interpretations.



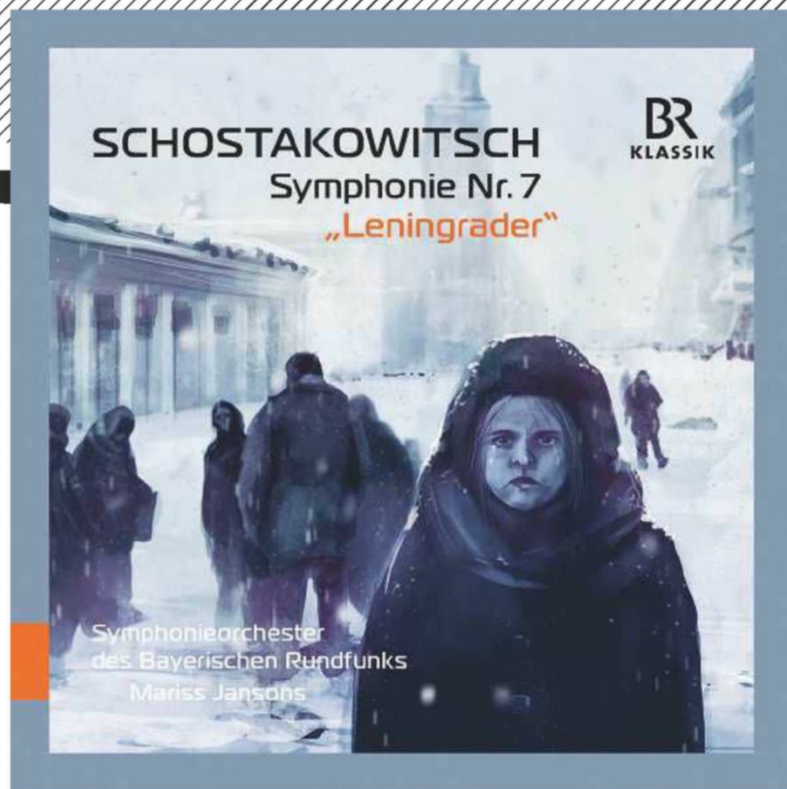
PHOTO: BR KLASSIK

That said, his third current recording of Symphony No 10 [BR Klassik 900707] is arguably too beautifully played to match the intensity of, say, the RLPO/Petrenko Naxos version. (Both these conductors had put their feet into it with reported sexist remarks about women conductors...)

Symphony No 6, however [BR Klassik 900161], has the most tightly organised account of the long opening that I have encountered, while the excellent Stravinsky *Symphony of Psalms* coupling shows an iron grip on rhythmic patterns and has beautifully clean textures.

With music not demanding such emotional commitment Jansons could be magical – is there a more enjoyable recording of Haydn's Symphony No 88 than the Jansons/Bavarian RSO's [see 'Essential

➔ The most recent of Jansons' recordings of the 'Leningrad' Symphony is on BR Klassik 900184. It was recorded at 48kHz/24-bit [see 'Hi-Res Downloads' HFN Jan '20]



Recordings' for details]? And nothing illustrates the orchestra's *pianissimi* better than the 2006 live performance of Richard Strauss's *Der Rosenkavalier* Suite [BR Klassik 900707] where Jansons really let his hair down in a most seductive, charming reading.

The same disc includes a sharply detailed account of *Till Eulenspiegel* where his 'death' and the coda are unexpectedly moving and real. Anya Harteros in the *Four Last Songs* is an overlooked triumph. Her attention to word meaning is exceptional and, rather than this seeming like an orchestral piece with voice, Jansons' subtle accompaniments make this definitely a *song-cycle* with orchestra supporting.

The Bavarians' Beethoven symphony cycle was mostly recorded live in Tokyo, the orchestra on tour there, and prior to that (Nos 3 and 6) in Munich. Uniquely, for the CDs a modern work was chosen to complement each work rather than a Beethoven overture, *etc.* The DVD set [ArtHaus Musik] is all from Suntory Hall performances while the CDs come singly or boxed as a set [BR Klassik 900119, six discs].

You'll find that this label offers some of its Jansons catalogue in alternative couplings, while it also issues some works in SACD format; downloads are so far limited to 48kHz/24-bit. BR Klassik also puts high-resolution concert videos on its website for a restricted time only. ☺

➔ The Munich Herkulessaal, home of the Bavarian RSO and venue for many DG recordings

## ESSENTIAL RECORDINGS

### Beethoven: Mass in C; Leonore No 3

BR Klassik 900170  
Bavarian RSO and Choir with fine soloists. 'Jansons is aware of the emotions running through the work but is perhaps more attuned to its lyricism than its drama', said one review.

### Brahms: The Symphonies

BR Klassik 900140 (three CDs)  
Kubelik did the first Bavarian RSO cycle in 1983; Jansons' (2004-12) is available in different couplings, Nos 2 and 3 on SACD.

### Dvorak: Cello Concerto

Erato 7352972 (budget CD)  
Truls Mørk with the Oslo PO – 'for sheer poetry this is unbeatable' said *BBC Music*.

### Haydn: Symphony No 88

BR Klassik 900175 (ten discs)  
With the *Harmoniemesse* this is in the SACD set *Mariss Jansons: The SACD Recordings* but can be extracted as a CD quality download.

### Schubert: Symphony No 9

BR Klassik 900169  
A 2018 recording of the 'Great C Major', with all repeats observed – quite forcefully driven, I thought, praised elsewhere as having 'overwhelming force and grandeur'.

### VPO New Year Day Concert, 2019

Sony 88875174772 (two discs) also DVD/Blu-ray  
The most recent of his three Vienna concerts (2006, 2012, 2016) all currently on CDs/DVDs.

# Vinyl Release

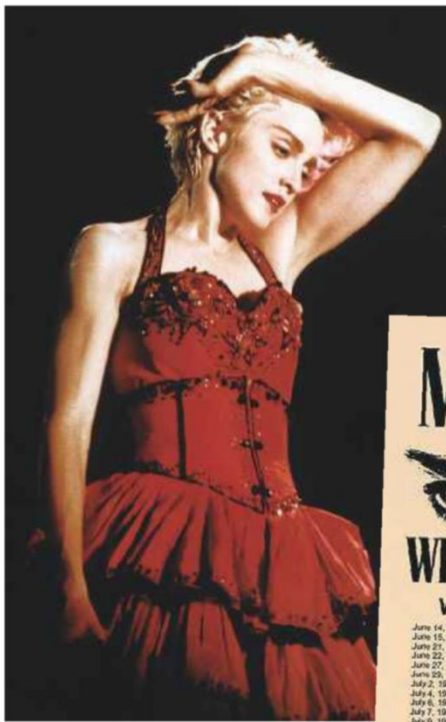
BEHIND THE MUSIC WITH HI-FI NEWS & RECORD REVIEW

## Madonna *True Blue*

Pinball wizard **Steve Sutherland** looks back on meeting Her Madge in the early '80s and her career-altering controversial third album, now released on 180g vinyl

She looks a bit lost, standing alone backstage leaning against the wall, watching all the celebrities mingle, clink glasses, air kiss and gossip. Lost and a little bored. Same as me, to be honest. So I cross the room and say 'hi'. She says 'hi' back. To break the ice, I point to the pinball machine, unoccupied, just over there, and ask if she fancies a game. She smiles again. 'Sure.' And away we go at it. As I remember, I won, although I'm sure – if she recalled it at all – she'd disagree.

Soon enough it's time to take our seats. I have good 'uns, about six rows back. Hers are way better. Front row... sitting next to Nile Rodgers of Chic. Who is that girl? Yup, you guessed it. March the 21st 1984, New York's Madison Square Garden and Duran Duran's biggest gig to date. Best of all, it's the day I meet Madonna.



➔ Madonna in Rotterdam on her 1987 *Who's That Girl* tour and (right) the tour poster



Within six months she's No 1 all over the world with *Like A Virgin*, her accelerating fame eclipsing forever every single other star in attendance this night. Her masterpiece, and third long-player, *True Blue* – the album we're here to celebrate – is just two years down the road.

### PUBLIC MYSTERY

This was the really big one. The album that elevated her critically from a canny pop star surfing the MTV zeitgeist to a *bona fide* artist of intelligent merit, someone with an insatiable ambition and desire for fame, and a fearless agenda in pursuit of it. And she didn't care who she used or abused to get where she wanted. In fact, the bigger the heap of targets and victims, the better. *All* publicity was good publicity in her eyes, and although it was pretty shocking at the time, we soon became attuned to her brutal baitings and the coy way in which, by and large, she refused to explain her beliefs and motives. A very public mystery she was, all surface and deep depths. A calculated shrug.

The song that initially got everyone going was 'Papa Don't Preach', a mini-movie in its own right. Madonna's a pregnant teenager, and explaining to her devastated dad how she doesn't care what anything thinks and, damn the consequences, she'll be keeping the baby.

As it ascended the charts, it was accompanied by one heck of a hullabaloo. The Planned

### 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...



Parenthood organisations claimed it would undermine efforts to promote birth-control among adolescents. Some even went so far as to suggest that, as Madonna was such a popular role model, she was *encouraging* teenage pregnancy.

However, anti-abortionists seized upon it as an anthem. Here's Susan Carpenter-McMillan, president of the California Chapter of Feminists For Life: 'Abortion is readily available on every street corner for young women. Now what Madonna is telling them is, "Hey, there's an

“It's a song that everyone is going to take the wrong way”

alternative”. Weirdly, it also appeared to support the Catholic Church's stance on birth control – at any rate until Madonna mockingly dedicated her 'blasphemous' 1987 *Who's That Girl* tour to Pope John Paul II

who immediately instructed that all true believers should boycott her shows.

### DELICATE BEAUTY

Madonna stayed shtum for some time, reaping the reward of all the attention, her publicist Liz Rosenberg issuing this statement on her behalf: 'She is singing a song, not taking a stand... her philosophy is people can think what they want to think'. Finally Her Madge brought this to the table: '[It] just fits right in with my own personal zeitgeist of standing up to male authorities, whether it's the Pope or the Catholic Church, or my father and his conservative, patriarchal ways.

'[It's] a message song that everyone is going to take the wrong way – immediately they're going to say I am advising every young girl to go out and get pregnant. But it's really about a girl who is making a decision in her life. She has a very close relationship with her father and wants to maintain that closeness.

'To me it's a celebration of life. It says, "I love you, father, and I love this man and this child that is growing inside me". Of course, who knows how it will end? But





➔ Priced £19.99, the 180g vinyl reissue of *True Blue* is available to order online from [www.juno.co.uk](http://www.juno.co.uk)

at least it starts off positive.’ The song itself, by the way, is a thing of delicate beauty, like Naomi Watts’ audition scene in David Lynch’s *Mulholland Drive*: you know it’s artifice and yet, such is the purity of the performance, you are seduced into believing it’s true.

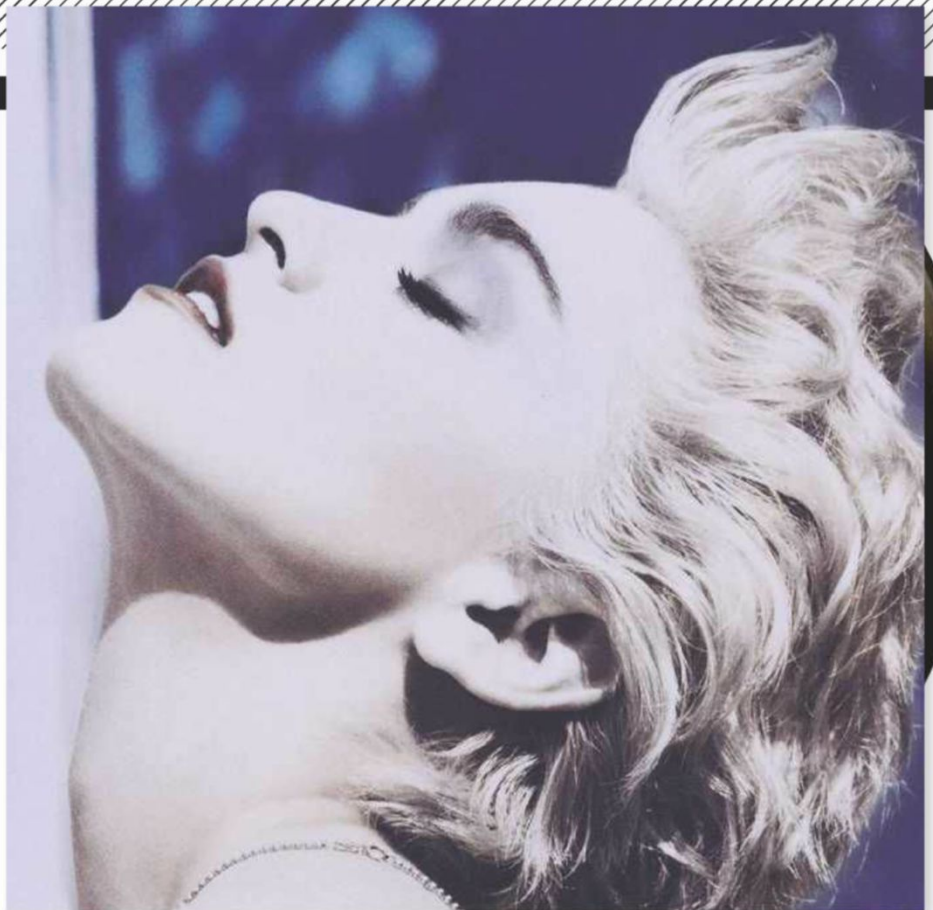
### EXPLOSIVE PRODUCT

We’ve already touched lightly on MTV but actually in 1983 the channel was in its absolute pomp, introducing acts to a global public becoming at least as addicted to pop visuals as pop sounds. But whereas most settled for strutting their manicured stuff in front of the camera, a few viewed it as a vital artistic component beyond mere marketing. Chief among them was Madonna. The imagery and scenarios in her videos, when linked to tracks with even the faintest whiff of attitude, served to create an explosive product.

Take ‘Open Your Heart’. Like many of the tracks on *True Blue*, it wasn’t written by Madonna. It was originally meant for, and rejected by, Cyndi Lauper – nothing too shabby but nothing remarkable until Madonna picked it, related to something personal in it, altered it beyond belief, inhabited it, then made it her own little drama by aligning it to a video in which she plays a stripper performing in a peep show to an audience of pathetic, slavering men.

When she waltzes out at the end, hand in hand with a small kid who’s been sneaking into her shows, all manner of questions are raised (and characteristically left hanging) about sexual power and freedom of expression. Her method on the album was brilliantly simple: she took the scripts and acted them.

And when there wasn’t any controversy to be milked from a lyric, Madonna went full-on populist. For the ‘50s retro title track (dedicated to future short-term hubby, actor Sean Penn) she staged a competition on MTV which screened, for a full day,



viewers’ own homemade videos to go with the song, Madonna herself presenting the winner with a handsome cheque on air.

And then there were the ones that gained notoriety as time went on. ‘Live To Tell’, for instance. It began life on the album as the silent partner to ‘Papa Don’t Preach’, the one that expressed all the teen emotions that weren’t released in adolescence. Said Madonna, ‘I thought about my relationship with my parents and the lying that went on. The song is about being strong, and questioning whether you can be that strong but survive’.

### CROSS WORDS

But in 2006 it grew teeth, Madonna performing it on her Confessions tour strapped to a mirrored cross and wearing a crown of thorns. The Vatican and just about every other religious organisation in the world went ape, and, once all the noise had sold the tickets she deigned to explain: ‘There is a segment in my show where three of my dancers “confess” or share harrowing experiences from their childhood that they ultimately overcame.

‘My “confession” follows and takes place on a crucifix that I ultimately come down from. This is not a mocking of the church. My performance is neither anti-Christian, sacrilegious or blasphemous. Rather, it is my plea to the audience to encourage mankind to help one another and to see

the world as a unified whole. I believe in my heart that if Jesus were alive today he would be doing the same thing.’ Right. OK.

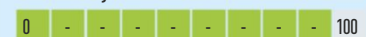
Before we go, let’s not forget the lovely ‘La Isla Bonita’, a song celebrating Latino culture, the video stuffed, of course, with Catholic symbolism and a free-spirited girl seemingly liberated from it.

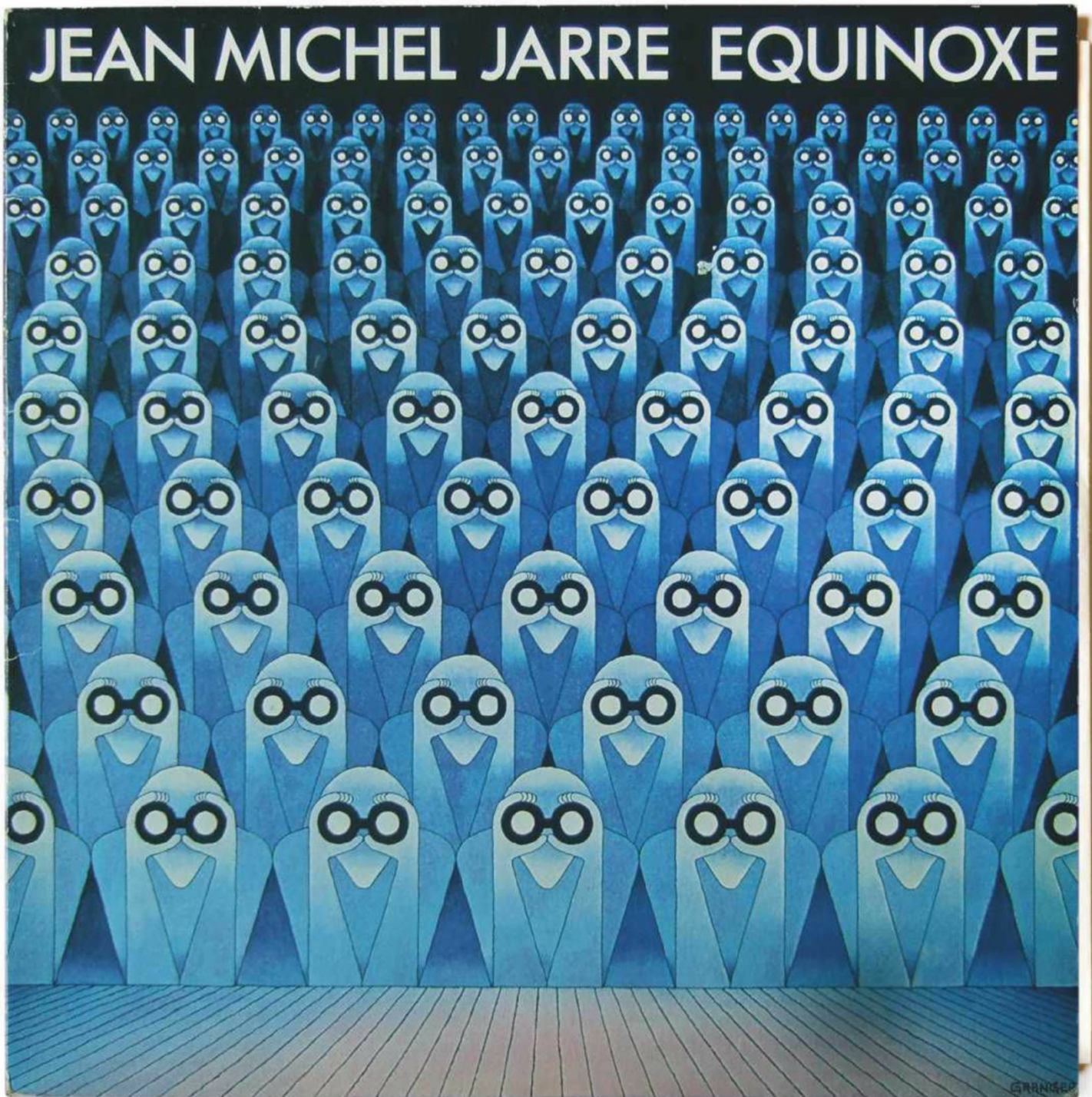
*True Blue* went on to reach No 1 in the charts in 28 countries. She wasn’t deaf, she wasn’t dumb, she wasn’t blind and, take it from me, she didn’t play a mean pinball. Back then, though, she was utterly fabulous, wasn’t she? ☺

### RE-RELEASE VERDICT

Produced at Channel Recording Studios, Los Angeles, in spring 1986, Madonna’s album *True Blue* first appeared in the States that June, issued on the Sire LP label, a part of Warner Music Group [LP: 1-25442], with a dedication to then-husband Sean Penn. There were also US CD and 8-track transfers in 1986. The cover shot was by Herb Ritts. Our Juno Records 180g reissue LP [Warner 060349 7849321] is pressed in clear vinyl and comes with a poster. **HFN**

Sound Quality: 90%





# Jean-Michel Jarre *Equinoxe*

It was panned by the British musical press on its release in 1978, yet this shiny synth classic would not only peak at No 11 in the UK charts but see Jean-Michel Jarre break all records with a live performance of the album drawing a crowd of one million  
Words: **Johnny Black**

Although there were many pioneers of electronic music, there's no doubting that Jean-Michel Jarre's 1976 album, *Oxygene*, was the first encounter with fully synthesised and sequenced music for millions of listeners across the globe.

