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OCTOBER 2007

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network music player

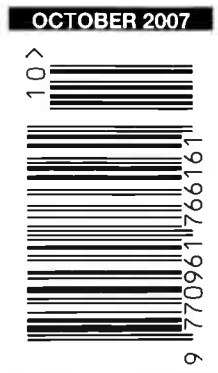



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- > LEEMA XERO MINI MONITOR LOUDSPEAKERS
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Remember High Definition Compatible Digital? Launched in 1994, HDCD was the first real upgrade to the Compact Disc digital audio format. It created a real buzz at the time, and showed that what we'd been saying about CD was right all along – in standard guise, it just wasn't up to the job.

Sadly though, it flopped, holed below the waterline by news of a new 'super CD' (i.e. DVD) a year or so later. When we first heard it could carry 24bit, 192kHz digital audio, few could see the point of investing in anything else...

Well, that was until news of Super Audio Compact Disc arrived shortly afterwards! In SACD, we had a backwards-compatible format that sounded great, better than ordinary digital many thought, and you didn't need a video display to play it.

Now in 2007, we have HD-DVD and Blu Ray discs with vast amounts of storage to provide ever better multichannel music, like DTS-HD Master Audio with its 7.1 channels of 24/96.

Sadly though, despite all these developments in digital, I've still yet to hear any derivative come close to a well set-up high end turntable. Back in 1980 you could buy a brand new album and get staggering levels of musicality and dimensionality (from a high end LP system), but nowadays new releases invariably come on CD, which offers but a pale approximation of this.

Still, it's a great shame SACD and DVD-A never really took off, as they're so much better than CD in theory. In practice, it's a different story though - new 'hi-res' album releases are few and far between, as are serious audiophile players to hear them on.

The good news is that HD-DVD and Blu Ray will surely bring the issue of high resolution digital audio back to the fore, whilst online downloads are improving with the likes of Linn Records and Apple offering high(er) quality options. That's why this month's *Hi-Fi World* sports a variety of digital kit, from our group test of five excellent affordable A/V receivers to Linn's new Klimax DS music player.

Be it downloads or digital disc, I hope that some degree of standardisation will emerge, and that the industry will get behind one single hi-res format, adopted by all hardware and software makers. Don't hold your breath though - HDCD might catch on faster!

David Price, editor



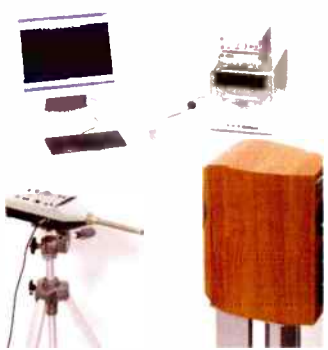
testing

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.



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verdicts

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

simply the best
extremely capable
worth auditioning
unremarkable
seriously flawed
keenly priced

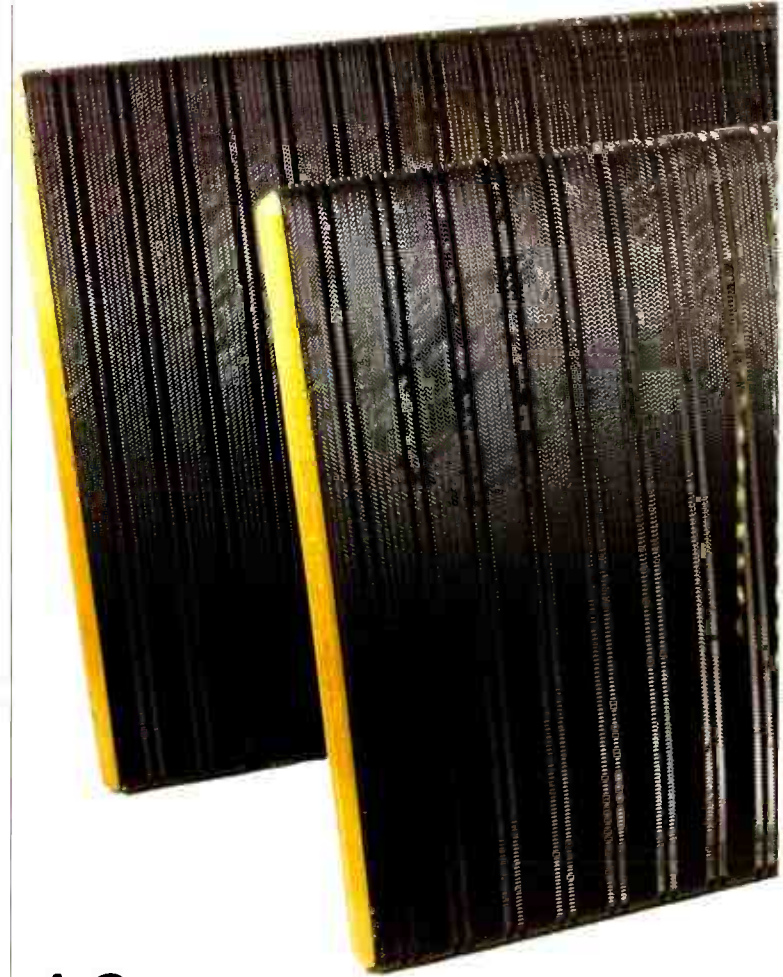
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Distributed by Seymour Distribution Ltd 86 Newman Street London, W1T 3EX Tel: +44 (0) 20 7396 8000 Printed by St.Ives, Plymouth Tel: +44 (0) 1752 345 411
Our Agents in Malaysia Millennium Hi-Fi & AV Simon Chang Showroom & office, 500-1-3 First Floor Wisma Indah (Shen Court), Jalan Tun Razak 50400 Kuala Lumpur, Malaysia
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Mordaunt Short Avant 914i speakers - champagne sound at a beer money price.



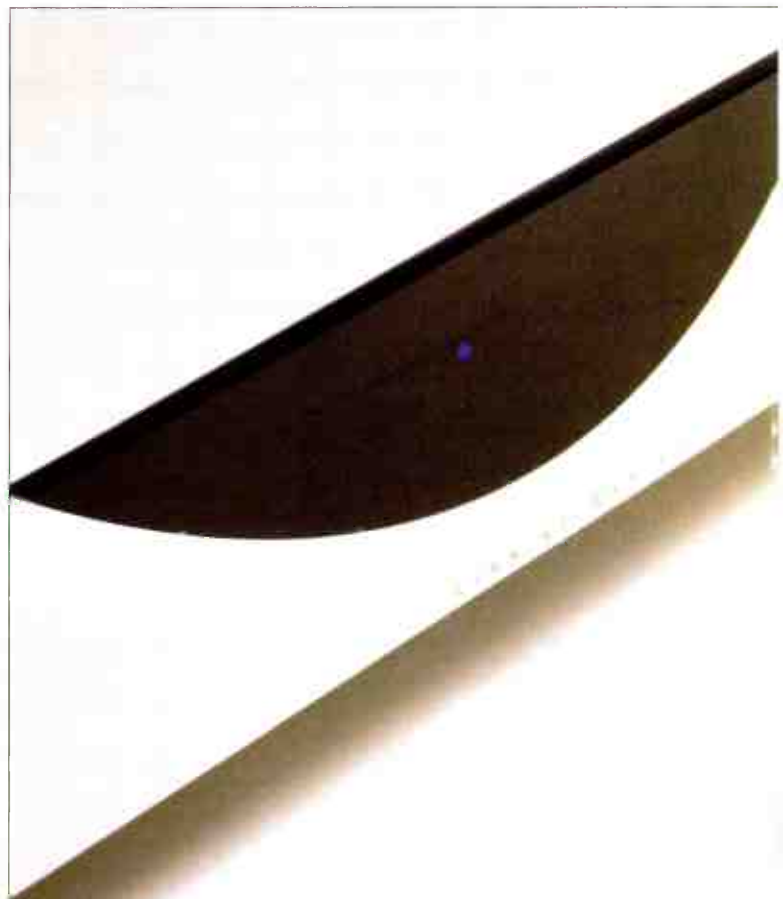
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We've claimed that Gold Signature reaches unprecedented standards of design, innovation, performance, technical excellence, build quality and value in its class. But you don't have to take our word for it.

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news



MAKING MOVIES

Graham Tricker, the man behind GT Audio, has a new preamplifier to match his superb Tron Seven tube phonostage. The predictably entitled Tron Seven Preamplifier features five line level inputs, a gain control, mono/stereo switch and mute switch. An Elma silver sector switch is used, along with a Noble volume control, silver plated RCA phono socketry, silver and copper internal wiring, a unique floating circuit board decoupling system, non-ferrous case and internal partitioning separating the PSU from the audio circuitry. The price is yet to be finalised; for details see

www.tron-electric.co.uk.

TOYS FOR THE BLACK STUFF

Pro-Ject's new Debut USB turntable is an interesting way to make vinyl more accessible for the computer generation. Lovers of black plastic can transfer all their LPs, 12 inchers and singles straight to computer (and then to their music portable) with this clever device. Simply plug it in to the nearest USB port, click on your chosen recording software and start archiving your collection. The company says there will be no worries about clumsy adaptors and mismatched software, as the whole process is as simple as listening to a record! Based on the award winning Debut, the new USB model sports both line level and USB outputs. It features inverted hardened stainless-steel points and sapphire thrust-pad bearings in the tonearm, a headshell and armtube formed from a single piece of aluminium and a steel platter with felt mat. There are also close-tolerance chrome-plated stainless steel shafts on a polished ball bearing in a brass bearing housing and a decoupled motor to reduce vibration. The Debut USB comes in a choice of black or silver finishes.

Also new on the turntable front is another entry-level deck, the RPM1, or 'Genie' as it will be known. This is a very cute little unit, featuring a new S-shaped arm with full VTA adjustment and bearings that comprises inverted hardened stainless tips in ballraces. The MDF platter has an inverted main bearing and is belt driven from a decoupled motor. Retailing for £125, an Ortofon OM-3E cartridge is included in the price.

The company also has an impressive new range of mini components out, claiming "audiophile sound quality, low price and a uniquely straightforward design". The key design principles behind the Pro-Ject "Box Design Line" are the smallest possible size, a concentration on the basic important functions, and the highest performance sound quality - focusing manufacturing costs onto the internal circuitry rather than the external box. The new line comprises stereo and mono amplifier versions of the Box Amp; a matching preamplifier, the Pre Box, and the Phono Box II USB, which will allow the digital recording of analogue vinyl discs. There's a new line of "big boxes" called the "SE II" series, which are twice the height of a small box but the same width, including the new Phono Box SE II phono preamplifier, the Head Box SE II headphone amp, the Tube Box SE II valve-based phono preamplifier using premium ECC803S valves and finally the Speed Box SE II, a speed controller for the Pro-Ject turntables. All have beautiful 4mm thick, brushed aluminium front panels finished in either black or silver and feature very similar pricing to the first generation models. To find out more, visit: www.henleydesigns.co.uk.



Pro-Ject Debut USB



Pro-Ject RPM 1 'Genie'



Pro-Ject Pre Box



Pro-Ject Amp Box



REPLAY FOR TODAY

Nearly twenty years after the first Revolver turntable, the brand is back. The new £1,499 Replayer is a split plinth design, fitted with an electronically controlled motor giving 33.3 and 45RPM speeds via a flat section peripheral belt driving a 38mm thick polyester resin platter. The single point bearing has a typical running clearance of 0.0004" at room temperature, and is isolated by a one point cross suspension system. A static balanced straight pipe tonearm, effective length 228mm, is fitted as standard. The deck weighs 23kg, measures 440x360x155mm, and comes finished with gloss black marble plinth, piano gloss black sub-plinth and chrome posts and feet. Also harking back to Revolver's origins is the 'Pig 2' record clamp, however unlike the funny rubbery original item, this time it's a solid and very weighty metal device with a felt underside, retailing for £60. For more information contact www.revolveraudio.co.uk.

ON THE BUSES

Lehmann's new Black Cube USB Headphone Preamp is "a product which turns a computer into a high end audio music source". The USB input works with virtually all computers accepting connections from USB 1.0 onwards and working with sample rates up to 48kHz. There is an additional analogue input with gold-plated RCA and 3.5mm jack connectors with loop through, and input selection is automatic with the USB connection being given priority. This Black Cube amplifier has the maximum gain selectable up to 20dB, which effectively optimises the output level of the zero global feedback Class A output stage. "Practically every high quality dynamic headphone available today will show the best possible performance", says the company. Carefully selected components and a sophisticated circuit design are claimed, and the power supply features low-ESR electrolytic capacitors. The double-sided audio board incorporates Burr Brown audio grade components. Housed in a high quality non-magnetic aluminium case (in a choice of anodised black or silver), it retails for £750. For more information, visit www.henleydesigns.co.uk.



RING OF SILENCE

Goldring's new NS1000 noise cancelling headphones use noise reduction technology bought in from a specialist company, and are then further tuned by the boffins at Goldring. They're claimed to be "light and comfortable" and the sound is "truly class leading". Build and finish are said to be excellent, and instead of all the mains adaptors and rechargeable cells required by most rivals, the NS1000s run off a single AAA battery said to last up to forty hours. They come with a detachable lead designed by QED, terminating with a 3.5mm plug, an aircraft adaptor, 6.3mm plug adaptor, battery and smart protective carrying case to hold everything safely in your hand luggage. See www.armourhe.co.uk.



BEE HERE NOW

NAD's new £180 C315BEE is the latest spiritual successor to the classic 3020 integrated amplifier. With six line level inputs, full IR remote control, defeatable tone controls, and a front panel input for a portable MP3 player, it has a decent sprinkling of facilities to go along with its 40 watt power output. "This is far more usable power on tap than other amps at this price", says NAD. It comes in a choice of NAD's classic Grey or a new Titanium finish. For more information, click on <http://nadelectronics.com>.

MUSO TALK

To complement Arcam's new Solo systems, the Muso/Logo loudspeaker system has been launched. Arcam's first foray into speaker design for nearly twenty five years, the company says, "the Muso and Logo complement Solo beautifully with discreet looks and stunning performance. Construction uses the very latest techniques including combined aluminium/steel enclosures (Muso) and the very latest driver technology". The Muso two-way loudspeaker is said to offer a bass performance beyond that of typical satellite speakers, meaning it can be used as a simple stereo pair when placed close to a wall. With the addition of the Logo sub woofer, a full range system can be configured for stereo music or movie systems. For more information, click on www.arcam.co.uk.





SPOTTED: VROOM ACOUSTICS

Meridian's Bob Stuart just before his hot lap of Silverstone on a Ferrari track day in June. The softly spoken digital boffin confessed to *Hi-Fi World's* editor that his first car was a Hillman Imp, which doubtless helped prepare him for tail-out antics in this rather racier bolide! As it happened, Bob got round the circuit faster than you can say "snap oversteer" and denied that Ferrari had told him, "you bend it, you mend it" prior to his supercar sojourn...

GLOBE TROTTING



Scottish specialist cable manufacturer Atlas Cables has announced upgrades to enhance the performance of its highly acclaimed Equator interconnect cable. As with all Atlas products, this cable has been designed, developed and made in Scotland. Changes include the use of even higher purity copper conductors and the use of the exclusive Atlas high-performance RCA connectors. This asymmetrical unbalanced cable has a concentric stranded 99.9997% pure OFC copper multi-stranded conductor in a low loss foamed polyethylene dielectric. This cable is double shielded with close lapped 99.9997% pure OFC copper multi-

stranded screen providing 100% coverage for the avoidance of RFI. This 75 ohm cable has an overall sheath of ivory coloured soft PVC with an overall diameter of 8.5mm. The new RCA plug, fitted at both ends of the cable, features a beryllium insert for a very tight fit. Sonically, "the changes deliver an impressive immediacy as the signal path from source to amplification is delivered with the minimum of degradation or loss", says Atlas. This upgraded version of the Equator interconnects will retail in the UK for about £45 for a one metre length. For more information, call 01563 572666 or visit www.atlascables.com.

PRE, EMINENT

Details are reaching *Hi-Fi World* towers of a new 'statement' preamplifier from Music First Audio, the brand behind the superb MF Audio Passive Magnetic Preamplifier, a product that this magazine considers to be already one of the best of its type available. Reputed to cost around five and a half thousand pounds (although this is unconfirmed at the time of writing), it boasts greatly enhanced flexibility and even better sonics. The MF Audio Passive Audio Control System boasts the new Stevens and Billington 'Nickel Brick' (TX102-mkIV) transformer featuring refined winding geometry, a new 25% bigger core and improved shielding characteristics. Indeed, it is a six transformer configuration to provide transformer-isolated Record and Auxiliary outputs, a TX102 MkIV Main Output and higher resolution of attenuation steps at low volume for more precise level adjustment. There are four unbalanced inputs on 'CMC' gold plated, high quality RCA connectors, two balanced inputs on Neutrik gold plated nickel XLR sockets and dual main outputs on Neutrik gold plated nickel XLR sockets, plus dual main outputs on 'CMC' gold plated, high quality RCA connectors. The company says all internal components are mounted on a thick, heavy, dual material laminate block for added weight, stability and vibration immunity, and unlike the existing MF Audio preamplifiers it is a full size (432x88x400mm) design. Finally, the option of remote control of level will subsequently be offered. For more information, contact Music First Audio at +44(0)1424 439315 or click on www.mfaudio.co.uk.



NEW TECHNICA

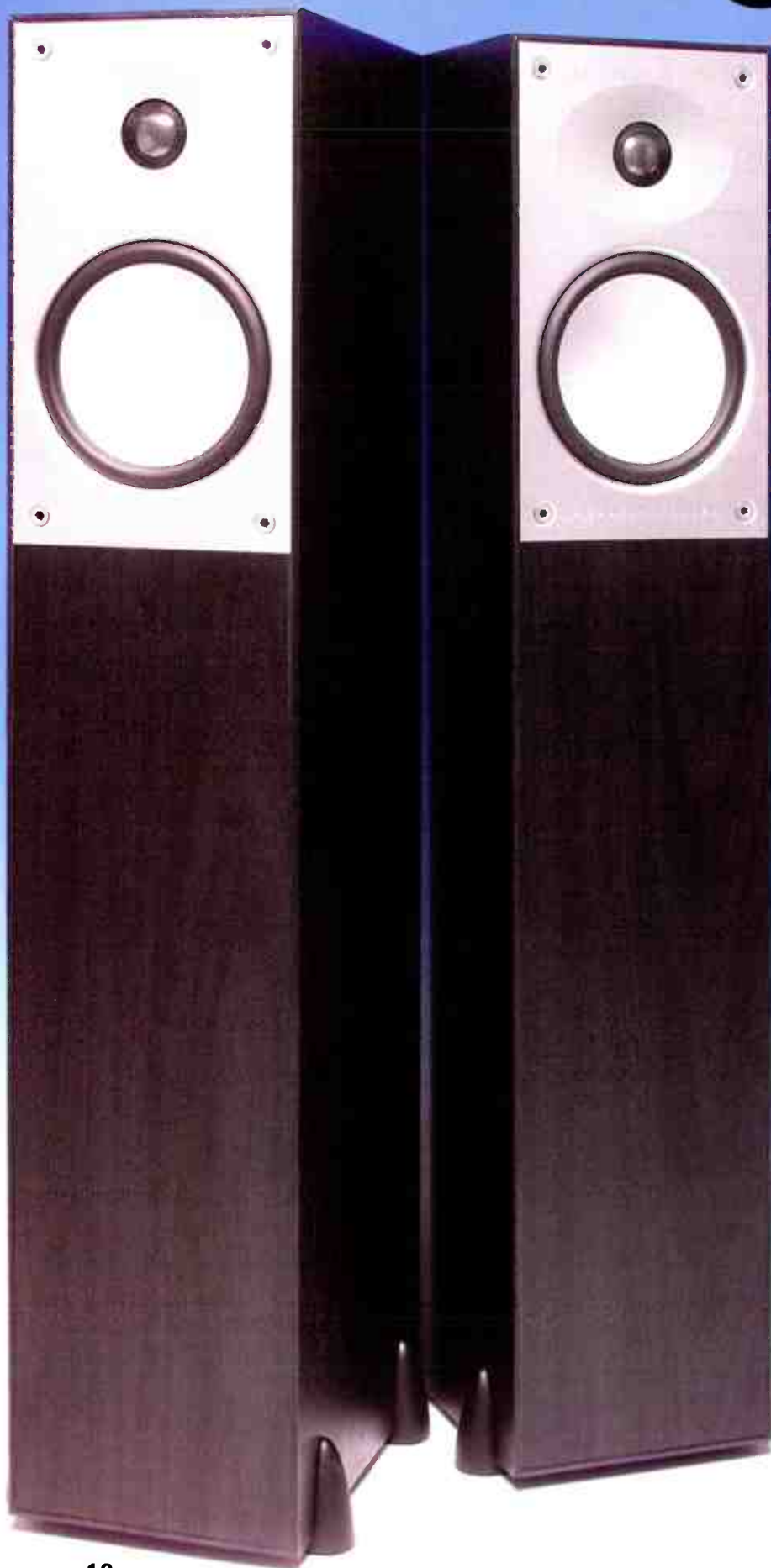
Japanese specialist Audio Technica has a brand new range of headphones destined for Europe. It includes something for just about everyone, from funky colour-matching headphones for the most fashion conscious iPod Nano owner to headphones that deliver superlative hi-fi levels of performance. It includes some high end hi-fi designs crafted from Japan's finest Hokkaido cherry wood. For more information, try Audio Technica's new 'e-tail' site, www.ateadphones.com.

CASING THE POINT

Here's an interesting little gizmo from Kensington – the £34.95 FX500 Speaker to Go is a portable active MP3 speaker small enough to pack into your suitcase. It's not hi-fi we grant you, but it's a nice way to get music on the move for iPod owners (and its 3.5mm minijack plug means it works with any other audio portable too). The thin shock-absorbent case closes around the music device, and there's also an iPod sized recess (complete with iPod Nano adaptor). The battery operated device can play music for up to ten hours. For more information, click on www.kensington.com.



Avant garde



Following the success of the 'i' variants of the Avant 900 series loudspeakers, Mordaunt Short have worked the same magic on their 910 range as well. Adam Smith listens to the floorstanding Avant 914i...

It's amazing the variety of materials that have found their way into loudspeaker drive units over the years. Paper, of course, was where it all started and this has remained popular to this day thanks to its virtues of light weight and low cost. More exotic materials have gradually become more and more common over the last thirty years or so, however, as loudspeaker technology has evolved.

Back in the nineteen seventies and eighties, we saw a variety of exotic plastics appearing, such as the Bextrene used by KEF on their B110 drive unit, up to the Cobex used by, amongst others, Goodmans and Epos further into the 1990s. These seemed to open the floodgates somewhat and from then on, the sky was the limit...

Carbon fibre, Kevlar and even wood soaked in sake appeared and increasingly exotic materials found themselves in use. Even the humble paper cone did not escape the onslaught, as various other fibres were mixed with the paper pulp in order to try and attain that holy grail of a cone material that would exhibit just the right balance of rigidity and damping. However, despite the best efforts of banana pulp and hemp, amongst others, the idea never really took off on a large scale and those more exotic materials are continuing to rule the roost.

One material that has a longer history than many people realise, however, is metal. Made most popular in the 1980s by the classic Acoustic Energy AE1 designed by Phil Jones, metal coned drive units nevertheless have a heritage stretching back to the 1950s. It was at this time that GEC developed their first units, items that showed great promise but were found to have a somewhat coloured overall nature. A young engineer by the name of Ted Jordan was introduced to these loudspeakers at a young age and this convinced him of the benefits of such materials, so much so that he later started

developing his own metal coned drive units, the latest variants of which remain in production to this day. Many other manufacturers duly followed suit.

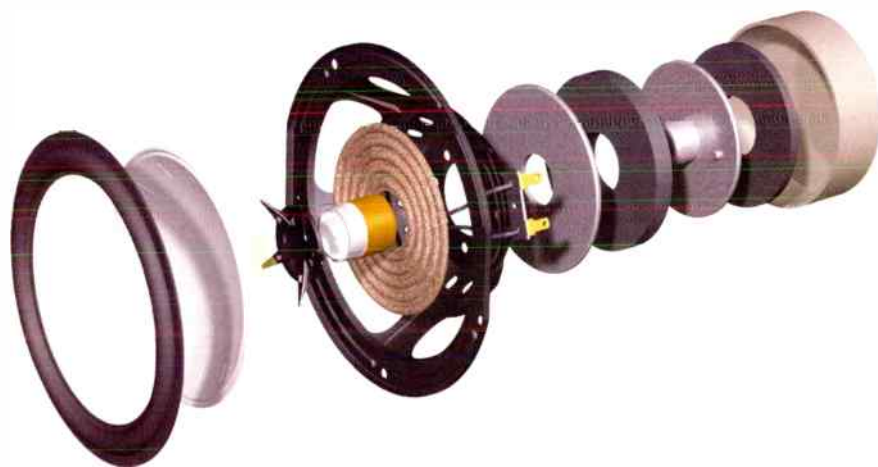
When Mordaunt Short took a new turn under the ownership of Audio Partnership in 1998 and developed their first brand new range of products, metal was also the material chosen for their drivers. However, rather than big old lumps of iron, MS took the aluminium road, a well chosen one by virtue of this particular metal's rigidity but relative lightness.

The first range to use these new drive units were the Declaration series, a full range of standmounters, floorstanders and surround sound units that all used one or more 5.25in drivers, depending on the model, in tandem with a one inch aluminium dome tweeter. These early units were quite simple, with a basic aluminium 'dish' type cone that was a one-piece unit, thus requiring no dust cap [see 'CPC TECHNOLOGY' box] and allied to a reverse-roll rubber surround.

Reviews of these new products were very promising, with reviewers' comments being well backed up by healthy sales. However, Mordaunt Short decided not to rest on their laurels: they reworked the range into the 'Avant' series in 2003, featuring sleeker cabinets and improved drive units, including changes to the aluminium dishes. Further praise followed and the range underwent its second major overhaul last year, gaining an 'i' suffix and reaching even higher levels of performance.

However, there was something of a little pair of forgotten waifs in all this development. At the same time as the original Declaration 900 series, MS also designed and released two slightly bigger brothers, the 912 standmounter and 914 floorstander. These used a 6.5in CPC bass driver rather than the 5.25in of the 900 series, and used more complex second order crossovers, unlike the simple first order devices used by the Declarations. Well received by the press, the 912 walked off with top honours in a standmounting loudspeaker group test in the January 2003 issue of *Hi-Fi World* and the 914 remains a long-standing favourite of publisher Noel.

So it was something of a surprise to quite a few of us that these models were never expanded into a larger range, and never received an 'Avant' makeover alongside their smaller-driven brethren. Still, Mordaunt Short have finally cottoned onto this as well, and the 910 series



CPC TECHNOLOGY

Mordaunt Short's Continuous Profile Cone (CPC) technology involves the use of a single, dish-shaped piece of aluminium to do the job of the cone and also obviates the need for a separate dust cap. The advantages are several - firstly the cone can maintain a uniform strength across its entire surface, with no interface issues where the dust cap is attached, and no similar areas of weakness where the cone attaches to the voice coil. With their CPC cones, Mordaunt Short attach the dish to the voice coil via a small adaptor that is glued to the top of the coil and then stuck to the underside of the dish. This helps to maintain the rigidity of the centre of the cone as well as the voice coil and helps to ensure "controlled piston-like movement at low frequencies and minimal breakup at higher frequencies", according to MS.

Another advantage is the lack of dust cap. Contrary to what many believe, dust caps do contribute to the high frequency output of a driver. The top end rolloff of such a unit can actually be finely tuned by choosing the correct dust cap size and profile, so dispensing with it makes a designer's job easier in many ways. As a final step, MS use a variable thickness surround that attaches to the edge of the aluminium dish via a 'V'-shaped interface channel. This gives extra area of contact between the two items, making them more robust at high excursions, and conferring greater control on the dish as it moves, thus minimising distortion and improving transient response - and therefore timing.

now boasts a full Avant i-style rework, along with the addition of the two and a half way Avant 916i. However, rather intriguingly, the 912 standmounter seems to have vanished from the catalogue...

As mentioned, the Avant 914i is a two way floorstander, utilising a totally new 6.5in (165mm) CPC aluminium bass driver, and 1in (25mm) aluminium tweeter. These are mated using a second order crossover that makes use of Dual Value Parallel (DVP) capacitors, where two capacitors in parallel are used to make up the value required rather than one, lowering distortion. The enclosure is ported to the rear, with a second aperture allowing for sand-filling of the lower chamber, which pays dividends in terms of bass solidity and control. Measuring 860x180x270mm (HxWxD), the 914is are available in Black, Calvados and Honey Maple finishes.

SOUND QUALITY

It is very fortunate that the days of wincing at the sound of a metal-coned drive unit are long gone, and Mordaunt Short's woofer design is an exemplary specimen of how to get such a driver right. As a result, the Avant 914is impress from the word

"go" in that they have a pleasingly dynamic and forthright nature that firmly pulls up the socks of music to bring it forth in a delightfully incisive manner.

It is, however, worth mentioning that the Avant 914is, as with all MS speakers I have found, do really need a good period of running in before they really give of their best. The process of run-in tends to be a source of controversy in the hi-fi fraternity and I still remain completely unconvinced of its necessity for cables and leads, but for mechanical items such as loudspeakers it's essential. The resins used to treat the material of the drive units' suspensions, for example can take many hours to be flexed and 'worked in' sufficiently to ensure even movement across their diameter and, up until that point, the driver will not be able to move truly freely.

However, once sufficiently run in, the Avant 914is loosened up nicely and lost their rather edgy presentation that was noticeable when listening straight out of the box. Vocalists came across with excellent scale and presence, something which I was pleased to hear given that the Avant 906is I tested back in the June 2007 issue were a little reticent



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in this respect. Not so the 914is however, as they took the likes of Eleanor McEvoy and gave her voice magnificent emotiveness, projecting it well into the room and setting up a quite uncannily large central image. The backing acoustic guitar on the track 'The Rain Falls' from her 'Yola' album was also pleasingly lifelike and well rendered, plucked notes starting and stopping with alacrity and the gentle strumming showing an impressive level of separation between each string, where a less sensitive loudspeaker can tend to blur them together somewhat.

Moving up to the higher frequencies, the advantages of the uniformity of sound that can be gained by making the main driver and tweeter dome from the same material were patently obvious. The upper midrange blended seamlessly into the treble, and the aluminium dome tweeter offers commensurate high frequency detail and insight.

I still think that Mordaunt Short offer some of the best budget metal dome tweeter designs on the market and the Avant 914is continue to uphold this theory with aplomb. Treble frequencies struck an expert balance between being smooth yet not at all muffled, and detailed without being harsh. Spinning the Cowboy Junkies CD 'Black Eyed Man', the track 'Oregon Hill' had stunning levels of space and air around all instruments, with Margo Timmins' vocals rock-solid centre stage and full of emotion.

The tapped hi-hat that provides a steady backing to the main music of this track can often be rather lost and the recording itself seems to have been mixed to remove some of its metallic nature. As a result, through many loudspeakers it sounds like drummer Peter Timmins is tapping away on the bottom of an upturned cardboard box, but the Avant 914is made it clear that there was definitely something metal lurking within the depths somewhere.

Increasing the pace somewhat, courtesy of Grace Jones and her 'Slave to the Rhythm' album, the Avant 914is positively lapped it up. Rhythm and timing are spot on, and they have a pleasingly effortless and detailed bass. With the title track, as with other pieces of music, the Mordaunt Shorts showed themselves able to resolve complex bass lines, keeping up with pacy material and giving excellent realism to bass instruments, whether acoustic, electric or synthesiser.

The only slight downside I did encounter in low frequency terms was when spinning tracks that

feature very low bass. As mentioned the Avant 914is are very well tuned and have good extension and control, but very occasionally they seemed to 'let go' ever so slightly right at the very low end, a sudden "whoomp" appearing out of nowhere and then vanishing just as quickly.

This was most noticeable on tracks like The Cinematic Orchestra's 'Every Day', which has a full low end courtesy of a prominently-mixed double bass, and this could bloom on occasion. However, to counteract things, this phenomenon actually worked wonders on dance music, adding surprising weight to the beat, with the speakers' quick recovery managing to not add any undue boom.

The weighty nature of the bass also added impressive impact to more dynamic classical material. The crescendos from 'Also Sprach Zarathustra' struck out superbly and rolled around the room with great dexterity, the Avant 914is being more than equal to the task of reproducing them with feeling and scale.

CONCLUSION

The Avant 914is are clearly a Mordaunt Short product, as they have the 'family sound' in spades - definitely no bad thing in my opinion. They have the traditional qualities of detail and clarity but add in a lovely all-encompassing midrange that offers detail and atmosphere by the bagful - an area in which I found the Avant 906is ever so slightly wanting. Their only small hiccup was in terms of the occasional low bass outburst, but these were very few and far between and relied on finding the correct combination of source material, matching components and volume setting - I suspect it will not ever make itself apparent to many listeners.

All in all, the Avant 914is are a very fine loudspeaker and combine a well thought-out design with excellent construction quality and superb value for money at their £300 retail price. My only complaint is that it took Mordaunt Short so long to get round to updating the original 914s!

REFERENCE SYSTEM -
 Pioneer PLC-590/SME M2-10/Ortofon Rondo Bronze turntable
 Eastern Electric MiniMax phonostage
 Eastern Electric MiniMax CD player
 Red Wine Audio Signature 70 amplifiers



VERDICT ●●●●●
 Another budget stunner from Mordaunt Short - dynamic, detailed and with a superbly integrated overall sound.

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 www.mordauntshort.com

- FOR**
- mid & treble integration
 - capacious soundstage
 - top end detail, smoothness
 - driver technologies
- AGAINST**
- occasional bass instability

MEASURED PERFORMANCE

The Mordaunt Short Avant 914is measure well, with a generally smooth output across their full bandwidth. Treble output remains smooth with just a slight rise up towards 20kHz, meaning the Avant 914is should have a nice, sparkly top end but without undue brightness.

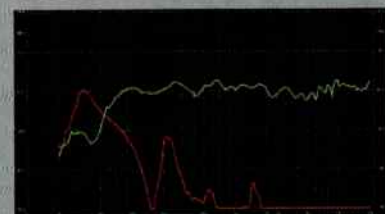
The midband is also well controlled with no major peaks or troughs, and the slight depression in level from 1-7kHz should serve to ensure that there is no midrange harshness.

Bass output is fine, commencing rolloff from the main drive unit at around 70Hz, and aided by the port which is tuned to 35Hz. As the bass section looks nicely damped, the Avant 914is should turn in a punchy performance which can be fine-tuned by judicious placement thanks to the rear-firing port.

Electrically the Avant 914is have no surprises in store. Average measured impedance was 5.8 Ohms, dropping to a minimum of around 3.5 Ohms at higher frequencies, so they will need a proper 4 Ohm feed. Their sensitivity however is

good at 87dB and so 40W or so should see them singing well. AS

FREQUENCY RESPONSE



Green - driver output
 Red - port output

IMPEDANCE



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Multi Choice

Noel Keywood and Adam Smith round up five of the latest affordable multichannel A/V receiver marvels...

and film soundtracks are commonly recorded in ordinary digital (uncompressed PCM). Now that Blu-ray has enough space for uncompressed music, the need to use losslessly compressed formats like these from Dolby and DTS isn't so great. Film soundtracks like 'Pirates of the Caribbean - Curse of the Black Pearl' on Blu-ray has a 5.1 channel, 24bit/48kHz PCM uncompressed high definition sound track, for example, that will give very high audio quality through all five channels. This can only be conveyed through an HDMI connection, so both player and receiver must have them. The 24/96 and, occasionally, 24/192 digital code on DVD-Audio discs is also transmitted through HDMI. So now for a surprise!

At present many receivers with HDMI inputs cannot process the information it conveys. They act as simple "pass through" connectors, usually switching two inputs through to one output, onto an HDMI equipped TV. This is commonly described as HDMI "switching", as opposed to "processing", the latter being an altogether more complex matter, implemented on the Onkyo, Yamaha and Marantz receivers in this group.

With HDMI processing you can connect an HDMI equipped DVD or HD player with a single lead, which really is the point of HDMI; it carries everything - pictures and sound - in one lead, in digital form. In future, when the currently messy and extremely complicated situation where both old and new exist is sorted out, one lead will be used from player to receiver, and one to the TV.

Only SACD gets a little peculiar here. Although the high resolution DSD data from an SACD can be transmitted over HDMI 1.2 or later (i.e. 1.2a or 1.3), few if any players do this, even though some A/V receivers can decode DSD data, including the SR6001 tested here and the TX-SR705 from Onkyo. Many SACD players do not output raw DSD at present, but some such as Arcam's DV-139 turn DSD to PCM internally and output that instead, allowing SACD to be transmitted digitally via the HDMI link.

In the past, A/V receivers did not match stereo amplifiers, sounding ragged and sharp. This isn't the case anymore, as the receivers here, when switched to Pure Direct (which bypasses digital processing) sounded impressive with 16bit PCM from CD and 24/96 material from DVD. Massive power supplies, quality output stages and top notch 24/192 digital converters are likely the reason for a generally relaxed and open sound, but also one that was highly detailed and concise with digital sources. Multichannel is a world away from stereo, but no less impressive for it, and getting better rapidly.

Surround sound is changing, stepping up from DVD standards - including now defunct DVD-A audio - to Blu-ray (and DVD-HD) High Definition standards. Manufacturers will be rushing out new receivers and players over the next year to meet demand for HD pictures and super sound to go with it. In our group test this month we are taking a timely look at the old and new, to see what you need to move up to multichannel audio quality unlike anything that's gone before...

Let's start with the juicy bits: tomorrow's new audio standards. Both Dolby and DTS have new lossless audio schemes, True HD and Master Audio. If you want them, then you'll need a receiver that can decode them. Onkyo's new TX-SR60S in this group is one of the first to handle both, yet costs just £400, and is the talk of the (global) town at present. So is it a foregone winner against receivers without full HD decoding, like Arcam's AVR-280, Yamaha's DSP-AX861SE, Marantz's SR6001 receiver and Cambridge Audio's Azur 640R also tested here? Seems like a no-brainer, but perhaps not!

TrueHD and Master Audio have fantastic audio specifications for sure, but are ahead of their time. Little commercial material exists in either format at present, and when it does appear you'll need a very good system to appreciate the improvement it brings. That means full range hi-fi loudspeakers at front, like the KEF iQ9s we used, with an iQC6 centre and iQ3s at rear.

How soon we will get video or audio discs with recordings in either TrueHD (comprising MLP PCM + Dolby Stereo, Meridian tell us) or Master Audio isn't something we would like to predict. High quality music



ARCAM AVR-280 £1,200

With its smooth, satin silver fascia, simple legends and good end detailing, Arcam's AVR-280 was arguably the easiest on the eye of all our receivers - and most on the market today. All seven channel A/V receivers are large; styling influences their visual impact in the home and it is here Arcam's latest scores. At £1,200 however, you do pay for it and since the line up of facilities and output power are much like that of rivals, bar the HDMI processing Onkyo, Yamaha and Marantz, it is on appearance, sound quality, UK build and relative ease of setup and use that Arcam argue their corner.

Producing no less than 200 watts from each of its seven channels under measurement, the AVR-280 has plenty of punch. At full tilt on all seven channels well over 1000 watts is available - hardly surprising, then that it weighs a solid 16kgs. However, measuring 433mm wide, 420mm deep and 145mm high it isn't the biggest receiver around, being one of the most compact in our group. Loudspeakers are connected through seven pairs of rear terminals, but these are not colour coded. It isn't a major point, but such coding can help if you use colour tags on the cables. They do, however, accept 4mm plugs, which is a boon, as screwing down fourteen heavy duty multistrand cables and ensuring there is no short is a tedious business...

Arcam fit all the usual surround-coding schemes from Dolby and DTS, up to 6.1 from Dolby Digital

EX and DTS-ES 6.1 Matrix, or discrete - a rare format. The two rear loudspeakers act together, giving mono in effect, in 6.1 mode. There are a range of Hall effects too, plus DTS Neo 6 and Dolby ProLogic IIX, music or movie, complete with submenus giving stage width and the like. Both these schemes process surround from stereo and they can be very effective, depending on how much out-of-phase information exists in the stereo recording. Matrix decoding is included too, to handle matrixed surround, sometimes found on TV. As we mentioned in our general introduction though, Dolby TrueHD and DTS Master Audio are not onboard, because they cannot be utilised without the HDMI digital processing this receiver lacks.

The three HDMI sockets fitted are for switching a pass-through signal out to an HDMI equipped TV. The two inputs are marked satellite and DVD, the latter being an HD-DVD or Blu-ray player. Because the AVR-280 does not process signals from the HDMI input the receiver's on screen display (OSD) will be unavailable unless you also use analogue connection and switch between them at the TV.

Multichannel sources must be connected through the single analogue input able to accept discrete 7.1 sound, comprising eight phono sockets from an external player (7 channels plus subwoofer). That means you can hook up a Blu-ray or HD-DVD player, but not an SACD as well.

As usual there are two channel

inputs for CD, tape, aux, DVD and much more, with tape outputs, but no multichannel preamplifier output for external power amplifiers or powered loudspeakers. Each set of stereo inputs has an associated composite video and S-video input that can be switched through to composite or S-video outputs, for a TV. It is to these sockets that you can fit a SCART adaptor lead, for SCART sets. Or you can fit one to the high quality video outputs that can be set to give either RGB or Component YUV; choose RGB for SCART. There are two inputs that switch through to these outputs.

Because there is no rear SCART socket you must use a SCART to composite/S-video/RGB adaptor cable, available from QED, if you have a SCART-only TV. The other receivers had no SCART either and Arcam told us their arrangement was better implemented than those of rivals, as the AVR-280 can supply a trigger signal. By the way, RGB gives best quality and most TVs have it, but not all; S-Video is next best and Composite last - but it can be relied upon to work!

Of course, you should ideally connect the audio from DVD players through their digital outputs and the Arcam has three coaxial/optical digital inputs to cope, plus one digital output.

Arcam include a VHF/FM tuner, but it is a high quality analogue module, not the 'interesting' Radioscape Software Defined Radio that includes DAB, they are fond of. Like all VHF/FM radios this one needs

a strong signal for good results, but our measurements show it gives excellent quality and is worth it.

Arcam's remote handset is nicely laid out and easy to use, but has an absolutely infuriating 'satellite delay' before the receiver responds - when using the onscreen display it is all too easy to keep jabbing away at the buttons to try and elicit a response, only to find that it suddenly does so, and flies past the option you wanted - not good.

SOUND QUALITY

Connecting the Arcam up and setting it for multichannel play, the AVR-280 gave a good account of itself. Spinning 'Living in your Eyes' from Larisa Stow's album 'Moment by Moment' from a 5.1 DTS DVD-Audio disc through the coaxial digital DVD input gave a lovely deep and expansive soundstage that placed each instrument very well. Larisa's vocals were solidly located in the front centre channel, with the surround channels adding just the right amount of atmosphere and spatial decay. The only downside I did note here was that there was a tendency for sibilants to have something of a 'spitch' to them, which made the presentation slightly 'edgy'.

Changing to the same source and track through the 7.1 direct input (labelled as 'DVD-A' on the Arcam) brought about an improvement. The 'spitch' disappeared, leaving high frequencies well defined and with good clarity, and the soundstage expanded further, extending back beyond the television screen in a quite uncanny manner.

Moving to a feature film, the Arcam gave excellent scale and impact to the sound of 'I, Robot'. Vocals were very well defined from the centre channel and the Arcam had no trouble keeping up with the action as it became faster. Where I was a little disappointed was in terms of bass, which seemed lightweight. In fact, this was so pronounced at times that we did actually run an independent pink noise check using a spectrum analyser for measurement, to check that all the bass management really was switched off when it was supposed to be. It turns out that it was, and all the settings were correct, so the Arcam definitely seems to be a little constrained in terms of low end grunt in multichannel modes. Still, you can always crank the subwoofer up a bit more...



