

# HI-FI WORLD

JULY 2007

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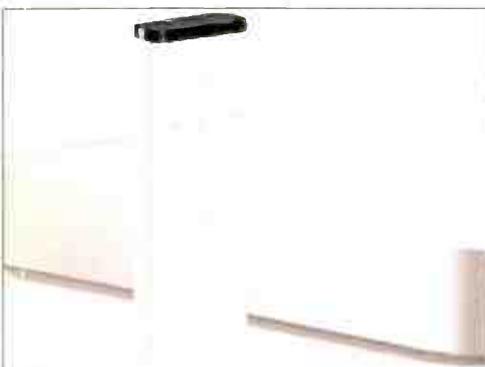
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**LINN SONDEK LP12SE**  
turntable - see supplement



**ONKYO D-TK10**  
novel standmounters



**APPLE TV**  
wireless media player

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QUESTIONS ANSWERED**

## FINELY BALANCED

**Shanling CD3000  
& Audia Flight CD Two  
CD players...**



- > DENSEN B-410 CD PLAYER
- > MARANTZ ST-15S1 TUNER
- > LEEMA ANTILA CD PLAYER



JULY 2007



**COMPREHENSIVE 12-PAGE BUYING GUIDE INSIDE - see p85**

# Zingali



*Zingali Loudspeakers  
has been my passion.  
A crusade since I heard  
them nine years ago...*

*Jack Lawson*

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The Italians enjoy life to the full. Everything they make expresses the full experience and their Hi-Fi is no exception. Zingali loudspeakers present music with an authenticity unrivalled even by other so-called Italian loudspeakers. Let's just say that exceptionally Zingali crafts his loudspeakers organically within Italy; using his drivers, his cabinets, his reflex chambers, and his horns. Most loudspeakers are designed subtractively: cabinets are damped, crossovers are subtractive, and components are OEM.

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Celebrating the company's 20th year, the company has moved to the largest and most modern

loudspeaker factory in Europe. The economies of scale permit the launch this Spring of a range of affordable speakers which use the unique and patented Omniray horn design. Never one to escalate costs by marketing and distribution you will not find these on the High Street but you will pay High Street prices for a crafted product.

Check the used markets worldwide and you will confirm our boast and Zingali's pride. Few people feel the urge to upgrade when the variations within your chosen music ensure that you will never tire of these loudspeakers; and having made the discovery, you will never switch brands.

**Besides, "she" would never allow it!**



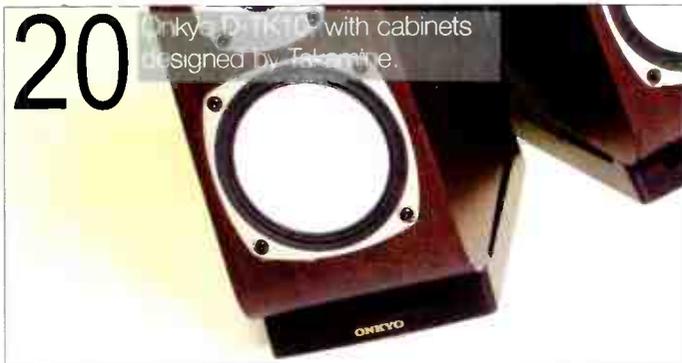
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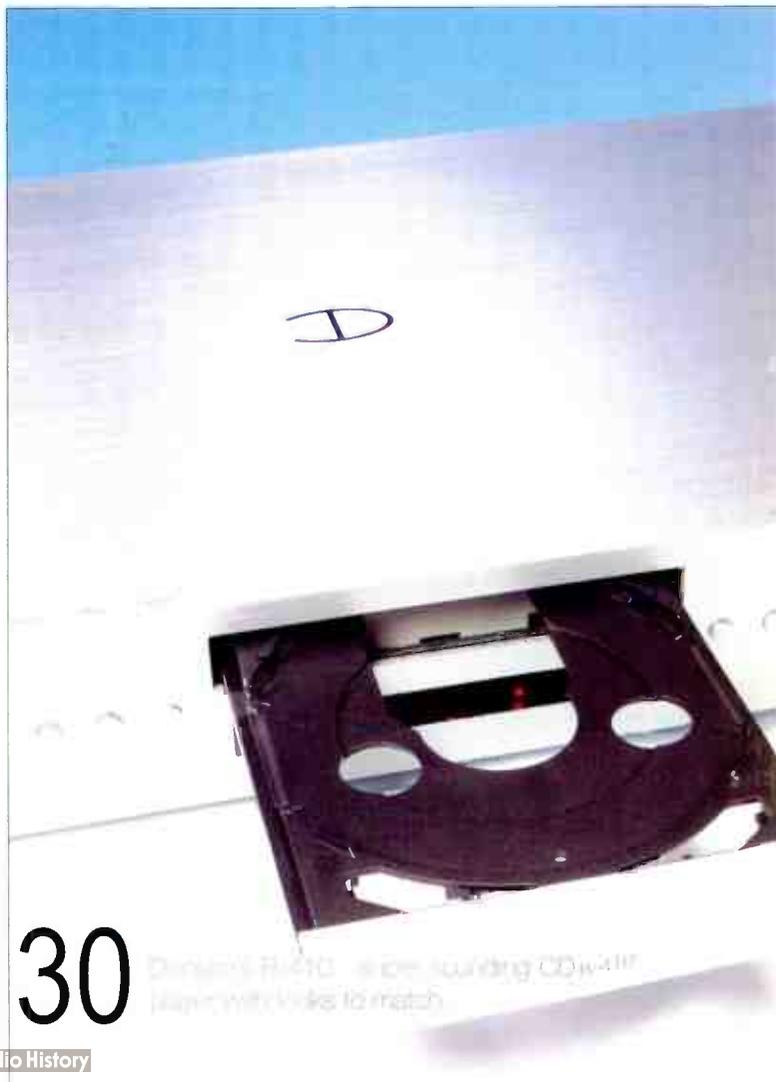
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LINN

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



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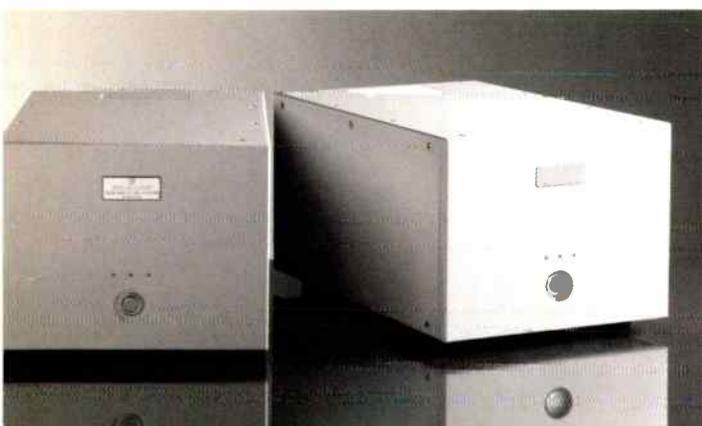
For more information and details of demonstration events in your area visit [www.linn.co.uk](http://www.linn.co.uk), or call 08000 277 181.

news@hi-fiworld.co.uk

# news

## SAIL ON

Marantz has a new flagship silver disc spinner, in the not inconsiderably sized SA-7SI 'reference standard stereo Super Audio CD player'. The princely sum of £4,999.90 buys you what Marantz call their "most refined product to date". The 22kg behemoth follows in the footsteps of the legendary SA-1, which this magazine still holds in extremely high regard. Its full-metal chassis employs a double-layer bottom plate and is completely copper-plated. All key internal components are also copper shielded, and there's a segmented power supply that includes a high-capacity Super Ring toroidal transformer entirely shielded by an aluminium shorting ring and copper-plated case. There is also rectification by Schottky barrier diodes and oversized storage capacitors custom made to Marantz specifications. The disc mechanism sits in a 10mm case of extruded aluminium and is coated with a non-reflecting material to prevent light reflection. A pair of mono DACs - each comprising four separate processors for both DSD and 24bit PCM audio playback - work in tandem with Marantz's latest HDAMs (High Definition Amplifier Modules). These devices replace the single chip, 'off-the-shelf' op-amps that many other manufacturers use. The output buffer amps are HDAM-SA2 modules, and circuit topology is direct and fully balanced dual-differential. A switchable digital filter completes the package. Click on [www.marantz.co.uk](http://www.marantz.co.uk).

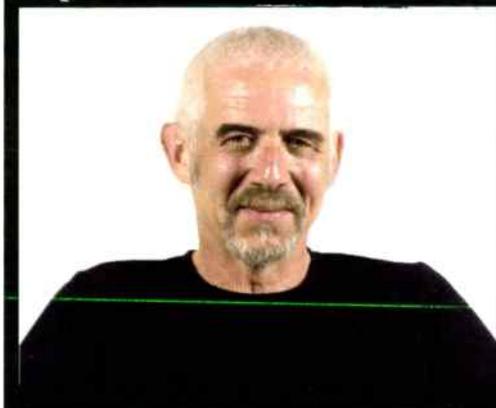


## GOLD STANDARD

Goldmund's Telos 200 is the smallest mono amplifier of the Goldmund 'High-End' line of products. Only slightly bigger than the Mimesis 18.4 it replaces, the Telos 200 (costing a cool £11,790 per pair) uses a Telos circuit derived from the one in the Telos 400. It provides a built-in digital input, auto-start circuit with signal-sensing and input attenuator. The latest version of the Telos circuit makes for 200W into 8 ohms or twice that into 4. "Ultra-high speed" is claimed, and a DC to 2MHz bandwidth at full power before protection. There are unbalanced and balanced inputs available, with thermal grounding construction which means the power output MOSFETs are assembled on a large gold-plated pure copper heat-transmitter to achieve an ultra-fast heat transfer and so limit temperature-related dynamic losses. The "ultra-fast power supply design" means four built-in high-speed transformers with new rectifiers and low capacitor values for "the fastest possible signal amplification without power-supply-induced contamination". Vital statistics are 210x240x380mm and 18kg apiece. For more information, click on [www.goldmund.com](http://www.goldmund.com).

## HOUSE MUSIC

After fifteen years as Linn's PR supremo, Brian Morris is opening House of Linn. Described as "an independent Linn reference location and true centre of excellence", House of Linn's five demonstration rooms feature Linn stereo and multichannel components and systems, as well as offering expert advice, service and sales for all things Linn. Featuring Linn's best stereo system, Komri Aktiv, LP12 SE and Linn digital sources on permanent demonstration, Manchester-based House of Linn offers by appointment demonstrations and caters for all existing or potential Linn customers from the UK and beyond - and can even arrange accommodation for those wishing to make a day (or two) of the audition experience. For more information, email [info@houseoflinn.com](mailto:info@houseoflinn.com).



## RESEARCH MACHINES

Rega Research Limited has a new Planar 3, with "most areas of the turntable changed" no less! The new plinth is said to be rigid thanks to phenolic resin laminates, with a high quality edging. A "high performance motor" is fitted, the same low vibration unit found in the P5 and 9 turntables. The controlling circuitry can be adjusted for phase angle of the motor coils resulting in "very low vibration levels", said to give a considerable performance increase over the outgoing P3. The new deck can now take Rega's outboard turntable PSU first developed for the P7 turntable, a synthesised low distortion AC supply which is crystal controlled, and with the convenience of electronic speed change control. The famous RB300 has been modified to improve production and give a higher musical sound performance. A better vertical bearing housing has been used, which gives improved rigidity in the tonearm's mounting, reducing the stresses in the main 13mm bearings - plus improved RB700 bias housing and phono cable. The newest P3 costs £398 and is also available with the Rega Elys cartridge fitted for £498. For more information click on [www.rega.co.uk](http://www.rega.co.uk).



## FOUR PLAY

German loudspeaker specialist Quadral has an unusual new pair of digital wireless hi-fi speakers. The new Argentum 02WL is a wireless hi-fi loudspeaker, which claims "a high quality digital transmission process" and two 50W digital amplifier modules per speaker to "guarantee CD quality sound". It sports a 25mm soft dome tweeter claimed to stretch up to 45kHz and a 130mm mid/bass driver in a bass reflex cabinet. Transmission range is said to be at 30m, and the speakers themselves measure 310x168x251mm. For more information, click on [www.quadral.co.uk](http://www.quadral.co.uk).

## SILENT RUNNING

Advanced Acoustics offer acoustic treatment from as little as £70. Their room treatment solutions "drastically improve the sonic performance of the room taking away the negative influences the room has on both the equipment and the music", it is claimed. Installed in the corners behind the speakers their Corner Sound Trap Panels reduce the low end build up that congregates in the corner giving the room a better response at the low end. The Wall Sound Trap Panels let you "experience a massive soundstage that before you could only dream about". Visually their panels need not overwhelm a room and to further help them integrate aesthetically they are able to finish the panels with a design based on a picture provided by the customer. For more information, click on [www.advanced-acoustics-uk.com/highendaudio](http://www.advanced-acoustics-uk.com/highendaudio) or call +44 (0)1623 400660.



## VITAL SIGNS

Following in the footsteps of the Tivoli-troubling Vita R1 table radio, the new £219.95 R2 adds an extra channel, making it a stereo FM/DAB Digital radio with RDS. The walnut finished beauty boasts two switchable line inputs, a front mounted headphone output, two 3.5" drivers with a 2x10W nominal power output. There's a compact remote controller and gold plated phono inputs and outputs on the rear. Dimensions are 120x340x170mm and weight is 3kg. For more information, click on [www.vitaaudio.com](http://www.vitaaudio.com).

## NOW EAR THIS

Chasing the high end portable market is Denon's brand new AH-C700 ear-canal earphones. £139 buys you a very high quality 'earplug' design that insulates the ears from outside noise. Whereas its rivals use lightweight plastic capsules, the AH-C700 uses ultra-rigid machined aluminium housings that are said not to resonate. Advanced 11mm diaphragm drive units and audiophile cables complete the technology picture, and soft silicone adapters in three sizes let the C700s sit comfortably in most ears. There's 1.2 metres of cable, made of durable elastomer with pure-OFC (Oxygen Free Copper) conductors



for best sound, and a gold-plated aluminium-bodied 3.5mm stereo mini jack plug. There's a choice of silver and black finishes. For more information, click on [www.denon.co.uk](http://www.denon.co.uk) or call +44 (0)1234 741 200.



## RADIO GAGA

Tangent's Quattro is a svelte looking new internet radio and wireless music player. The display shows the names of all internet radio stations, which are automatically gathered by genre or location, "so the only difficulty users may have is deciding which one to listen to", says Tangent's Torben Kristensen. No computer is necessary, but a Wi-Fi broadband connection is needed. The powerful 3" upfiring driver unit and rigid cabinet is said to prevent resonance. For more information, visit [www.tangentaudio.com](http://www.tangentaudio.com).

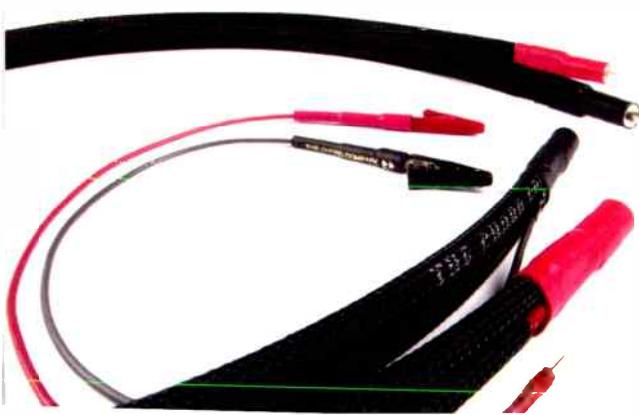
## METAL MACHINE MUSIC

KEF describe Muon as "a remarkable two-metre high loudspeaker" created by KEF and Ross Lovegrove. A materials and technology-led industrial designer, Lovegrove's work features in permanent collections in design museums globally including the Museum of Modern Art in New York (MOMA) and the Design Museum in London. He has worked on projects for Airbus, Apple Computer, Tag Heuer and Japan Airlines, to name but a few. The Muon loudspeaker is fabricated from super-formed aluminium, which uses a similar moulding process to vacuum forming. The concept uses malleable sheets of heated aluminium to achieve otherwise impossible shapes, says KEF. A UK based company that has strong links with the aeronautics and automotive industries milled the first prototype from enormous billets of solid aluminium. Using state-of-the-art computer-aided manufacturing software, the machines precisely cut away the excess material from the six-foot long block of solid metal to reveal the final form – in total the milling took about a week. Muon's four-way speaker system sports KEF's Uni-Q drive unit array, and two additional bass drivers mounted at the rear. The 6mm thick, heavily damped aluminium shell provides a totally rigid structure that minimises any sound-distorting vibrations. KEF's senior Acoustic Engineer, Andrew Watson said, "we wanted to take our technology to the limit and then develop it further". Muon comes as a limited edition of one hundred pairs, and price is in the region of £70,000. For more information click on [www.kef.com](http://www.kef.com).



## SUMMER SPECIAL

Those sunny folks at the Chord Company are running a limited period trade in offer giving £150 off Chord Signature Interconnect. They'd like everybody to have the chance to hear the multi-award winning cable. All you have to do is trade in an interconnect, regardless of brand, to get a £150 reduction on the price of a brand new Chord Signature RCA interconnect cable. Just take any interconnect along to any participating retailer during May, June, July or August 2007 and you'll get £150 off the normal selling price of £550. Check [www.chord.co.uk](http://www.chord.co.uk) or call 01980 625700 for a full list of participating retailers.



## CLICK ON THIS:

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Warner Bros Records online vinyl and DVD Audio store features all types of music, including regular weight records, 180g audiophile pressings, exclusives to the site, 7" singles, coloured vinyl, picture discs, box sets and much more.



# Music

**One of the most interesting loudspeakers to debut at last September's Heathrow Hi-Fi Show was the Podium One, designed by an international concert pianist of considerable repute. David Price gets a virtuoso performance...**

**H**igh fidelity music reproduction is where science meets art. As many a giant Japanese corporation has shown, it is perfectly possible to make a hi-fi component that measures very well – almost perfectly, even – and yet it still doesn't 'play music'.

Loudspeakers are surely where this is most pronounced. There's the need to understand the mechanical and electrical engineering processes involved in the cabinetry, driver and crossover systems, and also the necessity to be able to 'voice' the whole package so it's able to communicate on an intuitive emotional level. No surprise then, that if ever there was aspect of hi-fi design where 'the black arts' come in, this is it.

Interestingly, almost without exception, all production loudspeakers are firstly designed by clever people with the appropriate engineering qualifications, and then voiced often by the very same people, sometimes with input from the company's marketing men.

In the case of the Podium Ones, the design process has taken a slightly different trajectory. Whilst Shelley Katz, the man behind both the speakers and the company, has had considerable previous design experience with electric pianos, he is – first and foremost – an accomplished professional classical musician who has worked at the highest levels.

He began his studies at the Conservatoire de Musique in Montreal, and went on to the world renown Julliard School in New York. As a soloist, chamber musician and accompanist, he played under Bernstein, Solti, Ozawa and was the pianist for New York Contemporary Ensemble under Skrowaczewski. He then spent eight years based in Germany, recording with some of the great international singers including



# Maestro

Nicolai Gedda, Dame Gwyneth Jones and Jochen Kowalski. A PhD at Cambridge in psychoacoustics followed, which lead him to develop the loudspeakers you see here.

It has to be said that this is not the career path that most loudspeaker designers take, which probably explains why the £6,895 Podium Ones are not like most loudspeakers. They are panel speakers, like electrostatics, ribbons and NXT SurfaceSound designs, but are different to all three. A flat horn, floating tapered line array dipole, using a novel application of compliant surround loudspeaker technology, they share some things in common with NXT panels (they actually use the very same 'exciters', or 'drivers' as Katz calls them), but to assert that they're the same is like saying a 1979 Ferrari 308 GTB and a 2007 Honda Civic are one and the same because they both run on fifteen inch alloy wheels.

Katz explains that NXT speakers are constrained panels; their outer edges are held rigid by the frames of the speaker – in a sense akin to the way that an infinite baffle has its moving coil drivers constrained by the air on the box, which can't get in or out. The Podiums work on precisely the opposite principle; the panels are able to 'float' in air like woofers in bass reflex speaker boxes. Essentially then, the Podium panels are free floating, rather than being reigned in and controlled as per NXT. With the Podium Ones, the speakers energise the room, just as a concert grand 'drives' a hall.

Being panels gives them some tremendous advantages, as there is effectively no cabinet to interfere with the proceedings. No matter what loudspeaker manufacturers say about how inert their boxes are, they are always there - the devil in the room whose name they dare not speak. Instead, the Podiums have frames, and unlike the Quad 989s which I have used as a long standing reference, these are not wobbly structures. Rather, the 72x24x0.66" affairs are made of the finest English birch, rigid and beautifully finished as per the very best marine applications.

Running down the centre rears of the Podiums is a tapered spine containing the five 'drivers', which

are coupled to the vast metal honeycomb panels. The drivers are linked in such a way that the panels will move a centimetre or two forwards or backwards (if you push them, or the drivers excite them). The drivers are wired with fine grade silver wire, running down to a single pair of binding posts at the bottom. The stands are Sheffield stainless steel shafts, which insert into a recess at the base, and provide a stable resting place for each 15.6kg speaker. Despite being of Canadian extraction, Shelley Katz is emphatically proud to say that, 'drivers' aside, the Podiums are entirely made in England – even down to the fine quality front grille cloth (available in black or white)!

## SOUND QUALITY

These loudspeakers are unlike anything I've ever heard – which is to pass absolutely no judgement, merely a statement of fact. Logically, this could only be the case, because they are a unique design - like Quad's ESL-57 or Apogee's Scintilla, they do things in a very different way to the moving coil driver and box brigade.

So they are highly distinctive, but I warn you now - if you like big behemoths which assault you with a fat, sumptuous sound, then you'll be left wanting. Podium Ones are even less fulsome than Quad 989 electrostatics for example, meaning that the 99% of hi-fi folk who've never heard loudspeakers without boxes will find them odd at first.

The situation is made stranger by their sensitivity to placement - in short, they're bloody fussy to position. Shelley Katz told me they'd work almost anywhere, but I have to disagree. In my room at least, they were unusually - almost unprecedentedly - room sensitive. Yes, they'll make a noise anywhere, but to extract from them the performance they're capable of, don't think you can just plonk them either side of your chimney breast and forget them...

I actually got my review pair singing when they were at either end of my listening room, some ten metres apart, toed in at nearly 45 degrees and pulled out by about 30cm from the rear walls. Furthermore, I found they really don't like cool rooms; they need at least 20 degrees centigrade to

really sing. They also don't like cheap ancillaries and, like my Geraniums, definitely prefer residing on the warmer side of the street – valves and vinyl, enough said...

Next on the list of caveats is the fact that they are unusually music dependent, really shining with classical, electronic or acoustic material, but being less convincing with rock and reggae. Once again, this is often the case with high end loudspeakers, and the same observation can be made of Quad 989 electrostatics, for example. Likewise, not even JBL would pretend that their K2 S9800 is as clean across the midband on classical as a Quad. At this price, you pay your (not inconsiderable sum of money) and takes your choice...

In my system, in my room and when finally positioned properly, the Podium Ones imaged better than any loudspeaker I've yet heard, and that includes B&W £10,000 801D and Meridian's £16,175 DSP7000s which have resided with me for many months over the past few years. The ability of these speakers to fill a room with sound, and place images in space, is peerless in my view. Rather like placing a grand piano in your front room, they simply take over and turn your whole space into part of the performance. Much has been written about the ability of Quad electrostatics, for example, to disappear into space, but you've got to hear these to know what it really means – they're in a gang of one in the way they melt into the room. ELO's 'Living Thing' on LP assumed massive physical proportions, effortlessly pouring out all around my very ears.

This brings me onto their next striking characteristic – transient speed. Again, my reference Quad 989s were left sounding ponderous and ever-so-slightly 'wrong footed' when asked to reproduce Kraftwerk's 'Techno Pop' from their 1986 opus 'Electric Café'. The Podiums



# Join a great team!

Owing to the strength of our people, Cambridge Audio has rapidly become one of the world's most successful hi-fi and home cinema brands. Following expansion in key overseas markets, we wish to strengthen our 70-strong team with yet more ambitious, flexible, hard-working colleagues.

## Business Development Executive

This key role will focus on helping to grow our global distribution. Reporting to our busy Business Development Director, you'll be a flexible, high-performer with strong commercial awareness. You'll be tenacious and energetic, possessing the ability to divide your attention across numerous clients. A genuine passion for products and the ability to transmit your enthusiasm to others are vital. Possibly ideal for someone currently in retail. A valid passport and an interest in travel are also absolutely critical!

## Software Design Engineers – Embedded

Our successful candidates will be experienced in C and assembler programming for both low level 'bit bashing' and higher level processing techniques with a good appreciation of hardware design and schematic capture. Experience of developing consumer products would be highly advantageous.

## Electronic Design Engineers (Audio products)

To qualify for one of these exciting roles you'll be experienced in the following; high performance analogue audio design, amplifier, digital audio, DSP, radio systems, digital and analogue video. Experience of consumer electronic product development is essential as is the desire to squeeze the maximum performance out of any given budget!

## Electronic Design Engineers (A/V products)

We're looking for candidates with a background in the following; Crystal/Cirrus Logic DSP systems, HDMI, analogue and digital video systems, video upscaling, surround-sound processing/room EQ, AV receivers, DVD players, schematic capture/PCB layout, design for LVD/EMC compliance. Experience of A/V product development is essential as is an in-depth knowledge and interest in the features, technology and specifications that characterise these products.

## Test Development Engineer

Responsible for creating hardware and software test systems for our manufacturing sites, the successful candidate will develop testing regimes and fixtures for both complete products and individual PCBs and sub-assemblies. You will be expected to specify test plans and to design, build and commission the test fixtures delivering hardware, software and documented procedures for use by our manufacturing partners.

## Product Design Manager

We're seeking a product designer – probably from an engineering background – who wishes to move to a product management / architectural design role. The successful candidate will need a strong appreciation of analogue and digital audio design techniques and in-depth knowledge of high performance audio/video systems along with their features and specifications. A desire to create innovative products coupled with strong commercial awareness is crucial. The successful candidate will also possess the ability to research and absorb new technologies. The ability to select and manage relationships with technology providers, development partners and Asian factories is a pre-requisite for this pivotal role.

## Got another skill to bring to our team?

We're constantly on the look-out for new people across all disciplines – from product development to sales to marketing – so if you're looking for a new career, why not drop us a line?



To apply, please send your CV together with a covering letter – stating the post for which you are applying and your salary expectations – to: [careers@cambridge-audio.com](mailto:careers@cambridge-audio.com). All applications will be treated in the strictest confidence.

For more information on Cambridge Audio visit: [www.cambridge-audio.com](http://www.cambridge-audio.com)

are startlingly fast in the way they can catch the first milliseconds of a transient, making them - in their own unique way - great for heavily syncopated music. They're able to eke their way into the most complex of mixes, and 'unwrap' everything so you can hear right into the music. I found myself hearing rhythms in the song's bass sequencing that I hadn't previously come across. By contrast, the Quads sounded a tad wooden and woolly; their less-than-rigid cabinetry damping down the attack transients that their electrostatic panels had captured.

Another example of this was the ultra tight percussion on Haircut 100's 'Love Plus One'; there was no denying the brilliance of drummer Blair Cunningham (Paul McCartney later asked him to session for him) and his blistering snare work. Again, the Podiums were especially adept at capturing every last rim shot from beginning to end, allowing the listener to marvel at the speed and complexity of the song's percussive work.

With this in mind, you might imagine that the Podium Ones were brilliant with rock music, but here I found them less convincing. In my room, the Podiums sounded more lightweight (if cleaner) than the Quad 989 and lacked the physicality of the Yamaha NS1000M. The Podium One's bass is nicely deep and even but can't be considered over-generous, and in my system didn't seem muscular enough to give a truly moving account of this song.

The Podiums gave a very particular rendition of Supertramp's 'School' on LP, with that wonderful multi-dimensional soundstaging, oodles of detail and insight into Roger Hodgson's vocals, plus the dizzying speed I'd come to expect from them, but again when the band kicked in in earnest, it was a tad underwhelming in terms of physical impact. With this in mind, I'd counsel that those looking for gut thumpers - who want their internal organs momentarily rearranged by their loudspeakers - to look elsewhere.

Rather the Podiums are about delicacy and dimensionality, which is - funnily enough - what classical music demands more than anything else. For example, my classic Philips LP pressing of Debussy's 'Submerged Cathedral' was mesmeric. The piano tone was quite sublime, the Podiums seeming to penetrate the very insides of the instrument, and convey its every inflection.

The midband of these loudspeakers is obviously well lit, allowing the tonality of an instrument

in a recording to be ruthlessly revealed. Whereas the Quad 989s sit on the warm side of the fence, the Podiums err towards the opposite, with a vivid midband that casts a penetrating light on every aspect of the recording. It makes for startling clarity in some senses, but also means you'll do well to ensure they're partnered with smooth sounding ancillaries.

My well-worn DG pressing of Beethoven's Pastoral Symphony (Dresdner, Karajan) showcased the Podium Ones at their very best. A vast, concert hall-sized recorded acoustic beckoned, massively airy and spacious like no other loudspeaker I've yet heard in my listening room. They hung the image back seemingly for miles, and allowed every instrument a great deal of space to breathe. Tonally dry without a hint of bloom, the strings were rendered in a highly realistic manner, and the innate sense of timing the Podiums possess made for a fast and vigorous listening experience, fully communicating the majesty of the music.

**CONCLUSION**

One of the most focused loudspeakers I've ever heard, some will love the Podium Ones and others won't. If you sit on the 'electrostatic' side of the fence, and demand the absolute minimum in colouration and the maximum detail retrieval, you'll likely adore them. Others who crave cream in their coffee, so to speak, will seek more beguiling and ultimately less incisive designs elsewhere. Rather like a pair of Stax Electrostatic Earspeakers, this is the sort of product that polarises opinion, so those wanting a general, 'do-it-all quite well' sort

**SECOND THOUGHTS**

The Podium Ones certainly look like no other loudspeaker and, as David says, sound pretty much the same way. They don't rock like mad things, are very material-dependent and need a sympathetic source if that midrange peak is not to be objectionable. They are definitely more position sensitive than we had initially been led to believe, but get this right and they reward like few other loudspeakers in many respects. With jazzy female vocal music for example, the Podium Ones are truly eye-opening with the vast image that they lay before you. Pianos are vivid, drums have real body, double basses seem propped up just at the end of your foot and vocalists seem almost in your lap. They have a surprisingly lively bottom end too. Ultimately, the Podium Ones will not be to all tastes, and I suspect they will be seen as something of a 'Marmite' design that will invoke strong reactions - like the aforementioned food, you'll either love them or hate them. Personally I think they are very impressive - but then I've always liked Marmite... AS

**REFERENCE SYSTEM:**

Michell GyroDec/TecnoArm/vdH Frog turntable  
Note Products phono stage  
Marantz CD63KI DP CD player  
MF Audio Silver Passive Pre  
World Audio K5881 power amp  
NuForce Reference 9SE amps  
Yamaha NS1000M speakers  
Quad 989 loudspeakers

of speaker will find them unforgiving. Rock fans may not like them, whilst classical music aficionados will regard them as amazingly capable. I personally have never come across such a difficult product to rate (some would award them six globes, others three!) - so the best thing is for you to listen carefully for yourself with your favourite music. One thing is certain - as debuts go, the Podium One is a veritable show-stopper.

**VERDICT** ●●●●

Exceptionally capable imaging, speed and insight makes them brilliant classical music transducers, but unusually music dependent.

**PODIUM ONE** £6,895  
Podium Sound Ltd.  
☎ +44(0)845 229 7922  
www.podiumsound.co.uk

- FOR**
- peerless soundstaging
  - speed, musicality
  - insight, detail
  - design, build, finish

- AGAINST**
- unusually music, room and system dependent
  - brightly lit midband

**MEASURED PERFORMANCE**

The Podium Ones are an interesting loudspeaker to measure, and not only because they only just fitted into our measurement area! As a result of the fact that they do indeed radiate well in all directions, finding a result that truly represented their performance took a while.

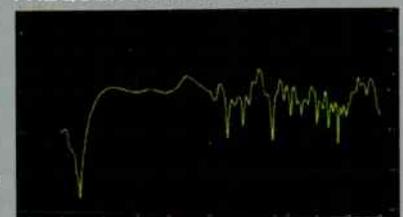
However, I persevered and finally settled on a microphone position towards the centre of the panel and tilted down to match the gentle backwards slope of the 'speakers themselves. In this position, for a single, flat panel, the Podiums do pretty well. They give a healthy level across the entire frequency range, maintaining output right up to 20kHz. There is something of a dip in the 5-10kHz region which should soften the mid to high frequencies, however the midrange peak at around 1.5kHz could well add stridence to vocals.

Bass output is very good and flat down to 80Hz, before a gentle 1dB rise, finally tailing off below 40Hz. The Podiums should have good weight and punch. Ultimately, however, it is difficult to predict how they will sound overall, as their positioning will be more critical than usual.

Electrically, the Podiums have

a gently rising response from 20Hz upwards. Average measured impedance was 4.5 Ohms, with a minimum value of around 3.5 Ohms which is not too bad, but this minimum occurs at 20Hz, so an amplifier with good current delivery at low frequencies will be required. To counteract this, sensitivity is a very healthy 89dB so they will not require too many watts in order to sing - around 30 should be fine. AS

**FREQUENCY RESPONSE**



**IMPEDANCE**





SHANLING CD 3000

# Achieving Balance

**Ever more hi-fi products now sport a set of balanced XLR signal connectors. Built to survive the loving attention of roadies at rock concerts, Noel Keywood looks at their impact upon the gentler world of high fidelity. Do two new CD players, the Shanling CD3000 and Audia Flight CD Two, achieve balance through XLR he wonders?**

**D**esigned to withstand abuse of every type in stage P.A. equipment and still deliver the sonic goods, Canon's bulky XLR connector is now appearing on hi-fi equipment, from CD players to amplifiers. The reason isn't to make rock stars feel at home with their hi-fi, so much as improve sound quality. Two brand new, quality CD players arrived at Hi-Fi World recently and both had balanced outputs. I thought I'd use these players to illustrate the benefits of going balanced.

To use the high quality

balanced signal lines you will need a connecting lead with an XLR plug at one end and a socket at either end, as by convention sources such as CD players output a signal through a chassis plug, whilst amplifiers accept an input through a socket.

The XLR plug is a big, cumbersome device, usually equipped with three pins. Its socket is even bigger, and takes up large amounts of panel space. They were designed to withstand constant connection and disconnection, as well as heavy handling. However, their real benefit lies in separating a pristine audio signal from outside interference of

many sorts. Quite how can be a little technical, so we've put it in a separate box. The primary benefit for ordinary mortals is simple: improved sound quality.

Another little mentioned benefit I discovered recently when re-wiring my SME312 pickup arm lead with XLRs is that each plug can easily cope with large diameter audiophile cables. Not that good cables necessarily need be vast, which is another discussion, but that many are and, where the RCA cannot cope, the XLR can. Just as well though, because balanced signal cables are a step up in complexity from unbalanced ones! See our separate explanation on this.

The XLR output of a CD player, or any source if it comes to that, is the high quality output. It isn't fitted for any other purpose, certainly not to keep roadies happy, so if you buy a top quality CD player and use its conventional phono outputs you may well be missing out on what it can really do.

Whilst an increasing number of players arrive at our offices fitted with balanced XLR outputs, they're not matched by the number of amplifiers fitted with XLR inputs as



**Chord Anthem 2 (white) and Chameleon Silver + balanced XLR cables.**



AUDIA FLIGHT CD TWO

yet. Which is a trifle unfortunate, as you do ideally need an XLR equipped balanced input on the amplifier as well. One reason I suspect is that amplifiers have multiple inputs, whilst sources have just one output. The XLR socket is such a huge device that fitting many of them is impractical, but it is possible to fit a few and switch them, as Lux do in their L-550A amplifier. It wasn't the Lux that spurred me into this subject though; I design and build balanced amplifiers for our test bench, where balanced lines are these days obligatory, yet balanced test equipment is rare.

Over the last few years I have watched the subject make slow headway everywhere in electronics, its emergence in hi-fi being eased by the presence of balanced line driver chip sets from major suppliers such as Burr-Brown. Not everyone uses these; transformers are a perfect way to derive balanced lines, but audio transformers give most designers nightmares because they are an art as much as a science - and like a lot of art, pricey as well! Within CD and SACD players modern audio driver chips are commonly used, with balanced line receiver chips in amplifiers.

The quality CD players to recently arrive at our offices so equipped were a Shanling CD-3000 tube output CD player priced at £1100 and an Audia Flight CD Two at £2000. Both offer 24/192 upsampling conversion, normal phono outputs (i.e. unbalanced connection) plus a pair of XLR outputs.

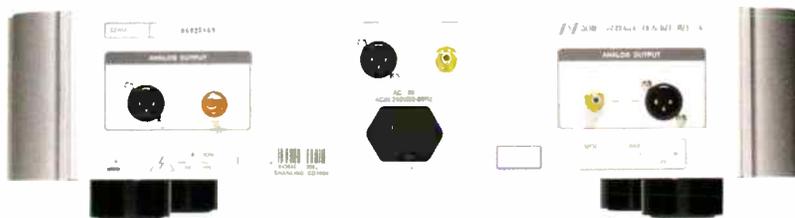
So just what benefit does the balanced output offer over the usual unbalanced one with these players? Do sources sound better through their balanced outputs, and if so, in what way? Both players offered an interesting picture of what to expect.

The Audia Flight CD Two has normal unbalanced phono socket outputs, plus a balanced output through XLR sockets (but no digital output). Audia tell us they use discrete devices (i.e. individual transistors) to develop the balanced signal, not a chip, which a look inside confirmed. They also use a Crystal Semiconductor CS43122 convertor and Analogue Devices AD1896 upconvertor. The circuit board was crammed with small power transistors, acting as regulators I suspect, suggesting Audia like to use the not uncommon approach of separating the power lines of circuit blocks. The CD Two also has substantial main power supplies in the centre of the board.

Shanling's CD-3000 is very different. A Philips CD711 servo system is used in the transport, which sits in the heavy alloy lid. The casework is, as always with Shanling, hewn from solid aluminium to form a massively rigid construction. On

the circuit board lie a Burr-Brown PCM1794 convertor chip and Burr-Brown SRC1492 24 bit/192kHz upsampling processor. Where Audia use discrete transistors to derive their balanced output, Shanling choose to use four OPA627 chips. In both cases the preceding circuitry will be single ended, which is why I say the balanced output is "derived", through extra active devices. But the CD-3000 also sports a pair of Electro Harmonix 6922 (ECC88) valves and these feed the phono outputs, so in this player the unbalanced outputs are very different from the balanced, just one example of the many differing arrangements that can be used to feed audio output sockets.

When the internal circuitry differs like this then obviously the whole point of having different outputs is that they should sound different, the balanced output not necessarily being better than the unbalanced, just different. This isn't the only situation in which the choice



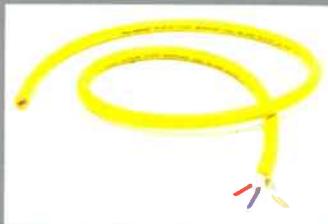
The Shanling, with digital output via XLR at centre, analogue left and right.



The Audia Flight CD Two with balanced XLR at right, plus phono.

## CABLES & PLUGS

Music venues, recording studios, broadcast studios and such like must send audio over long distances and here balanced connection rules, to combat hum and noise pickup. They comprise twin conductors surrounded by an overall screen. Most effective at resisting interference



A VanDamme SPOFC balanced microphone cable, with two signal cores and external screen.

is a Star-Quad arrangement of inner conductors, where two pairs of tightly twisted conductors are used. When you add in foil and braid screens, drain wires and such like, cables like this get very complex.

Nigel Finn at The Chord Company confirmed that their balanced hi-fi cables were physically complex and difficult to make. They use a variety of different materials and constructions, including Star-Quad, telling us that the shielding arrangements had a

significant impact upon sound quality. The Chord Company use PTFE and Polyethylene dielectrics, copper and silver plated copper conductors, braid and foil screens in various arrangements, for best sound. So if you decide to go balanced your cabling becomes decidedly complex.



The XLR plug - big but strong.

Fortunately, the Canon XLR plug is large enough to accommodate large, complex cables and anchor the screens firmly to a strong solder tag. The signal pins are strong and have a large contact area. The outer body is metal and screened, and the earth makes contact before the signal pins, avoiding crashes and bangs from the loudspeakers in a live system.

Finally, the AES/EBU balanced digital interconnect uses special 110ohm cable, so they differ from normal analogue cables, another example of the extra sophistication of balanced connections.

between using balanced and unbalanced is unclear. McIntosh and Melody use balanced internal valve circuitry in their products, for example, so you must use fully balanced connection here for best results. Shanling also fit an AES/EBU balanced digital output, as well as an SP/DIF phono output. A small additional wrinkle of balanced line complexity comes in the form of the AES/EBU digital input, which requires special 110ohm 'characteristic impedance' cable, with XLR plug and socket. At present few transports or players have such an output, but as the trend everywhere is toward better worked out connection technology with appropriate cabling, balanced digital connections are likely to become increasingly common too.

## SOUND QUALITY

As listening progressed I began to identify why I was so immediately attracted by the Audia Flight CD Two player, via its balanced outputs. This player's presentation is nothing other than conspicuously dramatic. The sound stage was wide and instruments at extreme left and right on the soundstage had sufficient power and

definition to totally capture my attention, be it a single horn at extreme left in Mercury, from Holst's 'Planets' suite, to accompanying vocalists in Angelique Kidjo's 'Wombo Lombo'. This subjectively widened the sound stage in comparison to the unbalanced output, painting a large picture between the loudspeakers, heightening impact generally.

With strongly etched cymbals, rim shots and the like piercing out strongly, accompanied by bass with enormous impact, the CD Two was a gripping player to hear. There was perceptibly less mush around instruments and singers, setting them out in greater relief against a quiet background, where subtle ambient cues could be heard. As the orchestra died to a murmur in Saturn, a single clarinet and a plucked bass played mournfully in peaceful solitude. With Rock music the Audia was fast paced, sharply defined and unforgiving, yet able to tease out the finest details.

For quite some time the attention grabbing dynamism of the Audia had me convinced it was able to justify its £900 margin over the Shanling CD-3000. Via its balanced outputs the latter player offers a slightly gentler presentation. Rim shots in Steve Earle's Back To The Wall had a tad less power and the sound stage, although wide, wasn't as strong at extreme left and right. However, where I found strings via the Audia attention grabbing, via the Shanling they were slightly smoother, described by a broader tonal palette and generally easier to accept as real.

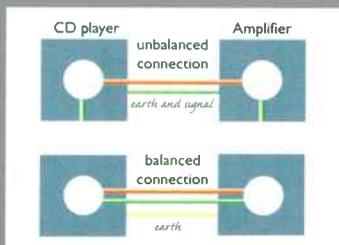
With Rock music I found much

## BENEFITS AND DRAWBACKS

Balanced signal leads suppress noise and interference from outside sources. This is "common mode noise" as it is common to both lines and cancels out in a balanced system. Interference is a catch all term for hum and radio interference from a variety of sources, including motors, transmitters and even nearby microprocessors. Balanced connections do not cancel hum, distortion and noise from preceding circuitry though.

Arguably as important is the fact that balanced signal lines carry only the audio signal, not earth currents. In so doing they eliminate hum pickup from this mechanism in unbalanced lines, offering a conceptually purer con-

nection methodology. Directing audio down an earth connection is an idea that has had its day.



A balanced connection separates signal from earth.

A commonly raised objection against balanced lines, especially on high level connections such as from CD player to amplifier, is that the signal must pass through extra circuitry at either end and this introduces degradation. In prac-

tice, however, benefits seem to outweigh this potential drawback. Valve amplifiers from McIntosh and Melody are fully balanced internally, so their XLR connectors are definitely the ones to use. Whilst a CD player or tuner can never be a true balanced source, a moving coil pickup cartridge feeding a centre tapped input transformer is an ideal balanced source and is planned as an option in the World Design Phono3 preamplifier.

Another drawback is that of cost. Balanced circuitry and connectors increase cost, as do complex balanced cables. XLR sockets are large and cumbersome, as are the plugs. Mini XLRs exist, and DIN connectors can do the job, but both are non-standard and neither can accept large cables.

the same. Strummed guitar at the start of Santana's Put Your Lights On was wonderfully rich and resonant, and as Santana slips into using the wah wah pedal and feedback the Shanling remained easy on the ear, yet wonderfully clear and easy to sit in front of. It lacks the drama of Audia Flight's CD Two, but its slightly gentler sound is easier to relax to, whilst remaining impressive by modern standards. Where the Shanling gets almost worrying is its valve output. Initially I preferred the panoramic sound stage and tighter composure of the balanced non-valve

"the Audia was fast paced, sharply defined and unforgiving"

output, but changing from balanced to unbalanced on the Lux was a doddle and encouraged me to spend a long time going from one to the other with a wide range of music. Generally, the unbalanced valve output doesn't image as hard at stage extremes and it lacks the ability to pick out individual instruments with the surety and precision of the balanced output, yet the sound stage develops depth and

performances take on a liquid ease that makes them enjoyable. In effect, Shanling's CD-3000 offers two different performances, each with its own merit, so you have a choice. Whilst at present not many people will be able to use its balanced output, the unbalanced phono socket output offers a great valve sound at a sensible price. The Shanling is a class act in its sound, finely honed and beautifully presented.

### MEASURED PERFORMANCE

#### SHANLING CD-3000

Shanling have directed valve output through the unbalanced phono socket outputs, giving 0.7% distortion at full output (0dB), purely second harmonic. At -6dB this subsides to 0.33% then to 0.03% at -30dB before converter non-linearity comes into play, causing distortion at lower levels to rise.

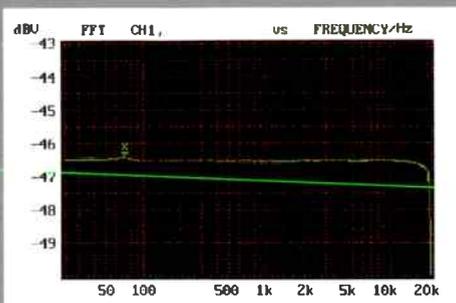
The balanced output bypasses the valve stage, producing much less distortion at high levels as a result, but the same results at low levels. Extended distortion harmonics and quantisation noise were present below -60dB, analysis showed, but the balanced outputs still gave an exceptional EIAJ dynamic range figure of 113dB. Curiously, selecting 24/192 upsampling increased distortion a little, from 0.0005% up to 0.002% for example at -6dB.

Frequency response from both outputs was flat to 20.6kHz (-1dB), with or without upsampling. There was a smidgeon of low frequency lift and response reached 8Hz, not the 2Hz achieved by most players nowadays.

The CD-3000 is a complex machine that measures very well in all areas, except full output through the valve stage, but this will only affect fleeting peaks. NK

Frequency response (-1dB)	8Hz - 20.6kHz	
Distortion (%)	Bal	Unbal
0dB	0.0004	0.7
-6dB	0.0005	0.33
-60dB	0.25	0.38
-80dB	2.3	3
Separation (1kHz)	112dB	
Noise (IEC A, Bal/Unbal)	-121/-104dB	
Dynamic range	113dB	
Output (bal / unbal)	4.4 / 2.2V	

#### FREQUENCY RESPONSE



### MEASURED PERFORMANCE

#### AUDIA FLIGHT CD TWO

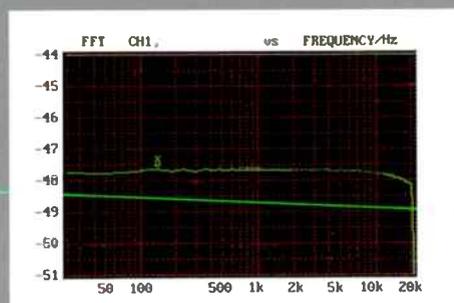
The Audia Flight CD Two player has a small upward trend in response toward low frequencies and a roll down above 10kHz to -0.5dB at 20kHz. Both these effects look small but they are sufficient to contribute to the player's character in a subtle way, to ensure firm bass and smooth treble. This player is unlikely to sound sharp or bright.

Distortion levels were on par with the best, our analysis showing a value of 0.0043% measured at -30dB - a typical music level. There are some higher order components and further analysis at lower levels revealed the presence of high order distortions - not so common nowadays - albeit in small-ish quantities. This set the EIAJ dynamic range value to -110dB, around 3dB off the best. Results were identical on the unbalanced and the balanced outputs. As there is no digital output jitter could not be measured. Output from balanced was double the unbalanced, suggesting balanced is the primary output from which unbalanced is derived and therefore best used.

The CD Two should sound firm and smooth. It may lack the delicacy and detail of the best, but in exchange it might well sound fast and hard hitting. NK

Frequency response (-1dB)	4Hz - 20.6kHz	
Distortion (%)		
0dB	0.0012	
-6dB	0.0014	
-60dB	0.23	
-80dB	2.7	
Separation (1kHz)	96dB	
Noise (IEC A)	-100dB	
Dynamic range	110dB	
Output (bal / unbal)	4.88 / 2.46V	

#### FREQUENCY RESPONSE



#### VERDICT ●●●●£

Easy going, clean and natural sound with great balance and flow.

#### SHANLING CD-3000 £1,100

Real Hi-Fi  
+44 (0)870 909 6777  
www.shanling.com

#### FOR

- Easy, natural sound
- Realistic timbral palette
- Valve & transistor outputs

#### AGAINST

- Large and heavy
- Top loading only

#### VERDICT ●●●●

A fast, dynamic and exciting sound, but a little forced at times.

#### AUDIA FLIGHT CD TWO £2,000

Henley Designs  
+44 (0)1235 511166  
www.audia.it

#### FOR

- Fast, punchy sound
- Wide sound stage (balanced)
- Clean low levels (balanced)

#### AGAINST

- A little 'enhanced'
- No digital output

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# Axe Hero

**Onkyo's D-TK10 mini monitors have cabinets designed in conjunction with Japanese guitar specialists Takamine, and the result is a soaring performance, says David Price...**

**"**It is not for cars to have character, it is their owners who should possess this". So said the late great LJK Setright to me one afternoon outside a Maida Vale eatery, wearing a dapper grey and white bold pinstripe suit, with carnation in buttonhole, drawing on his French cigarette like Marlon Brando in 'On The Waterfront'...

He was standing opposite his anonymous looking Honda Prelude, a car which I soon discovered he never drove at anything less than full throttle everywhere, and very skillfully I must add. Given that his previous vehicles included a Bristol 409 and Suzuki Whizzkid, I wondered if there was a dash of irony in what he'd just said, but it was an interesting point all the same!

You see, his epithet pretty much sums up the hi-fi Holy Grail these days, which is the never-ending pursuit of neutrality – or lack of character. Every new loudspeaker promises ever greater levels of resolution, ever more transparency, ever increasing amounts of detail. But to what end, I ask myself? Given that so many people use CD as their source, which is hardly 'the highest of fi', and to make matters worse we have had DAB and MP3 joining the party too of late, what's the point of 'speakers that tell you how bad everything is? Why not give loudspeakers 'a good tone', as people used to say?

Personally, I've gone increasingly far down the 'transparency' route (although I must confess it mustn't be at the expense of musicality, which is why I'll never be running Celestion SL6s - sorry DT!) so Onkyo's D-TK10 was a fascinating proposition to review. Here are little boxes that break all the rules – no massively braced cabinets weighing ten tonnes here. Rather, their cabs are designed to resonate (in a very controlled way,

might add) just like an acoustic guitar. No surprise then that they were designed in conjunction with Japanese guitar specialists Takamine – who know a thing or three about making nice noises from wobbly bits of wood.

The D-TK10 is a two way bass reflex design that's very small (133x276x220mm) and light (2.9kg),

finished in beautiful rosewood cabinets which – contrary to all rules of hi-fi loudspeaker design – do not produce a dull thud when you 'rap' them with your knuckles.

The woodwork is beautiful, curved like a guitar, and the front baffle has a slight cant back from bottom to top. The so-called





'Takamine Acoustic Voicing Technology' results in very thin sidewalls - like a guitar - but are well braced in strategic places. Curvatures in the wood were used to add strength without having to resort to thicker materials like MDF.

Takamine is a Japanese guitar maker of forty years standing and great repute. The company was approached by Onkyo some four years ago for advice on implementing their idea of making a speaker enclosure from the body of an instrument, and needless to say it became a collaboration that finally hit Japanese shops in December 2005, although the D-TK10 was premiered in the UK as recently as the Bristol show February 2007.

It sports a 100mm 'Onkyo Micro Fiber' bass unit (which looks a bit like glass fibre to me, but is actually

three layers, comprising an outer polyethylene naphthalate (PEN) layer and an inner Aramid layer sandwiching a flexible cotton weave layer. This crosses over to a 25mm 'Ring Drive' tweeter at 3.5kHz, fashioned from aluminium. There's a single front slotted bass port made of rosewood which is a long narrow duct that Onkyo calls an 'Aero Acoustic Drive' to underline the fact that it's very different to a conventional circular port.

### SOUND QUALITY

I have to say this is one of the most obviously characterful loudspeakers I've reviewed in a long time, if ever. It is not especially accomplished in some ways, but possesses tremendous talents in others which make it well and truly stand out from the crowd.

First and foremost, the D-TK10 does TARDIS-like tricks with size and

space. I have never heard any small (almost tiny, in truth) loudspeaker drive my largish listening room with such ease. After fiddling around with Atacama 24in stands, I eventually dispensed with them and sat them on top of my Yamaha NS1000Ms (themselves on Custom Design frame stands). Sitting over a metre high then, the little Onkyos sang like a bird, and sounded as free as one too.

The next thing that strikes you is the 'tone'; it is rich and mellow, but doesn't get this richness from the simple expedient of bumping up the bass port's contribution to the proceedings (which makes for full bass but also a boom, and the tendency to 'one note' low frequencies, which in turn slows down rhythms). Indeed, the Onkyo D-TK10 is the first 'fruity' sounding loudspeaker I've heard in a long, long time. This colouration is like none other I've encountered, because it is from those guitar-like sidewalls thrumming gently and benignly in the background. If you're unclear about the effect those cabs have on things, then take an acoustic guitar, pluck the bottom string and listen - then stuff a T-shirt inside the aperture at the bottom of the neck (to damp the body) and do the same. This clearly shows how, if done correctly, resonance can be a good thing!

The next most dramatic aspect of the D-TK10 is their timing; they time like few loudspeakers at any price. This is, talking as an ex-Linn Kan owner, a very important facet of any speaker's performance for me. Once again though, the little Onkyo doesn't sound like your average well-timing loudspeaker. Naim's similarly priced Allae floorstander is a great example; it's lightning fast yet tonally a tad thin, whereas the D-TK10 is lightning fast yet fruity as a raspberry and banana smoothie.

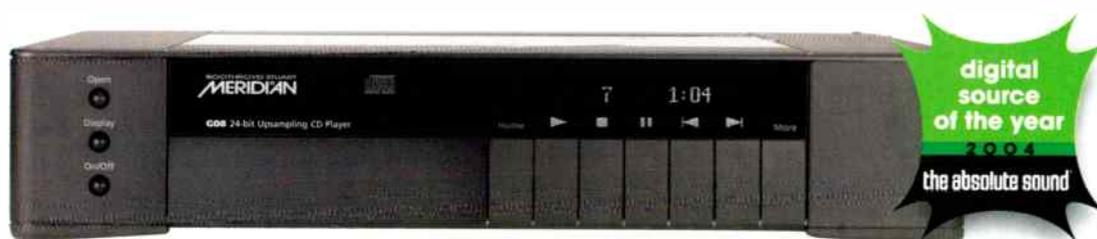
Bring that supernatural spaciousness together with the wonderful tone and superlative timing, and the result is an immensely enjoyable loudspeaker. Indeed, it is one of the most exuberant, joyful sounding devices I have ever heard. It is a consummate good time, party speaker - but not because it makes a loud booming sound, but rather because it injects power, passion and *joie de vivre* into everything it touches. I never thought I'd say this, but so upbeat it is that I could even manage a minute or two of Norah Jones before diving for the 'off' button...

# Great... Greater... Greatest...



**The affordable G06:** "...assured, detailed and refined... this is a really music-loving piece of hi-fi equipment. Meridian has achieved a high and consistent standard with this player... a highly recommendable item."

—Richard Black, *Hi-Fi Choice*, July 2006



**The impressive G08:** "I've not heard a more elegant sound emanate from a transistor-based system in quite some time."

—Sue Kraft, *The Absolute Sound (US)*, February/March 2005



**The incomparable 808:** "I've had a Meridian 808 in my reference system for about three months and frankly, I can't imagine my system without it."

—Robert Harley, *The Absolute Sound*, September 2006

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"they make musicians sound like they've swallowed pep pills..."

than any speaker at or near the Onkyos' price.

Beethoven's Pastoral Symphony (DG, Dresdner Philharmonic) showed the Onkyo's brilliance – violin and cello string sound was a joy, its ability to communicate dynamic contrasts superb, and the music romped along with infectious energy. However, this piece also showed their weaknesses too, the Onkyos' colouration working less well and intruding too much on the proceedings.

Here, I began yearning for altogether less characterful speakers, yet just when I starting thinking about their slightly midband 'nasality', the D-TK10s would thrill me with their handling of dynamic crescendos and that wonderful upper bass cello sound – rarely have I heard such an instrument sound so 'breathy' and full bodied.

