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# hi-fi

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## WORLD

12 PAGE **DIY**  
**SUPPLEMENT**  
INSIDE! No. 83

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ROKU SOUNDBRIDGE NETWORK MUSIC PLAYER  
DVD: PAST, PRESENT AND FUTURE  
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# THE DIGITAL ISSUE

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When I joined *Hi-Fi World* some eleven years ago back in 1994, I can still vividly remember one of our rival magazines describing Compact Disc as 'perfect'. Back then, this was enough to raise a wry smile in our office, but in these enlightened times not even the format's greatest fans would make this claim in any seriousness. If they did, it would be even harder to argue, considering CD's progenitors have already come up with its replacement which, to

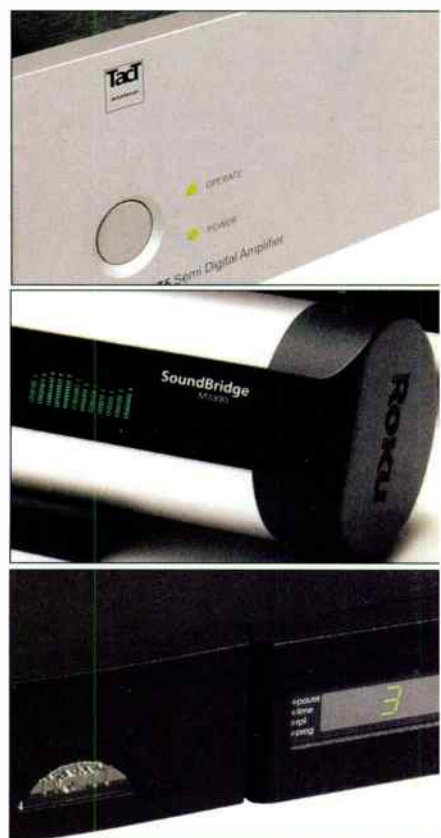
follow the logic, must be 'even more perfect'!

CD is not flawless, and even in its supreme guise (24bit, 192kHz DVD-Audio) struggles to match high end analogue. But that's not to deny the fact that digital is now showing real promise. By any measure, we're entering an age where designers know why their machines sound good (or bad), and how to improve them. Low jitter transports, upsampling and careful attention to power supplies and analogue output sections are raising the game – so much so that, as our CD vs. LP shootout on p32 shows, highly respected analogue turntables are no longer having it all their own way – far from it...

In this issue, we get deep into digital. We kick off with our review of Naim's DVD-5, the first DVD spinner from a company once indissolubly linked to high end analogue replay. And what a result; read it on p12. Then we look at a brace of affordable DVD spinners at varying prices, and come up with something of a surprise – on p16. Patrick Cleasby – one of Digital Versatile Disc's closest followers – looks at its past, present and future on p21. Retail expert Dominic Todd pens a paean of praise to MiniDisc - Sony's great mobile music format, arguably now in the twilight of its life, on p37. Analogue addict Channa Vithana pits three high end CD/SACD spinners against one another on p40. Audio engineer Noel Keywood examines TACT's new digital amplifier in exhaustive detail on p50; we've devoted no less than seven pages to this product, so significant we believe it to be. And on p69 yours truly puts down his black plastic for a 'baptism of fire' with Meridian's stunning DSP7000 active digital loudspeakers.

This magazine has wrongly been labelled as 'digital-sceptic' by some, but I'd say we're 'digital-realist' - which makes us all the more qualified to report on these significant developments!

**David Price, editor**



## testing

Hi-Fi World has its own advanced test laboratory and acoustically treated listening room, and a dedicated team of experienced listeners. We review thoroughly by extensive auditioning, rather than by quick-fire group listening tests. Our engineering team designs a wide range of products in-house. No other hi-fi magazine is so expert and dedicated.

## verdicts



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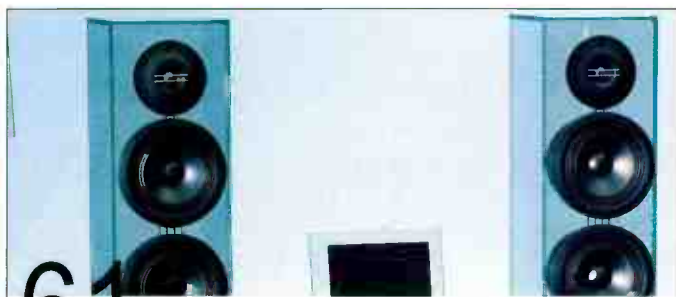
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## Rockers



“Amazing value and massively impressive performance.” *What Hi-Fi? Sound and Vision*

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# news



## ZERO THREE

Rotel's new RA-03 integrated amplifier follows a tradition that extends back to the famous RA-820 of the early eighties. The RA-03's circuit is designed symmetrically to ensure accurate stereo separation, driven by an 'ultra-stable' power supply built around a Rotel-manufactured toroidal transformer and high quality (DNM Design) slit foil storage capacitors. All ground paths for signal routing and power supplies are separated and copper bus bars are used for all high current sections. The RA-03's line stage is based on the RA-02 and uses short, symmetrical signal paths for maximum resolution, and includes a high quality MM phono input. The RA-03 is further updated with new Burr

Brown op-amps that offer greater transparency and resolution of fine detail. Conservatively rated at 2x70watts (8ohms), the power amplifier in the RA-03 should drive low impedance, difficult speaker loads with ease. Rotel is a 40-year-old family business run by Bob Tachikawa, son of the original founder who is still active in the company today. The RA-03 is an international effort, designed with the cooperative effort of development teams in Japan and the United Kingdom. Parts are selected from all over the world: capacitors from the UK and Germany, semi-conductors from Japan, transformers are manufactured in-house. The RA-03 is available in black or silver at a retail price of £499. For more information, click on [www.bwgroup.com](http://www.bwgroup.com).

## ITIME

Grado's new anniversary SR325i headphones boast an upgraded driver design, and enlarged and improved mass distribution in the metal housing, meaning the way that the SR325i's new driver and metal housing move air and react to sound vibrations is less affected by transient distortions. The tasteful shade of Gold is to honour the company's fiftieth anniversary.

For more details, call 01279 501111 or click on [www.amourhe.co.uk](http://www.amourhe.co.uk).



## BIG UP

Titan Loudspeakers Model T2SR/e is said to be 'designed for the 21st century at an affordable price'.

Interestingly, especially at its £499 price point, it features a double aluminium ribbon tweeter, working with a 200mm piston aluminium mid/bass driver in a pyramid enclosure. Finish is any colour you like as long as it's 'Focus blue metallic'. For more information, call

Titan Hi Fi Speakers on 01702 206870 or click on [www.titanloudspeakers.co.uk](http://www.titanloudspeakers.co.uk)

## JBL ON TOUR

Another iPod accessory arriving this month is JBL's On Tour, a £70 active loudspeaker that's battery powered, so you can take it with you wherever you're going. Compete with a universal AC adaptor allowing for easy worldwide use, this gadget is hip-flask size and very durable. The integrated protective cover and stand is part of its unique appeal – not only does it look great but it also protects your sound system and serves as a stand when open. Class D digital amplification means low power consumption. In the UK, it's available from Maplin Electronics (product code A55CL) on 0870 429 6000, or click on [www.maplin.co.uk](http://www.maplin.co.uk)



## JET POWER

Elac's new £5,000 per pair FS 607 X-JET high end loudspeaker features the company's radical new X-JET midrange/tweeter ribbon. Said to be the world's first coaxial driver using a ribbon tweeter, it uses a massive aluminium cabinet and structure, boasts stunning imaging with a wide sweet spot, fast and tuneful bass with very strong dynamics, and a frequency response from 28Hz to 50,000Hz at up to 400 watts. The X-JET driver is a new midrange-tweeter driver of coaxial design, a unique combination of a planar aluminium honeycomb midrange diaphragm surrounding a JET III ribbon tweeter. It's claimed to approach the ideal point source and the resulting dispersion characteristics offer relaxed yet detailed reproduction. The ultra lightweight honeycomb planar diaphragm combined with strong neodymium driver magnets, delivers excellent transient response to match the ribbon tweeter. The system is driven by a 78 mm moving coil and high efficiency is achieved using coppered aluminium flat wire, edgewise-wound, on a ventilated capton bobbin. The new 3.5-way floorstanding loudspeaker is claimed to offer high resolution, precise imaging with great depth, strong dynamics, crisp sound and a broad listening area, and said to be the perfect loudspeaker to freestand in a large room due to its sensitivity of 89dB and its maximum sound level of 109 dB/1m. For more information, call 0800 652 5002 or click on [www.elac.com](http://www.elac.com)

## CORRECTION:

In April 2005's *Hi-Fi World*, our resident ghost in the machine removed one globe from the verdict of the Trio L-07D. It should, of course, have scored the full five!

## NEW PHON

Accuphon's Model 88 Pre-amplifier and Model 80 Power Amplifier use high quality wood cases (Maple, Cherry or Walnut), with brass panels front and rear. The internal chassis are made from alchrom-plated aluminium and support glass-fibre PCB's which include a copper screening layer. A feature of the designs is an ability to reject strong interference signals, whilst displaying a wide bandwidth and low distortion. The £995 Model 88 Pre-Amplifier has seven line level inputs, all of which can be selected for listen and/or record, the function being displayed on an illuminated pushbutton. Pre-Outs and Record-Outs are available on balanced XLR and unbalanced RCA/Phono connectors. Power (24V) for the pre-amplifier is obtained from the power amplifier or alternatively from an adapter. The £1,995 Model 80 Power Amplifier is rated at 25W per channel into 6 ohms. Operating in class A, it uses fast MOSFETs in a full bridge configuration to provide a balanced output. Inputs are balanced XLR (but may be used with unbalanced to balanced converters) to allow the power amplifier to be sited some distance from the preamplifier. Outputs are on safety-style 4mm banana sockets as well as a four pole Neutrik Speakon socket. A standby mode is featured which is also part of the loudspeaker protection. There are no exposed heatsinks, the cooling being by means of a pair of super-quiet fans. For more information, call Accuphon Audio on 01233 662599 or click on [www.accuphon.co.uk](http://www.accuphon.co.uk)





## GOING BRAHMAS

Nordost Brahma reference AC power cable boasts the company's Micro Mono-Filament FEP technology, also used in Nordost's flagship audio cables, 'Valhalla' and 'Valkyrja'. The conductor size has been increased to a 16 awg, solid core, to handle the scale of the mains power delivery. The patent pending design offers major advantages over conventional power cable construction, with improved signal speed, better power transfer and increased thermal efficiency. Brahma is constructed employing five mono-filament conductors, each being 16 AWG, solid core, silver plated, 8N OFC. The conductors are ultrasonically cleaned and highly polished before, and after they are extruded with 60 microns of silver. Each conductor is polarity coded by a coloured mono-filament; red for live, black for negative and green for the (ground) earth. The single coloured mono-filament™ of FEP is extruded onto the mono conductor, and then helically wound to form a spiral bridge support for the extruded FEP air tube insulation. The precision of the mono-filament reduces insulation contact with the conductor by more than 80%. This pricey (£899 per two metre length) reference power cable is claimed to offer a vast improvement in many facets of both the musical and visual performance. For details, click on [www.nordost.com](http://www.nordost.com) or call +44(0)1352 730251.



## SHOW AND TELL

Brussels Hi-Fi & Home Cinema Show 2005 is held at the Brussels Sheraton Hotel, Place Rogier, 3-1210 Bruxelles, on Saturday 1st and Sunday 2nd October 2005, between 10am and 7pm. Entrance is free. For information, click on [www.brussels-hifi-show.be](http://www.brussels-hifi-show.be) or email [org.hifishow@pro.tiscali.be](mailto:org.hifishow@pro.tiscali.be).



## BLACK BACK

Henley Designs Ltd is pleased to announce that it is now the UK Distributor for Lehmann Audio, a brand founded by Norbert Lehmann which has gained a reputation for manufacturing state of the art audio equipment at affordable prices. All Lehmann Audio devices are developed and handcrafted in Germany. The Black Cube phono stage has gained cult status among vinyl oriented music lovers since it hit the market in 1995. The company's newest product, the Black Cube Linear, is a headphone amplifier and a single source preamp. This unit is the ideal solution for practically any dynamic headphone and the ultimate solution for playout stations in multiroom installation environments. For more information, call Henley Designs Ltd. on 01235 511166.

## CUB CLASS

Loudspeaker specialist Focal has developed a new concept to allow iPod and hard drive jukebox users, plus WiFi and PC/server music fans, an easy way to convert their products into the heart of a true 2.1 hi-fi system – the £450 iCub integrated sub woofer. Based on the specification of the recently introduced Cub 2 subwoofer, iCub integrates three amplifiers, with a maximum capacity of 400 Watts, a high precision 20bit D/A convertor (ST TDA7535) and multiple inputs, including optical digital, all with automatic detection so there's no need to manually turn iCub on or off. Said to be incredibly simple to configure and use, a pair of speakers can be connected directly to the outputs on the iCub's stereo amplifier. A special adjustment switch allows the output to then be 'customised' to the size of the speakers being used (large or small). Sources can be connected either via analogue RCA or digitally via the optical input and the system volume can be controlled by the included infra-red remote control. iCub accepts all the standard audio formats, such as DVD and CD, via either the analogue or digital input. But it is also the ideal system for connecting to a standard walkman MP3 or integrated hard drive product like the iPod. And with 60Gb of data storage it is possible to record audio titles in their native format - uncompressed - to give the added benefit of optimal audio quality. Thanks to the optical input, iCub also offers new prospects for greatly improving music quality when streaming using a Wifi connection and a computer: it also becomes very easy to create a sophisticated Multiroom system by using several iCubs distributed throughout the house, with each then controlled by the PC or Mac. For more information, click on [www.focal-fr.com](http://www.focal-fr.com).

# A new NAIM

**Long recognised as one of the premier British audio brands, Naim Audio has launched into the world of video with the DVD5 CD/DVD-A/DVD-V player. Patrick Cleasby sounds it out...**

**N**ow you may have spotted that I'm not your average hi-fi buff, showing far too much interest in computers and video, but even I knew I was in for something special when I was asked to review the Naim DVD5. After all, twenty years ago I had temporarily used a Naim Nait while my Cyrus One was poorly, and recognised something of quality. I have also always been a died-in-the-wool believer in the principle that one machine at the centre of my living room ought to be able to meet my needs for both audio and video of reference standard. Thus when DP told me he had heard an early DVD5 in the factory and had found its CD playback capability incredible for a DVD player, I knew I was going to be auditioning what was potentially the perfect machine for me...

Little did I know what I was letting myself in for. Firstly I thought it advisable to check the video capabilities of the machine out with the kind of display most potential purchasers would be looking to use. Courtesy of Pioneer I was able to use a 43" plasma, and I thought this,

coupled with the usual multi-channel test bed of a Denon AVCA1SRA and a 4xGR20/ GR Centre 5.0 Monitor Audio speaker set would allow me to take care of myself. How wrong I was. In common with the stated tenet in the (highly readable) manual to the effect that Naim gear should be dealer installed, so Naim and their PR were insistent that they should journey up to see that the plasma was correctly set-up for the machine. My eyes were about to be opened to a world of tweaking, both video and audio-related, but even I can see the sense of calibrating the plasma with a blue filter (one is supplied with the machine) and a suitable testing DVD. The resulting picture did indeed look vastly improved over my naïve rehearsal fumbblings, but maybe that was just the qualities of the DVD5, of which more later...

DP's enthusiasm over CD playback, and a conversational mention of Jaco Pastorius, was enough to persuade me to give 'Birdland' a spin, from the 2CD Rhino anthology. I was immediately impressed with the exquisitely musical rendition of this most musical of performances. Having been

wincing slightly at the sound of the SACD of Talk Talk's 'Colour of Spring' on a Japanese universal player earlier that day I gave the CD layer of the hybrid disc a spin on the DVD5. Pausing only to acknowledge the respectful recognition from Naim's Julian, obviously a fellow music fiend of taste, I was once again bowled over by the natural sound delivered on this most organic of recordings. I would swear the CD layer was sounding better than the SACD layer on other machines.

There's the rub – if you are looking for the ultimate machine to act as the single source for your system, in common with certain other UK machines the DVD5 ticks all the requisite boxes except the one marked SACD. (Surround DVD-Audio requires the addition of the £215 McC Multi-channel option, over the base model at £2350, which is nonetheless capable of 24/192 stereo DVD-A without it if surround is not your thing). Does this really matter any more? Not if the CD layer can sound this good! Now obviously if you're a surround fan you are going to have to get your surround SACDs converted to DVD-A to enjoy them

# in Video



on a DVD5. Let's face it, there probably aren't going to be that many more of them, so it's a finite task. Maybe I should offer a service?

Once my mentors had departed I was free to experiment to my heart's content. The first piece of good news was that all the currently extant flavours of this new-fangled Dual Disc business bar Warners (i.e. Silverline, Sony, and Universal), played without complaint, both 'CD' side and DVD side. The next piece of good news is that if you only have Snow Patrol's 'Final Straw' on SACD and not Dual Disc, have no fear – using the complexities of the track 'Wow' the CD playback of the DVD5 runs the 24/96 Stereo from the Dual Disc very close indeed. The 24bit definitely exhibits the usual characteristics of rounder, better defined bass along with more realistic metals in the top end, but there is really not that much in it. Interestingly there was just the slightest hint that the CD sound from the 'CD' layer of the Dual Disc was not quite as full as that from the CD layer of the hybrid SACD, but that could be just my imagination. The 24/48 surround version of the track was also conveyed in a convincing surround sound field.

My early experience of superlative CD sound led to me throwing an immediate challenge at the DVD5. The lead track from Beck's Guero CD/ DVD-A deluxe edition 'E-Pro' is intentionally dynamically compressed to the max and can be most unforgiving on an untalented system. On the DVD5, that ugly wall of sound was portrayed in beautiful slab-like

fashion, rather than just sounding harsh and confused, and the 24/48 version was able to make even better sense of it than the CD playback. Even better, the new Tears For Fears release, which contains great music but atrocious mastering, (somebody please let me know if the US master without the two extra tracks has not been similarly massacred?), was for the first time turned from an irritating screech back into a piece of music, with the bass sounding like a real instrument rather than some digitally granulated facsimile. Miraculous. I asked how they achieve this trick and it was explained to me that it is simply a matter of exacting electronic and mechanical design and engineering, and looking at the incredibly solid construction of the unit and feeling its considerable weight I can well believe it.

To try out the DVD-A

“compared to a high end Japanese player on HDCD, plain vanilla CD on the DVD5 gave a markedly superior result!”

threatening class of the CD playback, is there anything better than the impeccable clarity of Steely Dan's 'Gaucho? Using the CD layer of the SACD I was able to demonstrate that the CD rendition ran the 24/96 stereo from the DVD-A incredibly close, with similar levels of detail, and only marginally less bass and vocal realism. I started to make many other almost counter-intuitive discoveries. Using the HDCD

decoding capabilities of the Denon (which admittedly I have found to be somewhat wanting in the past) I was able to listen to Bryan Ferry's 'Sensation' from the 1999 HDCD master as HDCD via S/PDIF, but found that auditioning the same track non-HDCD decoded via the analogue outputs of the DVD5 gave a markedly superior result! This is not a machine you use simply as a transport. In fact the analogue connection being preferable to the digital holds just as much for any CD use...