Switching off all the technical wizardry and moving to conventional CD reproduction through the CD input, and with 'Direct' mode engaged, the Arcam again proved a very competent performer. Treble was smooth and well extended, giving a good amount of insight into cymbals and the like. Midrange was also mellifluous and nicely composed, but could be a little over-smooth at times, blurring the leading edges

fine tuner section. Sensitive and easy to tune, it offered a very natural presentation with excellent stage depth and composure. Once again, however, the treble could be a little splashy at times.

CONCLUSION

The Arcam is a nicely consistent performer, offering good facilities and a pleasant, enjoyable sound that is maintained throughout the sources

"with 'Direct' mode engaged, the Arcam again proved a very competent performer"

of notes ever so slightly. Intriguingly, bass was exactly the opposite to that found with multichannel operation, being strong and detailed with commendable punch and verve, if a touch overblown on occasion.

Finally, tuning in the radio showed that the AVR-280 has a very

and processing options it offers. The inability to decide whether it wants to be a little overenthusiastic in bass terms (Direct CD), or rather shy (DTS) is the only real area of concern, but Arcam have come up with another typically well engineered product in the AVR-280.

MEASURED PERFORMANCE

The AVR-280 produces 120 watts into 8 Ohms and 196 watts into 4 Ohms on each of its seven channels (driven individually), so its total power output comfortably exceeds 1000 watts. Distortion levels were low, even at high frequencies, where just 0.012% was recorded at 1 watt, crossover being negligible, so its amplifiers are good quality. Switching in Dolby Pro Logic processing, with attendant A/D/A conversion (analogue CD input) made little difference to the distortion figures from the CD analogue input.

Bandwidth was a wide 4Hz-48kHz (-1dB) in Direct Mode, sufficient to do SACD and 96kHz PCM justice. Processor noise wasn't high either.

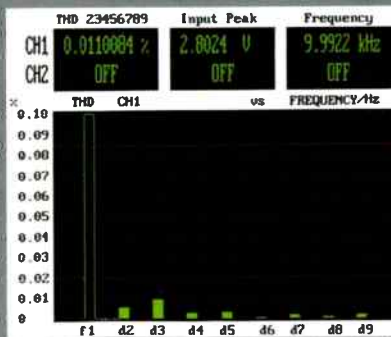
Arcam fit a conventional VHF/FM tuner, not the 'digital' tuner from Radioscape they often use in conjunction with DAB. It is a quality unit, with very low distortion and noise, and has a particularly flat frequency response to 15kHz, so it will give fine sound. As always, a strong aerial signal is needed, just over 0.7mV, for minimum hiss (full quieting).

This is a powerful and refined unit and so justifies its cost. It should give a smooth, powerful sound. NK

Power	120watts
CD	
Frequency response	4Hz-48kHz
Separation	72dB
Noise	-80dB
Distortion	0.012%
Sensitivity	300mV

TUNER	
Frequency response	10Hz-15.2kHz
Stereo separation	30dB
Distortion (50% mod.)	0.3%
Hiss (CCIR)	-70dB
Signal for minimum hiss	673µV
Sensitivity (stereo)	42µV

DISTORTION



VERDICT

Crisply styled, fine all-round performer with a typically consistent Arcam performance.

ARCAM AVR-280 £1200

Arcam
 ☎ | 44(0)1223 203200
 www.arcam.co.uk

FOR

- overall sound quality
- excellent FM tuner
- build quality

AGAINST

- sluggish remote
- inconsistent bass
- no HDMI processing



CAMBRIDGE AUDIO 640R £600

This review sees something of a departure for Cambridge Audio as their combination of UK-based design and Far Eastern build gives them excellent value products able to compete with dearer items with ease. This time, however, the budget honour goes to the Onkyo at £400. All the same, at £600, Cambridge's 640R receiver is by no means expensive and packs an impressive amount of features and technology under its bonnet...

Walloping out a hefty 240W into 4 Ohms from each of its seven outputs, Cambridge Audio have certainly not scrimped on the amplifiers that form the heart of the 640R, and it should have no difficulties in driving even the most difficult loads. To assist in this, Cambridge use what they call 'X-Tract' - a Forced/Convection heat tunnel. What this basically means is that there is a large heatsink at the centre of the unit, which has been designed to optimise heat dissipation from the output devices that are strapped to it. A fan is fitted which kicks in under extreme conditions to assist this process. As a result the 640R does dissipate a fair amount of heat and so plenty of space around it is a wise move, and the rear ventilation grille should not be obstructed.

A full complement of colour-coded loudspeaker terminals are fitted to the rear, which makes identification of each channel's loudspeakers much easier when peering over the back of the unit in a poorly lit room. The terminals themselves are also good and

sturdy, better than some we have experienced on previous Cambridge products, although still not quite up to the standard of the VBT devices fitted to the 840A amplifier.

Like the Arcam, the 640R does not offer any processing for the new high definition formats, so has no Dolby TrueHD or DTS Master Audio facilities. It does, however, possess analogue 7.1 direct inputs (as well as 7.1 preamplifier outputs should you feel the need for even more power via external amplifiers!) so these can be connected to an external device that creates the eight channels independently.

As to the other surround processing formats, the Cambridge is well stacked, offering basic Dolby Digital and DTS, plus Dolby Digital EX, DTS-ES Matrix and DTS-ES Discrete for compatible multichannel sources. The 640R also offers the Dolby Pro Logic IIx and DTS Neo 6 options that can synthesise six channels from two, along with DTS 96/24 that offers 5.1 channels of 96kHz/24bit audio from DTS audio and video sources that can pass this datastream over their digital outputs. The 640R also has a handful of internal DSP modes, namely Theater, Hall, Movie and Music for generating ambient effects from stereo.

The Cambridge's connectivity lineup is suitably comprehensive, offering eight analogue audio inputs and the aforementioned 7.1 input, as well as five digital coaxial and six digital optical inputs. The video side of things is taken care of courtesy of five composite, five S-Video and three component video inputs, and the 640R also offers three HDMI inputs

and one output. These are straight-through connections, as the 640R offers no HDMI processing, but they can be assigned to the DVD, Video 1, Video 2 or Recorder 1 inputs.

The 640R offers socketry for connections to Cambridge's multiroom 'Incognito' system as well as other manufacturer's products that conform to 'A-BUS' standards, and the unit can be remotely controlled in a Custom Install situation via an RS232 socket.

The 640R's tuner section offers AM (MW) and FM wavebands, with full RDS compatibility on FM. Aerial inputs are via a 75 Ohm coax socket for FM and push terminals for an AM loop aerial.

Supplied with the usual high quality Cambridge Audio remote handset, the 640R proved pleasantly easy to use. Although this is partly due to it not being as feature-packed as some of the other units on test, it is also helped along by the remote being more dedicated to the receiver itself, rather than having the ability to control televisions, DVD players, video recorders, hi-fi equipment, etc. Whilst this will invariably mean that your remote control count will need to be higher than with the other receivers, it makes the Cambridge very easy and intuitive to use, with added advantage of dedicated buttons for various operational parameters.

Setup of the 640R is manual, with no automated loudspeaker tuning gizmos of the kind fitted to the Marantz, Yamaha and Onkyo. However, this proved to be nice and simple to do, the onscreen display showing all you'll ever need and being quite intuitive in navigation terms.

It also responds instantly to button presses, unlike the irritating delay experienced when operating the Arcam, for example

SOUND QUALITY

The Cambridge Azur 640R offers a capacious sense of realism and dynamics in multi-channel mode. The Larisa Stow track was superbly reproduced, with a prolific level of

"the Cambridge proved itself to be extremely competent"

detail and atmosphere. The acoustic guitar used in the track is very finely played with vivid hand movements audible up and down the fretboard, and the Cambridge pulled these out of the mix with commensurate dexterity.

Depth of soundstage was very good, maybe a strange thing to say in terms of a multichannel system but, believe me, soundstage depth and scale can vary just as much with seven loudspeakers as it can with two. The Cambridge proved itself to be extremely competent in this area, adding superb atmosphere to Larisa Stow, and making the Blue Man Group's track 'Sing Along' a quite amusing experience, as their invented and wacky instruments popped up here and there around the room.

Moving to video, the Cambridge made excellent work of films, staying pin-sharp in terms of accuracy and pace when the action speeded up, but maintaining a sense of effective subtlety during quieter moments. The clip from 'I, Robot' rumbled the floor magnificently as the helicopter flew overhead and dialogue from the centre channel was clear cut, adding excellent levels of definition to the speech of the main characters on screen, but without making the all-too-common error of stealing everything from the front left and right channels, and consequently robbing front soundstage width.

Switching over to two channels, the Cambridge continued to impress. It has a smooth treble, reminiscent of the 740A amplifier and offers excellent levels of detail and atmosphere. Midrange has good projection and the 640R gives vocals plenty of room to breathe, avoiding the somewhat



congested and nasal nature that A/V receivers of the olden days could impart onto such material.

At the bass end, the 640R offers good weight and pace. The low end of The Cowboy Junkies' 'A Horse in the Country' was very nicely detailed, the Cambridge layering the performance well and following the tunefulness of the bass guitar expertly, but it did have a tendency to bloat lower bass a little. This never made it sound boomy, but meant that it was not quite as tight at the very low end as a comparable dedicated two channel amplifier.

Turning to the tuner, the 640R proved to be very sensitive and pulled even distant stations out of the ether with ease. The downside

was the sound quality which, although quite listenable, was rather thin and reedy at the top end, making announcers sound nasal, exacerbating any apparent compression of stations.

CONCLUSION

It may be a little repetitive to read it more, but the fact is that, once again, Cambridge Audio have come up with yet another superb design that can take on much more expensive equipment and more than hold its head high in such exalted company.

The 640R is a veritable powerhouse with a very good, if not quite class-leading, selection of inputs and facilities that offers a sound quality that is more than able to take on not only multichannel rivals, but quite a few dedicated two channel units as well. Add in the ease of setup and intuitive, easy to use remote handset and Cambridge Audio have quite clearly produced another audiophile A/V bargain.

MEASURED PERFORMANCE

The Cambridge was enormously powerful, delivering 162 watts into 8 Ohms and 240 watts no less, into 4 Ohms, from each channel. As most bass units are 4 Ohms these days, this is the true power in real life, so it is definitely for those who feel they need such high power in each of seven channels. Distortion levels were low, even at high frequencies, so the amplifiers are good ones, in line with the company's reputation in audio. The A/D/A processing was clean, inserting Dolby Pro Logic IIx from the analogue CD input adding no extra distortion. There was more processor noise than Direct mode, but no more than rivals at -83dB.

The VHF tuner has a pronounced treble peak of +2dB at 8kHz in its frequency response and will sound bright as a result. Distortion levels were on the high side too: 0.6% at full modulation and 0.3% at 50% mod, when 0.1% is more common nowadays. Sensitivity was good and hiss low though.

The amplifier sections and Crystal digital converters were good, but as the only digital inputs are SP/DIF carrying digital CD, and not HDMI, there is no form of high definition digital audio link;

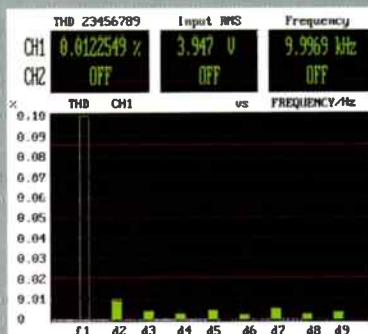
analogue connection must be used. NK

Power	162 watts
CD	
Frequency response	4Hz-52kHz
Separation	76dB
Noise	-83dB
Distortion	0.011%
Sensitivity	290mV

TUNER

Frequency response	10Hz-15.2kHz
Stereo separation	30dB
Distortion (50% mod.)	0.3%
Hiss (CCIR)	-70dB
Signal for minimum hiss	1.2mV
Sensitivity stereo	37µV

DISTORTION



VERDICT

Another fine Cambridge Audio product. What the 640R lacks in features it more than makes up for in ease of use and sound quality.

CAMBRIDGE AZUR 640R £600

Cambridge Audio
+44(0)845 900 1230
www.cambridgeaudio.com

FOR

- sound quality
- ease of use
- simple remote control

AGAINST

- fewer facilities than rivals
- slightly over-warm bass



ONKYO TX-SR605 £400

The advanced specification of Onkyo's new TX-SR605 receiver has raised eyebrows everywhere, especially considering its extremely low price of around £400. In particular this is one of the first receivers able to decode Dolby TrueHD and DTS HD Master Audio, super high fidelity formats within Blu-ray and HD-DVD specifications. To handle these the Onkyo has full HDMI processing, in and out, so it can be connected to a DVD or High Definition player, Blu-ray or HD-DVD, by one HDMI cable alone, and to the TV by another - and that's it! Well, it is unless you are an SACD fan, and assuming HDCP doesn't play up and spoil the party, in which case connection to TV can be by made using Component Video cables. We used both.

And there's more - much more. Onkyo fit seven 24bit/192kHz D/As no less, so that should anyone ever produce such a recording in seven channels (i.e. 7.1) on Blu-ray - likely soon as demos already exist - this receiver can read it via HDMI and give you sound quality that should be nothing short of breathtaking. As it stands the Onkyo reads almost every format via its HDMI link, effortlessly reading CD and DVD-A (24/96 & 192), as well as all the compressed video formats from Dolby and DTS. It lacks SRS, of little interest to audiophiles, but it also lacks the DSD processing of the Marantz - consequential if you want SACD and would rather not use analogue connection from the player to this

receiver.

Like the Marantz though, Onkyo provide Audyssey (see www.audyssey.com) room equalisation, where a small supplied microphone allows the receiver to 'listen' to the room and make corrections. It got our loudspeaker positions absolutely - eerily! - right, but the levels set were those already set by us manually using the receiver's on-board test tones, plus a Chesky surround-sound test disc! Comparing Audyssey equalisation against none (Off) showed no perceptible difference, meaning it did nothing - which is probably just as well, as the room is acoustically treated and carefully balanced using a Bruel & Kjaer measuring microphone and spectrum analyser. So in other words, by doing nothing Audyssey got it right. The system is for those who would rather not do the tweaking themselves.

Onkyo have been keen to get just about every conceivable feature onto the TX-SR605 to make it a market leader. Quoted at 90 watts per channel, our measurements showed 112 watts into 8 Ohms and 169 Watts into 4 Ohms, in each of its seven channels. If you would rather not bother with 7.1, then two channels can be assigned to bi-amping a front pair of loudspeakers, usually left and right. This usually enhances dynamics and perceived 'cleanliness' of the sound by a small but perceptible degree. There is a single set of 7.1 input sockets able to accept an analogue surround signal, such as that from an SACD player for example. Onkyo fit a 7.1 preamplifier

output too, so external power amps or powered loudspeakers can be used.

The Onkyo will cross convert between video formats - up to a point. It will send low resolution analogue like Composite, S-Video and Component to HDMI, but it won't send HDMI to anything else, so if you connect to DVD via HDMI, as we did, you must connect the TV via HDMI too. When we connected to TV using Component cables we found the DVD player's set up menu would not display. This is a common difficulty though. To see set up menus, either HDMI must be used or analogue.

A wide range of analogue and digital (coaxial and optical) connections are fitted, so TVs, CDs, DVDs and what have you can be connected. In future, only HDMI need be used with digital sources and this is how we ran the receiver.

Onboard is an VHF/FM and Medium Wave AM tuner. They will auto or manual tune and VHF/FM can be switched to mono, which lifts muting as well as minimising noise. A 'Tuned' indicator is fitted to indicate when correctly on-station, but there is no signal strength indication. A stereo beacon is fitted, as is RDS and forty pre-set memories for AM and FM in any combination.

The most important audiophile feature of the Onkyo is the Pure Direct button. This causes a bright blue surround to the fascia button to light up and made an appreciable improvement to the sound from all sources, we found. North American models don't get it though, instead

being provided with Neural Surround and Sirius and XM radio readiness. Pity them!

Tone controls and a five band equaliser for each channel are fitted so a lot can be done to balance each channel. As there are a bewildering number of 'listening modes', a preferred mode can be assigned to a source, so when you switch to DVD, for example, Pure Direct switches on, and with TV Dolby PLIIX Movie will kick in.

In advanced set-up, there are various obscure functions, such as HDMI lip synch adjustment, xvYCC colour correction, cancellation of HDMI sound output, and ways of feeding another listening zone. This is an extremely complex receiver, astoundingly so given its price, but it is enormously flexible and capable.

SOUND QUALITY

With slight concerns that the level of facilities offered by the Onkyo, combined with its low price tag, might mean that savings had been made on the sound quality front, we nervously connected up and switched on. Fortunately, we quickly came to the conclusion that the only cost-saving area was styling...

The TX-SR605 is a fine sounding unit. In multichannel mode it offered good levels of separation and clarity to the sound in all channels, giving solid definition to instruments in multichannel mixes. Larisa Stow's vocals were pleasingly emotive and detailed, without any trace of harshness or 'bite', and the rendition of the acoustic guitar backing her was nicely mellow. Where things were a little less convincing was in terms of soundstaging. Despite having five loudspeakers playing away to their heart's content, the Onkyo struggled to really create a convincing arena to the sound. The speakers really did mark the outer limits of the soundstage quite noticeably - all was well in between them but there did not seem to be too much beyond them.

This effect was also still slightly noticeable on film material, with gunshots, pinging bullets and general action panning across the soundstage very well but disappearing off the edge of it more rapidly than some of the other receivers here. That said, though, the Onkyo still acquitted itself very well in terms of speech placement and dialogue clarity, making sure that all performers



"the Onkyo proved to be a smooth performer"

were well located with respect to their position on screen.

Pressing the Pure Direct button and watching its bright blue surround illuminate, as well as the display extinguish gave the real surprise of the review, namely that the Onkyo turned in an extremely capable two channel performance. The Pure Direct option seemed to rescue the soundstage that was noted to be missing in multichannel modes and, although not quite up to the standard of the other units, the TX-SR605 suddenly became nicely atmospheric.

Midrange definition was good, adding emotion to vocals and giving instruments a good sense of body. Allied to a sweet and detailed treble, the Onkyo proved to be a smooth performer with a nicely weighty bass to underpin its performance. The low end did lack the insight of the other

units, notably the Marantz, but the Onkyo was never blatantly found to be wanting in any area.

Switching to FM, the TX-SR605 again proved to have a good tuner section, with commendable sensitivity and good clarity, allied to a sweet overall nature. However, it did occasionally seem to be a little compressed sounding, taking the edge off the dynamics of some performances.

CONCLUSION

An absolutely astonishing performer for its price, the Onkyo TX-SR605 is a very impressive unit, offering cutting-edge technology allied to a huge feature count and topping the whole lot with fine sound quality. Onkyo seem to be making market grabbing pitch with this one; it's quite a proposition however you view it.

MEASURED PERFORMANCE

The Onkyo TX-SR605 isn't as powerful as its rivals in this group, but most would not notice, I suspect, as it is less than 2dBW down on the Cambridge for example, and 169 watts into four Ohms, or 112 watts into eight is plenty, especially when feeding seven loudspeakers. Much like the others, this receiver generates very little distortion right across the audio band, being every bit as good as hi-fi amplifiers. It managed 0.012% at low level / high frequencies, for example, where crossover usually mars the picture. So the Onkyo should sound smooth enough. Like the Cambridge, it runs hot, suggesting a useful amount of low level Class A working in a Class A/B biasing scheme.

The VHF tuner has a frequency response -1dB down at 7kHz, so it will sound relaxed, although likely not overtly dull. Distortion was very low, just 0.1% at 100% modulation, so this is an effective tuner that should be an easy listen.

With HDMI digital connection of video and audio signals possible from DVD, Blu-ray and HD-DVD players, the Onkyo needs no other form of signal connection (except analogue from SACD, as it cannot process DSD internally). This is a significant

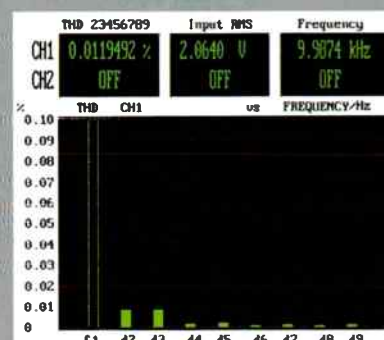
advantage, as are its multiple 24/192 D/A converters. NK

Power	112 watts
CD	
Frequency response	3Hz-60kHz
Separation	74dB
Noise	-86dB
Distortion	0.012%
Sensitivity	250mV

TUNER

Frequency response	8Hz-7kHz
Stereo separation	46dB
Distortion (50% mod.)	0.07%
Hiss (CCIR)	-69dB
Signal for minimum hiss	1.2mV
Sensitivity stereo	40µV

DISTORTION



VERDICT ●●●●£

All we can say is - how the heck did Onkyo fit in all these features and add in fine sound quality for such a low price?

ONKYO TX-SR605 £400
Onkyo UK
 ☎ +44(0)1494 681515
 www.onkyo.co.uk

FOR

- value for money
- facilities
- auto set-up accuracy
- sound quality

AGAINST

- styling
- non-Pure Direct soundstage



MARANTZ SR6001 £700

In the battle for market supremacy Marantz are pitching this monster, the SR6001, against machines like the Onkyo TX-SR605. For avid surround-sounders this means a sizeable receiver jammed with facilities and massive audio ability is priced at a very reasonable £700.

Our tests show that the 15kg SR6001 delivers a huge 225 watts into 4 Ohms from each of its seven channels, making it the second most powerful receiver of the group, behind the Cambridge. It's nice to see Marantz proudly claiming it has a proper E/I mains transformer inside, just like our own World Audio amplifiers, because toroidals have inferior performance (their only benefit is they are cheap!). Marantz's copper banded transformer is massive, but it ensures the amplifier doesn't wilt when delivering solid bass through seven loudspeakers, and power wastage and heat production due to core losses are less than a toroidal.

The SR6001 loses ground to the Onkyo TX-SR605 by its lack of Dolby TrueHD and DTS Master Audio support, because it employs HDMI version 1.2 in (and 1.1 out), which does not support either format. However, Marantz call the SR6001 "future-proof" by dint of the fact that it has 24bit/192kHz D/A converters on all seven channels, like the Onkyo. This means it can accept normal digital (i.e. Linear PCM) audio through its HDMI input and process it. So film tracks in multichannel PCM, or music, can be handled, right up to Blu-ray's full spec. of 24/192 on seven channels (phew!). Out

of interest, there's little difference between TrueHD and PCM, other than the former takes up half the space, due to its use of Meridian Lossless Packing, and there is the quality check of MLP. Dolby bought this technology from Meridian.

Marantz say in their handbook that the SR6001 can decode the DSD (Direct Stream Digital of SACD) signals transmitted over the HDMI link, but we could not test this, not having a player that would transmit DSD, including Marantz's own DV7001. This was disappointing, as SACD digital through the SR6001 would likely be very impressive and is something those who want a relaxing yet realistic sound should look for. Who knows - DSD might even get put onto Blu-ray one day, as both are Sony technologies.

All Dolby and DTS systems are included, as you might expect, plus Dolby headphone surround, Dolby Virtual Speaker, for surround sound from two (stereo) loudspeakers, SRS Circle Surround II, another synthesis system that creates surround even from mono(?) and HDCD, which when used with HDCD-encoded CDs makes for a very smooth, and dynamic sound by interpreting HDCD's better resolution.

Audyssey automatic loudspeaker tuning is fitted, but you can set up manually too, of course. There is a nine band equaliser on each channel to adjust frequency response if an owner so wishes, but those of the opposite persuasion may prefer to use Pure Direct sound which avoids equalisation and switches off all displays and paraphernalia, or Direct Sound where the DSP is bypassed,

but the displays remain on. We always used Pure Direct for listening tests and Marantz make the interesting point that when this is selected all loudspeakers are deemed large, and a subwoofer is connected, so it is for true hi-fi. Bass management to preserve small loudspeakers is bypassed and, if used, they may fry!

Connecting up was easy enough, as Marantz now use terminals that will accept 4mm banana plugs and all are colour coded. There are two pairs of fronts, and two pairs of Rears, allowing stereo in a second room, or bi-amping if the remaining channels are used for 5.1.

Both Adam and I, in different locations and systems, were confused by the apparently mystical disappearance of the setup display (OSD). Both AMP and MENU must be selected on the remote to view it, but stretching a big hand across the remote to MENU cancelled AMP, causing the MENU to disappear, we found. There was bewilderment here.

Another wrinkle is the Audyssey tuning system, which set rear channel levels a little high, likely due to Marantz rather than Audyssey, since the Onkyo did not do this. Marantz like an 'enhanced' sound. We used manual tuning with test discs, ears and a Bruel & Kjaer SPL meter for accurate setup, not Audyssey as implemented by Marantz. Whilst enhanced rear channels and humongous bass sound initially impressive, especially with film, such effects soon become a headache with music. Ironically, the SR6001 doesn't need to artificially enhance sound, as it is impressive enough when set not to do so!

A VHF/FM radio is fitted, with an AM Medium Wave section. The VHF tuner was a bit erratic in its success at auto-tuning into stations with weak or very strong aerial signals, being inclined to miss Radio 3 at 91.3 and Kiss at 100, so is best manually tuned. However, once locked on stability was good with a big roof array pointing at Wrotham.

Those with video cameras will appreciate the front panel S-Video and audio sockets, as the picture is routed to the TV and the sound through the hi-fi.

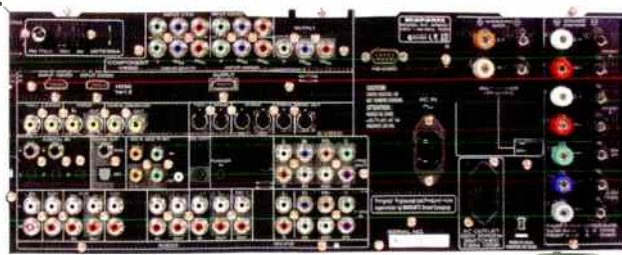
SOUND QUALITY

The Marantz really perked up the pace of the test when fully set up and playing multichannel sources. It has a magnificently capacious, all-enveloping soundstage with bags of detail and an overall sense of assured confidence. Larisa Stow's backing acoustic guitar was stunningly realistic with an almost uncanny sense of palpability to the string strikes and fretboard movements. Her vocals were captured expertly in the centre channel but with copious levels of ambience in the other loudspeakers, setting up a soundstage that seemed to stretch far beyond the boundaries of the room.

Switching back to the Blue Man Group imbued 'Sing Along' with a fabulous dynamism and pace that really set the feet tapping, the SR6001 picking up on every nuance in the recording and setting it perfectly into the performance. One thing interesting to note here also was found when comparing the direct digital DVD input to the analogue 7.1 inputs, as we did with all units. In this case, the SR6001's soundstage became more stable and wide, with better atmosphere through the 7.1 inputs, but the difference was much less marked than with the other receivers - a testament to the quality of its internal DACs.

This sense of dynamics and control continued into video material, keeping well up with the action in 'I, Robot' and ensuring that every little sound effect was grabbed and presented to the listener. The helicopter scene positively shook the floor and yet soft voices were perfectly clear and audible, showing that the Marantz has excellent dynamic abilities.

Hitting the Pure Direct button and switching to two channel was no less impressive.



The spacious soundstage was still present and correct and the SR6001 served up a smooth, composed and open midrange, still adding excellent atmosphere to performances and helped along by a sweet yet crisp treble.

At the low end, bass was tight, deep and detailed with an infectious boogie factor; the Marantz positively lapped up rhythms and pacey beats, but calming down with alacrity to whisper and reveal subtleties when required.

Finally, switching to FM, the tuner proved more than a match for the rest of the unit. As mentioned, its muting threshold seems to be set rather high, as some stations

would not tune in without switching to mono and, despite being clear, disappeared again when switching back to stereo. However, with a good strong signal the Marantz excelled, offering all the clarity, dynamics and top end sweetness that is expected of a good tuner.

CONCLUSION

The Marantz SR6001 proved a superb performer. Other than the slight irritation of its hit-and-miss tuning on FM it really did not put a foot wrong throughout the audition.

Offering a wide range of facilities and absolutely superb sound quality for the very reasonable price of £700, the SR6001 is an essential audition.

"the Marantz positively lapped up rhythms and pacey beats"

MEASURED PERFORMANCE

The chunky Marantz produces 225 watts into 4 Ohms from each of its seven channels, when driven individually, or 136 watts into 8 Ohms, but 8 Ohm loudspeakers are becoming rare. It outguns all the other receivers in this group, except the Cambridge, so the chunky casework is no sham and with well over 1000 watts in total it will shake any room!

This receiver's amplifiers possessed classic crossover distortion, but it was quite well suppressed, measuring around 0.1% or so below 1 watt and 0.07% above it, up to full output. This is unlikely to be audible. Generally, this is a good low distortion design like the others, if a little less slick overall.

The VHF tuner has a roll off in treble that will give it a softer, but not dull sound. Some peaking caused by max filter mismatch will add upper treble though, and measured response was very wide due to a high 17kHz upper limit. Distortion was low enough (0.1%) at typical modulation levels and innocuous second harmonic in nature. Hiss was a few dB lower than usual, so this is a quiet tuner.

The SR6001 has a fine measured performance and should give a good account of itself NK

Power	136 watts
CD	
Frequency response	18Hz-60kHz
Separation	73dB
Noise	-84dB
Distortion	0.07%
Sensitivity	240mV
Damping factor	54

TUNER	
Frequency response	15Hz-17kHz
Stereo separation	39dB
Distortion (50% mod.)	0.1%
Hiss (CCR)	-72dB
Signal for minimum hiss	600uV
Sensitivity stereo	34uV

DISTORTION

THD 23456789 Input RMS Frequency

CH1 0.0304517 % 2.7359 V 1.00023 kHz

CH2 OFF OFF OFF

VERDICT ●●●●●
A superbly built AV receiver that allies a high feature count to superb sound quality.

MARANTZ SR6001 £700
Marantz UK
+44(0)1753 680868
www.marantz.co.uk

- FOR**
- sound quality
 - feature count
 - build quality
 - FM performance
- AGAINST**
- FM tuning idiosyncrasies
 - auto speaker setup levels



YAMAHA DSP-AX861SE £700

Of course, no surround sound receiver test would be complete without a Yamaha, but if you are familiar with Yamaha's model nomenclature then you will realise this one would seem to be at a disadvantage straightaway - being a 'DSP-AX' rather than an 'RX-V' means that it is just an amplifier, not a receiver. Yamaha said that, from their point of view, the amplifiers are proving more popular than receivers, hence the reason for sending us the DSP-AX861SE. I suspect this may have something to do with the fact that people are buying separate tuners, as very few A/V receivers have DAB. The RX-VI700 receiver is available if you want your radio but, to make up for its lack of airwaves, the DSP-AX861SE does have a little trick up its sleeve that none of the other units offer, more of which later...

Finished in Yamaha's traditional titanium the DSP-AX861SE is quite large but, to my eyes at least, is quite stylish with the front panel not being too overcrowded with switches, buttons and fripperies. Of course, the downside of this is that the remote handset is quite complex.

Facility-wise, the Yamaha has pretty much everything you could ever need. It offers full processing of Dolby Digital and Dolby Digital EX decoding, as well as DTS, DTS-ES Matrix and Discrete, and DTS 96/24 decoding for SACD sources and the like. As per the other contenders, the Yamaha also offers Dolby Pro Logic IIx and DTS Neo 6 for generating surround sound from two channels

plus a huge variety of Yamaha's own Cinema DSP effects.

Although these are broadly encompassed under the headings of 'Live/Club', 'Classical', 'Entertainment' and 'Movie', there are several sub-divisions within each of these categories to take care of playing a computer game, watching sport, music or a film. Things get scarily complex when you realise that you can go into each of these individual settings and play around with a huge variety of parameters, such as initial presence and surround delay times; room size, room 'liveliness' and reverberation time, delay and level. The DSP-AX861SE can generate Cinema DSP effects through two loudspeakers and has a seven channel music enhancer for playing compressed music in two channels. Finally, if this is all too much choice, there are also 'Straight' and 'Pure Direct' modes for hi-fi listening, the latter switching off all video conversion and processor operations as well as the display.

The Yamaha also has the full complement of connections that one might expect. Two HDMI inputs and one output are provided, with full HDMI processing. The DSP-AX861SE can upconvert and upscale video inputs from its Component video, S-Video and Composite video inputs to feed out through the HDMI output and audio can be fed in and out via HDMI. On the video side of things, the DSP-AX861SE has six Composite video and six S-Video connections as well as three component video inputs, and monitor outputs through all three types of connection.

In audio terms, the Yamaha offers seven line level analogue inputs, plus four optical and two coaxial digital connections. A multichannel input caters for a separate input of up to 7.1 channels and this consists of six sockets, which cater for 5.1 channels. If you want to use 7.1, then the front inputs of this become the surround back channels, and the fronts can be assigned to any of the line level inputs via one of the receiver's menus. Additional multichannel outputs are provided for feeding external power amplifiers or active loudspeakers. It is also on the input count that the extra feature I alluded to earlier shows itself - an MM phono input no less. With no tuner to listen to, I felt obliged to wade past the piles of monitors, DVD players and surround loudspeakers building up in the *Hi-Fi World* listening room for this test to dig out our trusty Goldring GRI in order to have a listen!

The Yamaha is just as powerful as the other units on test, kicking out 136 watts into 8 Ohms on the test bench, but there may be a degree of difficulty in experiencing this, thanks to one of the most dismal set of loudspeaker terminals I have ever encountered on any equipment, at any price. They do not accept banana plugs, only bare wire, but even this is not achieved through a nice, solid post with a handy 4mm hole in (into which a banana plug tends to fit), but through wrapping the wires round some truly nasty, wobbly terminals. Not only that, but these terminals are spaced closely together and not colour coded, meaning that wiring

up loudspeakers is an unnecessarily frustrating endeavour - big black mark here.

If you do have the patience to get to grips with them, however, then you can connect the usual seven channels-worth of loudspeakers, plus an additional front presence pair to make full use of the DSP-AX861SE's own sound effects menu, effectively giving 9.1 (phew!). Also these terminals can be used to connect an alternative front pair of loudspeakers and again, this is all configured in the setup menu. Yamaha use their own automatic microphone-based loudspeaker equalisation system, called the 'Yamaha Parametric Room Acoustic Optimizer' (YPAO) which proved to give quite good results compared to manual setup by trained ears and a sound level meter.

SOUND QUALITY

From the off, the Yamaha impressed with its sense of spaciousness and detail. Once again the soundstage stretched well beyond the boundaries of the loudspeakers and the DSP-AX861SE pulled out every nuance of detail from the Larisa Stow DVD-Audio disc. Once levels were set up the centre channel gave great detail without dominating proceedings and was well backed by the front left and right channels to give a pleasingly widespread front soundstage.

The Blue Man Group once again boogied with aplomb, sound effects from their rather eclectic instruments whizzing around the soundstage like demented mosquitoes. The Yamaha, like the Marantz, had plenty of verve and liked to boogie but could also be relied upon to whisper instead of shout when required.

Returning to 'I, Robot' the Yamaha added magnificent spaciousness to the scene where Will Smith's character addresses the one thousand robots in a large hanger, giving a palpable sense of 'being there' to proceedings. When the helicopter appeared, the room also rumbled suitably well.

Moving to two channel the DSP-AX861SE continued to prove its audiophile credentials. Switching to 'Straight' mode brought about noticeable differences from standard stereo with the processor still active, but, as with all of the other units, hitting the 'Pure Direct' button really moved things up a gear.

Two channel reproduction through the CD input was more than capable of taking



on a good stereo amplifier, with its smooth and detailed midrange and sweet treble offering a real aural treat in soundstage terms. Vocalists were locked centre stage with backing singers and instruments laid out nicely around them, and the DSP-AX861SE proved adept at capturing the subtleties of acoustic instruments. Bass was fulsome and superbly detailed, possibly the best of the group in this respect, but did not quite have the low end tightness and punch of the Marantz.

Finally, taking the brave step of nervously trying out the phono stage of an A/V amplifier I was delighted (and relieved) to hear that Yamaha have done a good job here as well. LPs were smooth and detailed with

excellent treble and good clarity. Whilst, true that bass was not quite as deep as, say a Cambridge Azur 640P and the soundstage was definitely a little on the narrow side, the DSP-AX861SE's phono stage is clearly not just a quick 'bung it in to raise the feature count' job and is eminently listenable.

CONCLUSION

Another success from the Yamaha stable, the DSP-AX861SE is a very fine A/V amplifier that turns in an excellent performance in both multichannel and stereo settings. With its bewildering array of internal DSP options, it also makes a fine companion with which to while away those long, dark winter evenings.

"the DSP-AX861SE proved adept at capturing the subtleties of acoustic instruments"

MEASURED PERFORMANCE

The Yamaha produces a useful 136 watts into 8 Ohms, rising to 210 watts into 4 Ohms, meaning it can comfortably exceed 1000 watts total from its seven channels. This makes the Yamaha A/V amplifier (it has no radio) powerful within this group, but not a match for the Cambridge. Nevertheless, it has plenty enough power for most situations.

Distortion at 10kHz was below the published spec. of 0.06%, and at this low level was on par with the other receivers of our group. It was pure crossover distortion but at this level should not be discernible.

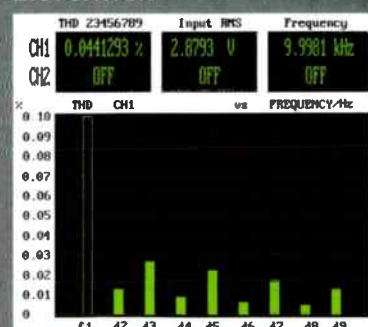
Sensitivity was good at 230mV, so all sources are catered for. The MM phono stage sensitivity measured a normal 4.2mV. Input noise on phono was low at 4.2uV, so hiss will be inaudible. There was a slight depression in the frequency response characteristic at low frequencies, which may well give the impression of a little bass lightness, or lack of warmth, but this was small. There is no warp filter.

The Yamaha DSP-AX861SE measured well in all respects. It is powerful and will likely sound smooth. NK

Power	136watts
Frequency response	4Hz-82kHz
Separation	78dB
Noise	-86dB
Distortion	0.042%
Sensitivity	230mV

Disc	
Frequency response	8Hz-23kHz
Separation	73dB
Noise (e.i.n. A wtd)	0.38uV
Distortion	0.06%
Sensitivity	4.2mV
Overload	73mV

DISTORTION



VERDICT

Another excellent Yamaha A/V amplifier that mixes superb sound quality to more DSP options than you could possibly wish for.

YAMAHA DSP-AX861SE £700
 Yamaha Electronics UK Ltd.
 ☎ +44(0)1923 23166
 www.yamaha-uk.com

FOR

- sound quality
- fine MM phono input
- comprehensive DSP options

AGAINST

- loudspeaker terminals



It is a couple of years since we last sat and played with any A/V receivers in anger and this test proved to be a very interesting experience. As mentioned in the introduction, there has always tended to be something of a mindset amongst audiophiles that such units make a rather ear-wounding effort of reproducing stereo from CDs and the like. Consequently self-respecting music fans have often tended to keep multichannel and two channel firmly separated.

Fortunately, this review has proved that this need no longer be the case, as the performance, in hi-fi terms, of such units has come on in leaps and bounds over the last few years. The advent of proper direct pathways around the receivers' circuits means that a two channel signal no longer needs to fight its way through a whole gamut of processing logistics (even ones that are ostensibly switched to 'flat') in order to arrive, bruised, at the loudspeaker terminals.

Modern receivers like those we have tested here are more than capable of forming the heart of a multipurpose hi-fi and audio/visual system without any compromises. They are very convenient in this respect, as a multitude of inputs with easy switching makes building up a large system that caters for many sources a straightforward process. But, of course, we have five contenders here, so where should you spend your money?

The obvious unit to consider first is, of course, the Onkyo. Quite how the boffins who designed the TX-SR605 have squeezed so much under its bonnet and then been able to charge £400 for it has absolutely baffled us. We are willing to bet that there will be an initial sales surge for

this item, purely from rival manufacturers buying one to open up and have a good poke round inside! We could even have made a case for the TX-SR605 if it sounded rather average - but we were astonished to find that it doesn't. Admittedly, a little more limited in terms of dynamics and scale than the other units in multichannel mode, and you can see where the odd corner has been slightly trimmed in terms of styling and build quality, it nevertheless astonished us with its stereo performance and really is an absolute 'no-brainer' at the price, if £400 is your budget limit.

However, what if your budget is three times that? £1,200 will buy you the Arcam AVR-280 and this, again, turned in a very impressive performance. Arcam always seem to have the ability to turn out extremely competent products - superbly engineered, very well built and with consistently good sound quality. The AVR-280 upholds this tradition well, with its sense of reassuring solidity and pleasing styling. Never less than enjoyable in all sound modes and with an excellent tuner, the only flies in the AVR-280's ointment were its somewhat inconsistent bass performance with different sources and its price. Considered on its own, it is a very worthy purchase, but the fact that its competitors in this test were considerably less expensive cannot go unnoticed.

Dropping back to half the price we have the Cambridge Azur 640R which has another set of advantages up its sleeve. No, it doesn't have all the bells and whistles of the other receivers and, no, its remote will not control everything else that you own but, in many ways these are its strengths. The Cambridge was the easiest of all our contenders to

set up and simplest to use, helped along immensely by a concise and waffle-free manual. Add in excellent sound quality in all modes and a very sensitive tuner, albeit one that could sound rather better, and you have a recipe for success. It offers the usual superb Cambridge value for money and, in the words of many a Scooby Doo villain - "If it wasn't for that pesky Onkyo, they'd have gotten away with it". Nevertheless, it merits a hearty recommendation.

So, to the final pairing of the Yamaha and the Marantz, both of which turned in a superlative performance. The Yamaha DSP-AX861SE may lack a radio, but it more than makes up for this in other areas, including its bewildering array of internal DSP options. The interesting thing is that these actually work rather nicely and you can hear what the Yamaha engineers were trying to achieve in their implementation. Compare this to some of the other units' internal sound effects and they end up sounding like added weird echoes. Factor in a fine MM phono stage and super sound quality through all inputs and modes and you very nearly have a winner...

...but not quite. The Marantz SR6001 may lack the complex DSP options and the phono stage, but it adds in a superb FM tuner (once you get it locked onto a signal, anyway) and sound quality that is just that little bit tighter at the bottom end, a smidgen more defined in the middle and a tad crisper at the top. Add in the high quality audiophile elements to its design, its sheer solidity and the fact that its loudspeaker terminals were not designed by Satan, unlike the Yamaha's, and these are enough for us to allow it to snatch victory from the DSP-AX861SE.

Picture Perfect

Surround-sound receiver picture processing gets ever more sophisticated...

In the same way that audio is experiencing a slow and erratic transition from what we can term the Standard Definition of CD to the High Definition of DVD-A, SACD, Blu-ray and HD-DVD, so video is on the move from Standard Definition to High Definition as well. The ability of receivers to handle both old and new video formats is also going to be an issue for most buyers. Being A/V receivers, the five models we review here have various video conversion facilities.