**CONCLUSION**

It's tremendously tricky to assess Onkyo's D-TK10s using conventional criteria. They are coloured, and serious dyed-in-the-grain audiophiles are taught to believe this a bad thing – but these loudspeakers prove that it ain't necessarily so... Okay, on classical music, those used to electrostatic levels of clarity will find the Onkyos a tad 'muddy' and rose-tinted in their tonality. But on almost every other type of music, I found – in the specific case of the D-TK10s – that this was a joy. Then there are the frequency extremes; speakers this small don't have any real low bass, and the treble was less precise and atmospheric than some similarly priced rivals (such as Yamaha's Soavo 1). They're not flawless, but having lived with them, I found myself forgiving them their foibles. It's not just their

euphonic colour that sets them apart; by any standards they are exceptionally musical and time beautifully, and going back to a 'normal' speaker makes the music seem to slow down and falter. The closest I can compare them with in this respect is the original Acoustic Energy AE1 (Classic), which made everything sound like the musicians have swallowed 'pep pills' just before the performance. The Onkyo D-TK10 repeats this trick, and makes music sound wonderfully upbeat and exuberant with it. I personally loved them, but am not going to give them the full five globes because they are simply not capable enough as all rounders. However, those interested in the baby Onkyos will regard this as precisely part of their charm - if a loudspeaker is going to have character, they'll find few better than this.

The Bee Gees' 'How Deep is Your Love' kicked off with a delicious Fender Rhodes sound, reminding me what a beautiful instrument it is. Then the vocal harmonies kicked in, sounding as smooth as Baileys' Irish Cream. Although the snare drums seemed a tad recessed in the mix, the song shifted along much faster than usual, with hi-hat cymbals having a real 'connectedness' and sense of life. Moving to 'Night Fever', the wah-wah guitar, often lost after the opening two bars of the song, was playing prominently right throughout the song, adding a real percussive element to the proceedings. This fact alone took my breath away; you can listen to this song through everything from Quad electrostatics to Meridian DSP7000s and not hear it, but suddenly these little Japanese curios lock on to it with ease!

The opening bars of Simple Minds' 'New Gold Dream' were again a revelation, the bass guitar rarely sounding as dynamic as through the D-TK10s. When the song kicked in in earnest, it sounded so different from most loudspeakers I listen to that it could have been a remix. The Onkyos hung Jim Kerr's vocals right back, showing wonderful spatiality, while they threw the lead synth lines forward with ease. They were also able to 'unpick' all those swirling keyboards from one another, turning the song from a congested morass of sound into a number of individual elements playing together as one. Most importantly, these speakers caught the dreamy, pensive, mysterious mood of the song better

**REFERENCE SYSTEM:**  
 Michell GyroDec/TecnoArm/vdH Frog turntable  
 Whest Audio PS.20/Msu20 phono stage  
 Marantz CD63KI DP CD player  
 MF Audio Silver Passive Preamp  
 NuForce Reference 9SE power amplifiers  
 Yamaha NS1000M loudspeakers

**VERDICT** ●●●●● £  
 Outstanding music makers with a lovely, unique, tone - but not all things to all men. Future classic in the making, and an instant cult loudspeaker.

**ONKYO D-TK10** £1,999  
 Onkyo  
 +44 (0) 1494 681515  
 www.onkyo.co.uk

- FOR**
- brilliantly musical
  - unique tone
  - spacious, room filling sound
  - charming character
- AGAINST**
- limited frequency extremes
  - slightly nasal midband

**MEASURED PERFORMANCE**

The Onkyo D-TK10s have a hint of unevenness in the midrange and the large peak in port output at the same frequency suggests that this may be causing a certain amount of colouration. This is in the 700Hz-900Hz region which may rob a little impact and detail from vocalists. Other than this, they have a very well sorted frequency response, being largely flat right through their midrange and treble region, with just a slight lift at the very top end to add atmosphere. Overall, I would expect an even and smooth sound from the Onkyos.

Bass output tails off below 100Hz, but the port helps things along with its tuning frequency of 50Hz and so the D-TK10s should have reasonable punch considering their diminutive proportions.

The impedance curve is largely flat and quite well damped with an average measured value of 5.9 Ohms. This drops to a minimum value of around 4 Ohms, so the Onkyos require a 4 Ohm-capable output. Sensitivity is

83dB, which is fine for their size, but would make a 60 watt or more amplifier a sensible proposition for good listening levels. AS

**FREQUENCY RESPONSE**

Green - driver output  
 Red - port output

**IMPEDANCE**

# Minimalist masterpieces!



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**HI-FI WORLD**  
**VERDICT** ●●●●●

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# Tree-Mendous

**Like natural musical instruments, Denon's superb new AH-D5000 high end headphones use wooden bodies for superior resonance control. David Price heads off in the sonic sunset with them...**

The fact that Japan's headphone market is one of the most developed in the world might come as a surprise to the average European. We rarely – if ever – see anything interesting coming from the Land of the Rising Sun, but the likes of Sony, Denon and Stax all make very high end designs, using either innovative materials and/or transducers that justify their very high prices. The problem is, these companies are often of the view that we won't buy them in large enough numbers to justify the long boat ride over.

The reason for this can be largely summed up in the two magic words - 'Sennheiser' and 'Beyer'. These two German brands are very strong in the European market, and they don't have such a long way en route to the UK, hence prices can be significantly lower. The result is that the likes of Sennheiser's HD650 has pretty much sewn up the UK audiophile market at around £300 (or less when discounted), and you'll have to pay at least three times that for anything substantially better from Stax...

Enter Denon's AH-D5000, a £499.95 design using housings made of natural wood. Like Onkyo's D-TK10, rapping them with the knuckle yields a dull 'woody' sound, albeit very well damped. It is certainly a different, deeper note to striking the plastic bodies of, for example, the Sennheiser HD650s. The finish of these housings is superb, as you'd expect from a high end Japanese product, and again feels a whole level up from the (admittedly a bit cheaper) German opposition.

Lightweight magnesium frames encircle these wooden bodies, and these are linked to a lightly padded headband (of the best quality vinyl). The earpads are also beautifully soft and comfortable, and despite the not inconsiderable 370g weight, they proved extremely wearable over long periods. Leather in place of vinyl would have been nice though, as a double album's worth of listening can feel a little sweaty. In this respect, the

felt-feel earpads of the Sennheiser are preferable. In every other case though, the Denons are more comfortable, the tighter, more firmly padded German headphones feel like wearing a vice by comparison. Despite this being a closed design, Denon say they have adjusted "the sound pressure balance in front of and behind the diaphragm", to avoid that 'under water' sensation you get from non-open back designs.

The diaphragms are formed from 'microfiber' for lightness (giving speed and sensitivity), with 50mm Neodymium magnets. Three metre runs of high quality cables, equal length for both channels with high purity 7N-OFC cables with a cloth mesh jacket, are fitted. This terminates in a 3.5mm gold plated stereo mini plug, with a 6.3mm jack plug adaptor – disappointingly, this last item was less impressive than that supplied with Sennheisers. The company claims an input impedance of 25 ohms, sensitivity of 106 dB/mW, 1,800mW maximum input signal and a frequency response of 5-45,000Hz.

## SOUND QUALITY

All this attention to detail pays sonic dividends, as the AH-D5000s sound quite superb. They're a tantalising blend of the insight and detail of the aforementioned Sennheiser HD650s, but with the fuller body you get from entry-level Stax electrostatic designs. Isaac Hayes' 'Café Regios' showed these headphones to have wonderful tonal accuracy, highlighting the richness of those superb strings, capturing their every harmonic. By comparison, the HD650s sounded a little drier and less interested in conveying the shimmering textures in this rich recording. Overall balance was just a touch on the brightly lit side for my tastes, although bass was decently warm and strong too, and certainly more sumptuous than any of the German competition.

4hero's 'Morning Child' showed



the Denon's excellent rhythmic alacrity, giving a large scale 'widescreen' sound that captured the lush orchestrations of the track beautifully. Bass was full and a tad warm – very welcome as far as I'm concerned – while the midband was crisp and clean, and sported real 'hear-through' insight into the quality of the recording. Once again, the track sounded superb, with soaring vocals and a truly euphoric feel to the proceedings – those wooden earpiece housings certainly invest these phones with musicality and tonal colour alike. Treble was crisp and subtle, with just a slight 'zing' to CD. Move to vinyl though, and things smoothed right out and sounded even better still.

## CONCLUSION

Overall then, a delightful sounding pair of headphones, and one that sounds quite unlike the German competition that we're used to in this country. Partner carefully with high end ancillaries though – they won't work wonders with your iPod!

**VERDICT** ●●●●●

Genuinely special sounding headphones with wonderful tonality, but need high end ancillaries to match.

**DENON AH-D5000** £499.95

**Denon UK**

+44(0)1234 741 200

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

### FOR

- rich, natural tonality
- musicality
- comfort, build

### AGAINST

- partner carefully to avoid brightness
- vinyl trim, not leather

# Alternative TV

**On first appraisal, traditional audiophiles may find the brand new Apple TV hard to fathom, but Patrick Cleasby thinks this wireless media player could usher in a whole new way of playing music (and video) media. And no, it's not a television...**



COURTESY OF APPLE

It has been slightly surprising that, in the two years since Apple's Airport Express was released and reviewed in these pages, Apple have done little to develop further the idea of media streaming around the home. The Airport Express was a handy enough means of getting music from a computer into your hi-fi, but lacked any interface or control mechanism, leaving iTunes to the job of controlling it...

However, going back a year to the tail end of G5 iMacs and the launch of Intel-based Mac Minis, Apple subtly shifted the paradigm. They began supplying a small simple infrared card remote control which controlled the full screen media management interface called Front Row, which came bundled with new Macs, and started to advocate hooking the DVI output of your Mac Mini to your TV. The idea was to put the dinky little computer under your TV, and presumably often adjacent to your hi-fi (digital audio out was also added). The side benefit for Apple was their increasing colonisation of the living room as well as the office or the lap.

The idea really never took off in a big way, requiring as it did

(Apple Remote aside), a Bluetooth keyboard and mouse to be on hand somewhere to get general utility out of the computer. Hardcore Mac IT geeks might regard such computer positioning as logical, but many more normal and/or female folk might object to the idea.

It is this issue that the Apple TV goes a huge way to addressing. Unusually trailed six months ahead of release under the working title iTV, it was clear that what obviously excited the usual geeks immediately could also have what it would take to drive the wireless entertainment concept into the mainstream.

So, asked what it is, I frequently have to tell the complete novice that it is not a TV, and I tell those familiar with the Airport Express concept that it is Airport Express on steroids with an internal hard disk, a remote and video capability. Even so, it is still a very complicated thing to conceptualise and explain, so even dyed-in-the-wool Mac-heads will often ask, "what exactly is it for? Convince me..."

## SWITCHING ON

First things first, and it is almost essential that you have an HD-ready flatscreen TV to run with your new

purchase. Those of us with lower than component analogue-fed tube TVs will have to investigate the third party component downconversion options available, but the Apple TV does have both interlaced and progressive SD settings, so a new TV purchase can be avoided if you really want to.

What you get in the stylish folding box is the Apple TV itself, an Apple Remote (which is so tiny and slim it just seems to seek out the cracks in your sofa in which to hide), a power lead (standard figure of eight mains lead only – a nice touch as Mac Minis have large external power supplies to clutter the rear of your setup) and an exhaustive manual. The unit itself is a smallish (197x197x28mm, 1.09kg) box, looking not completely dissimilar to a Mac mini of yore. It's a bit slimmer and sleeker, but you get the general idea. You plug it in to the mains, to your TV (via HDMI or Component video) and your hi-fi via the pair of RCA phono sockets and/or the optical digital output, switch on and you're off...

The Apple TV needs a PC or Mac running a wireless network, and iTunes. As soon as it detects these, it is up and running. First, your

"you might suddenly start wondering how you lived without it..."

computer is identified to the Apple TV, which then triggers a Bluetooth-like key code input on the iTunes concerned. Once linked, the lengthy process of transferring your music and video media from your main computer to the Apple TV begins... (Normally, this is done automatically, but you can set-up the rules by which your media is updated to the Apple TV's 40GB hard disk. These function much like iPod loading rules for music, movies, podcasts and photos and are pretty flexible. Photo syncing requires iPhoto on Mac and Photoshop Elements or similar on the PC.)

On an 802.11g-based network you will be waiting all evening to fill your disk up – I now have a strong yen for a new Mac and a new Airport Extreme for speed reasons! These would also serve the other method of operation, which is that the Apple TV can stream media from up to five other iTunes libraries (which must be left open on those machines). Maximum spec 720p 24 frame per

and the addition of digital audio out and wireless capability. It will play everything an iPod will, plus 720p24 HD (expect a new iPod with something approximating that spec shortly).

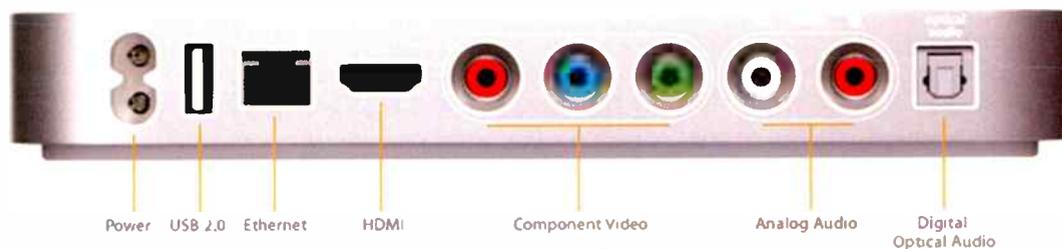
### IN USE

So now we know that it works, what it needs to work and how it works, the question is – how well does it work? Audio through optical S/PDIF lossless playback of my CD collection, ripped through iTunes, whether on the synced machine or streaming 802.11g, is flawless. The 'new' Prefab Sprout 'Steve McQueen' CD remaster was every bit the equal of playback from a mid-price universal player through my Arcam AVR350 AV receiver reference. My only regret is that attempted playback of 24/96 Alan Parsons lossless or PCM files did not light the magic '96kHz' light when digitally connected the Arcam. This implies that something in the chain is capped at 48kHz sampling – meaning the current Apple TV is very

(ALAC)) material with which I choose to test them to the limits.

Well, there's a reason that the Apple TV should exceed the performance of these 802.11b and g offerings, which is that it's an 802.11n (draft specification) capable device. Apple had to do this to try and get their highest permitted bandwidth (almost) HD video files streaming across a home network. To fully exploit this capability you would need a 2007 vintage Intel Mac, and crucially the product released at the same time as the Apple TV, the similarly new, flat and square 802.11n Apple Extreme router.

This is not to say that the Apple TV won't downshift to the infinitely more common 802.11g wireless standard that almost all of us use (even the older slower 802.11b is permitted, but will only suffice for music). I have been through the setup process both on Belkin wireless routers on cable, and on the super fast Be There Bebox (badged Thomson Speedtouch) modem/router, and it simply works with typical Apple efficiency. Just make sure you know the SSID (network name) of your home network, and you have your encryption password



COURTESY OF APPLE

**Apple fit analogue audio output sockets (right) and an SP/DIF digital output for connection to your hi-fi DAC or AV receiver.**

second pseudo-HD files (a nice way to watch the latest Sopranos!) can struggle to stream across an 802.11g network, so if you want to do that, consider an 802.11n upgrade...

When your media is finally transferred, it suddenly all becomes available at the touch of the Apple TV's remote control button – all watchable and/or listenable on your television and/or hi-fi and very easily accessible without any need for clicking a mouse or touching a computer keyboard – ultimately this is point of Apple TV.

The on-screen interface is superficially Front Row-like, minus the DVD player option – Apple TV has nothing to do with DVD, unless you're ripping yours to an Apple TV/iPod friendly format (more of which later). So, with its 40GB drive, Apple TV is more like a flattened, under-capacity iPod with HDMI and Component analogue output

much a video-centric v1.0 product with the audiophile bells and whistles not thought through - shame! It is very good, but could be better still.

Via the standard analogue outputs, don't expect fireworks – it's a clean and dry sound with no nasties, but the likes of a Cambridge Audio 540C CD spinner (£200) would shame it. Basically, if you want great sound from your computer audio, you'll have to hook up the Apple TV to an external DAC such as the superb Russ Andrews DAC-1 USB (£600) reviewed in *Hi-Fi World* May 2007, or your CD's digital input (if it has one) or AV receiver.

You may recall from *Hi-Fi World's* previous reviews of wireless audio players, from the Acoustic Energy and Roku Soundbridge to the Slim Devices Squeezebox and Transporter, they have all occasionally struggled to play the high bandwidth/ quality (24/96 PCM or Apple Lossless

to hand and you're away, the Apple TV taking you through a sequence of simple set-up screens.

On the film front, again the Apple TV worked very well, but didn't quite tick all the audiophile boxes. For example, the high quality h.264 Quicktime movie trailers found on the Apple website can now be viewed directly from within the Apple TV interface and in their full screen glory they look very fine indeed. But the ludicrous thing is that although these trailers have contained 5.1 AAC soundtracks for some time, Apple TV does not make the best of them. If HD DVD and Blu-Ray machines can convert to DTS on the fly, why couldn't Apple have given us a decent route to proper discrete surround?

### CONCLUSION

Don't be put off - it is far harder to explain what Apple TV is, than to actually use it! Doubtless many

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readers will still be wondering why they need it, and the answer is of course that you don't. However, if you have a lot of digital media on your computer already (all catalogued and organised by iTunes – which is by far the best tool available for this task!), and you buy Apple TV out of interest, then you might suddenly start wondering how you lived without it. Essentially it's a very slick 'front end' for all that digital media you have, from videos to CDs to Podcasts, and it works very well.

However, as interesting as it might be, it still lacks the drivers necessary to force mass market take up, particularly in the UK. But as soon as Apple launches their Movie and TV downloads here (and material in the 720p 24fps h.264 Apple 'HD' format – with surround please! - on both sides of the pond), depending on your media consumption preferences, this could be a very useful way to get those programmes onto your flat screen TV. The market-dominating strength of iTunes suggests Apple are well-placed to shape how this market develops in this country

If you're assessing whether to get one, pay no heed to in-store Apple presentations – in a slightly clueless coup they are frequently demmed with 320x240 pixel 1st Gen iPod video stuff, which does them no justice, but 2nd Gen and HD flavours look great!

Overall then, a very interesting product, opening up a world of possibilities (or rather – to be more precisely, opening up existing possibilities to the world). If you compare what it does over and above a competing audio-only device like the Slim Devices Squeezebox for a only few tenners more at £200, this should

**FEEDING IT**

The ungeeky UK reviewer's commonplace complaint is that they can't see the point of Apple TV until the UK store sells TV and movie content (mooted to be later this year/early next), but I beg to differ. The short-sighted viewpoint obviously ignores its fully rounded music capabilities, surround-sound aside. But it also ignores the reality of modern media consumption. Firstly, it is inevitable that the same impetus for us to store easily accessible digital archives of our music will cede to video (DVD in the place of CD) in time, as cheaper storage and greater bandwidth permit. Secondly, how do you think most people in this country are watching *Heroes*? Not as badly encoded 4:3 on the Sci-Fi channel, but as high quality HD-sourced Divx AVI files is the true answer!

Now those won't play on the Apple TV unhacked, but the whole software widget ecosystem around the video iPod has moved to embrace Apple TV formats, from Quicktime Pro's basic export option, to Splasm's ViddyUp file conversion utility, to the freeware Handbrake DVD ripping/h.264-ing tool. This one now includes the option to turn 5.1 DVD soundtracks into Pro Logic II-encoded Apple TV files. Handbrake-ripped 640x480 files look every bit as good as current SD broadcasts, possibly better.

COURTESY OF APPLE



*geek chic: telly addicts are using Handbrake to rip DVDs to their computer, whereupon they can watch them via iTunes on the iPod and now, Apple TV...*

be the clear way to go, as long as you have a flatscreen telly beside your hi-fi! On the other hand, the annoyingly non-achieved implementation of

surround and 96kHz capability has to result in the docking of one globe from what would otherwise clearly be full marks.

**HACKING**

We'll probably never know whether it is by chance or design that the Apple TV has already proven so easy to modify, but always remember that the origins of Apple were two tweaky geeks pursuing their obsessive hobby with such zeal it turned into a legendary company. They would be proud of the perspicacity of their acolytes. The speed and voraciousness with which the Apple TV hacking community sprang up was a sight to behold, and the joy of the Internet is that their exploits have been easy to track. After finding that the Apple TV was basically a Mac in all but name, they modified the system kernel to work around a few hardware limitations with emulation, and what has been semi-jokingly called the 'Mac Nano' was born.

As ever on the wild web frontier, treat everything you read with a pinch of salt, and proceed with caution and many backups if you decide to invalidate your warranty. However, even if you do not progress as far as running full Mac OSX it is well worth enabling non-Apple codec playback, and putting in a larger disk (taking care to match the original's heat and power specs to avoid meltdown). If I ever find the time to plump my Apple TV I may well file a report, but in the meantime your best points of reference are the Awkward TV Wikipedia and blog, or the main Apple TV Hacks website. Shouldn't be difficult to find!

**VERDICT** ●●●●● £

A less obviously compelling proposition than the much anticipated iPhone, still this may yet be another market winner in a new sector for Apple... ingenious!

**APPLE TV** £199

Apple Inc  
 +44(0)800 039 1010  
[www.apple.com/uk/appletv](http://www.apple.com/uk/appletv)

**FOR**

- design
- ease of use
- hackability!

**AGAINST**

- cack-handed hi-res/surround
- lame promotion
- losable remote

# Beat Master

Densen's striking new B-410 Beat CD player claims substantial improvements over its predecessor, but does it deliver?  
Channa Vithana listens in...

It wouldn't be the first time that a hi-fi manufacturer has claimed better performance for the new model superseding the old – the industry sort of works that way... It is a little more original however, for Densen to claim that their new B-410 silver disc spinner comprehensively outperforms the previous B-400 Plus, which was no less than £450 more expensive.

Densen says that the reduced price has been reached by using more sophisticated production methods, "by making a more effective design in all parts of the player." Indeed, while using the same 'Plus DAC' 24bit DACs as the B-400 Plus, the B-410 now has a much shorter digital signal path, where the length from the servo to DAC is 150mm instead of approximately 500mm previously. Also for better sound quality, the isolated DAC section is shielded to avoid digital interference with the analogue stages.

Densen have now written all the software to control the transport, the user interface for the optional Gizmo remote and to match the displays of their amplifiers. Further transport modifications include a clock controller that allows the motherboard to control the system clock, to avoid jitter by using the same clock at both sending and receiving end of the data stream. The circuit boards are made from double-sided Teflon and solder is applied in a sealed, nitrogen atmosphere to avoid oxidation, improving signal transfer.

In comparison to the previous more expensive B-400 Plus and

(£2,500) B-400 XS models, Densen's linear power supply for the B-410 has almost doubled with a 90VA rated transformer instead of 2x20VA and has 40,000 micro-Farads storage now, versus 25,000 before. Consequently, the B-410 features seven regulators for the independent power supplies, including ones for the DAC, positive and negative analogue stages, microprocessor and digital receiver. The B-410 uses the company's application of zero feedback (neither global nor local feedback) and a Class-A output which is capable of 6 Watts.

The B-410 is upgradeable to the £1,400 B-420 which features a superior power supply with a 300VA rated transformer and the forthcoming sub-£3,000 B-440 which has the B-420's power supply and a more advanced DAC board. Available in either black or 'Albino,' the beautifully designed and built aluminium casework reduces the amount of energy stored in the cabinet (compared to steel). A knuckle tap to the casework confirms that it doesn't have any ringing resonances either, although the disc tray was less than impressive, feeling flimsier than many computer CD-ROMs! Vital statistics are 440x310x64mm and 8kg.

## SOUND QUALITY

No sooner had the review sample been properly run in and warmed through did it become obvious that the B-410 was able to match all the claims made by Densen. Here is an exceptionally musical silver disc spinner, with a very clear and free

flowing sound. For example, the phrasing of the violin was excellent on the Cho-Liang Lin's 'Sibelius & Nielsen Violin Concertos' disc, where I could follow the instruments effortlessly. The musical structure was wide and deep, with excellent violin timbre. The orchestra had definition and scale, while demanding crescendos were handled with aplomb.

'Wild Flower' by The Cult showed the B-410's excellent timing; the bass lines and drum track flowed effortlessly while the separation of instruments and vocals was so explicit that I could easily appreciate what the different band members were doing.

'Kiss From A Rose' by Seal was deep and widely revealed, the superb separation allowing every strand of music to open out the convincing three-dimensional soundstage. The Densen didn't sound out of control here, and capably held all the differing musical strands together. Seal's voice was similarly radiant and revealed with life-like timbre.

Miles Davis's trumpet on 'Teo' (1961) from the Miles Davis & John Coltrane CD 'The Complete Columbia Recordings' sounded clear with great air around it, while also having first-rate definition and phrasing. The player's insightful nature again enabled the music to flow in a natural manner. When Coltrane's tenor saxophone appeared, it was clearly distinct yet cohesive within the musical structure of 'Teo.'

In isolation the Densen proved extremely capable, but how would it compare to a class-leading rival machine? The Vincent CD-S6MK



**REFERENCE SYSTEM:**  
 Naim CDX2 CD player  
 Vincent CD-S6MK CD player  
 Moon Audio i-3 integrated amplifier  
 Waterfall Victoria loudspeakers

**MUSIC**  
 Cho-Liang Lin, 'Sibelius & Nielsen Violin Concertos' (2001)  
 The Cult, 'Electric' (1987/1997)  
 Seal, 'Best 1991-2004' (2004)  
 Davis/Coltrane, 'Complete Columbia 1955-1961' (2000)

**VERDICT** ●●●●●  
 Tuneful, class-leading sound and exquisite styling make this a formidable mid price CD spinner.

**DENSEN B-410** £1,000  
 Densen  
 ☎ +45(0) 75181214  
 www.densen.com

- FOR**
- outstanding timing
  - tuneful bass
  - lucid, free-flowing sound
  - upgradeable
- AGAINST**
- flimsy disc tray
  - remote optional

(£999), which came top of *Hi-Fi World's* May 2007 CD player group test, was duly wheeled in. With the 'Sibelius & Nielsen Violin Concertos' the upper mid of the violin showed fine timbre, but the Vincent didn't sound comfortable with the crescendo, and verged on the strident. It had a good spatial quality which I liked, but by doing so it revealed its lack of phrasing ability when compared to the Densen.

On 'Wild Flower' by The Cult, Jamie Stewart's bass lines were indistinct, while the guitar solos had somewhat unmanageable ringing distortions that detracted from the Vincent's generally excellent sound quality. While vocal inflection was very good on 'Kiss From A Rose' by Seal, the Vincent had an indistinguishable and slightly veiled bass quality by comparison. With 'Teo', the Vincent enabled the music of Davis and Coltrane to sound pleasantly smooth and wide but the trumpet playing was somewhat strident at peaks, while the jazz-structured bass was a little over-smooth, which dislocated it from the drums and wind instruments.

An impressive showing from the B-410 then, so how would it stack up against one of this magazine's favourite 'entry level high end machines' – the Naim CDX2? Despite the Naim costing almost three times the price of the Densen, at first I couldn't separate the two on 'Wild Flower' by the Cult. Both machines flowed equally with great rhythm, although I could discern that the Naim had a slightly superior midrange, which sounded fuller in the



vocals and guitar timbres while the Densen had better bass tunefulness and instrumental intelligibility.

The Naim had a quieter musical background to the 'Sibelius & Nielsen Violin Concertos' piece with deeper atmosphere to the violin and cello. However the Densen was more free-flowing and clearer with better phrasing to the stringed instruments. The biggest differences were with the Seal and Davis/Coltrane recordings. Here the Naim structured the music, with the bass lines and phrasing of instruments and vocals organised within a strictly regimented order, presented slightly forward. The Densen sounded more free-flowing with a wider, less obviously structured presentation that allowed better instrumental and vocal tunefulness, if not outright bass extension – an exceptional result

**CONCLUSION**

Thumbs aloft then for an extremely capable silver disc spinner. I have always respected Densen products for their understated looks and beguiling sound, and the B-410 continues

the theme in earnest, bringing redoubtable performance to the £1,000 price point. To my ears, the new Densen showed a clean pair of phono sockets to the excellent Vincent CD-S6MK, and gave the Naim CDX2, at three times the cost, a harder time than it might like. As such, the Densen B-410 is one of the best Compact Disc players at or near its price - a true grand design.

**MEASURED PERFORMANCE**

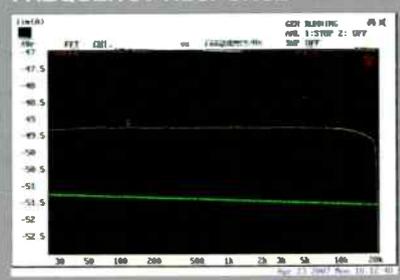
The Beat B-410 produced more noise than usual from today's CD players; there was a pronounced spectrum, together with inharmonic 'distortion' components. This measured -93dB IEC A weighted, low enough to be inaudible, but it suggests unusual circuitry. There was a little more distortion than usual too, enough to result in a mediocre EIAJ dynamic range value of 103dB, but again this is no disaster. It was not possible to lock the analyser to the digital output, switched on, to measure jitter.

Frequency response has a slight downward trend at high frequencies, so the B-410 will not sound sharp. Non-harmonic distortion components were visible and, because of the way our analysers work, they are not fully accounted for in the recorded distortion figures. The B-410 could have been better in this area.

The Beat B-410 measured reasonably well, but it does not match the best, as both distortion and noise values were higher than usual. NK

Frequency response (-1dB)	2Hz-21kHz
Distortion (%)	
0dB	0.017
-6dB	0.0045
-50dB	0.48
-80dB	6
Separation (1kHz)	77dB
Noise (IEC A)	-93dB
Dynamic range	-103dB
Output	1.97V

**FREQUENCY RESPONSE**



# Steam Stereo

**Stereo had not arrived in Britain in the age of steam, but you can add it easily enough with a One Thing Audio external VHF/FM stereo decoder for the Leak Troughline tuner, says Noel Keywood...**



**M**y dear Leak Troughline tuner slowly faded away some time ago and I have not had time to restore it to good health. I'm a bit retentive about things like this: either I do it or it doesn't get done! This isn't particularly sensible though, as One Thing Audio and GT Audio offer expert repair and restoration services for this venerable wonder, and since I'm busy soldering other things I should be asking them to return it to health. Luckily, when One Thing recently sent in a repackaged version of their Troughline stereo decoder for us to look at, we still had a restored Troughline Stereo tuner on our shelves, awaiting return to Graham Tricker of GT Audio. It was purloined for this review.

Not only does a Troughline give amazing sound quality from VHF/FM radio, but a good working model is worth a tidy amount these days. Like most classics its value goes up, in gratifying contrast to much of today's mass market products with a lifespan of a just a few years, after which they are worth zilch. So owning and using an old classic like this makes nothing but the greatest sense! Mine is a Troughline Stereo from the 1960s, making it around forty years old now, and the oldest piece of hi-fi I use.

Since the BBC commenced stereo radio transmission from Wrotham in 1962 using the American Zenith GE system, Leak's own stereo decoder, fitted to the Troughline

Stereo model was fairly crude, using early transistors; there was insufficient room in the compact chassis for a valve circuit. It's a relatively easy task to add a modern decoder to bypass the original decoder, or as an upgrade to earlier Troughline monos. Modern decoders are based on silicon chips, by the way, making them small and inexpensive.

My experience with the One Thing was initially a little shaky as set up instructions were not included and the front panel stereo width adjustment pot was loose. But I doubt this is going to be representative and One Thing are easily contactable by phone. Fitting a stereo decoder like this is easy enough if you have a tuner with an mpX output, - just plug it in using a phono lead. Our GT Audio model did not have an mpX out, so I had to tap in internally, using the feed to its internal GT Audio decoder. This carried 85V d.c. as well as a relatively strong audio signal that overloaded the OTA until its internal input adjuster (V1) was turned down. The OTA has an input blocking capacitor to cope with the d.c. voltage present, but is sensitive enough to work from a lower level signal available from the internal discriminator coil T4 as well as this high level output.

If you have to open up the tuner in order to pick up the multiplex signal (comprising mono baseband + difference on a 38kHz subcarrier) you will need the circuit available at Kiewa Valley Audio ([www.werple.net.au](http://www.werple.net.au)) website. I would recommend,

however, that this work is left to One Thing Audio or GT Audio, as dangerous voltages are present, including exposed mains. As the OTA decoder includes 50uS de-emphasis (as does the GT Audio decoder) this must be removed from the tuner feeding it, or you'll get a very dull sound.

Our review decoder worked perfectly after being set up. You have the option of Stereo, Mono or Stereo with variable blend to reduce noise. As a side note, the Troughline needs a strong aerial signal of 2mV or more if hiss is to become almost inaudible. If you live close to a transmitter, then with a large aerial you may well get 6mV-10mV and -64dB hiss, from this decoder and the GT Audio unit too. I get 2mV maximum in Central London with a large outdoor array pointing at Wrotham with a small bias toward Crystal Palace.

## SOUND QUALITY

The One Thing Audio decoder reflects the Troughline's classic properties of smoothness and neutrality, I felt when listening to it. It has a balance and a presentation that brought to mind my Quad Electrostatic ESL-63 loudspeakers, that is a sound completely free of its own character, one that you cannot easily pin a label on. Modern ears may find this "BBC" balance dull, wishing for something more conspicuous and challenging, but that's not the OTA's metier. It is totally neutral and it is meant to be. I spent a lot of time switching between

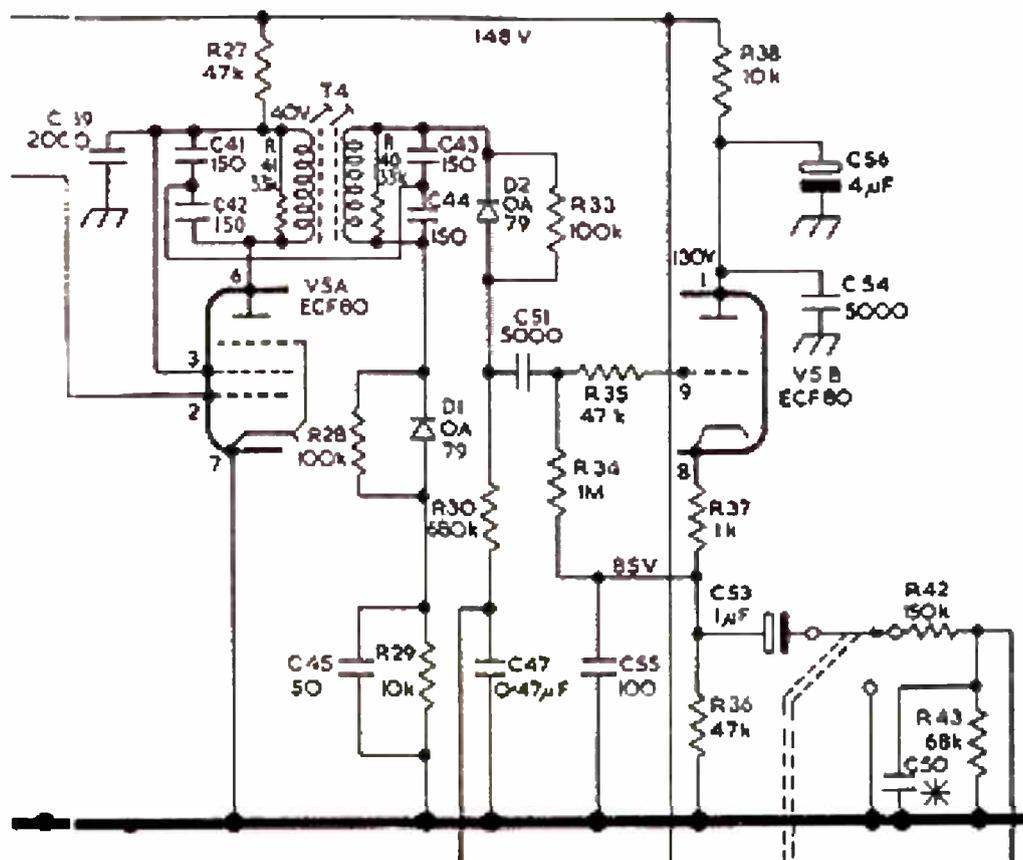


it, the GT Audio decoder and the Marantz ST-15S1 reviewed on page 62.

Listening to discussion between Donald McLeod and Dutch expert Tom Koopman about Dietrich

Buxtehude, on Radio 3's Composer of the Week series, the OTA interestingly constructed a wider and seemingly more open sound stage than the other tuners, possibly because it doesn't suffer phase shifts

from mpX filtering. This put it ahead straight away. Of all three systems the OTA was to my ears most neutral and natural, but as I have already said others may prefer a little more zing. With the studio discussion



The composite stereo signal, comprising mono + stereo subcarrier can be picked up at T4, One Thing told us. I used the high level point shown by our red arrow. Note this is at 85V and may give a small belt (I didn't try it!), so exercise caution if you do this yourself. Best to let One Thing instal and set up.

Award winning musical sound  
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# VINYL WORLD

JULY 2007

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## SPECIAL ONE **EXCLUSIVE!** Linn's brand new Sondek LP12SE...



**EXCLUSIVE!**  
**DUAL CS505-4**  
the legend returns



**EXCLUSIVE!**  
**GOLDRING 2400**  
brand new high end MM



**HEED QUESTAR MC**  
super new phono stage



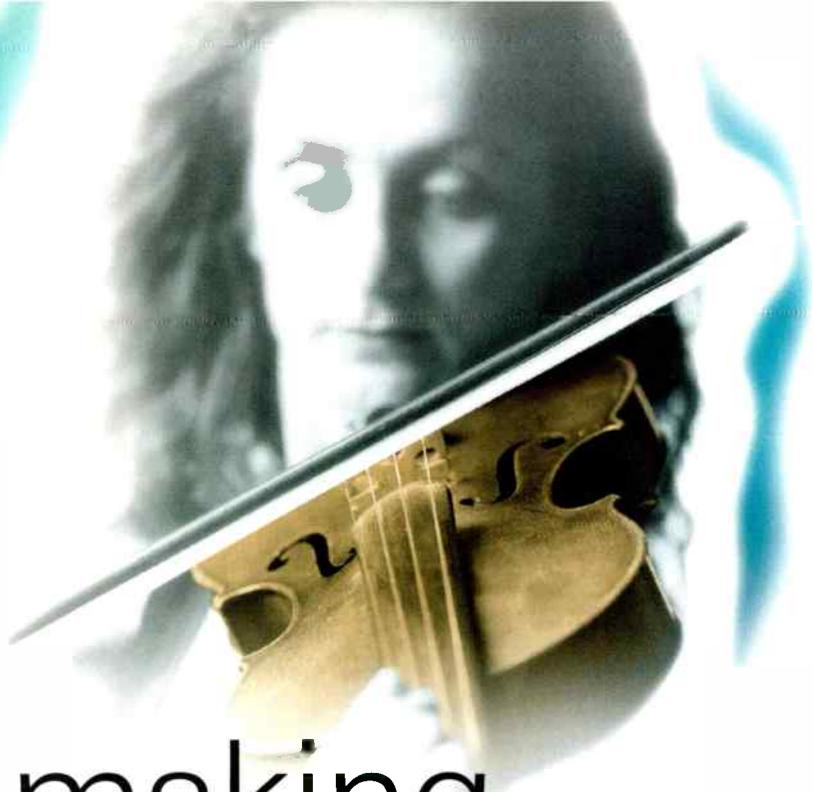
**ALL THE LATEST AUDIOPHILE VINYL RELEASE NEWS - see page 3**  
World Radio History

"So compelling, so completely authoritative that it threatens to make every other cartridge I've heard sound (dare I say it!) wrong; washed out; has-beens." Edward Farrelly, 6moons Internet Magazine

"Simply: A great phono cartridge".  
Paul Szabady, The Stereo Times

"This cartridge has become my reference"  
Geoff Husband, TNT-audio Internet Magazine

"In the right combination this cartridge gives an ear boggling account of itself - the one to beat"  
Richard White, Hi Fi World



# the art of making music



The all new *Music Maker III* now in its latest and best guise, is a truly beguiling Cartridge. As a moving Iron Cartridge it has none of the drawbacks of low output moving coils, and yet offers the listener the chance to experience music in a truly sublime way. No wonder some reviewers have described this as one of the best pick up cartridges available, period.

## Technical Specification

Output voltage	4.5mV
Frequency response	10Hz - 50KHz
Stereo separation	>25dB across 10Hz to 30KHz range
Loading requirement	47K Ohm (standard moving magnet)
Capacitance	100pf (not critical)
Cartridge weight	6.2g
Stylus type	proprietary extended contact area diamond
Tracking force	1.5g +/- 0.05g (critical)
Arm requirement	medium to low mass (13g or less)
Bias (anti-skate) requirements	minimal

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# vinyl news

## FEAR FALLS BURNING

One of the great things about vinyl is its cult nature - small record labels can easily produce limited run records of often superb music, suitably marketed in a package worthy of its niche status. Take



Fear Falls Burning's 'I'm One Of Those Monsters Numb With Grace' via Equation Records. A US import, the music can be described as a soundscape nirvana. Imagine Tangerine Dream and Klaus Schulze starting out with guitars instead of synths and you get the idea... The gatefold sleeve contains a single album on grey vinyl. There are only 399 copies in existence (50 of which are on gold vinyl), so get one while you can.

[www.chronoglide.com/equation](http://www.chronoglide.com/equation)

## STRANGE SOUL

Aldemaro Romero and Monna Bell's 'La Nueva Onda En Mexico' proves that audiophile vinyl can involve joys of discovery. Romero was a musical innovator who in the very late 1960s created the Onda Nueva (or 'New Wave'), which was nothing less than a mixture of modern jazz orchestrations, the hypnotism of the Bossa Nova guitar, Venezuelan folklore melodies and original and complex vocal structures set to the fast-paced 3/4 rhythm typical of some Venezuelan traditional music. This album is rare even for Romero fanatics. If your tastes extend as far as Ennio Morricone, then check this one out via Vampi Soul. [www.vampisoul.com](http://www.vampisoul.com)



## BEATLES ON BLACK PLASTIC

After being asked by the remaining Beatles, Ringo and Paul, along with Yoko Ono Lennon and Olivia Harrison, to make experimental mixes from their master tapes for a collaboration with Cirque de Soleil, Sir George Martin, The Beatles' legendary producer and his son Giles Martin worked with the entire archive of Beatles recordings to create the album, 'Love' via Parlophone. Using the master tapes at Abbey Road Studios, Sir George and Giles created a unique soundscape. The CD version has been out for some time, but now the album's out on vinyl. It's limited to just 5,000 units worldwide, is printed on two 180gm discs with printed inner sleeves and a 28-page booklet including all the imagery and photos from the CD, but on a far more sensible and civilised 12" square size... [www.parlophone.co.uk](http://www.parlophone.co.uk)



## CURE GO AUDIOPHILE

The Cure is about to be launched upon the audiophile vinyl market for the very first time. Published on the Lillith label, the first album to hit the market will, rather suitably, be the band's debut album 'Three Imaginary Boys' which was originally released in 1979. The reissue will mimic the original UK pressing - the US version had a different title ('Boys Don't Cry') and a re-jigged track listing.



## CLASSICS FROM CLASSIC

Recently emerging from a hiatus which has seen the label undergoing an internal reorganisation that has resulted in several new vinyl releases being delayed somewhat, the label has announced three new vinyl releases: Mike Oldfield's 'Tubular Bells', Benny Green's 'Soul Stirrin' and Lou Donaldson's 'Swing & Soul'. Mastering engineer, Chris Bellman, has been drafted in to work on the original master tapes to create the 'Tubular Bells' issue, using Classic's 'all tube' cutting system whilst Bernie Grundman has been working on the original full track mono master tapes for the Blue Note classic, Lou Donaldson's 'Swing & Soul'. Grundman has also been assigned to the Benny Green album, 'Soul Stirrin'. The new reissue will not only feature an authentic laminated cover art, but also the 'deep groove' in the centre label. [www.classicrecords.com](http://www.classicrecords.com)



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[www.hi-fiworld.co.uk](http://www.hi-fiworld.co.uk)

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David Price has the very first review of Linn's heavily upgraded LP12SE turntable, complete with the brand new Keel subchassis, Trampolin base and Ekos SE tonearm.

### GOLDRING 2400 9

Adam Smith tries Goldring's brand new high end moving magnet cartridge, the 2400, and pits it against the state-of-the-art Ortofon 2M Blue too...

### DUAL CS505-4 12

No, this isn't an olde worlde - Dual's budget battleship is back, slightly improved and considerably more expensive. Adam Smith listens in...

### HEED QUESTAR 14

This interesting and unusual little phono stage gets the treatment from Adam Smith.



# Shine On

**Thirty five years since its inception, Linn's ubiquitous Sondek LP12 turntable has just received one of its most profound upgrades in the shape of the Keel subchassis, Trampoline base board and Ekos SE tonearm. In this exclusive review, David Price details the differences...**

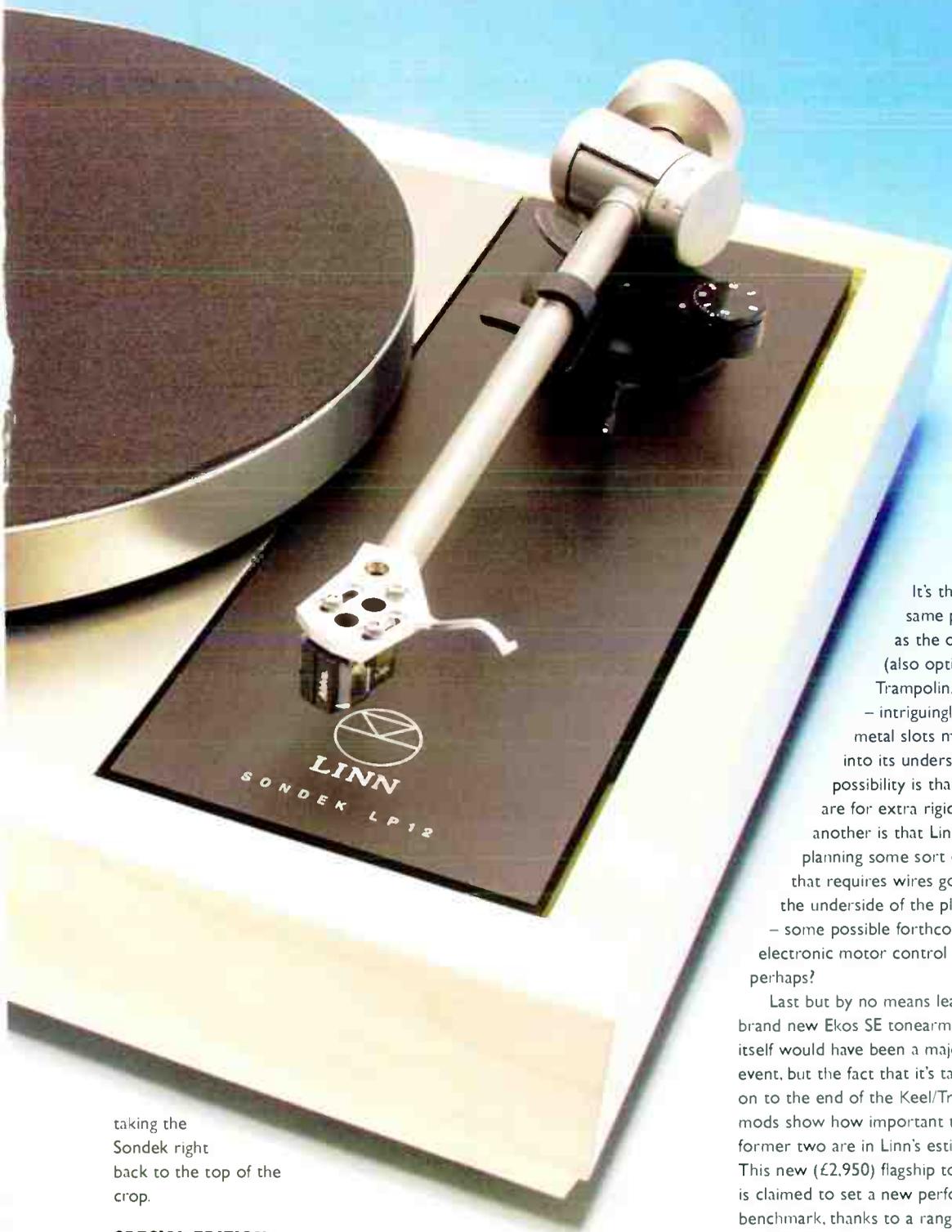
**T**he best way to conceptualise the LP12 is to think about what Porsche have done with the 911 sports car. Like this evergreen automotive icon, superficially it's pretty much the same product that it was when it launched all those years ago. Underneath the skin however, vast engineering changes have meant that the new LP12SE shares little – if anything at all – with that first 1972 production version. The result is that this very latest LP12, like the 911, performs very differently to the original article yet curiously, in some elemental way, still provides a very similar user experience.

The Sondek is more than a turntable, it's an audiophile icon with a passionate – almost religious – following from many owners, who

consider the LP12 to be more a way of life than a mere record player. Having 'committed' to the deck, many owners have simply left it as is, and got on with the process of listening to music. Others camp outside Linn dealers waiting for the next upgrade, an event which was a surprisingly regular occurrence throughout the nineteen seventies and eighties. We had the Nirvana suspension kit, Valhalla motor control mod, Lingo motor power supply and Cirkus bearing kit, plus a vast number of minor motor, chassis and plinth mods, all of which invariably made a small but appreciable difference to performance, and made the Sondek move slowly from a big, fat, euphonic sounding device to a much tighter, tauter and more incisive tool. Arguments have always raged in Linn

circles about the relative merits of each upgrade, and so it shall be with the Keel subchassis LP12SE you see here!

Personally speaking, I thought those rolling upgrades were essential to keep the deck on the pace, but by the mid nineties to my ears the LP12 no longer sounded comprehensively better than the superdeck opposition anymore – just different. Since then, it has been a case of recommending readers to buy one if they like the sound (which is still quite lovely), rather than simply because it is the best outright. After the excellent Cirkus bearing upgrade of the mid nineties, the mods seemed to slow down, but not before time we have three brand new LP12 upgrades (with more promised) – and yes they really do make a dramatic difference.



taking the Sondek right back to the top of the crop.

### SPECIAL EDITION

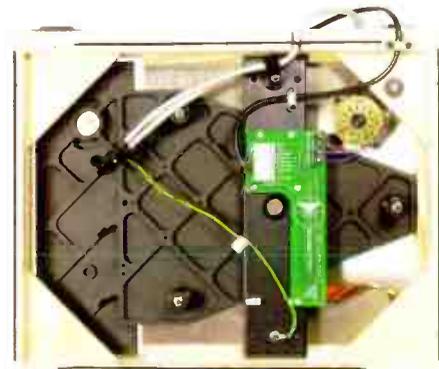
One of the few parts that has remained constant in the LP12 over the years is the subchassis, the part that links the bearing housing to the suspension mounting points and armboard. This is a decent steel affair that has done the job effectively enough. However, the new £1,950 Keel is the centrepiece of the three upgrades that constitute the LP12SE package. It is a combined subchassis, armboard and collar, machined from one solid piece of aluminium to provide the most rigid support to the tonearm and platter possible. There are no screws, fixings or joins to the part, and it is ribbed for extra strength. It has also been balanced to maintain the same mass and centre of gravity as achieved with the separate

subchassis, armboard and collar, and comes in a matt black finish.

The second of the three upgrades is the new metal Trampolin base board (£140). The enclosed plinthed design of the LP12 has both advantages and disadvantages. The plinth can actually catch a lot of the mechanical vibrations going into the turntable (rather than letting them go straight for the tonearm and cartridge), but if it doesn't dissipate them properly then it's effectively acting as a 'voice box', amplifying all those unwanted resonances. The Trampolin base board is manufactured from aluminium for increased rigidity, and acoustically deadened for reduced vibration.

It's the same price as the old (also optional) Trampolin, and – intriguingly has metal slots machined into its underside. One possibility is that these are for extra rigidity, another is that Linn is planning some sort of mod that requires wires going into the underside of the plinth – some possible forthcoming electronic motor control upgrade perhaps?

Last but by no means least is the brand new Ekos SE tonearm. This in itself would have been a major launch event, but the fact that it's tagged on to the end of the Keel/Trampolin mods show how important the former two are in Linn's estimation. This new (£2,950) flagship tonearm is claimed to set a new performance benchmark, thanks to a range of detailed materials upgrades – not least of which is the use of titanium for the armtube. There's also a new stainless steel bearing housing and new ultra-low friction bearings, plus temperature-compensated precision springs. Low-loss cable and gold connectors complete the package.



### SOUND QUALITY

Any comments about the sonics of this upgrade package have to be referenced to the standard LP12 Lingo/Ekos, which is why I spent



two days at Linn's exclusive new retail environment House of Linn ([www.houseoflinn.com](http://www.houseoflinn.com)) where I was able to properly A-B the non-SE and SE variants of the Sondek, before having them set up a full LPI2SE in my own listening room.

Those who've never heard a stock Sondek before will find it quite an intriguing device. It is, by the standards of 2007 sub-£2,000 turntables, quite characterful sounding. More diffuse in

terms of detail rendition than many rivals, it nevertheless sounds highly compelling. You're aware of a slightly compressed left-to-right soundstage, although the LPI2 goes nicely far back behind the plane of the speakers, and you'll also think it's a tad warm and wooden in the bass compared to the likes of Michell GyroDec, for example. However, what it does, it does brilliantly, and that is to very cleverly tease out the tiny rhythmic inflections in the music that rival decks – whilst sometimes giving you the big picture more explicitly – miss. The result is that many find the LPI2 quite beguiling, despite its obvious lack of analytical transparency.

The LPI2SE changes all that. Starting with the Keel subchassis mod (with the standard Ekos/Akiva tonearm/cartridge combination) plus new Trampolin, and you're struck by the deck's greater focus and wider soundstaging. Rather than appearing as a very pleasant, euphonic layer between the original recording and your loudspeakers, the LPI2SE seems more like a shortcut between the two. There's far less sense of there being a turntable there at all, the LPI2SE digging extremely deep into the groove and seemingly beaming it all directly to your loudspeakers.

The basics are all so much better – left to right soundstaging is far wider and more expansive front to back too. Within the recorded acoustic, instruments appear far more explicitly located and better rendered. There's a lot more midband detailing, with plenty of air to treble instruments which was previously absent. Bass is perhaps the most dramatic area of improvement though, with a far tighter and bolder performance. It isn't just louder and/or more boomy, it is louder when

called upon to so be, and boomier only if that was on the original recording. Indeed, on some songs, the Keel mod can make the LPI2 sound more bass-light – it all depends on what you're listening to; the point being, however, that you're no longer listening to the LPI2!

The fascinating thing about the Keel mod is that it exists as a 'hi-fi' upgrade – it gives you all that extra scale and depth and detail, but it also enhances the LPI2's inherently musical nature. The upshot is that on tracks such as UB40's 'King' (from their superb first album), there is not only a deeper, tighter and tauter bassline, but a far more fluid one too. At the same time, the percussion becomes far more pronounced, as does its interplay with the keyboards. Likewise, the vocals become closer, more 'breathy' and more arresting – making this plaintive song a genuinely emotional experience.

Going back to the non-Keel/Trampolin but with the new Ekos SE tonearm, and there was an equally dramatic improvement, but of a different kind. The differences between the old Ekos and new Ekos SE are, in my opinion, far greater than that between the old Ittok LVIII and first generation Ekos. In fact, they're so great that I felt a real sense of disappointment, because I'd previously held the Ekos in very high regard, whilst the new SE version was making it sound rather lame and lacklustre.

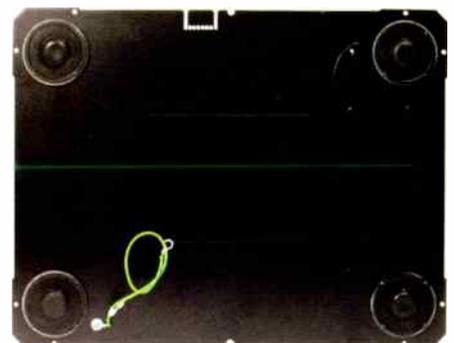
Essentially, the new flagship Linn arm takes the basic Ekos sound and puts it into far sharper focus. The Ekos SE simply sounds cleaner, crisper, more incisive, more dimensional and dynamic. On the stock LPI2, it makes a big difference, strangely giving quite similar subjective improvements to the Keel – odd considering one is a flat piece of aluminium under the deck, the other a tube of titanium on top! Basically, there's more grip to the bass, and a substantially more tuneful nature – you can really feel what the musicians are doing, and where they want to go with the song. Midband is more brightly lit than with the old Ekos, but there's no glare and a lot more tonal variety – warm instruments sound warm, cold ones cold. Treble is actually the most profound improvement to my ears, the new arm giving a deliciously incisive yet silky sound. Rhythms and dynamics are also a step change upward.

Together as a package, the LPI2SE/Ekos SE/Trampolin is a superb sounding device, one that would not flinch against

any £6,000 turntable. Moving to classical music in the shape of my beloved DG pressing of Beethoven's Pastoral Symphony (Karajan), and the LPI2SE/Ekos SE ran rings around the stock version. The result is an extremely musical device, one that is more instinctively rhythmic than ever before. Whatever disc you put on the LPI2SE, it just goes straight for the rhythmic jugular and sings like a canary. Bass lines, which seem powerful and well articulated on other similarly priced turntables are also this on the LPI2SE, but they start bouncing like a rubber ball. The midband now has class-competitive insight to any other deck of the price, and imaging to match, but the difference is that is boogies along with unfettered joy. The treble is now as open and clear as it can be at the price, but those gentle hi hats cymbals have an exquisite rhythmic 'float', where the LPI2SE's rivals would simply sound matter-of-fact.

Like the latest Porsche 911, the new Linn won't be for everyone – choice is wonderful thing, and some fifteen years after LPs were officially supposed to have died, there are more high end turntables around than ever. However, the new LPI2SE is now thoroughly class-competitive in every technical hi-fi respect, but retains its trademark rhythmic alacrity (what Linn's Ivor Tiefenbrun calls "pitch accuracy"), and indeed improves on this very thing dramatically.

