

# HI-FI WORLD

JUNE 2007

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**EXCLUSIVE!**

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**EXCLUSIVE!**

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Origin: USA } CS3.7 shown



**Ayre** }  
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**Zingali** }  
Origin: Italy } Client Name shown



**Mark Levinson** }  
Origin: USA } 326S shown



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## verdicts

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



Were I a nineteen eighties hi-fi journalist, then the chances are that many people reading my magazine would have – at some stage in their hi-fi history, owned something made by Pioneer.

Indeed I would wager a lunch voucher or two that their first turntable could well have been the PL-12D, so ubiquitous in the mid seventies was this simple belt drive deck. The princely sum of £50 bought a sleekly engineered and built device

that delivered surprisingly good sonics. More importantly, it was only £10 or so more than the clunky, noisy budget Garrard and BSR models, which might as well have come from another age...

As a nineties hi-fi hack, I found many readers of this magazine had owned another Pioneer – the A400 amplifier. I too had one in fact, and it was a cheap looking, plasticky black box – that didn't have a right to sound as good as it did for its £300 purchase price.

What a shame then that we're heading towards the end of the noughties now, and there hasn't been a single 'affordable audiophile' Pioneer product. Whereas it had traditionally made great budget hi-fi, the company spent most of this decade selling (admittedly superb) plasma TVs and DVD players.

Until now, that is – because the new Pioneer A-A6-J integrated amplifier is the direct heir to the aforementioned A400, and the PD-D6 SACD player (pictured top right) is, I suppose, a distant digital descendent of the PL-12D turntable. They're back, and on p39 you can read the result. I got a chance to take a good listen to the company's first foray into serious two channel audio in a decade, and was impressed by the style, sound and build. This is obviously no half-hearted attempt to move back into their old market - Pioneer mean business.

To them - and to Denon and Marantz, who have also recently 'come home' to two channel hi-fi after far too much time in the AV wilderness - I say welcome back. The UK hi-fi buyer hasn't profited from Japanese companies being absent from this sector, because there's no denying they know a thing or three about engineering and building things beautifully over in Tokyo and Osaka. Here's hoping the likes of Sony and Technics get the message too. *Kanpai!*

**David Price, editor**



## testing

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

Loudspeakers are measured using a calibrated Bruel & Kjaer microphone feeding a Clio-based computer

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

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



## ELECTRONIC MAGAZINE

Go to our website [www.hi-fiworld.co.uk](http://www.hi-fiworld.co.uk) to buy an electronic version of this magazine, individual issues or a subscription. At present we do not offer back issues, but hope to soon.

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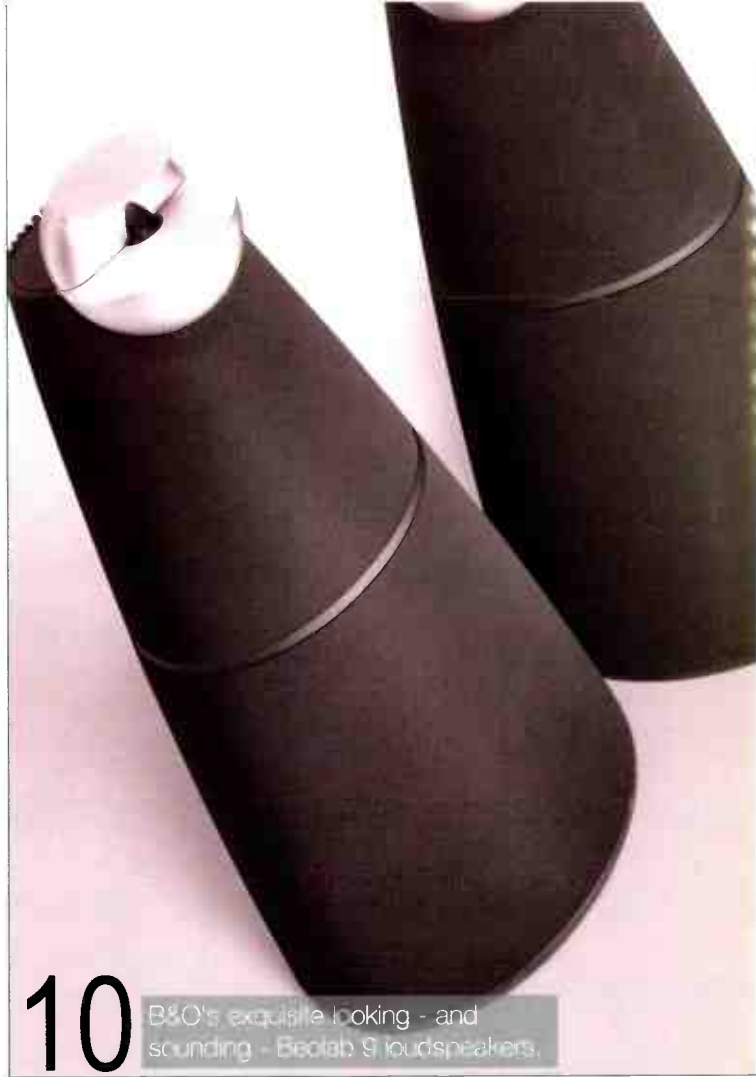
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What's remarkable about the new series of LP12 SE upgrades is not that it's taken 35 years to develop them, or that they can be retro-fitted to any Sondek LP12 turntable, but the fact that they retrieve even more music from your vinyl collection than ever before.



**Experience a revelation in turntable performance.**

For more information and details of demonstration events in your area visit [www.linn.co.uk](http://www.linn.co.uk), or call 08000 277 181.



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# news

## LINN DEPENDENT'S DAY!

At last - what those countless thousands of Sondek LP12 owners out there in hi-fi land have been waiting for! Linn's first major revision of the LP12 in decades is finally in dealers now. Thirty five years after this legendary turntable was born, surely its biggest ever rework is here. The new LP12 SE series comprises three new upgrades, the Ekos SE tonearm, Keel one-piece subchassis, armboard and collar, and new metal Trampolin base board. Each upgrade benefits from design and craftsmanship of the highest standard, and represents the highest performance product of its type ever produced by Linn, says the company. The new £2,950 Ekos SE is Linn's flagship tonearm, designed to extract the maximum information from vinyl. It features advanced materials carefully selected for their sound performance, including a machined titanium arm tube to reduce resonance within the arm and a stainless steel bearing housing which helps reduce unwanted tonearm movements. The £1,950 Keel is a combined subchassis, armboard and collar, machined from one solid piece of aluminium to provide rigid support to the tonearm and platter. There are no screws, fixings or joins to the part, which removes virtually all vibration, resulting in even more accurate reproduction of vinyl recordings. Keel has been engineered to maintain the same mass and centre of gravity as achieved with the separate subchassis, armboard and collar, ensuring that it integrates seamlessly with the suspension system of every LP12 turntable. It comes in a standard black anodised finish to complement the simple design of the Sondek, and is currently only available with a Linn arm fitting - but rumour has it that a Naim ARO version may be made available. The new £140 Trampolin base board is manufactured from aluminium for increased rigidity, acoustically deadened for reduced vibration, thus providing even better audio performance, says Linn. Events demonstrating the LP12 SE upgrades are currently taking place at Linn Turntable Specialists worldwide. More details can be found on [www.linn.co.uk](http://www.linn.co.uk).



## KIMBER WILD!

Russ Andrews have just announced their new ultra high end Kimber Kable interconnect, the £1,700 Kimber Select KS-1036. Using 'Black Pearl' silver conductors, the finest purity silver used in a Kimber cable, the KS-1036 is a no-compromise interconnect for the most demanding of systems, RAA says. An application of high-pressure, low-temperature V-Teflon dielectric and the utilisation of the X38R core compound aids the reduction in signal distorting influences. Secure electrical and mechanical connection to the electronics is via the new WBT-0102 Ag nextgen connectors with 'passivated' pure silver conductors. Russ Andrews says of the new cable, "this is the most detailed, smooth, natural and musical sounding interconnect I've yet heard. It has a sweet, but uncoloured transparent sound". For more information click on [www.russandrews.com](http://www.russandrews.com) or call +44(0)845 345 1550.

## NEW MILLENNIUMS

No sooner than we review Ortofon's brand new 2M series of moving magnets, then famous UK name Goldring announces its own new range of high performance phono cartridges. Designated the '2000 Series', the range consists of five MMs boasting "every technical advantage expected of the very highest quality audiophile designs". These include Samarium Cobalt magnets for higher outputs and Permalloy armature tubes to reduce mass. Super Permalloy shielding is used to reduce noise and the same material is utilised to form the poleshoes to provide higher sensitivity. All connector pins are gold plated, eliminating corrosion and minimising contact resistance, whilst the cartridge bodies are threaded to allow easy and secure fitting. Goldring say that, "sonically they clearly raise the bar for cartridges in their price sector". The range starts with the '2100' at £70 and goes up to the £185 2500. "There are distinct improvements as you progress up the range," says Goldring, "each model delivering a more detailed, open, and dynamic sound than the one before. The sound quality of the range-topping '2500' model will delight even the most discerning audiophiles." This model features a rigid metal body for improved bass definition and an ultra high quality '2 SD' diamond stylus, bonded to a tapered alloy plated cantilever. For more information, click on [www.goldring.co.uk](http://www.goldring.co.uk) or call +44(0)1279 501111.



## PERFORMANCE ART

The new £1,670 Performance turntable presents a truly high-end analogue turntable in a fit-and-forget package of elegant appearance and design philosophy, says Clearaudio. Most interesting is its use of the latest patented Clearaudio Ceramic Magnetic Bearing. The main bearing shaft of the Performance is machined from an exclusive new ceramic alloy, allowing a much finer polished surface than that previously obtainable in turntable bearings. As the bearing does not use a ball bearing nor a thrust pad of any kind, it avoids any point of load and so eliminates bearing friction, wear and noise. The Clearaudio Performance chassis is precision manufactured from High Density Fibreboard within an aluminium frame, which is then sandwiched between two layers of 'Staron' artificial stone. The separate motor is entirely isolated from the chassis, driving the precision-machined 40mm thick GS-PMMA acrylic platter via a Clearaudio 'silent belt'. This joint-less silicon based drive belt transfers less noise into the platter than traditional rubber types. The deck is also fitted with Clearaudio's Satisfy Carbon Directwire tonearm sporting magnetic bias compensation, sapphire and ceramic bearings, woven carbon fibre arm tube. Completing the package is

Clearaudio's top of the range Maestro Wood moving magnet cartridge. The satiné wood body provides the perfect mechanical match for the Satisfy Carbon tonearm. Vital statistics are 420x330x130mm and 10kg. For details, contact Audio Reference on +44(0)1252 702705 or click on [www.audioreference.co.uk](http://www.audioreference.co.uk).

## OBITUARY: GEORGE HADCOCK (1930-2007)

The passing of George Hadcock marks the end of an era. A very talented designer and manufacturer, he first shone in the aeronautical industry before moving on to develop and build tonearms. An unswerving advocate of unipivots, the first of which the Unipoise introduced in 1975, his greatest success was the GH228 from the late 1970s. Constantly seeking improvements, other models followed in more recent years, such as GH242 in 1998 (with the encouragement of Len Gregory) and the 'Cryo' in 2005. George was a delightful man who exuded old-fashioned charm, and was a genuine one-off in the audio world. As with many audio entrepreneurs, his enthusiasm was driven by a love of both engineering and great music – Elgar was a particular favourite – and he enjoyed playing the piano and was also a gifted artist. His legend lives on, as son Charles is taking over production of the tonearms. He will be sadly missed. **COLIN WALKER**

## QUIET LIFE

Sennheiser's PXC 450 NoiseGard 2.0 are the world's "first high end noise-cancelling headphones", according to the manufacturer. The £299 design uses new technology, plus experience gained from making their respected high end hi-fi products – including drivers and audio technology from the Sennheiser Hi-fi range. Sennheiser's patented Duofol diaphragms for clarity and an adaptive baffle damping for deep bass. They sport 'intelligent adaptive noise cancellation' said to remove 90% of ambient noise, with a TalkThrough button that allows users to hear conversations and benefit from noise reduction at the same time – ideal for ordering your drinks on the aeroplane, we are reliably informed! All controls are located in one easy-access cluster on the right capsule, including a touch-button electronic volume control with 'soft' fade-in and fade-out. Battery life is claimed to be over twenty hours from one AAA battery (which are globally available, so there's no need for travellers to carry a charger). The fold-flat design is ideal for travel use, and there's a case supplied. For more information, click on [www.sennheiser.co.uk](http://www.sennheiser.co.uk).



## MOVING PICTURES

...is what Denon claim for their new £649.99 DVD-2930 DVD universal player. With all metal three-box construction weighing 7kg and a bespoke DVD transport, Denon say it is a "superb music player for CD, SACD and DVD-Audio". A double layer lid, triple layer bottom and heavy transport structure is featured, and all audio and video boards are separated with multiple power supplies. There are five matched Burr-Brown 24/192 DACs, a 'Pure Stereo' path and audiophile capacitors for the analogue power supply. The video section is well specified too – while most players just upscale pictures to 1080, the DVD-2930 enhances standard DVD pictures with broadcast-quality Silicon Optix REON VX Picture Improvement Circuitry and only then is the picture upscaled to full-HD 1080p. This is the same technology Denon say is used by US HDTV networks like CBS, CNN etc when they run out of HD content, and when bought by studios the technology in this player costs over £25,000. Real HD can be better of course, but Denon point out that there is a format war and a choice of less than fifty movie titles across both new formats, as opposed to the 100,000 plus DVD titles on sale. For more information, click on [www.denon.co.uk](http://www.denon.co.uk) or call 01234 741 200.



## NEW REFERENCE

Twenty five years after its famed Reference turntable was launched, Goldmund is set to introduce a very limited series of 25 Reference IIs, with a degree of refinement and a number of new features never seen before. Designed by Georges Bernard and members of the Goldmund design team, it sports new ideas and new technologies, although much of the design is based on the solid principles founded in the original Reference. Delivered in five crates on five pallets(!), each turntable will be individually installed by a team from Goldmund to ensure optimum set-up and performance. With a weight of more than 350kg, the new Reference II pushes the Mechanical Grounding Construction developed by Goldmund to an unprecedented new level. The stand itself is an ultra-sophisticated assembly of steel and aluminium weighing more than 200kg and of a rigidity usually only encountered in big machine tools from which it is inspired. The turntable itself is suspended with a platter one metre above the floor to make the manipulation of the controls comfortable. The platter has been doubled in size and inertia since the first Goldmund Reference with a combination of brass, methacrylate and lead in a proportion exactly cancelling reflection of vibrations in the platter. The rotational mechanism remains similar to the first Reference; most of the early turntables remain in service today, proving its phenomenal durability. The Reference II uses a DC brushless motor generating no radiation from the motor to the cartridge. Its regulation is not only precise in speed but uses an extraordinary slow correction period to completely cancel the frequency modulation introduced by all regulation systems. As standard the Reference II is able to playback discs at speeds of 33, 45 and 78. Total adjustment of speed on 78 is available to allow for the wide variance of different discs. For more information, call Symmetry on +44(0)1727 865 488 or click on [www.symmetry-systems.com](http://www.symmetry-systems.com).

## ARCAM ADVANCES

One of the most interesting devices premiered at the Bristol Sound & Vision show back in February was Arcam's new Solo Movie 5.1. This £2,000 bit of kit is claimed by its maker to be "the world's finest one-box DVD Home-Cinema system", offering HDMI switching and DVD 720p/1080i upscaling, CD, SACD, DVD-Audio, DAB and FM Radio, iPod integration. Based on Arcam's respected high end AV, DVD and hi-fi components, the new Solo Movie 5.1 is designed to be a high performance, do-it-all solution. It boasts connectivity and playback abilities beyond current one-box home cinema systems, superb ergonomics and fine build. The feature count includes 2 into 1 HDMI switching at 1080p to route Sky HDTV, X-Box 360, etc., plus "audiophile-grade" hi-fi sound from CD, DVD-Audio, SACD, DAB and FM Radio. There is full iPod integration and control with Arcam's optional rLead and rDock, 5x50W RMS per channel, "heavyweight power, current delivery and drive", "the world's finest clock radio", a simple intuitive operating



system, large clear dot-matrix display and an elegant learning system handset. For more information, click on [www.arcam.co.uk](http://www.arcam.co.uk) or call 01223 203 200.



## BEAT THIS

The new £1,000 B-420 CD player could only be from Danish hi-fi specialists Densen. Its unique minimalist styling contrasts that of rivals, and it promises excellent performance. Densen says that whilst its price suggests it is the replacement for the B-400+, it "actually is more of a successor to the significantly more expensive Densen B-400XS". The signal comes from the heavily modified CD transport, with external clock control to avoid jitter by using the same clock at both sending and receiving end of the datastream. It then passes through to the DAC and then analogue output stage which uses Densen's "unique non-feedback Class A topology". The power supply is said to be comparable to many power amplifiers - with a 300 VA transformer, 40,000uF storage capacity, and eight individual regulators and four bridges. All digital stages, analogue stages and microprocessors and display have individual supplies to avoid interference. The microprocessor contains Densen's own control software that works both the CD drive and display, link and remote. The CD drive is modified with an external clock controller. The analogue stages are based on Densen's 6 watt Class A amplifier stage, with no negative feedback (neither global or local). For more information, click on [www.densen.com](http://www.densen.com).

## PLAY TIME

AlbumPlayer is a PC jukebox, focused on the serious music collector, listener and audiophile. Claimed to be a very intuitive, visually-driven piece of software, it offers a number of fine features



including support for lossless formats FLAC, APE, WavPack and WAV, plus ASIO. This new format bypasses the Windows Mixer entirely, and is used by the recording industry as a standard. By bypassing the Windows Mixer and running ASIO with lossless audio formats, you're getting performance theoretically up to that of CD (although you'll need an audio card with native ASIO drivers, such as those from M-Audio). AlbumPlayer's own database is able to store large amounts of album-related data and retrieve it fast. There's a special filter function to find an album easily, and a feature called "database shuffle" which automatically adds songs to particular playlists based on criteria chosen by the user (genre, score, song length etc.). There's even a configurable "Party mode" to protect your database from editing during parties! The AlbumPlayer is a shareware product - users pay a one time registration fee of 29.50 Euros, after that every future upgrade is free. Download a free demo version from [www.albumplayer.com](http://www.albumplayer.com).



**Adam Smith auditions Bang & Olufsen's stunning looking Beolab 9 loudspeakers...**

# Lab Report

**B**ang & Olufsen in the pages of a serious hi-fi magazine - what's the world coming to? Well hold on a minute please, all you doubters, because as editor DP rightly said in his *Olde Worlde* article on the lovely Beomaster 2400-2 back in July 2002's *Hi-Fi World*, whilst it is indeed "hard to make a case for every B&O product ever made", they have certainly turned out a few truly innovative and

excellent products over the years.

Lest we forget, the Beogram 4000 turntable put the concept of linear tracking properly onto the map when it was released to the unsuspecting public in 1974 and, moving forward a decade, Bang & Olufsen developed the domestic version of Dolby's HX recording system that offered better dynamic range from cassettes. To this list, I personally would have no problem in adding one or two of their

loudspeakers, certainly those made in the last twenty years.

Up until this time, B&O took the conventional route of using passive loudspeakers with an amplifier (or more usually, receiver) and whilst some of their larger designs, such as the M-100s, MS-150s and MC-120s were fine units, they still lacked that certain something to lift them above the rather ordinary. Fortunately, this all changed in 1987 with the release of the Pentas, a superb sounding



column loudspeaker available with (Beolab) or without (Beovox) built-in amplifiers.

This marked a change for Bang & Olufsen, and one from which they have never looked back, as they embraced active loudspeaker technology with great enthusiasm. Although the Beolab Pentas were not truly active, but were strictly an amplified passive loudspeaker that still used a conventional crossover, B&O developed the technology further and all of their subsequent designs have made use of the fully active method of operation.

Whilst many people are aware of the advantages of active operation, namely that each driver has a truly dedicated amplifier which can be optimised for the frequency range it requires, it also allows for a little bit of performance tweaking, and it is in this respect that B&O have really made use of the opportunities available to them. Naturally, pleasing aesthetics are high on the list of Bang & Olufsen's priorities and this invariably involves compact and slim enclosures, which in turn means small drive units. However, the active mode of operation has allowed B&O to extract good bass from such units whilst permitting the protection they require when the volume goes high.

The system they use is called Adaptive Bass Linearisation (ABL); simply put this involves gradually cutting the lowest frequencies to the drive units as output level increases, in order to prevent them from overheating or literally ripping themselves apart. If the unsympathetic user continues the onslaught too much, then the loudspeaker will shut down until the signal is reduced. As the owner of a pair of Beolab 8000 loudspeakers, featuring two 4in (100mm) bass drivers, I can confirm that they do generate impressive bass for their cabinet volume, will play loud enough when required and no, I have never forced them to shut down!

The ultimate culmination of the active technology had to be 2003's Beolab 5 - a £10,000 four way technical *tour-de-force* featuring 2,500W of amplification per loudspeaker, automatic room calibration and the first appearance of the 'Acoustic Lens' technology, exclusively licensed to Bang & Olufsen from Sausalito Audio Works in the USA. This takes the output from an upward-firing midrange or treble driver and spreads it over a 180 degree arc, rather than just straight out towards the listener. The Beolab 9s are the fourth application of these acoustic lenses and come

lower down the range, effectively replacing the Beolab 1s.

So, what does your £5,000 buy you? In the case of the Beolab 9, a rather unusually styled three way design. Opinions on their styling have varied from "kettles" to "penguins" on the internet, but I think they are very neat and different and, at 775x400x300mm (HxVxD) are smaller in the flesh than they appear in pictures. Most of the main body is covered in grille cloth and this is available in black, dark grey, blue and red.

Driver lineup consists of a 10in (250mm) bass driver in an 18 litre enclosure driven by its own 500W ICEpower amplifier [a Class D

"an absolute must-audition for those who prize imaging and realism above all else..."

module also seen in the superb Rotel RB-1092 power amplifier reviewed in April - Ed.] a 5in (130mm) midrange unit in a separate four litre enclosure and powered by a 100W hybrid analogue amp; and a 0.75in (19mm) tweeter located in the acoustic lens at the top of the 'speaker fed by a second 100W analogue amplifier module. Whilst lacking the automatic room EQ facility of the Beolab 5s, the 9s do have a three-position switch that allows fine bass adjustment for freestanding, close-to-wall or corner placement

Connections to the Beolab 9s are through Bang & Olufsen's proprietary 'Powerlink' sockets and this is where things can become a little awkward. These are 8 pin DIN sockets and, in the context of a complete B&O system, each cable carries left and right signal, source and level information for those loudspeakers that have displays on them, a switching signal to activate the loudspeakers when the system is switched on, and a signal to mute the system's output if the 'speaker is overdriven. In your B&O system, you simply plug in your Powerlink leads, set the mode switch to tell each loudspeaker to play the left or right channel signal and off you go. To mate to non-B&O equipment, the mode switch needs to be set to 'Line' whereupon the speakers stay in standby mode until a signal is applied, when they will switch on. Subsequently, after no signal for ten minutes or so, the 'speakers switch back to standby.

This is all very well, but B&O used to apply the line input through

a separate phono socket, however more recently, these have vanished and the line input goes straight into the Powerlink socket through a special phono plug to DIN lead. These are available from B&O, but mean that cable upgrade opportunities are virtually nil for those who like to do such things. Even making up your own leads is not easy, due to the complex screening arrangements required by the Beolab 9s - it is all too easy to end up with loud buzzes, no music or even both, as I found out only too well when being impatient for the correct leads to arrive from B&O!

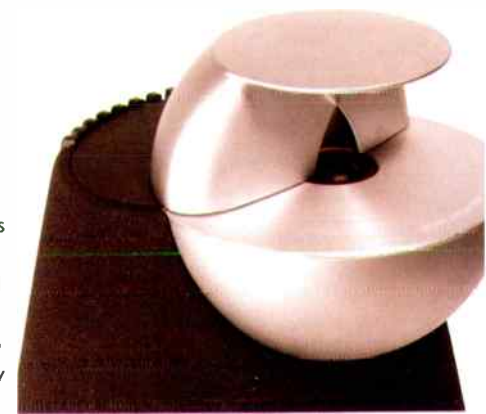
However, arrive they duly did, and so after a suitable run-in period,

the Beolab 9s were inserted into our reference system and driven by both a Quad QC24 preamplifier, plus the preamp section of the Luxman L-550A reviewed this month. Sources included Eastern Electric Minimax phono stage and CD player, plus our Pioneer PLC-590 turntable, complete with SME M2-10 arm and Ortofon Rondo Bronze cartridge.

### SOUND QUALITY

The predecessors to the Beolab 9s, the Beolab 1s, were often a little controversial from a B&O enthusiasts' perspective. Although very good loudspeakers in their own right, they broke away from the traditional 'B&O sound' and had a quite forward balance that was not to all tastes. Well, the Beolab 9s have righted this 'wrong' and sound absolutely stunning as a result.

For those who are not familiar with it, that 'B&O sound' can be summarised as smooth and detailed, but with real top end clarity and insight. This sums the Beolab 9s up to a tee as they have a wonderfully



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composed nature, yet pick out everything lurking in a recording. I cannot think of too many other loudspeakers, at any price, that serve up the midrange and treble of these units.

Starting at the top, the treble is completely free of the sometimes slightly ragged nature that can arise from devices that spread output over a wide area. Deflectors and omnidirectional designs invariably generate a commensurate sense of space and atmosphere, but sometimes fall down with detailing. The Beolab 9s are truly accomplished in this area, which speaks volumes regarding the design and implementation of the

acoustic lenses that they use.

A prodigious soundstage emanates from the Beolab 9s and no matter what material you put through them, they disappear more effectively than most other loudspeakers I can think of, leaving you alone with the music. Even more uncanny is the way you can move away from what would normally be considered as the stereo hot spot, and the image stays rock-solid. You have to

be quite a long way off-axis before the band or orchestra vanishes and the two loudspeakers reappear, meaning that these 'speakers are an absolute must-audition for those who prize imaging and realism above all else.

Of course, imaging is all very well but if instruments are not faithfully conveyed, then all that hard design work ends up ruined. This most certainly is not the case with the Beolab 9s, as instrument representation was impeccable. During auditioning I found myself searching out tracks that incorporate lots of percussive elements, as the Beolab 9s have astonishing powers of revelation with such items. Drum kits had depth and power to them, with each stick strike having real feeling. Cymbals were the best of all, however, with a beautifully metallic ring and an almost shimmering sense of decay to

them as they faded away. Some other loudspeakers make them sound like rusty dustbin lids by comparison.

At the bottom end, the combination of ten inch driver and 500W amplifier makes itself known in a surprisingly subtle way, as the Beolab 9s have an aura of effortlessness about them. Should you so wish, they are more than happy to headbang or turn your lounge into a nightclub, yet the bass drum rolls across the soundstage of Steve Earle's 'Copperhead Road' had realism and an underlying authority that is usually only achieved by cranking up the volume. The Beolab 9's bass has no colouration or boom and is a testament to the cabinet design and construction. This also has the advantage of adding to the feeling of realism that they generate - once again you are left with the instruments and no unpleasant side effects.

**CONCLUSION**

Let's start with the obvious point straightaway - yes, you can buy a very impressive amplifier and loudspeaker combination for the Beolab 9's purchase price of £5,000, however I suspect you would struggle to find seven hundred genuine watts for this amount and, to be frank, I think this is missing the point. With loudspeakers like these, you are paying your money to buy not only top quality drive units and amplification, but the knowledge that they have all been mated together properly and set up for optimum performance.



Bang & Olufsen have designed a loudspeaker that makes superb use of their technologies, from the highly efficient and powerful ICEpower amplifiers at the bass end, to the Acoustic Lens technology that lifts treble performance comfortably above the rest of the crowd. The Beolab 9s are superbly engineered and built loudspeakers with each area of the frequency range expertly integrated to, and thus complementing perfectly, the other areas. Not only are they a technical accomplishment but, more importantly, are a musical delight

Yes, we're a serious hi-fi magazine, but these are serious loudspeakers that add another nail to the coffin of the idea of Bang & Olufsen equipment being 'all style and no substance'.

"...the Beolab 9s have an aura of effortlessness about them."

**MEASURED PERFORMANCE**

Output from the Beolab 9s remains generally flat across the frequency range, with a rise in output above 10kHz. This will mean that the Beolab 9s should have an even, but clean and crisp sound with good high frequency detail.

The Acoustic Lens on the tweeter spreads the output from the dome very effectively and measurement shows very consistent results off-axis - this will work wonders for the imaging and mean that the Beolab 9s should not have a narrow and distinct 'hot spot'

Bass output from the sealed ten inch driver is good, with rolloff commencing at around 40Hz. The three position location switch introduces cuts of up to 2 and 4dB in the 60-100Hz region, but does not appreciably

increase the bass rolloff point. As a result, this will be useful for fine-tuning the loudspeakers' output depending on their positioning, without just 'killing off' low bass output. AS

**FREQUENCY RESPONSE**



Green - 'Free' position  
Red - 'Wall' position  
Blue - 'Corner' position

**VERDICT**

Superb loudspeakers with first-rate sound and genuine technical innovation, wrapped in B&O's trademark stylish package.

**BANG & OLUFSEN**

**BEOLAB 9 £5,000**

Bang & Olufsen (UK)

+44 (0)118 969 2288

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**FOR**

- stunning treble clarity
- stable soundstaging
- overall integration

**AGAINST**

- connection to non-B&O equipment could be easier...



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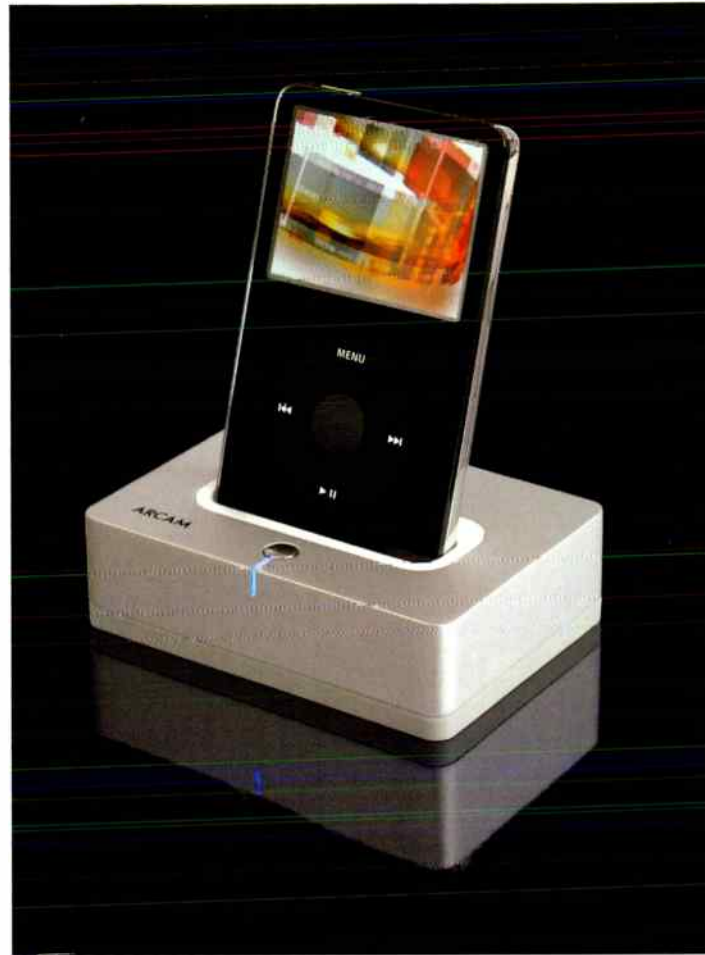


**ARCAM RDOCK £129.95**

We know that a sizeable part of this magazine's readership will regard 'iPod' as hi-fi's most scurrilous four letter word, but there's no denying it's a brilliant crossover product, getting rookie audiophiles into the real thing. This is precisely what Arcam's rDock is all about – the missing link between the dreaded Apple digital music portable and your prized hi-fi. There are a number of iPod docks around already, but Arcam reckons the rDock is "the first audiophile dock worthy of the name" no less! The company says it uses serious hi-fi components and construction techniques, plus Arcam Intelligent Charging with programmable "charge-on, charge-off" settings. To wit, whereas other docks leave the iPod charging all the time, the rDock features a programmable 'charge-off' setting that allows battery cycling. The rDock also uses iPod's line-out connector, bypassing its poor quality headphone amp, and there's a built-in preamp with high performance op-amps and low noise

double regulated power supplies. RCA phono sockets are fitted to the diecast alloy base.

Hooked up to a £10,000 valve system via £300 Clearer Audio Silverline interconnects, a 2G Apple iPod Nano gave superb results on 320kbps CBR AAC – providing the charging system was switched off. A surprisingly dimensional sound greeted us, with real finesse and a lovely rhythmic flow. Compared to Denon and Onkyo docks, already a massive improvement on Apple's standard item, the rDock was a revelation. Bass was decently strong, midband smooth and detailed and treble silky. No, it doesn't take iPods up to high end separates hi-fi standards, but pulls them well and truly out of their portables-only rut – and is the first dock so to do. Surely the best way to integrate your mobile music with your home hi-fi, Arcam's rDock is expensive – but worth every penny, we think. For more information, click on [www.arcam.co.uk](http://www.arcam.co.uk) or call 01223 203 200.

**ECLIPSE TD307PAII £400**

Unsurprising isn't it, that the Japanese would perceive the need for a very compact active loudspeaker system that also happened to be sonically capable enough for those used to high end hi-fi? This brand new, revised Eclipse TD307 is aimed at just such people, and while in this country it may be students in bedsits, or those with spare rooms, studies or bedrooms that need them – as opposed to Tokyo apartments the size of six tatami mats – they're of

no less use. The important thing to remember though is that Eclipse isn't exactly Matsushita – it's a small enthusiast-driven (and run) operation that comes up with wilfully eccentric yet effective products that aren't everyone's cup of nihoncha (green tea). Whatever - the system is certainly visually striking, comprising as it does two smallish (130x195x176mm) egg-shaped speakers with a separate 12W (159x154x137mm) amplifier that can be fed directly from any line level

stereo source.

The new 307s are less of an acquired taste than the last ones, but still something of a passion for some and a chore for others. Opinions are mixed about Eclipse speakers at HFW Towers, but the editor loves them – pointing out that they need a serious source, and the grilles must be removed and the speakers Blu-tac'd to the desk. This done, if you substitute the cheapo speaker cable supplied, you're finally getting their best, which is very good indeed. They are nothing if not musical, brilliantly able to capture the spirit of a performance and oozing with detail across the midband, but don't expect miracles in the bass (there's a subwoofer, but at £650 don't ask how much it is!) Frequency extremes are obviously curtailed, but those who can listen beyond this will love the fact that what they do well, they do very well – which is to throw music into the room with brio. Factor in fine build and sublime styling, and they're a superb niche product. For more information, click on [www.smallroom.co.uk/eclipse/](http://www.smallroom.co.uk/eclipse/) or call 020 7328 4499.

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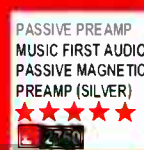
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# Speakers' Corner

**Modern standmounting loudspeakers can give superb results but, for many, floorstanders are still the preferred option. Adam Smith auditions four models in the £350-£500 bracket from Acoustic Energy, ALR Jordan, Mordaunt Short and Tangent, to check out the benefits that a bigger cabinet brings...**



personally always much preferred a nice, big, unstressed engine in my cars, to a small, revvy type that has been tuned to within an inch of its life. Consequently, larger floorstanding loudspeakers have always appealed to me as there is less of a case of having to wring the last ounce of performance from them, especially down the bass end.

Back in the good old days when you could leave your front door unlocked and it was 'all fields 'round here', a floorstanding loudspeaker invariably meant a large box, usually with an eight inch or larger drive unit, and these were big and bulky (and often boomy). Fortunately, in the same way that advances in drive unit design have helped out standmounters, they have also given their larger relatives a helping hand. As a result, the fashion changed some years ago for floorstanding loudspeakers to have an array of smaller drive units in a columnar enclosure. This reduces the frontal aspect of the loudspeaker, making it more domestically acceptable.

The other problem with larger loudspeakers, and something that also afflicted many older designs, was the lack of rigidity in the cabinet that arises from making it larger. Big floppy cabinets do not make for good bass (well, not of the accurate and tuneful kind anyway...). Fortunately, a handy side effect of making the

cabinet narrower is that you instantly reduce one of its dimensions, giving rigidity a helping hand, and making the addition of extra internal bracing a less complicated affair.

As a result, modern floorstanding loudspeakers bear little resemblance to their ancestors and sound quite different as a result. A good modern design should give the nicely extended bass that a standmounter cannot achieve, but without any cabinet distortion; and a capacious soundstage without the necessity for a structure that dominates the room. As a bonus, there is no need for a shopping trip for any stands and even better, little temptation to plonk the 'speakers onto a handy wobbly bookshelf, doubling up as bookends, unless you happen to have particularly large bookshelves of course.

The four examples we have chosen to evaluate here all fit within the £350-£500 price bracket and come from well-respected manufacturers with a wealth of design experience between them, although the names of ALR Jordan and Tangent may not be quite as well known as those of Acoustic Energy and Mordaunt Short, in the UK at least.

All four pairs were evaluated in our standard system, driven by both Naim Nait 5i and Luxman L-550A amplifiers. Sources included our old friends, the Eastern Electric Minimax CD Player and phono stage, and a Pioneer PLC-590 turntable with SME M2-10 arm and Ortofon Rondo Bronze cartridge.

**A**s we showed in our loudspeaker group test back in the February issue of Hi-Fi World, modern standmounting loudspeakers give superb results for a relatively small outlay. Advances in drive unit and cabinet design have wrung hitherto unheard-of levels of performance from small cabinets and these sort of 'bookshelf' designs work very well.

The problem is that these types of loudspeaker need a certain amount of care and attention in order to deliver their best. Proper stands are absolutely vital as they really do not work on a bookshelf, despite the common moniker! The other problem is that, as a petrolhead like editor DR, I have

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The second generation of Mordaunt Short's successful Avant range of loudspeakers hit the shops last year, with the 'i' suffix bringing about a number of improvements. These included new surrounds for the bass/midrange drivers and updates to the tweeter dome design to lower distortion and improve smoothness. The cabinets for each loudspeaker in the range also gained additional bracing to make sure the wobbly cabinet syndrome is avoided and sand filling a lower chamber for stability is possible too.

The Avant 906is are second from the top of the range and the middle floorstander. A two and a half way design, the 906is use a 1in (25mm) aluminium dome tweeter and two 5.25in (130mm) bass/midrange drivers that incorporate Mordaunt Short's proprietary aluminium 'Continuous Profile Cones' (CPC) and 'V-form technology' for the surround attachment. The surrounds themselves vary in thickness across their width for improved driver operation and this is an idea that has been carried over from the flagship Performance range.

Measuring 850x165x295mm (HxWxD) the 906is are slim but deep and weigh in at 12kg without any mass loading added. They also offer bi-wiring capabilities through two pairs of rear sockets, featuring new terminals, which have also 'trickled-down' from the Performance 6.

## SOUND QUALITY

Having always been something of a fan of the old Avant series, I was pleased to hear that Mordaunt Short have successfully overcome their main failing, namely a tendency to become a little unruly treble-wise at times. The 906is are fantastically detailed and composed at the top end, with superb levels of treble articulation, but they never descend into fizziness when the going gets tough. Leading edges of steel guitar strings had commendable definition and cymbals had a beautifully metallic 'ting' to them.

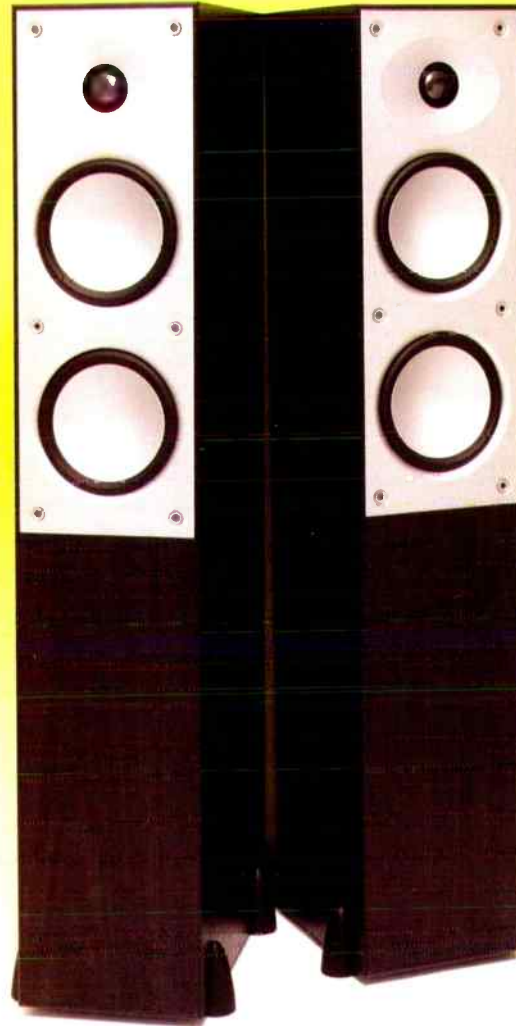
Soundstaging from the Mordaunt Shorts was superb and they have the ability to generate a wonderfully stable image of bands, vocalists or orchestras that stretches well behind and, intriguingly, above them - they sound much taller than they are! Midrange was equally proficient, making singers come across with real emotion and clarity.

The dip in the midrange response did have a tendency to push lead vocalists a little further back into the soundstage than the other loudspeakers in the test but, fortunately, this had the result of making them blend with the backing track quite well, rather than making them lost in the mix.

At the bottom of the frequency range, bass from the 906is is excellent, and shows that the work carried out on the cabinet and drivers has paid off. Bass lines were confident, weighty and detailed and the Avants were equally happy with the intricate melodies of a double bass as they were with the pounding out a sturdy synth bass beat.

Overall, the Mordaunt Short Avant 906is have an assured, dynamic and exciting sound with superb levels of insight into all music

## Mordaunt Short Avant 906i



## MEASURED PERFORMANCE

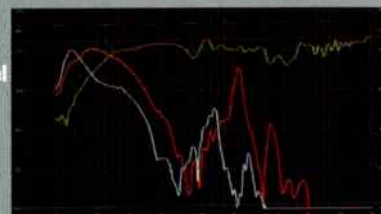
The gently rising treble response generated by the Avant 906is will ensure that their sound is lively and dynamic. Across the rest of the spectrum, the response is smooth and even, so the bass and midrange should integrate well. The dip in midrange level may rob some atmosphere but should minimise harshness.

Another two and a half way design, the Mordaunt Shorts have two rear mounted ports - one for the bass/midrange driver and one for the dedicated bass unit. The first of these is tuned to 40Hz and the second to 30Hz, so the Avant 906is should have good bass punch. Both ports are rear-mounted and thus allow for fine tuning through positioning.

The impedance curve is well damped at lower frequencies but with a larger reactive peak in the tweeter crossover region. Average impedance was measured as 5.8 Ohms, dropping to a minimum of around 4 Ohms, so the Avants are a 4 Ohm load. Measured sensitivity was 86dB, again falling

rather short of the quoted 90dB AS

### FREQUENCY RESPONSE



Green - driver output  
Red - port No.1 output  
Blue - port No.2 output

### IMPEDANCE



## VERDICT

Dynamic and confident loudspeakers that perform superbly well with all types of music.

**MORDAUNT SHORT AVANT 906I** £350

Audio Partnership  
+44(0) 207 940 2200  
[www.mordauntshort.com](http://www.mordauntshort.com)

## FOR

- Treble detail
- Overall integration
- Large and dynamic soundstage

## AGAINST

- Lead vocals can be a little shy

The Neo range is new from Acoustic Energy, and replaces the successful Evo range. Comprising all-new designs throughout the range, the name comes from the fact that AE have made use of powerful Neodymium magnets for all of the drive units in each speaker, as opposed to just the tweeters, which is more common.

Neodymium has a higher magnetic flux than the ferrite usually used. It also offers better linearity over its operating area, and AE have used this property to design double magnet structures with long voice coils on the 5in (130mm) bass/midrange drivers and claim reduced distortion as a result. The cones of these items are pressed alloy allied to foam surrounds, which are becoming an increasingly rare sight these days. The AEs have a sand chamber too.

The Neo Threes' 1 in (25mm) tweeter is also new and uses a dual ring-radiator design that offers "exceptional off axis frequency response, wide bandwidth and low distortion". Measuring 905x203x242mm (HxWxD) and weighing 14kg, the Neo Threes are available in Black Ash, Light Oak and Walnut veneers.