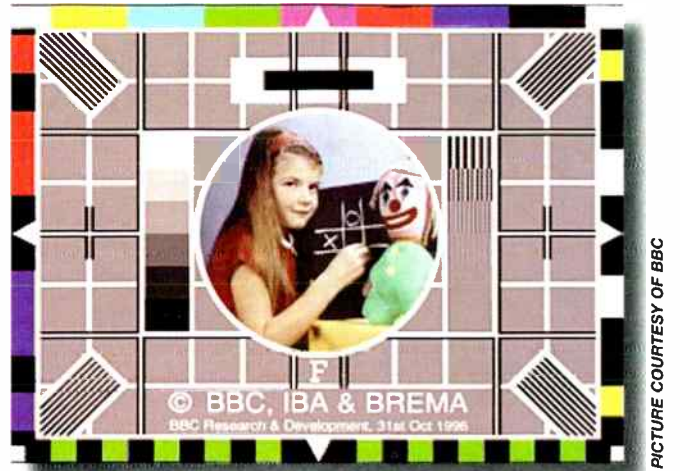
All A/V receivers switch video input signals through to a monitor output feeding a TV. Just a few years ago, there were three or so analogue formats to consider: Composite, S-Video and Component. Recently, HDMI entered the picture. It is a digital link and already has a specification stretching out to video definitions way beyond HDTV, so this is the future. HDMI replaces everything in principle; quite how successful it will be in practice we will have to see. A complicating factor is a copy prevention scheme known as HDCP. In truth it doesn't necessarily prevent copying, as when HDCP is absent from a component within a chain, the picture resolution can be reduced to ensure any copies made are of mediocre quality. Our receiver handbooks continually warned that if pictures do not appear on an HDMI linked TV, then it may not be HDCP compliant. HDCP has the ability to prevent HDMI links from working - a tortuous and controversial subject we cannot enter here. We used an HDMI link successfully between various

DVD players and all the receivers under review, and an analogue video link to the monitor.

These receivers had a variety of video processing schemes. The Arcam and Cambridge pass HDMI digital video straight through; they process between analogue video signals only, being able to accept S-Video in, for example from a camcorder, and send it out through the Component output to a monitor. If the HDMI link out to a TV does malfunction, then using Component connection, a high quality analogue link, is the best alternative - one we used much of the time.

Receivers with HDMI processing perform additional tricks. The Onkyo, Marantz and Yamaha can be set to upconvert all incoming analogue video, sending it either to the digital HDMI output, or any of the analogue outputs. So a TV can be connected up with an HDMI lead and all video directed to it through this lead. The Yamaha and Marantz can de-interlace and upscale video too, so if you send in ordinary Standard Definition TV, like UK PAL (576i) for example, it will output HDTV, 720p or 1080i. You will not get more detail, and HDTVs have internal upscaling between their SD tuner and HD screen in any case, but it may be useful. Obviously, camcorder S-Video can be upscaled to give a pseudo-HD picture.

Whilst HDTV is unavailable at present, unless you pay for Sky on top of your TV license, it will become available next spring. The BBC are going ahead with their Freesat



PICTURE COURTESY OF BBC

service, which will beam down HDTV accompanied by Dolby (AC3) surround sound. Like Freeview, you need only buy the receiving equipment; the programmes will be free and unencrypted. The receiving unit will output surround, likely via analogue and SP/DIF (as AC3 bitstream) and any of these receivers can process it. As Britons are prodigious buyers of HDTVs, recent GfK market research figures show, it's likely Freesat and the HDTV pictures it provides will prove popular. This is likely to stimulate all things high definition in 2008, as all the various parts needed for a full high definition, surround sound system come together. Picture-wise, the receivers we review this month are ready to fit into this scenario.



An HDMI cable like this one from Monster carries digital audio and video signals, plus a variety of signalling data, so a TV knows, for example, what resolution data is being sent, and it can switch accordingly. Data rates are extremely high, demanding wide bandwidth. This means cable construction and materials are critical. Modern HDMI cables from companies like Monster are highly developed to support data rates demanded by the latest HDMI 1.3 specification. Cheap HDMI cables may not support today's demanding data rates and can give poor results, especially over long runs. So buy carefully; HDMI is a very advanced data link.

Picture the sound

As Blu-ray and HD-DVD enter the market, surround sound moves up a gear. Noel Keywood looks at the big picture...

Surround sound gets very complicated and - yes - all those loudspeakers can be intrusive, but it also has some intriguing advantages over stereo. You get the full benefit of multichannel SACD and DVD, and also forthcoming Blu-ray and HD-DVD discs. Even stereo sounds good these days, through the quality receivers we tested this month, and if you want to turn it to surround-sound then both Dolby Pro Logic IIX and DTS Neo6 can do this.

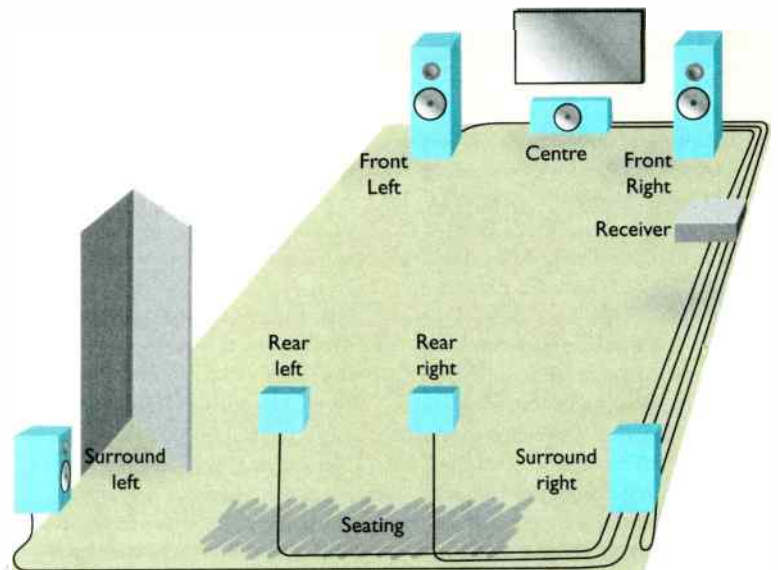
Here is a brief overview of what a modern surround system can offer, the practical difficulties, the jargon, drawbacks and - especially - the benefits. Of course, being a hi-fi magazine, the issue of sound quality is what we will concentrate on.



Usher 520 - ideal for high quality surround-sound.

PHYSICAL LAYOUT

Surround sound's primary purpose is to reproduce film soundtracks and its layout derives from cinema sound systems. A standard domestic '5.1' system has a loudspeaker at front



In a typical domestic surround sound system purposed for music, shown here, a subwoofer isn't vital. This is a 7.1 installation (with the .1 subwoofer channel fed to the front left and right loudspeakers), which all receivers tested this month offer. A 5.1 installation lacks the Rear loudspeakers, whilst a 6.1 has just one rear. Rear speakers can be put on a wall shelf. The diagram clarifies the issues of cabling and Centre speaker position.

centre (C), which in a cinema handles dialogue. It is supported by front left (FL) and right (FR) loudspeakers that construct a frontal sound stage. At rear are two, often small, surround loudspeakers, usually identified as Surround left (SL) and Surround right (SR). Then there's the subwoofer, fed from a sixth low frequency effects channel (LFE), which accounts for the 0.1 part of 5.1, as it is in octave terms one tenth of the audio spectrum.

This basic specification is commonly expanded to 7.1 where the Surround channels are supplemented by two rear channels, often pictured as a pair of small, full range loudspeakers on a shelf. Nowadays most receivers have seven amplifiers on board to accommodate 7.1. However, as 7.1 means having no fewer than four rear loudspeakers, plus cables of course. For small benefit, just about all 7.1 receivers can be reconfigured to run 5.1, with front loudspeakers bi-amped - the audiophile choice - or two

loudspeakers in another room. At present movie sound tracks and most surround music discs (SACD and DVD-A) are 5.1 format by the way; the rear channels being synthesised from 5.1, meaning they are fake. Initially, its best to keep it simple and install a 5.1 system. Whether true discrete 7.1 surround will ever arrive no one knows, but receivers here with HDMI processing can handle it.

In most rooms, finding somewhere to put the surround loudspeakers and getting cables past the living room door are the two main difficulties. Small rears can conveniently be put on a wall shelf. Side surrounds can be placed on stands or shelves. Ideally, all loudspeakers should be the same size and full range. In practice, small, full range hi-fi loudspeakers like Usher S-520s costing £265 per pair are a fine choice and will give great results. Surround sound makes this more attainable than stereo, as the total acoustic power in the room is split

between six (inc subwoofer) or more loudspeakers and the front sound stage uses three of them, so none are especially stressed - and you can hear this as an easy, relaxed presentation with big dynamics.

It is easier to visually accommodate many small speakers, especially when it comes to the thorny problem of the centre front. And if all loudspeakers are identical, you get a smooth, cohesive sound all round, especially across the front sound stage, which is most critical.

Today's surround sound systems are a cabling nightmare, but this is easing. HDMI links replace all digital and analogue cables, with the peculiar exception of SACD, which still must be connected with analogue cables, unless you have a player like Arcam's DV-139, that transmits SACD as PCM over its HDMI output.

You need to keep your feet on the ground and not get carried away with the many technicalities of surround to achieve good sound quality. Best to go for a good quality basic receiver like those we review this month, as they will give great stereo and surround high fidelity, as well as a wonderful cinema experience if you watch DVD.

It is the front centre loudspeaker that is ill suited to music and most difficult to accommodate and optimise for high fidelity. It is usually pictured as a small oblong box below the TV. Unfortunately, mixing engineers tend to direct vocals and drums into this channel on music discs, meaning lead vocals emanate from the floor and the drums have a boomy sound - not exactly realistic. The speaker can go above

even dispersion, and a set of five small iQ3s with the centre on its side is another possibility, although KEF make two dedicated centre speakers in this range.

There's disagreement about use of the centre channel even amongst recording engineers and sometimes it is not used in music discs; Chesky put height information into it (and the subwoofer channel) for example! A real centre channel gives stronger imaging of course, but it is a mixed blessing with music. It is this sort of malarkey, as well as an endless variety of proprietary processing schemes, from Dolby and DTS in particular, and the peculiar logic where a system has more back channels than front channels, that tends to turn people off surround sound.

Another contentious feature of surround is the Low Frequency Effects (LFE) channel, which carries explosions and what have you in film sound tracks. It isn't really necessary for music and isn't always used, meaning a subwoofer is optional where music takes precedence.

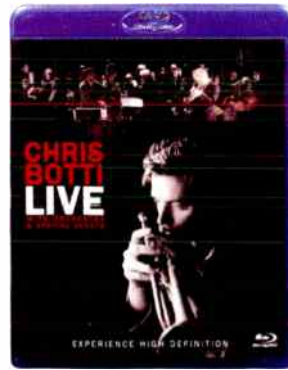
On the matter of subsonics, to reduce boom from the subwoofer, keep it away from corners if possible. Accurate tuning is crucial to get a smooth, integrated sound, yet it is a difficult process without test equipment, so take care here.

SOURCES

Multichannel systems can process a wide variety of sources, a point in their favour. In fact, the variety of source material receivers can handle gives greater bragging rights than the number of channels they have. Best to input CD digitally through HDMI or SP/DIF optical or electrical (RCA 'phono' socket) inputs. Try not to use the analogue connectors, as A/D then D/A conversion is introduced, which will degrade the sonics.

The high resolution layer of SACD, which gives best (DSD) sound quality, can come in stereo or surround mixes. You need to look at the album's label to see whether it is a Stereo or Multichannel DSD (Direct Stream Digital) recording. All SACDs have a CD layer to make them compatible with CD players, and this is always stereo. SACD gives lovely sound quality so it is worth being able to play it in full surround mode. As it is a Sony technology though, and Sony are also behind Blu-ray, it may well fade away (Sony won't tell us whether DSD will ever find its way onto Blu-ray). DVD-A is all but a dead format, it seems.

As Blu-ray and HD-DVD enter the market, new issues arise. The good news is that the HDMI digital



Music on Blu-ray is usually in 5.1 surround-sound. On this disc it is audiophile 24bit/96kHz PCM in all channels.

connecting cable, universally adopted in these players, carries pictures and sound in digital form and is largely future-proof. It eliminates analogue signal cables completely. Note that only HDMI Version 1.3 or later will cope with DTS Master Audio or Dolby TrueHD, but earlier versions will handle high resolution PCM (Pulse Code Modulation, or 'standard' digital), such as 24bit/96kHz surround recordings, or 24bit/48kHz 5.1 channel movie sound of the sort we are liable to get on Blu-ray, with its large capacity. So today's Blu-ray players, like Samsung's popular and affordable BD-P1000 are not as hobbled as some reviewers think. The day when we get Blu-ray DTS Master Audio or Dolby TrueHD surround-sound recordings is likely some way off, as it's more than most recording studios can manage at present.

CDs do not become obsolete relics in a surround-sound system. Best to connect a CD player digitally, via the SP/DIF interface, and then you can play in stereo or try switching in Dolby Pro Logic IIx or DTS Neo6, which most receivers have. This turns stereo into surround, which once sounded horrible but nowadays does not, due to the sophistication of processing algorithms and the power available to execute them.

Finally, High Definition television commonly has Dolby 5.1 surround sound that can entertainingly be channelled through a suitably equipped system. Next year BBC HD TV will become available from their own subscription-free unencrypted Freesat service, sporting Dolby AC3 surround. So, as higher definition music recordings are released in surround sound, enjoying them becomes an ever more compelling experience.

See P59 for information on the BBC's forthcoming HDTV services.



The coaxial driver in KEF iQ loudspeakers has even dispersion and suits hi-fi surround-sound. KEF now offer special packages too.

the screen, but then it is high up and visually intrusive. A small speaker like the Usher S-520 is easiest to accommodate here, one reason for choosing five small hi-fi loudspeakers in the first place. Concentric loudspeakers like KEF UniQs work well as centres too, because of their



Net Working

Reflecting the move away from storing music on physical media, Linn's brand new Klimax DS network music player is one of the company's most interesting products to date. In this world exclusive, Professor Malcolm Hawksford assesses the technical aspects of the design, and David Price does the listening...

Targeted squarely at the audiophile, Linn's new network-enabled music player is quite unlike any other such device on the market. The Klimax DS, as it's called, is a statement product in every sense, and has been conceived as a bridge to link networked media devices with a conventional two-channel audio system - in crude terms, it's a hi-fi DAC that attaches to your computer.

When you first set eyes upon this new Linn product, it's hard not to be consumed by the striking solid aluminium enclosure. The Klimax DS shares common heritage with the (now legendary) CD12 by being carved from a solid aluminium ingot, while its understated but elegant lines are the new art deco.

The Klimax DS's job is to take a digital audio stream from your computer and convert it simultaneously to balanced and unbalanced signals suitable for direct connection to an analogue stereo system, using XLR and RCA connectors respectively. The idea is to store your music on a PC or networked hard drive (either in uncompressed .wav or lossless compressed FLAC formats), and then with the help of the Linn

PC software you can play it back in any number of ways. Your computer effectively becomes your music library, and the Klimax DS is what turns the digits into music.

Effectively then, it works as an intelligent DAC. It has no internal storage of its own (aside from a buffer to smooth the flow of music) and instead runs together with either a PC and/or what's known as a Network Attached Storage (NAS) device, which is a standalone hard drive, holding all your music.

It comes with a Linn Graphical User Interface (GUI) which runs on an Ultra Mobile PC (UMPC), and is the only computer kit required in the listening room. Such devices can be attached to your network by wireless, effectively making them compact and simple remote controls with their own touchscreens. Alternatively, a standard desktop or portable PC can be plugged in, or multiple users on a network could access and control Klimax DS. All this means the Klimax DS is a very flexible widget indeed!

A conventional remote control is provided, so that if a playlist has been pre-programmed then this music can be accessed without the need for a screen in the listening room. This

is another attractive feature, as the presence of an illuminated screen can distract, enticing one to skip tracks and become preoccupied with the electronics rather than the music.

So much for how it works, what about its audio capabilities? Well, as you'd expect the Klimax DS plays high quality LPCM audio files and accommodates standard sampling rates up to 192kHz at 24bit precision. It also has a Xilinx FPGA upsampling stage for conversion to either 384kHz or 352.8kHz and new Wolfson multibit sigma-delta modulators provide conversion, with output transformers used for isolation. The sample clock is free running and controls the flow of audio data from Ethernet; as you'd expect, it is optimised for extremely low jitter. This holistic design philosophy adopted for Klimax DS, including EMC screening and mechanical isolation derived from the solid casework, bodes extremely well for a low-noise low-jitter converter. MH

SOUND QUALITY

The Klimax DS is a dealer installed product, so would be professionally supplied and fitted in your home, and connected up to your computer via

Ethernet with the supplied Linn 'GUI' and Twonky media server software. In my case, I set the Linn up via a Linn-supplied Toshiba PC, and plugged its balanced outputs into my reference MF Audio Silver Passive Preamplifier, driving a World Audio K5881 tube amplifier and Yamaha NS1000M loudspeakers.

The results were deeply impressive and, spookily, I couldn't stop thinking about my year spent with a Sondek CD12 some time back. Although the Klimax DS and CD12 share little (beautiful aluminium billet case excepted), Linn's high end digital products are so meticulously voiced that – despite the very different chipsets inside – the two have the same silky but ultra high resolution sound that gets into the groove with the best of them.

With all of my own reference recordings, committed to the Linn PC as .wav files (i.e. uncompressed 16/44 LPCM), I heard a consistently smooth and well finessed performance, with an extremely neutral yet vivid tonality. Bass was strong and expressive, but in no way warm or overblown. Midband was tremendously wide and deep, bristling with detail and yet never veering towards stridency, whilst treble was fine and subtle. The key to the

performance that simply makes me wish I was playing my vinyl version of this Blue Note classic, I heard a smooth, natural, spacious rendition of the disc, with that lovely ebbing and flowing rhythm that 'I Have a Dream' sets up. Once again, the textuality of the instruments was beautifully carried, with 'shouty' brass instruments such as the trumpet and fluegelhorn losing none of their feel but – unusually for digital – gaining no chromium plating either. Speaking of metal, the heavily compressed, noise-added thrash of Ministry's 'Corrosion' was massively powerful yet surprisingly listenable – testament to the Klimax's characteristic 'iron fist in a velvet glove'. DP

CONCLUSION

While many British hi-fi manufacturers have been unstinting in their condemnation of 'computer audio', Linn were an early adopter (the original Kivor is several years old already), and have once again done themselves proud with the Klimax DS. Obviously, it's not a product for everyone, but to those with large amounts of digital music stored on their computers and/or hard drives (and this number is bound to increase exponentially over the next few years as the iPod generation

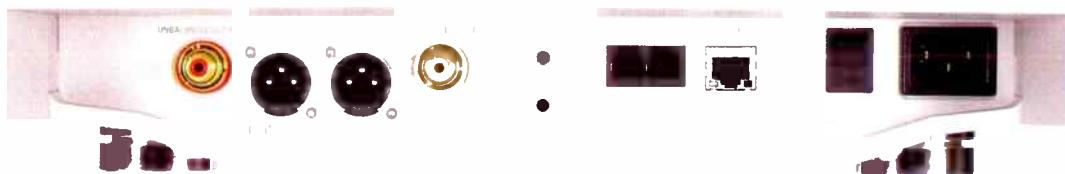
grow up into real hi-fi), it's a landmark product.

Essentially, the first truly high end, high resolution network music player, it boasts the company's trademark superlative design and build, plus sonics which are the equal of pretty much any optical disc player on the market.

A beautifully engineered, flexible and superb sounding music playing device, its biggest problem is simply the fact that most people won't yet understand its reason for being. Although obvious to 'early adopting' digital music devotees, mainstream audiophiles may struggle to see how it works and even why it exists in the first place. Then of course, there's the price, which is prohibitively expensive for most people - here's hoping the technology will 'trickle down' into more affordable fare.

As the whole world slowly moves away from 'physical media', there will be more and more products like Linn's Klimax DS, but this one is special and will continue to be years later. Whether it's too far ahead of its time right now, remains to be seen. DP

[turn to p33 for MEASURED PERFORMANCE]



Klimax DS was the way it conveyed vast amounts of detail and strung it all together as a coherent and very emotive musical performance.

With 4hero's superbly recorded new album, 'Play With The Changes', I got a tremendously neutral vocal sound on 'Give In'. The Klimax DS captured the singer's voice with an eerie realism, and intimated his every subtle inflection. Behind this was a sumptuous keyboard backing which the Linn again carried with aplomb, proffering an extremely wide soundstage that hung back more than I'd heard with CD to date. The Klimax provided razor-sharp timing, as evinced by the giddy attack of hi-hat cymbals.

Herbie Hancock's 'The Prisoner' was also unrecognisably 'analogue' sounding, the Klimax DS giving no clues that it was [a] digital and [b] using a Toshiba PC's hard drive as a source! Instead of the usual stilted

SECOND THOUGHTS

I installed the new Klimax DS as the front end of my reference system. Linn supplied me with a Dell PC (so I didn't need to set up my own), which came with a number of high resolution tracks pre-loaded (after all, the unit will sing all the way to 192kHz sampling) but I also installed some additional tracks including some high quality Chinese recordings which I had discovered on a recent trip to Singapore. (Believe me, some of these CDs put to shame many of the factory-studio discs we see in the West - the recordings are mastered in DSD, employ high-quality electronics and microphones and use simple techniques with little or no compression). Replay equipment included Audio Physic Tempo loudspeakers with two muRata supertweeters atop each one, LFD power amplification and a digitally controlled analogue gain stage. Normally my system incorporates an LFD DAC3 preceded by a dCS sampling-rate converter to filter source jitter. Audition commenced in a darkened room to reduce cross-sense contamination, first by sampling the hi-res Linn tracks and then moving to familiar CD recordings.

It was obvious that the Klimax DS occupied rarefied and esoteric sonic territory, as I don't think I've ever heard better from a digital source. The results were magical, and it was immediately evident that the performance had risen significantly above my in-house reference converter, itself capable of superb clarity. The stereo soundstage proved truly capacious, giving a wonderful sense of envelopment, and transients were fast and totally devoid of grain, edge or smear. Vocals had stunning presence and immediacy, and overall the sound texture was delicate, natural and beautifully reproduced. As the music faded at the end of a track, it seemed to reach out and touch infinity, such was the clarity and low level signal integrity of this machine. Although the supplied 24/192 recordings proved wonderfully realistic, fast and articulate with a lush, shimmering metallic quality to percussion, what really surprised me was how well the Klimax DS did with plain old 16/44.1. The sound was a revelation, but I just wish it hadn't taken over thirty years to get here – all those wasted hours! MH

VERDICT ●●●●●

Impeccably engineered, built and voiced, this is a landmark high end digital product, but whether it's too far ahead of its time is too soon to say.

LINN KLIMAX DS £9,600
 Linn Products Ltd.
 ☎ +44 (0)500 888 909
 www.linn.co.uk

FOR

- state of the art sonics
- superlative build and finish
- concept, flexibility

AGAINST

- price

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MEASURED PERFORMANCE

Jitter is a barometer of the effectiveness of any digital audio system design - ideally there should only be a small amount of narrowband random jitter, as this is least damaging sonically. So to measure the Klimax DS's jitter, I used a high-amplitude, high-frequency input signal together with an analysis technique capable of fine spectral resolution, and noise averaging to expose any coherent jitter sidebands. My selected test signal was a maximum amplitude sine wave set at one quarter the sampling rate (i.e. 24kHz for a 96kHz sampling rate). This signal was computed over 221 samples and gives a spectral resolution of 0.046Hz, then loaded into a PC, streamed to Klimax DS and subsequently recaptured by a high-performance analogue to digital convertor. The results proved very impressive - the spectrum in figure 1 is extremely clean, and consists mainly of noise extending about 10Hz either side of the excitation frequency. Although predominantly contained within a 1Hz bandwidth, there are some minor spectral lines just evident above the noise, which I should think are benign and just as likely to be related to the ADC clock - no measurement instrument is perfect!

The next measurement, again performed at 96kHz, used a 221 sample noise sequence equalised for a flat amplitude spectrum. The frequency response is shown in Figure 2, while Figure 3 shows the interchannel crosstalk. These show the new Linn has a well extended low frequency response, with the -3dB break frequency at about 1Hz. However, at high frequency there's an apparent 0.7dB peak in the response at about 35kHz - just before the high-frequency low-pass filters kick in. I was initially concerned, but it was found to be a function of ADC loading and the mildly inductive output impedance of the transformers. As you can see in Figure 4, where the error disappears, a preamplifier offers a kinder load.

When I did the jitter test, I found there were narrow band sidebands distributed around the test frequency. Now, when an equalised noise excitation is used, this actually consists of series of closely spaced sine waves having random phase, so if you imagine similar noise sidebands about each of these components. Because the lines are so close, the result is noise in the measured frequency response. Also, because there are now multiple tones, any non-linearity in the system will add intermodulation products to the output. By first smoothing the frequency response, distortion in the spectrum can be estimated, and in Figure 5a both frequency response (top) and spectral error function (bottom) are shown. The total error in each spectral line from sideband noise and intermodulation is around 80dB. Given the 0.046Hz line spacing, this is an excellent result - especially as both DAC and ADC errors contribute, so the Klimax DS must actually be a little better than this result suggests.

Increasing the line spacing to 100Hz, sideband noise due principally to jitter is reduced and the frequency response error then falls to below 100dB as shown in Figure 5b, while in Figure 5c the noise between the spectral lines can be seen to have fallen to

the noise floor. Obviously, any practical 24bit digital system is going to have a noise floor significantly above the theoretical level (see red traces where appropriate). The noise spectrum was measured both with Klimax DS switched on and off, and as there was only a tiny perceptible difference in the measurements, this shows the Linn has lower noise than the measuring analogue to digital convertor!

In further tests, sparse low-level line spectra (around -140dB) were observed, which are very likely to be interference from a nearby PC and very difficult to eliminate in practice - again this is no reflection on the Klimax DS. These very low-level artefacts become visible when extending resolution to 24bit, which in practice is about 4 to 6bits greater than what's really needed for high quality audio. (Just because a system has 24bit resolution does not imply accuracy to 24bit, and this goes for both recording and reproduction systems.)

Overall, these measurements show that Linn's new Klimax DS is doing a fine job in terms of signal conversion - there's very little to criticise, which is just how it should be. Given the clean jitter waveform and low distortion, I'd expect a neutral and accurate sonic performance. Low distortion and jitter bode well for what I euphemistically call the 'signal-to-grunge ratio', which often pervades lesser equipment and is the principal reason why perceived dynamic range and clarity are often less than might be expected from basic frequency response and noise measurements - engineering this out is what master-class level electronic design is all about. Klimax DS ticks all the right boxes and I have little to criticise in terms of design ethos, its execution and electronic performance. MH

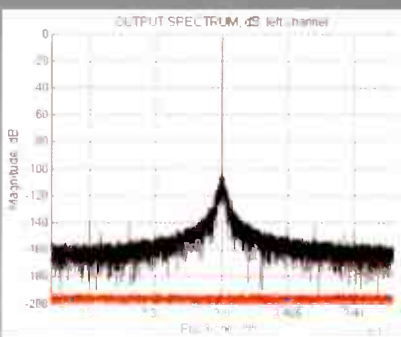


Figure 1 Jitter spectrum zoomed in to 24 kHz excitation signal.

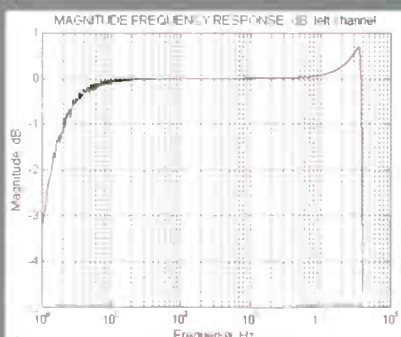


Figure 2 Frequency response, output loaded by ADC.

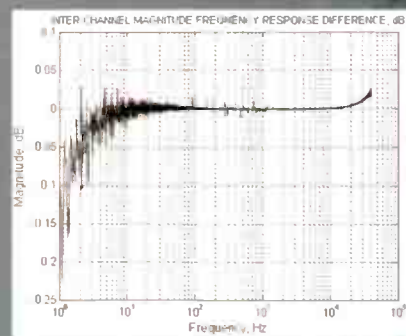


Figure 3 Inter-channel (crosstalk) frequency response difference.

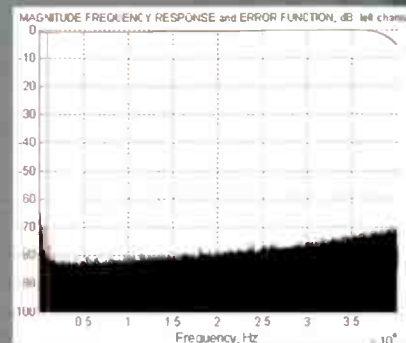


Figure 4 Frequency response with minimal output loading.



Figure 5a Frequency response and error function, 0.046 Hz line spacing.

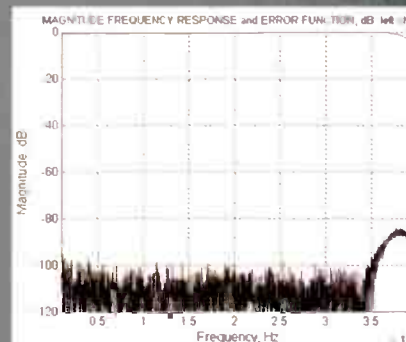


Figure 5b Frequency response and error function, 100 Hz guard bands.

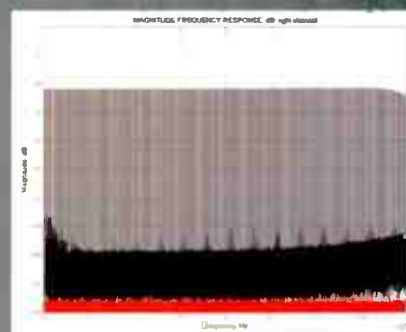
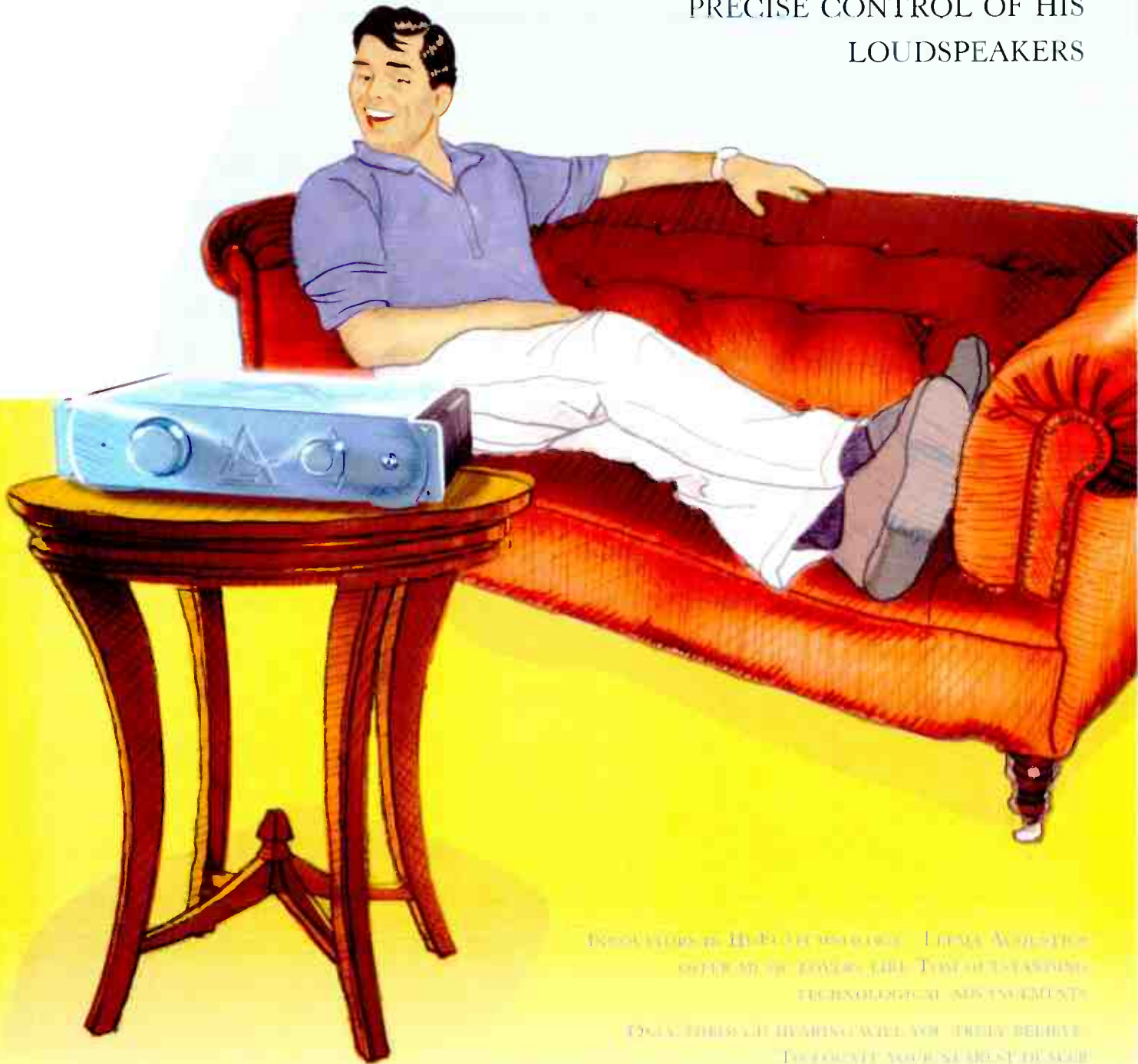


Figure 5c Output spectrum, 100 Hz guard bands (observe noise floor between lines).

TOM WAS AMAZED BY THE
TUCANA'S VICE LIKE GRIP AND
PRECISE CONTROL OF HIS
LOUDSPEAKERS



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ROTH AUDIO MC4 £399.95

If you haven't succumbed to the allure of Apple's diminutive iPod digital music portable yet, the sprawling numbers of iPod accessories will perplex you. However, the simple fact is that it is the fastest selling music player in history, making Sony Walkman sales pale by comparison, and it's for this reason that such gadgets find their way into *Hi-Fi World*. Like it or not, the iPod is the entry point for music playback for millions of people.

In the case of the Roth MC4, there's another, too. It's not just an iPod amplifier, it's a valve iPod amplifier. Truly a niche product if ever there was one, it would have been unimaginable to see such a thing just a few years back, but such has been the swing back towards tube amplification – in hi-fi, pro audio and now consumer audio – that the MC4 is possible. Still, if you've resisted the temptation of Apple's little portable, the MC4 also sports a 3.5mm minijack input (for a Discman or computer soundcard, for example) and a pair of RCA phonos for a hi-fi CD player.

The Music Cocoon is an interesting design. Measuring 187x174x108mm, this 1.8kg device has four valves (two non-branded, Chinese sourced 12AX7 and ditto two 12AU7s) and two output transformers arranged in a semi-circle around a central universal iPod docking connector. The tubes are uplit with red LEDs, and the effect is striking – despite the finish of the product being nothing to write home about. Two front mounted control knobs are offered, one the volume control and the other source selection between iPod, CD and MP3.

Around the back, there are four decent loudspeaker binding posts, a 3.5mm minijack input socket (providing a single line-level auxiliary input), and a pair of full size RCA phono sockets. It is claimed that a remote control is bundled too, but our review unit did not come with one. There's also a mini-DIN socket for the supplied power supply, which is a surprisingly chunky affair as iPod accessories go!

The claimed power output is 2x13W into 8 ohms (the same as the original Naim Nait, coincidentally), which is more than might be expected. Roth claim a frequency response of 20Hz-30kHz, a THD figure of <0.5%, a signal to noise ratio of >90dB, input impedance of 100Kohm. In use, these specs don't seem too wide of the mark, the MC4 pushing out a decent amount

of power and proving surprisingly devoid of noise. Roth say the unit has thermal shutdown (at 85C), speaker short circuit protection, speaker protection when turning on and fuse protection in the power adapter.

SOUND QUALITY

Roth's promotional literature makes a big deal of how the warmth of tubes complements the somewhat less than perfect sound of compressed digital audio, and they're right. The MC4 does indeed have a warm sound, precisely the sort of thing that most who've never heard tubes would imagine – although it won't be so familiar for those using modern valve amplifiers, some of which can sound startlingly open and vivid.

Connected to an iPod Nano running 320kbps CBR AAC (the very best possible quality that the compressed AAC format affords), and driving a pair of Wharfedale Diamond 9.1 loudspeakers, the Music Cocoon sounded absolutely superb. It's not going to make your Audio Note Ongaku redundant, but for £400 it was an unexpected pleasure – and true to the maker's claims, it is a very euphonic device that really does provide a synergistic match to the iPod. The easiest way to characterise it is as a sort of low rent Quad II – although it doesn't use EL34s, it is of that school, providing a smooth, warm, beguiling sound that gently

lilts along. It's always inoffensive, yet surprisingly musically communicative at the same time.

Interestingly, it's a joy to listen to at low levels – something rare even with high end hi-fi – yet when you pump up the volume the Roth holds things together far better than expected, with little or no signs of output transformers overloading even at maximum volume. Bass is big, warm and fulsome – and although it's hardly from the Naim school of tautness, it bounds along like a Labrador and provides an enjoyable underpinning to an open and natural midband. It would be unfair to say it's in any way transparent or detailed, but it's expansive across the plane of the speakers, and nicely rhythmical too. Treble is smooth, but a tad soft and lacking in atmosphere – but that's no bad thing with a 128kbps MP3 track!

Overall then, an endearing little amplifier that in some ways offers even better performance than its Fatman rivals and – much to our surprise – delivers its (admittedly limited) power without falling to pieces like some other cheap tube amps. It's not as well built as some similarly priced hi-fi, and isn't such an accomplished all-rounder as Onkyo's superb A-933 (at just £375) integrated, but if you want proper iPod connectivity, then right now it's the one to have. **DP**



Soundbites

Art Worker



Accustic Arts CD player 1 Mk 2 is the name, and extracting the maximum from CD replay is its game - says David Price...

Here we are in 2007, some twenty five years after the Red Book CD specification was published and twenty four since the first machine hit European shop windows and, for most audiophiles, Compact Disc digital audio is still the way to listen to music.

Considering that a CD player is essentially an optical drive feeding data into a computer in real time, it's amazing that we're still running 16bit, 44.1kHz technology. I say this because the outside world has moved on rather a lot since then – by way of an example, in 1983 I was using a 1MHz 6502A-based Acorn computer with 32KB of RAM, whereas now my 1GHz Mac PowerBook has a Gigabyte of memory (and it's already five years out of date)!

How then can we justify the continued existence of these little silver Frisbees? Well, although the basic spec remains the same (i.e. archaic), in the intervening years consumer electronics manufacturers have come a long way in pushing this

underwhelming digital format to its very limits. Effectively, it's the audio equivalent of extracting a quart from a pint pot.

The Accustic Arts CD player 1 Mk2 you see before you is a case in point – it runs the now obligatory 192kHz upsampling chipset (which isn't so special these days – Cambridge Audio has 384kHz upsampling in their sub-£1,000 840C, for example). But there's more to it than that, because it's perfectly possible to make a mediocre-sounding upsampling CD spinner – taking the sampling rate up to 192kHz is no guarantee of sonic prowess. Instead, Accustic Arts say that what gives this machine the edge is its meticulous attention to detail and very highly toleranced passive componentry. In turn, this is what justifies its not inconsiderable £3,985 price tag.

Experience gathered from over a decade of professional music production was bundled together in 1996 with the founding of SAE - Schunk Audio Engineering GmbH & Co KG, the company behind the

Accustic Arts brand. Initially involved in professional recording, SAE developed and produced its own near-field monitors to meet the high standards for acoustic requirements in recording studios. The knowledge gained from co-operation with external developers and audio experts came together to make this machine.

The starting point is the excellent Philips CDM Pro-2 metal diecast mechanism, using mechanical decoupling in a top loading configuration. The disc is inserted from above, and correctly positioned using a magnetic puck, after which the top cover is closed. Esoteric transports aside, this is one of the best CD mechs around right now, and shows that Accustic Arts are willing to spend money where it counts. This feeds a 24bit, 192kHz Cirrus Logic DAC with an "extremely fine analogue output stage with only a 12dB Butterworth filter", a "generously dimensioned" buffer section and selected filter capacitors and metal film resistors.

A generously specified magnet-

ically shielded, toroidal cored 75 VA transformer is used, feeding five separate power supply units for laser control, digital signal processing, display control, display heating and the D/A converter section. A very high capacity (35,000 µF) Panasonic capacitor is used here, along with high quality ultra-fast diodes. Balanced analogue output (XLR) with Neutrik sockets are fitted along with unbalanced analogue outs using WBT RCA phonos. A resonance-minimising aluminium housing is used, plus shielded separate compartments for the drive mechanism, mains power components, digital signal processing, display control and the D/A converters.

Overall, the 15kg player feels very solidly made, although its metalwork feels positively 'agricultural' compared to similarly priced Japanese fare. The 482x110x375mm box is a redoubtable piece of work, but just doesn't have the finesse of the likes of £4,995 Esoteric's X-03SE for example. Nor at its ergonomics in the same ballpark – the top loading mech is nice but the sliding cover just feels clunky compared even to Philips' original top-loading CD100 from 1983! I wasn't impressed by the front panel control knobs either – again they feel rough compared even to your average £500 Onkyo. The display doesn't impress either – budget Shanlins do better. The sad thing is that it's obvious the manufacturer has made an effort to do something interesting and different, and has succeeded in this sense, but at the same time hasn't made it any nicer to use.

SOUND QUALITY

If the aesthetics and ergonomics were very much a matter of taste [They must be; I thought they were superb! - AS], then I'm pleased to say the sound wasn't. Indeed, I would be surprised if anyone took exception to the noise the Accoustic Arts made. In a word, it's bold. Still, this doesn't mean brash – quite the opposite in fact. What I heard was a CD player that paints very big and powerful pictures, but inside the large canvas was a very highly detailed soundscape with truly excellent colouring and texturing.

Kicking off with The Police's 'Wrapped Around Your Finger', and I was surprised by the tremendously capacious soundstage. Deep and wide and tall, it pushed Compact Disc out of my loudspeakers like few other CD players I've heard. Its impact was further heightened by the machine's powerful dynamics – Stewart Copeland's trademark drumming

was caught in all its glory, showcasing this oft-underrated sticksman's incendiary speed and power. Better still, it wasn't showy in a hi-fi sense, the Accoustic Arts instead sounding beautifully natural and unprocessed.

No less impressive was this machine's textuality – it was able to catch the full bloom of the track's vintage analogue synthesisers and Sting's distinctive voice. The lead vocalist's bass guitar playing was also beautifully caught, sounding full and expressive (so much so that I initially wondered if the machine had a tube output stage), but tight and taut and melodic. The cymbal sound was also a delight, with real delicacy and not a hint of fizz or harshness, but neither did the machine sound 'rolled off' and veiled in an attempt to get artificial warmth. Overall, the track was rendered beautifully and proved exceptionally musical for a digital device.

Ralph Vaughan Williams' 'On Wenlock Edge', just out on Linn Records, was an unexpected pleasure. String sound on CD rarely convinces me, but the Fitzwilliam String Quartet's superb playing was captured in all its beauty, with blindingly fast and vivid violins that remained surprisingly free of grain despite being so intricate and engaging. Piano was another piece of pure pleasure, with a natural tonality, yet able to hang back in the recorded acoustic and play totally independently to the strings. Depth perspective was yet another strength, it being able to string layer upon layer of sound together without one jeopardising another, to produce an utterly believable sense of perspective. The overall effect was extremely convincing on this, the most demanding programme material that requires a mixture of subtlety and insight to carry properly.

Moving to some modern R&B, and 4hero's 'Give In' was again most pleasurable, the Accoustic Arts CD player 1 Mk 2 providing an eerily three dimensional performance. Each individual strand of the mix was unusually well delineated and sat there in its correct place with

tremendous stability. The synth sounds were wonderfully full and fruity, the vocals uncannily natural in both timbre and timing and the bassline unexpectedly strong, tight and tuneful. The track bristled with detail, the like of which I haven't heard from this CD before.