Opinions vary on the respective performance gain from the Keel and Ekos SE, but I'd say the Keel does about sixty percent of the work, and the Ekos SE about forty, but others think it closer to fifty-fifty. Either way, individually or as a whole, I can confidently recommend the new Linn Sondek LPI2SE as a modern, state-of-the-art turntable once again. The pricing has raised a few eyebrows on certain anti-Linn online forums, but before you hurrumph too loudly in public I would seriously advise you to go listen for yourself – you might be surprised. As for me, my only complaint is – why did it take so bloody long?



**VERDICT** ●●●●●

Comprehensive upgrade package takes the legendary LPI2 right back to the top of the musical tree, but not before time!

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LINN KEEL	£1,950
LINN EKOS SE	£2,950
LINN TRAMPOLIN	£140
Linn Products Ltd.	
☎ +44(0)500 888 909	
www.linn.co.uk	

**FOR**

- musicality
- focus, detail
- tonality
- build

**AGAINST**

- having to wait so long for it!
- price



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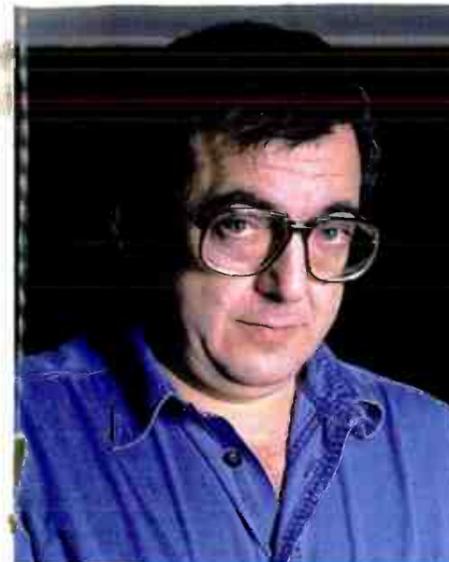
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**STREETFIGHTING MAN**

David Price talks to Linn Products' Ivor Tiefenbrun...

Anyone who's maintained more than a passing interest in audio should know the Linn story by now – in 1973 an outspoken young Glaswegian launches a turntable, with machining work by his father's engineering company. It takes the hi-fi world by storm and builds up a huge consumer following in the process, and he grows his company up to a three hundred person strong powerhouse in one of the most deprived areas of the United Kingdom, to great international acclaim. In the process, he makes many enemies and accumulates countless detractors, earning himself the reputation as something of an audio maverick...

"I was in a struggle with people more interested in themselves or their money," confesses Tiefenbrun in his trademark high tones, "English buffoons". Age has not withered Ivor's infinite variety – he is still outspoken – but despite the eye-watering frankness of his words, they're not said with spite. Indeed, his voice is soft and his vowels crisply intoned – there's a calm, contemplative lilt to his voice. Then he adds gently, "everything you say is used against you by cretins!"

The Linn story is remarkable one – surely few better examples of how to build up a successful company from nothing exist? And despite Ivor's abrasive edge, the Linn factory at Waterfoot seems a happy place with plenty of unprompted smiles on staff faces. There's almost a sense of them and us, just in case you hadn't noticed, Linn is not universally loved in the British hi fi world, and Ivor is seen as something of a renegade, but he likes it that way. Indeed, he appears far more interested in people inside Linn,

plus his family and friends, than in the outside world. He talks passionately about being a good employer, giving jobs to people in an economically challenged area. Despite making no secret of his contempt for Britain's current political class (a popular conversational topic for Mr. T on the day of our meeting!), he obviously values his staff and shows genuine interest in – and concern for – their lives. "Ivor's advice is offered whether it's asked for or not", one employee told me in the Linn factory canteen, with a wry smile on his face.

"Today's innovation is tomorrow's commodity, and trash triumphs. If you want to make money, then your ambition is to sell a commodity product in volumes", confides Tiefenbrun. Later over dinner he elucidates, explaining how much he loves the manufacturing industry per se, and how important it is for him to be an engineering company designing and making high quality products, rather than chasing far more lucrative markets like mass-market consumer goods sourced from wherever. "Linn addresses a discriminating minority; we can't compete with pile 'em high and sell 'em cheap merchants".

"You are what you are and you do what you do", he adds, suggesting that there are easier ways for Linn Products to proceed than the design and engineering-driven path they've trod since their inception some thirty four years ago. But for him personally, engineering is what it's all about. His passion for this is obvious, and again he laments the fact that twenty first century Britain has a tragic lack of respect for the vocation. "Most people just take things entirely for granted, they have no understanding of what's needed in design. Engineering is making things work... this miracle of life is lost on us".

Hi-fi is, of course, one place

"buying hi-fi is one of the most important purchases of your life..."

where mechanical and electrical engineering meet what is surely the most expressive art - music. As such, it's a unique vocation. "Buying a hi-fi is one of the most important purchases of your life - it's not something you can rush," says Tiefenbrun, "and the hi-fi industry is about getting a better sound from the standard available software". Back at the time of Linn's inception of course, the predominant

format was the vinyl LP, and he adds that, "I discovered that turntables were fatally flawed when I bought my own".

Lest we forget, back in the early nineteen seventies, hi-fi magazines and dealers alike were preaching the importance of loudspeakers to system sound. As the music emanated from them, it seemed logical enough, but Tiefenbrun declares that, "I made the importance of a better turntable apparent". Even Ivor's most vociferous fans would be forced to concede that one, although his argument now began to get more controversial. "Modern hi-fi doesn't maintain the linear pitch relationships in music," he told me, "and the real test of the engineer is to maintain the pitch relationships within the music. The beat is the most fundamental thing, and above that is the carrier, the melody".

This point defines Linn's distinctive system sound. Many hi-fi journalists remark on how spry, crisp and pacy Linn products are, almost regardless of type, format or age – and "pitch accuracy" is how Ivor explains his aim when voicing products. This is partially explained by the famous 'pace, rhythm and timing' aphorism, but not entirely. Indeed, Ivor's account of "pitch accuracy" is defined by an even more enigmatic notion. "Just as looking is different from seeing, listening is different from hearing. Listening is an active thing, and it is defined as 'silent repetition'".

Essentially then, "silent repetition" is the process of being able to recognise musically in sound – and this is made possible by "pitch accurate" equipment. For Ivor, the key to live music is the experience and enjoyment of these "linear pitch relationships", and as such is the start point for how you voice your hi-fi designs. He dismisses other manufacturers' equipment that is

less rhythmically explicit, but perhaps warmer or more euphonic sounding, as bogus precisely because it doesn't offer the rhythmic sensations of live music. "If you don't have a reference, you can't have an opinion; you have a prejudice. People are entitled to their personal prejudices, but they're not entitled to share them", he says pointedly, adding "communicative power is what matters in music".

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# Magnetic Personality

Adam Smith takes Goldring's new 2400 MM cartridge for a spin...

Like many grandmothers, my dear old nan used to have a wise saying for most occasions. She would share these at every opportunity and it is interesting how some have proved to be true surprisingly often. I think anyone who has prepared a dinner party or barbecue for a number of people will agree that too many cooks can spoil the broth; I don't think there is any doubt that practice does make perfect and my ever-changing collection of non-working 'classic' hi-fi proves that a fool and his money really are soon parted...

To these three I think we can add another - 'You wait ages for one and two turn up at once'. Most often applied to buses, it leaped immediately to my mind recently in terms of moving magnet cartridges. No sooner have we all recovered from the surprise that was the Ortofon 2M series - the first truly brand new budget cartridge designs seen in Europe for many years, than Goldring merrily announced the 2000 series - the second truly brand new budget cartridge designs seen in Europe for many years!

I don't think there is any doubt that, certainly here in the UK, Ortofon and Goldring have been two of the biggest players in MM cartridges for a number of years now, and the fact that they have both invested the necessary time and effort in totally new designs speaks volume for the recovery of the vinyl format, and its future prospects.

Made in Japan to Goldring's specifications, the new 2000 Series are to be sold alongside the existing, and highly regarded, 1000 Series for the foreseeable future. Comprising five models, they span a price range from £70 up to £185, with the 2400 being one from the top and retailing at £160. Whilst the styli for

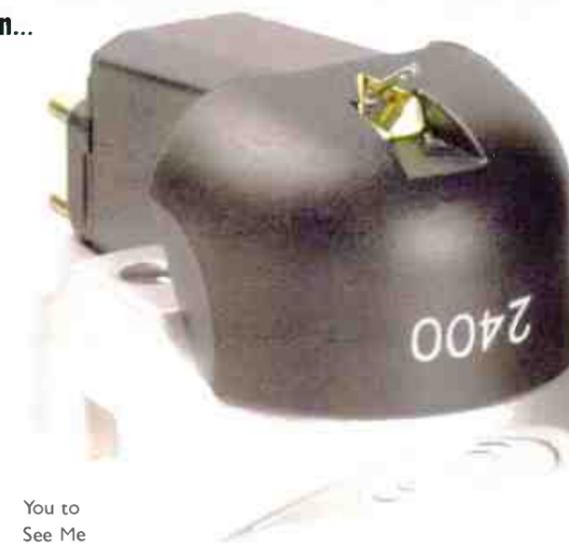
all models are interchangeable it is worth remembering, before you add a 2500 stylus to your 2100, that the 2400 and 2500 models use metal bodies, whereas those of the lesser three models are a composite plastic. Styli range from the straightforward elliptical types of the 2100 and 2200, through the Gyger II of the 2300 and up to the 2SD of the 2500. The 2400 here uses a Vital type.

Unwrapping the 2400 from its stylish packaging, the cartridge reveals itself as a very solid item and complete with a sturdy pair of Allen bolts for fixing, plus the requisite Allen key. Installation is straightforward, thanks to the cartridge body having tapped holes, and these mean that it can be cranked into your headshell nice and tightly.

I listened to the 2400 in a few different arms, but the majority of auditioning was carried out in a Rega RB250 arm on a Goldring GR2 turntable. I also took the opportunity to make a few comparisons to the Ortofon 2M and our old friend, the Goldring 1042, to see how the newcomer stacked up.

### SOUND QUALITY

As measurement shows, the 2400 is a thoroughly modern cartridge and this is reflected in its sound. There is no soft fluffiness or woolly warmth here - the 2400 delves into music with the tenacity of a terrier and pulls absolutely everything out, particularly across the midrange. Eleanor McEvoy's album 'Yola' is one of my favourite recent LP discoveries and, although well recorded, does have a slight cloudiness to the vocals - some warmer sounding cartridges can make it sound a little dull. The Goldring did not suffer this fate, and the vocals were superbly clear - in fact I think it gave one of the best renditions of the track 'I've Got



You to See Me Through' that I have heard from any cartridge, regardless of price.

The good impressions continued with a bit of classic rock, courtesy of Be Bop Deluxe's 'Axe Victim' album. The track 'Adventures in a Yorkshire Landscape' has a magnificent electric guitar solo, but the 2400 ensured that the acoustic rhythm guitar was right up there in the mix, and added a superb spatial sense to everything, with each instrument having plenty of room to breathe. Classical music reinforced this impression, with the Boston Symphony Orchestra's rendition of 'The Planets' being presented with magnificent scale and precision, the individual timbres of each instrument being immaculately represented.

The 2400's treble is very clean and clear without resorting to the harshness that can sometimes accompany such a character - a testament to its quality stylus. This was aptly shown by Energy Orchard's 'Sailortown' which was given a brightly lit performance by the Goldring, but without making sibilants spitty, something that can occur all too often with this track. The rise in output at higher frequencies [see MEASURED PERFORMANCE] seems to be at a



sufficiently high frequency to impart good detail without adding any midrange forwardness, although we did find during measurement that a rise in output lower down the range can be induced by capacitive loading. Goldring recommend a maximum value of 200pF, including leads and amplifier input capacitance, and this would seem a sensible value to stick to, in order that the midrange does not start to become dominant.

Down at the bottom, the Goldring has a big and solid bass that digs superbly deep and offers a positively visceral punch with the right material. Bass drums pounded, double basses had a lovely fulsome bloom to them and bass guitars set up rock solid rhythms. The only area in which I found the 2400 to be a little lacking in this respect was in

**NOEL SAYS**

I'm a big Goldring fan. I love their moving magnet cartridges and am a long term user of the 1042. So their announcement of the 2000 Series made me sit up. I'm happy to say the 2400 performs as superbly as I'd expected. It has a glass-like sense of clarity, with occasional brittleness due to the strong upper treble lift. This made itself known on discs with extended treble and a bright balance. One example was our 180gm Phil Collins 'Hello I Must Be Going', where the often strident horns on 'I Can't Believe It's True' were just a bit too sharp. Similarly, the pin-sharp balance of the Zutons 'Tired of Hanging Around' occasionally tipped toward frigid when sibilance cut like ice. However, most of the time this effect wasn't obvious and the 2400 was easily one of cleanest and most insightful moving magnet cartridges available today. It retrieves huge amounts of detail and pulls instruments and singers out of a disc better than Tommy Cooper. Bass is tight and supremely integrated; Heaven 17's 'Lady Ice and Mr. Hex' had all the bottom end drive I know it for. Older recordings didn't fare as well as newer ones; 'Highway Chile' even on new 180gm vinyl had Hendrix singing into an empty bean can, it seemed to me, due to a balance that was strident. The older 1000 Series are less ruthless and a bit more flattering of imperfect recordings. So the 2400 is challengingly modern. It offers very high standards of reproduction, but the brightness may not appeal to all. NK

terms of pace. Whilst generally it is a very tuneful cartridge, it did seem to struggle a little with faster dance type music. As a result, this had a tendency to rob recordings like the Scissor Sisters' 'Ta Dah' of a little of their impact and sheer gusto. Never falling over itself or becoming confused, the Goldring nevertheless may require careful auditioning if you spin plenty of 'phat choons' and occasionally like to recreate Ibiza's finest clubs in your living room

**CONCLUSION**

A very well designed and built cartridge, the Goldring 2000 series is

a welcome addition to the affordable moving magnet cartridge market, and if the rest of the range is as good as the 2400 then they should have no problem at all racking up formidable sales figures.

The 2400 is a beautifully balanced cartridge, offering good bass depth and impact and an almost moving coil-like smoothness and insight to its midrange and treble. It brings a touch of sophistication and polish to vinyl reproduction that, until recently, was seldom heard at this price point

Going back to my dear old nan, one of her favourite pearls of wisdom was "You get what you pay for". Well, I'm not so sure about that - with the Goldring 2400, you get a whole lot more besides.

**VERDICT**

A well designed and sturdily made cartridge that brings new levels of almost MC-like clarity and detail to its price bracket

**GOLDRING 2400** £160  
 Armour Home Electronics  
 +44(0)1279 501111  
 www.goldring.co.uk

- FOR**
- magnificent clarity
  - superb imaging
  - build, ease of fitment
  - exemplary tracking ability

- AGAINST**
- bass not the fastest around

**THE RIVALS**

Bolting in both the Ortofon 2M Blue and then the Goldring 1042 for comparison to the 2400 seemed an obvious thing to do, and gave some intriguing results. Firstly, the 2M Blue shares the insight and clarity of the 2400 but can very occasionally veer into sharpness at the top end. The 2M Blue has an analytical nature that digs right into music, even further than the 2400 but the downside is that it is ruthlessly revealing with poor recordings, telling them like they are. The 2400 will still show up a bad recording, but is a little less brutal when telling you the truth. The 2M Blue does, however add in an infectious 'boogie' factor and a bass that, although not quite as deep as the 2400's, is tighter, punchier and happier to pound out fast rhythms

Moving to the 1042, this was very interesting. We know this cartridge well here at *Hi-Fi World* and have long been a fan of its all-round abilities. Whilst it has a quite similar overall sonic signature to that of the new 2400, its bass is tighter, albeit not as rock-solid as the 2Ms, but it can tend to blur finer details in the mix somewhat, unlike the 2400 which plonked them firmly into place within the overall setup. The 1042's midrange came across as a little jumbled as a result and it has a slightly more laid-back nature than either the 2400 or the 2M Blue. What did surprise me though is that the 1042 still has the sweetest and cleanest treble of all three cartridges - it really is very impressive in its high frequency abilities. Ultimately, the 1042 still stands up superbly well to the new competition, a testament to its original design.

So, which one to choose? The sweet lucidity of the 1042, the irresistible pace and punch of the 2M Blue, or the sublime clarity and insight of the 2400? Well the obvious answer is to listen to all three and see which sonic footprint takes your fancy. My choice? Well, I have seventeen quite different-sounding turntables so one of each wouldn't go amiss...

**MEASURED PERFORMANCE**

The 2400 uses a low impedance generator that gives a ruler flat response to 8kHz. Above this, tip mass resonance forces output up to a +5dB peak at 18kHz our graph shows. The 2400 will have a super clear midband, that's for sure, but the peak may give it obvious brightness or spit. The low frequency end is flatter than usual, so it may well have tighter bass. Inner groove tracing losses were low, due to effective stylus geometry.

Channel separation was a good 28dB and lateral distortion around average at 1.1%, primarily second harmonic. A high vertical tracking angle gives plenty of disc clearance but makes distortion high at 5%. Luckily this is mainly second harmonic and affects left and right images only. Tracking ability was excellent at 300Hz where groove amplitude is important and at 1kHz where acceleration dominates, the 2400 clearing the most challenging test grooves. Output was fair at 5mV at 5cms/sec rms, although this is not a high output type.

The 2400 is very much a modern design benefitting from a low impedance generator with few coil turns, meaning less wire, a flat

frequency response and greater insight. NK

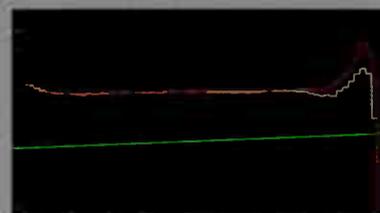
Tracking force	1.8gms
Weight	8.2gms
Vertical tracking angle	32degrees
Frequency response	20Hz - 12kHz
Channel separation	28dB

Tracking ability (300Hz)	
lateral	90µm
vertical	45µm
lateral (1kHz)	25cms/sec.

Distortion (45µm)	
lateral	1.1%
vertical	5%

Output (5cms/sec rms)	5mV
-----------------------	-----

**FREQUENCY RESPONSE**



Red - outer grooves  
 White - inner grooves

# 505 Live

Adam Smith takes a look at the latest incarnation of a truly classic turntable - the Dual CS505-4...

**T**his isn't an 'Olde Worlde!' You may be as surprised to learn, as we were, that this is in fact a current Dual CS505-4, fresh from the factory in St. Georgen, in the beautiful Black Forest area of Germany and reintroduced to the UK courtesy of RPM Audio.

Upon researching this situation, I was intrigued and surprised to learn that the CS505 has never actually gone out of production, but disappeared from the UK market, and most people's awareness, in the late 1980s. It was 1988 in, fact, when Dual was bought by Schneider, who used the name as a brand on various consumer electronics and by 1993, they had undertaken the decision to terminate the selling of Dual record players, although production did continue at a very small level for the local market.

Moving forward to 2006 saw the creation of the company 'Dual Phono GmbH' following the bankruptcy of Schneider. This came under the careful guidance of Alfred Fehrenbacher, who was the original Production Manager for Dual. As a result, a small production line of fifteen workstations produces the decks, using locally sourced parts and all the original tooling, which had been carefully stored. Finally, towards the end of last year, German distributor Sintron added Dual to their impressive portfolio, which already included Thorens and Dynavox, as well as Sintron's own brand, Vincent. Currently, the Dual range comprises five models, with all but the cheapest being made in Germany, and there are rumours of two brand new decks coming next year.

The CS505 was always a very successful product and marked the first step on the ladder for many audiophiles. The current model will be instantly familiar to anyone who owned an earlier one as it is basically unchanged - surely a case of, 'if it ain't broke: don't fix it!'. However, for those of you who are lucky to be young enough not to remember the original, the deck is a two speed belt drive unit with end of side auto stop

and lift, and around 6% speed adjustment through a clever segmented motor spindle whose effective diameter is altered by the speed adjustment knob.

The tonearm is a fairly straightforward type, using gimbal bearings and a detachable headshell. Tracking force is applied via a spring and a calibrated knob, and bias has separate settings for spherical and elliptical styli, with the handbook adding recommendations for both 'Dry' and 'Wet' playing settings, which was a nice trip down memory lane!

The CS505-4 is supplied pre-fitted with an Ortofon OMB-10 cartridge and really is simplicity itself to set up. Simply unpack, fit platter, mat and counterbalance weight, set tracking force and bias, release suspension transit bolts, connect up and play. Available in both black and silver, the CS505-4 is as beautifully made as it always was and feels reassuringly well engineered in use.

## SOUND QUALITY

Cueing up the CS505-4 was like revisiting an old friend, and the sound that results was equally familiar. Dual decks always had a reputation as being smooth and composed in performance terms and the latest incarnation of the CS505 is no different.

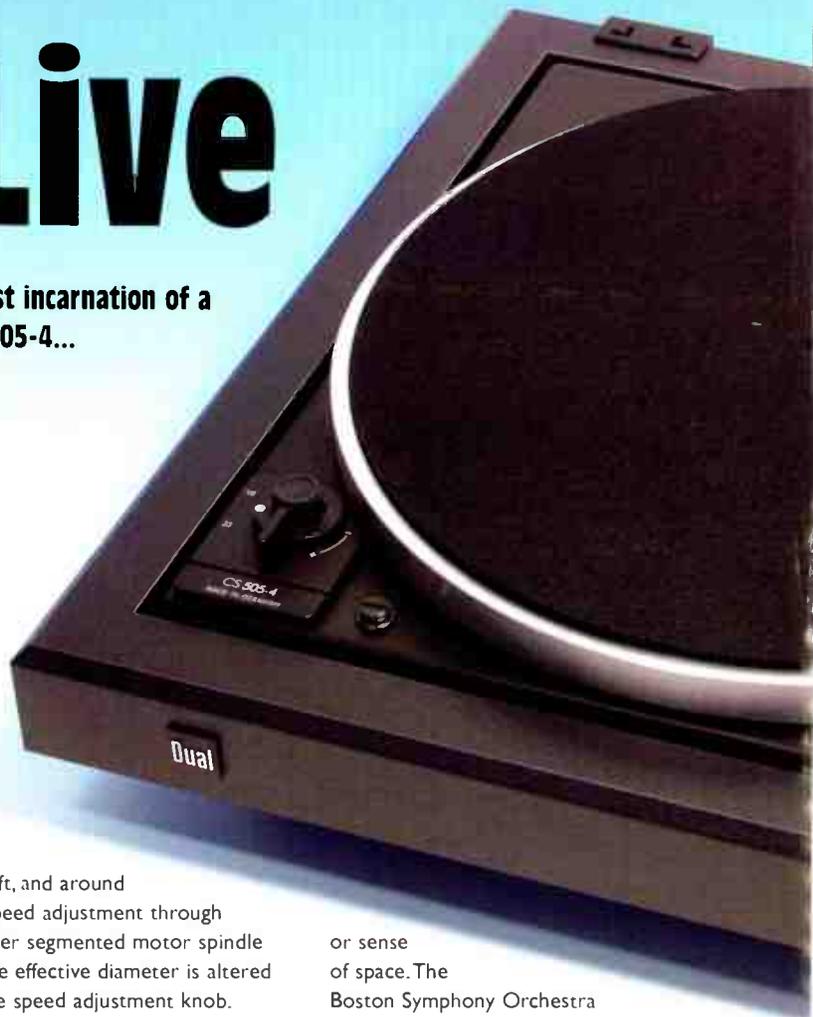
Across the midband, the CS505-4 has a fluidity that makes both vocalists and acoustic instruments take on a beguiling and mellifluous nature. Images are laid out very well in front of the listener, but without much attempt at a true soundstage

or sense of space. The Boston Symphony Orchestra playing Holst's 'The Planets' were all there, and very clear and clean in their presentation, but where each musician was located was something that the Dual seemed reluctant to reveal.

At the bass end, the Dual was pleasingly weighty with good depth and punch. Upper bass detail was commendable and acoustic basses came across with good body and scale. The CS505-4 took faster, more complicated bass lines happily in its stride, but it didn't really get down and groove with the best of them. Once again, that composed and smooth nature came through to make sure nothing became too wild and crazy - all very well but, if you are playing a wild and crazy track at the time, perhaps not ideal...

Where the smooth nature really came to the fore, and worked well, was in the treble. Here, the Dual does stand out from its contemporaries by being much softer and far less harsh than some. Whilst a side effect of this is that it did not dig as much high frequency detail out of the grooves, it turns in a sweet performance and never becomes harsh or strident.

Ultimately, the word that kept on coming back to me as I listened to the Dual was 'nice' and this is not necessarily a bad thing. The CS505-4 has a lovely, fluid nature that means you could listen all day long, and





**THE COMPETITION**

I briefly compared the Dual to £250 worth of Goldring GR1/1012GX and the results were interesting. Whilst the Dual's smoothness meant that aspects of music that became a little harsh with the Goldrings were much easier to listen to and it added a nice level of emotion to the Goldring's rather sterile midrange, it lost out comprehensively in other areas. The Goldring combo opened up the soundstage considerably, put superb air and space around instruments and turned the backing 'donk' from Julia Fordham's 'Happy Ever After' into proper bongo strikes. Fitting the 1012GX to the Dual helped the CS505-4 in respect of detail and atmosphere, but turned the midrange into a glassy and hard affair - clearly not happy bedfellows. I also noted that the Dual's arm only just balanced the 1012GX - I had to set the tracking force to zero and rely solely on the counterbalance weight right at the back of its travel to set the correct downforce. Probably best to leave the OMB-10 in place...

to any sort of music, without ever becoming tired of it, or suffering any sort of harsh assault on your ears. The Dual maintains the character of its predecessors, has that much-talked about 'vinyl warmth' in spades and may well come as a welcome relief to anyone used to the more challenging listening experience of some harsh budget CD players.

**CONCLUSION**

For those wanting a nice (there I go again!) and easy record playing solution, the Dual makes a good case for itself. As a complete package

that is easy to set up and use, and with a cartridge that matches the nature of the deck well, it can be up and running and making pleasant noises very quickly. However, I feel that it has two main problems.

Firstly, whilst it really is enjoyable to listen to, the Dual doesn't really dig into the very heart of what vinyl is about - LP is capable of more than just a 'nice' sound and the Dual does not

really explore this.

The biggest problem, however, is quite simple - price. In the olden days, the CS505 was a budget unit that was an excellent stepping stone to a Rega Planar 3, for example. However, for the current £450 cost of the Dual, you can buy the Rega's modern incarnation, the P3, plus the likes of a Goldring 1042 cartridge and still have enough change to buy an LP to play on it.

Personally, in a 'head versus heart' tussle, the Dual CS505-4 still exerts a strong pull on my ticker as it's lovely to use, and sounds pleasant. Ultimately, however, my head says that, for £450, this is not enough.

**VERDICT** ●●●

A likeable, pleasant-sounding and easy to use unit that is never harsh, but the level of performance is at odds with the price.

**DUAL CS505-4** £450  
 Distributed by RPM Audio  
 ☎ +44 (0)7790 907737  
[www.sintron-audio.de](http://www.sintron-audio.de)

**FOR**

- composed and fluid sound
- build quality
- ease of use and setup

**AGAINST**

- price
- sound lacks insight
- cartridge compatibility

**MEASURED PERFORMANCE**

The belt drive system on the CS505 produces a good IEC weighted Wow and Flutter figure of 0.078%. The largest element of this is at the lowest frequencies and around the region that suggests a small cyclic eccentricity on the main platter. This is unlikely to be noticeable *per se*, but may well come across as a slight smearing of dynamics and pace. Speed accuracy was good, and stable.

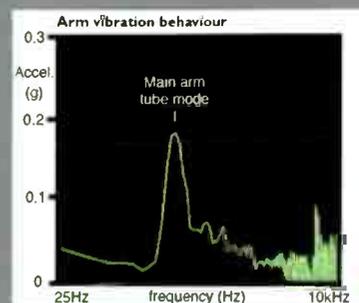
Vibrational analysis of the arm shows that it has a large main arm tube mode around 300Hz. The width of this peak, combined with the highish levels above it, indicates that the arm is not particularly well damped. This is most likely due to the arm's Ultra Low Mass design and narrow tube, and means that it is really best suited to very lightweight cartridges, such as the fitted Ortofon OMB-10.

Higher up the frequency band, the cluster of peaks show that the headshell of the CS505-4 is quite lively and, again, this could well result in brightness with cartridges that are

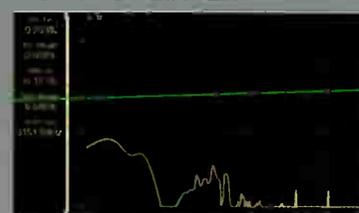
anything less than creamy smooth.

All in all, the Dual measures reasonably well, but in a way that is typical of an older, budget design. AS

**ARM VIBRATION**



**WOW AND FLUTTER**



# Take Heed

Adam Smith hears Heed Audio's Questar MC phono stage...

**H**eed Audio are a relatively new name to many people, but they have been around since 1991 under the leadership of chief designer Zsolt Huszti.

The company's first product was a pre/power amplifier, designed with the help of Richard Hay, formerly of Ion Systems, and the family connection has been maintained, as it is Richard's son, Robert, of T Source, who now imports the products into the UK.

The current lineup consists of the unusual Envoy loudspeakers, with their upward firing drive units, plus a range of electronics including amplification, the Orbit power supply for the Linn Sondek LPI2 and similarly-motored turntables, and a couple of phono stages, of which they refer to the Questar as the 'MVP', or Most Valuable Product!

A simple one box unit, the Questar is available in MM or MC variant and it is not possible to convert one to the other. The MC version comes preset for 220uV input sensitivity and a load impedance of 100 Ohms and is powered by an external 'wall wart' type power supply, although this can be upgraded to the PSU used by the £550 two-box Quasar MM/MC phono stage. Connections are simple, with one pair of inputs, one pair of outputs, PSU connector and an earth terminal.

## SOUND QUALITY

Budget phono stages, particularly MC types can sometimes be a little challenging on the ears, especially for those of us who commonly use a silky Eastern Electric valve phono stage, but the Questar MC was a great relief in this respect. It has an immaculately smooth treble that removes the stridence from harsh recordings without falling into the trap of muffling

anything. Somewhat less detailed than some, the Questar MC has very good levels of treble ambience and space, although it does have a tendency to gloss over the metallic ring of cymbals and hi-hats a little, and a little more treble energy would not go amiss.

Midrange from the Heed is very fluid and composed. Although obviously lacking the insight of valves, it is still commendably detailed and atmospheric, giving a good sense of realism to instruments, and setting up a stable and deep soundstage in which they are firmly located. The Heed spreads orchestras out well before the listener, and plays smooth vocalists with good atmosphere and feeling. This melds smoothly into the bass, which is where the Heed really does score.

At the bottom end, the Heed has surprising depth and grunt, thanks to the measured rise in output level [see MEASURED PERFORMANCE] but fortunately, this does not result in a wallowy boom. The Questar MC is fast, taut and throws bags of detail

in for good measure. Bass lines could rumble the sofa with suitable material, but the Heed never became less than well controlled, and it tracked complicated bass lines, whether from a bass guitar or a synthesiser, with the skill of a bloodhound.

## CONCLUSION

For its selling price of £225, the Heed Audio Questar MC is something of a bargain. Briefly, and somewhat unfairly, comparing it to a £1,200 Trichord Diablo we had available showed that, although the Trichord had a definite edge in terms of soundstage, atmospheric and treble insight, the Questar MC was able to show it a clean pair of heels in terms of bass depth and detail - I came away impressed with this little black box!

Although the lack of fine tuning of gain and loading is a slight disadvantage in terms of getting the most out of your cartridge, the fit-and-forget nature of the unit will appeal to many. For £225, it warrants a firm recommendation.

## VERDICT ●●●●£

Simple but effective MC phono stage that turns in a smooth and weighty performance at a bargain price.

**HEED AUDIO**  
**QUESTAR MC** £225

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## FOR

- bass weight and detail
- overall cohesion
- smooth, fluid nature

## AGAINST

- treble could be more detailed
- no cartridge loading options

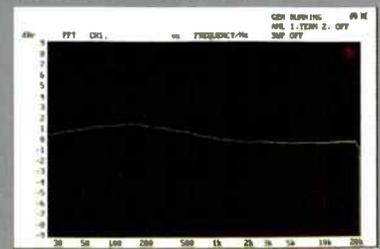
## MEASURED PERFORMANCE

Frequency response measurement shows the Questar has a +1dB lift at low frequencies, due to the 318uS characteristic being a bit awry. This will subtly lift bass and give more body to the sound, as it affects the lower midband too. Deep bass, influenced by the 3180uS time constant, falls back a bit so the Heed shouldn't sound wallowy, as stages with too much low bass can easily do. At warp frequencies, around 5Hz, response is -6dB down, which is useful. Noise was fairly low at 0.08uV, and gain very high at x1930, making the Questar suitable for low output moving coil cartridges.

The Heed measures well generally, but it will sound a little fuller and stronger at low frequencies. NK

Frequency response	12Hz-70kHz
Separation	62dB
Noise (e.i.n. A wtd)	0.08uV
Distortion	0.008%
Gain	x1930
Overload (in / out)	3mV / 6V

## FREQUENCY RESPONSE





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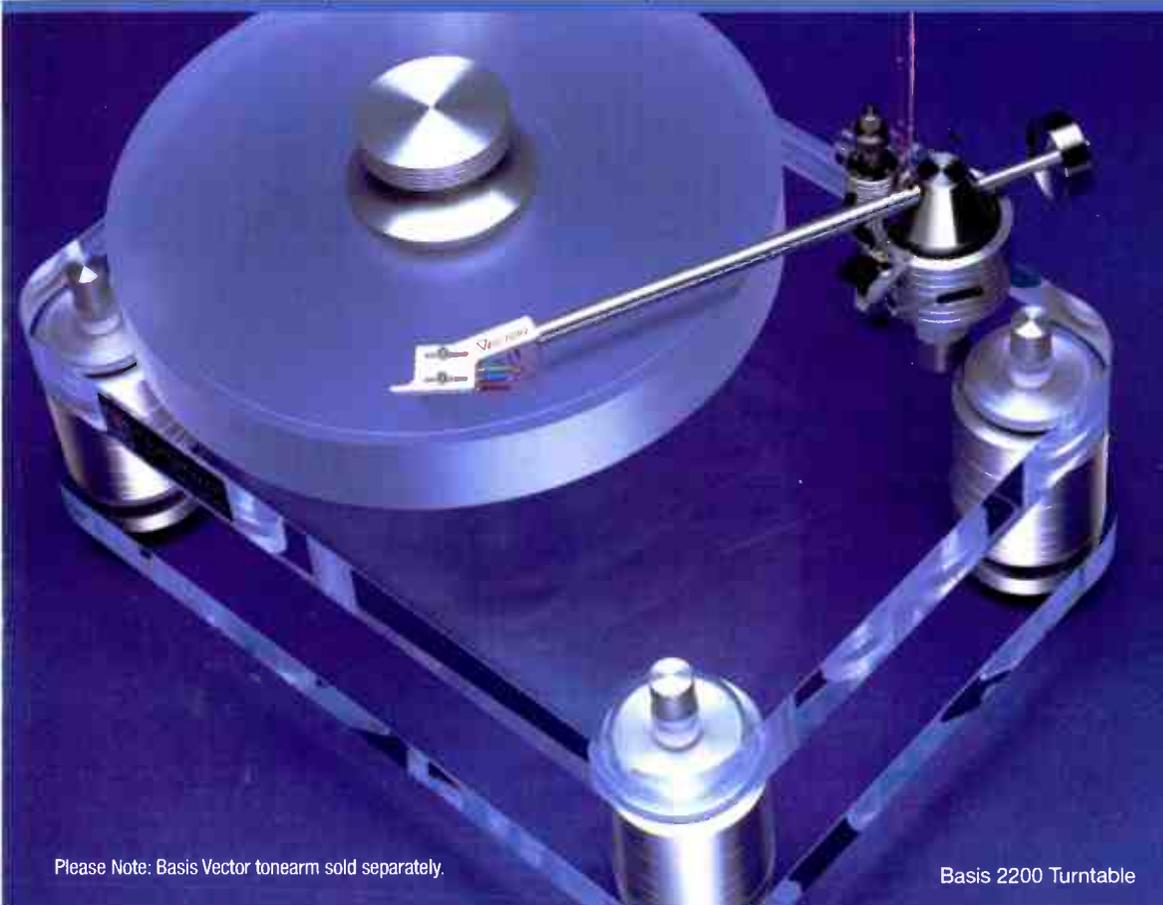
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<b>2200C</b>	Debut
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- Melody
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- ⊙ **Basis**
- EMT
- Feastrex
- Gershman
- King Sound
- Basis PSTT Cables
- Boston Audio
- Harmonix
- Mundorf



2500 with Vector arm

2800 Turntable

PSTT wiring loom

Debut Signature



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The One Thing decoder has a three position switch, for Stereo, Mono and Stereo Blend. The rotary control varies Stereo Blend.

about Buxtehude I initially wondered whether a channel imbalance existed, as McLeod was off centre, but then Koopman cut in, showing both were neatly positioned either side of centre, precisely located.

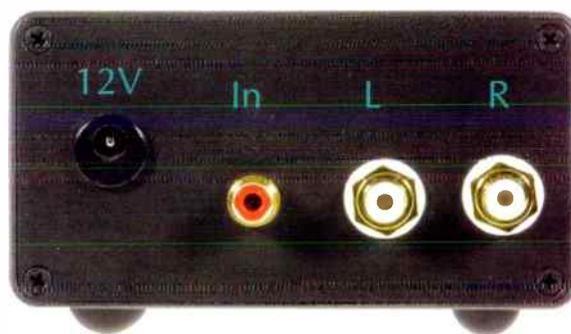
Troughlines are strongest with this sort of live studio material, conveying a great sense of atmosphere. Solid-state tuners tend to obliterate ambience and it was an area where the Marantz didn't excel. However, the Marantz was always sparkingly clean and concise, making the OTA sound a little dark and short of see through clarity. I suspect the slight opaqueness came from distortion, including intermod against the pilot tone. I say this because the GT Audio decoder was cleaner and transparent, sounding more like the Marantz in this respect and stage width, yet without the Marantz's weak retrieval of ambient information; Radio 3 studio ambience was still audible via the GT Audio decoder.

Where the GT Audio decoder either pulled ahead or slipped behind, according to taste, was its slight emphasis on the upper harmonics of strings, making them sound vivid and incisive. This wasn't unpleasant, but it was a slight enhancement that with Rock programmes, gave it the most exciting sound of all three, as Troughlines are not short of bass either.

**CONCLUSION**

The One Thing Audio decoder offers BBC monitoring accuracy with a sound stage that is more expansive than that of almost any tuner available. It isn't the most squeaky-clean sound, but

it has properties that are unique and impressive. Of course you need a decent Troughline to appreciate this, plus the very best aerial you can find, but given these the inexpensive OTA does a great job of maximising this classic tuner's natural stereo sound.



The composite signal from the tuner connects to the single phono socket. Audio is output from the stereo pair.

**MEASURED PERFORMANCE**

The OTA decoder's frequency response is smooth and extended, our analysis shows, measuring 30Hz-12kHz within tight 1dB limits. Above 12kHz there is little roll down though, as there is no mpx filter to remove 19kHz pilot tone. The GT Audio has an mpx filter, which limits its high frequency extension, but also removes supersonic rubbish from the output.

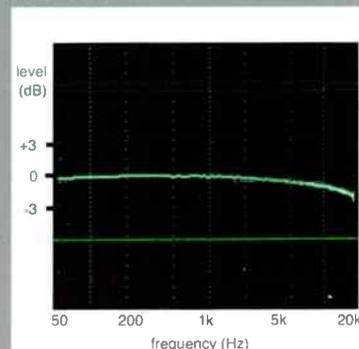
Distortion from the OTA measured 0.8% second harmonic at full modulation, and 0.4% at 50% modulation, the latter figure being most relevant to listening. Distortion figures depend upon tune accuracy and this is always a bit variable on a Troughline, but the above figures are after tuning in using the Magic Eye, not tuning for minimum measured distortion, which can go as low as 0.3% or so. The GT Audio decoder produced less distortion, around half that the OTA.

The OTA managed -55dB hiss at 1mV from the aerial and managed -62dB at 6mV, where the GT Audio managed -55dB and -64dB. The OTA actually got even quieter with more signal, but few aerials will ever deliver much more than a few mVs, so it is academic in practice. Separation was a satisfactory 32dB.

The OTA decoder worked nicely in all areas. Expect a smooth response balance and an open sound, as there's no mpx filtering and associated phase shifts. But there is more unwanted supersonic mush. A lot of signal is needed for low noise, as usual with the Troughline. Distortion is rarely a problem in use as it is second harmonic, but Troughlines must be carefully tuned for best results. NK

Frequency response	30Hz-12kHz
Stereo separation	32dB
Distortion (50% mod.)	0.4%
Hiss (IEC A, 3mV)	-55dB
Signal for minimum hiss	20mV
Output	500mV

**FREQUENCY RESPONSE**



**VERDICT**

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  - revealing ambience

- AGAINST**
- no mpx filtering
  - some opaqueness
  - needs initial adjustment

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# Media Studies

**Hi-fi isn't the only thing that's benefited from the rush of new digital coding technologies of late, because recent developments in television are also really moving the game forward, says Steven Green...**



**T**he last couple of years have seen the introduction of some new technologies and services that will radically alter the quality of broadcasts and the way people access television over the next few years. The quality aspect I'm referring to is of course HDTV, and the good news is that HDTV really does deliver a much better picture quality than on the standard-definition TV (SDTV) fare we see today.

Such higher definition is the result of using almost four times as many pixels (short for 'picture elements') to make up an HDTV picture as an SDTV picture, which translates into the resolution being almost four times higher than with SDTV. This means that much finer detail can be revealed, so the picture looks much sharper and more vivid than on SDTV.

However, in order to see the improvement in quality it is necessary

of 'HD ready' TVs in the shops can only natively display 720 or 768 picture lines whereas the HDTV picture format we're using in the UK uses 1,080 picture lines, so if you want to take full advantage of the higher definition you really need a TV that can natively display all 1,080 lines.

## GOING HI DEF

The only way to watch a range of HDTV channels at present is if you're a Sky customer, and to get the service you have to pay £299 for the Sky HD box, £60 for installation and an additional £10 per month on top of your Sky subscription. For this you can watch HD versions of Sky Movies, Sky Sports, Sky Arts, National Geographic, the History Channel, Discovery, Sky Box Office and the BBC HD channel.

The Sky HD box supplied is actually a PVR (personal video recorder) rather than a standard set-

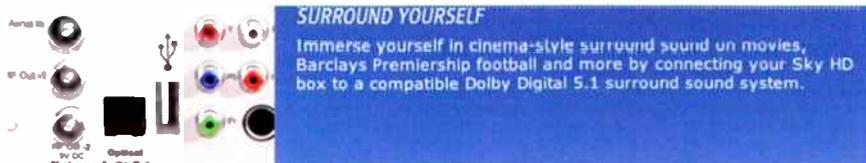
with a single press of a button via an electronic programme guide (EPG); live TV can be paused or rewound; and they allow you to fast-forward through the adverts in recorded programmes.

Despite the significant costs involved, the Sky HD service attracted 244,000 subscribers in its first ten months since being launched in May 2006, making it Sky's fastest-selling "additional TV product" ever.

The only HDTV channel available on Virgin Media (the new cable operator) at the present time is the BBC HD channel, which is available to subscribers of the V+ service. The V+ service costs either £10 or £15 per month (depending on which pay-TV package you have), for which subscribers are provided with an HD-enabled PVR. ITV, Channel 4 and Five are at least gearing up for HDTV, though, as they all took part in an HD over Freeview trial in London recently, so maybe the BBC HD channel won't be the only HD channel on Virgin Media for much longer..

The Beeb's HD channel is also freely available on satellite to anyone with a suitable receiver, and one such example is the Humax HDCI-2000, which costs around £200 (Richer Sounds), and it supports the MPEG-4 H.264 video codec, Dolby Digital 5.1 surround sound and DVB-S2 satellite transmission formats necessary for HDTV broadcasts on satellite.

The BBC HD channel will be made available to a wider audience



**High Definition TV usually comes with surround sound**

to watch it on an 'HD ready' TV, which signifies that the TV meets the minimum requirements necessary to display an HDTV picture. Bear in mind, though, that the vast majority

top box. PVRs contain a hard disk to record programmes onto, but they're far more than just a replacement for a video recorder, as they allow programmes to be set up to record

next year though, when the new Freesat system is launched. As its name suggests, Freesat is a satellite version of Freeview, so it will only require a one-off payment to get it, and it has already been announced that Freesat receivers will support HDTV as standard and PVRs will be available.

Just to confuse matters, Sky already has its own free satellite package called 'Freesat from Sky' (which costs £150 for the equipment and installation), but the problem with this is that users are forced to use Sky's equipment, which means that if they want to watch the BBC HD channel or use a PVR they're forced to pay Sky £10 per month for the privilege! There is a question mark hanging over Freesat at present, however, which is that Channel 4 and Five are encrypted by Sky, which means that although they are free to watch they can only be viewed on a Sky digibox. However, Channel 4 recently said that it would like its channel to be freely available on Freesat when it launches, so this issue might be resolved by the time Freesat launches.

Altogether there are 206 TV channels available on 'Freesat from Sky', and all of these channels will be available on Freesat apart from a handful of channels that are encrypted by Sky. There are also 98 digital radio stations freely available on satellite, and many of these stations use higher bit rate levels than on DAB so the audio quality is better.

The reason why there are so many channels available is that transmitting a TV channel on satellite costs a tenth as much as it does on terrestrial TV (£700,000 for a standard definition TV channel on satellite compared to £7m on Freeview, according to the BBC) and there is an abundance of bandwidth available. For these reasons, it is

likely that we will see a significantly wider choice of free HD channels available on Freesat than we'll see on Freeview in years to come...

### NET TV

All well and good, but the cheapest way to distribute (and receive) television is of course via the Internet, costing just £70,000 – or 1% of the cost of transmitting on Freeview – and Internet bandwidth will continue to get cheaper over

time as broadband speeds increase. The reason these costs are so low is due to the use of a highly efficient Internet distribution technology called 'multicasting', which only requires a broadcaster to send one stream of each TV channel to each Internet Service Provider (ISP) instead of having to send one stream to each user – where there could potentially be tens or hundreds of thousands of users – which is how Internet streams are distributed at present using the inefficient 'unicasting' method.

The BBC, ITV and some of the commercial radio broadcasters have been trialling multicast over the last year, and the BBC iPlayer, which is due to launch later in the summer or early autumn, will include live multicast streams of all of the BBC's TV channels and radio stations.

Unfortunately it is looking likely that only the relatively low quality streams of the TV channels will be available when the iPlayer is first launched, but once it is fully up and running there should be streams of the BBC TV channels with a similar level of picture quality to that available on Freeview, satellite and cable. The number of ISPs that support multicasting remains

relatively limited at present, although this number should rise once the iPlayer has been launched, and it is encouraging to see that Virgin Media is currently testing it – including testing HD over multicast as part of its 50Mbps broadband technical trial in Ashford, Kent.

The BBC has also successfully tested sending HDTV over multicast, but we will probably have to wait a couple of years before we see the BBC HD channel being delivered

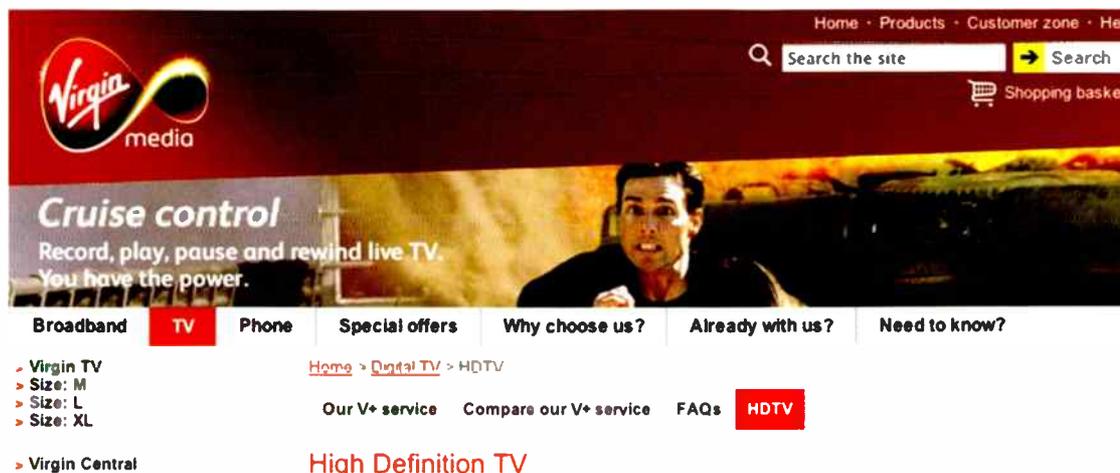
"compared to what it is now, television will be unrecognisable in five years' time ..."

over the Internet, and we will only begin to see the true potential of multicast in about two to three years' time, once most people have "up to 24 meg" ADSL2+ broadband connections.

However, watching live TV – so-called 'linear' viewing – is expected to decline in popularity over the coming years as more people choose to watch 'video-on-demand' (VoD – or just 'on-demand') instead. On-demand is part of a general move towards freeing the viewer from the constraints of the TV schedule, which is a trend that was arguably started by the success of the PVR, where owners began to 'timeshift' most of the programmes they watch rather than watching them live.

As with PVRs, 'true VoD' allows the viewer to control playback as if they were watching a DVD, but rather than being limited to watching programmes they've previously recorded, viewers can choose what to watch from a large library of video content.

The most successful on-demand service in the UK so far is Virgin TV On Demand on cable, which is a true VoD service. This service offers a large library of films, music videos and popular TV series, as well as



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Digital TV

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High definition

## What is HD TV?



**HD or HD TV** stands for **high-definition television**, and it's a new development in digital TV.

HD gives very clear, crisp pictures with vivid colours and much more detail than ordinary standard-definition TV. Some programmes are made with cinema-style "surround sound". HD broadcasts are particularly suited to the larger flat TV screens (LCD and plasma).

### MORE INFORMATION

- Public Value Test for HD trial
- BBC HD
- Sky HD
- Virgin Media HD
- HD Ready – to check which TV sets are HD ready
- HD TV frequently asked questions

The BBC is not responsible for the content of external internet sites

offering a '7-day catch-up' service, which consists of the pick of the previous week's TV in case people missed it when it was first broadcast. BT Vision is another service that offers true VoD, and it provides users (who must be BT Total Broadband customers) with a Freeview PVR for people to watch ordinary TV channels, but the receiver can also connect to the Internet, which allows users to view on-demand material from the content library or the catch-up TV service. Another service provider using the Internet to deliver TV and true VoD is Tiscali TV, which bought the Homechoice pay-TV company last year.

It isn't economically or practically feasible to provide 'broadcast quality' true VoD over wireless broadcasting systems, so Sky is unable to provide it via satellite. Instead, it has launched its Sky Anytime service, which consists of 'Anytime TV' and 'Anytime on PC'. 'Anytime TV' is what's called a 'Push-VoD' service, which means that Sky selects the pick of the previous week's TV and automatically 'pushes' it onto the hard disks of users' PVRs; so this is effectively the same as providing a limited 7-day catch-up service. In contrast to the on-demand services described above which allow users to begin watching programmes immediately, 'Anytime on PC' requires users to download programmes to their computers before watching them.

'Anytime on PC' uses a peer-to-peer (P2P) network where users download small chunks of the TV programme files from other users' computers rather than everyone having to download the whole files directly from Sky's website, which vastly reduces the amount of bandwidth Sky requires to provide the service.

Other new and forthcoming on-demand services that use peer-to-peer networks to allow users to download programmes include Channel 4's new 4oD service; the BBC iPlayer; a new service called Joost; and ITV's on-demand service that is due to launch within the next few weeks.

All 'terrestrial broadcasters' apart from Five will be offering a broadly similar on-demand service once fully up and running, which will include a catch-up TV service, as well as offering archive TV programmes. Five, on the other hand, only offers episodes of its US import series for download.

The main difference between these services is the price: BBC and ITV programmes will be free to watch, whereas Channel 4 offers some free content but you have to 'rent' the rest, and Five charges for everything. ITV is also planning to launch live streams for all of its TV channels when it launches its catch-up TV service, and Channel 4 has been streaming since before Christmas – although the Channel 4 live stream is a prime example for why multicasting needs to replace unicast for live streams, because the quality is very poor.

My initial experience of using the 4oD and Joost applications was that they're a bit buggy at the moment, but it is very early days for these on-demand Internet applications, and some teething troubles were always to be expected. The picture quality of the material I've seen so far has been nothing to write home about either,

### STANDARD vs HI DEF

The picture format used for SDTV uses 576 horizontal picture lines, with each picture line consisting of (typically) 720 pixels, or 414,720 pixels making up a full screen. The HDTV format we're using in the UK – called 1080i – increases these values to 1,080 picture lines and 1,440 pixels per line, or 1,555,200 pixels in total. An HDTV picture therefore consists of 3.75-times as many pixels as an SDTV picture, which means that the resolution of HDTV is 3.75-times higher than the resolution of SDTV.

In case you're wondering why 1,440x1,080 is not in the correct 16:9 aspect ratio for widescreen, this is a trick used by the broadcasters to reduce the bit rate by 25%, and HD set-top boxes will scale – i.e. stretch – the picture horizontally so that the dimensions are 1,920x1,080 when displayed (or it will scale to whatever dimensions the TV can handle), which is in the correct 16:9 aspect ratio for widescreen.

but I'd expect this to improve over time as well.

One big advantage of downloading video content is that it removes the real-time element, so it is a much simpler proposition to deliver HD content on-demand than it is to provide a high bandwidth live HDTV stream. Therefore, as more programmes are made in HD – the BBC has committed to produce all of its content in HD by 2010, for example – we will hopefully see plenty of HD content available on these on-demand applications in the next few years.

Amusingly, Bill Gates said earlier this year that TV will be dead in five years which, in my opinion, is akin to arguing that we'll all have replaced our cars with jetpacks by then. But one thing's for sure – compared to what it is now, TV will be unrecognisable in five years' time.

# Power Playing

The beauty of Naim separates is their very well delineated, effective upgrade path. With this in mind, Channa Vithana tries three different ways of hearing the CDX2 CD player...



**N**aim Audio is probably unique in the hi-fi world for its upgrade path, which, rather than being an afterthought, is an integral part of the whole company's philosophy. For example, you could buy the reasonably-priced yet capable Stageline phono stage and external iSupply (about £315), then replace and upgrade the iSupply via the Flat-Cap2x (£550) or Hi-Cap2 (£985), or even the Super-Cap2 (£3,000) power supplies if desired. As such, this philosophy has engendered tremendous brand loyalty amongst Naim customers, and ensures the products are rarely, if ever, obsolete.

With their new flagship CD555 CD player retailing at over £14,000, Naim extended its upgrade philosophy further by releasing its accompanying PS555 separately for use with the CDX2 and CDS3 players (and possibly some older

models; please check with Naim about this). Several years earlier, the company did precisely the same thing when the CDS3 CD player, the company's previous flagship digital disc spinner, was released and its accompanying XPS2 appeared as a standalone product. This very combination was reviewed extremely favourably by editor DP back in June 2003, when he found the CDX2 CD player really came into its own with the XPS2 PSU.

Recently, Naim has moved into interconnects too. The company has traditionally not been terribly concerned with them, arguing that their supplied wires are fine for the job, and saying that they'd tried many other types but not found an outright improvement. Well, in 2006 the £495 Hi-Line arrived, to universal acclaim – the verdict was that it was expensive, yet effective. To wit, this feature looks at how the company's various upgrades (the £495 Hi-Line,

£2,550 XPS2 and £3,995 PS555) can improve the excellent Naim CDX2 CD player.

## THE SOURCE

The £2,995 CDX2 is a justifiably popular seller in Naim's range, being an effective bridge between the company's 'entry level' CD5 model and the high end CDS3 and CD555. It's an elegant design, not least because it features the manually-operated swing-arm disc loader – which I think is one of the very best industrial design solutions yet devised for this operation. It carries within it the decoupled and suspended Phillips CD transport. The CD mechanism is suspended on elastomer springs to provide isolation from external vibration and this also has the added advantage of minimising the effect of mechanism-generated noise on the player's internal electronics. CDs are loaded with a stabilising magnetic puck.

Internally there are two mono Burr Brown DACs and twenty regulated power supplies plus separate power supplies for the servo control board and display. There's also HDCD (High Definition Compatible Digital) function for suitably encoded CDs, which many believe sound superior to the standard versions. At the rear panel are phono and DIN sockets, RS232 and RS5 sockets for home automation or wired remote, a switched IEC power socket and finally a large socket to attach the hefty Burndy-plugged cable from optional XPS2 or PS555 power supplies. When not connected this large socket is fitted with a chunky link plug. With the CDX2 you have the option of using it in DIN or phono mode, or with both active. Naim says for best sound quality, it is better to use just one option and not both – this is easily selected via the remote.

## THE UPGRADES

Starting with the Hi-Line interconnect, and this is a departure for Naim in that it uses a new type of socket connector called the 'Air-Plug'. The Air-Plug is necessary, say Naim, to prevent 'vibrations from one product being transmitted, via the cable, to another product and to stop airborne vibrations being picked up by the cable being transmitted (back) to the products it is connected to'. Internally, it uses a lower metal content to reduce eddy currents and is strategically held in place to the conductor cable without squashing it so that its impedance isn't affected. The flat-formed cable itself is made from twisted pairs of 80 Litz conductors surrounded by PTFE, Kapton and PTFE tape, covered by a semi-conductive shield to reduce static charges. This is then wrapped by two spiral wound copper shields and lapped PTFE tape. Two of these assemblies side by side are then wrapped in layers of PTFE tape and finally a rubber outer covering.