**SOUND QUALITY**

The Acoustic Energy Neo Threes are an altogether softer proposition than the Mordaunt Shorts. Their treble output is flat up to 20kHz in measurement terms [See MEASURED PERFORMANCE] and this comes across in their sound, which is even and well controlled. High frequency detailing was good, but there was a sense that things were lurking further back in the mix than they should be. Norah Jones' vocals had a huskiness to them and cymbals lacked their characteristic metallic ring. In one jazz track I used that features a gently brushed hi hat, the Neo Threes made this something of a blur, rather than distinguishing each individual stroke.

Midrange from the AEs was commendably smooth, offering good body to instruments and vocalists, and serving up a capacious and stable soundstage. Integrating well with the bass, the Neo Threes extracted good levels of detail and finesse from the lower midrange and upper bass, and had a pleasingly weighty low end. Once again, the sturdy cabinet construction paid off to ensure no woodiness or boxy colouration, but the Neo Threes did have a slight tendency to ponderousness with fast bass lines. They never wallowed or actually fell over themselves, but sometimes gave a sense of struggling to keep up with the pace.

Overall, the Neo Threes are composed and enjoyable to listen to, with a smooth and 'safe' presentation. Their only real downfall is that they lack that last ounce of pizzazz that lifts them above their contemporaries.

**Acoustic Energy Neo Three**



**MEASURED PERFORMANCE**

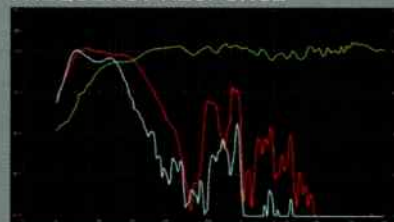
The Acoustic Energy Neo Threes have an even response across their output bandwidth. A small rise in treble output in the 9-15kHz region should add good atmosphere without veering into harshness and nothing leaps out as being of concern.

Two ports are fitted to the rear of the Neo Threes, one to load the bass/midrange driver and one for the dedicated bass driver. The former is tuned to around 40Hz and the latter to 30Hz, offering useful extra extension to the main drivers, which roll off at around 60Hz. As a result of these aspects, the Neo Threes should have good bass extension and an even, clean sound.

The impedance curve shows a well damped design, with an average measured impedance of 5.6 Ohms, dipping to a minimum of around 4 Ohms, thus presenting a conventional 4 Ohm load to an amplifier. Their measured sensitivity of 86.5dB falls short of AE's quoted 90dB but is nevertheless

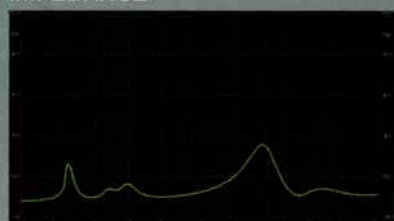
acceptable and a 50W amplifier will be fine for the Neo Threes AS

**FREQUENCY RESPONSE**



Green - driver output  
Red - port No.1 output  
Blue - port No.2 output

**IMPEDANCE**



**VERDICT** ●●●●  
Smooth and likeable loudspeakers that remain inoffensive and unflustered no matter what they play.

**ACOUSTIC ENERGY NEO THREE** £370  
Acoustic Energy  
+44(0)1285 654432  
www.acoustic-energy.co.uk

- FOR**
- Detailed and composed midrange
  - Pleasantly smooth nature
  - Good bass weight

- AGAINST**
- Slightly veiled treble
  - Bass a little ponderous with fast material



**S**till relatively unknown in the UK, partly thanks to their lack of fixed distribution (other than the odd Richer Sounds or Currys store), Tangent nonetheless have an impressively wide range of loudspeakers. Part of the Danish Eltax corporation, Tangent have been manufacturing loudspeakers since 1996 and the Clarity range are the latest addition to their portfolio. Consisting of a pair of standmounters, the floorstanders under review here, a centre channel and a subwoofer, the most striking thing about the Clarity range is their selection of finishes, namely gloss black or gloss red, the latter being ideal for those Ferrari fans out there.

The Clarity 8 floorstanders are a two way design, using two 6in (165mm) bass/midrange drivers and a 1in (25mm) soft dome tweeter. At the bottom of the rear panel are located four input terminals to allow for bi-wiring and a large bass port. They are the only loudspeakers in the test that do not allow for the addition of sand or similar ballast for cabinet loading, but the cabinet itself is well built and sturdy.

Measuring 900x198x280mm (HxWxD), the Clarity 8s are much the same size as the other test contenders and will similarly not dominate any room in which they are placed. Unless, of course, you go for the red finish and deliberately intend them to do so!

## SOUND QUALITY

The Tangents have a visually similar measured response to the Mordaunt Shorts and, in some ways, exhibit a similar character to them. They have a correspondingly bright and dynamic nature but unfortunately it appears that their soft dome tweeter is not as well controlled as the aluminium dome of the 906is. Consequently, it does not take much provocation for the treble to become rather hard and spitty with brighter material and violins also had a tendency to sound rather screechy. Other than this, they have good high frequency insight and offer commendable realism to cymbals and hi hats.

Once again, a good soundstage emanates from the Clarity 8s and they can cheerfully fill a room with sound on modest power, thanks to their high 89dB sensitivity. Vocal definition was very good and instruments were presented with a pleasing level of insight - leading edges on guitar strings, for example, were tight and well controlled.

The broad output from the port does indeed add real grunt to the Tangents' performance, and they have a weighty and solid low end. The bass goes deep and has superb pace and timing, but it could also be a little too much at times, as a rather resonant thud would occasionally come out of nowhere. I feel the large port is to blame for this.

Ultimately, the Tangents are lively and dynamic loudspeakers that will rock with the best, but they have an innate hardness that can become a little too relentless at times. Partnering them with a valve amplifier will help to tame this but, as a result, careful auditioning and system matching is even more important than usual.

## Tangent Clarity 8



## MEASURED PERFORMANCE

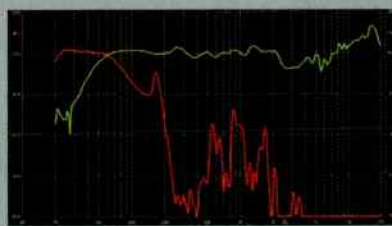
The Tangent Clarity 8s are very smooth and even up to around 2kHz, when the response dips by 3-4dB before rising again steadily to 20kHz. This should give a lively balance but may rob the midrange of some detail. Only listening will reveal whether the treble offers detail without hardness.

Bass output from the twin drivers is good and even down to 60Hz or so and then hands over to the port which has a broad output from 50Hz down to its peak at around 25Hz. As a result, the Clarity 8s should have good bass weight and any colourations from the port should be minimised through its rear-mounted location.

The impedance curve is quite even across the frequency range and average measured impedance is 6.2 Ohms, dropping to a minimum of 4.5 Ohms, so the Clarity 8s are not especially difficult to drive. Combined with their high measured sensitivity of 89dB, a 30-40W amplifier should power them well.

AS

### FREQUENCY RESPONSE



### IMPEDANCE



## VERDICT

Forward and dynamic loudspeakers, the Tangents offer good definition and bass weight, but their high frequencies can be too relentless at times

**TANGENT CLARITY 8** £400

Tangent Audio

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[www.tangent-audio.com](http://www.tangent-audio.com)

## FOR

- Dynamics and excitement
- Deep and rhythmic bass
- Gloss black finish!

## AGAINST

- Treble can be too hard
- Low bass unruly



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**A**LR Jordan hail from Essen in Germany, and have been manufacturing loudspeakers since 1989. The Entry Series, as might be expected from their name, marks the first step on the ALR Jordan ladder, below the Classic and Note ranges. Another design from the pen of loudspeaker design supremo, Karl-Heinz Fink, the Entry Ls are the second from the top of the Entry range, below the larger XLs and above the standmounting S and M models. Obviously there are no prizes for guessing how the S, M, L, XL, range nomenclature came about, but whether this raises any concerns about an impending crisis involving 'Size Zero' loudspeakers, I am not sure....

Effectively a floorstanding development of the Entry M bookshelf, the Entry L makes use of the same 6in (160mm) Jordan aluminium-coned bass/mid driver and 1in (25mm) soft dome tweeter as its smaller sibling. The Entry Ls are a relatively simple two way design, with drive units integrated using a fourth order crossover and bass loading is facilitated via a front-mounted port. As with all the other units on test apart from the Tangents, the Entry Ls have the facility to be mass loaded via judicious application of sand or other dry material into a lower chamber.

Tipping the scales at a sturdy 14.9kg., the Entry Ls measure 860x203x290mm (HxVxD) and are available in Black, Beech and Silver with the option of black or blue grilles.

## SOUND QUALITY

The ALR Jordans are another smooth performer, lacking the ultimate high frequency extension and details of the Mordaunt Shorts or Tangents, but with better insight than the Acoustic Energys. Their treble performance was very smooth and, as I found with the Classic 1s back in our February group test, they have a certain sense of sophistication that seems to appropriately befit their status as the most expensive members of the group. The Entry Ls are polished and sweet performers in the treble department, and are not upset by harsher material, or violins for that matter!

Combined with a smooth midrange, the overall effect was to invoke a pleasing level of evenness and composure across the mid and upper frequencies, giving superb composure and insight into instruments and vocals. The Entry Ls placed singers right up close to the microphone, and captured every breathy detail.

Down at the lower end, whilst still pleasingly weighty, the ALR Jordans do not offer the ultimate in bass extension, as might be suspected by their driver count disadvantage compared to the other contenders. However, what they lack in extension they make up for in articulation and detail. Bass lines were self-assured, delivered with Impeccable timing and low end details were picked out with aplomb.

In summary, then, the ALR Jordan Entry Ls are a classy and refined pair of loudspeakers. Although their polite nature may not totally satisfy those looking for the ultimate in emotion, they perform superbly in terms of detail, scale and evenness across the frequency range.

## ALR Jordan Entry L



### MEASURED PERFORMANCE

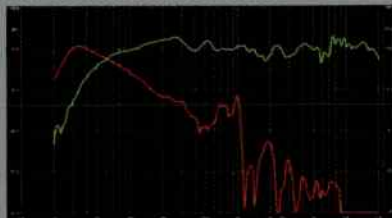
The ALR Jordan Entry Ls have a smooth midrange and treble response that has something of a rise in the 8-10kHz region, augmenting upper mid and lower treble detail. Other than this, their response is smooth across the measured bandwidth, so the Entry Ls should have an even and detailed sound.

Bass drops off at around 70Hz and the driver hands over to the front-mounted port at 35Hz. Extension should therefore be good and the rise in output at around 200-300Hz will add perceived weight to the upper bass registers.

The impedance plot shows that the Entry Ls are not as electrically well damped as others in the test, but their response is still even with no areas of concern. Average impedance came out at 6.3 Ohms, dropping to a minimum of around 5 Ohms, so they are a relatively easy load. Sensitivity is good at 87dB

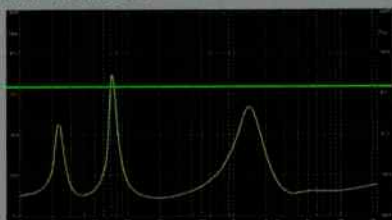
and a 40-50W amplifier should elicit good results. AS

#### FREQUENCY RESPONSE



Green - driver output  
Red - port output

#### IMPEDANCE



#### VERDICT

Well integrated and unflappable loudspeakers, the Entry Ls offer sophistication and poise to all music.

**ALR JORDAN ENTRY L £500**

Uberphon

+44 (0)1730 261924

[www.alr-jordan.com](http://www.alr-jordan.com)

#### FOR

- Excellent midrange and vocal detail
- Tight and pacy bass
- Smooth yet detailed treble
- Sophisticated nature

#### AGAINST

- Ultimately a little polite



*exposure*



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- Larger power supply
- 110 watts RMS (as compared to 100W for the previous model)
- Capable of driving sophisticated speaker systems, in bi-amping mode or monoblock mode
- Clean and extended low frequency response

As soon as listening commenced on this test, the advantages of floorstanding loudspeakers over their smaller siblings became instantly apparent. You simply do not obtain the scale of sound and all-encompassing soundstage from a smaller enclosure that a larger type can generate, certainly at this price level. All four of our contenders proved that the design of floorstanding loudspeakers has come a long way and that, despite their compact dimensions compared to the models of yesteryear, they are more capable than ever of delivering the sonic goods.

The four designs under test gave interesting results in that they fell into two distinct sonic camps that had very similar innate natures but with slightly different results. On one hand, there are the Acoustic Energys and the ALR Jordans, both of which are rather more composed and smooth, and on the other there are the Tangents and Mordaunt Shorts whose presentation is more forward and dynamic.

As with so many hi-fi components, each loudspeaker sings a slightly different song and each model has its own strengths which will appeal to certain people. However they all share the same properties of being well made, nicely (if simply) styled and able to fit into a modern home environment without undue upheaval. There can, of course, be only one winner so let me dally no further and, in true Miss World reverse-order style, proceed with the verdict.

In fourth place, we have the Tangent Clarity 8s. A stylish design in an immaculately presented gloss-finish cabinet, the Clarity 8s have a good deal going for them, including excellent bass weight and a lively presentation that bounds along like an enthusiastic puppy, injecting verve and vigour when required. The problem is that, like the aforementioned puppy, that enthusiasm can become a little wearing after a while. It does not take a lot of provocation to make the Tangents become unruly and I feel that their tweeter needs more refinement in order to really exploit the potential that they undoubtedly have, waiting to be tapped.

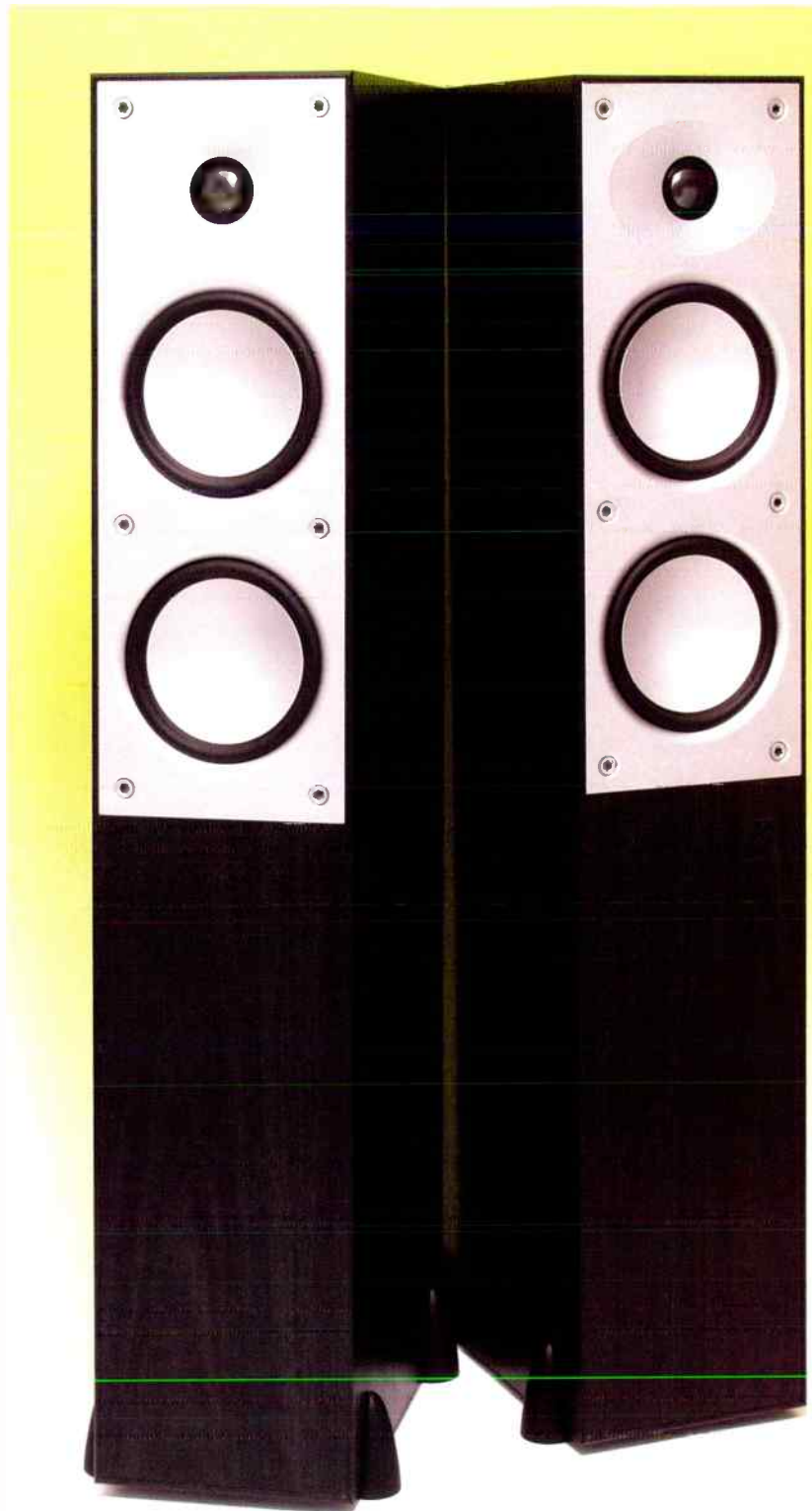
In third place, we have the Acoustic Energy Neo Threes. As with so many Acoustic Energy designs, these are thoroughly competent and enjoyable loudspeakers that do not offend in any way. They have a well integrated sound with a pleasing overall nature and I can see many prospective purchasers choosing them for their uniform treatment of source material. Indeed, I would be more than happy to live with them myself, but know it would not be too long before I found myself wondering if I could have bought just that bit more treble detail, a touch more excitement, and a more lithe bass for my money. The other contenders in this test prove that, yes, I could have done, although the AEs remain worthy of serious consideration.

So, this leaves us with an interesting situation in that the top spot is left to be fought over by the most and least expensive contenders! Considering the ALR Jordans first, these resemble the overall character of the Acoustic Energys, but add in the little bits that are missing. Whilst they do not quite have the bass extension of the Neo Threes, nor indeed the other contenders, their low frequencies are tight, tuneful and able to dig excellent levels of detail from the bass end. The midrange is composed and well defined and the treble has the extra degree of detail and sweetness that is missing from the AEs. As mentioned in the review, I cannot get away from the feeling that these really do have a sense of class that sets them apart from the others - if you were to listen to all four contenders blindfold and be asked which was the most expensive, I think the Entry Ls would be picked every time. Their polite sense of sophistication is quite

noticeable.

Which leaves the Mordaunt Shorts, spiritual brothers in many ways to the Tangents. Whilst they have a similar dynamic nature to the Clarity 8s, the Avant 906is add stunning levels of composure to the treble, in addition to the dynamics and detail, and always remain clear and clean. Coupled to a tight, fast bass that hits hard when required, and treads softly when not; a luminous midrange and a large, dynamic soundstage, you have a recipe for an excellent loudspeaker.

Whilst it is true that the Mordaunt Short Avant 906is do tend to lack the sense of intimacy with vocals generated by the ALR Jordans, their intrinsic dynamic nature won me over and makes them the pick of the bunch for my ears. It is also difficult to ignore the fact that they are the least expensive units on test, making them a veritable bargain.





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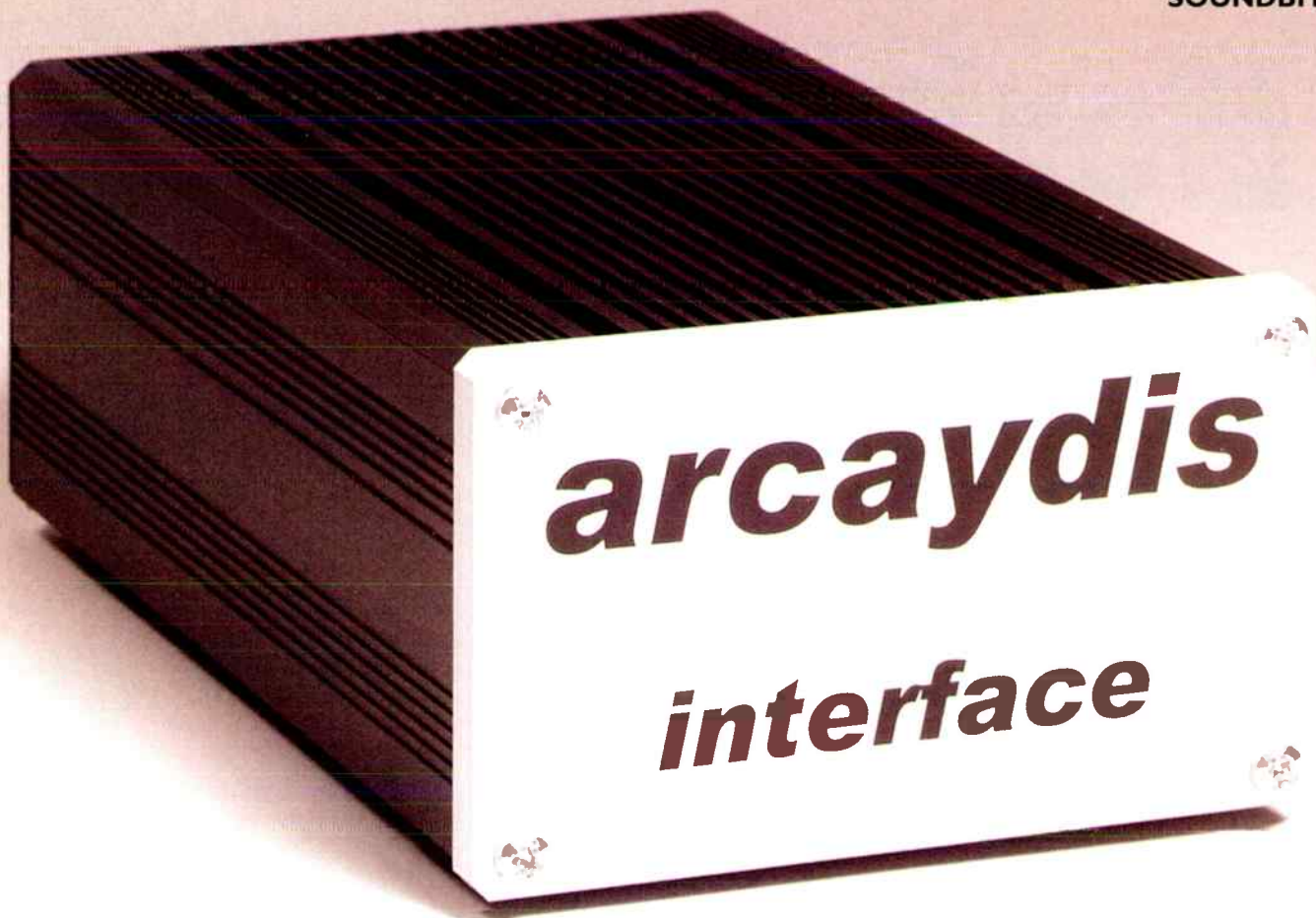
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**O**n the face of it, £250 would seem a lot to pay for a box that apparently does not do much, but there is more to this particular box than meets the eye. Richard Allan of Arcaydis came up with the Interface Box in order to optimise the connection between any piece of equipment with considerable gains in sound quality, and without spending a fortune on interconnect.

The actual internal circuit is very simple, as it carries out no signal processing and offers no amplification or attenuation. In other words, it is a unity gain device and what goes in, comes out! What this box actually does is offer a 100k Ohm load to any source device connected to its input, meaning that the source device in question requires very little current to drive the input line.

At the other side, the output offers a very low 10 Ohm source impedance which is used to drive the output line efficiently. As a result the Arcaydis can power extremely long cable lengths without difficulty and Richard Allan describes it as being ideal for use in between a preamplifier and power amplifier, particularly if the latter consists of a pair of monoblocks placed close to the loudspeakers. Essentially, therefore, what this box gives is a line buffer, making it very easy for any source device, whilst providing

an ideal source for any device being driven.

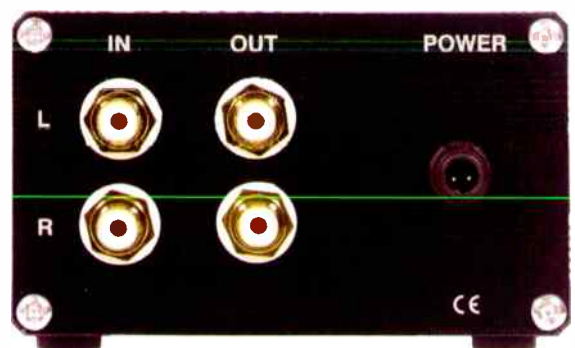
The finished product is housed in a small extruded box, measuring 70x108x188mm (HxWxD), and weighing a featherlight 0.8kg. It comes with a separate plug top power supply which delivers 12V to the interface box. There is no power switch, no power light even, the 8mm thick stainless steel front plate merely carries the legend 'Arcaydis Interface' and the rear has a locking power connector, a pair of RCA inputs and a pair of RCA outputs. All connectors are good quality and fitted securely to the rear panel.

Fitting the interface between our Eastern Electric Minimax CD player and the Quad QC24 preamplifier it was interesting to hear the difference the Arcaydis made - whilst it did not turn our Spondor S8es into B&W 801s, it seemed to bring the innate character of the music out more. Cymbals became better focused with more of a natural 'ting' to them, vocalists appeared to have moved closer to the microphone and each instrument seemed slightly better defined.

Reconnecting the Arcaydis between the Quad preamplifier and the II-Forty power amplifiers gave the same result plus a little more besides. Much as we love the Quads here at *Hi-Fi World* we are aware that they can be a little soft in the bass and lack the sheer grip and

pace that the likes of the Naim and Vincent pre/power combos we have tested recently can generate. Here the Arcaydis definitely tightened the low end up and again gave better definition to bass drums and bass guitars, whilst repeating the general soundstage clean-up that it performed in between CD player and preamplifier. As a result, the whole frequency range seemed a little clearer and more effortless. Everything became more relaxed, focused and stable.

The Arcaydis Interface is an interesting proposition that works quite nicely. Its abilities to reduce the load on the output stage of one component and simultaneously feed the input stage of the next properly mean that the components can get on with making music which, after all, is what it's all about. [Contact Arcaydis on +44 (0)1562 865788 or visit [www.arcaydis.co.uk](http://www.arcaydis.co.uk)]





# Moving Pictures



**Steve Green outlines the latest technological developments in mobile TV...**

**M**obile TV – meaning the ability to watch TV on your mobile phone – is a feature that has been on the cards for a number of years, but which only actually materialised in 2005 when Orange, Vodafone and '3' began offering mobile TV to their 3G customers.

Watching TV whilst out and about isn't a new concept however, because Casio has been selling small handheld TVs for a couple of decades now. But mobile TV offers some significant advantages compared to

weak to be received at street-level on devices using low-gain aerials.

Although mobile TV is still in its infancy, many in the mobile phone and broadcasting industries see it as being 'the next big thing' in the world of entertainment, and some estimate that around 200 million Europeans will be watching mobile TV by 2015 and the market could be worth £13 billion per annum in Europe alone.

Of the mobile TV services currently on offer in the UK, Vodafone's service is the most developed as they were the first to team up with Sky, and it offers

respectively, and Vodafone also offers a separate Sky Music Pack for £5 per month.

Orange carries the next most channels, with a £10 pack giving access to all twenty-seven channels available, or smaller bundles of channels costing £5 per month that have between four and nine channels each. These include two mix packs, and packs for music, entertainment, football and a family pack.

The '3' network only offers a single mobile TV package at £5 per month, where users get access to all fifteen channels carried, and the network with the fewest channels available is Virgin Mobile, which carries just five channels for £5 per month. T-Mobile and O2 are the only networks that don't offer mobile TV yet.

The names of the channel packs give a good indication of the kinds of channels that are on offer, and the news and music channels are apparently the most popular with viewers. Many of the channels will be familiar names to Sky and

"we could see four different systems being used for mobile TV in the UK!"

handheld TV, such as eliminating the need to carry an additional device around with you, and the reception quality should be good so long as you're inside the coverage area – handheld TVs suffered from poor reception quality due to the strength of analogue TV signals being too

thirty-one channels on its Mobile TV Value Pack for £10 per month. This gives access to all of the channels on the Sky News, Sports & Factual Pack, the Sky Entertainment Pack and the Vodafone Variety Pack. These smaller packs can each be subscribed to individually for £5, £5 and £3,

cable subscribers, although channels don't necessarily stick to the same schedules as on normal digital TV, as many channels are 'made-for-mobile', where the content consists of shorter clips rather than full-length episodes due to people tending to watch mobile TV for shorter durations than when they're sat at home.

One broadcaster that has been conspicuous by its absence from mobile TV has been the BBC, but at the beginning of April the BBC's Director of Future Media & Technology, Ashley Highfield, announced that BBC 1, BBC 3 and BBC News 24, as well as Radios 1 - 4, 6 Music, 1Xtra, BBC7 and the Asian Network will be available on a year-long trial to subscribers of the mobile TV services on Orange, Vodafone and '3'.

These three networks are using spare capacity on their 3G networks to carry mobile TV, and channels are delivered using the 'unicast' method of distribution, where each viewer receives his or her own individual transmission of the channel they want to watch. This situation is okay at the moment whilst people are still migrating from the 2nd generation GSM system over to 3G, but once everybody is on 3G there won't be enough capacity to transmit mobile TV as well as carrying all of the voice and data traffic.

The solution to this problem comes in the form of broadcasting the mobile



*The original way to see TV on the move, a Casio portable TV, this one coyly hiding its long telescopic aerial, necessary for good reception!*

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### Vodafone Live! delivers Sky TV to compatible 3G mobile phones.

TV channels in separate spectrum so that anyone with a suitable mobile phone can receive the channels, and this frees up the 3G network for its primary purposes of carrying phone calls and data.

However, because it is estimated that the mobile TV market will be worth so much money in years to come, a number of different mobile TV broadcasting standards have been designed which are all incompatible with one another. These systems consist of DVB-H (Digital Video Broadcasting – Handheld), which is an extension of the DVB-T system used for Freeview; T-DMB (Terrestrial – Digital Multimedia Broadcasting) and DAB-IP (Digital Audio Broadcasting – Internet Protocol), which are near-identical extensions of the DAB system; MediaFLO (Media Forward Link Only), which was designed from the ground up specifically for mobile TV by US company Qualcomm; and MBMS (Multimedia Broadcast Multicast Service), which is an extension of the 3G standard to allow signals to be broadcast.

The systems that are extensions of existing broadcast standards have had stronger error correction coding added to them to make reception more robust – this allows the DAB-based systems to receive video transmissions

(video is more fragile to data errors than audio is) and it allows DVB-H signals to be received when travelling at high speed (DVB-T was originally designed for stationary reception).

I'd like to be able to tell you that the companies and organisations involved have all reached a common consensus and only one of these systems will be used in the UK so that there will be no handset incompatibility issues, and just one transmission network will carry all of the channels so that spectrum won't be wasted duplicating them on different systems. Unfortunately, however, as it stands it's quite possible that we could see four different systems being used for mobile TV in the UK!

This situation hasn't been helped by Ofcom holding back UHF (Ultra High Frequency) channel 36 on which O2, Vodafone, Orange, '3' and T-Mobile want to launch a jointly-run national DVB-H multiplex. The current licence holder, BAe Systems, has agreed to vacate the channel (which is used for airport radar), but Ofcom has decided to hold back the channel so that it can be included in next year's auction for spectrum that will be freed-up once analogue TV has been switched off – Ofcom and the government are clearly hoping for a re-run of the lucrative 3G spectrum auctions.

The only broadcast mobile TV system currently in use in the UK is DAB-IP, which Virgin Mobile's service is using. This service consists of five channels that are broadcast on the Digital One national DAB multiplex,





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**The new technology will even provide TV viewing in serious business environments such as this...**

which means that subscribers to the service can also receive DAB radio on their mobile phones.

However, as the Virgin Mobile TV service consumes 30% of the capacity of the Digital One multiplex, in order to make way for the service the Primetime radio station was forced to withdraw from DAB last year, and three music radio stations on the Digital One multiplex were reduced to mono. A further three DAB-IP mobile TV channels could launch on Virgin Mobile next year if Channel 4 wins the licence for the new national DAB multiplex, but this would steal another 20% of the capacity of a national DAB multiplex away from its originally intended use of carrying radio.

The launch of the Virgin Mobile TV service late last year should also act as a cautionary tale for those making the more inflated claims about this fledgling industry, because a £2.5m TV advertising campaign for the launch of the new service only led to 10,000 signing up. The small number of channels available and the fact that customers were forced to use a specific handset were blamed for the lack of interest.

Of the other broadcast systems, Vodafone, Orange and '3' participated in a trial of the MBMS standard in the Bristol area recently. One of the attractions of using MBMS for the mobile network operators is that they can transmit the service in 3G spectrum that they already own but which is separate from the 3G spectrum they're using for voice traffic.

The final system that might be used in the UK is MediaFLO, which Sky is said to favour after it trialled the system in Cambridge last year. Sky has a three-year contract for the mobile TV rights for live football

starting from next year, and it's been reported that Sky might go it alone and launch its own mobile phone service using the lure of live football to pull the punters in.

All of the broadcast systems apart from DAB-IP are using the new MPEG-4 H.264/AVC video codec (which is the same video codec as used for HDTV) and the AAC+ audio codec (which is the codec that has been adopted for the new DAB+ system). DAB-IP on the other hand uses the Windows Media Video (WMV) and Audio (WMA) codecs.

Although these are all modern and efficient codecs, the picture and audio quality on the current mobile TV services is poor due to the bit rates being used for the TV channels being too low. For example, the bit rates used for the channels on Virgin Mobile's DAB-IP service are only 88kbps combined for the video and the audio streams, whereas for good quality they should be in the region of 250–300kbps.

The picture and audio quality should improve in future, though, as more spectrum becomes available for mobile TV. As well as the UHF channel 36 mentioned earlier, Ofcom will be auctioning 'L-band' spectrum covering frequencies 1,452 – 1,479MHz later this year, and this spectrum has been earmarked for mobile TV use across Europe. Mobile TV operators are also expected to bid for some of the spectrum that will be freed-up once analogue TV has been switched off in 2012/2013.

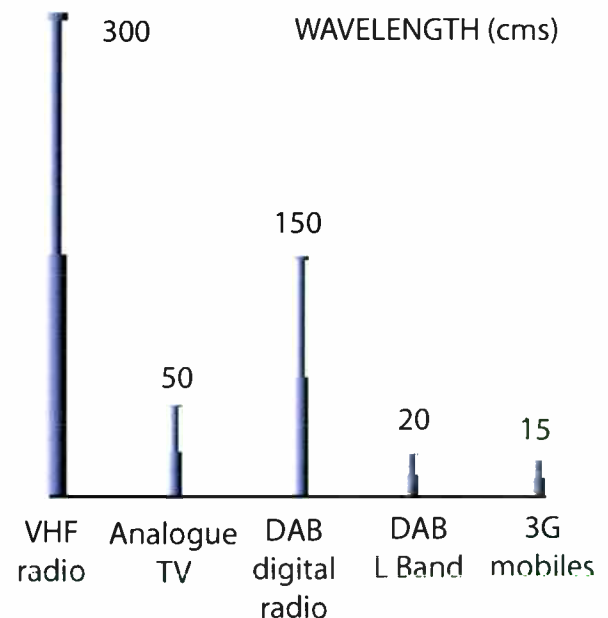
The design of mobile phones is likely to gradually change as mobile TV becomes more popular, as many handsets that have been designed with built-in mobile TV receivers have larger displays than normal to aid TV viewing.

Looking ahead, a new DVB

standard called DVB-SH (DVB – Satellite services to Handhelds) has recently been finalised, and the French company Alcatel demonstrated the new system late last year. As its name suggests, the standard has been designed for satellite transmission, with terrestrial-based 'gap filler' transmitters being used to cover built-up areas where the satellite signal is blocked by buildings. DVB-SH is targeted at 'S-band' frequencies below 3 GHz, and spectrum covering 2,170 – 2,200 MHz has been earmarked for DVB-SH to use across Europe.

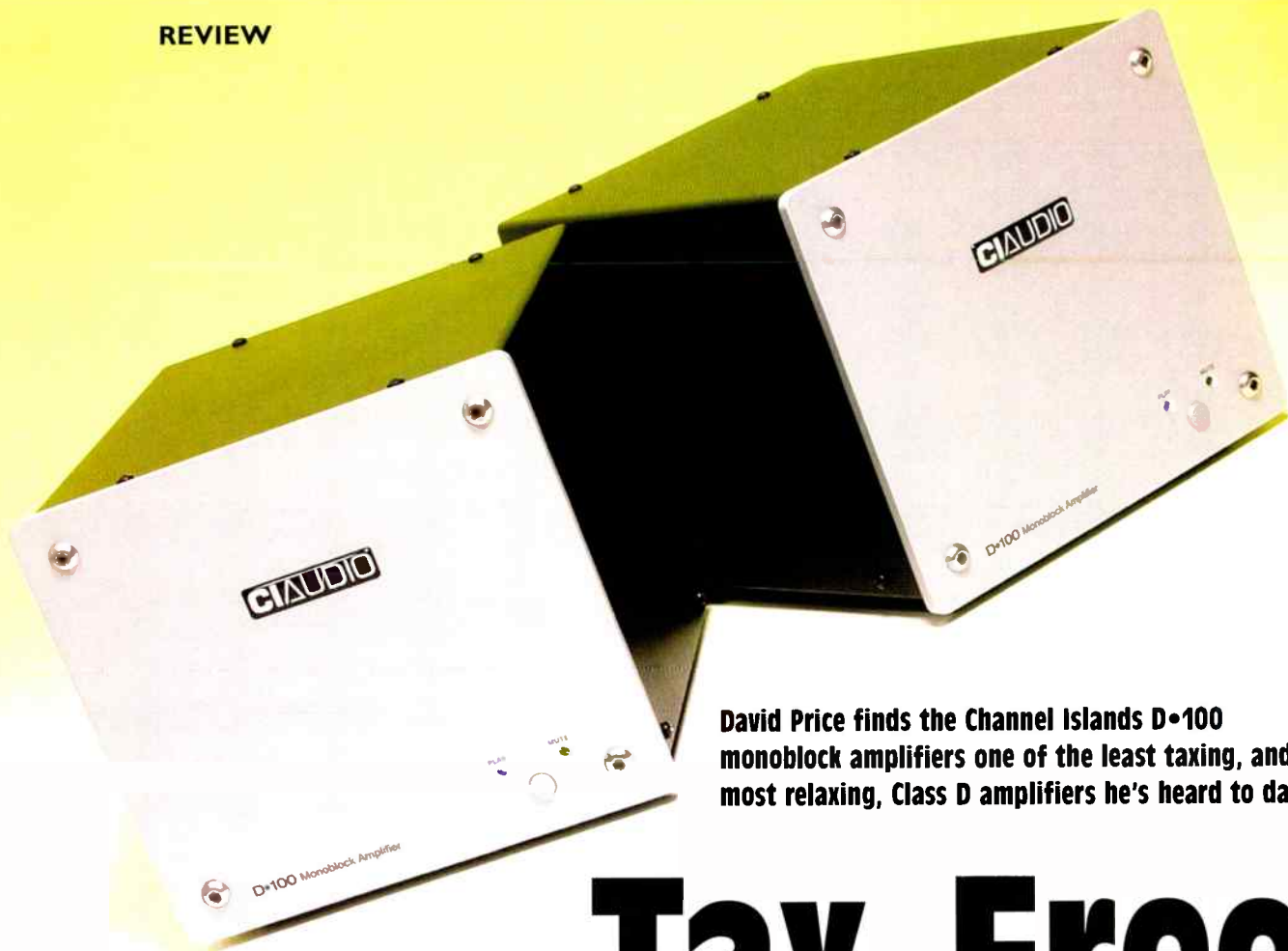
Looking further into the future, there are already plans for an upgraded version of DVB-H, called DVB-H2, although this probably won't see the light of day for a few years yet.

South Korea is currently the leading nation in terms of mobile TV handset sales as it was the first to launch a broadcast service using its homegrown T-DMB system. But DVB-H looks like it could become the dominant mobile TV system in the years ahead, as it has already been trialled in thirty-one countries – its main competitor, T-DMB, has only been trialled in seven countries so far. Also, a nationwide DVB-H network has been launched in Italy, and national DVB-H networks are due to be launched this year in France, Germany, Spain, and Finland, and a rollout to the thirty largest cities in the US is set to begin this year as well. The UK on the other hand will have to wait until the Treasury's palm has been greased next year before we see DVB-H...



**Aerials have got smaller over the years as transmission wavelengths have decreased. This chart shows that DAB L Band compares with 3G.**





David Price finds the Channel Islands D•100 monoblock amplifiers one of the least taxing, and most relaxing, Class D amplifiers he's heard to date...

# Tax-Free!

**W**e are undergoing an audio revolution, the like of which we haven't seen since the mid-sixties. Back then, the status quo was valve amplifiers such as the (now) classic Quad II. The advent of solid-state audio devices meant that a raft of new, more efficient solid-state based designs appeared. They used transistors that operated in Class B, switching on and off as the music signal required. Thanks to the dramatically lower heat produced more complex circuits producing considerably more power could be used.

This radically changed the whole hi-fi landscape. Just as CD transformed the 'default' sound of a hi-fi system in the mid eighties, so the transistor had done the same in the late sixties. In both cases, what was once smooth, warm and loose became tauter, tighter and tonally leaner – and in both cases, the change wasn't universally applauded as a step in the right direction. As with CD though, the advent of solid-state Class B amplification made hi-fi dramatically more reliable, practical and – not to put too fine a point on it – cheap to make (if not buy)!

With the exception of a few heretics (many of whom read this

very magazine), approximately 99.9% of the hi-fi listening classes now use solid-state amplification, invariably heavily Class B biased. To 'golden eared' tube aficionados, whenever they hear such a 'tranny amp', it sounds predictably tonally monochrome and two dimensional. Class B solid-state might be efficient and cost-effective, but it is not a universal panacea.

Well, that was how the world looked until recently. The past couple of years has seen the rise of Class D. Contrary to what is often supposed, the 'D' doesn't denote digital. Rather, Class D is a type of ultra high speed analogue switching transistor amplifier (the design of which has actually been around for years), which may or may not be run in conjunction with a digital input to modulate the output (as per Lyngdorf, for example). It uses a comparator/modulator scheme to look at the input signal and switch output devices on or off at a very high frequencies to replicate the input signal. Until recently they've been sonically underwhelming, but now – just now – we are witnessing a step change in Class D designs. At last, there are some which are now as good as (if not better) than serious Class AB designs, and they

offer unique advantages, as well as disadvantages.

Obvious positives are the thermal efficiency and low power consumption. Because the output transistors are only switched on for tiny fractions of a second, heat production is very low, and little in the way of heatsinking is needed to give adequate cooling. Given that heatsinks are massively expensive (as one glance at the Maplin catalogue will attest) – and heavy too – their omission is a major cost-saving boon. This low heat output also means lots of power is possible, relatively easily and inexpensively. Last month's review of Rotel's RB-1092 showed 586W into 8 Ohms (and around twice that into 4 Ohms) for £1,500. Fifteen years ago, you'd have to have added another zero onto that price tag, for a Krell or suchlike...

The downside is simple - many people think they are not musical. Personally I think this is a reductive analysis - a bit like saying that Italians are crazy drivers or the British drink tea all the time, there is an element of truth here, but it certainly doesn't necessarily apply in every case!

As far as Class D amplifiers are concerned, there are a number of different approaches, and whilst all share similar overall 'sonic footprints',

the devil of the performance is in the detail. What is true is that Class D sounds 'clean' - go back to a Class B amplifier after a decent Class D, and you'll hear a zingy, fuzzy upper midband that somehow doesn't sound quite right. If you're listening to a Naim, or some other successful Class B design however, you'll also hear a liveliness and sense of animation that most Class Ds lack.

Hence the 'Class D isn't musical' refrain...

Well, Class D is getting increasingly more animated. And it doesn't do it by sounding zingy and forward as per Class B, but in its own special way - which is something that I for one rather like. The Channel Islands Audio D•100 is an amplifier I have a particularly high opinion of - and that comes after living with the excellent aforementioned Rotel RB-1092 (at roughly the same price) and the superb NuForce Reference 9SE monoblocks at nearly £1,000 extra. The CAI D•100s are different to these, using Philips Class D technology, and you can hear it...