As far as the dubious Sony Dual Discs go, my first chance to hear the DVD5's Dolby Digital capabilities was on the 5.1 version of Destiny's Child's new album. The use of the surrounds for aggressive vocal placements revealed a delicate touch with voices, despite the impoverished bitstream, and the bass was superbly tight. Music 5.1 DTS was up next,

with the inevitable Porcupine Tree 'Blackest Eyes' test (from the video on the 'In Absentia' DVD-A) demonstrating a nice smooth way with circular pans, with none of that sense of a surround field lacking integration one can sometimes get.

It is evident that there are some aspects of the DVD-Audio experience that this introductory Naim effort is not quite ready for. On a disc such as Steely Dan's

# Walrus



11 New Quebec St, London W1

So many exciting things, so little space to tell you about them in. Sorry, the pictures had to go...

Audio Aero - the Capitole CD Player. It's not often we get excited by a digital product, but this product of the French Aerospace industry (!) is really superb. It fulfils almost every possible digital wish as well as the obvious one of playing CDs. You can feed up to 3 wired and 2 optical digital sources up to 24bit / 96k standard through its superb DAC - Digital Radio, DAT, Minidisc, almost any current digital source can be fed through the Capitole's 24bit / 192k processing engine. If you purchase the version of the Capitole with analogue inputs, you can even feed two single ended and one balanced analogue source through the player's top quality stepped volume control and valve output stage, eliminating a preamp from your system altogether. This is now our reference digital source; we feel sure you will agree when you hear it.

Musical Fidelity is a permanent feature at Walrus. Les and I have been involved with them from the start, way before we founded Walrus. We remember selling their original product, The Preamp, back in the Eighties, a cute little beast it was too! We watched them grow from the original "garage-built" operation to the highly professional company they are now, with a range of superbly built and excellent sounding products, one of the few manufacturers to continue supporting and furthering the cause of High Fidelity when others were abandoning it. And, their products are consistently great value for money, something other manufacturers could learn from. The latest "X" series, now in v3 form, are very popular purchases: X-10v3 Buffer Stage, X-CANv3 Headphone Amp, X-LPSv3 Phono Amp, X-DACv3, X-PSUv3, all on demo and usually from stock. The recent A5 Series Amp and CD Player (with valve output stage), and the limited edition KW500 Amplifier (500W/channel) are also all on demo, and ought to be heard before you consider buying anything else of similar price. By the time you read this, we will also have the new top-end KW Preamp, KW Phono Stage, and the amazing KW750 Power Amp. We were shocked - even the preamp alone can supposedly sustain a 20W continuous output - who needs a power amp!! However, if you feel you do, the KW750 manages 750W per channel, adequate for most situations.

Brinkmann is a German company (still run by its perfectionist founder, Helmut Brinkmann) which we have been supporting for several years. Their range of products is small, but very high quality, the best known being the outstanding LaGrange turntable, one of the very finest turntables in the world, and now in full time use by at least a couple of well known reviewers. You really should make an effort to hear it, as a reference point, before considering any other top end turntable; the difference is clearly audible. At the other end of the spectrum, the Brinkmann Integrated Amplifier with, or without, integral valve output DAC should be auditioned by anyone contemplating mid-price amplifiers. It has the same standard of finish and reliability as all other Brinkmann equipment, with a beautifully even and detailed sound quality, plus a load of power considering its slim-line form factor. In the middle of the range sit the Pre and Power amps. We don't make a big song and dance about these, yet they get used extensively for demonstration of other items in our studio - you might well have heard them without realising it if you've had a demo with us in the last year or two - they simply do their job transparently and effortlessly!

It's always been difficult for a company which was very successful early on in its life to still make class leading products many years later; too many get distracted and lose their way. Spondor Audio, however, whose earlier designs such as the legendary BC-1 received so much acclaim, and who were one of the very few manufacturers to receive a licence from the BBC to manufacture the famous LS3/5A mini monitor, are now treating the next generation of audiophiles to the pleasures of their accurate, but never boring, loudspeakers. They've not been distracted by gimmicks, they continue to carefully produce most components in-house, and have been rewarded by excellent reviews and success for their S range of speakers. Key attributes are an even-ness most speakers can't match, with just a hint of warmth, and natural dynamics. Just as with the Brinkmann amps, we often use Spondors to demonstrate amplifiers or turntables. Again, they just do their job without drawing attention to themselves, drawing out the very best from the source components, possibly the highest praise you can give!

One of the most exciting pieces of equipment to arrive recently is the Shanling CD-T300 (pictured). This limited edition CD player (only 300 pieces will be made) is not only stunning looking, but equally stunning sounding! If you are at all interested in it, book soon to hear it and reserve yourself one; we can't see supplies lasting long. Don't forget, of course, Shanling's existing CD-T100 player, still deservedly selling well.



Running out of space now, so just room for a company Sonneteer; with their Orton integrated high quality transmitter and receiver set, either analogue, or digital via USB, for quality audio transmission around the house.

mention of exciting new products from British amp, and their new Bard Audio wireless system, a

Bye for now, see you soon! Pete and Les.

air tangent amazon amphion amplifon anthony gallo apollo fumiture argento audible illusions audio aero audio physic audiovalve black rhodium breuer dynamic brinkmann cartridge man cawsey clearaudio consonance decca london duevel dynavector ear yoshino final lab graham slee hadcock heart incognito infinity isolda jadis jbl k2 klimo koetsu korato lavardin lyra magneplanar michell engineering morch musical fidelity nordost nottingham analogue opus 3 origin live ortofon pro-ject rega revolver ringmat roksan shun mook shahinian shanling shelter slinkylinks sme something solid sonneteer spendor stax sugden sumiko tannoy tci cables tom evans townshend audio transfiguration trichord trigon van den hul voodoo wireworld xlo



'Everything Must Go' it should be possible to toggle between the 24/192 Stereo and the 24/96 Surround dynamically using the 'Audio' key on the remote, but on the DVD5 this simply gets an 'Operation not possible' message on the players admittedly attractive and well-designed on-screen graphics display. More worryingly there are sometimes audible clicks over the speakers when a track launches, with the most extreme issue being that when the 24/192 option is selected and the track played from the menu on the aforementioned Dan disc, the signal is distinctly garbled for a few seconds before sorting itself out – you can then track forward and back and everything is clean, but like the thumps and clicks, one would hope that this will shortly be resolved by one of those firmware updates which are required all too frequently in the world of DVD-Audio. This is certainly the expectation of Naim's PR, and the necessity of this activity is a recognised fact of life for many high-resolution player manufacturers.

That having been said the sonic quality of 24/192 playback is superb, and notably better than the 24/96 equivalent – easily demonstrated using one of Classic Records dual-sided 24/96 DAD / 24/192 HDAD discs such as the Alan Parsons Project 'Turn Of A Friendly Card' which really does sound like master tape quality on this system.

Despite this being primarily an audio magazine it would be a crime to test this machine without making reference to its equally excellent video capabilities. Considering this is Naim's first video offering it is amazingly accomplished, although maybe not yet standout class-leading when compared to the higher-end models in this month's group test. It is certainly very much on a par with the Arcam DV79 and the Pioneer 868AVi.

For the purposes of this test the hook-up to the plasma was via the DVD5's HDCP protected DVI-D output, adapted to HDMI, and connected using HDMI Silver Plus cable from The Chord Company.

Audio connection was six channel analogue using a TCI Viper 6 set of interconnects, and digitally using coaxial on the port (of two) which Naim said sounded better (they know not why), which is port two, fact fans! Apart from the customary Naim DIN connections, stereo phonos are available, along with optical digital if you have to, and a plethora of high quality analogue video connections.

As far as DVD-Video testing goes, in theory you shouldn't be able to get much better than one of Columbia Tristar's Superbit DVDs with full bitrate DTS audio. I only have one, and that is Paul Verhoeven's 'The Hollow Man', which I own for this purpose only as I got it off the market for a fiver (honest!). It does demonstrate a fine picture, but I remain to be convinced by the Superbit hype. Anyway, the DVD5 demonstrated admirable image clarity, although on the HDMI connection it does seem to add mosquito noise to some of the on-screen titles, as do those other two HDMI players mentioned above. Its presentation of a DTS action movie soundtrack was adequate, if a little less crash-bang-wallop than that of the Arcam. Where it really excels is in the presentation of a cinematic soundtrack, like the walking bass part on the title music for 'Monsters Inc', which was conveyed with beautiful musicality, whether in its Dolby Digital or DTS guises.

That disc is also an exacting test of ability to handle high contrast and motion pans in a fully computer generated image, and the DVD5 passed with flying colours. The quick pans

and riotous colours of the opening sequence were a joy to behold, and combined with the classy audio the overall effect makes for a highly enjoyable watch.

If for nothing more than its truly impressive CD spinning ability (but there is so much more!) I cannot hesitate to commend this player to those who don't care about SACD. For the video freaks among you there is the promise of a scaling board option, which puts all of the responsibility for filling an HD display in the player's control, and will likely substitute an HDMI socket for the current DVI-D. The only comment I could elicit at the moment was that it would be 'not inexpensive'. A bit like this machine – not inexpensive, but very much worth every penny.

**VERDICT** ●●●●●

Truly accomplisher all rounder whose best party trick is the way it blows almost all similarly priced bespoke CD spinners out of the water. Superb value for money for Naim aficionados and agnostics alike.

**NAIM DVD-5** £2,350  
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[www.naim-audio.com](http://www.naim-audio.com)

- FOR**
- stunning CD playback
  - excellent Picture
  - scaling Upgradeability
- AGAINST**
- minor disc playback glitches
  - no SACD
  - err, that's it

**MEASURED PERFORMANCE**

Much like Naim amplifiers, the DVD 5 was bandwidth limited, reaching just 25kHz (-1dB) with 24/192 DVD-A stereo audio, little more than CD which made 21.2kHz (-1dB). However, the player's DVD-A frequency response rolled down slowly, giving a -3dB bandwidth of 33kHz for example. It isn't great and somewhat contradicts the intent of high resolution DVD-A, which is to get analogue bandwidth out to where it is not a matter of contention.

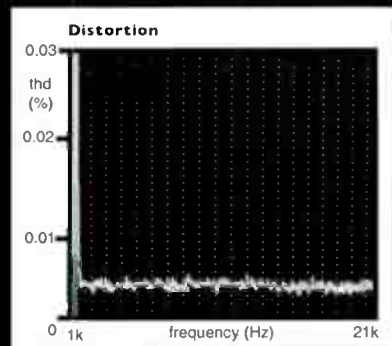
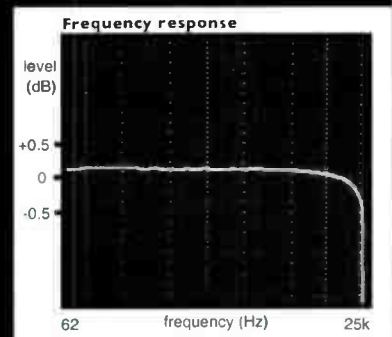
The DVD 5 was as linear as you'd hope from DVD-A stereo though, producing just 0.07% distortion at -60dB and resolving a -100dB signal well, returning a measured distortion value of 6.6%, much of this being noise. So in this area the DVD 5 compared favourably with other DVD A players.

It also had astonishingly low levels of jitter, less than 20pS or so on peaks, with no signal related components up to 100kHz.

All other audio parameters measured well both with CD and DVD Audio, so the DVD 5 looks respectable enough under measurement, as a high quality audio player. NK

Frequency response (-1dB)		
CD	4Hz - 21.2kHz	
DVD	4Hz - 25kHz	
Distortion -6dB		
CD	0.0005%	DVD
		0.0006%

-60dB	0.23%	0.07%
-80dB	4.4%	0.66%
-100dB	-	6.2%
Separation (1kHz)		111dB
Noise (IEC A)		-110dB
Dynamic range (CD)		111dB
Output		2.15V





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# Higher & Higher

As the world waits patiently for blue laser DVD spinners, there's a good case to be made for an existing multi-format machine. Patrick Cleasby examines four very different models at ascending price points from NAD, Marantz, Pioneer and Arcam...



## NAD T513 £150

Incredible value at £150 or less, and for that you get full PAL progressive analogue component output, but no DVD-A or SACD. Like the Marantz, the NAD is multi-region out of the box. Destiny's Child is way more musical on the NAD than on the Marantz, displaying cohesive surround with great timing and those lush vocals sounding as good as can be expected in Dolby Digital - not so far off Naim DVD5 level with the same material!

The CD side scans fine but playback is accompanied by a mechanical whine from the player which could be obtrusive at lower sound levels. On movies, 'Monsters Inc' soundtrack is more musical than the Marantz, and the image quality a marked improvement. There is more detail, more colour, the contrast is getting back up to Naim DVD5/ Pioneer DV868AVi levels, and the motion pans are still dealt with well. There are slight jaggies on diagonal edges, but you can't have everything - these are probably just hidden in the Marantz' fuzz. 'Hollow Man' demonstrates bass in the title music which is almost as realistic as the far pricer Pioneer, and the action sequences more convincing than on the Marantz in both picture and audio terms! On CD playback, 'Boys And Girls' is musical with great imaging; even played as non-HDCD through the analogue outputs quality is still very good. No real need to move up to the SACD generation mastering - this one works fine!

Via a simple tweak in the menus, digital audio can be allowed out at 96kHz, so we are able to sample the DVD-Video spec 24/96 side of the Alan Parsons Project HDAD, and while the result sounds less precise than the Pioneer or the Arcam, the vintage Gibson bass sound is authentic, accurate and clearly located in space. Coming back to issues with Hybrid SACD CD layer playback, I was to find that listening to the 'Gaucho' SACD as a CD was not a happy experience, noted as 'not great, not awful'. It just sounds digitally processed when it should

sound naturalistic. Listening to the DVD-Audio of it as surround Dolby Digital was a happier thing, although unsurprisingly that challenging bass part on 'Babylon Sisters' came across a bit cardboard-y. Thankfully the 'Everything Must Go' DVD-Audio contains a DTS track, and although the Dolby Digital track was consistent with Destiny's Child in that it at least sounded musical, the DTS track sounded superb with significant bass extension. Not the best here with CD, but its price-performance ratio is remarkable; something for which NAD is famous.

## MEASURED PERFORMANCE

With some peaking from its anti-alias filter, our analysis shows, the T513 is going to have a bright edge to its sound when playing CD. This is a bit unlike NAD, who tend to a warm, smooth presentation. But then CD replay is not this DVD player's primary purpose.

Distortion levels were reasonable throughout the player's dynamic range, if not class leading, as you'd expect. The EIAJ dynamic range figure reflects this, being a reasonable 109.5dB, close to the best in terms of linearity if not quite there. For a budget player, good enough all the same.

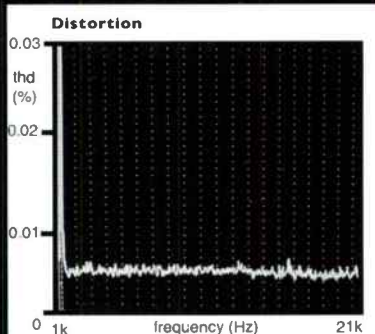
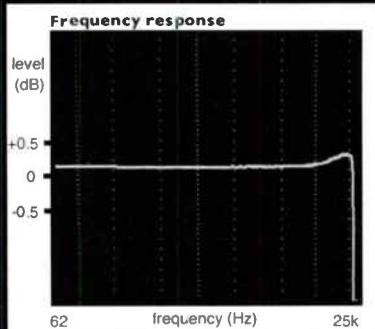
There was little jitter, non programme related f.m. products measuring less than 200pS. There were no programme related products.

The T513 offers a reasonable CD replay performance, but it will sound bright. NK

Frequency response 4Hz - 21.8Hz

Distortion	
-6dB	0.005%
-60dB	0.4%
-80	10%
-80 dithered	1.8%

Separation	
1kHz	123dB
20kHz	110dB
Noise (IEC A)	-113dB
Dynamic range	109.5dB
Output	2.0 V



## VERDICT ●●●●£

NAD Electronics  
www.nad.co.uk

### FOR

- astounding Value
- progressive scan video performance
- great sound per pound

### AGAINST

- no hi-res
- Dual Disc noise

**MARANTZ DV6500 £400**

**A**s well as hi res, we also have PAL progressive video output, so by the simple expedient of changing the settings in the (relatively rudimentary) on-screen menus from interlaced to progressive and hooking up the component output to the Pioneer plasma's media box using three phono leads we were able to obtain a very rich image.

It is here that it becomes apparent that there are swings and roundabouts to this HDMI versus component progressive debate. Yes, the two HDMI-capable players here show extremely clean and detailed images, but all that clever motion-adaptive technology can sometimes cause its own artefacts too, and sometimes you can't help feeling that the analogue route makes these issues moot, or at least less obvious?

Using 'Monsters Inc' as an example it is immediately evident that the overall image quality isn't that far behind that of the more expensive HDMI models. The Marantz is actually a less forceful exemplar of this than the NAD, and does seem to portray colours as slightly washed out, and blur image detail across the picture generally. However aspects such as the fast pans across the child's room in the first scene move in a more natural way than any of the digitally connected competitors.

Sonically, the Marantz is slightly disappointing, with the DTS intro to 'Monsters Inc' sounding diffuse and unreal. The 24/96 side of 'Turn Of A Friendly Card' was satisfying enough. Although 24/96 can be passed over S/PDIF the analogue outputs sounded more pleasant, with the vocal performance standing out from

the soundstage nicely. The sound is tight, but not markedly musical. Moving up to the 24/192 version only improves things slightly, with more spectral 'strings', but the bass lacks the essential bounce and life that say, the Pioneer can bring. Put simply, the sonic qualities of the Marantz don't make you want to sit down and listen to music. The 24/192 version of 'Everything Must Go' has satisfying low-end bass, but the top is brittle.

On the other hand, as you might expect with Marantz, the SACD playback is more convincing. The surround 'Babylon Sisters' nicely conveyed with real, musical horn sounds, but even here the voice is

missing the breath of life, and that bass part sounds fake. Strangely enough the DVD-Audio multichannel renders the horns more plastic, but improves both the bass part and the vocal. CD wise the Marantz struggles manfully, and 'Babylon Sisters' sounds pleasing but is improved in two channel DSD, and then improved again in 24/96 stereo MLP. The 'CD' side of Dual Disc is really a no-no, with slow load times accompanied, as is playback, with ominous mechanical knocking.

Price considered, the neat looking Marantz puts up a 'conscientious' performance, but falls awkwardly between the value of the NAD and the skill of the Pioneer.

**MEASURED PERFORMANCE**

With CD this universal player gives a flat frequency response that reaches 21kHz, which is normal enough. Distortion figures were a little off the mark though, especially at -60dB, where 0.27% contributed to a relatively poor EIAJ dynamic range value of 108dB. At 80dB and at -30dB the figures were on par with the competition though.