CONCLUSION

There's very little to criticise about the sonic performance of the Accoustic Arts CD player 1 Mk 2. I took an instant dislike to its clumsy styling and ergonomics, but as soon as I powered it up such considerations faded into the distance, such is its deliciously vibrant, detailed, dimensional, dynamic and inusual sound. Even if you spent an additional £1,000 or so on the Esoteric X-03SE, you'll struggle to better it for sheer listening pleasure. It certainly deserves serious auditioning, and shows just what twenty five years of experience garnered honing humble old 16bit can do if it's applied properly.

REFERENCE SYSTEM:
 Marantz CD63KI DP CD player
 Marantz DV-9600 universal disc player
 MF Audio Silver Passive Preamp
 World Audio K5881 power amplifier (modified)
 NuForce Reference 9SE power amplifiers
 Yamaha NS1000M loudspeakers

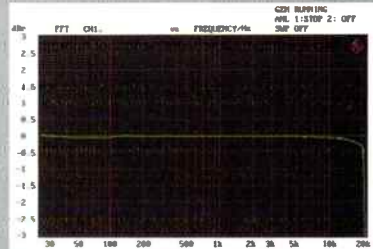
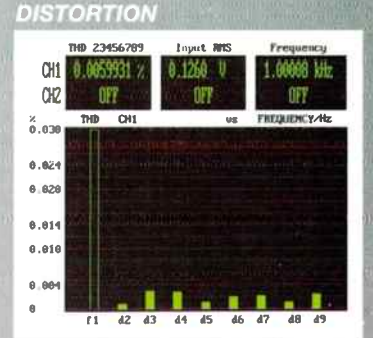
VERDICT ●●●●●
 A superbly musical and natural sounding high end CD spinner, but ergonomics and finish are humbled by Japanese price rivals.

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- FOR**
- natural musicality
 - rich harmonics
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- AGAINST**
- dubious ergonomics
 - fussy CD loading
 - finish, styling, display

MEASURED PERFORMANCE

Frequency response of this player runs smoothly up to 20.7kHz, our analysis shows, with just the slightest filter roll down above 10kHz. This is a well tailored characteristic that will ensure this player has an accurate tonal balance free from sharpness or spit, but without giving the impression of being smoothed either.	Frequency response (-1dB) CD 4Hz - 20.7kHz
Distortion levels were low throughout the player's dynamic range, measuring just 0.006% at -30dB our analysis shows - as good as the best players available. It resolved a -80dB dithered signal, returning just 1.7% second harmonic distortion, which is very respectable for CD.	Distortion (%) 0dB 0.0013 -6dB 0.002 -60dB 0.22 -80dB 2.6
The unbalanced phono outputs and balanced XLR outputs gave identical results when measured, except that the unbalanced phonos give 2V out as usual, whilst the balanced XLRs double this value to 4V.	Separation (1kHz) 114dB Noise (IEC A) -111dB Dynamic range 110dB Output (unbal / bal) 2 / 4V
There was a little signal related jitter on the balanced digital AES XLR output, amounting to 150pS up to 1kHz, above which the level dropped away. This isn't quite a match for other players, but not bad all the same.	FREQUENCY
The Accoustic Arts CD Player 1 Mk2 measures well in all respects, delivering a fairly normal set of results that suggest it will sound at least clean and well balanced. NK	DISTORTION

Retro Activated



Classique Sounds' new Passive Preamplifier is all about modern values in a traditional setting, says Tony Bolton...

The past few years have seen a gradual standardisation of certain things in the hi-fi world. We now expect all source components to output their signal at line level voltage, and to be able to mix and match preamp A with power amp B. Extraneous switchgear is usually avoided (except in the budget arena) and everything is connected through RCA phono plugs. But it was not ever thus the way...

Back in the nineteen fifties and sixties, each manufacturer had their own way of doing things. In the case of the Leak preamplifiers, output from the pre to the power amp was via a large octal plug, which effectively stopped any other maker's equipment being used. The high sensitivity of Leak power amps (100mV gives full power) meant that the matching preamps were 'lossy'; in other words, the output was of a lower voltage than the input signal (by comparison, contemporary Quads IIs required 1.5V for full output power). This incompatibility between the products of different makers meant that most people bought a complete package from their supplier of their choice,

and accepted any shortcomings in performance and usability.

In the case of the Quads, the 22 preamp is quite a reasonable performer, but those who bought Leak products weren't so lucky. The power amps are very good, but the same cannot be said for the preamplifiers, whose performance standards have not stood the test of time – to say the least!

There were two Leak preamps offered with the Stereo 20 power amp – the Point One Stereo and the more complex Varislope Stereo. The former had five inputs, the usual tone and balance controls, selector for mono, stereo, left and right channels, and a rumble filter. The Varislope added a variety of preset equalisations for RIAA, NARTB, 78, etc., as well as a switchable filter with a variable slope, in the Quad manner. Sonically the two were not that different, so for this review an original Varislope was used to compare with Classique Sounds' new passive preamp.

This interesting and very distinctive £299 device was developed by Paul Greenfield of Classique Sounds because of his

complete dissatisfaction with the limited performance of Leak preamps. The high sensitivity of the Stereo 20 makes it very suited to passive preamplification, so Paul had the idea to remove the insides from a dead Point One Stereo and replace them with modern components, thus keeping the aesthetic appeal of the matching unit, but with up to date performance. Simple but effective.

Indeed, the insides of the 'Passive' are very simple. The phono sockets at the back have been replaced with new Rhodium plated ones, sensibly spaced to allow for the size of modern cables and plugs. These are wired to a source selector switch and an Alps stepped potentiometer with 1mm diameter 99.99% pure silver cable in a PTFE casing using silver solder. No other controls are used, so the original tone and balance control pots are disconnected and left in place for appearance's sake.

SOUND QUALITY

For the purposes of the review, I began by listening to an original Leak Varislope. I could not be harsh and say that it was a bad unit, but it was not that good either. The

overall impression was of a slightly stilted, held-back sound. The stereo image was compact, staying well within the speaker boundaries, with a limited depth to the soundstage. High frequencies seemed to stop at a certain point, and the bass lacked the subterranean depths that I know the Stereo 20 can produce. The Varislope was not the most silent preamp I have heard, leaving the impression of listening to a slight 'gauze' of background mush interwoven with the music. The onboard phono stage was adequate but uninspired, sounding very boxed-in. I briefly tried the range of filters and EQs, which worked in their way but did little to release the vibrancy and colour in the music, merely altering the pigment of the differing shades of grey that coated the sound.

Changing over to the Passive was a delight. Gone was the vague and cloudy sound with its hemmed in frequency response, to be replaced with a clear, precise and open rendition of the music. The most obvious change was in the scale of the soundstage. The sound now seemed to extend beyond the speakers to produce one of the widest soundstages that I have

"even 78rpm pressings of Rachmaninov sounded better!"

experienced on this system. There was clear space in between each of the performers which, combined with a good sense of depth, produced a pleasingly realistic holographic image.

Bandwidth seemed greatly increased. Bass now had a bottom to it, rather than being a deep thud connected to the floor. Bass notes moved and grooved, driving the rest of the music along with a very zestful energy. Midband was far more lucid, leaving me with the impression that a singer was separate to, but surrounded by, a band, rather than encased by the musicians in an enclosed mass. The high frequencies seemed to extend a lot higher, before gently fading away into infinity. The high end extension was not as good as we now expect from a contemporary design, but neither was it the curtailed, rigid sound that had come via the Varislope.

I tried a wide range of recordings through both preamps, ranging from Rachmaninov's 1929 recording of his Piano Concerto No. 2 (HMV DB 1333 -1337) through to the modern electronic sounds of Human Blue's album, 'Electric Roundabout' (Spiral Trax SPIT LP 010). Surprisingly, even

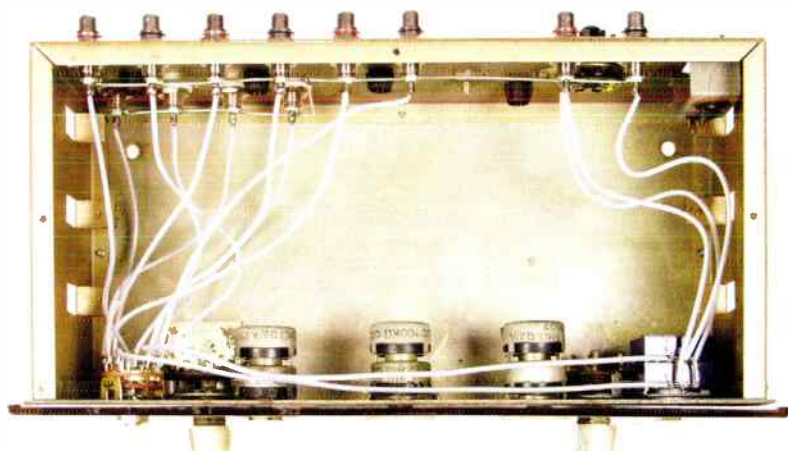
78rpm pressings of the Rachmaninov sounded a lot better through the Passive unit! Even with its comprehensive filter system, the Varislope did not cope that well with the inbuilt surface noise of shellac. Using the filters cut the crackle, but also had the effect of making the music sound very compressed and sluggish.

Whereas the old fashioned method of dealing with surface noise was to cut it out with a filter, the modern concept seems to be to extend the frequency range as much as possible, allowing the crackles and pops to move up and away from the recorded sound, becoming less obtrusive and oppressive as a result. Playing such elderly records through the Graham Slee Audio Jazz Club phonostage and then into the Passive produced an involving sound that left me aware of the limitations of the original recording, without taking away my enjoyment of the performance.

Playing modern electronica through the Varislope was not a satisfying experience. Timing was restrained, and the compressed sensation to the sound robbed it of its sense of movement and flow. Changing to the Passive released the vibrancy and life trapped in the grooves, and the improved detailing in the stereo image showed off the sonic tricks being played in the studio, with sounds swooping around the room, weaving their way through and around each other.

As you may have realised, I was rather impressed with this 'new' passive preamp. I compared to an Audio Synthesis Passion Passive unit, and found the latter to have a cooler, less involving sound. The soundstage was smaller, and did not seem to be as well lit as that of the Classique Sounds product, and the different tonal qualities of the music seemed less pronounced.

Prices for a Classique Sounds Passive start at £299 for a unit with three inputs, provided the customer supplies their own unit for modification. One with five inputs would cost £349. If the unit is supplied by Classique Sounds then another



Lots of fresh air inside the Classique Sounds Passive Preamp...

£100 can be added to these prices. Each unit can be configured to the customer's requirements with tape loops, iPod sockets or any other special fittings required. If you want to buy an original Leak preamp, then the Varislope tested here is available for £150. The performance



...certainly more than in an original Varislope Stereo!

is adequate, but uninspiring.

The Passive unit has so far proved very popular, and Paul is now looking into the concept of having the casework remanufactured, given the finite number of original cases that are in good enough condition to modify, and the amount of work required in cleaning and stripping the case of its old components. He is also looking into the possibility of including a battery powered phonostage, if there is enough customer demand.

CONCLUSION

If you own a Leak Stereo 20, then I can thoroughly recommend matching it with a Classique Sounds Passive. It is a combination that allows the Stereo 20 to be heard at its best, and has the added appeal of looking right, rather than one having to suffer the incongruity of a classic power amp sitting alongside a very modern looking preamp. If you don't own a Leak but love the retro aesthetics, then this passive comes equally heartily recommended.

VERDICT ●●●●£

Fiendishly clever concept that offers super sound at a very modest price – ideal for Leak power amp owners and retro fans alike.

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- tonality, imaging
- retro styling!
- value

AGAINST

- nothing at the price

Good Vintage

Adam Smith tastes the rich flavoured sound of Red Wine Audio's Signature 70 mono integrated amplifiers...

As I sat back last weekend with a nice glass of Wolf Blass's magnificent Cabernet Sauvignon (surely the best easily-available red wine under £10 at the moment?) I had a thought. [what, that you'd have another one? - Ed.] Luckily this was only the first glass and so the thought was actually quite sensible, and that was that a good red wine can bring about a similar sense of relaxation to a good hi-fi system. Both are ideal ways to unwind after a long week, and both have the ability to instill a sense of wellbeing and fulfilment in the drinker/user. However, the simple fact that if either are bad in some way then the whole experience can be ruined also applies.

Consequently, I am quite surprised that no one else has come up the link to audio - as far as I am aware, Red Wine Audio are the first, but I'm pleased that someone got there in the end! Red Wine Audio were formed in 2005 by Vinnie Rossi, an Electrical Engineer with a passion for hi-fi and music. He has, however, taken a rather different route in the products that he has designed, aiming to combine the best aspects of both solid state amplifiers and single ended valve designs.

The method that Vinnie chose to use, like quite a few before him, but who met with varying degrees of success, was to isolate the power supplies of the amplifiers completely by embracing sealed lead acid battery technology (SLA). Red Wine Audio state this preference as a result of its removal of all the noise and unpleasant 'hash' that a conventional power supply, whether linear or switch-mode, has the potential to introduce onto the power supply rails of the amplifier itself. SLA batteries are chosen as they "have

a very low internal resistance and they are very robust in delivering clean power". Red Wine Audio state that further advantages of this system include obviating the need for dedicated power leads, mains conditioners and even the specific mains spurs that many audiophiles swear by.

Of course, batteries are all well and good, but will not last long powering a pair of single-ended 211 valves, for example. Red Wine Audio's amplifiers should not have this problem, however, as they utilise cool-running, efficient Class T amplification, courtesy of Tripath chips. The heart of the Signature 70 is the Tripath TK2501 chip, powered by two 12V batteries, which run in series to provide the amplifier with a 24V supply. A charger is supplied with each amplifier and this is designed to be left permanently connected, with a switch on the rear of the amplifier that allows the unit to be put into 'On' or 'Off/Charge' positions. In the latter, the batteries are disconnected internally and the charger maintains their state of charge; in the 'On' setting, the charger is disconnected and the amplifier runs on the batteries, which provide enough juice for around twenty four hours of listening.

The Signature 70s offer one input per unit, directly connected to a DACT CT2 precision stepped attenuator, which feeds both the amplifier module as well as a second variable line level output, for driving a subwoofer, for example. This design means that each channel is in a separate box and there are thus two volume controls to be twiddled for output level adjustment. The number of inputs can be increased by the addition of a Signature 3S source switching unit, a passive component that offers connection and selection

of up to four inputs.

Well made and neatly styled, the Signature 70s measure 75x300x200mm (HxWxD) and tip the scales at around 5.5kg so they are both compact and unlikely to break your shelves. Power is rated at 30W into eight Ohms, like the smaller Signature 30 stereo amplifier but, unlike this, the output rises to 70W into four Ohms as a result of paralleled output stages.

SOUND QUALITY

After a day or so of twiddling my thumbs and waiting for the two charger lights to go green, they finally did so and the Signature 70s were duly powered up and set up for office background music duties for a good few days - something we do to warm up all review equipment. Unfortunately a hiccup was experienced here as powering up the Signature 70s caused our resident DAB tuner to lose the ability to find any stations, so we had to resort to re-discovering the delights of the *Hi-Fi World* CD collection instead!

Duly run in, the Signature 70s proved a very interesting aural experience, in that they sound most unlike the common conception of the 'classic' digital amplifier. Regardless of how good such units are, we have been well aware that they do not generally trouble most valve amplifiers in terms of warmth and fluidity, but here, at last, is a design that does.

The Signature 70s have an astonishingly warm, sweet and open midrange that is every bit as good as, if not slightly better than, many valve amplifiers I have heard. They add emotion to performances and have a pleasing ease in the way in which they put vocalists centre-stage with great depth and stability. Spinning Cowboy Junkies' 'If you



were the Woman and I was the Man' had singers Margo Timmins and John Prine sounding like they were sat in front of me on the floor, rather than coming from the loudspeakers, with the backing cymbal tapping gently away in the background.

Comparison to a similarly priced Melody SP9 valve amplifier proved very interesting at this point, as it reversed these within the soundstage, placing the cymbal right into my lap, and pushing Margo and John away into the background. Both units beautifully captured the essence of the clarinet that comes in towards the end of the track, but the Signature 70s added just that extra hint of solidity to it.

Treble also seemed quite different to the 'normal' forward nature of a digital amplifier. High frequencies were soft, detailed and spatially enveloping. The Signature 70s did not quite have the last ounce of top-end crispness, nor the startlingly vivid nature of the best thermionic designs, but offered an incredibly clean presentation. Even with less than perfect recordings, mid and high frequencies were superbly defined, and the Signature 70s cut through any murk very well indeed. Sibilants were pin-sharp with no slurring, and I suspect this is as a result of the battery power, as the Signature 70s seemed to have the same sort of clean sound that comes about as a result of a good mains treatment.

At the bottom end, bass was fulsome and weighty, with excellent

control and pace. Bass guitars came through the rest of tracks to really get to the heart of backing rhythms, the Cowboy Junkies track really shining here again. However, the Signature 70s were also quite happy to punch out a pounding electronic bass line. Silicone Soul's instrumental version of 'Right On' was superbly pacy and well focussed, although lacking the last ounce of sheer grunt of the Rotel RB-1092, for example. The lowish damping factor of 22 [see MEASURED PERFORMANCE] meant that the Signature 70s did not completely hold our Spondors in a grip of iron but, that said, they never became wallowy or boomy.

CONCLUSION

The Red Wine Audio Signature 70s are not only one of the most intriguing amplifiers I have listened to in a while, but the best digital amplifiers I have heard to date. They make use of two relatively unusual technologies but do a superb job of combining them. I would say that, in aiming for his goal of marrying up the "rock-solid bass, dynamics, control and timing" of solid state designs and

the "midrange warmth, rich tonalities and smooth non-fatiguing upper frequency resolution" of valves, Vinnie Rossi has succeeded pretty well.

If you are a fan of digital amplifiers, then these show just what such designs are capable of, but if you thought you weren't, the Signature 70s might just be the units to change your mind. Try them, if you've got the bottle.

VERDICT ●●●●●

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FOR

- superb midrange fluidity
- good bass weight and control
- soundstaging and detail

AGAINST

- treble a little soft
- seem to upset DAB tuners!

MEASURED PERFORMANCE

The Red Wine Signature 70 amplifier produces 32 watts into 8 Ohms and, possessing good regulation from its batteries, nearly double into 4 Ohms, 56 watts in fact. These figures are at full charge; they decrease as the batteries discharge.

Frequency response varied with load, as with many 'digital' switching amplifiers. Into 8 Ohms there was a treble rise of +1.3dB at 20kHz which will give a slightly bright sound. However, into 4 Ohms frequency response goes slightly in the other direction, a small treble loss being recorded under measurement, so the Signature 70s will sound smooth under these circumstances.

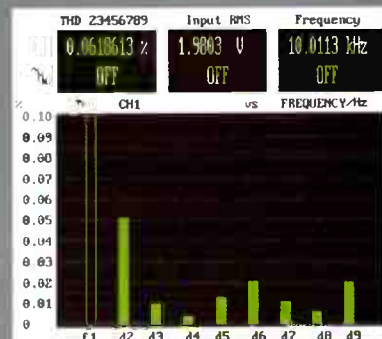
Distortion was surprisingly benign even at high frequencies, comprising mainly second harmonic over all output levels and frequencies, even at high output at high frequencies - unusual for a switching amplifier. The amplifier was very stable in its distortion pattern - always a good sign.

Used into 4 Ohm loads the Signature 70s should sound smooth and

relaxing. With battery power I would also expect a purity due to lack of recirculating mains currents. NK

Power	32watts
Frequency response	6Hz-28kHz
Noise	-83dB
Distortion	0.04%
Sensitivity	420mV
DC offset	1.3mV
Damping factor	22
DC (common mode)	13V

DISTORTION



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WIN A SUPERB SHANLING MC-30 VALVE CD SYSTEM WORTH £500 IN THIS MONTH'S GREAT GIVEAWAY!

Here's your chance to win *Hi-Fi World's* favourite mini system – Shanling's superb tube-aspirated MC-30 CD player/tuner/amplifier – in this month's competition. Here's what David Allcock wrote about it in the September issue:

"Despite the compact chassis, the MC-30 weighs just over 8kg and is beautifully finished. It is superbly built, the detailing is impeccable, and the connectors are of superior quality (a match for anything I've seen in the high end), whilst panel fit is beyond reproach. The MC-30 is dominated by the top loading CD transport and the transformer covers at the rear. Inside its 266x143x385mm chassis lies a CD player with a dedicated Philips

VAM-1202 laser transport and CD-7 II servo mechanism and Burr Brown PCM-1738 DAC, as used in many high end CD players. The tuner is an AM/FM analogue model with 20 memory locations. Behind the CD transport is the stand for an MP3 player. The amplifier is single ended using a pair of 6P1 tetrode valves, but outputs a very modest 3 watts per channel, demanding efficient speakers. As for the remote control, Shanling are to be applauded for their foresight in supplying such a high quality unit.

Whilst 3W may not sound like a lot, you would be surprised at the loudspeakers that are happy to work with this much power. Every Shanling CD player I've heard has been very musical, and this one was no different, the MC-30's CD section and amplifier

were excellent, whilst the bass was not as detailed and controlled as the standalone CD-T100 when mated with high quality amplification, it still communicated the energy of Sophie Ellis Bextor's 'New York City Lights' from 'Trip the Light Fantastic'. The bass line propels this track and the MC-30 did not let me down with excellent timing and remarkable transient attack. Likewise, the midrange was excellent with just a hint of extra warmth in the lower midrange giving a slightly richer, fuller sound to vocals. Male vocals are equally well catered for, with Sting's 'Windmills of your Mind' showing just what this little unit can do. The Shanling MC-30 proved a deeply impressive unit – providing you pair it with sympathetic loudspeakers. Indeed I cannot find a combination of standalone components at anything like this price which can surpass its performance."

If you'd like a chance to win this superb system, then all you have to do is answer the following four easy questions. Send your entries on a postcard only by 30th September to: October Competition, *Hi-Fi World* Magazine, Unit G4, Argo House, The Park Business Centre, Kilburn Park Road, London NW6 5LF.

QUESTIONS

[1] The MC-30's PCM1738 DAC is seen in many what?

- [a] high end CD players
- [b] powerboats
- [c] Casio watches
- [d] fashionable eateries

[2] Its single-ended amplifier uses which tubes?

- [a] 6P1
- [b] EL34
- [c] 300B
- [d] 845

[3] The Shanling makes how many watts?

- [a] 3
- [b] 30
- [c] 300
- [d] 3,000

[4] The MC-30 displays remarkable what?

- [a] "transient attack"
- [b] chutzpah
- [c] courage
- [d] audacity

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**JULY 2007 REVOLVER AVF FLOORSTANDERS WINNER:
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Another Thing!



One Thing Audio now offer an even better upgrade to Quad's original ESL-57 loudspeaker. Is this the electrostatic for you, wonders Noel Keywood?

As I waved my Tannoy Yorkminsters goodbye, a tear in my eye, I was dreaming of my next affair. There's always another, different experience around the corner. The notion of a perfect electrostatic was on my mind and, as if reading it from afar, a pair of revamped, tuned Quad ESL-57 electrostatic loudspeakers arrived in the office from One Thing Audio.

The large spaces left by the outgoing Tannoys were promptly filled and my tears vanished...

The ESL-57 was Quad's first ever electrostatic loudspeaker. Introduced in 1957, it is still popular today, retaining value as a classic. However, the '57 was always a little fragile and most around today, with a good forty years use under their belt, are barely working. One Thing provide a unique rebuild service for this loudspeaker:

they equip it with new, improved panels, and revamp it to provide a level of performance considerably better than the original.

If you already have a pair of 57s, the upgrade costs an affordable and highly reasonable £1,450. To that, add £235 per pair for the Rupert wooden stands you see in our pictures, and £79.95 per pair for Widgets (yes, that's their official name) that make the loudspeakers

a friendlier load for transistor amps. You end up with a loudspeaker that's not only a classic but, we have found from past experience, frighteningly good by today's standards. Which is why I was dreaming of electrostatics again when the Tannoys went...

If you are wondering why the ESL-57 looks like a radiator - a common accusation - it's because it is a panel loudspeaker. To be precise, each one uses three sheets of Clingfilm - or something like it in truth - to produce sound. One sheet, tensioned in a frame to form a panel, sits vertically at centre, radiating high frequencies. Either side of it are bass panels - hence the oblong proportions of the composite whole. The louvred metal covers let sound out, front and back, whilst preventing inquisitive little fingers from getting in, because lethal voltages exist inside; these speakers are mains powered.

I had a long talk with One Thing about what they do with the ESL-57 and its technology in general because, as you might imagine from someone who dreams about such things(!) I am more than a little interested. I did, after all, run ESL-63s for many years, modifying them heavily and finding there was always more to come.

One Thing can accept just about any ESL-57, irrespective of condition, and renovate it fully. If you don't already own a pair, then they should cost around £400 per pair second hand, but having said that some ask for much more, up to £1,000. One Thing recommend people buy tatty ones cheap, as good ones are likely to be good looking rather than good sounding, and One Thing replace all important parts and can even fit new grilles. All you need to be aware of is that models predating 1960, with a Serial Number below 1200, are balanced for mono, having less treble energy due to fewer turns on the audio transformer's high frequency secondary winding. So pairs should have similar Serial Numbers to avoid a pairing of old and new models, which sometimes happens, and which One Thing cannot rectify, as the audio transformers are different.

The ultra light film diaphragms of electrostatics follow musical waveforms with unnerving accuracy, magically banishing screechy violins caused by the wayward cones and dome tweeters of conventional box loudspeakers. The lighter the film, the less energy it stores to colour the sound, and the faster it accelerates and decelerates, to better follow the music. In this respect electrostatics are way ahead of cone loudspeakers, something that is audibly very apparent.

Whilst Quads and other electrostatics traditionally used difficult to obtain special DuPont films, One Thing went to Germany and ordered an industrial quantity of a specially manufactured film 2.8microns thick, compared to 6microns of the original. This is coated with a highly resistive conductive film so the surface holds charge, resisting charge migration. I was surprised to learn that One Thing also fit high voltage secondary protection circuits of the sort used in later ESL-63s, which from experience I know work well. So their upgraded

With the Almarro valve amplifier I used, it offered a small subjective improvement, adding just a little body to voices. All the same, with it or without it the ESL-57s sound bright in their balance, due to a +5dB lift at high frequencies our measurements show, which is quite a lot. I would be tempted to equalise them flat. One Thing said many listeners prefer this balance, and it does mimic the lift found in many modern loudspeakers. I am used to a 'flat', neutral balance that is gentler with DVD-A, which tends to sound brittle in any case;

'a radical proposition they're one of the world's most extraordinary loudspeakers'

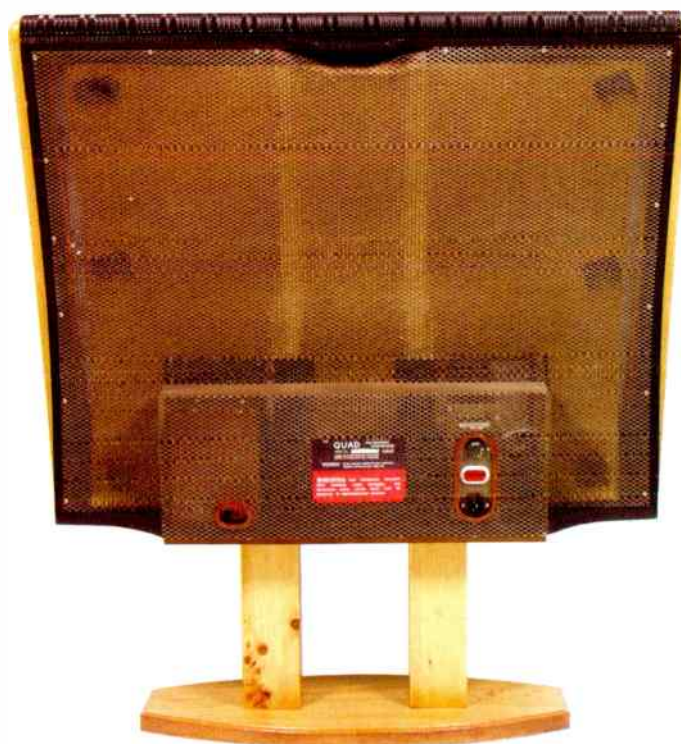
ESL-57s are all but bullet proof, which is good to know because I remember the originals being prone to arcing when overdriven. Additionally, they fit improved front electrodes to better disperse mid and high frequencies, and stronger rear electrodes. All in all then, this is a very modern electrostatic, to the pattern of the original, but otherwise broadly updated. Only the audio transformer is retained.

Some solid-state amplifiers find electrostatics difficult to drive - meaning they blow up! Mindful of this, One Thing offer a Widget that makes the Quad an easier load (it is a reactive network, not just series resistance). This, they find, improves sound quality with solid state amplifiers. With valve amplifiers it has least affect, they told me.

the 57s were also bright with much SACD, even though it has subtler treble than DVD-A, but they were better balanced with most LPs.

SOUND QUALITY

I'm talking only tonal balance here. Transparency and insight are other important properties and here the ESL-57s were unmatched. They see through everything, being brutally frank about recording quality and balance. As much as I enjoy old classics like Billy Idol's 'White Wedding', or Steve Earle's 'Copperhead Road', they sounded dated with these loudspeakers. The recordings were ill balanced or congested, the Quads told me. Yet at the same time, whilst limitations in recording quality were starkly



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10 AUDIO REVIEW

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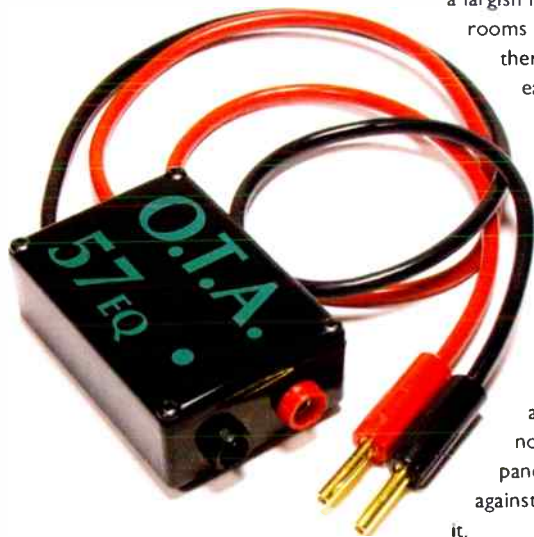
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revealed, I was fed Steve Earle and Billy Idol at the microphone like never before: fantastic!

Spinning a good, modern recording on DVD-A like Toy Matinee's 'Turn it on Salvador', the extra resolution of 24bit at 96kHz was glaringly apparent. Instruments were sparkling clean, vocals starkly clear: what revelation! Where a big Tannoy brings lusty dynamics to all sources, the Quads perform analytical surgery on a scale unknown to most - loudspeakers or men that is! - laying bare both performances and the technology used to capture them.

These particular ESL-57s are about the most revealing loudspeakers I have ever heard, helped by the fact that they have been built with just that property in mind. The modifications One Thing make, such as a lighter diaphragm film, give subjective improvements that capitalise upon the loudspeakers intrinsic strengths, moving it even further ahead of the herd.

Quad ESL-57s do not have deep bass, nor a full bodied or warm sound. Being an open dipole, exactly what you get from them depends much upon the room and their positioning within it. In a suitable room I have heard 57s give bass of a quality, if not a power, far beyond any box loudspeaker, but this is rare. Basically, 57s peak up in the upper bass region (90Hz) and roll off below this point. You get a form of bass, but it has no great depth nor thunderous strength - at least, in my room. A subwoofer can help.

Quads benefit from having some space behind them, to 'lose' sound from the rear. This, and their size, mean that

a largish room is best. Long narrow rooms measuring 20x12ft or thereabouts are ideal, with each panel end-on against or close to the side wall, facing down the room.

Positioned like this the side walls augment bass from the panel and the rear wave is usefully attenuated. An alternative is to place absorptive panels a small distance behind each speaker, using acoustic foam or similar. Do not expect to place any open panel, including this one, flat against a wall, nor anywhere near it.

Remembering back to earlier Quad electrostatics I have used, these upgraded ESL-57s are easily the most revealing. One Thing say they are a big improvement upon those we reviewed in our October 2003 issue. Everything editor DP found was repeated with these upgrades. They were spectacular with large orchestral works, bringing an open, airy sound to Wagner for example; horns had strength, yet sounded wonderfully rich and natural. They called out magisterially from a vast sweep of an orchestra, strings behind sounding as smooth yet finely differentiated as you could ever wish for. A roll on a kettle drum had more power to it than I am used to, resonating nicely around my room. I fancy these ESL-57s have better dynamics, more volume and generally more vivacity and speed than I am accustomed to from any electrostatic I have heard before.

There is some slight sense of

the metal front grilles being there still; I can perceive this because I have used 63s bare. All the same, when you hear natural instruments, like woodwinds, horns and violins through electrostatics as good as these you are reminded just how their lush timbral properties are twisted and sat upon by ordinary loudspeakers. Quads bring life to the gentle tranquility of orchestral ensembles, as they don't lose resolution at low levels yet, in Lohengrin, when the orchestra rises to a brief crescendo it does so with a sudden force that is breathtaking through these 57s.

The same revelation the Quads bring to Rock vocals they also bring Classical vocals. There was a gentle purity to Renee Fleming's voice singing 'Madame Butterfly'; it was a simple, uncluttered sound yet at the same time richly detailed and finely nuanced. And what they bring to Renee Fleming on CD, they improve upon with Eleanor McEvoy on SACD, as this source is the best we have at present, a quality these Quads are able to completely reveal.

CONCLUSION

Sadly, ESL-57s occupy space in my lounge I need for living in, and as amazing as they are, the need to keep them well ahead of rear walls means they take up more space than the outgoing Yorkminsters. But if you have a suitably proportioned room, then One Thing's ESL-57s are a radical proposition, as their value could go up as you listen to what is one of the world's most extraordinary loudspeakers. That would dry the tears from anyone's eyes.

MEASURED PERFORMANCE

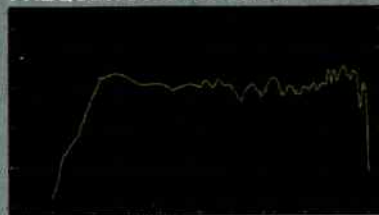
The One Thing Audio ESL57s have a rather saddle-shaped response, meaning that they peak in output towards both the top and bottom end of the frequency range. This means that they will have a tendency towards brightness but should also mean that they give very good upper mid and high frequency detail, along with good atmospherics.

Down the bottom end, the Quads roll off quite sharply below 60Hz, but peak up in output prior to this at around 80-90Hz. Consequently, they should have quite good low end punch and detail but will not dig all that low, compared to conventional box loudspeakers.

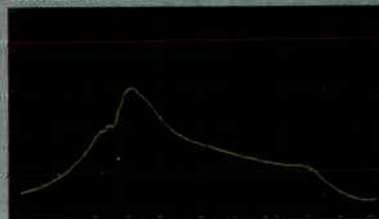
Electrically, the Quads measure like little else, with a single peak in impedance at 100Hz, rolling down both above and below this. Average measured impedance was 10.5 Ohms, but this dipped as low as 5 Ohms at

LF and 3 Ohms at HF, so the One Thing Audio ESL57s do need some current from a suitable 4 Ohm amplifier tap. Sensitivity was average at 85dB. AS

FREQUENCY RESPONSE



IMPEDANCE



VERDICT

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- high resale value

AGAINST

- bright tonal balance
- little deep bass
- size

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NET AUDIO SONANCE DAC £700

When we reviewed the NET Audio MicroClone in June 2005 we had a few reservations about the lightweight casing. The Sonance well and truly nails this criticism, as this Trichord Dino-sized box is now fronted with thick aluminium which looks understated, just like high-end hi-fi should be. The simplicity of style is carried through to the socketry. Consisting of just a single RCA phono digital input and RCA phono outputs, the Sonance provides the absolute basics only. If your disc source provides just an optical output, then you'll need to look elsewhere...

Internally the DAC is a very pretty sight, and the specification is impressive. Twin screened power supplies provide separate signals for digital and analogue sections. The DAC chip is the well-respected Burr Brown PCM1716E with a Cirrus Logic CS8414 handling the audio receiving. The output is fully discrete, with shielding around left and right channels. Everywhere you look, there are signs of quality engineering and materials. Rubycon capacitors extravagantly populate the circuit board, whilst all the internal wiring is silver plated OFC copper supplied by the well-respected The Missing Link.

With the Sonance hooked up to a Cambridge CDM3 transport, first impressions were very good. The keen sense of rhythm and pace from the older model was still there, and whilst not window-rattlingly deep, bass was taut, well defined and smoothly integrated with the midrange. Transients proved especially impressive, giving drums great impact. In terms of staging, the Sonance appeared to go for width over depth,

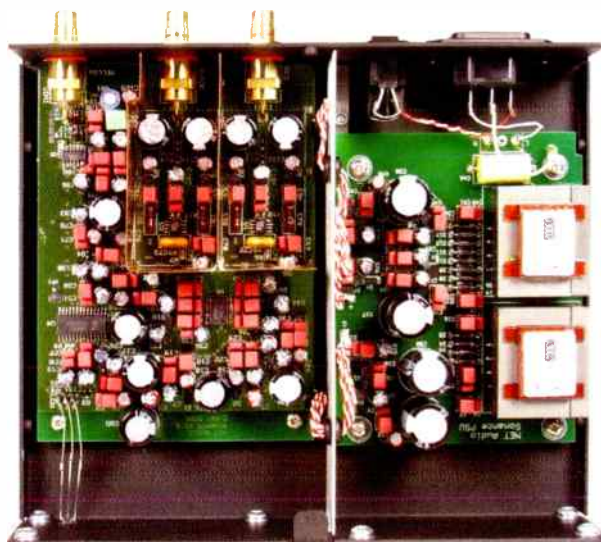
"everywhere you look, there are signs of quality engineering and materials..."

but wasn't deficient in terms of the latter. Treble was even-handed and explicitly detailed, yet some brightly lit programme material would occasionally push it to harshness. Still, Claire Martin's voice proved there was little to worry about with typical female vocals, being accurately and smoothly portrayed with no undue sibilance. Indeed, the Sonance gave fine insight, with the sort of texture and articulation that you'd expect to find in more expensive machines. Brass sounded upbeat and vivacious, and had the sort of bounce that Naim fans get off on.

Moving to Classical music, and the NET Audio showed that it wasn't genre dependant. With Mendelssohn's Piano Concerto No.1 (CBSO with Stephen Hough) the excellent timing prevailed. Piano timbre was extremely well portrayed and there could be no arguing with the pace of the piece. If the piano's reproduction was faultless at this price, then the strings did sound brightly lit, so best partner the Sonance with smooth systems, or employ it intelligently to perk up dull ones.

Overall, the new NET Audio had little trouble painting a broad, clearly defined sound stage and always kept the listener involved with its intimate detail and excellent timing.

For most people, the style and build of the NET Audio Sonance should deserve an unqualified thumbs up - although those with optical digital outputs might think otherwise! Its sonics are similarly impressive, with the caveat that it should be used in an appropriately smooth system. This done, listeners will be able to bask in its timing, cohesion and sheer vitality - finding it a compelling listen. Not a product to be universally recommended then, but the flashes of brilliance will no doubt endear it to many. [Contact: NET Audio +44 (0) 1487 814 657, www.net-audio.co.uk].



SOUNDBITES

Xero sum game

Leema Acoustics' latest mini-monitor is called the Xero, and promises extensive improvements at no extra cost. In fact, they're £330 cheaper, says David Price...



The little Leema Xens were one memorable highlight of last year's bleak winter. At just £1,000 (less one pound) they provided a superb, classic mini monitor sound in the vein of the Rogers LS3/5a and Harbeth HL-K3ES. Hardly surprising really, as Leema Acoustics was formed by two ex-Beeb engineers, Lee Taylor and Mallory Nichols.

Indeed, the latter was involved in the manufacturing of MAGTRAX monitors for recording studios and mastering companies from the early nineties and Lee Taylor, the recipient of BAFTA and Palme d'Or awards, is experienced in recording and mixing for television, music and film. In short, although the company is a young one, the Xero's designers are

old hands – and its shows when you plug them in....

Whereas the £999 Xen was the company's first loudspeaker, the £670 Xero is its third, and is essentially a downsized Xen – and unusually these days, Leema has seen fit to pass on the price saving of the slightly smaller cabinets and simpler construction. The Xen used a hybrid steel and wood cabinet with metal front baffle, whereas the Xero employs a more conventional all wood affair. It's slightly smaller at 220x140x206mm and lighter at 10kg (still a lot for a speaker of this size). Although the Xen's metal front baffle looked beautiful, certainly the Xero doesn't seem any less well built and appears just as robust. Internally, there is extensive damping from a double layer of bitumastic lining.

The Xeros feature a 1-inch (25.5mm approx.) Vifa Tymphony fabric dome tweeter that uses high-flux neodymium magnets and ferro-fluid damping, plus a new bespoke 100mm magnetically screened mid-bass driver marked 'Leema Acoustics'. The crossover uses hand-wound air-cored inductors, high quality capacitors and PCBs with thinner multi track copper, rather than a typical fatter single layer. Whereas the Xen ran two semi-restrictive bass ports on the front baffle, the Xero has a single, fluted, rear mounted, free flowing 25mm affair. Just above this is a block of bi-wireable binding posts with gold plated links. The wood veneer was of excellent quality and comes in a choice of Cherry, Birds Eye Maple, Black, Ebony or Black Ash.

Quoted sensitivity is 86dB [see MEASURED PERFORMANCE] which means that only reasonably powerful amplification need apply. I found the Xero less than happy on the end of my World Audio 20W valve amplifier, and instead substituted the excellent NuForce Ref 9SE monoblocks which proved more than comfortable with the Xeros. I found they worked best on Atacama 24" stands, about 30cm from my back wall, toed in slightly – although you can run them slightly closer to the rear walls without setting their bass ports off and provoking them into resonance. They were fed from the NuForce monoblocks with the superb Clearer Audio Optimus Reference loudspeaker cable.

SOUND QUALITY

Sounding a touch shrill and cloudy, initial results weren't positive, but careful positioning and a good warm through began to bring real rewards. A slight tighten of the drive unit screws, some Blu-tac to lock them onto their stands and an extended run-in brought an even more impressive

for such a small box, and one seldom experienced at this size and/or price point. Of course, you don't get Tannoy Westminster-style seismic activity, but there's a confidence there that belies their baby boxes.

Moving up to the midband and this is where the Leemas shine brightest. The insight from the Xeros wasn't noticeably less than my reference Mel Audio Horamas, which are approximately five times the price. Indeed, there's a degree of transparency here that you'd be happy to get from any speaker of any size costing £670, let alone these pint pots. Troy Overwater's 'Op' SACD, a jazz/classical fusion recording of stunning clarity showed the Leemas to be able far beyond expectation. The striking dynamics from the drum kit and double bass, allied to some beautifully silky tenor sax sounds showed these speakers at their best.

Indeed, most impressive (for their size and price) was their winning combination of musicality and couthness. Whereas some less boxes are good fun to listen to yet rough and ready with it, or others are

well, their only weak spot being a marginal lack of treble ambience and less confidence when it came to imaging 'out of the box'. Being very compact mini-monitors, the Leemas project very well indeed – just as you'd expect – but they're just a tad more directional than some and so a touch of toe-in helps here. Taking the grilles off also helps, but this can also make the upper midband ever so slightly forward for more conservative tastes. For example, on Donald Fagen's 'Tomorrow's Girls' (an upfront and unashamedly 'well lit' recording), they could sound a tad bright when run 'naked'.