Anyone who remembers Audio Alchemy (anyone still have a Digital Decoding Engine?) may be familiar with Dusty Vawter, who was that company's customer service manager. When they went out of business, he teamed up with Monolithic Sound's Greg Schug to make Channel Islands Audio, designing various preamplifiers and power supplies. The D•100 uses a UcD-180 Class D module from Philips DSL via Hypex, modified in-house at CAI, with lots of attention to detail paid to - yes, you've guessed it - the power supplies...

Each (6.25" w x 5.5" h x 8.0") monoblock boasts a large 300VA custom toroidal transformer in conjunction with eight parallel capacitors, and discrete Schottky diodes in the bridge rectifier. There's a front panel 'standby' switch, which allows critical circuitry to be kept powered up. Round the back, there's a pair of speaker binding posts and an RCA phono input (there's an option of balanced XLR), plus an IEC mains socket. Unlike the ultra modern industrial design of the NuForce Reference 9SE, the D•100 is surprisingly 'old school' in look and feel. It's basically a heavy gauge steel chassis with 3/16" brushed, anodised aluminium front and rear panels, around which a crackle black finished pressed steel cover is fastened by stainless steel hardware. It is 'honest looking' I suppose, and to its credit is nice and compact too, but don't expect it to win any prizes in the style stakes. Channel Islands Audio

offer two derivatives, with 26dB or 32dB of gain.

## SOUND QUALITY

Having spent this year so far with Class D power amplifiers - in the shapes of NuForce Reference 9SE and Rotel RB-1092 - driving both my Yamaha NS1000M and Quad 989

behind the plane of the speakers.

Contrast this to the similarly priced, excellent Class D Rotel RB-1092, and the latter is pushing images well ahead of the speakers, feeding you the music almost into your lap. But despite being more laid back, the CAI monoblocks don't sound two dimensional and

"one of the most laid-back, organic and natural of the breed I have encountered..."

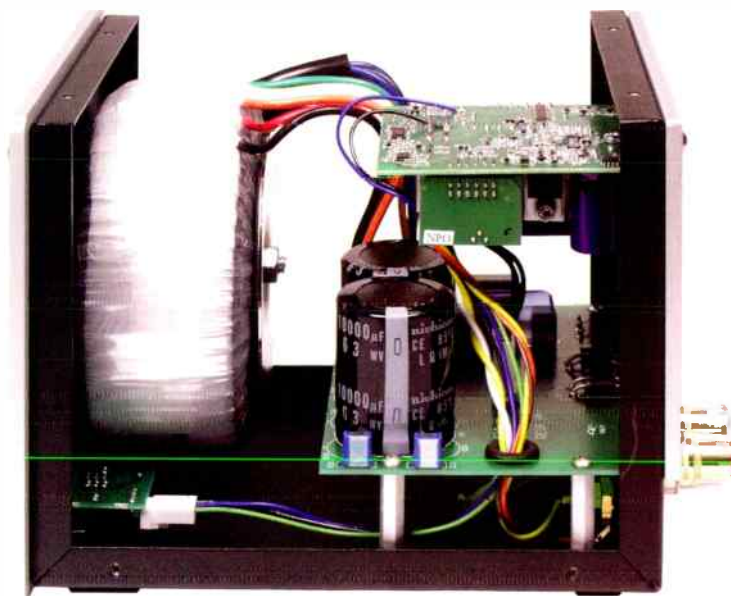
reference speakers, it was fascinating to go directly to the Channel Islands Audio D•100s. Those who dismiss Class D amplifiers as unmusical are wrong in at least one respect, as this is just as misguided as saying 'all valve amplifiers are soft and loose'. Whilst there are a great many unmusical Class D designs (and loose valve amps for that matter), they do not all sound the same. Just as per any other type of amplifier, it ain't what you do but how you do it - and in this case Channel Islands have done it very well. Here's one very pleasant and endearing sounding D-type.

Kicking off with The Byrds' 'Draft Morning' on vinyl, instead of getting the rather clinical, mechanical and analytical presentation I have come to fear from amplifiers such as these, I was greeted with a surprisingly warm and enveloping sound. Indeed, I would go as far as saying this is one of the most laid-back, organic and natural of the breed I have yet encountered. Most surprising is the amplifier's midband, which is - if anything - a little recessed for some tastes. The D•100s don't throw the soundstage out into your face and pin you back in your seat, choosing instead to hang the image around, or even a little

flat. Rather, the soundstage hangs back way behind the speakers, and is extremely clear all the same. The Byrds' 'Chestnut Mare' was a delight, vocals located precisely in the centre of the soundstage but way back behind the speakers, and the oodles of atmosphere, those gently jangling guitars sounding beautifully sweet.

Tonally, the D•100 is again very accomplished. It is one of the most neutral Class Ds I've heard to date, making even the NuForce 9SEs (at £1,000 more) seem a little artificial, whilst the similarly priced Rotel suddenly seemed a tad chrome plated in the upper mid and treble. This amplifier is definitely from the 'black magic' school, with a deep, velveteen feel that is anything but forward, clanky or metallic. In my system, with my turntable and tube phono stage, they could sound a little dull through the (admittedly dull sounding) Quad ESL-989s, but the 'well lit' Yamaha NS1000Ms suited the D•100s superbly.

Stephen Duffy's voice in The Lilac Time's 'In Iverna Gardens' was a treat - as creamy as I've heard it through solid-state, and delivered delicately enough to catch all his tiny vocal inflections. Again, these monoblocks





# Minimalist masterpieces!



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 Marantz CD63KI DP CD player  
 MF Audio Passive Magnetic Preamplifier (silver)  
 NuForce P9 preamplifier  
 NuForce Reference 9SE power amplifiers  
 World Audio K5881 valve power amplifier  
 Rotel RB-1092 power amplifier  
 Yamaha NS1000M loudspeakers  
 Black Rhodium interconnects/cables

the two presentations floats your boat – certainly at the price, both amplifiers are superb.

**CONCLUSION**

Having spent a happy month in the company of the Rotel RB-1092, and loving it for its power, projection and self-assuredness, I now find myself delighted with the Channel Islands Audio D•100s for altogether different reasons. These are almost the Rotel's antithesis – with an unusually organic and natural sound that majors on rhythmic flow and tonal colouring, they are about as close as Class D comes to a good tube amplifier (certainly, from what I've heard to date). I miss the Rotel's effortless, carefree power, but then again I don't know how I could live without the way the D•100s set up a groove and get into it with such aplomb. If you're of the tubular persuasion but require serious power then these are an inspired compromise, and if not then these should still be an essential audition.

"for those of the tubular persuasion, who require serious power..."

really suited the dreamy mood of the music, showing their romantic side. While the Rotel RB-1092 delivered a wonderfully well resolved, powerful and dynamic sound, the Channel Islands monoblocks were ever so slightly less explicit and less muscular, yet seemed to carry the song's groove better – giving the sense of a flowing, lilting piece of music rather than a sequence of meticulously well defined notes. It's hard to describe, but suffice to say it was more emotionally engaging and less cerebral.

There's no doubt that the D•100s are a tad looser than the RB-1092, and this is down to their bass which is just a little softer and warmer than that of the Rotel. Whereas the latter can start and stop on a sixpence, the former are ever so slightly less taut down below. Don't for one second think they're loose and wobbly; they're not; it's just that the Channel Islands monoblocks' *pièce de résistance* is that lovely velvety, musical midband. Likewise, they're blessed with a very silky treble. It's not valve-like, but it's gentle and unflagging whilst being detailed and spacious. Again – I've yet to hear a Class D amplifier that has the sheer 'hear through' transparency of a top tube design, but I'd say that this treble is certainly no disgrace – and better even than that of the NuForce Reference 9SE.

Aside from the aforementioned slight looseness in the bass, the only downside of the D•100 is its stereo image

projection. Although I do love the fact that it is the least 'in your face' Class D design I've heard, it doesn't project images left and right with the same assuredness of the Rotel RB-1092. The latter has a sense of massive, untrammelled power (and all the confidence that comes with it), whereas the Channel Islands Audio D•100 is by nature more of the 'pale and interesting' variety. It is ultimately more satisfying musically, although lacks the Rotel's barrel-chested muscularity. I will leave it to you, dear reader, to decide which of

**MEASURED PERFORMANCE**

This tiny Class D monoblock delivers disproportionately large amounts of power - by Class AB standards anyway - producing 112 watts into 8 Ohms and 196 watts into 4 Ohms. This is enough to cope with any domestic situation.

Distortion levels were very low all round, both in the midband (0.0008%) and at high frequencies, at all power levels. Our analysis shows 1 watt at 10kHz into 4 Ohms, where a figure of just 0.009% distortion was recorded - unusually low for Class D. Minuscule amounts of third harmonic mostly account for this. The D•100 monoblocks deliver exceptional results here and are in a class of their own amongst PWM amps. More surprisingly, although there was a tell-tale high frequency (400kHz, 0.28V) signal on the loudspeaker line, there was no d.c. offset.

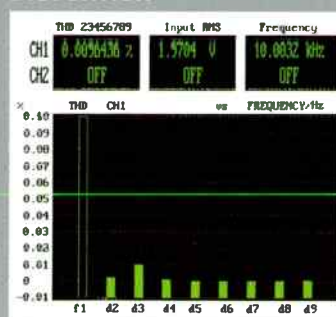
Frequency response measured a wide 7Hz-30kHz (-1dB) with a slow roll off above 30kHz, much like conventional amps.; there is no sharp low pass filtering at 20kHz and frequency response did not vary with load. Sensitivity was low at 1.3V so a preamp with gain will be needed

unless the sources are of the silver disc variety.

This is a neat and very well engineered Class D amplifier, one that measures a whole lot better than most. NK

Power	112watts
CD/tuner/aux.	
Frequency response	7Hz-30kHz
Separation	monoblock
Noise	-128dBV
Distortion	0.01%
Sensitivity	1.3V

**DISTORTION**



**VERDICT**

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# The Write Stuff



**Channa Vithana is enraptured by a high end Voyd, Audio Note and Stax system owned by international author John McLaren...**

**W**hile a few very expensive hi-fi systems totalling hundreds of thousands of pounds can be heard at hi-fi shows, there are surely even less that can be experienced properly in their final location, within a good quality listening room, let alone a noisy exhibition one. The Audio Note and Stax system featured here is one of those exceptional rarities, and is owned by the financial specialist and internationally published author John McLaren.

John is no less serious about music and demonstrates his commitment by serving on the London Symphony Orchestra Advisory Board, and is also the founder and Chairman of Masterprize ([www.masterprize.com](http://www.masterprize.com)) which is described as "the world's leading composing competition".

While living and working in Japan, John procured his Stax ELS-F83 electrostatic loudspeakers for about £4,000, which he says would be the equivalent of £20,000

now. Stax is primarily known for its outstanding electrostatic 'Ear Speaker' headphones, but has also been responsible for exquisitely designed and built DACs, cartridges and amplifiers, as well as electrostatic loudspeakers. The ELS-F83s remained the high-end mainstay of John's system; from Japan, the US and to Britain. The Stax loudspeakers stayed the course, says John, because they, "help to reproduce the live quality of music from concert halls."

Each electrostatic panel is a two-part metal-framed copper-mesh (behind the grill) which uses an undisclosed internal diaphragm material that has to be precisely located within consistently minute tolerances to work, hence their lasting mechanical reliability. The copper-mesh panels enable a comprehensive frequency range which is a claimed 35Hz-20kHz, along with 78dB sensitivity and 300W power-handling, according to the original handbook. If these specifications are accurate and inclusive of approximate 4ohm impedance – the ELS-F83s will be a tough load for most amplifiers! Vital statistics are 450x1950x350mm and 36kg.

In the late eighties John owned the legendary Audio Note Japan Ongaku integrated amplifier which had around 27W of power and cost roughly £55,000 at the time. This Japanese Ongaku made me take notice of Audio Note, and as an absolute hi-fi statement of the period, it is one I will never forget. In the

early nineties John moved onto the high-end priced and similarly highly-rated Kego power amplifiers by the same brand, which utilised volume controls.

Now, his system consists of Audio Note UK components and a Voyd Plus turntable which replaced a Linn LP12 about fifteen years ago. The Voyd cost about £2,000 when new and was fitted with an AN-1s tone arm (included in the price). A £2,000 loll cartridge replaced a Koetsu Onyx about nine years ago and is connected with Audio Note wiring through a £5,500 AN-S7c Impedance Selector for cartridge-loading. This vinyl source is fed into the £22,500 M8Phono valve feedbackless Class A preamplifier.

The manufacturer-rated "45 watt Class A parallel single-ended no feedback mono triode power amplifiers" are Gaku-On monoblocks which cost John £125,000. The Gaku-Ons, says John, have offered "the biggest step in sound quality" as they can dynamically power-drive the difficult load of the Stax electrostatics combined with, importantly, a lyrical sense of musicality. An outstanding two-box Naim Audio 'olive' casework Nat 01 tuner (which would cost about £2,800 new) handles the radio; as a reviewer, it remains my favourite tuner in terms of design purity, ergonomics and sound quality.

CD replay consists of a £4,950 Audio Note CDT Three transport (sitting onto a Townshend Seismic Sink platform) purchased about six





months ago, which features a Philips CD Pro mechanism plus a Black Gate aspirated power-supply, and £39,500 DAC5 Signature featuring a valve-regulated power-supply plus internal silver wiring. Unlike the majority of CD replay systems, the DAC5 Signature has no analogue or digital filters, and also negates oversampling. It must be noted that John has traded-in most of his older components during the purchase of these system pieces. Cables are high-end Nordost Valhalla for the loudspeakers and non-vinyl interconnects, plus Nordost Thor power distribution.

## SOUND QUALITY

We listened to a wide variety of material on LP and CD including Oscar Petersen, Chopin and Liszt piano suites, Rossini cello pieces and Mozart. The stunning musicality of this system enabled these great jazz and classical pieces to be reproduced in an entirely free-flowing manner with outstanding instrumental and vocal intelligibility – such was the combination of musical phrasing and timbral acuity. John also likes Keb Mo and we listened to a superb blues piece with slide-guitar and



affecting vocals – the harmonic quality and depth to the voice and instrument was convincingly lifelike in dimensionality and emotional feel. The sonic result was no less than I imagined it would be from a super-high end valve and electrostatic system playing choice classical, jazz and well-recorded blues music...

We also listened to Jeff Buckley's 'Grace,' and The Orb 'Live' on LP, along with CDs of The Corrs 'Live,' Eric Clapton 'Unplugged' and ABBA 'Gold'. There was also music by The Beatles with 'Abbey Road' and Eleanor McEvoy's 'Yola.' What was most fascinating is that this system played these modern compositions with equal composure, resolution and vitality as it did with the high-art classical pieces. Even though a few of these non-classical pieces were comparatively compressed, the system did not gloss over their faults or rose-tint them.

For example the many layers of high resolution vocals within the compressed sounding instruments in ABBA's 'Take A Chance On Me' were beautifully revealed, while the atmospheric and complex poly-rhythmic patterns of 'Little Fluffy Clouds' by The Orb were deeply engrossing. Indeed, John played me an early eighties Wagner 'Parsifal' digital recording conducted by Karajan, which he said was almost unlistenable until he heard it through this system. I could tell that this type of recording would remove tooth fillings on almost any other CD player except this one, and as such the digital Wagner was surprisingly agreeable considering its infamous recording reputation.

With all the compositions, John's system revealed so much in the manner of timbre and the 'soul' of the music yet importantly, it did not struggle with huge dynamic shifts, epic crescendos or the powerful grip needed for bass tunefulness and extension. That it did so using the spatial, dipole nature of the Stax electrostatics, which totally disappeared unlike many 'box' loudspeakers, and at very moderate volume levels, was simply exceptional.

According to John, a good philosophy is that "genuinely natural playback must be able to show the greatest contrasts", which means great hi-fi should reveal the music unadulterated. While this approach can also reveal very bad recordings for what they are, more importantly the reproduction is more faithful in that instruments and vocals retain their identity.

## CONCLUSION

There are many who remain cynical of the claims made by high-end systems like this. However, as you will have ascertained from his career background at the highest levels, John McLaren is clearly no fool and his system isn't some millionaire's audiophile folly. Like many successful self-made people who know exactly what they want - it is his understanding and appreciation of the value of the material quality within the components and the lateral-thinking and scientific research behind the designs which has led him to this system. John could probably afford to change components every month, but chooses not to. Instead considered modifications are only made very cautiously within the context of the system, and the results speak for themselves - it is high end *par excellence*.

### THANKS TO:

Howard Popeck at <http://blog.listencarefully.co.uk>  
Nigel Crump at [www.symmetry-systems.co.uk](http://www.symmetry-systems.co.uk)

### THE MAN BEHIND THE MUSIC

John McLaren was originally a diplomat at the Foreign Office in London and then in Japan at the British Embassy, Tokyo. His post-diplomatic work entailed investment banking and venture capital in the States. Subsequently a series of directorships beckoned including appointments at prestigious financial institutions like Morgan Grenfell and Deutsche Bank. He has advised the likes of DaimlerChrysler, BMW, Nissan, BBA and Siemens on important merger and acquisitions business proceedings, and is the Chairman of the Barchester Group Limited. During his diplomatic years, John had to write important letters and documents, and it was this very rigorous process that helped him to script technical detail with fluent readability. So, in latter years, having already achieved a stable career path in the financial sector, John used his well-honed writing skills to craft a series of successful novels: 'Press Send' (1997), 'Seventh Sense' (1998), 'Black Cabs' (1999), 'Running Rings' (2001), and 'Blind Eye' (2004). 'Black Cabs,' 'Press Send' and 'Blind Eye' are currently being developed into films.





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**Fifteen years ago, Pioneer stereo separates were top of the British budget crop, but the advent of AV saw the Japanese company hastily abandoning the market. But with the new PD-D6 SACD player and A-A6-J integrated, Pioneer are back in stereo land with a vengeance, says David Price...**

# Two's Company

**P**ioneer's decision to concentrate on Digital Versatile Disc and plasma display screen technology in the mid-nineteen nineties meant the company's once-great two channel presence - for which it fought hard since the early seventies - declined. The result was that by the early noughties, Pioneer DVD players had reached the forefront of the market, as had its superb plasma TVs which were head and shoulders above those from its Japanese rivals. But conversely, the company's rich legacy of affordable high quality hi-fi separates, from 1974's PL12D turntable to 1989's A400 amplifier, began to be forgotten...

Well, in 2007 Pioneer is back in stereo land. Industry insiders have confided to me that it is increasingly hard to compete in price terms with the technologies it once did so much to bring to market. Outselling Pioneer by factors of five or more, companies like Sony and Panasonic gain massive economies of scale, making it hard for Pioneer to contest profitably. And then there's the

Chinese, making £30 DVD players and LCD TVs for a few hundred pounds, transforming the budget market. Factor in the fact that the AV market is now mature and relatively stagnant, and the company - like Marantz and Denon before it - is moving its scooters back on to the two-channel lawn.

Welcome back then, Pioneer, to affordable audiophile hi-fi. As a one-time A400 owner (for which I have fond memories), I know how good the company was in the early nineties, when it was making low cost, high performance silver disc players and integrated amplifiers - precisely what the new £399.99 PD-D6 and A-A6-J are, in fact.

Things have changed though. Rather than pug-ugly designs with cheap feeling cases, plastic knobs and flimsy pressed steel sleeveings, this new combo is one of the most attractively presented pieces of hi-fi I've seen for ages. The styling of both the disc player and amplifier are so attractive that they wouldn't disgrace a Meridian badge. Although obviously built down to a price, the slim (420x100x340mm) separates don't

remind you of this, every time you use them. Rather, their fine gunmetal grey finish, elegantly sculpted and detailed fascias and classy paper white LC displays look fresh, not flashy.

## PLAY TIME

The new PD-D6 follows the precedent cleverly set by Marantz a few years back by being a two-channel SACD player (obviously with CD compatibility). The fascia is a joy - the bare minimum of facilities and a cryptic AIR logo to the right that denotes the fact that it features "AIR Studios Sound Tuning". The 4.5kg player features 192kHz/24bit Twin Burr Brown D/A converters and Pioneer's proprietary Legato Link Conversion PRO, the latter said to "ensure minimum phase shift across the entire audible frequency band". There's also "an extremely stable, high performance low-jitter crystal oscillator circuit". The PD-D6 not only handles CD and SACDs but also CD-R and CD-RW, and is compatible with MP3 and WMA compressed audio formats. A low resonance Honeycomb Chassis is featured, as



are "high quality parts" including a Schottky barrier diode.

Although Pioneer describe the A-A6-J as a "Class AB Dual Mono symmetrical amp, apparently it operates in pure Class A mode "at low power". Well, the Pioneer must have been in this very mode when generating the very healthy listening levels I got from my Yamaha NS1000M loudspeakers, because it was running seriously hot – only a Sugden A21a or Musical Fidelity A1 would have it beaten in the Celsius stakes!

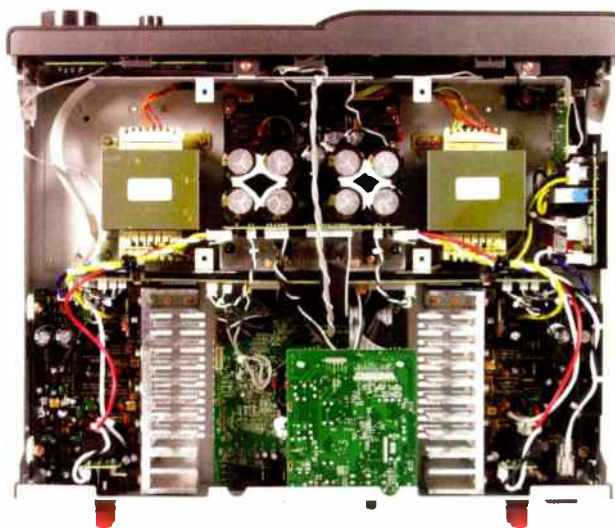
At 10kg, it's a heavy beast considering the modest price, and sports the same Honeycomb Chassis of its silver disc spinning brother, plus a "Quick Response Power Supply Circuit", and "LAPT Power Devices". There's a decent smattering of controls available via the remote, but Pioneer has avoided the temptation to clutter the fascia with buttons. Indeed, the front panel contains just the two most important – the on/off switch and the 'source direct'. There's a single rotary volume knob and a rotary source selector, for CD, Aux, Tape, Tuner and Phono. Readers will be relieved to know that the A-A6-J's phono stage isn't much better than that of the old A400, which isn't saying much!

## SOUND QUALITY

Although ostensibly a system review, I couldn't resist trying both SACD spinner and amplifier separately. How would a mass market £400 Japanese transistor integrated fare with my high end vinyl source? Would it do the business like the long-dead A400 did it, which was so well that reviewers recommended it with esoterically priced sources and speakers? The short answer is yes...

I kicked off with a Classic Records pressing of Genesis's 'Foxtrot', and was genuinely surprised. Having just come from the £4,000 combination of MF Audio Passive Pre Silver/Channel Islands monoblocks, I sat back and expected my ears to be assaulted by a painful cacophony, but they weren't. No – the A-A6-J wasn't anywhere near as good, but it was still genuinely enjoyable to listen to and it covers its tracks very well. Its sins are those of omission, rather than addition – it certainly won't have you running for the ear protectors, and really sings with a serious source.

In truth, this new Pioneer amplifier doesn't sound a million miles away from the old A400X, aside from the fact that it's tighter and more open in the midband, and less mushy in the bass. This makes it



an engaging transistor design, which although a tad thin across the upper mid, really gets into the music and pushes it out at you with more aplomb than many of the Class D rivals, such as Onkyo's slightly more expensive A-933. It has a spry bass, with just a smidgen of warmth in the lower mid, a decently open and spacious mid and a nice crisp treble, lacking just a little air in absolute terms. More than this, it puts everything together in a convincingly rhythmic way – one than you might not expect at this price.

Although lacking the atmosphere you get from the likes of Sugden's A21a (at nearly three times the price), 'Supper's Ready' displayed a truly believable sound with nicely etched guitars, a well rendered Peter Gabriel vocal, and some tight snares and smooth, crisp hi-hat cymbals. It's a little two dimensional in soundstaging terms, with a slight tonal greyness across the midband, but by £400 standards the Pioneer gave an amazingly insightful sound, along with real finesse. It never sounded coarse or painful, even through my ultra revealing Yamaha loudspeakers.

Michael Jackson's 'Don't Stop Till You Get Enough' on LP was a delight – the Pioneer hung on tight to the prodigious percussive detailing and managed to string the bassline together convincingly. Bass synthesiser was full yet decently fast, Jackson's voice clean and expressive and best of all, the Pioneer proved more dynamic than it has a right to be at this price – being able to signpost his expressive vocal phrasing and accented snare drum hits with ease (considering its lowly position in life).

In absolute terms, it is of course a little limited in its ability to image 'out of the box'; the soundstage stays a little closer to the speakers than it might, and it is a tad two dimensional in depth terms. You're also aware that you're not quite getting the whole

story in terms of midband detailing. Although it has excellent transients, letting percussive instruments like snares scythe through a busy mix with ease, it's not brilliant at conveying the air and space around instruments. But it performed in line with its price.

Whilst very able, in my view the PD-D6 SACD player was less accomplished in absolute terms. The A-A6-J is amazing at the price, the PD-D6 merely excellent. It is a very couth performer that has none of the stridency of some cheap CD spinners, or none of the mush of others. The overall effect is a super clean sounding device that is very detailed and pleasantly musically engaging too. I actually think its CD performance is its forte; SACD was impressive, but not spectacular.

Kicking off with Prefab Sprout's 'Appetite' on CD, the Pioneer threw out a wide soundstage (excellent left to right but less impressive front to back), and had a very tight bass sound. It was very strong indeed down below – Cambridge Audio's (admittedly a bit cheaper) 640C CD spinner was obviously warmer and looser with less dynamic inflections. Midband was bristling with detail, the PD-D6 showcasing Thomas Dolby's classic production to great effect. Vocals were very clean, with an excellent sense of immediacy that some CD players at twice the price lack. Treble was clean, the Pioneer displaying a fine overall cymbal sound, although it did lack some atmosphere up top – hi hats didn't have an especially long decay, for example.

Moving to my Roxy Music 'Avalon' SACD, and the Pioneer sounded superb for a £400 machine, with a wider and more capacious soundstage, and deeper and more fluid bass, even more midband detail and a tad more treble air too. However, as with the (£600) Marantz SA7001KI Signature I tested a few months back, I didn't experience the 'great leap forward' that SACD is, in

real terms, over CD – just a subtle but useful improvement. My suspicion is that the PD-D6 has been optimised for CD replay, and given that 99.9% of all digital discs are such, this is fair enough.

The Pioneer was never less than musical – a Deutsche Grammophon pressing of Beethoven's Pastoral Symphony (Berliner Philharmonic, Karajan) was pure joy. Bass was as taut and tuneful as anything I've heard under £500, and the authoritative sounding PD-D6 gave excellent insight into the recorded acoustic, again suffering from just a slight lack of air. As with its integrated amplifier brother, it was very tasty with dynamics, being more able than even the Marantz SA7001 KI Signature, for example, at conveying dynamic

accenting. As you might imagine, together this dynamic duo really sang, making for a musically insightful yet refined combo that was as good as anything I've heard at or near the price. Although tonally a little grey in absolute terms, it was never less than listenable with everything it played. A superb result at the price - with SACD as an added bonus.

**CONCLUSION**

In sonic terms, this new Pioneer combo gives away nothing to any of its price rivals; quite the reverse in fact, as it is not far off the likes of Marantz's SA7001 KI Sig/PM7001 KI Sig. and Audiolab's 8000CD/8000S, despite being considerably cheaper. Factor in what (for me personally) is superb styling and ergonomics,

decent build and useful real-world facilities, and these new Pioneers

make an excellent case for themselves. Of the two, I think the A-A6-J is genuinely special at the price, and represents a budget audiophile

bargain the like of which we haven't seen since its predecessor, the A400. The PD-D6 is a sleek, svelte and sonically accomplished silver disc spinner, and offers bargain-priced entry into what was once the esoteric world of SACD. Welcome back, Pioneer.

**REFERENCE SYSTEM**

- Michell GyroDec/vdH The Frog turntable
- Note Products PhoNote phonostage
- Marantz SA7001 KI Signature SACD player
- Marantz CD63KI DP CD player
- MF Audio Passive Magnetic Preamp (silver)
- Channel Islands D100 monoblock power amplifiers
- Marantz PM7001 KI Signature integrated amplifier
- Yamaha NS1000M loudspeakers
- Black Rhodium interconnects/cables

**MEASURED PERFORMANCE**

Pioneer's A-A6 produces a modest 50 Watts into 8 Ohms, not large by today's standards but still plenty enough for high volume in most systems and homes. This increases to 80 watts into 4 Ohms, and since most loudspeakers these days use 4 Ohm bass drivers, that's what the amp. gives in most circumstances.

Distortion levels were low even at high frequencies, with no sign of classic crossover in the distortion residual. Our spectrum analysis reveals the presence of lower order components only, mainly second and third harmonics, and this didn't change much with level - a good sign. The A6 will have no roughness in its treble and will likely sound easy going. Being a high feedback amplifier it has a low output impedance and high damping factor of 60. Sensitivity was usefully high at 240mV.

The phono stage has bass lift below

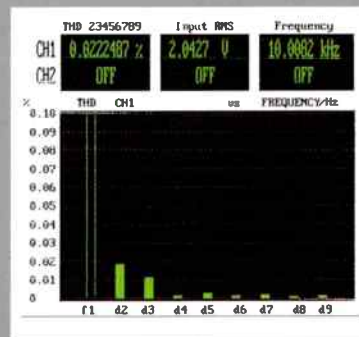
100Hz and no warp filter either, so warps and bass will be accentuated. Equalisation was otherwise accurate within 0.1dB limits up to 20kHz. Noise was low enough, sensitivity useful at 2.4mV and overload satisfactory. So it works well enough, if lacking the last ounce of RIAA accuracy.

The A6 measured neatly enough in all areas. It should give a clean, modern sound, and plenty of bass weight with LP. NK

Power	50 watts
CD/tuner/aux.	
Frequency response	1Hz-73kHz
Separation	88dB
Noise	-100dB
Distortion	0.004%
Sensitivity	240mV
d.c. offset	14/23mV
Damping factor	60

Disc	
Frequency response	50Hz-43kHz
Separation	68dB
Noise	-86dB
Distortion	0.006%
Sensitivity	2.4mV
Overload	65mV

**DISTORTION**



**MEASURED PERFORMANCE**

The PD-D6 was a little unusual with CD, exhibiting a sudden high frequency roll down above 16kHz, our impulse response analysis shows, where most players are flat to 20kHz. This will likely remove some of the sharpness CD commonly suffers, giving a slightly easier sound, without obvious dullness or warmth however. With SACD the player reached smoothly up to 42kHz and was -8dB down at 100kHz, a good result comparable with the best. Our impulse analysis also shows an unusual -0.5dB loss at 20Hz but this wasn't supported by steady tone tests, so will not make itself known in use.

Distortion levels were low with both CD and SACD, the latter producing one-tenth the distortion from CD at -60dB, as a good player should. A very low -100dB tone was resolved cleanly and accurately - always a good sign. This is where SACD is a big

improvement on CD.

Jitter on the digital output was satisfactorily low at 20pS, rising to 80pS in a peak at 16kHz - not as good as some, but acceptable all the same.

All other performance values were good with the PD-D6; it is well engineered. I would expect the PD-D6 to offer a smooth sound with less of the edginess and spitch of conventional CD, plus the greater detail and finesse of SACD. NK

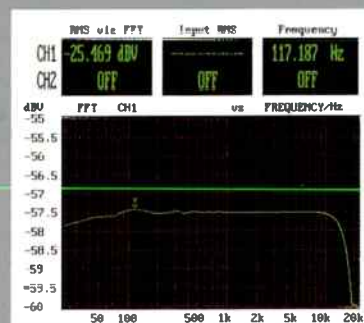
Frequency response (-1dB)

CD	2Hz - 16.25kHz
SACD	2Hz - 42kHz

Distortion (%)	CD	SACD
0dB	0.0032	0.0005
-6dB	0.0033	0.0003
-60dB	0.04	0.005

-80dB	2.6	0.38
-100dB	-	2.3
Separation (1kHz)	116dB	
Noise (CD, IEC A)	-123dB	
Dynamic range (EIAJ, CD)	111dB	
Output	2.24V	

**CD FREQUENCY RESPONSE**



**VERDICT**

**PIONEER PD-D6** £399.99  
Beautiful budget silver disc spinner with a musical sound, decent build and useful SACD functionality.

**LIKES**

- detail, smoothness
- SACD functionality
- style

**DISLIKES**

- nothing at the price

**VERDICT**

**PIONEER A-A6-J** £399.99  
Superbly clean and musical at the price, fine style and good build make this a new budget audiophile benchmark.

**LIKES**

- clarity, grip
- musicality
- style

**DISLIKES**

- dull phono input

**PIONEER PD-D6** £399.99

**PIONEER A-A6-J** £399.99

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E. EMT JSD Cartridge  
F. Luxman 609F  
G. Basis PSTT Cables

H. Basis 2800 & Vector Arm  
I. Feastrex Coastal Drive Unit  
J. AirTight ATM300B  
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### OEHLBACH XXL PHONO STAGE £145

Sitting in a tiny box measuring just 137x50x100mm, the XXL is smaller than most. To eliminate hum, it has an external power supply of the usual wall wart variety which feeds a smooth d.c. supply to the unit - one niggle being a reversible connector that came apart in our hands and was ambiguous in its polarity marking. Pressing the front power

button caused its surround to light up bright blue, which looked attractive. The other button selects cartridge type - MM or MC. The former Moving Magnet provides 35dB of gain, which is low; 40dB is more common; but Oehlbach say that the very latest XXLs have slightly more gain. Amplifiers with reasonably good input sensitivity of 200mV or so are most suitable, otherwise volume will have to be wound up. Pressing the button in selects MC, increasing gain to 60dB Oehlbach say, but we measured a useful 62dB. It also usefully drops input load to 100

Ohms, unlike many rivals that leave it at an incorrect 47k Ohms needed by MMs.

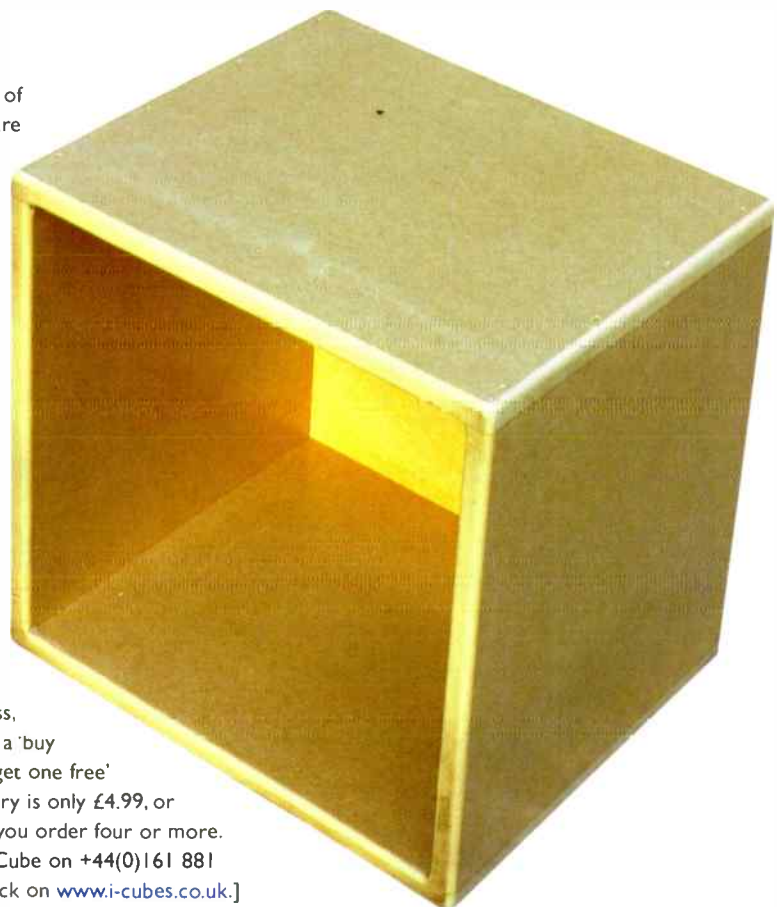
With a low output Ortofon Kontrapunkt b moving coil cartridge there was all but no audible hiss, nor any hum, even with volume cranked up for a low level cut like Phil Collins's 'Hello I Must Be Going'. This is an accurately equalised stage, our measurements showed, and it sounded nicely balanced in use. There was no midband screech from poor quality parts, bass dynamics were tidy and without restraint. Against the *Hi-Fi World* reference Eastern Electric Minimax phonostage, the Oehlbach is more mechanical and less atmospheric, but then the price difference is huge. Tidy in its sound and basically easy to listen to, it was well able to reveal the fundamental strengths of LP reproduction and is a great starter phono stage. [Contact: Acoustat UK Ltd. on +44 (0)20 8863 8979.]

### iCUBE VINYL STORAGE £29.95

Strange as it may seem, but not everyone in this life appreciates the beauty of vast numbers of vinyl records sprawled across the living (i.e. listening) room floor. To this end, enter iCube, a so-called 'intelligent' vinyl storage system, providing a safe house for approximately 100 LP records for £29.95. They're well made, stackable, sturdy and if treated with a coat or two of varnish look the business - and there's even the option of a neat crackle-black finish for £34.99. You could always try housing your black plastic in cardboard boxes of course, or those Stucco record boxes that DJs use, but the former fall apart under the weight of more than a few LPs, and the latter are 'all show and no go' - they look impressive but make your prize vinyl hard to reach.

By contrast, iCubes are an elegant and practical solution, and are even tall enough to accept LPs with polyurethane 'outer' sleeves (that some of us who worship at

the 'House of Wax' feel are essential for the long life of our discs). Some might say iCubes are a little pricey perhaps, but they're still the best long term solution we've come across, and there's a 'buy seven and get one free' deal. Delivery is only £4.99, or free when you order four or more. [Contact: iCube on +44(0)161 881 8112, or click on [www.i-cubes.co.uk](http://www.i-cubes.co.uk).]







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# Slim Line

## Adam Smith auditions Revolver's waif-like AVF floorstanding loudspeakers...

they are supplied with spiked plinths for conventional floor standing locations.

Although originally intended for front channel duties in a Revolver Audiovue surround sound system, designer Mike Jewitt informed me that he sells a surprising number for stereo use on their own. As a result, I was keen to see if the AVFs could cut it when lacking the reassuring heft of a separate subwoofer.

### SOUND QUALITY

The answer is yes, they can. More than capable of filling a room with sound on their own, they generate a capacious soundstage that belies their lack of cubic inches. Bass has good weight and heft, and the AVFs do not struggle when the pace of things increases - in fact, they bounce along very well, with good timing and rhythm. Things were less accomplished in terms of bass detail, as subtle low frequency effects, such as the string intricacies of a double bass, tended to be rather lost in the background.

The soundstage generated by the little Revolvers is surprisingly wide and stable. Whilst not projecting the image behind them greatly, performers are well laid out between and beyond the sides of the AVFs. Coupled with lively and precise midrange, this adds excellent emotion and definition to both vocals and instruments.

Mixing in to this effect nicely is the treble which, although

quite forward, is nevertheless sweet and intricate, with excellent levels of information retrieval. Cymbals in particular had a real impact behind them, and high notes decayed superbly, adding to the sense of space.

### CONCLUSION

The Revolver AVFs are well balanced and enjoyable loudspeakers. They offer a surprisingly grand sense of scale along with good midrange and treble, along with commendable bass weight.

Their forward nature does require a certain degree of thought with regard to matching amplifiers, as our old friend the Naim Nait5i could make things a little spitty on occasion. Make sure this is taken into account, however, and the AVFs turn in a very rewarding performance.

It's always amusing when a new review item comes into the office and everyone who encounters it has exactly the same reaction. Such an event happened with the Revolver

AVFs and the reaction in question was, "where's the second box?"

Incredible as it may seem, the AVFs do indeed come in a box that looks more suitable for one floorstanding loudspeaker, thanks to their miniature proportions. A height of 100cm is conventional enough, but width and depth of 10.5cm and 17cm respectively, put the AVFs firmly into the 'dinky' category. Fortunately, as would be expected from a respected company like Revolver, a good deal of technology is packed into those compact dimensions.

The AVFs are a three-way design, comprising two front mounted 75mm midrange drivers, flanking a 25mm metal dome tweeter. Tucked away on the side of each cabinet is a 130mm woven glass fibre bass driver plus port, and a link that reduces bass output slightly for close to wall placement when removed. The AVFs can be wall-mounted using matching wall brackets, available separately, but

<b>VERDICT</b>	
Charismatic loudspeakers giving an enjoyable sound in a compact package.	
<b>REVOLVER AVF</b>	£999
The Acoustic Partnership	
☎ +44 (0)870 047 0047	
www.revolveraudio.co.uk	
<b>FOR</b>	
<ul style="list-style-type: none"> <li>- surprising bass weight</li> <li>- midrange and treble detail</li> <li>- soundstaging</li> <li>- size, style</li> </ul>	
<b>AGAINST</b>	
<ul style="list-style-type: none"> <li>- bass detail</li> <li>- require careful matching</li> </ul>	

### MEASURED PERFORMANCE

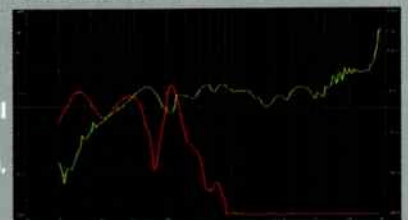
The AVFs have a somewhat uneven nature to their response, with a dip in the midrange at around 1kHz before gradually increasing in output to be no less than 15dB up on average output level at 20kHz. This is not necessarily bad however, as the midrange dip is in exactly the right place to remove any harsh midrange nasties and the increasing treble response will add detail and sparkle to high frequencies.

The bass response is equally uneven, however this is due to measurement difficulties encountered as a result of the side-firing bass driver. A spliced response shows that this operates down to around 100Hz before handing over to the port, which peaks in output at 40Hz. I would expect the AVFs to sound detailed and smooth, but with limited reserves of bass.

Electrically, the AVFs present a smooth and even load to an amplifier, with an average measured impedance of 6.4 Ohms, dipping to a minimum of around 4 Ohms. Measured sensitivity is

good at 87dB and the AVFs should work well with around 50W of amplification. AS

#### FREQUENCY RESPONSE



Green - driver output  
Red - port output

#### IMPEDANCE







# NU Frontier

**NuForce's brand new P-9 preamplifier promises outstanding measured performance at the price, but does it deliver the sonic goods? David Price decides...**

**T**he story so far – small American-based company starts making odd looking, strangely coloured Class D power amplifiers, promising huge power and superb sound per pound. Is successful. Annoys established brands. The end. Well, it's a bit more complicated than that, but you get the general idea – and I'm sure, much to the chagrin of NuForce's rivals, they're not stopping at power amplifiers...

The P-9 is the company's first serious 'high end' preamplifier - high end in NuForce terms, not Mark Levinson, that is. The princely sum of £2,200 buys you this two-box affair. They call it an "ultimate performance audio preamplifier", but don't hold that against them. The quoted figures are indeed impressive [see MEASURED PERFORMANCE for our take on them], but for me the beginning and end of it is how it sounds in situ in my review system, next to my reference £2,750 MF Audio Passive Magnetic Preamplifier, which casts a wide shadow over this price point!

Debuted at the Manchester Show last January, the P-9 was designed by Demian Martin. It's an interesting

design, based on two separate chassis. The first contains three separate power supplies and microprocessor control logic, the second chassis the analogue volume control input selection relays and sensitive analogue circuit components. As you'd expect, it matches the form factor of the NuForce Ref 9 series power amplifiers.

This an in op-amp based design, with "ultra low noise monolithic dual JFETs, specially selected VMOS FETs and extremely flat hFE bipolar transistors arranged in a dual cascode configuration, shield driven to reduce capacitive loading on the final voltage amp". No capacitors or DC servos are to be found in the signal path. The two boxes are linked up with a computer-style bus lead, and a switched IEC in is to be found on the back panel, along with RCA phono inputs and outputs, plus balanced outs – disappointingly, unlike the MF Audio Passive Preamp, there are no balanced ins.

The P-9 is operationally more sophisticated than the MF Audio – not least because of the sleek finish and light, 'snick-snick' action of the controls. The finish is up to NuForce's traditional high standards, although I

found the black a tad oppressive, and welcome the arrival of the distinctive 'burnt orange' colour of the Ref 9SE power amplifiers. There's a white-on-black backlit display, showing input source selection and volume – no prizes for ergonomics but it does the job. Whereas I criticised the ECS Pre recently for having an absurdly large and imposing display, I am doing precisely the opposite here... As for the remote - it's one of the coolest I've ever seen, and could easily have come out of the nineteen seventies Boothroyd-Stuart stable.