SACD was more linear but still didn't get the sort of result that is possible, with 0.15% at -60dB. A -100dB signal was resolved well, however, with 6.5% distortion, again as expected. Frequency response reached 36kHz (-1dB) before rolling away to reach -30dB at 100kHz. This helps keep supersonic noise down.

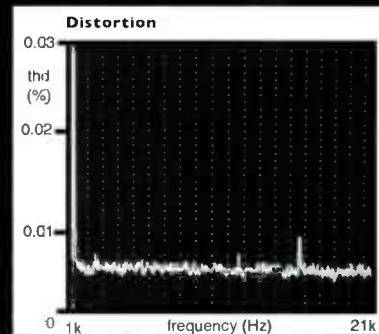
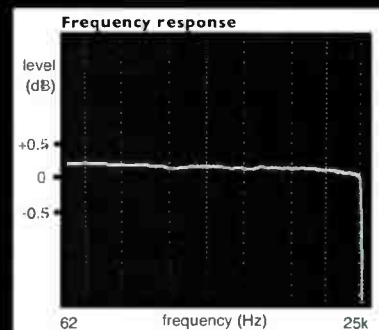
DVD-A behaviour was again off the mark a little, with distortion figures looking much like those of CD at -60dB, although -80dB and lower were far better. Frequency response was flat to 63kHz and -2.2dB at 90kHz, somewhat better than SACD as always.

The DV6500 was respectable enough in all areas but it was a little behind class leaders like the Pioneer. NK

**Frequency response (-1dB)**  
**CD** 4Hz - 21kHz  
**SACD** 2Hz - 36kHz  
**DVD** 4Hz - 63kHz

Distortion	CD	SACD	DVD
-6dB	0.002%	0.004%	0.0006%
-60dB	0.27%	0.015%	0.25%
-80dB	4.5%	1.7%	2.2%
-100dB	-	6.5%	8%

Separation (1kHz)	124dB
Noise (IEC A)	-121dB
Dynamic range (CD)	108dB
Output	2.12V

**VERDICT** ●●●●£

Marantz UK

☎ +44 01753 680868

www.marantz.com

**FOR**

- universal capability
- acceptable video
- attractive design

**AGAINST**

- lack lustre audio
- Dual Disc knocking



## PIONEER DV868AVI £800



**A**s one of the earliest HDMI- and iLink-capable players it is impressive that this Pioneer is holding its own! Its video abilities are every bit the equal of the Arcam, the one area where the latter prevails is in its handling of DTS, with the swinging bass of the 'Monsters Inc' intro being just marginally richer played on the DV79. But other than that it is basically parity, with a striking and lively contrast on the Pioneer, much like the Naim DVD5.

'The Hollow Man' is where the winning musicality of the Pioneer starts to shine through. Despite the DTS observation with the 'Monsters Inc' music, in this case the insinuating title score in full bitrate DTS is presented by the Pioneer in a notably lifelike fashion. The image is extremely filmic in its look, with involving audio which doesn't quite reach the impact of the Arcam.

Moving to CD playback, the compression nightmare tests are passed more convincingly than the Arcam, with Beck's 'E-Pro' coming across as more musical than it has a right to, and the Tears For Fears track faring equally well whether through the analogue connections or the coaxial. Sound is very evenly matched via those two routes, and it is only the Bryan Ferry HDCD test which allows the digital route to impart a glossier sheen thanks to the Denon's HDCD decoding.

Then we get to SACD, and before the specifics my notes contain the single word "superb!". The entrancing stereo

presentation of the intro to 'Sensation' just becomes even more epic and panoramic in DSD stereo, while the multichannel version spreads the action all around in gloriously cogent fashion. The 'Gaucho' test now becomes an SACD/ DVD-Audio head-to-head, and in multichannel DSD the smooth 'Babylon Sisters' is given an extremely clean piano tone, the horns fill the rears effortlessly, but Fagen's vocal parts are a bit tame, and the bubbling bass part seems unconvincing. Moving onto the same track in 24/96 surround DVD-A gives a marginal improvement to the life of the vocal, but emphatically turns that complex

bass part from something which is not quite working into an ideal musical underpinning to the track. The 24/192 stereo on 'Everything Must Go' only heightens the sense that this player is in complete control of the timing of a musical performance, as does the 24/96 surround.

The Pioneer clearly extracts the maximum possible incremental benefit out of 24/192 discs with some phenomenally good imaging and a gloriously tight bass sound. All of this and it has no problems with any flavour of Dual Disc either, so how could you go wrong? It's a great player, which is still top of the class all these months on.

## MEASURED PERFORMANCE

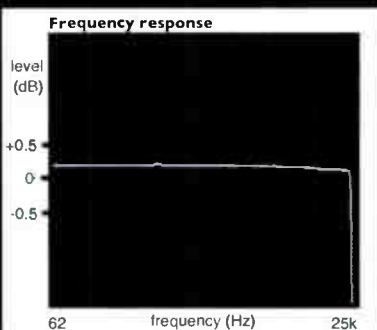
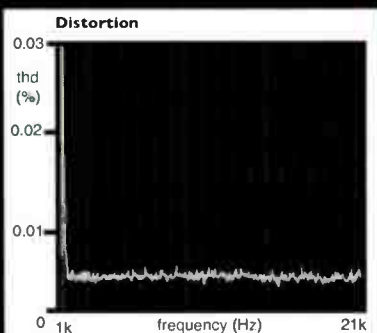
The Pioneer turned in an immaculate set of distortion figures from both CD and DVD-A, amongst the lowest I have yet measured. This does not mean it will have the best sound quality, but it is an encouraging sign. Just 0.13% from CD at -60dB is as low as it gets.

Whilst CD frequency response reached the usual 21kHz limit and is completely flat our analysis shows, suggesting a bright sound, DVD-A at 24/912 reached 52.5kHz (-1dB) before rolling away slowly at higher frequencies, reaching -7dB at 90kHz. With wide separation figures, low noise (output muting at 0dB I suspect) and an excellent EIAJ dynamic range value of 111dB and negligible jitter (less than 50pS) up to 100kHz, this player measured very well in all areas. NK

Frequency response (-1dB)	CD	DVD
	4Hz - 21.1kHz	4Hz - 52.5kHz

Distortion	CD	DVD
-6dB	0.0006%	0.0003%
-60dB	0.13%	0.05%
-80dB	3.6%	0.5%
-100dB	-	3.5%

Separation (1kHz)	126dB
Noise (IEC A)	-122dB
Dynamic range (CD)	111dB
Output	2.1V



VERDICT ●●●●● £

Pioneer GB Ltd.  
 ☎ +44 (0)1753 789789  
 www.pioneer.co.uk

## FOR

- superlative picture
- musical sounds
- iLink Too!

## AGAINST

- unattractive remote
- daunting complexity

**ARCAM DV79 £1,000**

**T**he DV79 is a really top class DVD-Video player, as was immediately apparent with the action in chapter 22 of 'The Hollow Man'. The image was impeccably clean, even under heavy motion conditions, and the DTS audio was the most impressive of all the machines tested. The machine's excellence with DTS was reinforced when it showed great dexterity in handling the cymbals on the Porcupine Tree 'Blackest Eyes' video, along with wonderful surround steering.

Moving on to the audio, I kicked off with the CD layer of the 'Gaucho' SACD. 'Babylon Sisters' sounded bright with the vocals lacking in subtlety, although, as the inverse of the case with the Naim, the quality was improved switching to coaxial digital rather than analogue connection. Moving up to the 24/96 DVD-A of 'Gaucho' gave a marked boost to the realism of vocals and percussion, and a much fuller piano sound. The 24/192 on the Dan's 'Everything Must Go' sounded even better, and the surround presentation of both discs was pleasingly cohesive. However the direct 24/96 to 24/192 comparison of the same stereo material, using Classic Records' 'Turn Of A Friendly Card' HDAD disappointingly revealed only a marginal added refinement with the higher sampling rate – unlike the Naim.

Again unlike the Naim, receiver-based HDCD decoding was able to add some sparkle to Ferry's 'Sensation' when compared to the machine's analogue output.

Snow Patrol's 'Wow' from the CD layer of the SACD

showed the DV79 brittle in its handling of CD, although the same track from the DVD-A side of the Dual Disc showed a much more convincing way with the splashy percussion, although the overall surround was not up to the reference Naim DVD5, as you'd expect at twice the price! It is here that I must pause to note that the Arcam has a problem with nearly all flavours of Dual Disc, specifically in dealing with the 'CD' side of the disc. Silverline and Universal discs cause it to go into an infinite 'Load' loop, and Sony discs go through a very long load before finally

appearing to be playable. As far as the non-playing discs go, this is not necessarily Arcam's fault, but if there happen to be close-to-maximum-CD-thickness discs on the market, and some machines will play them where Arcam ones do not, they will be at a disadvantage if the Dual Disc market takes off and some resolution to this issue cannot be found.

Overall then, a brilliant DVD video player and a very impressive lossy multichannel music performance, but it wasn't quite as invulnerable as some would think considering its premium price!

**MEASURED PERFORMANCE**

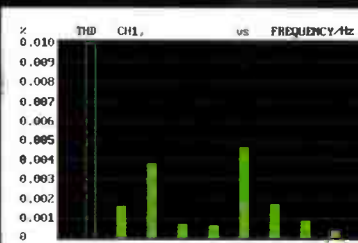
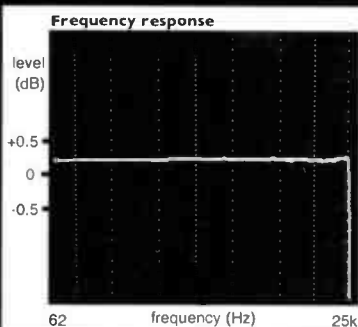
**Frequency response with CD shows Arcam's usual slight roll-down at high frequencies, our analysis shows, in order to ensure the player delivers a smooth and cohesive sound, largely free from CD's potential to sound sharp. With 24/192 stereo DVD-A the player measured flat to 40kHz, rolling off slowly above this frequency; it was -10dB down at 90kHz and -15dB at 100kHz. These figures compare well with the best rivals.**

**Distortion was very low with CD, right through the player's dynamic range. A figure of 0.18% at -60dB was excellent, resulting in an EIAJ dynamic range value of 111dB. DVD-A was three times better though, producing just 0.06% distortion at -60dB, full resolution and good level accuracy being held down to -100dB. Jitter levels were negligible across the audio band and up to 100kHz, peaks reaching 30ps maximum. So the DV79 handles high resolution DVD-A audio well, getting fine results from it.**

**With normal output level and wide separation the DV79 looks well engineered. However, it rejected a lightly abraded Philips test disc that others accepted, so the transport optics could be better. NK**

**Frequency response (-1dB)**

	CD	DVD
4Hz - 21kHz		
4Hz - 40kHz		
<b>Distortion</b>	<b>CD</b>	<b>DVD</b>
-6dB	0.0007%	0.0002%
-60dB	0.18%	0.06%
-80dB	3.8%	0.7%
-100dB	-	5.7%
<b>Separation (1kHz)</b>		<b>115dB</b>
<b>Noise (IEC A)</b>		<b>-102dB</b>
<b>Dynamic range (CD)</b>		<b>111dB</b>
<b>Output</b>		<b>2.2V</b>

**VERDICT**

Arcam  
 ☎ +44 (0)1223 203203  
 www.arcam.co.uk

**FOR**

- great DVD-Video
- excellent lossy surround
- attractive styling

**AGAINST**

- no SACD
- average CD
- Dual Disc incompatibilities

# Conclusion

Obviously this group test is a bit of a mixed bag, split between PAL progressive and HDMI capable players. But one doesn't have to automatically cleave to the view that HDMI is essential; progressive scan component can create some very attractive pictures too. Ultimately if you are in the market for a more sophisticated replacement for your current DVD player, all of these models have their own areas of merit, but for me the pecking order is fairly clear...

Least desirable of the four would have to be the Marantz DV6500, suffering from the typical 'jack of all trades' problem, which even players at four times the price can struggle to resolve completely. While a satisfactory video performer, its musical capabilities across the full gamut of formats let it down as an audiophile component. It would make a new format enthusiast who wasn't a hi-fi buff very happy, but might disappoint the more scrupulous.

Despite my introduction, it is almost inevitable that the other PAL progressive player should come next. Despite its lack of any high resolution abilities, the NAD T513 is a real revelation – that such compelling video and audio performance can be provided at a budget is absolutely amazing. If you're not looking for high resolution audio capability or for a single source for your system, but for an affordable performer to slot into your video set up until the time comes to dabble with the new video formats, this one is worthy of your closest attention. Its main drawback for me was that if you wish to use it for CD play and the Dual Disc format takes hold, its mechanical noise while spinning the thick disc is a major issue.

And now the tussle between the two big guns. Well, for me, despite closely matched video performance, similar levels of configuration flexibility and overall attractiveness, there can only be one winner. The Arcam DV79 is a handsome machine with stunning video capabilities and superior multichannel audio sonics, but it has always had the bugbear for

the hardcore hi-res enthusiast of not having SACD capability, and to this must now be added the fact that it is not particularly Dual Disc friendly. This is a real disadvantage in the case of discs where the DVD side may not contain hi-res stereo, and the only way to listen to the stereo will be the 'CD' side. Who really wants to have to clone each Dual Disc to CDR? (even if the Dual Disc will load in your computer of choice!)? Even though this is the most expensive player here it may be unfair to compare it to the much more expensive Naim, but in this test it is up against one of its most direct

“Pioneer still know how to make an analogue-connected component sound like true hi-fi...”

competitors.

No, for me the real winner here is the time-served, but still impeccable Pioneer DV868AVi. There may well be a similar successor towards the end of the year before blue-laser time, and it may well be cheaper, but this one should still be the benchmark against which both more lofty and more lowly universal players have to be judged. Almost every facility you can possibly imagine is offered, and the sound in every flavour is to die for. And that is without even trying it in its high quality iLink connected mode this time around. It is also hugely impressive that the player handles both sides of a Dual Disc with considerable aplomb and nary a complaint or wheeze...

Despite their problems with some models and certain DVD-Audio discs in the states, the reason Pioneer are able to play the Dual Disc so flawlessly is that they



assiduously track the authoring changes which cause these gremlins, and fix them with firmware upgrades. It is to be hoped that some of the other manufacturers are able to resolve some of the Dual Disc issues, although I can't help feeling that the problem is often more mechanical than in the bits and bytes.

Pioneer may be at the forefront of a lot of these new-fangled digital developments, but they still know

how to make an analogue-connected component sound like true hi-fi. You would do well to keep your eye out for end-of-life bargains on this one, whatever comes next, as you could be in for a really affordable treat.

Ultimately the decision of whether to upgrade your DVD player centres on how much DVD you intend to watch in the next few years before the High Definition formats take hold, and in what quality, and that can only really be your decision - but if you have a High Def display, all of these machines will fill it admirably.

#### REFERENCE SYSTEM:

Pioneer PDP434HDE plasma display  
Van Den Hul HDMI cable  
TCI Viper 6 analogue interconnects  
Naim DVD-5 DVD-A player  
Denon AVC-A1SRA AV receiver  
Monitor Audio GR20 loudspeakers

99 cd-s

99 cd-p

fm tuner

pre-amplifier

stereo power amplifier

mono power amplifier

909 stereo power amplifier

# quad 99 series



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# Disc changes

**Inveterate early adopter Patrick Cleasby reminisces about the DVD format in conversations with John Bamford of Pioneer GB and Tony Spath of Dolby Labs, tracking its progress from video beginnings, via high resolution audio, to the forthcoming blue laser based High Definition formats...**

I don't often lay claim to any special prescience in these high tech areas which obsess us, having often backed wrong horses including DCC, but even though I wasn't in a position to pontificate about it at the time, I was proud that I got behind DVD in a big way from the off, and I was right for once! But before I got my hands on DVD there were a number of years of development and consolidation...

**JOHN BAMFORD:**  
"It's hard to imagine this, but in Japan DVD video wasn't such a deal because a third of Japanese households already had a LaserDisc player..."

## THE CREATION

**JB:** "Wind the clock back to 1994. I

remember a guy called Dr. Yamamoto, he was a main board director for Pioneer Corporation Japan, he was in his late sixties and already semi-retired. When I discovered who he was, it was like – this guy's the godfather of optical discs, I mean this guy practically invented Laservision as it was! This was before e-mail – he faxed me saying, 'I'm coming over, I need you to make an appointment to meet Mr. Bob Stuart of a company called Meridian Audio, I don't know if you've heard of them?' I'm going – not a problem mate, I'll just phone Bob. Also he said I need to visit this professor at Essex – Hawksford, and I already knew who he was. I went to pick up Dr. Yamamoto at the airport. This is well before DVD-Video – I remember then having conversations with Bob Stuart, Dr. Yamamoto, Professor Hawksford – I'm not a genius, but doesn't take a genius to realise that for Compact Discs to be

superseded by a new kind of disc, it would have been dead handy if it were some kind of hybrid disc. I remember making that point and everybody was scratching their heads going – John you're right but there's a problem – and it was only then that it was explained to me that a DVD was going to be two half thickness discs bonded back to back for rigidity and flatness. It was because of that that the DVD-Audio disc was always destined to not be like a hybrid SACD. It wasn't even DVD at the time – Toshiba were promoting something called SD – Super Density disc. Philips were promoting MMD – Multi Media Disc. I can't remember which we were talking about now...

Wind the clock forward. Heathrow Show, September '95. Engineers from Pioneer came over – I don't know how I swung it, containers came with TAD monitoring speakers, we had a prototype DVD player, and amplifiers and pre-amplifiers and modified 96kHz DAT machines running at double speed, an interface with a box of tricks that was like a bit reallocation system, probably Pioneer's idea, similar to what became MLP, made on an engineer's workbench. So this DAT machine could actually record 24/96 not 16/96, it was linked in with an umbilical cable to this AIRS interface and we were playing 24/96 DAT tapes in stereo, and then also playing for the first time in the damn world, 24/96 being played off an optical disc. We were showing what DVD meant for hi-fi. This was kind of DVD-Audio being demonstrated before DVD-Video even launched!

I can remember our first player, it was a LaserDisc player that could play DVD-Videos as well! Of course it kicked off first in Japan, and in Japan it wasn't that big a deal because it's almost impossible to imagine this, but a third of Japanese households had a LaserDisc player.



**Pioneer Corporation's Dr Yamamoto** – often referred to as the father of optical disc technology – was in charge of R&D when the first LaserDiscs were being developed during the 1980s. An opera lover and serious audiophile, he was also responsible for Pioneer developing 'HS-DAT', high-sampling DAT recorders with 96kHz sampling frequency. Just before Dr Yamamoto retired, John Bamford of Pioneer GB met up with him to witness the launch of Pioneer's first D-9601 professional HS-DAT recorder at the AES convention in New York (summer '93)...