Having scored gold and platinum sales with *Oxygene* in several territories, Jarre then had to deliver a convincing follow-up album which would, hopefully, achieve even greater success. And with *Equinoxe*, he did exactly that.

At the time of *Oxygene*, the British public knew Jarre little more than as a handsome Frenchman – he was not yet even married to actress Charlotte Rampling. Virtually none of his new fans knew that *Oxygene* was actually his third album, or that he'd already carved out a respectable career composing soundtracks and writing lyrics for a number of French pop artists. What's more, his father was Maurice Jarre, the revered composer of film scores.

#### FAMILY AFFAIR

*Oxygene* had been a huge leap forward for Jean-Michel, not just in terms of sales, but because it sounded radically different from any of his previous albums, and also dramatically different from albums by contemporaries such as Tangerine Dream or Vangelis. Much of this change had come about because, halfway through making it, Jarre had begun a collaboration with Michel Geiss, an electronic innovator and instrument designer.

Geiss had helped Jarre get to grips with the ARP 2600, the era's most user-friendly keyboard-

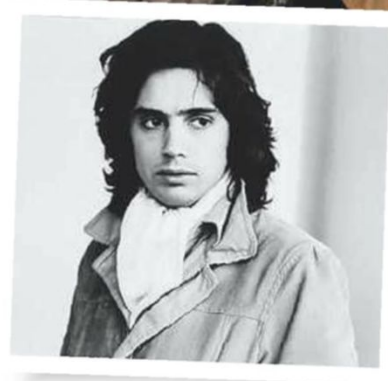


Label for Side 1 of the original 1978 LP *Equinoxe* which first appeared on the Disques Dreyfus imprint

Jean-Michel Jarre pictured in Berlin in 2016

Polydor press shot of Jarre from 1977, used to promote *Oxygene*

The tracks 'Equinoxe Part 4' and 'Part 5' were released as singles, a cover version of 'Part 5' becoming a Top 50 hit for The Shadows in 1980



operated audio synthesiser, and when they started work on *Equinoxe* in January 1978, their relationship blossomed. 'I remember those years as a fantastic musical and creative experience, and I enjoyed very much working with Jean-Michel,' Geiss has said. 'It was even more than a full-time collaboration, as I was even sharing a good part of his family life.'

#### MACHINE HEAD

Working in Jarre's home studio, a narrow, converted dining room in a flat just off the Champs-Élysées in the heart of Paris, the pair spent much of their time searching for new sounds. Jarre often turned to Geiss to help him realise what he was hearing in his head. 'I am a composer, not an engineer,' he explained in 1979, 'but I do work with an engineer. He is working on creating a special range of instruments. The 20th century needs to come up with new instruments, just as craftsmen did in the 17th century with the guitar and violin. The instruments we use today, are just electrified versions of old instruments.'

Jarre had always maintained that while it was an instrumental

suite, *Oxygene* did not have any story or concept behind it. With *Equinoxe*, however, he revealed that he had a definite story in mind, which involved a representation of a day in the life of one individual, from waking in the morning to falling asleep again at night.

#### TRACK AND FIELD

Although the music itself suggests different moods and atmospheres from that day, Jarre's use of sound effects – the thunderstorm in 'Equinoxe 5', the street band in 'Equinoxe 8' – enormously enhances the images that appear in the mind's eye while listening. It's worth noting that Michel Geiss designed those rain and thunder sounds with Jarre, and we know that on subsequent albums, Geiss went on field trips

to collect sound effects, notably the train recordings on *Magnetic Fields* from 1981.

If Jarre's melodies and rhythms must take most of the credit for why

*Equinoxe* works so beautifully as ambient trance, as bouncy pop instrumentals and as dance music, the composer himself never forgets that his machinery also plays a major role. 'Take albums such as *Oxygene* and *Equinoxe*, the analogue delay coming from two Revox B77 tape recorders is probably making almost 50% of the sound of these albums.'

It's also true that while Geiss's specially-made gadgets provided many of *Equinoxe*'s unique sounds,

'The studio was simply the dining room of Jarre's flat'





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## VINYL ICONS

### PRODUCTION NOTES

Although *Equinoxe* was considered to be a state-of-the-art electronic album on its release, it was produced under conditions that any mid '70s anti-establishment indie rocker would have approved of. The studio was simply the converted dining room of Jarre's Paris flat. Much of the equipment was secondhand, which Jarre had re-conditioned or adapted himself, and included a none-too-fancy Scully eight-track recorder, though this gave way to a 16-track MCI for the making of *Equinoxe*.

This was pressed into service to record Jarre's array of analogue electronic instruments, which ranged from a very basic Korg Minipops drum machine to the world's first commercially available string synthesiser, the Eminent 310, kitted out with an Electro-Harmonix Small Stone phaser on its string pads. The main sound from 'Equinoxe 1' consists of the Eminent's 'SUST strings' setting and an 8ft organ tab with chorus. Jarre employed liberal lashings of echo on the various sound effects generated by his VCS3 synthesiser while also present was Jarre's ARP 2600 synthesiser.

Jarre and engineer Michel Geiss made a formidable team. 'Part of my artistic collaboration was to use my training and knowledge in electronics to build new instruments or modify existing ones to adapt them to



DANIELE DALLEDONNE

← Jarre live at The Forbidden City in Beijing in 2004



Jarre's knowledge of much older electronic instruments enabled him to make choices, such as the eerie theremin sounds employed to enhance the synthetic sounds on 'Equinoxe 2'. (Invented in 1920, the theremin had been providing voice-like electronic tones in horror film soundtracks for decades.)

### MOOD MUSIC

Intriguingly, Jean-Michel's estranged father, Maurice Jarre, originally a purely orchestral composer, would produce several entirely electronic scores, including *The Year Of Living Dangerously* (1982), *Witness* (1985) and *Fatal Attraction* (1987). Perhaps unsurprisingly given that his eclectic musical background included a classical

education, a father who composed film scores and exposure as a child to avant garde jazz, Jarre's attitude to electronic instruments was very pragmatic. 'I think of synthesisers as instruments, musical instruments. Like the piano is a machine, an acoustic machine, but very much an instrument as well'.

Although it's understandable that Jarre is generally considered to be an electronic composer, *Equinoxe* provided early hints that his liberal musical education was already having an effect. For example, the synthesised street band melody at the start of 'Equinoxe 8' is clearly the work of a man with a love for French folk tunes, while the intricate round of 'Equinoxe 1', and its pseudo-orchestral evocations of morning, point to his classical education.

Something else Jarre shared with composers of earlier centuries was an awareness that music could be functional. By the 1970s, the term 'background music' was most frequently used as an insult, akin to 'wallpaper' or 'elevator' music. Most 'credible' jazz or rock musicians of the era considered their work to be creative, imaginative and intellectual. However, Jarre said, 'I want people to use my record to play at different times when they are in different moods'.

For Jarre, the term 'use my record' was a very conscious recognition that composers of the past, including

Bach, Mozart and Handel, had often created music which was functional. Handel's *Music For The Royal Fireworks*, for example, was designed to be played during a fireworks display, ie, it was deliberately composed as 'background music', but that did not detract in any way from its quality.

### LONG HOURS

For reasons which have not to date been disclosed, one of the album's most enchantingly melodic pieces, 'Equinoxe 7', was at first felt by Jarre to be not good enough for inclusion on the album. It was Geiss who changed his mind, arguing for the piece – another illustration of ↻

↑ Rear sleeve of the 1986 vinyl reissue

← The Eminent 310, which was the first commercially available string synthesiser

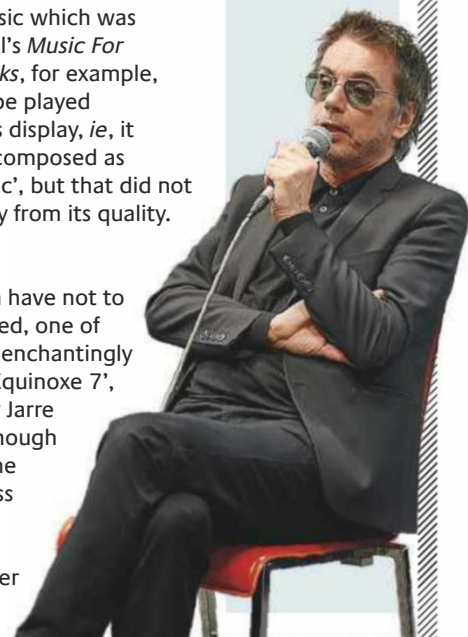
↓ Jarre at the 2018 Audio Video show in Poland

Jarre chose the theremin to enhance "Equinoxe 2"



his musical concept,' explained Geiss. 'Jean-Michel expressed his wish to do sequences on a matrix. I started thinking and designed the Matrisequencer 250. This would play standard notes with the octave divided in usual semitones, within a range of four octaves.

'Jean-Michel immediately accepted it as soon as I had finished it. And it became one of the main instruments in *Equinoxe*.'





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# Alternate Format Discography



➔ Jarre plays guitar on stage at the Coachella Valley Music And Arts Festival in California, in 2018 and (below) in an Aug '88 press shot

Geiss as an important influence on Jarre throughout making the album.

Michel Geiss is a modest man not given to speaking in public, but he has said that working in Jarre's home studio was a liberating experience. 'Working in such conditions cannot be compared with other album recordings for which people compose songs, hire a producer or a sound engineer, book a studio, record and mix, pay the bill and go!

'Our long hours spent in his studio were fully part of the creative process, which cannot be the case in a commercial studio, where the clock is running and bookings usually cannot be extended. Jean-Michel understood that sound was a major element for his music. He was really friendly, had a lot of energy and a lot of humour. I felt he had a quite unusual dimension. You know, success doesn't come from nowhere!'

## PRESS RESPONSE

*Equinoxe* was released in Dec 1978 and was immediately rubbished by the British music press, with *Melody Maker* declaring it to be, 'as slushily, pseudo-galactically crass and vapid as last year's *Oxygene*', while *Record Mirror* deemed it, 'very artificial, and as a result quite emotionless.'

This, remember, was an era when punk was on the rise, heavy guitar rock was the norm, and disco was the teen *musique du jour*. Electronic

innovators like Brian Eno, Kraftwerk and Vangelis were tolerated as aberrations so long as they didn't get ideas above their cult status. Jarre, of course, had committed the ultimate sin of scoring a hit single with 'Oxygene IV'. Who did he think he was? Yet, the signs were there. Donna Summer's heavily electronic disco collaboration with producer Giorgio Moroder on 'I Feel Love' had been a global smash in 1977, so Jarre's electronic rhythms, although alien to jaded music critics, were familiar to millions of young groovers. His time had come.

Advance orders for *Equinoxe* had been 1.5m, so there was never any doubt that it would be a success, but no-one could have predicted

that it would take Jarre onto the charts in 35 countries and confirm him as the world's most successful electronic composer.

A little over six months later, on July the 14th 1979, Jarre played his first live concert on the Place de la Concorde, Paris. It attracted a million people, becoming Jarre's first of several entries in the *Guinness Book Of Records* for the largest crowd for an outdoor concert. No wonder he has declared, 'Oxygene and *Equinoxe*

changed everything for me, financially, socially. I made a lot of new friends, lost a lot of old ones. It was like vertigo, very strange.' ☺

'Jarre had committed the sin of scoring a hit single'

Of the 247 documented versions of *Equinoxe*, 125 were released between 1978 and 1980, so there's little difference between them other than their country of origin (unless they were 8-tracks or Compact Cassettes).



## ORIGINAL LP (1978)

This original vinyl artefact [Disques Dreyfus FDM 83150] was mixed at Studio Gang in Paris and pressed by a facility located in Tourouvre, North-West France. Although still quite highly rated among collectors, there are some who consider there to be too much treble in some sections. The 1978 German vinyl pressings [Polydor 3100 478] were also considered good and remain prized by collectors.

## 8-TRACK CARTRIDGE (1978)

This release appeared in the US [Polydor 8T-1-6175] though it suffered from a frequent problem with the 8-track format in that parts 3 and 7 were both split between the end of one 8-track 'program' and the start of the next.

## CASSETTE (1978)

Details are identical to the 1978 French vinyl edition, except that this version appeared as a Disques Dreyfus cassette. A chrome tape version [Polydor JAR4 2] was later released in Canada in 1986.

## FIRST CD (1983)

The first CDs [Disques Dreyfus FDM CD-83150] were not remastered or enhanced in any way. They were well accepted by fans, except that some batches suffered from audible crackling noises in the left channel at around 9s into Pt 3. A case of try before you buy.

## REMASTERED LP (1986)

The first vinyl remaster popped up in the US where Jack 'Supercutter' Skinner had handled the mastering at the estimable Sterling Sound studio in New York [Polydor 422 829 456 1 Y1].

## REMASTERED CD (1991)

Produced by Moulages et Plastiques de l'Ouest' in France, this was commissioned as part of a complete remastered Jarre box set, but it was also released separately [Disques Dreyfus 824 747-2].

## MOFI REMASTERS (1995)

As might be expected, these are still widely regarded as the best versions in their respective formats, most closely resembling the original vinyl, with admirable warmth and good sound throughout top, bottom and midrange [MSFL 1-227, vinyl; UDCD 647, CD].



## REMASTERED CD (2014)

There was a flurry of digitally remastered *Equinoxes* in preparation for the new millennium, starting with Scott Hull of Masterdisk's 96kHz/24-bit edition [Disques Dreyfus 487376 2]. Among the most interesting is a 2014 re-master from the original analogue tapes by Dave Dadwater at Paris-based Yakuda Audio [Disques Dreyfus 88843024692].



# Meet the Producers

BEHIND THE MUSIC WITH HI-FI NEWS & RECORD REVIEW

## Jack Nitzsche

From '60s solo artist to Phil Spector's right-hand man, this US-born 'influencer' not only produced superstars such as Neil Young and The Stones, but wrote a string of soundtracks nominated for Academy Awards. **Steve Sutherland** on Jack Nitzsche

There's a particular species of character that, although essential, has been mightily ill-served by pop historians. It's tough to pin down exactly what role these personalities play in the creation of popular music. What they actually *do*. And so it's hard to know what we should call them.

For want of an established title, I'm going to plump for the *vibes guy*. Guru's probably a bit too strong. But they're Pan-like individuals, those who instinctively determine and direct the spirit of rock 'n' roll, conducting its course like lightning.

### TRACK RECORD

Which brings us to Jack Nitzsche. You might ask what he's doing here in a feature dedicated to producers and, going by the book, you'd have a right to question his credentials. But sod the book, Jack Nitzsche acted as midwife for more brilliant records than you might care to count.

He was all about the track, not necessarily about the artist he found himself working with. In fact, as he staggered through his blessed – and occasionally blighted – existence, his relationships invariably soured as he

Jack Nitzsche pictured in the mid '90s. Born in Chicago in 1937, he was raised on a farm in Newaygo, Michigan, before moving to LA in 1955

The Rolling Stones' *Between The Buttons* from 1967, one of a number of the band's early albums on which Nitzsche played piano and harpsichord



BRIAN ASHLEY WHITE

felt his former employers/playmates betrayed their talent, made monkeys of their muse and belittled rock 'n' roll. Once his charges/compadres deviated, tempted by riches, fame, drugs or fear of failure, he washed his hands of them. Often, to the detriment of his career.

But what did he *do*? Here's Andrew Loog Oldham [*HFN* Oct '17], erstwhile manager of The Rolling Stones, on what Jack did for them beyond playing on such masterpieces as 'Play With Fire' (harpsichord), 'Have You Seen Your Mother, Baby (Standing In The Shadow)' (piano) and 'You Can't Always Get What You Want' (choral arrangement): 'If I were to try and define his contribution, I'd say he provided

the glue and imagination... the denseness... the body... All through those sessions, it's like he was providing the melodic bond. The undercurrent, reinforcing the layers of brainwash that Keith and Brian are laying down.

'Jack gave us an understanding of tone. Which thing was hummable in the street?... The other thing that Jack had was a grasp of, and interest in, sex. How to inject sex into the sound is a gift of understanding between you and your third ear. That's a huge component.'

### SAX AND THE CITY

Jack Nitzsche was born in Chicago in 1937, went to music college then bummed his way to LA with a vague notion to play saxophone. That didn't work out but he wound up in an office with Sonny Bono who in turn was helping out Phil Spector. Phil and Jack hit it off instantly and





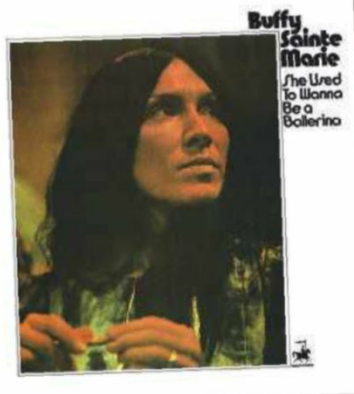
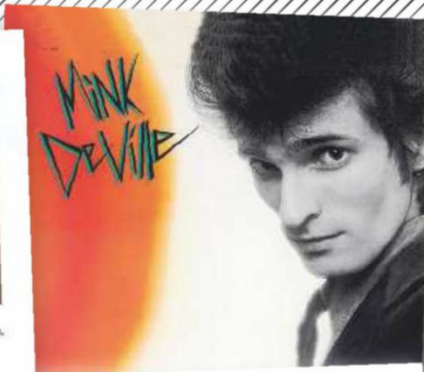


PHOTO: RICHARD HENKEL

he began to arrange Phil's numbers, creating the famous Wall Of Sound. Phil credited him on the records as 'Specs'. The relationship began in 1962 with The Crystals' 'He's A Rebel', and it was Jack behind the arrangements for 'Be My Baby', 'Then He Kissed Me', 'Baby I Love You', 'River Deep, Mountain High', 'You've Lost That Loving Feeling' – all the Spector greats.

After arranging four or five Spector hits, Jack had the formula down: 'Four guitars play 8th notes; four pianos hit it when he says roll; the drum is on 2 and 4 on tom-toms, no snare, two sticks – heavy sticks – at least five percussionists'.

Spector paid Jack a paltry \$50 a tune but Jack didn't complain. This was his calling. 'What I want to do is combine the commerce techniques and the things people associate with rock 'n' roll with classical tradition,' he said at the time. 'I try to build everything to a big peak. My biggest inspirations have been Richard Wager and Frederick Chopin.'