## SOUND QUALITY

In a direct, face-to-face shootout with my reference MF Audio Silver Passive Preamplifier, the NuForce P9 managed to hold its own in many respects, despite being £550 cheaper - it is that good. This isn't to say that the two preamplifiers sound the same, as the differences are marked, and I'm sure they're down to the fundamentally opposing approaches of the two products, and not simply about the execution of each respective type, which is excellent.

Kicking off with Be Bop Deluxe's 'Modern Music' on vinyl, I found the P-9 to be an extremely energetic

sounding device, bristling with detail and throwing out a big, assertive soundstage. Within the recorded acoustic, I could certainly hear the NuForce searching out more treble detail, making the MF sound a tad veiled up top. There was a tangible zing to the hi-hats, which shimmered like the sun on still water. This was further substantiated when I moved to Michael Jackson's 'Rock With You', where the P-9 provided a well illuminated treble with more air apparent - in comparison to the MF Audio hi hats were marginally smoother but less sonorous and easy to follow.

'Pastoral' symphony (Karajan/Berlin Philharmonic), and the NuForce put in a spirited performance, with wonderfully spacious and airy treble, deep and powerful yet taut bass and oodles of detail across the midband, with excellent left-to-right image placement. Switching to the MF Audio, I found things a tad more reserved and less spacious across the treble, and it seemed superficially slower and less rhythmically engaging - yet when the orchestra wound up, suddenly the MF Audio preamplifier was the more dynamic and better scaled, with considerably superior depth perspective. That tremendous 'hear through' midband is what makes the MF Audio so mighty, and the NuForce wasn't even on the same page in this respect.

**CONCLUSION**

A good few days were spent darting between one preamplifier and the other, and in the end I concluded that I preferred the MF Audio on rock, jazz and acoustic music, while the NuForce was ahead on pop and electronica. In absolute terms, it's a less 'transparent' sounding



**REFERENCE SYSTEM**

- Michell GyroDec/Origin Live Enterprise/vdH The Frog
- Note Products PhoNote phonostage
- MF Audio Passive Magnetic Preamplifier (silver)
- NuForce Reference 9SE monoblock power amplifiers
- World Audio K5881 (modified) valve power amplifier
- Rotel RB-1092 power amplifier
- Yamaha NS1000M loudspeakers
- Quad ESL989 loudspeakers
- Black Rhodium interconnects/cables



At the opposite end of the

frequency scale, the MF also took a bit of stick. It sounded a tad more fulsome, but marginally slower in terms of attack transients compared to the NuForce, which pushed things along with greater speed in the bass. Indeed, the P-9 was wonderfully quick - its silky but incisive treble allied to its lightning low frequencies was a joy to hear. At the frequency extremes, the MF Audio sounded soft and veiled, and even ponderous in the bass sometimes.

This was really going some for a

"at its price point, the NuForce P-9 is dazzlingly capable..."

preamp that costs over five hundred 'notes' less than the class leader, but much as I loved what the P-9 was doing in the bass and treble, its midband proved obviously less dynamic, detailed or dimensional. The NuForce's commendable speed seemed to hurry the midband along, giving the immediate impression that it was the more musical of the two. However, the MF Audio's trump card was dynamics, where it made the P-9 look less distinguished. Make no mistake, as £2,200 preamplifiers go, the NuForce is superb - brilliantly musically articulate - but it just couldn't quite match the might of the MF Audio in this area. The upshot was that, even with the sedate, jazz-pop of Simply Red's 'Playground', the MF Audio sounded just that little bit more dimensional and dynamic across the midband.

Moving to my favourite DG pressing of Beethoven's

device than the MF Audio across the midband, and less dynamic too, yet is obviously more animated in the bass and explicit in the treble. In its own right then, at its £2,200 price point, the NuForce P-9 is

dazzlingly capable. If you've got around two thousand pounds to spend on a preamplifier, this product recommends itself - it is a class act.

However, surely the question prospective purchasers are asking themselves is whether to save up the extra for the MF Audio? In my system with my tastes, I'd take its wonderful tonal palette, the range of which the NuForce can't quite equal, and the superior midband dynamics which really floated my boat. Had I pair of speakers with a looser bass or less explicit treble than my Yamaha NS1000Ms (the Quad ESL989 being a perfect case in point), I'd opt for the NuForce without a moment's hesitation, with its tighter, tauter lows and more spry and spacious treble. My recommendation then is to try both before you buy. Either way, rest assured that whichever you choose, you're getting a brilliant bit of kit that should stand you in good stead for many years to come.

**MEASURED PERFORMANCE**

The NuForce P-9 is unusual in being all but bandwidth unlimited. It amplifies d.c., and it also has a d.c. output offset, of 13mV and 20mV. As power amplifiers typically have a gain of up to 30, those that are themselves direct coupled will develop up to 0.6V output offset, which is too high to be acceptable. Many sources output d.c. too, which will be communicated to power amps. So this preamp is for a.c. coupled power amps.

The upper frequency limit is 175kHz, higher than usual for audio preamps. The NuForce P-9 offers a modest x2.3 gain, surprisingly from both its unbalanced and balanced outputs; balanced does not give twice unbalanced. With a power amplifier of 1V input sensitivity this level of gain

gives just over 400mV input sensitivity, enough for modern sources, but low for old cassette decks, tuners and many external phono stages. Noise was almost non-existent at 19uV and output overload high enough at 14V.

The P-9 is an ultra wideband, super low noise preamplifier. Its gain is limited, making it best suited to modern sources, but not external phono stages unless they have high gain. NK

Frequency response	d.c.-175kHz
Separation	92dB
Noise	-95dBV
Distortion	0.001%
d.c. offset	20mV
Gain	x2.3
Overload	6V in/14V out

**VERDICT**

High resolution high end preamplifier with a wonderfully engaging sound from head to toe.

**NUFORCE P-9** £2,200  
**HiAudio Distribution**  
 +44(0)8450 252529  
 www.nuforce.com

- FOR**
- atmospheric treble
  - bass grip and speed
  - midband detailing
  - overall musicality

- AGAINST**
- nothing at the price





# Luxury Lifestyle

**Classic Japanese valve brand Luxman is now making its name with high end pure Class A solid-state designs. Noel Keywood auditions the lavish new L-550A integrated...**

**W**hen my lovely shiny, super modern looking Cambridge P50 blew up - as most did! - I ended up with a gold Luxman.

It felt lovely and sounded good, more svelte if less vivid than the Cambridge. Now, some thirty years later, the Luxman L-550A in front of me looks little different from the humble budget model I once owned, in detail at least. Yet the L-550A reviewed here is in truth no ordinary Class B like mine of yore, or the L-505f we reviewed in our April 2006 issue. It is an altogether more ambitious and specialised design, offering pure Class A operation, a difficult technology to domesticate.

Class A transistor amplifiers don't produce the low level mush from crossover distortion that lurks in the background with Class B. They have a reputation for sounding clearer and cleaner as a result. Our

favourite Sugden A21a is a classic example of pure Class A: it streams heat, but boy does it sound good: clean, clear and very composed in a way that few rivals can approach. Curiously, the Sugden, producing 18 Watts per channel, appears to be a rival for the considerably more expensive Lux that is also rated at 20 Watts per channel. But Lux's figures are bafflingly conservative: we measured no less than 78 Watts from this amplifier, which is in line with a hefty weight of 22kg and an equally hefty price tag of £2,800; I'd expect a little more from it than the Lux Corporation!

The large heatsinks of Class A amplifiers always run burning hot, but in the L-550A they are inaccessible, lying inside the casework. Large bottom and top vents allow the heat to escape, but the casework stays cool, even after hours of use. Lux have always made a user-friendly hi-fi product, packed with every facility.

This amplifier has tone controls with a bypass switch, provision for two sets of loudspeakers with switching between them and off, a record source selector, headphone output, an unusual mode selector that offers the option of left channel through both left and right, right channel through both, mono and stereo. There is one phono input, switchable for Moving Magnet or Moving Coil on the front panel, where Lux also provide a switchable warp filter - always a useful facility as it suppresses loudspeaker cone flap from warped LPs.

Unlike amplifiers of yore this one has two pairs of XLR socketed balanced inputs in addition to normal phono socket unbalanced inputs. They are both line level, one for CD and the other for general purposes. Why use these inputs? They are for the connection of sources fitted with balanced outputs, using an XLR lead. This avoids hum loops and provides



cancellation of induced noise and some distortions. I regularly get sceptical letters about this from engineers who know that running via balanced connections can mean going through two extra chips, suggesting worse rather than better quality. In the Lux L-550A however, our Rohde & Schwarz UPL spectrum analyser showed there were small but clear improvements available through the balanced inputs, from 0.0055% to 0.002% distortion for example at 10kHz, so scepticism is best suspended, I suggest! There is no balanced output from the preamp section, but Lux do offer an external bridging link between pre and power amps through phono sockets, so you can set up an unbalanced output from the preamp.

The large front panel meters actually show output volts in dB terms, full output (25V) being marked as 0dB and -20dB (ten times less) on the scale being 2.5V. The meters proved quite accurate in their calibration.

Lux amplifiers have a distinctive feel about them. The switches have a soft, almost springy action about them, rather than the hard click of a strongly sprung detent. It's nice enough all the same. I hear loudspeaker sockets are screw type that accept bare wire or 4mm banana plugs. Lux provide a remote control too, which is nicely made and controls all the basic facilities.

A Lux amplifier is always nice to use and I enjoyed my time with the L-550A. Those big, illuminated meters look the business and usefully warn of approaching overload if you really push it. This alone makes them a useful tool, rather than an attractive electronic bauble.

### SOUND QUALITY

I spent some time with the Lux before really getting a hold on what it was doing; this isn't an amplifier to coat music with honey; quite the reverse it is ruthlessly revealing and of a dry, almost sparse nature that seems initially ungenerous. What the Lux reminded me about was recording quality and what might really lie on the discs I was listening to; by looking deeply into recordings it did not always come up with the loveliest interpretation; more it was frankly and sometimes brutally revealing.

With a nicely assembled and recorded performance from the Stranglers in 'You Always Reap What You Sow' however, I was enormously impressed by the L-550A. Kick drum was firm and Jean Jaques Burnel's bass guitar had a quality and presence that struck me as more characterfully comprehensive and plausible than I am used to. This amplifier really fleshed out the timbral character of instruments, yet it didn't artificially enrich them.

Horns rasped out strongly from a clear background in 'Mayan Skies' and Jet Black's drum work was sharply outlined, each strike of the kick drum coming over with a sharp crack. Against other amplifiers this one is an analogue delight in that it teases out every last nuance of complex performances and lays it out with a vivid clarity that is starkly revealing. In doing so the L-550A comes over as unusually tight at low frequencies, likely as a result of its unusual negative damping factor. It was much more retentive than a Naim for example, which has a low positive damping factor, and I chose to use our fairly rich sounding Eastern Electric Minimax





CD player to achieve a balance: more on this later.

The telling drum strikes at the start of Steve Earle's 'Copperhead Road' underlined the extreme grip of the Lux and - interestingly - this was apparent with LP also. Paired with our Pioneer PLC-590 currently sporting an Ortofon Rondo Bronze moving coil cartridge in an Audio Origami PU7 tonearm, the L-550A was again ruthlessly revealing, coming across as fast paced and totally in control. 'She's My Man' thundered out from the Luxman, sounding faster than ever from the Scissor Sisters, who I suspect have their studio material speeded up! All the same, the amplifier's grip on pace coupled with vast revelation make it a jaw dropper with modern 45rpm vinyl like this.

With no one around, I put on a new 180gm vinyl of the Who and 'The Kids Are Alright', a song that brings quizzical stares from anyone not there at the time. This isn't the



greatest of recordings: the question always is will I enjoy it? Through this amplifier the answer was a massive 'yes'. Moon's drumming was explosive and Daltrey's vocals as clear and convincing as I've ever

forceful full left and right images than the Minimax via unbalanced inputs, it widened the sound stage considerably. The sound stage also fell back in terms of depth. Time domain events became particularly

"Class A at its most vivid - a superb way of hearing what is on the disc..."

heard them. Where other amplifiers tease little out of this old recording, the Lux brought everything out. The L-550A puts real life into vocals by revealing every little nuance, intonation and the full timbral signature, yet without warmth. 'Talkin' About A Revolution' went on as I wound the vinyl years on and again the Lux showed just what a supreme master it was at placing Tracey Chapman in the room, free from artifice. This amplifier constructs a tapestry of detail, one that's starkly presented but gripping. Here is Class A at its most vivid - and an utterly superb way of hearing what is on an LP, modern or from the past. This is an amplifier to silence those doubters of vinyl; it brings forth its glories without the slightest contrivance.

Finally I managed to secure a fully balanced CD player, an Audia Flight CD Two and this proved a whole step up for CD sound quality when connected with XLR leads to the L-550A's balanced CD inputs. Firmer and more

forceful: back to the Stranglers and both the strength and pace of Jet Black's drumming was superbly revealed in 'Was it You'. Sliding into 'You'll Always Reap What You Sow' and now instruments had a naked power and independence on the sound stage that is a rare occurrence. In my increasing experience of using balanced connections I find generally that there is usually a perceptible lessening of mush, better image focus and seemingly improved dynamics. This was very apparent with the pedal steel guitar that rang out from our Spendor S8e loudspeakers as the Stranglers track ended. The Lux's revealing nature capitalises upon the benefits of balanced connection to yield a breathtaking final result.

**CONCLUSION**

The big Luxman is an expert's amplifier. More revealing and less flattering than most, it is challenging. But then this is Class A; Sugden's A21a isn't a shy performer either, it just has less power than the L-550A. If you want an amplifier that is almost frighteningly revealing and dramatic when partnered with top quality sources, this is it. I strongly recommend using a balanced CD player with it, and a high quality turntable combo, as then it can give a dramatic performance from silver disc and vinyl.

By managing to work successfully with both, and at the same time offer a wealth of facilities, this is a massively capable amplifier. Superbly honed, it is a top choice for those who are looking for the highest level of resolution from silver and vinyl discs.

**VERDICT** ●●●●●  
Powerful and revealing Class A sound allied to great build and useful facilities make this an extremely impressive amp.

**LUXMAN L-550A** £2,800  
Select Audio  
+44(0)1900 813064  
www.luxman.co.jp

- FOR**
- highly revealing
  - balanced CD input
  - fine phono stage

- AGAINST**
- dry bass
  - stark presentation

**MEASURED PERFORMANCE**

Although a Class A design, which usually means limited power output, the L-550A produces a substantial 78 Watts into 8 Ohms and 114 Watts into 4 Ohms, so there's plenty of power available. Better still, it produces minimal distortion right across the audio band, and up to full power output where there is no sudden change of transfer characteristic that 'substantially Class A' amps show.

The balanced CD input gave even better results than the unbalanced phono socket input, with our analyser revealing that distortion fell to a minimal 0.002% when delivering 1 Watt output into 8 Ohms at 10kHz, contrasting with around 0.005% via unbalanced inputs - a revealing test. This is a low distortion design and should sound clean.

The amplifier has plenty of bandwidth via CD, and LP frequency response goes down to 8Hz on MC and 4Hz on MM, so Luxman wisely fit a front panel switchable warp filter. The MC stage is a little noisier than independent units, so it is best with higher output moving coil cartridges. With the ability to handle very low frequency signals and an unusual negative damping factor the L-550A will likely have a dry balance, combined with tight, deep bass.

All inputs, including balanced, were very sensitive, needing just 170mV for full output, so the volume control will be set fairly low most of the time.

The Luxman looks good under measurement, turning in an impressive set of results. It should give the classic clarity of Class A but with the added benefit of a healthy power output. NK

Power Output 78watts

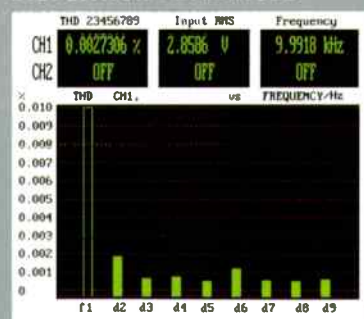
CD/tuner/aux.

Frequency response	1.5Hz-42kHz
Separation	66dB
Noise	-79dB
Distortion	0.002%
Sensitivity	170mV
d.c. offset	9/7mV
Damping factor	-46

Disc

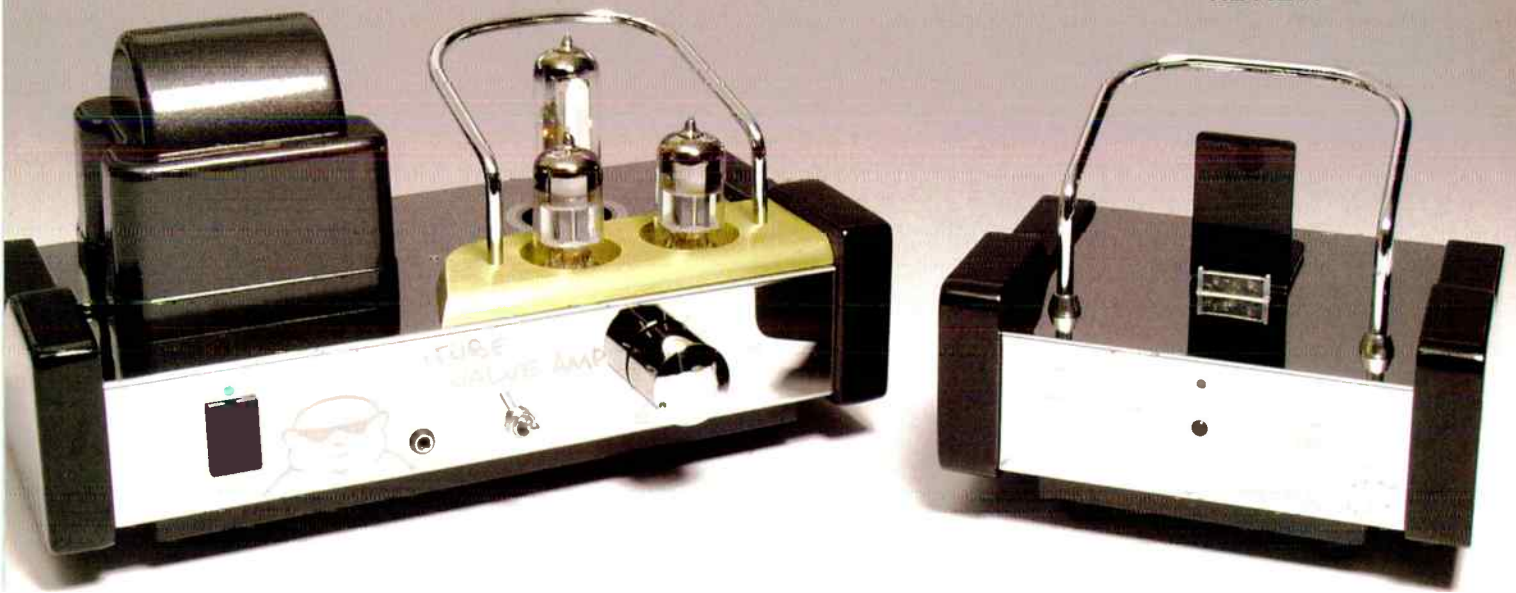
Frequency response	MM 4Hz-91kHz MC 8Hz-50kHz
Separation	65dB
Noise (MM/MC)	-64/66dB
Distortion	0.006%
Sensitivity (MM/MC)	2.7/0.3mV
Overload (MM/MC)	150/16mV

**DISTORTION - BALANCED**



**DISTORTION - UNBALANCED**





# Fat Fighter

The Fatman iTube isn't the first valve-based iPod docking station package to hit the market, but it is the most accomplished. Patrick Cleasby goes back on the bottle...

I first became aware of the existence of the Fatman iTube at the Christmas Party of one of its distributors, where it was the star prize I failed to win. A loud West End basement bar and a banging Nano didn't afford the best opportunity to assess its finer nuances, so I welcomed the chance to listen in calmer surroundings.

Between Christmas and the Bristol Show the iTube was apparently doing great business both as a mass-market novelty (valves - surely they went out with the Ark!) and as a word-of-mouth audiophile success story. The version reviewed here is the speaker-less dock and amp combination which should set you back around £270. Don't waste your time with the sets including speaker, they are for the high street crowd.

So is there more to it than the simple appeal of rotund bloke-in-sunglasses branding? In a word, yes. Having just completed auditioning some new reissues and some prized oldies in my high end universal player/AV amp combination I can report that the iTube is every bit the equal of some grand solid-state setups in sonic terms.

The downside is the fact the iTube is so evidently cheaply 'Made in China'. Ditto the remote, whose faint echoing of old school white with shiny back iPod-ism is bound to wear or scratch off to an unappealing plastic backing. Still, once the iPod is docked it's nice to have full remote

control functionality for the iPod, with tone controls very useful to iron out any lack of bass in the silky valve-born versions of some tracks.

The Fatman sang out my lossless tracks - the impossibly huge bass in both Prefab Sprout's 'Faron Young' and Dave Gilmour's 'On An Island' impeccably rendered, but not overpowering the mid and higher ranges. The Man Machine' from Kraftwerk's 'Minimum Maximum' was rich and exciting as ever, and even VBR MP3s of dubious provenance sounded reasonable. The maximum allowed 160kbps AAC on homemade DVD ripped iPod Video sounded very fine indeed. It is warm and sweet, as you'd expect from a valve amplifier; but don't think it's an Audio Note Ongaku on the cheap - because it isn't. In absolute terms, we're talking very limited power and a samey rose-tinted tonality, but at least it makes digital sound warm and inviting.

The Fatman iTube's looks are not going to be to everyone's taste - in fact a female of my acquaintance described it as looking as if it belonged in an <expletive-deleted>

bachelor pad, but its sound should be enough to win any waverers over. However, worries over some interference in the docking unit (there's some low level electrical noise when the iPod's disk drive is

searching out a track) must lead to the docking (ho ho) of one globe from what would otherwise have been a five globe review.



## VERDICT

Superb value iPod amplifier, although styling is questionable and the docking station less than perfect.

**FATMAN ITUBE** £299  
TLAudio  
+44 (0)1462 492090  
www.fat-man.co.uk

## FOR

- euphonic valve sound
- magic eye!

## AGAINST

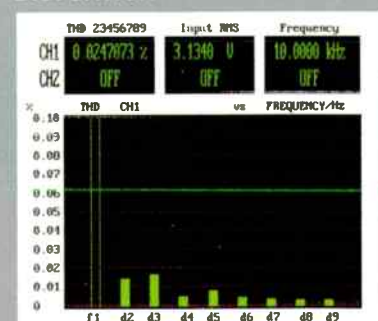
- mediocre dock
- temperamental connection
- cheap finish/remote

## MEASURED PERFORMANCE

This is a hybrid amplifier with valve input stages, a wonderful EM84 'Magic Eye' as it was known, and solid state output stages; there are no output transformers, just a single stack for the mains transformer. We measured 10 Watts into 8 Ohms and 20 Watts into 4 Ohms, but they were clean watts, with just 0.01% distortion in the midband and at high frequencies, free from crossover products. So the power amp is a decent design, not any old rubbish simply because of the role, reproducing compressed digital audio - unless you are using Apple lossless, of course. Frequency response was wide, extending from 10Hz up to 70kHz. Input sensitivity was high at 340mV. So this little box is very nicely engineered, being technically elegant as well as visually striking. NK

Power	12watts
CD/tuner/aux.	
Frequency response	10Hz-70kHz
Separation	82dB
Noise	-95dB
Distortion	0.01%
Sensitivity	340mV

## DISTORTION







# n-Vious ?



## bloody right

World class sound with clarity of vision. This powerful new performer boosts the home cinema experience up to a whole new level.

**n-Vi** An upgradeable high-end, integrated DVD player, DVD-A player, CD player, AV processor, audio pre-amp and 5 channel power amplifier - **all together** in one neat package. Digital audio inputs for integration with your games console, satellite receiver and mp3 player, plus optional FM/DAB radio module.

Experience full Dolby® Digital, DTS, Dolby® Pro Logic II and Neo:6™ surround sound from the comfort of your own armchair. Brought to you by the people with a passion for sound. So you can enjoy movies like never before.

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iPod is a trademark of Apple Computer, Inc.



world class sound... with vision

World Radio History

# On The Run

This month's running report sees David Allcock tell the story of his current reference system...

I came to the world of hi-fi later than many fellow audiophiles. It was at the venerable age of sixteen that I decided I wanted the best video recorder money could buy, which at the time was a JVC HRD-370EK with 'Hi-Fi Stereo' audio capability! To make the best of this, I purchased a Realistic stereo receiver, Technics cassette deck and a used pair of Sony three-way speakers. Suddenly, things stopped being mangled by the family's Amstrad rack system, and I found myself increasingly listening to music!

After eighteen months, I started looking for a CD player, and this led me to the Denon DCD1500 MkII, a stunning multibit player, but at the same time I heard an Audiolab 8000A amplifier, which when partnered with the Denon amazed me. I also heard a pair of SD Acoustics SD-3 standmount speakers, and a Denon DRM-24HX 3 head cassette deck. Whilst a purely digital system initially, a day listening to a friend's Linn LP-12/Ittok/K9 combination showed me the error of my ways, so within the month I found a mint, used Michell Syncro with Linn Basik arm. At this point, the entire system was housed in a room only 3.2 by 2 metres!

Another eighteen months passed until I started to look for an upgrade to my system, and knew that I wanted a source better than the Syncro. After auditioning, and being disappointed by, most of the suspended subchassis designs such as the Pink Triangle PT TOO and Michell GyroDec, along with what was considered to be the best arm

at the time, the SME V, I eventually heard about a new US turntable called the Basis Gold Debut, a formidably expensive deck which was engineered on a massive scale by an ex-aerospace engineer.

In 1991 I finally heard this turntable, along with the original Graham tonearm. After auditioning a pair of Magneplanar 3.3R speakers I knew I'd found the sound I wanted, and in rapid succession heard the Apogee Stage and Martin Logan Sequel speakers, but in every case they would not even fit in my room, and clearly a room upgrade was necessary. Over the next three years I put the equipment upgrade plans on hold and instead converted my garage into a listening room. The new listening room meant I could really take the gloves off, so I installed a full home theatre with a CRT front projector, but now the SD-3 speakers were struggling to fill the new 7x3.5m space. In 1995 I was fortunate to find a mint used Basis Gold Debut Standard being sold by a dealer in the USA, and the same dealer supplied a Graham 2.0 tonearm, along with what was considered by many to be the finest phono stage available, the Klyne System 7PX 3.5.

After this spending spree, I realised that to fulfil my ambition to use a panel speaker, I would need a pre/power combination, and again I looked to the USA for my preamp, which materialised in 1996 in the shape of a Krell KRC-3. I was finally in the position to purchase the power amp and speakers, and after listening to several of the suspects available at that time including the Magneplanars again, but also the Apogee Caliper and Wilson WITT, I decided upon the Martin Logan SL-3, and now needed a



monster power amp to drive them. I was hearing good things about the Bryston 7B-ST and I purchased a pair of these used in the UK, and finally an ex demo pair of Martin Logan SL-3 hybrid panels. Needless to say my CD performance was now lagging behind, and once again the Internet came to the rescue with a used Wadia 64.4 DAC in 1997.

Whilst this system ran unchanged for four years, a couple of weeks with a Perpetual Technologies P-1A upsampler/P-3A DAC in 2001 meant an upgrade for my CD performance. Time spent with the Bryston 14B-SST in 2002 brought about my next upgrade, replacing the 7B-STs. Good as the 14B-SST is, I felt a more modest, real world amplifier was needed for my system, so the 14B-SST was supplemented in 2004 by its little brother, the 3B-SST. I returned to using a single box CD player in 2006 when I heard Shanling's radical CD-T300 Omega Drive, whilst SACD playback is handled by a Shanling SCD-T200

I am delighted with my current system's performance, with only an arm and cartridge upgrade planned this year. This system is capable of astonishing dynamic range, a stunning, holographic soundstage and a smooth frequency response from 35Hz to 20kHz. Whilst this system is an outstanding reviewing tool, it never ceases to delight with its musicality and energy regardless of the material it is given. It's been a long climb, but I'm getting close to the top of my stairway to hi-fi heaven.





# Rock On!

**For many, mid-price Denon universal players have been where it's at for upscaling Standard Definition DVD Playback, so does the new DVD-3930 cut the mustard in sonic terms? Patrick Cleasby decides...**



It is amazing that the universal player concept holds firm in 2007. Here we are, half a decade after high resolution multichannel audio first reared its doomed-to-fail head, and we still regularly test players designed to play two basically legacy audio formats which, barring the odd Sony-related SACD releases (Rickie Lee Jones and Danny Elfman? Fine, but hardly A-list!) are almost impossible to buy.

Personally - and I know there is a small minority of our readership who will agree with me on this - I am grateful that a pool of great players exists, which will (via secondhand purchases on eBay no doubt) ensure that we who hold a reserve of incredibly valuable hi-res discs will be able to listen to what digital music should have sounded like well into our dotage...

Denon have always been top of the class (or thereabouts) in this regard and continue to add bells and whistles to their wondrous devices that make each successive generation more desirable than the last. In terms of current video and audio specs there is almost nowhere to go for Denon short of tackling the knotty issue of HD-DVD/BD universals which play all prior 12cm formats decently - a challenge which quite probably only Marantz and Pioneer (separately or together) are in an equal position to attempt.

Where Denon really score over the current opposition (Arcam

DV137, Marantz DV9600) is that when you drop beneath their flagship A1XVA to the DVD-3930 reviewed here, we are looking at a very wallet-friendly £900 or so - a fair few hundred notes saved there, Terence...

Where are the economies made? Well, the 3930 is functional and Japanese where the Arcam is artfully British and the Marantz is tastefully Europeanised, but all snobbery aside, depending on your preference of hires formats the 3930 could be the one to go for.

All three offer the 1080p upscaling which I am regrettably mere weeks away from being able to test out properly, but that's all about the video, which may not concern Hi-Fi World readers one jot. Likewise all three are HDMI 1.1 level - so digital multi-channel DVD-A via the single AV link is permitted, but not SACD. The Marantz lacks the Dix playback which the other two cannily sport, but only spotty oiks download that stuff, right? Well wrong actually, but let's allow Marantz-lovers to scorn our nefarious tendencies. But with the Arcam being a first-time-out SACD player for that company, surely Denon's longer experience in universals should pay? Well, it does, but in a curious, and frustrating way...

## SET UP

How is the beast to handle and install? Well, cosmetically it is virtually indistinguishable from the couple-of-years old, 1080i 3910. An attractive player, it lacks the heavy-duty

individuality of both the DVD-A11 and the DVD-A1XVA, and looks solid but ordinary, with a lumpy old remote which is in keeping. The usual multi-coloured display can also be an unappealing distraction.

However, rear panel connectivity is nigh-on perfect for this level of player. The dated IEEE1394 audio option is gone, and the space released is used to add a high quality BNC option for the component video connection.

Regrettably, although the 3930 offers digital surround DVD-A and SACD output (for those with a suitable Denon Link third edition AV amp) I was not able to audition this capability for want of a higher than DL SE amp. For comparability to prior reviews, and ease of connection to our current surround reference Arcam AVR350 amp, surround audio was rigged using a TCI interconnect 5.1 phono snake.

As usual, my stereo auditioning for HDCD, SACD and DVD-A was done using the left and right of this phono loom, bypassing the Denon AL24 processing issues with the analogue stereo outputs of the 3930 outlined in NK's test results. Digital interconnect for CDDA, DTS CD, and DVD Dolby and DTS was achieved, again as usual, with a Chord Prodac Pro cable. Video connection for BNC Component was also done with a Chord cable, but HDMI was connected with a Missing Link HDMI 1.3 (1080p compatible) cable. Video monitoring was via a Toshiba



768 vertical pixel LCD screen, with upscaling resolution set to 720p.

To the uninitiated, the routine to configure the 3930 may be a bit daunting, with initial setup constituting 15 out of 50 pages of the English section of the impressively detailed manual. If you have any familiarity with DVD-Video and hi-res surround audio concepts you should be able to set up the 3930 adequately, but the sophistication and complexity of the machine's video setup may mean that it is preferable to use the services of a professional installer, or at the very least make use of a Digital Video Essentials DVD, in order to make the best use of your expensive DVD Player.

## IN ACTION

Here's a confession - reviewing a number of these players in recent months has even started to concern me that I may be boring you with roughly equivalent batteries of tests using the same audio and video material, but it really is the best way to provide comparability between equivalent players.

To get video out of the way first, it was immediately apparent that while the BNC component terminals provided a fine image, HDMI in 720p mode was marginally superior. The usual tests of standard definition DVD performance were used, with the excellent chroma test of Miranda Richardson's livid red lips in 'The Goblet of Fire' ably demonstrating that while the Denon surpassed the

colour performance of the Marantz it lagged significantly behind the luscious capabilities of simple Xbox HD-DVD replaying the same material in 720p! To that test was added the equivalent one of 720P Blu-Ray from PS3 versus the same material from SD DVD on the 3930 - in this case the lurid fluorescent green/pink skeletons in the bar scene of 'The Corpse Bride' - once again the HD version firmly hammers in the nails on the coffin lid of the old 'upscaled DVD is just as good' argument - it isn't!

Once we moved on to good old CD auditioning it was impossible not to essay the impeccably remastered (by original producer Thomas Dolby) 'Steve McQueen' by Prefab Sprout. Playing digitally into the AVR350 via the Chord digital cable the mighty bass sounds and gossamer-light vocals of the first four unsurpassable tracks were good, but in particular the

lossless AAC) via an Arcam rDock. The Denon was impressive across the midband on CD, with a very clean and smooth midband and a delicate treble. Better still, a spin of King Crimson's HDCD 'Thrak' album lent an exquisite delicacy to 'Walking On Air' via the 5.1 L/R outs. Overall though, don't buy this player for the ultimate Red Book Compact Disc playback - it is very good as universal machines go, but similarly priced bespoke CD spinners will do better still.

This was followed by the standard SACD/ DVD-Audio comparative test - Steely Dan's 'Babylon Sisters'. For some reason, counter to usual practice I did SACD first, and was rewarded with an exquisite, nuanced, enveloping surround performance, far exceeding any other universal player I have ever tested, compelling me to carry on listening to the album. "Great". I

"I was genuinely amazed to hear SACD sound so perfect..."

sibilant vocals of 'Bonny' were better rendered by the analogue surround outputs, through which the music sounded satisfyingly warm and sweet.

Neither analogue or digital outputs were able to make the best of Guy Pratt's bass on David Gilmour's 'On An Island' - more realism was to be obtained from the same material on my iPod (playing

thought, "they have finally matched their DVD-Audio performance!")

Er, no. Unfortunately as soon I played the 'Gaucho' DVD-A I could tell that the DVD-Audio playback was sorely lacking in comparison. It sounded brittle, harsh and lacking in cohesion, and I was unable to listen to the entirety of the track. But it didn't stop there. Moving on



# Essential Components for Clean Power

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## *Tim de Paravicini*



listenable, and ye olde CD and HDCD are a delight (particularly the latter). I would imagine Region 1 freaks are in the minority these days (all the ferocious early adopters have gone over to trying to work out which Blu-rays will actually play on their Zone B PS3...) but the fact that in common with most Denon universals since the DVD-A11, the 3930 is easily handset hackable to make it multi-region (tip – try it a few times...) is one more checkbox ticked...

The real cheapskates who realise that their Xboxes and PS3s are rubbish for standard DVD playback tend to go for cheap universal players, but the savvy ones will go for the Denon DVD-3930. I agree with you, this really is the one to go for, with the sole globe-dropping caveat that if you're at all interested in DVD-Audio, look elsewhere. If you are with 99.999% of the normal population, forget that and call this a five star review.

to the same band's 'Everything Must Go', it was apparent that the overall character of the 24/96 surround track was similar to the earlier album, and worse, the usually plainly discriminatory 24/192 stereo on the title track sounded no better at all.

More bizarrely, (and indicative of the machine being tuned for simple DVD-Video performance), choosing lossy surround music formats gave much more satisfactory results – both Don Henley's 'End Of The Innocence' DTS CD, and Ben Folds' 'Songs for Silverman Dolby Digital Dual Disc sounding smooth and musical. As Marvin Gaye once wondered, what's going on?

**CONCLUSION**

If you really wish to spend the best part of a grand on a standard definition film player you couldn't do any better than to plump for this Denon. The only issue is that if you haven't seen disc-based HD yet I urge you to tap up a Dixons Stores guy or a mate and take a peek at how the two HD games formats treat their respective film disc formats, then imagine what even a Samsung or LG HD universal (let alone a putative Marantz, Denon or Pioneer) could do with them. Trust me, you'll be spending that grand on two games consoles and a few software titles if you have any wisdom – HD is that good, film buffs!

Much lower on the priority list,

having fondly cherished a Denon DVD-A11 for a number of years as the ideal pre-1080p universal machine, it is with deep regret that I have to report that any self-respecting DVD Audio lover should definitely make sure they audition the DVD-3930 prior to purchase. Coupled with both mine and Noel's problems with unexpected muting, it is to be hoped that our issues with this player may be due to a duff sample, as middling DVD-A performance and random behaviour are not typical Denon traits.

On the other hand, SACD lovers should rush to sample the lush joys of the DSD playback on the 3930. I was genuinely amazed to hear a Denon making what has previously seemed to be very much a secondary format for them sound so perfect.

Even if your horizons are primarily limited to DVD-V with a bit of CD on the side, you should consider the DVD-3930. Both Dolby and DTS are rendered extremely



**VERDICT** ●●●●●  
Blinding SACD and fine Compact Disc sound, but DVD-A proved less impressive on the review sample. An excellent do-it-all product all the same.

**DENON DCD-3930** £900  
Denon UK  
☎ +44 (0)1753 680568  
www.denon.co.uk

- FOR**
- great SACD
  - class leading DVD video
  - 'handset hackable'
- AGAINST**
- DVD-A sound
  - stodgy remote feel

**MEASURED PERFORMANCE**

Audio from CD via the 2channel (i.e. stereo) output undergoes AL24 processing, but from the 5.1ch surround sound output (Front L&R) is unprocessed. Denon's processing scheme reduces bandwidth quite drastically, to just 8.5kHz (-1dB) our measurements show, and CD via the stereo outputs will sound less sharp than that via Surround Sound outputs as the latter reached 21.3kHz, measurements revealed. However, with SACD and DVD-A the 2ch stereo outputs gave much the same results as the front L&R Surround Sound channels, albeit with a tad less distortion.

Both SACD and DVD-A distortion figures were very similar and around ten times better than CD at low levels, as expected so the Denon works well here. As usual, SACD reaches 45kHz against DVD-A's 91kHz and it has more supersonic noise, so it looks worse, but these differences are academic.

Channel separation and noise levels were fine, as was CD dynamic range.

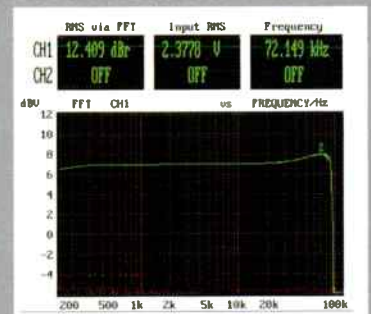
The DVD3930 does it all - and well measurement shows. The 2ch outputs give an unusual result from CD, due to AL24 processing, but the Front Left and Right Surround outputs avoid this. SACD and DVD-A worked well. NK

Frequency response (-1dB)	CD AL24	SACD	DVD-A
CD AL24	2Hz - 8.5kHz		
CD surround	2Hz - 21.3kHz		
DVD-A	2Hz - 91kHz		
SACD	2Hz - 45kHz		

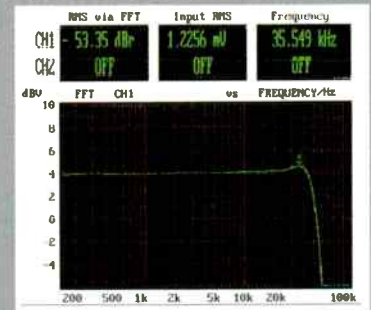
Distortion (%)	CD	SACD	DVD-A
-6dB	0.0006	0.0006	0.0002
-60dB	0.21	0.03	0.028
-80dB	2.8	0.31	0.31
-100dB	-	2.4	2.7

Separation (1kHz)	110dB
Noise (IEC A)	-101dB
Dynamic range	111dB
Output	2.2V

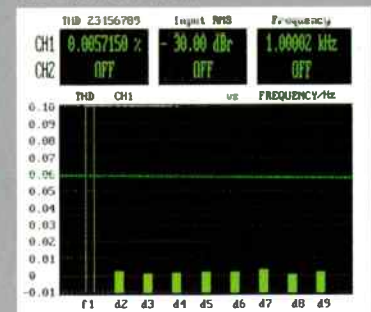
**DVD-A FREQUENCY RESPONSE**



**SACD FREQUENCY RESPONSE**



**CD DISTORTION**





# A1 Sound

**The latest attempt by a manufacturer to achieve true full range performance from a single drive unit, Aurosal's A1 loudspeaker is given the once over by Adam Smith...**

It is time once again for me to unburden my soul with a confession. It just so happens that there are four words that strike dread into the depths of my soul and can even set me off into a healthy nervous twitch. No, not "the barrel's empty, sir" but "full range drive unit"...

You see, my former colleagues and I spent long enough attempting to design such items for customers to come to the conclusion that the whole affair was a case of deciding which compromise was appropriate. We lightened cones to increase high frequencies and listened to them howl as they entered breakup; we added twin cones (surely the work of the devil) to extend high frequencies and watched as they introduced huge off-axis frequency response chasms and increased distortion; we wound lightweight coils to reduce moving mass and watched as they went up in smoke on power tests. Ultimately we all came to the conclusion that full range drive units are probably more trouble than they are worth.

In many ways, this was a shame, as the single drive unit has many things going for it, in theory at least, not least the goal of being a proper point source. However it is asking a heck of a lot of a single unit to reproduce everything from low bass (which requires a large surface area to shift air) to high treble (which requires low moving mass). It is for this reason that the likes of Tannoy's Dual Concentric designs, KEF's Uni-Q drivers and, to a lesser extent GLL's ICT technology found a loyal band of followers, as placing the treble driver at the 'throat' of the bass unit approximates that point source nicely. However, Aurosal reckon they have come up with a genuine solution...

Generally, when designing any loudspeaker drive unit, one of the main goals is to minimise or control the breakup of the cone as this can cause horrendous distortions. In a multi-way system, this is, of course,

filtered out by the crossover; and so is far more important in a full range system. What Aurosal claim to have done is made use of a driver that deliberately incorporates a certain amount of flex in its operation, a property which can be harnessed in order to augment the performance of the unit. As a result, Aurosal claim "unrivalled detail resolution and clarity throughout the frequency range" and a near flat frequency response from 44Hz to 22kHz..

The drive unit used on the A1s is a 4in (100mm) unit, with light metal alloy cone incorporating "tailored flex", a rubber surround and, unusually for a main driver, ferrofluid damping. Although visually similar to a popular off-the-shelf-unit, it incorporates various modifications, specified by Aurosal's Kevin Warne. Contained in a compact, ported enclosure measuring 360x205x270mm (HxWxD) and weighing 7kg, the A1s are neat standmounters. Auditioning took place with them sat atop Sound Organisation Z1 stands and powered by Naim Nait 5i and Luxman L-550A amplifiers.