So – here's a video, you don't have to wind the tape – they hadn't been winding tapes for years! For the first year, because of that combi player Pioneer had fifty percent of the Japanese market! Over here we had about six movies, and people were saying is it ever going to catch on, because the yanks have got all these discs and we can't play them because of region coding, at least with LaserDiscs we could play them even though you had to buy them under the counter because of the BBFC! Of course the rest is history – it just snowballed at a rate of knots..."

**TONY SPATH:**  
"I think DVD con-founded everybody by actually presenting an experience which was significantly better than anything anybody had ever had..."



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*AUDIO REVIEW Italy, July 2004, Claudio Checchi*

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**NASCENT FORMAT WARS**

**PC:** Before I got involved as a punter and then as an author there was the small matter of a format war to avoid. Tony Spath, VP of International Marketing for Dolby Laboratories, echoes the same reasons for DVD's success which I always felt were instrumental...

**TS:** "You look back on DVD and say, oh yes, it's really successful, everyone knows this, but at the time those two formats came together, firstly a lot of industry pundits had been saying - 'of course it ain't going to happen until they do come together' - and that bit was absolutely right, but an awful lot of people at the time were saying - 'well, it's not going to be that successful because it doesn't record' - but I think DVD confounded everybody by actually presenting an experience which was significantly better than anything anybody had ever had, and suddenly video on a shiny disc became very sexy and very desirable. This was a playback only medium, in effect

anyone had ever seen in the home, and arguably better than any digital broadcast, DVD is still the best looking by some way - you could then argue that that is the reason that HD is going to make a difference in broadcast, and I sincerely hope that they actually do a good job with HD and don't end up turning down the bitrates again, so what you end up with is something which is only marginally better than DVD. The point is that DVD made a significant difference, and the question is there going to be a significant enough difference with HD formats for the consumers to go out and pay more".

**PC:** Combining competing formats, this time around...?

**TS:** "There appears to be a considerable amount of interest in how these two formats can be brought together".

**PC:** Is there a realistic prospect of that happening?

**JB:** "I'd like to imagine that there is, but I don't know - it's going to be messy. Bob Stuart gives the vibe to me that there's always a chance that it will come together, and I'm thinking - God, I wish I had your optimism mate, I just can't see it".

**TS:** "Clearly Dolby's influence here is not significant, in that we are not going to be at the centre of discussions as to how that happens - the technologies themselves in terms of video and audio may be fairly similar, if not identical, but the actual physics of how the discs are put together is what has to be sorted out, and that's not really a thing that I'm placed to comment on".

**THE DVD-AUDIO HIATUS**

**PC:** Remind me about why DVD-Audio got delayed for copy protection reasons?

**JB:** "I remember it well. I'd have to check my diary I think it was the Hi-Fi News September Show, probably 1999. I was so excited because I wasn't a movie man, I had been waiting for this. The engineers had come over again, and at the Pioneer booth we were playing prototype DVD-Audio which were about to come out at Christmas time. We had a couple of discs, some 24/96 multi-channel, and we had a seriously high end DVD-Video player which was going to be our first DVD-Audio player, and I was sworn to secrecy because I was the only guy who knew - it played stereo SACD as well. It was the Pioneer DVAX10, only ever sold in Japan and the United States. Pioneer were about to

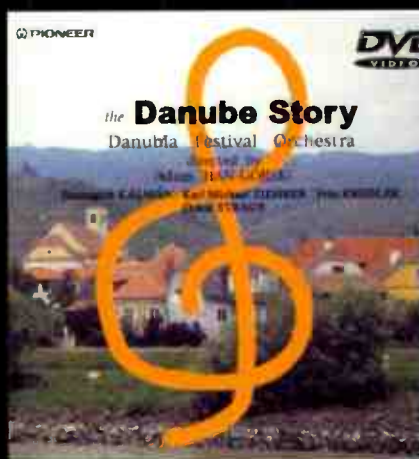
**DVD FORMATS**

Dual Disc 'CD' side	bonded back to back with a 4.7GB DVD (video/audio)
DVD-Video	playback only video
DVD-ROM	read-only data storage
DVD-RAM	read-write data storage
DVD-R & +	write once DVD-Video, DVD-Audio or data
DVD-RW & +RW	re-recordable DVD-Video, DVD-Audio or data
DVD-Audio	playback only multi-channel audio

start selling this in Japan - coming up towards Christmas, my Japanese line manager took to me to one side to say - DVD-Audio's not happening, it's postponed, Warner have pulled the plug, because CSS has been hacked, they want a more secure encryption. It was to be designed by the 4C entity, Toshiba, Intel Matsushita and IBM - it ended up taking twelve months and they came out with CPRM and CPPM. In the meantime Pioneer Japan had been controversial and started selling the DVAX10, with a promise to every customer that it would be modded once CPPM was finalised".

**THE DVD-AUDIO PROBLEM**

**JB:** "I did resign myself to the fact that it probably didn't matter that DVD-Audio was never going to be a hybrid disc. I was swayed by everybody else's enthusiasm for DVD. I thought the fact that everybody was buying DVD players would mean it would work. I was wrong wasn't I? Because what none of us could have predicted was the apathy and the doggedness and the laziness of record shops. The suits



Once DVD-Video was on the market, Pioneer was ever-eager to exploit the audio potential of this new media. This disc is one of several Pioneer was selling in Japan with limited playing time and not-too-ambitious video, as most of the data rate was taken up with 96/24 LPCM audio.

replacing VHS sell-thru, and history has shown us that great quality widescreen pictures and surround sound are something which people will go out and buy even though it doesn't record"

**PC:** Is it going to be possible to carry off the same trick twice?

**TS:** "You have to start asking a question - when is good enough good enough? If you go back to DVD, DVD presented something which was significantly better than



Playing at being DJs were Mr Ema (Pioneer's most senior DVD engineer) and Mr Nishi (Pioneer's numero uno audiophile and designer of the first TAD professional speakers thirty years ago). System used was as follows: D-9601 HS-DAT recorder, interfaced with 'ARTS' decoder to provide 24bit resolution (from DAT!). ARTS = Advanced Resolution, Twice Sampling. 96/24 copy master tapes could then be compared with the sound from 12cm optical discs played back on a prototype DVD player. Everything was strictly two-channel, of course ... as this was only Linear PCM. Pre/power amplification was Pioneer's high-end 'Exclusive' marque (only ever sold in Japan) feeding TAD professional monitors. Note the ribbon supertweeters perched on top!



**CSS encryption on DVD-V had been exposed, consequently DVD-Audio was 'still born' in 2000, as the major labels decided they would stall until a more advanced encryption could be incorporated into DVD-A. This didn't stop some labels selling DVD-Audio in Japan, regardless. Discs weren't encrypted, of course, and hardware sold to audiophiles had been sold with a promise that the manufacturer would upgrade it when DVD-A was re-specified with new copy-protection; CPPM, of course. During 2000 any audiophiles visiting Tokyo were scouring 'electric town' for any hi-res software they could find. Here's a quirky example on the Extone label, released in 2000 both on DVD-A and SACD. Both discs are merely stereo; the DVD-A simply 96/24 - so it needn't have been authored as DVD-A format. They could have released it as DVD-V and everybody would have been able to play it in full resolution. Doh! Audiophiles were all desperately excited to try DVD-A versus SACD comparisons but these EXTONE discs didn't really help. Unless you read Japanese - and even if you did - it was impossible to know whether the master recordings were high-speed PCM or DSD ...**

who are running the big record companies would have had more enthusiasm if they had seen the record shops were starting to stock these things and sell them. The problem is they weren't selling them, so of course they weren't selling discs and if they're not selling discs then of course there going to be more focused on their DVD-Video catalogue than their DVD-Audio catalogue. DVD-Audio became a failure because the record shops didn't know where to put them - I can't put Fleetwood Mac 'Rumours' with the DVD-Videos because someone might buy it thinking it's a video of Fleetwood Mac, I can't put them with the CDs because for a start the Super Jewel Box is too big for the CD racks, and people might buy it thinking it's a CD. And in the meantime SACD went from being two channel to multi-channel, and then they pulled the masterstroke and went hybrid, and I was left going - didn't I talk about this years ago before DVD was even invented? Bugger, bugger, bugger! I think that everybody knows the Dual Disc is the last chance".

**THE CODEC QUESTION**

**PC:** The difference between last time and this time is that previously the selling points were widescreen and 5.1 audio, and at the start it was basically Dolby. Now DTS have done well in pushing into that market in the intervening years. Although I think with new packaged media the up-sell is primarily going to be HD quality on your big flat screen, but audiophiles will be interested in the prospect of lossless audio. **TS:** "I was very pleased to hear John Ives from Sony giving an overview of the state of HD and

what's going to happen in Europe, and he came back several times to the statement that - Sound is half of this experience and it is clear that surround sound makes a big difference to people - you show the

"everybody knows the Dual Disc is the last chance..."

same program with an inferior bitrate on one screen compared to another, put 5.1 on the first screen and people think that picture looks better. I don't think it's just the audiophiles who like surround sound, I think it goes a bit further than that".

**PC:** I haven't had a lot to do with H.264 yet (the MPEG-4 based video codec to be used in both blue laser formats), but I've spoken to people who are used to looking at HD video in MPEG-2 and they're saying they don't like the look of H.264 as much. Have you seen them side by side?

**TS:** "Yes, there have been lots of comparisons, either side by side or split-screen. There are various techniques for viewing artefacts, because whether it's in digital cinema or broadcast the bottom line is that people are looking at the quality versus the bitrate. It is a different technology, and I do not profess to be a picture expert. It's a technology which has used a lot of the benefits of ten years of development in MPEG-2, and as a result the bitrate is significantly lower".

**PC:** Whither MLP?  
**TS:** "If you do lossless intelligently you actually end up with less bitrate on your lossless than some of the higher bitrate lossy coders. Bob Stuart at the recent AES conference made the statement that if you look at movie soundtracks and analyse them after they have been through the production process, which is a multi-generational process, you end up with a resolution which is something like 18 bit, and if you consider that movie soundtracks contain long periods of dialogue and not much happening audio-wise, the influence that that has on data rate is that you need rather less bits than you would if you were recording a classical concert. So Bob's conclusion was that you can code feature films losslessly for less bits than you can with some of these high bitrate lossy schemes.

I think lossless makes a difference to the audiophile

community, clearly, and I think this will be a benefit to High Def discs from the audio point of view. What you have to also bear in mind is that you want to have other features on there, so audio is going to be part of

the bit budget debate - so we have lossy compression as well, there's Dolby Digital+, which provides a more efficient coding and also allows stream mixing and thus opportunities for interactivity."

**BLUE LASER IN THE REAL WORLD**

**TS:** "I don't believe there is much mastering going on at the moment. The information that we are hearing is that these titles will be emerging round about the end of the year in the States. Clearly you would need to look at where are there more screens which can show this difference, and you would have to say in the US and probably Japan there is a higher proportion of High Def screens in the market. Now I think the situation in Europe will change significantly over the next few years - if High Def broadcasting starts here then clearly that will drive screen sales. That will again be driven by content, and when broadcasters start to come on the air there will be much more awareness of this. But at the moment the US has to be the primary market for HD titles."

**PC:** Have any of the player manufacturers declared likely dates yet?

**TS:** "Again these look to be round about the last quarter, and you've got people talking about putting drives in PCs around September / October."

**PC:** Because of the experience of having done it all before, more of the thinking has been done upfront, in terms of the writeable side of things, compared to last time, when DVD-R came after the launch of the packaged media...

**PIONEER**  
The Art of Entertainment

24-bit / 96kHz  
Advanced Digital Audio

HI-FI News & Record Review

**SEMINARS**  
Presented by  
Professor Madslein Madslein

**DEMONSTRATION TIMES**

Thursday 14th	1.00 pm	Friday 15th	12.00
	2.00 pm		1.00 pm
	3.00 pm		2.00 pm
	4.00 pm		3.00 pm

Free admission from  
the 20th Nov. & Record Review stand in the hall.



**TS:** "Yes, there is the fact that HD programming is going to be on the air, therefore the consumer is going to want to be able to record that."

**PC:** Does Dolby get into rights management for that kind of thing?

**TS:** "No, not from the point of view of discs. Yes, they can record stuff providing they have the rights to"

## THE FUTURE

**TS:** "I think that the best chance for an HD format is that the communication with the consumer is simple and that it makes a difference. I think that from a market point of view it would be better if there were one format, however Dolby aren't really in a position to influence which way that actually goes. Content drives it – our job is to enable the best experience. From the audio point of view we clearly have a step up from DVD in that you will now be able to put lossless audio along with picture.

People have shelves of DVDs, you can have two or three copies of the same thing like you can do with books, but I think one of the significant things is that people have gone out and bought DVDs, but often people don't actually watch DVDs. They'll just leave them on the shelf or coffee table - it's like coffee table books, it's a statement of here are the things I like, and here's what I do and here's what my life's about. I would see that rental is going to see some kind of surge, because there's only a certain number of great titles out there and people will want to browse and have a look at new stuff and their shelves are getting full!"

**PC:** To my mind the main danger to their commercial prospects is less the ability of the HD formats to convince the consumer of their video quality, than the rapidly increasing ability of downloadable formats such as Divx AVIs to match the discs' video quality at HD resolutions, but as ever, there is the difficulty such dodgy formats have with incorporating decent surround audio. Perhaps high quality surround, lossy or lossless is the differentiator which will mean packaged media is still in with a shout, but as bandwidth and compression technologies continue to improve it can't be long until the downloadable version can match the packaged version in almost every way.

## DISC CAPACITIES

<b>HD</b>	0.14GB
<b>CD</b>	0.65GB
<b>DVD-5</b> single sided, single layer	4.7GB
<b>DVD-9</b> single sided, dual layer	8.5GB
<b>SACD</b> single sided dual layer	8.5GB
<b>DVD-10</b> double sided, single layer	9.4GB
<b>DVD-18</b> double sided, dual layer	17.0GB
<b>HD-ROM &amp; HD-DVD</b> variable depending on the number of multiple layers employed, likely to both start at Dual layer, but to creep up to as many as 8 layers. Both formats to have variants to include a standard DVD layer, either DVD-5 or DVD-9 equivalent, to ensure single inventory, backwards compatible to SD, High Definition discs.	
<b>BD-ROM</b> 25GB per layer – 50GB dual layer at launch?	
<b>HD-DVD-ROM</b> 15GB per layer (i.e. single sided dual layer 30GB, double sided 60GB)	

## AUDIO FORMATS:

### CD

16 bit, 44.1kHz sampling frequency

Two channel stereo at 6.144Mbps

'enhanced' multimedia capability

SCMS (Serial Copyright Management System) built into subcode

96dB signal/noise ratio, 20Hz-20kHz frequency response

### SACD

1bit DSD at 2.8224 MHz sampling frequency

Up to six channels with a transfer rate of 2.8Mbps – option of carrying both multi-channel and two channel mixes on the same disc

Hybrid disc option offering 16/44 PCM stereo playable on any standard CD player

No 'watermarking' - copyright protection is kept separate from musical data

120dB signal/noise ratio, 2Hz-100kHz frequency response

### DVD-AUDIO

16, 20 or 24 bit PCM at 44.1, 48, 88.2, 96, 176.4 or 192kHz sampling frequency

Up to six channels with a transfer rate of 9.6Mbps maximum. MLP option.

Supplemental information storage, including album title, song titles, plus URLs

No regional coding, unlike DVD-Video

Optional audio format facility (i.e. SACD)

Not compatible with conventional CD or DVD video players

optional 'watermarking' (copyright protection) encoded into the musical data

144dB signal/noise ratio, 2Hz-96kHz frequency response

### DUAL DISC

- 'Non-DVD' side: as per Redbook CD spec, but not acknowledged as such by Sony/ Philips

- DVD side: most commonly as per DVD-AUDIO spec, but the only mandated element is that it should contain the same running order as the 'Non-DVD' (ie. CD side).

### HD-DVD

MPEG-2, MPEG-4 AVC and SMPTE VC-1 video formats.

LPCM as well as Dolby Digital, Dolby Digital Plus (mandatory), Dolby Lossless (mandatory),

DTS digital surround and DTS-HD audio formats

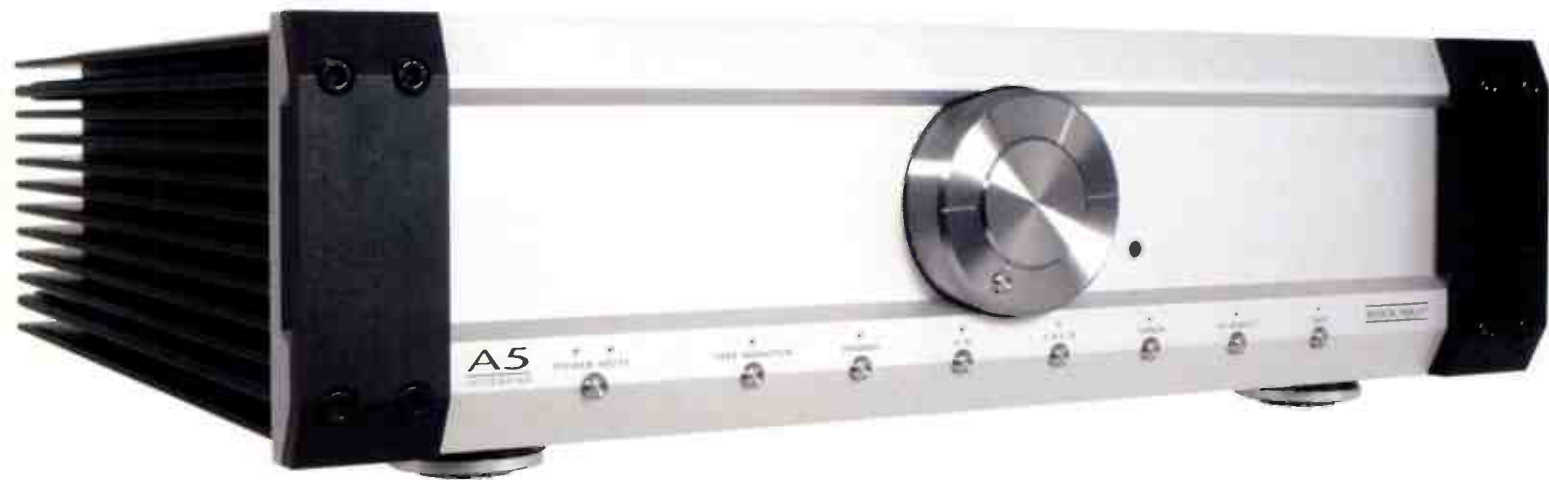
### BLU-RAY (SPECIFICATIONS NOT FINALISED)

MPEG-2, MPEG-4 AVC and SMPTE VC-1 video formats.

LPCM as well as Dolby Digital (mandatory), Dolby Digital Plus, Dolby Lossless, DTS digital surround (mandatory) and DTS-HD audio formats.