CONCLUSION

The Leema Xeros produced a superb sound in their own right, and during the audition period I had to constantly remind myself that I was listening to a sub £1,000 pair of loudspeakers. They are tremendously musical, boasting nine tenths of the Acoustic Energy AE1 Classic's redoubtable skill in this respect, yet offer more detail, clarity and finesse as far as I could discern. At £670 they are, to all intents and purposes flawless – and in absolute terms they're easily capable of working with high end equipment; indeed, it's almost a shame not to deploy them this way. Regular readers might have noticed I'm a fan of Leema; it's rare to find a newish British company doing such interesting, impressive and able electronics and loudspeakers. Long may they run!

REFERENCE SYSTEM
 Marantz CD63KI DP CD player
 MF Audio Silver Passive Preamplifier
 NuForce Reference 9SE power amplifiers
 Mel Audio Horama loudspeakers

VERDICT ●●●●●
 Excellent class-leading mini monitors with musicality, finesse and detail that belies their humble price tag – partner with high end electronics for super results.

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FOR
 - resolution, speed
 - musicality, tonality
 - value

AGAINST
 - nothing at the price

these loudspeakers are extremely convincing in the low frequencies

sound. At last the Leema Xeros were ready to rock...

Simple Minds' 'Promised You a Miracle' was the first track to go on, and the Leemas proved utterly unfazed by the big, fat bass lines and powerful drum work. Played on lesser equipment, this song can sound like a dirge, but the Xeros cut through the slightly 'grey' mix and began to unpack the track, throwing all its individual elements in sharp relief. Their basic sound was very clean, open and detailed in the greatest tradition of BBC mini monitors, but they didn't sound as slow, lightweight or nasal as LS3/5as – indeed they are more reminiscent of Acoustic Energy AE1 Classics in the way they're detailed yet truly dynamic.

Considering they run bass drivers the size of beer mats, these loudspeakers are extremely convincing in the low frequencies, in two respects. First, they go down low and are tight and taut with it, with no sense of the bloated, boomy boxiness you get from most speakers running bass ports. Second, they don't compress the sound even at high levels and/or with wall-cracking transients. There was no sense of a tiny driver huffing and puffing through a big bass port in an attempt to drive the room. This is a very clever trick

consummately well mannered yet dull as dishwater to listen to, the Xeros are blessed with an Acoustic Energy AE1-style *joie de vivre*, yet they remind me of the Harbeth HL-K3ES in their civilised demeanour – providing they're fed with a good source.

The first track on 'Op', 'Laverne Walk' was a delight to listen to, the Leemas getting into the swing of things, whilst never showing signs of distress at high levels. The cymbal work was no less enjoyable, the Xeros giving decent smoothness to the hi-hats and ride cymbals. The clarinet and flugelhorn work on 'Two Little Pearls' can often grate on this starkly open recording, but the Leemas remained unstrained. I particularly enjoyed the way these loudspeakers conveyed the vibrant texturing of these acoustic instruments.

In absolute terms, against the far pricier reference Mel Audio Horamas, the Leemas performed startlingly

MEASURED PERFORMANCE

The Leema Xeros have a gentle lift to their response right in the midband, and so should offer good midrange detail and vocal projection as a result. The lift peaks at the exact region where harshness can become a problem however, and so they may need careful matching to ensure that they do not become a little edgy.

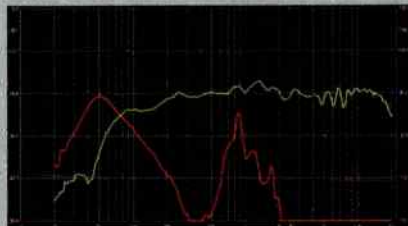
At the top end, the response starts to fall at around 16kHz which, whilst not being obviously noticeable, may rob some treble atmosphere from the overall presentation.

Bass is fine for such a dinky enclosure, output from the drive rolling off below 100Hz or so, and the port strutting its stuff at 50Hz, but the Xeros will not shake the room.

Electrically, the Xeros are not so well damped at the bass end, but have a nice easy measured average impedance of 10.8 Ohms, dropping to a minimum of around 7 Ohms, so they are not a difficult load. This will go some way to making up for their low


sensitivity of 84dB and meaning that 60W or so from a driving amplifier would be wise. AS

FREQUENCY RESPONSE



Green - driver output
 Red - port output

IMPEDANCE



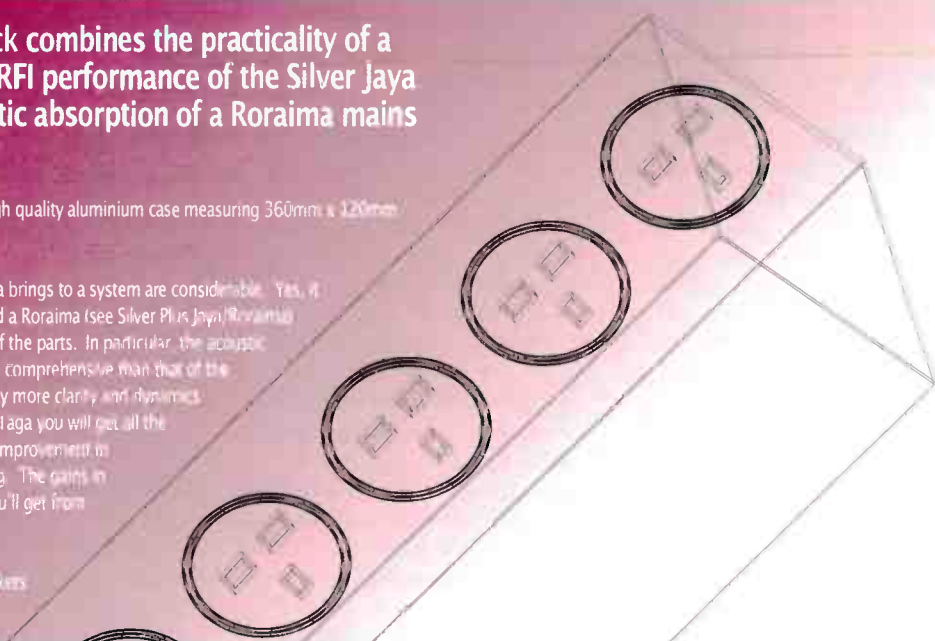
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The price of the 6-way Taga with UK 13A sockets is £795.00 (inc VAT).



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Small Talk

The Revo Pico+ is a highly portable DAB/FM radio with MP3 playback. Steve Green tries it for size...

The Revo Pico+ is a feature-packed portable DAB/FM radio costing £130, available in black, white or silver. It's stylish and modern with a compact build (dimensions are 4x4x7inches), and this makes it an ideal travel companion, with its portability enhanced by a splash-proof case and integrated NiMH rechargeable battery.

Despite its small stature, the Pico+ packs almost as many features as you find on the most advanced DAB radios available. The features I liked and used most of all were related to its ability to playback MP3 files, as it has an SD card slot on the back of the radio, as well as a connector on the front – which Revo calls the 'M-Port' – that makes it easy to connect the Pico+ up to act as a speaker for an MP3 player.

As well as its ability to play MP3 files, the radio also allows live radio to be recorded onto the SD card, or radio recordings to be played back from it, with the recorded files using DAB's MP2 audio format. The Pico+ also provides pause and rewind functionality, which allows up to thirty minutes of audio to be stored temporarily, and all of the usual DAB text information, dynamic range control and options for managing the list of DAB stations are supported. On FM, tuning must be performed manually, and there is no RDS support to display station names, but there are five preset slots in which to store FM station frequencies.

The rear panel houses a headphone socket, USB socket for loading tracks onto the SD card from your computer, and a pair of phono audio outputs to allow external recording. Both the rear panel and the M-Port on the front also sport rubber covers to protect the radio from moisture. The radio comes supplied with an adaptor cable that allows it to be powered via a car's cigarette lighter; interchangeable 2-pin and 3-pin plug socket adaptors to allow operation both at home or abroad; a lead to connect the Pico+ to an MP3 player via its M-Port; and

it even comes with a small remote control.

Operating the Pico+ was easy using the wheel to scroll through lists of stations or tracks on the SD card, but a minor grumble was that in order to change the volume it was necessary to first press a button before being able to change the volume via the wheel, and the 'function' button had to be depressed simultaneously with the pause, rewind, fast-forward or record buttons in order to operate these functions.

Reception quality on DAB wasn't quite as good as on some of the other well-known DAB manufacturers' radios, which I would attribute to the Pico+ using a shorter aerial than most DAB radios use. The Pico+ uses software-defined radio (SDR) to implement FM reception, and as is almost always the case with DAB radios, FM reception was poor in comparison to what you'd find even on a cheap analogue portable.

SOUND QUALITY

The sound quality of the Pico+ was excellent for a radio that only has a single two inch loudspeaker. As would be expected, it was best with high bit rate MP3 files, and the Pico+ delivered a crisp, dynamic and open sound. DAB was also very good, with the highlight unsurprisingly being the classical music stations, which had a decent level of detail and were delivered with plenty of energy. The Pico+ also performed impressively with the other DAB music stations, as its dynamic sound complemented the better-sounding stations and added much-needed life to the stations that tend to sound flat. Most of the numerous speech-based DAB stations that are available were a pleasure to listen also, with voices sounding rich and clear.

FM sound was strong on some stations, but performance was spoiled

by the radio's poor FM reception as the signals became easily distorted, and there was a high-pitched background whine – which is the software-defined radio equivalent of hiss – on the quieter-sounding stations, such as Radios 3 and 4.

The Pico+ could be pushed to surprisingly high volume levels considering it only has a small single speaker. However, there was an issue when playing the louder sounding genres – such as indie and rock music – at higher volume levels, as the audio tended to distort, although the radio could still be pushed to a reasonably high volume before this became a problem.

Overall, if you want a DAB radio/MP3 player with good sound quality that you can take with you anywhere, the Pico+ would be ideal. But if you only want a DAB portable radio for around the house then there are better-sounding portable DAB radios available, such as the excellent Roberts RD78, albeit that is mains-powered only.



VERDICT

Highly portable DAB radio/MP3 player with fine sonics, although there are better value rivals available.

REVO PICO+ £130

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FOR

- features
- sound quality
- portability

AGAINST

- FM reception



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KEF WIRELESS SYSTEM £399.99

Anything that reduces the number of wires in a surround sound system is a good thing. This little outfit from KEF gets rid of the cables feeding the rear loudspeakers by transmitting the music wirelessly. Great idea, except that a few moments thought about this suggests it has as many drawbacks as benefits. Rear power amplifiers are needed, plus a mains connection and speaker cables, so things don't get simpler. KEF's solution seeks to avoid this: it's a simple plug-and-play system aimed at technophobes who want less hassle - not more!

KEF simplify the whole business by encapsulating a tiny Class D ('digital') power amplifier in each receiver module. Stand the module atop its loudspeaker, or on the floor, and you can connect up using a short piece of cable with either bare wire or 4mm plugs at either end - couldn't be simpler. Class D amplifiers are super efficient, meaning they run cool and produce lots of power from a small package, in this case KEF quote 50 watts (we measured 45W). It's a lot of power from a flyweight unit measuring 150mm high and a slim 30mm wide, except for its 80mm diameter circular base. One reason is that the power supply is a separate block, albeit a light one that likely houses a Switch Mode Power Supply delivering 22V at 2.7A. Each lead is 3m (9ft) long, so a power point must be within this distance from each rear loudspeaker, or a mains extension lead will be

needed. Alternatively, the short 2ft mains cable feeding each supply and terminated by a figure-of-eight plug can be replaced with a longer one.

As KEF supply two of these mini power amplifiers per kit, it is for a 5.1 system having just two rear loudspeakers. Another awkward point is that most surround sound receivers deliver at least 100 watts nowadays, so these mini-amps are not a perfect match power wise. It means the rear channels could overload should power be turned right up. Although generally less power is directed to the rears, in some cinema scenes rear explosions and other cinematic effects may be a little much for them. Surprisingly the power modules have no audio output that can be directed to a more powerful rear amplifier.

The transmitter is another, similarly small unit, again mains powered, but by a small 'wall wart', as it needs less power. Into the transmitter is plugged a lead that picks up the signal from the loudspeaker output terminals of each rear loudspeaker amplifier. Connecting up is a simple, quick and relatively painless process. There are no adjustments to be made and certainly no fooling around with the user names, passwords, I/P addresses and what have you of a computer Wi-Fi network; our unit worked perfectly first time.

KEF quote a transmission frequency band around 2.4GHz, using a frequency hopping, spread spectrum transmission scheme that keeps the channel free of noise and interference. Being for hi-fi, linearity is

good. We measured 0.01% distortion at 1kHz and noise within the audio band was low too, at -107dB (A weighted). Microwave transmissions at this frequency can travel through walls, but are attenuated by them. KEF quote a maximum (unobstructed) range of 25m, which is more than enough.

Class D amplifiers vary widely in performance, poorer ones generating significant amounts of high frequency distortion. These units worked well though, with minimal distortion in the midband. A small rise in intermodulation at high frequencies occurred but this is to be expected. Damping factor was low at 9, close to that of valve amp.

Like many Class D amplifiers, KEF's sounded clean and dry in use. They kick out a lot of detail in the upper registers, the crash of cymbals and twanging steel strings of Steve Earle's guitar in 'Esmeralda's Hollywood' having a forceful presence. Earle's guttural tones were a little short of fullness and body but in rear channels this sort of skew in balance would probably go unnoticed. Bass came across as spry and subtle, if lacking in subterranean depth. It carried the general rhythm of a song well all the same, as there was no slowness or wallow.

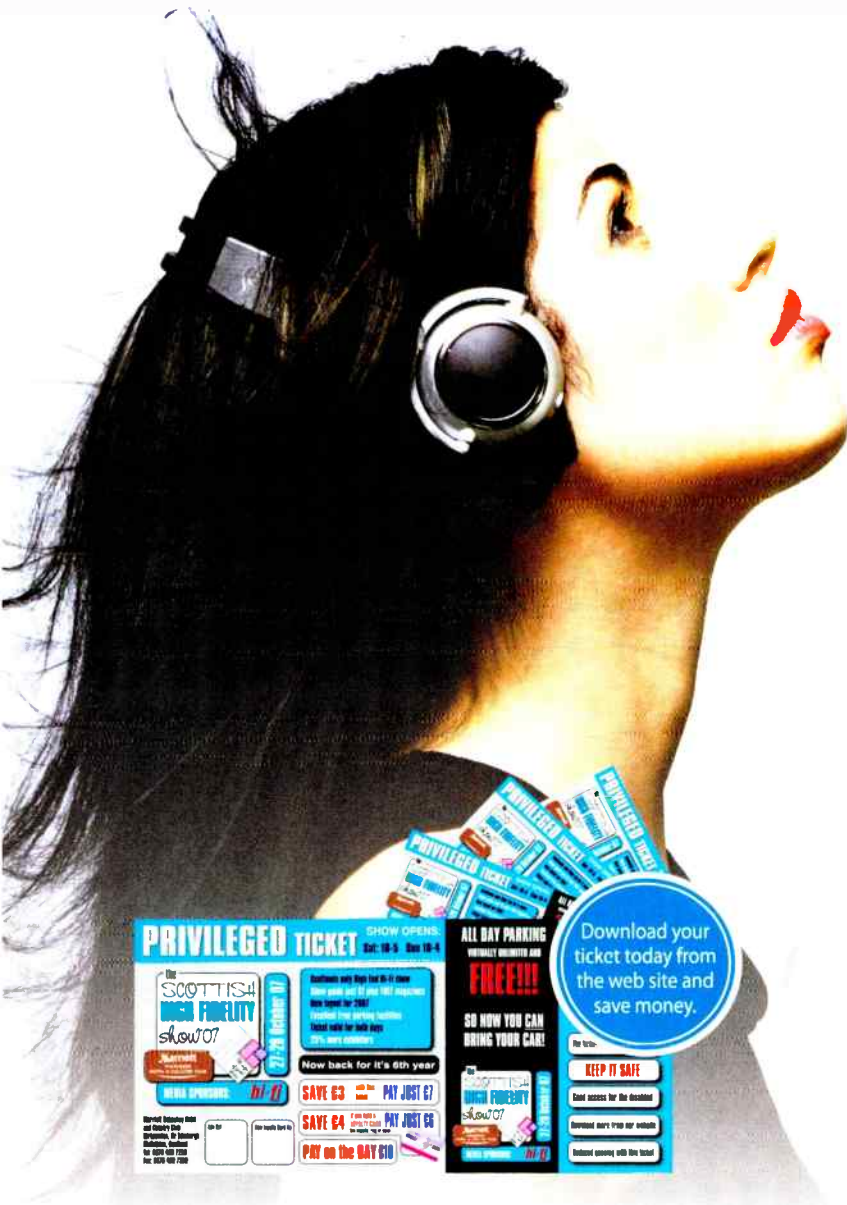
If you want to avoid wires to rear loudspeakers in a surround-sound system, then KEF's wireless transmission system is as simple and effective as it gets for a high quality music solution.

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BBC goes HD

HD-TV is due in 2008 and should sound wonderful, thinks, Noel Keywood...

The announcement by the BBC that they are to start broadcasting High Definition TV full time in 2008, is another small but significant step forward for TV in the UK. With it will come surround sound audio, bringing an altogether more immersive experience to many programmes, from action movies to sport. This promises to be an exciting move forward.

Curiously, at present the BBC are noncommittal about the technological side of this change over, in their response to our questions about it, even though when questioned most viewers who have experienced HD-TV were enthusiastic about improved quality. Our group test of surround-sound receivers this month suggests future HD-TV could be an altogether more gripping experience than most people are likely to be aware of, however.

One reason for this is that little true High Definition material is currently available. Even programme on Sky HD is sometimes shot in Standard Definition video, broadcast on the HD channel, and this may often be the case in future HD TV channels. The BBC expect most of their material to be HD by 2010, they said.

Whilst most film nowadays is shot in HD, as well as much TV programming, there's still a lot of Standard and even Low Definition around. This isn't so obvious through a Standard Definition television broadcast system, but as the window opens up it will become more so to home viewers, as will bad sound. But then that is the point: HD-TV will be revealing, demanding of broadcasters and film makers, but a great experience for viewers when done properly.

Properly? Ah, yes, there are some 'interesting' details to consider if you feel you may want to immerse yourself in the 2008 Olympic Games from China or Soccer World Cup in 2010. HD-TV needs more bandwidth than normal TV and cannot easily be squeezed into the Freeview spectrum, unless just one channel

is provided. Satellite is, for the next five years at least, the cheapest, easiest and most appropriate way to deliver HD-TV and the BBC will be using it. It needs just one transmitter in the sky, instead of a network on the ground and, in terms of geographical coverage, everyone can receive it, unlike terrestrial transmissions such as Freeview. Only flat dwellers may have problems, especially in conservation areas where visible satellite dishes may be unacceptable.

The BBC's transmissions will be 'free' in the sense that there will be no increase in license fee, nor any subscription. However, a satellite dish and special HD set-top box will be required and must be purchased, likely cost around £150. The BBC told us their service won't be encrypted.

Beware that at present an HD-TV will not receive HD-TV! Current 'HD Ready' TVs have the screen resolution (a widescreen display of at least 720 lines, compatible with 1080i and 720p, 50 and 60 Hz, signals, and with HDMI connection including HDCP content management), but they do not have an onboard HD TV tuner able to decode HD-TV transmitted data. At present, the HD-TV you buy in a store has an old fashioned SD tuner on board, and this will not receive satellite signals. However, such a TV will almost certainly connect up to a dedicated HD-TV satellite receiver and, we hope, work properly too, assuming HDCP doesn't frustrate this, according to how content flags have been set. Otherwise, it's best to connect video through analogue Component leads, which give pictures little worse than HDMI. Component outputs will, hopefully, be fitted to satellite receivers.

HDMI and likely SP/DIF will be used to convey, either to a TV or surround-sound receiver, the digital Dolby Digital (AC3) 5.1 surround sound that is used universally at present within HD-TV. This is the



PICTURE COURTESY OF BBC

same sound that you get on video DVDs. It's plenty good enough for the present, even if Blu-ray and HD-DVD promise better. In anything other than a carefully controlled studio environment, surround is difficult to capture well, as it needs a complex microphone array, suitable electronics - and a cameraman that doesn't grunt! So expect stereo as well as surround-sound; High Definition will expose format and quality differences in both sound and vision, especially on today's large HD screens.

Quite whether the BBC will transmit current channels, such as BBC1, etc., in High Definition - in effect Simulcasts alongside SD-TV - or compile wholly new channels containing unique HD content, they could not tell us, saying this was a matter for the BBC Trust to decide, suggesting that heads are currently being scratched. Whatever they decide, we should all soon be able to enjoy a much richer TV experience at home, courtesy of HD-TV with surround sound.

[for more information, see www.bbc.co.uk/guidelines/dq/contents/television.shtml#HDGuide]

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CLEARER AUDIO COPPER-LINE POWER CABLE £95

Clearer Audio, not to be confused with the similar-sounding German producer of gorgeous turntables, are a small family-run company, based in the UK and founded in 2003. Manufacturing and selling a range of interconnects, loudspeaker cables and mains leads from entry-level to high end, Clearer Audio state that they aim to make use of, "innovative conductor materials, high performance dielectrics and geometries, advanced multi-layer shielding and ferrite technologies, together with high performance audio-grade connectors" in order to achieve the best performance possible.

The Copper-Line is the entry level range with the Silver-Line, Silver-Line Optimus and Silver-Line Optimus Reference taking the product collection into more high-end territory. The mains lead under consideration here is from the Copper-Line range and makes

use of 6 nines multistrand copper conductors with thick audio-grade copper foil shielding and further 6 nines braid shield. The connectors used are the chunky Wattgate 320i IEC plug and a swanky Clipsal mains plug that features a silver plated fuse holder and fuse, both of which are treated with CAIG DeoxIT contact cleaner before assembly. The fuse value fitted can be specified on ordering, as opening up the plug to change it will invalidate the cable's warranty.

Each cable is run for 48 hours using an Audiodharma Pro 2.5 Cable Cooker before despatch, which sends special dynamic waveforms at high current through the cables in order to burn the cable in and make them sound "more dynamic, detailed and transparent" straight from the box.

Performance, when compared to



a standard lead, showed

improvements in terms of background silences becoming more pronounced, most likely due to the quality shielding, and this gave good advances in terms of improved low level detail resolution to music. Overall, the Clearer Audio Copper-Line is a thoughtfully designed and very well made cable that won't break the bank. Impressive stuff. [Contact Clearer Audio on +44 (0)1702 543981 or click on www.cleareraudio.com.]

soundbites

TECHLINK WIRES XS INTERCONNECT £30

Techlink are a relatively new name when it comes to cables, but they are a UK-based company who have been trading for over twenty five years and have a very wide range of products, including cables, stands, supports and accessories. Basically if you need a widget or thingy to connect up, hold steady or switch between virtually anything in the field of for home hi-fi, cinema and A/V switching, then there's a good chance that Techlink probably sell something to do the job.

New arrivals to their top end 'Wires XS' range are the stereo interconnects under consideration here. These consist of a pair of silver plated, OFC copper conductors around which is wrapped a foam polyethylene (FPE) insulation that "eliminates cable-to cable signal migration". These are then finally wrapped in silver plated return signal braid and enclosed in a transparent PVC outer jacket. Techlink clearly working on the theory that if you've paid for it, you might as well be able to see it.

At each end, the lead terminates in corrosion-proof gold plated phono plugs and the whole item arrives in a very swish foam lined presentation tray. All of this makes it even more astonishing that the price quoted above is correct. We haven't missed a nought off - they really are £30 for a one metre set!

Connecting up the Techlinks revealed that this is a cable that more than transcends its price tag in performance terms. The overall presentation is very smooth and assured, with excellent bass weight and, more importantly, bass control - the Wires XS lead made a £50 TCI Viper interconnect sound loose and rather vague in comparison.

Midrange was equally good, offering detail and insight but remaining composed and fluid at all times. This allied to a sweet and detailed treble to ensure that the Techlink maintained an air of sophistication to any material put through it, from Mozart to Metallica.



For their £30 price tag, the Techlink Wires XS stereo interconnects are an absolute bargain, and can more than take on quite a few interconnects at many times their price. [Contact Techlink on +44(0)1732 779400 or click on www.techlink.uk.com.]

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NAITology

If there was ever a quintessentially British affordable audiophile amplifier, the Naim Nait is it. Nearing its twenty fifth birthday and into its fourth incarnation, the little integrated has gathered many myths along the way. To find out the truth, Channa Vithana decided to revisit each successive model, with surprising results...



James Almey of Tom Tom Audio

The original Naim Nait became an instant classic when launched back in 1983 for the princely sum of £253. It sounded quite unlike any other integrated of its day (or now, for that matter), and set a trend for so-called 'super integrations', bridging the gap between basic entry level amps and high end pre-power combinations.

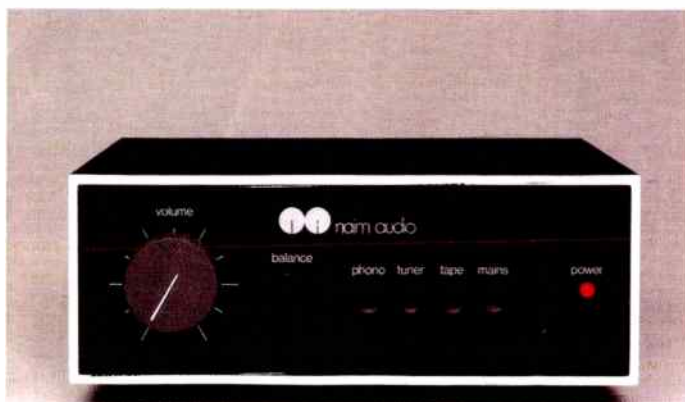
In the intervening quarter of a century, it has been the subject of several revisions, and been a breeding ground for many myths and legends, not least of which was that the only 'red light' Nait was the best sounding of the bunch. In an attempt to get to the truth, we at *Hi-Fi World* decided it was time to take a scientific approach to the subject and audition perfectly

preserved examples of them all, one-after-the-other.

To do this, I enlisted the help of James Almey of Tom Tom Audio, who is fortunate enough to own first-rate examples of the Nait, Nait 2, Nait 3 and current-spec Nait 5i. The listening was done in strict conditions, using loudspeaker cables with Naim-tolerant inductance and capacitance, and top quality phono-to-DIN interconnects, into the excellent Kudos range of loudspeakers. Here goes then – a look at each successive Nait amplifier and a direct A-B-C-D comparison.

THE MODELS: NAIM NAIT 1983-1988

The original, and some say the best, Nait was voiced by Naim's founder



1983 NAIM NAIT

Julian Vereker. I heard a 1986 vintage with red power LED (later models had green LEDs, slightly inferior sounding according to legend). Although this information was never publicly disclosed at the time, I can confirm that the first Nait's factory power output figures were 13W/8ohms and 19.5W/4ohms. The beautifully built half-size (276x205x76mm) box featured an Alps volume-control and linear

power supply that included a 100VA toroidal transformer. The aluminium casework has a shiny edge-on 'chrome bumper' finish. The front-panel has a rotary volume-control and just three inputs, inclusive of 'Phono' MM phonostage. The balance-control is fiddly to operate and source-selector buttons aren't the sturdiest. Currently, second-hand prices for the original Nait range from about £245-£345.

NAIM NAIT 2 1988-1993

Voiced by Naim's Technical Director Roy George, the Nait 2 also came in 'shoe-box' casework. From 1988 – 1989 it was the 'chrome bumper' style and afterwards replaced by the 'olive' version (black aluminium case and green front-panel) - Naim says there was no performance improvement from 'olive' over 'chrome bumper' casework, contrary to the rumours! Naim's Nait 2 power output figures equal the Nait at 13W/8ohms and 19.5W/4ohms, but the 2 was better built and more sophisticated with rotary source selector and mute, monitor, extra 'Aux' input functions, and says Naim, a "traditional balance control" (the original Nait had only gain adjustment on left channel). The 2 is also configurable into a preamplifier but only with a Naim power amplifier, and



1993 NAIM NAIT 3

not upgradeable via external power-supplies. The version I heard was of rare 1988 'chrome bumper' vintage. Second-hand 'olive' prices range from £345 while the 'chrome bumper' costs about £445.

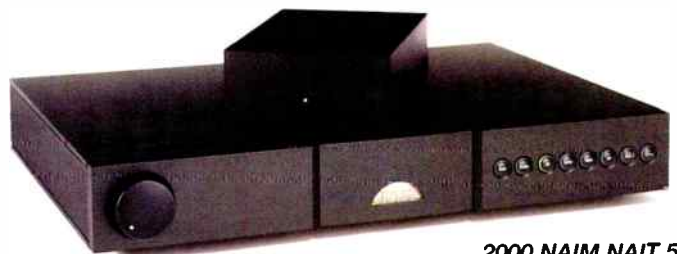
NAIM NAIT 3 1993-2000

Again voiced by Roy George, the 3 had wider 430x300x56mm 'olive' casework which Naim says allowed "for better component spacing to help improve sonic performance." The 3 looks even more minimalist with the power-switch at the rear. From 1995, a remote-controlled

minimise vibration to circuit-improving sonic performance." Power was now fed via a larger 180VA rated toroidal transformer while the preamplifier power-supplies were double regulated in comparison to the Nait 3, though Naim's power figures remained the same at 30W/8ohms and 45W/4ohms. The volume control was a discrete resistor ladder design. The 5 was more sophisticated with six DIN only inputs and the preamplifier source-selection was microprocessor controlled. A remote control was standard, which could electronically



1988 NAIM NAIT 2 ('chrome bumper' version)



2000 NAIM NAIT 5

3R (necessitating separate remote-control board) was released. The 3 could be converted to a 3R or akin to a NAC 92 preamplifier (which shared the same pre-section) thus allowing power-amplifier and power-supply upgrades. It has four DIN line-inputs (including tape in/out) and one set of phonos for optional phonostages. An Alps volume-control was used and the linear power supply's toroidal transformer had a higher 120VA rating. Naim's power output figures were also higher with 30W/8ohms and 45W/4ohms. I listened to a 1998 vintage. Second-hand prices range begin at £245.

adjust the balance and output of individual inputs. The 5 was upgradeable with preamplifiers or power amplifiers and featured an IEC mains power input, which Naim says offered "better sound quality" (it also allowed the use of non-Naim mains cables). The 5 costs approximately £445 second-hand.

NAIM NAIT 5 2000-2003

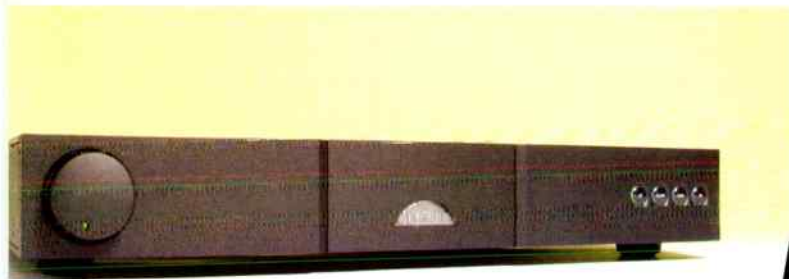
The first 'modern' Nait was also voiced by Roy George, and featured new all-black 432x301x58.5mm aluminium casework which, says Naim, had a "better chassis and decoupled preamp section to

NAIM NAIT 5I 2003-PRESENT

The current Nait 5 was voiced by Steve Sells. Without options for power supply and power amplifier upgrades and just four inputs, it is described by Naim as a, "complete redesign over the previous Nait 5, with surface mount technologies and the addition of an Alps volume pot." The 5i's linear power-supply utilises a much bigger 240VA rated transformer and an increased power-output to 50W/8ohms and 75W/4ohms (in the December 2006 HFW, Noel Keywood measured the



1990 NAIM NAIT 2 ('olive' version)



2003 NAIM NAIT 5i

5i at 60w/8ohms and 110W/4ohms). The remote controlled 5i has DIN and phono sockets, and like the 5, has the best Nait build quality overall, as evidenced by the thick front panel and finely damped source selector buttons. Its dimensions are 432x301x70mm and the current list price is £725 or around £495 second-hand.

THE LISTENING

Throughout the audition period, all the Nait's were partnered with a £2,950 Naim CDX2 CD player, £495 Hi-Line interconnect, £1,450 Kudos Cardea C1 standmount loudspeakers and £11/m Naim NAC A5 loudspeaker cable. The C1s have a claimed 87dB sensitivity with 8ohms impedance and were sited on £175 Kudos S50 stands.

Kicking off with the very first Nait, 'Car Wheels On A Gravel Road' by Lucinda Williams was pure and clear. The sound was vibrant and alive. It was just as good with the hard rock dynamics of 'Celebrity Skin' by Hole, where the musical timing was impeccable for such a modest device, giving a stunning level of precision. Instrumental phrasing was so clear and enjoyable that I found this an amazingly engaging and fun amplifier to listen to.

Moving to the Nait 2 brought obviously higher resolution to the vocals with both the Lucinda Williams and Hole tracks. Here the sound was also fuller and deeper, and I could hear the timbre of the instruments brilliantly. Bass became wonderfully tuneful and cymbals more expressive, giving the sense of quieter musical backgrounds to all the CDs I'd used. I could simply hear more information, but there was still a slight lack of 'air' compared to the original Nait.

Moving to the Nait 3, and Lucinda Williams sounded even purer. Here her vocals were more natural and expressive, and there was a superb upper-bass and lower-midband quality to the drums, bass and guitar. On Hole's rock music there was more drive and dynamics compared to the Nait 2, and the music sounded more effortless. One of the key differences with the Nait

3 was its ability to open out the sound with greater spatiality. Coltrane's 'A Love Supreme' was more convincingly reproduced – especially the cymbals, drums and saxophone. However the Nait 3's high frequencies could also sound a touch sharp with female vocals at crescendos.

Moving to the current Nait 5i was fascinating. It was very immediate sounding in comparison - here Hole and Lucinda Williams sounded instantly punchier, as if the 5i had grabbed the music with an invisible hand. The sound was highly structured with everything in its place, from cymbals to guitars and violins and violas. Due to its immediacy, the 5i felt more forward than its predecessors but also much 'quieter' than the Nait 3, and more focused but a little less free-flowing as a result. The 5i showed its superiority with the tonal qualities of the music where the viola, violin and cello work of the Kronos Quartet was revealed with greater depth and more convincing timbre than the other Nait's. While sheer 'loudness' was never a consideration with any of the Nait's in the review system, the 5i did show the older models how it was more powerful sounding, even at the same volume.

CONCLUSION

Like many I suspect, I have often wondered what all the various different Nait's would sound like, and here I got a rare first-hand insight into Naim Audio's musical evolution. What I found was that the original Nait had the best musical timing with precision tempos. The Nait 2 had the most tuneful bass with a much quieter musical background in comparison to the Nait. The Nait 3 had clearer sound overall than all the others, and opened out the music superbly by being the most free flowing. The Nait 5i was easily the most refined, yet was more immediate too. It proved superb with



the tonal qualities of instruments, and added a dash of sweetness to higher frequencies also. Personally, I was torn between Nait's 2 and 3 - but any of these versions, new or old, would still be my top recommended integrated amplifier in the £500-£900 price range – and don't forget that Naim have an outstanding service back-up with prices from about £145 - £250 for a full rebuild.

A fascinating comparison then, which for me debunked the myth about the first Nait being the best. It's easiest to characterise the first three as being quite similar – think of them as Keith Richards; characterful, with a swaggering tunefulness. The later 5i however is more of a Mick Jagger - still musically virile after all these years but more urbane. Nait's have changed for sure, but for me they all remain highly endearing and – thanks to that brilliant Salisbury service back up – brilliant second-hand buys.

Thanks to Doug Graham, Jason Gould and the team at Naim Audio (+44 (0)1722 426 600, www.naim-audio.com).

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"the good old Technics can more than hold its head up..."



adam smith

The audiophile forums on the internet seem to be abuzz with another new hot topic, one which is very much close to my heart as it involves vinyl replay. You see, people are cottoning onto the recently revived subject of modifying the good old Technics SL1200 and I know that there has been some keen anticipation for David's upgrade article that we finally published last month. As a matter of interest I received both a number of direct emails as well as a few forum questions to the effect of "When is it coming?", prior to its eventual arrival. Consequently we can only apologise for the unforeseen delays that meant a three month or so wait for those of you out there in audioland, with screwdrivers and drills poised!

Still, the article finally made it into print and the controversy and comments have not stopped there. Naturally, we hoped for quite a few positive comments and have not been disappointed. It seems that quite a few people are now realising that the good old Technics can more than hold its head up against the current crop of budget superdecks from the likes of Project and Rega - that is not to say it is out and out better in standard form, it just offers a different musical presentation, one which seems to appeal to quite a few listeners out there, judging by our postbag.

However, to counterbalance these, there are still plenty of people out there that cannot believe that we are bothering to waste our time mucking around with a thirty year old piece of "Jap crap". The problem is that, whilst there may be a whole wealth of excellent turntable designs

on the market now (and there are - with quite a few more that we know of in the pipeline) the sort of things that the Technics does so well are the sort of things that you generally have to pay far more on a modern design in order to achieve. If anyone out there can show me a brand new deck for under £1,000 that can match even a standard SL1200 for bass dexterity, tunefulness and sheer punch then I'll eat my Achromat. So, to any doubters out there I would say that you really need to listen for yourself - maybe the resulting sound isn't your cup of tea, in which case, fine, but at least be prepared to countenance the possibility that this old timer still has plenty of audiophile life left in it.

As a further thought, I know that manufacturers often take a surprising interest in these sort of discussions and I would not be at all surprised if at least one voice at Technics HQ has raised the possibility of either offering the SL1200 with the option of a better arm or, even better, resurrecting the SL120 armless version - how about it, Technics?

In the meantime, the current discussions and articles have taken care of the people who purely wish to gain the sort of sound that the Technics makes for as reasonable an outlay as possible, but there's another select band of tweekers out there, namely those who are purely interested in just how much performance can be wrung out of an old deck, regardless of cost.

This is another topic that is of interest to me, as my main vinyl spinner of choice is a Garrard 301. Let us not forget that, twenty years ago, these were largely considered old relics that were worth very little, as they belonged to a bygone era of

tracking weights measured in ounces rather than grams, and big, resonant plinths that amplified rumble with great enthusiasm. Fast forward to today, and there is a whole industry built around servicing these machines, supplying spare parts for them (newly remanufactured in some cases), making solid plinths for them and optimising various aspects of their performance. These decks can no longer be picked up for pocket money, unless you are astoundingly lucky, and the sky is the limit as far as potential upgrade costs are concerned.

I suspect it will not be too long before a host of similar items crop up for older direct drives like the Technics to rival the likes of KAB Electro Acoustics in the USA who are, to the best of my knowledge, the only people who market a range of Technics upgrades at the moment. They sell power supplies, fluid damper troughs for the original arm, 78rpm kits and even a circuit that disables the strobe for improved performance.

As mentioned before, I have a Technics SL1210 that is now sat idle and I hope to start having a good poke around it with a view to applying suitable upgrades some time soon, and am looking forward to seeing just what it can do. At the moment, however, I am happy to go back to those internet discussion groups and embroil myself in the debates of which material works best as an armboard, whether the Mk2 or Mk5 give better performance, and which replacement arm is the one to go for. As to predicting which turntable will be the next 'big thing' another twenty years down the line, I wouldn't like to guess! ●

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"a more expensive hi-fi system isn't necessarily going to bring any more pleasure than a cheaper one..."



dominic todd

What's the fastest car you'll ever drive? Reckon it's something exotic and Italian, an uber-engineered German or perhaps a US muscle car? Well, in fact the answer is probably none of these. That's because, as all drivers know, the fastest car we all get to drive is most probably our first car! It can be as lowly as a 1,000cc shopping trolley, but combine the thrill of a recently-won sensation with the headstrong attitude of youth, and it's more than probable that your first car will be driven like no other – tyres will screech, axles will tramp, brakes will take a hammering and valves will bounce – regularly!

Talk to long-standing hi-fi addicts, and you may find a similar sentiment. Many audiophiles have fond memories of a student system that probably consisted of a Dual CS505 turntable, NAD 3020 integrated amplifier and Wharfedale Diamond loudspeakers. It's this system that's often remembered long after many more illustrious components have come and gone. Careless student days and discovering the joys of music, amongst other things, will probably cloud the issue somewhat, but in terms of musical enjoyment, there's often little to beat a decent budget system – even if it may have taken something of a thrashing from time to time!

Of course, rather like a car only being as good as the road it's driven on, a system can never make up for the music played on it. There's nothing sadder, in hi-fi terms at least, than to see a top-flight system whose owner only has a dozen or so 'test' discs and probably little interest in music at all.

So, when it comes to it, a more expensive hi-fi system isn't necessarily

going to bring us any more pleasure than a cheaper one. Yet perhaps there's more to this than mere price. For most of us our first experience of quality hi-fi is probably the typical student system. This is the system that we have the first bond with and therefore this is the system that forevermore conditions our tastes in hi-fi.

Those brought up with a decent turntable probably still prefer the sound. Those who've only ever had a decent CD player will probably prefer CD. It's not a case of one format or product sounding categorically better than the other, merely that tastes differ, and tastes differ because we've all acquired our own set of sonic senses and preferences. This is why there will always be those that prefer CD to vinyl, cassette to MP3 or transistors to valve amplification. It's also the reason why, much to the annoyance of many hi-fi dealers, a good number of us will audition five pairs of well reviewed loudspeakers, only to leave the shop empty handed as we prefer our existing ten-year-old 'speakers back at home.

The time we find our greatest aural challenge is when a new format or technology is introduced. Over my time in reviewing I've had to adapt to the sound of upsampling, compressed music, DVD-A, SACD, NXT speakers, 1 bit DACs and a host of other one-off technologies. It would be fair to say that if the said product is merely trying to represent the music in the truest manner possible, then there shouldn't be any difference in the sound quality at all, but we all know this not to be the case; different technologies do sound different and do put their own sonic signature on the sound.

The idea of sonic signatures and personal sonic comfort zones has been especially resonant with me of late. The technology in question here is Class D amplification. This is the amplification format that's rapidly making inroads into all aspects of audio from portables to high end power amps. The problem is that, although I admire the logic behind Class D - low energy use, compact size and amazing power outputs - I've yet to hear one in an application that I actually like the sound of. To me, all the Class D amps I've heard sound as though they're twisting the harmonics in the upper midrange. There's something about violin reproduction, in particular, that just doesn't sound right. Whether this is just because the sound is unfamiliar to me and that I need to adapt – just as I do when switching between CD and vinyl or valve and transistor – or if it's that the technology has yet to be used to its full potential remains to be seen. Clearly, it is still early days for Class D and it's only very recently that there's been a real investment and commitment in the technology from established brands. If we think back to MiniDisc or CD, it took a good number of years before the technology came good.

Perhaps it's just that I can't relax with the music as I'm constantly listening out for subtle differences – right and proper for reviewing but dreadful when you're just trying to let the music wash over you. Either way, there will always be good and bad examples of the technology, so ranking and judging products will remain an objective task. As to whether we actually like the sound though, well, that remains subjective. To paraphrase Star Trek, "it's hi-fi Jim, but not as we know it..." ●

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VERDICT



"vinyl is still king of the hi-fi hill. To say otherwise is hubris!"



paul rigby

Hubris - possibly humanity's greatest failing. From the great to the terrible: Henry The Eighth had lots of it and the second part of Adolf Hitler's biography, written by the eminent historian Ian Kershaw was actually entitled with this very word. It's also to be found on more intimate levels - your last headmaster or PE teacher, or even the local traffic warden?