## SOUND QUALITY

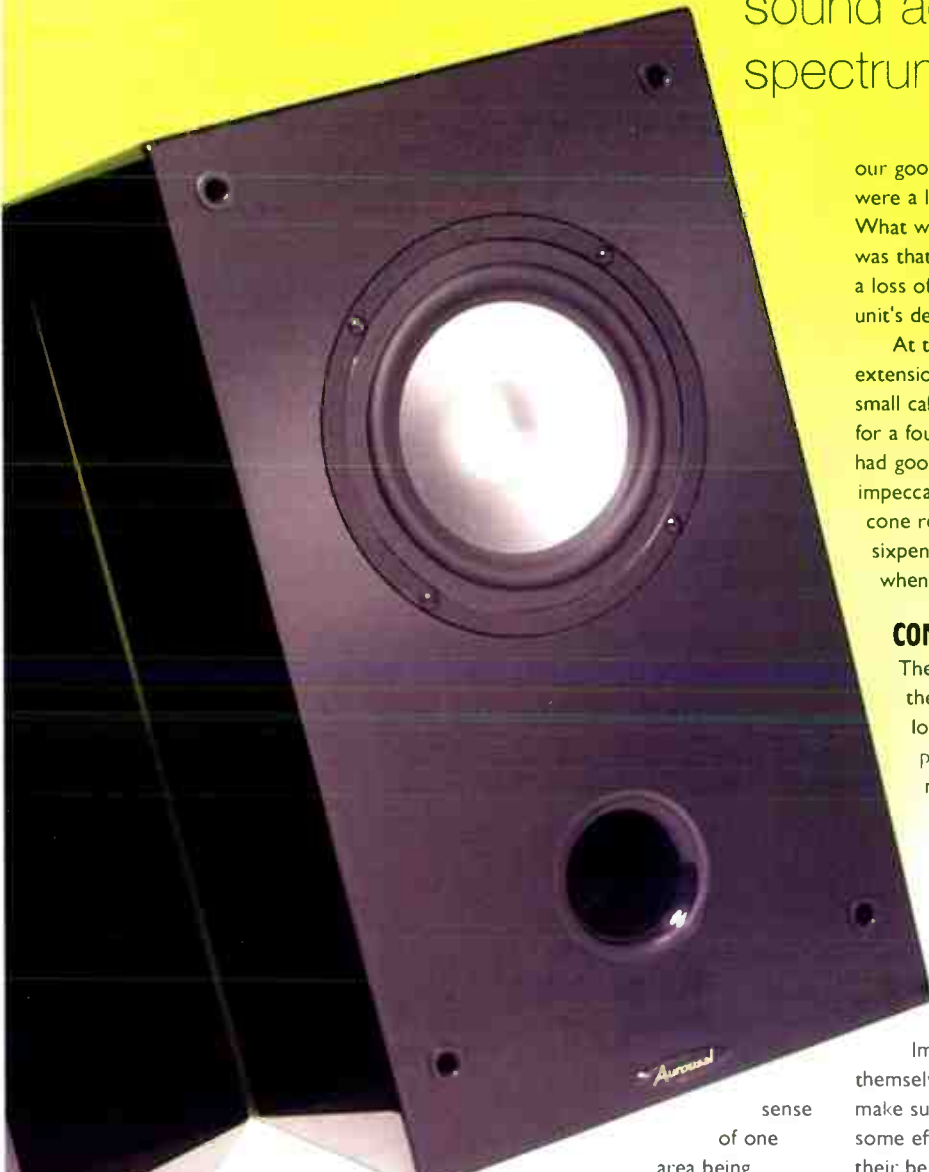
The opening bars of the first track I played had me transported straight down memory lane. You see, I lived with two different pairs of GLL Imagio series loudspeakers for a number of years, both of which used GLL's ICT drive units. The Aurosal A1s have a very similar balance to

my now-departed Imagios and it was easy to remember what I liked about them.

Firstly, their use of a single drive unit really does work wonders for imaging, although I found that you have to do a bit of legwork in order to maximise their potential. Aurosal recommend that the 'speakers are set up close to a rear wall and toed in so that their effective axis crosses in front of the listener. Of these, I would say that the wall placement is more of a personal preference. Whilst the A1s did indeed sound fine up against our rear wall with a good, punchy sound, I found that they could also become too hard like this, and



"they have a well-integrated sound across the frequency spectrum"



our good old Celine Dion test CD were a little hard on the ear at times. What was commendable, however, was that this did not come across as a loss of control - testament to the unit's design.

At the bottom end, bass extension was very good for a small cabinet, and quite astounding for a four inch drive unit! The A1s had good weight for their size and impeccable dynamics - that small cone really can start and stop 'on a sixpence', conveying pace and agility when required.

**CONCLUSION**

The Aurousal A1s are probably the best single drive unit loudspeaker I have heard. They present music in a different manner to a similarly sized conventional two way design and have a nicely judged sense of coherence to them. The fact that all of this comes from one single, unaugmented four inch drive unit is nothing short of remarkable.

Imagery fans owe it to themselves to audition them, but just make sure you're prepared to put in some effort to really hear them at their best.

**VERDICT** ●●●●● £

Intelligently designed loudspeakers that reward the careful setup they require with a unique and satisfying sound.

**AUROUSAL A1** £450  
**Aurousal**  
 ☎ +44 (0)7837 956069  
[www.aurousal.com](http://www.aurousal.com)

**FOR**

- driver design works!
- coherent sound
- good imagery
- commendable bass weight

**AGAINST**

- require careful positioning
- vocals can be strident
- treble insight still no match for a conventional tweeter

sense of one area being

sacrificed in order to help another along. They also do indeed have proper treble, although this has a rather soft nature, robbing percussion of some of its metallic shimmer. Good high frequency definition and smoothness were present and correct, however, and this nicely took the sometimes harsh edges off steely recordings like Steve Earle's "Copperhead Road"

In the midrange, vocalists had excellent scale and body, but the mid-frequency peaks in the response [See MEASURED PERFORMANCE] do add a certain amount of stridency to performers, meaning that the likes of

preferred them pulled out by around a foot or so. However, the toeing-in is essential as it really focuses the stereo image in front of you and gives the best soundstage. Interestingly, just as I found with my old Imagios...

The most important thing to note however is that, although quite forgiving in horizontal positioning terms, I found it absolutely essential to make sure that the drive units are at ear height when in your listening position. If too low, the Aurousals lose top end quite drastically and become dull. However, once optimally set up, the A1s really do come on song and offer a quite unique sonic experience.

The soundstage set up by the A1s is very good, and they have a well-integrated sound across the frequency spectrum; there was no

**MEASURED PERFORMANCE**

As a first step towards checking Aurousal's claims of full range performance, the A1s show great promise in measurement terms. They do indeed have a consistent output across the full frequency spectrum without the vertiginous dips and peaks that are often associated with the likes of twin cones, for example. The breakup of the cone is well controlled and should mean the sound is free from any distortion related nasties. The small peaks at 700Hz and 1.5kHz are in the vocal region and will add presence to voices, although only listening will reveal whether these cause any harshness.

At the bass end, bass output is good down to 60Hz and the port helps this along with its tuning frequency of 40Hz. All in all, the A1s should sound even and detailed with good punch for their size.

The impedance curve is nice and simple thanks to the single driver and average measured impedance is 7.3 Ohms, dropping to a minimum of around

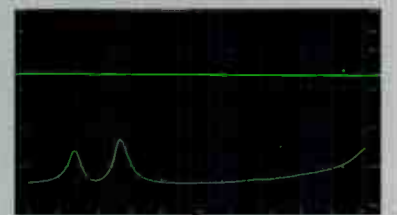
6 Ohms. Sensitivity is fine at 86dB and the A1s present a benign load that is unlikely to upset any amplifiers. AS

**FREQUENCY RESPONSE**



Green - driver output  
 Red - port output

**IMPEDANCE**







**European design combined with Chinese manufacture means the Tube Amplifier Company's T.A.C. 834 valve amplifier promises serious sound per pound, but can it enchant Adam Smith?**

# Magic Touch

**T**he humble thermionic valve is going from strength to strength, and it seems that new tube designs are appearing on the UK market daily. The problem with this is that, whilst many of them are very good, many people who wish to explore the valve world seem keen to ascertain what exactly one push-pull EL34 amplifier with four line inputs gains over another, apparently very similar, push-pull EL34 design with four line inputs!

The problem is that, in a transistor amplifier, there are literally hundreds of different output devices that can be chosen and, when one considers the different ways they can be implemented alongside another

selection of hundreds of driver transistors, the combinations are huge. However, to many new valve converts it seems that once you have taken your EL34s and put the trusty ECC81/82/83 driver valves and associated circuitry with them, there isn't a huge amount left to do apart from sourcing good quality mains and output transformers and building it all well using good components.

Whilst this is true to an extent, don't forget that designers can inject a little bit of magic to make their amplifier special. In the case of the Tube Amplifier Company, what might that be? Well, as far as I am concerned, you will stumble across it when you finally locate them on the internet, as a Google of "Tube

Amplifier Company" doesn't bring much clarification. It turns out that the initials 'T.A.C.' are to be found in the 'Product Group' section of none other than the Vincent website. Thinking back to both the superb Vincent SA-T1 and SP-T100 amplifier combo that I reviewed back in the March 2007 issue of *Hi-Fi World*, and the excellent SV-236 that impressed publisher NK back in November 2006, I realised that this could well be the magic ingredient that makes the T.A.C. 834 shine.

Looking at the facts first, the 834 is a push-pull design, using two pairs of paralleled EL34s per channel to generate a rather optimistic quoted 120W per channel. These are driven by one 12AX7 (ECC83) and one

12AU7 (ECC82) valve per channel. The output valves operate in fixed bias mode which, confusingly, means bias needs to be adjusted via preset potentiometers that are accessible in the top panel, in conjunction with a multimeter used on the appropriate test points beside each valve.

Input count is four at line level but there is no tape loop facility, and the hefty output transformers have dedicated taps for four and eight Ohms. Finished in a very pleasing shiny chrome, offset by matt black transformer covers, control knobs and valve covers, the T.A.C. 834 is a very smart device and is sturdily built, as shown by its 25kg weight. Fortunately, it is quite compact, measuring 420x210x270mm (WxHxD), and so it does not consume a vast amount of rack space. Duly sited and warmed up, I was ready to see if it would work any magic on my ears.

**SOUND QUALITY**

From the electronic measurements made [see MEASURED PERFORMANCE], Noel said he would expect a "great sound with plenty of oomph" and I am pleased to say he was spot on. The T.A.C. 834 has real gusto and energy in the bass department and pounds out heavy bass lines with aplomb, unlike several other similar designs I have auditioned. Anyone who subscribes to that old chestnut that all valve amplifiers are soft and woolly will find a quick blast of the T.A.C. 834 should soon change their mind!

Connected to our reference Spendor S8es, bass was confident and pacy with good detail. The guitar on used for bass duties by Fairground Attraction had excellent weight and depth to it, with the innate resonant nature of the instrument well recreated - this helped tracks like 'Find my Love' to flow superbly. Moving to music featuring more intricate bass lines the T.A.C. 834 once again proved no slouch in picking out the finer details and was able to follow more convoluted players as they wrung the last ounces of rhythm from their bass guitars, without tripping over itself.

The only situation in which I did find the T.A.C. 834 becoming bogged down was with synthesiser bass lines. Here, bass notes did not stop and start as quickly as they should have, and this added something of a 'bloom' to things. This situation arises from the low damping factor of the output stages combining with the low damping of our Spendors. The situation is effectively a slight mismatch and is neither component's



fault - it merely underlines that the T.A.C. 834 will need careful matching to a well damped loudspeaker in order to fully give its best.

Of course, thunderous and solid bass is very often not something that valve aficionados put at the top of their wish list, and in every other respect, the T.A.C. 834 is impeccable. Midrange and treble both have the typical sweetness, composure and opulence that valves are famous for, giving vocalists in particular a sense of faithfulness and realism. The T.A.C. 834 cheerfully pulls every last

power output at a reasonable price. It offers the traditional valve advantages of superior atmosphere, detail and midrange, but without falling into the trap of neglecting the extreme ends of the frequency spectrum.

It has a clean, sweet and detailed treble that never veers towards the unruly and bass is impressively weighty, pacy and detailed. As long as the earlier mentioned caveat with regards to speaker matching is heeded, the T.A.C. 834 will happily weave its magic on many a system.

"anyone who thinks valve amps are soft and woolly will soon change their minds..."

nuance and fine detail from the mid and high frequencies and presents them with a superlative sense of ease, never becoming harsh but equally not glossing over poorer recordings

The soundstage generated by the T.A.C. 834 is positively vast, placing singers expertly centre-stage and laying their accompanists securely round them in a way that is almost uncanny. Whilst a good surround sound setup is always enjoyable, it proves that an amplifier like the T.A.C. 834 can actually do almost as good a job as a roomful of loudspeakers!

**CONCLUSION**

Another success from the Vincent stable, the T.A.C. 834 is a well built and fine sounding amplifier with healthy

**VERDICT**

Sturdy and powerful amplifier that shows off valve technology admirably, without cutting corners. Excellent value for money.

**TUBE AMPLIFIER COMPANY**  
 T.A.C. 834 £1,499  
 Distributed by Ruark Acoustics  
 +44(0)1702 601410  
 www.vincent-tac.de

- FOR**
- expansive soundstage
  - fine midrange
  - good bass weight and pace
  - healthy power output
- AGAINST**
- requires careful 'speaker matching for optimum bass performance

**MEASURED PERFORMANCE**

As valve amplifiers go, this one produces a lot of power by running EL34s in parallel output pairs, with fixed bias - meaning you have to adjust it! One channel gave 84 Watts under measurement and the other 100 Watts; neither could manage 120 Watts as claimed by the manufacturers. I would conservatively rate this amplifier as 80 Watts, but that's still a lot - more than enough for most loudspeakers and homes. The 4 Ohm tap - most useful in practice - gave a few Watts less, due to lower coupling efficiency, but not so much as to make a difference.

Like most fixed bias amps this one overloads fairly sharply, unlike more common auto bias, but within its operating range the T.A.C. 834 produces expected levels of distortion, managing less than 0.1% in the midband at 1 Watt for example, increasing to 0.4% second harmonic near to full output. High frequency distortion was higher but again mainly second harmonic, as our analysis clearly shows. Bass distortion was held in check by hefty output transformer cores so the 834 should sound clean and tight in its bass.

Sensitivity was usefully high at 0.4V and noise low, with hum components measuring 0.8mV in all. Output damping factor was 2.4.

The T.A.C. 834 uses eight EL34s to give a mountain of power from a compact amplifier by valve standards. The EL34 can sound very good (it's much liked in China!) so in this arrangement I'd expect a great sound, with plenty of oomph. NK

Power	85 Watts
CD/TUNER/AUX	
Frequency Response	4Hz-71kHz
Separation	69dB
Noise	-96dB
Distortion	0.2%
Sensitivity	400mV
D.C. Offset	0/0mV
Damping factor	2.4

**DISTORTION**

THD	23456789	Input RMS	Frequency
CH1	0.2577299 %	3.014 V	9.9971 kHz
CH2	OFF	OFF	OFF



// the singularly most addicting  
piece of gear I have ever heard"

10 AUDIO REVIEW

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Since I've been listening to turntables professionally for 32 years and am aware of the pitfalls of ultimate proclamations, I hesitate somewhat to make this statement. Nevertheless, it is true. The level of musical communication available from the Illustrious/Aurora Gold is in a class by itself. It sets a new reference."

STEREO TIMES on the Aurora gold turntable & illustrious tonearm

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## LOGITECH WIRELESS MUSIC SYSTEM

£60

Not a name traditionally associated with audio equipment, Logitech are best known for computer peripherals like keyboards and webcams, but the iPod revolution, along with the emergence of online music buying and streaming and Internet radio, means that a widget such as this makes sense – providing it's good enough to perform...

Unlike more expensive 'Wi-Fi' radio designs such as the Pinnacle Soundbridge, this system uses Bluetooth technology to transmit the audio from your computer to a receiver connected to your hi-fi via standard RCA phono connectors. Bluetooth is a radio standard that, for example, enables mobile phones to link with 'hands free' kits and earpieces. Apart from the lack of connecting cables, the wireless approach also overcomes potential problems associated with earthing, such as hum loops, that could occur with a physical connection. The range extends up to about 100 metres, which should be more than enough.

The Logitech system comprises two main components: a combined Bluetooth transmitter and soundcard that plugs into a Universal Serial Bus (USB) port on your computer and a Bluetooth receiver and Digital to Analogue Convertor (DAC) that connects into the hi-fi. It is not necessary to install any additional software on your PC if you are running Windows XP or Windows

Vista, although Logitech do supply some 'Music Anywhere' software that can be installed to provide extra functionality if desired. However, all your existing media players will work with the device since it appears as another soundcard on your PC when plugged in.

In addition to the transmitter and receiver, the unit comes with a mains adaptor for powering the receiver (the transmitter is powered by the computer), a USB extension lead and a small plinth to support the transmitter if the USB port on your PC is not in a convenient location. Finally, there's a remote control to control the volume and (if the optional software is installed) track selection. Incidentally, the receiver includes a switch to lock the output at maximum, which I would recommend for hi-fi applications as this sets the output at a normal line signal level.

Inside the unit resides a Wolfson Microelectronics WM8955LS stereo DAC, "for portable audio applications" according to the company's datasheet. It features include an integrated headphone amplifier which can deliver 40mW into a 16 ohm load, as well as the line outputs.

Installation was a case of connecting the power adaptor into the receiver and plugging the supplied phono leads into a spare input on your hi-fi system and into the receiver. Insert the transmitter into a USB port on your PC and you are

ready to play music.

Compared to the average PC soundcard and speakers, the Logitech was a revelation – Internet radio at even modest bitrates sounded respectable. This is a clean sounding device, with no obvious nasties. Obviously, it's not going to worry the likes of the SlimDevices Transporter as a serious wireless network music player, but for the price it is excellent and a great way to escape the perils of mediocre PC music systems. For more information, call Logitech on +44 (0)207 3090127 or click on [www.logitech.com](http://www.logitech.com)







**Relatively unknown in the UK, Genesis are famous in their native USA for high end loudspeakers. David Allcock tries the new 7.1c standmounter...**

# New Beginning

**B**est known in their native United States for ultra high end designs, Genesis's show stopper is the formidable I.1, a direct descendent of the legendary Infinity IRSV and one of the most sophisticated and expensive loudspeaker systems in the world. The I.1 stands 2.25 metres high, weighs more than half a ton per side and costs in excess of \$130,000, but thankfully the 7.1c you see here is a little more modest in size, weight and cost!

It is Genesis's take on a multi-purpose two-way infinite baffle speaker, measuring a substantial 603x200x278mm and weighing in at 13.6kg. The drivers are novel in themselves, being a pair of 150mm

Titanium cone bass drivers partnered by a pair of 25mm circular ribbon tweeters laid out in a D'Appolito configuration. Placement is anything but conventional, with a single offset tweeter between the bass drivers and a second located on the back of the speaker! The tweeters themselves are circular ribbons with a Kapton transducer which has the voice coil photo etched on the rear in 0.0002 mm aluminium, the upshot being that this tweeter has incredibly low mass and extends up to 36kHz, says the company.

The enclosure is finished in a Maple veneer with the baffle made from Cebuano Rosewood. The speaker has a few unusual features which betray its heritage as a product designed to cater for the needs of

both the home theatre and stereo communities. Although supplied as mirrored pairs, the baby Genesis can also be used horizontally as a centre channel, allowing the 7.1c to be easily integrated into a 5.1 or 7.1 surround sound system with an excellent tonal match between the stereo speakers and the centre channel speaker.

Around the rear not only is there a tweeter, but also two pairs of five way binding posts, yet this is not a bi-wire ready speaker - instead the second set of binding posts are for a pass-through function, feeding low frequencies to a partnering subwoofer. The actual binding posts are of very high quality and made a secure connection to every pair of speaker cables I had on hand.

Also on the back panel are three

controls, two switches, one to turn the rear tweeter on and off, and a second one to turn the outputs on and off to the subwoofer. The third control is a potentiometer that controls the level of the tweeters.

I can imagine that many purists are recoiling in horror at the thought of these options on a loudspeaker, but it is very sensible. When you consider the greatest non-linearity in your system is in the speaker/room interface, and this represents a level of distortion an order of magnitude greater than anywhere else in your system, anything that can be done to improve this must represent an asset.

## SOUND QUALITY

My first impression was very favourable; I do not usually like standmount speakers because I miss the dynamics and low frequency extension of floorstanders, but the 7.1c offered remarkable extension for a standmount, and threw an image which genuinely surprised in both size and focus. Indeed, they sounded more like small floorstanders such as PMC's super GB-1.

It is often commented that standmount speakers simply vanish into the stage, but with cabinets as large as these, it was always going to be difficult to pull off this trick. Still the 7.1c achieved it with ease - as soon as the music starts playing you cannot easily locate them, and the music floats freely, effortlessly filling the room with sound, extending wall to wall and beyond. Whilst not matching the Martin Logan Vantage or Hyperion HPS-938 in this respect, these speakers were good enough for me to leave in position long after the listening tests were completed.

Placement of the individual instruments in the Philadelphia Orchestra's rendition of 'Clair De Lune' from the 'Oceans Eleven' soundtrack was excellent - not only precise and stable but superbly focused with very good depth portrayal. On a simply produced vocal track such as Sting's 'Windmills of the Mind' from 'The Thomas Crown Affair OST' the precision of the soundstage placement is further driven home, with Sting's voice floating in the room nearly a metre in front of the plane of the speakers, with the keyboards, drum kit and strings behind. Still the 7.1c offers the listener the same superb illumination of instruments at the rear of the stage as those at the front, allowing every nuance of each musician to be heard effortlessly as if stage centre.

Unusually for a standmounter, bass performance was very good, and whilst a pair of 150mm mid/bass

drivers is never going to deliver room-shaking bass, at no time did I feel the bass was light or lacked body, instead down to the speakers lower usable limit, which was around 45Hz in my room, they deliver a full, rich bass which is solid with superb definition and control. Even the extreme provocation of Timo Maas 'To Get Down' from 'Loud' failed to elicit misbehaviour from these speakers, and whilst lacking the seismic slam of the 400W of active



two-way in the world to set up or drive, when properly fettled the Genesis 7.1c certainly sounds one of

"they threw an image which genuinely surprised in both size and focus . . ."

bass in my ML Vantage Reference or the four 200mm drivers in the Hyperion HPS-938, this was still an astonishing performance.

This loudspeaker offered superb articulation throughout the midrange. 'Intuition' from Jewel's '0304' starts with simply an accordion before launching into the main track with seemingly every piece of studio hardware including a kitchen sink, yet with the 7.1c her vocals simply stepped forward from the speaker plane and every lyric and shift in intonation was clearly discernible even when the track was at its busiest.

Given the rich vocals of Diana Krall on 'Fly Me To The Moon' from 'A Night in Paris' the 7.1c delivered a smooth, lush performance whilst preserving every detail in Krall's voice captured by this superb live recording. In the upper registers the excellent ribbon tweeter made itself known with its incredible resolving capability, the cymbals on 'S Wonderful' shimmered with a hint of metallic sheen, but were superbly resolved, whilst tambourines and the top notes of an acoustic guitar were equally detailed and focused. I rate this tweeter as one of the best out there, and to my ears certainly more than a match for the Beryllium unit in the Focal Utopia Be series.

## CONCLUSION

Although not the easiest

the best at its price. Whilst it cannot match the energy of a floorstanding speaker, the Genesis simply melts into the background, leaving behind a superbly focused soundstage populated with totally believable music. Even if I had the budget to purchase the Focal Micro Utopia Be, I would still prefer these, with that bass extension, transparent midrange and superb ribbon tweeter. If you have up to £2,000 to spend on your next pair of loudspeakers I would urge you to audition them intently.

### MUSIC

'The Thomas Crown Affair OST', Pangaea  
'Oceans Eleven OST', Warner  
Timo Maas, 'Loud', Perfecto  
Jewel, '0304', Atlantic  
Diana Krall, 'A Night in Paris', Verve

## MEASURED PERFORMANCE

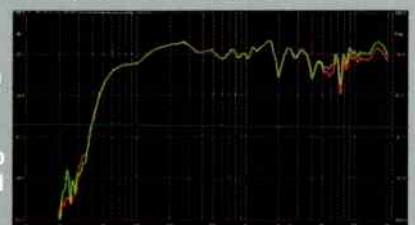
The Genesis 7.1c loudspeakers have a broadly even frequency response, with something of a dip in the 3-5kHz region. This will help to alleviate any midrange harshness and they should sound smooth and clean as a result. The treble peak at 15kHz will add detail and should give good high frequency performance. As can be seen from the second trace, the tweeter level control offers adjustment of level above 5kHz and has a range of 2dB, enough for fine-tuning the loudspeakers once positioned. A second tweeter is fitted to the rear of the enclosure and connected out of phase with the front item - this can be switched on or off.

Bass output is healthy down to around 60Hz which is fine for a moderately-sized, sealed enclosure. A two position switch on the rear allows for the 7.1cs to be run on their own, or with a subwoofer, for which a 'loop-through' output is provided on the rear panel.

Impedance in stand-alone mode shows a relatively well-damped response, with a measured average

of 4.4 Ohms, but dipping down to a minimum value of 1.6 Ohms at 60Hz. Measured sensitivity is 88dB, so 40-50W should see them singing happily, although an amplifier that can drive a genuine 2 Ohm load is advisable. AS

### FREQUENCY RESPONSE



Green - tweeter output maximum  
Red - tweeter output minimum

### IMPEDANCE



### VERDICT

Quirky standmounter that is tricky to set up and partner, but boasts superb imaging and focus, plus fine value.

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### FOR

- stunning treble
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- outstanding imaging
- build

### AGAINST

- demanding load
- intolerant of poor supports



# Solid Heir

**It was never going to be easy to replace Quad's classic II tube power amplifier, so the 303 was always going to be Peter Walker's most controversial product, says Tony Bolton...**

**N**ineteen sixty seven may have seen the first summer of love for The Beatles, Mary Quant and the Californian Monterey Pop Festival, but for the more conventional gentlemen of Quad in Huntingdon, there was a revolution of an altogether different nature going on, for this was the year that the 303 power amplifier replaced the II in the company's product range.

It was a tremendously bold move for such a company to replace its much loved, best selling and sweet sounding stalwart power amplifier for something dramatically different, using 'space age' solid-state technology. Just months earlier, Britain's then Prime Minister Harold Wilson had talked of Britain being bathed in, "the great white heat of technology", and the 303 epitomised precisely this...

The design was revolutionary. Not only was this the company's first foray into the world of solid state, it had also been done in a

of the transistors permitted effective control of the output current. Since the voltage was also controlled, the transistors could only operate within their ratings, and caused the quiescent current to be independent of output transistor temperature. Distortion could thus be reduced to a desired level without sacrificing stability, and reliability was also improved. The concept was to win a Design Council award in 1969.

Amazingly, the amplifier stayed in production from 1967 to 1985, by which time nearly 100,000 had been produced. The near bomb-proof build and reliability of the 303 means, for the modern user, that the majority of those produced are still functioning, and are a relatively cheap and easy way in which to enter the high quality amplifier market.

The 303 used a 4-pin DIN input, in which the signal is carried on pins 1 and 3 (left and right channels respectively) whilst pin 2

The

interconnects supplied by Quad make an electrical connection, but do little for the 303's sonic capabilities. Several companies make replacement leads, such as Atlas Elektra ([www.hifi.org](http://www.hifi.org)), Chord Company ([www.chord.co.uk](http://www.chord.co.uk)) and Russ Andrews ([www.russandrews.com](http://www.russandrews.com)). The mains lead can also be replaced using Isotek leads sporting miniature Bulgin plugs, for example. Such plugs are available from Maplin, and also some ships' chandlers (the waterproof design making them popular with the boating fraternity). Consult your favourite cables manufacturer for availability.

At the other end of the signal path there are equipment matching traps for the unwary. These amps were designed to go with relatively high impedance loudspeakers and do not function that well when connected to speakers with much

"beautifully designed and built, it will soldier on long past many moderns..."

totally new way. Previous solid-state amps had a tendency to suffer from thermal tracking problems with the transistors, which caused both sonic and reliability problems. Peter Walker, founder and head of Quad, solved the problem in the 303 with the 'Triples' arrangement of output transistors. In this, the symmetrical arrangement

carried the common return. Pin 4 is not connected and is therefore redundant. The initial idea was to power the 303 from the 33 in the manner of the previous Quad 22/ II models, and it should be noted that the pin 4 output of a 33 is actually live in preparation for this, and must never be connected to anything!



bridged, and each amplifier's output connected separately to the treble and bass inputs of the speaker via two lengths of speaker cable.

Using this 'dual mono' configuration results in a level of sonic control and agility, especially in the bass, that a single 303 struggles to achieve unless allied to very sympathetic period speakers, with the imaging improving

an invaluable help with the technical aspects of this article) advised *Hi-Fi World* that a service starts at £48, and any components costing less than £1 are not charged. Output capacitors are replaced as a matter of course, in view of their age, at a cost of £6.20 each plus VAT (there are 4), and a full overhaul rarely exceeds £100. Unless the example you have has been serviced within the last ten years it is advisable to have it done, although 303s carry on working and sounding tolerable even when in poor health. A fully restored example, however, can be a revelation.

There are plenty of amplifiers around that might have better treble extension or deeper bass, but matched to friendly loudspeakers, the 303 holds its own when compared to some thousand pound-plus designs. They time well, image well and give a beautifully detailed sound, making music a thoroughly enjoyable and absorbing experience.

The Quad 303 is unlikely to garner the classic status of the 11s, but lovers of affordable audiophile hi-fi can do nothing but benefit from this state of affairs. A pair of 303s, fully overhauled and equipped with modern cable looms costs less than the price of a half-decent modern integrated, but the results are palpable. You also have an extremely well made power amplifier combination, beautifully designed and built, and which will solder on long past many 'moderns'.

lower than 8 Ohm impedance. At low volumes the performance is okay, but as the volume is increased the bass seems to get lighter than it should be. Quad 303 users report that using two 303s in parallel with biwireable loudspeakers gets over this problem. To do this requires pre to power interconnects in which the 303 end is wired with pins 1 and 3

markedly. The usual complaint about these amps being a little cloudy disappears when allied to suitable preamplifiers. On the downside, extremes of treble are a bit laid back compared to more modern equipment - although this can be a blessing if you have a less than super-smooth digital source in charge. As for the old adage that Quads do classical but cannot rock, be prepared for a surprise when listening to 303s doubled up.

Ken Bunting, Senior Engineer in the Quad service department (and

**WHAT TO PAY**

A working 303 can usually be found via the classifieds in the hi-fi press, local newspapers or eBay. Expect to pay around £100 for a working boxed example, more if it has had a recent service by Quad. The 33 preamplifier usually accompanies it, although 303s made from 1982 onwards would have been partnered with the 34 preamp. A fair price would be £50 for a 33 and up to twice that for a 34. The latter is a more suitable machine for the modern environment, the replaceable input module cards allowing for moving coil pickups and CD players to be plugged in without matching problems, and there is also the advantage of phono sockets on later models instead of the previously used 5-pin DIN sockets. However both preamplifiers sound a bit vague by modern standards, and a modern passive such as Icon Audio's E225 design gives the openness in sound that we expect in the twenty first century.



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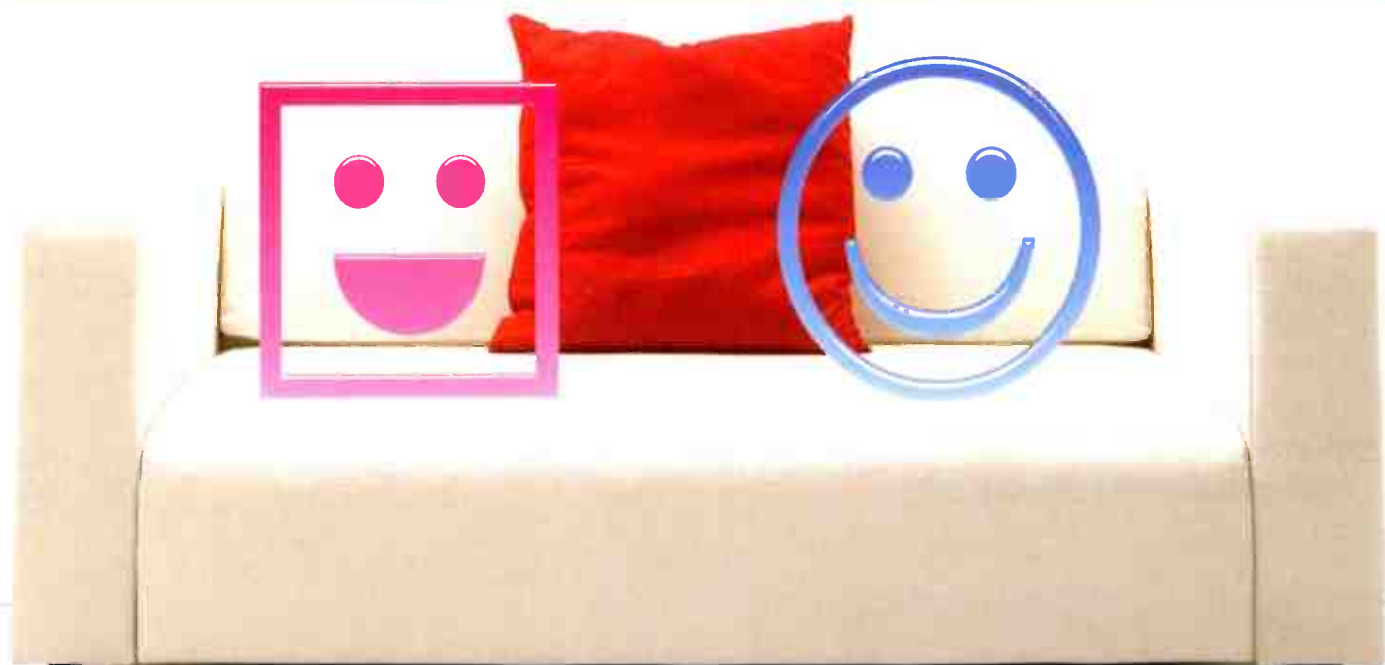
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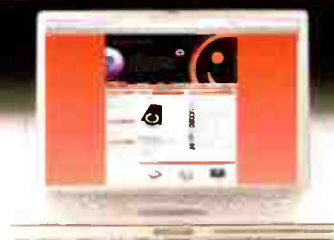
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## WIN A PAIR OF MOWGAN AUDIO'S SUPERB ARTIO LOUDSPEAKERS WORTH £1,549 IN THIS MONTH'S GREAT COMPETITION!

**H**ere's your chance to win a pair of Mowgan Audio's fantastic Artio loudspeakers, a stand-mount version of the Mellt floorstanders that so impressed Adam Smith in the February 2007 issue of Hi-Fi World. Here's what he had to say about them...

"Scotland's Mowgan Audio have chosen Celtic deities as names for their four-strong range, namely Artio, Mellt, Mabon and Ogma. Mellt was apparently the god of lightning and Mowgan Audio have chosen a cunning analogy here, as they are keen to make much of the Mellt's transient response and fast sound.

Your money buys you a compact and neat two and a half way loudspeaker with impeccable fit and finish. Driver complement is a soft dome 25mm tweeter and two 180mm bass/midrange units. I chose Jeff Buckley's 'Grace' as the first album into the CD player, and vocals were truly superb - large and detailed with every subtle distinction faithfully reproduced. I was also pleased to hear that Mowgan Audio's claims of fast bass for the Mells had substance, as the bassline for the track was deep, detailed and punchy.

A quick blast of Holst's Planets Suite revealed that the Mells suit classical material very well. Along with excellent instrument separation and

good scale they have an excellent ability to keep up with the faster moments of Jupiter and yet go quiet and subtle when required. Mowgan Audio have produced a pair of loudspeakers that are thoroughly competent and enjoyable to listen to, thanks to the fact that they are carefully designed and very well made. The sound of the Mells is dynamic, exciting and clean and yet they appear quite happy with a wide variety of source material. I personally enjoyed the Mellt loudspeakers and found their presentation very satisfying. I am sure that once Mowgan Audio becomes better known, there are many audiophiles out there who will find them exactly the sort of loudspeaker that they have been looking for. A present from the gods perhaps?"

If you'd like to win a superb pair of Mowgan Audio Artio loudspeakers, then all you have to do is answer the following four easy questions. Send your entries on a postcard by 31st May 2007 to: **June 2007 Competition, Hi-Fi World Magazine, Unit G4, Argo House, The Park Business Centre, Kilburn Park Road, London NW6 5LF.**

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### QUESTIONS

- [1] Where are Mowgan Audio from?  
 [a] England  
 [b] Ireland  
 [c] Wales  
 [d] Scotland
- [2] What are the speakers named after?  
 [a] French film stars  
 [b] cooking utensils  
 [c] 1970 bass guitarists  
 [d] Celtic deities
- [3] What type of design is the Mellt?  
 [a] two-way  
 [b] three-way  
 [c] one-way  
 [d] two and a half-way
- [4] How did AS find their presentation?  
 [a] "fair to middling"  
 [b] "a bit plodding"  
 [c] "nice in a funny way"  
 [d] "very satisfying"

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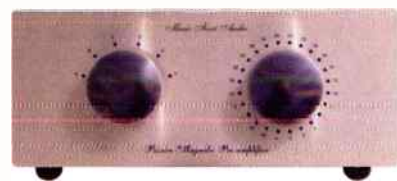
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# "what do you do if no-one makes what you need?"



## adam smith

I cannot think of many other three-letter acronyms that strike such fear into the hearts of so many people than that of DIY. Even to the non-hi-fi savvy it invariably means a trip to your local home improvement supercentre and the thought of impending work. I know that I personally consider that my wife and I 'wasted' a recent sunny weekend, even though we now have a neatly mown lawn, power-washed patio, weed-free flowerbeds and some rather attractive new plants to show for it!

Even amongst the hi-fi fraternity this is a topic that can draw wildly differing opinions. Of course, we all want to own equipment that sounds good, but comparatively few people understand what goes on 'under the bonnet' as it were, consequently, very few manage to explore the possibilities that a spot of tinkering can bring about.

Personally speaking, the very same uncle who bequeathed me his Garrard 301 was also a highly technically competent electronic engineer, and the 301/SME/Shure themselves and his cassette deck were the only items that he bought ready-made. The rest of his setup consisted of an amplifier, tuner, loudspeakers built into the walls of his lounge, a timer, and another amplifier that piped music around to every room of his three storey house. To a wild-eyed young record player obsessive this was manna from heaven, and it is still working superbly to this day. What was even more impressive than the sound of the system was that he built all of these items himself!

This, for me, is the beauty of having a go at something yourself. Even on the most basic level of tinkering, it is a fact of life and economic necessity that some

corners have to be cut inside more mass-produced equipment, until you reach true high-end designs (and prices!). For this reason, in the first case, there exists immense possibilities for upgrading volume controls to high-precision pots; changing standard resistors for low-noise, high quality types; upgrading loudspeaker crossover components and generally fitting the audio equivalent of a set of nice alloy wheels, performance air filter, set of Recaro seats and a good tune-up. The trouble is, this requires a certain amount of knowledge in order to make sure nothing goes bang and, even more importantly to ensure that the user/modifier doesn't end up going "ouch" or worse! If this is not a problem, and you know your JFETs from your electrolytics, the next step is obvious - why not go the whole hog and design your own?

Many people do just this and, as far as I can see, there are three main reasons for doing this. The first is the conviction that you can come up with a better design than anything out there on the market. Now this often takes some serious research and positively encyclopedic knowledge of electronics fundamentals and principles, but we know that there are quite a few hi-fi enthusiasts out there who have these abilities and some of the designs they come up with are nothing short of spectacular. In many cases, this has marked the formation of a new company in itself, making the product that the designer has developed.

The second reason is the simple fact that, whilst there are some truly exceptional designs out there, they tend to have somewhat lofty price tags, which inspires many enthusiasts to build their own version at a rather more reasonable cost. The perfect example of this is the Evolution

parallel tracking arm reviewed on page 84 this month. Air-bearing arms have been around for years and work stunningly well, but I know that I personally do not have the funds for a Kuzma Air Line or an Airtangent 2002, and neither did Vic, its designer. However, his DIY skills have brought to market a competent and superb-sounding device for around £500 - can't complain about that!

Finally, and probably the most likely reason why people turn to DIY - what do you do if no-one makes what you need? Certainly no-one made a multi-channel amplifier for distributing music round the house 30 years ago, hence my uncle building his own. Back in the days when I used to restore old (and I mean OLD!) Garrard autochangers, the sort where tracking force could be measured in ounces and ceramic cartridges were the only types that would cope with this, there was no way of checking their finished performance easily without the use of an ancient and fairly uninspiring amplifier that has a ceramic phono input. Hence the reason why I built my own ceramic cartridge preamp, using a Babani circuit - this enabled me to check the old clunkers out fully in my own system (and actually surprised me at how good an old Sonotone 9TA or BSR SC12 ceramic cartridge can sound, but that's a story for another time!).

For the DIY-er, a whole raft of suppliers and supplies has now sprung up to fulfil virtually every need you could possibly think of. Sadly, RS still insist on sticking to only selling to business users, but the likes of Maplin, CPC and Greenweld cover pretty much all of their bases and can be a fantastic source of components and electronic discoveries that you never knew you needed. There has never been a better time to wield your soldering iron! ●



Some decisions are just so simple

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"I welcome the increasing focus many manufacturers are placing on integrating new media with old technology..."



## dominic todd

It has now been a couple of years since the beginning of the iPod 'revolution'. True, it and its ilk had been around for years before, but it wasn't until early 2005 that the concept really took off. Like it or not the iPod and - let's not forget - a host of other portable devices have become a part of many peoples' lives.

At the time, many in the hi-fi separates business recognised this trend and saw opportunities ahead. If just some of this enthusiasm could come the way of the hi-fi separates market, then it could inject a much-needed boost in to the industry. Looking at the market today, it's pleasing to see that embracing the iPod market is exactly what many in the industry have done.

It started just over two years ago when Onkyo, I think it was, first produced an iPod docking system and control with at least some pretension towards an audiophile market. Since then we've seen a great wave of docking stations, and not just from the Japanese.

Recently I had some experience of the latest rDock from Arcam and came away impressed. Before this docking station had come along, the others tended to be much of a muchness. The Arcam is the first one I've seen that offers genuine audiophile qualities. The unique charging system, which runs the iPod using its own battery as much as possible, introduces a whole new market to the idea of the advantages of battery power over mains - this is high end audio thinking coming to the mass market. The quality preamp, buffered output stage and diecast chassis are all other examples

of proper hi-fi engineering.

Arcam should be commended for their efforts but, encouragingly, it doesn't look like they'll be alone for long. Other UK companies are working on rival docking stations, whilst we already have TL Audio's Fatman range. Launched towards the end of last year the Fatman shows marketing genius and is the type of product that many others in the business must have wished they'd thought of first. Like all great ideas, the concept is simple...

Take a basic iPod docking station and marry it with a simple hybrid valve amplifier. The real skill then comes in making it affordable and, at less than £400 for the system I would say it is. It's attractive too - the glossy finish with contemporary graphics is perfectly pitched towards a younger target audience, whilst the remote control will help further in creating a wider appeal. The key aspect with the iTube is that it excites the iPod generation without intimidating them.

Ironically, the docking station itself is, unlike the Arcam, pretty basic stuff, but at a stroke it makes small valve amps appealing. Let's face it, most of the target audience would never have bought a valve amplifier if it wasn't for the iTube. They may know about the advantages of tubes, usually from guitar amps and so on, but the likelihood of the same people splashing out on a valve amplifier for their home hi-fi has always been low. The iTube is one of a handful of products that friends of mine who aren't the least interested in hi-fi have actually bought or at least covet.

So, thanks to Arcam and TL Audio, then, we have battery power, buffered

outputs and valve technology all brought to the masses. None of this technology is too tweaky or likely to frighten people off, but it does produce fine sound quality. Like the Cambridge Audio Azur iPod command remote control, or Pioneer's iPod input socket, these products are inclusive of the new digital formats without necessarily compromising their core values of sound quality.

Taking a different approach are AVI. Like many others, they see the MP3/iPod and multimedia markets as the way forward. Interestingly, there's little new with their current range of speakers, but they are being marketed in a different manner. The ADM9s are a compact active speaker with digital and analogue inputs (DAC built-in). Others such as Meridian have been doing this for ages, but what they haven't is deliberately market this type of speaker for use with Mac Minis and Sky boxes.

As you'd imagine, this has caused some consternation amongst dealers and fellow reviewers but, whilst I may not agree with the style, I do understand the reasoning. Many will never accept the bulk or perceived complexity of hi-fi separates, so why not at least be able to sell quality active speakers to this market?

Controversy is set to run for sometime within the industry yet, as TL Audio have shown, technologies can converge and both parties can benefit. Personally I welcome the increasing focus that many manufacturers are placing upon integrating new media with old technology. Not doing so easily leads to exclusion - and exclusivity, more often than not, leads to extinction... ●





*Lucy just couldn't understand Tom's sudden lack of interest in an early night*



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"Linn Records has launched a revolutionary service – studio quality downloads direct from the label itself..."



## paul rigby

recently speculated that the future of hi-res music will not be found in the physical realm, but rather is destined to rest in the virtual world, possibly within an important niche of its own, similar to the position audiophile vinyl now finds itself.

Two companies are currently pioneering that very vision. Firstly in the USA, MusicGiants, which already sells CD quality WMA albums ready for download, has announced that it will be producing surround sound hi-definition albums for download sometime this year.