## GLOSSARY:

- HD** High Definition video is commonly defined by how many pixels high the image is. A Standard Definition PAL image is 576 pixels tall. There are essentially two flavours of HD resolution, 720 pixels tall and 1080 pixels tall. As these can be found in both interlaced and progressive flavours (particularly with 1080 there are a number of format permutations to take into account, and that's before we get into frame rates...
- CE** Consumer Electronics
- CCS** Content Scrambling System – the disk encryption technology for DVD which was patently too weak as it was cracked by then teenage hacker DVD Jon (who continues to be a thorn in Apple's side with clever workarounds for their DRM technology). This gave the world deCSS the core engine in any DVD ripping tool. Hence...
- CPRM** Copyright Protection for Recordable Media
- CPPM** Copyright Protection for Pre-recorded Media
- DRM** Digital Rights Management – generic term for the various means with which content providers and CE manufacturers try to prevent the illegal dissemination of copyrighted works.
- H.264** An efficient video compression codec based on MPEG-4 which contains intellectual property from a variety of partners including Dolby and Apple among many others.
- MPEG 2** Motion Pictures Electronics Group standard which is used in DVD-Video, almost all Standard Definition digital broadcasts, as well as High Definition cable and satellite in the States.
- MPEG 4** More advanced compression standard than MPEG-2 which allows for tighter bitrates due to more efficient coding. iTunes AAC is an audio subset of this standard, as are the two HD packaged media permitted codecs, H.264 and Microsoft's VC1 (née VC9 aka WMV HD), which are also the prime candidates for European HD broadcast.



**WIN MUSICAL FIDELITY'S SUPERB A5 INTEGRATED AMPLIFIER IN THIS MONTH'S GREAT GIVEAWAY!**

**QUESTIONS**

[1] How does DT describe the styling cues?

- [a] Art Deco
- [b] Deluxe
- [c] Delightful
- [d] Decorative

[2] What is the toroidal transformer?

- [a] beefy enough
- [b] beef and onion
- [c] beef cake
- [d] British beef

[3] How did DT find the soundstaging?

- [a] 'wall like'
- [b] 'off the wall'
- [c] 'off the map'
- [d] 'wonderwall'

[4] As integrations go, is it...

- [a] 'mightily impressive?'
- [b] 'transcendently splendidous?'
- [c] 'splendidly magnificent?'
- [d] 'mendaciously splendidous?'

June 2005 Competition  
 Hi-Fi World Magazine  
 Unit G4 Argo House  
 The Park Business Centre  
 Kilburn Park Rd.  
 London NW6 5LF

**H**ere's your chance to win a fantastic Musical Fidelity A5 integrated amplifier worth £1,500! In May's *Hi-Fi World*, Dominic Todd wrote:

"For a £1,500 amplifier, the A5 looks very fine. In fact, apart from the lack of an outboard power supply, it looks much like the £4,000 KW500. I rather like the industrial Art Deco cues, and think that it manages to look a good deal more expensive than it actually is. Corners certainly haven't been cut when it comes to case construction. The familiar, thick front aluminium panel, with black, faux rack handles is in place, as are the chunky ribbed aluminium side cheeks. As with other MF designs, the transistors are bolted directly to these... The toroidal transformer is certainly beefy enough... the circuitry is generally neat, well planned and features components of a good enough quality, such as ALPS for the volume control and Jamco for the capacitors. It won't come as a surprise to hear that the A5 has no shortage of drive. Put an upbeat, busy, track on such as

Dr John's 'Chickee Le Pas', and it's hard not to be impressed by the effortlessness of the way the amplifier will just sweep through the music... There was fine separation from the rest of the mix, and that excellent balance that most MF products seem to get just right these days, of projecting but not forcing the sound forwards. With a more mainstream and commercial recording there was superb control of the bass, and a super balance of taut, pacy timing combined with weight and power... Staging was, once again, wall-like in its sheer presence, and the song was driven along with great gusto... In terms of depth and layering I would even go

so far to say that it's one of the finest integrations around this price. The wonderfully expansive sound stage and ease of delivery is superior to anything else at the price... As integrations go it's mightily impressive and a worthy addition to the MF range.

If you'd like to win this superb product, then all you have to do is answer the following four easy questions. Send your entries by 31st May 2005 to:

**June 2005 Competition, Hi-Fi World magazine, Unit G4, Argo House, The Park Business Centre, Kilburn Park Road, London NW6 5LF.**

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- 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

**entries will be accepted on a postcard only**

**MARCH 2005 REL STRATA III SUBWOOFER WINNER:  
 Hassni Malik of Brighton, East Sussex**

# SEVENOAKS

## SOUND & VISION

### NEW STORES

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Situated on Crown Street, the store has three fantastic demonstration areas where you can audition the very best in home cinema and hi-fi. Easy parking available at the rear of the store.



#### SWINDON 8-9 COMMERCIAL ROAD 01793 610992

The Swindon store has reopened after a short break with an improved range of the best in hi-fi and home cinema. The excellent facilities and quality of service remain the same. The store is close to the town centre with parking nearby.

### smart home show

14-17 April 2005  
NEC, Birmingham

The new Smart Home Show brings together everything you need to create your own unique digital home.

The Sevenoaks Sound & Vision Fusion Lounge (Stand 3409) allows you to experience an incredible 'real world' concept room, containing some of the world's best home entertainment systems - a 'must-see' if you're looking to integrate music/home cinema systems into your home. Plus, when you visit the amazing Fusion Lounge, you could be in with a chance of winning £25000 worth of state-of-the-art equipment! Terms and Conditions apply



### HDTV

(High-Definition Television)

will start to be broadcast in the UK within the next 18 months. With almost double the resolution of normal broadcasts, HDTV is set to redefine picture quality.

In order to enjoy the benefits of HDTV, you'll need a suitable television. Most televisions in the world today will not show HDTV, but there are some that are HDTV ready.

Want to know more? Sevenoaks was one of the first to demonstrate HDTV. Most Sevenoaks stores have a dedicated satellite link to Euro1080, Europe's first HDTV channel and can advise you which screens are future proofed.

Contact your nearest Sevenoaks Sound & Vision store today and get ready for tomorrow. THE 'HD READY' LOGO IS A TRADEMARK OF EICTA.

With over 30 years experience, SEVENOAKS Sound & Vision is one of the largest and most respected Audio/Visual retailers in the country.

Each Sevenoaks Sound & Vision store stocks a wide range of quality products, covering all categories of specialist home entertainment, from Hi-Fi separates and systems to DVD recorders, widescreen plasma televisions and projection systems.

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- THE BEST PERFORMANCE
- THE LATEST TECHNOLOGY
- THE WIDEST RANGE
- ... AND TOTAL PEACE OF MIND

#### ABERDEEN (NEW)

- BEDFORD
- BIRMINGHAM
- BRIGHTON
- BRISTOL
- BROMLEY
- CAMBRIDGE
- CARDIFF
- CHELSEA
- CHELTENHAM
- CRAWLEY
- CROYDON
- EALING
- EDINBURGH
- EPSOM
- EXETER
- GLASGOW
- GUILDFORD
- HOLBORN
- HULL
- IPSWICH
- KINGSTON
- LEICESTER
- LEEDS
- LINCOLN
- MAIDSTONE
- MANCHESTER
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- STAINES
- SWINDON (NEW)
- SWISS COTTAGE
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## Arcam

Arcam has spent more than a generation building some of the finest high-fidelity products the world has ever seen. Whether you're interested in two-channel or a complete multi-channel AV system, the Arcam DiVA series offers the music and movie lover the most complete range of high-performance home entertainment solutions from any specialist manufacturer.



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**DT91 DAB TUNER**  
**DV78 DVD PLAYER**  
**DV79 DVD PLAYER**  
**AVR250 AV RECEIVER**  
**AVR300 AV RECEIVER**

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  - RA-02 AMPLIFIER**
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  - RCD-02 CD PLAYER**
  - RT-02 TUNER**
- ### 10 SERIES
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Project is currently one of the world's leading suppliers of turntables, with a range of models designed to satisfy all levels of expectation and budget. The range is simple to use, maintenance free and will function for a lifetime.

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We always try to ensure our prices are highly competitive. In the event you can find the same products and excellent service at a lower price, please bring it to our store managers' attention.

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**ADVERT VALID UNTIL AT LEAST 05/05/2005, E&OE.**



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**Kandy**  
KA1 MKIII AMPLIFIER  
KD1 MKIII CD PLAYER

**Caspian M SERIES**  
CD PLAYER  
AMPLIFIER  
PREAMPLIFIER  
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Since 1972 Monitor Audio has been developing and perfecting the implementation of metal drivers, innovative crossovers, and exemplary speaker cabinet construction and finish to further the ideal of achieving sound which is to the original "as close as it gets".

The range includes - Gold, New Silver RS, Bronze and Radius, a seriously compact system bringing true hi-fi performance to both music and movies at home.



**MODELS INCLUDE**  
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## Digital Radio Harman Kardon

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**Pure DRX702ES DAB/ANALOGUE TUNER**



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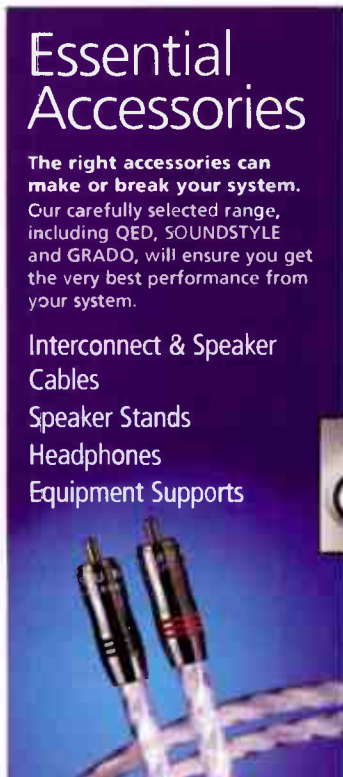
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"The overall balance of the speakers is their finest characteristic. Thanks to near-perfect driver integration, music sounds wonderfully natural and transparent. This is a bar-raising effort from Wharfedale: these are ridiculously good speakers at the budget price level." digital technologies from one of the oldest hi-fi names.

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SR5500 AV RECEIVER  
DV4500 DVD PLAYER

**CD5400** "This is a remarkable CD player for the money, with superb sound, looks and feel - A very solid buy and a lot of fun."



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Established in 1987, Acoustic Energy is one of Britain's premier loudspeaker manufacturers offering one of the most targeted range of hi-fi and home cinema loudspeaker systems on the market today.

**AE1 MKIII** **AELITE THREE**



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X-RAY™ CD PLAYER  
**A5 SERIES** A5 AMPLIFIER & CD PLAYER



## Product Selection

Some products/brands are not available at all stores. Please call to confirm or visit [www.sevenoakssoundandvision](http://www.sevenoakssoundandvision) before travelling.

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Linn RANGE	£ CALL
Michell Gyro SE/RB300	£1049.95
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Arcam DIVA T61	£229.95
Arcam DIVA DT91 DAB/FM	£449.95
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Arcam FMJ CD33T	£1349.95
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Quad 99 Power	£549.95
Quad 909 Power	£899.95
Roksan Kandy KA1 MKIII	£649.95
Roksan Caspian M	£999.95
Roksan Caspian M PreStereo Power	£1999.95
Rotel RA-01	£249.95
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Rotel RA-03	£499.95
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Acoustic Energy Aegis Evo Three	£249.95
Acoustic Energy Aelite Two	£449.95
Acoustic Energy Aelite Three	£749.95
Acoustic Energy AE1 MKIII	FROM £1699.95
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# Unequal

Speak to most analogue addicts and they'll swear on their styluses that – even if it's not the best in all respects – vinyl offers far more sound per pound than Compact Disc. With this in mind, Channa Vithana put Clearaudio's Champion Level 1 turntable (£3,265) against Metronome Technologie's CD3 Signature silver disc spinner (£4,795), with interesting results...

## THE CONTENDERS: ANALOGUE

Clearaudio's Champion turntable is available in three adjustable variants. The basic single-plinth Champion with 30mm platter costs £810. The Level 1 with extra plinth (and pods) costs £1,365 and Level 2 has advanced bearing assembly, larger pods in-between plinths and thicker 70mm platter at £1,935. The upgrade efficacy is measured at (quoted) 80, 82 and 84dB S/N ratios for each model respectively.

housing containing sapphire bearing (sitting on a hardened steel spike). The striking carbon-fibre arm tube has Clearaudio's Turbo Weight at the end for cartridge tracking force adjustment. VTA, Azimuth and Anti-Skate (thread + weight) are also adjustable. The head-shell is machined from a solid tapered cylinder with a central cut-out (pzena groove). There is an aluminium cartridge plate with black finger lift. This is secured onto the head-shell cylinder with a single

voltage of 0.7mV (at 5cm/sec). The manufacturer's tracking force is between 2.2g-3g. Finally an aluminium jewel-like Clearaudio Basic Symmetry phono stage at £540 completes the system. This is an exacting, high-performance instrument which can be ruthlessly revealing (for more details see our April 2005 phonostage special). Both upper plinth and arm sit on the lower plinth which itself has corresponding bolt fixings to its



The Champion Level 1 deck has an inverted, bronze-plated, hardened-steel bearing assembly into the upper plinth. It has machined holes on its underside to accept three screw-in stainless-steel bolts that subsequently attach to stainless steel pods. Each pod has three clear synthetic rounded feet for grip, stability and isolation. The £695 Unify tonearm comes in two parts: a stainless-steel arm base, then the unipivot arm itself which has a machined aluminium

hex-head bolt. The head-shell is a delight to calibrate, easily enabling azimuth (at its fixing to the arm tube). The Unify is terminated with Clearaudio's Sixstream Litz cable with bespoke phono and ground wire connections.

The £665 Symphony MC Cartridge is ebony wood-bodied. It has a Boron cantilever, Clearaudio Trygon PII diamond tip, 24ct gold coil material and Samarium-Cobalt magnets. It has a quoted output

underside with matt-finished GS-acrylic cones. The isolated motor is sealed inside a super-finished stainless-steel cylinder. It sits atop a matching 'decoupling device' enabling correct belt-pulley/platter alignment. Clearaudio recommend approximately 1/8 inch deflection for belt tension. Once lowered onto the bearing spindle, sans belt, the gentlest one-finger push actions the 30mm (matt GS-acrylic) platter, procuring perfect, free-flowing rotation, hinting



# Measures?

at the high level of manufacturing precision. The Champion comes with an extra belt, three fit pairs for cone surface protection. Precision level gauge, syringe of bearing lubricant, small tools, white gloves and Clearaudio's clever dust cap.

Assembly was completely straightforward. With clear G5 acrylic plinth (there is nowhere to hide imperfections) and exquisitely finished arm, phono stage and cartridge, the Clearaudio is not only well made and engineered, but is the complete package and utterly beautiful to boot. It is extremely quiet in operation and though unsprung, the acrylic plinth, pods, synthetic feet and cones splendidly isolate the platter, arm and motor. It measures 470x390x180mm and

around a team led by Dominique Geyer. It features a top-loading Phillips CDM12 Pro2 V6.1 transport located centrally on three feet with Delta damp and stainless-steel shaft for better CD stability and low jitter. The suspension of the mechanism (including the use of selected polymer mounting plate) is very important. There is a composite construction replacement motor spindle and other modifications to the transport to minimise sources. There is a continuous ground link from the disk surface to the electrical earth, no CD static charge so no ESD.

There are six regulated power supplies (vs four transformers) plus a 'Shelter Filter'. Four separate transformers power the DAC,

top with Metronome logo and moves with perfection. Near the lid is a set of operation buttons with legends for play, stop, pause and forward/back tracks. At the rear are IEC mains socket, depth off switch, high-quality braided phono, digital and balanced XLR sockets.

The system remote is a gem! Made from a two-piece black aluminium casing it is beautifully designed, weighted and accurately works in multiple angles. The Metronome case with three super-finished Delta cones to go under matching Delta feet. The cones made a massive difference, lowering subjective distortion, giving higher volumes and thus preferred in operation, the Metronome is one of the quietest CD players I have



weighs approximately 14kg with motor.

## THE CONTENDERS: DIGITAL

Established in 1987, France's Metronome Technologie products share a design house style - elegantly machined solid aluminium fronts and substantially built chassis. The new CD3 Signature is the company's entry-level player at £4,795 (the range reaches £26,700 for the top-flight transport/ DAC), designed

analogue and display sections, and the analogue stage is said to be totally original with very "in phase" analogue filtering as short signal pass. For digital, an upsampler from Crystal (8420) and 24bit/ 192 kHz converter from AKM with differential outputs are used. The substantial steel case has a finely layered textural finish and 20mm thick aluminium front panel, anodised in clear or black options. The manual aluminium transport lid has an acrylic

encountered, with a microscopically silent transport, hinting at the seriousness of its mechanical isolation. It is fussy though, needing at least two weeks of constant running-in. Size is 425x110x450mm and weight 13kg.

## SOUNDING OUT

The Metronome elicited wonderful bass - extended and affectingly resonating from The Blue Nile's classic 'A Walk Across The Rooftops'.

Well-placed string sounds melted with outstanding timing and excellent rhythm. The tone to the piano/keyboard section was especially tangible with real in-room extension heightening the atmospheric nature of this song. The Clearaudio's superior build nature was manifold with 'Walk Across The Rooftops'. This came across as a 'natural' delivery with a less insistent progression in comparison. Upon extended critical assessment though, the Clearaudio narrowed in emotional elucidation considering

Though as a whole, considering musical relationship to the vocals - the Clearaudio (although more sympathetic) didn't have the same emotional execution and therefore involvement as the Metronome.

The Cull's 'She Sells Sanctuary' on the Metronome had huge swathes of bass power at only moderate levels. You could feel it radiate through your bones with corporeal conviction. However, there was noticeable HF ringing distortions with Bill Duffy's main melodic guitar parts as he went for the solos. 'Love

demanding parts of the chorus. Simultaneously evident was a hardening of HF vocals which unravelled a slightly nasal and brittle quality. When it came to the harmony parts, the Metronome further revealed plenty of schlock/verb used to make her vocals sound more three-dimensional. The Clearaudio on the other hand produced a stunningly emotive Madonna, with especially sexy vocals on 'Open Your Heart', this was further evident on the vinyl version when she went for those difficult notes, the Clearaudio navigated around any stridency, without losing out on the emotional whole, providing a more sensitive relationship to her vocals. The sheer slam of the Metronome was sadly missed though...

One thing that always annoyed me about REM's 'Green' is the way it was mixed/ produced, as Michael Stipe's vocals and Peter Buck's Guitar could sometimes sound seriously strident. Accordingly both the Metronome digital and Clearaudio analogue had issues with 'Green'. The Metronome came off worse, as it ruthlessly exposed the HF strains on 'Get Up', while there were fewer problems regarding this on vinyl, though not completely diminished on the Clearaudio. On 'You Are My Everything' the Metronome did a wonderful job with the flute and organ/keyboard sounds in the background and was also nicely adept with the plucking of the mandolin/acoustic guitars too. The Clearaudio showed what a delicate vocal Stipe uses on this song while the mandolin/acoustic guitars were sweeter than the Metronome. The feel and bandwidth from the Clearaudio was greater too but the bass was and Mike Mills' background vocals were less well defined in comparison.