### PURE JACK

In 1963 alone, Jack's name was applied to no fewer than 23 chart hits in a row in the USA. If you want pure Jack, check out Judy Henske's 'Road To Nowhere', just about as dramatic and brutal as a record can be.

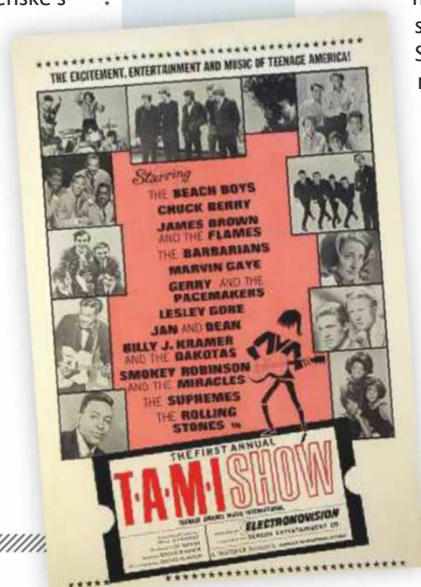
He was top of the world when he met The Rolling Stones in 1964, the band turning up unannounced at a session he was working on for Hale And The Hushabies. Oldham and his charges were enthralled by an instrumental solo hit of Jack's called 'The Lonely Surfer' and the fact that he'd co-written 'Needles & Pins' for Jackie DeShannon with his mate, Sonny Bono.

Poster for the 1970 film *Performance* for which Nitzsche wrote the soundtrack

*She Used To Wanna Be A Ballerina* by Buffy Sainte-Marie, which Nitzsche produced

The 1977 LP *Cabretta* by Mink DeVille, and Willy DeVille live in Cologne in 2008

Poster for the 1964 TAMI Show which Nitzsche put together



'When they first breezed in, everybody in the studio stopped what they were doing and stared,' said Jack. 'Mick came in bobbing and weaving and snapping his fingers. Keith looked like he always looks – a criminal. I'm sure he would've become a convict if he hadn't made it as a musician. And Brian was dressed ultra-mod, in a suit and vest. It was all totally out of place – it just didn't fit.'

But it was love at first sight. And from that moment on, whenever The Stones were in the States, Jack was there too.

The Stones asked him to play piano at their recording sessions. According to Jack, those early records came together magically through sheer spontaneous energy: 'The Stones sessions were like nothing that had ever happened before... They didn't know what they were going to do until they were in the studio... They stood for something.'

'I thought they were going to be leaders of change. They were telling record executives to go f\*\*\* themselves a long time ago, and not cracking under the social pressure and not doing it the way other people would have done it.'

It was Jack who, in 1964, put together the famous Santa Monica TAMI Show, which saw The Rolling Stones gain mass exposure.

### COP OUT

But the money rolled in, the egos grew, the drugs got serious and Jack, though no saint, bowed out: 'I think *Satanic Majesties* was when

**“The Stones just copped out when they hit that peak”**

they all started changing a lot. I didn't work on any of that. The next time I saw them they were different people. They'd become, well, more decadent. Whole

different attitudes – it wasn't loose and friendly anymore. It was real affected. They were performing all the time, whenever anyone was around it was into the act.

'They just copped out when they hit that peak. I guess they got to where they were heading... And I guess they don't have any obligations to change things for everybody else. It still disappoints me. I think they should keep changing and fighting until the day they die – if you mean it. There's no reason to ever repeat yourself.'

Jack later visited the band on their all-conquering '72 tour of the States and told them to their faces that their music had gone stale. That they were repeating their past sound and were destined to become the Chuck Berrys of



**ortofon**  
accuracy in sound

# CADENZA

The Cadenza Series of high-end Moving Coil (MC) cartridges allow you to get the most from your vinyl records. By carefully implementing cobalt-iron pole pieces, using new improved winding processes on the armature, and employing an extruded aluminium housing - amongst other changes - the Cadenza Series is able to out-perform all those that came before it.

The name *Cadenza* comes from the Italian word for cadence, which refers to a soloist during an orchestra performance where they play alone in an elaborate manner. It therefore seemed fitting that such a capable and nuanced cartridge series should use the same name.

Like other modern ranges, the Cadenza Series is structured in Ortofon's preferred colour-tier nomenclature; so there are Red, Blue, Bronze, and Black variants available to suit varying budgets and tastes.



## Red

This MC cartridge and introduction to the series features a Nude Fine Line stylus which delivers open, dynamic sound with a touch of warmth.



## Blue

Featuring much greater dynamics and resolution, the sound is more open and reproduces more accurate details thanks to the Nude FG 70 stylus.



## Bronze

A step up in the range, this cartridge boasts a Replicant 100 stylus to produce stereo imaging capabilities that illuminate the farthest corners of the soundstage.



## Black

Flagship of the range, the Cadenza Black is simply the best and features a Nude Shibata stylus which guarantees amazing tonal neutrality, dynamics and purity of sound.

# MEET THE PRODUCERS

BEHIND THE MUSIC WITH HI-FI NEWS & RECORD REVIEW



## 1963

An early hint at Nitzsche's work as a soundtrack composer, 'The Lonely Surfer' is a Top 40 hit thanks to its mix of reverberated guitar and soaring strings



## 1966

Working with Phil Spector, Nitzsche arranges tracks on Ike & Tina Turner's *River Deep - Mountain High*. On release the album is a Top 30 hit in the UK charts



## 1969

Nitzsche decides to double-track a choir on The Rolling Stones' 'You Can't Always Get What You Want', making a memorable addition to the *Let It Bleed* LP



## 1970

Retiring to a 'witch's cottage' near Laurel Canyon, Nitzsche scores the soundtrack to the British crime drama movie *Performance*



## 1972

Nitzsche has the LSO play on the song 'A Man Needs A Maid', which is first released on Neil Young's 1972 album *Harvest*



## 1977

Taken from their Nitzsche-produced debut album *Cabretta*, Mink DeVille's 'Spanish Stroll' peaks at No 20 on the UK charts



## 1979

Nitzsche enters the studio with Graham Parker in order to give the band a rawer sound. *Squeezing Out Sparks* takes 11 days to complete and is a critical success

the '80s, faded but not forgotten. He wasn't wrong, was he?

Another of Jack's most famous gigs was working with Neil Young. In 1967 he arranged Young's beautiful 'Expecting To Fly' for the *Buffalo Springfield Again* LP and encouraged his new buddy to quit the band, helping arrange his solo deal and co-producing his debut solo LP.

### TORTURE TOUR

Jack worked with Young on the singer's richest seam, from *After The Goldrush*, through *Tonight's The Night*. He joined Young's touring bands The Stray Gators and Crazy Horse, producing the latter's debut LP. Most notably, he arranged 'A Man Needs A Maid' and 'There's A World' on *Harvest*

working with the London Symphony Orchestra, but by 1974, Jack was done with Young. 'His lyrics are so dumb and pretentious,' he told *Crawdaddy* magazine that year. 'I mean anyone who would write lyrics like "Someone and someone were down by the pond, looking for something to plant in the lawn"!'...

'The tour was torture. Everyone in the band was bored to death with those terrible guitar solos. He would turn and face the band with this stupid grimace while he was playing, and I would nearly roll on the stage laughing. He takes himself so seriously...' A decade or so later, he was claiming to *Mojo*: 'I called Neil up recently. I said... I'd like to

produce his next album. He said, "God damn! That excites me more than anything I've heard in years". So I tell him to, "start writing songs like you used to when you had seizures". And he said, "I'll do my best". Cos he wrote special songs back then.

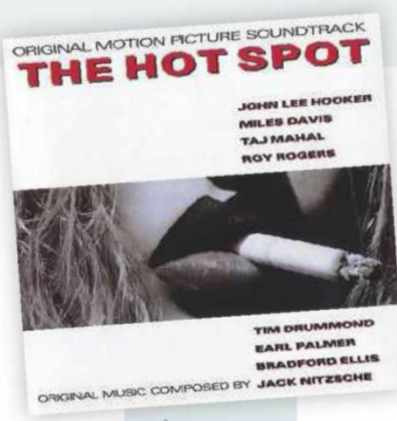
'Anyway, he's too rich to listen. I went up a few times, we talked and played around, did stuff. He came up with two songs but neither of them had

got it. I told him the truth. And that was the end of me as the producer.'

Other notable collaborations within a career crazy packed with greats: he produced Bob

Lind's 'Elusive Butterfly' and Buffy Sainte-Marie's 'She Used To Wanna Be A Ballerina' in 1971, spawning the hit 'Soldier Blue'. The couple married in 1982, the year that they co-wrote the Joe Cocker/Jennifer Warnes megahit 'Up Where We Belong' for the movie *Officer And A Gentleman*.

Jack's last, and perhaps his happiest, musical collaboration came with Willy DeVille. He produced all the great Mink DeVille albums including the debut, *Cabretta*, which



↑ The 1990 movie *The Hot Spot* with Nitzsche's soundtrack played by John Lee Hooker and Miles Davis

↓ Neil Young pictured in a Warner Bros press shot released in the 1970s

featured the mighty 'Spanish Stroll'. As far as I know, the pair never fell out but, tiring of the music business and those who worked within it, and as so many do, unravelling due to a dubious lifestyle, Jack took to scoring movies.

Way back in 1970 he'd done perhaps his most brilliant work with the soundtrack to Donald Cammell's *Performance*, the trippy one shot in London by Nic Roeg, starring Mick Jagger, Edward Fox and Anita Pallenberg. It was a scarifying work combining sitar, Merry Clayton's unearthly wailing, somewhat satanic choir music and graveyard blues.

### OSCAR SCORE

He did William Friedkin's *The Exorcist* in 1973, and was nominated for an Oscar for his score for *One Flew Over The Cuckoo's Nest* in 1975. He did two pictures for Paul Schrader, *Blue Collar* in 1978 and *Hardcore* in 1979. Then there was Dennis Hopper's 1990 movie, *The Hot Spot*.

Jack Nitzsche passed away on the 25th of August 2000. 'I heard that Neil Young turned up when he heard Jack had died,' says Andrew Loog Oldham. 'But he wasn't there exactly out of compassion: he was looking to see if there were any tapes left in the house. That's what I heard.'

In his grave and still causing trouble, literally a Jack of all trades and master of *all*. ☺



HENRY DIETZ



### THE J GEILS BAND

The Morning After

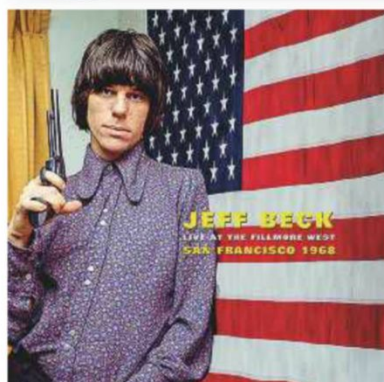
Mobile Fidelity MFSL1-415 (180g vinyl)

Aside from the atypical hit single, 'Centerfold', the UK never 'got' Boston's J Geils Band. But then this wasn't a singles band. They arrived at the tail end of the 1960s playing down 'n' dirty R&B, paving the way for The Fabulous Thunderbirds, Dr Feelgood and others, and they had a secret weapon in Magic Dick, arguably the best harp player ever. This 1971 LP, their second, didn't quite match the eponymous 1970 debut, but it still blows away anything else in the genre. Each musician was peerless, and lead singer Peter Wolf had stage presence of Jagger-esque proportions. A staggering mix of originals and soul/funk classics, the sound is magnificent and its bottom octaves will scare you. *KK*

Sound Quality: 95%



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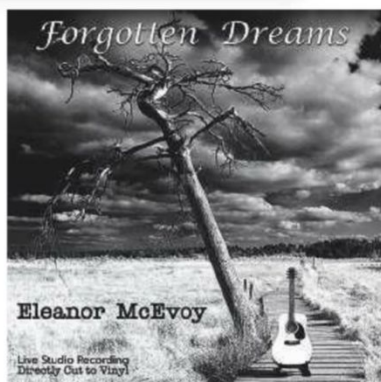
### JEFF BECK

Live At The Fillmore West, San Francisco 1968

London Calling LCLPC5037 (180g white vinyl)

Out of copyright in certain territories usually means inferior stuff that should never see the light of day, but this is magnificent. The fabled lineup of Beck, Rod Stewart, Ron Wood and Mickey Waller performing tracks from *Truth* days before it was released, along with Beck faves including 'Jeff's Boogie' and 'Blues Deluxe'. What is so shocking about this LP, taken from a live FM broadcast, is the sublime sound, considering its origins: properly wide stereo with precise placement, rich lower registers, crystal clear vocals. As one who considers *Truth* to be among the top 50 LPs ever, this is an unalloyed treat. Buy now as it's a 1000-only limited edition LP. *KK*

Sound Quality: 85%



### ELEANOR McEVROY

Forgotten Dreams

Chasing The Dragon VALDC006 (Direct cut LP)

In November 2018, I reviewed the CD of this and it deservedly earned release of the month. This direct-to-vinyl album is even better, flowing as it does without the gaps and sounding that much closer to the open-reel tape. (No, I am not going to lobby PM to add a page for pre-recorded tapes!) It delivers a more vivid sense of McEvoy negotiating the studio as she goes from instrument to instrument, and it is so real-sounding that – had the Geils Band LP not come out this month – it must tie with it. If the CD didn't interest you, and you don't have a reel-to-reel deck nor time for cassettes, this is the closest you'll get to McEvoy performing in your home. *KK*

Sound Quality: 95%



### KT TUNSTALL

Acoustic Extravaganza

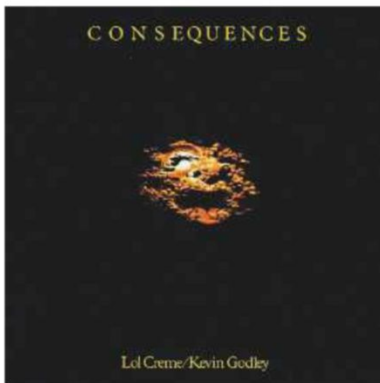
UMC Virgin 7768710 (coloured vinyl)

First vinyl release for Tunstall's second album, from 2006, and it's an absolute treasure. Though it didn't rattle cages like her debut, and its follow-up garnered better reviews, this was a delightfully intimate set with plenty of acoustic material to warrant the title and to entice audiophiles. Among the semi-unplugged and wholly electricity-free tracks are gems that also appeared as B-sides, while a critical standout is her cover of Beck's 'Golden Age'. Tunstall is that rare contemporary performer, one who exudes undeniable authenticity and eschews hype, and she's currently undergoing a career renaissance, so this is a beautifully-packaged, welcomed refresher. *KK*

Sound Quality: 90%



# AUDIOPHILE: DIGITAL



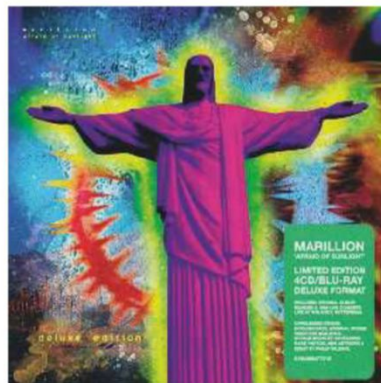
## LOL CREME/KEVIN GODLEY

### Consequences

Caroline CAROLR085CD (five discs)

A guilty pleasure for 10cc fans, the debut of what became Godley & Creme, now regarded as rock video pioneers, was issued in 1977 as a costly triple-LP. It's inventive but limitlessly self-indulgent, with moments of pop brilliance, exquisite sound quality and a sense of grandeur marred by the usual 'concept LP' let-downs (unless we're talking The Who or The Kinks...). It helps if you love every utterance made by Peter Cook, only some of which is truly funny. This contains all of the LP set, the condensed *Music From Consequences* and a CD of highlights. At under £18, it costs a lot less in real terms than the £11 LP did 43 years ago: that's £75 in 2020 money. *KK*

Sound Quality: 85%



## MARILLION

### Afraid Of Sunlight Deluxe Edition

Parlophone 0190295477219 (four CDs + Blu-ray)

Again uniform with Jethro Tull's expanded catalogue, this gorgeous long-box library-case contains enough material to occupy a fan – and this band's followers are hardcore – for a weekend binge. Marillion's eighth studio album, released in 1995, was their last for EMI. While it was cursed with little promotion, the group's payback was critical acclaim and you'll hear why from the opening tracks, even if prog-rock or Psychedelia 3.0 aren't your thing. The CDs contain a remix of the album, the original 1995 mix, a concert from Rotterdam in 1995 on two CDs, while the Blu-ray adds two stereo and two 5.1 versions in assorted formats, a documentary, jams and more. *KK*

Sound Quality: 90%



## MFSB

### Philadelphia Freedom/Summertime

Vocalion CDSML8561 (SACD)

Unusually, this pairing from 1975/6 features the first album in both stereo and with the optional quadraphonic mix, while the latter is stereo-only – a concrete indicator that quad had flopped. Most of you will play this in stereo regardless; suffice it to say that this SACD delivers the punch and scale of 'Philly Sound' disco/soul with all the requisite impact. More familiar than you might believe, the standouts include both title tracks – 'Philadelphia Freedom' an Elton John/Bernie Taupin number and 'Summertime' from Gershwin – and the sound is so rich that one of the bass-lines has been commandeered by Shaggy. As for the percussion – astounding. *KK*

Sound Quality: 90%



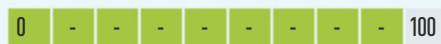
## THE DOORS

The Soft Parade

Elektra 603497851324 (three CDs + LP)

Continuing the 50th anniversary reissue programme, we're up to The Doors' fourth, which kicked off with the mournful/joyous 'Tell All the People'. They followed that with the magnificent 'Touch Me', the two openers cocking a snook at the emerging 'Big Band Rock' outfits like Blood Sweat & Tears, Chicago, et al. Punchy brass, sublime guitar-work stage right, even a commanding vocal from Jim Morrison: it wasn't enough to prevent negative reviews and so-so sales. Time hasn't been too kind, but some (like me) consider it vastly under-rated. Along with the remastered album are the stripped-down, horns-less mix, new solos by Robbie Krieger, an hour-long jam and a bonus original LP cut by Bernie Grundman. *KK*

Sound Quality: 90%





RACHAEL & VILRAY

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**RACHAEL PRICE AND VILRAY**

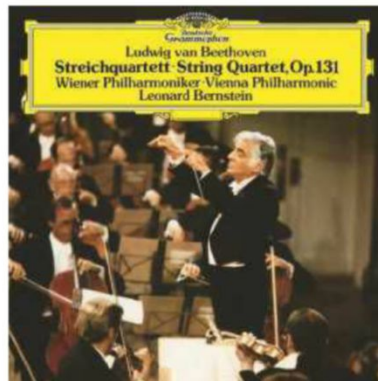
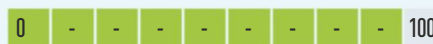
Rachael & Vilray (88.2kHz/24-bit, FLAC; MQA)\*

[www.hiresaudio.com](http://www.hiresaudio.com); Nonsuch Records n/a cat no.