"There are an estimated 35 million 5.1 music systems in US homes," said Scott Bahneman, CEO of MusicGiants. "We believe that combining the highest sound quality music available over the Internet with the exceptional listening experience of 5.1 will provide a significant market opportunity." MusicGiants is looking to stock DVD-Audio grade sound files at either 88.2kHz or 96kHz sampling rate at 24bit.

Closer to home, the software division of British audiophile hi-fi specialist Linn Records has launched a revolutionary service – studio quality downloads direct from the record label itself. Renowned for the care and attention it devotes to the quality of its record releases, Linn Records has launched a trio of download formats that breaks with the current norm, at least in the UK. The lowest quality files available are 320kbps MP3 (priced at £8/album), which tops by some distance typical MP3 files offered by the majority of download services today. Lossless WMA (CD-quality) downloads are also offered (at £11/album) with a FLAC option to follow for Mac users, plus the

world's first 'Studio Master'-quality hi-res WMA downloads (at £18/album). In with the music data are extra files relating to artwork, and the like.

Taking a typical 8Mb/s broadband connection as an example, a standard 'Studio Master' file will take around thirty five minutes to download. On sound quality terms, of course, the 88.2kHz/24bit (typically) files blow CD quality music to the four winds. "We realised that there's a big future in digital music and we wanted to be part of that but we didn't want to be part of the low quality services on offer," explained Caroline Dooley, who runs the record label.

Quietly launching in January this year, Linn Records has already sold 12,000 tracks but is only now formally announcing the service – partly because of the intriguing customer response. Only 20% of customers have downloaded the MP3 format, 50% have downloaded CD quality albums and a large 30% have downloaded the studio masters.

Despite being £5 more than physical DVD-As or SACDs, the digital studio masters sales have actually exceeded sales of their physical versions. Why? According to Dooley, "there's the geographical reason, many people don't have instant access to physical music. There are also impatient listeners who want their music now and, finally, many users are buying media receivers or are connecting their broadband link to their hi-fi and are finding it convenient that they can readily transfer a high quality digital album direct to their hard disks instead of having to go through the tedious ripping procedure."

Just as noteworthy is Linn Records' decision to remove any

form of Digital Rights Management (copy protection) from its music. "If you sell someone a physical disc they can copy it, they can then move it to their computer. We know that our customers download studio masters for their hi-fi, compress it for their MP3 players and a burn a CD copy for the car. As a company, we're just being realistic." There are fail safes built in to the system too, in case of accidents, "You can download the file again within forty eight hours without asking but, after that, you can contact us to explain your problem and we can make the file available to you again."

Linn currently has 250 albums available, 60 are SACD-quality and 15 of those are currently online. Three new SACD albums are being added to the list every week. What interests me is the CD-only quality albums Linn has on offer. Of course, the studio original will be of a much higher sound quality. Will Linn eventually upgrade those to SACD-quality? The company's keeping quiet on that one for now.

Linn's move is intriguing because the best way to currently play their studio master digital downloads is via a suitably configured Media Centre. That is, a box with the guts of a PC hooked to decent speakers. Surely, if other record labels decide to copy Linn and also produce high quality digital downloads, this will serve to put pressure on audiophile hardware companies to invest in creating more true audiophile media centres or, possibly more likely, a dedicated discless, Hi-Def digital audio-only player [like the SlimDevices Transporter reviewed last month – Ed.] that can be integrated into current hi-fi set-ups? ●



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# DAB+ will be used in the UK, no matter what some would have us believe...



## steven green

Over the last couple of months, various parts of the media have reported on the issue that the new DAB+ system will eventually replace DAB and in the process make all existing DAB receivers obsolete. However, because there are no DAB+ receivers in the shops yet, the industry fears a reduction in DAB radio sales in the meantime. So to counter these news stories, some sections of the UK DAB industry have begun flatly denying that DAB+ is going to happen here...

An example of this occurred when Quentin Howard (current President of the WorldDMB Forum – the organisation in charge of DAB around the world – and chief executive of the Digital One national commercial DAB multiplex) appeared on the *Working Lunch* programme on BBC2 to answer questions on the issue. When asked, "What is DAB+ going to mean, and have people wasted their money?", he replied, "the answer is nothing in this country. DAB+ is an additional standard that has been passed by the WorldDMB organisation for use in countries who haven't started DAB yet". Holding up two documents he continued, "there's [Ofcom's] technical standards and the advertisement for the next national multiplex; they both specifically say that you can't use DAB+ in this country, only the existing standard." In my book, that is a complete denial that DAB+ will ever be used here.

In reality, Ofcom's official statement on the matter conveys a rather different message: "Ofcom is not currently proposing any changes to the DAB coding standard at present... Ofcom will however keep this matter under review". They add, "It is important for the industry to

work with manufacturers now to get future-proof sets into the market as soon as possible".

A short while later, Channel 4's application to run the new national DAB multiplex – that will be launched next year – was published on Ofcom's website. In the application, Channel 4 is proposing to run a podcast service from the outset, which they say would be "delivered using the DAB+ format". Channel 4 also expects that, "within the next 24 months all new kitchen radios on the market will be natively capable or upgradeable to DAB+ audio coding... this will include the cheapest receivers in the marketplace". In a section called "DAB+ – the future of DAB", they say, "A significant opportunity for expansion of services at high audio quality arises from the potential introduction of DAB+," and that they are, "keen to explore further the possibility that adoption of DAB+, with its inherently more robust error protection scheme, will provide". This is all a very far cry from DAB+ never being used in the UK!

In my opinion, this podcast service would be an excellent way to kick-start DAB+ receiver sales and speed up the transition to the new system. Furthermore, existing DAB owners can have no grounds for complaint about the proposed podcast service using the DAB+ format, because there are no DAB receivers that are capable of receiving podcasts of any kind at present, so everybody would have to buy a new receiver no matter which format were being used for them.

Channel 4's application is not all good, however. For example, they're proposing, incredibly, to transmit stereo radio stations at 112kbps using the existing MP2 audio format

– that's even lower than the woefully inadequate 128kbps used at present! And they're also proposing to use 20% of the multiplex capacity for mobile TV channels.

The other application for the national DAB multiplex came from the transmission network provider National Grid Wireless. NGW proposes to carry the BBC Asian Network on the new multiplex, which would free-up a small amount of capacity – a measly 64kbps to be precise – on the BBC's national DAB multiplex; and they haven't reserved any space for mobile TV. The application proposes that stereo radio stations would be transmitted at 128kbps, which is the same bit rate that the vast majority of stereo stations use now. All they say about DAB+ is that they have drawn up plans for its adoption, but these plans are confidential, at least as far as you and I are concerned.

Comparing the applications from an audio quality perspective (still a matter of concern for some of us!). Channel 4's application would bring a slightly faster switchover to DAB+ but lower quality in the meantime, whilst NGW would bring us a small improvement in quality on a couple of BBC stations.

Sadly, Ofcom's actions so far show that it isn't remotely interested in audio quality, so it will make its decision based primarily on the perceived merits of the radio stations proposed, as well as on the issue of using national DAB multiplex capacity for mobile TV.

It is difficult to predict who will win the licence, although I would say Channel 4 is the narrow favourite. But one thing is for sure is that DAB+ will be used in the UK, no matter what some people would have us believe. ●



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"one day we might return to the quaint notion that high quality is an end in itself..."



## noel keyword

**W**hat I suppose was the BBC-dominated outlook within broadcasting in the 1970s about the need to constantly improve sound quality, drummed into us at interesting Press Conferences, has been turned on its head. Nowadays the keyword is variety, unfortunately at the expense of all else - especially quality. Interesting for us then to see our argument for improved quality in DAB, or Digital Audio Broadcasting, now beginning to seep through, as Steve Green explains in his column this month. This argument is broader than 'broadcasting' though.

Quality sells and has always done so. We all want to be immersed in a brilliant performance, musical or otherwise. There's no substitute for being at a live event and, happily, audio in the home can get very close at times, largely because totally convinced hi-fi enthusiasts around the world continue to strive for it. That broadcasters should be in denial about quality is a peculiar local difficulty in their time domain; they will get over it in due course, under pressure from outside opinion and events. For the time being we have to suffer their stubborn refusal to appreciate the value of quality, and any need to maintain it. But this situation is starting to improve.

We are not the only ones to argue for improved standards generally in compressed music. In a different but parallel world Apple recently announced its iTunes service will be distributing Beatles songs only in high quality 256kbps AAC files. They too see the way ahead as improved quality. Apple currently are style leaders and have great influence. If Steve Jobs declares the Beatles go out at 256kbps then a lot of people will take note. The wonder of Apple as far as I am concerned is that they

make an issue of quality and style, blatantly charge more - often far more - for it than rivals and get away with it.

Their recent commercial success is so staggering everyone is being forced to take notice. I am expecting a lot more people to suddenly start declaring that we "need 256k" now that Mr. Jobs has come out and said so. It's as simple as that. If anyone can get quality back into fashion it is Apple. And if anyone is able to show those of little faith and even less ability that the world will pay for it too, then again it is Apple.

I have spent considerable time listening to compression schemes in the past - through highly revealing stripped down and tuned up Quad ESL-63 electrostatic loudspeakers I need to add. I mention this because to hear the precise nature and extent of degradation you do need to use professional quality monitoring equipment, another point lost on broadcasters. It was only low compression 5:1 schemes like Sony's ATRAC, as used on MiniDisc, that gave acceptable results. At 10:1 compression violins start to homogenise into a single mass, one that shakes and screeches if we are talking about 128kbps and archaic MP2 compression as used in DAB radio broadcasts. The 192kbps rate preferred by the BBC for classical music isn't really good enough, but when you are up to 256kbps (4.86:1) and using a good compression scheme like AAC from the Fraunhofer Institute, then making direct comparisons between the original programme and a compressed version shows differences are small.

In effect then, we do not need to make massive changes to improve DAB radio from its current dire quality, suitable only for portables, to one that should satisfy all except the

most fastidious.

Why shouldn't we use 256k? As SG points out, if available broadcast bandwidth was used more effectively, and if there were perhaps fewer stations, then higher bitrates become possible. I well know about the variety offered by modern radio, by the way, as we listen to it in the office. I am also aware not only about poor sound quality, but limited play lists and endless repetition. More isn't necessarily better.

The way things are going right now, internet speeds should increase significantly in the UK as BT's 21CN network phases in, making 256k more likely for internet radio at least. More terrestrial transmitter bandwidth will be available from DAB L Band services too, plenty enough I would have thought for stations using 256kbps compression to be accommodated. Then there's satellite radio, such as the American Sirius system (see <http://satelliteradiou.com>) which has much more bandwidth available for quality programming.

One way or another bandwidths are going up for, as BT say in their 21CN website, the UK has an enormous appetite for it. Audio quality will follow upward accordingly. At some time in the distant future we may actually return at last to that 'quaint' 1970s notion that high broadcast quality is an end in itself worth pursuing. I never thought I would end up liking the unlovely 1970s, which started with Harold and mercifully ended with Sunny Jim, but it did have great music and, by today's grim standards, quality radio broadcasts. It won't be until modern broadcasts start to approach the sort of extraordinary quality available I can get from a Leak Troughline receiving VHF/FM that radio finally recovers from its current predicament ●





**CHRIS MCGREGOR'S  
BROTHERHOOD OF BREATH  
*Brotherhood*  
Fledg'ling Records**

Born in South Africa, McGregor discovered black jazz, founded the Blue Notes band, headed a big band, was hounded by the authorities and then fled to Scandinavia and England. His sound combined jazz improvisation and South African vibes and possibly because of this, he never really received the backing he deserved from his record label, RCA. This album, featuring McGregor and his 12-strong band, including three of the original Blue Notes, was released in 1972 and a little cracker it is too.

"It transpired that the rights to the album had reverted back to the artist," said label boss David Suff, "and Chris's widow wrote to the label and asked for the master tapes back. They're in pretty good nick, they don't look as though they've ever been touched."

The quarter inch tapes were flat transferred into the digital domain and then Dennis Blackham,

engineer at Skye Mastering mastered them from there. "He had a very musical approach to the album," said Suff, "He was more interested in preserving the feel of the album rather than taking a pernicky view. You know, 'there's a funny little noise from the foot pedal of the piano that we can take out' which then damages the frequencies elsewhere. Not Dennis, he uses his ears." Suff did an A-B comparison with the original album after the event – not before or during – just to monitor how the mastering had gone. "The newly remastered album has more life in it, it's far more interesting. Dennis has done so little yet has squeezed that little bit of extra energy out of the tapes."

**THE SUPREMES  
*This Is the Story, the '70s  
Albums Vol. 1 1970-1973: The  
Jean Terrell Years*  
Hip-O-Select**

Digitally remastered, this three CD box set is beautifully presented in hard-back book-style packaging, and examines the oft-overlooked

early seventies recordings of The Supremes. This was a tumultuous period when Diana Ross left, and taking her place, in walked Jean Terrell. Terrell's Supremes were a brilliant outfit and are often overlooked or, worse, deemed unworthy of attention because of the void created by Ross. The new group was a lot more democratic than the Ross lead version, as producer, Frank Wilson explained, "I wanted to demonstrate a greater degree of versatility with the group, so it wouldn't just be ooh and aahs, but Mary would take a lead and Cindy would take a lead." In addition, Terrell had the power to lead from the front, "It was a voice that got your attention", said Wilson.

The group scored three hits in the early '70s: 'Up the Ladder to the Roof', 'Stoned Love' and 'Nathan Jones'. 'Stoned Love' was the final number one R&B and pop hit for the Supremes in 1970, while both 'Nathan Jones' and 'Up the Ladder to the Roof' were Top Ten pop and R&B hits in 1971 and 1970, respectively - all are included on this set.

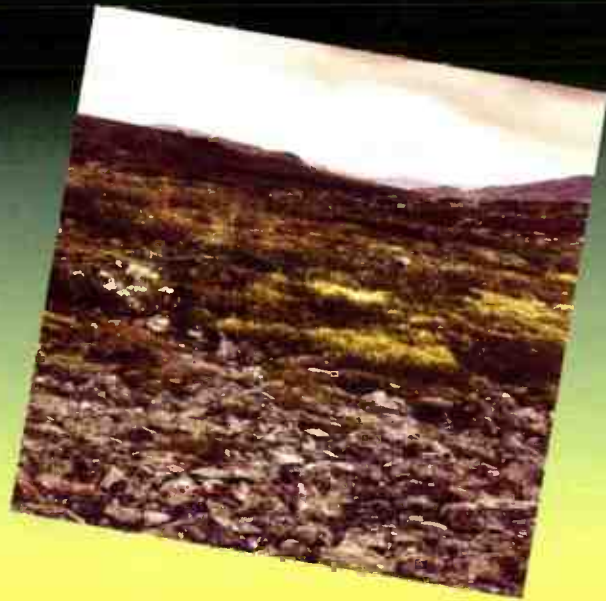
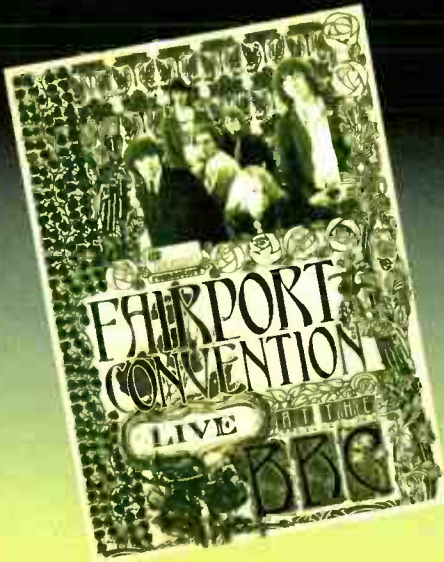
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This box collects their five studio albums: 'Right On', 'New Ways But Love Stays', 'Touch', 'Floy Joy' and 'Produced And Arranged By Jimmy Webb'. In addition to the official albums you also receive a variety of bonus tracks including thirteen previously unreleased songs. With a grand total of 68 tracks plus over 40 pages of liner notes and rare photos, this is a superb production. The Terrell-lead Supremes lasted until 1977, which presumably is where volume two of this series will take us.

### FAIRPORT CONVENTION *Live At The BBC* Universal

Covering four discs with many unreleased tracks and much that will be new even to hardcore fans bedecked with bootlegs, this BBC-inspired collection contains FC's complete surviving BBC radio recordings from this period. Also included is a disc of 'off air' recordings. Sue Armstrong, Product Manager, Universal Music explained that, "the BBC provided some of the tracks but, as most people know, the BBC's archiving policy has been 'sporadic' over the years. Many classic sessions and concerts have been lost or taped over, leaving gaps in their archive. This was the case for quite a bit of these recordings. The BBC were able to supply some 'off air' discs - tapes made by fans when the original session was broadcast - and I managed to get copies of other missing sessions from some of the Fairport fans and experts." It included material of varying quality and recorded over

many years, so the main concern was to give a consistent listening experience as well as to bring out the best in each track.

"All the sources provided were on CD-R so we had no access to multitracks - only the mono/stereo mixes that were broadcast," explained Simon Murphy, Studio Engineer for Sound Recording Technology who worked on the set. "The main work was EQing tracks along with level matching to enhance elements of the mix and to give consistency. Some required more attention than others and needed de-noising, de-clicking and editing. Others had clearly been copied from other CD-Rs where the source had skipped, so I had to do some intensive editing to fix this type of problem." The end result is worth it however, and whilst not exactly audiophile, this set is a valuable historical document of a significant folk band.

### METHENY MEHLDAU *Quartet* Nonesuch

That's Pat Metheny and Brad Mehldau, two jazz artists who have achieved cult status in the field, and two people who have been looking to play in each other's company for some time. When they eventually did meet they opened a whole new can of worms because this is their second album in six months. So much to play, so little time, it seems Metheny's mastery of improvisation and guitar has introduced a way of playing that is both melodically rich and harmonically advanced. Brad Mehldau, who Metheny himself has

called, "the most exciting pianist to come along since Herbie Hancock", is among the most compelling, daring and innovative young pianists in jazz. What has emerged however is a remarkably deep chemistry right from their first collaboration 'Metheny Mehldau', especially considering this was a first encounter. But this disc's two quartet tracks with the pianist's regular crew - bassist Larry Grenadier and drummer Jeff Ballard - were its clear highlights, as well as a promise of better things to come when it was announced that this second release would focus more on the quartet.

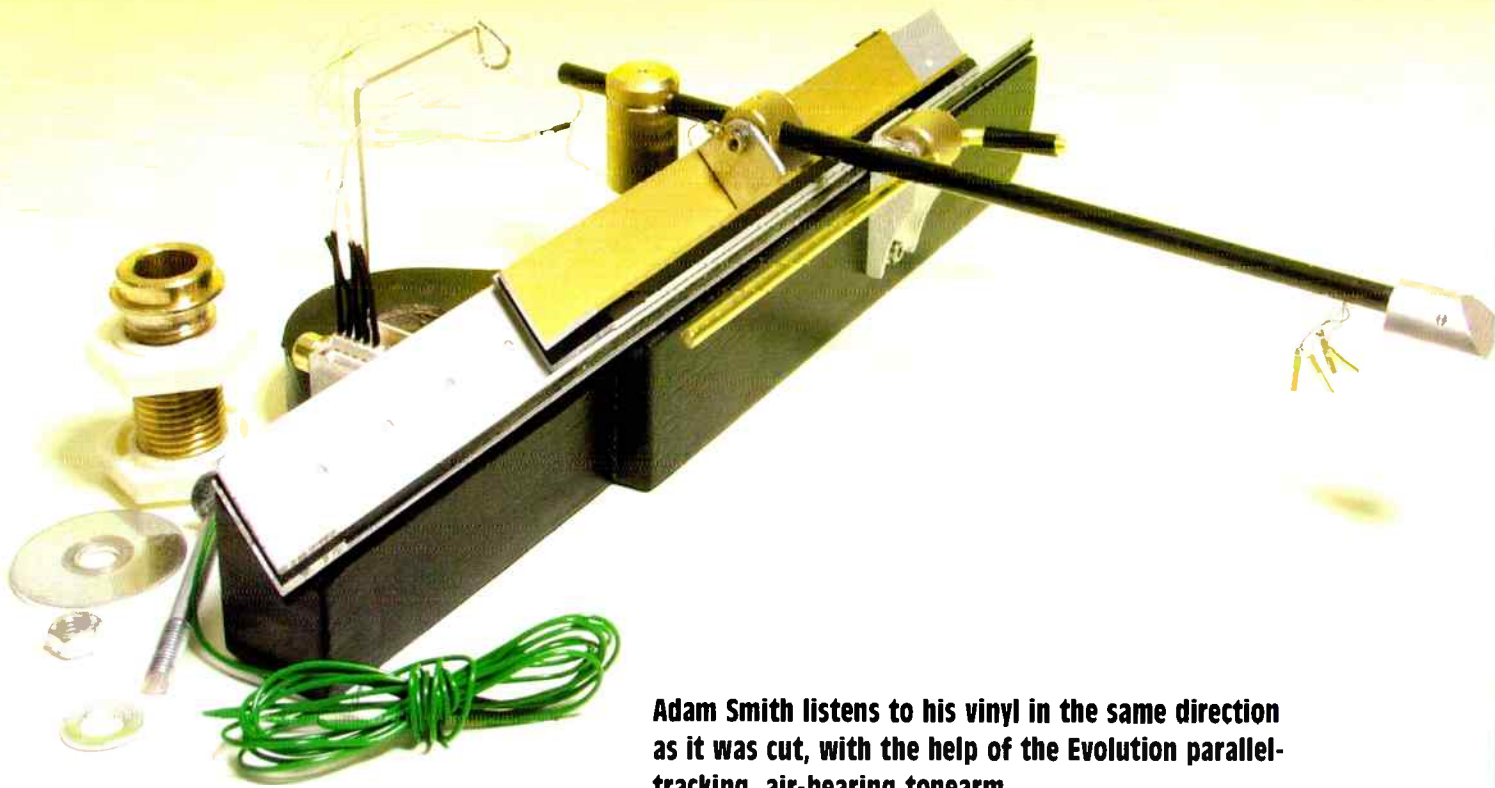
Seven of these eleven tracks feature the quartet and the duets on 'Quartet' work much better than those on 'Metheny Mehldau'. 'Quartet' is a stripped down album, with a lack of intrusive production. What this means in practical terms is that the artists sound more spontaneous. Production values are high on the CD but they generally are from all releases on this particular label, in that the mastering is sympathetic to the compositions, rather than getting in the way, forming a barrier you must clamber over to get to the songs themselves. This is a direct album, no extraneous noodling or needless egotistical posturing, just damn fine music.

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**Adam Smith listens to his vinyl in the same direction as it was cut, with the help of the Evolution parallel-tracking, air-bearing tonearm...**

# Sideways Evolution?

I am sure you can imagine the scene. There I was, facing the public for the first time at my first hi-fi show working for *Hi-Fi World*, in Manchester last October. Suddenly, in between the steady flow of enthusiasts and readers who came to see the 'new boy', a gentleman sidled up to me and asked if I'd like to see some pictures. Now, being a trustworthy sort, I immediately said that I would be happy to, before suddenly wondering what I might be letting myself in for. Fortunately the gentleman in question had read of my status as vinyl fanatic, and was merely bringing to my attention the work of his friend and colleague, a certain Mr. Victor Patacchiola, dentist, guitar builder and now, maker of an air-bearing tonearm.

The design stemmed from that first penned by Poul Ladegard over

twenty years ago, but incorporates many improvements over the original. In fact, Vic's website shows how the design of his own arm has evolved, and he has even been in touch with me regarding further improvements since he dropped our review sample off last month - clearly there is still plenty more potential to be released from this design.

The whole system is actually quite simple - an inverted V-shaped trough is drilled to permit air flow along its length from an external pump, and a second item sits in this channel, on the bed of air, and carries the main arm. The carbon fibre arm tube pivots vertically in precision roller bearings, and can be easily altered for effective length, giving a wide range of adjustment and making fitment to virtually any turntable relatively easy.

The base in which the air channel sits can be supplied in almost any material you like and, so far, Vic has supplied customers with wood, granite, slate and even clear acrylic items, although the latter has to be outsourced with consequent increase in both cost and lead time. As these arms are handmade to order, any interested parties will need a certain amount of patience anyway, whilst their new arm is lovingly handcrafted!

Our review sample was set in a black-painted wooden base and was well finished, although it clearly retains a certain 'home-made' charm! The internal arm wiring is 30 strand copper litz, terminated to two solidly-mounted phono sockets and cartridge fitment to the solidly machined headshell block is relatively easy thanks to threaded holes. Cartridges with top-mounting

screw holes like the new Ortofon 2Ms might cause a headache in this respect due to the headshell's curved top surface, but I am sure a chat with Vic will elicit a suitable solution if this is of concern.

The optional pump/air reservoir is even more utilitarian-looking than the arm, but is quiet, works well and comes with a good length of hose to permit it to be positioned well away from the arm itself.

After a little headache concerning the protruding VU meter display panel on our Pioneer PLC-590 turntable (underlining the importance of providing Vic with the full details of the turntable you wish to use!) the arm was fitted, levelled, and charged with air, and I was ready to listen. I had to hand a range of cartridges from a £100 Goldring 1012 MM right up to a £500 Ortofon Rondo Bronze MC and was keen to hear how the Evolution would perform.

"It exemplifies what we analogue addicts love about the black stuff..."

**SOUND QUALITY**

I must shamefully confess to Vic that, during the final setup stages, I was harbouring some slightly unworthy thoughts along the lines of, "can this really sound any good?" and, "well, at least it will make an interesting DIY-type article". And then the Goldring 1012 hit the first groove and I knew my fears were groundless.

Julia Fordham's 'Happy Ever After' leapt forth from the loudspeakers with gusto, enthusiasm and fantastic detail. The Evolution picked out everything from the depths of the track and laid it out with the precision of a head waiter at a five star restaurant. Treble was sweet and clean but added superb atmosphere to the sound, without ever resorting to becoming harsh or hard.

Moving to something a little heavier, Primal Scream's 'Come Together' showed that the Evolution has simply staggering dynamic and resolution abilities. The 'Screamadelica' album is well recorded, but the whole soundstage is rather 'busy' and can end up as something of a muddle with less capable turntable/arm combinations. The Evolution picked absolutely everything out and kicked it out with great poise and verve. Bass was deep and very well resolved, never resorting to boom or wallow, and maintained a superb sense of

tunefulness, no matter how difficult the material I threw at it.

If I am giving the impression so far that the Evolution is an enthusiastic performer and that's it, this is definitely not the case. Some gentle classical courtesy of Holst's Planets Suite showed that this is an arm which can murmur sweetly when required, and its aforementioned strengths of detail retrieval and transparent top end really help to make the most of orchestras.

Acoustic music reinforced this impression further, with each note from both Michael Hedges' guitar and Therese Schroeder-Sheker's harp having expertly defined leading edges and a lovely natural decay. Soundstaging had very good depth, although perhaps not as much width as that generated

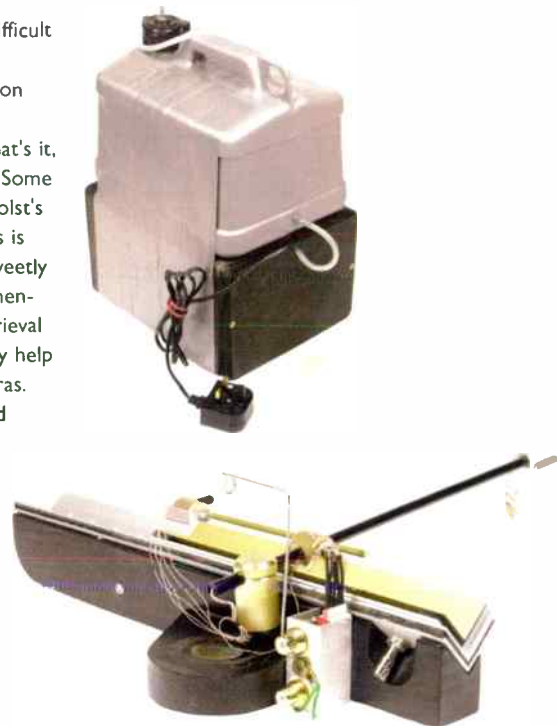
by the likes of the SME M2-10 that we use a great deal.

Having said this, though, the arm's dynamic abilities are so accomplished that I found myself rummaging through the *Hi-Fi World* record library for anything funky, rocky or generally rhythmical - the Evolution is quite addictive in this respect and I would not be surprised if new purchasers end up with untidy lounges/listening rooms very quickly as piles of favourite LPs start to build up, waiting to be rediscovered.

**CONCLUSION**

The Evolution air-bearing arm is a very fine unit, and those who would dismiss it purely because of its apparent simplicity of design and build (like I nearly did!) are doing themselves a real disservice.

At its selling price of £499 complete with pump and expansion tank assembly (it is also available without, for £450) the Evolution offers a highly addictive rhythmical ability with superb separation, detail and clarity. It really does



exemplify all that we analogue addicts love about the good old black stuff and shows just how two dimensional and sterile CD can occasionally sound.

True, it does not have the air of sophistication and capacious soundstage of the £650 SME M2-10, (or its exemplary setup instructions for that matter!) but it addresses the latter's low frequency shortcomings and really brings music to life. Add to this the extensive upgrade and tweak possibilities made easy by its simplicity and you have an arm that makes a virtually water-tight case for itself. If you are tempted, then be patient whilst yours is built - the wait will be well worth it.

**VERDICT** ●●●●£  
Detailed, dynamic and engaging tonearm that's superb value for money - just don't expect SME finish or ease of set-up!

**EVOLUTION PARALLEL TRACKING ARM** £499  
Trans-Fi Audio  
☎ +44 (0)7941 474710  
www.trans-fi.com

**FOR**  
- addictive dynamics  
- superlative clarity  
- rhythmic, weighty bass  
- build quality

**AGAINST**  
- soundstage could be wider  
- fiddly setup

**MEASURED PERFORMANCE**

Under measurement, this short stiff carbon fibre arm behaved in a way that is consistent with our findings to date about pickup arms, namely that relatively simple structures perform unusually well, because the vibrational behaviour of structures is complex and not especially well represented by the simple *ad hoc* models in use today.

So although the Evolution looks spindly and unconvincing, under measurement it was precisely the opposite: stiff and well controlled in its vibrational behaviour. Stiffness is revealed by its high 829Hz main arm tube mode; conventional aluminium tubed designs tend to ring at 280Hz or thereabouts, compromising bass quality and stereo stage width at lower frequencies.

The tube peak is fairly narrow and well suppressed in amplitude, so little energy is going into this mode, it appears. The suggestion is the arm will have clear bass and wide soundstaging, with well established left and right images.

Higher up the frequency band, the Evolution's simple headshell was less lively than most; there are few peaks and not the clusters often seen.

The Evolution might look simple, but deceptively so. Under measurement with an accelerometer it performs extremely well, better than most. **NK**

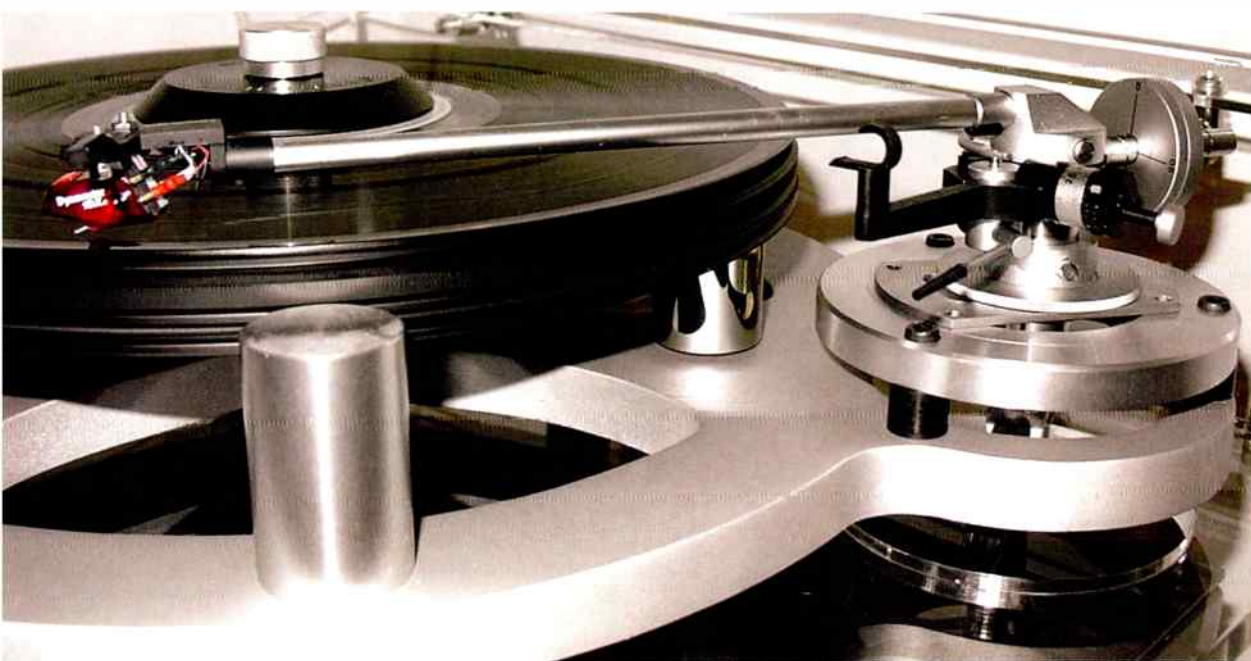
**ARM VIBRATION**

Arm vibration behaviour

15Hz frequency (Hz) 6kHz



# The Black Arts



**Want stunning LP sound without spending many pennies? David Price describes the fine art of setting up your turntable...**

**U**nlike digital discs, which are simply an assemblage of ones and noughts, vinyl records have continuously varying grooves which must be accurately traced by a tiny stylus glued to the end of a sprung cantilever. Being analogue, there is (theoretically) an infinite amount of information to be read, but no turntable, arm or cartridge has – by definition – ever read it with complete accuracy.

The reasons for this are myriad – most basic is that tracing such a groove is a mechanical process, and so to do it perfectly would require infinitesimally accurate mechanical precision on the part of the cartridge, tonearm and turntable. This, despite what the manufacturers would have you believe, is not possible. Also, your turntable system is constantly being assailed by external vibrations (i.e. sound waves) which sully its ability to do its very intricate job, and there's also the small question of whether the deck is best aligned to do it in the first place...

Essentially then, vinyl is a potentially ultra high resolution music source, hamstrung by poor engineering tolerances, external vibrations and the basic inability of the replay equipment to stay perfectly in tune. This is why, despite

the brilliant sound possible, many turntables sound less than superb. The good news is though that a little care and attention can eke out a serious performance gain from your black plastic – and it isn't rocket science. In fact, by and large, it's about following a simple procedure, such as this...

## PLACEMENT

This is the beginning of where it all starts for your turntable. Put the most expensive Linn LP12 on the floor, and it will struggle to compete with a Rega P3 perfectly sighted on a light, rigid wall shelf that isn't getting vibrations piped directly into its plinth. This is because the stylus makes music by being vibrated by the record groove, and if something else joins in (i.e. sound from your speakers), then the music will be muddled. Elaborate suspension systems or 60kg plinths are one way of coping with this, but another is to minimise it in the first place.

With this in mind, buy yourself a bespoke turntable table, or better still use a rigid, strong wall shelf. If you have to sit your deck on a basic equipment support, window sill or wardrobe, then use a sub-table as a first line of defence against those bad vibrations. A cheap way to effect this is to stand your deck on a piece of MDF, under which is placed one half of a tennis ball (cut in half) per corner. A more elegant but pricier

solution is to substitute Bright Star IsoNodes, FoculPods or similar) for the tennis balls. Least elegant but most effective is a bicycle inner tube placed under a glass or MDF slab, partially inflated to provide a gentle springiness. Best of all is a purpose-built equipment support, such as Audiophile Furniture's Base SP-01 (£60), which is a neatly finished isolation platform with resonance reducing bars and Sorbothane feet.

Whatever you choose, the other essential is to ensure it is level. Not only will this ensure that the tonearm tracks the disc in the way it was designed to do, it means that the load presented to the springs on independently sprung subchassis designs such as Michells or Linns is even. Such decks do offer their own height adjusters in the suspension, but often these often also alter the spring rates, thus affecting the evenness of the suspension bounce – which is a bad thing. So get your deck on a subtable that is perfectly level, then you won't have to level things using your turntable's own height adjusters.

## SETUP

The way to best set up your turntable obviously varies from model to model, but if yours is of the non-suspended variety, then you need to pay particular attention to the previous 'Placement' section, and then go straight to the next



**A spirit level is essential for setting up your turntable.**



**Keep your records clean with a decent carbon fibre brush.**

paragraph. Those with sprung decks, such as Michells, need to work on the principle that the three springs need to move up and down at precisely the same rate and in the same direction. This means that you should adjust them with this end in mind. Pay special attention to the clip clamping the arm cable to the plinth, as the arm lead transmits airborne vibration like anything else, and this will go straight into the tonearm if it is not 'grounded' by the plinth. Likewise, the plinth's suspension should not in any way be compromised by how you've clamped the arm lead to the plinth, so leave an inch or so of arm lead for the suspension to move up and down with. Correctly aligned, your deck should bounce directly up and down freely in an ever-decreasing piston motion. If it wobbles from side to side like a jelly, it's time to get the springs working in unison!

The condition of your turntable's main bearing is paramount, so be careful when moving your deck around - always remove the outer platter. Most main bearing housings can be flushed out with detergent, cleaned with isopropyl alcohol and then refilled to the recommended level with lightweight fully synthetic motor oil such as Redline 5W30 (£15 per quart), or van den Hul's TLF (£35) which is a bespoke formulation available from Henley Designs. This should be done periodically - once every year ideally - for best performance, and you might be surprised at how much difference this can make to the sound.

Turntable drive belts should be renewed if excessively loose, or otherwise regularly cleaned with isopropyl alcohol on a lint-free duster. Check the cleanliness of the belt's path (the surfaces it comes into contact with, including the drive pulley and inner platter) and clean them if necessary with isopropyl alcohol, including the pulley, belt and inner platter - again, smooth clean drive belt paths make for a smoother and more musical sound with superior speed stability.

Cartridges should be properly aligned and securely fixed to the headshell. Use a good quality

alignment protractor such as that from Ortofon, or the Mobile Fidelity GeoDisc, and secure the cartridge in place with quality Allen bolts (such as those from SME), tightened hard. Not too hard mind, or you'll crack your cartridge body or headshell! When fitting the cartridge, don't touch the bare cartridge pins as the dirt from your fingers will degrade the electrical connection and dull the sound - if possible, always clean them with liberal amounts of isopropyl alcohol before fitting.

Don't trust your tracking force to your tonearm - unless you have something of the quality of an SME Series V. Ortofon's stylus force gauge is very accurate, cheap at £6 and easy to use. Rega RB300 owners - and indeed any users of arms with springs to apply downforce - should try setting the tracking force to zero (effectively disengaging the spring) and balancing the arm via the counterweight and a stylus pressure gauge. The springs in some arms can cause sound degradation.

Stylus cleanliness is all-important, and again isopropyl alcohol is the stuff to use, applied on a fine artist's brush from back to front. Take care not to get fluid onto the upper part of the cantilever, as it can work its way up into the suspension with unfortunate results. An even better answer is vibrating stylus cleaner such as Audio Technica's AT637. Now long deleted, they can still be picked up on eBay for under £25.

Back in the eighties, obsessive vinyl users used to keep their styluses clean with a special type of sandpaper such as Linn's Green Stuff - it's effective but has disastrous consequences if used any more than occasionally. Another idea is Cardas's Sweep record, which not only cleans the stylus by vibrating it ultrasonically but also offers a Densen DeMagic-style demagnetising track too. Again, look online or in the classifieds.

### SIGNAL PURITY

With such low level signals, it is essential that you keep the contact points on your cartridge and tonearm scrupulously clean. If you're really fussy, removing the gold plating on the cartridge pins or arm lead terminations is worthwhile, as it simply obstructs the signal and - invariably being impure, doesn't prevent oxidation. Put a tiny amount of metal polish or T-Cut on a cotton bud and work it around the insides of all phono plugs and the outsides of sockets in your system. It should then be buffed off with a duster or cotton bud until it shines, and then cleaned with isopropyl alcohol on a cotton

### TURNTABLE TWEAKS SOUNDDEADSTEEL ISOPLATMAT £79

[www.sounddeadsteel.com/](http://www.sounddeadsteel.com/)

Made from Sonphonon, which is a non-magnetic, noise and vibration damping material. This platter mat has a surprising effect on most turntables, from Garrards to Linns and Michells, making the music smoother and more dimensional.



### BRIGHT STAR ISONODES £15/4

[www.absoluteanalogue.co.uk/](http://www.absoluteanalogue.co.uk/)

Made from a unique polymer claimed to reject a wide range of vibrations, the IsoNode is said to act as both a liquid and a solid for superior vibration control. We recommend the larger type for turntables, four of which can support 42lbs. They bring increased depth and speed to the bass, a cleaner and more three dimensional mid-band and a smoother treble.



### REDLINE 5W30 £15 per quart

[www.redlineoil-europe.com/](http://www.redlineoil-europe.com/)

Like all other metal-on-metal contact areas, turntable main bearings need oil to minimise wear, and this is one of the very best - its superb lubricity will help the platter spin with minimum load on the motor, and improve sound as a result. Keep 5% for future turntable use, and the rest of it in your car engine - it too will run sweeter!



bud and then wiped dry with another. The insides of phono sockets can be cleaned with pipe cleaners dipped in isopropyl alcohol, with the unit's power switched off and disconnected from the mains.

When you've cleaned off every last trace of metal polish with Isopropyl, give your contacts a swipe with Kontak on the end of a pipe cleaner. This stuff works wonders everywhere. Ensure your deck's mains plug is clean, using the cleaning method above. It's even worth opening up the mains fuse (disconnected from the mains, of course!) and cleaning the fuse and fuse holder in the manner detailed above. All this done - your turntable should sing like a bird!



**Isopropyl alcohol: an inexpensive way to clean your cartridge pins.**





# Cubular Belle

**Lehmann Audio's new high end Black Cube Decade phono stage proves that small is beautiful, says David Price...**

**S**urely it was the Michell ISO that started it all? Back at the end of the eighties, word got out that there was a little black box that, when plugged between your turntable and amplifier's aux input, would transform your vinyl sound. The rest, as they say, is history. Within a few years there were countless designs reaching the market, and by the mid-nineties we were seeing the advent of the £1,000 phono stage – a lot to pay for what used to come as standard in your preamplifier or integrated!

Germany-based Lehmann Audio has been an increasingly strong player in this market in recent years, especially in mainland Europe. The £300 Black Cube put the company on the map, and has proved enduringly popular. Now though, the new £1,100 Black Cube Decade finds itself in a different market altogether,

one with some established favourites such as the ISO's distant relative – the Trichord Diablo – plus Whest Audio's PS.20/MsU.20 and Eastern Electric's MiniMax Phonostage – competition is indeed tough.

The package comprises two standard-sized (280x110x44mm) Lehmann boxes, with a choice of either black or silver aluminium fascias. One is the phono stage itself, the other the PWX II power supply and they are joined to one another via a chunky cable terminated in XLRs. The audio stage boasts high quality electronics – Lehmann says its input stages can also be found in “top notch mixing consoles or well-known professional microphone preamps”. The passive filter network between the two linear gain stages has “high precision MKP caps” and there's a zero global feedback Class A output stage. Gold-plated RCA connectors are fitted to the high quality double

sided printed circuit board. The power supply actually has two power output feeds, so two phono stages can be run from its 30VA toroidal transformer, which sports a grounded isolation coil between the primary and secondary coil. There are chokes before and after the voltage regulation, and high quality double-sided printed circuit boards are used for optimal signal routing and component placing

Unlike the Whest Audio PS.20/MsU.20, which is highly adjustable but uses fiddly loading plugs (which must be obtained from Whest in advance), in some respects the Lehmann Black Cube Decade is more easily configurable via the front panel. One switch allows for MM or MC cartridges, and there's another giving an additional 10dB of gain. However, cartridge loading is less easily configurable, as it comes set up for 100 Ohm and 1k Ohm, and any change of input

capacitance means you'll need to use the internal slot system. The input capacitance can be set to 100pF, 220pF and 1nF — an unusually wide range. A 60Hz subsonic filter is fitted, switchable from the front panel.

**SOUND QUALITY**

First things first, and in my system at least, I found the Black Cube Decade's performance was severely hampered by the supplied mains lead — a change to a Black Rhodium Fusion (£81/m) made a dramatic difference. I also placed the audio box on four Bright Star IsoNode feet, which really moved it forward in terms of clarity and musicality for around £20. I compared it to my solid-state reference, the Whest Audio PS.20/MsJ.20, which was also thus set-up.