Gwen Stefani's 'What You Waiting For' on the Metronome had an agreeably furious energy radiating from the (always) sublime Nellee Hooper production. Stefani's high-pitched but beautiful vocals were brilliantly rendered on the

"however the timing remained matchless, the percussion and rolling drum sounds were simply awesome".

individual instruments within the musical structure - where it didn't have quite the same resonance and impact. But it gained with a perceptive spatial understanding, enabling better instrumental separation (if not emotional impact), therefore lending the music that 'natural' feel.

'Mad World' from Tears For Fears on the Metronome exposed some ringing distortion from the keyboards within its melody - as this recording is quite coloured. However the timing remained matchless, the percussion and rolling drum sounds were simply awesome. Keyboards in later passages were handled with real air, and Kurt's vocal combined warmth and silkiness to express pathos convincingly. As 'Mad World' fused into 'Pale Shelter' the guitar was sublime, slicing through the mix with affecting precision. The sheer amount of information coming through the Metronome was palpable.

Still, the Clearaudio turntable took the Metronome's high-quality vocals further, revealing superior expansiveness, adding a discernable sweet tonality. The music too was fluid and unrestrained, timing was good and the ringing distortions from keyboard parts minimised.

is a bright recording and the Metronome exposed its weaknesses without mercy. However the main thrust of 'She Sells Sanctuary' was really enjoyable, high guitar solos aside. On 'Brother Wolf Sister Moon' Ian Astbury's vocals range from the guttural to the delicate and as such this song had heaps of ambience with vocals beautifully revealed. The acoustic guitar which forms a backdrop was exquisite. Though ringing was still discerned as the guitar and keyboards reached crescendos on the final coda. The Clearaudio revealed much less HF guitar distortions (though it was still there) and made 'She Sells Sanctuary' even more enjoyable to behold. The gorgeous resonating bass was there in all its glory and the Clearaudio's timing matched the Metronome too...

Madonna's 'Open Your Heart' had fluid, deep bass expressed through its incredibly addictive beat programming via the Metronome. There was also exquisite and textural high-hat percussion. On 'Live To Tell' the decaying notes prevalent on the bass were stunning. Madonna's vocals were liquid, warm and tangible. The Metronome, however, exposed the limitations of her vocals when she clearly struggled with the more





**MUSIC:**  
 The Blue Nile 'A Walk Across The Rooftops' (Linn) 1983  
 Tears For Fears 'The Hurting' 1983  
 The Cult 'Love' 1985  
 Madonna 'True Blue' 1986  
 REM 'Green' 1989  
 George Michael 'Listen Without Prejudice' 1990  
 Gwen Stefani 'Love Angel Music Baby' 2004

Metronome, and the rhythm was propulsive with a hugely pleasurable and addictive feel. The timing was

sanguinely majors on an effortless delivery. There's depth, bandwidth, feel and talented musical timing – especially for a turntable. It also had a minute but discernible sweet quality with music. As a music maker it is generally, enjoyably-

balanced. The Metronome has staggering bass tunefulness and extension with a perfectionist zeal

"for our many vinylista readers, not to mention the editor, this was a shock result!"

faultless with the 'Tick Tock' rhyming part of the song. On 'Rich Girl' even Dr Dre's production was appreciable, with superb melodic vocal phrasing alloyed with an insistent ska beat. The Clearaudio was pretty much even with the Metronome regarding timing. The vocals were sweeter and more three-dimensional while the overall high-resolution sound from the Clearaudio was most satisfying. On 'Rich Girl' the vocals had added fluidity to the already elastic nature of the recording, while the ska beat was superior to the Metronome, being less strident and adding-to rather than detracting-from the composition.

**THE VERDICT**

This was an absorbing comparison to make. Both players are heartily recommended (at a hefty cost) for their ability. The Clearaudio

for musical instruments (inclusive of midband and treble) within compositions. Its timing overall is near-perfect and as such is a real joy. It goes head to head with the Clearaudio and equals its resolution on some recordings, while incongruously - for a CD player - exceeding it with the sheer emotion of musical passages present.

To my ears, the Metronome digital player wins because it communicated the music more emotionally, and for

me to make a difficult choice - was superior to the Clearaudio. To put this into context, the Clearaudio presented music in the familiar first-class vinyl fashion, an ease to the proceedings, sounding immediately natural compared to the Metronome. Beyond immediacy however it made everything sound this way, and utterly wonderful as it was, I felt in comparison, the Clearaudio did not appreciate all the recordings' identity. The issue of identity here isn't splitting hairs, chasing shadows nor a night and day distinction, but present all the same, as a persistently luxurious, minutely sweet, tonal undercurrent to all music. Conversely on the Metronome some music in absolute terms didn't fare so well in comparison, but it is not the fault of the player, rather I ultimately preferred it because it didn't lessen a recording's individuality. This is very important to me.

Many, when faced with a comparison such as this will prefer the more acquiescent medium-rare charms of the Clearaudio, while for me - in this review context - I demand the musical emotion served up spinetingly rare - as on the Metronome. For our many vinylista readers [not to mention the editor - Ed.] this was a shock result!

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**MEASURED PERFORMANCE**

The Metronome manages a very flat in-band audio response with a sharp cut-off at 21kHz by the anti-alias filter, shown by our impulse analysis. This sort of filtering and resultant response usually gives a fairly bright sound from CD.

Linearity was good at high levels but at and below -60dB the Metronome could have been better. There were extended quantisation products, measuring in all 0.5% distortion. This resulted in a mediocre IIAJ dynamic range figure of 108dB. Output was a normal 2.3V, channel separation very high and noise low at -88dB.

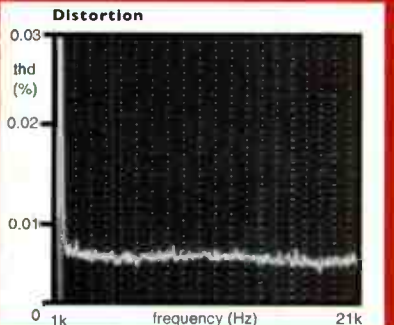
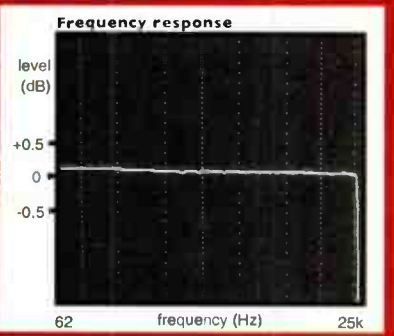
Non-programme related jitter was low, but a small amount of programme related modulation reached a maximum 100µs, a good result.

The Metronome is tidy enough, but its measured performance is commonly bettered in terms of linearity newslays UK.

Frequency response 4Hz - 21.3kHz

Distortion	
-6dB	0.008%
-40dB	0.5%
-80	10%
-80 dithered	2.5%

Separation	111dB
1kHz	99dB
20kHz	
Noise (IEC A)	-88dB
Dynamic range	108dB
Output	2.3V



**REFERENCE SYSTEM:**  
 Exposure XXIII / XVIII amplification (£2,798)  
 Waterfall Victoria TWN loudspeakers (£2,000)  
 Chord Company Signature Interconnect (£500)  
 Chord Company Odyssey 4 speaker cable 5m (£340)

# *The colouration's in the finish*



# *Not in the music*



# MD, RIP?



**Sony's once great MiniDisc format is now being comprehensively outsold by the new generation of digital audio portables, the ultimate exponent of which is Apple's iPod. Dominic Todd remembers it fondly...**

**T**he introduction of CD in the early nineteen eighties had been a huge success. Joint creators Sony and Philips had been so surprised that even their most optimistic forecasts had proved, by the decade's end, wildly pessimistic. It therefore didn't take much figuring out that a recordable version would be highly beneficial indeed...

Further momentum came from the fact that, after a memorable peak in 1988, sales of Compact Cassette were in steep decline. As Sony and Philips had originally cooperated on Compact Disc, so they initially developed a recordable disc together. The result of their combined efforts was to launch a Write-Once (WO) optical disc in 1986 and a Magneto-Optical (MO) disc two years later. Rumour has it, that when the recordable disc was first shown to journalists at a New York show, the prototype ran so hot that it had to be cooled, out of sight, by an engineer with a Japanese paper fan!

Not the most auspicious of starts, but it was enough to impress Sony's president of the time, Ohga, that the technology should be perused. Still, he wanted to see progress made in making the disc smaller and more shock resilient, and that the new format had to at least

match Compact Cassette in these areas.

Philips, being the inventors of Compact Cassette, had other ideas, and preferred instead to develop the Compact Cassette and eventually offer CD recording as a studio or high end domestic based system. So, after years of collaboration, the two companies parted. Philips went on to develop the Digital Compact Cassette (DCC), which flopped and then, much latter, a Compact Disc Recorder which did rather well. Sony, on the other hand, went its own way, and came up with MiniDisc (MD).

Sony brought together the same top engineers that had worked on the development of CD, and began the work based around Sony's existing MO disc. It was soon established that in order to be considered portable, the new disc needed to be about one quarter the size of a CD, but still hold up to 74 minutes of information. With the cooperation of the Sony Information Systems Research Centre, this led to the development of the ATRAC (of which more later) compression system. To ensure that the format would stand up to the rigours of portability, a tough outer casing and new, shockproof, memory based on semiconductors, were developed

alongside the ATRAC system.

By 1991, development was concluded and by late 1992 the first machines began to trickle their way onto the market in Japan. As it turned out, this was exactly the time that Philips launched DCC, and so the next few years were to see a fierce rivalry between the two formats.

## TECHNOLOGY

Central to the success of MiniDisc was the Adaptive TRansform Acoustic Coding (ATRAC) compression system. Unlike lossless converters often used now, ATRAC is a lossy algorithm. In order to get the maximum compression possible, not every bit of the original data is preserved, but just what's considered to be the most important. Data is reduced by about one-fifth of the original using a psycho-acoustic transfer function, similar to that used for MPEG compression systems. In theory, what this filter does is to block frequencies hidden to the human ear, and also remove information that is deemed to be outside of human hearing.

With the first ATRAC system, the practice actually turned out to be rather different, with the "masked" frequencies being sonically obvious. The sound lacked detail and

"space" around instruments, and proved noisy too. As we'll see, though, it didn't take Sony long to address these problems, and the ATRAC system of today is a very much more sophisticated system than the original. As a comparison to today's MP3 codecs, it's interesting to note that the bit-rate originally used by MiniDisc was 292kbps. Against the average 128kbps for MP3 this isn't at all bad. Out of interest the Long Play 2, which doubled recording time, offered a still competitive rate of 132kbps, whilst Long Play 4 offered a less than ideal 66kbps.

The main part of MiniDisc's evolution came from the development of the ATRAC compression system. Whilst it's true that Sharp, the only other major contributor to the development of MiniDisc, used their own version of ATRAC, it was the Sony system that proved the most innovative. During its lifetime, the ATRAC compression system has gone through no fewer than eight versions. It was actually less than a year before ATRAC 2 came on the scene and improved upon the original version by offering 16x24 bit rather than 16x16 bit multiplication.

Most are agreed, though, that the real breakthrough didn't come until the fourth generation of chip – ATRAC 3.5. Launched in the latter part of 1995, ATRAC 3.5 used a Block Floating type calculation to improve performance on small signals. The result was superior detail and, with machines such as the Sony MDS-JA3ES, it proved to be the final nail in the coffin for rival DCC. Yet, MiniDisc didn't stop there. The next ATRAC system, ATRAC 4, improved the multiplication process to 24x24 bit. Used by players such as the immensely popular Sony MDS-JE500 and '510, it could be argued that this was the first system that truly bought compressed music to the masses. Sony later introduced the Long Play system, which varied the bit rate (see above) and offered up to four times the length of the original 74 minutes. If this wasn't enough, an 80 minute disc was unveiled, that made it possible to record CDs of longer length than 74 minutes.

With MiniDisc now gathering momentum, Sony pulled all the stops out and launched the highest quality ATRAC system yet: ATRAC 4.5. This used an Adaptive High Band Control and, for the first time, pushed the frequency response to 20kHz. It was also claimed that noise was lowered by 3dB due to higher computation



***the Network Walkman – not even Sony Corporation could resist online music downloading; this Memory Stick player is a middling attempt...***

accuracy. Initially launched in players such as the high end MDS-JA50ES, the technology eventually filtered down to the humble, and best selling, MDS-JE520 of late 1998.

The next big development in MD came in mid-2001 with the introduction of Net-MD. Launched towards the very end of the year, the portable MZ-N1 was the first recorder to use the new technology. As the name suggested, Net-MD allowed direct music transfer from PC to MD via a USB link. The main advantage was a fast transfer rate, of up to 64x when recording onto LP4. Obviously, by this time MP3 was really starting to catch on, so it was no coincidence that Sony chose to make MiniDisc computer compatible.



***Sony MDS-PC3 arrived 1999, giving extensive computer connectivity; very useful for all that laborious titling!***

Around the same time, they also took another look at the ATRAC system and came up with the Type-R version. Rather like the high performance Hondas that share its name, the Type-R was the most highly specified ATRAC to date. Essentially, a high performance Digital Signal Processor (DSP) made better use of redundant disc space, by making better use of available bits.

The aim was to improve high frequency performance and, with recorders such as the Sony MDS-JB940, it clearly worked. This machine has become something of a stalwart, and is arguably the best ever full size MiniDisc recorder in terms of the price/performance equation.

Bringing us bang up to date are Hi-MD and the ATRAC3plus systems. Launched as recently as January 2004, Hi-MD is the most sophisticated version of MD yet and, many would argue, what the format should have been from the off. With Apple's recently launched iPod Shuffle, however, it looks like a case of Sony being just too late. Nevertheless, there's plenty for the MD aficionado to be excited about with the Hi-MD.

Firstly, the new ATRAC3plus codec analyses longer periods of audio signals, and also enhances data allocation. The result is a compression potential of one-twentieth. To coincide with this, Sony reformatted existing MD to offer double the capacity – 305MB per disc. The biggest news, however, was the launch of a 1GB blank disc that, when recorded on at 48kbps, was claimed to be able to hold 45 albums on a single disc. Perhaps the best news of all for the audiophile was the ability, for the first time, to be able to record uncompressed PCM. Finally, using a 1GB disc, one could now record an album (up to 1 hour 34 mins) on a single disc, with no compression. As you'd expect, the results are sonically excellent, and represent the very pinnacle of what MD can achieve. If only it had happened a little sooner...

## CONCLUSION

You only need to take a look at the dedicated websites to see just how loyal MiniDisc devotees are. Yet devotion alone won't be enough for MiniDisc to eventually become

an unrealistic commercial venture for Sony. As has already been reported, Sharp has dropped its range of portable players in the UK, and it can only be a matter of time before others follow. Yet, lack of fashion status has only ever meant good news in the second-hand market place, and so for anyone investing in the format, now is an excellent time to do so.

## MD SOUND

Interestingly, with its highish bitrate of 292kbps, MD should be capable of at least half-decent sound, but early machines such as the very first 1992 MZ-1 portable were awful. Mechanical, cold, dull and lifeless, this was digital at its worst. Only when ATRAC 3.5 arrived did things start getting good, but even 1996's MDS-JA5ES high end hi-fi recorder was a tad 'frigid' and processed sounding compared to the 1997 MDS-JE500 at one third of the price, as this was when ATRAC 4 hit the market. Suddenly, we had a smooth, sweet and tuneful digital source which could actually sound more benign than cheap CD, thanks to a slightly fulsome bass (due to rolled off treble) and big, fluffy, expansive midband. It was Sony's MDS-JA55ES in

1999 that showed how good the format could be; magically musical and with a gratifyingly expansive and sweet sound. Still 292kbps, but these bits weren't being lost in translation! Compared to similar bitrate MP3, MD struggles gracefully – assuming a top notch MP3 codec is used (i.e. Fraunhofer), as this has its DNA in Philips' PASC (Passive Adaptive Sub Coding) developed for DCC, which always sounded substantially better than MD, generation for generation. Better still is AAC at 320kbps, but it's taken ten plus years and no less than Apple Computers to finesse the hardware (iPod) for MD to be kicked into the weeds as a portable music medium. Hi-MD sounds great of course (when uncompressed), but it's too little, too late – if Sony had got it to us five years earlier, it might (just might) have been a different story...

*by the late nineties, Sony was bundling full MD capability into its home-market VAIO multimedia PCs*



## BUYING

Machines fall into two categories: portables and hi-fi separates. Every manufacturer has their own nomenclature but with Sony, the product numbers decode as follows: MDS implies a separates recorder. MZ-E is for a playback only portable, MZ-R a conventional portable recorder and MZ-N a portable Net-MD recorder. There are many designs to choose from, but the following is my pick of the best.



First of course is the MDS-JE500-series, Sony's best selling and most ubiquitous. Personally, I'd avoid the '500 and '510, and begin by looking at the 520 for as little as £40. A good number will have been used as semi-professional workhouses and tough as they are, they do die when hammered. The cost of a fitted, replacement laser is often more than the machine is worth, so if you have any doubts, look elsewhere. Even the very best, most immaculate MDS-JE540 shouldn't cost any more than £100. Those more serious about the format, then you'd probably be drawn towards Sony's QS-series. This was the affordable audiophile range and, in time, almost challenged CDR in the sonics stakes. Every model from the MDS-JB920 is excellent but, these days, the prices have taken such a battering that its well worth seeking out a newer '930, '940 or

even the latest '980 model. Bearing in mind that a certain famous online store is offering brand new MD-JB980s for just over £200, then a second-hand price of over £150 is surely unsustainable for any 900-series recorder. That having been said, there are those who reckon the older '940 model outperforms the latest '980. I'd say the differences are negligible, and certainly not worth paying a premium for. As with most Sony products, the ES range offers the usual small improvements in sound quality with large improvements in finish and build integrity. If you're a MiniDisc addict then you probably won't settle for anything less than an MDS-JA333ES or '555ES. Both use the excellent Type-R DSP and R-Core transformers. Second-hand you can expect to pay between £200-£300 for either model. Be wary of the midi sized Sony units as they often used older ATRAC systems from their full size brethren of the time.