Moving on to the two power supply upgrades, and the £2,995 XPS2 is a very heavy standard sized Naim box housing a huge toroidal transformer (plus smoothing capacitors), with six power regulators which supply six isolated power outputs. The £3,995 PS555 has superior textured anodised aluminium casework and features seven power regulators. The 650VA rated transformer is said to be forty percent larger than the one used within the XPS2 and features five secondary windings. For the CD555 player there are two outputs; for the

"Naim's upgrade path is an integral part of their philosophy..."

analogue and digital sections via the large Burndy-plug connecting sockets at the rear panel. For the CDX2 and CDS3, only one socket (Output 1) is used.

## THE LISTENING

On its own, Naim's CDX2 is a fine performer, utterly class-competitive and with that distinctive Naim sound that majors on timing and dynamics. It is not the world's warmest or most euphonic performer, but is able to unlock the music's essential rhythmic accents like no others at the price. It is a very impressive bit of kit, but the trouble is, when you start upgrading it, you realise how much you were missing by listening to it in standard form...

The £495 Hi-Line interconnect, in place of the standard Naim grey-sleeved version, showed an obvious improvement. This was both impressive, but disappointing too – as it highlighted the fact that Naim electronics have obviously been 'held back' by the stock wire for many years. For example, there was superior phrasing with the interplay of the cello and violin on the 2006 release of the La Serenissima 'L'Amore per Elvira' Vivaldi recording. The music became more effortless by comparison, and the resolution of individual instruments was also superior, with more musical information on offer. Much finer detail retrieval and instrumental decay were also noted beneficiaries of the Hi-Line, and this aspect went hand-in-hand with better instrumental separation. With The Fine Young Cannibals' cover of The Buzzcocks' 'Ever Fallen In Love', the Hi-Line brought more definition to the midrange and bass. Timing was superior in comparison to the standard Naim grey interconnect, too.

Retaining the Hi-Line interconnect and adding an XPS2 power supply reaped further rewards, the sound becoming richer and more atmospheric with better detail retrieval. The music became obviously more refined and the background even quieter than with the addition of the Hi-Line interconnect on its own – there was a cleaner and comparatively less brittle quality to the music. The music on my Vivaldi piece became smoother, yet it took a little away from the animated yet high-resolution music making skills of the CDX2 and the Hi-Line, making it less convincing – if you have heard the transcendent delicacy, resolution and speed of an unamplified small classical combo live, you will know exactly what I mean because there



good: Naim Hi-Line interconnect...

is no need for added smoothness altering the sound.

'Ever Fallen In Love' by the Fine Young Cannibals was musically more cohesive with superior tempos and rhythmic response. Guitars were less brittle and jarring by comparison where they became more intelligible



...better: Naim XPS power supply...



## VERDICT

“ With jazzy female vocal music for example, the Podium Ones are truly eye-opening with the vast image that they lay before you. ”

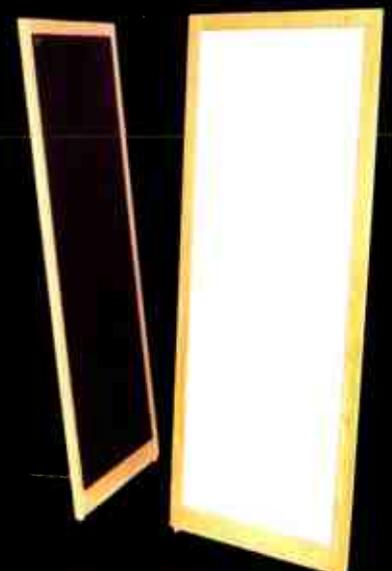
Adam Smith, Hi-Fi World, July 07

“ They're able to eke their way into the most complex of mixes, and 'unwrap' everything so you can hear right into the music. I found myself hearing rhythms in the song's bass sequencing that I hadn't previously come across. ”

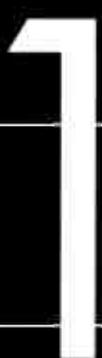
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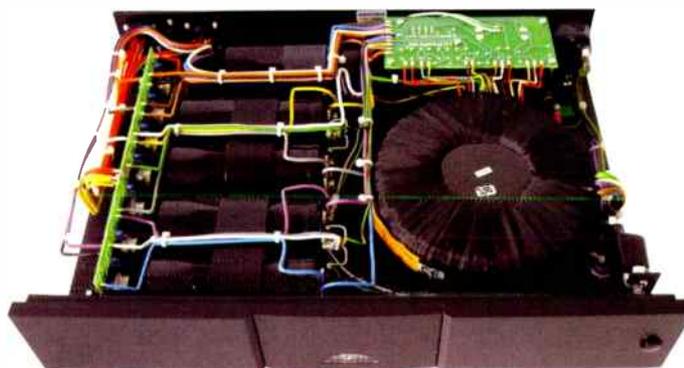
as instruments. Definition to the bass lines was improved, which allowed for deeper low frequencies without any distended looseness. The mix of guitars, vocals and electronic sounds was much clearer and convincing as the instrumental and vocal separation was superior. The powerful bass lines to 'The Big Blue' soundtrack were more defined now and audibly ahead of the addition of just the Hi-Line previously. There was even greater low frequency decay which made the music and resultant atmospheric quality of the soundtrack more enveloping, and the tension created by the tempos and rhythms was not lost with this improvement in bass resolution. With 'Going Back To Cali' by L.L. Cool J, the bass lines were more tuneful than with the already great Hi-Line, and there was a wider more powerful musical structure overall. Like the Vivaldi piece though, I discerned some added and unwanted smoothness overall which substituted some of the free-flowing impact and power of this song.

Moving to the mighty PS555 power supply in place of the XPS2, the music from the Vivaldi piece was finer and more lyrical with the phrasing of the violin where the playing was deftly more expressive and vital – yet, it was also more sophisticated with superior resolution and spatiality to the whole recording. Consequently, instruments in isolation were a particular delight where the timbre was finer and they were life-like in atmosphere. On the Fine Young Cannibals recording there was more bass power with superb propulsion and expression. Thus, rhythms were tauter and enjoyably more together. The music was clearer and wider also, while instrumental

the music was not only deeper, wider and spatially enveloping but also more tantalising. Bass extension was now both tunefully and powerfully superior. Yet it was most intriguing listening to 'Going Back To Cali' by L.L. Cool J with the PS555 installed. The music had higher resolution with the additional benefit of sounding even cleaner. Bass lines were more three dimensional with a fuller and deeper presentation. The

a serious high-end interconnect – without any of the drawbacks like 'nice-sounding' but dislocated musicality. The CDX2 really deserves the Hi-Line as a basic starting point, so I can thoroughly recommend it as the most straightforward first (or indeed last) upgrade.

The power supplies are an altogether pricier option, and made a more fundamental difference to the sound, transforming the



...best: Naim PS555 power supply!

PS555 power supply made music more subtle and delicate, yet more powerful and engaging too – a clever trick!

**CONCLUSION**

This was an interesting experience for me – because as I went through these different upgrade options for the CDX2, I was struck by how each made a tangible improvement, and how this was in direct relation to the relative price differences between the upgrades. First and foremost, the Hi-Line is an outstanding upgrade over the standard Naim DIN interconnect. It transformed the CDX2 making it sound like a new and improved CD player – it really was that good.

CDX2 into a truly 'high end' design, class-competitive with any rival from anywhere in the world – and better, if you like 'the Naim sound'. Personally, I'd recommend that you bite the bullet and go straight for the £3,995 PS555 over the £2,550 XPS2. Alternatively, buying a well looked after second-hand XPS2 would nevertheless be a financially attractive upgrade for owners of compatible older Naim players. Personally though, I found that the XPS2 plus CDX2 was ever-so slightly flawed with the Vivaldi and L.L. Cool J pieces, sounding artificially smoother.

With the PS555 there was resolutely no question mark over any aspect of the sound, however. It was quite spectacular in its ability to excavate fine detail and reproduce brilliant instrumental and vocal textures without falling into the high end trap of sounding 'hi-fi' - its flawless dynamic phrasing made the CDX2 sound sublime. An extremely impressive, well delineated upgrade path then, but as ever a visit to the dealer is recommended to choose the right addition(s) for your Naim CDX2.

"the PS555 power supply made the Naim CDX2 CD player sound sublime..."

and vocal separation, on an already uncluttered production, was notably better without any nasty dislocation of any one aspect (like the guitar or vocals) from the main structure of the piece. Roland Gift's charismatic vocals had more expression and acoustic decay, and he sounded more real in comparison to using the XPS2.

Individual elements on 'The Big Blue' soundtrack had superior resolution. The scale of the music was now huge in scope, and the sound was more powerful. Here, as with the L.L. Cool J and Vivaldi pieces,

Most impressive was how it revealed the inherently wonderful phrasing, tempo and rhythm of the instruments and vocals for all the music used. It brought the usual refinements in resolution and timbral superiority one expects from

**REFERENCE SYSTEM**  
 Naim NAC 252/Super-Cap2 preamplifier  
 Naim NAP 300 power amplifier  
 Spendor S9e loudspeakers

**MUSIC**  
 La Serenissima/Vivaldi, 'L'Amore per Elvira' (2006)  
 Fine Young Cannibals, 'The Raw And The Cooked' (1988)  
 Eric Serra, "'The Big Blue' Music From The Original Motion Picture' (1988)  
 'Less Than Zero, Original Motion Picture Soundtrack' (1987)

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# On The Run

This month, it's the turn of assistant editor Adam Smith to tell all about his hi-fi history...

I suspect that there are not too many hi-fi reviewers out there using much less than modern, 'state-of-the-art' equipment, and I would wager that I am probably in a unique position in that my main system consists of a 45 year old turntable, through 25 year old amplifiers and into 30 year old loudspeakers! As my hobby has been repairing, restoring and collecting hi-fi equipment since my teenage years, to run you through the full complement of equipment I have used since then would fill the entire magazine, so I shall attempt to restrict myself to the 'highlights'.

In the beginning, when my father bought some shiny new Yamaha equipment, I inherited his Hitachi turntable, Eagle International amplifier, tuner and loudspeakers, and Technics cassette deck. My school friends were suitably impressed, mainly because the 'speakers were quite large, and this system did me sterling service for a couple of years until the first upgrade came along - I haven't stopped since...

This first change was my uncle's Garrard 301/SME 3009S2/Shure M75ED, and the 301 has been my absolute pride and joy ever since. The next big change came when I spotted an unwanted pair of big, ugly loudspeakers at an audio fair. These were Ferrograph S1s - hefty three ways with a quarter-wave loaded KEF B139 bass driver, Goodmans midranges and tweeters. They were in poor condition, but complete with their matching stands and carrying a price tag of £55. Needing some behemoths for upcoming party duties I grabbed them, complete with non-working tweeter in one, and a truly evil replacement Soundlab unit in the other. I was surprised to hear that they were really rather good so I stripped them down, repainted and rewired them, and fitted new Audax tweeters - they never went to any parties!

Shortly afterwards, I married my girlfriend and moved into her one-bedroom house. She accepted

my hi-fi rack with good grace but not the Ferrographs, so into storage they went. A pair of Mission M71s impressed me at a show, but at 'terraced house' listening levels I found them rather lifeless and so they stayed just two weeks. Luckily this coincided with an old stock clearout at Goodmans Loudspeakers, where I worked, and I snapped up a pair of GLL Imagio IC258TLs - floorstanders with two bass drivers in a transmission line in addition to GLL's proprietary ICT driver. They had fabulous bass and superb midrange and imaging, thanks to the ICT, however those two additional bass drivers tended to overpower the ICT's treble unit and they did sound rather dull.

At this time I stumbled across a set of Quantum Electronics amplifiers, namely a 102 preamp and two 202 power amps for £60 and they helped to open up the GLLs, but their treble was still hardly crisp or detailed they were replaced by a pair of Monitor Audio Silver 5is.

We finally moved to a bigger house in 2005 and I was granted a listening room. The Ferrographs duly came out of storage, and now reside atop a pair of dedicated stands. The Quantum 202 power amp's 45 watts struggled to drive the 82dB S1s effectively but finding a top of the range 207 model with 80 watts per channel has perked things up nicely.

I still use my Garrard 301, now in a custom-made, lead-lined plinth with an Audio Technica AT1130 arm and a temporary AT110E cartridge whilst I ponder which new moving coil cartridge to buy to replace my recently deceased Ortofon MC10 Supreme. Other sources are a Marantz CD94 CD player and a Bang & Olufsen Beocord 5000 cassette deck for the few dozen radio comedy cassettes I have. These play through the Quantum Electronics 102/207 into the Ferrographs.

As to the future, I have the Marantz's matching CDA94 DAC upgrade awaiting repair, a Cardas-rewired Alphason HR-100S arm

waiting for a new mounting plate to be made and have also been pondering a new preamplifier. Then there are also the other systems in the lounge and dining room to consider...

My strange collection of 'old bangers' make a noise that I thoroughly enjoy, and I often tend to lose hours when I just intend to 'quickly play something' - always a good sign.



# Green Machines

**Adam Smith helps prevent global warming by listening to Flying Mole's eco-friendly DAD-M310 monoblock power amplifiers...**

**B**uzzwords like 'carbon footprint' and 'global warming' seem to be on everyone's lips right now. Regardless of which theory of the global warming situation that you subscribe to, it makes sense to minimise our energy consumption if at all possible as, regardless of the environment, most of our fuel sources have a finite lifespan.

This was brought home to me as I connected up the Flying Mole DAD-M310 monoblocks into our reference system here at *Hi-Fi World* towers. It was a warm day and, leaning over the top of the Luxman L-550A amplifier that Noel reviewed last month and that we have grown rather fond of, I was aware that the huge draughts of heat that it produces turned me into a sweating wreck in a short space of time. The problem is that the Luxman is a Class A device with an efficiency of around 30%. Good for sound quality, maybe, but bad for the environment!

One distinct advantage of digital amplification is that it is far more efficient than conventional Class A, AB or B types and this, together with the improvements in the designs of such units over recent years should now mean that we eco-aware audiophiles can enjoy our high quality sound whilst maintaining our environmentally friendly credentials.

The Flying Mole corporation are rightly proud of the eco credentials that come as part of their digital designs, of which the DAD-M310 monoblocks are their reference product for audiophile use. Quoting their efficiency as 85% at full output and 60% at normal listening level shows just how much energy can be saved by changing over to these little

units.

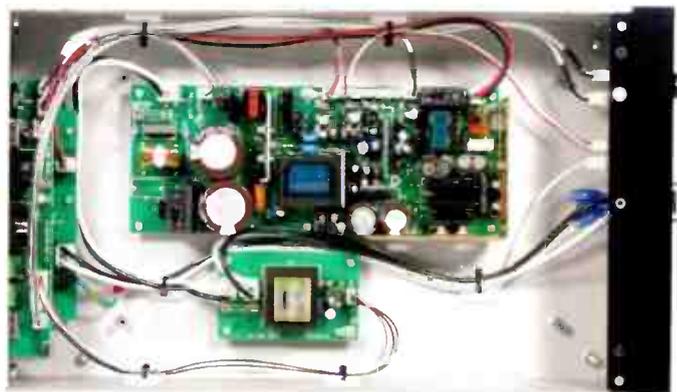
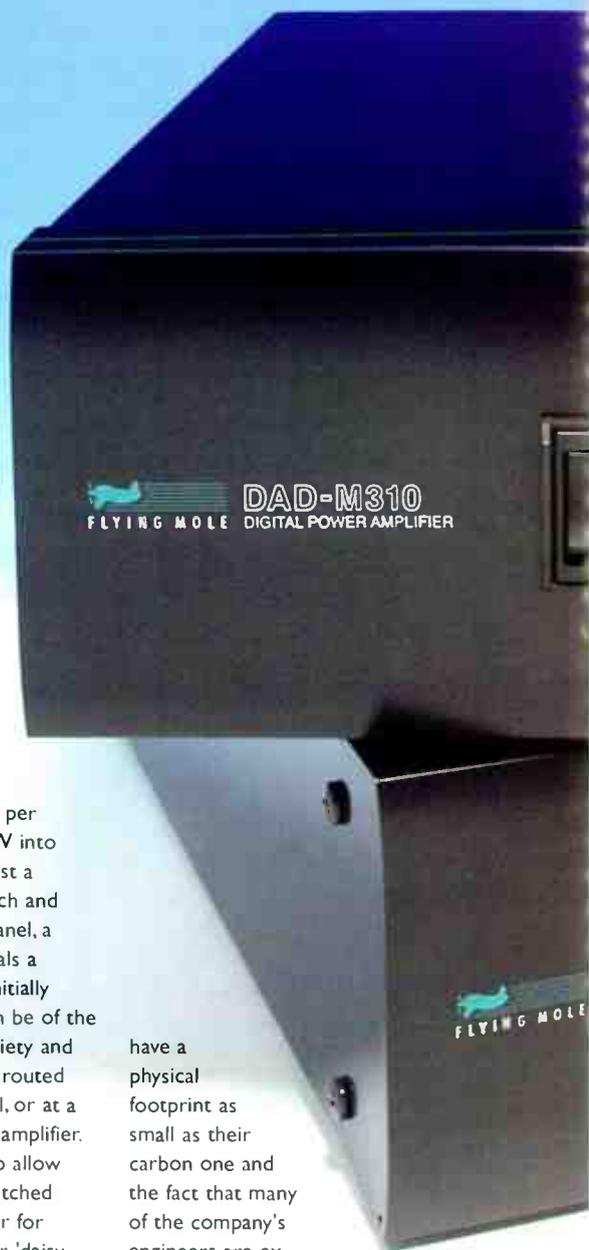
Very well specified, the DAD-M310s are quoted as delivering 180W per unit into 8 Ohms and 300W into 4 Ohms. Although having just a volume control, on/off switch and status LEDs on the front panel, a poke around the back reveals a little more than might be initially suspected. Firstly, inputs can be of the balanced or unbalanced variety and the unbalanced one can be routed through the volume control, or at a fixed level straight into the amplifier. Also provided is an input to allow the unit to be remotely switched on and off (by a preamplifier for example) as well as a similar 'daisy chain' type output so that one amplifier can switch the other one as well.

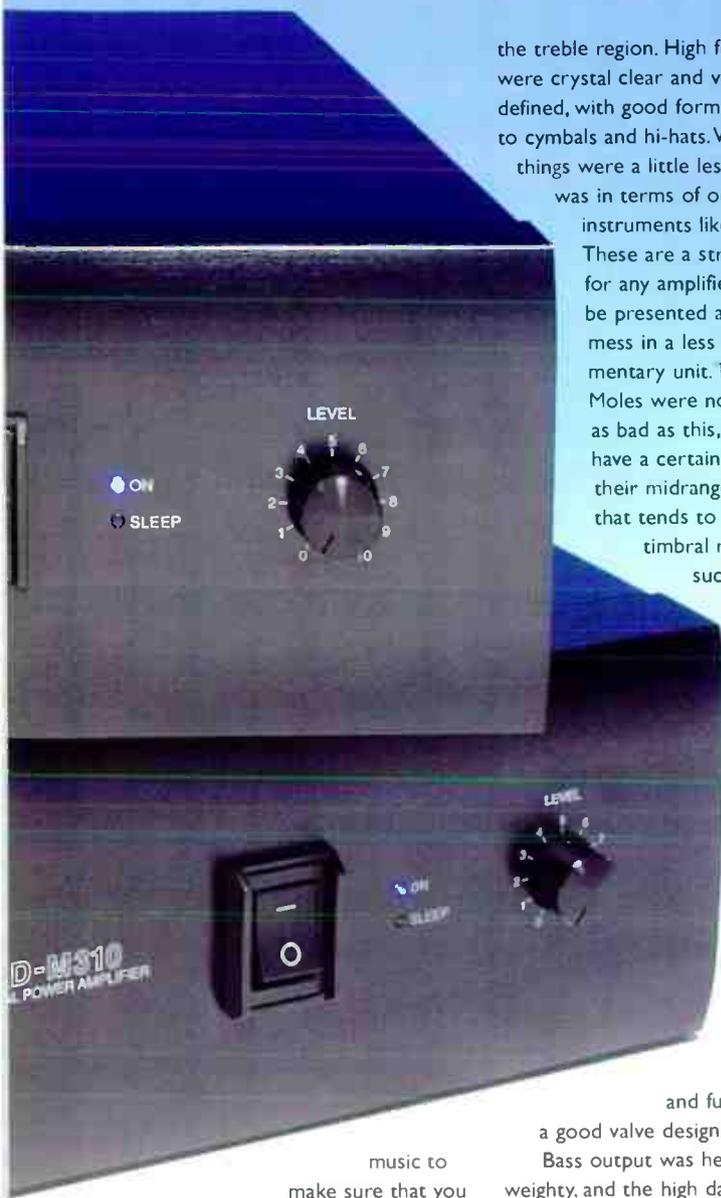
I was also relieved to see that Flying Mole have fitted 'proper' loudspeaker terminals to the DAD-M310s, rather than the stylish and sturdy, but rather awkward types fitted to the CA-S3 amplifier that we reviewed back in our January 2007 issue. Measuring a compact 214x91x405mm (HxWxD) and weighing 4kg each, the DAD-M310s

have a physical footprint as small as their carbon one and the fact that many of the company's engineers are ex-Yamaha employees is quite obvious from the neat, but familiar curve of the fascia on the units.

## SOUND QUALITY

It seems that the bad old days of hard and unpleasant digital amplifiers has now, mercifully passed, and the Flying Moles sound well balanced and detailed from the moment you start listening. Where they really shine is in picking out the minutiae within





the treble region. High frequencies were crystal clear and very well defined, with good form and body to cymbals and hi-hats. Where things were a little less successful was in terms of orchestral instruments like violins. These are a strenuous test for any amplifier and can be presented as a screechy mess in a less than complimentary unit. The Flying Moles were nowhere near as bad as this, but they still have a certain hardness to their midrange and treble that tends to lessen the

timbral richness of such instruments.

This was helped out by using the balanced inputs [see boxout], but I feel that they still fall a little short of most conventional, analogue amplifiers in this respect,

and further short of a good valve design.

Bass output was healthy and weighty, and the high damping factor of the DAD-M310s [see MEASURED PERFORMANCE] gripped our Spendor S8es firmly by the scruff of the neck to tighten their low end up superbly. As a result of this, bass lines were prodigiously fast and tight, adding an almost explosive power to punchy material. A minor failing was in terms of upper bass detail which could tend to wash over the intricacies of bass guitars, for example, and make their upper registers sound a little bland.

The DAD-M310s were able to dig into the heart of music well, but I felt they were on the side of sounding highly defined at the expense, perhaps, of being a little sterile. Whilst creating a

**THE RIVALS**  
A natural competitor to the Flying Moles are the Channel Islands Audio D100s reviewed by DP last month. Switching to these kept the detail of the Flying Moles but added the air and space to instruments that were absent. They also added the missing extremities to the soundstage that I found to be missing. Although less versatile in terms of connections and facilities, the D100s would appear to be worth their £500 or so premium that they command over the DAD-M310s, in purely sound terms.

stable soundstage between and behind the speakers, I also found the image moved little beyond them, constraining the soundstage somewhat, especially when compared to the Channel Islands Audio D100s, although the latter are £500 more expensive. The Flying Moles trade that last little spark of emotion and musical flow for precision and impact.

**CONCLUSION**

The Flying Mole DAD-M310 monoblocks have some great strengths, in particular the way in which they gather detail and sort through jumbled source material to extract its finer points. This sort of presentation will appeal to those who prize a clean, concise sound. Fast, tight bass is another feature many crave, especially to control wayward, under-damped loudspeakers. If this sound is to your liking, then the DAD-M310s represent good value and offer some useful facilities wrapped up in an efficient package.

**VERDICT** ●●●●●  
Compact and efficient monoblocks with a clean and clear sound, that dig out bags of detail from music

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- FOR**
- bass weight and control
  - tight and detailed sound
  - efficient design
  - connectivity
- AGAINST**
- curtailed soundstage
  - lack emotion

music to make sure that you are hearing everything that you should be. Instruments were strong and clear, and the DAD-M310s had a pleasing ability to unravel complicated recordings. The track 'Summertime' from The Sundays' 'Static and Silence' album is a densely recorded affair that can fall out of the loudspeakers in a tangled mess if the amplifier it plays through is unable to sort it out, but the Flying Moles dissected it with almost surgical precision.

In the middle and top of the spectrum, the Flying Mole's midrange flowed melliflously into

**DIFFERENT CONNECTIONS**  
Trying all the different connection methods offered by the DAD-M310s showed that the fixed, unbalanced inputs offered an improved sense of space and solidity over the variable input and this is how most listening was carried out. A listen to the balanced inputs added a dose of smoothness to the sound, helping to alleviate the slight steeliness noted during listening. However, the soundstage did lose some focus in this mode, so the unbalanced, fixed inputs still get my vote.

**MEASURED PERFORMANCE**

Unlike most Class D amplifiers, this monoblock had no d.c. on the loudspeaker outputs. It produced plenty of power though, as expected, delivering 180 watts into 8 Ohms and 239 watts into 4 Ohms. Together with an extremely high damping factor of 317 this amplifier is likely to have plenty of low frequency punch and good bass control over a wide range of loudspeakers.

Frequency response varied with load, reaching 52kHz with 8 Ohms, but just 14kHz (-12dB) into 4 Ohms, so tonal balance will vary according to the loudspeaker used, low impedance loudspeakers having a distinctly warmer balance. There was a lot of supersonic noise and this interfered with high frequency distortion measurement at low levels (1W), a standard test we carry out. You can see this in our analysis that shows harmonics disappearing into noise. SACD does something like this though, so it isn't unacceptable subjectively. However, high frequency distortion was a little higher than is common nowadays at around 0.3% and this is

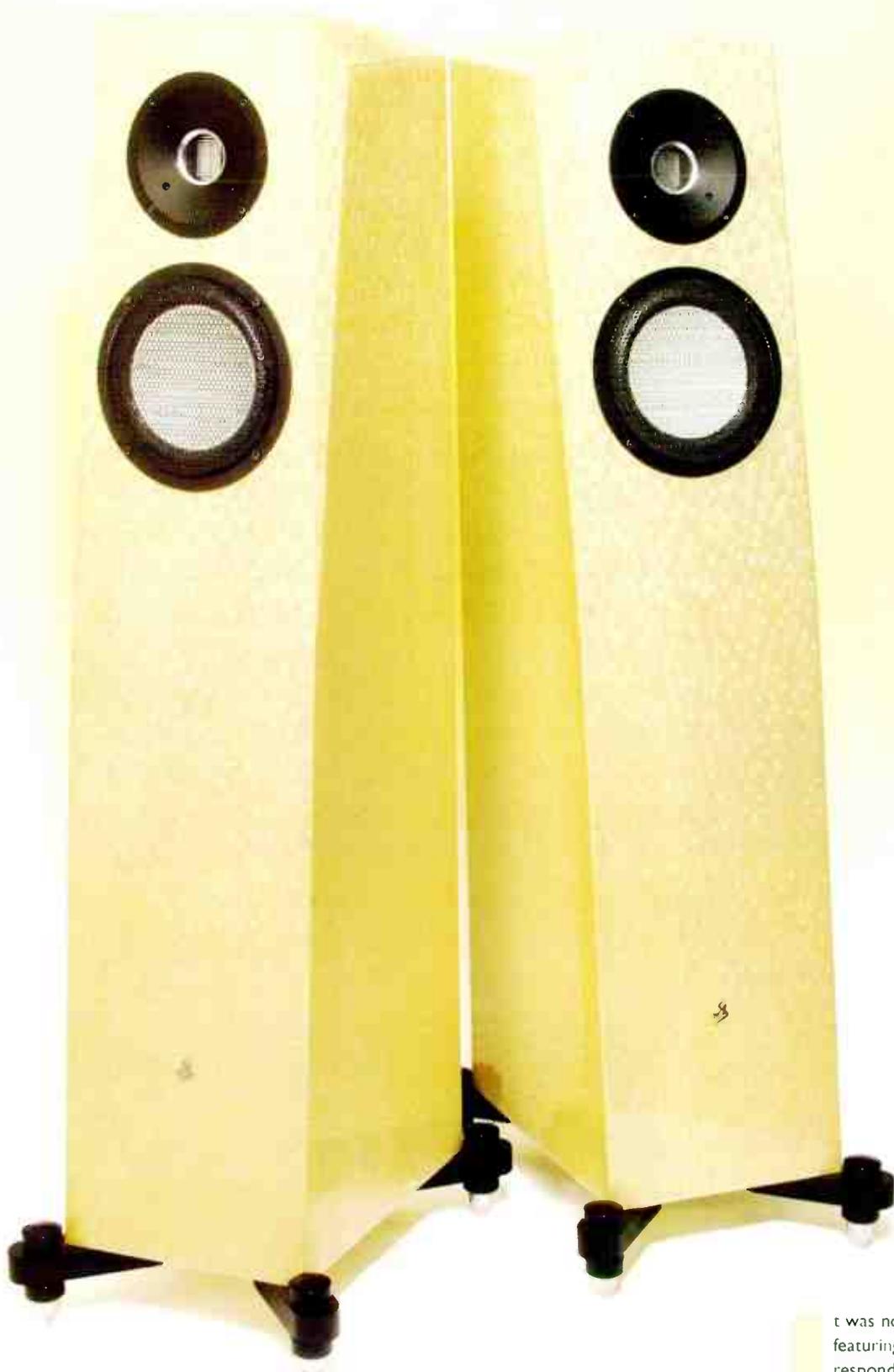
likely to add some of the incision to transient Class D amps are known for.

The DAD-M310 has plentiful power and excellent loudspeaker control. It produces a little more high frequency distortion than the best. I would expect a fast, tight sound from this one. NK

Power	180watts
Frequency response	2Hz-14kHz
Noise	-93dB
Distortion	0.1%
Sensitivity	2V
d.c. offset	1mV
Damping Factor	317

**DISTORTION**

CH1	RMS via FFT	Input RMS	Frequency
CH2	8.294 dBV	2.5984 V	10.0111 kHz
	OFF	OFF	OFF



# JAS Funk

**JAS Audio's Orior Grand loudspeakers boast impressive 'high tech' drive units all right, but can they boogie together? Adam Smith listens in...**

It was not so long ago that any loudspeaker featuring exotic drive units carried a correspondingly high price tag. Bass/midrange drivers that used rare materials or a ribbon tweeter generally tended to be upmarket - meaning expensive. This is gradually changing as Far-Eastern manufacturers bring in their technologies, together with lower costs - a win-win situation.

JAS Audio was founded in Hong Kong in 2002 with precisely the aim of providing quality products at reasonable prices. Our very own Channa Vithana was suitably impressed by the smaller Orsas, fitted with a ribbon tweeter, in his system feature back in our May 2006 issue. However, moving upwards in the range to the Orior and their floorstanding brethren, the Orior Grand, adds further temptation into the mix, in

the form of an Accuton ceramic bass driver.

It seems that more and more manufacturers are making use of these superb German-designed drive units, from Germany's Isophon to Sweden's Marten Design, so JAS Audio are in good company! Accuton state that the membranes of these drivers offer an unsurpassed stiffness to weight ratio, resulting in the "cone rigidity and hardness which is needed for speed and accurate impulse response".

In the Orior Grands, a seven inch (180mm) version of the driver is utilised, and mated to JAS Audio's twin aluminium ribbon tweeter, all wrapped up in very nicely finished cabinet. Ours were Birds Eye Maple, but other finishes are available, including Plain Maple and Italian Black Ash. Measuring 1050x300x430mm (HxWxD) and weighing 28kg each, the Orior Grands are heavy and well finished but not imposing.

The crossover only allows single-wiring, through some superbly sturdy terminals. Unusually, it possesses two settings - "Reference" and "Dynamic", selected via a keyswitch, no less! The Dynamic setting apparently makes a few subtle changes in the midrange region to make things more...well...dynamic. Sadly, our review samples came without keys so I was unable to explore the differences; luckily both were set to the same (Reference) setting, as my lock-picking skills are a little rusty...

**SOUND QUALITY**

I was hoping for good things from the Orior Grands, given the ingredients they have to work with, and initial impressions were very favourable. They are an impressively large-sounding loudspeaker and have a commendable ability to generate sizeable and stable stereo images with all kinds of music. Orchestras positively filled the room and even more middling studio recordings positioned rock bands firmly around me, making it easy to discern when the main 'action' shifted from one player to another. The Orior Grands have impressive bass output as well, imparting real weight and solidity to the low end of suitable recordings.

The ribbon tweeter used by the Orior Grands really is something of a gem. It is prodigiously detailed and sweet, pulling every last ounce of ambience from every track and making sure subtleties are well slotted into the performance, and not overlooked. The gently rising response adds fulsome detail, imparts a gloriously metallic shimmer to percussion and makes the leading

edges of drum strikes and guitar strikes absolutely solid..

The rise in output around 800Hz confers excellent body and depth to vocals, pulling singers right out of the background. The emotion in Nick Drake's voice as he sang 'Northern Sky' was palpable, making the hairs on the back of my neck stand up even more than they usually do when I play this fabulous track. Some vocalists did however have some previously-unheard hardness in their performance, which I suspect is due to the 1.5kHz and 2.5kHz peaks in output at the top end of the bass driver's frequency range. JAS Audio have generally done well to mate the tweeter to the bass driver with no major nasties, as ribbon tweeters rarely work much below 3kHz and the Accuton bass driver used is specified up to 4kHz. This is quite a small region to allow for successful overlap, but measurement [see MEASURED PERFORMANCE] shows that the region in which the two units mate shows no big 'holes'. I suspect that the two peaks mentioned are the beginnings of driver breakup, which would be masked if JAS used a lower crossover frequency; however this is not possible with the ribbon tweeter.

So, the JAS loudspeakers have made a superb case for themselves so far, however there is something of a 'but' coming. As I mentioned, the bass from the loudspeakers is very deep, and they offer real left and impact without ever becoming boomy. Where they did fall down, however, was in their low frequency timing.

On the Unplugged version of 'Hey, Hey' by Eric Clapton, the guitar maestro taps his foot along with the song and this generates two distinct events - the actual tap that you can hear, and the bass note that results from the hollow floor. With the Orior Grands, the bass note lagged very slightly behind the main 'tap' which is not uncommon with poorly designed or inappropriately sited subwoofers, for example. Whilst the slot port used by the Orior Grands usually gives clean output, I suspect that it is not quite tuned to the driver and cabinet as well as it should be.

My other concern here was that lower

bass was not as detailed as it could have been - a result of the 100Hz 'suckout' shown in the measurement. The Orior Grands romped along happily at low frequencies, but without great insight. Consequently bass lines were solid and well paced but sometimes the real intricacies of stringed bass instruments were a little lost.

**CONCLUSION**

Generally, speaking, the JAS Audio Orior Grands are very accomplished loudspeakers, with an impressively broad soundstage, great solidity and bass power and the delightfully incisive and luscious treble that comes from a good ribbon tweeter, all wrapped up in a sturdy and attractive package.

Their weaknesses in bass detailing and timing are mild: they remain enjoyable to listen to and merit serious consideration even at the £3,000 price point. That said, however, these minor problems are surmountable and should not be too difficult to overcome if what is already a very good loudspeaker is to become an exceptional one, better able to justify its price.



**VERDICT** ●●●●●

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  - capacious soundstage
  - fine bass weight
  - build quality
- AGAINST**
- bass timing
  - low frequency detail
  - occasional midrange hardness

**MEASURED PERFORMANCE**

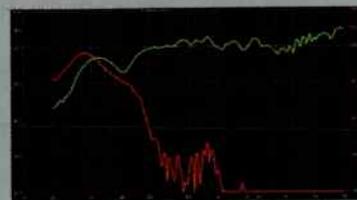
The Orior Grands have an even response across the upper midrange and treble, with only a small dip at 4-5kHz, that will aid smoothness. There is a gentle rise in output towards 20kHz that will add detail. Ribbon tweeters usually measure flat, but the subtle rise seen here will help to overcome limited vertical dispersion. The Orior Grands should sound sweet and even as a result.

Bass output is good, although we did measure a cancellation dip at around 100Hz, most likely due to interference reflections from the floor-firing port. This will lessen detail and give 'divorced' bass. Other than this, the Orior Grands measure well, the port carrying output to below 40Hz, so they should have fine weight to their sound. Output from the slot port was clean at higher frequencies - a good result.

The impedance curve is unusually flat, thanks to a combination of ribbon tweeter and a well damped bass. Average measured impedance was 8.3 Ohms, dipping to a minimum of around

6 Ohms, so the Orior Grands are an easy load, but will require 60 Watts or so to overcome their low 84dB measured sensitivity. AS

**FREQUENCY RESPONSE**



Green - driver output  
Red - port output

**IMPEDANCE**



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**R**evolver's elegant AVFs are surely the best small-footprint floorstanding loudspeakers around, and here's your chance to win them! This is what Adam

Smith said in the June 2007 issue:

"Incredible as it may seem, Revolver's AVFs come in a box that looks more suitable for one floorstanding loudspeaker, thanks to their miniature proportions. A height of 100cm is conventional enough, but width and depth of 10.5cm and 17cm respectively put the AVFs firmly into the 'dinky' category. Fortunately, as would be expected from a respected company like Revolver, a good deal of technology is packed into those compact dimensions. The AVFs are a three-way design, comprising two front mounted 75mm (3in.) midrange drivers, flanking a 25mm (1in.) metal dome tweeter. Tucked away on the side of each cabinet is a 130mm (5in.) woven glass fibre bass driver plus port, and a link that reduces bass output slightly for close to wall placement when removed. The AVFs can be wall mounted using matching wall brackets, available separately, but they are supplied with spiked plinths for conventional floor standing locations.

More than capable of filling a room with sound on their own, they generate a capacious soundstage that belies their lack of cubic inches. Bass has good weight and heft, and the AVFs do not struggle when the pace of things increases - in fact, they bounce along very well, with good timing and rhythm. The

soundstage generated by the little Revolvers is surprisingly wide and stable... performers are well laid out between and beyond the sides of the AVFs. Coupled with lively and precise midrange, this adds excellent emotion and definition to both vocals and instruments. Mixing in to this effect nicely is the treble which, although quite forward, is nevertheless sweet and intricate, with excellent levels of information retrieval. Cymbals in particular had a real impact behind them, and high notes decayed superbly, adding to the sense of space. The Revolver AVFs are well balanced and enjoyable loudspeakers, and they offer a surprisingly grand sense of scale along with good midrange and treble, along with commendable bass weight."

If you'd like the chance to win these stunning speakers, then all you have to do is answer the following four easy questions, and send your entries on a postcard to: **July 2007 Competition**, by 30th June 2007 *Hi-Fi World* magazine, **Unit G4, Argo House, The Park Business Centre, Kilburn Park Road, London NW6 5LF.**

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- ONLY ONE ENTRY PER HOUSEHOLD
- MULTIPLE ENTRIES WILL BE AUTOMATICALLY DISQUALIFIED
- PURCHASE OF THE MAGAZINE IS NOT A PRE-CONDITION OF ENTRY
- NO CORRESPONDENCE WILL BE ENTERED INTO
- THE EDITOR'S DECISION IS FINAL
- NO EMPLOYEES OF AUDIO PUBLISHING LIMITED, OR OF ANY COMPANIES ASSOCIATED WITH THE PRODUCTION OR DISTRIBUTION OF THE PRIZES, MAY ENTER

**QUESTIONS**

[1] What category could they be put into?

- [a] 'dinky'
- [b] 'Corgi'
- [c] 'Matchbox'
- [d] 'Hot Wheels'

[2] What cone material is used in the bass driver?

- [a] glass-fibre
- [b] Kevlar
- [c] carbon fibre
- [d] paper

[3] What belies their lack of cubic inches?

- [a] "a capacious soundstage"
- [b] "a fulsome bass"
- [c] "an airy treble"
- [d] "an expansive midband"

[4] according to AS, they offer a surprisingly...what?

- [a] "grand sense of scale"
- [b] "big bang for the buck"
- [c] "large sound"
- [d] "wide image"

July 2007 Competition  
*Hi-Fi World* Magazine  
 Unit G4 Argo House  
 The Park Business Centre  
 Kilburn Park Rd.  
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**entries will be accepted on a postcard only**

**APRIL 2007 BRILLANCE HI-FI CABLES WINNER:  
 Mr Anthony Light of Penzance, Cornwall**



**A**s you may well have already realised, MIT cables herald from the USA, where bigger is usually better! The price tags are immediately recognisable as being American, a 5m pair of speaker cables costs £5,120 and the 1m interconnects are £809. If the intention of MIT was to intimidate their rivals with their physical presence, then they should succeed with these monsters. The MIT Shotgun MA cable is massive, measuring 22mm diameter, and then there is the termination box. MIT use a technology which they have christened 'Multi Pole'. The theory is that all cables have a limited range in which they work optimally, and by using a network at the speaker end of the cable, this range is dramatically expanded. The network box is large, measuring 70x215x90 mm (HxVxD) and has a pair of terminals, onto which the leadout wires are attached. These wires have screw threads on them allowing a variety of different terminations to be used, but an 11mm socket wrench is needed to fully tighten the terminals and ensure a positive connection is made.

The interconnect, the Shotgun SI, is the top of the range from the Shotgun series (the MA speaker cable is from their top of the range Maximum Articulation series) and also features a termination network. This cable is unusual in the ability to allow you to adjust the cable to optimise its performance at a given input impedance. The range is wide enough (5kOhm to over 100kOhm) to allow these cables to be adjusted for almost any component.

I am fortunate in having a second pair of speaker cables (the Basis PSST) which also cost just over £5,000 for 5m, so a meaningful comparison could be made with these, and my lower cost reference cable, the Atlas Ichor. Likewise I also use Basis PSST interconnects (£1,500 1.5m) and Atlas Elektra (£450/m) interconnects, for direct comparison with the SI.

I started with the speaker cables, and it was immediately apparent that

these are an excellent item.

My reference Martin Logan Vantage and Hyperion HPS-938 speakers were used throughout this review, and in comparison with the Atlas Ichor, the MITs immediately showed greater stage depth with superior delineation of images, giving more space between the layers, whilst stage illumination was superb, with instruments right at the back of the stage offering the same clarity and spacial precision as those at the front. On lateral images, however, I did feel that the Ichor gave me superior imaging outside the speaker, with the MIT sounding just a little too regimented and over-controlled, I felt that information about the venue was being reduced.

The cables' performance across the entire frequency band was uniformly excellent, though I must make special mention about the treble, which was outstanding, being detailed and very well controlled without exaggeration or undue emphasis. The bass was likewise crisp, fast and extended. Given that the MIT is ten times the price of the Ichor, I decided to offer up the Basis PSST cable, and now things became much harder for the MIT. Whilst it is unquestionably excellent, the PSST sounded even cleaner and the soundstage opened up considerably with no loss of focus or spacial precision. The MIT is an excellent cable, but at this elevated price point I did feel it sounded a little spacially constricted, and compared back to back with the PSST it lacked the incredible clarity and musical fluidity of the Basis cable.

Turning to the Shotgun SI interconnects, these are immediately impressive with their incredibly even-handed performance. The impedance adjustment facility does work and the difference is very audible. In my system the medium setting

left me with a reticent high frequency range, the high setting diminished bass weight, but the low setting seemed to give me the ideal sonic balance. When matched to my system this gave a very broad soundstage with excellent illumination front to back, but the focus was still not as good as the Basis PSST or the Elektra. The high frequencies were excellent, with cymbals giving a realistic shimmer and right hand piano notes possessed a tonality which was very convincing without forwardness or hardness. The midrange was very good, with just a hint of extra warmth in the lower end, whilst the bass was extended and powerful, yet seemed to lack the absolute control of the PSST.

Ultimately I found these cables to be very good, but you cannot overlook their cost and, against some admittedly outstanding competition, I felt the interconnect to be more competitive than the speaker cable. The interconnect's pricing slotted between my reference Elektra and PSST and, whilst its performance was appropriate for this price point, I feel it is a little closer to the Elektra than PSST.

The Shotgun MA speaker cable was superb, but at £5,120 it should be. The trouble is the Basis PSST speaker cable was more open with better soundstaging and greater transparency, and is only £300 more, and I still cannot get over the feeling that having those extra components in the filter networks must compromise the absolute transparency of these cables. If you are in the fortunate position to be able to purchase them, I would also listen to the high end Atlas, Black Rhodium and Basis cables, but I am sure the MIT is going to attract a significant following with its even handed performance. The ability to tune the interconnect cable optimally for your system is also sure to find many friends.

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SOUNDBITES

# Interstellar?

**Can Leema's Antila overthrow the established high end CD player order? David Allcock thinks it shines as bright as the constellation with which it shares a name...**



If there is one unwritten rule in the audio industry, it is that no manufacturer makes great products across the board. Some companies do great source components and 'less than great' loudspeakers, with others it's the other way around. As such, there are precious few brands that can produce a serious system from front to back, but – with their first source component in their Constellation series of electronics – British specialist Leema Acoustics intends to swell these narrow ranks by at least one...

Big and heavy, the Antila tips the scales at 10kg in a chassis measuring 440x110x330mm. Leema believe mechanical integrity is just as important in electronics as it is in speakers, so the Antila is housed in a chassis with an 8mm brushed aluminium front panel with cast 10mm side panels, a 2mm rear panel and base plate, whilst the top plate is a 4mm thick aluminium sheet.

Delving under the skin, the Antila is no less impressive. On the left hand side of the chassis is a large 250VA toroidal transformer – which would be impressive in an integrated amplifier, let alone a CD player. The transport is a Philips VAM1202 mechanism mated to an L1210 loader, a combination used in many players as it is one of a handful of dedicated CD playback mechanisms still in production for the audio industry, as many manufacturers have now resorted to using cheaper, more readily available CD-ROM and universal transport mechanisms. Happily, several manufacturers still believe that using a dedicated

transport continues to yield superior sonic results.

The unique aspect of the Antila's design is its DAC stage, which uses ten Crystal Semiconductors surface-mount CS4345C stereo 24bit/192kHz chips controlled by a programmable FPGA, using software designed in house by Leema. This has the aim of dramatically reducing the distortion inherent when using a single or dual DAC configuration. To ensure the hard work done by the DAC stage is not undone in the following analogue stage, high quality Analog Devices OP275G surface mount op-amps are then used before feeding the dual outputs, with both single ended RCA and balanced XLR outputs which are driven simultaneously, allowing quick and easy comparison between the two outputs.

Externally the player has a very simple layout, with the front panel featuring an open/close button to the left, the disc tray centrally mounted over the back lit LCD electro luminescent display, and a vertical array of play/pause, next, previous, fast forward, fast reverse, display and stop to the right. Finally a power on/off button is on the far right, although this is more of a standby switch with the actual power switch on the rear panel, alongside the IEC power inlet.

On the rear panel there are a pair of digital outputs, with both Toslink and S/PDIF catered for, and pairs of both balanced and RCA outputs, both on very high quality connectors. There are also a pair of 3.5mm jacks, which look like iPod headphone outlets, but these are for the unique Leema LIPS system,

the remote protocol which allows Leema components to communicate and remotely control each other. A compact remote control is supplied with basic control functions for not only the player, but also the matching Tucana amplifier, allowing the entire system to be easily driven from a single remote.

The next question was then which output to use, and as is common in my system the balanced output was preferred, though the single ended output was much closer in performance than I usually hear, with balanced having the edge in bass slam and dynamics. It should be noted that both outputs are at a 2.4V level, so ensure you level-match when A/B testing with other players, and unusually the XLR input does not have the usual 3dB increase in volume, again this should be considered when auditioning.

## SOUND QUALITY

Leema products have a reputation for being revealing, but the Antila took this to new heights. This player didn't so much put discs under a microscope as perform a dissection on the recording, yet it still managed to mate this ultra revealing quality with an inherent musicality and energy which is rare in any player, let alone one at this price point. The Antila, whilst highlighting differences in recordings, sought neither to flatter poor recordings nor spotlight flaws in lesser discs to the point where it hindered musical enjoyment.

For example, the soundtrack to 'Oceans 11' has music from multiple sources (locations, studios and historical times), including



"it presses all the right 'hi-fi' buttons, yet is so musical in the way it strings everything together..."

some original recordings where the different studios and recording techniques could be easily discerned. Whilst these differences are easily noticeable on other players, the Antila draws you a large diagram to illustrate the point, showing not only the placement of the musicians on the stage, but also the location of the microphones relative to the musicians – such is the precision the player is capable of.

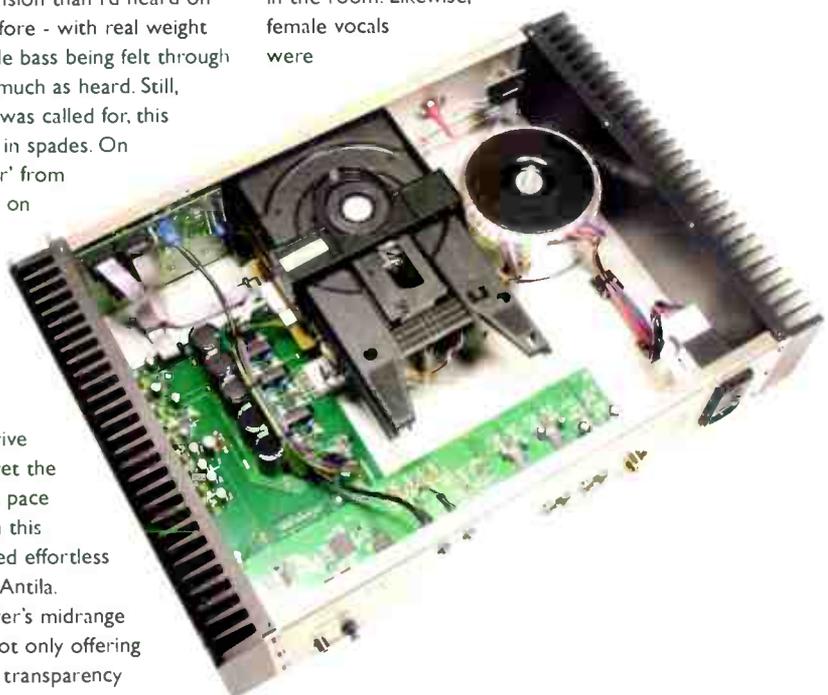
Whilst the soundstage on 'Boobytrapping' could be clearly heard to extend well beyond the outer edges of the speakers, the mixing and production on Madonna's 'Confessions on a Dance Floor' did not record this information, and to its credit the Antila's presentation respected this, with a very well defined and precisely positioned soundstage, with every track constrained by the position of the loudspeakers. By contrast, The Corrs 'In Blue', which locates several instruments far beyond the outer boundaries of the speakers, was portrayed as such, with musicians being located outside the physical boundaries of the listening room. In the depth plane this player was also superb, perfectly happy when called

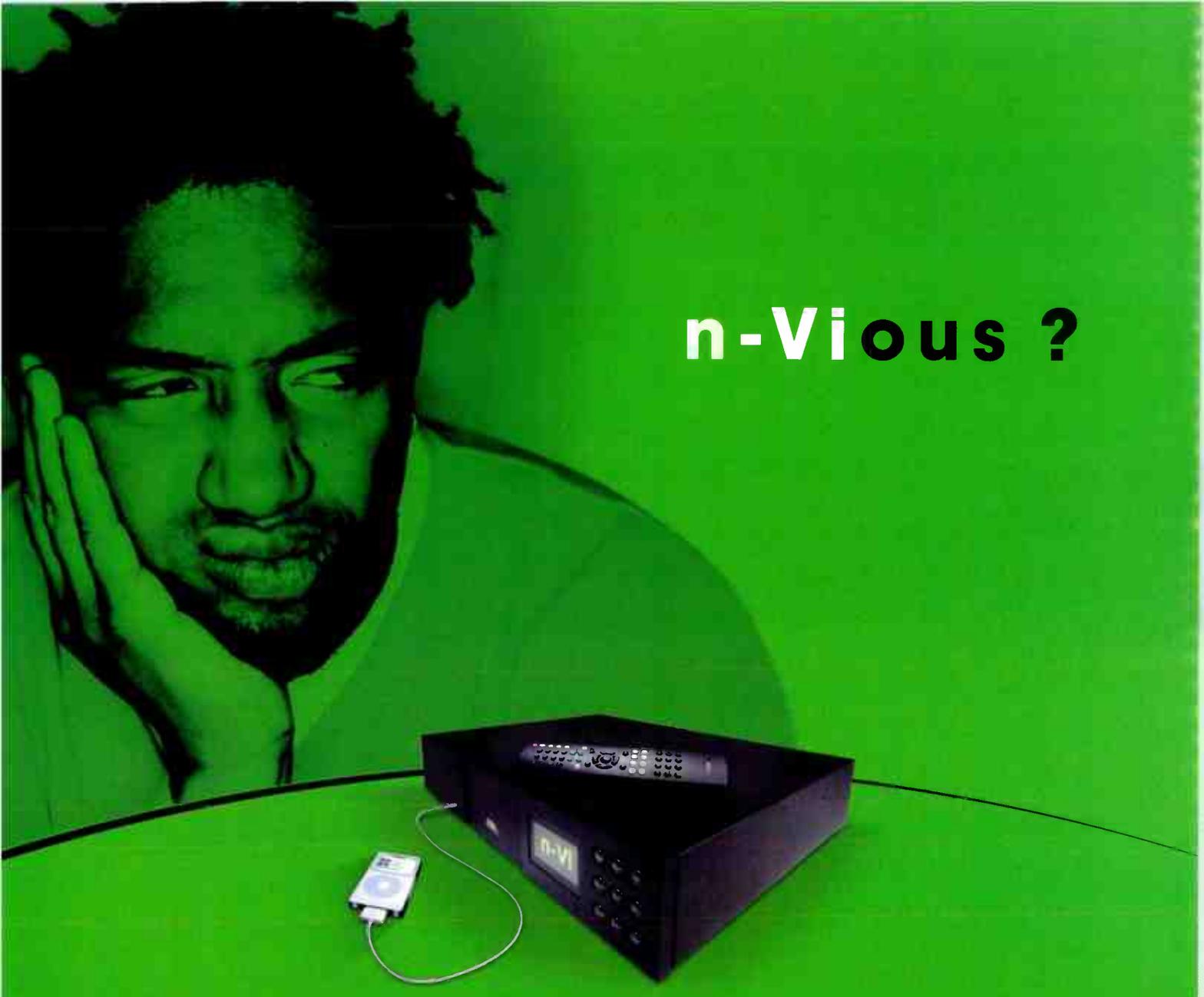
upon to place instruments through the front wall and well down my garden, yet recordings with little depth information in them were reproduced equally faithfully.

Bass notes were superb, with the bass line on 'Gritty Shaker' from 'Oceans 11' not only displaying excellent dexterity, but also having greater extension than I'd heard on this track before - with real weight on the double bass being felt through furniture as much as heard. Still, when speed was called for, this player had it in spades. On 'Future Lover' from 'Confessions on a Dance Floor' the driving bass line was propelled along with incredible drive and power, yet the lightning-fast pace called for on this track sounded effortless through the Antila.

The player's midrange is sublime, not only offering tremendous transparency

but also displaying superb balance. The human voice is always difficult to reproduce convincingly, simply because we are so used to hearing it, so when I heard the lines of script delivered by George Clooney and Brad Pitt reproduced so realistically, I knew this player was good - quite simply, they sounded as if they were in the room. Likewise, female vocals were





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outstanding, with Enya's breathy vocal style played with gossamer-like delicacy. The track's electronics were stripped away remorselessly, allowing me to concentrate on her voice. The track 'Anywhere Is' is very busy, yet Enya's voice simply floated free of the musicians, allowing the listener to hear every inflection in her vocal delivery, free of any sonic aberrations through the midrange, the balance was that good.

Cymbals and triangle in the high frequencies always seem particularly difficult for CD players to get right, yet the Antila renders these instruments beautifully, without exaggerating the high frequencies to give the illusion of more detail, or hardening them and losing the subtle tonality and slight metallic sheen. 'Black & White X5' from 'Thomas Crown Affair OST' is recorded in a large studio with a full orchestra present, yet opens with a single piano playing the melody in the top octave, and for the first time with the Antila I could hear the rest of the orchestra present during this solo, including very low level sounds such as sheet music rustling, whilst the top octave of the piano was outstanding, lacking the hard ringing often heard when digital components try to replay this range.

**CONCLUSION**

Given that Leema, a relatively young and small British company, have already come up with a highly capable mini-monitor in the shape of the Xen (HFW, December 2006) and a superb integrated amplifier in the Tucana (HFW, May 2007), it is a 'big ask' to expect their company's first CD player to be of an equally high quality – but they've done it. The Antila is simply very difficult to

"the Antila is simply very difficult to fault"

fault - with a tremendously clean midband, extremely powerful bass and a shimmeringly smooth treble., it presses all the right 'hi-fi' buttons,

but is more than this, thanks to the musical way it strings everything together. Indeed, to my ears it delivers one of the most balanced sonic performances I've heard from any player under £5,000. Then there's the fact that it offers the kind of engineering usually found in players from Wadia and Esoteric, and does so in a package which is both easy to use and stylish enough to grace any living room.

The only downside is the fact that some might find it just a little too starkly detailed for their musical tastes - shining as it does a bright light on every recording, it doesn't flatter poor source material. Still, it's never less than highly musical, and indeed with such high performance, it should worry every other machine in the sub £5,000 bracket – to my ears it takes a player like the Esoteric X-03SE to

realistically compete. Overall then, thumbs firmly aloft for Leema, which now has a superb system range from source to speakers.