Properly fettled, the Black Cube proved a state-of-the-art £1,000 solid-stage phono stage, giving away little to either the Whest or the Trichord Diablo at the price — but that is not to say it sounds the same... If the Trichord were at the far left of our scale — very musically engaging and propulsive, then the Lehmann would be at the right, and the Whest in the middle. By this I mean that it is a silky sounding solid-stater with lots of detail and space, but doesn't have the vim that the Trichord or (less so) the Whest possess. This is interesting, because until recently I thought the Whest was on the ultra smooth and analytical side of things — and here we have something that makes it seem quite rough and ready!

Don't get me wrong, I am not about to lapse into cliché and call it a typically Teutonic 'hi-fi' sounding device that tells you everything that's happening but doesn't involve you that is not the case. But it has what I'd call a 'studio sound', inasmuch as it is technically excellent but lacking in any real character of its own. There are two schools of believers here — Noel loves the *joie de vivre* of the Eastern Electric tube stage, whereas I often find myself going more towards this type of presentation, which is obviously more detailed, better architecturally and more 'technical' sounding. Still, one listen to the Note Products PhoNote tube phono stage (at nearly twice the price of the Lehmann) and I find I can be pulled back to valves!

The Crusaders' 'Street Life' saw the Lehmann offering a wide open window on the music. Most striking is the proportionality. Whereas valve stages like the Eastern Electric throw you right in the 'stalls', the Lehmann puts you on the best seat in the balcony, where you can hear how

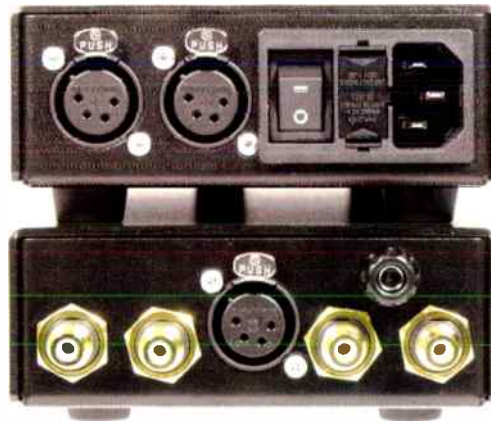
everything relates to everything else in the mix with total precision. By the same token, it's a less intense emotional experience, but it's that classic trade-off. The Whest puts you in the circle, by the way, just a bit closer to the proceedings, but retains an excellent sense of scale despite its greater immediacy.

The midband is excellent then, but in a solid-state sort of way. Like Naim amplifiers, it doesn't major on telling you about the tonal texturing of the instruments in question. It's smooth and almost silky tonally, but everything sounds this way, even the raw clarinets on The Crusaders 'Rodeo Drive'. Instead, the Lehmann focuses on the start and stop points of notes, and how they all fit together in the big musical jigsaw puzzle that is the mix. To wit, it's very fast and clear across the bass, mid and treble.

Another one of its talents — and this is only when it's isolated and powered by a decent mains cable — is dynamics. It is deceptively dynamic in fact, and enjoys signposting the subtle accents of Robert Fripp's guitar as much as it does snare drums being assaulted by a young Keith Moon. The Charlatans' 'Then' proved great fun — it's a busy mix, somewhat dull sounding but very brooding, and the Lehmann did its stuff by cutting through the dirge like a hot knife through butter, throwing out a wide, well proportioned recorded acoustic and masses of detail. Bass was taut and tuneful, midband clear and spacious and treble sweet. Indeed, moving to the Whest showed less 'breathing room' around the individual elements in the mix, and a very subtle loss of detail. By the same token, it was obviously more engaging and tuneful, making the musicians sound like they really meant it.

**CONCLUSION**

Had I not souped up the Lehmann Black Cube Decade with a decent mains lead and spent some time isolating it from mechanical



vibration then I don't think it would have got the reception it did, which was very positive. Surely it wouldn't hurt the company to throw in at least a slightly better mains lead with their top phono stage? Likewise, these two pressed steel £1,100 boxes lack the mechanical vibration resistance of a £300 Trichord Dino. Still, in the end, the top Lehmann delivered the goods very nicely thank you very much. It has a wonderfully spacious sound, and is truly exceptional in this respect at the price, with fine dimensionality, dynamics and a very natural, airy treble. As such, it comes heartily recommended, but it won't suit those who place immediacy over accuracy, for whom there are many choices.

**VERDICT** ●●●●  
Excellent solid-state phono stage with tremendous detailing and a silky sound, but faces stiff competition from tube and transistor designs alike.

**LEHMANN BLACK CUBE DECADE** £1,100  
Henley Designs  
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www.lehmannaudio.de

- FOR**
- detail
  - perspective
  - space
  - smoothness
- AGAINST**
- set-up dependent

### MEASURED PERFORMANCE

The Black Cube Decade offers High and Low gain with either MM or MC cartridges. MM Low was very low at x60, x100 being a common minimum, and High will be most useful, as MM cartridges rarely give more than 5mV or so output when playing an LP. With MC at High there is enough gain even for low output types, although only just. With insensitive amplifiers of 400mV or more, volume will have to be turned up a little, but this should not be a problem as the Decade is reasonably quiet at 0.074uV equivalent input noise, if not up with the best that manage 0.04uV — around 5dB quieter.

Equalisation was deadily accurate right across the audio band, the -1dB limits being 20Hz-96kHz. Our analyses clearly show this. Switching in the Warp Filter rolls down bass below 125Hz (-1dB), which is a bit severe, the -3dB frequency being 52Hz. There is a healthy -18dB attenuation at 5Hz, where warps live.

The stage overloads at 8.8V output, so input overload values depend on gain used, but are high enough for all real life situations. Distortion was minimal and separation wide.

The Decade is a well engineered, simple to use stage that performs very well. The warp filter could usefully have been a little more slick, as it affects audible bass as well as warps. NK

Frequency response (MM&MC)	
20Hz-96kHz	68/78dB
Separation (MM, MC)	0.24/0.07uV
Noise (MM/MC)	0.001%
Distortion	x60, x184 x628, x1908
Gain	8.8V out
Overload	

#### MM FREQUENCY RESPONSE

#### MC FREQUENCY RESPONSE



# Show Time

Adam Smith reports from the Park Inn Heathrow High Fidelity Show 2007...

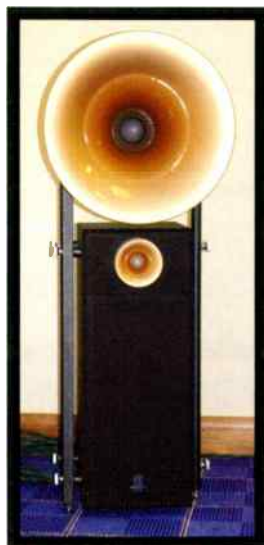
**T**he weekend of the 30th March and 1st April saw the Park Inn Hotel at Heathrow playing host to the High Fidelity Show 2007, more commonly known as the High End Show. Despite sunny blue skies and the lure of the garden, the show was well attended on both days.

*Alium Audio were exhibiting a system comprising the rather pretty Consonance Droplet LP5.0 turntable and Reference 2.2 CD player, through Consonance amplifiers and Gemme Audio Vivace loudspeakers, which hail from Canada and are new to the UK. Making use of a single full range drive unit in a back-loaded horn enclosure, they were generating astonishing bass from their four inch Fostex driver. Apparently I was not the only visitor to the room enquiring about the existence of additional, unseen drivers within the cabinet...*



*Anatek Acoustics used the show to launch their new A50R integrated amplifier and were demonstrating the new MC1 Phonostage, which is a Class A discrete design that uses no feedback. In a system comprising their CM0.5 preamplifier and MB50 monoblocks through Eben X-3 loudspeakers, the MC1 was taking its signal from one of two Technics SP10 turntables at the show, and sounding very fine. I was also pleased to hear Anatek breaking away from traditional 'safe' hi-fi show music and Metallica's "Master of Puppets" album was drawing quite a crowd, including yours truly!*

*Graham Tricker was making use of the new TW Acoustic Raven One turntable, fitted with a Vivid tonearm and ZYX cartridge, which was attracting a great deal of positive attention. Playing through Tron amplification and Avantgarde Acoustics Nano horn loudspeakers, the sound was very well integrated and lifelike.*



The second system to make use of a Technics SP10 turntable at the show was the setup in the Coherent Systems room. Fitted with an SME V arm and Audionote IO cartridge, this played through a new prototype phono stage from designer Guy Sergeant and into his Puresound amplifier. Through Focal loudspeakers, the sound was very good, and the room always seemed busy.



The English Valve Amplifiers room attracted me early on thanks to the promise of a new Transcriptors turntable. Sadly there was only a static display model in there but fortunately the system on demonstration made up for this. Using an SME turntable with TriPlanar tonearm through the EVA Proteus amplifier and into Audio Physic Scorpio loudspeakers, the sound was dynamic and exciting. Once again, a good selection of music helped things along immensely.



The loudspeakers that many people came to see in Audiocraft's room indeed proved to be quite a draw. The £125,000 Marten Design Coltrane Supremes are physically huge and had an equally vast soundstage, giving a sense of scale I have not heard the likes of before. However I did personally feel that the older MOR recordings they were playing most of the day on the Saturday were not doing the 'speakers justice - more wild stuff next year, please chaps!



Horn Audio were one of the companies using horn loudspeakers, demonstrating their brand new models which feature an impressive 112dB sensitivity. Driven by a kit monoblock amplifier delivering no less than 1.75W per channel (yes, you did read that right - one and three quarter watts!), the demonstration proved that you don't always need power in order to corrupt...



A last minute addition, Sounds4Enjoyment were demonstrating the rather lovely Isophon Cassianos that impressed me so much last month, with the help of a Leema Acoustics CD player and amplifier. This superb-sounding setup was augmented by a static display of other Isophon models, including some rather eye-catching blue Corvaras.





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"As the audiophile press has affirmed for several years now, GamuT is on to something very, very good." (JV Serinus, Stereophile)

GamuT's latest arrival, the CD3 CD player, completes a **SUPERBLY MUSICAL SYSTEM**, everything in its place and sounding "right".

"It has superb resolve of fine detail ...a perfectly judged balance and ...an irresistible ability to draw you into the music." Hi-Fi Choice

GamuT have merged their excellent D3 preamp with the legendary D200 power amp (an earlier Editor's Choice), making the Di150, an impressively **CAPABLE AND TRANSPARENT** integrated amp.

Hi-Fi Choice's view on the GamuT Di150: "This is clearly a gorgeous amplifier"– another Editor's Choice.

GamuT make three speakers – the stand-mount L3 and two floor-standers – all cut from the same cloth and using superb drive units such as the Revelator tweeter.

Comments on a GamuT system: "The CD3, Di150, and L-7 just flat-out worked for me. Music was alive and filled with the little pleasures that make you smile, nod, tap your foot, or even boogie." (Stereophile)

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**CD:** ACCUSTIC ARTS, BEL CANTO, dCS (ELGAR, DELIUS, PURCELL, VERDI, VERONA, P8i), GAMUT, RESOLUTION AUDIO, STELLO, WADIA. **VINYL:** AESTHETICS, AVID, CLEARAUDIO, DNM, GRAHAM, THE GROOVE, LEHMANN, MICHELL, ORIGIN LIVE, SUMIKO BLUE POINT SPECIAL, TRANSGURATION. **AMPLIFIERS:** BEL CANTO, CAT, DK DESIGN, DNM, GAMUT, HALCRO, HOVLAND, SONNETER, STELLO. **LOUDSPEAKERS:** AUDIO PHYSIC, DALI, ETHOS, GAMUT, NEAT, TOTEM. **CABLES:** CHORD Co., DNM, NORDOST, SILTECH, VERTEX AQ. **MAINS** Vertex AQ. **SUPPORTS:** ARCICI, STANDS UNIQUE, VERTEX AQ

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# Designing Speakers

## Part 7 Crossover Design continued

**Plugging in calculated 'theoretical' crossover values into a speaker design is a recipe for disaster. Peter Comeau shows you why.**

### GETTING STARTED

In the previous article we showed that the simplest crossover is the first order – a coil in series with the bass unit and a capacitor in series with the treble unit. Although this is practically unusable with the majority of drive units that doesn't mean that it isn't a good place to start. We can build the crossover up piece by piece using this method and add further elements as we need them.

So the first item is to select an inductor for the series element with the bass unit. Now, if you have followed this series carefully, you will have seen that bass units have, almost without exception, a rising midrange response when put into a cabinet. So we need to use the coil not just to provide a crossover slope but also to 'flatten' the midrange output. If we don't do this then the speaker will sound bass light – a common characteristic of speakers where the designer has used calculation to decide the coil value.

To see how this works we'll look at a drive unit with a smooth response and put it in a cabinet. The SEAS H1217 is an 18cm driver offering a smooth midrange output, which is ideal for a simple crossover. Placed in a large baffle it measures as shown in Fig 1.

Now compare that to this graph where the driver has been put in a narrow, floorstanding loudspeaker with a baffle width only slightly wider than the driver. This is typical of the modern 'fashion' in loudspeakers, in fact some might say that 20cm is too wide to be commercially successful! (see fig 2) Now our baffle 'step'

occurs where the wavelength starts to diffract around the baffle edges. This starts to happen where the minimum baffle size is a half wavelength and is calculated by:  $F_{step} = 344 / (\text{width (m)} \times 2)$

Fig 3 shows the effect of putting a driver in a 45cm diameter spherical baffle. In a rectangular cabinet the baffle step is softened by the width to height ratio of the baffle, but is most noticeable at the minimum baffle dimension.

For our 20cm wide baffle this

equation becomes:  
 $344 / 0.4 =$   
860Hz.

Above this frequency the output will be as flat as the drive unit can make it, while below this frequency the output begins to fall reaching a -3dB point given by the equation:  $F_3 = 115 / Bw$  where  $Bw = \text{Baffle Width in m}$ . In our narrow, tower enclosure, then, the -3dB point occurs at 575Hz. This corresponds roughly to the -3dB point on the graph, not exactly because the baffle is bigger vertically

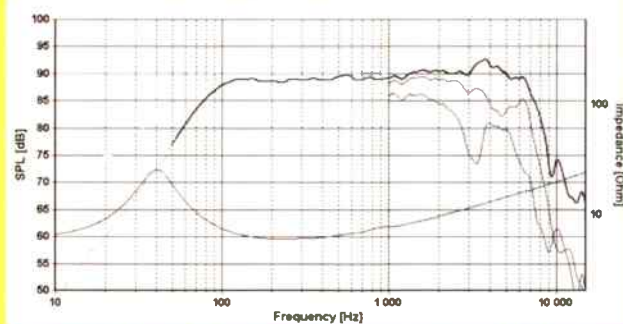
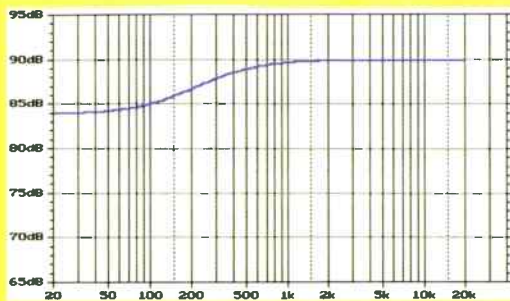


Fig 1 - SEAS H1217 drive unit in a very large baffle

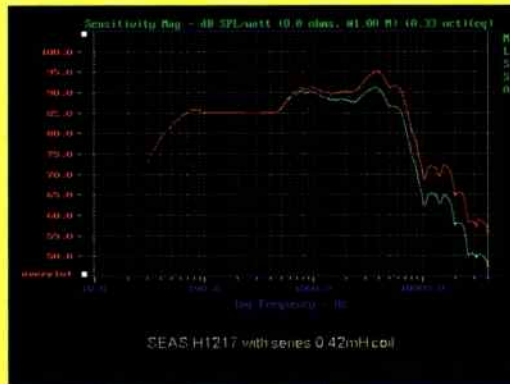


Fig 2 - SEAS H1217 drive unit in a 20cm wide baffle

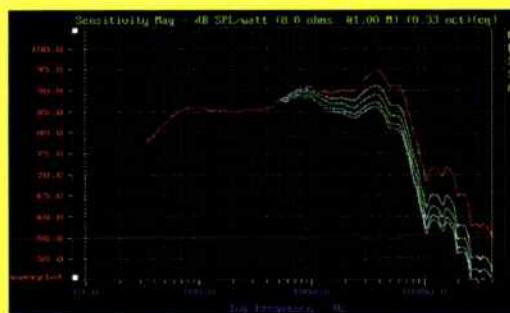




**Fig 3 - SEAS H1217 drive unit in a 45cm spherical baffle.**



**Fig 4 - SEAS H1217 drive unit with series 0.42mH coil.**



**Fig 5 - Effect of series 0.4, 0.6, 0.8 and 1mH coils.**

than its width so the fall in output due to diffraction is reduced slightly. You can also see that the output continues to fall until it levels off at -6dB.

### BAFFLE STEP COMPENSATION

Now what does this mean in practice? You would expect to have to put a complicated network in the crossover to give a -6dB step to equalise the output to make the overall response flat. But the more astute amongst you will already have noted that the impedance of the drive unit continues to rise through the midrange. As the impedance of the coil and the impedance of the drive unit are in series, we can choose a fairly large coil value to 'flatten' the baffle step without causing an early roll off.

So, let us put this into practice. The standard first order crossover calculation for an 8 Ohm drive unit and crossover frequency of, say, 3kHz would require a series coil

of 0.42mH. Let's just see what this does to our response graph: (see fig 4) Well, yes, it does drop the upper mid and, thanks to the natural roll-off of the drive unit, give us a crossover of sorts, albeit at a high 4.5kHz. But it has no effect below 1kHz and certainly doesn't equalise the baffle step.

So just how big a coil do we need? I have traced several coil values so that you can see the effect: (see fig 5). At 0.6mH or 0.8mH the baffle step is starting to be compensated better. But you can see how a first order crossover is still fairly disastrous in terms of achieving a flat frequency response. Don't worry about the apparent upper midrange dip and peak at the moment—we can sort that out fairly easily.

Of course the whole process could be made a lot easier by widening the baffle. This would lower the F3 of the baffle step (the -3dB point) and so reduce the 'peakiness' of the response around 800Hz as the coil

above floor level.

Even here there is still some room gain at higher bass frequencies and we normally expect the baffle step to reduce by a dB or so. That's why it is important to listen. If we were to flatten the midrange response entirely with a massive 3mH coil then we would almost certainly find that the bass to midrange balance sounded too bass heavy when the speakers were played in a typical room.

So, back to the plot, we chose a series coil somewhere around 0.6 – 0.8mH and here I've listened and decided on 0.82mH. But it was fairly obvious when listening that there was a dip in the upper midrange and a peak towards the treble. You might not be too aware of this without crossing over to a treble unit, but you would certainly notice it as soon as you did!

It is also obvious, looking at our measurement graph, that there is a peak before the drive unit rolls off naturally at 4kHz. We need to control this, and flatten the response above 1kHz. This is fairly easy to do with a second order crossover.

Now this is where I'm going to take a short cut. I use a piece of software called LspCAD into which I can put the measured response and driver impedance. LspCAD then allows me to construct a 'virtual' crossover so that I can see the effects of adding components. I don't expect you to splash out on LspCAD for your home designs at present, but you can, of course, do exactly what I am doing by actually constructing a physical crossover and measuring the results.

Over in LspCAD I have inserted my series 0.82mH coil and have put in a capacitor in parallel with the driver, thus forming a second order crossover. This is typical of a standard 'calculated' crossover and you can see the results: (see fig 6).

Again the 'calculated' crossover looks pretty disastrous. Far from smoothing the roll off the capacitor has made the treble peak even more 'peaky' and audibly obvious. A small adjustment to the capacitor value and the inclusion of a resistor in series with the capacitor (see fig.7) luckily solves the problem (fig 8).

Now at this point you might be thinking about objecting to the elevated 'plateau' about 800 – 1kHz, especially if you are aiming for a ruler flat response. Remember that this area is exactly where we calculated our baffle step to be. In fact this area is more obvious on-axis than it is off-axis which tells us that it is actually due to diffraction at the edges of the

would do a better job of smoothing the midrange. Bear this in mind when designing your cabinet!

For the meantime let's continue with this design exercise. What I would now do is start listening to coil values to see which gives the right sort of balance between bass and midrange. Why listen at this stage? Well the measurements don't take into account the room gain.

If you have been following this series you will have seen that room gain provides us with extra bass for free. As a result of reflections from local boundaries (floor, walls and corners) the bass output is commonly elevated by 3dB or more. Indeed if we were at liberty to place our 18cm bass unit at the base of the cabinet, close to the floor, we would see that the baffle step was reduced by close proximity to the floor boundary conditions, probably to around 3dB. Unfortunately, in this design, we want to use the driver as a bass-midrange, so it is about 0.5m

baffle. We could 'cure' this by extra elements in the crossover but, in my view, the extra complications cause more problems than they solve. This baffle diffraction area is not as audibly obvious as it appears on the graph. A better way of getting rid of it would be to opt for a wider baffle and you can smooth it by using a large radius on the baffle edges too. Yet another reason, in my opinion, of keeping clear of narrow baffle cabinets in your design!

## MEASURING IS THE KEY

So I hope that you can see that, without some form of measurement system, it is almost impossible to put together a crossover just by traditional calculation methods and listening. Ideally you do need to experiment by measurement and listening.

There are several speaker measurement systems on the market. The traditional speaker designer's system is MLSSA – a combination of computer hardware and software that enables you to take measurements

without having to use an anechoic chamber. The way it does this is by generating an MLS (Maximum Length Sequence) burst of 'noise' and measuring the output of the speaker in an adjustable time window so that you can cut out most of the reflections from nearby room boundaries.

Traditionally the anechoic chamber is used for speaker measurement, the idea being that only the output of the speaker reaches the microphone and all reflections are absorbed. Using a measurement system with a time window, however, enables you to do without the anechoic chamber and measure in a largish room instead. I have found that the most troublesome reflection is from the floor boundary as this reflection occurs very quickly after the initial impulse from the speaker and is difficult to 'dial out' using the time window.

One way round this is to put lots of absorbent material between the speaker, floor and

## ROOM GAIN

It is very important to take room gain into account when designing our cabinet and crossover. Not only does room gain ameliorate the baffle step but it also helps us maximise the sensitivity of our speakers. If we take the worst case of a 6dB baffle step you can easily calculate the loss in sensitivity once we have added our correcting crossover. Suddenly our 89dB sensitivity bass-midrange drive unit has turned into an 83dB sensitivity speaker! You may want to consider using room boundary conditions to their maximum effect if you are designing a high sensitivity speaker. For example placing a bass unit, or bass units, close to the floor boundary can boost bass output considerably in a three-way speaker. But to manage this sort of design successfully you will still need to put your midrange driver on a wide baffle to make sure the baffle step doesn't result in a loss of lower midrange.

One cunning design trick is to incorporate the baffle step from the midrange unit into your bass-midrange crossover. Just calculate your baffle width so the F3 of the baffle step is at your crossover frequency. This might allow you to use just a single series capacitor as your midrange high pass crossover element.

Another way of putting drive units close to bass reinforcing boundaries is to design the speaker for close-to-wall positioning. As you can see in our WD25 design this is a favourite trick of mine. By designing a relatively shallow cabinet even a front mounted bass-midrange unit can integrate successfully with the wall behind to deliver remarkably powerful bass whilst maintaining the high sensitivity of the midrange performance.

Pundits will tell you that the downside of this 'back-to-the-wall' design is the loss of deeply spacious 3D stereo imagery due to early reflections of midrange and treble from the rear wall. Actually I haven't found this to be a problem in speakers I have designed. It is certainly true if the off-axis character of the speaker is vastly different to the direct sound (and overcoming this is part and parcel of good crossover design), but if the reflected sound is similar in character to the direct sound from the speaker I find that the ear integrates the two very successfully.

I'll be using this back-to-the-wall technique in some of the speaker designs we will be covering in this series as it really is a very good way of providing an even and articulate bass performance in a wide variety of rooms.

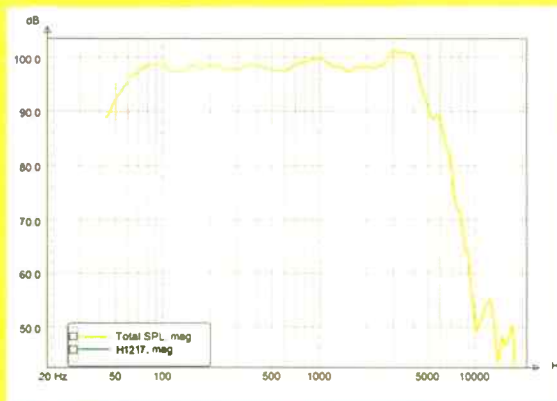


Fig 6 - SEAS H1217 drive unit with simple second order crossover

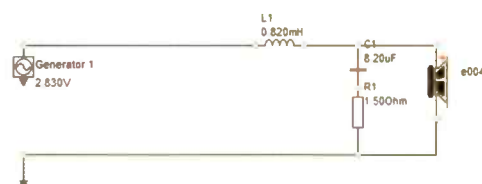


Fig 7 - Optimised crossover schematic

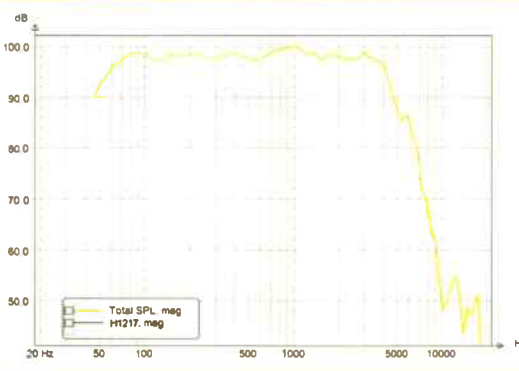


Fig 8 - SEAS H1217 drive unit with optimised second order crossover

microphone position. For example you could put the speaker at one end of a sofa with lots of soft cushions on it and position the microphone at the other end.

MLSSA is expensive to buy and difficult to install in modern computers (it is DOS based and uses a full length ISA slot), so is not ideal for the amateur even though it has become the professional's 'standard'. A simpler version of doing a similar job is CLIO which integrates more easily with Windows and comes as a complete system with microphone.

If you are only going to use a measurement system once, or occasionally, even CLIO might seem over-the-top on expense. So next month I will show you some cheaper 'kit' type methods that, with a little bit of ingenuity, you can assemble into a measurement system that will be more than adequate for the home speaker designer.



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## Letter of the Month

### THE NEXT STAGE?

I read your magazine every month and find it an excellent read and value many of your tests. I am a long-standing hi-fi nut, mainly turntable biased, but like the odd Compact Disc (I use a Musical Fidelity Electra 60 CD player). I have an Ariston RD 11s turntable with an Origin Live DC motor kit fitted and use a Rega RB300 arm with Incognito rewire and Origin live counterweight. At present I have a Rega Exact fitted but this is soon to be upgraded to a Dynavector 10X5 or DV20X MC cartridge. I use a Gram Amp 2 with upgraded power supply. My amp is a Roksan Kandy 3L model and my speakers are a set of Tannoy M4 Mercury's (not the best but cheap!).

I like what I hear but find that the sound can be a little forward and bright. I like the sound of the Ariston which I have grown very fond of over the years and would like to keep this in my system at present. I will be investing in a set of Duevel Planet speakers (thanks to your April 2007 review) in the next couple of months. My choice of music varies from Rock to classical.

I am thinking of going to valves but I am not sure what is the best way forward, I was thinking about a valve phono stage and I like the look of the Icon Audio PS1 (it looks a bit like a Ming Da model) or maybe the Project Tube Box SE MC/MM stage. Do you think that just replacing my phono stage with a valve unit will give me a smoother valve sound or would you suggest that going for a total amp upgrade to a hybrid (Unison Research/Vincent) would be a better bet? I welcome any help or advice.

**Robert Gardiner**

Hi Robert. I am not quite sure why your system sounds bright, but my suspicion lies with the Incognito silver wire. If you use a Shure M97xE or Nagaoka MPI I then this upgrade is appropriate, but not with a Rega Exact I suspect (not having heard this combo). I say this because our



**World Design Pre 3, PSU 3 and Phono 3 are all but ready. Final testing has been going on for some time at World Design in Cambridge and Hi-Fi World in London.**

Michell TecnoArm, also an upgraded RB300, exhibits the same characteristics, making it great match for some cartridges, but unsuited to others. A valve phono stage will not really help here: good ones are very accurate in their equalisation, so there's no artificial warmth, and they are revealing of the cartridge too, so don't rely on a fluffy blanket to disguise inadequacies elsewhere! Improving the cartridge will help, but again moving coils rarely sound warm so the basic balance of your system will not change. We are awaiting the new Project Tube Box II; watch this space. Also, there is the forthcoming World Designs phono preamp., which you will find described on p93 in this issue. **NK**

The Rega RB300 is a little thin sounding tonally, and your Rega cartridge makes things worse still. I think that if you move to the Dynavector DV20X, you'll find things smooth out a lot. Likewise a change of arm to the Roksan Nima will really help, for a modest price, as your modded RB300 is worth at least £150. Essentially, what you have right now is a warmish turntable and a very thin tonearm and cartridge, so don't despair - things can only get better when you change the latter

two items. I'd also counsel a move to the Graham Slee ERA V Gold, which is a consummately warm and smooth phono stage. Your speakers would be next in line - Revolver R45is would mellow things out, but certainly not at the expense of musicality - quite the reverse! **DP**

### WORLDLY WISE

Hi, you have been running a series lately on the designing of a new preamplifier which would include a phono stage. It looks very interesting - I assume this will be from World Designs? Is it possible to purchase it yet, only there is no info about this on the World Design web site ([www.world-designs.co.uk](http://www.world-designs.co.uk)).

**Philip Twomey**

The item in question is the new all-valve World Design Pre 3 modular preamplifier system, which is indeed a World Designs product. The three-box unit consists of a power supply, line preamplifier and separate phono stage and Peter Comeau has been covering its design in Hi-Fi World since the January 2007 issue. Like earlier WAD preamps, this one will use high quality input transformers, for low noise and optimum matching to moving coil cartridges. It also has relay input switching and, as always,





**The World Design preamplifiers being tested by Noel Keywood at left and Peter Comeau at right.**

you can tune and tweak with special components to end up with a unique phono preamp.

Having spoken to Peter, he has confirmed that it will be on the World Designs site shortly - see p93 of this issue. Best to start warming up your soldering iron soon! **AS**

Peter and I were measuring the final prototype of the Phono stage last week (just before Easter) and it's up with the best in all areas. Equalisation is super-accurate, and input noise through the MC step up transformers as low as it gets at 0.04uV (that's equivalent input noise, IEC A weighted. Solid-state usually comes in at around 0.06uV). There was no hum, as the power supply is in a separate case and, unlike earlier WAD products I worked on including my own beloved KLPP1, Peter Comeau has done what we always dreamed of, and that is arrange input switching by remote relay. This gets rid of long cable looms to front panel switches, with their associated problems of hum and noise pickup, signal degradation in the cables and the progressive decay of the switches themselves over time due to oxidation of silver contacts and wear. Relays are nowadays designed for low level audio signals: they contain an inert gas and are sealed, so are preferable in every way to mechanical switches.

As an aside, I continue to have so much trouble with mechanical switching of audio on the test bench and in various preamps like the wide bandwidth THATS 1512 chip I am currently experimenting with, where the Rg gain terminals are radio receivers (!), that I am going to use d.c. switching with relays too, in order to totally eliminate rotary switches and long leads, both of which are troublesome and anathema to audio - as well as unnecessary nowadays.

So check out the new World Designs phono stage, as ever

designed and specified to the very highest standards by Andy Grove, including all the transformers, which are built by the only (UK) supplier we entrust for these crucial items, and who work under our guidance. We do not buy in transformers by the way, and likely never will. **NK**

### **BUILDING A SYSTEM**

*I am thinking of putting together a low cost system within the equivalent amount of £1,200 (max). My room is about 16' x 13.5' x 13' (LxWxH) and I listen mostly to Western classical, Jazz, and oldies (like Nat, Pat, Frank, Dean, Peggy, Connie and Nancy Sinatra)*



**Usher 520 - a great budget loudspeaker.**

*mostly on CDs. I like detailed sound and good imaging and do not care much about bass weight. Currently, I have been thinking of Audiolab 8000CD, Rotel RA-04 and Usher S520, then possibly a budget silver interconnect. I don't mind analytical sound as long it is not too painful! Also I would be using headphones a lot since most of my listening happens post-dinner (9:30-11:30pm). I like the Rotel RA-04 but I cannot try out the Audiolab CD player or the Ushers as the outlet I use can only obtain them against a confirmed order, hence I would be grateful for your advice.*

**Sudip Dutt**

We feel that the Usher S520s would suit anyone - they are truly a loudspeaker for all seasons. The plastic cone is peculiarly uncoloured and well damped, giving a more spacious sound that is also smooth. Bass is very good for a cabinet of the size, and clean rather than heavy or ponderous. The Audiolab 8000CD is a fine player, but the Russ Andrews DAC-1 USB is also great, if you already have a player you can use as a transport. **NK**

The Audiolab 8000CD is an exceptionally clean and crisp sounding device, with a stark midband that casts a brilliant white light on the music. As such, I actually think it will suit your requirements perfectly. It is not light on bass, but doesn't add any extra, unlike the more euphonic sounding Marantz SA7001KI Signature, for example, so again the Audiolab will suit. The Rotel is a warm, beguiling integrated in its way - certainly not stark, so it will match the even presentation of the Ushers and the spry sound of the Audiolab. Overall, a very well matched system - couldn't have done better myself! Just remember to use a nice, smooth, musical speaker cable such as Black Rhodium's Tango. **DP**

### **BACK IN BLACK**

*Last year we renovated our house and after everything was finished I brought back the hi-fi equipment from the attic where it had been for a couple of months. My wife almost started crying when the black Tannoys (2xM3, 2xM1, MC), the very black subwoofer, the blackish TV and a bundle of black components (Sony STR DB930 tape deck, DVD/IHD-recorder) filled the space that for almost a day had been light, cheery and very empty. So, she convinced me something had to be done and the search started. Looks were the important thing here, although as we both enjoy music and movies, the quality*

should be equal or better to the system we had.

After we went through all the normal stores where hi-fi equipment with high WAF and low sound quality were happily standing next to washing machines and dishwashers, we found no speakers that we thought both looked and sounded good, we went to a real audio store. My wife directly fell in love with a pair of silvery Linn Komponent, way beyond our budget. And she really needed the REL Strata V (with a nice veneer finish) to accompany them. Of course they sounded so, so much better than what we were used to that it was now easy to convince her we should at least try to balance the rest of the equipment so that it was all in the same league and at least a bit better than what we have now.

The current status is that we have the following setup - Linn Komponent 110 floorstanding loudspeakers,



**What the wife went for: Linn Komponent 110 floorstanding loudspeakers. Tom Cruise move aside!**

Komponent 106 centre channel and Komponent 104s for the rears, REL Strata V subwoofer, Cambridge Audio 640C CD player, Sony STR-DB-930 home cinema receiver and a Sony RDR-HX 925 DVD/HD recorder. At the moment I'm thinking about buying the Cambridge Audio 640R to replace the STR-DB-930 then, when we'll have saved some more, I want to connect a Cambridge Audio 840A and 840C to it so we'll have very good stereo and very enjoyable 5.1. This will set me back about £1,500/ £1,000 this year and twice that amount in the future.

I have also agreed with my wife that we'll buy a DVD/HD-DVD/Blu Ray player when our current television gives up, probably somewhere in the next two years.

The thing is that, for less money, I could buy a Denon AVR-4306 receiver and a DVD-3930 DVD player. This would give me already a very good DVD/CD player and a more powerful



**If you want good quality surround sound get an Arcam AVR280 receiver. It's true high fidelity.**

receiver with bi-amping possibilities. I'm sure this will give me better 5.1 sound, but how does it compare in stereo terms? And, will the Linn speakers be the bottleneck of that system? I know Linn has a very good reputation, but those speakers (not to mention the LPI2) are in a very different budget arena. Can you give me any advice what to do, please?

**Martin Boer**

of course. I feel it is great value and an easy item to live with. It is not a real hardcore audiophile player in any area, but it gets very close, likely close enough for all except the most fastidious. I am less happy with what I have heard from Denon surround-sound receivers, feeling that Arcam's AVR280 offers a superior sound quite frankly. It is altogether smoother and more solid sounding, with real solidity and punch. I'm not averse to a good surround-sound system, but you need to choose carefully because a lot of product is fairly mediocre sound quality wise, and you end up spending a lot of wonga for 5.1 pains in the ear, instead of two! **NK**

#### OUT OF BALANCE

Hi, I'm hoping that you can find the time to reply to this e-mail. My amp and/or speakers are not working properly as, when I turn the balance knob on the amp one way no sound comes out. Album tracks are therefore missing guitar solos etc. I have unhooked everything and set it up again but there was no change. Thanks for your time.

**John Kelly**

John, one of your channels has stopped working and there are three possibilities as to why. The first is that you have a broken or damaged cable somewhere in your setup, secondly that one channel of your amplifier or source component has died or, thirdly, that one of your loudspeakers is not working.

Cables can break along their length or in the plugs, especially if run under carpets, forced into a tight space or if they are laid in a way as to be inviting to the pet cat/dog/rabbit, but they can be checked out by testing the continuity of each one with a multimeter if you have one. If not, simply change each one in turn and see if the errant channel comes alive. If it does not, then the problem must be equipment related.

Fortunately there is a step-by-step way to check this out as well that shouldn't take too much of your time. For the purposes of the explanation, I am going to assume

Hi Martin - the Denon AVR-4306 is a 'solid' AV receiver, but don't expect it to work magic into very revealing loudspeakers such as the Linn 110s, especially in two-channel mode. My experience of Denon AV receivers is that they're a tad clinical and cold sounding, although can amaze with movies because of their sheer wallop and mass of facilities. If you must go for an AV receiver and not the 840A/C immediately, then I'd choose the Cambridge Audio 640R without a doubt, and get a 740C CD player, which did so well in our CD group test, to partner it. For slightly less engaging CD sound, but do-it-all digital disc functionality, the Denon DVD-3930 is excellent. **DP**

Hi Martin. The Denon DVD-3930 has been reviewed in this issue and it is indeed an interesting and capable unit. It actually has DVD-A, SACD and CD, as well as DVD video replay



that you are using a CD player, that it is the right channel that has stopped working and that you have checked all your cables are okay. The first step you need to take is to swap the channels over on the loudspeakers, in other words, plug the left speaker into the right amplifier output and the right speaker into the left output. If the right channel still does not work, then your right loudspeaker is faulty, but if the right 'speaker starts to work and the left one stops, then the fault is somewhere in your amplifier or CD player.

If the channel did swap, thus proving the amp or CD player is the problem, then the next step is to put the loudspeaker connections back to the correct way round so that the right channel is not working again, and then swap the CD player leads - in other words plug the right channel output of the CD player into the left channel input of the amplifier and vice versa. This time, if the faulty channel is still on the right, then your amplifier has a problem, but if the fault switches channel, the CD player is the issue.

Obviously I don't wish to blindly guess, but I would say it is most likely that either the amplifier or a connection is the issue. If your source is indeed a CD player, then these are generally very reliable, however if it is a turntable you are using, then you would also need to check out the arm wiring and interconnects, as well as checking to see whether the cartridge has become faulty - this is rare but not unheard of. Personally, I would think it is extremely unlikely that a loudspeaker will be so badly damaged that it falls completely silent - usually they become distorted or one drive unit fails. If the whole lot goes at once I would expect it to be accompanied by a loud bang, a burning smell and possibly some smoke!

If the fault turns out to be the amplifier then it may simply be that one of the output channel fuses has blown and a replacement item will make everything work again, or it may be the case that one channel of the output stage has blown. In this case, repair or replacement will be the only option. **AS**

### THE VINYL FRONTIER

Some advice on what the next steps should be with regard to my turntable/ phono stage set up would be very welcome. A couple of years ago I purchased a second hand Linn Sondek LP12 to replace my standard Project turntable. The LP12 is approximately twenty years old and has an Ittok LVII tonearm that I run with an Ortofon



**Linn LP12, a classic turntable that has just been upgraded by Linn. See our Bristol Show report.**

Rondo Red cartridge. The LP12 was recently updated with the Linn T-cable and also an Origin Live Ultra DC Motor. I run this using a Graham Slee Gram Amp3 Fanfare phono stage and my new Sugden A21 Series Two integrated amp using Focal 714V speakers.

Generally I am pleased with the standard of sound that I am getting and there is no doubt that it is a step up from the Project. However, I can't help feeling that there is still more to come. I am finding myself seduced by pictures of new (compared to the LP12) turntables and going to the Bristol hi-fi show has made this worse. The two possible turntables that stand out for me are the Michell Orbe and the VPI Super Scoutmaster. At this stage this is based on looks only as I haven't yet had the opportunity to audition them. Am I wasting my time here or would either table be a significant step up from my LP12 or would a new arm/cartridge combination be better for me than to start from scratch with a new table?

I am also beginning to think that the Graham Slee is the weak link in my current system and maybe just upgrading the phono stage would help. I am reading more and more about the benefits of the vlv approach (valves & vinyl) and am intrigued by the Eastern Electric valve phonostage but am also considering other products. What do you

think? Any advice would be appreciated.  
**James Ellis**

Ho hum James - this is a tricky one! Basically, it all depends on how well your Sondek is set-up, and how old it is. First things first, I would suggest you get it fitted with a Cirkus bearing kit - this will take it to latest spec (Keel subchassis upgrade notwithstanding). Your Ittok LVII is likely quite tired by now, and so I would suggest an Origin Live Silver to replace it. The Rondo Red is excellent, but again you should treat yourself to a Kontrapunkt b, because it moves things on a stage or three from the Red. This done, you will have an excellent sounding deck by any standards, but still not up to - in my opinion - the Michell Orbe.

The good news is however that, if you so desire, the OL Silver/ Ortofon Kontrapunkt will swap over to a new Orbe very nicely. You could then sell your recently Cirkus'd LP12, and get good money for it. The other option is to get a new Keel subchassis for the LP12, which will - if my initial listening tests are correct - take the Sondek (SE) right up to Orbe performance levels for around £2,000. At this stage, it's time for you to audition the two - because it's a case of different presentations, and



**Eastern Electric Minimax valve phono stage - a great sound from moving magnet and moving coil cartridges. Note the big audio transformers for moving coil cartridges.**

not obviously better/worse. Basically, both are great! **DP**

If you can stretch to the £1,100 or so needed for the Eastern Electric Minimax phono stage my advice is to do so. It's what I choose to use in preference to all else; valves give a more spacious sound than solid-state and this stage is superbly engineered. Bear in mind that the tapped input transformers provided for low and high output moving coil cartridges contribute as much to the sound as the valves, as transformers are the only way to exploit the power available from an MC cartridge so that its full potential can be realised. You get a very low noise floor, a little lower than the quietest solid-state input stages.

The secret lies in the transformers of course, which need good quality Permalloy cores, Permalloy shielded cases, high quality wire and so on. Notice the size of the cases on the Eastern Electric and World Design preamps, both of which use MC input transformers to feed subsequent valve amplifier stages. Moving magnet cartridges have higher output, so feed in direct to the valves. Granted, nowadays solid-state circuits have incredibly low noise, down close to the thermal limit, but you still do not exploit a moving coil unless you match its ultra low impedance generator (2 ohms or so) to the 1Mohm of a valve grid via a transformer. Just feeding the signal into a solid-state stage is conceptually inelegant, if not ineffective I can say from experience.