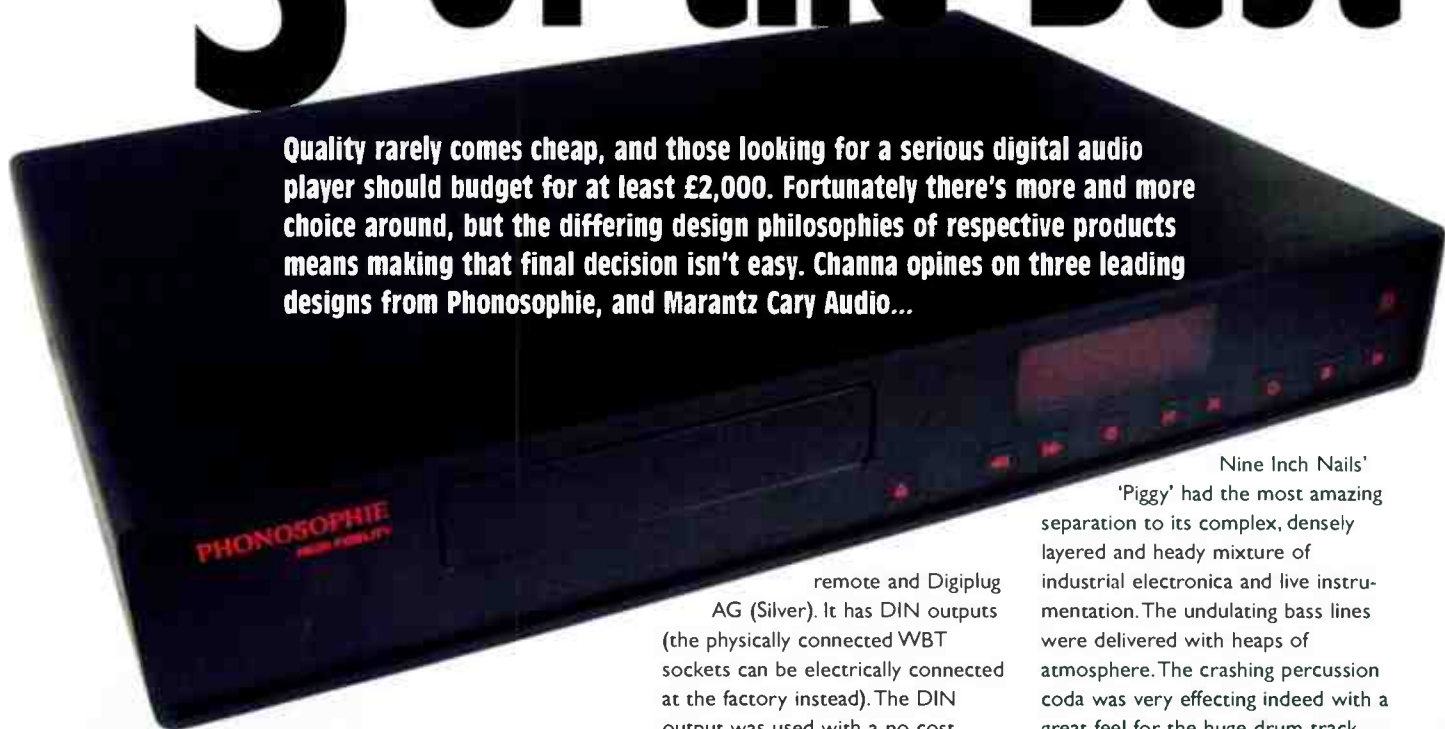
Away from Sony, at the budget end of the market, Yamaha's MDX595/596 made a smoother sounding alternative to Sony's 500-series. The build quality is also a little more solid. After a slow start, some of the later Pioneer decks were rather good, too. Like the Yamahas, the Pioneer MD-D508 offers a richer sound, with more warmth than the equivalent Sony. Moving up to the midrange, and Kenwood's, 1999, DMF-9020 is worth seeking out. This £500 recorder used the ATRAC 4.5 system and was considered to be a class leader in its day. Six years later, these decks rarely come up sale second-hand, but when they do, the relative obscurity sees them sell for as little as £100. Best of the rest is probably Denon's DMD-1000, a big, chunky and smooth (if dull) sounding unit.



Regarding portables, it really is a case of age and condition – the newer and cleaner the better. The best new model is undoubtedly the MZNH1 although, as it's only been about for less than a year, second-hand prices are still holding up. Still, it is possible to pick one up for around half its new price of £300. Even brand new, companies are advertising the first Hi-MD recorder for less than £230. Otherwise, if you need Net-MD then look for an MZ-N recorder, if not then any Sony from their 900-series or Sharp from their 800-series will make a good bet. If it's a classic portable you want, a Sony MZ-R55 from 1998 is about as good as they get, with a strong, full and vibrant sound. As with any portable, condition is key, and be very wary of any recorder with a dented or cracked case – the chances are that it will have been dropped, and repair will, likely as not, be uneconomical. Add a decent pair of headphones (like Sennheiser's MX550) and you'll have a sound quality comfortably ahead of most portable jukeboxes using the MP3 codec.

# 3 of the Best

Quality rarely comes cheap, and those looking for a serious digital audio player should budget for at least £2,000. Fortunately there's more and more choice around, but the differing design philosophies of respective products means making that final decision isn't easy. Channa opines on three leading designs from Phonosophie, and Marantz Cary Audio...



## PHONOSOPHIE IMPULS 1 £2,675

Phonosophie is a German company that has been operating since 1985. They hand make everything and produce complete systems, including turntables, tonearms, amplifiers, speakers and the Impuls range of CD players. The Impuls 1 can be upgraded to 1.5, 2 and 3 specification. They all share the same Phillips 12.3 transport mechanism and 1bit NPC SM5872 DAC. The £3,675 Impuls 1.5, £4,875 Impuls 2 and £12,725 have better circuitry, power supplies, transport modifications and Phonosophie's own analogue filter. All Phonosophies use hand-wound transformers made especially by Toroid (Sweden). Silhouetted, the Impuls 1 resembles the previous 'olive' Naim 3 series. There is the attractive wrap-around curved and low-slung stance, aluminium cover and plastic face-panel framed within. However there are differences, the 4mm charcoal aluminium casework is made in Germany for Phonosophie and is a highly polished with a very fine across-ways grain giving a refined feel. Dimensions are 447x 70x 340mm, weight 7kg.

The Impuls 1 comes supplied as standard with PK2 DB55 DIN interconnect (£125), Powercord CU (copper plated contacts) (£120), FBI

remote and Digiplug AG (Silver). It has DIN outputs (the physically connected WBT sockets can be electrically connected at the factory instead). The DIN output was used with a no-cost option PK2 DB52 DIN-BNC lead which requires BNC to Phono adapters at £8.90 each for non DIN/BNC amplifiers. BNC-Phono adapters according to Phonosophie provide matched 50 Ohms to the BNC from the DIN while a direct DIN to Phono lead is unmatched. Also on the rear panel are IEC mains input with switch, switchable int/ext DIN power supply connection and phono sockets for system remote. The Impuls 1 is designed to be left on, has adjustable display (in sleep mode for best sound) and logo (attuned through a 'secret' button behind). There is a digital volume control via the remote.

### SOUND QUALITY

The Phonosophie lent a wonderful expansive quality to Joe Jackson's 'Steppin' Out'. It was structured and rhythmical, with the piano sub-melody especially good, as it is so important to the whole piece and when properly done - as it was here, it surges gorgeously within the composition revealing "Steppin' Out" ecstatically. Bass was deep and tuneful and the vocals were very well executed with Jackson's voice, minimising the sometimes edgy tonalities but not the brilliant phrasing of the lyrics. However, there was just the slightest discernable mid-forwardness to vocals but this did not deter the enjoyment.

Nine Inch Nails' 'Piggy' had the most amazing separation to its complex, densely layered and heady mixture of industrial electronica and live instrumentation. The undulating bass lines were delivered with heaps of atmosphere. The crashing percussion coda was very effecting indeed with a great feel for the huge drum-track and accompanying decaying notes. 'You Don't Know Me' by Ray Charles and Diana Krall was plush yet emotional and highly resolved. There was extended, expansive sound all round with Ray's vocals providing deep in-room emotional resonance, while Diana's were arresting. Strings had the requisite lush embalming quality of this genre yet they were respectfully placed into the whole mix, neither lost nor dominant. 'Largo' from the 'Handel Recorder Sonatas' had body and delicacy in equal measure and though simple it was benignly addictive, gluing me to my seat. The String and Vocal mix of 'Joga' had profoundly placed strings, creating large orchestral swathes. Bjork's vocals were stunningly allowed to breathe, naked, alongside the orchestration. Her singing was beautiful with tangible expression and self-assuredness.

## CARY AUDIO 300/303 £2,225

US firm Cary is best known for its high-end valve amplifiers. The 300/303 CD player is in a new range of CD/DVD and SACD players. It has a nicely finished anodised aluminium front plate; black epoxy coated steel chassis and anodised adjustable cone feet. There is a top mounted bubble-level. The 300/303 comes in either a black or silver anodised front plate



plus matching drawer cover. The top cover has two sets of heat vents and the right one is removable enabling the easy change-over/upgrade of the two 12AU7/ECC82 valves. The Cary uses a triple beam CD/DVD ROM transport, C-Core transformer, two Burr Brown PCM1792U DACs, 3rd Order Bessel Analogue filter and a Cary DSP-300 digital filter with HDCD capability. Cary state, "by the time the data is passed on to the DACs or digital output, the jitter is incredibly low – in fact the CD 300/300 has the lowest jitter we have ever measured on a CD player around 90 picoseconds, with the jitter spectrum held below 0.1Hz!"

There are physically separated motherboard and DSP boards which have independent power supplies to computer, decoder, FIFO buffers, DSP upsampling, DACs and digital output. The PC boards employ 6-layer technology for the lowest possible noise, jitter and to ensure optimum grounding. The 300/303 is complex. The standard 16bit 44.1kHz CD signal is first expanded to 24 bits and then up-sampled to 96,192,384,512 and 768kHz respectively through a front panel button. This upsampling is said to be done in one of three 190 Millionths of Instructions Per Second (MIPS) processors operating with 48-bit precision. Cary claims that this is true DSP upsampling, unlike anything else available in the marketplace! You can further select tube or solid state output through a button on the left hand side of the front plate. Both the solid state and tube sections can transmit three digital outputs via optical, coaxial and AES/EBU sockets. The digital output itself is run at a sample rate of 44.1kHz and this can be upsampled to either 96kHz or 192kHz.

The 300/303's variable analogue volume control (0dB to 63dB), changeable display brightness and the DSP/Tube adjustability are all accessed with the remote. The remaining front panel buttons operate power stand-by, open/close, play, stop, prev, next and there is an HDCD indicator. Dimensions are 450x390x130mm, weight 20kg.

**SOUND QUALITY**

I preferred the Cary without the tube stage or any selectable upsampling invoked. I found that these additional facilities impinged on the sound as a whole creating a softer more lush sound in some respects but also dislocating the impressive musical performance of the Cary as standard, especially in terms of its superlative timing. The

Cary demonstrated its innate timing ability with superb velocity through all the recordings used. It made 'Steppin' Out' sound awesome, the piano sub-melody was handled superbly and the whole piece was suitably fluid with respectable bass dexterity.

There was a slight treble emphasis though that continued with 'Piggy' which had excellent timing, making for a thrilling if slightly thinner musical vista. 'You Don't Know Me' had an expansive sound with plenty of 'air' compared to the other players which was the same story with Bjork's 'Joga'. However where the Cary really excelled was with 'Largo' - it was wonderful, well balanced actually, entirely neutral and therefore thoroughly enjoyable. There was no discernable treble emphasis from Pamela Thorby's recorder either. A brilliantly propulsive player then, with an ever so slightly sharp top end, which can be ameliorated with the tube output, at the expense of a little definition. Some will find the Cary the best here, but it's still not the best all rounder.

**MARANTZ SA-11S1 £1,999.99**

An exquisitely hewn two-channel SACD/CD player. It is cunningly designed, softening its considerable bulk by using complimentary textured aluminium extrusions. The front panel features two gorgeous side extrusions in a solid, satin-matt silver finish while the central drawer and display area is capped by a C-section brushed aluminium front plate. The drawer itself is similar to plastic one from the Marantz DV8400 universal player, though the blue illumination this time emanates from both sides. Overall finish is first-rate, but the top-plate was disappointing though, as it was noticeably thin in comparison to the other panels and was resonant. At the copper-plated rear are balanced and phono sockets alongside optical and electrical digital outputs, and a well-made if not especially ergonomic RC-11SAS1 silver

remote is included. Dimensions are 440x123x418mm, weight 14kg.

Internally the chassis is copper plated, there's a 'Super Ring' transformer, current feedback HDAMs are employed in the output buffer stage and the transport is Sony (FGSA11) - but Marantz have tuned it to have better 'planting', equipment damping and a disc stabiliser. Two NPC SM5866 DACs per channel are employed for optimal channel crosstalk prevention and the best possible output level linearity. The NPC was also chosen for its acceptance of different filter modes for the SA-11S1. These filter modes along with DC-filter and Noise-Shaper adds complexity and adaptability to suit different recordings. There are three filter modes for CD and SACD. For CD there is FIL1, FIL2 - a Marantz LMF type which was used in their legendary CD7 (for the SA-11S1 it is modified to 8x oversampling) and FIL3 - which copies the SAA722PB coefficient that Marantz adopted in the past with the CD94, CD95, CD95SE and others as a referential digital filter for audio CD. For SACD, FIL2 and 3 reduce bandwidth for certain amplifiers unable to handle SACD while FIL1 is direct without filter for full bandwidth. The DC filter

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**MEASURED PERFORMANCE**

<p>With a smooth pass band response characterised by a little high frequency roll off, our impulse response analysis shows, the Phonosophie CD player is conventional enough in response terms, it's upper -1dB limit measuring a normal 20.8kHz. Looking well damped, this player will sound smooth enough in basic tonal balance.</p> <p>Linearity was good at high levels but, by modern standards poor at -60dB, distortion measuring 0.58%, a sea of quantisation noise showing on the analyser, stretching to 20kHz. This resulted in a poor EIAJ dynamic range figure of 105dB. Luckily, the player was in line with market expectations below -60dB, with 10% distortion at -80dB being normal enough, sinking to 2% with dither.</p> <p>Output level was normal enough at 2.3V and jitter well suppressed at around 150pS from programme related products, a good performance, although common enough now.</p> <p>The Phonosophie could usefully have been more linear at -60dB, otherwise it measures normally enough.</p> <p><b>NK</b></p>	<table border="0"> <tr> <td>-80 dithered</td> <td style="text-align: right;">2.0%</td> </tr> <tr> <td><b>Separation</b></td> <td></td> </tr> <tr> <td>1kHz</td> <td style="text-align: right;">137dB</td> </tr> <tr> <td>20kHz</td> <td style="text-align: right;">124dB</td> </tr> <tr> <td>Noise (IEC A)</td> <td style="text-align: right;">-98dB</td> </tr> <tr> <td>Dynamic range</td> <td style="text-align: right;">105dB</td> </tr> <tr> <td>Output</td> <td style="text-align: right;">2.3V</td> </tr> </table>	-80 dithered	2.0%	<b>Separation</b>		1kHz	137dB	20kHz	124dB	Noise (IEC A)	-98dB	Dynamic range	105dB	Output	2.3V
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Output	2.3V														

**Frequency response**

**Distortion**

<p><b>Frequency response</b> 4Hz - 20.8Hz</p> <p><b>Distortion</b></p> <p>-6dB 0.0008%</p> <p>-60dB 0.58%</p> <p>-80 10%</p>	
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# Caspian M series Caspian M series

The **M-series**, twenty years of **pedigree** combined with **passion**,  
design **integrity**, copious hours of listening and refinement, **intelligent** application of  
**technology** and **flawless** implementation of design make the **M series**  
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CD Player / FM tuner / PRE amp / MONO amp / STEREO amp / INTEGRATED amp / PHONO amp / SPEED control

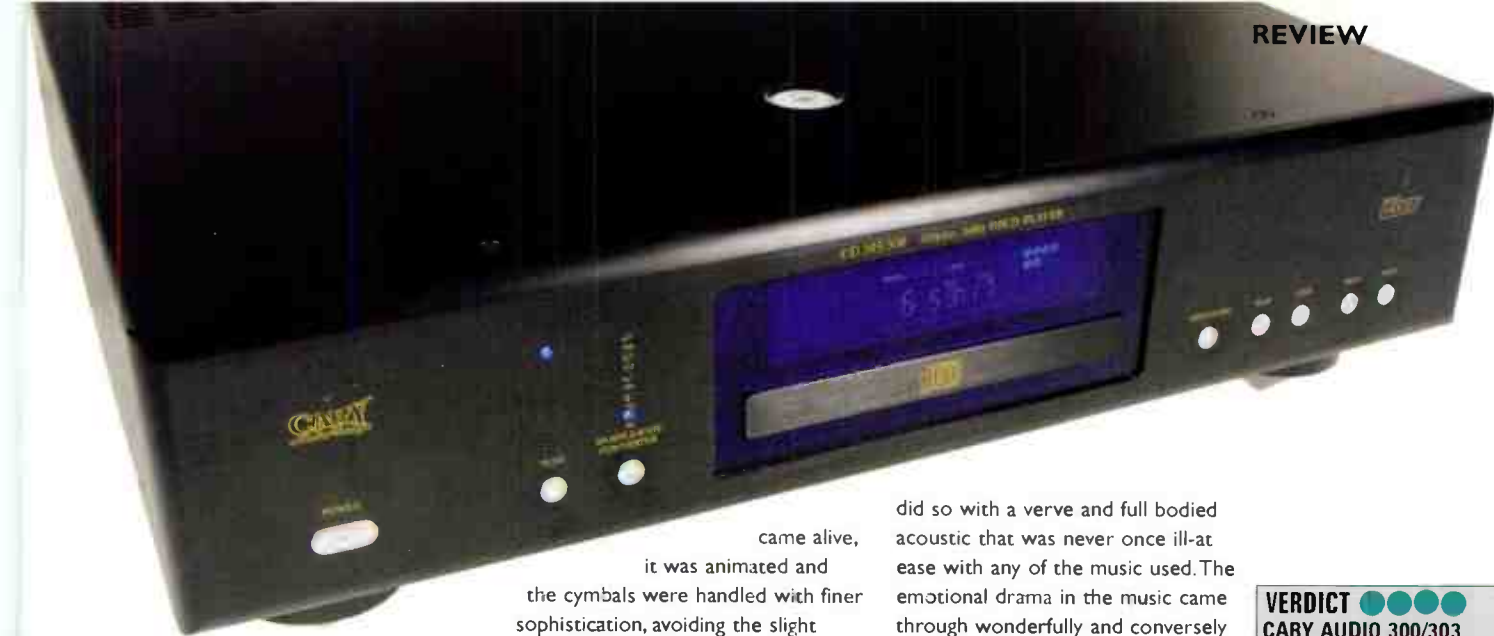
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Technology



counters the added DC level used by poor A/D converters and mastering equipment for some older CDs.

## SOUND QUALITY

On the Marantz I preferred CD at FIL3, SACD at FIL1, DC Off, Noise Shaping Off, Display Off and Digital-Out, Off. 'Steppin' Out' had a lush sound with beautifully fluid rhythm through the Marantz. It has a silken midrange, superior but similar, to the £1,200 Marantz DV8400 universal player that I enjoyed recently. Bass was not as extended as the other players, especially the Phonosophie, but the strength in LF tunefulness was there all the same. Timing on this song was good if not quite up there with the Cary or Phonosophie and with both vocals and instrumentation there was less emotional insight than the more costly Phonosophie.