The arrival of this album immediately caught my attention, for Australian-born Rachael Price is the 'can do no wrong' voice of Lake Street Dive, one of those bands tending to appear a lot in my listening sessions. If their beautifully crafted recordings sound good on a system, you can be sure it's doing pretty well! This is Price's debut album with songwriter/guitarist Vilray, whom she met back in 2003, and with whom she has been performing since 2015 – and it's been well worth waiting for. With all

but two of the tracks original Vilray compositions, the set plays to the not inconsiderable strengths of Price's voice. It's an intimate, thoughtful album, immaculately produced with fabulous focus by Dan Knobler, who has previously worked with Lake Street Dive. As even the unfamiliar tracks already sound like jazz standards, what more could we possibly ask? Fabulous, and heartily recommended. *AE*

Sound Quality: 90%



**VPO/LEONARD BERNSTEIN**

Beethoven: String Quartet Op.131 (arr. Strings) (192kHz/24-bit, FLAC)

[www.hiresaudio.com](http://www.hiresaudio.com); DG 483 7766

As you only get the cover here, a few facts first. Bernstein conducts a transcription for full strings prepared by his former mentor and NYPO predecessor, Dimitri Mitropoulos. It's reportedly edited from autumn 1977 performances given in the Vienna Konzerthaus and at the Salzburg Festival, and dedicated to the conductor's wife – Felicia Montealegre had died that June. (Incidentally, Op.131 was the piece played in the Christopher Walken film *A Late Quartet*.) Audible here and there (eg, trk4 at 59s/1m23s), Bernstein achieves some inspired playing, and captures the gravity of the music. But full strings will be all too remote from the interplay of just four players on a stage for some tastes – the final section is just oversized, whereas the *Presto* [trk 5] works effectively. Anyway it sounds better than the LP did! *CB*

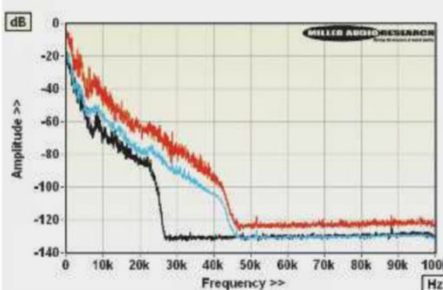
Sound Quality: 85%



**OUR PROMISE**

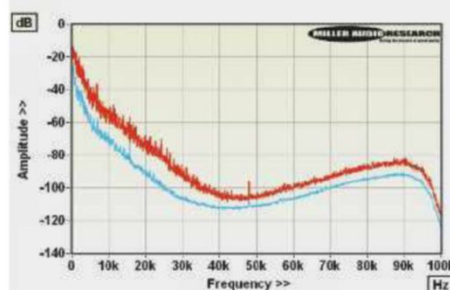
Following our Investigation feature [HFN, Jun '11] in which we examined the claimed quality of high-resolution downloads, *Hi-Fi News & Record Review* is now measuring the true sample rate and bit-depth of the HD music downloads reviewed on these pages. These unique reviews will be a regular source of 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**



Recorded/mixed in different studios, there are two file types here: trks 3, 4, 9 and 12 may be 48kHz upsamples [black trace], the others are commensurate with 88.2kHz. Max. recording level is ~0dBfs, and note spurious 28.8kHz tone. PM

**LAB REPORT**



Information about the remastering of this legacy recording is scant, although the noise-shaping [see Graph] suggests time as DSD128 followed by downsampling to 192kHz LPCM. Note spurious tones at 15.6kHz (-62dBfs); 48kHz (-98dBfs). PM



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### TRIO ATANASSOV

Chic À La Française (96kHz/24-bit, FLAC)

[www.highresaudio.com](http://www.highresaudio.com); Paraty PTY179185

Graduates of the Paris National Conservatoire these three musicians formed their piano trio in 2007 – going on to win various international competitions. This is their second recording (their Hänssler debut won the Diapson d’Or award) and it comprises the Piano Trios by Ravel and Debussy and a 20m set of Variations by the composer Philippe Hersant. It’s all related to church bells and quotes, eg, Mussorgsky and Bizet – though I didn’t spot these. Hersant is interviewed in the PDF. The piano is the tolling bell (boosted to full stage-width in *fortes*), with melodic snatches from the cellist, while the violin mostly has to play feverish high register rhythmic patterns. Balance is excellent in the two earlier works (the Debussy written when he was 18), and what’s striking here is the unanimity shown by these fine players. They’ve really grasped these pieces. *CB*

Sound Quality: 85%



### LANG LANG

Beethoven: Piano Sonatas Op.2:3; Op.57; Op31:2 – first movt only (44.1kHz/24-bit, FLAC)

[www.highresaudio.com](http://www.highresaudio.com); Sony 19075951552

This is a reissue of live performances of the two sonatas performed at the Vienna Musikverein in 2010 – the ‘Appassionata’ and the early one in C major so often played by Michelangeli. This was Lang Lang’s debut after he had signed to Sony. But now, curiously, Sony has added a 2010 New York studio recording of just the opening *Largo-Allegro* of the ‘Tempest’ Sonata (Sony’s PDF wrongly says the finale). It’s the most interesting track here – better sound too – with the pedalled recitatives imaginatively done. Enjoy the two complete sonatas (with applause) for Lang Lang’s immaculate technique. He’s more personal in the early work, while the ‘Appassionata’ is too focused on the moment rather than with the kind of overview Kempff, say, brought to it. The coda sounds as if Lang Lang is intent on setting a speed record! *CB*

Sound Quality: 80%



### COLDPLAY

Everyday Life (48kHz/24-bit, FLAC; MQA)\*

[www.highresaudio.com](http://www.highresaudio.com); Parlophone 0190295337834

The latest set from the band decried by many for being too successful takes a new turn by adding elements of darkness, anger and musical experimentation. So, while parts of it are unmistakable anthemic and crowd-pleasing, there’s definitely an edge here. Opening with an orchestral interlude, the album takes a turn with ‘Trouble In Town’, which breaks into dialogue from a police radio and some language way from the usual safe image of the band, a theme to which Chris Martin returns in the vehement – but undeniably catchy – ‘Guns’. That track in particular shows a new stripped-down Coldplay, but then this album also takes in world music influences, gospel and more. The production job is clearly slick [but see PM’s Lab Notes], with powerful bass and bags of detail, so even if Coldplay isn’t coming to a city near you any time soon, there’s much to enjoy here. *AE*

Sound Quality: 80%



#### LAB REPORT

Recorded at the Studio de la Philharmonie de Paris, this is a genuine 96kHz rendering where the full ~45kHz bandwidth is, on occasion, occupied by the extended harmonics of that ‘feverish’ violin. Piano occupies just 12kHz. *PM*

#### LAB REPORT

The limited 44.1kHz sample rate is just sufficient to capture a solo piano. The spurious tone at 20.9kHz (–72dBfs) is on all the Vienna, Golden Hall recordings but absent on trk 8, the ‘Tempest’, captured at New York City’s Avatar Studios. *PM*

#### LAB REPORT

The 96kHz LED will light on your USB DAC, but most of the tracks here are 96kHz upsamples of 48kHz mixes. There’s other content at 44.1kHz (trks 4, 9 and 13; black) and even some legacy 32kHz material (trks 2, 8, 10 and 15; green). *PM*

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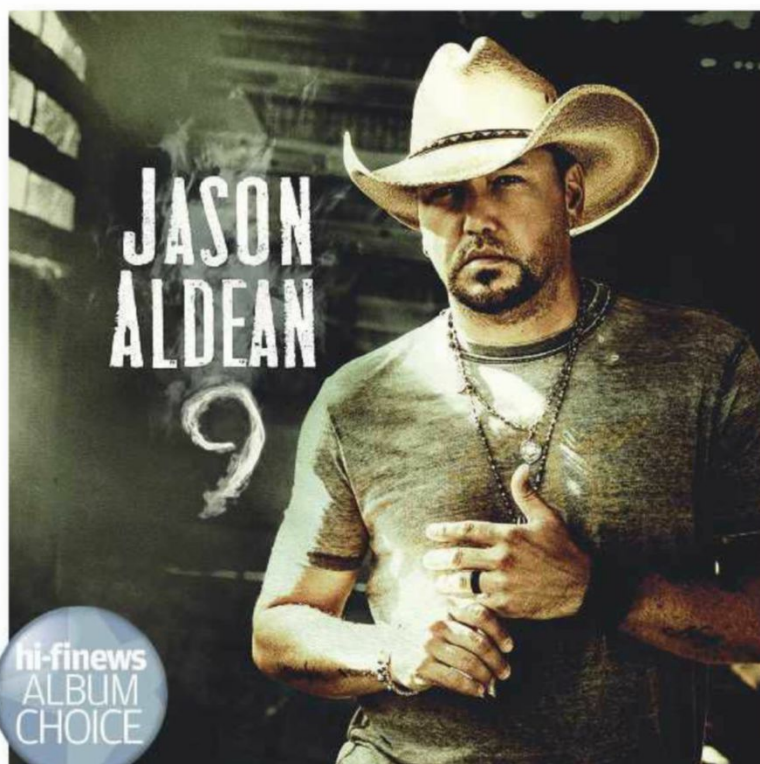
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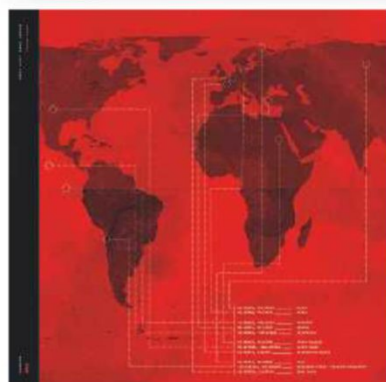
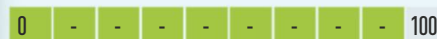
### JASON ALDEAN

9

BMG Records 4050538532944

Aldean is a country superstar with a substantial back-catalogue, but he's probably best known to music lovers here as the guy who was playing onstage in Las Vegas in 2017 when 58 fans were killed by a gunman firing into the crowd. Maybe that experience changed Aldean's perspective but, whatever the reason, this is an extraordinary album. Country and rock have been merging since the late '60s, but what we have here is a new departure, a guitar-rock dominated album with an unmistakably country vocal at its heart. Lyrically, he delivers all the country tropes – the demon drink, small-town cowboy values, women as angel-whores – but the band exists in territory more usually occupied by riff-rockers. *JBk*

Sound Quality: 90%



### RIGHT HAND LEFT HAND

Zone Rouge

Bubblewrap Collective BWR 050CD (two LPs: BWR 050DLP)

When did we last feature an album by an almost exclusively instrumental rock guitar duo? Probably never, but Cardiff-based Andrew Plain and Rhodri Viney both play guitars and drums in a style that reminds me of several classic '80s krautrock artists including ambient guitar pioneers Michael Rother and Ashra. They build up their powerfully atmospheric tracks by looping and overlaying guitar lines, sometimes beyond the point of distortion, but usually to a decidedly hypnotic effect. Each track is named after a location, eg, the Siberian open-pit diamond mine at Mirny and nitrate mines in Chile, all of them sites of natural disasters, and wonderfully evoked here. *JBk*

Sound Quality: 90%



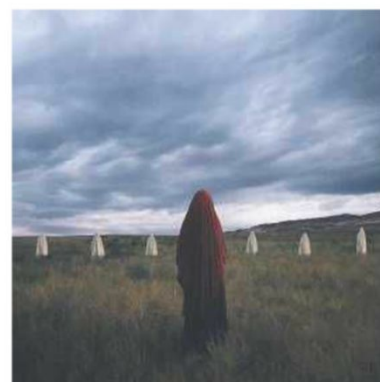
### SPEARMINT

Are You From The Future?

Hitback Records hitBACK50CD

It's 20 years since London-based pop-rockers Spearmint released their debut album but, despite frequent acclaim, they've never attracted wide attention. Their 11th album is easy on the ear but it's all a bit mellow and decidedly lacking in identity. Maybe their main singer and songwriter, Shirley Lee, is the problem because he (yes, *he*) rarely sounds as if he cares about the words. Even their recent single, 'St Thomas In The Darkness', starts off with a powerful electronic throb and revolves around an appealing chord pattern but, vocally, it lacks any melodic direction. Top marks for persistence, but they need to sound more committed. *JBk*

Sound Quality: 80%



### CLINT LOWERY

God Bless The Renegades

Rise Records Rise 452

As guitarist, vocalist and songwriter of multi-platinum nu-metal juggernaut Sevendust, Clint Lowery has been in the vanguard for more than two decades. This, his first solo album, should help to broaden his audience still further. Lowery's buzzsaw guitars and guttural vocals remain front and centre, but producer Michael 'Elvis' Baskette (Slash, Alter Bridge) contributes analogue synths, keyboards and organ, which add welcome textural variety to the sound. Tracks like the jangling 'You Go First' and the chiming closer, 'Do We Fear God', are more mainstream than the alt-metal for which he is famed, but Sevendust devotees will not be disappointed. *JBk*

Sound Quality: 90%



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### CHARLES LLOYD QUARTET

Montreux Jazz Festival 1967

TCB Music 02462 (two discs)

By the time he appeared at the first Montreux Jazz Festival, Lloyd's quartet had become the one jazz group that could reach rock audiences in the Summer of Love. They could get exploratory and 'progressive' on 'Sweet Georgia Bright', or become dreamily psychedelic on 'Love Ship'. Alongside Lloyd's always intriguing tenor sax, and his weaker but somehow appropriate flute, you get amazing playing from the youthful Keith Jarrett, eg, in his Tatumesque intro and fabulous solo on 'Love Song For A Baby'. The long-running Swiss Radio Days series has brought us many gems from the broadcaster's vaults, but this 1967 one is really special. *SH*

Sound Quality: 80%



### JEAN TOUSSAINT ALLSTAR 6TET

Live At The Jazz Cafe 091218

Lyte Records LR049 (two discs)

Saxophonist Jean Toussaint spent four years with Art Blakey in the 1980s before moving to the UK. He's followed Blakey's precepts ever since, encouraging young talent and always putting on a great show. Alongside trumpeter Byron Wallen, trombonist Dennis Rollins and pianist Andrew McCormack are the younger London musicians Daniel Casimir on bass and Empirical drummer Shaney Forbes. They stretch out on 'Amabo' (named for Obama of course), on two more tunes from 2018's *Brother Raymond* and some new originals. Nothing goes on too long – though there's too much audience response in the mix – and 'Moanin' brings a memorable evening to a rousing end. *SH*

Sound Quality: 85%



### HIROMI

Spectrum

Telarc TEL0081

Hiromi's new solo album marks the end of her 30s, but its theme looks back further as, she says, her first piano teacher 'taught me to see colours through music'. It opens with a typically spectacular attack on the piano in 'Kaleidoscope' but in 'Whiteout' she conjures a snow scene with Debussyan delicacy, while 'Yellow Wurlitzer Blues' is a kind of hyperspace boogie plus harmonic twists. With 'Rhapsody In Various Shades Of Blue' she revels in Gershwin's bravura but adds other references, even The Who's 'Behind Blue Eyes'. Finally there's the delightful classical-style nostalgia of 'Sepia Effect'. A fabulous pianist as always, and a great artist too. *SH*

Sound Quality: 90%



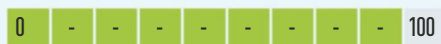
### MARIUS NESET/LONDON SINFONIETTA

Viaduct

ACT Music ACT 9048-2

An unrivalled master of his instrument, the Norwegian saxophonist is also a remarkable composer. This second collaboration with the London Sinfonietta and conductor Geoffrey Paterson follows his 2016 *Snowmelt* project and was a commission for the 2018 Kongsberg Jazzfestival. Speaking of *Snowmelt*, Neset said that the three words in his mind before he started writing were 'acrobatic, virtuosity, romantic' and maybe that still applies. He chose the name *Viaduct* to connote 'a connection to different musical ideas... how you go from one world to another'. He runs the gamut of 20th century art music, and jazz rhythms too, with the Sinfonietta players rising brilliantly to the most extreme demands. *SH*

Sound Quality: 90%



### Marius Neset

London Sinfonietta

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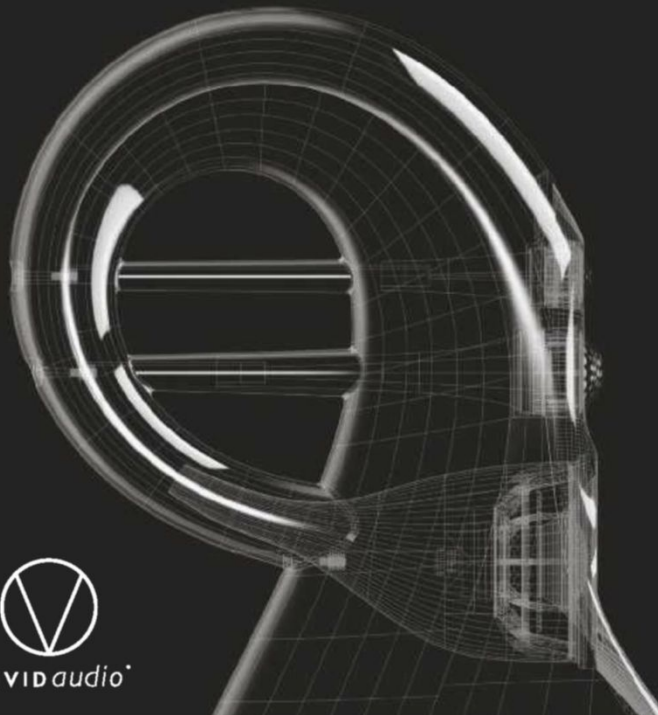
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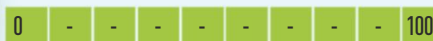
PROKOFIEV/RACHMANINOV

Piano Works  
Sandro Nebieridze

Harmonia Mundi HMM916115 (downloads to 96kHz/24-bit resolution)

Nebieridze is a young Georgian pianist/composer (just 19) and his debut recording is full of contrasts. Rachmaninov's unashamedly romantic Sonata No 2 (revised version) and Prokofiev's determinedly modern No 4; the motoric drive of his E minor *Étude* and the wistful *Vocalise*; the brio of 'Mercutio' and the pathos in 'Romeo and Juliet before parting' in Nebieridze's four chosen *R&J* excerpts. Then there's the unfailing articulation where high speeds are required versus an inwardness in slow music where the pianist explores depth of intentions in the writing. A fine Steinway recording and considered gap-lengths between tracks complement this absorbing playing. *CB*

Sound Quality: 95%



FALLA

El Amor Brujo; El Sombrero de Tres Picos  
Marina Heredia, Carmen Romeu, Mahler Chamber Orchestra/Pablo Heras-Casado

Harmonia Mundi HMM902271 (downloads to 96kHz/24-bit res)

Unusual repertoire for the Mahler CO perhaps, but vivid performances under Heras-Casado, who has an earthy Granadian flamenco singer in *El Amor Brujo*, as Falla would have wanted, contrasting with the gentler tones of the mezzo's brief numbers in *Three-Cornered Hat*. You can simply picture everything in this ballet: the ripostes of the 'blackbird' made me laugh, as did the bassoon solos characterising the pompous Corregidor. The Barcelona Auditori Studio recording is exemplary as are the annotations included with this CD – full song texts as well, of course. *CB*

Sound Quality: 95%



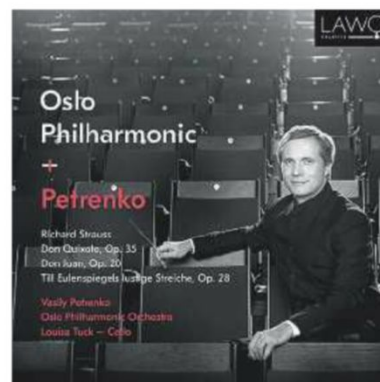
PRISM II

Music by Bach (arr. Förster), Beethoven, Schnittke  
Danish String Quartet

ECM 481 8564 (downloads to 96kHz/24-bit resolution)

ECM's *Prism* series has a transcription from a Bach fugue, a modern work and then a Beethoven Quartet. *Prism II* leads to his Op.130 where the players opt for the *Grosse Fuge* as finale. They are on their mettle for this so it's a shame the sound is brought too forward. Quoting the *Grosse Fuge*, the Schnittke is a *tour de force* with its melodic lines scribbled over with pitch-slides, screams and more. The Beethoven I thought a little too self-conscious in places, too 'tidied'. Taken very fast, for example, the *Presto* doesn't sound a little 'crazy', while the *beklemmt* passage in the *Cavatina* is more delicate than grieving. *CB*

Sound Quality: 80%



R STRAUSS

Don Juan; Don Quixote; Till Eulenspiegel  
Louisa Tuck, Catherine Bullock, Oslo PO/Vasily Petrenko

LAWO LWC1184 (downloads to 192kHz/24-bit resolution)

Like the Maazel [VPO/Decca], Petrenko's *Don Quixote* is with orchestra principals (ladies from London and Yeovil here!), in this generously filled second Oslo Strauss disc. Louisa Tuck is eloquent in the 'Knight's Vigil' and touching in her 'expiry' and if the orchestra hasn't the burnished gloss of the Berlin Philharmonic they make up for that in vital characterisation under Petrenko. He is particularly good at seamless transitions in these three pieces (where both *Dons* and *Till* all perish!) and this is far from a 'hear once and then forget' trio of performances. You'll discover lots of orchestral details lost with other conductors. *CB*

Sound Quality: 85%



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## 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

# Missing links

Confused by audio marketing hype? **Barry Fox** reports on a recent conference on the latest developments in technology and how reliable standards need to be established for our industry

**A**dmission: I feared that the huge roster of hi-fi and electronic industry bigwigs billed to speak at the recent Audio Collaborative conference (now held annually by audio market researchers Futuresource Consulting) would be overkill. No-one would have time to say anything of any significance. Fortunately my fears were largely unfounded.