Hubris can also be linked to laziness where, through a lack of knowledge, arrogance is used to bluff through a situation. Such attitudes can be dangerous of course, within people of influence, especially when they find the ears of the ignorant. I'm a freelance journalist, and I've seen enough of my colleagues - fortunately not connected with *Hi-Fi World* - who would rather sit on their backsides and spout from a press release rather than find the core of the story and the real facts. Remember this when you read your daily paper over your next breakfast...

However, the worst case of hubris can actually change your daily life and, in extreme cases, history itself. Humanity has an annoying habit of taking a piece of knowledge, examining it in wonder, exclaiming that it's the best thing since sliced bread and then playing with it like a two-year old child, wallowing in its ownership and the fact that it exists at all.

One of the solutions to hubris is to repeatedly say to yourself that

you know next to nothing. Another solution is to believe in lateral thinking. Another is to believe that everything is connected to everything else. Nothing in the universe acts on its own. Patrick McGoohan was right when, in his TV series 'The Prisoner', he proclaimed that he was not a number. However, that doesn't mean he - or we - are individuals. We, at the risk of me turning into a Buddhist before your very eyes, are part of the whole.

One man I recently talked to understands this. Klaus Schulze is a Krautrock legend. He was a member of the legendary German electronica outfit Tangerine Dream, appearing on their debut album 'Electronic Meditation', and in 1969 he cofounded another legendary group, Ash Ra Tempel, debuting in 1971. He first used synthesisers in 1972, they made their first appearance in 'Blackdance' a solo album he issued in 1973. Schulze later moved into, and embraced, dance culture as well as his own, more ambient soundscape works.

Schulze touched on another form of hubris, found in the hi-fi arena. Specifically, those music fans who believe that the noises emanating from a CD are all we ever need because, hey, anything else over and above that is inaudible to the human ear, so why bother?

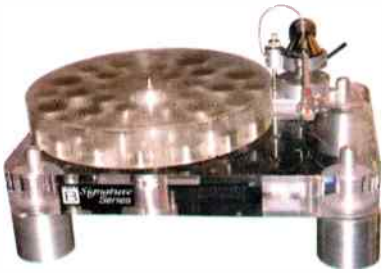
Schulze is of the view that, "when you listen to opera, there are an incredible amount of overtones that move over 20kHz from the orchestra and the vocals. These are the most

difficult areas for digital to reproduce. Of course, we don't hear these overtones. However, they influence the frequency range that we do hear. For example, on a piano, if you play a deep note and then play a high note simultaneously, the two wave patterns merge and interact and create new waves. The same things occur during the frequency spectrum of other general recordings. We hear with our ears from around 15Hz-20kHz but there are lots of sounds above and below that we don't hear. Many people say that they don't matter. Of course, it doesn't really matter that we hear these tones but the influence of these waveforms changes other sounds that we do hear. So, whilst we don't hear the origin, we hear the influence ...unless you're Batman."

Which, Batman aside, is the ultimate damning case against Compact Disc and the ultimate triumphant statement for vinyl. CD pumps out far less of Schulze's 'overtones'. So you're also not going to get all the intermodulations, the combining of the audible with the inaudible, like water ripples, that give you that newly created added extra. That - despite its problems with conveying bass due to its own inherent technical drawbacks, the 'warmth' that is added largely due to mechanical influences elsewhere and the fact that it can click and pop like an avant-garde electronica combo - is why vinyl is still king of this particular hi-fi hill. To say otherwise is, I tell you now, hubris! ●

Walrus

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"the BBC has got a hell of a lot to answer for with regards to DAB..."



steven green

Following last month's incident when the BBC's honesty was called into question, Director General Mark Thompson said, "we must never, ever knowingly deceive the public. There is no excuse for deception... we will regard deception as a very grave breach of discipline". I have to say that I think it's great that the BBC won't be deceiving the public any longer, because I happen to think that's exactly what they have been doing for several years over DAB.

The first example of this happened in 2000 when they published a public consultation for their five new digital radio stations. The situation was that adding five new stations to their already almost full national DAB multiplex would inevitably lead to a drastic reduction in quality. But quoting from an email sent by Simon Nelson, who was the BBC Controller in charge of DAB at the time, and the architect behind adding the five new stations to DAB, "the BBC didn't raise the consequences for audio quality of additional stations when we consulted the public about them."

I'm in no doubt that the BBC deliberately withheld this crucial piece of information from the public because they will have known that being honest about the reduction in audio quality would have jeopardised their plans to launch all five of their proposed stations. As it transpired, most respondents to the consultation were actually against the BBC launching two of the stations, but all five stations still launched anyway.

Then, on 21st December 2001, the BBC reduced the bit rates of all existing stations on their multiplex to the levels that they would be forced to use once all of the new stations

had launched. The problem with this was that the reduction in bit rates happened ten months before it was necessary to reduce them! The only plausible explanation for this was to minimise the number of people that would experience the stations at higher quality – applying the old adage: what they don't know won't hurt them...

Since then, the BBC's attitude towards the audio quality issue has simply been to consistently deny that there is even a problem. For example, Simon Nelson appeared on Radio 4 Feedback twice and on the PM programme, and although the very reason he appeared was due to people complaining about the quality, he used each appearance as an opportunity to promote DAB on the basis of its sound quality!

One such example was as follows, "and the message we need to get across is that for the vast majority of people, the sound quality they're getting through their digital radio set is vastly superior to that which they've ever had through their analogue radio." And when he was asked why Radio 4 was sometimes reduced to mono on DAB, he replied, "yes, that does happen from time to time. Erm, it's because the programme has been made in mono". The truthful answer, which he must have known, considering that it was his job to decide such things, was that Radio 4 is reduced to mono whenever Radio 5 Sports Extra is on-air after 5pm – it is a pure coincidence if Radio 4 is in mono on DAB and the programme being broadcast was made in mono.

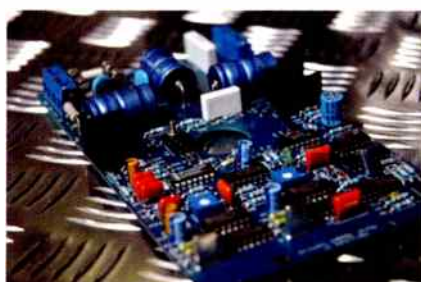
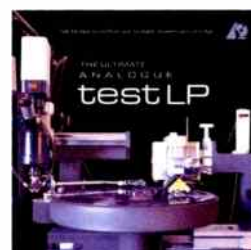
I thought I'd heard the last of this kind of thing now that Simon Nelson has moved to TV (he was promoted, which speaks volumes about the BBC's attitude towards

quality these days). But when his successor, Mark Friend, appeared on 'Feedback' in early August to answer questions about DAB and DAB+, he said, "Is DAB in danger of becoming an obsolete technology? I would say no." But he then bizarrely went on to mention that we would be able to buy radios with DAB+ in the coming months – i.e. the exact technology that will without question make DAB obsolete in the coming years!

The BBC also partly funds the DRDB (Digital Radio Development Bureau), and the BBC's Director of Radio, Jenny Abramsky, is its Vice-Chair. The DRDB is the organisation behind the numerous advertising campaigns you might have heard for DAB on commercial radio, which in the past have claimed that DAB provides "superb digital quality sound", along with making numerous highly disparaging remarks about FM. The claim that DAB provides "superb digital quality sound" is obviously trying to suggest that DAB provides CD-quality, and this claim was also the first thing people saw when they visited the BBC Digital Radio website until around a couple of years ago – that website reportedly used to receive 900,000 visitors per week when the BBC's DAB adverts were being shown on TV.

Another area that I've become increasingly concerned about is whether the BBC is deliberately degrading the audio quality on the non-DAB platforms. But I plan to return to this issue at a later date, so I won't say anything more about it here. Admittedly, things have improved since Mark Thompson took over as Director-General, but the BBC has got a hell of a lot to answer for with regards to DAB, and they're still nowhere near being honest about it. ●

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"I heard some brilliant stereo from the AV receivers in this month's group test..."



noel keyword

I know many of you get apoplectic if we dare mention the term "surround sound", but it really is rather good - honest! What amazes me most however is that the accent on this whole technology has swung decidedly away from the picture side of things toward real high fidelity. And they told us stereo was dead!

Yes, I did say "stereo", because I heard some brilliant two channel from the AV receivers reviewed in this month's group test; they are fine at it. And you can have so much more than stereo if you want. Coupled to a decent modern DVD player (I ended up using Arcam's DV-139), they'll play DVD-A, video DVD, CD, multichannel SACD and just about anything else you can throw at them. Alright, the user manuals are an inch thick and you have to read them front to back - especially the small print - intently to get things working. And the technology is more complicated than ever, we found. But the end result was more impressive than ever too.

Even with favourite CDs I have been playing for years, like Gerry Rafferty's 'North and South', results were fantastic. This has always sounded a little muddled, as you might expect from a heavily mixed album from the late 1980s, but on these receivers it sounded cleaner and clearer than I ever remember it, especially with Pure Direct selected. Most receivers have this and it is just one of many concessions to audiophiles.

I know the main drawback to surround sound is getting five loudspeakers and a subwoofer into the lounge without losing floor area and suffering their looming visual presence. Heavens, even a pair of Tannoy Yorkminsters fitted my lounge better than surround sound does and, to my eyes at least (there's 'debate'

about this!); they looked nicer too. Only the front Centre 'speaker' defeats me, as below the TV it is too low for my taste, and above it is too high. In due course I may be able to overcome this by finding a receiver that adds Centre into Left and Right channels, in order to eliminate the Centre speaker altogether. This, in effect gives stereo up front and is 4.1, or Quadraphonic!

Much of the complication today's buyers face is due to the fact that old standards are being dropped and new ones adopted. During the changeover phase we have both old and new, making everything twice as confusing. With HDMI you need not use any analogue input or output, in theory, yet there are lines of them on every receiver. Ironically, the only one I turn to for plug-and-play salvation, SCART, is the first to go, so if you have a SCART-only TV you will need an adaptor lead.

Added to the complication are the wrinkles. The signal routing and sensing inside a receiver is horrendous, as are the various digital conversion schemes, especially those for upsampling video. My determination to get SACD playing properly through an HDMI link unearthed a few of them. Marantz DV7001 and Denon SACD players don't output DSD (the high resolution digital data on SACD) digitally, so with both of them I was met with silence from SACD; an analogue connection must be used.

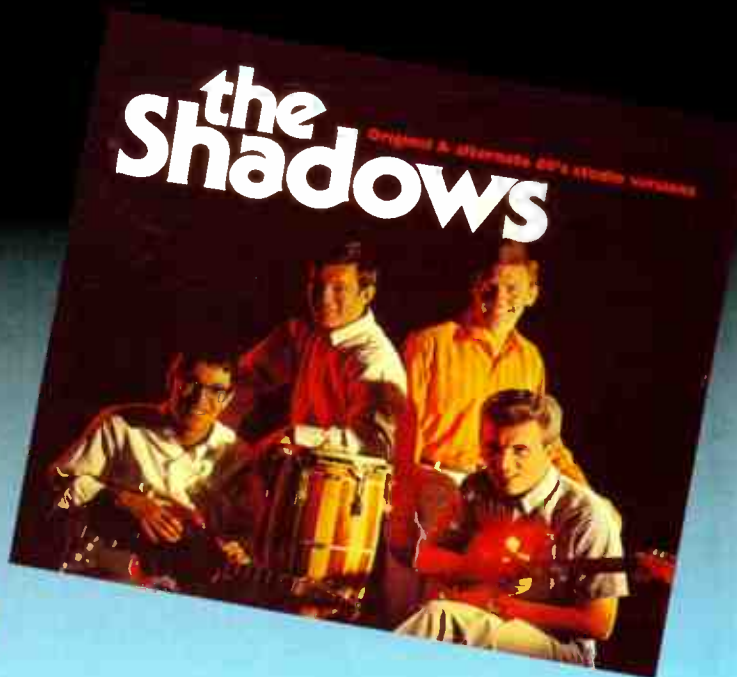
Arcam's DV-139 converts DSD to PCM internally and outputs that instead. So I connected a DV-139 to the Marantz SR6001 receiver and was met by - silence! It turned out that selecting CD Direct on the DV-139, which was meant to turn off video information for a better sound, also turned off the audio, via HDMI anyway. DVDs of all sorts played, but

CD would not until I turned CD Direct off. Oh the bafflement...

Multichannel SACDs and CDs then started playing via the HDMI link, until I put in Eleanor McEvoy's 'Yola' stereo SACD, that is. The Marantz then fell resolutely silent again; no amount of button pressing during an evening test session had any effect, so I went to bed.

Wandering in with a cup of coffee in the morning I switched the system back on, pressed Play on the DV-139 to try again - and was greeted by music! What had I done differently, I wondered, or did the SR6001 just work properly after a good sleep? Experiment showed that after playing multichannel PCM the Marantz would not change data rate to stereo 176.4kHz automatically; it had to be switched off and back on. Then, at last, I was greeted by wonderful sound quality from high resolution stereo (DSD layer) from SACDs.

This shows how erratic and baffling the whole business of surround currently is. On the plus side though, as I had hoped, playing the high resolution DSD data of SACDs through a digital HDMI link to the Marantz gave superb sound quality, from stereo or multichannel SACD recordings. I also got a wonderfully rich panorama of sound from discs like Carlos Santana's 'Supernatural' DVD-A, mixed and mastered in 24/96 specifically for surround. This had a crystal-clear front sound stage free from the middle CD stereo suffers, with Santana, drums and other instruments clearly positioned on it, but with percussion in rear channels, as well as some frontal bleed to add stage depth. A disc like this demonstrates just how good high resolution surround sound can be. Hopefully, with Blu-ray and HD-DVD it will get even better. ●



ENNIO MORRICONE
L'Alibi
Dagored

Ennio Morricone is nothing if not prolific - this guy could never be accused of being lazy. He has recorded hundreds of film scores plus many other experimental and collaborative works, too. Best known for his 'spaghetti western' creations and his close work with Sergio Leone on films such as 'The Good, the Bad and the Ugly' and 'A Fistful of Dollars', Morricone is also one the most collected of all soundtrack composers due to his innovative approach, and the fact that he touches on so many diverse genres, as his works cover jazz, pop, rock and electronica. He's also not afraid to include *avant-garde* ideas, even in broad commercial projects. This example from the 1969 film covers a wide range of moods. For example, one minute the soundtrack utilises pop and bossa nova rhythms, the next Morricone is infusing the music with tension and portent with orchestral dissonance.

One of Morricone's signature stylings is his use of the voice as an instrument, which he often uses to great effect and does successfully here - whether that be via a vocalisation or whistling, the latter being another trademark of the man. Morricone's vocalisations are mixed with complimentary orchestral *avant-garde* touches. There's also a sleazy side to the music, used with soaring chorals and swooping strings and lightly treated percussion.

This is an excellent CD and, unlike some composers who think up a five minute theme and then beat it to death by cramming the accompanying CD soundtrack with twenty five different variations on that single theme, Morricone takes us on a musical journey, as a regular instrumental album would. This release arrives in a gatefold digipack with images from the original film within. Also look out for other soundtracks which were released around the same time as this: 'Corleone', 'I Crudeli' and 'Trio Infernale'.

THE SHADOWS
Original & Alternate '60s Studio Versions
Magic Records

Bernard Broche, President of The French Fan Club for The Shadows, helped Magic Records in the creation of this and many other Magic Shadows CD reissues. A serious collector holding thousands of 'Shads' records, Broche is also close to the band. "The Shadows members know me well, I've always sent a copy of all final CDs to The Shadows members and the Cliff Richard organisation," he said. Broche, in fact, was able to help fill in gaps left by EMI, "I personally have all Shadows tracks so, if Magic Records requires a particular track that is not available via the master tapes, I send it to Magic," he said.

This extends to the artwork. Magic has a wide range of Shadows reissues present on digipack in which they take the original album and populate them with many extra live or unreleased tracks or other songs created in the same year

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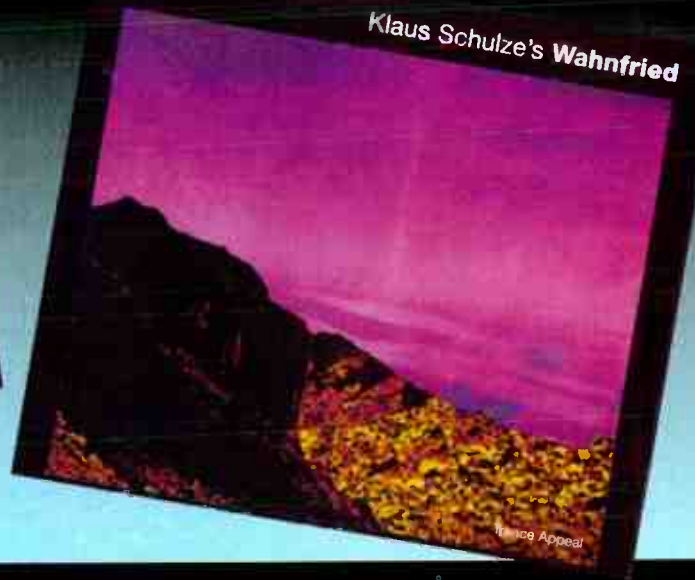
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Richard Barbieri
Things Buried

Klaus Schulze's Wahnfried



of that album's release, "then the artwork is scanned from a record in my collection, showing the original French album, single or EP covers," said Broche. Which, apart from the extra tracks, provides an excellent alternative to the normal UK release fare.

This 2CD release takes many nineteen sixties releases and, basically, doubles up – issuing the original stereo version and then an alternative stereo version or the original stereo version and an alternative mono version or, in one case, 'Perfidia', the original stereo version and the alternative French mono version. There are unreleased tracks here too, including an alternative stereo version of 'I Wish I Could Shimmy Like My Sister Arthur (John's Rocker)'. The double CD is held in a very presentable gatefold, fold-out digipack, featuring liner notes in French by Broche and contemporary colour photographs of The Shadows in action.

RICHARD BARBIERI *Things Buried* Snapper

Ex-Japan keyboardist and current member of the band Porcupine Tree, this CD might surprise some as it's his very first solo album – despite around thirty years in the business! So why now? "I saw a lot of people go through solo work and they always found it a miserable experience; self-doubt and paranoia crept in. I remember watching David Sylvian making his solo albums after he left Japan. He was always concerned and it didn't seem an overly joyous experience. Also, I like working with

people and receiving some sort of creative feedback. I was always guarded about working on my own because you can get very lost as it's all from your perspective." So is it a confidence thing? "I think it might be, yeah," agreed Barbieri. So what's changed? "The technology has enabled me to make music on the move and jot down ideas at my own speed. There's no pressure of working in an expensive studio. Also, the concept helped."

For a clue to the concept look at the album title. 'Things Buried' relates to things in your past that pop up out of nowhere into your head. Memories for different times of your life that, when triggered, roll through your head like a short film. "I got to the point where I could have released the album as it was, but what I was yearning for was a human feel to recording the album." Hence, the inclusion of Andy Gangaden from The Bays and the legendary Percy Jones, famed for his work with Brian Eno and Brand X. Japan fans will love this album, it has that late period, slightly spooky, Japan feel to it with extra maturity that has been enhanced by life experience. A beautiful yet powerful album.

CLAUS SCHULZE's Wahnfried *Trance Appeal* SPV

Keyboard wizard and Krautrock legend Klaus Schulze is, I reckon, one of the few artists who might give Ennio Morricone a run for his money regarding the accumulation of creative works. Schulze creates a lot more work than ever hits the shelves but

those releases are certainly plentiful. Although he normally prefers to work solo, ("In Tangerine Dream we used to talk about music for ten hours and play only for one"), this 1996 release, sees another Klaus Schulze, under the Wahnfried pseudonym, as his collaborationist project name.

Although revelling in his solo work, he does enjoy working with artists he trusts. In this case it was Jorg Schaaf who worked on keyboards and computer programming. "The collaborative idea was taken from my one-off appearance with a collective called Go," explained Schulze, "an English band featuring Stomu Yamashita, Steve Winwood, Al Di Meola, Jerome Rimson, Michael Shrieve and Phil Manzanera. I found the idea very nice and so decided upon Wahnfried, a 'band' name with different collaborators".

Each collaboration dominated the flavour of the album. For example, there have been other Wahnfried albums with mainly percussive or guitar flavours because those collaborators played those instruments. "My band pseudonym for the Wahnfried projects is 'Richard Wahnfried'. The Richard part comes from the classical composer, Richard Wagner, and the Wahnfried part was the name of Wagner's house. I think I did eight Wahnfried albums in total." The end result is a mixture of ambient washes interspersed with surprising interjections of synth and choral work to provide texture. These flavours are mixed with almost Kraftwerk-like bass fests and trance dance celebrations that demand you throw your hands in the air.

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Designing Speakers

Part 11 – WD18BR – Refining the Crossover

It's all in the listening. Peter Comeau shows you how to refine your crossover using your ears and LspCAD.

Last month we ended with fine tuning the crossover in LspCAD6 Lite to achieve a frequency and phase response which was likely to give us good listening results. Well, guess what, it did just that! When I built the crossover and ran a pair of prototypes my daughter commented that it really sounded as though there was a jazz band in the room. But that doesn't mean we cannot refine the crossover further. If it was that easy to create a great sounding speaker then everyone would be doing it!

The first thing is to play a variety of music to hear what is right and what is wrong with the speakers as they stand. What my daughter had remarked on was a disc that I normally use on first listening. It is a big jazz band disc that is so well recorded that it sounds good on just about anything. That doesn't mean that it always sounds 'right' on any speaker, just that it makes most speakers sound better than they usually are.

So why start with it? Well I don't like becoming dispirited on first listening! If I start off with a disc with what I would call 'difficult' music I'm usually tempted to throw in the towel and start the design all over again. So find some 'easy listening' music to start with and bask in the glory of your creation.

After a few minutes you should find that there is something niggling at your brain. Something that isn't quite right. Even with the jazz band playing I could easily hear that the bass was too powerful, for example. Now a lot of people love that from a stand mount speaker. To create a compact design that sounds as

though it has the prodigious bass output of a floorstander is quite a feat!

Cast your mind back to the work that we did in LspCAD6 Lite on the virtual enclosure tuning and you may remember that the SEAS H1217 driver gave a 'hump' in the bass response before roll off. It is this 'hump' that is responsible for the bass emphasis. Launch a commercial speaker like this and it might be an instant success. Demos of speakers with emphasised bass and treble often result in a quick sale.



But for long-term listening pleasure, forget it!

What we should be after is a speaker that reproduces music in a



Fig. 1 - Effect of increasing bass unit series coil to 1.6mH to induce a falling upper midrange level

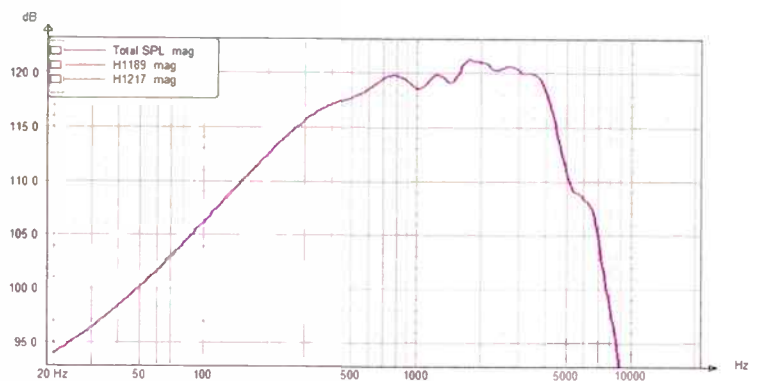


Fig. 2 - Effect of reducing bass unit series coil to 0.6mH to induce a rising upper midrange level

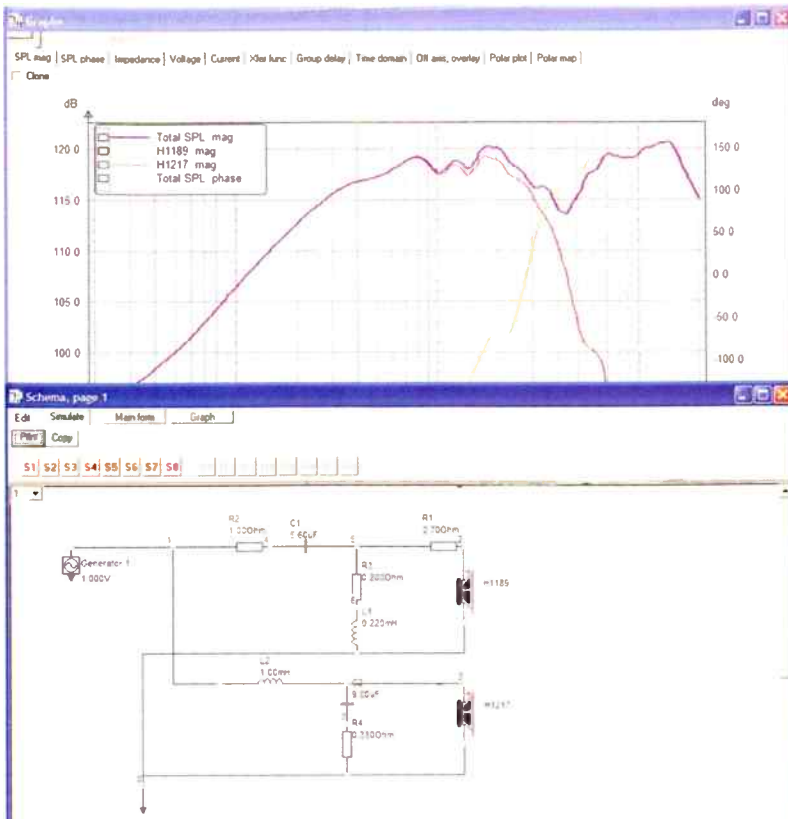


Fig. 3 - Effect on crossover of changing bass unit series coil value.

natural manner without any bass, treble or midrange emphasis. In fact it would be marvellous not to have any emphasis on any part of the spectrum at all. Then we can be sure that, whatever the style of music, the speaker will play it in a natural and realistic manner.

At this point you may be asking why this bass emphasis didn't show up on our frequency response graph. Could we not have tuned it out when we were refining the crossover in LspCAD6 Lite? The short answer is that any measurements you take with a short 'gated' window in the time domain will restrict the bass response analysis. We have to choose a short 'gated' window in order to rule out the floor reflection and this also selects out the long wavelengths i.e. the bass frequencies.

So, should we struggle to try and capture the bass response? Only if you want to display the ruler flat frequency response to friends and, perhaps, customers! Your ears can tell you far more about the bass performance of the speaker than the frequency response can!

Anyway, back to the plot (sorry). I can hear the bass emphasis quite clearly, so what to do about it. What we have to do is re-balance the speaker, and we do this by restoring some of the midrange and treble that our prototype crossover has pruned out when we aimed for the ruler-flat frequency response in LspCAD. Note that this does not mean that LspCAD6 Lite got it wrong. All it

means is that we made the wrong decision at the time based, in this case, on not enough evidence i.e. not being able to 'see' the bass response.

BIG BASS FACTOR

Now the big factor in any crossover which balances the midrange and bass performance is the series coil to the bass unit. Make it bigger and the midrange plunges downwards. Make it smaller and the midrange hurtles skywards. (Figs.1 & 2)

Remember that we put in a fairly hefty coil to help overcome the baffle step at between 500 and

600Hz. Well it looks as though we've overdone it. What we see on the frequency response isn't necessarily what we hear. And, as the baffle step is due to diffraction round the cabinet, it is often far more innocuous audibly than it appears on the response graph.

Here room acoustics come into play. For example because there is a wall behind the speaker some of the output of the speaker that diffracts around the cabinet, (and looks 'lost' on the measured response), is reflected forward to the listener. The upshot is that completely levelling the baffle diffraction step might yield a ruler-flat measured response but usually results in a depressed midrange when the speaker is playing in your living room.

Of course you could go back to LspCAD6 Lite at this point and play with the crossover component values but I suggest you do some tuning through listening first. The reason is that it is useful to become used to the iteration between listening and testing. If you do all your work theoretically you will find arriving at the final 'perfect' solution takes a lot longer than if you alternate between listening and measurement.

So the very next thing I did was slot in some smaller value coils and listen for when the midrange and bass achieved a better balance. This should be fairly obvious but I would point out that, when you change the coil value, you are going to wreck your crossover with the treble unit.

Personally I can 'dial out' the treble in my mind when I'm listening to the midrange/bass balance. You might find this difficult, in which case you may find it helpful to

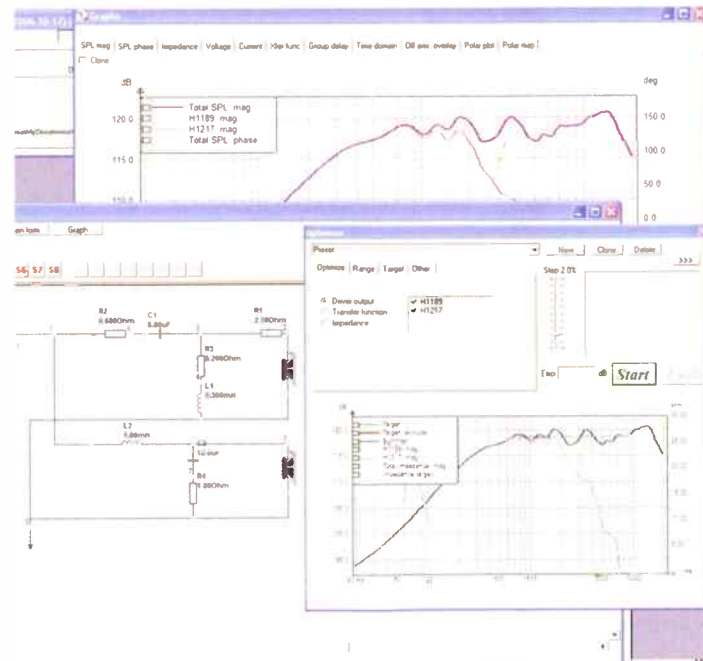


Fig. 4 - Using LspCAD's Optimiser to smooth the response through the crossover region..

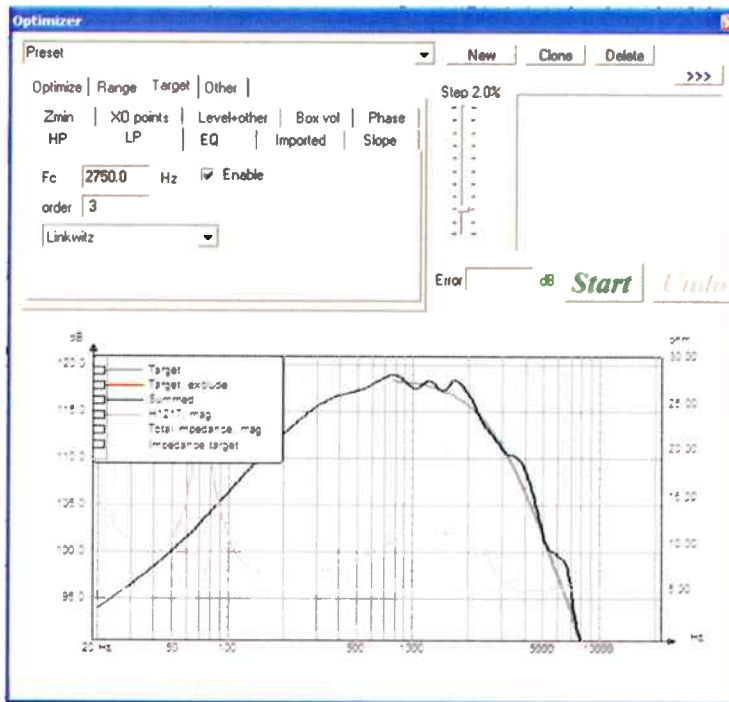


Fig. 5 - Using the Optimiser to check the acoustic slope against a Target slope. You can fine tune the component values manually to see how close to the Target slope you can get, or let the Optimiser try too.

disconnect the treble unit so it doesn't interfere with the bass crossover you are changing. As I bi-wire my prototype crossovers as standard it is really easy to do this – just unplug the lead to the treble section!

After a bit of listening to a few discs I found that dropping the series coil value down to 1mH (from the original 1.25mH) gave me a better balance. The bass still sounded a bit fulsome but remember that I haven't brought the treble level up yet. The main thing was that the midrange had now been restored to a more forward position.

Now we can get back into LspCAD and see what plugging in a 1mH coil gives us. Whoops, the graph now looks very ragged through the crossover, though this is hardly unexpected (fig. 3). So back to the Optimiser and we'll see if we can correct this.

As a quickie I can enter the required flat response Target, (I have chosen 800Hz to 10KHz and set a suitable Level), into LspCAD6 Lite, select both drive units and all the crossover components with the exception of L2 (because L2=1mH is what I chose through listening), and click the Start button. The result, after manually modifying the circuit to choose preferred component values, is shown in fig. 4.

Now this is quite a good balance overall but I don't like the appearance of those humps either side of the dip at the crossover frequency. These may balance out tonally but I would

expect such peaks to make the speaker sound overbright. I would prefer to move a little closer to my target performance before I start listening again so let us have a look at the crossover slopes to see what clues those give us.

Again I can use the Optimiser. Instead of the flat response Target I use the LP and HP filter options and select the appropriate drive unit to look at. Eyeballing the SPL graph I guess the crossover to be at 2750Hz, so I enter that into the Target. Now what crossover slope to use? Well

a Linkwitz 3rd order looks a close match to the bass driver crossover (see fig.5) so we will stick with that. (Purists may like to point out that, electrically, there is no such thing as a Linkwitz 3rd order. But here we are looking at a combination of a 2nd order electrical filter plus the acoustic roll-off of the drive unit which gives us a 3rd order slope).

Apply the same slope and frequency to the treble unit and we start to see where the discontinuities appear from (fig. 6). There isn't much we can do about the dip at 2.3KHz as that, again, is something diffracting on the cabinet, but we can attack the 3 – 4KHz area. Deselect L2, C2 and R4 from the Optimise window, click Start and...not much happens! That's LspCAD trying to tell us something. And that something is that we will have problems optimising the response at that particular crossover frequency. So let us try a different approach.

Now let's assume, for a moment, that the dip in the treble response at 2.3kHz isn't really there. Yes, I know we can see it on the graph but if it is a result of diffraction it may not show up on all the listening and measurement axes. So let's try ignoring it and sort it out in the listening if it does turn out to be obvious.

One way to 'ignore' a dip like this is to centre the crossover frequency on it. So we put in a revised crossover frequency of 2.3KHz into the Optimiser and adjust each crossover according to the Linkwitz 3rd order slopes (fig.7). Quite frankly it doesn't look any better (fig.8).

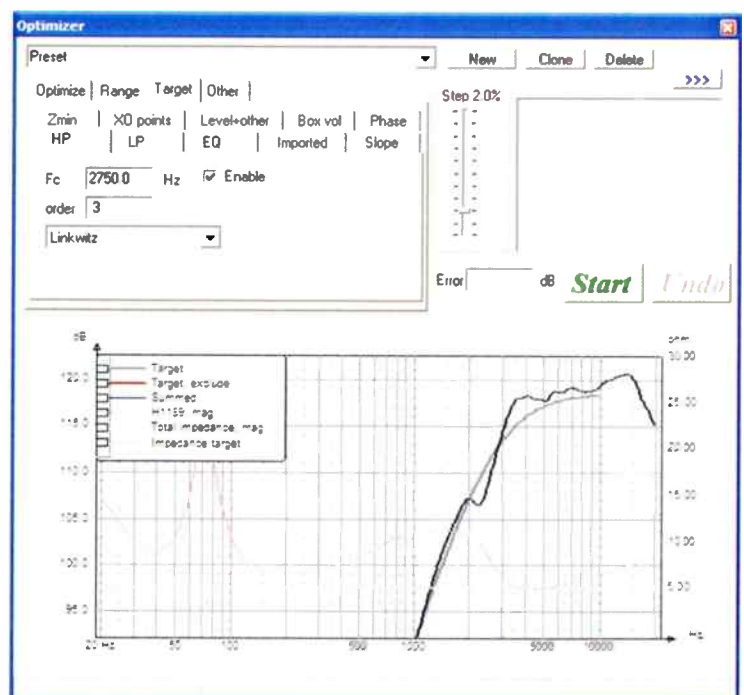


Fig. 6 - The treble unit presents a bigger problem for the Optimiser.

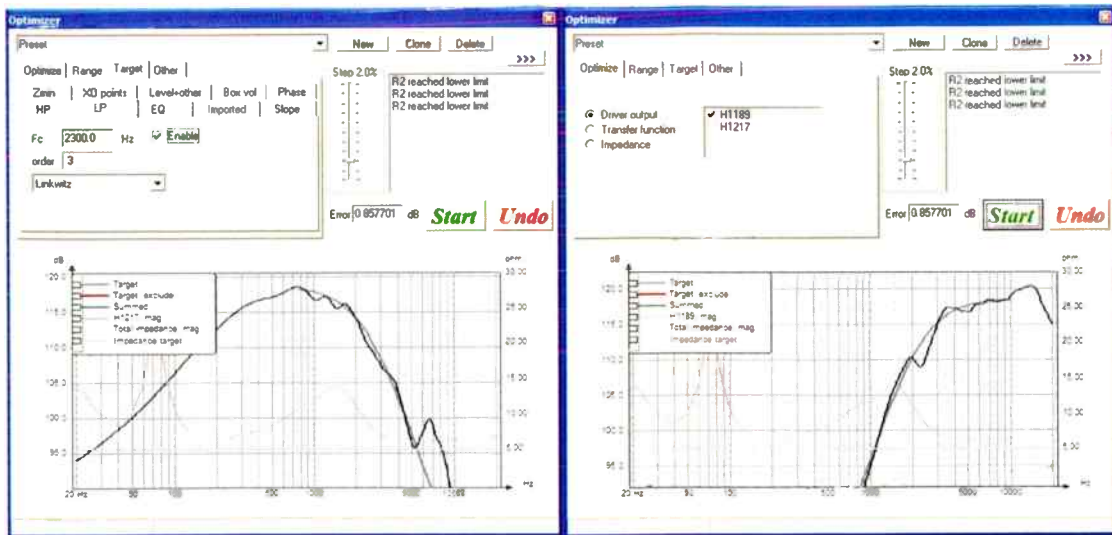


Fig. 7 - You can try out different crossover frequencies to see if the Target slope is easier to match using the Optimiser to adjust the crossover values for you.

Back to the listening, then. Sounds pretty good but, yes, there is a tinge of brightness and roughness to the upper midrange and treble. I feel

high frequency notch filter but, as the resistor is raised in value, we can lower the Q of the filter to broaden its effect to the crossover slope at

values – see the effect – optimise a bit further. And so on. Many happy hour of listening and twiddling component values later and we are getting there. A final crossover looms (fig. 11). Then, to throw in an extra variation, we bring in the floorstanding cabinet with its totally different bass performance and we need to rebalance the speaker slightly for an accurate tonal balance there too.

WD18BR is available as a kit of components from World Designs. You can choose to build the woodwork yourself or we can supply a light oak veneered cabinet ready for you to finish in your own choice of wood stain, lacquer or Danish oil. Check the World Designs website at www.world-designs.co.uk for details or phone 01832 293320.

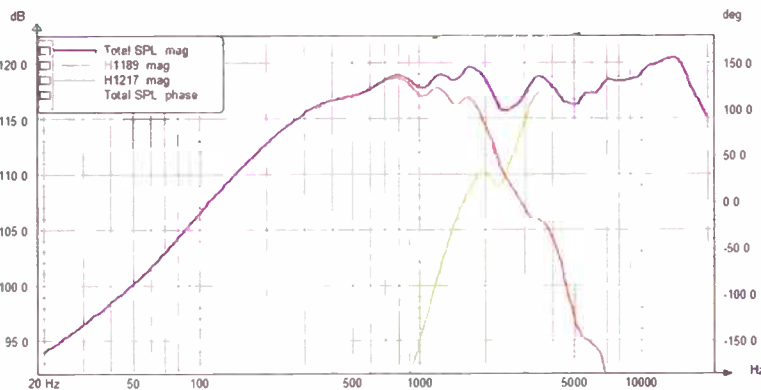


Fig 8 - The result of optimising for a lower crossover frequency. No improvement, so back to the drawing board.

we need a little more sophistication in the crossover – a few added elements that will allow us to control and tidy up the areas of integration that we have highlighted.

The neatest way of adding extra control to a treble crossover is to add a second series capacitor. Conventionally this looks like it ought to make a third order electrical slope, but if the second series capacitor is large in value all it does is modify the acoustic slope at and below the crossover region. By the way, the added benefit here is that the power sent to the treble unit at low frequencies is reduced, boosting power handling capacity and reducing dome excursion.

Similarly, in the bass section, we can add a control element to optimise and smooth the slope, and its phase, too. This extra element is a series capacitor and resistor which are placed in parallel with the series inductor. Theoretically this forms a

and above the crossover frequency.

These sound like niceties but you would be surprised how effective they are. To give you an idea graphically let's use our trick of looking at the integration of the drive units by reversing the phase of one of them.

Remember that, for a perfect filter, if we reverse the phase of the drivers then we should see a deep notch at the crossover frequency. Have a look at the comparison between the crossover with, and without, the extra elements (figs. 9 & 10). I know which I would choose.

Now I have some extra elements to help refine the crossover it also gives me components that I can change while listening. And so it continues. Have a listen – pick out something not quite right – change some values – is it better? Yes, but on a wider range of music I spot something else not perfect. So back to LspCAD - plug in the changed

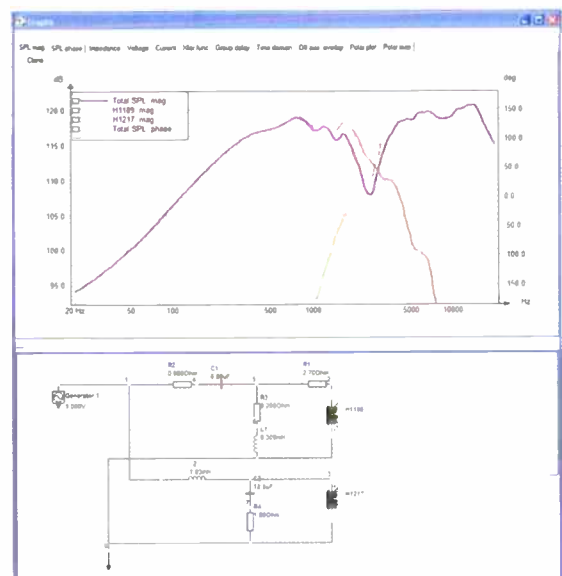


Fig. 9 - You can check the phase integration of the drive units by reversing the phase of one of them. With the drive units out of phase you will see a notch at the crossover frequency as their outputs cancel.

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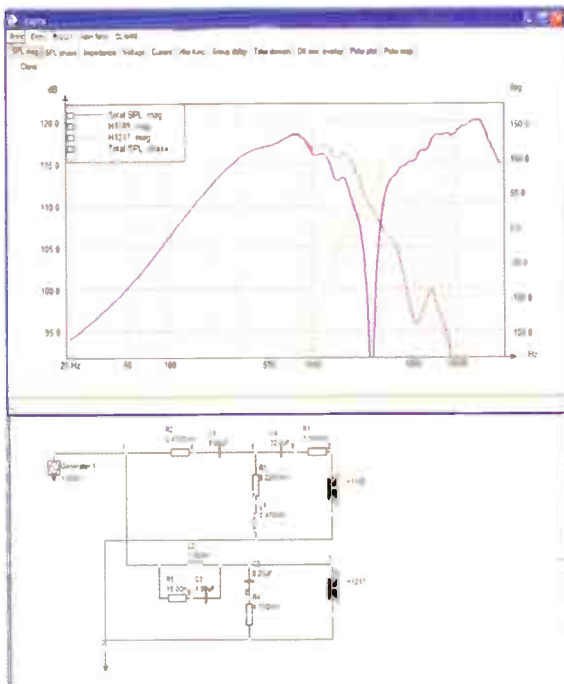


Fig. 10 - With extra control elements added to the crossover (C4, C3/R5) it is easier to obtain superior phase integration as shown by the deep notch if we reverse the phase of one drive unit.