**REFERENCE SYSTEM**

- Shanling CDT-300 CD player
- Mark Levinson 326S preamplifier
- Bryston 3B-SST and 14B-SST power amps
- Leema Acoustics Tucana integrated amplifier
- Martin Logan Vantage loudspeakers
- Hyperion Sound Design HPS-938 loudspeakers

**MUSIC**

- The Thomas Crown Affair OST (Pangaea)
- Oceans Eleven OST (Warner)
- Madonna, 'Confessions on a Dance Floor' (Warner)
- The Corrs, 'In Blue' (Atlantic)
- Enya, 'The Memory of Trees' (Warner)

**VERDICT**

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- musicality
- build

**AGAINST**

- nothing at the price

**MEASURED PERFORMANCE**

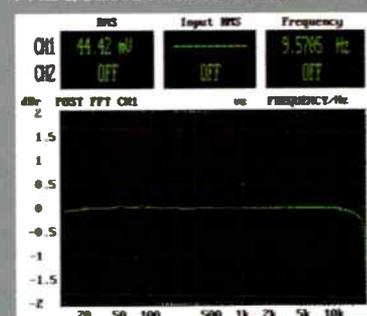
Our frequency response analysis shows the Antila is flat across the audio band, but there's a slight roll down above 10kHz to -0.25dB at 20kHz. There is also a slight lift below 100Hz, but this amounts to just +0.12dB at 20Hz. It's enough to ensure the player doesn't subjectively lack bass. Unbalanced and balanced outputs were identical.

At low levels, below -60dB, there were extended quantisation products; linearity could have been better here. At -60dB and above however the Antila matched the best, hence its good -111dB EIAJ dynamic range value. Output measured 2.37V from both balanced and unbalanced outputs, balanced not offering the usual doubling of output.

The Antila measured well in all areas. Low level linearity could usefully have been better, but results still matched market leaders. NK

Separation (1kHz)	116dB
Noise (IEC A)	-108dB
Dynamic range	111dB
Output	2.37V

**FREQUENCY RESPONSE**



**DISTORTION**



Frequency response (-1dB)  
5Hz - 21.3kHz

Distortion (%)	Bal	Unbal
0dB	0.001	0.001
-6dB	0.002	0.003
-60dB	0.25	0.44
-80dB	2.8	3

**SECOND THOUGHTS**

It is unusual to see a new British hi-fi 'start up' performing so well across the board so soon, but Leema are going from strength to strength right now, and the Antila is arguably their strongest product to date. It brings Japanese battleship build – something you usually have to pay more for – to the party, along with an extremely crisp, clean and open sound with a truly musically engaging nature. Romantics may opt for softer sounding designs like Eera's DL1 (£1,850), which are almost supernaturally analogue in their presentation, whereas the Antila dispenses with the rose-tinted glasses for a much more brusque, upfront presentation. Thumbs firmly aloft then, and we await their next product with interest! DP

# Song Maker



**The Aesthetix Calypso is a high end US tube preamplifier with looks to die for, but does it deliver in the sonic stakes? David Allcock listens in...**

**A**gainst all odds, when Jim White left Theta Digital, he opted to go in a completely different direction and launched an ultra high end valve phono stage called the Callisto. Its uncompromising design stunned the US high end community – the fully configured lo and Callisto made for a six box preamp weighing in at over 270lbs, that needed most of the average British living room to accommodate! Thankfully, Jim decided to 'trickle down' his ultra high end designs into a more practical format, hence the Rhea phono stage and Calypso line stage.

The Calypso is a fully remote controlled preamplifier housed in a single box with an inner stainless steel 'U' chassis, having the front and side panels manufactured from 10mm thick steel and a 7mm brushed stainless steel front panel. The top plate is a 3mm steel panel with two large mesh grilles, secured with heavy duty Velcro allowing the user easy access to the internals.

Looking into the chassis of the Calypso you see a pair of circuit boards with three large capacitors for the local power supplies, a 12AX7LP and a 6922 dual triode valve for each channel, a centre channel carrying the mains power to the power supply stage at the front of the chassis, and a shielded module

at the front containing the power supply, microprocessor control system and display. On the back panel are six inputs, each with both single ended RCA and XLR balanced inputs, whilst a tape loop and home theatre bypass are also supported on both connectors, with two pairs of outputs, again on both balanced and single ended connectors, allowing the Calypso to be integrated in any system.

The IEC power inlet and on/off switch are located in the centre of the back panel, but usually you will turn this preamp on and off via the standby button on the front panel. This sports a large blue LED display in the middle. The volume control is conspicuous by its apparent absence, but, as with the Rhea, this is actually the display itself, which is pivoted, so pushing on the right turns the volume up and the left lowers it. To overcome the possibility of digital noise from the front panel display polluting the signal path, the processor only wakes when it is actually being used.

Internally this amplifier is a fully balanced design, meaning single ended inputs are converted to balanced signals almost as soon as they enter the preamp, theoretically offering greater immunity to interference and noise if implemented correctly. As mentioned, the power supply is located in the front of the chassis,

hence the reason why the majority of this unit's weight is at the front. The power supply is fully enclosed in a Faraday cage which is designed to completely shield it from the audio circuits and prevent the intrusion of RFI (radio frequency interference) and EMI (electro magnetic interference). One of the biggest problems anyone is likely to have with this device is housing it - outside of the Boulder 1012 and the MBL Reference, this is one of the largest line stage preamps I've encountered, measuring 110x455x460mm and weighing in at 17.5kg!

## SOUND QUALITY

Whilst the single ended output is impressive, in my system I preferred the balanced output of the Calypso driving my Bryston 3B-SST power amplifier. Whilst the balanced inputs offered their usual advantages of lower noise and improved dynamics, the sonic balance between the two input types was remarkably similar - something I've only encountered on one other preamp, the Mark Levinson 326S.

This was an incredibly quiet design - even turned up to its maximum volume and with an ear within 50cm of my Martin Logan loudspeakers, I could hear no hissing or humming whatsoever. Indeed, when music was actually playing through the Calypso, it was not

obvious one was listening to a valve-based preamp, so extended were the lower and upper frequencies.

The Calypso proved extremely strong in the bass, with bass guitars, kick drums and double bass possessing greater power and depth than my reference Krell KRC-3. I knew the Calypso was obviously doing something right when I dropped on Enigma's 'Sadness', the lower registers proving effortless. The dynamic range available from this preamp is redoubtable, with 'Like Love' from Timo Maas having a bass line which could knock items off shelves. But it's not just about bombast, as the 'micro dynamic' subtleties of the best musicians and vocalists are not lost. Subtle pedal work on Dave Brubeck's piano during 'Strange Meadow Lark' from 'Time Out' gave the track a level of realism in my room I've rarely heard.

The Calypso's midrange balance made the best of any well recorded vocals, and delivered an incredibly transparent window into the recording, Celine Dion's vocals on 'Refuse to Dance' grabbed my attention with their presence in the listening room, being completely natural yet simultaneously highly resolving, displaying every nuance and shift in emphasis. When given a slightly warmer recording, such as Diana Krall's 'A Night in Paris', the Calypso continued to impress, giving her voice the smooth, velvety richness that just draws you and leaves you wanting more. The Calypso refused to impart any kind of personality on the proceedings, allowing each recording to stand or fall on its own merits. Whilst this doesn't make the Calypso one of the most forgiving components around, its honesty is unquestionable.

In the high frequencies the Calypso offered excellent focus and resolving capabilities, bringing out a very high level of detail without over-emphasis. Even when provoked with a somewhat lively recording in the upper registers, such as Timo Maas's 'To Get Down' where there is a definite forwardness to the cymbals, the Calypso never allowed things to turn hard and forward. Joe Morello's cymbal work on 'Take Five' showed just what it could do given a truly exemplary recording, the incredible dexterity and subtlety of playing

was laid bare, with even minute shifts in weight on the cymbals clearly audible, whilst the upper registers of Dave Brubeck's piano were simply sublime.

Imaging was equally impressive, not only was the soundstage huge, effortlessly removing the walls of my listening room in both planes, but it offered excellent scaling, with all instruments and performers in proportion to the rest of the soundstage, lateral imaging was outstanding, whilst the depth plane gave very good layering with the back of the stage fully illuminated and extending back beyond the physical boundaries of the listening room. Image focus was excellent, with the edge definition of each performer very well defined, separating the musicians from each other with only a very slight haziness around the edges, though I felt my reference Mark Levinson 326S could better this, albeit at a higher price. Even beyond the outer edges of the speakers, imagery was still consistently very good, with musicians sonically located beyond the physical boundaries of the listening room and maintaining focus.

**TUNING**

The Calypso uses a 12AX7 in its input stage and a 6922 in the output stage, but this preamp is able to use most variations on this valve, and this makes a considerable difference to its tonality. I found the 12AX7WB to have a lower mid richness which did not entirely suit my system, whilst the 12AX7LP and 12AX7LPS both gave the Calypso greater extension in the higher registers and a more even sonic balance throughout the frequency range, whilst substituting ECC83s tended to fill out the midrange somewhat and make the lower registers a little looser. I personally preferred the Sovtek to the Teslovak valves, though I have heard both Telefunken and Siemens NOS valves can bring further improvements in transparency and resolution. The 6922 valves again can alter tonality, though not as dramatically as the input valves, but very accurate matching of these items is critical, otherwise a channel imbalance may result, as I discovered when I tried a pair of unmatched 6922 and found a significant imbalance in output levels. Whilst this review used Sovtek valves, I would urge owners to try alternatives to suit personal taste.

**SYSTEM**

- Basis Gold Debut Standard/Graham 2.0/Benz Glider L2 turntable
- Shanling CDT-300 CD player
- Klyne System 7 PX 3.5 phonostage
- Krell KRC-3 preamplifier
- Mark Levinson 326S preamplifier
- Bryston 3B-SST and 14B-SST power amps
- Martin Logan Vantage loudspeakers
- Hyperion Sound Design HPS-938 loudspeakers

Audio's considerably cheaper Silver Passive Preamplifier, which at £2,650 offers no less impressive sonics – albeit in a very different and far less user-friendly package. Then there's the NuForce P9 which at some £1,000 than the Aesthetix less offers the convenience and microprocessor control of the Calypso and runs it close in sonics, albeit with a different, more 'solid-state' character once again. Competition is stiff, and my only counsel is to go out and audition them all with your ancillaries – the Aesthetix offers a lot, and you will surely enjoy the experience.

**VERDICT** ●●●●

Excellent build, superb connectivity and feature count plus a spacious and powerful sound make this an essential audition – if you've got the house room!

**AESTHETIX CALYPSO** £3,395  
 Audio Reference Ltd.  
 ☎ +44(0)1252 702705  
 www.audioreference.co.uk

- FOR**
- build
  - connectivity
  - powerful sound
  - even-handedness
- AGAINST**
- size
  - competition



**CONCLUSION**

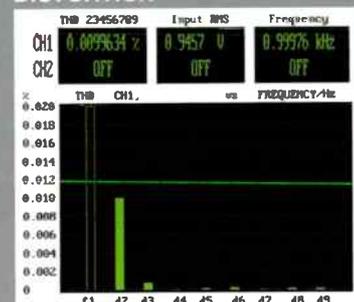
A very fine preamplifier then, offering a great user interface, proper build quality, real versatility and super sound for an admittedly serious price. Indeed, the only cloud on its horizon is the competition from MF

**MEASURED PERFORMANCE**

The Calypso uses two double triodes per channel, a 12AX7 followed by a 6922, configured differentially to give a gain of x4.7 through the unbalanced phono inputs/outputs, but x9.5 through the balanced XLR connectors. The volume control uses an FET switched resistor network. Frequency response measured a usefully wide 3Hz-26.5kHz, distortion was low and hum and noise negligible via the balanced path. There is enough gain for most purposes via unbalanced, and plenty via balanced. The Aesthetix is neatly configured to give good results from valves; it measures well. NK

Frequency response	3Hz-26.5kHz
Separation	68dB
Noise	-100dBV
Distortion	0.01%
Sensitivity	9V out

**DISTORTION**



**MUSIC**

- Celine Dion 'Colour of My Love', Epic 474743 2
- Enigma, 'MCMXCAD', Virgin CDVIR 10
- Dave Brubeck Quartet, 'Time Out', Classic Records CS8192
- Timo Maas, 'Loud', Mushroom Records PERFALB08CD
- Diana Krall, 'A Night in Paris', Verve 065 369-2

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# Classical Kudos

Adam Smith lends his educated ears to the new Cardea C2 loudspeaker from Kudos Audio...

If my rather dusty memories of the equally dusty Classics room at my school serve me correctly, according to Roman mythology Cardea was mainly famous for being the goddess of thresholds and door hinges. Now, personally I cannot remember any shrines or churches dedicated to any deity of door furniture, although I could be wrong, but upon poking round the Internet to confirm my memories, I discovered that one of

her secondary roles was as benefactress of craftsmen, no less.

I was especially interested to learn of this secondary role for Cardea, having just unpacked the Kudos Cardea C2 loudspeakers under consideration here. Whether the chaps at Kudos have been praying or sacrificing small mammals to the aforementioned celestial being I do not know (and am not sure I want to, if the latter is the case...) but, as the Cardea C2s are some of the

most immaculately built and finished loudspeakers I have seen at any price, it appears that she has suitably rewarded their use of her name!

Kudos Audio will be a familiar name to many readers, as they have been around since 1991 and gained a good reputation for their well designed and sturdy loudspeaker stands and equipment supports. Now, it would seem to me that a reasonably logical next step for such a manufacturer would be to make



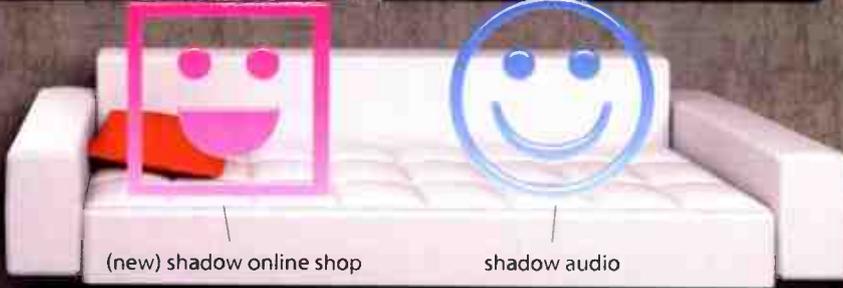
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Remember !! List is updated on our web site daily!

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AudioNet Art V2, silver / blue display, immac cond, boxed, remote (£2400)	£1595
Cambridge Audio Azur 840C, only 3 months old!, mint, fully boxed (£750)	£595
GamuT CD-1, mint condition, only 18 months old!, fully boxed (£2995)	£1995
Audio Research CD3 MK1, excellent condition, black faceplate (£5000)	£2295
Linn Klassik, CD+Ampl+Tuner, All in one system, only 6mths old!, black (£995)	£745
Musical Fidelity DM25 DAC + Transport, only 1 month old (£4000)	£3395
Musical Fidelity KW 2505, All-in-one CD, DAB Tuner, Amplifier, mint (£4999)	£3795
AVI Lab Series CD, current spec, boxed, unmarked condition (£1499)	£1195
Shanling CDT300 Omega Drive, ex dem, immaculate cond (£4000)	£2995
Resolution Audio Opus 21, 2 box cd player, boxed, black/silver (£2950)	£2295
Marantz SA-11S1, mint, 2mths old, silver finish, boxed (£1995)	£1395
Marantz SA15-S1, silver finish, unmarked condition, high end SACD! (£1100)	£795
Krell Standard 5.2 SACD, silver, mint, few months of use, original box (£4200)	£2995
<b>AMPLIFIERS</b>	
Krell 280p Pre Amp, silver, immac, only a few months use, fully boxed (£3000)	£1995
Mark Levinson 380 Pre, mint, fully boxed with manual, 3 years old (£6500)	£2695
Cairn 4810 Integrated, silver, immaculate cond, just over a year old (£2700)	£1795
Bryston 4B-SST Power Amp, 2 months old!, like new, 300wpc (£2750)	£2245
EAR Yoshino 834T Hybrid Int, mint, boxed, 8 months old! Bargain! (£2800)	£1995
Qinpu A1.0x, ex What HiFi review model, boxed in immac cond (£300)	£230
Qinpu A-8000 MK II, ex HiFi World review model, boxed as new (£1295)	£795
Musical Fidelity A5 Int, 250wpc, 6 months old, boxed, as new (£1499)	£995
Musical Fidelity A5 Pre, mint, only a few months old, fully boxed (£1499)	£995
Bryston B-100 SST Int amp + DAC, unmarked condition, boxed (£3750)	£2995
McIntosh C220 Pre, only 2 months old!, boxed, mint. Simply stunning! (£3300)	£2795
Jadis DA30 valve integrated, mint, 2yrs old, fully boxed, 30wpc (£4000)	£1995
Bel Canto Evo 2i Integrated, boxed, mint cond (£2800)	£1595
Primare I21 Integrated, black, immac, boxed with manual, 1 year old (£750)	£545
Musical Fidelity KW550 Integrated, only a few months old!, mint (£5000)	£3995
AVI Lab Series integrated, immac cond, only a few months old! (£1599)	£1095
AVI Lab Series Power Amp, immac, less than 1yr old, boxed (£1650)	£995
Linn LK280 Power Amp, 2 available, both in excellent condition (price of each)	£295
Pathos Logos, brand new sealed box!, canc order, great opportunity (£2700)	£2295
Eastern Electric M520 Int, What Hi-Fi 5 star review, 4 months old (£1539)	£1095
McIntosh MA2275, immaculate condition, only 1 year old! (£5700)	£3995
McIntosh MC501 Monoblocks, mint condition - as new (£8050)	£5995
Manley Labs Neo Classic 300b Monoblocks, 25wpc, mint! Sensational! (£5895)	£3495
Nagra PSA Power Amp, very rare, only 6 months old!, immac, stunning	£3395
Moon P3 Pre, immac, black with silver legs, one owner from new (£2500)	£1495
Bel Canto S300i Integrated, mint condition, only 2 months old (£1799)	£1495
Audionet SAM V2 Integrated, mint, silver with blue display (£2400)	£1495
Shanling STP-80 Int, 18 months old, few slight marks, fully boxed (£1350)	£795
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Pass Labs X1 Pre Amp, mint, less than 1yr old!, sep power supply (£4700)	£3495
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Acoustic Energy AE1 Classic, ex-display, never been played, fully boxed (£845)	£650
Wilson Benesch Arc, silver stands and side cheeks, immac cond (£2600)	£1795
Ref 3a De Capo-i, redwood finish, superb cond, boxed (£2500)	£1695
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JM Lab Diva Utopia BE, exc cond, boxed, tweeter covers and spikes (£7500)	£3995
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B&W PV1 Subwoofer, mint, only 2 months old!, fully boxed (£995)	£795
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Trichord Dino+ PSU, silver, excellent condition, 1yr old, boxed (£249)	£175
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PI Scout inc JMW-9 tonearm, immaculate condition, boxed (£1650)	£1195
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Nordost Blue Heaven Speaker Cable, ex-dem, 4m pair, bi-wire (£489)	£349
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something to sit on top of those stands and this is exactly the route Kudos have taken, recently branching out into loudspeaker manufacture with a four-strong range.

Consisting of the Cardea C1, C10, C2 and C20 models, retailing for £1,450, £1,950, £2,450 and £2,950 respectively, Kudos have been cunning in the use of virtually identical cabinets for the C1 and C10 standmount units; and C2 and C20 floorstanders. Where they differ is that the C10 and C20 use even higher specification SEAS drive units than the already good quality units used by the C1 and C2.

In the case of the C2, these comprise a seven inch (180mm) coated paper cone woofer and the SEAS Excel one inch (25mm) tweeter, the latter being mounted in its own dedicated sub-enclosure within the cabinet. These units are connected using a simple, low-order crossover and two pairs of terminals are provided for bi-wiring duties. In fact, Kudos lead you toward this connection method as no jumper links or connection bars are provided to join the terminals for single wiring duties. The cabinets are resplendent in real wood veneers, with a choice of Rosenut, Cherry, Walnut and the supplied Sycamore.

At 925x200x270mm (HxWxD), the C2s are compact and these dimensions include a plinth fixed to the bottom of the sturdily-braced cabinets, creating a gap through which the downward-facing bass port fires. Kudos say that this arrangement allows for greater flexibility of placement within the listening room and also confers extra stability upon the C2s.

**SOUND QUALITY**

What we have here is an ostensibly simple loudspeaker - no outlandish cabinet design, no outwardly high-tech drive units and no complicated crossover trickery. It is always interesting to audition a loudspeaker of this type as, very often, the result can be like the design in that it is competent and pleasant, if rather unspectacular. Consequently it is always a nice surprise to find that, once settled comfortably onto the *Hi-Fi World* sofa for auditioning, the first bars of the first track selected make you sit up somewhat. As the coffee stain on said sofa will now attest, the C2s did indeed make me sit up...

These are loudspeakers that are more than happy to strap on their oxygen tanks and take a dive right into the murky depths of music to dig out every little detail lurking

therein. They have a magnificently clear and strong top end that picks out every last subtlety to lay out before you. Often, the downside of a design like this is that things can become harsh and ragged with unsympathetic material, but the C2s remained composed and clean, no matter what I fed them with, or how high the volume was pushed. A track I often use to try and provoke loudspeakers is The Corrs' 'Only When I Sleep' - a superb piece of music, but with a decidedly strident and forward recording. Sometimes this is verging on unlistenable, but the C2s separated everything out very well, without disguising the decidedly challenging nature of the recording.

Another wise check with more forward sounding 'speakers is violins, as it is all too easy to make these resemble an alley cat committee meeting in their screeching and yowling. Luckily once again, the C2s proved themselves to be clean and unfazed by such material and Nigel Kennedy's version of Satie's 'Gymnopédie No. 1' was fabulously composed and vivid.

Even more encouragingly, the entire rest of the frequency range was more than up to matching the high standards set by the treble. The lift in output in the midrange region ensured that vocals were superbly centre-stage and right to the front of the mix, giving real body and depth to performances. Eva Cassidy singing 'Penny To My Name' had a magnificent aura of space around her, and the natural decay of the room in which the track was recorded was spot on. These are loudspeakers that have the ability to set up a large and expressive soundstage.

No less accomplished is the bass performance of the C2s. They have superb weight, clarity and pace and can follow complicated bass lines with ease. The only caveat I have here, however, is that, as suspected from the impedance measurement [see MEASURED PERFORMANCE] the C2s do need a firm guiding hand in the form of an amplifier with a highish damping factor to ensure that they do not become a little wallowy. As long as this is taken into account, the C2s are as firm and tight as could be hoped

for, thumping out Jakatta's 'American Dream' with impressive gusto.

Overall, the C2s have a dynamic and lively character but without ever descending into harshness. They have superb integration across the frequency range and I thoroughly enjoyed my time with them.



**CONCLUSION**

A loudspeaker like this shows just how well a deceptively simple, yet carefully thought-out and well made design can work. The Kudos Cardea C2s are impressively constructed and turn in a superbly integrated performance. Across the frequency range they have an unerring ability to pick out the finest of details and present them with the sort of confidence and precision that separates a good design from an excellent one.

The Roman poet Ovid said of Cardea, "her power is to open what is shut, to shut what is open". Given the first part of this statement, I wonder if he had heard the C2s?

**VERDICT**

Dynamic, detailed and thoroughly enjoyable, they show just how well a simple design can work when properly implemented.

**KUDOS CARDEA C2** £1,950  
 Kudos Audio  
 +44 (0)845 601 9390  
 www.kudosaudio.com

**FOR**

- superlative build and finish
- dynamic alacrity
- detail retrieval
- overall cohesion

**AGAINST**

- amplifier matching issues

**MEASURED PERFORMANCE**

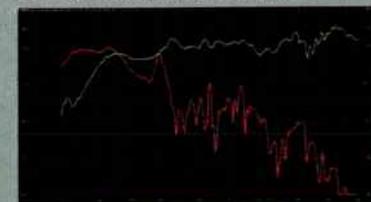
The Cardea C2s are a little uneven in the midrange and treble regions, with a dip at around 2-3kHz and corresponding peaks at 5kHz and around 13kHz. The dip is where the ear is at its most sensitive however, so this should help to alleviate any midrange harshness that can arise from unsympathetic material. The rise in treble will add detail and presence to high frequencies.

Bass output is also a little uneven with a drop in output below 200Hz before the rolloff proper commences at around 50Hz. The port fires through the bottom of the cabinet and onto a plinth, and so provides output over a wider frequency range than a conventional type, assisting bass down to its tuning frequency of 30Hz. This is good for a compact floorstander and so the C2s should have good weight and clarity to their sound.

The impedance curve shows that the C2s have a sensitivity of 86dB and a measured average impedance of 10.4 Ohms, dipping to a minimum of around 7 Ohms, so they are not a difficult load

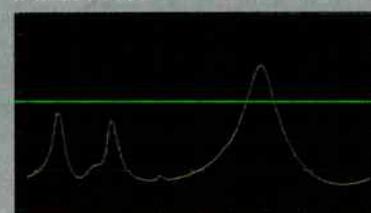
by any means. However, they are not as well damped as some and have a large inductive component at 2kHz, so careful amplifier matching may be necessary to hear them at their best. AS

**FREQUENCY RESPONSE**



Green - driver output  
 Red - port output

**IMPEDANCE**



# Electric Radio

Marantz have released a new upmarket tuner, the ST-1551 with Medium Wave, VHF/FM and DAB on board. After enjoying Steam Radio in the form of Leak's lovely Troughline, Noel Keywood listens to this new-fangled electric jobbie...

Perhaps the idea of having just ten or so quality stations on VHF/FM in the UK seems quaint by today's viewpoint, but if you have ever heard live broadcasts through a good VHF/FM tuner it's difficult to argue with the idea. Stunning quality is possible, especially from well engineered live broadcasts, but quality is at the expense of variety. Digital Audio Broadcasting (DAB) was meant to answer this trade off by offering 'CD quality' we were told, whilst meeting today's desire for variety. The new Marantz ST-1551 tuner seeks to offer the best of both worlds: top quality VHF/FM as well as the variety offered by DAB - and you get Medium Wave too, but not Long Wave.

The ST-1551 is a hands-off design aimed at giving easy, fast access to preset stations on all wavebands. It does have manual tuning, but with no indicators for tune accuracy or signal strength it is better to use the presets. One hundred stations across the three wavebands can be set and manually named, using 63 character alphanumeric set, with an eight character word limit, but as DAB stations self identify and, nowadays, so do most VHF/FM stations, there was little need. Tuning is carried out by spinning the horizontal wheel to select preset stations and a remote control is available, but ours came without one.

Marantz fit Radio Data System (RDS) to the VHF tuner so, for example, traffic broadcasts (TP) can be found, as can programme types

such as Jazz, etc. DAB sends out a mass of info about such matters and the Marantz can receive and display it all, like most specialised DAB tuners, such as those from Pure. This includes the Bit Error Rate, which gives some idea of signal quality, but it lacks the signal strength indication the Pure tuners usefully provide. As low signal strength and burbling or breakup are an issue with DAB, it is handy to have some idea of what is coming down the aerial, especially at the price.

With tuners, quality is very dependent upon signal strength; ironically DAB was meant to break this link - but instead got entangled by it! So an expensive tuner with serious pretensions to quality like this one really needs signal quality monitoring of some sort. Marantz have even removed optional mono switching on VHF, which also lifts signal muting so really weak stations can be found. So the ST-1551 is strictly for entertainment purposes, not for distant station searching. Having said that, our tests showed it is a sensitive tuner able to keep noise right down to its lowest value (i.e. full quieting) from just 0.5mV or more from the aerial, an extremely good result. Indoor or loft aerials can provide this level of signal if the transmitter is reasonably close, say up to ten miles or so away.

The DAB tuner will receive L Band transmissions, if or when they arrive in the UK, but this is a few years away yet I understand. L Band will allow higher data rates and better quality, but it is strictly for

short range local reception because frequency is so high.

Marantz supply an AM loop aerial, and a short DAB stick antenna that connects through an F connector. VHF/FM connects via 75 Ohm coaxial panel plug as usual.

Weighing 12.3kgs this is a heavy tuner, solidly built and finely finished. Measuring 416mm deep, 440mm wide (17in) and 123mm high it is sizeable by any standards. The traditional Marantz horizontal spin wheel span freely, if not quite with the vigour of earlier tuners that used this tuning system. However, in this case the wheel is used for jumping between preset stations, rather than spinning across a frequency band quickly and its action suited this slightly different role.

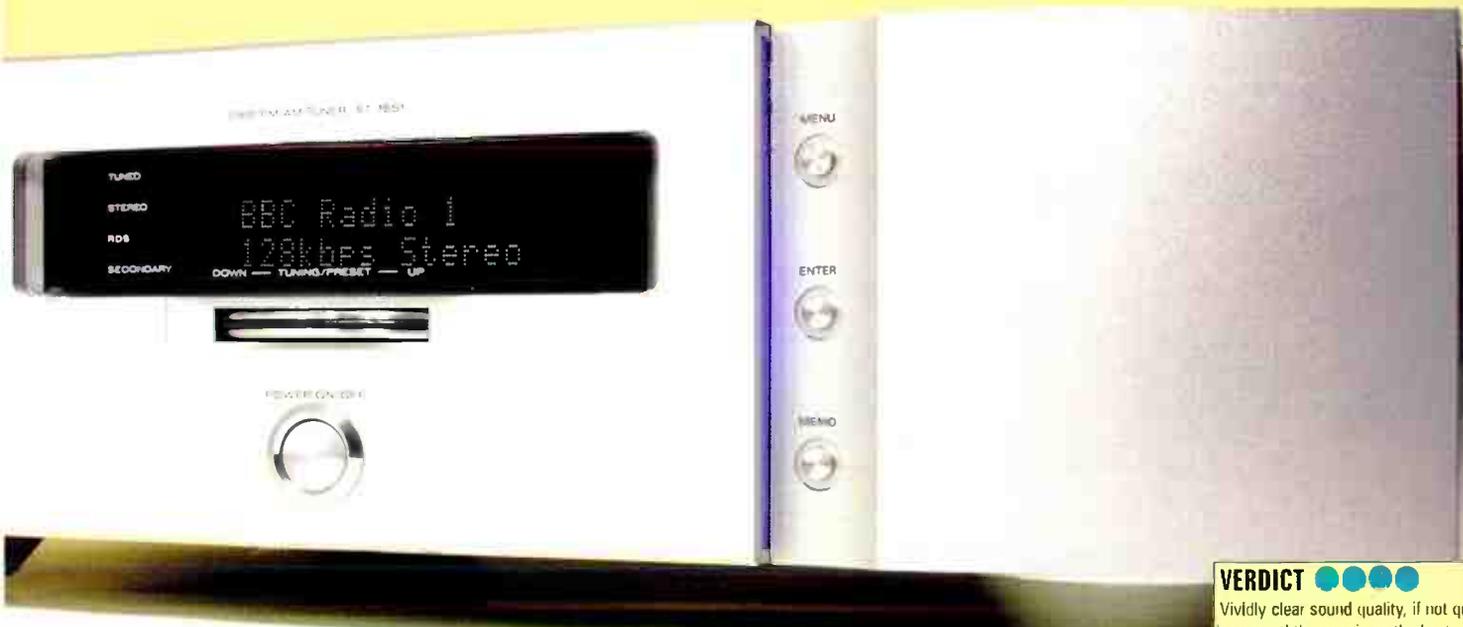
On my aerial, a multi-element high gain array pointing at Wrotham, which serves London its BBC VHF/FM stations, the Marantz tuned in three Radio 3s, two Radio 2s and two Radio 4s, memorised into adjacent presets. These comprised the main Wrotham signal and signals from distant transmitters at different frequencies. I realised that Marantz have included a form of logic that causes the tuner to scan a waveband, like VHF/FM many times, first storing powerful stations in A1-10, then progressively weaker ones further up the alphabet. It may work with an 'average' aerial however Marantz have defined it, but it did not with mine. It's best with this tuner, like many auto-tunes, to find local station frequencies, then tune in and preset manually.

This problem didn't occur with DAB. The ST-1551 tuned in London's DAB stations perfectly, in the same efficient manner as most DAB receivers.

## SOUND QUALITY

Kicking off with Radio 2 on VHF/FM, a good benchmark for quality allied to high signal strength where I live,





"this is a tuner with sweet sounding treble - and no lack of it."

music in The Steve Wright show was perfectly clean and concisely composed. I'd noticed from days of listening and comparison with a Leak Troughline that the Marantz was always super clean sounding on VHF/FM, even in London's crowded airwaves at night. This reflects the tuner's excellent selectivity in particular. Whilst Steve Wright's voice did not sound very fulsome - probably due to the mic - Eric Clapton's 'Wonderful Tonight' had strong yet supple bass, superb instrument placement and Clapton's guitar strings had plenty of snap to them. This is a tuner with sweet sounding treble - and no lack of it. That's not to say it has a bright tonal balance, just that it is sparkingly clean and open. It does have an upper midrange sheen though, that brings a slight forwardness to music. This effect didn't help Steve Wright sound especially fulsome.

Switching to DAB was not always the shock it once was, because the BBC have upgraded its mp2 broadcast compressors, but nevertheless Radio 2 on DAB (128kbps) was a small notch down in quality, with considerably less inner detail, plus some general coarseness and confusion; it was passable for portables.

I had less luck with Heart when making this comparison: VHF sounded fine but DAB lost much of its low frequency power, likely as a result of the station's DAB modulators.

With Radio 3 on VHF/FM the Marantz was superbly clear and concise in its presentation of speech

and instruments. It comes across as highly insightful. By contrast the Troughline sounded more easy going and natural, certainly more atmospheric and absorbing as a result, if not as squeaky clean, especially at night as the airwaves became more crowded and twitterings and noises started appearing in the background, due to nearby stations breaking through.

Radio 3 on DAB (192kbps) sounded good with simpler material, but DAB deteriorates with heavy orchestral material that demands a lot of bits on an ongoing basis and here VHF/FM was considerably better, not falling into the confusion suffered by DAB. Happily, a tuner like this can resolve the full quality of VHF/FM, giving fine sound quality, whilst at the same time offering the variety available with DAB.

On Medium wave Radio 5 Live came in clearly enough at 693 and 909kHz, and World Service had authentic crackles and some noise at 648kHz; it's clean and clear on DAB of course, but not at all evocative like this!

The ST-15S1 is reasonably easy to use, as any modern tuner

should be, if not to set up. Tuners of this price and pretension should have some form of signal strength display I feel, to let their owners know whether their expensive acquisition is able to deliver its full potential. Otherwise, this tuner is a fine example of Marantz's very high standards of radio engineering, honed to deliver not just good tech specs but fine sound quality too. It's a great performer and an able partner for Marantz's high end amplifiers.

**VERDICT** ●●●●

Vividly clear sound quality, if not quite as smoothly organic as the best. Superb build and finish justifies price.

**MARANTZ ST-15S1 £700**  
**MARANTZ UK**  
 + 44(0) 1753 680868  
 www.marantz.co.uk

**FOR**

- superb clarity
- insight
- low noise

**AGAINST**

- midrange sheen
- no useful indicators
- limited facilities

**MEASURED PERFORMANCE**

The VHF/FM section of this tuner has some small high end ripples caused by the mp2 filter used, but they amount to just 0.5dB which is perfectly acceptable. The upper response limit is a high 15.5kHz and down at the other end of the frequency scale the lower limit measured just 2Hz. Pilot tone rejection was good at -45dB and there was no subcarrier at 38kHz, so little in the way of unwanted mush is put out.

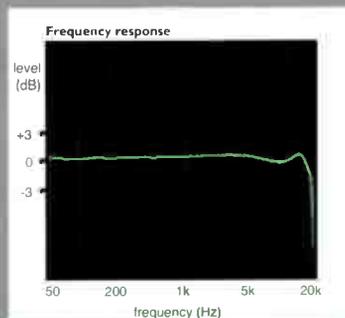
Distortion levels were low at just 0.08% at 50% modulation, rising to 0.4% at full modulation, third harmonic being as strong as second, so there may be just a little sheen to the sound from this effect. There was little measurable hiss, a value of -70dB being maintained right down to 0.5mV of aerial signal - very good. The ST-151 will be quieter than most even with signals of modest strength. The -50dB stereo limit measured 48uV, but the -50dB mono figure could not be obtained because the tuner muted before it was reached and muting cannot be lifted.

The ST-15S1 produced a tidy set of VHF/FM performance figures. It will be quiet even with mediocre aerials and tonally well balanced, with extended treble. NK

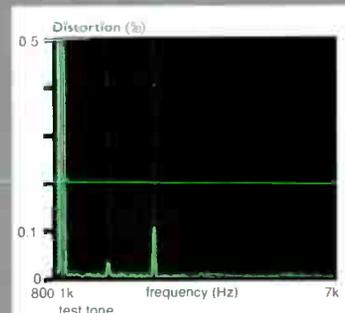
Frequency response 2Hz-15.5kHz  
 Stereo separation 42dB

Distortion (50% mod.)	0.08%
Hiss (CCIR)	-70dB
Signal for minimum hiss	0.53mV
Sensitivity	
mono	mutes at 11µV
stereo	48µV
signal strength meter	none

**FREQUENCY RESPONSE**



**DISTORTION**



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piece of gear I have ever heard"

10 AUDIO REVIEW

"A new benchmark for musical communication" **STEREOTIMES**

"One of the truly special products I've reviewed in the past 18 years" **STEREOPHILE**

Winner of Stereo Times magazine Most wanted component of 2005 award

"The best tonearm I've heard" **HI F I WORLD**



Your cartridge can deliver vastly improved results if coupled with a high grade arm. Great tonearms of the past were recognised for what they contributed but we would suggest it's time to upgrade. Massive performance improvements are now possible, so why not advance your system to a new level? After all, a significant tonearm upgrade offers many times the improvements of those given by cartridge upgrades, and last a lot longer. Our multi-award winning arms are offered with a no risk, money back guarantee should you be anything other than delighted.

**Tonearm Models**

- Enterprise
- Conqueror
- Illustrious
- Encounter
- Silver
- OL1



Closest to the original sound



**Ultimate performance**

"The best musical results of any turntable I've ever heard, regardless of price.

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

**STEREOTIMES** on the Aurora gold turntable & illustrious tonearm

ORIGIN LIVE  
Tel/Fax: +44 02380 578877  
E-mail: [info@originlive.com](mailto:info@originlive.com)

Full information on web site

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



### MAGICBOX IMP ADAPT £130

Hard as it may be for many audiophiles to accept, but wireless music players such as this might one day outsell Compact Disc players. The idea is simple; more and more people are now storing their music on their Wi-Fi enabled computers (in either compressed or, more often uncompressed formats), so why not 'beam' this music from the PC or Mac to a box such as this, which is designed to plug directly into your hi-fi system, just like you would a CD player? This done, you have access – via the supplied remote control – to your entire computer music library at the touch of a button, making the idea of physically loading and/or unloading digital discs seem as quaint as dropping a needle into the groove of a vinyl record. Moreover, you also have Internet Radio, which means some 2,500-plus stations from all around the world, some streaming at considerably higher bit rates than DAB.

MagicBox market two versions of the IMP (Internet Music Player), both retailing at around £130. The standalone 'radio' was recently

favourably reviewed in these pages, but this is the hi-fi-specific IMP Adapt which sports a line level audio output designed to go straight into your amplifier's auxiliary input. The package includes a power adapter, mini-jack to RCA phono interconnect, remote control (with AAA batteries) and a user manual. The unit itself is compact, measuring 180x60x55mm and elegantly finished in silver with black trim, and black end panels. The right hand end cover can be removed to reveal the DC input socket and audio output socket. The fascia sports a good-sized blue backlit display, and for those with less than 20:20 vision there's a Zoom mode, which doubles the size of the characters on the display.

Setting up is an easy and intuitive process involving a series of screens offering choices that can be answered using the remote control. If WEP or WMA encryption is involved, you'll be prompted for the access code – in all cases, the Wi-Fi works flawlessly, and once you're logged on to a suitable network you can use the remote's navigation buttons to select

stations either by location or genre. In menu mode, the screen displays the various setup options or details of the currently selected radio station; alternatively it can be used in volume mode to display and/or adjust the audio output level.

Obviously, the MagicBox IMP Adapt's sound quality depends on the bit rate of the files it is streaming, but on high quality 320kbps CBR AAC it turned in a respectable performance at the price; not quite up with the SlimDevices Transporter (at nearly ten times the cost), but decent all the same, with good levels of clarity and a smoothish and enjoyable sound that was inevitably lacking at frequency extremes. It streams .mp3, .wma, .ra, .aac and .ogg files. Spending twice as much on the likes of a Roku SoundBridge will yield sonic rewards, but is only worth the extra outlay if you're a serious 'power user' of computer audio. It's a fine bit of kit considering the lowly price, with just one drawback – the fiddly remote control. In this one respect at least, the next generation of audio has a lot in common with the last...

# soundbites

# System Addict

Adam Smith takes a trip back to the eighties courtesy of Mordaunt Short's System 442 loudspeakers...



It is becoming ever easier to, "remember the good old nineteen eighties", as the Electric Light Orchestra sang in 1981, thanks to the decade's revival that has been happening recently. Musical artists like ABC, Gary Numan, The Beat and Duran Duran are enjoying new levels of fame and we are even seeing the return of dubious fashion items like legwarmers and scrunchies. The Porsche 911 and VW Golf GTi are still on sale and I have even consid-

ered rummaging around in the depths of the loft for my old Filofax, ready to plan for when "my people call your people" for a spot of 'networking'!

It even seems that this interest in the decade of my youth has extended to the hi-fi circle. My regular perusal of internet forums and eBay leads me to conclude that the small, well designed 'cottage-industry' components from this era made by the likes of, amongst others, Myst, Onix, Inca Tech and Nytech are fetching healthy prices. Loudspeakers are another interesting area, as this particular aspect of hi-fi underwent something of a renaissance around this time.

The 1970s idea of lots of big drive units in a big, floppy box finally gave way to some seriously thought-out design work, with new exotic plastic cone materials appearing, and computer-aided measurement and design giving us the likes of the Celestion SL6, covered by Dominic Todd in the May 2007 issue of *Hi-Fi World*. Manufacturers finally started to think 'out of the box' with their designs, however only one manufacturer took this literally...

Mordaunt Short began life in 1967 and felt that the time was right to celebrate their 20th anniversary by making something different from the worthy budget designs that made their name, such as the Carnival, Festival, Pageant, and the subsequent MS series units. The route that

designer Phil Ward took was to attempt to minimise the role of the cabinet in the reproduction process, effectively isolating the drive units from it. Mordaunt Short's reasoning at the time was that the cabinet has the potential to store energy and then re-radiate it at the listener, adding colouration and distortion. As anyone who has heard a big, resonant '70s design will know, they had a point!

In the case of the System 442s, this meant constructing the whole loudspeaker around a substantial central stand assembly, to which were mounted two baffle plates. The first was set on six aluminium bars in front of the stand, and held the tweeter and main bass/mid driver. The second was at the rear supporting a second bass driver. The back driver was open at the rear of the cabinet and connected out of phase with the front unit, only operating below 250Hz. This meant that, at frequencies below this, the mechanical energy supplied by the two units into the stand assembly cancelled out, further reducing vibration. As a further aid to rigidity, both drive units were connected by a locking bar, bolted to the motor assembly of each unit and passing through the centre of each voice coil. Finally, the cabinet, designed by Roberts Weaver Design, 'floated' around this structure, supported by energy-absorbing seals and thus being effectively acoustically separated from the driver/stand assembly.

The drive unit lineup for the System 442 comprised two 6.5in (170mm) polymer coned bass drivers with rubber surrounds and a one inch (25mm) tweeter with one-piece titanium dome and voice coil former, so Mordaunt Short certainly did not take their new enclosure design and stick any old drivers in it.

All of these were connected together through a crossover that allowed for bi- and tri-wiring and -amping. Originally retailing for around £1,000, the System 442s were a suitable flagship for Mordaunt Short's 1987 range.

**SOUND QUALITY**

The System 442s were well liked on their launch, with reviewers at the time praising their openness and lack of colouration, suggesting that MS achieved their goals.

Listening to a well-preserved pair, I was struck by how 'big' the System 442s sound. Measuring 945x260x375mm (HxWxD), they are not truly huge loudspeakers, although they are quite deep, but they do disappear superbly well when correctly set up, and it is here that prospective purchasers should be cautious.

As a result of the rear-firing woofer, the System 442s cannot be placed close to a wall - if you try this their image collapses and they sound boomy and slow. They need to be a minimum of twelve inches (30cm) away from a rear wall and can benefit from being further than this - in my room I found around fourteen inches worked best. Once positioned correctly, however, they reward with an expansive and coherent soundstage that makes it quite easy to forget they are there. Treble from my examples, which have replacement tweeters (more of which later), is very smooth and detailed, with none of the harshness that so often accompanied early metal dome tweeters.

Bass is perhaps the only area in which the System 442s are not totally convincing. Whilst their upper bass is tight, fast and detailed, they do not go very deep. Mordaunt Short originally quoted 50Hz as the lower frequency response limit, which isn't too spectacular for a decently-sized floorstander. What's more, you cannot move them closer to a rear wall to augment this, because of the rear-facing driver issue mentioned previously. Interestingly however, the System 442s respond better than most other loudspeakers I have heard to bi-wiring and bi-amping, with a further increase in depth and a tightening of soundstage.

One quirk is that the two opposing drivers do have a cancellation at one spot frequency where their distance apart is equal to half a wavelength. Although this equates to an alarming-sounding 35dB drop at 200Hz it is not something that I have ever found apparent, and so unless you like listening to sine wave sweeps you will never notice it. Overall, they are not the ultimate floorshakers but they are clean, detailed, sweet and dynamic. They are pleasingly unfatiguing to listen to and really show the benefits of their innovative cabinet design.

As a final thought, Mordaunt Short have never abandoned the isolation technologies they first unveiled in the 442s, carrying them over into the 1990s Performance 820, 860 and 880 models, and right into the current Performance series. Indeed the mighty £2,500 Performance 9 subwoofer mounts its two opposing bass drivers in a hefty metal structure, directly coupled to the floor and surrounded by a 'floating' cabinet - sound familiar?

**BUYING SECOND-HAND**

System 442s are not exactly thick on the ground, but neither should you have to wait too long if you have your heart set on a pair. Original cabinet finishes were Walnut and Black Ash, with the former more common - I had a wait of six months or so to find a black pair.

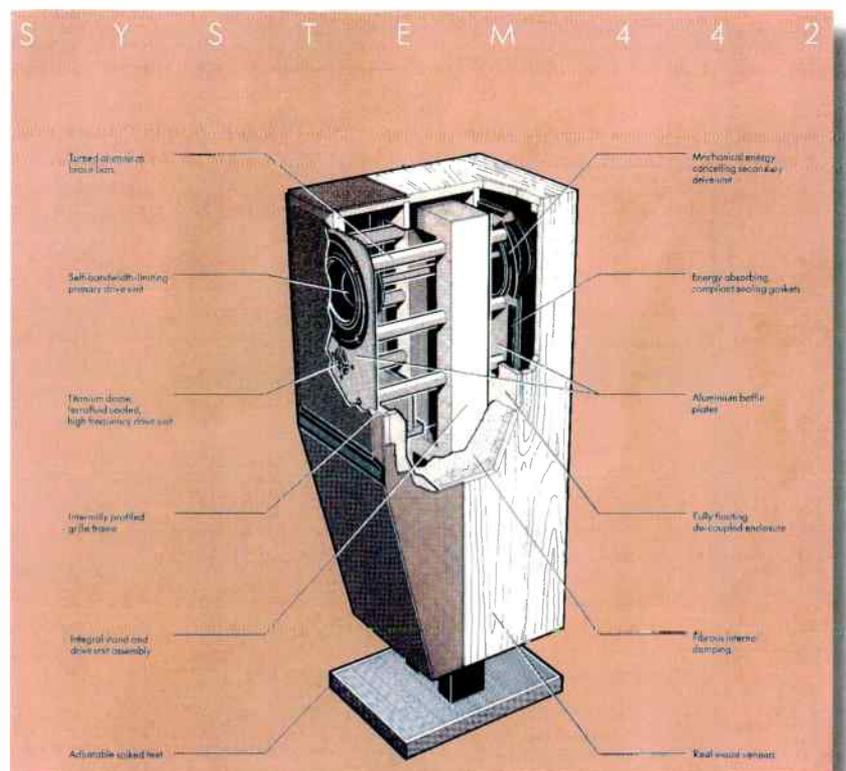
The big issue to watch for is the tweeter. The original unit is a German MB unit, and this is the weak link in the loudspeaker. Despite the best efforts of the 'Positec' protection system that MS fitted, the tweeters are fragile and easily blown and this is precisely how mine arrived.

Unfortunately, according to the fine people at Lockwood Audio, who provide spares for all pre-Audio Partnership Mordaunt Short 'speakers, the spares situation for the whole loudspeaker is quite simple - there aren't any! My own loudspeakers came with some replacement SEAS tweeters which work very well, but have also now been discontinued. However all is not lost, as Wilmslow Audio say that the Peerless V-Line D25AG-35-06 type is an equivalent to my SEAS equivalents, and will not break the bank at £33 each.

Replacement of any of the drivers is not for the faint-hearted, however, as the disassembly process is quite complex, owing to their design and the connecting rod between the two woofers. I have never before taken apart any loudspeaker where the first step is "remove main driver dust cap"...

Mordaunt Short System 442s were an innovative loudspeaker that are still more than

capable of showing modern designs a thing or two about imaging and soundstaging. A fully working pair should set you back around £175-£250 depending on condition, but make sure the tweeters are either working perfectly or have been suitably replaced. Haggle accordingly if not.



# Designing Speakers

## Part 8 - Loudspeaker Measurements

**Peter Comeau explains why you need to measure your crossover design, and how to go about it.**

If you have ever looked at Noel and Adam's measurements in loudspeaker reviews in this publication you might have wondered exactly what relevance the loudspeaker response has to the subjective comments. Indeed it is not always the speakers that have a 'ruler flat' frequency response that do best.

In fact frequency response is only one arbiter of speaker quality. For the reviewer it is just a check that the speaker designer or manufacturer is not totally incompetent and that there are no 'glaring' faults. The experienced user, like Noel, can spot potential flaws and tonal inaccuracies but, in general, it is not easy to 'see' the character of a speaker from its response. For the designer, however, everything changes. With a little bit of insight you can quickly learn to

'see' potential problems from the individual drive unit response and impedance curves. How can this be?

To start with you can look at the individual 'raw' driver response in your chosen cabinet. If you measure the response over a range of axes, say 30 degrees horizontal and 5 degrees vertical, as well as the 'on axis' response, you can easily start to judge how the speaker is going to 'sound' in the room and how well it will integrate with other units. Combine this with the impedance plot and you'll get a good idea of how simple, or complex, a crossover design is going to be.

### WHERE TO START

Don't let any of this preamble put you off! If you haven't understood what I mean by '30 degrees horizontal' don't worry, I am going to lead you through it. We looked, last month, at the basics of crossover design and why you needed to be able to measure the response of the drivers in your cabinet. That doesn't stop you selecting the best drive units for the job at the outset from the manufacturer's data.

What we are looking for are drive units that are going to make our job easier. That way we are more likely to end up with a crossover that is going to be relatively simple, not upset any amplifiers by incorporating crazy impedance phase angles, and is going to be simpler to fine tune when we start listening.

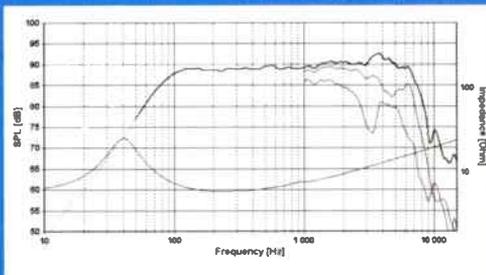
One driver I started work with last month is the SEAS HI217. This has exactly the sort of response we need from a bass/midrange unit for a two-way system. The response on axis, that is directly from in front of the driver, is nice and smooth over a very wide bandwidth. Its working response extends up to 7kHz, which is going to make crossing over at

anything up to 3kHz so much easier because the crossover slope beyond 3kHz is going to be fairly linear and so will integrate much easier with a variety of treble units.

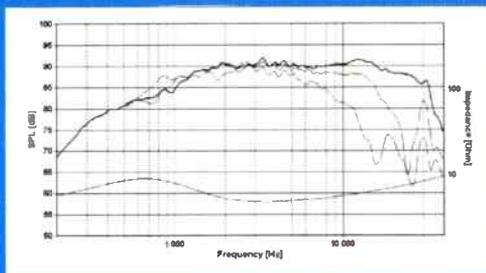
But, as we have discussed, on axis response is not everything. To obtain some idea of the true character of this drive unit, look at the frequency response off axis. To take this response the microphone is moved horizontally by, say, 30 degrees. This shows you two things. One is the response that a listener who is sitting away from the optimum listening axis will receive. The other is the frequency range that is going to be reflected from the side walls and floor and ceiling of the room.

It is these reflections that largely determine the 'character' of a speaker in a room, so always check them, especially when you are designing your crossover. So look at the 30 degree response (the thinner line below the main response trace). Here you can see that the response is still smooth up to 3kHz and beyond. The trace below is at 60 degrees and the output here has a dip at 3.5kHz due to interference from the outer parts of the cone, but this shouldn't concern us much at this stage.

Similarly the impedance plot (the very bottom trace, which is plotted against the index on the right hand side of the graph) shows only a small perturbation around 800-1kHz. This indicates that the cone breakup



SEAS HI217 driver frequency response at 0, 30 and 60 degrees off axis, plus impedance



SEAS HI189 tweeter frequency response at 0, 30 and 60 degrees off axis, plus impedance

(the points at which the cone stops behaving as a true piston and only the inner sections of the cone are producing high frequency output) is nice and smooth. This augers well for a clear, low coloration, midrange performance.

Applying the same criteria to a treble unit we can look at a dome unit from the same stable, the SEAS HI 189. Again what we are looking for here is a smooth response to way below the crossover frequency, and no peaks in the upper treble area. HI 189 extends smoothly beyond 20kHz and has a low fundamental resonance at 550Hz.

Once again the off-axis responses tell us something more. At 30 degrees the response holds up very well to beyond 12kHz, which will help maintain the 'character' of our final speaker design and deliver good quality treble to listeners sitting off the 'sweet spot'. The peak at 30kHz indicates that this is the primary dome breakup mode – well beyond the limit of audibility thankfully.

The impedance plot shows the well damped fundamental resonance (this unit has ferrofluid damping and a rear chamber). Overall this unit should work nicely with a second order or third order crossover, we hope.

## MEASURE FOR MEASURE

Of course you are free to select your own drivers from the extensive range that is out there – just bear in mind the criteria I have outlined when doing so. As far as cone and dome materials are concerned it is easier to avoid the exotic unless you have plenty of experience dealing with their occasional difficulties. For example ultra stiff cones, such as aluminium, will have high frequency resonances which you will have to suppress with a notch filter. With a bit of experience you could incorporate this into your crossover, but it is a problem you could do without when just starting on the speaker design road if you ask me.

So let us get the measurements underway. As I said last month there are now several systems that you can use to generate a frequency response from your speakers. The old method was to take the speaker into an anechoic (without reflections)

chamber and sweep a slowly increasing frequency range into the speaker and plot the output from a calibrated microphone on a graph paper.

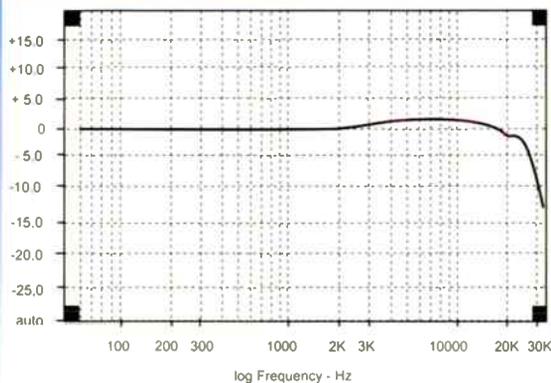
The modern method is to feed a pulse into the speaker which contains every frequency we want to measure and to use a computer to analyse the output of the calibrated microphone. Now there are several advantages to this method. The major one for the home designer is that we no longer specifically require an anechoic chamber. Because we are just measuring everything from a pulse we can select only the pulse and ignore any room reflections which will arrive later at the microphone.

We mentioned last month that the great grand daddy of MLS is the MLSSA program. This has become an industry standard for speaker designers but is sadly outdated by its DOS interface and requirement for a full length ISA card which you can't put into modern computers. Another frequently used system that features an MLS option is CLIO, and this is the system that Noel and Adam use for loudspeaker measurements in the magazine. As an all-in-one solution, complete with calibrated microphone, CLIO is very versatile and will get you up and running quickly, but it is not cheap.

So to get you going I suggest a 'home made' system that you can use with any computer. Proper, calibrated, measurement microphones are expensive, but for our purposes we don't need them. All we need is something that has a flat frequency response. Now you might think that all high quality mics are like that, but they are not. Mics often have a 'presence boost' in the midband to highlight vocals, and rarely have an extended response at bass or treble ends of the spectrum.

One relatively low cost mic that will suffice for our purposes is the Behringer ECM8000. You can pick this up for £35 from a variety of sellers, such as Digital Village ([www.dv247.com](http://www.dv247.com)) for example. This is a condenser type microphone which is ruler flat from 20Hz to 3kHz, has a mild 1dB lift to 20kHz and comes complete with a mic stand adapter.

Being a condenser type it does require power (15v to 48v) but this



## Behringer ECM8000 microphone frequency response

can be supplied by any microphone preamp offering what the PRO boys call 'phantom power'. Again there's a variety of mic mixers that will give you this, but I've found an all-in-one soundcard and mic preamp that interfaces very nicely with the ECM8000.

## SOUND CARD

For MLS measurements you need to be able to use your computer to generate the MLS pulse and receive the input from the microphone at the same time. So your computer has to have a soundcard that is 'full duplex', in other words it can handle input and output simultaneously. If your soundcard doesn't do that then I have a solution for you.

The M-Audio MobilePre USB (around £89) is an all-in-one mic preamp and soundcard that plugs straight into your USB port, so it can be used with a laptop too. It provides phantom power on its XLR mic inputs, so an XLR cable will connect straight to the ECM8000 and away you go!