You won't perhaps have heard of Knowles Electronics, but it makes many of the miniaturised microphone and balanced armature multi-speaker drivers you find inside portable audio devices. Then there's Qualcomm, which doesn't just make phone-chippery but designs processor and codec ICs.

### PLAY FOR TODAY

Companies like these hold the key to portable wireless hi-fi devices that run for a useful time on a tiny battery. The key is SoC, System on a Chip – a whole audio system sits on a single chip. So copper signal paths are super-short and current flow and battery drain is reduced. Currently SoC is delivering around five hours of playing time from a pair of buds that push hi-fi stereo direct into the ear. The Holy Grail is all-day play, so current drain has to fall further, from 6mA to 4mA and below.

A year or so ago we were all getting excited about sudden advances in voice and gesture control. This followed the breakthrough, from trying to store huge intelligence in a consumer device, to storing it in the cloud (actually a bank of computers in a bomb-proof building). So a simple audio device can continually get better at recognising commands. If you drive a car you'll welcome the chance to tell the music system what to do, without taking your eyes off the road to find the right buttons.

'Listeners then wonder what all the fuss about hi-fi is about'

**RIGHT: The panel at the Audio Collaborative event, held in London last November (l-r) – moderator Simon Bryant of Futuresource Consulting, Henrik Brodersen of B&O, Anders Andreen from Urbanista, Shay Kamin Braun of Knowles Electronics and Grace Lo of KEF**



But Simon Forrest, Futuresource analyst, warns that current technology has pretty much hit the end-stops. 'Virtual assistants are now very good but they need to move from 1.0 to 2.0, and there is a chasm to be bridged. In a noisy environment with music playing loud the system has a hard job hearing.'

To give two random examples: it may seem simple to show a camera a picture of five bananas in a hand and say 'Order me five of these'. But then, does it order five lots of five bananas or five hands? Or, how do you replicate the physical experience of skimming through a pile of LP sleeves, looking for a flash of artwork you remember from years back as a way of finding an album?

'What we need are things that just work – imperceptible technology, people-literate technology. We shouldn't expect people to be tech-literate' says Forrest.

Grace Lo, KEF's Managing Director reminds us that: 'Audiophiles are ordinary people'. And ordinary people are very confused by some of the marketing hype they are now faced with. Shay Kamin Braun, who is Director of Product

Marketing at Knowles Electronics, worries about the confusions now arising from the proliferation of HiRes codecs and music services – LDAC, LHDC, ALAC, FLAC, DSD, AIFF, AAC, aptX HD, AptX Adaptive, MQA, Tidal, Spotify, Amazon, Kugou (in China) and more...

### MY QUEST

Warns Simon Bryant, Director of Research at Futuresource: 'What's to stop a cheap-product Chinese company claiming premium quality? What the industry needs is a standard or logo. Currently it's all down to clever marketing. There is very little awareness of the need for all links in the chain to match – and this issue will come to a head as more companies like Amazon launch hi-res services'.

If both ends of a hi-res chain don't talk to each other, everything defaults to the lowest common denominator. Listeners then wonder what all the fuss about hi-fi and 'hi-res' is about.

So I have now started on a quest to see what kind of consumer protection there is for 'ordinary people' who want better audio quality for their music but are totally confused by the promises which companies are currently free to make. And so far, it's proving very revealing indeed. ☺



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## 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

# Days without electricity

As wildfires threatened the region, **Barry Willis** packed a few precious items and moved to a safer area, with time to become accustomed to a darker life with a new silent background

**E**lectrical power was shut off early one Saturday evening throughout most of a three-county region here in the States – a precaution to prevent the spread of a wildfire that was raging due to strong winds and high temperatures. At 4am Sunday morning, police cars blaring European-style two-tone sirens alerted us all to evacuate our homes.

In earthquake country, we're advised to have emergency gear in our vehicles at all times: water, blankets, clothing, toiletries, sturdy shoes. I was prepared in that regard. By the front door I had two laptop computers, a hard drive loaded with music, my Nikon camera, and supplies for my little dog.

### DRIVE TO SAFETY

When the alarm came I put it all in the van and almost pulled out of the driveway. Then I dashed back in, grabbed a favourite bicycle and bike paraphernalia (helmet, shoes, shorts) because I knew from previous fire seasons how long insurance claims can take to process. I did not want to be without a bike for months while I waited.

And as a safety measure, when the power was shut off, I'd gone throughout the house and unplugged everything. There's a huge potential for surges when the utility company toggles it back on.

I drove three towns south to an area not threatened by the fire but still without power, and spent two days staying with friends. Daytimes we squinted through thick acrid smoke even though the fire was more than 30 miles away. We had gas for cooking and amused ourselves at night playing Trivial Pursuit by LED camp lanterns, with a battery-powered radio nearby, tuned to an emergency station. Then after two days we were allowed back home. The

'My house was eerily quiet, just leaves rustling and the wildlife'

**RIGHT: The Dutch & Dutch 8c is an active loudspeaker housing twin 8in subwoofers, an 8in midrange driver and a 1in tweeter all driven by Class D amplification. Ethernet connectivity and a mobile app means music can be streamed to the speaker, and it also packs on-board DSP**



electricity was still shut off. We have so many unconscious assumptions about the technology we depend on. And I felt like a fool every time I flipped on an inoperative light switch.

### ROOM TONE

One thing I became instantly aware of was *silence*. When the power grid is live, there is background noise that we accept as normal. My neighbourhood and my house were eerily quiet: only the rustle of leaves and wildlife. Background noise in the house – what recordists call 'room tone' – had vanished. For two nights I practiced the lost art

of reading by candlelight. I also practiced the lost art of washing over the sink with bottled water. Where I live, no power also means no water, as we depend on an electric pump to pressurise the pipes.

During those days I went to a nearby town that still had power and used the public library's Internet connection and electrical supply to charge my phone. On the second day, some of the traffic lights came back on in my town, and by late

afternoon of the third day the entire town was energised. I can't express the elation I felt coming home and seeing lights on.

Nearly a week without power had given me new appreciation for all of it – the pleasure of a hot shower, the ease of pulling up favourite tunes, instant access to hundreds of channels of television, or communicating in more-or-less real time with anyone in the world. We are enormously and permanently dependent on electrical power. It's something really quite miraculous.

### PROGRESS REPORT

That power-free week also gave me a serendipitous audio opportunity. A friend in the lone town still energised had on test a pair of Dutch & Dutch 8C powered loudspeakers, a product intended for the pro market but one which has been shown at hi-fi events such as the 2019 Hong Kong AV Expo [*HFN Sep '19*]. An all-in-one solution, it obviates the need for separate amplifiers and preamps, DACs, etc, and the snake-pit of cables that accompany them. While it still needs some tweaks to its operating system to make it truly a fit for most audiophiles, the 8C design makes me rejoice at how much I love progress. 🎧



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## 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

# Casting the Roon

A recent software update brought a major upgrade to Roon, and a change to the way the company thinks of its subscribers. **Andrew Everard** thinks it's heading in the right direction

Most readers will be familiar with the Roon story: it started out as the manufacturer of an expensive music server some dozen years ago, was snapped up within a year by Meridian Audio and then spun back out as a separate operation in 2015. Since then it's been providing a subscription-based music management system – and hardware options to run its software – as well as signing up companies offering 'Roon-ready' audio products.

### DATA RICH

At first glance some have felt Roon expensive, at \$119 a year or \$499 for a lifetime subscription, for something that plays music – something other software packages seem to do for free, or in return for a one-off purchase fee. Indeed, I often hear from readers and others asking 'just what do I get for my money?'

The answer to that isn't in the way Roon plays music, but in everything else it does to enhance the listening experience, from allowing products from different brands to coexist in a single system, to the enormous richness of data it pulls together about music in your own library and on streaming services. That makes searching for something to play a delight, as is the way Roon can find connections between seemingly unrelated releases and make surprisingly satisfying suggestions for your further listening.

This was brought home to me when I received information about the latest update to Roon, which brings a whole host of new features to the system. The company says that over 40 million extra credits have been added to make searching by all sorts of parameters (such as supporting artists, recording location, conductor and so) simpler, and also

**RIGHT: Roon's new Artist Play and Composer Play options use Valence to pick a selection of an artist or composer's best music by determining their 'heyday' periods then suggesting lesser-known pieces**



allow more intelligent links to be made between tracks or albums.

There are particular advances in the way classical music is handled, and the whole search algorithm has been reworked for greater accuracy and relevance. Similarly, the way Roon suggests content has been improved: new releases will be prioritised according to the user's listening history and existing library, as will listening recommendations.

### BIG CRUNCH

Roon is calling its new backroom technology Valence, and explains it as 'a system built on a massive new cloud database, which uses machine learning algorithms – designed with our passion for music – to model the many dimensions of relatedness more deeply than ever before'.

All that number-crunching is what your subscription pays for, and the company is also changing its subscription model. The annual price remains at \$119, but the lifetime subscription has risen to \$699, Roon CEO Danny Dulai saying that, in essence, that it doesn't want lifetime subscribers any more. With admirable candour, he explains that 'We initially offered the lifetime for early commitment, not so people could rent-to-own. The goal was

to bring forward four to five years of revenue so that we could fund the start of the company. It worked. We never raised external funding.

'However, as we keep expanding the product and the team, paying for new data sources, and increasing our per-user costs... the lifetime subscription is not healthy for our future. It never was healthy, it was just a way to feed our hungry business early on.

'Since those early days, we have grown considerably. Cash flow is more predictable, and we are investing in longer-term projects. The lifetime continues to be the "junk food" of our revenue stream. Tasty, but not healthy.'

### ANNUAL RETURNS

He also says that 'It's unlikely that we'll offer a lifetime option forever. If customers enjoy Roon and believe in what we're doing, the best way to support us is to subscribe annually. We will do our level best to earn that support for many years to come'. And he admits that the long-term plan could even lead to a monthly subscription.

To me, that seems a sensible approach: if you like, the 'lifetime' offer was to get money in, much in the way that many companies now 'crowdfund' their initial development. And a monthly subscription? Well, I already do that for music streaming services, broadband, Microsoft Office, Adobe applications... ⚡

"The lifetime subscription is not healthy for our future"

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## Christopher Breunig Music Journalist

Christopher Breunig trained as an architect but became won over by music and collecting classical recordings. He was Hi-Fi News' Music Editor from 1986-2000

# The eyes have it

How does a conductor make intimate eye contact with a platform crammed with musicians, asks **Christopher Breunig**, who then casts a sceptical eye over the promotional videos for new CDs

**T**owards the end of a rehearsal clip with André Previn preparing a performance of Rachmaninov's *Symphonic Dances* with the Leicestershire Schools Orchestra in 1973, which you can view on YouTube, he makes a telling criticism. 'For the general public it often doesn't seem that the orchestral players ever really look at the conductor. But in, say, the LSO, they have learned the trick of seeming not to look, but they really *do* look. Now you *seem* to look but you don't!'

Once, when Previn was about to go into the pit at the Vienna State Opera to conduct *Die Fledermaus* at a New Year's Eve concert, the leader of the orchestra asked him 'Are you going to conduct, maestro, or shall we just play it?'

### EYES CLOSED

Coming up to date, Linn Records recently made a film of Robin Ticciati working in Berlin with his Deutsches Symphonie-Orchester ([www.youtube.com/watch?v=Gw07TgpdVF8](http://www.youtube.com/watch?v=Gw07TgpdVF8)). 'It's an incredible psychological balance,' says the conductor. 'How to engage with the individual or the group. To know when to step out and conduct the group as one – and see no-one. You can make anything happen, just with gesture. There is this point of stillness that anything can emanate from. The incredible thing about music is that the moment it sounds, then it's gone.'

Of course, Herbert von Karajan, in his time working in London with the Philharmonia Orchestra, conducted not only from memory but with his eyes closed altogether. In later years he didn't do this, especially with choral works, although those glamourised videos he so assiduously edited convey a rapt figure emanating energy.

**RIGHT: Khatia Buniatishvili floats gracefully into view in her Sony Schubert piano works promotional video, an image after Millais' *Ophelia* painting from 1852**



PHOTO: SONY CLASSICAL

And while Leonard Bernstein's facial expressions told the story – see him with the VPO in Brahms's *Academic Festival Overture* or his own *Candide Overture* from the Barbican – with Bernard Haitink's last performance of Beethoven's 'Choral' Symphony, with the Bavarian RSO, his face is just as relaxed as it would have been in conversation with a friend.

### EYE CANDY

Why, I wonder, do record companies concoct such extraordinary scenarios for their promotional videos when the artist is a young woman? Last year we saw pianist Beatrice Rana filmed playing her Fazioli concert grand in a brilliantly-lit Italian courtyard, pounding out part of Stravinsky's *Firebird*, the camera circling around her. Then the film (by Warner Classics)

cuts to closeups of young and elderly listeners caught in trance-like states, awakening then laughing. And earlier in the year Sony presented a filmed Khatia Buniatishvili floating in water, after the Sir John Everett Millais painting of *Hamlet's Ophelia*, to promote her CD including Schubert's last Sonata D960. A still was

used for the booklet cover. Both these films used a lot of slow motion to give a sense of rapture.

For her 2018 DG album *Nightfall* (Debussy/Ravel/Satie) the German-Japanese pianist Alice Sara Ott was filmed – yes – *at night* playing in total darkness in an urban setting. Her other promos are like fashion films: lots of reflections and spotlights. makeup being applied, etc.

For the men you wouldn't have that approach. Contrast the promo for American pianist Murray Perahia, studious and earnest, when DG released his Beethoven 'Moonlight' and 'Hammerklavier' Sonatas coupling.

These videos are of course meant to increase sales, but they don't always work. Take the latest set of Beethoven Piano Concertos with soloist/director Jan Lisieki. (I believe the recordings were made because Perahia had become indisposed but that everything was booked anyway.) We see this young Canadian's mop of fair hair almost brushing the keyboard and nary a glance at the partnering St Martin's Academy.

It certainly wouldn't persuade me to explore further, whereas what we have seen of Boris Giltburg, working with producer Andrew Keener and recording with the RLPO and Vasily Petrenko, means a project I'll be looking out for. ☺

'Beatrice Rana plays her Fazioli in a brilliantly-lit Italian courtyard'

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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

# The end is nigh – maybe

We've been threatened with an FM switch-off for years, in favour of Digital Audio Broadcasting. And it still hasn't happened. **Steve Harris** looks at current listening trends and forecasts

Still listening to FM radio? You are an endangered species, but final extinction may still be quite a way off. DAB, terrestrial Digital Audio Broadcasting, has been with us for more than 20 years, but we still don't know when FM broadcasting will end in the UK. By contrast, the switch to digital TV broadcasting, a much bigger upheaval, was completed in 2012.

### SWITCH-OFF PROSPECTS

At the end of 2017, Norway became the first country to switch off FM for national stations, completing a year-long transition to DAB with its farthest-flung Arctic regions. But local stations can continue on FM until 2022. In September 2019, Switzerland's Federal Office of Communications announced that FM would cease by the end of 2024 at the latest. But the authority said it might allow VHF transmitters in peripheral areas with insufficient DAB+ coverage to continue for a limited period after that.

In the UK it was once envisaged that FM broadcasting could end as early as 2015, on the assumption that by 2013 more than half of radio listening would be digital. That milestone was actually reached in the first quarter of 2018, so you might have expected the FM switch-off to follow in 2020. But this won't happen.

In March 2018, the BBC's position was set out in a conference speech by Bob Shennan, its Director of Radio and Music. 'We are fully committed to digital and we believe we should review the landscape again in a few years' time. Great progress has been made but switchover now would be premature. For now we believe audiences are best served by a mixed economy.'

In May 2018, Margot James, then Minister for Digital and the Creative

Industries, announced a new government review of radio broadcasting, to be completed by June 2020. Speaking in May 2019 at the Radio Festival, she referred to the competition that radio faces from podcasts and streaming: 'A consideration about the future of radio can no longer be seen as just a binary decision about a switch from an analogue to a digital broadcast platform. A review must have a much broader focus to reflect the growing challenges arising from IP-based audio content delivery and how this affects future decisions on radio distribution.'

### LISTENING ONLINE

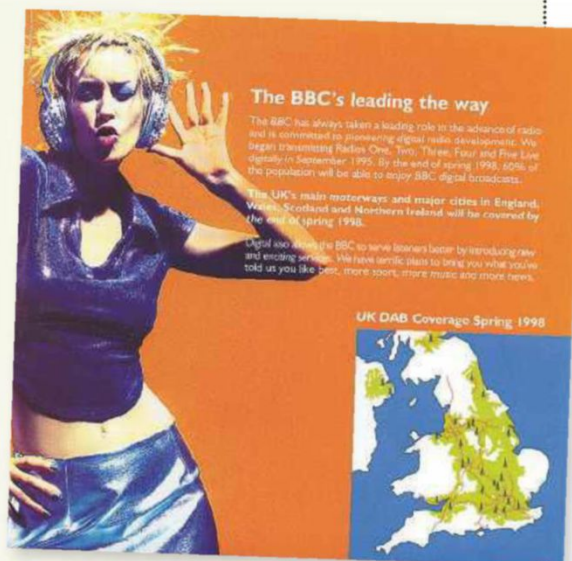
Reporting on the third quarter of 2019, RAJAR (Radio Joint Audience Research) showed that the proportion of digital listening had continued to rise, but also that much of the increase was due to online listening, rather than DAB.

Ford Ennals, CEO of Digital UK, commented: 'Digital listening has grown to a new record of 56.8%, driven by three factors – the growth of listening via smart speakers and apps, the increased proportion of cars with DAB and the continued rise of national digital broadcast stations'.

DAB now accounted for 39.7% of all listening and 70% of digital listening. This was slightly less than the 2018 third-quarter proportion of 72.2%, because while listening via DAB grew by 0.5% year on year, listening online and via apps grew by 30%, now accounting for 13% of all listening and 23% of digital listening.

It turns out that 80% of listening to commercial stations is now digital. So it isn't surprising that the BBC still prefers

'Many once loyal BBC listeners have switched off altogether'



**ABOVE: A BBC brochure from early 1998 said that 60% of the UK population would be able to receive DAB by the end of spring that year**

'a mixed economy' – for the near future at least. Both Radio 2 and Radio 4 have lost big chunks of their audience in the last year or so. You could say that rather than waiting for the end of FM, many once-loyal BBC listeners have just switched off altogether anyway.