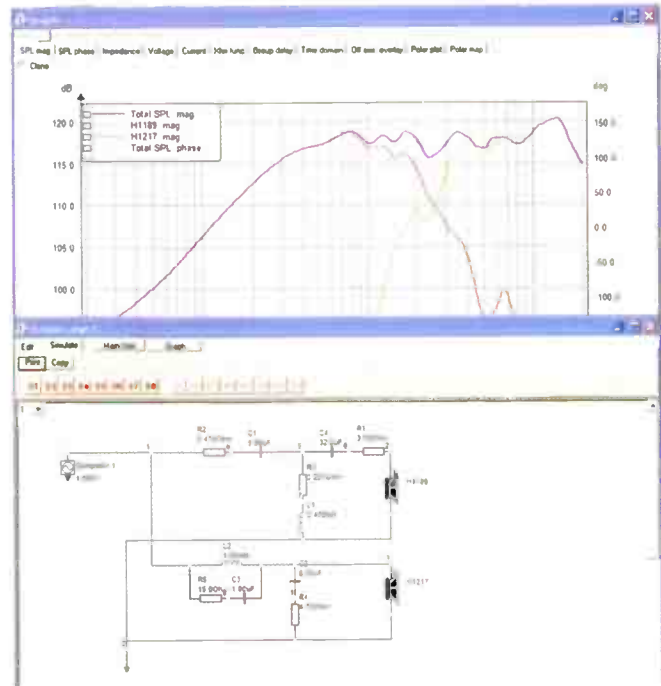


Fig. 11 - And with the drive units back in phase again we obtain a better balanced crossover. Ignore the dip at 2.3KHz which is due to a diffraction effect and does not show up on all measurement, or listening, axes.

LSPCAD6 LITE

LspCAD is more, much more, than just a speaker measurement and box calculation program. Within LspCAD6 lite you can start by designing your cabinet and trying out different drive units in it, all in a virtual lab! Then, when you have constructed the real thing, you can measure the output of your drivers, using the MLS function built into LspCAD6 lite, and start on the crossover design.

LspCAD6 lite allows you to construct both active and passive crossover configurations just by dragging and dropping components onto the page. In this way you can construct as simple, or as complex, a crossover as you like and see the results displayed on the output graphs in real time. If you are unsure what the component values in a crossover should be, don't worry. LspCAD6 lite includes an Optimiser function which can either adjust the crossover slopes to any desired target, or just automatically adjust your crossover values to achieve a flat response. You can change the component values and characteristics easily just by typing in new values or by using your keyboard arrow keys to move the value up and down, all the time watching the effect on the output graphs.

This really is a boon when you are 'fine tuning' a crossover. For example you can listen to your crossover, change some of the components to make it sound 'better' then immediately adjust those components in LspCAD6 lite to see what effect they have on the output graphs. Once you've measured your drive units there is no need to re-measure the speakers again - LspCAD shows you exactly what is happening automatically. The output graphs show frequency response, impedance, crossover transfer function, phase, group delay, cone excursion and port air speed, in fact everything you need to know about how your speaker is going to behave as you finalise the design.

LspCAD6 lite is available now from www.world-designs.co.uk. You can try it out as a fully functioning demo for 15 days before purchase. Price is £59 including VAT.

OUR NEXT FLOORSTANDING PROJECT

Next in this series is a closed box or 'infinite baffle' design. In today's commercial market of small boxes, for big bass output the closed box system doesn't cut the mustard. But as kit designers we can be different - very different indeed!

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As you know you can put one, two or more drivers in parallel to increase dynamic output levels and sensitivity. Now this is entirely predictable if you use identical drive units, no matter what type of enclosure you choose.

But what happens if you decide to use differing drivers? Does the same apply? Will it work or will it be a disaster? Have a look at the photo on the right and see if you can figure out what we have done - and why!

I'll explain it all next month.





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



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CLEARAUDIO PERFORMANCE 86

David Price takes this sleek all-in-one turntable package for a spin.

SONDEK SOUPED UP 90

Adam Smith checks out some upgrades available for the Linn Sondek LP12.

TRANSFIGURATION AXIA 95

Channa Vithana auditions an innovatively engineered mid-price MC cartridge.

MF AUDIO STEP-UP TRANSFORMER 97

Adam Smith listens in to this high end step-up device.

RYAN ADAMS IS ORANGE

Ryan Adams, the singer-songwriter from the USA whose blend of alt.country has hit a chord with many UK fans, has released his ninth studio album 'Easy Tiger'. Including a guest spot from Sheryl Crow on the single, 'Two', the album has been issued as a limited edition on orange vinyl.



IT IS UNUSUAL

Tom Jones, the UK's own Mr. Pelvis, a man who knew a quality pair of knickers when they were thrown at him, is underestimated in many respects, and that includes his interpretive abilities. Which is why his own take on the works of Lennon and McCartney is of enough interest to prompt a 10-track compilation via Lillith Records in Russia. The album features 'We Can Work It Out', 'Let It Be' and 'Twist & Shout'.



CLASSICS FROM GERMANY

Audiophile specialists Speaker's Corner has produced three contrasting new issues on 180gm vinyl. Van Morrison's first solo effort, 'Blowin' Your Mind', features the classic 'Brown Eyed Girl'. This is the stereo version of the album (Sundazed already has a mono version on sale) utilising, so say Speaker's Corner, "superior reproduction of the original master tapes". Next up is Jimmy Cleveland's 'Introducing Jimmy Cleveland And His All Stars'. Cleveland was one of the best jazz trombonists around during the 1950s. This, his debut released in 1955, features a number of Quincy Jones arrangements. Featured artists included Max Roach, Oscar Pettiford, Hank Jones and Lucky Thompson. The Quincy Jones connection continues to the third release from the diva herself – Dinah Washington's 'The Swingin' Miss "D"', packed full of standards, was originally released in 1956 and was arranged and conducted by Jones. Not so much a jazz piece – despite solos from the likes of Clark Terry and Charlie Shavers – it stands along contemporary releases by the likes of Frank Sinatra.



news

LIMITED BJORK

Off the back of her latest album release, 'Volta', her record label One Little Indian has released this sumptuous vinyl version spread over two discs of wax. A limited release, the album is produced on heavyweight vinyl and comes as a red box which features a front cover split down the middle, and which opens to reveal the album. The cover is sealed by the Bjork cover art, which is attached as an enormous sticker. The album itself is interesting as a creative piece of work for Bjork's production direction with collaborators such as Anthony (from Anthony And The Johnsons) and Timbaland plus other specialist instrumentalists including sometime Sonic Youth collaborator, the drummer, Chris Corsano.



SUNBEAM SCORCHERS

There are reissue labels and then there is Sunbeam. Just about every record from Sunbeam is either a lost classic or an undiscovered gem. These three new and recent releases on 180gm vinyl are a case in point. Terry Smith's 'Fallout' is the first, and full of bop-like jazz guitar. Voted by the UK music media as the best jazz guitarist of 1967, this Scott Walker-produced album, released in 1968, is recommended for British jazz fans. Synanthesia's self-titled album from 1969 takes that jazz vibe and mixes it with lots of folk to produce a late night, soothing quality. Finally, an album for those hankering for strange folk, Mark Fry's gatefold edition of 'Dreaming With Alice' was an obscure folk release when it was released in 1972 and can sometimes be compared to Donovan in his psychedelic period. An intriguing trio from an intriguing record label.



ROUND AND ROUND

There aren't many jazz singers who have been invited by Frank Sinatra to sing with him onstage. Carol Kidd was, at the Ibrox Stadium in Glasgow in 1990. This was when her career effectively began. She signed to Linn soon after and produced this, her fourth album and her third for Linn, in 1998. Featuring an excellent recording on 180gm vinyl, this is a welcome reissue from this quirky record outfit – the only label I know to advertise a turntable on the back covers of their vinyl record releases, bless 'em!





Performance Art

Featuring a fiendishly clever new bearing, Clearaudio's new Performance attempts to be both an easy-to-use package and an audiophile turntable. David Price decides whether it delivers...

Clearaudio is an interesting company. Making moving coil cartridges since 1978, it has progressively grown its range to its present capacious state – lest we forget – as overall vinyl sales went south throughout the eighties and nineties. Now in 2007, it makes some of the most stunning vinyl disc spinners I've heard – not least the Clearaudio Reference that I reviewed in February 2004's edition of *Hi-Fi World*. I actually think that, in this country at least, the vast expanses

of beautiful translucent acrylic that these turntables use are not helpful. The problem is that the decks look so good that some, more dyed-in-the-grain, British audiophiles think of them of as 'all show and no go', which couldn't be further from the truth.

In truth, Clearaudio are very serious about mechanical engineering. Unlike many UK turntable specialists, as well as doing motor units they manufacture their own tonearms and continue to make cartridges – all of which show very clever use

of materials technology. Despite being a relatively low end product (for Clearaudio), the new £1,670 Performance turntable package exemplifies this – there's acrylic in the platter and base, carbon fibre in the tonearm and wood in the cartridge, plus the company's new ceramic magnetic bearing. Not bad for what's supposed to be a basic 'fit and forget' all-in-one package.

Starting with the chassis, and it's a non-sprung sandwich design, but with more ingredients than a Burger King Double Whopper. It's essentially



High Density Fibreboard set within an aluminium frame, which is then sandwiched between two layers of 'Staron' artificial stone (sourced from Samsung), not too dissimilar to ARCB used in Trio's classic L-07D turntable, no less. Vital statistics are 420x330x130mm and 10kg.

Into this is set the main bearing shaft, which is machined from an exclusive new ceramic alloy, allowing a much finer polished surface than that previously obtainable in turntable bearings, claims Clearaudio. As the bearing does not use a ball bearing or thrust pad of any kind, it should theoretically be immune to friction, wear and noise.

The motor is a separate affair, which is modern belt drive best-practice. It drives the precision-

machined 40mm thick GS-PMMA acrylic platter via a Clearaudio 'silent belt', a joint-less silicon based design which is claimed to transfer significantly less noise into the platter than traditional rubber types.

The tonearm is Clearaudio's own Satisfy Carbon Directwire, which is a beautifully finished straight tube design, with a woven carbon fibre arm tube that's both extremely rigid yet light. The vertical bearing uses a shaft made out of wolfram, the polished ends of which run in sapphire watch bearings, and the twin horizontal bearings are of ceramic type. Wiring is an unbroken run of Clearaudio's own Direct Wire from the cartridge to phono plugs, and cartridge pins are Clearaudio's own impedance-matched sprung

connectors. Bias compensation is magnetic. Completing the Performance package is Clearaudio's Maestro Wood cartridge, the company's top moving magnet that boasts a satiné wood body holding a Boron cantilever.

SET UP

Despite being an 'all-in-one' turntable package, unfortunately you still have to assemble it as it comes in semi-kit form, as per Michell turntables. Putting it together is quite a long process, although certainly not complex – dare I say, it's easy enough without resorting to the instruction manual, as per standard hi-fi reviewer practice!

The main thing is the tonearm installation, which requires three allen

Some decisions are just so simple

WHAT HI*FI?
SOUND AND VISION

AWARDS 2006

PRODUCT OF THE YEAR

STEREO AMPLIFIERS

ROKSAN KANDY L.III



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World Radio History

bolts to be pushed through its base onto the plinth; you then run the arm lead through the recess and slot the arm into position. I then fitted the cartridge, which is easier than usual thanks to the Clearaudio's clever cartridge mounting bolt arrangement – you secure it to the carrier with one allen bolt for tracking angle adjustment. It's not quite up to SME levels of finesse, but it's way better than average.

You then place the bearing top on the shaft, after applying a few dabs of oil, and the platter on the bearing top, ensuring two little dots line up to give the platter a snug fit. You can then adjust the tracking angle, arm height and tracking weight and bias accurately with a record on the platter, using the supplied (excellent) gauge. Then it's time to move the deck into position, and position the motor, before which you have to secure the pulley wheel about 3mm above the base of the motor shaft. Easy stuff, but lots of fiddling.

Finally, you put the supplied white cotton gloves on, and position the belt around the rim of the platter. A choice of three fine speed settings are provided per speed (i.e. 45RPM-, 45RPM, 45RPM+).

The whole assembly process took about one hour. Duly fettled it proved a nice deck to use, although I wasn't best impressed by the way the pulley scrabbles around at switch on – I presume you're supposed to manually rotate it slightly first. The Satisfy arm feels good too, although I dare say Michell's Tecnoarm seemed smoother to use and slightly better constructed. As a devoted hand-cueer, I really didn't like the Clearaudio's Noddy fingerlift.

SOUND QUALITY

The first few hours with the Performance proved most promising, the deck having the brand's trademark, erm, clear sound. This is a light, spry sounding deck that will do nothing for those seeking a quintessentially 'warm and woolly' (i.e. romantic) analogue sound. It has very large incisors, which bite right into the mix and throw out massive amounts of detail in a way that is very impressive for what's essentially a £1,000 deck (minus arm and cartridge).

After the deck had a good twenty four hours' use, I kicked off listening-a-

proper with UB40's 'Don't Let it Pass You By'. I was greeted to a slightly more bass-light sound than the similarly priced reference Michell GyroDec/Tecno Arm combination. Bass guitar was decently taut and controlled, and the bassist's left hand seemed to move up and down the fretboard with greater ease than the Michell, but it lacked some of the slam all the same. The upside of this was that where the Gyro sounded a tad ponderous with this track's very dominant bassline, the Performance was snappier.

This tallied with the midband, which was a touch better detailed on the Clearaudio, which threw out vast amounts of information into the speakers about the percussive instruments. This meant better microdynamics, showing the subtle accenting of the drummer's stick work better. The Gyro, by contrast, was also detailed but sounded a touch more diffuse and seemed to sit on small dynamic accents slightly. It was actually no less pleasurable to listen to – indeed some might prefer it – because the Michell mustered a large 'swell' of sound, whereas the Clearaudio seemed more analytical but slightly smaller in scale.

One reason for this was the Clearaudio's marginally less expansive imaging; whereas the Michell pushed the images way out to the sides of the room, almost unnaturally so some might say, the Clearaudio was a tad more constrained left to right. This is not so much a criticism as an observation, as the British deck can sometimes sound like someone pressed the 'stereo wide' button.

Supertramp's 'Dreamer' was an ear-opener, the Performance throwing out masses of detail with an incredibly low noise floor. Again it was better on subtle low level detailing and dynamic accents – the electric piano work that 'drives' this song was superbly carried, the deck getting an obviously better grip on the attack transients of the instrument. However, once again the Gyro seemed happier with the left handed piano work, giving greater heft to the bass notes and pushing the song along better, and again engendering a better sense of scale.

Up top, the Clearaudio deck was a joy – partly helped by its synergistic match with a cartridge that's a tad on the bright side – giving a very clean, explicit cymbal sound that really showcases vinyl's superbly airy treble.

Its superior attack also meant that struck cymbals seemed more life-like and believable.

This became a recurring theme with whatever discs

I tried, from the classic acoustic Blue Note jazz outing that is Lou Donaldson's 'Alligator Bogaloo' to a Mercury Living Presence pressing of Stravinsky's 'The Firebird' ballet (Dorati/LSO).

CONCLUSION

Having just heard the Kuzma Stabi S/Stogi S last month, I was most interested to hear this, almost direct rival. It's a different kettle of fish, with a more solid and analytical sound against the very lyrical Kuzma, and offers better value too with its bundled Maestro cartridge. Although this by no means stretches the deck, nor does it hold it back. Properly positioned (this is important, given its lack of suspension) on a Base SP10 platform and carefully set up (taking special care to keep the drive belt/pulley/outer

REFERENCE SYSTEM:

Michell GyroDec/Tecno Arm
Lyra Dorian moving coil cartridge
Linn Linto phono preamp
MF Audio Silver Passive Preamp
World Audio K5881 power amplifier (modified)
Yamaha NS1000M loudspeakers

TECH SPECS

CLEARAUDIO SATISFY CA DW TONEARM

Overhang	17.31 mm
Offset angle	23°
Effective length	222 mm
Weight (including arm lead)	340g

CLEARAUDIO MAESTRO WOOD CARTRIDGE

Output Voltage (1kHz, 5cm/s)	3.6mV
Load capacitance	100pF
Load resistance	47kOhm
Coil inductivity	0.42H
Recommended tracking force	2.2g
Total mass	7.0g

platter meticulously clean – otherwise speed stability suffers all too easily), it's a very impressive package.

In absolute terms, it could do with being a tad more speed-stable and having a touch more bass push, but at the price it makes a convincing case for itself. Although I'd fall to the bigger, more powerful sound of the Gyro, many would not – and for them this, with its simple, fuss free set-up (no springs – hurrah!) will be a joy. Essentially, this turntable attempts to give the best of both worlds (a fuss-free all in one package and no-compromise sonics at the price), and pretty much succeeds.

VERDICT ●●●●£

Accomplished all-in-one turntable package that's both impressive sonically and easy to set-up and use. Superb value.

CLEARAUDIO

PERFORMANCE £1,670

Audio Reference

☎ +44(0)1252 702705

www.audioreference.co.uk

FOR

- excellent detail retrieval
- cohesive yet incisive sound
- build
- value

AGAINST

- nasty hand cueing lever



Spinn Doctors

Adam Smith listens in to three ways of maximising a Linn Sondek turntable...

There can surely be no other hi-fi component that has had as much written about it over its lifespan than the venerable Linn Sondek LP12 turntable. Attracting both fans and detractors in equal amounts, I would say that this, actually fairly humble, design has attracted more column inches, more table-thumping pronouncements and more internet forum space than any other hi-fi com-

ponent instantly recognisable alongside an original, they do not share any parts.

The fact remains however that there are thousands of LP12s out there in 'hi-fi land' that have not had a great deal of attention or upgrades applied to them in recent years, meaning they're ripe for modification! Naturally, with the advent of websites like eBay, the keen vinyl dabbler even has the opportunity of purchasing a relatively early and unmolested

for those LP12 owners who remain unconvinced by, or simply cannot afford, the £990 Lingo, £1,950 Keel and £140 Trampolin, there are a number of cheaper options.

With this in mind, we dug ourselves up what is arguably one of the most widely available versions of the LP12, namely a very tidy late 1980s Valhalla-equipped item, fitted it with an Ittok LVII arm and Ortofon Rondo Bronze cartridge and set about seeing what improvements the good people at Stamford Audio, Heed Audio and the Funk Firm could bring about it.



The original Linn Valhalla power supply...

ponent I can think of.

The LP12 is the turntable brainchild of Linn's Ivor Tiefenbrun; it first stumbled blinking into the spotlight in 1972. It drives a two piece platter via a flat belt from a synchronous AC motor, and features a three point suspension system that decouples the main bearing and armboard from the main plinth into which the motor is mounted.

Ever since its introduction, upgrades have been regularly introduced in an attempt to keep the deck at the top of its game, some more successful than others. Notably successful were the Valhalla power supply upgrade from 1982 and the Cirkus bearing upgrade of 1993. In fact, dare I say it, there is a rather strong feeling that LP12 had been somewhat resting on its laurels for the last few years, until Linn finally drop-kicked it well and truly back into touch recently with the advent of the Keel subchassis, Ekos SE arm and new Trampolin II base. Interestingly, there have been so many updates since the first deck rolled off the production line in 1972 that, although the modern LP12 is

deck second-hand, creating a blank turntable canvas upon which to build. The problem then arises - what can you do to your mint 1972 LP12 that you've just found under a table at your local car boot sale (well, stranger things have happened...) to improve its performance?

Clearly the first options are to follow those paths laid by Linn themselves. A really early LP12 will start to sound quite different when you add a £410 Cirkus bearing, armboard and spring upgrade, but the benefits of the Valhalla PSU can no longer be had as they are not available any more, leaving you with Linn's top item, the Lingo, at a rather steep £990. Of course, third party upgrades have been available over most of the history of the LP12, including items from the likes of Heybrook, Avondale Audio, Manticore, Naim Audio and Pink Triangle. Some of these were particularly liked at the time, owing to the fact that Linn did not add a standard 45rpm facility to the LP12 until the early 1990s with the arrival of the upgraded Valhalla and Lingo PSUs. This is still a flourishing industry, however, and so

SOUND QUALITY

Starting with the standard Valhalla'd LP12/Ittok/Rondo Bronze, it is easy to hear both sides of the arguments over this product. The first thing that really leaps out at you is just how well the LP12 can romp out a tune. The Linn just seems to dig into the heart of the music and bring forth every little rhythmical nuance into a wonderfully cohesive overall bundle, carrying tunes with aplomb and making the whole event thoroughly entertaining.

However, as you listen more closely, you do tend to realise that the bass does not dig especially deep and the upper bass has a tendency to be rather bloated and nowhere near as tight as a good direct or idler drive deck. The treble is definitely a little on the soft side, lacking that ultimate glassy clarity that other decks can offer and, in ultimate terms, the soundstage is rather odd - stretching quite well back from the loudspeakers but not being especially wide. I also felt our sample had something of a hole in the middle effect, too.

The stock Valhalla LP12 also seems to suffer from source material choosiness. As mentioned, it is a superbly rhythmical beast, but seems to affect an almost disinterested air over quieter and more mellow tracks. Ultimately, if you happen to play the right sort of music and happen to value its strengths over its weaknesses, then the LP12 tends to hit the spot - I know I found myself rather enjoying it as I listened.



However, would the modifications I had lined up be able to transform the deck? It was time to dig out the tool kit and find out...

STAMFORD AUDIO HERCULES II £170.

Taking the ethos of the Valhalla and improving upon it, Stamford Audio are able to offer the new Hercules II power supply for the LP12 which, very handily, sits over the mountings already present on the chassis for the Valhalla. The Hercules II replaces the Valhalla board completely and can be fitted in a very short time, merely requiring the mains lead and motor wires to be disconnected and refitted to the new board once in place.

Also supplied in the kit is a new on/off switch that replaces the LP12's original item, and this has two LEDs fitted rather than the original's one to show the selected speed, as the Hercules II offers both 33 and 45 rpm. Even handier is the fact that both speeds are selected through this single button - from standby mode you simply press to switch on at 33rpm and light the red LED or press and hold for more than five seconds to switch to 45rpm and light the blue LED. A very simple process, but one that can be unnerving initially, as the platter does not actually start rotating for around seven seconds, until it has determined which speed you require - patience is the key here!

Manufactured in Hong Kong for

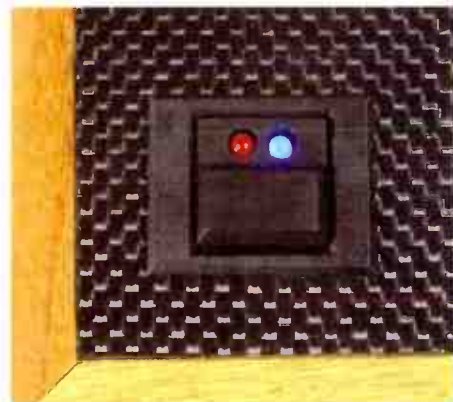
Stamford Audio, the heart of the Hercules II is a pair of low noise, high precision crystal oscillator circuits that have their frequencies divided to generate a clean AC sine wave which drives the motor at either 50Hz (for 33rpm) or 67.5Hz (for 45rpm).

SOUND QUALITY

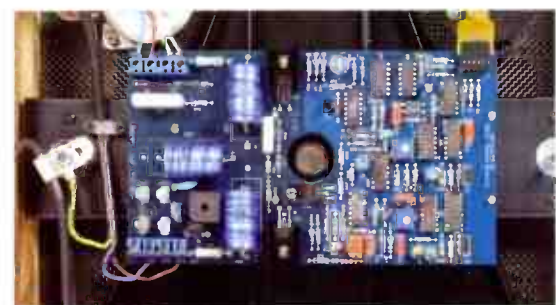
The improvements made to the LP12 are evident even before the stylus hits the groove, as the motor seemed to be spinning much more smoothly once the Hercules II was warmed up and running. Previously a hand on the top plate near the motor would pick up a very gentle vibration, but through the Hercules there was none.

Sonically, the changes were just as noticeable. Suddenly the hole that I had noticed in the middle of the soundstage was filled in, putting vocalists and instrumentalists back in their proper place. Paul Desmond was now rock-solid centre stage playing his saxophone on the Dave Brubeck Quartet's 'Take Five' with the surrounding drums and double bass much more focused in terms of image stability.

The Hercules II also improved the bass end. Although not digging a great deal lower, the upper end of the low frequency spectrum was



Stamford Audio's two-LED replacement power switch



The Stamford Audio Hercules board, mounted on the LP12's subchassis using the Valhalla's mounting points

much tidier, improving the sense of pace, removing the rather flaccid nature noted previously and generally tightening things up very well indeed.

All in all, the Hercules II kept the innate nature of the LP12 but made it sound much more confident. It also made an improvement over another earlier noted weakness, that of rather softer tracks. Where the Valhalla seemed to lose interest in this type of material, the Hercules II kept the atmosphere up and was able to tease small subtleties out of the background.

HEED AUDIO ORBIT 1 £250

The Orbit 1 and 2 power supplies make up part of Heed Audio's 'small box' range of equipment which also includes the Questar phono stage reviewed in the *Hi-Fi World*, July 2007 vinyl supplement. Both units operate on the same principle, namely that they use a quartz generator circuit along with two mains filtering transformers and a high current amplification circuit to ensure a smooth power delivery. Early incarnations of the unit were single speed, but both variants now have push button speed change on their front panel.

The key difference between the Orbit 1 and Orbit 2 are the voltages that they output. The Orbit 1 under test here has a 110V output and is suitable for driving the motor of an LP12 (or similar) directly. The Valhalla power supply board, or whichever variant is fitted, is removed and Heed Audio supply a small interface PCB that connects the supply output lead from the Orbit 1 to the motor wiring, as well as adding a phase shift capacitor to the motor connections.

In contrast, the Orbit 2 outputs 220V and so is literally a plug-and-play item that still runs through whatever motor control circuitry the deck is already fitted with. Heed Audio state that the Orbits



Heed Audio's Orbit 1 PSU

are suitable for any turntable using a synchronous AC motor and the Orbit 2 is perfect for those who would rather not delve into their deck's innards.

Housed in a small black box, the Orbit 1 is a compact device measuring just 75x90x224mm (HxWxD) and sits neatly beside the turntable. Input to it is via a 3 pin IEC mains plug and output to the turntable is through a corresponding 3 pin IEC panel-mounted plug. A suitable cable-mounting socket is provided for fitment onto your turntable's mains lead.

SOUND QUALITY

The Heed Orbit 1 had just as marked an effect on the sound quality of the LP12, but in a somewhat different way to that of the Hercules II. Whereas the Hercules really scored on widening the soundstage and opening up the atmosphere of the performance, the Heed hits the dynamic hotspot, and does it very effectively indeed.

At the top end, the Orbit 1 imbues the LP12 with real clarity and spaciousness. The steady backing cymbals on 'Take Five' suddenly gained real scale and a magnificent sense of airiness to them - the decay of the note produced by each one was startlingly vivid, adding commensurate metallic shimmer to them.

Equally obvious were the improvements at the opposite end of the frequency range, and this is where the Heed really came into its own. Bass not only seemed to go considerably deeper, but the Orbit 1 gripped the upper bass with an iron fist and added a considerable amount of extra detail - quite startlingly so in fact.

The bass guitar used on the Icicle Works' 'Blind' took on real form through the Orbit 1, whereas it had been rather lifeless and blurred through the standard Valhalla. As this is actually played and used as a main rhythmic underpinning of the track, it increased my enjoyment of it immensely and really shifted

the LP12's performance up a gear. Spinning Grace Jones' 'Slave to the Rhythm', the Orbit/LP12 combo proved to be incredibly adept in low frequency terms and I would say that the Orbit 1 puts it within shouting distance of a full-blown new LP12 with Keel and Lingo - it really is that good.

Once again, the soundstage also filled out nicely when compared to the Valhalla. That hole in the middle effect disappeared and the whole front image became much more stable, but the Orbit 1 was still not quite as expansive as the Hercules II in this respect. Nevertheless Deacon Blue's 'When Will You (Make my Telephone Ring)' from their 'Raintown' album took on a new lease of life and gave a much more uniform performance, whereas it had only really kicked into life during the busier parts of the track with the Valhalla.

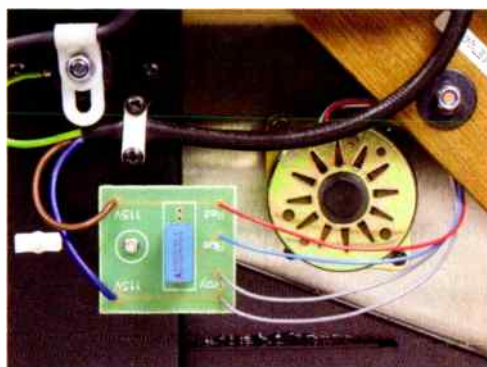
All in all, the Heed Audio Orbit 1 proved to offer a dramatic improvement to the LP12 but in a different way to the Hercules II. It augments the LP12's innate rhythmical abilities whilst adding a healthy dose of dynamic slam and top end detail that is missing in the original.

FUNK FIRM K-DRIVE PSU/CLARITY TOP PLATE £585/£354

The Funk Firm have a considerable history of upgrading Linn LP12s dating back to their previous incarnation as Pink Triangle, when the original 'Pink Linnk' was available. This was a battery-powered PSU that required the fitment of a new DC motor as well as a new top plate, as the motor position changed as well.

Many of the ideas live on into The Funk Firm's present range of motor and PSU upgrades to the LP12, which start at £265 for the V1, which is a voltage-based DC power supply with speed switching and variable speed adjustment. However, we have opted to take a look at the £585 K-Drive, which uses patented circuitry to drive the motor via current-derived servo operation. A Class A output stage is utilised which is fully isolated from the mains and claimed to be incredibly load-tolerant.

The new motor benefits even further from a new mounting position, as per the original Pink Linnk, moving it from 'ten o'clock' to nearer 'eight o'clock' with respect to the centre spindle. This is a key part of the upgrade, The Funk Firm's theory being that any vibration from the motor in its original position is transferred through the belt onto



The Heed Audio's interface PCB - a small amount of soldering required!



Funk Firm K-Drive Power Supply Unit

the platter and acts at right angles to the stylus. Now as the stylus is wiggling in precisely this direction in order to grab the music from the grooves, The Funk Firm say that this vibration is also picked up, causing a "bloomy sound, lacking definition" at low frequencies. Moving the motor through around ninety degrees to put it in line with the arm and cartridge reduces this side-to-side wiggle and is claimed to improve low frequency performance, pitch and timing accuracy.

To achieve this new position, the £354 Clarity carbon fibre top plate is required, which has the mounting hole for the motor in the correct position. Incidentally, either can be used independently so the original motor can be repositioned using the Clarity top plate, or you can mount your K-Drive DC motor in the original motor's place. As standard, the Clarity comes pre-drilled with extra holes to allow you to further upgrade to a full-blown Vector Link at a later date, and ours was supplied with the original motor position drilled out as well (which The Funk Firm can supply to customers on request). This enabled both changes

LP12 featuring Funk Firm Clarity Top Plate, showing original motor position (rear) and new position (front)



to be checked independently.

Once again, the power supply is in a standalone box, with switch selection of 33 and 45rpm, and each of these individually adjustable via trimpots accessible through holes in the front panel. A bi-colour LED shows the speed selected - green for 33rpm, red for 45. Connecting up requires no technical knowledge, as the new DC motor comes pre-fitted with a flying lead terminating in a 5 pin DIN plug, which simply plugs into the back of the power supply.

SOUND QUALITY

So then, if the Stamford Audio Hercules II adds a lovely dose of soundstage and fluidity to the LP12, and the Heed Audio Orbit turns it into a dynamic powerhouse, what does the K-Drive and Clarity combo bring to the party? How about all of the above and more, besides?

The Funk Firm upgrades really do put an older LP12 into a new level of performance and bring it bang up to date with the ability to take on any modern design. Once again, bass went deeper, and faster with vastly improved levels of detail, perhaps lacking the last ounce of sheer grunt of the Heed but pretty close nonetheless. Once again, Chris Layhe's bass guitar really showed this off expertly, gaining even more speed and dexterity and making each Icicle Works track gel superbly.

The K-Drive/Clarity made similarly impressive changes to the treble, adding huge levels of detail and layering to high frequencies. Although, again, lacking that last little ounce of intensity offered by the Heed Orbit I at the very top end, the Funk Firm setup improved on this in terms of clarity in the upper midrange and lower treble registers - cymbals and hi-hats took on a magnificent sense of

realism and scale, locating themselves much more rigidly within the soundstage. As to the soundstage, this really was the very best of all the

contenders. The good old LP12 suddenly started to make up real ground in terms of chasing the Michell GyroDec and SME 10A in terms of atmosphere and spatiality. The Funk Firm's upgrades really do push the overall presentation far wider and bring it out to the listener, without masking the innate rhythmical tautness of the deck. They take its basic character and use it as a solid foundation on which to build a superb level of performance gain.

Briefly trying each upgrade separately, it seemed to me that the repositioning of the motor was chiefly responsible for the tauter, deeper bass, with the K-Drive taking the honours for the top end clarity and majestic soundstage improvements. Personally, if you were going down this route, I'd go the whole hog and opt for both, as they work so well together.

CONCLUSION

An LP12 with Lingo and Keel is a superb turntable, of that there is no doubt, but it is undeniably expensive and adding these key items to our fictional mid-80s Valhalla LP12 will not leave much change from £3,000 - enough to buy a fine new turntable in its own right. You can improve your Sondek for much less, these three products show - all take the basic foundations and improve them significantly.

First up, we have the Stamford Audio Hercules II. For your money, you get improved soundstaging, increased 'confidence' to performances, better pace, and switched 45rpm. Even if you are happy with your old Valhalla'd LP12 and hadn't even thought of upgrading it, you might be surprised at the improvements a mere £170 investment will bring you.

Taking this up to £250, the Heed Audio Orbit I takes a slightly different approach, majoring on dynamics, pace and clarity. It is in rhythm and low end presence that the Heed really scores and, being used to idler drive Garrard bass, I couldn't help but love it for this alone. Add in the extra top end clarity and you have another budget winner, one which would just sneak ahead to get my vote over the Hercules II if your budget is limited.

At £939, the full Funk Firm K-Drive and Clarity top plate are virtually the same price as a Linn Lingo, but really do move the LP12's performance to another level, bringing the venerable Sondek bang up to date and showing just what the basic design is capable of when its potential is released.

STAMFORD AUDIO
HERCULES II £170
 Stamford Audio
 ☎ +44(0)845 603 5781
www.stamfordaudio.co.uk

VERDICT ●●●●● £
 Bargain upgrade that adds poise and superb soundstaging to the LP12's performance. Easy to fit.

HEED AUDIO ORBIT 1 £250
 T Source
 ☎ +44(0)1803 226104
www.tsource.co.uk

VERDICT ●●●●● £
 Neat external PSU upgrade that turns the LP12 into a dynamic powerhouse. Also available as plug-and-play Orbit 2.

FUNK FIRM
K-DRIVE/CLARITY £585 £354
 The Funk Firm
 ☎ +44(0)208 697 2705
www.thefunkfirm.co.uk

VERDICT ●●●●●
 Not cheap, but incredibly effective at bringing the LP12 right up to date in sonic terms. Don't scrimp, though - buy both upgrades together...

AT LEAST Half Price

There's at least 50% off the original RRP on these end-of-line* hi-fi and home cinema separates, speakers and accessories. Stock is very limited, so hurry.

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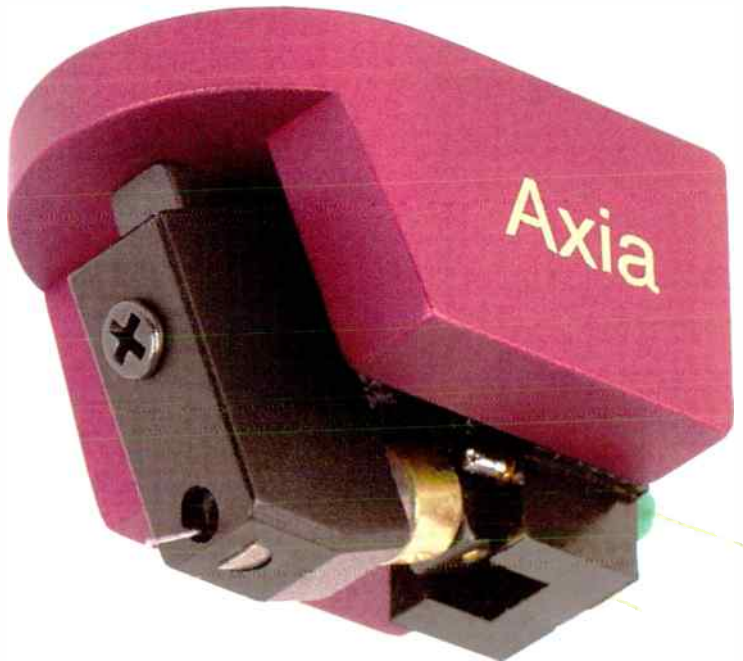
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Axia-lent

Channa Vithana reviews the new Axia moving coil cartridge from Transfiguration...



Designed exquisitely in Japan by Seiji Yoshioka for Immutable Music, Inc., Transfiguration cartridges are unusual for being yokeless moving coil

designs with a patented ring magnet. Traditionally most cartridges would have a single magnet assembly placed away from the coils, and therefore the power supplied by the magnet is transmitted via a series of yokes (metal plates/extrusions) down to the coils. Transfiguration's design, however, features a double ring magnet located fore and aft of the coil itself (located along the same axis as the cantilever, stylus and suspension).

Very simply, due to its closer coil proximity, Transfiguration's yokeless method makes the transmission of magnet power quicker and more evenly applied to the coils for music signal transfer than the traditional yoke method (cartridge maker Lyra has their version of a yokeless magnet system which utilises 'disc' magnets before and after the coils, as in the Dorian reviewed last month).

The £890 Axia uses a Boron cantilever with a PA solid diamond stylus. It weighs 7g and has an outer aluminium body in a very finely finished light-magenta hue. The Axia body shape is similar to the previous lower-cost Aria model (which cost about £690) in that it surrounds rather than covers the cantilever

and mechanics. Tracking force ranges between 1.7 and 2.2g, and I found it worked best at 2g. Cartridge alignment can be a little tricky however, as the body has a circular front rather than a squared-off one.

SOUND QUALITY

This is a very vivid and explicit sounding cartridge, majoring on information as per Lyra's £500 Dorian. The music on 'Scarlati Harpsichord Sonatas' (1975) by Blandine Verlet was clear and effortlessly flowing. Harpsichord timbre was first rate with convincing depth, and the acoustic decay of notes was very easy to follow from the moment they dissipated and into the tiniest whisper. Timing was also excellent, as the interplay between notes was seamless and without dislocation.

Just like the harpsichord music before, the opening flamenco on instrumental 'Run Across Desert Sands' from 'Atomic Playboys' (1989) by Steve Stevens had beautiful tone and phrasing. The

next track, 'Slipping Into Fiction' was revealed with equal aplomb as the supernaturally fast yet tuneful playing of Stevens (now playing electric guitar) was most engaging. With those snappy kick drums and anthemic late eighties hard rock vocals, the music was reproduced with true insight, clarity and tonal power.

I compared the Axia to Transfiguration's £995 Spirit 3 MC and found surprisingly little difference in the overall sound. Whereas the Spirit had a touch more openness, the Axia was marginally smoother on guitar or violin.

CONCLUSION

Considering the Spirit 3 has a more sophisticated body construction, similar to the more expensive Transfiguration Phoenix (£1,350) and that I previously found it to outperform the almost twice as expensive £1,800 Linn Akiva (see HFW April 2007, p73), this is an superb result for the £890 Axia, which costs £105 less. Consequently the Transfiguration comes very highly recommended.

VERDICT ●●●●●

Wonderful musicality with superb resolution, this excellent performer beats respected designs at twice the price.

TRANSFIGURATION AXIA £890

Audio Reference

+44 (0)1252 702705

www.audioreference.co.uk

FOR

- timbre and depth
- timing, insight

AGAINST

- tricky to align
- requires careful partnering

MEASURED PERFORMANCE

The Axia tracks well at 2gms downforce, clearing torture tracks at 300Hz and 1kHz, the latter being particularly impressive. It translates through to a confident, stable delivery of vocals in particular. The Axia is up with the best in this area and should sound confident in the groove.

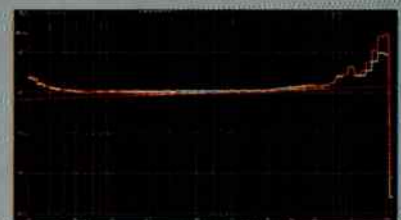
Whilst lateral tracing distortion was very low, vertical distortion was high at 5.6%, mainly second harmonic, due to a high Vertical Tracking Angle of 32degrees. This may colour left and right images a little. Output was low at 0.42mV at 5cms/sec rms, so a quiet MC phono stage is needed.

Our frequency analysis trace shows strongly rising treble above 8kHz, enough to give quite a sting to the sound from LPs with strong treble energy on them. The Axia will sound bright and, since tracing loss was low on inner grooves, indicating a quality stylus, inner groove distortion from some discs may be a little obvious.

The Axia measures well, but it will have a bright sound by any standard. NK

Tracking force	1.7-2.2gms
Weight	7gms
Vertical tracking angle	32degrees
Frequency response	20Hz - 12kHz
Channel separation	23dB
Tracking ability (300Hz)	
lateral	88µm
vertical	45µm
lateral (1kHz)	25cms/sec.
Distortion (45µm)	
lateral	0.6%
vertical	5.6%
Output (5cms/sec rms)	0.42mV

FREQUENCY RESPONSE



Red - outer grooves
White - inner grooves

UP TO

35% OFF

Time to pick up a bargain. With savings of at least 25% off the original RRP, these end-of-line* hi-fi and home cinema separates, speakers and accessories are outstanding value. But hurry, stocks are limited.

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BRISTOL

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B&W HTM 7 Speakers	£749.00
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CAMBRIDGE

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Yamaha MCXA10 MusicCAST Server	£449.00
Yamaha YSP1 Digital Surround Projector	£519.00

EALING

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B&W LM1 Satellite Speakers	£149.00
B&W 704 Speakers	£1,049.00
Cyrus Link Power Power Amplifier	£324.00
Denon AVR4306 AV Receiver	£1,099.00
Denon AVR1907 AV Receiver	£299.00
Fujitsu P42XHA58B Plasma Monitor	£1,650.00
M&K K5 Surround Speakers	£390.00
Marantz DV6600 DVD Player	£135.00
Marantz PM4001 Amplifier	£135.00
Marantz CD5001 CD Player	£125.00
Monitor Audio i-Deck Compact Speakers	£75.00
Nordost 4 Flat (2m Pair) Speaker Cable	£109.00
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Yamaha YSP800 Digital Surround Projector	£299.00
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EPSOM

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Arcam DVA P1000 Power Amplifier	£1,269.00
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Marantz SA7001 SACD Player	£299.00
Marantz ST7001 Analogue/Digital Tuner	£224.00
Marantz PM4001OSE Amplifier	£185.00
Marantz PM4001 Amplifier	£134.00
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GLASGOW

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Denon S101 DVD System	£579.00
Denon AVC-A11XVA AV Amplifier	£1,799.00
KEF KIT100 DVD System	£649.00
KEF KIT100 Stands	£95.00
Marantz SA11S1 SACD Player	£1,299.00
Marantz PM11S1 Amplifier	£1,599.00
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Head First

Adam Smith auditions MF Audio's new moving coil phono transformer...