Now all we need is some software to generate the MLS pulse and a method of analysing the output from the microphone. There are a few systems available to download:

(1) WinMLS. Easy to use and you can try it free for 30 days – but you need the Level 4 PRO version to generate an MLS output, so not much use for the amateur!  
<http://www.winmls.com>

(2) ARTA. Complete, and complex, program developed by Ivo Mateljan. A demo is available and the program is £69 to purchase if you like it.  
<http://www.shareit.com/programs.html?productid=300069215>

(3) Speaker VWorkshop. Clunky interface but it is free! Good support via the forum, and you'll need it until you've mastered its strange system.  
<http://www.speakerworkshop.com/SW/Download.htm>



**Behringer's ECM8000 Microphone - an ideal microphone for a budget measurement system.**

# Walrus

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*One of the finest turntables in the world...*



**New!** Kibri Naima (£1650)  
*A new design from Danish company Kibri. They call it "semi omni", we call it "fantastic"!*



**New!**



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**New!**



**Duevel Planets (£799)**  
*Hot off the drawing board these cute omni speakers fill your room with high quality sound.*



**Funk Firm Vector (£750 + arm)**  
*Original styling and performance beyond its price range ensure this lovely deck's popularity.*



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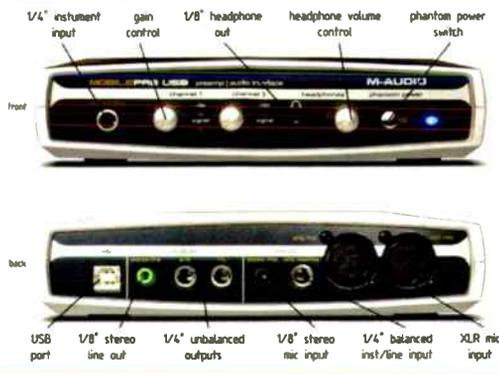
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**M-Audio MobilePre USB microphone preamplifier/soundcard has a good array of features at a budget price**

The Speaker Workshop forum also has a discussion about using the Panasonic electret microphone for measurement. If you are DIY capable this is an excellent way of cutting the microphone costs right down as there is a preamp circuit detailed for this too.

Of course you will also need to connect the soundcard output to your amplifier. A good soundcard will produce a line level output that you can connect to the Aux input of your amplifier in order to drive the speaker. You want to avoid a soundcard that only has a speaker output as its internal amplifier can often be very noisy.

Whichever software you choose you will find that it uses one channel of its input for measurement and one for reference. The reference signal is an attenuated voltage fed from the output of your amplifier. The purpose of this is to make sure that any noise or frequency response errors in your soundcard and amplifier do not affect the measurement. By comparing the output of your amplifier (the reference signal) to the output of the microphone the software can dial out any errors caused by the soundcard or amplifier output.

This type of self calibration is essential if you are to see a clean signal. Although the software is working digitally, the test signal is converted to analogue through your soundcard output, amplifier and speakers as well as your microphone and mic amplifier. Any errors in the chain will screw up your measurements and give you a false reading. Both ARTA and Speaker Workshop show you how to build a suitable attenuator and wire up the inputs to obtain the reference signal.

Note that this reference signal cannot take account of your microphone performance. In particular, in order to obtain accurate sound pressure level readings you will need to enter the manufacturer's

calibration figures into the software. This only matters if you want to see the true sensitivity of your speakers. For crossover design we don't need that level of accuracy.

## FROM A DISTANCE

So, armed with our microphone and software let's look at what we can do. I'm going to use MLSSA

here simply because I use it all the time, but ARTA provides a straightforward interface with easy to create graphs that will give you exactly the same results.

First off we need to measure our drive unit in an enclosure for both frequency response and impedance. The standard distance for measuring speakers is at 1m distance between the front baffle of the speaker and the front of the microphone. This is to allow for a fair degree of integration from the drive units, to integrate the time of arrival of the individual wavefronts from the treble unit and bass unit, although it would be closer to the reality of most listener's typical positions if speaker measurements were taken at 2m.

But the problem with increasing the microphone distance is that you bring the time of arrival of the MLS pulse from the speaker and reflections from nearby boundaries closer together making it more difficult to 'gate' the measurement window. So I would recommend that you stick to around 0.5m or less when measuring in a room. This will give you accurate measurements of the individual drive units, and is usually good enough for working out the starting point of a crossover.

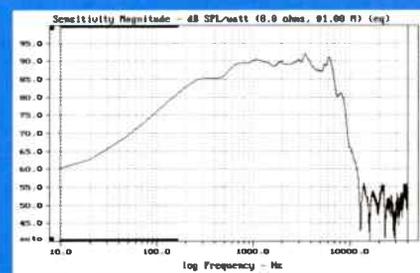
For frequency response we want to look at the on-axis response, that is directly in front of the speaker at the height that your ears are at when you are seated. With a speaker design with treble unit at the top this usually means on the treble unit axis. For a tall speaker you could be pointing the mic mid-way between the drive units. The point of choosing this axis is to find a place which will allow you to align your crossover design to give an even response. Once you've chosen your axis of measurement stick exactly to it for all future on-axis measurements.

So, find your ideal on-axis position and run a frequency response. You will almost certainly see a deviation from the drive

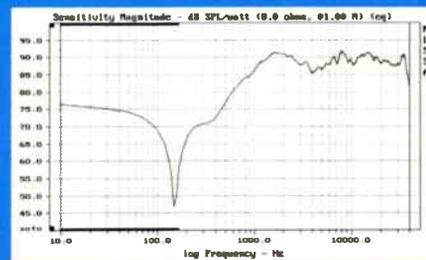
unit manufacturer's response. For example, as outlined last month, you'll see the baffle step for the bass driver. Also, presuming that your mic is pointing at the treble unit, the bass unit treble output will fall off a little earlier than expected. This is because you are actually measuring the bass unit off its central axis and its high frequency output will be curtailed.

Turning to the treble unit you'll see, here, the effects of the baffle edges and any impediment to the baffle itself. Because a dome treble unit sprays high frequencies in all directions any surface edge, ridge or hollow on the baffle will cause an early reflection which can interfere with the main output of the treble unit. This is why speaker grilles are generally considered a 'bad thing' when listening to speakers. Interestingly, the biggest hollow on the baffle is the bass unit cone itself, and its surround and chassis cause reflections very close to the treble unit. This is one good reason to recess the chassis of the bass unit into the front baffle.

So you will probably see a dip in the treble unit response which, again, makes it look rather less smooth than the manufacturer's spec. At this stage I wouldn't worry about these deviations. You could spend days trying to cure them and often the cure is worse, acoustically, than the problem.



*With H1217 in an enclosure with a 20cm wide baffle the baffle step becomes clearly visible. Ignore the response below 200Hz as the gating is not wide enough to show any accuracy down here, as shown by the black bars.*



*H1189 in the enclosure doesn't look much like the manufacturer's spec, does it? The dip between 3 – 6kHz is partly due to the proximity of the cabinet edges and also due to the bass unit cone below it. Again ignore the trace below 200Hz.*

## FINE-TUNING THE MLS MEASUREMENT

To measure without an anechoic chamber we need to be able to separate out the pulse received from the speaker and the reflections from the room. Graph 1 shows the first 20mS of sound received by the microphone. You can clearly see the initial pulse from the speaker, then the output settles down to a smooth (silent) period, followed by the microphone picking up the small reflections from the room boundaries numbered 1 to 5. The first, no.1, reflection is that from the floor. This is because the floor is the closest boundary to the drive units. After that the reflections will arrive from the next nearest of the walls or ceiling and, finally, from the wall behind the speaker or the microphone.

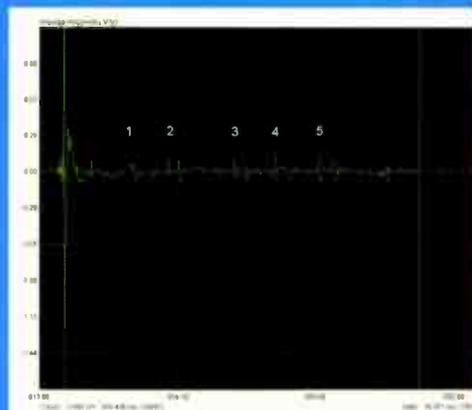
Now, just by moving the cursor on the time display, we can tell the computer only to select the part of the pulse which falls between the cursor marks. We call this 'gating'. The cursor marks form a 'gate' where the open area between the cursor marks is the period we want to measure.

Although the pulse, called a Maximum Length Sequence (MLS), contains every frequency we want to measure, the system is only accurate if the time period enclosed by the gate is long enough to capture the time taken for the lowest frequency to form a half wave. The reason for this is that the MLS, although looking to us like a pulse, is actually considered periodic by the receiving software. So, unless the gate is long enough, there will be errors in the low frequency measurement.

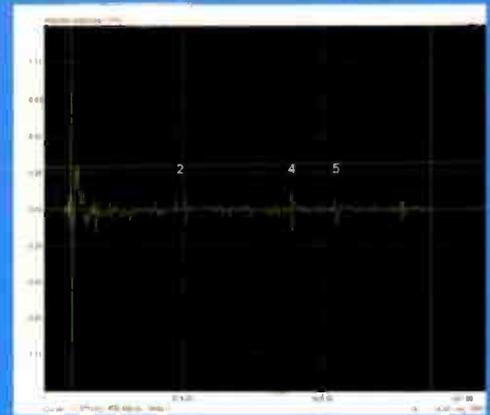
In fact we don't have to worry about this too much. Opening the gate too wide will bring in the room reflections, so don't do that. Keep the measurement gated to remove the reflections and put up with a curtailed LF response instead. The bass end of the graph doesn't really tell you what the speaker is doing in the room anyway and, as we want to concentrate on the crossover area, we really only need to look at the midrange and treble performance.

The more seasoned MLS user will mathematically splice a measurement taken close to the drive unit to one taken at 1m. This effectively gives a good indication of the bass performance in free air as the close mic technique (usually around 1cm from the driver) avoids all reflections. It doesn't tell you how the speaker works in a room, though, so the amateur designer is better off using his ears. This close mic technique can be used successfully for subwoofer design though, so it is worth mentioning.

There is one trick that you can use, however, to open the gate wider. Position the mic and speaker at opposite ends of a sofa, place lots of soft cushions or pillows on it, and you should 'lose' the floor reflection. That will be as close as you can get to 'anechoic' in your living room!



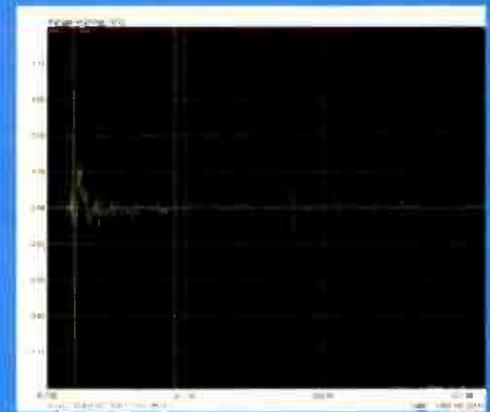
**Graph 1 - This is the impulse response of a speaker in a room. The initial pulse is the speaker output, followed by boundary reflections 1 to 5.**



**Graph 2 - The little trick of placing microphone and speaker either end of a sofa removes the ground reflections and subdues some of the wall reflections.**



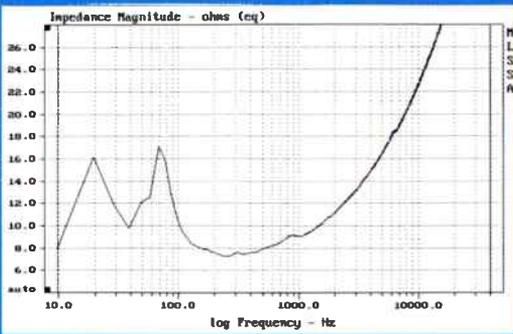
**Graph 3 - With the time gate open fairly wide these remaining reflections still cause a very jagged looking frequency response.**



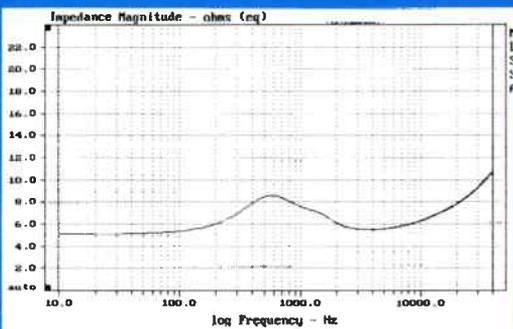
**Graph 4 - We use the cursor markers to limit (gate) the analysis and 'lose' the reflections.**



**Graph 5 - This gives us a usable frequency response but with an inaccurate bass content (shown by the yellow bar at the base of the graph).**



The impedance plot of H1217 shows the typical double hump of a bass reflex tuned to 40Hz. Ignore the triangular look of the peaks which is because the number of points plotted down here doesn't provide high accuracy. The wrinkle in the trace at 300Hz indicates an enclosure resonance (well damped). Another wrinkle at 800 Hz is part of the drive unit characteristic. We know this because it can be seen when the impedance is measured outside the enclosure.



Impedance of the H1189 treble unit shows the broad, well damped fundamental resonance of the unit due to ferrofluid damping and the rear enclosure used on this unit.

## THE IMPEDANCE QUESTION

Now let's turn to impedance. These traces should be fairly straightforward and, with a little bit of knowledge, will help you see what is going on inside the cabinet. Each trace will have a hump at the bottom end of the drive unit's bandwidth which shows the fundamental system resonance  $F_s$ . For a bass unit in a sealed box you will see one major peak. For a reflex system you will see two major peaks, and here it is the valley between the peaks which shows the box tuning frequency. A transmission line should look a little bit like a reflex box but with the bottom peak so low it may well be off the end of your graph. We'll go into these in more detail when we get to the actual design stage.

The height and breadth of these peaks will depend on the amount of damping included in the system. This is important. If the peak is low, smooth and broad (low  $Q$ ) you may have overdamped the system and have too 'lean' a bass performance. If the peak is high, narrow and sharp (high  $Q$ ) the system is probably underdamped and will sound boomy

or resonant.

If you see any major deviations in the impedance trace higher up the frequency scale then these indicate other problems. What you have to remember is that the impedance trace is taken from the back EMF of the drive unit – the voltage fed back from the drive unit to your computer. So the drive unit is acting as a microphone itself.

A bass cone, for example, will pick up any resonances inside the enclosure, and these will reflect as deviations in the impedance trace. So, for a floorstanding cabinet, you will probably see a small peak in the impedance trace between 100 – 250Hz. This will be the effect of the primary

standing wave set up from the bottom to the top of the cabinet.

Higher up in frequency you may see another peak in the trace. This may be the reflection from the back to the front of the cabinet. If the sound from the back of the cone hits the cabinet right behind the bass unit it will bounce back onto the cone. If you didn't put any damping material in this area.

You can also look for wiggles in the trace which are due to panel resonances in your enclosure. If you have an unbraced box these can be quite severe and you'll need to apply panel damping compound to the interior of any resonant panels (you can hear these just as well by tapping the enclosure panels with your knuckles).

For a treble unit you'll probably just see its  $F_s$ . If the treble unit has ferrofluid in its voice coil gap then this fundamental resonance will be broad and smooth indicating the effect of the ferrofluid damping. But have a look and see if there are any wiggles in the trace at high frequencies. These can indicate resonances in, or behind, the dome.

Not much you can do about these, of course, so they are only of interest as to the 'quality' of the drive unit design.

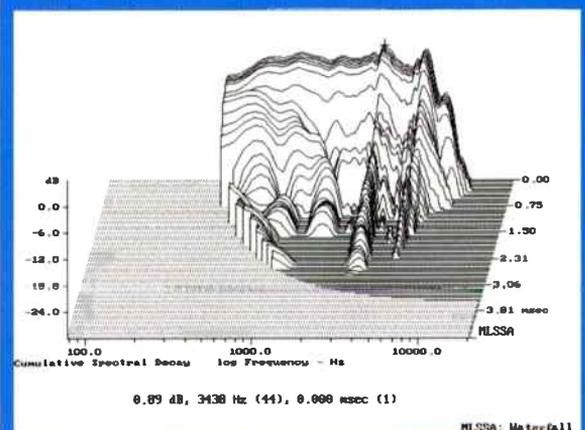
So, now that you've made a start on your measurements and, hopefully, are feeling more confident in your use of the software, what's next? Well next month you will be happy to know that we are starting our first loudspeaker design project and, as the easiest way to teach is by example, I'll show you how to run through a speaker design from start to finish.

## MLS 'WATERFALL' GRAPH

You can get a clearer picture of all these resonances if you run a 'waterfall' graph. Some of the software I have recommended provide this facility, otherwise called a Delayed Resonance display. What the software actually does is to run an FFT analysis on different parts of the output of the speaker over time. If you like it does its own 'gating' and looks at the speaker output after the pulse has finished as well as the pulse itself.

So what you see in the waterfall graph is the initial frequency response of the unit, displayed at the back, and then response traces taken at increasing time intervals stacked up in front of it. A perfect speaker would only have output at the initial pulse but, of course, all speakers hang on to some energy (drive units as well as cabinets) and this is output after the pulse has finished.

These 'delayed resonances' are shown as ripples in the response which spread forward as the time from the initial pulse increases. Now it is going to be difficult for you to separate out the resonances from the enclosure and the resonances from the room. You will need to play around with the way you use the gate markers in order to avoid room resonances creeping into the time window for the waterfall trace and this takes a lot of experiment and experience to make any sense of what is really going on in the speaker itself. But do have a go – just don't get worried by the results at this stage.



'Waterfall' delayed resonance graph of H1217 in its enclosure. The ridges at 3500Hz and 6000Hz correspond to peaks in the frequency response graph and indicate minor resonances in the drive unit.

"the cassette went on to become one of the biggest selling music formats"



## adam smith

I must confess to a slight nostalgia trip this week, on reading that Currys are now to stop selling blank cassettes in their stores, following in the footsteps of Woolworths and HMV, who have already stopped. They also say that they will gradually be phasing out the sale of what they optimistically refer to as 'hi-fis' with cassette decks as well.

It was way back in 1963 that Philips introduced the 'compact cassette' to Europe and, although it was originally intended for data and speech and definitely not for music, this was the free-thinking sixties, man, and so this was promptly ignored. Consequently the cassette went on to become one of the biggest selling music formats for many years.

Now, as a vinyl fan from a early age I have never bought a pre-recorded cassette in my life, but did a fair amount of recording my own over the years, both of my brother-in-law's huge record collection and for the making of various compilation tapes for the walkman and, latterly, the car. As a result, I still have fond memories of the skills that had to be mastered in order to achieve a good result. Whether it was skipping through the louder parts of an LP (which you could easily, see, unlike on a CD!) to set your record levels; releasing the pause button at just the right moment to avoid either that thud as the stylus landed or missing the first few bars of the track; or skillfully fading out the music as you saw the tape coming to an end whilst the music was still playing, these were techniques that took some mastering.

I suspect I am also not the only one who used to religiously spend Sunday evenings recording favourite songs from the 'charts' and the knack of swiftly fading things out just before

the DJ started speaking really sorted the men from the boys in recording terms. Borrowing a similar tape from friends who had not perfected the art was always an irritating experience!

As a development of open reel tapes, cassettes were a revelation, as they were convenient, compact, self-enclosed and, with the advent of high speed dubbing, were easy to copy. They even started to make half decent noises eventually, thanks to chromium dioxide and metal cassette variants and the superb efforts of, amongst others, a certain company called Nakamichi.

The trouble was, their disadvantages still outweighed their advantages for many people. Cassette decks are complicated beasts, owing to the need for precisely moving the tape past the head at a precise one and seven-eighths inches per second (ips). The forerunner of cassette, the open reel tape, ran at a minimum of three and three quarters ips and more usually at 7.5 or 15ips for high quality work, consequently the frequency response offered by cassette suffered, with most decks achieving an average upper limit of around 14-16kHz.

In order to achieve this performance, many moving parts were required. One or more motors need to be combined with one or more pinch rollers and capstans to drive the tape, and then there are usually at least two drive belts (I have seen up to six...) to take care of fast forward and rewind operations, along with a whole host of rubber drive wheels, mechanical linkages to position everything and tension springs to keep these linkages in place, until needed. As a result, even the simplest decks are relatively complex beasts, and can cause an unsuspecting engineer a considerable

fright when opening the bonnet of one for the first time!

It is not even the case that a hugely flourishing second hand market for such items exists, due to this complexity. Second hand cassette decks are something that even I tend to steer clear of as, whilst it is possible to stumble on a good 'un every now and then, they are not the sort of machine that you can take a quick poke round in order to ascertain its health. Whilst an operation check will tell you if all those belts are basically OK, it is impossible to check whether the heads are damaged or even correctly positioned. Some spares are still available but they require test equipment and rare alignment cassettes to set up properly, although you can get about 90% of the way there with a well recorded tape on a known good machine and with a good ear. Servicing cassette decks can be something of a challenge for even the best-prepared and I can remember occasions when a simple belt change has taken me upwards of two hours, simply because of the need to disassemble the entire mechanism to get at the thing!

With the advent of mini discs, recordable CDs and now, of course, MP3s, the writing has been on the wall for the good old cassette for some time now, and it would appear that it is finally starting to come to the end of the road. Whilst a now surpassed format, I still think that, for those of us who have ever swapped compilations with our mates, carried out the aforementioned Sunday evening chart ritual, or even loaded a game onto a ZX Spectrum, the good old cassette will have a place in our hearts, for nostalgia reasons if nothing else. A moment's silence is in order I feel...●

# "imagine how we'd react to a typical hi-fi system of 1973?"



## dominic todd

As I write, the surreal BBC drama 'Life on Mars' has just reached its conclusion. In a way, any series that skillfully taps into the romanticism of the past can't help but succeed; we're all susceptible to a little nostalgia. Whilst reveling in the delights of nineteen seventies fashion, brown Cortinas and dubious ethics, I couldn't help but wonder about the hi-fi back then. Imagine how we'd react to a typical hi-fi system of 1973? Interestingly, although loudspeaker technology hasn't changed a great deal since then, it's probably the one part of a typical hi-fi that we'd find the most alien to our 2007 ears.

Three and half decades ago, the typical speaker was broad of girth and short of depth. It would have had multiple drive units, a flimsily (by today's standards) constructed cabinet and complex crossover. The sound quality was, more often than not, bassy to the point of boom and certainly not all that great in terms of imaging or insight. There are literally hundreds of designs that would fit this type but, if you really had to have an example, then look no further than the KEF Cadenza.

Finished in obligatory teak, it was a three-way design with, good quality, drive units scattered across the baffle in a manner typical of the days before computer aided placement technology. The ABR (Auxiliary Bass Radiator) or 'racetrack' woofer was and indeed, still is something of a KEF speciality and would no doubt have lent plenty of heft to proceedings. However, I can't help but think that broad black baffle can't have been too good in terms of allowing the sound to breathe. Naturally, most listeners would have been blissfully unaware

of what lurked beneath the stapled on cloth grill, as those were the days before it was considered *de rigueur* to remove it.

Hearing this speaker recently did make me yearn for something a bit more minimalist, and that's exactly what we got in the 1980s. Whilst interior design magazines might like to think the term was created on a wave of *Feng shui* inspired design ten years ago, there was definitely an attitude of less is more, well before that. From the world of hi-fi speakers, early eighties designs such as the Wharfedale Diamond, Celestion SL6 and Acoustic Energy AE1 satisfied our cravings for the more discreet and subtle.

Such designs proved that a big sound could indeed be achieved from a small box, that loudspeakers really only needed to be two-way and that it was better for imaging to keep the front baffle as narrow as possible. All-in-all, we were pretty smug with our new found intelligence, even if hindsight has shown that such boxed wonders weren't always as infallible as we believed at the time. No matter how loud they go, small boxes do compress dynamics. Then there's the issue of efficiency. Most struggled to achieve a figure beyond the mid eighties (dB) which directly stifled the success of sweet Class-A and valve amplifiers that struggled to provide enough juice.

Roll on 'Britpop', and the loudspeaker climate changed once more. By now, efficiency was being seen as a more important issue. Cabinets were also getting bigger to provide sufficient power for the increasingly bassy musical tastes of the time. Crucially, lessons had been learned from the seventies and although speakers were large again,

this time they were also narrow for improved imaging and used simpler drive unit arrays. For a typical nineties speaker think TDL RTL2/3 or Mission 733 and you'll be right on the money.

So, where does this leave us today? Well, at this point, it's hard to define a particular trend: only hindsight will be able to provide us with that. What it is possible to see, however, is a series of small changes in design. Interestingly, many saw the domination of sub/sat 'speaker systems as inevitable, although this never really happened. True, the likes of KEF's KHT 'eggs' and the Mordaunt Short Genie systems are popular with home cinema fans, but the sub/sat formula has yet to make a great impact on the two-channel market.

I would argue that what we are seeing is a return to smaller boxes. Given that housing is becoming increasingly dense, this is no surprise. Whilst quality slipped from the obsessive eighties to the cost-conscious nineties, we have seen a recent renaissance here; especially amongst cheaper loudspeakers. Finishes are far more lustrous than they ever used to be, and even £100 cheapies now come with piano gloss paint jobs or even real wood veneers. Finally, the speaker shape is subtly evolving. Everywhere you look edges are rounder, and there seems to be a particular fashion for the teardrop profile that increases cabinet volume whilst keeping the baffle narrow.

Whilst the hero of 'Life on Mars' may have felt the flawed seventies a better place to be, in terms of hi-fi loudspeakers I think that the here and now is the better option. That said, I will always make time for the odd indulgence: as I write, a pair of KEF R105s are already on my shopping list...●

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World Radio History

"vinyl is now being seen as a format that record labels want to exploit, once more..."



## paul rigby

**R**emember Alan Whicker, that much-impersonated globetrotter who many years ago used to roam the world visiting all and sundry? One week it was a rather nasty dictator, the next a super-rich lady dripping with diamonds. In many ways, Whicker was a media prophet, opening up the Pandora's Box of what we now see as 'celebrity culture'. From David Beckham to Paris Hilton, much of society is transfixed by the life, times and movements of such people.

This 'celebrity culture' is now permeating many aspects of life, and reaching as far as the hi-fi industry and beyond. Even the studio side of the recording industry has its cult figures, and a subset of that – the vinyl industry – has its celebs too, such as big name mastering engineers. Indeed, it's a symptom of the increasing popularity of vinyl that the music industry now believes we all need to know about the movements of this select bunch of people.

In fact, Rhino thinks it should shout about them from the rooftops. "Warner Brothers records with Rhino/Reprise recently announced that they have hired Steve Hoffman, one of the world's most revered mastering engineers, to undertake the most ambitious vinyl reissue programme of any major label in recent history."

We'll get to the juicy vinyl news in a minute but, before we do, doesn't it strike you as interesting how Rhino has gone about announcing this news? The above is a verbatim copy of the very first paragraph of a 500 word

press release. Back in the old days, Rhino would have announced its vinyl issue programme by jumping up and down at the titles it was releasing, shouting about release dates and possibly the fancy packaging but would never have even considered to tell us who was going to master the things.

After all, a mastering engineer is a backroom boy, the guy who messes with all of that very complicated machinery, the chap who gets his hands dirty. Who wants to know about a mere record company employee? (You could imagine a nineteen seventies besuited record label executive almost spitting out those words as if he's found a bad taste in his mouth!)

It was Dylan who talked about times a 'chargin' wasn't it, and boy haven't they? Because of those very seventies recording industry execs, the vinyl industry was decimated in terms of research funds, hardware budgets and the supply of talent. The vinyl industry has now become a niche – a strong niche but a niche all the same. So now that vinyl is suddenly being seen as a format that record labels want to exploit – once more, the genuine talent is thin on the ground.

Supply and demand is in favour of the workers. So, when a record label, even as big as Warners, which owns Rhino, manages to pull off a recruitment such as Steve Hoffman, it's an event. Hoffman is now a star, something to shout about. "Hey! Hoffman's here! He's working for us! Sorry? The vinyl, yea, we'll get to that but, listen, Hoffman's working for us!"

Ah, the irony...

As for Rhino and that vinyl? It all sounds rather luscious. Steve Hoffman will be working with his cutting cohort Kevin Gray, at Gray's AcousTech Mastering, an outfit that has been no stranger to Classic Cuts or my audiophile vinyl review column. The records will be pressed on 180gm virgin vinyl at RTI and all are being cut from original Warner Brothers/Reprise stereo master mixes - some of which have been untouched for thirty five years.

A confirmed list of releases is rather elusive but expect to see albums such as Fleetwood Mac's 'Rumours', James Taylor's 'Sweet Baby James', Van Morrison's 'Moondance' plus artists as diverse as ZZ Top and Frank Sinatra. The announcement doesn't just relate to classic vinyl, either. Hoffman is currently working on a vinyl version of The White Stripes' new album 'Icky Thump' – sourced from "amazing sounding 30ips master tapes". There will be a dedicated website where you will be able to order these titles and much more: [www.becausesoundmatters.com](http://www.becausesoundmatters.com).

Hoffman himself said that, "the old EQ cutting masters had compromises built in to the sound of the tapes. In the old days the tapes were routinely EQ'd, compressed and sometimes filtered to make it easy for needles to track the groove. When I bypass those tapes the original untouched master mixes will reveal a whole new scene; detailed, beautiful sounding dynamic music appears, and we can cut this directly onto a phonograph record." Can't wait...●

Some decisions are just so simple

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# "DAB radios only account for a measly 3% of all radios in use in the UK..."



## steven green

Ofcom recently announced that they would be holding a review of FM transmission in 2012, at which point they may set a switch-off date for it. Unfortunately, certain parts of the media reported this using headlines that made it sound like FM hasn't got long to go, which will no doubt fuel the growing urban myth that FM will be switched off at the same time as analogue TV in 2012 – which I can assure you it won't be.

To put the situation of switching off FM into context: according to Ofcom there are around 150 million FM/AM receivers in use in the UK, and total sales of DAB receivers currently stands at 4.6 million. Despite DAB radios only accounting for a measly 3% of all radios in use in the UK, Ofcom has bullishly estimated that digital radio listening, in all of its various forms, will account for 90% of all radio listening by 2017 – a forecast that was described as being "totally delusional" in the *Sunday Herald* by radio expert Ken Garner. Irrespective of Ofcom's state of mind, they've certainly got a mountain of Everest-sized proportions to climb before FM could be switched off.

One issue they face is that, although they haven't stalled completely, DAB sales are well below the broadcasters' expectations. For example, the national DAB multiplex operator, Digital One, forecast in October 2005 that total DAB sales would be 5.2m by the end of 2006, yet they're only 4.6m now. So whereas sales had previously either met or beaten expectations, something seems to have gone seriously wrong over the last eighteen months or so.

One thing that the Digital One document predicted that hasn't gone according to plan was that DAB sales were expected to take off in the run-up to Christmas 2005 in Germany, Denmark, Norway, Sweden, Belgium, Holland, Switzerland, Spain and Italy, but sales remained stagnant in all of these countries other than in Denmark and Norway, and they only have a population of around five million people each.

The reason why the sales in other countries are holding back sales here is that the price of receivers in the shops is dependent on global sales volumes. So with low to non-existent sales in other countries, the UK is effectively trying to drag the selling price of DAB receivers down on its own, but there's a limit to what the UK can achieve in isolation – for example, DVD players wouldn't be anywhere near as cheap as they are today if they were only sold in the UK.

The UK broadcasters really need to try and get sales off the ground in as many countries as they can and as soon as they can, or else in my opinion they can kiss goodbye to their hopes of switching off FM any time before 2020.

However, those European countries where DAB sales haven't taken off will adopt the new DAB+ system, not DAB, so if the UK broadcasters want to help stimulate sales in these and other countries they need to introduce DAB+ receivers into the UK as quickly as possible, because the UK is the only country with sales high enough to bring the price of new receivers down to generally affordable levels.

Another issue they face is that all digital radio stations will have switched to using DAB+ long before

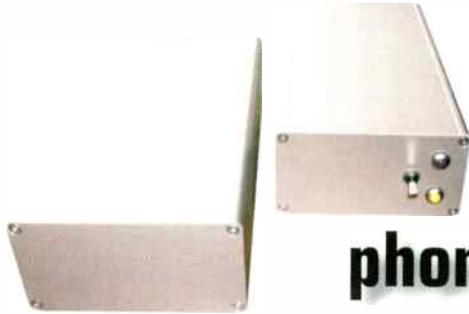
FM can be switched off, so any delay in introducing DAB+ receivers into the UK will simply put back the date at which FM can be switched off.

As the broadcasters would like to switch off FM as early as possible (because, amongst other things, it's expensive to transmit DAB and FM simultaneously), it is odd that they're apparently taking such a laissez-faire attitude towards getting DAB+ receivers into the shops. For example, despite new DAB/DAB+ receiver modules being available, I've been told that only the mid-priced and higher-end models will support DAB+ at first, and the entry-level receivers that are using these new modules won't support DAB+, even though it costs a pittance extra to add it.

However, Channel 4, which is moving into radio, has estimated that all new portable radios would support DAB+ within the next two years, but if it takes that long I can't see how they'll be able to switch off FM before 2020, because it would leave too little time to replace all of the FM/AM receivers in use. For instance, when exactly are they proposing that cars will be produced with factory-fitted DAB+ car stereos?

Personally, I'm not against FM being switched off, because by the time it could happen I'm confident that we will have near-CD quality – or possibly even CD-quality using lossless compression – radio delivered via Internet multicasting [see p36 for more information on this - Ed.] and DAB+ will have vastly improved the audio quality available on the DAB system as well. But if they want to switch off FM as early as possible, and I'm sure they do, they've certainly got a funny way of going about it. ●

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## phono stages

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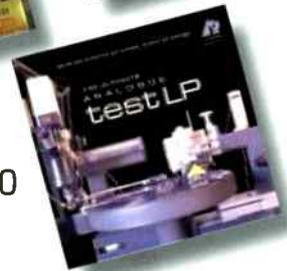
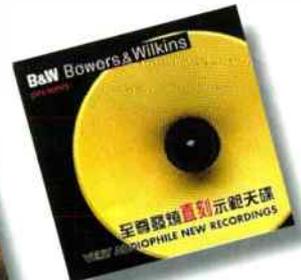
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"it is bizarre that radio sound quality has deteriorated rather than improved..."



## noel keyword

So what's the most boring site on the internet? Well, how about one that features pictures of aerials? Go to [www.mb21.co.uk](http://www.mb21.co.uk) and you will see what I mean - except that the pictures are anything but boring! Windswept moors, sunsets and even aerials with a crescent moon behind can all be found on this unusual website, as well as pictures from the tops of tall transmitters showing the surrounding countryside. I wonder whether big transmitters will continue to be imposing sentinels atop tall hills in future, because the nature of broadcasting is changing?

In the fight to reach you, broadcasters are going all out to perfect new ways of delivering movies, television and music to us all, in our homes and on the move. Aerials of the large transmitting type seen on mb21, often with romantic names like North Hessary Tor, don't easily fit this new scenario. The BBC once owned and ran them all, but those days ended some time ago when the nature of broadcasting started to change. If you are interested in this as I am (sad I know!) go to [www.uk.nationalgridwireless.com](http://www.uk.nationalgridwireless.com) who are now the keepers of the UK's aerial network and talk about the heritage.

Nowadays, we need small, pocketable radios, televisions and mobile phones. Small devices demand small aerials, which is the main reason, believe it or not, that those giant masts on distant hills are likely doomed. Small aerials are only efficient at high frequencies, and it so happens that we must use high frequency transmission to carry many channels of digital video. So where once a Roberts Medium Wave valve radio with its telescopic aerial could receive programmes from a giant transmitter a hundred

or so miles away, nowadays the scene is altogether different and more demanding.

Small aerials have become big business; you can read about a new one for mobile TV at [www.siano-ms.com](http://www.siano-ms.com). This tiny chip measures just 15x10mm and is designed for a new generation of mobile devices. Working across a very high frequency band from 470MHz up to 870MHz, signals of such short wavelength are easily absorbed and deflected by buildings, hills and trees. Consequently, the old scheme of placing transmitters on distant hills, such as those you can see on mb21, is slowly dying out as they transmitted much longer wavelengths. As Siano say, people nowadays are not prepared to pull out a telescopic aerial; it just isn't cool, hovering somewhere near to 1980s brick-sized mobile phones as an *outré* fashion accessory.

Nowadays we need aerials for much, much more than analogue television and radio. Those old masts and new ones now carry DAB, public service transmitters, digital terrestrial television (Freeview) and much else. But all is not going too smoothly in the changeover. As the Navy's old VLF (16kHz!) submarine transmitter masts are torn down at Rugby, symbolic of the passing of the old, the new isn't being greeted with universal enthusiasm. In place of those old masts sited far from view we now have a visible and intrusive national network of small transmitters dotted along motorways and secreted atop tall buildings in urban conurbations, including schools. I don't blame people for being suspicious about the potential health risk posed by these things quite frankly, as powerful microwave transmissions aren't especially friendly to living things. Whether they are directly responsible for health problems or

not, I somehow wonder whether the whole idea of erecting yet more to handle L Band DAB transmissions is a good idea?

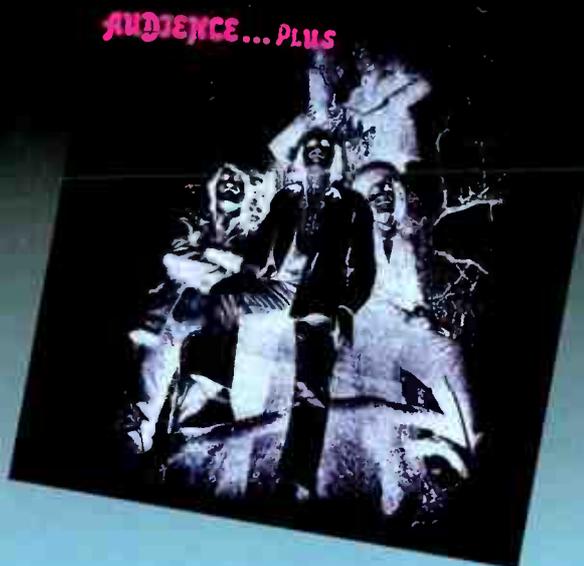
The alternatives of satellite and cable seem to offer more bandwidth together with less intrusion. Whether satellites will ever have enough power to feed personal mobile devices successfully is an interesting question. America has the Sirius satellite broadcasting system that offers high quality radio, and we have BSkyB of course, but both need large-ish aerials to gather a weak signal and if people are reluctant to use telescopic aerials nowadays I don't think they will take to carrying around satellite dishes for the mobile phone.

In the home though, the picture is rather clearer. Britain will be getting much improved broadband in the next few years, offering 24Mbps download speeds and this may well tip the balance toward receiving quality broadcasts via cable, spelling the end of the roof mounted aerial. I can't help feeling this might help improve UK broadcast quality standards to those enjoyed by the French and Germans, who have not sacrificed quality to quantity in the peculiarly crass way Britain has. Then it will take time and a lot of concerted effort from people like us at *Hi-Fi World* to try and convince our somewhat parochial and naive broadcast establishment that quality is valuable, which is why we are getting HDTV for example, and that it isn't either wise or necessary to sacrifice it completely for quantity.

It is bizarre that some fifty years or more after Britain commenced VHF/FM transmissions from those huge masts on distant hills, radio sound quality has deteriorated rather than improved. Those old aerials did a good job and I will enjoy looking at pictures of them for a few more years yet ●



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AUDIENCE... PLUS

**ROB MULLENDER, WOODEN SPOON, THE EIDETIC BAND, LADYSWOODSMAN**  
*Free London*  
**Bo'weavil**

A seriously leftfield record label, Bo'weavil concentrates on folk and free improvised music. 'Free London' features new Avant-Garde Folk, known simply as Avant-Folk. Each of the artists, on this double album limited to 550 copies, takes a single side for themselves so this is a compilation of artists as opposed to a combined artistic project, "They use traditional instruments that are synonymous with folk but in a more improvisational format," said label boss Mark Morris. "The artists come back to traditional formats or borrow melodies from other folk tunes. It is a scene that's been around for around ten years."

Music of this type requires a sympathetic production team, "I have to sit in on the cut to see what the guy's doing. Just so I know that he understands the music that he's dealing with, that later in the record there may be a louder more freer

part of it that he might not take into account," said Morris.

That is just for the act of cutting the record itself. The actual mastering, especially for this album, was done by the artists themselves. This makes sense because each side of this record sounds vastly different.

Rob Mullender's instrumental acoustic guitar is quite studio-like whilst Ladyswoodsman's more experimental effort sounds like it was recorded in a bare room. "It was," replied Morris, "for Wooden Spoon, you can hear the air around the recording. He uses a quarter-inch tape machine and it's the sound he very much wants. It makes you feel that you're stepping into a field recording from the 1960s." It certainly helps to give this form of music a uniquely English sound.

**AUDIENCE**  
*Audience... Plus*  
**Akarma/Polydor**

Originally released in 1969, Audience (which consisted of singer/ guitarist Howard Werth, saxophonist Keith Gemmell, bassist Trevor Williams

and percussionist Tony Connor) can be described as 'early prog' in style. Their music on this, their debut album, showed that typical approach that many similar bands of the time were struggling with.

Audience were part of a conglomeration of developing artists: those who were immersed in the typical blues/rock style that was awash on the scene at the time and those bands, like Audience, who were wanting to move forwards and try something new and more complex – more prog-like, in fact. The tracks on this album reflect this struggle.

'Banquet' is a mixture of Genesis vocals and Van Der Graff Generator sax-based vibes - which is odd because, when Audience would later sign for the Charisma label, they would tour with both bands. The second track on the album, 'Poet', is pastoral – very acoustic in approach with both acoustic guitar and flute. The third track, 'Waverley Stage Coach' features a blues vocal but with prog-like time signatures. Those signatures would be a little more developed in the track, 'Heaven Was

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An Island'. However, blues-rock is always there, trailing the album like the tail of a comet, slowly becoming detached but still forming part of the whole.

As the band developed, they were noticed by Charisma Records' Tony Stratton-Smith who signed them up to his label. Audience went on to record three albums with Charisma. This debut effort is a welcome re-release and Akarma should be praised for making the vinyl issue available again (the 'Plus' moniker reflects the inclusion of three bonus tracks) because the album's rarity value means that original copies change hands for upwards of £200 each.

**THE PRETTY THINGS**  
*The Pretty Things*  
**Sundazed**

One of the bands that formed the British Invasion, this album from 1965 showed the Americans exactly what 'shock and awe' was all about. They even put fellow invaders, The Rolling Stones, in the shade when it came to raw, punk-like, power (actually Dick Taylor, on guitar, was part of an early incarnation of the Stones). Sundazed was fortunate to grab the original master tapes when they produced this sparkling reissue, as CEO of the label and album producer, Bob Irwin, explained.

"The masters were in wonderful shape – with very little work needed. It was definitely a 'less-is-more' scenario. There is an art to know when not to mess around with something! Several of the previous editions of this material sounded very harsh compared to the original

US releases - we strived to capture the original, authentic sound of the recordings."

When creating this new re-release, the label referenced it against the first pressing of the original US Fontana album, "we made sure that we matched the sound of that record, which was always our goal", said Irwin.

In fact, the label has been close to the band for some time, although none of the band were included in the remastering. "We've known members of the band for many years," confirmed Irwin, "but this was a very straightforward affair - not at all a complicated or involved mastering project. This was a full-track mono tape, it sonically resembled the release envisioned on the original vinyl pressings from the 1960s. In the near future, we'll be applying the same philosophy to our upcoming 12" vinyl release of 'S.F. Sorrow.'" Good news for all Pretties fans, then – 'S.F. Sorrow' was the first rock opera – it even gave Pete Townshend the idea for The Who's 'Tommy'.

**CRAIG MOORE, RUDI PROTRUDI, THE OTHERS**  
*Yellow, Purple And Green*  
**FUZZTONES**  
*Salt For Zombies*  
**Teen Sound**

Both these new re-releases are limited: The Others to 500 copies and the Fuzztones to just 300 copies. Both LPs feature one Rudi Protrudi, who is also the lead singer on both. The style is garage/punk. However, in this case, not from an American suburb during the mid-1960s but from Italy during the late nineties and early noughties when the style was continuing a

revival and many European bands were not only aping the music style of the early garage bands but also dressing like them too. Both have just been released via the Italian record label, Teen Sound.

Massimo del Pozzo, label boss and founder of The Others has been adamant that the aim of the label has always been to keep alive the sounds of the 1960s, and vinyl has always been an iconic part of that ethos. "Since the start, I've always supported vinyl, as a matter of fact it's been the only format we've used until the very early '00s. To me it's simply the 'real thing', the way music should be recorded and produced for, not just listened through."

He uses Delta studios in Italy to produce his records. "Delta uses a 24 track mixing desk and analogue machines from the 1970s and early 1980s but also some vintage 1960s kit and various effects units from that era. In addition, they hold vintage organs and pianos, a 1968 Ludwig drum set and lots of exotic percussion."

Both albums have the same sixties vibe, very analogue-like in production, lots of energy – you can imagine the bands throwing themselves around the stage - and both vaguely American West Coast in direction. Recommended to garage fans, from both eras.

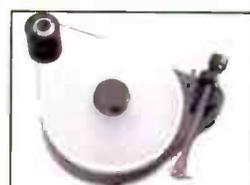
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*Lucy just couldn't understand Tom's sudden lack of interest in an early night*



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# WORLD CLASSICS

In this heavily revised section, you'll find the great and the good from audio's glorious past. Most are seminal designs which have earned their place in hi-fi history, but you'll also see some oddities which aren't classic as such, but are great used buys. The year of introduction is given, alongside the original UK launch price. Think we've overlooked something? Then write in and let us know!

## DIGITAL

**CAMBRIDGE AUDIO CD1** 1986 £1500  
Inspired Stan Curtis redesign of Philips CD104, complete with switchable digital filter. Lean but tight and musical performer.

**CAMBRIDGE AUDIO CD4SE** 1998 £200  
A touch soft in the treble and tonally light, but outstanding in every other respect.

**LINN KARIK III** 1995 £1775  
The final Karik was a gem. Superb transport gives a brilliantly tight, grippy dynamic sound, albeit tonally dry.

**MARANTZ CD73** 1983 £700  
A riot of gold brushed aluminium and LEDs, this distinctive machine squeezed every last ounce from its 14x4 DAC -super musical



**MARANTZ SA-1** 2000 £5,000  
The greatest argument for SACD. This sublime Ken Ishiwata design is utterly musically convincing with both CD and SACD, beating most audiophile CD spinners hands down.



**MERIDIAN 207** 1988 £995  
Beautifully-built two-box with pre-amp stage. Very musical although not as refined as modern Bitstream gear. No digital output.

**MUSICAL FIDELITY TRIVISTA** 2002 £4000  
When playing SACDs, the sweetest, most lucid and lyrical digital disc spinner we've heard. Old school stereo, pure DSD design. CD sound is up in the £1000 class, too! Future classic.

**MERIDIAN MCD** 1984 £600  
The first British 'audiophile' machine was a sweeter, more detailed Philips CD100. 14x4 never sounded so good, until the MCD Pro arrived a year later.



**NAIM CDS** 1990 £ N/A  
Classic Philips 16x4 chipset with serious attention to power supplies equals grin-inducing sonics.



**SONY CDP-101** 1982 £800  
The first Japanese CD spinner was powerful and involving. Brilliant transport more than compensated for 16x2 DAC, and you even got remote control!

**SONY CDP-R1/DAS-R1** 1987 £3,000  
Sony's first two boxer was right first time. Tonally lean, but probably the most detailed and architectural sounding machine of the eighties.



**SONY CDP-701ES** 1984 £890  
Sony's first ever bespoke high end audiophile machine used a 16x2 DAC to provide a clinically incisive sound; supreme build quality allied to the pure unadulterated luxury of a paperback-sized remote control.

**TECHNICS SL-P1200** 1987 £800  
CD version of the Technics SL-1200 turntable. Massively built to withstand the rigours of 'pro' use and laden with facilities - a great eighties icon. Sonically, it's pure fun, with hefty bass that can still show weedy modern players a thing or two!

**YAMAHA CD-X1** 1983 £340  
Nicely built 16x2 machine with a very sharp and detailed sound; sometimes too much so. Excellent ergonomics, unlike almost every other rival of the time.

## COMPACT DISC TRANSPORTS

**TEAC VRDS-T1** 1994 £600  
Warm and expansive sound made this a mid price hit. Well built, with a slick mech.



**ESOTERIC P0** 1997 £8,000  
The best CD drive bar none: TEAC's Tokyo boys pushed the boat out in style. Brilliantly incisive, ridiculously over engineered.

**KENWOOD 9010** 1986 £600  
The first discrete Jap transport was beautifully done and responds well to re-clocking even today.

## DACs

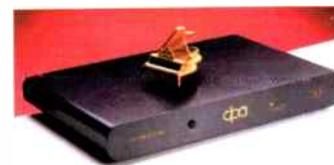
**CAMBRIDGE AUDIO DACMAGIC** 1995 £99  
Good value upgrade for budget CD players with extensive facilities and detailed sonics.



**DCS ELGAR** 1997 £8500  
Extremely open and natural performer, albeit extremely pricey - superb.



**DPA LITTLE BIT 3** 1996 £299  
Rich, clean, rhythmic and punchy sound transforms budget CD players.



**PINK TRIANGLE DCAPO** 1993 £ N/A  
Exquisite; the warmest and most lyrical 16bit digital audio we have ever heard. Clever plug-in digital filter modules really worked!



**QED DIGIT** 1991 £90  
Budget bitstream performer with tweaks aplenty. Positron PSU upgrade makes it smooth, but now past it.

**TURNTABLES**

**ARISTON RDI 15** 1972 £94

Modern evolution of Thorens' original belt drive paradigm. Scotland's original super-deck was warm and musical, albeit soft. Still capable of fine results today.

**PIONEER PL112D** 1973 £36

The beginning of the end for the British turntable industry. When vinyl was the leading source, this bought new standards of noise performance and stability to the class, plus a low friction S-shaped tonearm. Later PL112D was off the pace compared to rivals



**PIONEER PLC-590** 1976 £600

Sturdy and competent motor unit that performs well with a wide range of tonearms. Check very thoroughly before buying due to electronic complexity and use of some now-obsolete ICs.

**DUAL CS505** 1982 £75

Simple high quality engineering and a respectable low mass tonearm made for a brilliant budget buy. Polished, smooth and slightly bland sound.

**GOLDRING Lenco GL75** 1970 £15.65

Simple, well engineered motor unit with soft, sweet sound and reasonable tonearm. Good spares and servicing support even today from specialists. Eminently tweakable. Similar 88 and 99 motor units are budget 301/TD124 rivals.

**LINN AXIS** 1987 £253

Simplified cut-price version of the Sondek complete with LVX arm. Elegant and decently performing mid-price package. Later version with Akito tonearm better.

**LINN SONDEK LPI2** 1973 £86

For many, the Brit superdeck; constant mods meant that early ones sound warmer and more lyrical than modern versions. Recent 'SE' mods have brought it into the 21st century, albeit at a price..



**TECHNICS SP10** 1973 £400

Seminal Japanese engineering. Sonics depend on plinths, but a well mounted SP10/II will give any modern a hard time, especially in respect of bass power and midband accuracy.

**MARANTZ TT1000** 1978 £ N/A

Beautiful seventies high end belt drive with sweet and clean sound. Rare in Europe, but big in Japan.



**MICHELL GYRODEC** 1981 £599

Thanks to its stunning visuals, this bold design wasn't accorded the respect it deserved until recently. Early examples sound cold and mechanical, but now right on the pace. Clean, solid and architectural sound.

**REGA PLANAR 3** 1978 £79

Brilliantly simple but clean and musical performer, complete with ACUS-derived S-shaped tonearm. 1983 saw the arrival of the RB300, which added detail at the expense of warmth. Superb budget buy.

**GARRARD 301/401** 1953 £19

Heavy metal - tremendously strong and articulate with only a veiled treble to let it down. In many respects, better than the seventies 'superdecks' that succeeded it.



**ROKSAN XERXES** 1984 £550

Supposedly the first to 'better' the LPI2. Super tight and clean sound, with excellent transients. Less musical than the Sondek, but more neutral. Sagging plinth top-plates make them a dubious used buy.

**SONY PS-B80** 1978 £800

First outing for Sony's impressive 'Biotracer' electronic tonearm. Built like a tank with a clean and tidy sound, albeit lacking involvement. Scarily complicated and with no spares support - buy with caution!

**THORENS TD124** 1959 £ N/A

The template for virtually every 1970s 'superdeck', this iconic design was the only real competition for Garrard's 301. It was sweeter and more lyrical, yet lighter and less impactful in the bass.



**TOWNSHEND ROCK** 1979 £ N/A

The product of academic research by the Cranfield Institute, this novel machine has an extremely clean and fluid sound. Substantially modified through the years, and capable of superb results even today.

**TRIO LO-7D** 1978 £600

The best 'all-in-one' turntable package ever made, Trio/Kenwood threw their 'engineering best practice' book at this one with startling results. Clean, powerful and three-dimensional sound, ultimately limited by the tonearm.

**TO NEARMS**

**ACOS LUSTRE GST-1** 1975 £46

The archetypal S-shaped seventies arm; good, propulsive and involving sound in its day, but ragged and undynamic now.

**AUDIO TECHNICA AT 1120** 1978 £75

Fine finish can't compensate for this ultra low mass arm's limited sonics - a good starter arm if you've only got a few quid to spend.

**ALPHASON HRI005** 1981 £150

First class arm, practically up to present-day standards. Buy carefully, though, as there is no service available now. Totally under priced when new, exceptional.



**SME 3009** 1959 £18

Once state of the art, but long since bettered. Musical enough, but weak at frequency extremes and veiled in the midband. Legendary serviceability and stunning build has made it a cult, used prices unjustifiably high.

**GRACE G707** 1974 £58

This early Japanese example of the tonearm art has a smooth, lyrical sound. Imported by Linn, fitted to early LPI2s. Sonically way off the pace now, though.

**REGA RB300** 1983 £88

Inspired budget esoterica. Detailed, tight, neutral sound but tonally grey sounding in absolute terms. Responds well to tweaking, and its cheaper RB250 brother better still.



**SME SERIES III** 1979 £113

Clever variable mass design complete with Titanium Nitride tube tried to be all things to all men, and failed. Charming nonetheless, with a warm and inoffensive sound.

**HADCOCK GH228** 1976 £46

Evergreen unipivot with lovely sweet, fluid sound. Excellent service backup.



**LINN ITTOK LVII** 1978 £253

Arguably the first 'superarm'; Japanese design to Linn specs made for a muscular, rhythmic sound with real dynamics. Now off the pace, but the final LVIII version worth seeking out.

**NAIM ARO** 1986 £875

Truly endearing and charismatic performer - wonderfully engaging mid-band makes up for softened frequency extremes.



**TECHNICS EPA-501** 1979 £ N/A

Popular partner for late seventies Technics motor units. Nice build and Titanium Nitride tube can't compensate for middling sound.

**INTEGRATED AMPLIFIERS/COMBOS**

**DELTEC 1987 £1900**

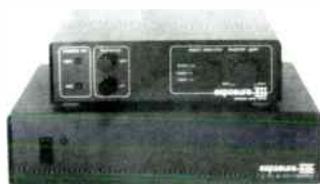
Fast, dry and with excellent transients, this first DPA integrated is the real deal for eighties obsessives. Ridiculously punchy 80W per channel from a tiny, half-size box. Radical, cool and more than a little strange.

**ROGERS A75 1978 £220**

The prototypical Audiolab 8000a – lots of sensible facilities, a goodly power output and nice sound in one box. The later A75II and A100 versions offered improved sonics and were seriously sweet and open to listen to.

**EXPOSURE VII/VIII 1985 £625**

Seminal mid-eighties Exposure pre-power, offering most of what rival Naim amps did with just that little bit extra smoothness and sweetness. Still, it's by no means 'sweet' by today's standards, being lean, punchy, musical. It's also possessed of that quintessentially eighties look – frumpy black steel boxes with rough silk screened logos!



**SUGDEN C51/P51 1976 £130**

Soft sounding early Sugden combo with a plethora of facilities and filters, complete with seventies-tastic DIN socketry. A sweet and endearing performer as you'd expect, but lacking in power and poor load driving ability, so partner carefully.

**VTL MINIMAL/50W MONOBLOCK 1985 £1,300**

Vacuum Tube Logic was one of the Europe's biggest tube names in the eighties, and it shows. Rugged, professional build and finish allied to a lively and punchy sound (albeit with limited power) make them an excellent used buy.

**A&R A60 1977 £115**

Sweet and musical feature-packed integrated; the Audiolab 8000A used its blueprint to great effect.



**CREEK CAS4040 1983 £150**

More musical than any budget amp before it; CAS4140 loses tone controls, gains grip.

**AUDIOLAB 8000A 1985 £495**

Smooth integrated with clean MM/MC phono stage and huge feature count. Extremely reliable, too. Post '93 versions a top used buy.



**MCINTOSH MA6800 1995 £3735**

Effortlessly sweet, strong and powerful with seminal styling to match.

**SUGDEN A21 1969 £ N/A**

Class A transistor integrated with an eminently likeable smoothness and musicality. Limited inputs via DIN sockets.

**MISSION CYRUS 2 1984 £299**

Classic eighties minimalism combines arresting styling with clean, open, lively sound. Further upgradeable with PSX power supply.



**MUSICAL FIDELITY A1 1985 £350**

Beguiling Class A integrated with exquisite styling. Questionable reliability.



**NAIM NAIT 1984 £350**

Superb rhythms and dynamics make it truly musical, but tonally monochromatic. Fine phono stage, very low power.

**NAD 3020 1979 £69**

Brilliantly smooth, sweet and punchy at the price and even has a better phono stage than you'd expect. The archetypal budget super-amp.