### BBC'S RIVALS

But RAJAR figures show that Radio 3 is holding its own, with an audience still close to two-million. On the other hand, Classic FM's audience comfortably exceeds five-million.

Scala, the new digital-only classical music station launched in March 2019, with its audience of less than 250,000, hasn't really dented the UK's established rivals yet. Neither, it seems, has the German-based classical music streaming service Idagio. And with a 'hybrid' future still ahead, it will be a while before Classic FM, now the UK's most successful commercial radio station, will have to think about changing its name. ☺



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ICON AUDIO  
STEREO 40 MKIV

Reviewed: August 2019 issue

**A**s its name suggests the Icon Audio 40MkIV is capable of producing 40 Watts of power from its KT88 valves – although pushed hard we managed 50 Watts. There's also three feedback settings (high, low and zero) and the ability to run it in ultralinear or triode mode, as well as fixed bias. So there's wide room for experiment here, including the rare zero feedback option. It means users can find the set-up that suits them best.

And what a sound it is! Used with our Martin Logan electrostatics it was both vividly dynamic and spacious. The output transformers give clean powerful bass – a world away from the occasional softness of some other valve amplifiers. With its huge soundstage and thunderous dynamics the Icon Audio is a long way away from valve amplifiers of yore. Truly a modern classic.



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JANUARY 2020 HI-FI WORLD

## YOUR VIEWS

# Sound Off!

Correspondents express their own opinions, not those of *Hi-Fi News*. We reserve the right to edit letters for publication. Correspondents using e-mail are asked to give their full postal address (which won't be published). Letters seeking advice will be answered in print on our Sound Off pages, but due to time constraints we regret we're unable to answer questions on buying items of hi-fi or any other hi-fi queries by telephone, post or via e-mail.

## SIZING UP A NEW AMP READER SEEKS HELP FINDING A COMPACT PRE

Kudos to the team at *HFN* for doing such a fine job. When I read about many of the new amplifiers that feature in the magazine, whether they be integrated, pre or power models, an important consideration as far as I'm concerned is their physical size.

My current amplifier set-up comprises twin Audiolab 8300MB power amplifiers controlled via an older Audiolab 8000C, which has a depth of around 335mm plus a little more to accommodate cabling. Little new equipment measures up to this compact and, dare I say, more domestically acceptable size. There are some exceptions – components from Naim, Exposure, some Hegel items – but why is it that modern separates generally, and not just amps, are so deep?

Given the size constraints that I have just outlined, could you recommend some options for improving on the Audiolab 8000C? My other components are an SME 20/2A turntable with Benz Micro Ace SL cartridge, a pair of KEF Reference 1 loudspeakers used on matching KEF stands, an Audiolab 8000T tuner, Audiolab 8300CD player, and a Nakamichi CR4 cassette deck. All produce some very fine sounds to my ears, though I have a nagging doubt that I might improve things further with

a new preamplifier benefiting from the latest thinking and technology.

As a first step I have been considering moving to a separate Ear Yoshino phono preamp and passing it through the 'Video' line input of the 8000C. Then change the 8000C to a line-only preamplifier. This way I won't be getting out of my depth. Do you think this approach worthwhile?

*Karl Kozurek, via email*

Andrew Everard replies: Thanks for the waves of nostalgia, for long ago and in another life I used to run an Audiolab amplification system of an 8000Q preamp and four 8000M monoblocks, which was both compact and capable of a superb sound. If the 8000C preamp is still in good health I'd stick with it. You may well find that after adding your valve phono stage you don't really need to invest any further in the system.

I take your point about the lack of slimline hi-fi components these days – I guess people want something big and impressive for their money! But to your suggested list you might add slim – well slimmish, anyway – preamps from the likes of AVM or T+A, or perhaps even the new preamp and phono stage from the PS Audio Stellar range, which are less than 8cm tall and, as far as I've heard so far, really rather good. Watch this space!



ABOVE: When size matters – Audiolab's 8300CD player is 317mm deep while the matching 8300A amp [*HFN* Mar '16] is 330mm deep (including connectors/controls)

Send in your views to:  
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## Drive shafted

DEDICATED RIPPER VERSUS TRADITIONAL CD DRIVE

I am wanting to rip my extensive CD collection to a computer and began doing this with a good external CD drive using the Exact Audio Copy software for Windows. Sadly, the series of earthquakes we suffered here in New Zealand a few years ago put an end to the CD drive.

One premium audio manufacturer offers a dedicated 'high-end' CD ripper for use with its portable devices and I've heard on the audiophile grapevine that this can be used to produce FLAC and WAV files with direct copying to a computer. Would this be superior to, or at least as good as, using the Exact Audio Copy software with a traditional CD drive?

*Gary Bull, via email*

Andrew Everard replies: Yes, there's certainly no shortage of 'miracle CD rippers' on the market, all claiming to create even more 'bit perfect' (!) rips of your discs, but provided you use a decent CD drive along with EAC software, I think you'll be doing just as well. I tend to rip CDs using an inexpensive Samsung CD drive and the X Lossless Decoder package on my Mac, and have had no problems at all with the resultant files, so I'd stick to your EAC software and invest in a decent USB CD/DVD drive. Buy a brand such as Asus or LG and you won't go far wrong, and you'll find it very hard indeed to spend much more than about A\$50 or so!

## WhitWorld

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## Open-reel: the fine print

TWO FURTHER ISSUES TO REMEMBER BEFORE EMBRACING REEL-TO-REEL AS SOURCE

I really liked Ken Kessler's feature 'Keeping it reel...' [HFN Dec '19] in which he looked at the current situation with regards to open-reel tape. However, I was a bit surprised that he did not touch on the two curses of the magnetic tape medium, namely tape hiss and print-through. Tape hiss is the high-frequency noise present on analogue tape recordings and defines the noise floor of the recording medium.

Even tape-recorders of the highest quality using the finest tape produce tape hiss. And this noise is 'inherited' by any copy made from the master tape. It can be reduced by increasing the amount of tape used per second when recording a signal, by increasing the speed of the recording, or the track width of the tape used (or both).

To further increase the dynamic range available for analogue recording on magnetic tape, noise reduction/filtering including frequency-dependant signal compression while recording followed by expansion in playback is often used. The various Dolby filters may add 10dB to the dynamic range on the tape, but will impact frequency dynamics meaning the music loses 'sharpness' or 'definition'.

I believe DBX filtering may add up to 30dB, at the cost of even more transient distortion and there are other complex processes and algorithms to reduce tape hiss, each with its own pros and cons.

Print-through is the undesired transfer of the magnetic signal from one layer of tape to another on the tape reel. It results in a low-level 'echo' which is particularly noticeable on old tapes. A tape with poor S/N ratio may well result in your hearing less print-through because the presence of tape hiss may mask it!

Storing tapes carefully at room temperature away from any stray magnetic fields and rewinding them through occasionally may reduce print-through. But storage and maintenance are yet further issues that should be considered by the open-reel tape enthusiast.

*Asbjorn Gyllensten, via email*



**ABOVE: Is interest renewing in reel-to-reel tape, asks Ken Kessler in HFN Dec '19**

Ken Kessler replies: Although it appears remiss of me in not addressing them, neither tape hiss nor print-through are – to me, I stress – issues that even remotely undermine my adoration of the open-reel format. And it's not just a case of weighing pros vs cons, eg, CD's undeniable convenience vs the brittle sound.

Regarding tape hiss, I am only aware of it between tracks, hiss disappearing once the music starts. A perfect analogy is the tracing noise between tracks on an LP, which hardly negates the joy of vinyl. While hiss may annoy some listeners more than others, for me, it's a minuscule price to pay for the dynamic range, sublime bass and other virtues of tape over all other formats.

As for print-through, I find this to be an overstated peril of tape for the simple reason that I have experienced so little of it, even with tapes that may have been stored in less than ideal conditions. I have now acquired over 900 pre-recorded tapes, all over 40-years-old, listened to 275 of them, and have detected so few traces of print-through that it never even bothers me on the rare occasions I do hear it because it is at such a low level.

Note that the tapes are of unknown provenance regarding how they were stored. Fewer than 1-in-20 have had to be discarded, which suggests the original owners were 'audiophile-enough' to have employed correct storage methodology: proper spooling, avoiding magnets and stable temperatures. Indeed, all of the rejects were due to poor tape handling, resulting in badly worn, badly spliced tapes, but not one for print-through.

## JITTERBUG

USB Filter



### 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.

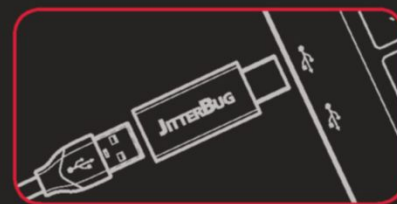
**Noise** is the problem. Real noise—the kind you can't hear directly. Most often, the word "noise" is used to describe tape hiss or a scratch on a record, but these sounds aren't noise; they are properly reproduced sounds that we wish weren't there.

**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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## Ringling the changes...

READER SHARES RESULTS OF ROOM AND SYSTEM ADDITIONS, AND NOT ALL ARE PREMIUM PRICED

I have been interested in hi-fi for around 50 years and started out building everything myself because I couldn't afford new components. But, like most audiophiles, I am always trying to get closer to the sound of music being performed live, as if the performance is taking place in front of me. This last year I have made three changes to my system and listening room, two of which are relatively low cost and the third less so. Each has taken me a significant step further towards my aim.

Firstly I bought two lounge room dividers costing around £100 each, and put them across the two corners of the room behind the listening seat. Secondly I purchased a record cleaner, in this case the VC-S2 ALU by Pro-Ject. I mostly play vinyl, on a Michell Orbe SE turntable equipped with an SME Series V arm and Koetsu Rosewood Signature cartridge.

Lastly I bought a second Devialet 220 Pro amplifier to run as a slave unit, giving me dual mono amplifiers with which to drive my pair of Sonus faber Olympica 3 loudspeakers.

I can now comfortably play at volume levels similar to those I would experience seated in an auditorium and the realism is transformed. But I am very surprised at just how much improvement in all areas that these three change have made.

*Martin Phillips, via email*

Ken Kessler replies: It appears that you have reached a stage where the details have been addressed, the system is balanced and even your software care has been dealt with by acquiring a record cleaning machine. Your next moves would have to be changing whole components,

**BELOW:** A pair of Devialet's Expert Pro 220 amps can be configured to run as 'master and slave' monoblocks



**ABOVE:** Pro-Ject's £399 VC-S2 ALU record cleaning machine uses a vacuum motor

but I would suggest that you savour what you have. After all, you've taken a half-century to get where you are! (See my reply to reader John Whitaker on p119 in the January 2020 issue.)

That said, it always starts with the source material. There's ample debate online as to which is the best record cleaning machine, one I am not about to enter here, but for me, any cleaning machine is better than none, and the affordable Pro-Ject, the Moth, the least expensive VPI and Clearaudio machines all do a fine job. In fact, Pro-Ject offers a similar, but more affordable, alternative to the £399 VC-S2 ALU machine, which is the VC-E at £299. Both models feature a metal arm and an aluminium enclosure, said to withstand excessive fluid spill, and both use the company's non-alcoholic vinyl cleaning concentrate, Wash-IT, which Pro-Ject says is eco-friendly.

For other maintenance regimes, if you use still cassettes or reel-to-reel tape, do not neglect head cleaning or demagnetising. CD maintenance is less of a DIY matter, but it can't hurt to remove the lid of your deck and blow out dust with a can of compressed air, as used to clean camera lenses. (Around £15 for a large can.) And do something we all neglect: every six months or so, unplug everything, clean the sockets and plug it all back in.



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Let the joyful experience begin!

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# Reception proves the rule

THE LOWDOWN ON FINDING THE RIGHT ANTENNA TO ENSURE YOUR RADIO RIDES THE WAVES

I get maximum enjoyment from *HFV*. Each issue is read from cover to cover then filed and re-read a year later before being passed on. Last year my old A&R Cambridge T21 tuner finally became too long in the tooth and was replaced with the excellent Rotel T11, which brings me to Jim Lesurf's article 'Immaculate reception' and Yagi FM aerials [*HFV* Dec '18]. A 'halo' FM aerial on a mast (with TV above) had been fitted to my house and, as Jim says, it was a poor design giving poor results. *ATV* in Sheffield has the best website I've ever seen on radio aerials ([www.aerialsandtv.com](http://www.aerialsandtv.com)), full of information, illustrations, charts, graphs and humour!

Following their advice I fitted an FM half-wave dipole, vertically polarised and have found that best for both FM and DAB. We live in southwest Shropshire and the transmitter is some way south near Hereford, but reception on both FM and DAB is excellent with this aerial – though I agree with Jim in that I prefer Radio 3 on FM to DAB.

*Christopher Lycett, via email*

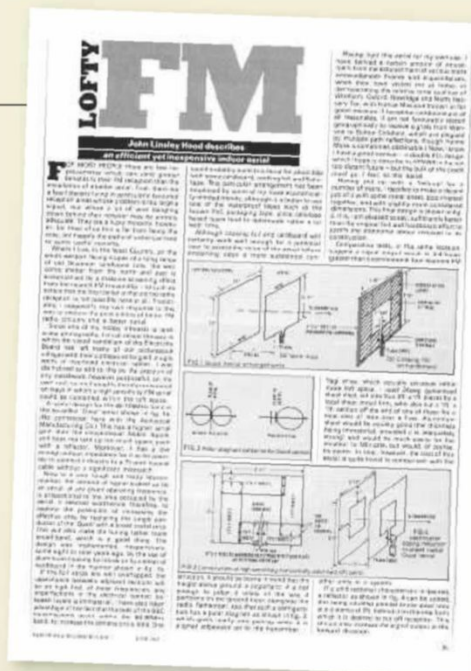
Jim Lesurf replies: The [aerialsandtv.com](http://aerialsandtv.com) website is a pretty good one to use as an introductory guide to the overall topic. So it's certainly worth a visit if someone has difficulty getting good FM/VHF reception. The main problem people face is that the optimum choice varies wildly from one location to another. So no one size fits all, and with a variety of designs on offer, most people are baffled about which to choose!

The key factor is the 'gain' of an antenna, which depends on its design and construction. However, this ability to collect more signal power is based upon making the antenna directional, and usually more complicated and physically bigger. In practice, you only find what your situation requires by experiment – ideally helped by a knowledgeable installer. Alas, these days most 'aerial fitters' are more used to UHF TV than VHF radio and will simply fit a halo, knowing little about the alternatives.

However these halo designs are down at the poor end of the scale of performance and provide essentially no gain at all, so the output signal level you get tends to be low unless you're lucky enough to live in a place where the VHF signals are very strong. They work as equally poorly for signals arriving in any old direction in the horizontal plane. This means they are a doddle for the fitter as they don't need to know which direction your VHF signals are coming from. If you're lucky, they will do the job, but it's likely that you'd benefit from picking up more signal – *ie*, using a directional antenna that provides more gain, but has to be pointed in the right direction.

Even a simple straight dipole has a modest gain, and will probably give a bit more signal than a halo, but this will need to be aligned correctly too. The good news here is that modern VHF transmissions generally have 'mixed' polarisation. This means a vertical dipole can be used, and they mimic the halo in letting you pick up signals from all directions in the horizontal plane. But they may not give much more than the halo, so it is a matter of circumstances as to whether the result is enough for good stereo FM listening. That said, as Christopher mentions, a potential advantage here is that some designs also work for DAB.

At the other end of the scale are expensive and elaborate concoctions – the large complicated crazy 'birdcages' that when mounted above your roof make your home look like an outstation for GCHQ. These may claim remarkably high gain values, but I've yet to see these figures reliably verified. So, personally, I tend to recommend using the well established 'Yagi' designs with from three to six 'elements'. These are relatively simple, and can provide gains from about 3dB (double the power) up to about 10dB (ten times the power). Frankly, if one of these designs can't do the job, then you may be better off resorting to the BBC iPlayer, always assuming of course, that you aren't so remote that you can't get a reliable Internet connection, either.



ABOVE: John Linsey-Hood's home-brew Square Aerial in the June '83 issue of *HFV*

As mentioned in my Dec '18 Opinion column, you can see a DIY example here: <http://jcgf.orpheusweb.co.uk/temp/VHF/VHFantenna.html> and the commercial designs should work as well or better. The main requirement is to be able to set them up so that they are pointing in the correct direction because the higher gain they provide means they are also more directional, so they need to be pointed at the transmitter with greater accuracy. And, yes, they can work in a loft (given the space!) but with a number of caveats.

There was an article by John Linsey-Hood in the June '83 issue of *HFV* in which he explains how to construct a Square Aerial for an FM radio tuner to be hung in a loft. In the article JLH says that it 'gives a signal three to four times greater' than a four-element Yagi placed in the loft, but while this sounds promising it can be misleading.

Conventional outdoor antennas are, indeed, designed to be used outdoors, on the basis that the signal will be arriving from one direction. Unfortunately, indoors in a loft space you tend to get multiple reflections that set up standing wave patterns. So if you put a large outdoor antenna in a loft it will find itself in an EM field pattern and will tend not to give its best. A loop like the JLH design acts more like a 'field probe', sensing the radio signals in the location of the loop. By moving around a loft or room you may well find a place where the reflections maximise the field and give decent output.



ABOVE: One for the BBC's 'mixed economy' output [see p111], Rotel's T11 FM/DAB+ tuner

# Slave to the ribbon

PRAISE FOR CLASSIC CELESTION SPEAKERS FROM A RIBBON-CRAZED READER

I loved the recent 'From The Vault' featuring the classic hybrid ribboned Celestion 3000 loudspeakers [*HFN* Nov '19], which I consider to be a highly innovative design. Then, in the December issue, came the informative letter from Mr Angel in the US, accompanied by the lovely panoramic photo of his listening room. Those big US rooms... Sigh!

Anyway, I have two questions. Are the Celestion 3000s effectively semi horn-loaded at high frequencies due to their front-slot delivery into the room? I also recall seeing a cutaway design blueprint of the speakers many years ago, which showed two sets of big ferrite slabs either side of the single ribbon. But from my experience of impedance and efficiency matching demands, they would need a matching conversion stage. So is there a transformer inside for driving the ribbons?

I built my own, 2m-tall curved and almost full-range dipole ribbon speakers, each having a length of un-transformed ribbon directly coupled to the amp. *HFN* featured them in the letters pages of the Nov '97 issue. These creations were born out of the loss of my stacked Quad ESL57s, and student poverty.

As for the servicing of Decca London loudspeakers with Kelly ribbons, which Ken Kessler referred to in his reply to Mr Angel's letter, a toothpaste squeezer is likely useful for the crimping of the ribbons, but only if you can get the correct,



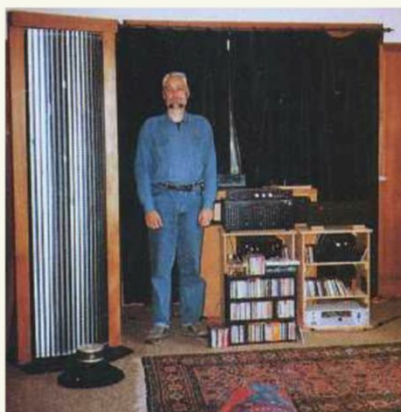
**ABOVE:** The Celestion 3000 ribbon hybrid speaker, originally reviewed in *HFN* Jan '90

thin gauge of aluminium foil. Their transformer does all the rest. The London's delivery set-up has a simple and intelligent build, especially with respect to the ribbon fixing, and with the squeezer and that knowledge, they shouldn't be too hard to service.