Today's solid-state phono stages, like the ones you mention, do a very good job, as did the Lehmann Decade that I snatched from the Editorial cupboard when unlocked, for a quick night's auditioning! I found it really easy listening and very nice indeed, but V&V&T - valves, vinyl and transformers! - are where it's at, on the cutting edge. And whilst not cheap, nor are such stages absurdly expensive either. Audio Innovations P2 was the first really good all valve phono stage I heard, back in 1996 - and it blew me away quite frankly. Guy Sargeant had equipped it with a valve regulated power supply. Then we produced the World Audio Design KLPP1, which I use today (tweaked!) and now you can choose between the Minimax or the new World Design Pre 3 if your soldering iron needs to know it still has a role in your life! **NK**

### MISSION ACCOMPLISHED

Would you advise what you think would be the best Cyrus power amp to use

with the Cyrus 8vs integrated in order to bi-amp, please? Also, do you feel it would be worth the investment to upgrade from the Mission 782 loudspeakers to Monitor Audio R6 or R8? **David Luk**

The obvious candidate from the Cyrus range would appear to be the 8 Power amplifier and this should work nicely with the 8vs integrated to allow you to bi-amp successfully. Another upgrade you could consider at some point in the future would be to add a PSX-R power supply upgrade, as this improves the performance of each individual component further. As to your loudspeaker question, I assume you are referring to the Monitor Audio RS6 or RS8. This is a trickier option to comment on without knowing your other equipment, your room size, the sort of music you play and the sort of sound you like. Personally, the Mission loudspeakers of the 782 era don't do a great deal for me, but they were well reviewed at the time (including in Hi-Fi World, August 2000!) and remain popular on the second-hand market. The Monitor Audios are dynamic and lively with good bass punch and I would personally prefer them to the Missions, but I know some consider them to be a little on the ragged side at times. As always, you should listen and let your ears decide. **AS**

### GRAMMY FOR YAMAHA

This year's Technical GRAMMY Award was presented to Yamaha Corporation in recognition of the company's long tradition of highly-successful recording products, including the legendary NS-10M studio reference monitors and recently launched HS monitors. I was surprised to see the HS series monitors in the list because they are relative newcomers. The reason they were also included might be that they were designed in the tradition of NS-10M monitors with the company slogan that "if your mixes sound good on these, they sound good on anything".

I am delighted as I own a pair of HS50M monitors, so I am listening to music on a product which was awarded a Technical Grammy. As I wrote to you in an e-mail before, I believe HS50Ms represent the biggest bargain in the audio history. They are exceptionally transparent to the input signal and they are also powered monitors so the bargain price of 260 includes bi-amplification and speaker cables.

I have read David Price's excellent



Cyrus 8vs amplifier - benefits from a PSX-R upgrade, says Adam.

review of the Yamaha Soavo 1 speakers in the April issue. By looking at the pictures I can see the similarities between the midrange drivers of the Soavo 1 and the HS50M's 5" white coned main drivers. The rubber surround of the driver looks very similar, but I think HS50Ms use bigger magnets because they have only one driver each channel for bass and mid frequencies and they are designed to handle high rates of power.

In my opinion HS50Ms midband (and even bass) would be more transparent than Soavo 1s (and NS10Ms for that matter) as they are active speakers. The reason that makes me think that way is that, after reading an interview with the late producer Arif Mardin (who was a Grammy Trustee himself), I learned that they had recorded Norah Jones' 'Come Away With Me' album at Sear Sound Studios in New York. I have checked Sear Sound's website and they have NS10M monitors in their studios. So there is a high probability that this album was mixed on NS10Ms. That is probably why it sounds amazing on my HS50M monitors, it is almost like being in the studio. Norah's voice on almost every song on this



Yamaha HS50M loudspeakers, meant for studios.

album sounds different. There are some songs (or part of the songs) that her voice has a nasal quality, but on songs such as 'Seven Years' and 'Painter Song', her voice is very realistic, warm, intimate and expressive (and sometimes very soft).

The reason for this variety is that I think HS50Ms are more transparent than NS10Ms, so they reveal more detail which wasn't detected by the



producer and the engineer on NS10Ms during the mixing of the album. Arif Mardin had said in the interview that they liked the vintage Telefunken microphone Norah was using during the recording so much that she ended up buying it from the studio. The whole album was recorded on 2" analogue tape using a Studer A827 machine. So there is an analogue warmth to the sound. I have a CD copy of the album but I imagine the vinyl pressing would sound great.

Another interesting highlight of this album is that, in some of the songs, the double bass and acoustic guitar really come alive on my H550Ms. I can hear all the notes and noises the player's fingers make while he is touching the strings of his instrument. This is not a case if the speakers are just recreating the image of the instrument; but further recreating the sounds of the instrument realistically in my room as if it were live. I think this kind of transparency would be rare at any price, for bass instruments anyway. I believe that H550Ms would also make excellent speech monitors since the 5" main driver handles all the frequencies up to the 3kHz crossover point, and their enclosures are really small and well made to eliminate cabinet coloration. I don't have any spoken voice recordings to test them out, but well recorded vocals (male or female) work superbly on H550Ms.

Yamaha also makes matching powered-subwoofers for the H550Ms and I have read positive reviews in the pro-audio press that together they provide a well matched full-bandwidth monitor system. I might be interested in adding not one but two subwoofers to my H550Ms (I am thinking Wilson Watt/Puppy combination!). But before I add subwoofers to my system I will audition the new MSP7 Studio Active Monitors coming out soon as Yamaha claims that they were designed for uncompromised quality to provide

accurate Hi-Fidelity. They have 6.5 inch main drivers, bigger cabinets and more beefy power amplifiers so there might be no need for a subwoofer. Interestingly though Yamaha also makes matching subs for the MSP7s!

**Billy Coskun**

...and there was me thinking I was a Yamaha speaker fan! Thank you for the insights, Billy, but I can simply say that I am not a fan of the NS10Ms in the least - they are 'rough and ready' near field monitors, but reliable and lively sounding, which is why studios use them for final mixdowns. The Soavo 1s are a different kettle of fish entirely. Not quite up to the NS1000M in matters of transparency, but terribly impressive at the price and an all round great affordable audiophile product. **DP**

**AND ONE (MORE) THING...**

In the letters page of the May edition you have answered Mr Mike Rodway's letter - followed by a picture of our decoder - with a cryptic comment suggesting his letter is a 'Disguised Press Release' of an 'unsubtle' kind. We do indeed know of Mr Rodway as he is a valve tuner enthusiast who has fitted many of our decoders in past years, but the last sale we made to him was in March 2002, and have had no contact since. He is thus even more mystified than we are as to why he should be supplying (even if he knew what one was, which he clearly doesn't) 'disguised press releases', however unsubtle!

There seems little point in reviewing the decoder. You have already reviewed it - HFW, June 1999. We have simply put it into a new box, as explained in the cover note. We thought you might like to see what it looks like now, given that it's never been off the market since August 1998 and that it's still under 200 quid. Perhaps your readers deserve to know that Trough Line (or Quad

FM2) aural bliss is achievable for £375 including a totally rebuilt Trough Line and a stand-alone decoder. Moreover, in June and August 1995 Dominic Baker reviewed the Studio 12 decoder, and that can still be purchased off Stan Halfyard at just £69.95. We also do our own mods. to this, making it truly 'audiophile'; this adds £50 to the cost, so some hard saving is called for here!

We simply felt that your publication which can be credited with single-handedly resurrecting great valve tuners of yesteryear (no-one else bothered) were perhaps neglecting to inform your readership that still some choice exists out there - and is thoroughly documented in back issues of HFW, beginning with Tim's glorious beast (HFW, June 1992) with which you were associated, I believe. Although unavailable, lots of these (as you've recently acknowledged) are still doing their rounds on the second-hand market.

No reviews, please - and we weren't even after a 'press release', as it's not



**Leak Troughline, now there's another decoder for it; One Thing have re-boxed their original.**

even a new product. Nor will production be renewed when present stocks are gone - and they very nearly are, even as I write. We do, however, have a new version of the ESL 57 (not the one you reviewed last time) and if you're interested we'd like, in due course, to get a pair to you.

**Steve Williams**  
**One Thing Audio**

**Billy Vee**  
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Hi Steve. Do you mind if we print your letter? It will clarify the matter. I hope you can understand that a few dealers and manufacturers have in the past generated their own letters of unbridled praise, sent out through friends/customers, in the hope they will appear in print as a form of promotion. This has affected all magazines and is a deceptive practice not greatly appreciated by them. Letters of this nature are not usually put into print as a result, but we thought this letter made a

our outboard version to a number of customers who have several tuners but this, as in all external decoders requires careful matching of the tuner to the decoder.

I would also like to point out that we do not offer just a realignment service. It is completely pointless to realign a tuner of this age without fully restoring it, as all the original components continue to age and the tuner effectively drifts out of alignment again, even after it has been realigned. When we have carefully restored the

on behalf of One Thing audio is most offensive. I wrote to Hi-Fi World to let your readers know of a better and cheaper alternative to G.T.Audio's decoder. Although I have great respect for One Thing Audio, I have never met the personnel and last purchased from them in 2002. One Thing Audio is respected world wide for their refurbishment of the Quad ESL 57 electrostatic loudspeaker and certainly do not need me as an undercover agent!

I have auditioned equipment on your say-so for many years and regret this disillusionment has arisen. Do you remember the tuner Denon TU-S10? I bought one following your review and you were correct, it is a very fine sounding tuner indeed. Let's hope you contain your suspicious nature in future!

**Mike Rodway**  
Christchurch  
Dorset

No offence meant, Mike. I am sure you understand that letters of unbridled praise about a product, especially when criticising a rival one, are viewed with great suspicion by all magazines - not just us - as this is a well known scam aimed at deceiving readers whilst making a fool of the magazine. It also raises reader's suspicions when such a letter is printed as most people nowadays tend to have fairly well honed doubt mechanisms, shall we say. I am glad your letter was sent in with good intention, to One Thing at least.

I also know that Graham Tricker has been in the restoration business for a long time and does a very good job too. The reason we published your original letter was that it reminded us all that tuner restoration services are still available, and that a restored valve tuner is a wonder to behold sonically. I am happy to publish this little debate to again bring to readers such specialised services - ones that I have always been intrigued by (well, I thought I was nuts!) **NK**



**One Thing decoder - breathes new life into an old Troughline**

### **Quad ESL-57, restored by One Thing to better the original. And now there's to be a new version.**

useful point. I am glad to be told it is genuine. I was just about to re-test your decoder and give it a page in the magazine. We could also put it into the context of tuner services available today. Please confirm you would rather we did not, as this will be popular and attract interest. We would love to review any new ESL-57 from yourselves; the last was memorable. **NK**

Hi Noel -

I guess things must look quite different from the other side of a publisher's desk! Please do as you wish if you feel it will make interesting reading.

**Steve Williams**

Hi Noel. I just thought I would make a brief response to the letter in this month's Hi-Fi World magazine "Cracking the Decode" as I do not think Mr Rodway was aware of all the facts regarding our Troughline restoration service.

As you know G.T.Audio has been restoring the Leak Troughline tuner for nearly twenty years and with the current stereo decoder about ten. This latest decoder has also been available as an outboard version in both standard and audiophile configurations. However, in about 95% of Troughline restorations the customer prefers to have the decoder installed inside the tuner as it is more convenient and is one less box to house. However we have also supplied

tuner then realignment is performed and this ensures 100% reliability and enables us to provide a full 12 months warranty on each tuner including valves. This service is also described on my website ([www.gtaudio.com](http://www.gtaudio.com)) under "Service and Repair"

To answer Mr Rodway's question about "sound quality suffering due to heat stress", well I am sure you can answer this, but as you know when Leak introduced the Troughline Stereo in the 1960s it was originally fitted with an internal stereo decoder. Although the Troughline uses valves, it does not get hot like a valve power amplifier, and as the tuner has adequate ventilation through both the top and bottom this presents no problem at all to the internal components, both in the tuner and the stereo decoder.

I hope this clarifies our Leak Troughline restoration service for Mr Rodway and your readers.

**Graham Tricker**  
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Thank you for your answer in Hi-Fi World to my letter about the One Thing decoder. I understand that you swim in murky waters in the hi-fi press, but your implication that I am some kind of secret agent acting





# Nola Viper Reference



At the 2007 CES Show in Las Vegas, the speaker that appeared in more rooms than any other must have been various models from the Nola Viper range, looking particularly beautiful in their new piano finishes (see photo). As you go up the range more of the drivers employ alnico magnets, which are very expensive, hence the price increase from around £3.5K to £13K. The fact that other manufactures use Nola to demonstrate their equipment, speaks volumes about their quality. These are unique speakers, so please do view their website ([www.nolaspeakers.com](http://www.nolaspeakers.com)), for more details and reviews from the Show, and then give us a call for a demo!

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## Sonus Faber Elipsa (NEW)

Elipsa, a major new introduction for Sonus Faber, is placed at the top of the highly regarded Cremona range yet borrows its sonic and design cues from the ultimate, Stradivari Homage.

Chief among the physical design elements is the use of the infinite baffle form pioneered on the Stradivari. Extensive use of sub-structural stiffening spars breaks up remaining resonance nodes. Wider than it is deep, this elliptical cabinet construction couples easily with even difficult room acoustics allowing bass to roll effortlessly into the listening space. Here, the form is more tightly tailored and the reduction in overall scale works to its advantage allowing it to be easily integrated into a variety of listening spaces. For Sonus Faber, the drivers are crucial to the sonic success of their approach. Sonus Faber continues its recent tradition of reducing moving mass, stiffening the coned drivers, while asking the tweeter to extend out well into the 40kHz region. What makes this recipe so remarkable is that as with all Sonus Fabers, balance and harmonic richness is retained.

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Following the magnificent Grand Concert and Concerto, Triangle and UKD are proud to announce the arrival of two new models in the Magellan Series - the Quatuor (£7,500 - pictured) and the Cello (£5,500). These have all the quality, finish and technology of their larger brothers. They're luxurious, emotionally involving speakers that will satisfy the most discerning music lovers. As Alvin Gold (Hi Fi Choice/Feb 2007) wrote of the Concerto "it looks fantastic... with a wonderfully passionate style of music-making..."



## PATHOS

Everything that comes from the Pathos factory at Vicenza, Italy has real class about it. A big hit already with audiophiles worldwide, the Endorphin (£4,500) is a fine example of the Pathos commitment to excellence. Other players may have good looks or performance, but none deliver both to the standard of this wonderful player. The Endorphin is a musical treasure, to admire and enjoy. If you're looking for a CD player that delivers the highest performance combined with superlative design and build, look no further.



Unison's goal is simple: beautiful, fine sounding valve amplifiers made for a lifetime of musical enjoyment. The new Preludio keeps faith with this tradition. This £1,795 integrated sets the standard for high-quality, affordable valve amplifiers. As What Hi-Fi note in the latest issue: "There might be cheaper valve amplifiers but none we've heard come close to this Italian integrated when it comes to all-round talent." Arrange an audition and discover this for yourself!



The latest model in the Final range of high definition flat panels is the 300i. This elegant, slimline floorstander \* offers all the insight and detail of the best electrostatic designs, and at a very attractive price. A stereo pair with matching subwoofer costs under £1,500 - astonishing value for a top quality electrostatic loudspeaker. The 300i is unique - whether used for 2-channel stereo or in a home theatre system. Call your nearest UKD dealer to arrange an audition.



\* 300i can also be wall mounted



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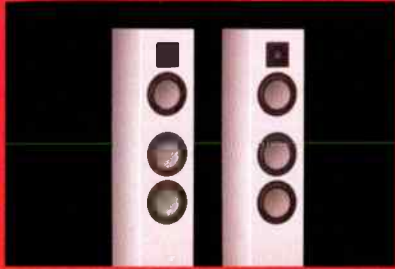
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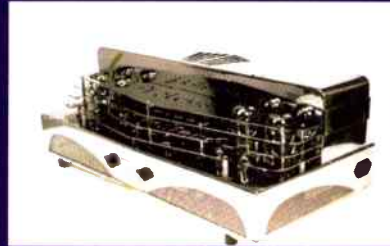
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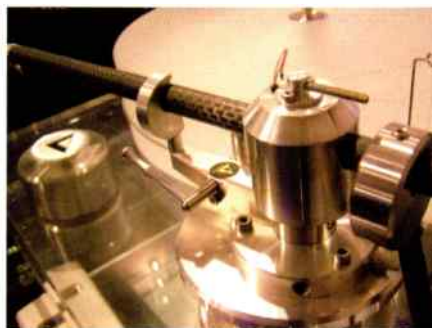
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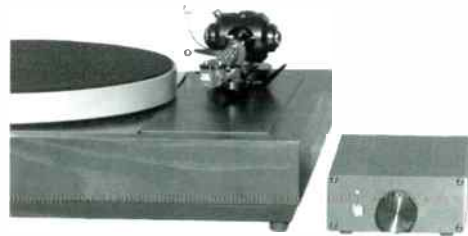
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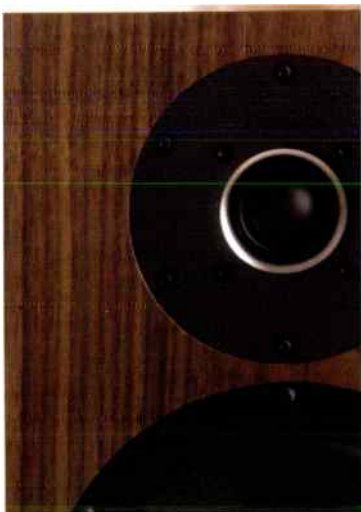
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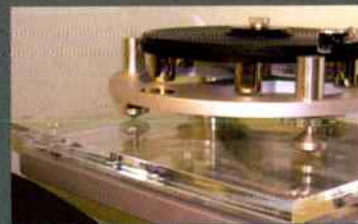
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47 Labs Flatfish MKII Transport S/H	3020	1995	JM Lab Micro Utopia Classic x-demo	4700 3750
47 labs Dumpty S/H	1425	899	JM lab Electra 927 25th Anniversary S/H	2800 1699
Audio Synthesis DAX Decade 22 Bit Balanced S/H	3500	1799	KEF Reference 104.2 S/H	N/A 449
Audio Synthesis DAX Decade 22 Bit Single ended S/H	2999	1499	Martin Logan Aeon 1 Oak x-demo	3189 2300
dCS Elgar Plus DAC BNIB	9500	6449	Monitor Audio Radius 360 Subwoofer Cherry S/H	350 249
dCS P8i SACD/CD Player factory BINB	6500	3999	Pen Audio Rebel 2 x-demo	995 699
dCS Verdi Encore Transport BNIB	9500	6449	Pen Audio Charm Active Subwoofer x-demo	1995 999
dCS Verona Clock BNIB	4099	2900	ProAc Response D25 Maple x-demo	2800 2199
Linn Karik CD Player S/H	1999	499	Rega ELA 2000 S/H	850 449
Linn Numerik DAC S/H	1500	499	Sonus Faber Concerto Walnut S/H	998 599
Marantz CD65 KI Sig MKII S/H	N/A	329	Spendor S3 Cherry S/H	599 379
Nagra DAC x-demo	7250	3999		
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Nakamichi MB10 5 play CD S/H	N/A	149	Audioquest 1.5m Topaz RCA-RCA S/H	n/a 99
Orelle CD100EVO S/H	1500	975	Cardas Cross 2M RCA-RCA S/H	590 399
Orpheus labs Zero CD player x demo	4600	2999	Cardas Quadlink 5c RCA-RCA 1m S/H	230 149
Shanling CD-T80 Valve CD Player S/H	600	399	Madrigal MDC2 1m RCA/RCA 75ohm Digital Cable new boxed	420 249
Sugden CD21SE CD Player S/H	1499	1099	Nordost Shiva 2m mains cable x-demo	220 175
Theta Generation V Balanced S/H	6290	1299	Nordost Tyr 1m Balanced interconnection x-demo	1135 899
Theta Pro Basic II DAC with Oscom/Balanced S/H	2990	695	Nordost Tyr 1m RCA Interconnect x-demo	1100 879
			Nordost Heimdall 1m RCA Interconnect x-demo	370 269
			Nordost Frey 1m RCA Interconnect x-demo	550 449
			Nordost Valhalla 1m RCA Digital Interconnect x-demo	1450 899
			Nordost Valhalla 1m Balanced AES/EBU Digital x-demo	1480 899
			Nordost Baldur 5m pair bi wired Speaker cable x-demo	1265 999
			Shun Mook 1pr Spatial Controller x-demo	450 229
			Shun Mook Ultra Diamond Resonators set of 3 x-demo	710 399
			Siltech LS188 Classic 2x3m Silver & Gold Speaker cable BNIB	3950 2995
			Sonic Link 1.4m Gold mains cable S/H	N/A 59
			Spectral MI-350 20ft Interconnect RCA-RCA x-demo	1400 799
			Transparent Music Link Balanced 2m S/H	479 299
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Audio Research SP16L	1799	1249	Audio Research • Magnum Dynlab	
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SALE DECCA FFSS pick up arm with London cartridge, original box. Lenco 88 turntable also available. Enquiries to [paulaldrige@hotmail.com](mailto:paulaldrige@hotmail.com) Phone: 61 7 47732937 or Skype (Australia)

MARANTZ CD17Mk2 KI compact disc player. Beautiful high end champagne finish CD player. CD tray needs new motor but otherwise in excellent condition. £300 ono. Email: [hifi@thehousewiththereddoor.co.uk](mailto:hifi@thehousewiththereddoor.co.uk)

CLASSIC MERIDIAN M3 active compact monitors. Mains/interconnect cables, stands. £295. Celestion A1 speakers, matching Celestion stands, excellent, boxed. (£1200) £450. Roksan Kandy integrated. One year old, boxed. £325. Tel: 01243 863 371

PAIR OF Dynaudio Contour 3.0 speakers. Black ash, floorstanding. As new, in original box. New £2500, accept £800. Tel: 07977 115 446

HI-FI EQUIPMENT rack, Optimum 660. Five glass shelves, gold finish, pillars very good condition. Cost £350, sell £100. Tel: John 07961 800 146 (Bath)

MISSION 775 floorstanding speakers. Boxed. Excellent condition. Black. Tel: 01728 602 939 (Saxmundham)

WANTED: MUSICAL Fidelity 1990's X Range Pre and X-A50 monoblocks. Also Akai GX cassette deck (any condition). Cash waiting. Tel Michael 01373 822 767

MORDAUNT SHORT System 442's, for sale, good condition, finished in black, very smooth sound, currently being driven by Exposure Pre/Power. Any reasonable offer accepted. Tel: Rob 0207 015 5184 or 07979 010636

FLYING MOLE CA-S3. Highly acclaimed stylish audiophile amplifier. Beautifully encased in an extruded aluminum enclosure. 5 star reviews world wide. New boxed £350. Tel: 07720 807013

MICROMEGA STAGE 6 CD Player in mint condition, hardly used, complete with manual, remote and original packing. Cost new £850, accept £300. E-mail [kennethwebster2002@yahoo.com](mailto:kennethwebster2002@yahoo.com) or Tel. 0141 571 0851

NAIM 112x, Naim 150x, Naim CD5i, Neat Elite S.E. speakers, Quadraspire (oak) stand. All less than two years old. Mint condition. £2,000.00. Can sell separately. Call Des: 020 7498 8902 (after 1:00 pm).

UNISON RESEARCH 'Simply Phono' Valve stage for Unison Research amps with 4 pin power outlet. £120. Ariston RD11 turntable with Connoisseur arm plus board for Rega arm. £50. Tel: 01484 712947 (Brighouse)

QUAD 99 & 909 pre/power amps, boxed with manuals, quadlink and r/control. £875 ono. Contact Steve: 07905 762 363, [sappleby@powelltuck.co.uk](mailto:sappleby@powelltuck.co.uk)

IMF RSPM MkIII Professional Monitor loudspeakers. Very neutral - tight, extended bass; clear midrange/treble. Good imaging. One owner from new. Mint condition. Classic transmission lines at compact price! £725. Tel: 01737 217246

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EASTERN ELECTRIC M520 integrated valve amplifier. Superb sound. 5 star rating. Pentode/Ultralinear adjustment. Three levels negative feedback. Remote. Excellent condition. Box. Manual. [www.morningstaraudio.com](http://www.morningstaraudio.com) £850. Tel: 0790 4000 896

QUAD ESL 2905 New, sealed cartons. Why wait 3 months. Warranty. £5750. Tel: 01903 261931

PIONEER CDR-609 £100. Denon PM250se £35. Heybrook HSI stands £30. Apollo 3 tier table £45. All in excellent condition. Newnes Audio and Hifi engineers Pocket book £5. [nick@nickpearson.demon.co.uk](mailto:nick@nickpearson.demon.co.uk)

AUDIOLAB 8000S Amplifier 60W £260. Monitor Audio 700 PMC bookshelf speakers £240. Yamaha DSPE800 AV processor/amplifier (3 channel) Dolby & DTS £90. Excellent condition 01689 608 925 or 0794 1107141

WOODSIDE (RADFORD) MA50 monoblock 50W power amplifiers vgc £950. Quad FMII self-powered valve tuner, Quad serviced last year, with original handbook £150. Tel: 0113 257 7793 Leeds

TOM EVANS - The Groove Phono. Set for Vdh cartridges. Eight months old and only forty hours use. Stunning sound - read the reviews. Only £1100 pounds. Tel. 07956 125 695

JAMO CONCERT II speakers £800. Music Maker 3 with Isolator £300. Kimber 8tc cable 10 foot pair £100. All items mint. Speakers boxed with manual. Prices ono. Tel: 01844 358104

MICROMEGA STAGE 6 CD player. Modified with Audiocom Clock, Burr Brown OPA627/ OPA637 op-amps, Silmic 2 capacitors. Great condition and fantastic sound. Email [ianmarkham@utvinternet.com](mailto:ianmarkham@utvinternet.com) with offers and more info.

AUDIOLAB 8000, pair P&C Black. Refurbished by Audiolab two years ago. Sounds superb. £475. - 01494 580640 or 07920 209207

MICHELL ORBE plus Origin Live Illustrious Mark I arm, £2,100. Both near mint. Superb sound. Email: [melaniecurtis@btconnect.com](mailto:melaniecurtis@btconnect.com)

ARCAM DIVA CD62T CD player in as new condition. Approx 10 hours use from new. Boxed with manual and remote. Happy to demo. £150 ono. Tel 0117 959 0663 (Bristol)





## WDKEL84 Valve Amplifier Kit

*"The quality that can be gleaned from this amp is a fine introduction to the joys of the valve sound"*

The WDKEL84 features a pair of EL84 valves in Push Pull configuration per channel, providing two channels each 18 Watts into an 8 Ohm load. Available as a 5 input integrated amplifier with ALPS volume control.

WDKEL84 kit £369

WDKEL84 built & tested £544



## WD88VA Valve Amplifier Kit

*"It proved itself to be an engaging valve amplifier that measured well and sounded superb. Quite simply it plays music, and plays it extremely well."*

Adam Smith, Hi-Fi World Dec 06

Often described as a 'sweet sounding' valve, our implementation of the KT88 makes sure that it is driven to its ultimate performance. Available as a 35W stereo power amplifier with single input volume control, or as a relay switched integrated with five inputs.

WD88VA Integrated Amp kit £849

WD88VA built & tested £1099



## Headphone II Valve Amplifier Kit

*"Headphone II is a single-ended design with the power pentode wired up in triode configuration for added purity and is as quiet as a mouse"*

A beautifully simple stereo headphone amplifier design using Mullard ECL83 valves. It works directly from any source. The circuit uses twin high specification E/I output transformers that can be wired to drive any headphones between 16 to 300 Ohms.

Headphone II kit £275

Headphone II built & tested £404



## WDPre3 Modular Preamplifier System

*"So there we have it, a pre-amplifier capable of driving any load and maintaining its linearity no matter what cables or partnering equipment you prefer to use."*

This 5 input line level preamp is essentially an SE triode power amplifier in concept. WDPre3 uses an ECC82 double triode arranged as input voltage amplifier and power output amplifier stages, the latter driving large 20:1 output transformers.

WDPre3 kit £299

WDPre3 built & tested £424



## WDPhono3S MM/MC preamplifier

*"...only a few designs meet the requirements of tonal accuracy and maximum retrieval of musical detail."*

Twin input preamp with MM and MC relay switched inputs, passive RIAA equalisation and wide bandwidth MC step-up transformers.

WDPhono3S kit £349

WDPhono3S built & tested £474



## WDPSU3 Power Supply

*Can be used to power either WDPre3 or WDPhono3 units individually or together.*

High performance choke power supply with separate HT and Heater feeds for both WDPre3 and WDPhono3 preamplifiers.

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WDPSU3 built & tested £299



All our kits are complete with pictorial easy-to-follow instructions. All parts are included - all you need is a screwdriver and soldering iron.  
World Designs, 59 Mill Street, Great Gidding, Huntingdon, Cambs, PE28 5NU

www.world-designs.co.uk  
Tel: 01832 293320

LEAK TROUGHLINE 2 tuner. One Thing serviced. £200 o.n.o. Tel: 01844 358104

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LINN LP12 Valhalla, Akito arm, K8 cartridge, mint condition £495. Audioblab amplifier black mint condition £195. Email: peterbrookes@bccbl.com or Tel: 07966 509901

AUDIOLAB 8000CD CD player, 8000S stereo amplifier and 8000P power amplifier or sale with Epos ES22 speakers. £1,200 ono. Will separate. Located in Berkshire. Call 07917123693 for details.

ATC-SCM20 SPEAKERS £1200. Complete in rosewood finish, with dust covers, immaculate. £2000. Also target R2 target speak stands immaculate £320. A bargain £1200 the pair. jeremyf@datasharp.uk.com Jeremy 07977254160

LYNGDORF/TACT AUDIO TDA2200 Room perfect int. amp, get perfect sound quality with Tact Audio's latest room correction software! £2800 no offers. Email: jeffhignett@hotmail.com

HI FI RACK For sale. 'Sound Organisation' 5 glass shelves, carpet spikes, silver. Perfect condition. £100. Call Brian on 07810502146 or Email me at: brian135@btinternet.com (Poole, Dorset).

AURA PA-200 Stereo mono power amplifiers, chrome fascia's, XLR & RCA inputs, 110 watts RMS per channel/ 250 bridged. Two available £400 each or £700 for both. Tel: 01202 298447 Email: paynetar@lineone.net

GARARD 301 turntable for sale. Not perfect condition, on/off switch snapped off. No history, sold as seen. Cash offers, buyer collects. Bracknell 01344450796 Mobile 07901864047

CYRUS 3 Integrated Amplifier Black £250. Cyrus Power Amplifier Black £250. Mission 752 Rosewood Veneered Speakers £300. All in excellent condition. Tel: 01263 732901 after 6 and weekends.

TRICHORD PULSAR DAC £300. Sony SCD-XB940 SACD £100. DPA Enlightenment DAC £250. Sony DVP-S735D DVD £150. JVC HM-DR10000 D-VHS £200. Rotel RT-990BX Tuner £150. Contact Martyn 07801 909912. Email: warwick456@btinternet.com

VALVE ENTHUSIASTS high power sower output transformers 75 watt and 100 watt fully shrouded excellent bass response low primary impedance for parallel push pull. Tel: 01223 322588 Email: saselec2000@yahoo.co.uk.

MERIDIAN 502 pre-amplifier, with MM phono option. Balanced and unbalanced inputs and outputs, excellent condition, with box, manual and accessories. £575. Tel: 07729 626598

MONITOR AUDIO Radius 90 speaker, black, £150. Rotel RA01 amp £150. Sony CDP-XB720E CD player £50. All as new, mint, boxed. Contact Paul on 07963 947 689 (Notts/ Derby area)

QUAD 99 + remote £560. ESL 63's £1699. Rotel RT950BX tuner £80 (£300). Marantz CD65BX £80. Sony STSB920 QS tuner £90. Philips CD601/25 £29. Panasonic VHSNVF65HQ £55. Wanted: ARCL50, IMF. Tel: Jim 01206 510 392 or 07880 983 630

DELTEC 50S power amplifier, dedicated speaker cables and interconnects £350. Rotel RA913 amplifier. Rotel RT925 tuner £150 pair. Leak Troughline FM tuner £35. Near offers considered. Tel: 01708 457 691

TURNTABLE PIONEER PL12D + cart OM10 £55. Rega RB300 arm £120. Tel: 01606 784 767

FOR SALE: E.A.R. 859 integrated valve amp. One owner. Immaculate condition, box and manual. £1000. Also Quad ESL 63s mint condition. Can demo. £1200. Buyer collects. Tel: Graham 01482 641 261 after 6pm.

VALDI TURNTABLE in rosewood. Separate P.S.U. Immaculate. £500 ono. Tel: 07747 753 007

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MARANTZ AMPLIFIER PM 7001 KI Signature £425. Marantz CD SA 7001 KI Signature £450. Marantz tuner ST 7001 £200. Silver. Boxed, mint, guarantees. B&W CMI speakers, maple £300. Glass hi-fi stand, 5 shelves £45. Tel: 0115 975 4070

**GUIDELINES FOR BUYING AND SELLING SECOND-HAND EQUIPMENT**

**FOR THE BUYER**

1. Not everyone is honest - Buyer Beware!
2. Don't send cash!
3. Accept no verbal guarantees.
4. Have you heard the item or something similar? If not, why do you want it?
5. Don't pretend to have knowledge - it's your fingers that will get burnt!
6. Is it working? If not, why not?
7. Has it been modified and, if so, have notes been kept?
8. Was it any good in the first place?
9. Don't send cash!
10. If you are in the slightest doubt, arrange an audition (see point 5) If it's too far, wait for another time.
11. Either buy it or don't: vendors are excusably impatient with 'consultation' exercises.
12. Don't send cash!

**FOR THE SELLER**

1. Not everyone is honest - Seller Beware!
2. Make no verbal guarantees.
3. Even 'nearly new' is still second-hand. If the manufacturer's guarantee is no longer in force, your price should reflect this.
4. There is very little intrinsic value in second-hand hi-fi: it's only worth what someone will pay for it.
5. The best guide to pricing is last month's Classifieds: that a 'classic' was worth £xxx a year or two ago is no guide. Values fall as well as rise.
6. Amateur second-hand dealing is not a big money game: you win some, you lose some.
7. Be prompt with despatch. If in doubt about buyer's bona-fides, either wash out the deal or send C.O.D.
8. There will always be time-wasters; be tolerant within reason!



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Sovtek 5881	£12.49
EL34 ElectroHarmonix	£11.85
EL34 JJ (balanced and precise)	£15.49
5U4G Sovtek	£9.94
GZ34 JJ	£16.99
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Svetlana 6N1P	£6.50
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ECF80 EI	£7.30



### VALVE BASES

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B9A Chassis Mount	£4.70
B9A PCB Mount	£4.70
Octal Chassis Mount	£4.70
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Self on Audio by Douglas Self	£26.50
Valve Radio & Audio Repair Handbook by Chas E. Miller	£22.50

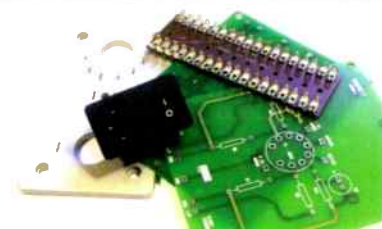
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Life & Works of A.D. Blumlein by R.C. Alexander	£18.00
Understand Amplifiers by Owen Bishop	£19.50
Audio & Hi-Fi Handbook edited by Ian Sinclair	£34.50



Eichmann Bullet Plug phono plugs - pack of 4	£25.00
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ALPS Blue Beauty 100k dual log pot.	£23.00
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KEL84 Power amp	£24.98



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Polyester 0.47uF 630v DC WIMA Metalised film	£1.29
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Bridge Rectifier 25A 700V 28.5mm x 7.5mm	£3.25

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**EPOS M22 speakers,** light cherry. Excellent condition. £450. Tel: 07944 594 705

**MORDAUNT SHORT MS 400** (pair) classic floorstanders, teak with black grilles, 38cms (w), 23cms (d), 74cms (h). 25 years old. Very good condition. Sound great. Offers. Email: mikelaws@hotmail.co.uk

**WANTED: YOUR redundant** Thorens turntable (or Technics Direct Drive) with or without pickup arm. Tel: 01706 641 998 (Manchester area)

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**NAKAMICHI CASSETTE Deck 2,** excellent condition. £70. Target HJ20 20" loudspeaker stands £30. Mitchell Banana plugs (8) £10. TDK SA C90 cassettes (25) £10. All prices plus postage. Tel: 01306 887 554

**AUDIOLAB 8000C preamp,** two 8000P amps, boxed with instructions, £650. Thorens TD160, extra headshell £75. Pair Kef T27 tweeters £40. SME flexible link £15. No reasonable offers refused. Tel: 020 8590 8530 (Essex)

**PIONEER PI-11000 Parallel Tracking Quartz Lock Direct Drive Turntable,** mint condition, little use from new, offers. 07985 323279

**SALE DECCA FFSS pick up arm** with London cartridge, original box. Lenco 88 turntable also available. Enquiries to paulaldrige@hotmail.com Phone: 61 7 47732937 or Skype (Australia)

**CLASSIC CONTACTS**

When a classic goes 'poof' your troubles have just started, but there may be a good ending. Replacing failing parts can improve the sound, so here is a short listing of all those companies who specialise in getting a classic up and running again after its deposited a small ring of soot on your ceiling!

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Quad's service department, able to repair almost all Quad products, from the very first. Tel: 0845 4580011 www.quad-hifi.co.uk

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Comprehensive loudspeaker servicing. Tel: 020 8 743 4567 Email: paul@wembleyloudspeaker.co.uk www.wembleyloudspeaker.com

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July's Hi-Fi World is packed with audiophilia from all around the world, from Onkyo's (pictured) D-TK10 loudspeaker (with woodwork courtesy of famous Japanese guitar company Takamine) and Denon's new walnut bodied AH-D5000 reference headphones to Densen's stunningly styled B-410 CD player and Bryston's exquisite B100 integrated amplifier – plus much more. Here's just some of what we hope to bring you...



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# THE GOLDEN AGE OF. NOW IS THE TIME

## THE ANDREWS SISTERS 2002

Classic albums are wholly subjective, and as such often the subject of heated discussion. What makes a classic a classic? How about music that is passed through successive generations and has almost become ingrained into society itself? Such music surrounds the legendary Andrews Sisters, one of the biggest, multi-record breaking acts of all time. 'Don't Sit Under The Apple Tree (With Anyone Else But Me)', 'Boogie Woogie Bugle Boy' and 'Don't Fence Me In' are just a tiny sampling of their work.

The trouble with classic acts, such as The Andrews Sisters, whose stars shone during the '30s and '40s is that most of their output originates on 78s which could only hold two songs per disc. This is most inconvenient for the prospective fan because the culmination is an oeuvre scattered to the four winds. Hence, if you want to find a single, all-encompassing Andrews Sisters collection, anything more than the interminable 'hits' packages (and, boy there are plenty of those, some of which are decidedly poor), then you're in trouble. This is where the specialist reissue label Jasmine comes in, with its two excellent collected works that not only feature a selection of hits but also a wealth of rarities mastered to a high standard direct from 78s, often in excellent condition, plus mono vinyl where necessary.

Geoff Milne, a vastly experienced chap who worked for Decca's American Decca label for thirty years

from 1952 as a manager, conceived and produced both albums as an antidote to the hits packages. "What I did was look for tracks which had never been released on CD before," explained Milne. "In fact, we pulled out a lot of tracks which had been almost forgotten."

The 2CD rarities package, 'Now Is The Time', was the first release. It became so popular that the 4CD box set, the 'Golden Age Of...' was released soon after. This set includes 2CDs of Top 10 Billboard hits plus a further two CDs of rarities.

Milne's contact base includes a serious Andrews Sisters collector, Ray Norton, who supplied him with many original 78s in excellent condition. All the 78s were edited and often rebalanced because sometimes original 78s can, according to Milne,

"a unique blend of hits with many rarities..."

"sound a bit odd. The 78s were played on a Thorens 521 turntable with an SME 3012 arm and a Shure SE35E for 78s. Plus an Ortofon 20E cartridge for the mono work - I've always liked Ortofons. They give a clean, round sound. We used Ortofons at Decca, you see, which is how I got used to them. The signal's then passed through a Sansui A80 amplifier, from the early eighties. It's very flexible. You can master on it while you're transferring something on another channel. The signal eventually ends up on a DAT tape, via a Sony DTC-60ES. I find it easier to edit from a DAT."

Due to the age and, often, wear and tear that many 78s experience,

the mastering engineer has his work cut out to get the best from the sound. The PC-based Cedar software system was able to remove these and other audio problems. Indeed, the mastering for all of the sets is excellent and the selection of tracks is a joy to behold, including duets with the likes of Bing Crosby and Danny Kaye plus rare soundtrack work from the 1942 film 'Private Buckaroo' and 'Buck Privates' (the 1941 Abbot & Costello vehicle - amazingly enough, the largest money making movie from Universal until 'Jaws' in 1975.)

The Jasmine collections, whilst magnificent releases, can be further topped up by adding a good basic hits collection to fill in a few gaps. MCA has a decent set called 'Their All-Time Greatest Hits'. Then,

another dedicated reissue label called Sepia has two collections of further rarities that complement the Jasmine releases. The Sepia releases are called 'Melody Time With The Andrews Sisters' and 'Music Lessons With The Andrews Sisters'. They feature 28 and 25 tracks respectively and again come highly recommended for all Andrews Sisters aficionados and include a fair few solo tracks from Patty Andrews.

Whilst not the complete and utter Andrews Sisters collection, the above releases provide most of the girls' releases for us all to enjoy. A unique blend of hits with many surprising rarities that will delight anyone interested in Swing or vintage pop. PR

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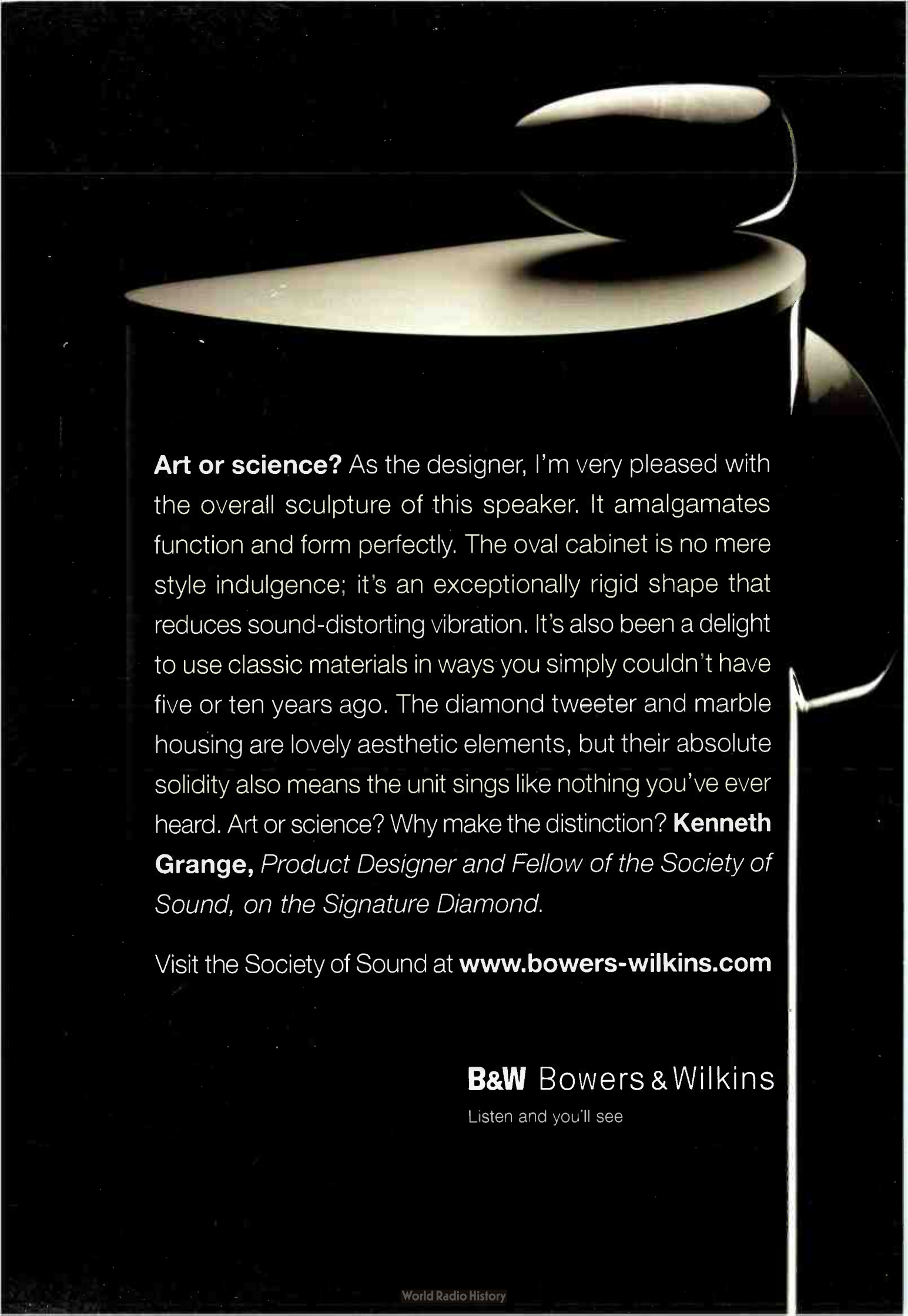
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