**MYST TMA3 1983 £300**

Madcap eighties minimalism, but a strong and tight performer all the same.

**ROGERS CADET III 1965 £34**

Sweet sounding valve integrated, uses ECL86 output valves, even has a half useable phono stage, sweet, warm a good introduction to valves



**ROTEL RA-820BX 1983 £139**

Lively and clean budget integrated that arguably started the move to minimalism.

**PREAMPLIFIERS**

**AUDIOLAB 8000C 1991 £499**

Tonally grey but fine phono input and great facilities make it an excellent general purpose tool.

**AUDIO RESEARCH SP-8 1982 £1,400**

Beautifully designed and built high end tube preamplifier with deliciously sweet and smooth sound. Not the last word in incision or grip, but that didn't matter to those who aspired to it.

**CONRAD JOHNSON MOTIV MC-8 1986 £2,500**

Minimalist FET-based preamplifier from the Yank valve specialists is brilliantly neutral and smooth with a spry, light balance in the mould of Sugden high end stuff. Something of a curio, but worthwhile nonetheless.

**CROFT MICRO 1986 £150**

Budget valve pre-amp with exceptionally transparent performance.

**LEAK POINT ONE STEREO 1958 £ N/A**

Good for their time, but way off the pace these days. Use of EF86 pentode valve for high gain rules out ultra performance. Not the highest-fi!

**LINN LK-1 1986 £499**

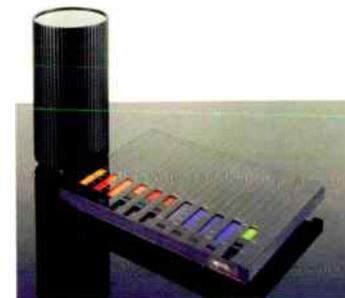
A brave attempt by the Glasgow boys to bring remote controlled user-friendliness to hair-shirt audiophile hi-fi. Didn't quite work, but not half bad for under £100.

**NAIM NAC32.5 1978 £ N/A**

The Salisbury company came of age with this, their classic high end pre. Brilliantly fast and incisive sound that's a joy with vinyl but a tad forward for digital.

**LECSON AC-1 1973 £ N/A**

Amazing styling courtesy of Allan Boothroyd can't disguise its rather cloudy sound, but a design classic nonetheless.



**QUAD 22 1958 £25**

The partner to the much vaunted Quad II monoblocks - cloudy and vague sound means it's for anacrophiles only.

**QUAD 33 1968 £43**

Better than the 22, but Quad's first tranny pre isn't outstanding. Responds well to tweaking/ rebuilding though...

**POWER AMPLIFIERS**

**LEAK STEREO 20 1958 £31**

Excellent workaday classic valve amplifier with decent power and drive. Surprisingly modern sounding if rebuilt sympathetically. Irrepressibly musical and fluid.



**LECSON API 1973 £ N/A**

Madcap cylindrical styling alluded to its 'tower of power' pretensions, but it wasn't. Poor build, but decently clean sounding when working.

# Performance series

L2 Series Loudspeakers  
99 Series Electronics



*"this system is something of a musical genius"*

– *What Hi-Fi? Sound and Vision*



January 2007

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**MARANTZ MODEL 9** 1997 £8000

Authentic reproduction monoblocks still more than cut the sonic mustard. Highly expensive and highly sought after.

**MICHELL ALECTO** 1997 £1989

Crisp, clean and beautifully controlled with gorgeous styling. Partnered with the £1650 Orca this sounds delicious!

**LEAK POINT ONE, TL10, TL12.1** 1949 £28

Early classics that are getting expensive. Overhauling is de rigueur before use, using original parts if possible. Surprisingly crisp and musical sound, that's far more modern than Quad IIs. Deeply impressive when in fine fettle.



**MUSICAL FIDELITY XA200** 1996 £1000PR

200W of sweet smooth transistor stomp in a grooved tube! Under-rated oddity.



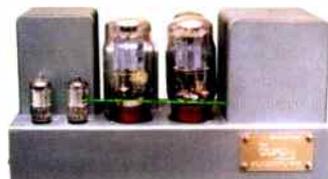
**RADFORD STA25 RENAISSANCE** 1986 £977

At the time, very possibly the least cool amplifier on the planet – and we're not talking heat dissipation here. This reworking of Radford's original late sixties design was possessed of a wonderfully rich, old school valve sound with enough power (25W) and lots of subtlety.



**QUAD II** 1952 £22

The all-time classic valve amplifier, with a deliciously fluid and lyrical voice. In other respects though, it sounds hopelessly dated. Low power and hard to partner properly.



**QUAD 405** 1978 £115

The first of the current dumpers is a capable design with smooth, effortless power and a decently musical sound. 606 and 707 continue the theme with greater detail and incision.

**QUAD 303** 1968 £55

Bullet proof build, but woolly sound. Off the pace, but endearing nonetheless. Some pipe smoking slipper wearers swear by them!

**KRELL KMA100 II** 1987 £5,750

Ludicrous monoblock version of the giant KSA-100 is one of the seminal eighties transistor power amplifiers. Massive wallop allied to a very clean and open Class A sound makes this one of the best amplifiers of its type, ever.

**PIONEER M-73** 1988 £1,200

Monster stomp from this seminal Japanese power amplifier, complete with switchable Class A and Class B operation. Clean, open and assured sounding, albeit a tad behind the pace on high speed dance music. Rosewood side cheeks and black brushed aluminium completes the eighties-tastic experience.



**PHONO STAGES**

**CREEK OBH-8 SE** 1996 £180

Punchy, rhythmic character with oodles of detail makes this a great budget audiophile classic. Partner with a Goldring G1042 for an unbeatable budget combination.



**LINN LINNK** 1984 £149

Naim-designed MC phono stage built to partner the original Naim NAIT - yes, really! Fine sound, although off the pace these days.

**MICHELL ISO** 1988 £ N/A

This Tom Evans-designed black box started the trend for high performance offboard phono stages. Charismatic, musical and punchy - if lacking in finesse.

**TUNERS**

**MARANTZ ST-8** 1978 £353

Marantz's finest radio moment. Warm, organic sound plus an oscilloscope for checking the signal strength and multipath.



**CREEK CAS3140** 1985 £199

Excellent detail, separation and dynamics - brilliantly musical at the price. T40 continued the theme...

**NAD 4040** 1979 £79

Tremendously smooth and natural sound allied to low prices and good availability make this budget analogue esoterica. Needs a good antenna to work properly, however.

**NAIM NAT03** 1993 £595

The warm, atmospheric sound is further proof of Naim's proficiency with tuners.

**PIONEER TX-9500** 1976 £295

Another of the serious classic solid-staters. Boasts the usual high end Jap package of fine sound, brilliant sensitivity and superb build.

**LEAK TROUGHLINE** 1956 £25

Series I an interesting ornament but limited to 88-100MHz only. II and III are arguably the best-sounding tuners ever. Adaptation for stereo easy via phono multiplex socket. Fed by a modern outboard decoder they're deliciously lucid with true dimensionality.



**YAMAHA CT7000** 1977 £444

Reputedly the best of the classic Jap analogues, this combines sleek ergonomics, high sensitivity and an explicit, detailed sound.

**QUAD FM4** 1983 £240

Supreme ergonomics and styling allied to a pleasingly lyrical sound with plenty of sweetness and detail made this one of the best tuners around upon its launch.



**REVOX B760** 1975 £520

More of a semi-pro machine than a domestic bit of kit, the Revox offers superlative measured performance although the sound isn't quite as staggering as the numbers. Fine nonetheless, and surely the most durable tuner here?

**NAD 4140** 1995 £199

Brilliant affordable digital tuner has a smooth, detailed musical sound plus sensible real-world facilities.

**ROGERS T75** 1977 £125

Superb mid-price British audiophile design, complete with understated black fascia. Fine sound in the true Rogers mould – smooth and sweet with fine dimensionality.

**SANSUI TU-9900** 1976 £300

A flagship Japanese tuner designed to steal sales from the likes of Accuphase and Revox, it boasts superlative RF performance and an extremely smooth and lucid sound, along with very fine build and finish.

**SEQUERRA MODEL I** 1973 £1300

Possibly the ultimate FM tuner. Massive in terms of technology, size and features dedicated to extracting every ounce of performance from radio, including impressive multi-purpose oscilloscope display.

**SONY ST-5950** 1977 £222

One of the first Dolby FM-equipped tuners, a format that came to nought. Still, it was Sony's most expensive tuner to date, and boasted a very good sound quality allied to brilliant ergonomics.



## CLASSICS

### TECHNICS ST-8080 1976 £180

National Panasonic's specialist hi-fi brand was a big hitter back then, and this is no exception. Superb FM stage makes for a very clean and smooth listen with lots of detail and depth.

### ANALOGUE RECORDERS

#### YAMAHA TC-800GL 1977 £179

Early classic with ski-slope styling courtesy of Mario Bellini. Middling sonics by modern standards, but cool nonetheless!



#### AIWA XD-009 1989 £600

Aiwa's Nak beater didn't, but it wasn't half bad nonetheless. Massive spec even included a 16x4 DAC!

#### NAKAMICHI CR-7E 1987 £800

The very best sounding Nakamichi ever - but lacks the visual drama of a Dragon.



#### PIONEER CTF-950 1978 £400

Not up to modern standards sonically, but a great symbol of the cassette deck art nonetheless.



#### REVOX A77 1968 £145

The first domestic open reel that the pros used at home. Superbly made, but sonically off the pace these days. B77 better, but couldn't match the Japanese.



### SONY WM-D6C 1985 £290

Single capstan transport on a par with a Swiss watch, single rec/replay head better than most Naks. Result: sublime.



### DIGITAL RECORDERS

#### SONY MDS-JE555ES 2000 £900

The best sounding MD deck ever, thanks to awesome build and heroic ATRAC-DSP Type R coding.



#### PIONEER PDR-555RW 1999 £480

For a moment, this was the CD recorder to have. Clean and detailed.

#### MARANTZ DR-17 1999 £1100

Probably the best sounding CD recorder made; built like a brick outhouse with a true audiophile sound and HDCD compatibility.



#### KENWOOD DM-9090 1997 £500

Serious and sophisticated sound thanks to well implemented ATRAC 4.S; surprisingly musical MD recorder.

#### SONY TCD-8 DATMAN 1996 £599

Super clean sound makes this an amazing portable, but fragile.

### LOUDSPEAKERS

#### ACOUSTIC RESEARCH

##### AR18S 1978 £125

Yank designed, British built loudspeaker became a budget staple for many rock fans, thanks to the great speed from the paper drivers, although finesse was most definitely not their forte...

##### BBC LS3/5A 1972 £88

Extremely low colouration design is amazing in some respects - articulation, stage depth, clarity - and useless in others (both frequency extremes). Came in wide variety of guises from various manufacturers building it under licence. Partner with Rogers ABI subwoofers for an extra two octaves of bass!



### LOWTHER PM6A 1957 £18

EACH

This seminal full-range driver is still manufactured. High sensitivity, as fitted to many classic horn designs.

### TANNOY

#### WESTMINSTER 1985 £4500

Folded horn monsters which certainly sound good if you have the space. Not the last word in tautness but can drive large rooms and image like few others.



#### JR 149 1977 £120

Infamous cylindrical speaker that was ignored for decades but now back in fashion! Based on classic KEF T27 / B110 combo as seen in the BBC LS3/5a. Doesn't play loud, needs a powerful transistor amplifier, but rewards with fine clarity and imaging.



#### SPENDOR BC1 1976 £240

Celestion HF1300 tweeter meets bespoke Spendor Bextrene mid-bass unit - and the result is a beautifully warm yet well focused sound. A little bass bloom necessitates careful low-stand mounting, but these prove that the seventies did have some fine designs after all!

#### QUAD ESL57 1956 £45

Wonderfully open and neutral sound puts box loudspeakers to shame. Properly serviced they give superb midband performance, although frequency extremes less impressive. Ideally, use in stacked pairs or with subwoofers and supertweeters.



#### KEF R105 1977 £785

Three way Bextrene-based floorstander (complete with castors!) gave a truly wide-band listen and massive (500W) power handling. A very neutral, spacious and polite sounding design, but rhythmically well off the pace. The quintessential nineteen seventies loudspeaker.

#### IMF TLS80 1976 £550

Warm and powerful nineteen seventies behemoth with transmission loading and a mixture of KEF and Celestion drive units. Impressively physical wideband sound but rhythms aren't its forte.

**MAGNEPLANAR SMGA 198X** £800  
Technological loudspeaker with genuinely musical abilities; fast, smooth, open, dry.



**MISSION 770** 1980 £375  
Back in its day, it was an innovative product and one of the first of the polypropylene designs. Warm, smooth, clean and powerful sound.



**MISSION 752** 1995 £495  
Cracking Henry Azima-designed floorstanders combined HDA drive units and metal dome tweeters with surprisingly warm results. Benign load characteristics makes them great for valves.

**HEYBROOK HBI** 1982 £130  
Peter Comeau-designed standmounters with an amazingly lyrical yet decently refined sound. Good enough to partner with very high end ancillaries, yet great with budget kit too. A classic.

**CELESTION SL6** 1984 £350  
Smallish two way design complete with aluminium dome tweeter and plastic mid-bass unit set the blueprint for nineteen eighties loudspeakers. Very open and clean sounding, albeit course at high frequencies and limp in the bass. Speakers would never be the same again...



**LEAK SANDWICH** 1961 £39 EACH  
Warm sounding infinite baffle that, with a reasonably powerful amplifier can sound quite satisfying.



**QUAD ESL63** 1980 £1200  
An update of the ESL57, with stiffer cabinets. Until the 989, the best of the Quad electrostatics.



**YAMAHA NS1000** 1977 £532  
High tech Beryllium midband and tweeter domes and brutish 12" woofers in massive sealed mirror image cabs equals stunning transients, speed and wallop allied to superb transparency and ultra low distortion. Partner carefully!



**MISSION X-SPACE** 1999 £499  
The first mass production sub and sat system using NXT panels is a sure-fire future classic - not flawless, but a tantalisingly unboxy sound nevertheless!



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# WORLD STANDARDS

These are the best products we've heard that are currently on sale in the UK, complete with the date they were originally launched and their current retail prices.

## TURNTABLES

### GOLDRING GR-2 2006 £265

Rebadged Rega P3 built on the cheap and sold with an excellent Goldring MM, this is cracking value for money.

### REGA P3 2000 £298

Great entry level audiophile deck with fine bundled tonearm. Tweakable, and responds well to careful siting on a Base platform.

### TECHNICS SL1200/III 1973 £395

Slick build makes it a respectable performer, although the cheapo arm limits it - fit a Rega RB250 and it's suddenly a serious mid-price machine.

### MICHELL TECNODEC 2003 £575

Superb introduction to Michell turntables on a budget. Top quality build and elegant design make it the class of the mid-price field.

### REGA P25 2001 £619

Until the TecnoDec, the best mid-price turntable package. Fine build and elegant styling. Clean, open sound but limited at frequency extremes in absolute terms.

### PRO-JECT X PACK 2005 £650

Decently musical sound, fine build and blistering value for money turntable, arm and MC cartridge package.



### ROKSAN RADIUS 5 2003 £750

Fantastic value allied to intelligent, interesting and 'out of the box' design makes for a wonderful entry-level superdeck. Open and musical sound is more inviting than Michell TecnoDec rival, and the bundled Nima Unipivot arm is a superstar.



### FUNK FIRM VECTOR 2006 £760

Innovative attempt to produce the best sounding turntable at the price; highly musically enjoyable.



### MICHELL GYRODEC SE 2005 £970

Design classic with superlative build and finish. Sound is beautifully smooth, expansive and effortless but lacks bass grip compared to some rivals now.

### MARANTZ TT-1551 2005 £999

This, the most musical sub-£1,000 turntable package, includes a fine tonearm and MM cartridge; plug and play vinyl at its best.

### ACOUSTIC SIGNATURE CHALLENGER 2006 £1,269

Heavyweight turntable in more ways than one; massive sharply focused soundstage allied to vast dynamic range makes it outstanding at the price.

### VPI SCOUT/9" JMW ARM 2006 £1,295

With a massive, solid and focused soundstage, superb transients and excellent musicality, this turntable is exemplary at the price.

### ORIGIN LIVE AURORA GOLD 2004 £1,470

Seminal 'entry level high end' deck showing obsessive attention to detail. The result is an extremely wide open and natural sounding machine.



### PROJECT RPM 10 2006 £1,500

Brilliant 'fit and forget' deck that gives everything it plays a clean, warm, enjoyable sound - but not quite as effective in absolute terms as some price rivals.

### CLEARAUDIO SOLUTION/SATISFY 2006 £1,650

Wonderfully big, powerful and enthusiastic sound is tempered by a little over exuberance on occasions. Super value, with a great upgrade path.

### THORENS TD2030 2006 £1,895

Excellent design and a supplied Rega RB300 make this a highly capable vinyl spinner. Blue tint to the Perspex base is rather pretty, too!

### MICHELL ORBE SE 2002 £1,916

Ultimate evolution of the Gyro adds massy acrylic platter and two-stage isolation. Fantastically capable all rounder with commanding, powerful, detailed sound that gets the best from almost any arm and cartridge



### LINN LP12/LINGO 1973 £2,100

The quintessential belt drive superdeck offers a beguilingly musical midband at the expense of lumpy bass and nebulous imaging. Latest Lingo brings a new lease of life, with even more punch and polish.

### SME MODEL 10A 1995 £3,333

Exquisitely engineered deck and SME V tonearm combo that's an extremely accomplished performer with classical music.

### CLEARAUDIO REFERENCE 2003 £4,000

The company's best value vinyl spinner; good enough to get the best from almost any tonearm and cartridge combination. Brilliantly open and neutral sound; superlative pitch stability; stunning build and styling - Michell Orbe does most of this at half the price, however.

### SIMON YORKE S9 2002 £4,995

Magnificently designed and built 'record player' that has musical abilities few can match. The arm is particularly impressive, despite its apparent simplicity



## TONEARMS

### REGA RB250 1984 £112

Sold through Moth Marketing, this is capable far beyond its price point, with a tight, lean and detailed sound. Responds brilliantly to Origin Live counterweight modification, and well to rewiring.

**MICHELL TECNOARM A2003 £399**

John Michell's brilliant reworking of the Rega RB250 theme, using blasting and drilling techniques usually seen in motorsport! The result is the best sounding arm at £400, and as good as some at four times the price.

**ORIGIN LIVE SILVER 2006 £599**

This expertly fettled Rega boasts a superbly even, transparent and tuneful sound. Gives away only a small degree of finesse and dimensionality to top arms.

**HADCOCK 242 SE 2000 £649**

Latest of a long line of unipivots, with added mass, revised geometry and better finish. Musical like no others at the price.

**SME 309 1989 £767**

Mid-range SME comes complete with cost-cut aluminium armtube and detachable headshell. Tight, neutral sound with good tonality, but lacks the IV's pace and precision.

**SME SERIES IV 1988 £1,127**

Offers nine tenths of the SMEV's magic at just over half price. Exquisitely built and finished, and a design classic. Faces stiff competition these days, but lovely nevertheless.

**NAIM ARO 1987 £1,425**

Charismatic unipivot is poor at frequency extremes but sublime in the midband; truly emotive and insightful.

**ORIGIN LIVE ILLUSTRIOUS 2002 £1,570**

A modern superarm with battleship build. Extremely strong, even and open sound in the mould of the late, lamented Zeta, plus fine tonal colouring. Exquisite.

**SME SERIES V 1987 £1,614**

The so-called Best Pickup Arm in the World isn't, but comes close. Vice-like bass with incredible weight, ultra clear midband and treble. Does everything except beguile the listener.

**LINN EKOS 1987 £1,700**

Subtle mods over the years, including revised bearings and the recent new wiring has kept it a serious contender in the superarm stakes. Lacks the SME's slam, the OL's clarity or the ARO's emotion, but has a feisty musicality all of its own.

**GRAHAM PHANTOM 2006 £2,495**

Sonically stunning arm with magnificent bass dexterity and soundstaging. Build quality almost up to SME standards, which is saying something..

**TRI-PLANAR PRECISION 2006 £3,600**

Stunning build, exquisite design and surely the most naturally musical and lucid sound around makes this a remarkable pickup arm.

**CARTRIDGES****AUDIOTECHNICA AT110E 1984 £29**

Great starter cartridge that's refined, detailed and musical beyond its price.

**GOLDRING G1042 1994 £135**

One of the best MMs going, with sweet and extended treble and punchy, muscular bass.

**ORTOFON 2M RED/BLUE 2007 £60/£120**

The first new budget MM designs for many years, Ortofon's 2M Red and Blue are high resolution designs that are an engaging listen

**ORTOFON SAMBA/SALSA 2006 £150/£200**

Fine cartridges that offer that MC magic at an affordable price. Samba is more dynamic and forward, Salsa rather smoother but both are great performers and track well.

**DENON DLI03R 2006 £200**

Awkward to get working properly with a poor mounting arrangement, yet it rewards with a musical performance that makes similar priced cartridges sound cold.

**DYNAVECTOR DV10X5 2003 £250**

A distant descendant of the classic Ultimo 10X, this has warmth and sweetness in spades, allied to a punchy bass. Beats G1042 comfortably.

**DYNAVECTOR DV20X-H2003 £395**

The best modern budget MC combines deliciously sweet sound with fantastic get-up-and-go. High output version works a treat with valve phono stages too.

**MUSIC MAKER 1999 £575**

This hand finished high-output pick-up gives an ear-boggling account of itself. Very high compliance ensures maximum information retrieval. A gem of an MM.

**ORTOFON KONTRA' B 1999 £720**

Surprisingly articulate performer by Ortofon standards. All the brand's usual polish and detail allied to real vim. Loves making music!

**ORTOFON RONDO BRONZE 2005 £500**

Excellent mid-price moving coil with real rhythmic alacrity and a decent deal of finesse.

**ZYX R-100H 2005 £625**

Exceptionally tight sounding and detailed cartridge with the musical skills to match, this is up with the very best at the price, with a presentation all of its own.

**ORTOFON KONTRA" C 2004 £1,000**

The most secure tracking MC we've heard; its super clean, fast, detailed and neutral sonics make it a brilliant partner to warmer sounding turntables.

**KOETSU RED 2004 £1,600**

Although the new Koetsu have lost some of their 'romance', you'll not hear a more lyrical and emotive performer. Startlingly 'analogue' nature makes rival Ortofon's and Clearaudio's sound frigid.

**DIGITAL DISC PLAYERS****CAMBRIDGE AUDIO****640C V2 2006 £250**

Superb entry level CD player; crisp, composed, musical sound plus fine build and ergonomics.

**REGA APOLLO 2006 £498**

Highly rhythmic and beguiling performer, although lacks some warmth of tone. Superb ergonomics and design

**RUSS ANDREWS DAC-1 USB 2007 £599**

Not just a USB gadget, but a truly accomplished upgrade DAC that makes the best of CDs, MP3s and digital radio

**CAMBRIDGE AUDIO 640H 2005 £599.95**

Fine sonics and decent build make this our favourite affordable HD music server.

**MARANTZ SA7001KI SIG2006 £600**

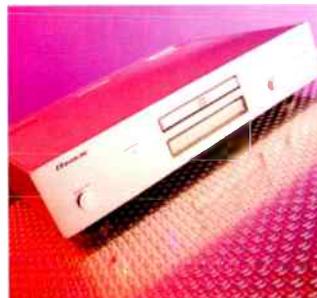
Brilliant CD/2ch SACD spinner with a big, sweet, analogue-like sound - CD is totally competitive at the price with the best dedicated machines..

**AUDIOLAB 8000CD 2006 £650**

Ultra clean and transparent sound with amazing detail retrieval; just a tad bright and analytical for some, though.

**SHANLING CDT-80 2005 £650**

Very impressive mid-price machine with a big, sumptuous, expansive sound - better still when tubes are changed.

**PIONEER DV-868AV1 2003 £799**

Pioneer's most accomplished mid-price machine to date, this boasts decent DVD-A/SACD playback, a welter of facilities and HDMI video and I-Link audio digital outputs.

**CAMBRIDGE AZUR 840C 2006 £800**

Well built CD player with a silky, yet detailed sound and a whole host of useful facilities. Excellent value for money.

**NAIM CD51 2005 £825**

Still the most musical sub-£1,000 CD spinner we know, the charismatic Naim majors on bass grip and dynamics.

**EASTERN ELECTRIC MINIMAX CD 2005 £925**

Highly accomplished tube-equipped all rounder with a clean, open and musically lucid sound; superb value.

**CYRUS CD81 2005 £1,000**

Highly incisive, engaging, grippy and dynamic sound, but needs careful matching to smooth ancillaries. Optional PSX-R adds bass and dimensionality.

**EXPOSURE 3010** 2003 £1,200

One of the most 'analogue' CD players, second only to the Shanling. Wonderfully beguiling balance leaves you looking for the tube output stage.

**STELLO DP-200** 2004 £1,495

Brilliant do-it-all upsampling DAC preamp with headphone output and phono. One of the best digital to analogue converters around, allied to mind-boggling flexibility.

**MARANTZ DV9600** 2006 £1,500

Impressively accomplished universal disc player, that performs superbly on CD, SACD, DVD Audio and DVD Video

**CHORD DAC64** 2005 £1,995

Bespoke architecture gives a truly uniquely musical sound that's beguilingly musical in nature, if a tad tonally dry. Superb build and aesthetics too!

**SHANLING SCD-T2000** 2007 £2,250

Updated version of original SCD-T200C standardises upgrades optional on the older model and adds a few more tweaks for good measure. The result is a stylish player that works superbly with both CD and SACD

**TUBE TECHNOLOGY****FUSION 64** 2006 £2,200

Unique digital and analogue audio engineering makes for an exceptional CD player that, on some programme material, is peerless.

**NORTH STAR MODEL 192 TRANSPORT/ EXTREMO DAC** 2006 £2,918

Superbly finessed and loquacious sound allied to excellent build and finish make for a brilliant value high end buy.

**NAIM CDX2-XPS2** 2003 £4,950

A fine high end machine, but add an XPS2 and it becomes one of the most characteristically engaging 16bit machines we've ever heard. Plays music with such passion!

**LINN UNIDISK 1.1** 2004 £6,500

Surely the ultimate universal DVD player; superb in every department, but its CD playback shines brightest considering it's not a bespoke Red Book machine.

**NAIM CDS3** 2003 £7,050

The most polished Naim CD to date; tremendously capable and musical, but lacks the Rottweiler quality of the cheaper CDX2-XPS2.

**ESOTERIC X-01** 2005 £8,995

Breathtaking feat of digital audio engineering, and surely the best sounding combination CD/SACD spinner money can buy.

**NAIM CD555/555PS** 2006 £14,000

Very probably the best CD player yet made - certainly the most expensive; a digital *tour de force*.

**DIGITAL RECORDERS****APPLE IPOD** 2006 £220

Genre-defining best of breed, thanks to supreme ergonomics and build allied to fine sound.

**SONY RCD-W3** 2002 £250

Usual superb Sony ergonomics make for non-nonsense budget buy. Fine direct digital copies, but analogue input poor. Middling sonics, but there's a digital output!

**YAMAHA CDR-HD1300E2002** £600

HD means MD-style ease of editing, but compromises recording quality ever-so slightly. Add decent CD replay and it's a fine all rounder nonetheless - top value.

**PHONOSTAGES****QED DISCSAVER** 1995 £35

Rhythmic, bouncy sound via battery, although it's bright and forward. Great value.

**PROJECT PHONOBOX LE2004** £99

Great little box that improves on most bundled phono stages found in budget integrated amplifiers, adding detail and definition and a measure of smoothness too.

**TRICHORD DINO** 2002 £299

Great all rounder with switchable MM/MC. Fast, fluid and smooth like no others at the price.

**EAR 834P** 1993 £400

Classic tube design with a fulsome, warm and expansive sound - shame about the loose bass and veiled treble!

**JOLIDA JD9** 2006 £400

Hybrid tube/solid state phono stage with a good range of adjustability. Excellent value for money and a fine, dynamic sound.

**GRAHAM SLEE ERA GOLD V** 2004 £460

Wonderfully warm, open and musical nature makes this an essential audition for those wanting a top value mid-price phono stage.

**LEHMANN BLACK CUBE SE2006** £495

Clean, smooth and even right across the frequency range, this phono stage represents super value for money.

**AQVOX PHONO 2 CI** 2006 £598

Brilliantly versatile yet affordable phono stage with a beguiling sound, but careful matching essential. Balanced operation of real benefit.

**CLEARAUDIO SYMPHONO+** 2006 £809

Superb high resolution phono stage with a tight, grippy and engagingly musical sound.

**LINN LINTO** 2000 £900

A musical and incisive performer, with more speed than the Delphini at the expense of detail and tonal colour.

**WHEST AUDIO PS.20/MSU.20** 2004 £1,000

Disarmingly clean, smooth, open sound makes this the very best phono stage we've auditioned to date, but some will still prefer the goutsier feel of the Trichord Delphini.

**EASTERN ELECTRIC MINIMAX PHONO** 2006 £1,099

A stunning phono stage with superb clarity and impeccable dynamics, allied to the atmosphere of valves. Can hold its own with even more expensive designs. A veritable bargain.

**TRICHORD DIABLO + NCPSU** 2006 £1,198

Highly musical performer, this is one of the best phono stages at or near the price, but lacks the polish of the rival Whest.

**AMPLIFIERS****NAD C352BEE** 2006 £250

Smooth, powerful, muscular sound with real speaker driving prowess makes this the most musical entry level integrated.

**CYRUS 6X** 2003 £600

Cracking do-it-all mid price design, bringing svelte sound, good connectivity and upgradeability and stunning style and build.

**MARANTZ PM7001IKI SIG2006** £650

Lucid sounding, warm and fulsome mid-price transistor integrated that's hard to beat at the price.

**ONKYO A-9755** 2006 £700

Beautifully built, usefully versatile and truly enjoyable sonics make this another great affordable audiophile product from Onkyo.

**CYRUS 8X** 2006 £800

Unusually warm and lyrical for a solid-stater, with decent power and punch. PSX-R adds dynamics, detail and dimensionality.

**NAIM NAIT 51** 2004 £825

The most musically engaging integrated at or near the price; real sophistication in sound allied to grip and power aplenty. Iconic styling and great build complete a very pretty picture.

**JUNGSON JA-88D** 2006 £899

Stunning value for money Class A monster integrated; extreme power and clarity at a puzzlingly low price.

**SUGDEN A21A** 2006 £1,020

The most musical amplifier at the price, bar none. Delicious Class A sound is smooth, sweet and wonderfully transparent with true tonal colour. Low power, so match carefully.

**AUDIO NOTE OTO SE** 2000 £1,199

This baby tuber is beautifully sweet and creamy, but lacks solid-state's clarity, detail and incision. Low, low power means speaker choice critical.

**CREEK DESTINY AMPLIFIER** 2006 £1,200

Superb build, useful power plus a deep full bodied sound make this an excellent mid-price buy.



**AUDIO NOTE SORO SE 2000** £1,699  
Wonderfully out-of-the-box sounding tube middleweight is all about sweetness and fluidity. Limited power and loose bass, but little the worse for it.

**UNISON RESEARCH S6 2002** £1,625  
Tremendously musical and lithe sound with real finesse and subtlety too. Very slightly upper mid forward encourages careful partnering with ancillaries (Revolver R4Ss are ideal), but overall fantastic value for money.



**SUGDEN A21SE** 2005 £1,995  
Brilliantly musical hear-through sound makes this one of the best transistor amplifiers ever made, but be prepared to match carefully.

**COPLAND CSA29** 2006 £1,998  
Unfailingly svelte, sophisticated and smooth - both to listen to and look at - this is a truly desirable high end integrated.

**VINCENT SA-TI/SP-T100 2006** £2,300  
Impressively built and stylish pre/power combo that take any kind of music and make the best of it

**LUXMAN L-550A** 2007 £2,800  
Monster Class A integrated with powerful and revealing sound and a whole host of useful features, including a highly competent MM/MC phono stage

**AUDIO RESEARCH VS155 2003** £2,895  
The Naim NAP250's tubular alter ego; oodles of power allied to a strong bass and smooth open midband makes this a brilliant all round amplifier. Lacks the subtlety and finesse of the low powered single-ended brigade but makes up for it with sheer brio.

**LEEMA TUCANA** 2007 £2,995  
Leema's success story continues with this integrated amp that combines power, detail and great musicality in a solidly built package

**NAIM NAC282/NAP200 2004** £4,000  
Wonderfully taut bass, lightning midband and incisive treble makes for an enthralling listen; this cracking combination looks great and is superb value too.

## AV AMPLIFIERS

**PIONEER VSA-AX51** 2004 £1,000  
Excellent do-it-all big Japanese receiver with all the inputs and outputs you could wish for. Decent sound, but not exactly beguiling.



**ARCAM AVR350** 2006 £1,500  
Superbly accomplished do-it-all AV receiver package, with an uncommonly, warm, natural and musical sound. A winner goes from strength to strength.

**NAIM AV2/NAP 150/NAPV 175** 2002 £4,190  
Brilliant audiophile multichannel pre-power amplifier combo; not as good with music as a two-channel Naim set-up at the same price, obviously, but surprisingly close. Elegant control layout plus a strong, clean and brilliantly engaging sound make this a serious crossover product. Ultimately lacks power compared to similarly priced Arcam gear, but is more musically involving.

## HEADPHONE AMPLIFIERS

**CHANNEL ISLANDS VHP-1/VAC-1** £390  
A truly exceptional headphone output stage; the best at the price and an essential audition.

**MUSICAL FIDELITY X-CANS V3** 2003 £249  
Mr Michaelson's best headphone amplifier to date, with an extremely open and explicitly detailed sound plus serious bass wallop and the ability to drive any phones to very high levels. Errs towards brightness with some headphones, so match carefully and use smooth cables.

**SUGDEN HEADMASTER 2003** £600  
Unusual combined preamplifier and headphone amplifier; this boasts a surprisingly smooth and open sound.

## PREAMPLIFIERS

**CREEK OBH-12** 2000 £220  
Brilliant value budget passive, giving little away in sonics to far more expensive designs. Connectivity and build aren't great, but what do you expect at this price?



**CROFT VITA** 2005 £990  
Truly delightful valve preamplifier with superb tube phonostage; not the most transparent but very musical and cracking value for money.

**MF AUDIO PASSIVE PRE 2003** £1,500  
Novel and effective pre with switchable gain via a transformer, and balanced operation. Open and incisive sound, yet makes most active rivals sound edgy by comparison. Silver version at the twice the price adds eerie transparency, and is superlative.



**MODWRIGHT SWL9.0SE** £2,000  
Captivating sound quality that will transform your system. Build quality is equally impressive and value top-notch. Highly recommended

**NUFORCE P-9** 2007 £2,200  
Impressive two box preamp with superb resolution and an engaging sound.

**MELODY PURE BLACK 101D** 2007 £3,295  
One of the best preamplifiers we have ever heard. Takes the clarity and openness we expect from valves and adds a staggering level of grip and detail. Stunning.

## POWER AMPLIFIERS

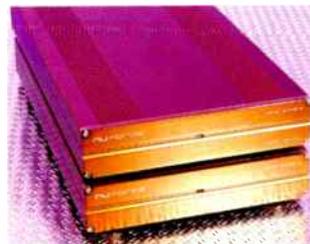
**QUAD 909** 2001 £900  
The latest current-dumper has a smooth and expansive character with enough wallop to drive most loads. Not the most musical, but super value all the same. Lovely build, finish and Quad's legendary service are nice.

**NAIM NAP150** 2002 £795  
Driven by a decent source and a NAC112, this gives highly enjoyable results - providing you like the Naim sound! Taut, fast and feisty despite its relative lack of power.

**SUGDEN MUSICMASTER 2003** £1,300  
Quintessential Class A Sugden sound is not warm as many expect, but extremely neutral and open with real tonal colour. By comparison, tubes sound bloated and standard solid-state hazy and brittle. Superb when partnered with efficient loudspeakers like Revolver R4Ss, but many will find it underpowered.



**NUFORCE REFERENCE 9SE** £1,550  
Brilliant value for money monobloc with massive power and super-clean, three dimensional sound.



**ROTEL RB1092** 2007 £1,595  
Hugely powerful digital amp with neutral midrange and a wonderfully spacious treble

**CHANNEL ISLANDS AUDIO D100** 2005 £1,595  
Clean and musical Class D monoblock power amplifiers in a neat, small package.

**CROFT TWIN STAR** 2003 £1,750  
With a taste of the best of both tube and transistor, this latest update of the Croft classic is a truly endearing experience.



**QUAD II-40** 2005 £3,230PR  
Brilliant modern tube monoblock power amplifiers with plenty of power, wonderfully liquid and open midband and spacious, airy treble. One of the best tube power amp combos ever.

**GRAAF GM20 OTL** 2003 £3,300

Awesome output transformer-less valve power amp gives dazzling speed and incision, with an ethereal soundstaging and delicious filigree detail. Tremendous punch belies its humble 20W power rating. Factor in one of the most exquisite finishes this side of an Aston Martin and it's very hard to say no...

**LOUDSPEAKERS****TDK S-80** 2002 £90

Ingenious NXT multimedia sub/sat system has a wonderfully even and open sound - like baby electrostatics.

**Q ACOUSTICS I020** 2006 £130

The best entry-level standmounter around right now: clarity, neutrality and poise for peanuts.

**ALR JORDAN ENTRY S** £200

Small in size but not in stature, this loudspeaker's imaging and dynamics make it a true 'super mini' monitor.

**KEF IQ1** 2005 £250

Highly polished and articulate standmounters at the price, but demand good ancillaries for best results.

**USHER S-520** 2006 £280

Astonishingly capable budget standmounters that offer detail and dynamics well beyond their price and dimensions

**MORDAUNT SHORT AVANT 9061** 2006 £350

Dynamic and impressive floorstanders with excellent insight and a lively nature.

**REVOLVER RW16** 2004 £400

Outstanding standmounter with tonal accuracy and speed that totally belies its price; good sensitivity for a small box makes it great with valve amps too. A budget audiophile classic.

**AAD C-550** 2006 £500

These highly polished and controlled floorstanders have a powerful studio monitor sound.

**ACOUSTIC ENERGY AE1 CLASSIC** £845

Brilliantly successful remake of an iconic design; not flawless, but surely one of the most musical loudspeakers ever made.

**SPENDOR S3/5E** 2004 £950

A natural successor to the BBC LS3/5a, whose impressive neutrality, imaging and evenhandedness makes this a superior, if less charismatic, loudspeaker.

**LEEMA XEN** 2006 £1,000

Affordable audiophile mini monitor with grip, composure, detail and scale that belie their diminutive dimensions.

**ELAC FS207.2** 2004 £1,000

Deeply capable mid-price floorstanders, distinguished by superb JET ribbon tweeter which is unmatched by class rivals; engaging, slightly warm nature needs serious transistor power to sing.

**REVOLVER RW451** 2006 £1,199

Very musical floorstander that's clear, concise and truthful, whilst being exceptionally amplifier friendly - a dreamboat for valves.

**SPENDOR S8E** £1,895

Generously large, silky smooth delivery, this dynamic sounding floorstander is an excellent all rounder.

**MONITOR AUDIO GS60** £2,000

Brilliant modern rock loudspeaker with a fantastically lithe and engaging sound, but partner carefully with a warm front end.

**NAIM ALLAE** 2002 £1,990

Taut and grippy like few others, this speaker majors on transient speed. Surprisingly smooth for a Naim box, with nicely etched treble. As always, tonally dry.

**PINSH 2.1** 2006 £2,000

Wonderfully neutral and self-effacing with Redoubtable low frequency articulation allied to the superlative hear-through clarity of the Pinsh ribbon tweeter makes for an extremely accomplished all round floorstander.

**YAMAHA SOAVO 1** 2006 £2,000

Musical and transparent floorstanders with impressive dynamics and cohesion. Fine build and finish.

**MARTIN LOGAN CLARITY** 2003 £2,895

Supremely transparent and open with brilliant depth perspective and image projection. The midband is up there with the very best at any price, while the bass and treble integrate well but don't especially shine. Dynamically limited, with middling bass punch, but that's not the point - that deliciously fluid and intricate midband wins great respect.

**QUAD ESL-988** 2001 £3,400

Sublime imaging and projection. Treble lacks extension, bass lacks weight, but still special all the same.

**B&O BEOLAB 9** 2007 £5000

Technically impressive and visually striking loudspeakers with sound quality that more than matches their looks.

**ARSAURES MI** 2006 £5,995

Sublime build and finish allied to an insightful, assured and even-handed musical performance makes these an essential high end audition.

**QUAD ESL-2905** 2006 £5,995

The old 989 with all the bugs taken out, this gives a brilliantly neutral and open sound like only a top electrostatic can; still not a natural rock loudspeaker, though.

**REVOLVER CYGNIS** 2006 £5,999

Revolver pull out all the stops and show what they can do with this magnificent flagship loudspeaker. A superb monitor that is like a mini B&W 801D in many ways.

**TANNOY KENSINGTON** 2006 £X

Don't let the looks fool you; these are fiercely fast and modern sounding monitors with a stunningly musical sound - not neutral though.

**B&W 801D** 2006 £10,500

In many respects, the ultimate studio monitor; dazzling clarity and speed with commanding scale and dynamics.

**ISOPHON CASSIANO** 2007 £12,900

Drive units featuring exotic materials allied to superlative build quality result in an immensely capable loudspeaker. Not an easy load to drive, however.

**ACCESSORIES****MONITOR AUDIO IDECK** 2006 £200

Fine design, impressive flexibility and a lucidly musical sound make the iDeck the current iPod dock champion.



**ISOTEK GII VISION 2006 £550**

A genuinely effective and surprisingly cost effective upgrade, but results could vary so a home dem of the power conditioner is recommended.

**TOWNSHEND MAXIMUM 2003 £800**

Classy ribbon supertweeter with flexible level settings and cool styling - you'll be amazed at the difference it makes, especially with Quad electrostatics.

**HEADPHONES****SENNHEISER MX-550 2005 £19**

Our unqualified recommendation for those seeking a serious sounding pair of in-ear phones. Smooth, detailed and musical.

**SENNHEISER PX-100 2002 £29**

Cracking pair of lightweight open back cans ideal for personals, but good enough for real hi-fi use. Superb build allied to a smooth and engaging performance make them the spiritual successor to the HD400s.

**GOLDRING DRI 50 2006 £70**

Excellent build and fine sound makes these budget cans superlative value for money.

**SENNHEISER HD-590 1998 £199**

The company's best real-world cans to date. Open and smooth with plenty of detail. Brightly lit midband makes them an ideal partner for a valve headphone amp.

**SENNHEISER HD-650 2004 £250**

Not the best headphone in the world, but a superb all round reference all the same. Very crisp, detailed and even sound allied to superlative build and fine comfort makes all most people will ever want. Cable upgrade yields great results.

**STAX SR-007T OMEGA****II/SRM-007T 2006 £2,890**

Simply the best headphones we've ever heard at any price, these sweetly translucent electrostatic earspeakers are like no other headphone, or loudspeaker for that matter...

**INTERCONNECTS****WIREWORLD OASIS 5 2003 £99/M**

Excellent mid-price design with a very neutral, silky and self-effacing sound. Superb value for money.

**CHORD COMPANY****CHAMELEON 2 £90/M**

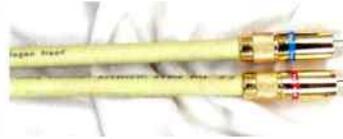
One of our favourites, these are musical performers with a smooth yet open sound.

**DNM RESON 2002 £40/M**

Neutral and transparent - a steal!

**VDH ULTIMATE****THE FIRST 2004 £260/0.6M**

Carbon interconnects that help you forget the electronics and concentrate on the music. Miraculous transparency. Tight and tuneful bass mixed with air and space results in a cracking cable for the money.

**TCI CONSTRICTOR****13A-6 BLOCK 2003 £120**

Top quality 'affordable' mains outlet block, with fine build and good sonics. Well worth the extra over standard high street specials, which sound coarse and two-dimensional by comparison.

**BLACK RHODIUM POLAR CRUSADER DCT+ 2006 £320**

Wonderfully smooth, sweet yet transparent interconnect with a deliciously musical sound - hurts cables at twice the price.

**TUNERS****DENON TU-1500AE 2006 £120**

Excellent entry level analogue tuner; slick sonics and fine feature count makes it a bargain.

**PURE DIGITAL DRX-702ES2003 £249**

Great with Digital Radio, but thin a tad sounding on FM at times. It's a top hybrid, nonetheless...

**CAMBRIDGE AUDIO 640T2005 £250**

Sweet sounding digital/analogue hybrid with fine build and finish at the price.

**MARANTZ ST-7001 2006 £299**

Stunning performance on FM (at the price) coupled with its ability to get the most from DAB broadcasts makes this the best affordable tuner.

**ARCAM DT91 2005 £450**

The very best DAB tuner around, with fine sonics and styling to match; FM is less impressive though.

**CYRUS FM X 2005 £500**

Great for Cyrus users, but its dry and precise sound can't match the best of the rest at the price. Worthy, nonetheless.

**CREEK CLASSIC TUNER 2006 £550**

No tuner offers better sound per pound; wonderfully three dimensional and smooth from bottom to top.

**NAD S400 2003 £600**

Highly accomplished specialist high end analogue tuner with a deliciously open and lucid sound, but it can't quite match the Myryad all the same.

**PRIMARE T21 2002 £600**

Seriously accomplished design with mature sonics, great styling and fine build.

**MYRYAD MXT-2000 2005 £800**

Truly sumptuous sound and excellent build is all most will ever need in a tuner; superb.

**MAGNUM DYNALAB****MD-100T 2006 £1,895**

One of the best ways to hear FM that we know; superbly open and musical sound in a quirky but characterful package.

**SYSTEMS****ARCAM SOLO 2005 £995**

Excellent all-in-one system, with a warm, smooth and balanced sound to match the features and style.

**DENON D-M31 2003 £250**

Excellent CD receiver package with surprising sonics and a brilliant tuner as a bonus, although its amplifier section doesn't quite match the Onkyo. Optional speakers are mediocre.

**ONKYO CS-210 2003 £300**

Superb value thanks to excellent sound, great build and ease of use, but the bundled 'speakers' rather let the side down.

**PIONEER NS-DV990 2003 £800**

Whiz-bang technology fest with DVD/universal playback, discrete display and NXT flat panel speakers. Superb for the spare room or study - truly intelligent and elegant design - but don't expect it to match the sonics of AV separates.

**LINN CLASSIK 2002 £995**

The best one-box stereo system money can buy; superbly musical sound beats equivalently priced separates.

**MERIDIAN F80 2007 £1,500**

Fantastically built and versatile DVD/CD/DAB/FM/AM unit, designed in conjunction with Ferrari. Ignore nay-sayers who sneer that it isn't a 'proper' hi-fi product; most see sense when they listen to it...



# KIT & COMPONENTS SUPPLIERS

## COMPONENT SUPPLIERS

### AUDIO SYNTHESIS

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Email salesinfo@audiosynthesis.co.uk.

Website www.audiosynthesis.co.uk

VISHAY BULK FOIL RESISTORS - unquestionably the world's finest resistor for audio applications. Thousands of VSRJ 0.3W 300V 5ppm 1% values in stock at the lowest possible prices eg. values up to 20K at £3.50+vat. HIGH PURITY SILVERWIRE - Teflon insulated >99.99% purity, 0.6mm and 1.0mm diameter. Ideal for internal wiring, interconnects or speaker cables.

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Suppliers of a selected range of audiophile valve kits and components. Including the Stoetkit range of valve amplifiers, Audio Note one times oversampling Dac Kit 1.1 and Lowther drive units. Plus a range of components and accessories from Eichmann, Furutech, Wonder Solder, Caig and many more. For a list of the extensive range of manufactured products and the special offers we stock please see our website or call for details. We are open from 9.30 to 5.30 Tuesday to Saturday, with demonstration stock of our kits available - please call in advance to book an audition.

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## LOUDSPEAKER KIT SUPPLIERS

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Huntingdon, Cambridgeshire PE28 5NU

Tel: 01832 293320 Fax: 01832 293372

e-mail: sales@seas.co.uk

Website: www.seas.co.uk

Arena Electronics was appointed official UK distributor for SEAS high performance drive units in January 2006. We offer the full range of SEAS drive units, designed and built in Norway, together with speaker kits and advice for DIY speaker builders. These include the World Designs WD25A project, complete parts for which can be purchased on our website including the cabinet kit.

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## Letter of the Month

### A RAW DEAL

Very recently I was in a position to invest a not inconsiderable sum in a really rocking hi-fi system. I knew more or less what I wanted to buy because I have researched and dreamed about what I wanted for many years. As my wife had often commented, if I had spent as much on the hi-fi as I did on the hi-fi magazines, it would be stunning! I have always dreamed of a Linn Sondek with Naim amplification although I have never had a great desire for any particular loudspeakers. However, in order to get some advice and thoughts from a different perspective, I decided to contact several shops and ask for their system recommendations.

I sent emails to eight shops in the Yorkshire area and gave them the following specification; that I wanted an all-British system (even down to cabling and stands if necessary) comprising a turntable, CD player, amplification (either preamp and power amp or integrated) and a pair of loudspeakers. I gave them the opportunity to quote me a system up to £10,000. I also intimated that I wanted the turntable to be the top priority in the spend. Music style was to be for Rock/Metal/Indie with the occasional classical piece. The results were truly surprising.

Five out of the eight shops have never contacted me or acknowledged my email; one shop came up with such a ridiculous system that I thought that they were joking - it was based on a £250 Goldring turntable, a £1,500 amplifier and a £3,000 subwoofer! Two shops did reply with great enthusiasm and came up with top-notch systems. It was extremely difficult to choose - essentially it was down to one supplying a Sondek and one supplying a Roksan Xerxes. I know how beautiful looking the Xerxes is, but the lure of the Sondek (and the sound!) could not be beaten. Eventually I came away with a Linn Sondek (fitted with Akito tonearm, Adikt cartridge and a Lingo power supply), Naim CDX2 CD player, I 12X



**Happiness was a pair of Linn Ninka loudspeakers!**

preamplifier, I 50X power amplifier, Stageline phono stage and some Linn Ninka floorstanding loudspeakers.

Incidentally, the loudspeakers were a real problem. I started off listening to some B&W 704s - and I thought that they were terrible. We then tried the 805s and I didn't think that they were anything special at all!! At that stage we were a little stumped, until the guy in the shop asked me why I hadn't considered the Linn Ninkas, and we were amazed at the difference when we heard them. I thought that they were terrific! Just goes to show, eh?

The system is now about two months old and more or less run in, but the main thing is that it sounds fabulous. And as for the shops that never replied to me? Well, business must be so good that they don't have to bother with a mere £10K! Thought that you might be interested.

**Jamie Straker**

Thanks for your comments Jamie. This is a pretty depressing tale, but I have to say it is sadly all

too commonplace, and does not shock me in the least. Whilst there are some superb dealers out there (personally speaking, it was the late, great Westwood and Masons in Oxford that got me into hi-fi, back in the early eighties - something for which I am eternally grateful), there is not - shall we say - an "embarrassment of riches". Seriously capable dealers are less commonplace than you might suppose, and we at Hi-Fi World are constantly regaled by tales such as this.

I am not quite sure why this is. Could it be that too many hi-fi dealers are hobbyists first and professional salespeople second - and therefore lack the necessary people skills and hunger to sell things to people? There's certainly too much amateurism in hi-fi retail, and that means poor advice, can't-be-bothered attitudes and even blatant rudeness to customers. I often think that, for example, most car salesmen could sell hi-fi in hi-fi

shops, but most hi-fi salesmen could not sell cars in car dealers...

Or maybe it is a cultural thing? One of the things I really noticed when I returned to this country after a long spell living in Japan was the service in shops, which is in stark contrast to that country's 'the customer is right' attitude. Japanese sales assistants always greet the customer as soon as he or she enters the shop and ask if they can help. If not, they leave well alone, and don't hover around in the background intimidatingly. If they can, they explain things in a very clear and polite manner. They never



**Revolver RW45 works well with the pure Class A Sugden A21a.**

ever give the impression that you're imposing on them, or that selling you something is too much trouble, and will often run (rather than walk) from one end of the shop to the other if they need to get stock to show you, for example, so as not to make you wait any longer than need be!

Once again, I must underline that there are some genuinely superb dealers in this country (many of which appear in this magazine), who will jump through a hoop backwards for customers, but if all the letters such as yours that we get are true, then sadly this seems more the exception than the rule. **DP**

**CRITICALLY SPEAKING**

*I currently have a Sugden A21 amplifier, two years old, with Wharfedale Evo 30 Pacific loudspeakers, an Arcam CD82T CD player and a late Michell GyroDec turntable. This features a Michell TecnoArm A and Sumiko Bluepoint Special Evo 3 cartridge, connected to the Sugden through a Musical Fidelity phono stage. I use QED cables throughout.*

*I would be interested if you have any comments on upgrading this system. My own idea would be to replace the Wharfedales with either PMC GB1s*

*or Revolver R45s, followed by the CD player with maybe a Copland. I listen to a wide range of music from rock and roll to folk, blues, and classic rock. Look forward to any comments you may have.*

**David Tyrrell**

Hi David - having heard the Revolver RW45s with the Sugden A21a, I can confirm that it is a particularly synergistic combination, and this is the one I would unhesitatingly recommend. Furthermore, a Gyro-Sugden-Revolver system is a very nice one indeed, with real tonal colour thanks to the Gyro, clarity and musicality thanks to the Sugden and speed and punch thanks to the super-efficient R45s. My main question mark would be over your Sumiko BPS which, in my view, is off the pace these days. A Goldring 1042 (£130) moving magnet, or better still an Ortofon Rondo Bronze (£500) moving coil would really add clarity and smoothness. Also, you could do much worse than investing in a few



**Sumika Bluepoint Special Evo 3 is off the pace and could be replaced.**

the A21 should minimise this. The Revolvers are rather more smooth and well damped in the bass, but with a good, insightful treble. Just to confuse you even further, you might like to also consider my personal £1,000-ish favourites, the Totem Arros. Diminutive they may be, but they are dynamic, punchy and should work nicely with the Sugden. **AS**

**A COG IN THE WORKS**

*I found the article about buying second-hand equipment very informative and useful, as it reminded me of an old CD player I have. I have been looking for replacement parts for this for a while as it was quite an expensive player at the time. Do you know of, or could you point me in the right direction of people who can replace these parts?*

*The model is an Arcam Alpha 5+, the only issue is that the cog for the transport has worn therefore it intermittently refuses to open the tray. I assume I just need a new cog. Apologies if this is not the correct place to ask these types of question, but you may be able to advise? I tried Arcam directly with no result.*

**Martin Derby**



**Arcam Alpha 5+ CD player - spares may prove tricky to locate...**

is essential - the PMCs are big and lively sounding, which can veer towards hardness occasionally, although the innate smoothness of

Ah, now my first suggestion can be crossed off the list, then, as I would have made Arcam my first port of call - they are usually pretty good

with regard to spares for their older equipment. However, are you definitely sure that it is the cog that is damaged? If this is the case I would expect the drawer to be troublesome every time you use it and not just intermittently. Consequently, it could just be a belt slipping, a situation I am very familiar with on my own player. If this is the case, then the likes of CPC ([www.cpc.co.uk](http://www.cpc.co.uk); 08701 202530) will sell you a new belt; all you need to do is take the old one out, measure it and order a new one slightly smaller than the old one! If it is indeed the cog, then I suspect your best bet is to look out for another Alpha 5+ to use for spares. **AS**

### VINYL REVIVED

I have been a subscriber for the last two years and enjoying every minute of it but this is the first time I am writing to you. After all I have been reading on how vinyl sounds so much better than CD and how lifeless digital is by comparison to analogue, I decided to go down in my cellar and dig out my very old Thorens TD145 (built in 1975) and compare it with the Marantz CD 6000 I've been using for the last couple of years. The poor thing had a couple of injuries but, and this shows how well they were built, motor and bearing were still running like silk. Unfortunately the tonearm was broken (not much of a loss here) so I decided to give it a good DIY treatment.

I dismantled and cleaned it. Rewired it completely, getting rid of all the unnecessary automatic nonsense.



**Thorens TD145, the wonder of analogue - after a cleanup!**

Completely insulated it inside with damping material and bought an RB250 to replace the TPI 6 (I know, not the best marriage but it is cheap). Finally, I bought a Grado Prestige Red cartridge and plugged it to my system.

Wow! Total amazement. The sound was just incredible! It's not the amount of detail or the dynamics or whatever. It just sounds so real and full of life. The musicians breathe and the music is lush and vibrant compared to the exact



**Rega RB250 - a wonderful sounding arm at a bargain price.**

sterility of CD. Unfortunately only some ten LPs survived from my collection and I now regret having offered about 500 of them to a very good friend (don't think he will consider giving them back and I don't blame him). It was the first time I heard vinyl for the past twenty years and, oh boy, have I been missing the essentials. I am since converted to the black plastic and have been buying LPs like mad.

Now I am thinking of upgrading the old box and would very much appreciate your opinion. I am considering the Project RPM 9.1 which sounds good and would be within my budget (they are rather cheap here in Austria). Another option could be the Michell TecnoDec. A friend of mine has one and I love it but it costs almost twice as much as the Project. Even buying it in the UK and bringing it back would be more expensive than the first option. I also thought of the Clearaudio Champion with its immense potential for upgrading but its way out of my budget and frankly I was not convinced by the sound.

I listen mostly to Jazz and Prog

Generally speaking, Thorens arms were nothing much to write home about, with the exception of the TPI3B fitted to the TD150Mk2, which Haden Boardman and I both think is something of an undiscovered budget gem. Other than this they tend to be rather lightweight, fragile and best junked in order to release the full potential of these decks. What you basically have now, then, is a TD160, as the 145 was based on this but with the addition of an auto-stop, which is a very good place to start.