*Dr Richard H Barton, via email*

Keith Howard replies: Yes, the Celestion 3000 has a bifilar wound, split-primary matching transformer within which steps up the 0.14ohm impedance of the 12 $\mu$ m ribbon supposedly to 5ohm, although in his informative *Stereophile* review (available online and well worth reading if you haven't already) John Atkinson recorded a minimum impedance of 3.25ohm at just below 5kHz.

The ferrite slabs either side of the ribbon are described as 'strontium/ferrite ceramic magnets' – today they'd almost certainly be neodymium (NeFeB). No, it wouldn't be accurate to say that the ribbon is semi-horn-loaded: there is no significant profiling of the ribbon's short waveguide, which opens to the external air almost at a right angle. Anyone interested in DIY ribbons should read Justus Verhagen's *Ribbon Loudspeakers*.



**ABOVE:** Reader Richard pictured in 1997 with one of his self-built ribbon speakers

A large, stylized image of an Apple logo on a white surface, with a stack of audio cables in the foreground. The cables are black and silver, with some red and green wires visible. The background is dark, creating a high-contrast effect.

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**HFN0220P**

# Philips FA860 amplifier

Marketed by Philips yet made by Marantz, is this purposeful-looking integrated packed with premium components an unsung hero of hi-fi's past? It's time to find out...

Review: **Tim Jarman** Lab: **Paul Miller**

Philips should have been a dominant player in the hi-fi arena, yet many of its products somehow missed the mark. Despite these repeated failures, every now and again the sleeping giant would wake from its slumbers and produce something miraculous – Compact Disc, Motional Feedback speakers – only to disappear until inspiration struck again.

The FA860 amplifier seen here is a product of one of the times Philips decided to try and take the lead at the top end of the hi-fi market, a move spurred by an important advance in CD player design.

## NUMBERS UP

The first Philips players used 14-bit DACs, unlike the 16-bit devices employed by the Japanese and it was generally agreed that in terms of sound quality, Philips led the field for the first few years. However, hi-fi marketing is all about numbers and so it was necessary for Philips to come up with a 16-bit DAC of its own. This emerged in 1985 as the TDA1541 chip, first seen in players such as its CD450 [*HFN* Aug '14].

Basic players were all very well, but what was really needed was a flagship model to showcase the new technology. For this Philips turned to its Japanese subsidiary MJI (Marantz Japan, Inc) which created two new machines based around the TDA1541 DAC. These were the



**ABOVE:** A break with the past stylistically for the Dutch company, as the FA860 came with casework of sheet steel rather than moulded plastic

CD-94 for Marantz and the CD960 for Philips. Announced in 1986, both were identical aside from their external styling and combined Philips components and technology with Japanese design and assembly techniques.

To sell the CD960 effectively meant that supporting equipment of an appropriate level of quality was needed and again Philips turned to MJI. Two amplifiers were produced to complement the CD960: the FA860 providing 2x70W into 8ohm

[see PM's Lab Report, p127] and the FA960 at 2x115W. Both were Marantz designs, sharing the basic structure and common blocks of circuitry from the same generation of Marantz models. But neither new amp was simply a re-badged Marantz. The FA860, for example, had no direct equivalent in the Marantz range and while it and the Marantz PM-50 shared the same basic output stage design, there were many differences. Nevertheless, while the FA860 may have said Philips on the front, it was very different proposition to that offered by a traditional Philips amplifier.

## PLUSH TOYS

No concessions were made to owners of Motional Feedback loudspeakers or older Philips tape recorders built to the DIN standards – everything was new. Gone was the gently futuristic European styling executed in soft-edged moulded plastic to be replaced with square-edged black satin alloy and painted sheet steel. Discarded were the wacky controls and experimental ergonomics of the past, replaced by a

**LEFT:** Beneath the Philips badge is a little silver sticker declaring 'Made in Japan'. This is a clue to what is hidden inside the Philips FA860, which was built using the best Japanese parts





standard set of knobs that worked in a conventional and intuitive manner. And the previously preferred DIN connectors had vanished, with industry standard RCA sockets, and screw terminals for the loudspeakers now taking their place.

Philips had traditionally used many of its own electronic components to construct its equipment but this all changed with the FA860, which contained not a single Philips-sourced item. Instead, Marantz raided its toy box for the best it had to offer, coming up with an oversized mains transformer from Matsushita, power transistors from Toshiba, specialist ICs from Sanken, capacitors from Nichicon and a four-gang volume attenuator from ALPS.

This attenuator was one component that made the FA860 special. Nothing matching its quality could be found in any directly comparable Marantz design and its four independent sections made it possible to control the signal level at both the input and the output of the preamplifier. This

arrangement eliminates the possibility of overload while giving the best possible noise performance, both key factors for an amp designed to make the most of CD.

### DIRECT ACTION

To improve the FA860's performance further, a 'CD Direct' option was also included. This bypassed much of the source selection and tone control circuitry, giving the clearest possible signal path. When not in 'CD Direct' mode, the FA860 offered the full range of facilities you would expect from a high-performance unit. Two tape loops, treble and bass controls, loudness compensation and the ability to dub between the tape decks in either direction were all included. The phono stage was built to a standard Marantz pattern and could be switched to suit MM or MC cartridges. The direct

'The FA860 may have said Philips on the front, but...'

**ABOVE:** Matt black fascia and no shortage of knobs and keys made the FA860 a cosmetic match for the flagship CD960 CD player. The CD logo illuminates blue when 'CD Direct' is pressed

approach was also taken at the other end of the amplifier, with loudspeaker switching handled by relays mounted as closely as possible to the two pairs of oversized output terminals.

Another area where the FA860 scored over similar amps marketed by Marantz was the use of dual power supplies for the power amplifiers. Separate rectifier and reservoir circuits for the left and right channels were employed, mounted as closely as possible to the output transistors for minimum power loss. The traditional approach of a common power unit mounted remotely in the chassis from the

**BELOW:** Original instruction manual, brochure and service information for the FA860, with the FA960 amplifier featured on the brochure cover

The collage contains three main items:

- Left:** A detailed circuit diagram of the amplifier's internal components, including a list of parts and their values.
- Middle:** A Philips CD Line brochure featuring a photograph of the FA860 amplifier and the model number 87-88.
- Right:** A technical data sheet with multiple tables of specifications for various components and models.

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power amplifiers was retained by Marantz for its PM-50 model.

In use the FA860 feels like a high-quality Japanese amplifier. Top marks must go to the volume control, which is quite the silkiest and smoothest of this type I can recall. It is perfectly weighted, precise, silent and distributes the available gain optimally over the arc of its travel. The minor controls work well too, although the balance slider can be tricky to set accurately. And while the phono stage doesn't look too promising on paper, being a dual FET circuit followed by an IC gain stage, it works well, applying automatically the correct loadings of 47kohm and 100ohm in MM and MC modes, respectively.

This amplifier isn't about records or tapes though; it was built for CD. In this respect, while the unit's overall gain is still as high as any other from the era, the volume control law was chosen to maximise its range across the full 2V output of a CD player.

#### TIM LISTENS

Similar Marantz amplifiers, such as the PM-50, have in the past been criticised for exhibiting a slightly pronounced midrange and it comes as no surprise that the Philips FA860, even in 'CD Direct' mode, exhibits the same basic trait. It is not as pronounced as that noted with the Sansui AU-317 II [*HFN* Jun '15] but it remains the central characteristic of the amplifier. This is not to say that the upper or lower frequencies are clipped – far from it. For behind the forward midrange, the FA860's treble is pleasingly bright while its bass is smooth and muscular. With a

*'This amp is a considered choice for a serious listener'*

clean source it plays powerfully with great ease and in a domestic setting the sound can become unbearably loud before the amplifier shows any signs of running out of puff.

Being a modern DC-coupled design with a clear signal path, things like imaging are limited mainly by the source components used. However, it's impressive

how the integrity of the soundscape is maintained even at high levels, thanks in part to the separate power supplies employed for the left/right power amps.

Why does the FA860 sound like it does? One possible explanation is that it

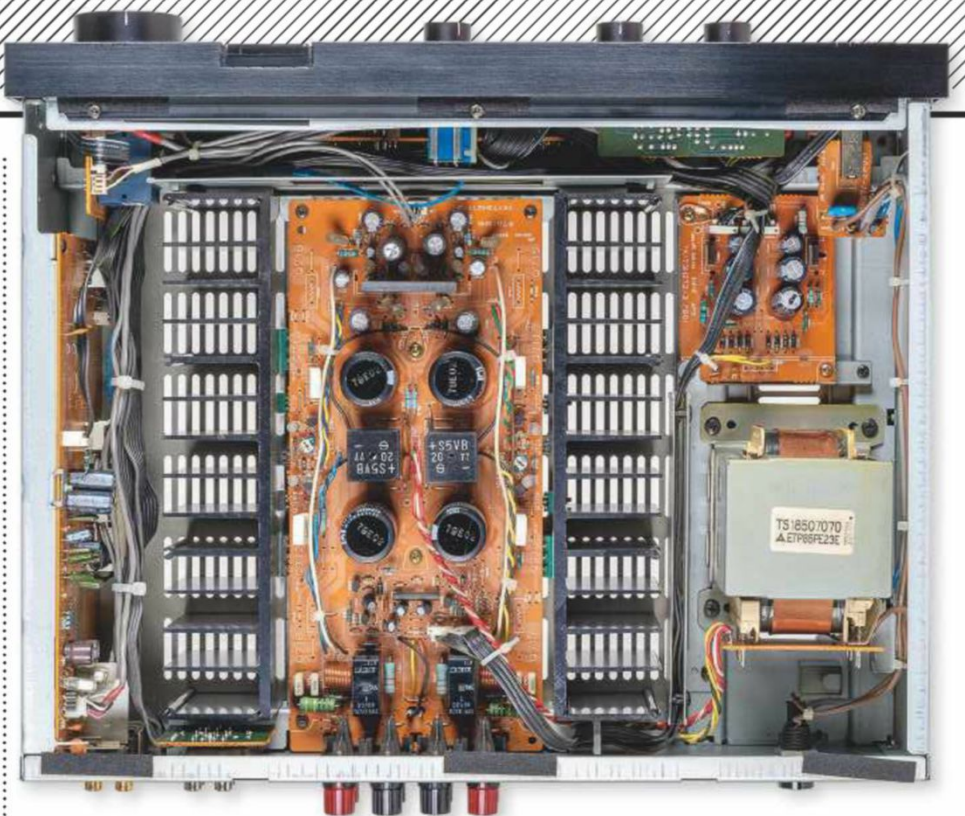
**ABOVE:** Under the lid can be seen the power amp PCB mounted in a large heatsink channel. Note the dual-mono power supply components [centre] and ALPS 'Blue' volume control [top left]

was designed specifically with Philips CD players (and the versions of these which were being sold by Marantz) in mind. Certainly, connecting the amplifier to a Philips player – in my case a CD104 [*HFN* Apr '14] – proved to be a revelation. These players are well known for their rich, fluid sound which addresses the initial complaints about hardness and coarseness that were associated with CD replay in the early days. If this comes at a cost, it is that the bottom end loses some of its pace and the midrange some of its focus compared to a well-engineered Japanese player. The FA860 seems to correct these shortcomings, bringing the Philips CD sound back into sharp relief.

#### SERIOUS CHOICE

When reviewing a Philips product from this era a Dire Straits CD is an absolute must, particularly that manifesto for digital recording: *Brothers In Arms* [Vertigo 824 499-2]. Hearing tracks such as 'One World' and, of course, 'Money For Nothing' through the FA860 is almost like hearing them for the first time. The underlying richness is still there and the percussion still shimmers as it should, but it's as if 

**LEFT:** Gleaming and factory fresh – a period publicity photo of the FA860. The FA960 model was taller and offered slightly more power, but otherwise the two amplifiers were very similar



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# LAB REPORT

## PHILIPS FA860 (Vintage)



**ABOVE:** Gold-plated RCAs serve MM/MC phono and CD inputs with nickel-plated RCAs for three line and two tape inputs. Two sets of speaker cable binding posts (not 4mm) are switched via relays controlled by buttons on the fascia [see p123]

a veil has been lifted from the midband. Yes, I thought the vocals were a tad too pronounced to begin with, but after a short period of acclimatisation, I would argue that it was how the album should sound.

Even with a Philips CD player as a source, some may still find the FA860 a little dry, but the more I listened the more I appreciated the way it sounded. It clearly wasn't designed to grab the buyer's attention in a crowded showroom with lots of boom and tizz. Rather, it is a considered choice for a serious listener. I've heard Dvořák's *Slavonic Dance* Op.72:8 in A-flat, with Pletnev [DG 477 056-2] sound warmer and more enveloping, but I can't think of much similar equipment that sets the orchestra in such a large projected space – one which seems to taper off in all directions to some distant point rather than having perceptible boundaries.

The fact that the amplifier was subjectively free from noise at any setting of the volume control and mechanically silent (no buzz

from the mains transformer) made it even easier to suspend belief and convince myself it was a live performance I was enjoying.

### BUYING SECONDHAND

The FA860 is well made and will give years of service. Replacement capacitors are available, but it is unusual to find anything wrong with the originals. One trouble spot, however, concerns the many switch contacts the signal has to pass on its way through the amp. Channel imbalances, noise and absent functions often resolve to this, and some carefully applied contact cleaner usually clears the faults.

In the power amplifier, the most vulnerable component is the STK3062 driver IC. Most Marantz amplifiers that use this IC have it mounted on a small heatsink but the Philips does not, raising its working temperature and putting extra strain on the soldered joints into the PCB.

The amp's output DC offset is regulated inside this IC and if it is excessive then replacement is the only answer. Marginal stability in this circuit will damage components in the output Zobel networks, causing them to burn out. The amplifier may still work, but loudspeaker damage could result. It pays to inspect these parts carefully at overhaul time.

### HI-FI NEWS VERDICT

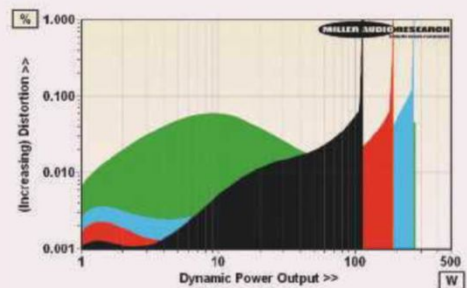
Despite not really being at home in an all-Japanese vintage system or in a Philips collection, for that matter, the FA860 is essential listening for anyone with a liking for the sound of the early Philips 14-bit and 16-bit CD players. And its phono stage is no slouch, either. While it struggled in what was a crowded market when launched, this amplifier deserves far better than the obscurity in which it currently resides.

Sound Quality: 86%

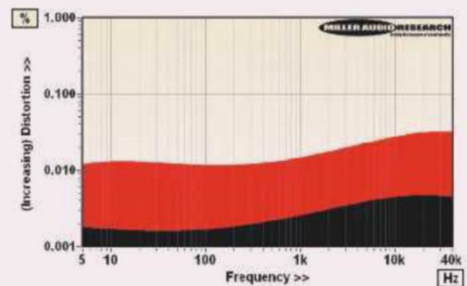


For once 'CD Direct' really does have a measurable impact on performance, not only bypassing the bass/treble controls (which are far from 'flat' in their default '0' position) but also the loudness control and L/R balance slider. There is only a 0.1dB difference in overall gain (+44.2dB) with CD Direct engaged or defeated but a difference of 1dB in A-wtd S/N (90.4dB vs. 89.5dB re. 0dBW). With CD Direct, the response is flat to within ±1dB from 4Hz-77kHz (-1.6dB/100kHz) but, defeated, shows a bass shelf of -1dB from 200Hz down to 10Hz, and a -0.25dB plateau out from 3kHz-60kHz. Distortion is more significantly influenced by output level than 'CD Direct', increasing from a low of 0.0015% at 1W/8ohm to 0.011%/10W and 0.022%/20W before stabilising at this level up to the rated 70W/8ohm power output (all at 1kHz). Implying a drift from low power Class A to Class A/B at a few watts, this trend of THD vs. level is more marked [black trace, Graph 1] than the increase in THD vs. freq. [see Graph 2].

While legacy schematics suggest a similarity in the FA860's output stage with that of stablemate Marantz's PM-50 from the same era, in practice the PM-50 had the edge in output, delivering 2x91W and 2x155W vs. the FA860's 2x85W and 2x130W into 8 and 4ohm loads, respectively. Both amplifiers readily exceeded their 2x70W/8ohm and 2x105W/4ohm rating but only the Philips model used electronic/relay speaker protection to limit output to 275W/16.6A into 1ohm loads [see green trace, Graph 1 below]. Output under dynamic conditions was otherwise well served by Philips' dual-mono PSU arrangement, producing 113W, 189W and 265W into 8, 4 and 2ohm loads (1kHz, 10msec, <1% THD). 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 16.6A



**ABOVE:** Distortion vs. extended frequency from 5Hz-40kHz (1W/8ohm, black; 10W/8ohm, red)

### HI-FI NEWS SPECIFICATIONS

Power output (<1% THD, 8/4ohm)	85W / 130W
Dynamic power (<1% THD, 8/4/2/1ohm)	113W / 189W / 265W / 275W
Output imp. (20Hz-20kHz/100kHz)	0.075-0.095ohm / 0.35ohm
Freq. resp. (20Hz-20kHz/100kHz, 0dBW)	-0.07dB to -0.1dB/-1.6dB
Input sensitivity (for 0dBW/70W)	17mV / 149mV
A-wtd S/N ratio (re. 0dBW/70W)	90.4dB / 108.9dB
Distortion (20Hz-20kHz, 10W/8ohm)	0.009-0.025%
Power consumption (Idle/rated output)	21W / 252W
Dimensions (WHD) / Weight	420x118x334mm / 10kg



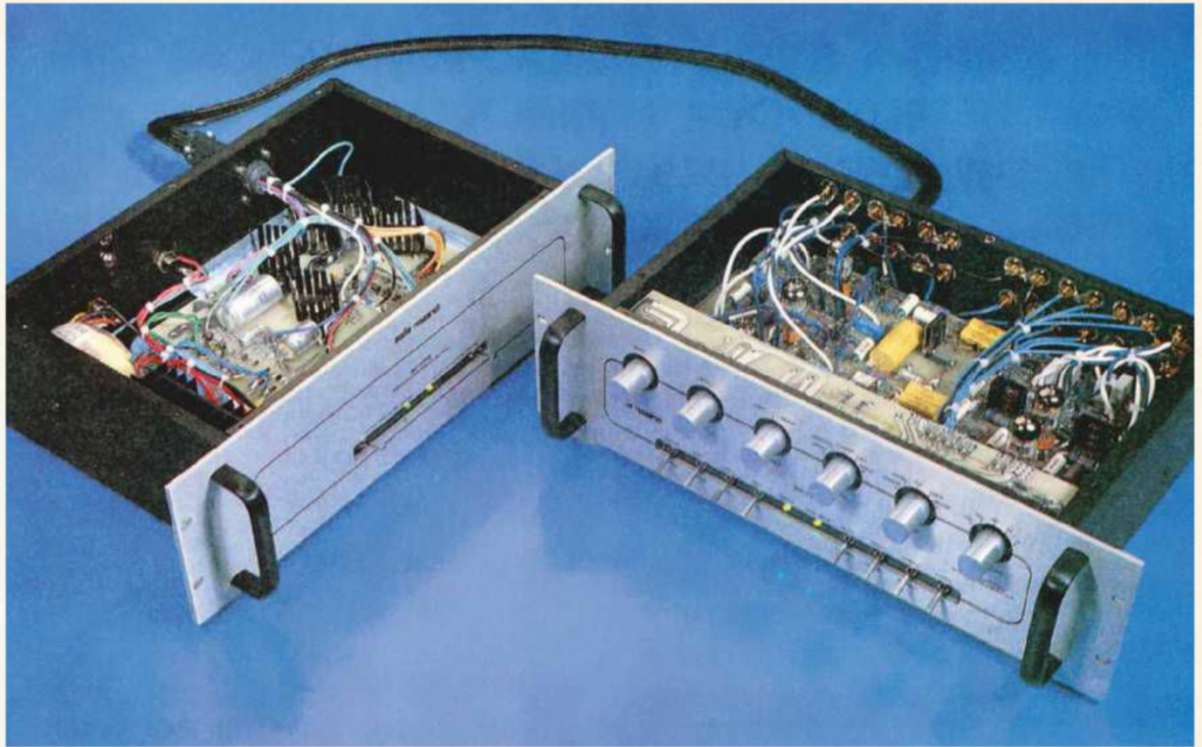
**ABOVE:** Review of the Marantz PM-50 by editor PM from *Hi-Fi Choice* Mar '90. Both the PM-50 and Philips FA860 were based on similar power amp stages

# Valvhalla

Ken Kessler takes delivery of the Audio Research SP-11 preamplifier

*Hi-Fi  
News  
June 1986*

Each month *HFN* will bring you an article from our vast archive of features and reviews from yesteryear



**ABOVE:** The two-box Audio Research SP-11 preamp with SP-11PS PSU (far left)



The time is early June, and let us imagine that this issue has been on the stands for two weeks. Editorial secretary Jennifer Scotland walks to where I am sitting and dumps a pile of letters on my desk. The angry correspondence has arrived.