There's much to be said for the benefits of passive operation in terms of amplification and stepping up voltages. The problem of which particular active circuit components to choose and how best to configure them disappears and, in theory, the resultant lack of circuitry should give your precious audio signal less of a sonic battering en route to your speakers.

That said, a passive design requires just as much thought and consideration to its implementation as an active one. The quality of the components themselves become more critical and the layout of the design can be problematic.

Music First Audio have already proved that they know a thing or two about this passive lark, as shown by their winning of the coveted *Hi-Fi World* award for Best Preamplifier 2006 with the Passive Preamp Silver. So we decided it was high time we took a look at the MF Audio MC Step-Up Transformer.

This £1,600 device is housed in a similar case to its preamplifier brother and is similarly well finished and neatly styled. Inside are two high quality transformers, one for each channel, that incorporate an 80% Nickel core, which MF Audio claim is the largest size ever applied to a low level transformer. The primary winding of each is split into four sections, allowing 1:5, 1:10 and 1:20 step-up ratios to cater for a wide range of cartridge output levels.

The adjustment of this also loads the cartridge with a different resistance, as it will see the ratio of

the transformer's output impedance, divided by the turns ratio squared. So, a standard 47kOhm MM input on the 1:10 setting will load the cartridge with 470Ohms. But there's also the option to add in dummy load resistors in parallel with the output for more available values - the second front panel switch selects options of 10, 20, 30, 40 or 80kOhms, or none.

The unit is compact, measuring 95x215x205mm (HxVxD). I found that MF Audio's warnings regarding earthing were wise to be heeded. The MC Step-Up is a quiet device, but only once connected with well shielded cables and fully earthed to both the turntable and arm in use, as well as the amplifier.

SOUND QUALITY

Wired up to our reference system, the MC Step-Up Transformer showed the advantages of a well designed passive step-up device from the off. Compared to the MC section of our Eastern Electric MiniMax phonostage, the MF Audio seemed to pull the whole performance forward to the front of the soundstage very effectively, whilst simultaneously adding an increased sense of space and air to the music. Classical material exhibited this nature well, the MF Audio bringing previously distant instruments in Holst's 'Planets' nicely into the overall fold.

Instrument definition showed improvement as well, the MF Audio adding excellent body and detail to both acoustic and electric instruments, making them sound more realistic and locating them in the soundstage well. I hoped for a

similarly pronounced effect on voices, but the MF Audio unit was less adept here, pushing Julianne Regan's vocals back into the mix and making them sound rather reedy on All About Eve's 'December'. Switching back to the MiniMax remedied this and put the emotion back into the performance that the MF Audio seemed to be missing.

Moving the pace up a little, the MF Audio unit gave mixed results once more. The Icicle Works 'Blind' again had good instrument definition, with the bass guitar rendered particularly well, and bass was nicely punchy, adding weight to the very bottom end that the MiniMax can tend to lack. However, the whole track seemed to be limping along, rather than flowing like it should, and the MF Audio had a tendency to blur the heavier passages, imbuing Ian McNabb's vocals with hoarseness.

CONCLUSION

The MF Audio MC Step-Up Transformer is a useful and well thought-out unit that shows the advantages to be gained in soundstage purity and spatiality from a good passive component, along with a good range of settings to allow for optimum cartridge-matching. Unfortunately, its tendency to blur more complex music and take the edge off dynamics means that it is more material-dependent than is ideal.

However, if you already have a high quality MM phono stage and you value atmosphere and detail above all else, the MF Audio is well worth checking out.

VERDICT ●●●

A well built unit that adds space and purity to the sound and offers a useful range of cartridge matching options, but struggles with dynamic material.

MF AUDIO MC STEP UP TRANSFORMER £1,600
MF Audio
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 www.mfaudio.co.uk

FOR

- sweet treble
- good air and spatiality
- cartridge loading options

AGAINST

- can blur complex material
- constrained dynamics
- needs careful earthing

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Letter of the Month

IN A MUDDLE

I wonder if you can help me get out of an unsound situation? I have haphazardly put together a system that I think is wildly unbalanced. The reason is that in the past I just purchased what I thought was the best component that I could afford at the time, and didn't realise how important system matching was - purchasing components over the last ten years based mostly on impulse. I bought my current speakers because my previous ones blew up the week before Christmas and I desperately needed music that weekend (they still arrived late anyway) and I purchased my turntable because I liked the way it reflected the light through the shop window.

The problem is I have ended up with a sound that is not brilliant for the money I have spent, although maybe I am expecting too much. You see the thing is, I really do like good sound, even more so than ever, but do not have the time or, more importantly, the skills to build a system with any real confidence. This is why I have been reading up on hi-fi magazines regularly for the past couple of years. This has helped, and in the past couple of years I have come realise how really, really important system matching is.

My system currently consists of a Pro-Ject RPM 9.1 turntable with Ortofon Rondo Bronze MC cartridge through a Cambridge Azur 640P phono stage; a Meridian 506/20 CD player; a Velleman K4100 preamp and K4000 valve amplifier; a McIntosh MC275 power amplifier and a NAD 412 tuner. Loudspeakers are B&W 704s and I also have a REL Storm subwoofer. Cables include Transparent Cable MLP2, Kimber Cable, some silver cable from Maplins, van den Hul D102III and Black Rhodium DCT speaker cable. My listening room measures 18 feet by 11 feet by 8 feet and the loudspeakers fire down the long length. There are windows behind the loudspeakers, a television between them and they are 2 feet from the back wall and 1.5 feet

from side wall.

The overall sound is very nice on some occasions and depresses me the next. I want the sound to be natural, I really do want to hear what is on the disc as clearly as possible, I don't want a romantic sound (except maybe in the evenings), neither a too clinical sound, just what's on the disc. I think the problem is the bass, it just does not sound real; the midrange and the treble sound nice enough and detailed (I think), if a little dull, although this could be due to damaged hearing from my younger sound system days. The bass really spoils it, does not boom, but can be ponderous on some electronic music but not on acoustic instruments. I have tried the subwoofer in all positions and carefully matched it with the main speaker so it is almost undetectable. It makes no difference to the bass, but without it there is no bass at all. Could it be a filthy mains supply?

I am thinking again of changing

seems to reduce the detail in the sound (I made a very cheap passive preamp just to see what difference it made, the midrange was much better but the bass was even worse). I wonder what changes you would recommend? I really want to build my system around the McIntosh as I think the sound is really clean and strong, and I think it is currently being wasted. What do you think of the Music First Passive Pre - it sounds interesting but I cannot justify to myself spending over two thousand pounds on a couple of switches and plugs and two coils of wire. Is it really worth it, or are there DIY or cheaper alternatives? I am really open to all suggestions.

Danny

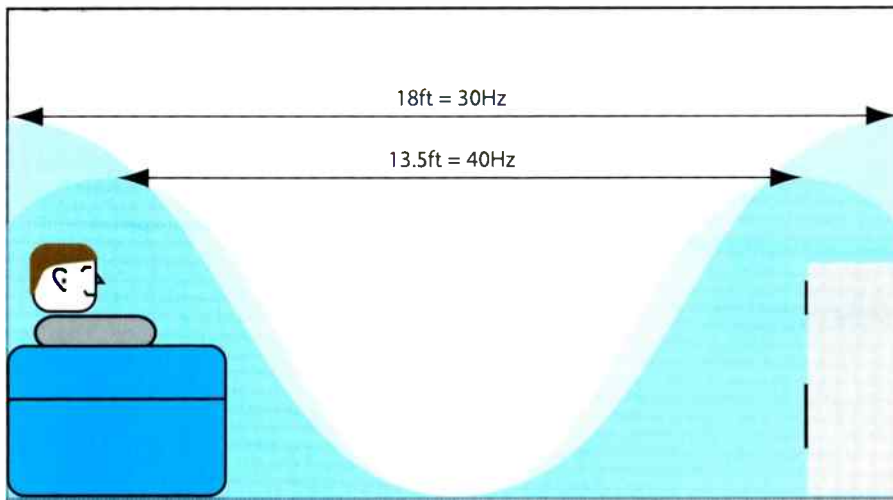
Hmm, an interesting situation. As far as I can see from your equipment list, you have some really good items and some not so good, so it's a case of sorting the wheat from the chaff.



McIntosh MC275 amp., a great sound with ample bass.

some components to alter the current sound but I would love some guidance as to how to do this without wasting hard earned cash again. I am thinking of replacing the preamplifier as it

David and Noel may well have other thoughts to add, but personally, I'd proceed as follows. First up, sell the Velleman preamp and power amp. I actually bought one of the preamps



An 18ft room supports bass down to 30Hz, and maximum Sound Pressure Level is against walls at either end of the room, its longest dimension. Bass content of recorded music commonly reaches down to 40Hz, so in a room this long you will probably hear most bass with ears and loudspeakers approximately 2ft in from either wall.

on eBay a week or so ago to have a play with and it's quite a respectable performer, but is definitely a bit bass light and the phono stage isn't up to much either. Equally, the power amp is okay but certainly not up to the standards of the mighty McIntosh that you also have - you are right to say that this needs to be pulled into service if you haven't done so already. To your sale list, I would also add the Cambridge Azur 640P phono stage; this is a fine little unit but it is a budget item and your turntable really deserves something better - if you can stretch to £800 then the Anatek Acoustics MCI is an absolute giant-killer that can take on units many times its price but, if not, then £225 on a Heed Audio Questar would be a good choice, as it has superb bass weight.

For the main preamp, the Music First Passive pre is apparently a quite spectacular unit, although I have not heard it so far; David can comment more on this item as he has one and would probably need to be surgically separated from it, as far as I can gather! Otherwise I would heartily recommend the Vincent SA-TI (£800), which is a very transparent sounding hybrid design.

As to the loudspeakers, your B&Ws are floorstanders that should be more than capable of kicking out a rollicking low end without the assistance of the REL which, incidentally, I suspect is the culprit behind the ponderousness of electronic bass lines. An obvious step to take is to push the B&Ws a little further back towards the surface behind them but if there really are windows directly behind them then these are not ideal and you may well benefit from moving your room around to get a solid wall

behind them (a solid outside wall is also always preferable to an interior partition wall).

If a room rearrangement is not feasible, then do consider getting in touch with Advanced Acoustics (+44(0)1623 400660 or www.advancedacoustics-uk.com) and having a chat with them regarding some room treatment panels, as these can make a quite noticeable difference, particularly in the bass and midrange.

I wouldn't worry too much about your mains supply at the present. Dirty mains manifests itself in fairly subtle ways, such as a lack of focus to the soundstage and slight blunting of transient details - it won't completely steal all the bass. **AS**

My main concern is that without your subwoofer "there is no bass at all". With a largish loudspeaker like the B&W 704, designed to give weighty bass like most B&Ws, and in a room 18ft long, you should get real bass weight, as theoretically the room reaches down, modally, to 30Hz. What may be happening is that you are seated close to the centre of the room, in which case both width and length modal SPLs will be at a minimum. Switch the subwoofer off, play music with plentiful low bass and sit on a stool, say, against the wall at the far end of

the room, from the loudspeakers. You should hear deep bass. If not I wonder whether there is another problem, such as one speaker being accidentally connected out of phase. Use a 1.5V battery to ensure that the bass cones of each loudspeaker move in the same direction (in or out) when you connect battery to each loudspeaker lead, positive to positive, so polarity is maintained.

Also, B&W quote a minimum impedance for this loudspeaker of 4.1ohms, suggesting the bass unit is a 4ohm type. As the amplifier must deliver most electrical power at bass frequencies this is where best electrical matching is needed, so use the amplifier's 4ohm tap, not its 8ohm tap.

Should you still feel bass is weak, then try moving the loudspeakers further down the room to the far wall, so they are against one wall and you against the other. I am not suggesting you use this arrangement, so much as run a test to see whether you get enough bass with both yourself and the loudspeakers in the best practicable position for full bass (putting your head in the corner actually gives this but I am trying to be sensible here!). If you feel there is enough bass in this situation, then try moving yourself, or your loudspeakers, or both, inwards to see whether you can get a desirable seating position that also gives satisfactory bass.

As Adam notes, partition walls suck out bass terribly; I presume you have solid brick walls. If not then you will need the subwoofer to put more bass energy into the room, but there will be a ponderous sound just as you describe. There is no easy fix



Consider swapping your B&W704 (left) for a 703, with two bass units, for more bass welly.

for this other than move home (!), although an even bigger loudspeaker with twin bass units might just tip the balance sufficiently. Here B&W's 703s, perhaps supported by their own ASW750 subwoofer, should do the job, but a home demo is recommended.

In a pure hi-fi system a subwoofer is unnecessary and can often 'slow' the sound, as very deep bass decays slowly. If you really want big lows then the subwoofer must be tuned in carefully. Corner positioning will give biggest bass, but also boominess. Moving it away from side walls will excite the room's modes less and make for a more even sound, which is usually preferable for music reproduction. I hope all this helps you get decent bass.

If you can, use the amplifier's balanced input. Melody make a fantastic all-balanced valve preamp, the Pure Black 101d. You also need a decent phono stage, as Adam says. I suggest either the Eastern Electric Minimax or the all-balanced Aqvox 2CI. Good luck. **NK**

My instincts would be, as Noel says, the Melody Pure Black 101d preamp or as you suggest, the MF Audio Passive. I haven't heard the former, but live with the latter so can assure you that there's nothing loose about its bass whatsoever! I would have thought that this, in conjunction with an excellent phonostage such as the Whest Audio MS.20/PS20 or the Anatek Acoustics MC1, and your superb McIntosh 275, would give you one of the best amplifier sections money can buy. The Project RPM9.1 isn't famously tight in the bass, so when you've addressed your loudspeaker and subwoofer placement issues, this is your next port of call - so email us when you've got this far. Meanwhile, an excellent high preamp with push you a good way in the right direction. **DP**

FATIGUE-FREE LISTENING

I am currently thinking of buying a new amplifier, to replace an Affordable Valve Amplifier EL34 model. The new amp must give me reproduction which is clear and with a good sound stage depth - and I don't want to go down the DIY path. My other equipment consists of Monitor Audio Silver 6 speakers, Roksan Kandy Mk3 CD Player, a Denon FM tuner, Pro-ject Perspective turntable with Goldring 1042 cartridge along with various CD-R/MD/cassette units. All cables are Van den Hul 102.

The one thing which I don't want, and which I have had in the past, is listening fatigue. Many of the transistor amplifiers I've owned in the past have,

in one way or another, not given me as much unfussed musical enjoyment as the AVC, except for a Class A Musical Fidelity. I have been thinking of the Roksan Kandy MK3 amplifier and the new Pioneer A-A9 as starting points, but would welcome any suggestions. My room is approximately 15'x14'.

My reasons for wanting to change are many. Reading the various internet forums I see that customer relations at AVC are described as erratic and the prospect of buying new valves every few years is daunting, to say nothing of servicing. I also need more inputs, to save using the switching boxes which I currently use, which can't be doing the sound much good. I realise that the valve sound is unique, and transistors don't give the same thing, they are just different. I will have about £700 to spend later this year, so any advice would be gratefully received.

Cliff Millward



Vincent SV-236, a hybrid amplifier with valve preamp and solid-state output, that gives the best of both worlds.

It does sound as if all your sonic requirements point towards a valve amplifier, but if you're keen not to have to worry about valve replacement, bias setting and the other assorted tweaky aspects of valve amplifier ownership, then solid state it is. If you would prefer something new then both the Roksan Kandy Mk3 and Pioneer A-A9 are very accomplished units, although I have only heard the Pioneer's smaller brother, the A-A6. However, if the A-A9 takes this recipe and improves on it then it should be well worth auditioning. I would also recommend checking out the Cambridge Azur 740A, coming in under budget at £500 and offering a pleasing sweetness to the treble, along with good midrange atmosphere and scale.

However, if you really want to pick up on as many of valve's strengths as possible, then I can't help but think that you really need to head straight for our old friend, the Sugden A21a. Unfortunately the new Series 2 variant is a little out of your

price range at £1,299 for the line level version, but if you really can't stretch to this then a secondhand version of the previous incarnation should be within reach and will still sound superb - you might even find a new old stock item with a decent discount if you're lucky. It has plenty of inputs for all your sources, will happily drive sensitive loudspeakers like your Monitor Audios and should never need any attention, providing you keep it well ventilated. **AS**

Another fine choice is the Vincent SV-236 hybrid amplifier, with valve preamp but solid-state output and 130 Watts on tap. It is a little expensive at £999, at least when I reviewed it back in our November 2006 issue, so it may be less by now, or available second-hand. It gives a great sound, very forceful and with wonderful sound stage imaging. Also, you could consider the latest Naim

Nait 5i, which surprisingly perhaps is quite untransistor-like in some ways, or a Creek Classic amplifier. **NK**

BRONZE MEDAL

Regarding the Ortofon Rondo Bronze, I see that you used this cartridge when reviewing the Simon Yorke S9 Record Player. Any information would be of



Ortofon Rondo Bronze has an even sound and is a good all-round MC cartridge.

great use to me, as I'm using a Thorens TD321 with rewired RB300 Rega arm. I'm currently using an Audio Technica AT-OC9 which is around fifteen years young - time to change I think!
Gordon Sullivan.

I am still a big fan of the good old AT-OC9 which, in case you didn't know, is still very much alive and kicking in 'MLII' form, retailing here in the UK for around the £300 mark, so don't dismiss another one of these if you like its style. Personally I love it and am highly likely to be buying myself one very shortly as it has addictive dynamic abilities, although it can be a little ragged unless carefully partnered and correctly loaded by the phono stage.

That said, we are extremely fond of the Ortofon Rondo Bronze here and it is actually our all-purpose reference MC for review purposes here in the listening room at Hi-Fi World Towers, as we find it has a pleasingly even-handed treatment of music, with very few nasties about its performance. It seems quite happy at home in the wide variety of arms into which we have installed it and it is a more smooth and composed than the OC9, whilst lacking the last ounce of the latter's verve. The most interesting aspect of the Rondo Bronze, however, is the fact that it offers about 95% of the performance of a Kontrapunkt b at around 65% of its price, which is very good going by anyone's standards.

The Rondo Bronze should work nicely with the RB300 on your Thorens and if you'd like to find out more technicalities about it then click on www.ortofon.com or buy yourself a back issue of the February 2007 issue of Hi-Fi World, in which Noel reviewed it. **AS**

NEW KIT

I am thinking of buying a World Designs PSU3 and Pre3. Although I have the confidence to assemble them - using a screwdriver and soldering iron only - how should I know if they have been assembled properly? World Designs offer 'built and tested' at extra cost but I am not sure if they are essential. Can you advise on this?

Also, as someone with little money and good DIY skills, will the World Designs kits be compatible with a transmission line kit from IPL Acoustics - for example the M3tlm? My musical tastes are guitar, piano, and jazz.

Albert Halliday

Our kits are supplied with full step-by-step instructions and illustrated with full colour photographs. In addition the PCBs are marked with



For IPL loudspeakers, try a WD88 amplifier.

the component legends, so you really can't go far wrong providing that you can solder. We also give a full testing procedure, for which you will need a multimeter measuring Volts AC and DC up to 500V and Resistance.

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**Peter Comeau,
World Design.**

GROOVE GURU SPEAKS

G'day Adam. Knowing that you own and love a harem of turntables (bless 'em), I'm turning to you for advice, please. For a secondary system of good, but not expensive old equipment in my office, I want to add a deck such as the Heybrook TT2 mating it with a black Linn Ittok that I have mothballed after installing an Ekos on my beloved Linn. Location is in my 'cubbyhole' media room (ha, in other words where the PC is housed) with a Creek amp driving Mark I Linn Kans (wall mounted).

I remember many cans of cold beer ago that the Heybrook TT2 was reckoned to be better than the Rega 3 of its day? I have a feeling that HFW may have reviewed this venerable old TT but I haven't the energy to clamber into the loft and start my search from Issue

No!! Man, am I a loyal reader, eh?

Incidentally, I'm the ex-pat Oz bud who accosted you at the Hi-Fi World Heathrow show back in March; the one who is a 'flat earther, with a slightly curved horizon'. The chances are you won't remember but its my way of toadying to the 'Great Groove Guru'. I have always liked the old 'tables such as LP12 (which I own), Logic DM101 and Heybrooks. I also have a Thorens 150 in pieces which I will get around to fixing one day before I head for the home for irritating oldies.

Many thanks mate, I owe you a coldy at the next show.

Ron Edley

Yes Ron, I remember you, and I have to say that the Heybrook TT2 brings back memories. I actually had the chance to buy one of these a few years back at a ridiculously low price, but foolishly passed it up; one of my many hi-fi regrets, along with selling my beautiful SME 3009 arm and Leak 2075 loudspeakers and not getting to the old studios of Radio Solent in Southampton quickly enough to see if the rumours of their old BBC-modified Garrard 301s ending up in a skip was really true.

But I digress; as you may be aware, the TT2 was a slightly cheaper rival competitor to the LP12 back in the day, and shared its same basic design, in other words the three point suspended belt drive layout that dates back to the original AR turntable and Thorens TD150, but the Heybrook differed from the LP12 in a few key details. Firstly, its armboard was made from plywood rather than MDF, and was shorter as a result of the power switch being at the front right hand side of the unit rather than the left like the Linn. The base was made from MDF with a wood veneer, unlike the solid wood of the Linn, although Heybrook did compensate somewhat by filling the empty areas within the chassis with shaped wooden blocks. The TT2 has

a thicker top plate than the Linn and stiffer springs for the subchassis which, usefully, are adjustable from above, making fine tuning the suspension a little easier. Most interestingly, the subchassis itself was a very thick aluminium design unlike the thin steel of the LPI2 - still at least Linn have finally caught up here with the arrival of the Keel!

Overall, the TT2 resembles a

also work for the TT2. Although you will not need it if you have an Ittok lined up already, a final little Heybrook rarity that turns up even less often than the deck and PSU was the matching arm that was available towards the end of the deck's lifespan. This was actually made for Heybrook by Alphason and based on the Delta, if memory serves me correctly.



Heybrook TT2, "a worthy candidate for a classic system", says Adam.

slightly cheaper version of the LPI2 (the subchassis excepted) but it performs very well and is a worthy candidate for a classic system of the type you are putting together. Reviews of the time suggested that it had a similar sonic character to the LPI2 but lacked the last degree of filigree detail and bass solidity of its rival, along with the Sondek's famous swing. That said, I suspect that a well fettled one fitted with an Ittok should give a good account of itself and should be a step up from even a modern Rega P3.

One thing to look out for would be a useful add-on that apparently shifted the Heybrook's performance into another league, namely the TPS power supply, unfortunately these appear for sale even less often than TT2s. The TPS was a neat little unit that was designed for the synchronous AC motors used by decks like both the Heybrook and the LPI2 and, not only improved the mains supply to them, but added switchable 45rpm, something neither deck had as standard. Again, reviews of the time said this was not as good as a Lingo, but it was considerably cheaper, selling for £90 new and the cynic in me wonders if this was an inevitable conclusion anyway...

Still, if you grow tired of searching for a TPS then I suspect that most of the modifications I have taken a look at this month for the LPI2, starting on p90, should

So, all in all, the TT2 is a fine choice and will make some very pleasant noises. Right then, that's the 'Great Groove Guru' signing off for now - see you in the bar at the next show! **AS**

This sounds like the start of a beautiful friendship - let's hope Adam's missus doesn't get jealous! **DP**

DARK SIDE OF THE TUNE

As a long standing reader I've finally been persuaded back to the dark side, but one thing confuses me, on some CDs there's a sound effect that mimics a turntable, adding snap, crackle and pop, presumably for 'authenticity'. So what happens when you buy the same album on vinyl? Does the sound effect become twice as bad, or is it removed from the mix?

Interesting thought isn't it?

Steven Dixon

The first track I ever heard with dubbed-in vinyl noise was De La Soul's 'Eye Know' from 1989, and temporarily having only a CD player at the time, I too wondered about this! When my beloved LPI2 came back from a major service though, I bought the same (great) single on vinyl and listened intently... answer: it generally sounded a lot better than the CD version, but the dubbed vinyl noise was still there, albeit sounding less intrusive (presumably because

my Sondek was smoother than my Sony CDP-557ES CD player)! **DP**

It is indeed an interesting thought, and one that I have spent more time than is necessarily good for me pondering, too. I have never quite seen the point of a nice new music format that removes surface noise, pops and crackles just to have them added back in again. This does, however, usually tend to apply to trendy R'n'B and hip-hop stuff (it's all a cacophony you know: there's no tune you can hum, and you can't hear the words...) and, as I am an old fogey at heart who does not have any of this in his record collection, I am unable to confirm whether it afflicts vinyl copies doubly badly. All I can say for certain is that there are no such problems with any of my James Last or Bert Kaempfert LPs, thank goodness.

I have also pondered the idea that, if I were in a band and releasing an album on vinyl, I would go one better and add the sound effect of an old Garrard autochanger dropping the record and the stylus landing at the beginning of each side, with the nice lift-off "thump" and mechanical switch-off noises at the end, maybe even with a continuous cheap idler wheel rumble in the background throughout the side. I can't think why no one else has come up with this idea yet... **AS**

Hi Steve. If you are suffering a lot of surface noise from your CDs I suggest you clean them with a carbon fibre record brush or replace the CD player's stylus. **NK**

FOLLOWING A LEAD

I was hoping that you could help me by giving me a recommendation on interconnects and speaker cables. My system comprises a Unison Research Unico hybrid integrated amp, Unison Research CDP hybrid CD player, Martin Logan Mosaic hybrid loudspeakers and Wireworld Aurora 5 power cords. At present I use Nordost Black Night interconnects and Kimber 8PR speaker cables. I'm not satisfied with these interconnects and speaker cables and am pretty certain that the system would sound much better with other cables - although the sound is pretty good as it is. I am thinking about buying Kimber KCAG, KS 1020 or KS 1021 interconnects and Kimber 8TC or Kimber Monocle X loudspeaker cables.

I am also considering Chord Chorus interconnects, and Chord Epic speaker cables or maybe Wireworld Eclipse / Silver Eclipse interconnect and Wireworld Oasis speaker cable. What about Nordost Blue Heaven interconnect

and speaker cable? As for music, I mostly listen to jazz, blues, bossanova and pop, and I like an open, airy sound with a deeper bass, sweet and warm midrange, transparent and extremely detailed treble.

Mario Jelenic



Chord interconnects we use at Hi-Fi World.

Interconnects and speaker cables are the twenty first century equivalent of tone controls. They work in a far more subtle fashion, but by and large it's fair to say they do the same job. However, just as I couldn't tell you - from my desk in Hi-Fi World towers - that you need to turn up your treble control by 1dB, I can't be definitive about cables either. I can only suggest what I've found to work in my system. The other problem here is that you've not specified what's actually wrong - you've just said you think you can do better!

My suggestion would be to start with Black Rhodium Tango loudspeaker cable (£15/m), which is an excellent silver-plated copper cable with an exceptionally smooth and beguiling sound - tonally it's superb at the price and rhythmically superior to some cables I have heard at £125/m. I suspect that this will really match your Unison Research

Unico, taking just a little of that brightly lit upper mid down a tad. As for interconnects, I'd suggest you push the boat out on a Clearer Audio Silverline interconnect (£120/0.5m), which is an 'inky black' sounding device with great smoothness and depth, although it's in no way coloured. Try these, and come back to me with more specifics about what how you want your system to improve next... DP

ARMED AND READY

Hi, I was just wondering if any of you have any experience of a Pro-Ject 9 arm on a Linn Sondek, as my dealer has recommended this to me for my LP12/Valhalla. Is it as good as the Rega RB250/300 or the Akito, or would it be more up to Ittok standards?

Eyal.

Well, I have not personally tried one on a Linn, but the Pro-Ject arms are pretty good and I would say that one should work quite nicely on the LP12. However, there are three different models - the original 9, which had a standard metal armtube, and the 9c



Fit a Project arm to an LP12?

and newer 9cc which have carbon fibre items. The carbon fibre versions would be the best ones to go for, but their price (around £500) means that they do face stiff competition and so you would be well advised to listen to them before committing to buy.

As to the alternatives you mention, there are of course the

good old RB250 and 300, but the LP12 really deserves a bit better and unless you are intending to buy one and then send it to the likes of Audio Origami or Origin Live for some turbocharging, then I would look a little further upmarket. The Akito is a nice enough item but I think its biggest problem is that its £650 price tag is right in the territory of a really good secondhand Ittok LVIII, which is the natural partner for an LP12, and an obvious choice. However, just to throw in a completely left-field suggestion, why not check out the Roksan Nima, which is around £350? This is a superb little arm and, although many people are scared of the idea of a unipivot on a suspended subchassis deck, let's not forget that the Naim Aro is a unipivot and is rumoured to work quite well on an LP12... AS

A BURNING ISSUE

Having read DP's advice on burning audio CDs some time ago, I seem to recall that he advised that the best quality could be achieved using a speed of 1x rather than 40x or 20x burning.

That used to be okay on my previous system but, having got a new CD-RW drive (a Sony CRX230EE), the slowest I can now apparently burn is 12x. I'm using Nero v6.6.0.12; do you have any thoughts on whether I can nudge the drive into working more slowly on writing?

Steve Reece

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Hi Steve - in a word, no! That would be a firmware issue and I suspect you'd need to get into some serious coding to do this. However, I suspect that the latest generation of CD burners are much happier at higher speeds than the older ones, and also the media itself is more able to cope with high speeds, so the speed issue might not be so significant. Notwithstanding this, one thought is that you might try a quick trawl through ebay to find an old first or second generation standalone USB CD burner - that is sure to do 1x or 2x. Another option is to buy a bespoke new hi-fi CD recorder, like a Sony RCD-W100 which retails new for around £200, and (obviously) runs in 1x (i.e. real time).

DP

TECHNICS THOUGHTS 1

Hi David. Just a short note to say how much I enjoyed your Technics/Rega project. The fact that in many ways belt-drive turntables doesn't surprise me. I was just wondering if you'd had a chance to compare it to an idler-drive deck: say Noel's Garrard? The reason I ask is that for the last couple of years or so I've been running a Lenco idler-drive turntable and I seem to spend more time fiddling with it than I do actually listening to records! The fit and forget nature of the Technics/Rega combo could be very appealing.

Mike Farrow.

TECHNICS THOUGHTS 2

Hi David. I've just read your Technics SL1200 tune-up article in the current issue of Hi-Fi World and the thought occurred to me that perhaps you could lose some of the 'shininess' from the sound by substituting the Roksan Nima arm for Audio Origami'd Rega. On paper they seem to be geometrically identical and so should be a straight swap. They are also about the same price. I would expect the Nima to open out the soundstage and be a bit more colourful, at the expense of some focus and grip. But I'm sure the Technics has plenty of that anyway.

I'm thinking about doing this to my elderly Michell Orbe, which has the original Michell badged RB300 to which I've added the Origin Live structural mod. Cartridge is Ortofon 2M Blue, bought after your review. This is the best cartridge I've owned. I think it is much better than the Goldring 1000 series or even the Reson derivatives which I'm quite familiar with. I do use all-valve amplification though (World Audio KLPP1 and K5881), and it sounds lively enough through this. Perhaps through solid state it would be too much of a good thing. Anyway, just a thought.

Keith Stickels



Tuned up Technics SL1200 turntable with Audio Origami Rega arm - "amazing everyone who sees it" says David.

Thanks for your input, guys. Although I haven't heard the Technics directly against a Garrard (although I've heard the Technics in my system and the Garrard in my system, just on different occasions), I would guess that the Garrard has an even better, deeper and more muscular bass. However, I would also bet the Technics has superior treble detail and air, as this is where I feel the Garrard falls down. We all have our own personal proclivities, and I'm a big 'treble person', so this has prevented me from going the way of the Garrard so far (although I'm very willing to have my mind changed for me on this issue). The Technics is duly amazing everyone who visits me, and I've tweaked it still further so it's working better than ever. We should have a plinth and integral sub-table made up for it soon, and I am desperate to put a high end Origin Live arm on it (which uses a Rega fit) - I think a Nima would be an interesting afternoon's worth of work too. This has been a real 'ear-opener', and rest assured we've only just begun! **DP**

To add to David's comments, as a Garrard 301 owner and a keen fellow listener alongside David to both the SME 10A and his modified Technics. I can safely say that I was absolutely blown away by the performance of the modified SL1200 - it really does release the potential of this deck and show what a superb bargain it is for the price. However, I have to say that, even if I modify my own SL1210 up to the level

of David's, it still won't be persuading me to part from my 301 as, to my ears, it reaches about 90% of the Garrard's performance level but still can't quite match it.

As David said, the most noticeable aspect of the Technics' performance when comparing it to a belt drive is in the bass - it starts and stops quicker, follows complex bass lines with assured ease and digs down very deep. However I still feel that the 301 just goes that little bit further; it has the same pace and flow, but just that extra ounce or two of sheer impact and scale that you don't really get with a direct drive unit until you're up in Technics SPI0 or Denon DPI00M territory.

I have to agree that the fit and forget nature of a direct drive is appealing, although I just recently stripped my own 301 down for a good cleanup and service and this is the first time I have done it in about the last eight years, so not too bad on the maintenance front, I feel!

Regarding the arm, I personally think that the Audio Origami item is by far the best upgraded version of the RB250 that I have heard to date, but I'm afraid that I still don't really buy into it as an all-conquering hero that can topple arms many times its price. The Nima would get a big thumbs-up from me, too. **AS**

I was mightily impressed by this pairing: the arm and turntable look fantastic together, work beautifully and offer the most practical way to play LP.

The only thing wrong with it in my view is that it looks more alluring than the Vestax + Rega I have just joined in unholy matrimony. You can read more about this next month!

NK



Don't forget the excellent Roksan Nima arm, an Adam favourite.

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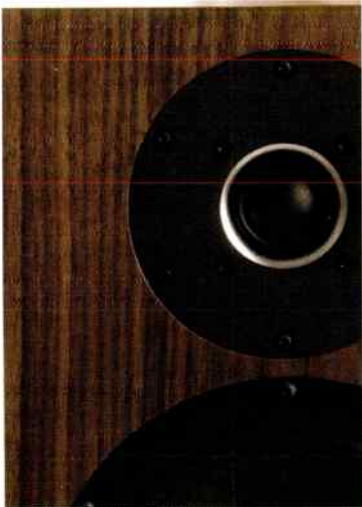
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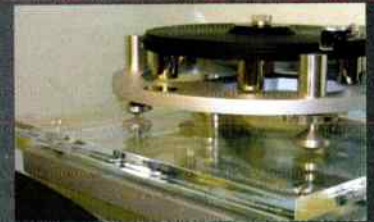
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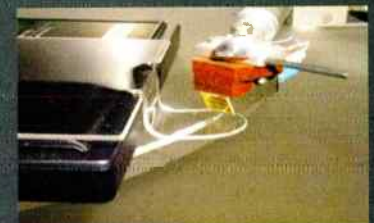
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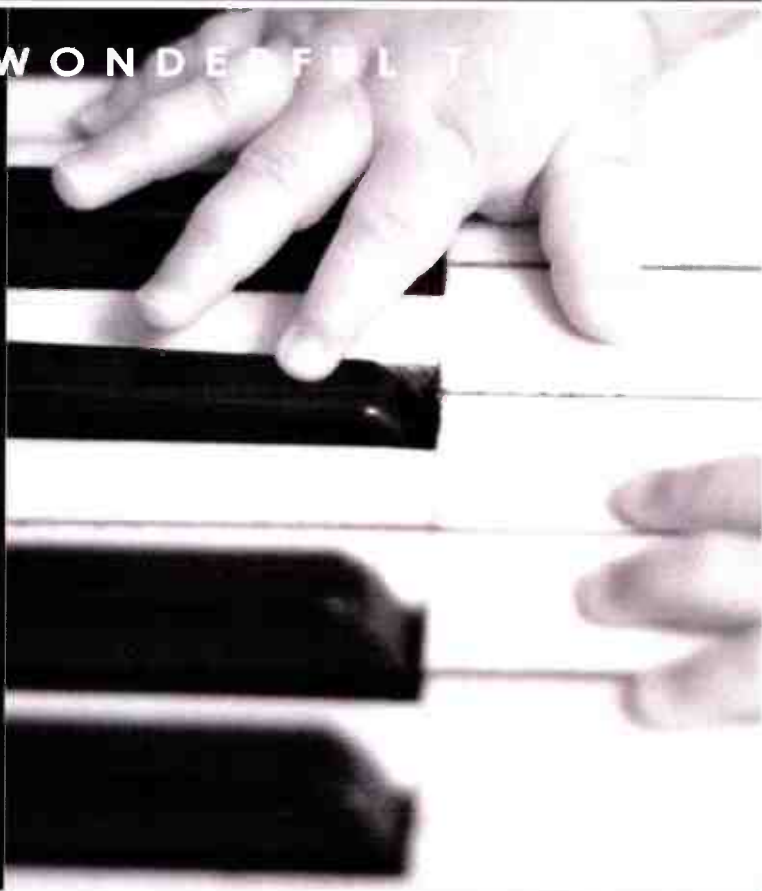
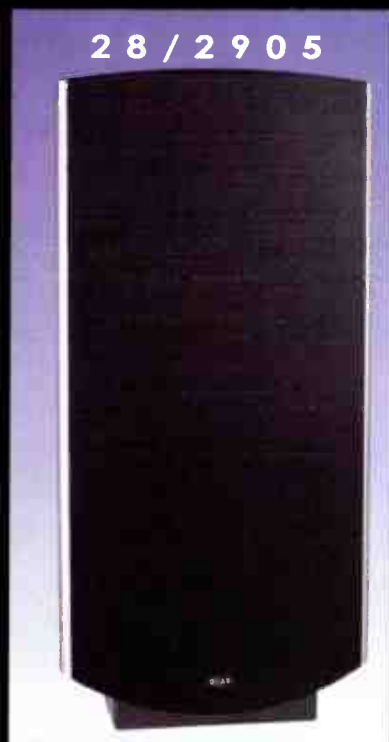
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Is this the future.?



In the Aug. issue I referred to the Nola range of speakers, and if you can afford them, it's something you really should hear, but the world according to AVI is changing, and although they manufacture a superb CD player and matching Integrated amp, they have recently produced a small pair of active speakers, including built in DAC (ADM9's), to be driven by the digital output from a computer such as the Mac mini, and controlled via an IR handset. With the trend towards minimalistic designs, this is certain to catch on, and I can see why AVI are so keen on it, even if it does restrict the sale of their other electronics!. So I will be trying to determine just how wonderful such a system can be, especially as I have customers who are going in this direction. So if of interest, give us a call - I will be reporting on it further in a later issue!

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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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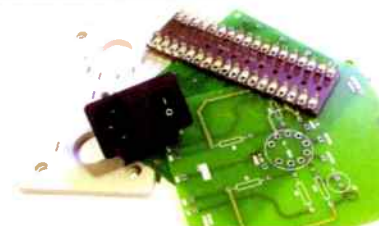
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PRIMARE CD110 all-in-one unit. 75w/ch.amp/CD Player/FM & DAB radio. Hi-Fi Choice Gold Award, with spare remote, £725 ovno. Unison Research Unico hybrid valve integrated amplifier £625 ovno. Both mint. Tel: 023 8073 8935

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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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NEXT MONTH

As the nights draw in, what better way to spend them than relaxing in front of your treasured hi-fi system, thumbing through your favourite hi-fi magazine? November's issue is packed full of cracking new kit, many of which are exclusive to **Hi-Fi World**, including Astin Trew's new AT3500 hybrid CD player, Ortofon's brand new 2M Gold and Black moving magnet cartridges and Revolver's super Music 3 loudspeakers. Here's just some of what we hope to bring you:

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ASTIN TREW AT3500 CD PLAYER **EXCLUSIVE!**

VINYL ACCESSORIES ROUNDUP **EXCLUSIVE!**

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HELIOS X5000 MUSIC SERVER

RRR FS100 LOUDSPEAKERS

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BERLIN HI-FI SHOW REPORT



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NOVEMBER 2007 ISSUE - 7TH SEPTEMBER 2007

DECEMBER 2007 ISSUE - 9TH OCTOBER 2007



EMERSON, LAKE & PALMER

FROM THE BEGINNING

2007

"the remastering work has released new music from the tapes which was previously masked..."

The subject of choice this month was going to be one of ELP's classic albums – and there are plenty to choose from via this, often derided, yet pioneering and innovative prog rock group. Possibly their self-titled debut album from 1970 or maybe their 1972 outing, 'Trilogy' or even 'Brain Salad Surgery' from 1973 or... Well, the choice was a problem until, quite coincidentally, the record label Sanctuary announced the launch of a massive six disc set covering the band's entire career...

The set includes a range of much loved and extremely rare tracks from the studio and via live outings. In addition, there are a number of rare B-sides, alternate studio mixes and other material taken from band rehearsals. You also receive a DVD entitled 'The Manticore Years', which is a documentary that goes behind the scenes and features a range of interviews. Finally, all three band members contribute to a 60 page booklet in which the chaps discuss their career as ELP.

Creating the box was a major enterprise and, for the attendant mastering engineer, tackling such a project was no mean feat. Paschal Byrne was assigned to the job. "I certainly have an interest in the music, that's my era. I worked for Decca studios in the nineteen seventies and the Decca Recording Centre in the eighties." In fact, when the Decca Recording Centre eventually closed, Byrne purchased most of the classic kit from the company to help form his own outfit, The Audio Archiving Company.

When the project began, Byrne

was given access to a wealth of quarter-inch, four and eight track masters. He and colleague Mark Powell, the project coordinator, sifted through the primary material and consulted with the band members themselves to select the best, and most publishable, material for the set.

Some of the original recordings were best described as a 'challenge'. "For example, the three rare live recordings taken from the Lyceum gig, from December 1970, placed on disc one of the box set, suffered from technical issues that the band themselves struggled with whilst on stage – they suffered from power cuts, for example, along with buzzes and crackles from the equipment. Also, because the recording was limited to 8-tracks the band had compressed various parts onto one track such as the guitar part and the backing vocal and a keyboard within the same track. We could only do so much with the material but we had the technology to do a decent job. We were able to dump that down onto a workstation, split the music into its various parts and remove some of the distortions and noises."

Byrne is also very concerned about the fact that he's using analogue sources. He's fully aware of those who advocate a pure analogue chain but his view is, "with the equipment you have, you do the best you can and that also means knowing how to get the best out of any analogue equipment that you do use. However, we wouldn't have been able to produce this box set without the digital tools."

The results, whilst not perfect,

are certainly a vast improvement. In fact, the attendant work has actually released new music from the tapes which was previously, effectively, masked. Such is the benefit of using a good mastering engineer who knows his stuff. Like a studied archaeologist, the modern mastering engineer, when considering reissues especially, is able to reveal new treasures from what appears at a first glance to be a conglomeration of difficult primary sources.

If you're looking to enhance your ELP collection, on the CD front, stick with Sanctuary who released the band's entire output in 2004. Priced at around £8 per album from the Internet, these albums are bargains and well mastered to boot. Speaking of 'boots', Sanctuary also released an excellent series of, what they term as 'Official Bootlegs'. Published as a series of multi-CD box sets, 'The Manticore Vaults' feature between three or four entire vintage gigs spread over five to eight discs per box. They are essential for dedicated fans and are well presented, although understandably the sound quality is not exactly audiophile.

Vinyl fans are not left out, either. Sanctuary completed an arrangement with the Italian company Abraxas to form the label Earmark. That is, Sanctuary supplied the original master tapes and Earmark completed the final mastering releasing 'ELP', 'Pictures At An Exhibition', 'Trilogy' and 'Tarkus'. All are recommended. However, the Speakers Corner edition of 'Pictures', which should still be available, has the edge on the Earmark release. **PR**

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