As to upgrades from the Thorens, do be aware that these old decks are remarkably capable when properly fettled and differences will most likely be quite subtle rather than 'night and day'. That said, both the Michell and Project are excellent record players and will add a certain touch of sophistication to the sound of your system. When it comes to choosing between the two, all I would say is that, if you know and love the TecnoDec, be careful of falling into the trap of settling for what amounts to a 'second best' for you. The Project is a very good deck (and looks superb!), but there is always the possibility that you might end up with a lingering doubt in the back of your mind, wondering if you would have been even happier had you bought the TecnoDec. If you really like the Michell, then I would personally save for a bit longer and go for it. **AS**

### AN EMT SPACE?

I was wondering whether you might ever have been considering featuring reviews and opinions on the range of EMT turntables? I have four at present, using them for both work and pleasure and consider them to be the best ever made! Although EMT does not exist anymore, many spare parts are still available from Germany to keep these lovely machines working. I would be very keen to hear your comments.

**John Shaw**

Rock and my system comprises an Arcam Delta 290 (slowly dying) and a pair of JBL XT1 100 which I love. Will the improvement be significant from my old Thorens?

Thanks and keep the good work.

**Ricardo Santos**

Well, Ricardo, I think you have taken the first and best step in upgrading your TD145, namely removing the original arm and fitting an RB250.

Speaking for myself, I have spent many an hour perusing the history and technicalities of these impressive machines, and continually despairing

at the second-hand prices they fetch, which are well out of my reach, sadly (and I have yet to see one at my local dump or car boot sale!). I gather from pretty much everything that I have read that they really are quite spectacularly good units.

Consequently you may be interested to know that we have in

*L80Ts, have a 10in bass driver and the difference is noticeable in comparison to the 6in bass unit on my previous speakers.*

*Looking at the loudspeaker market, there isn't much about in the range of £2,000-£4,000 unless one goes to mega bucks. Can you recommend a loudspeaker that would partner the*



**Coming soon, a feature on EMT turntables.**

our 'feature bank' a comprehensive guide to the history, purchasing and restoration of EMT turntables written by Stefano Pasini, whose website is an essential bookmark for fans of these decks. It is long, detailed and with many excellent pictures and we have so far not been able to fit it into the magazine easily. However, as the editorial team have now armed ourselves with a shoe horn and a large tub of grease I can only say, watch this space...

Incidentally, EMT are still very much alive, although no longer making turntables. We hope to be receiving one of their new cartridges for review soon. **AS**

Hi John - indeed, we are having problems with too many features and too few pages to print them on! This is why the EMT feature has been delayed. Apologies for this - we hope to bring it to you soon. **DP**

### BIG BASS, PLEASE

*I have just purchased the Musical Fidelity A5 pre and power amps, which have replaced a pair of Roksan Caspians. At present I am using a pair of 22 year old JBL L80T floorstanders and I would like to upgrade to something more modern that would better suit the MIF's power.*

*Reading Noel Keywood's reviews in last year's April issue on the PMC IBI, JBL K2, and big bangers like the Tannoy Yorkminster, I have to agree that a large bass driver makes a serious contribution to the overall bass quality e.g. the JBL*

*MIFs and still keep the qualities of the mid and high frequency ranges without drowning them in overpowering bass? Listening material is jazz and classics so the bass sound I would be looking for is good articulation on acoustic string bass for jazz, and more weight in the bass section of the orchestra - and I like it loud!! My room is 3.5m x 9.0m in a stone house with walls 18" thick, in the country in Turkey, where I now live. The locals think I'm quite strange.*

**Paul Hargreaves.**

As you rightly say, Paul, when it comes to decent bass, despite the advances in driver and cabinet technology in recent years, you really



**Tannoy Yorkminster: big loudspeaker with a big sound.**

cannot beat a nice big drive unit. However I would tend to agree with you that smaller seems to be more beautiful these days and generally loudspeaker manufacturers are fitting multiples of relatively smaller drive units in order to maximise bass from domestically acceptable enclosures. Mind you, I envy your listening room and location and it would be a shame not to make the most of them.

Consequently, you may be interested to know that one manufacturer that you mention has resolutely stuck with larger drive units in one of their ranges, and if you like the 'Tannoy sound', then you have a wide choice in their Prestige range, namely the Stirling SE (10in driver; £2,500), Glenair 10 (10in driver; £3,000), Turnberry SE (10in driver; £2,900) or the biggest of them all, the Glenair (15 in driver; £3,995). However, the Tannoy sound is quite distinctive and people tend to either adore it or wonder what all the fuss is about. Personally I have never really got on with the Dual Concentric presentation and so, if it were my money I think I would be most likely to take a listen to the B&W 803S (2 x 7in drivers; £3,800) and something of a wild card in the form of the Mowgan Audio Mabon (8in driver; £3,800) but I'm not sure how the latter's availability is in Turkey at the moment. **AS**

If you can possibly afford the extra, you might like to think about the Revolver Cygnis (£5,999), which to my ears is one of the most complete high end loudspeakers around, with a very clean and open sound, plus the physicality afforded by a high quality 10in bass driver. As Adam says, the Tannoys are very polarising loudspeakers - you love them or hate them; and they are as eccentric as they are concentric (!) - whereas the Cygnis is a far more even-handed and - in my opinion - more neutral design that still has a nicely sumptuous and smooth sound, perfect for your Musical Fidelity amplification. **DP**

### AZUR THING

*I enjoyed the CD player supertest in the May '07 issue, but must admit that I was surprised that the Cambridge Audio machine didn't show better, especially after the great review in the Feb '07 issue. Then the lights came on! I realised that the machine tested in February was the Azur 840C and that in the supertest was the Azur 740C.*

*This got the cogs spinning as the Azur 840C (at £750) also fits within the sub £1,000 limits of the supertest. The obvious question arises as to what would have been the finishing order*



**Cambridge Azur 840C - a fine player and excellent value for money.**

if the 840C had been part of the supertest. I know that it involved two different reviewers, but would you care to speculate?

**Steven Cocking**

Yes, you are right that the Azur 840C would also have fitted into the group test nicely, but given that the 740C was brand new and that Cambridge do have a knack of making products that can usually comfortably take on a group above them we felt it more than merited inclusion. This was proven by the fact that it acquitted itself remarkably well and is a fine-sounding player.

As to how the 840C would have fared instead, that's an interesting one, as I am providing a third opinion here! Having listened to the 840C myself, as well as listened to all the group test players with Noel, I think I would personally place it up with the Vincent but would be hard pushed to tell you which one I preferred without further direct comparisons. I feel that the 840C is a more refined player than the Vincent, with superbly smooth and silky sound, whereas the Vincent is more dynamic and forthright, adding real impact and emotion to music. Both are excellent players but present music somewhat differently - I could happily live with either. **AS**

**IN TUNE**

Global warming and the inevitable high winds prompted me to take my I7 element Galaxy aerial off the roof and rebuild it in the loft, thus compromising the signal to a Leak Troughline III Paravicini tuner. Between this component relegation and the constricting Optimod compression, I decided to sell the tuner.

It didn't take long before withdrawal symptoms developed, so I bought a Marantz 7001 on Steve Green's review (I know - listen first, then decide!). Consequently I wasn't impressed with FM so I thought I'd try the "dreaded DAB".

Still owning an Assemblage II DAC with all the audiophile candy your good selves recommended at the building stage and, for good measure, adding the latest Burr Brown op-amps, this gave good service until the Chord DAC64 became the new kid on the block. I dug this out and connected it up with some Chord Silver Plus coax and changing to an 'F' type aerial lead to the Galaxy, just for fun. As you know, this is not a Band III coathanger. At this stage I won't bore you with the rest of my kit lineup, but I got the best of three falls otherwise the wife would be driving a nice new family saloon...

The sound, though lacking air and timbre, still gives holographic imaging through valves. Needless to say, I'm chuffed. Roll on broadband, AAC+, DRM Mondial or any other well thought-out medium.

I am a regular concert-goer with eclectic taste and I've been around long enough to recognise hi-fi from the real deal. DAB in its present form isn't in the hunt but the lack of compression and the proliferation of choice makes it very attractive. As I write this I'm listening to 'The Jazz' coming from the Metropulse to the West Midlands - how's that for starters?!

**Stewart Horsburgh**

There cannot be so many people around with Ron Smith Galaxy I7 aerials, and even fewer with Tim De Paravicini's decoder. As I suspect you must be aware, your Galaxy isn't ideal for DAB, which uses 210MHz-230MHz and is vertically polarised. However, DAB receivers need very little signal (around 30uV I recall) to work (i.e. come out of muting) and with any signal, weak or powerful, they give minimum hiss, so DAB always seems 'quiet'. DAB Radio 3 is not subject to Optimod, which is analogue compression, but instead it is subject to mp2 data reduction (digital 'compression') which doesn't help quality one little bit. Having said that, the BBC upgraded their mp2

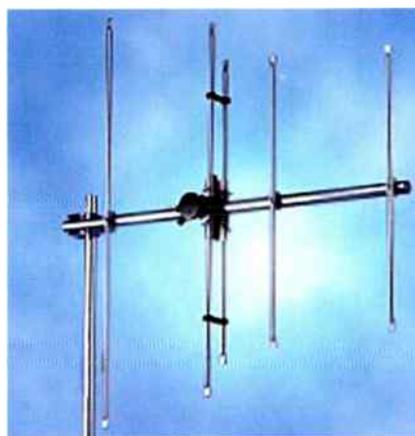
compressors nationwide recently, in response to all the flak they were receiving about poor programme quality. Radio 3 does now seem to sound better, although I haven't recently done a careful listening comparison with full orchestral programme, which stresses DAB heavily and shows up its flaws. I still would not compare it to VHF/FM, however.

The differences between the two are subjectively unusual in nature and difficult to describe, but DAB sounds peculiarly deficient of internal detail and bland against VHF. Massed strings in particular tend to take on a homogenous sound, where with a Troughline it is more apparent that there are many instruments playing, rather than one generalised one! All the same, BBC DAB quality at least seems to have improved,



**Tim De Paravicini decoder - works superbly with a Troughline**

although I cannot say the same for the commercial stations. It is but a small step to AAC and 256kbps data rate, which would be sufficient I believe to make DAB sound decent, giving the air and space you talk about. Personally, I am beginning to wonder whether broader broadband, that the upcoming BT 21CN network should allow, may be the answer, mobiles being fed by satellite such as Sirius. Littering the country with transmitters for DAB, 3G, L Band and all else may not be such a good idea. **NK**



**Antiference DAB aerial, with short elements arranged vertically for vertically polarised DAB.**



*TheJazz, broadcast in mono at low quality on DAB.*

It's interesting that you mention theJazz, because it seems to sum up DAB in a nutshell: it's a good example of the extra choice you get on DAB, but unfortunately it's in mono on DAB! Also, in order for it to transmit on the Digital One national multiplex two music stations had to be reduced to mono to fit it in.

I realise that DAB has some advantages, such as the number of stations available, but the price paid for the number of stations is that the audio quality is very poor, and the reason why it is so poor is simply down to the broadcasters using bit rate levels that are far too low.

Radio 3 is the only station on DAB in the UK to use the more reasonable bit rate level of 192 kbps – apart from when it is reduced to 160 kbps – but listening to Radio 3 on DAB, it's as if the microphones have been wrapped in cotton wool. I know that R3 FM uses Optimod compression, but if it's that or muddy, imprecise and homogenous audio, then there's no contest, in my opinion – that's not to say that I agree with the use of Optimod compression, though. Also note that many of the continental European classical music stations use a bit rate of 256 kbps on satellite, and there's even a couple using 320 kbps, so you have to question why the BBC deems 192 kbps to be adequate for classical music.

As for the stereo music stations that use 128 kbps on DAB – which is 98% of them – I think they sound

very poor. The problem is that they're using a bit rate level that the MP2 audio codec was never intended to be used at, so audio artefacts are generated whenever the audio is difficult to encode, which is most of the time. These audio artefacts consist of things such as the audio sounding gritty or dull and muffled, or the treble sounds splashy, or the stereo image collapses and you're left with a wall of mono sound – these problems are all caused by the encoder having too few bits to encode the audio, and they would be solved if higher bit rates were used.

Personally, I think it's ridiculous that they're providing such poor quality in this day and age, but at least DAB+ will solve the quality problems once it has fully replaced DAB, although that is a few years off yet.

If you like having a wide choice of stations and you want better quality, you can get it on the Internet already, and the quality will continue to get better over time. For example, there's a 128 kbps WMA stream of theJazz available on its website at [www.thejazz.com](http://www.thejazz.com), which is both in stereo and at higher quality than on DAB.

Satellite also has a wider range of stations and higher quality than on DAB, and if you spend a bit more you can receive the European satellites, which carry the higher bit rate classical stations I mentioned above.

As for the Marantz ST7001, I liked it, and it fared well relative to most of its peers in the tuners group test. I've never heard DAB through valves, though, so I can't comment on the use of good quality DACs with DAB is that if you've got one there's obviously no harm in using it, but DAB is damaged at source, and DACs are unable to undo this damage. **SG**

#### FURTHER GARRARD GUIDANCE

*After reading the mail in your April 2007 issue, particularly the letter under the title of "Garrard Guidance" I wonder whether you could provide me with the name and contact details of a person or company who could carry out repairs or service to a Garrard model 301 transcription turntable and model TPA10 pickup arm, along with a Laboratory Series Type A auto turntable?*

**Kenneth Thornton**

Well, let's start with the easy one – the 301 can be serviced by a whole host of worthy people, but I would say that the best candidates are Garrard/Loricraft themselves ([terry@garrard501.com](mailto:terry@garrard501.com); 01488 72267 – be patient, however, as it's sometimes difficult to get hold of Terry!) or Dr. Martin Bastin (01584 823446), who performed his magic on publisher Noel's 401.

The other two items are a little trickier. Loricraft quite clearly state that they cannot help with any models other than the 301 and 401. However, I do not know if Dr. Bastin dabbles in them at all. I must say that if you are using the TPA10 on the 301, it really does deserve an arm so much better, as I'm afraid the TPA10 is an old relic best left to a museum, or a nice display on your mantelpiece!

Regarding the Type A, this is another fantastic old timer that is impressively constructed and fearsomely complicated. The spares situation for this unit is simple – there are none – but generally all they need for servicing is a good strip down, clean and some nice new lubricant. As you may have gathered, this is not a job for the faint-hearted, however – my own Type A took me the best part of a week's worth of evenings to service a few years back.

Your best option would be to

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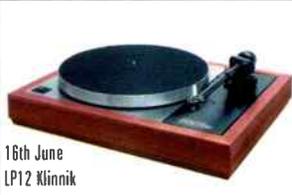
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**Garrard 301 - a wonderful piece of machinery, but one that needs regular care to run at its best.**

speak nicely to one or two of your local TV/electronics repair shops to see if any one of them would like to get their hands dirty. Sadly, however, I suspect that, as with the TPA10, any servicing cost would far outweigh the value of the item, so it depends on how sentimentally attached to them you are. **AS**

#### LINN LETTER

Hi there

I assume the hifi press is aware of the problems at Linn, referred to in the (Glasgow) Herald article dated 18 April? See [www.theherald.co.uk/mostpopular.var.1335339.mostviewed.linn\\_staff\\_face\\_up\\_to\\_job\\_cuts.php](http://www.theherald.co.uk/mostpopular.var.1335339.mostviewed.linn_staff_face_up_to_job_cuts.php)

It certainly came as a shock to this reader, and I wonder whether Linn can actually remain in business, whether other hifi manufacturers are in equal trouble, and whether most of us will be able to afford any remaining Linn products? The latest 'SE' updates for the Sondek (my only Linn product) certainly seem to set the tone for high prices! Are they intending to turn round the company out of LP12 owners' pockets?

You will see from the article that profits are down from some £2 million in 2000, to a latest figure of £173,000 - less than half the profit of the previous year. Seems like a nosedive to me.

cheers,  
**Tony Contoloy**  
London

I appreciate you referring Tony Cantlay's letter to me for my information. You should know that Loewe have set up their own UK distribution business and that this and other factors have had a material impact upon Linn's business. To summarise, our core hi fi business is strong, profitable and growing and has been since I returned to the business some months ago. I have had serious health problems over the last 4 or 5 years that compelled me to withdraw from operational aspects of

the business, but new medication has returned me to fitness with restored energy levels.

Linn sales subsidiaries in Germany and America are performing well and exceeding sales targets. Customers should not be concerned about future support. We continue to enjoy the support of our distributors and retailers throughout the world and they are committed to growing their Linn sales so our end users can be confident that they will continue to enjoy the kind of products and support for which Linn is famous.

regards,

**IVORTIEFENBRUN**

#### TECNODEC QUANDRY

Hello Channa, I have been following your turntable reviews with great interest, particularly the TecnoDec. Can you please help me to squeeze the best sound per pound for my intended purchase. I have a Rega P3- RB300-Elys, Naim 62190 with MM card, Myryad MXC 6000 CD, Dynaudio 140s and stands. Naim speaker cable and £1,100 burning a hole in my pocket. I am intending to fit the RB 300 to the deck, and was thinking of two options.

1) TecnoDec, VTA adjuster, TecnoWeight and The Cartridge Man's MM at £575  
2) TecnoDec, VTA adjuster, sending my RB300 arm to OL for structural, rewire and external rewire plus Rondo red, for £515. As you fitted an expensive MC to the RB 250 with excellent results, I would value your opinion as to spend the money on the arm or cartridge. I can get a free swap to MC card for my amplifier.

**Bob Dyer**

Dear Bob - I would suggest the following. get the MC card for the NAC 62 - check with Naim for MC cartridge compatibility if you are not sure. Then the Michell VTA Adjuster and TecnoWeight and Rondo Red MC for the RB300 for about £387

- and then enjoy more of the music. Then if you want even more music, get a TecnoDec for around £575. The Rondo Red and Michell products should total about £962. If you are feeling flush, the Rondo Bronze MC at about £500 comes very highly rated at Hi-Fi World - it will push the total to around £1,162. The MC route will put you in good stead for future upgrade cartridges, which the 'Michelled' Rega can definitely exploit (remember, I used a Michell upgraded RB250 without a rewire and it was stunningly good with the £995 Transfiguration Spirit III MC).

At a later date, if you really want to, you can get the Michelled-RB300 rewire - and this will further improve things, but not as much as doing the first set of upgrades. I haven't heard the Cartridge Man Music Maker Moving Iron (MM) Cartridge yet, and though it has a great reputation, I can't obviously comment on its sound quality. For practicality however, should you want to upgrade cartridges, then the MC route offers more possibilities... Do consult the very helpful people at Michell for advice on fitting their upgrades. **CV**

I'd go along with Channa's recommendations, but would like to add that I certainly advise spending the extra £200 over the Rondo Red for the Rondo Bronze, as I feel the improvement more than justifies the price. The Bronze brings real high end sophistication to the party, with massive amounts of detail and excellent tracking to boot. For me, this is effectively the cheapest MC worth having. Only when you move



**The Michell TecnoDec - has a whole host of upgrade possibilities.**

up to the Kontrapunkt b, for several hundred pounds more, do you realise that the Rondo Bronze is in any way lacking; it sounds just a tad 'flat' and mechanical by comparison. As an aside, I would personally recommend the Ortofon Rondo Bronze over the Cartridge Man Music Maker. I know the latter is held in high regard, but for me it sounds congested and lacking detail compared to the Ortofon. **DP**

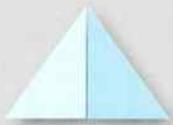
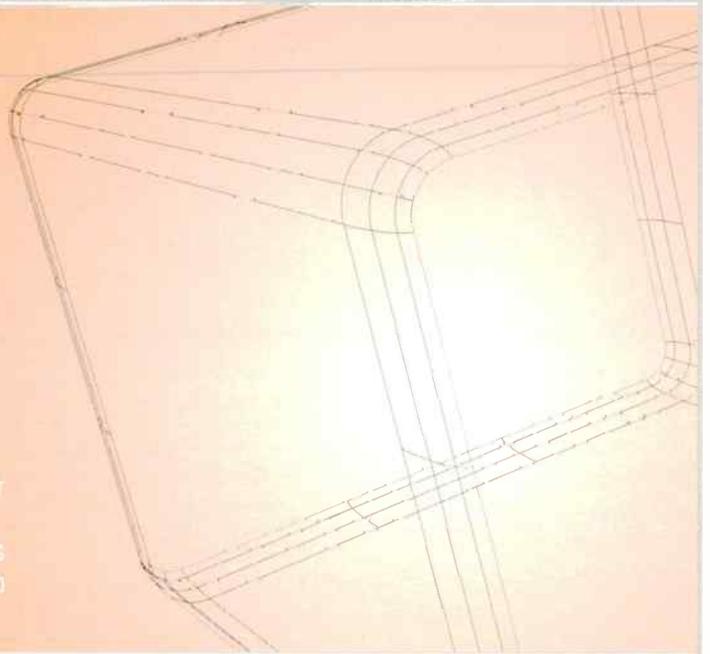
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Roy Gregory, Pico Review, Hi-Fi+ Issue 46

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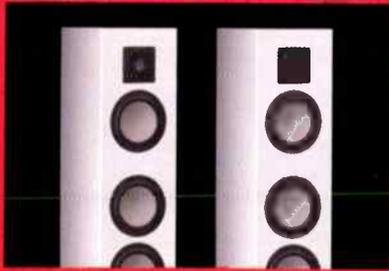
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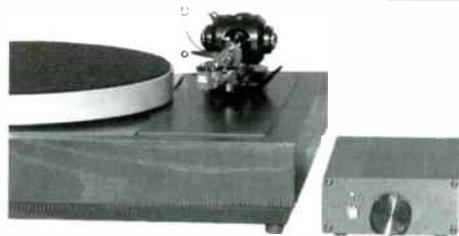
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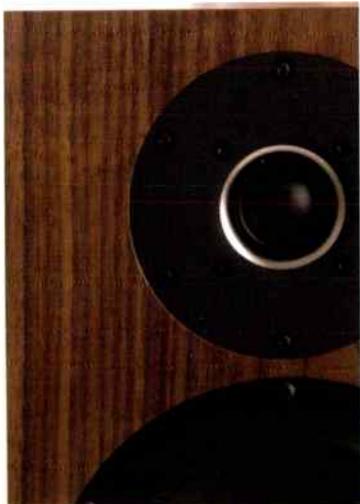
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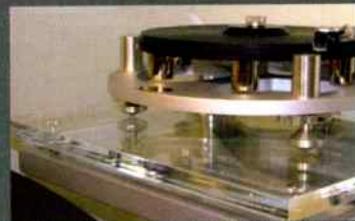
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FOR SALE: Naim prepower amp NAC82 £950. Supercap £950. NAP300 £3900. Acoustic Energy AE2 speakers/dedicated alloy stands £500. All original boxes. Phone after 6pm 07748947066. Email: [guillem@tiscali.co.uk](mailto:guillem@tiscali.co.uk)

REMOTE CONTROLLED valve preamp, separate PSU; 300B monoblocks; DAC; loudspeakers. all professionally built with premium components. Vivid, musical, open, dimensional sound. Seeking new home, hence £750.00. can separate. Email: [vita5@onetel.com](mailto:vita5@onetel.com) or phone 020 8883 5618

AUDIO RESEARCH D70II, revalved £800. Harbeth LS5/12a Teak £750. Tandberg 3001A tuner £450. Quad FM3, late model, Quad serviced £110. Quad FMII, Quad serviced £150. All boxed with handbook. Tel: Leeds 0113 257 7793

ARCAM ALPHA 8SE CD player, Pacific Microsonics PMD100 filter, so HDCD capable, mint, boxed, £195 (£600 new). Tel: Rod 01706 345418 or [mail@rodtheobald.force9.co.uk](mailto:mail@rodtheobald.force9.co.uk)

PYE 1005 record player. Excellent condition fully working order. Beautifully polished wood, no dents knocks! Used but well looked after. Serious offers please. Tel: 07729 865 500

HI-FI/TV Stand-Optimum OTP5500 five 6mm glass shelves, (WxDxH) 610/520/63mm, gold legs cost £349.99 as new £160 ono. Stafford area. Tel. 07817 379 508 or [ejgrovewood@ukonline.co.uk](mailto:ejgrovewood@ukonline.co.uk)

YAMAHA CT600 vintage tuner (1974) with original brochure, Instructions and accessories (except phono lead and packaging). Excellent with 2 spare new indicator lamps (£25) (Scotland) 01383 623989 ([ndbrown@talk21.com](mailto:ndbrown@talk21.com))

ROTEL STEREO Receiver, wood casing, VU meters, and DIN connection. Rich powerful sound. £40 ono. Rotel Stereo cassette deck, VU meters, wood casing, superhard permalloy heads. £40 ono. Contact 02087695537 or 07985972475

SONY STR-DA5000ES home cinema receiver, DD, DTS, 7.1, 7x170 watts. S-Master Pro amplification. gold finish. Mint condition. £500 call Mick 07932330269 Lancs

SONY FLAGSHIP Super Audio CD Player SCDXA9000ES (silver). Surround sound and stereo options. Hardly used, excellent condition, 10 months old, boxed. £1000. Tel. 0151 639 6001 after 6pm.

CHORD ELECTRONICS Prima Pre amplifier, superb condition, purchased 2006. RRP £3350, £1875. Contact James [jc.guch@ntlworld.com](mailto:jc.guch@ntlworld.com)

GOLDEN DRAGON (China) EL34, four new matched pairs. £17 per pair. Tel Leeds 0113 257 7793

AUDIOLAB 8000 P&C pair. Reconditioned by Audiolab. Excellent £450. Russ Andrews - 2 Reference Powercords £60 each, 2 Silver Streak interconnects £75 each. 01494 580640 or 07920 209207

WANTED: BEN Duncan's Pure Power (std) 1kVA, 240v/240v Isolation Transformer/Power Conditioner. Email: [alvinkearsley@hotmail.co.uk](mailto:alvinkearsley@hotmail.co.uk) Tel: 01204 531016.

FOR SALE: Naim NAC62S £100, HiCap £175, NAP250 £500, CD3 £175. Epos ES11 with Stands £130. Black LP12/ Cirkus/Trampolin/Ekos/Lingo/17D2 £1500 Good Condition. Original Boxes. Colin. [Barrett60@ntlworld.com](mailto:Barrett60@ntlworld.com)

ARCAM CLASSIC A&R A60 Amplifier and T21 Tuner, Black finish, original boxes and hand-books £150. Soundstyle XS105 shelf support, green with glass green onyx finish shelves £150. Email: mike.hannibal@ntlworld.com Tel: 01992 813956

LINN GENKI CD silver 17 months old, boxed (£1100) £650; LK85 Power Amp, same £350; Linn Kolector pre-amp £300; Arcam P75+ Power Amp, boxed (£380) £220. Nottm 0115 960 3934

GARRARD 401 deck, SME 3009 S11 arm, Shure M75ED cartridge, housed in an SME 2000 plinth system. East Yorkshire. £550, Tel 01482 666774

TIVOLI MODEL DAB. As new condition, Boxed. £100. Tivoli iPal. Good condition. Boxed. £60. Tivoli Songbook Yellow. As new condition. Boxed. £50. 07949 910455. mail@paulmcperson.demon.co.uk

EASTERN ELECTRIC Minimax Phono, upgraded valves, (£1,100) £600. Artemis Labs L-1 Valve Preamp (£2,200) £800. Slee Era Gold V (£480) £260. Chord Anthem RCA (£275), £135. All mint, boxed. 0788 915 6202 (London)

LENTEX PRE pre amplifier, for using a moving coil cartridge into a mm input on your amplifier. 100ohms. Very nice detailed sound. Any sensible offers. 01745 331681. Mobile: 07714530889.

WALKMAN PROFESSIONAL WM-D6C with case, stereo microphone and power adaptor. No instructions. Good condition and working. £260. Tel: 0114 236 2473 after 5pm till 9pm only.

QUAD AM2 European. Major overhaul. £225. Tel: 01344 776 445 (Berks)

QUAD 303, 33, FM3, £200. A&R A60 £50. Sansui AU217 II £50. Naim 82 Hi-Cap 250 £2000. Pioneer F676 £40. Rotel 965 BX Discrete £80. Marantz CD60 SE £70. All excellent condition. Tel: 01722 334 694

SHANLING OMEGA Drive CDT-300 £2350. Transparent Musiclink Super 1.5m RCA interconnects £345. Vertex Kinabula with Coupling Feet £190. Pioneer DVD-565A £140. Nordost Pulsar Points aluminium £35. Manuals. Tel: 078104 34589

MICHELLE ORBE SE with fully modded RB250 from Origin Live including internal rewiring in mint condition owned from new. £1500. Contact : gary\_sandison@dsl.pipex.com Tel 07957647669

ART AUDIO Tempo monoblocks, triode connected parallel push pull EL34's mint condition in black & chrome, H.T. regulation of driver valves, 25 watts per channel £525 plus P&P. 01840 212387.

NAIM NAIT5i still under warranty bought from Audioexcellence 12/11/05. Couple of small scratches in good working order great amp have upgraded £475 ono all packing etc. Tel: Cardiff 02920639478

AUDIO TECHNICA - AT-OC9MLII Moving Coil Cartridge. Brand New. Latest version with microline stylus. Make a big saving on this top MC cartridge. Reason for sale: - apparently this is not suitable for my low mass tonearm (I need a high compliance cartridge). Contact: 07855513325

WORLD AUDIO KLS3 Gold Speakers, 1" thick Iroko (Teak). £250 (West Yorkshire). Tel: 07792731082 Or B.Neen@bradford.ac.uk

KEF 103.2 speakers complete with Target sand filled stands. Terminals upgraded. £100. Phone 0115 9176416 (Nottingham) or E-mail phil.richmond1@ntlworld.com

CASTLE EDEN speakers. Excellent condition £250. Atacama stands. £50. Tel: 01379 853 580 after 6pm

BRAND NEW Product. Hand crafted Acrylic decks complete with arm - cartridge. Great looks, great sound. For details, photo Tel: 07914 696 538

LINN AKURATE 212s without stands, rosenut finish, two years old, £1700. Project Ground-It Deluxe granite-style isolation platform, £140. All mint and boxed. Tel: 01285 862 539

NAIM AUDIO NAT 01 two box tuner, original silver edged classic, £550. Nakamichi DR10 cassette, mint, boxed, instructions, £275. Audio Analogue Bellini preamplifier, silver, mint, boxed, instructions, £275. Tel: 020 8986 1762

ART AUDIO Quintet mono blocks, chrome chassis, gold transformer covers, HT delay, mint condition. Triode 15w Pentode 25w new valves, £650 ono. Project phono stage, valve, 3 months old £175. Tel: 01634 221 102

MAXELL TAPES 35-90B XLI with bags and labels. Used once for mastering onto CD. £8 each. Philips LP18/DPI8 and TDK 35-90B £5 each. 20% discount for multi-purchase. Tel: 07710 828 286

CLASSIC AMPS: Pioneer A88X £230. Mordaunt Short A5000 £180. Rogers Ravensbourne £85. Speakers: Tannoy P10's (cherry) £195. Wharfedale 708's (black) £180. Goodmans Imagio IC100's £110. Mint condition, Boxed. Tel: 07837 188670 (Ilford)

MERIDIAN 502 preamplifier. Bal/Unbal. Good condition. £550 ono. Pair Sonus Faber Concertos, piano black, single wiring £550 ono. Tel: 0121 744 5068

MANLEY STINGRAY amplifier £800. Meadowlark Shearwater HR's superb floorstanders. Originally £2200. Asking £700 ono. Phone for more details: 07864 102 846

UNISON RESEARCH S6, 35 watt single ended Class 'A' Italian beauty. Boxed with remote, manual and warranty. Excellent condition. £950 ono. Email: leif5000@hotmail.com or phone 07800 608 207

MUSICAL FIDELITY Nu-Vista CD player. Boxed. £1400 ono. Can deliver. Tel: 0113 240 235 or 07917 814 948

QUICKSILVER VALVE monoblocks (£4000 pair). Beautiful appearance, black - gold. Stunning sound quality. offers or exchange for valve preamp, e.g. Mark Levinson MM-MC or equivalent quality. Tel: Stanley 07951 553 091 (London)

FOR SALE: Living Voice Auditorium speakers, cherry finish, £575 ono. 2m pair Chord Odyssey bi-wire cables. Chord terminations. £50. Tel: 01483 728 657 before 9pm. Genuine reason for sale (Surrey)

MARANTZ PM-11S1 super integrated amplifier, silver, mint, boxed, all instructions. One year left on warranty. 5 globes awarded. £2500 new. £1800 ono. Considering buying new? Don't! This example as new. Tel: 07976 261 576

PRIVATE ELECTRONICS Hobbyist requires for projects non working or faulty Quad 34 or 44 preamps, Quad and Leak tuners, 303 and 405 amplifiers, Quad 33 boards etc. Contact Mike 01758 613 790







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## WDKEL84 Valve Amplifier Kit

*"The quality that can be gleaned from this amp is a fine introduction to the joys of the valve sound"*

The WDKEL84 features a pair of EL84 valves in Push Pull configuration per channel, providing two channels each 18 Watts into an 8 Ohm load. Available as a 5 input integrated amplifier with ALPS volume control.

WDKEL84 kit £369

WDKEL84 built & tested £544



## WD88VA Valve Amplifier Kit

*"It proved itself to be an engaging valve amplifier that measured well and sounded superb. Quite simply it plays music, and plays it extremely well."*

Adam Smith, Hi-Fi World Dec 06

Often described as a 'sweet sounding' valve, our implementation of the KT88 makes sure that it is driven to its ultimate performance. Available as a 35W stereo power amplifier with single input volume control, or as a relay switched integrated with five inputs.

WD88VA Integrated Amp kit £849

WD88VA built & tested £1099



## Headphone II Valve Amplifier Kit

*"Headphone II is a single-ended design with the power pentode wired up in triode configuration for added purity and is as quiet as a mouse"*

A beautifully simple stereo headphone amplifier design using Mullard ECL83 valves. It works directly from any source. The circuit uses twin high specification E/1 output transformers that can be wired to drive any headphones between 16 to 300 Ohms.

Headphone II kit £275

Headphone II built & tested £404



## WDPRe3 Modular Preamplifier System

*"So there we have it, a pre-amplifier capable of driving any load and maintaining its linearity no matter what cables or partnering equipment you prefer to use."*

This 5 input line level preamp is essentially an SE triode power amplifier in concept. WDPRe3 uses an ECC82 double triode arranged as input voltage amplifier and power output amplifier stages, the latter driving large 20:1 output transformers.

WDPRe3 kit £299

WDPRe3 built & tested £424



## WDPhono3S MM/MC preamplifier

*"...only a few designs meet the requirements of tonal accuracy and maximum retrieval of musical detail."*

Twin input preamp with MM and MC relay switched inputs, passive RIAA equalisation and wide bandwidth MC step-up transformers.

WDPhono3S kit £349

WDPhono3S built & tested £474



## WDPSU3 Power Supply

*Can be used to power either WDPRe3 or WDPhono3 units individually or together.*

High performance choke power supply with separate HT and Heater feeds for both WDPRe3 and WDPhono3 preamplifiers.

WDPSU3 kit £199

WDPSU3 built & tested £299



All our kits are complete with pictorial easy-to-follow instructions.  
All parts are included - all you need is a screwdriver and soldering iron.  
World Designs, 59 Main Street, Great Gidding, Huntingdon, Cambs, PE28 5NU

www.world-designs.co.uk  
Tel: 01832 293320

PRIMARE CD110 CD/FM/DAB £800. Unison Research Unico integrated amplifier, £650. Both as new. Quad 99 Bus leads (long) £30. Quad 99 remote control £25. Russ Andrews Yello 4-way power block £25. Tel: 023 8073 8935

QUAD 99 + remote. Still guaranteed. FSL63's, vintage. POA. Marantz CD65DX £60. Rotel RT950BX tuner £80. Classe Audio CAP151, quality 225wrms, £899 (£2100). Meridian DVD596 £1299. E.A.R. 8L6 POA. P/Ex? Tel: 01206 510 392 or 07880 983 630

MUSICAL FIDELITY A3 Amplifier, upgraded silver trim version. Mint, boxed (£850) £300. Musical Fidelity A3.24 Upsampling DAC. Selectable 96/192 rate. Mint, boxed (£800) £250. Buyer collects. Tel: 0151 608 4481 (Wirral)

VOYD VALDI Turntable in rosewood. External PSU. Mint. £500 ono. Also Audio Innovations PI (valve) phono amp. Bargain. £125. Quad FM3, offers please. Tel: 07747 753007

NEVER USED E.A.R. 834P black with volume control, £450. DNM Reson RSI turntable with stand, £400. Tel: Dave 07984 328 777

MISSION 752F speakers £225. Rotel RA-05 amplifier, £255 warranty. Kef iQ5 speakers, dark apple, £275. TCI interconnect £25. DNM speaker cable, £5.85 metre. Marantz 6000K1-Sig CD player, £325. Tel: 01582 724 414

LOWTHER LOWTHER Acousta twin cabinets wanted. Made late 1960's. Also wanted - drive unit mounting screws. Tel: Jeff 020 8220 0380

ROGERS LS7T speakers, black, on Foundation stands, £175. Excellent condition. Tel: 02380 736479 or 07909 535 102

THREE PAIRS of Chord Chameleon interconnects. £20 a pair or all three for £50. Chord Odyssey 4, 2x 2.5 metres £60. Tel: 07941 174 804 (Berkshire)

ROYD A7 speakers, black ash, £75. Linn Kan stands £100. Thorens TD150, with Linn Basik+ arm, £100. All ono. Tel: 0780 320 7330 (West Yorkshire)

LOWTHER ACCOLADE 2 loudspeakers fitted with new PM6 and C45 drive units with silver speech coils, £550. (cost £2500 new). Phone Ray on 07956 688 906 or 020 8361 7765

STEVE AT One Thing Audio selling one pair ESL63 at £1000 inc VAT. Rebuilt 24-04-07. No boxes hence buyer collects. Cheques to clear, Cr/Debit cards accepted. Email: one.thing@ntlworld.com

TUBE TECHNOLOGY Synergy valve integrated amp. Excellent condition. All original packing. Manual etc. Genuine enquiries only. Bargain, £1995. Please call Mike on 07932 154 901

NAKAMICHI DRAGON, slight marks, works perfectly, manual, boxed, £650 ono. Rotel RB9711 MkII, good condition, £100 ono. Yamaha CDR HD1300 120HD, £250 ono. Tel: 07728 04347

LEAK TROUGH LINE Series Three with external decoder from One Thing. Just had £100 overhaul (receipts). Ready for many more years of use. £190. Tel: 01424 203 192

MORDAUNT SHORT floorstanding loudspeakers MS40i. 2x 165mm bass drivers. 25mm tweeters. 90dB sensitivity. 300 watts power handling. Rosewood, mint, original boxes. £125. Buyer collects. Tel: 0151 608 4481 (Wirral)

WANTED: CAMBRIDGE P40 amplifier, Dual System 2 (1982) (all or separates). Marantz HD445 speakers. Tel: 01554 752275 12 to 1pm. Ad will still be valid in future.

FORE SALE: NAD C445 FM/AM DAB tuner, mint condition, perfect working order, boxed, manual, £200 ono. Tel: 02476 422 967

NAIM CD5i CD player under guarantee. New upgraded remote control. As new, boxed, hardly used. £500. Call Chris 01395 513 529 (East Devon)

B&W 603 Series 2 floorstanding speakers. Immaculate condition with original boxes. Can demonstrate, £350 ono. Tel: 01273 589 370 (Brighton area)

KEF SPEAKERS Q Series set. Q35.2 floorstanders. Q85s surround speakers. Q95c centre speaker. All in great condition. £260 for all speakers. Buyer collects. Tel: Jake 01707 852 119 (N.London) Email: jakedenner22@hotmail.co.uk

PINK TRIANGLE Export turntable. Natural ash with Linn LVX arm, moving magnet cartridge. New main bearing. Good condition. £395 ono. Tel: 07818 058 685

LOWTHER LOWTHER Acousta Twin cabinets wanted. Made, mid to late 1960's. Working drawings wanted. Tel: Jeff 020 8220 0380

TDK Xa-80 Active speakers (multimedia) comprising two NXT panels plus amp and subwoofer. New condition, hardly used. £40. Tel: 01341 422 111 (Dolgellau Gwynedd)

WANTED: DENON DCD 1290 or 890. I think these models matched the DAP 5500 Pre and POA 6600 monoblocks. Please ring with details 0191 4171 669 after 6pm

**GUIDELINES FOR BUYING AND SELLING SECOND-HAND EQUIPMENT**

**FORTHE 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!

**FORTHE 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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## DIY Valve Amplifier Parts - Valves, PCBs, Connectors, Hardware



We stock a full range of valves (tubes) from famous manufacturers. The list below is a selection of favourites. If you don't see what you want - please ring or e-mail. We are happy to match valves on request.

EL84M Russian (Sovtek)	£11.49
EL84 JJ (to Tesla Specification)	£9.75
JJ 300B (popular and reliable)	£83.50
EH300B Gold Grid	£69.00
Svetlana KT88 (outstanding)	£36.50
Sovtek 6550 WE	£19.49
Sovtek 5881	£12.49
EL34 ElectroHarmonix	£11.85
EL34 JJ (balanced and precise)	£15.49
5U4G Sovtek	£9.94
GZ34 JJ	£16.99
5687 WB Philips NOS (gutsy)	£12.49
Svetlana 6N1P	£6.50
6SN7GT EH (to RCA spec)	£10.25
ECF80 EI	£7.30



## VALVE BASES

B7A Chassis Mount	£4.70
B9A Chassis Mount	£4.70
B9A PCB Mount	£4.70
Octal Chassis Mount	£4.70
UX4 Chassis Mount	£16.98

## BOOKS

Valve & Transistor Audio Amps by John Linsley Hood	£24.50
Self on Audio by Douglas Self	£26.50
Valve Radio & Audio Repair Handbook by Chas E. Miller	£22.50

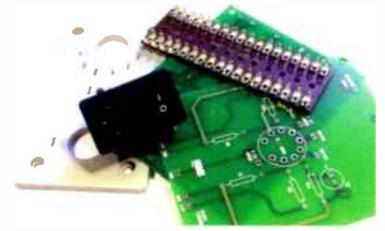
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Building Valve Amplifiers by Morgan Jones	£19.50
Life & Works of A.D. Blumlein by R.C. Alexander	£18.00
Understand Amplifiers by Owen Bishop	£19.50
Audio & Hi-Fi Handbook edited by Ian Sinclair	£34.50



Eichmann Bullet Plug phono plugs - pack of 4	£25.00
Neutrik Professional Gold Plated phono plugs - pack of 2 - Red/W	£1.69
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Silver plated speaker terminals pack of 2	£9.40
Twin speaker Terminal Set chassis insulated - Red/Bk	£2.94
Chassis mount earth post nickel plated	£1.23



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ALPS Blue Beauty 100k dual log pot.	£23.00
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Unswitched IEC AC 'mains' inlet chassis mount with fuse	£2.34
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## PRINTED CIRCUIT BOARDS

HD83 Headphone II	£16.25
Phono II phono stage	£16.25
PSU II power supply	£16.25
Pre II preamplifier	£16.25
KEL84 Power amp	£24.98



## POWER SUPPLY PARTS

UF5408 700V 3A rectifier diode ultra-fast recovery	£1.25
Cree CSD4060A rectifier diode Schottky 600V 4A	£6.75
Jensen 4700uF 16v DC 4 terminal electrolytic	£25.85
RIFA 47uF 100V DC PEG Axial Al Electrolytic	£2.99
RIFA 100uF 100V DC PEG Axial Al Electrolytic	£4.25
Polyester 0.1uF 630v DC WIMA Metalised film	£0.55
Polyester 0.47uF 630v DC WIMA Metalised film	£1.29
Panasonic FC 220uF 500V DC Low ESR Al electrolytic	£8.95
Bridge Rectifier 25A 700V 28.5mm x 7.5mm	£3.25

We stock a wide range of parts to facilitate the build of valve amplifiers. Please ring or e-mail for details. See our on-line catalogue at  
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www.world-designs.co.uk

Tel: 01832 293320

KEF R105 loudspeakers, bought 5 months ago from Big Ears. Perfect grilles, otherwise slight marks on wood. No catches, genuine bargain. Prefer Mission 770. Callers only, £80. Also Acoustic Research 142s, tatty grilles, £20. Tel: 01843 843 145

PLINIUS 2100i, boxed (£1300) £375. Audioplan Kontrasts (£3000), excellent, £600. Talk Electronics Breeze 1 with Whirlwind - 5 M/M - M/C, boxed (£1000) £250. Tel: 0772 962 0621

AMC CVT 3030 valve amplifier, used approx. one year, stored since (see Olde Worlde review) £150. Also Creek CAS3140 tuner £75. Both items excellent and boxed. Tel: John 01708 344 334 (Romford, Essex)

APOGEE STAGES, fair condition, no buzz. £500 buyer must collect (Kent) Kimber 8TC, 5m, £350. Philosophy speaker cable 5m, £750 Call 01843 600722 after 6pm

PIONEER 609 CD recorder £120 (£280). Immaculate, boxed as new with manual, remote, digital cable & discs. Mission 771e speakers £60 (£200) good condition, perfect working order. Atlas Questor interconnect 1metre. £35 (half price!) Boxed as new. Lee. West Midlands. 01384 412234, Email: lee-t@lycos.co.uk.

PMC OBI speakers, 300 watts £1700 ono (£2700). Nordost Silver Shadow XLR lead 0.6 metre DAC to Transport, £200 ono (£360) Musicworks six way block £95 (£230). Tel: Gary 0117 962 9725

QUAD 77 integrated amplifier £325. Goldring G1042 cartridge, unused, boxed, £75. Marantz PM17 Mk3 KI Signature, little used, £650 (£1500) boxed. Marantz CD17 Mk3, £350. Tel: 020 7386 9177

TANNOY CHESTER T165, walnut, excellent condition for year, 1978. 10 inch D.C., 90dB sensitivity. Best offer around £350 secures. Tel Darren 07968 764 293 or Email: dazzer@hotmail.com

MISSION 752 floorstanders (Mk. 1). Gloss black finish. Excellent condition, unboxed. Buyer collects or would consider delivery within 20 miles of Chester. £190. 0151 4734264 or 01978 762903 cawarra@tiscali.co.uk

LYNX TWO-A 4in 4out 24192 soundcard. Precision clock and components give punchy detailed sound with sense space. Loopback records what you hear. £855@Dolphin: £450 ono huw\_dav@hotmail.com 02086740678

TANNOY TD12 (£6,500) £2,900, Monopulse 42s beige and black £450, Usher 1.5 power amp (£1,500) £650, Rega Planet 2000 black £250, Musical Fidelity E100 £150. Tel: 07974733101 (Shropshire)

SYSTEMDEK IX with modded Rega 250 Arm (Michell Stub End, Weights & VTA Adjuster) plus spare belts. £150 onvo. Dynavector 10x4, approx 40hrs use, perfect & Boxed. £100. Musical Fidelity 10xD stage, perfect & Boxed. £70. Ortofon T5 Inline MC Step up. £40 Andrew.Burtchaell@btinternet.com

PAIR EARLY Quad ESL57 speakers good condition, £595. Immaculate boxed. SME 3009 fixed H/S, £170. Sugden A21 amp, £100. Thorens TD125, deck only immaculate £80. Tel: Steve on 01482 651677

QUAD ESL 63 Speakers, with stands and instruction booklet. Truly amazing sound quality, excellent condition, look like new. Audition welcome, first to hear will buy. £1,200. 07747697414 (Barry Adams, Essex)

B&W CDM-INT speakers and B&W FS-CDM stands - Like new condition in red cherry wood £450 - Based in Marlow, Bucks. Contact Sam - 077305 26654

MARANTZ DV7001 DVD/SACD multi-region player black as brand new List £600 accept £495 Tel: 020 8951 3178

ATC SCM20 stand mount in cherry with Target R series speaker stands immaculate £1150 ono. Dynaudio Audience 62 cherry £375 ono. Contact Jeremy 07977254160 jeremyf@datasharp.uk.com

PAIR OF Neat Elite SE speakers in ash £650 (£1300). Audiolab 8000A amp £250. Arcam Alpha+ CD £120. Sound Org 3 shelf rack £50. All in excellent condition. Tel Dave 01630 685966.

AUDIOLAB 8000S Amplifier 60W £120. Monitor Audio 700 PMC bookshelf speakers £120. Energy Take 5.2 Satellite speakers including stands (1 pair) & Energy centre speaker £100. Excellent condition 01689 608 925 or 0794 1107141 (Orpington, Kent)

PROAC STUDIO 125 floorstanding loudspeakers. Finished in cherry. Good condition and sound. Selling to fund DIY habit. £500 ono. Halifax, West Yorks. 01937 863495 (work), 01422 240168 (home), nick@lurcher.org

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!

**CLASSIQUE SOUNDS**  
(Paul Greenfield, Leicester)  
ESL-57s restored, rebuilt, fully renovated or improved. Leak, Quad valves amps etc. Tel: 0845 123 5137 / Mob: 0116 2835821 Email: classique\_sounds@yahoo.co.uk www.flashbacksales.co.uk/classique

**GT AUDIO**  
(Graham Tricker, Bucks)  
Leak Troughline specialists. Also Quad and most classic tuners, radios and amplifiers restored, repaired. Tel: 01895 833099 / Mob: 07960 962579 www.gtaudio.com

**AUDIOLAB**  
(Phil Pimblott, Leeds)  
Renovation, repair and restoration. Specialist in valve hi-fi, radio transmitters, cinema amps, kit building. Tel: 0113 244 0378 www.audiolabs.co.uk

**QUAD ELECTROACOUSTICS**  
(Cams)  
Quad's service department, able to repair almost all Quad products, from the very first. Tel: 0845 4580011 www.quad-hifi.co.uk

**Dr MARTIN BASTIN**  
(Shropshire) Garrard 301/401 restoration, renovation and service. Special plinths; rumble cures, etc. Tel: 01584 823446

**LORICRAFT AUDIO**  
(Terry O'Sullivan, Bucks)  
Garrard 301/401 and their own 501 repair, spares and service. Tel: 01488 72267 www.garrard501.com

**LOCKWOOD AUDIO**  
(London) Tannoy loudspeaker parts, restoration and repair. Also Epos and TDL loudspeakers. Tel: 020 8 864 8008 www.lockwoodaudio.co.uk

**CARTRIDGE MAN**  
(Len Gregory, London)  
Specialist cartridge re-tipping service and repairs. High quality special cartridges. Tel: 020 8 688 6565 www.listen.to/thecartridgeman

**TECHNICAL AND GENERAL**  
(East Sussex) Turntable parts - wide range of spares and accessories, plus arms and cartridges. Tel: 01892 654534

**REVOX**  
(Brian Reeves, Cheshire)  
Revox tape recorder spares, service and repair. Accessories also available. Tel: 0161 499 2349 Email: brian@revoxservice.co.uk www.revov.freeuk.com

**SOWTER TRANSFORMERS**  
(Brian Sowter, Ipswich)  
Large range of audio transformers for valve amps, cartridges, line drive, interstage plus all associated services. Tel: 01473 252794 www.sowter.co.uk

**ONETHING**  
(Coventry) Specialist in electrostatic panel manufacture and repair. Can refurbish ESL 57s and 63s as well as Leak Troughlines and Quad IIs. Email: one.thing@ntlworld.com www.onethingaudio.com

**OCTAVE AUDIO WOODWORKING**  
(Bristol)  
Unit 2, 16 Midland Street, St Phillips, Bristol. Tel: 0117 925 6015 www.octave-aw.co.uk

**ARKLESS ELECTRONICS**  
(Northumberland)  
Specialist in repairs, restoration and modifications to all amplifiers, valve or solid state, ancient and modern. Tel: 01670 829891 Email: arkless.electronics@btinternet.com

**WEMBLEY LOUDSPEAKER**  
(Paul MacCallam, London)  
Comprehensive loudspeaker servicing. Tel: 020 8 743 4567 Email: paul@wembleyloudspeaker.co.uk www.wembleyloudspeaker.com

**EXPERT STYLUS COMPANY**  
(Wyndham Hodgson, Surrey)  
Stylus replacement service for all types of cartridge. Including precise profiling for 78s Tel: 01372 276604 Email: w.hodgson@btclick.com

**CLASSIC NAKAMICHI**  
(Paul Wilkins, Worthing, West Sussex)  
Restore, Repair & Service Nakamichi Cassette Decks. Tel: 01903 695695 Email: paul@bowersandwilkins.co.uk www.bowersandwilkins.co.uk

## NEXT MONTH

With the summer finally upon us, *Hi-Fi World* is having its own silly season with The Alternative Hi-Fi Awards! No, these awards aren't bestowed from on high to worthy products by a jury of thousands. Instead, they're us taking a wry look at the weird and not-so-wonderful side of all the kit we've reviewed in the past year. Gongs will be given for accolades as diverse as 'the best disc drawer' and 'the most curious remote control'! Alongside this, you'll find a wealth of worthy review kit, from Consonance's CD120 Linear CD spinner [pictured] to Koetsu's evergreen Red Signature moving coil. Don't miss it!



LOVINGTON HORN SH1 LOUDSPEAKER:  
ARCAM DV139 DVD PLAYER  
JAMO C803 LOUDSPEAKER:  
TANGENT EVO MINI-MONITOR  
THE ALTERNATIVE HI-FI AWARD:  
ROBERTS DAB RADIO PORTABLE  
CONSONANCE CD120 LINEAR CD PLAYER  
DENON CX-3 MINI COMPO SYSTEM  
SENNHEISER PX-C450 HEADPHONE:  
KOETSU RED SIGNATURE CARTRIDGE  
AUDIA FLIGHT TWO INTEGRATED AMPLIFIER  
QUAD/BRYSTON/SPENDOR SYSTEM FEATURE  
ACOUSTIC SOLID ANALOGUE ONE TURNTABLE  
CAMBRIDGE AUDIO 740A INTEGRATED AMPLIFIER  
TECHNICS SL1200/AUDIO ORIGAMI RB250 FEATURE  
OLDE WORLDE: ONKYO DX-6990 GRAND INTEGRA CD PLAYER

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Charles Mingus Sextet  
with Eric Dolphy  
Cornell 1964



# CHARLES MINGUS SEXTET

## WITH ERIC DOLPHY

### CORNELL 1964

#### 1964

"all Blue Note and Mingus fans should make haste and grab this album as soon as they can..."

**L**ast issue's overview of The Andrews Sisters broached the question of 'what is a classic recording?' That particular column addressed one side of the conundrum – this one addresses another. Blue Note has just released a range of classic reissues under the 'Rudy Van Gelder' moniker. Van Gelder, engineer, was the driving force of the record label's music - in fact, the albums were recorded at his studio and he has remastered this newly reissued series.

"The concept of it came from Hitoshi Namekata", Van Gelder said. "He's the one that runs the Blue Note label in Japan for Toshiba-EMI. He wanted me to do it and he called Michael Cuscuna (boss of Mosaic Records in the USA) and Michael called me to see if I was interested and it ended up that absolutely I would be, just as long as I could get the original tapes whenever possible. It had nothing to do with Blue Note New York other than Michael as a producer. Subsequently, there are few issues being made in the United States. They are different. They have extra tracks on them. You see, the concept of this was to duplicate the original LPs as much as possible. They [Japan] didn't want any of the out takes or none of the additional tracks, they wanted it just as it was issued originally."

I can say right now that Van Gelder has done a magnificent job. He has given the CDs a vinyl-like warmth that is wholly sympathetic to the original. Examples of his work include Art Taylor's 'A.T.'s Delight',

Dexter Gordon's 'Clubhouse', Donald Byrd's 'The Cat Walk' and Jackie McLean's 'New And Old Gospel'. This particular reissue programme is more worthy than some as, whilst it includes old favourites, it also includes rare albums and this release – a recording of a live gig, is a classic recording. The only problem is that whilst the concert was a classic, it has never been released on record before.

Mingus's record label at the time, Fantasy, had nothing to do with the original recording – if they had then a live album would probably have been in the offing. According to Michael Cuscuna, "students at Cornell University did [the recording] and gave the tape to Mingus. In 1988, Sue Mingus [Charles' widow] had Fantasy Studios transfer the tapes to Mitsubishi X-86 reel-to-reel digital tape. No one knows what happened to the original tapes. They are not in Sue's possession or in the Fantasy vault."

Despite the missing original tapes, Sue Mingus kept the copies in a closet where they remained in good condition until they were used for this CD issue. Of course, Cuscuna is disappointed that the masters could not be found, "I would have liked to have the analogue original because we could have transferred it to 24bit with today's A-to-D converters, and it would have been closer to analogue in sound with more detail. We also would have been able to play with

the azimuth on the one tune that had a phasing effect on the cymbal in places. That said, I am pleased with the sound, overall. The Mitsubishi X-86 machine had a much warmer, more accurate sound than those horrible Sony U-matic machines."

What has been finally presented is the complete gig, with Clifford Jordan on reeds plus Jaki Byard on piano and Dannie Richmond on drums. The first CD is the first half and the second CD is the second half after an intermission. The energy and spirit of the entire concert is strong, but there are slight quality problems. For example, in addition to the cymbal phasing mentioned by Cuscuna, the trumpet is sometimes too low in the mix. However, Cuscuna has done a great job to encourage as much music to ooze out of the tape copy as possible.

For example, as a result of EQ tweaking, the team has been able to reinforce and bring out the bass to sound the way Charles sounded in a live situation. Also, that trumpet is in a no way a disaster, as it has been effectively helped out in places. In addition, the tape has had a general clean where ticks or other recording defects have been addressed. All Blue Note and Mingus fans should make haste and grab this album as soon as possible – but, before you run off to play it, make sure you cast your eyes over the other reissues in the Blue Note programme, as there's a whole host of treasures to explore. **PR**

*exposure*



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