John Atkinson was clever. Having bade farewell as editor in May, he knew he wouldn't be around to face the displeasure of readers who hate reports on expensive equipment. Incoming editor Steve Harris couldn't be blamed; he's not responsible for an issue that 'went to bed' before he even started work. KK is the only remaining guilty party. Let *him* explain why *HFN* devoted space to a £5000 preamp.

Save your stamps. I have no intention of answering a single letter which complains about the Audio Research SP-11 (or our coverage of it) because of price. We've been through this a dozen times, had anger-filled missives from readers who think we spend too much of our energies dealing with 'exclusive' equipment. But the facts remain...

To begin with, *HFN* is a specialist journal aimed at readers interested in the furthering of the state of the art. Then there's the fact that advances in hi-fi have accelerated at a rate which now yields up to a half-dozen monumental products per year, and such products rarely emerge from the budget sector. Finally, the best costs money. And I mean lots of money.

## THAT'S THE SPIRIT

I open this report on the SP-11 with these concerns because I wish to get them out of the way. I intend to revel in the SP-11 on page as I did while I had it at home. To those of you with no interest in products like the SP-11, which unabashedly strive to make music that much more satisfying, I ask, 'Why are you reading a hi-fi magazine with those same goals?'. There are other journals quite content to review £249 midi-systems and ghetto blasters; we believe that *HFN* readers



are all well into the advanced stages of separates ownership, even if they restrict their purchases to items that are far more affordable.

Enough. I've just finished the most intensive listening period I've ever experienced, having lived for a while with a system which costs more than I spent on my house. The gear is to be collected tomorrow, and I don't feel depression setting in because I have to let it go. Instead, I feel enriched, as rewarded as would be a whisky lover who had but one glass of a dream dram, knowing that he has to return to more ordinary drops for the foreseeable future. As one little ol' drinker sang, 'Memories are made of this...'

The SP-11 arrived in two boxes, each weighing no more than an average cassette deck. One held the preamp itself, the other the power supply which makes this preamp so different from its predecessor. As JA gleefully reminded me, the SP-11 has traded many of its valves for solid-state devices, including the whole of the power supply. 'Ken,' he chortled, flecks of Peperami sausage flying from his lips, 'you've fallen for a preamp that's 90% solid-state!'. 'It still houses six valves,' I countered.

'Big deal. They're used in the less critical stages. The rest is as God and Dan D'Agostino planned it. No vacuums, no heaters, no anodescathodesvalvepins. Ha-ha-ha! Next you'll be using a Linn Sondek!'

I left the office without twisting the knife: JA adores his SP-10, despite its valve complement.

The two units show no stylistic departure from the SP-10, and hi-fi shop habitués may be forgiven for not recognising the SP-11 on first encounter. As with the SP-10, the power supply sports two toggles, one for power-on and one to power the convenience outlets on the rear (blanked off for the UK). A captive three-core mains lead and a fat umbilical fitted with milspec connectors to attach to the preamp chassis complete the array.

### SET THE CONTROLS

The preamp fascia is packed with the kind of no-nonsense controls that will give palpitations to any true-blue tweaker. Full tape-dubbing facilities, source selection which includes inputs labelled 'CD' and 'Video', phono adjustment to select either 47kohm or four values up to 100ohm for MC,

stereo mode selection including left-only, right-only, and reverse, front-panel polarity inversion, mute, balance, gain, and level controls. Additionally, there's a bypass toggle which eliminates all non-essentials from the signal path. The back contains all-gold socketry, as well as a choice of direct or inverted main outputs. On Martin Collom's advice, the listening sessions were conducted using the non-inverting

outputs, bypass engaged, and with the Koetsu Signature Red cartridge fed into the 47kohm setting.

MC's hints saved me hours of experimentation, especially his finding that the SP-11 sounded best with the gain control on full, setting the listening levels with the level control, despite a slight increase in noise. With the gain control set at the 12 o'clock position, noise was non-existent, but soundstage was slightly reduced. As the noise was virtually insignificant even in the preferred full-gain position, this wasn't deemed a shortcoming.

JA had reservations about me using Beard amplifiers, despite my familiarity with their performance. Fortunately, a pair of the new Mark Levinson N°20 Class A monoblocks arrived in time for me to devote four days to uninterrupted listening with power amps more in keeping with £5k preamps. The ends of the system consisted of the Oracle turntable with Premier FT-3 arm, Garrott Decca and aforementioned Koetsu cartridges, and Apogee Scintilla loudspeakers. I also used a Yamaha CD-X1 CD player along with a Marantz 10B tuner.

### HOME TRUTHS

The total cost of the LP-only system (using the Levinson amps) was £2 short of *twenty-five grand*, counting mains plugs, Flux Dumpers, and every other little ingredient. This is more than I owe Nat West for my home, and more than double the nation's average annual wage. To say it was humbling hardly conveys the bowel-tightening realisation that insuring the system would result in looks of utter disbelief from any sane insurance salesperson (a contradiction in terms, I know).

When I learned that the Levinson amps, which I left on for the entire four days to eliminate warm-up periods, drew 500W each when idling, I made a mental note to always refer to 'the hidden costs of ownership' when reviewing high-end gear in future. And I used to think that only motoring journalists had to worry about that.

Before we get to the meat of the review – how it actually performed – I ought to mention that ergonomically the SP-11 was a delight, and that it has the look and feel you'd expect from a product

**'It's a preamp that presents itself as King of the Hill'**



**LEFT:** A hybrid tube/FET stereo preamplifier, the SP-11's control unit (top) housed six 6DJ8/ECC88 valves while the separate SP-11PS power supply was a purely solid-state design. The two chassis were connected via a supplied 4ft-long interconnect cable

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## FROM THE VAULT

which so blatantly presents itself as a contender for King of the Hill. Warm-up period was about an hour, no mismatches occurred with either cartridge or the CD player and tuner I used, and the only heart-stopper which presented itself was a nasty banging sound when a static-ridden disc decided it didn't like the Decca. The only other concern of note was a slight buzzing from the ILP-sourced toroidal in the power supply, though it was only audible when I placed my ear within a foot of the unit.

### ODIN BECKONS

I left all components powered up for the duration of their stay in my system. Particularly with the N°20s, cold listening was just horrible; no other word describes the sound of pedigreed components misbehaving. (Ask a Ferrari owner

what the car is like before the oil is warm.) Once my preferred levels were chosen, the only control used on the SP-11 was the muting switch to silence the system when changing LPs. Which reminds me: LPs sounded so gloriously superior to CD through this system that I only used the silver discs for comparison's sake. When it came down to gettin' down, it was music on vinyl all the way.

As this was only the second time I'd had the privilege of reviewing a piece from the Master, and my previous encounter (the D-70) resulted in greater insight into the muddiest of Stax recordings, what could I do but wrap the Oracle 'round Sam and Dave? No, I didn't play the digitally-reprocessed versions on the Atlantic box set, or the Japanese pressings, or recent UK or US reissues. I went back to the originals, which I'd played innumerable times and knew intimately. Did the SP-11 show me anything new? Did it increase my enjoyment? Did it make the performance more realistic than the best previous rendition? Yes.

We've all heard individual components so clean, so uncoloured that they added no unwanted by-products. We've also heard components so open and revealing

that they subtracted nothing. What the Audio Research SP-11 has, a quality which it shares only with the Koetsu Red Signature and the Stax Lambda Pros (in my experience) is the ability to yield signal suffering neither additive nor subtractive effects in *perfectly natural perspective*. Previously encountered hardware would improve soundstage, imaging, depth, dynamic capability, and other perspective-related details with varying degrees of success.

We would use terms like 'slightly better width (than the reference)' or 'more precise imaging than the reference'. These concerns are virtually inapplicable in this review simply

because the SP-11 – more than any preamp I've ever tried – defies criticism in the traditional areas.

I still use, as an 'aural magnifying glass', the Stax Lambda Professional

*'The churning bottom end curled from the loudspeakers'*



headphones for all assessment up to the preamplifier outputs. When driven by the SP-11, the Staxes revealed more detail, more openness, and more of the music than I've ever heard, and that's 'in the head', an instance where the 3D considerations of loudspeaker reproduction do not apply. By removing one whole element of musical reproduction – the need to create convincing 'space' – headphones enable the



**ABOVE:** Pages from the original Audio Research brochure for the SP-11 trumpet the strengths of this 'new reference-standard stereo preamplifier'. The unit was also available in solid wood cabinets in light oak or dark wood while black front panels could be specified at extra cost

**ABOVE:** The ARC SP-11 sported six control rotaries labelled 'Gain', 'Level', 'Balance', 'Mode', 'Input' and 'Impedance' while a row of toggles below these offered a range of tape monitoring, mute, invert, bypass and filter options

assessor to focus on the most important element of all, the very music, without the interference of the listening room used and its peculiarities. The SP-11's musical product is revealed as sweet and natural, solid and palpable even without the benefits of illusory three-dimensionality.

### VOCAL ACROBATICS

Having established to my satisfaction that the sounds it delivered were as good as the software allowed, I returned to the use of amp and speakers, for that is the preferred mode (unless neighbours deem otherwise). The sessions proved thrilling; there is no other word. The soul spectaculars proved that the SP-11 had no difficulty in conveying that most elusive of properties, sheer emotion, and I had no doubt that other vocal tracks would prove a doddle. If a system can handle Sam and Dave it can handle anything. But, with a nod to former *HFN* editor John Crabbe, I decided to turn to vocals that are less in line with my personal taste.

I chose the Swingle Singers and the King's Singers, both for the wide range of voices and the endearing penchant both groups have for vocal acrobatics. While I can't testify to the dimensions of the recording sites, I can categorically state that the Audio Research SP-11 gave the singers body and shape instead of replicating voice *sans* carcass.

The temptation is to start talking about the size of each vocalist's tonsils, or even whether or not they've had the operation. However, like the Koetsu Red Signature, the SP-11 does not exaggerate details. Why? Because the SP-11 does not place more emphasis on one part



## FROM THE VAULT

of the spectrum than another, nor does it have a peculiar sense of perspective. Nothing stands out unless it's supposed to stand out, so those of you wishing to 'remix' the oppressive, up-a-dozen-dB bass of reggae recordings will find no solace here. Indeed, if an SP-11 were installed in every recording studio in the land, it would probably make matters worse, because bass fetishists will positively wallow in this unit's lower registers.

Allied to the powerful slam available from the muscle-amp Levinson monoblocks, fed by the near-perfect Koetsu cartridge, and delivered to the eminently capable Apogee loudspeakers, the SP-11 taught me why Jack Bruce was worthy company for Eric Clapton.

### NICE 'N' SLEAZY

Having recently learned first-hand the glories of crossed-pair recording and how it renders studio recordings useful only for assessing sounds rather than space, I turned to a variety of Sheffield Lab LPs. Here the SP-11's spatial signature is seamless, wall-to-wall-to-backwall, and as convincing as the speakers will allow. Music lovers, though, don't give a hoot about architecture lessons when the performance should be paramount; the SP-11's handling of the power of the finale on LAB 24 indicated no squashing whatsoever of the Los Angeles Symphony Orchestra's might.

As with any component that aspires to perfection, the SP-11 wasn't generically restrictive. Classical, rock, jazz, soul – all were tried and all survived intact. The SP-11 cuts through mire, or, more likely, adds no mire of its own, and supplied with alarming regularity new insights into familiar recordings. Lyrics were easier to follow, meaning that the incendiary political content of The Fugs' first album hit home again, 20 years after events had rendered them passé.

Meanwhile, the churning bottom end of Root Boy Slim And The Sex Change Band's 'I'm Not Too Old For You' curled out of the speakers with an intensity that reflected the angst of the lyrics... which is why the rhythm section played those

*'You simply can't match this preamp at the price'*



notes in the first place. (This song, by the way, houses rock's finest lyric, something of an anthem for our departing editor: 'When you turn 17, I'll just be 32'.) And as for Ella – aah, Ella! Well, let's just say you had to be there. After all, *she was*.

BB King's 'Sneakin' Around' appears on one of those cheapo labels that probably measured out the paper content of its pressings – sludgy sound was the norm for those \$1.99 throwaways. But the performance – BB in front of a sleazy

orchestra – is the kind which transcends the storage medium. The SP-11 did only what a preamp should and nothing more. If a song could describe a hi-fi component, the SP-11's theme would be The Zombies' 'She's Not There'. Playing the BB King LP through this leading-edge component, every last vestige of the recording came through to prove yet again that even LPs bordering on the bootleg can be enjoyed if they're not compromised any further by the sound system.

### SETTING FIRE TO THE SHIP

'Not compromised' is the key phrase, for it only describes sound from components not compromised in their design. Which gets us back to why this preamp costs £5000.

The SP-11's cost is justified by one simple statement: you simply cannot match its performance for £4999. Which also makes it worth £10,000 or whatever price tag it wears until something better comes along. Which could mean waiting until *Götterdämmerung*. ☺

**TOP:** Original pages from the June 1986 issue of *HFN* which saw Ken Kessler play host to the two-chassis Audio Research SP-11 preamplifier. The cover spotlights the SME Series V tonearm, which finally arrived for review following the unveiling of a prototype two years previously at shows in the US and Germany [*HFN* Dec '19]



Also in *HFN* this month in 1986

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### BI-WIRING

Martin Colloms experiments with loudspeaker connections.

### SME SERIES V

Is this 'the best tonearm in the world'? Martin Colloms reviews the latest offering from SME.

### THREE PCM PROCESSORS

Martin Colloms assesses the Sansui PC-X11 Tricode, Sony PCM 501 and JVC VP-100BPS.

### REEL TO REAL

Ken Kessler takes TEAC's X-2000 open-reel recorder on safari.

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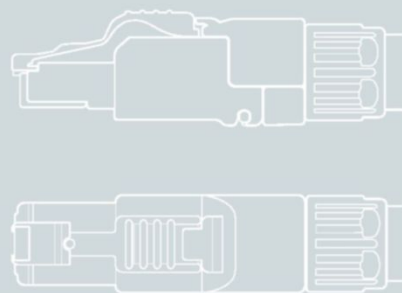
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# OFF THE LEASH!

KEN KESSLER TELLS IT LIKE IT IS...

**Ken Kessler** pays tribute to Ken Ishiwata and also remembers past mentors and heroes, now gone...



**Y**outh is a period when being obnoxious is the norm, and some would say I still behave like a 14-year-old. *Mea culpa*. But even so I was wise enough, even as a toxic brat, to respect and to learn from those who had earned *their* respect, and acquired the delivery tools for learning through decades of experience. It's called 'life'.

## AUDIO LEGENDS

Over the decades, in every aspect of my life, I gleaned precious knowledge from countless individuals, every conversation a shortcut to maturity, wisdom, understanding or mere competence, if not excellence. Andrew Merdek, a friend from my youth, introduced me – in a single day! – to more incredible music than I have space to list. My love for those artists, Sam & Dave and The Buffalo Springfield and The Youngbloods, has now remained constant for over a half-century. He also exposed me to Balkan Sobranie cigarettes and the works of novelist J P Donleavy; I am grateful for both.

Ted Chapin introduced me to high-end audio, when I worked for him up in Bangor, Maine. Then, as a hi-fi journalist, I was blessed with introductions to countless audio legends, among them the genius Stan Kelly, who lived nearby and whose every other sentence yielded either practical information or a historical nugget.

David Hafler (Dynaco), William Zane Johnson (Audio Research), Dave Wilson (Wilson Audio), Arthur Radford (Radford Electronics), Alastair Robertson-Aikman (SME), Jason Bloom (Apogee), Raymond Cooke (KEF), Enzo Natali (AudioNatali) – the list of those who influenced me is long and I could easily fill this page with even more names, but if I did all I would be telling you is that I am a magpie of sorts. Sadly, all of these heroes of mine are gone.

## A KEEN LOSS

Others, though, are still with us. I cherish every second I spend with Tim de Paravicini, who simply knows more about hi-fi and the entire music chain than anyone I have ever encountered. At hi-fi shows or simply during my travels, I seek out Dan D'Agostino, Karl-Heinz Fink (Fink Team), turntable maven Martina Schoener, Eveanna Manley, Heinz Lichtenegger of Pro-Ject, Ivor Tiefenbrun (Linn), Hideaki Nishikawa (TechDAS), Antony Michaelson (formerly of Musical Fidelity), Bob Ludwig, former *HFN* contributor John Howes and others who enrich my life at every meeting.

Absolute Sounds' Ricardo Franassovici and I – two mistrusted 'foreigners' – arrived on the UK hi-fi scene at the same time, and have been supporting each other – and sparring together – for exactly 40 years. We, too, have learned from each other, him

**'Ken's CD12/DA12 remains my reference after 30 years'**

sucking up my musical lore and love for *film noir*, me taking the opportunity to practise my poor French and Italian, both of us always arguing about the high-end.

So, today I am not alone and mentor-less, but on the 25th of November, 2019, I lost one of the most important influences of them all: Ken Ishiwata. Ken and I went back for around 35 years. He was headhunted by Marantz from Pioneer in 1978, and would eventually become the company's global 'ambassador'. It surprised no-one, because he understood the Marantz ethos, even receiving a benediction from company founder Saul Marantz himself.

## SIGNATURE SOUND

Ken's deep knowledge of audio, his love of music, his obsession with quality and his inability to compromise benefited every audiophile who ever owned one of the limited editions that bore his name, the components in the long-running, now-legendary KI Signature Series. What Ken did was to 'hot-rod' certain Marantz products, tweaking the components and adding superior parts. Marantz sold them alongside the standard models, with a premium price to account for the extras.

Amazingly, the KI Signature Series started with affordable CD players, reaching its apotheosis with the SA-KI Ruby SACD player and PM-KI Ruby integrated [*HFN* Jan '19], issued to celebrate Ken's 40th anniversary with the company. In between, he created what might prove to be, in retrospect, his greatest achievement: The CD12/DA12 combination transport/DAC which – to these ears – remains the finest-sounding 'red book' CD player ever produced. Indeed, it remains my reference after 30 years.

It's impossible for me to recount all of the times I spent with Ken. He was instrumental in arranging the privilege of my reviewing Marantz's legendary Project T-1 valve amp, the AX1000 test computer and other rarities. But what mattered more were the conversations about everything from single-ended vs balanced, triode vs pentode, or why Julie London was magical.

Ken was 72. His influence on the world of hi-fi? Ageless and timeless. His friendships? Limitless. Sayonara, Ken-san. ☺

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