Nine Inch Nails fared better with the already decent LF tunefulness (if not extension) being tightly defined. The Marantz had everything under control, good considering the complexity of 'Piggy'. Separation of instruments wasn't quite as good though as in the Phonosophie but overall I could discern a sweeter hue, especially when the drums crunched into the song's dissonant but powerfully effecting coda. Switching to the SACD layer of 'Piggy' was something else - subjectively quieter with a deeper background therefore inviting higher volumes while the tuneful bass gets utterly, convincingly, involving. There was finer insight into vocals and instruments and therefore advanced emotional feel. Treble also

came alive, it was animated and the cymbals were handled with finer sophistication, avoiding the slight stridency within the CD layer. The same conditions occurred with the Ray Charles and 'Handel Recorder Sonatas' SACD layers, where Ray and Diana's vocals became superior and the music gained eloquence and emotion. On 'Largo' the chamber organ/harpsichord had higher resolution, while there was no discernable coloration on the recorder either which was indicated on the CD layer.

## CONCLUSION

It was interesting comparing these three players with the high end Metronome CD player (see p32), because it highlighted their deficiencies in the midband and treble. Indeed it was altogether more sophisticated - understandable being almost twice the cost! The Phonosophie nearly matched the emotional delivery of instruments and vocals to the Metronome, with the Marantz just behind. The Cary however demonstrated timing parity; most impressive as the Metronome is dazzling in this regard.

The Phonosophie Impuls I gets my top recommendation in this group because it simply played CDs better than the other machines. It

did so with a verve and full bodied acoustic that was never once ill-at ease with any of the music used. The emotional drama in the music came through wonderfully and conversely so did the control it used to measure the music, it was simply stunning. I personally love the aesthetic design of the Impuls I, as it's a welcome return to the iconic industrial design of the past yet now inclusive of superb build quality, operation and finish. Casting aside the aesthetics which may not be to all tastes, it is

**VERDICT** ●●●●●  
**CARY AUDIO 300/303**

Cary Audio

☎ +44 (0)1305 257 555

www.stoneaudio.co.uk

**FOR**

- timing

- gripping performance

**AGAINST**

treble

## MEASURED PERFORMANCE

This is a complex player with fully balanced outputs from digital as well as analogue. Furthermore, Cary say the valve stage, which can be switched in and out, also feeds all outputs, so you can get a fully balanced digital signal from a valve output stage!

Cary use a pair of ECC82s (double triodes), known for being quiet, but microphonic and a little hard sounding, compared to the ECC83 (sweet but noisy). Luckily the ECC82s are well housed and, careful selection can, these days, minimise micophony. Measurement confirmed low noise: switching in the valve stage caused hiss (IEC A weighted) to rise from -110dB to -99dB - still a very low value for a valve. There was some I.f. thermal noise, as usual with valves, but it was minimal.

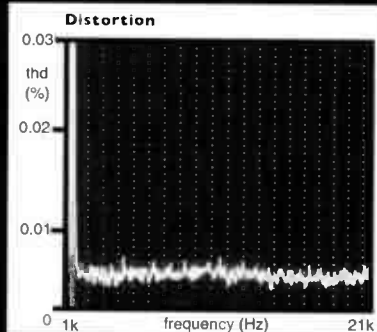
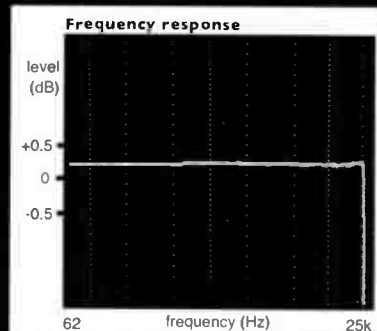
The Cary player produced class leading distortion figures, confirming Cary's claim to use super linear converters. Dynamic range measured a high 111.4dB. Frequency response was flat, our analysis shows, and switching in the valve stage changed this little. It also affected the distortion figures little, at -60dB degrading from 0.31% to 0.33% - minimal. And the contribution was innocuous second harmonic only. Switching in sample rate conversion didn't change in-band linearity or response behaviour.

Cary claim ultra-low jitter, but although low across the audio band and with no programme related products, a small lift toward 10kHz that reached around 150pS is satisfactory but unexceptional nowadays. All the same, it's a low jitter player.

The CD303/300 is very well

engineered and should offer some fascinating results. Cary have thrown the kitchen sink at CD here. NK

Frequency response	4Hz - 21.3Hz
Distortion	
-6dB	0.005%
-60dB	0.31%
-80	9.5%
-80 dithered	1.8%
Separation	
1kHz	124dB
20kHz	109dB
Noise (IEC A)	-110dB
Dynamic range	111.4dB
Output	3.2 V



## MUSIC

Joe Jackson 'Night And Day' (CD, 1982)

Nine Inch Nails 'The Downward Spira' (Hybrid SACD, 1994/2005)

Bjork 'Joga' (CD, 1997)

Ray Charles 'Genius Loves Company' (Hybrid SACD 2004)

Pamela Thorpy/Richard Egarr 'Handel Recorder Sonatas' (Hybrid SACD, 2004)



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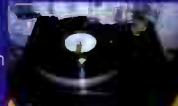
**Michell Tecnoarm A** This beautifully crafted Rega based tonearm features a bead blasted and perforated arm tube, easily adjustable VTA and monolithic litz pure silver wiring. Incredible resolution for the price: £420.

**Audion Silver Night MKII** A superb range of single ended 300B zero feedback amplifiers starting from just £2,250 for a power amp or £2,500 for the line level integrated version. Awesome 18W parallel single ended mono-blocks also available from £3,495. Excellent Premier MM valve phono stage also available: £650.



**Music first Audio TVC pre amplifier** Instead of using resistors to control the volume the TVC uses stepped transformers. Incredible transparency without any of the dynamic compression found in conventional passive preamplifiers. Copper wired version: £1,500. All silver wired: £2,700.

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also upgradeable to the highest player in the range as well as a good practical proposition because it is so svelte and low-slung, unlike the other two much larger and bulkier players. It is more expensive than both the Marantz and Cary, yet in the long term for those with extensive CD collections it represents better value through its upgradeability as well as inherently superior sound quality. This is a player that appeals to both the head and the heart

The Marantz is interesting because it is the complete opposite of the £2,000 Consonance Reference SACD 2.0 player I reviewed recently. The Consonance was simple to use and operate but marred by poor finish, exceptional with CD and very good with SACD. The Marantz is

beautifully finished yet complex to operate, it is a very good CD player but simply stunning with SACD! If you are a fan of SACDs this is the player for you. In SACD mode (FIL1) it has a fire in its belly, with superb dynamics and really tangible emotional delivery to both instruments and vocals. It is superbly crafted and many will prefer its balanced aesthetics to the others here. In this review context it represents fine value for money – and it is without the very best all rounder [without a doubt! – Ed.].

I loved the Cary's timing ability and it was absolutely brilliant in that regard. All the music was handled with a dynamism and velocity which was most refreshing. I did feel that the various upsampling and tube settings rather detracted from an otherwise well sorted (standard-setting) sound. Beyond immediacy it also exhibited a treble emphasis which gave more 'air' to some recordings but was occasionally strident in others. However you can tweak and upgrade the 300/303 from its standard supplied tubes with alternatives through the easy to open top

panel hatch, which is a nice touch. The 300/303 is no beauty, and aesthetically it is miles behind the lower-cost Marantz or the iconic slim-line styling of the Phonosophie. It is well made and finished though, and characterful in a way that will enchant many.

**VERDICT** ●●●●● £  
**MARANTZ SA-11 S1**  
 Marantz  
 ☎ +44 (0) 1753 680 868  
 www.marantz.co.uk

**FOR**  
 - wonderfully beguiling SACD  
 - fantastic value  
 - build, finish, operation

**AGAINST**  
 - CD less involving

**REFERENCE SYSTEM**

- Metronome Technologie CD3 Signature CD Player (£4,795)
- The Chord Co. Chameleon 2 Silver Plus Interconnect (£120)
- Exposure XXII / XXVIII Amplification (£2,798)
- Waterfall Victoria 'TWN' Speakers (£2,000)

**THE EDITOR SAYS:**

This comparison illustrates how hi-fi hacks can't just glibly label one machine 'the winner' and have done with it. All three machines have real and strong merit, but a very different combination of strengths and weaknesses. The Phonosophie is obviously the only CD spinner, so it's no surprise that it triumphs with ye olde digital disc. It shows us that, even its very accomplished opposition (famous for great 16bit) can't completely maintain low res standards when forced to include hi res – an interesting point. Still, slot an SACD into the Marantz and be amazed at its stunningly fluid and beguiling sound. It sounds silky and luxurious like the very best Supex moving coil of yore, and lets music ebb and flow in a similar way too. What it doesn't do is an explosive, 'seat of the pants' performance like the Cary (in non-tube mode); this player is licensed to thrill, yet doesn't seduce like the Marantz. Your call!

**MEASURED PERFORMANCE**

CD frequency response was a little unusual, having a little mid-band plateau lift, plus top end filter ripple. I would expect a fairly forward sound, not short of detail, but possibly with some digital sheen. Distortion levels were as low as they get, always a good sign, and output on the high side at 2.45V.

The SACD section (stereo only!) was notable for its bandwidth extension, reaching 100kHz, where it was -12.6dB down, far less attenuation than usual. Unfortunately, the down side of this was very strong out-of-band noise above 20kHz; SACD looks desperately bad in this area under measurement, with supersonic noise around -40dB down. Appalling.

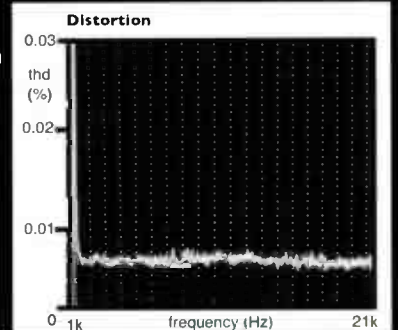
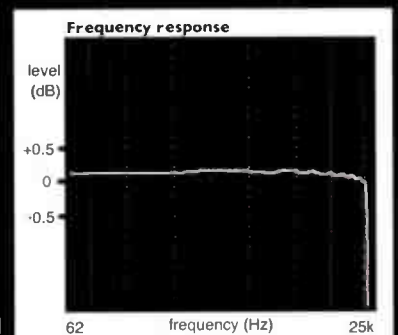
Below 20kHz though, in the audio band, the SA-11 was linear, producing 0.038% distortion at -60dB and 0.38% at -80dB. It was even resolving a signal well at -100dB, with just 2.8% distortion. Amazing.

The SA-11 measures very well, as a CD and SACD player. However, its supersonic noise output is prodigious, worse than usual, the downside of trying to engineer SACD well.

NK

<b>Frequency response (-1dB)</b>	
<b>CD</b>	4Hz - 21.1kHz
<b>SACD</b>	2Hz - 30kHz

<b>Distortion</b>	<b>CD</b>	<b>SACD</b>
-6dB	0.0004%	.0004%
-60dB	0.24%	0.038%
-80dB	4.3%	0.38%
-100dB	1.8%	2.8%
<b>Separation (1kHz)</b>	<b>125dB</b>	
<b>Noise (IEC A)</b>	<b>-105dB</b>	
<b>Dynamic range (CD)</b>	<b>111dB</b>	
<b>Output</b>	<b>2.45V</b>	





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# NET Gain?

From masters of cost-effective audio upgrades NET Audio, comes this intriguing mid-price digital to analogue convertor. John May listens in...

**T**he MicroClone consists of the DAC unit plus an out-board PSU. Considering the price I was somewhat disappointed by its looks. The DAC comes housed in a black extruded aluminium casing, the type that you can purchase from RS for around £13! The front panel is uncluttered featuring just two LEDs for indicating power on and digital signal lock. Around the back are a single gold-plated S/PDIF socket, gold-plated output phonos, and a S-VHS-type socket for the PSU. The PSU comes housed in a plastic enclosure, the type you might find packaged with a games console for example. However, never judge a book by its cover... or a PSU by its case! Inside resides a specially optimised power supply for use with the MicroClone. The DC supply is fed from the PSU to the MicroClone via PTFE insulated silver-plated wires to ensure cleanest transfer of power.

In something of an about-face to established digital design, the MicroClone is proudly described as being jitter-sensitive. Most modern designs feature upsampling re-clocking circuits in the battle to eradicate the dreaded jitter-beast, considered one of the main reasons for the chrome-plated sound which CD is often accused of possessing. These devices generally provide a consistent quality of sound regardless of the sources used. However NET Audio argue that a jitter sensitive DAC will lose performance with a poorly designed source, but will noticeably improve as your source improves, thereby allowing you to keep the DAC without the need to upgrade it. In short, it should offer the highest quality sound providing your CD transport is up to the task!

Minimalism is the key to this design. Much attention has been lavished on achieving the shortest signal paths possible. As few components as necessary are used in an effort to corrupt the delicate analogue and digital signals as little as possible. High quality parts are



employed, including Rubycon capacitors and dual AD826 opamps. In addition to these design considerations, there is – unusually – no power switch! Again this is done to keep things simple, and to encourage the DAC to be left on at all times for improved/consistent sound quality. Brief mention should be made of the output level. This is usually the standard 2v output, but in order to better match the DAC to my Ming Da pre-amp NET Audio kindly reduced output level to 1.25v.

The budget source for this review was the fantastic Pioneer DV-575A DVD player. The high-end transport was catered for by a Kenwood DP-X9010 [see p130], still highly regarded today which responds favourably to tweaking. It is a solidly-built veteran, optimised purely for CD-transport duties. It has been upgraded with NET Audio's own RockClock MK3 plus VDC power supply, ensuring the DAC is fed by an accurate low jitter signal to perform at its best. NET Audio suggest that for best performance the MicroClone should be positioned as close as possible to the transport, in order that one can use the shortest digital interconnect possible.

## SOUND QUALITY

NET Audio recommend turning down the volume on your amplifier for twenty seconds before doing any listening. If you don't you'll be

greeted with a sound akin to dry sand slithering about for a few seconds! A muting relay was considered to prevent this, but was discarded on the grounds of reducing the sound quality. The Pioneer DV-575A was connected to the DAC via a short length of solid-core shielded silver wire terminated in bullet plugs. Cabling elsewhere was a mixture of Van Den Hul and Audioquest, with CAT5 enhanced cable for the Mission M72 speakers. Both sources were placed upon an SRM/Tech Sound Stage platform atop a Sound Organisation rack.

Starting with Bowie's 'Somebody Up There Likes Me' from his classic Young Americans album I was immediately taken by an unusually full and organic bass line. The Pioneer is already pretty good in this regard using its own internal converters – if a little over-blown – but the MicroClone took this a step forward. The piano really stole my attention – I've rarely heard such weight conveyed from red-book CD with this instrument. The decay of the notes was highly impressive – something I haven't really noticed on this recording until now. I was also impressed with the way this DAC handled Bowie's voice. It was very natural, devoid of grain or any hint of

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quality via this pairing was of an altogether higher standard. It was more powerful, controlled and less 'one note' in nature. Treble detailing on 'One Way To Go' was more intricate and you could follow the hi-hats without difficulty. Instruments were cleanly delineated from one another, where before they had merged together somewhat. 'Moon Mist'

Audio's tweaked Kenwood transport this elder DAC sounded surprisingly good. The sense of refinement and of space that the MicroClone displayed were missing, and it was clear that the performance lacked the sophistication of the NET Audio design, but music was simply more fun to listen to.

I found reviewing this DAC a somewhat frustrating experience, as in some ways it offers the finest sound from digital I've yet laid ears on. It is clear that NET Audio have a potential success on their hands here. Sadly however no amount of system tweaking on my part could disguise the fact that there was something holding back the true potential of this design, preventing the music from truly breaking free of the speakers and creating a barrier between the listener and the music. Eventually, its measured performance provided the reason (see below).

Given the asking price of this DAC I'm afraid I find it hard to whole-heartedly recommend this design in its present form. However with some judicious tweaking of components and perhaps an improved standard of casing (particularly with regards to the PSU) NET Audio could well have something special on their hands in MkII guise. Definitely a design to keep an eye on for the future, so watch this space...

**VERDICT** ●●●  
 Outstanding resolution and exceptionally life-like sound are tempered by closed-in quality. Great potential, but not there yet

**NET AUDIO MICROCLONE £700**  
 Net Audio  
 ☎ +44 (0)1487 814 657  
 www.net-audio.co.uk

**FOR**  
 - top timing  
 - very organic nature

**AGAINST**  
 - price  
 - looks  
 - veiled sound

sibilance. I became aware of how far from the microphone he was standing, such was the MicroClone's resolution of space and ambience clues.

Next on was The Verve's 'One Way To Go'. This track is effective at sorting out the uninvolved DAC's from the involving ones. This track came across as sounding rather diffuse and muddy. The bass was also rather one-note and overblown. The following track, 'Man Called Sun', displayed the same pitfalls. However it also displayed an eerily spooky recreation of the cymbal work in this recording. They were rendered glass-clear, and decayed with a satisfying sense of realism into the acoustics of the venue, rather than hissing off into the distance without a trace on less capable digital equipment.

Moving onto an easy listening classic, 'Moon Mist' by The Out-Islanders from the fantastic Mondo Exotica CD, the same strengths and foibles were again in evidence. There was that uncanny sense of space, of the acoustic in which the musicians were playing. Instruments were possessed of a genuine sense of solidity and presence. Timing of the music was also top-drawer, feeling neither rushed nor too loose – just like being at present at a live performance. However that feeling of the music being 'sat upon' was still there. Experimenting with different digital interconnects failed to improve matters.

To see if NET Audio's claim of the DAC sounding better as the CD transport improves in quality, the Kenwood DP-X9010 was installed in place of the Pioneer. Would this pairing of transport and DAC banish the somewhat diffuse sound of the MicroClone, and open things up a tad? The two were left playing a CD on repeat for a couple of days in a further attempt to give the MicroClone time to fully bed-in...

It was apparent that the bass

was possessed of a more compelling sense of timing and had a tad more sparkle to the sound than with the Pioneer as a transport. The sense of acoustic was again very much to the fore – closing one's eyes really did give you an insight into a groups of musicians playing within a real environment. Saxophone sounded extremely life-like, you could hear how the instrument was being played, almost hear the angle at which the musician was holding the saxophone in relation to the microphone. This kind of insight into a recording doesn't come cheap, and the MicroClone almost justified its high price here.

In an effort to open up the sound, a passive preamp was tried. This is a pre-production shunt design from NET Audio, featuring a 10k stepped attenuator in an aluminium enclosure, and high quality silver wire connected to the input/output sockets. Surely this would afford the MicroClone a chance to really strut its stuff? I'm afraid to say it only served to highlight this feeling of the music being speaker-bound, unable to really blossom into the room and allow you to get into the 'vibe' of the piece. There was nothing obviously wrong with the sound, but the performance lacked any sense of involvement, bite or sparkle.

Changing to a vintage DAC from DPA Digital – the PDM One series 2 – restored the sparkle and life to music. Indeed working in tandem with NET

**MEASURED PERFORMANCE**

The NET Dac was linear enough over its entire dynamic range, returning low distortion figures from 0dB down to -80dB, especially with dithered signals where there was less distortion than usual.

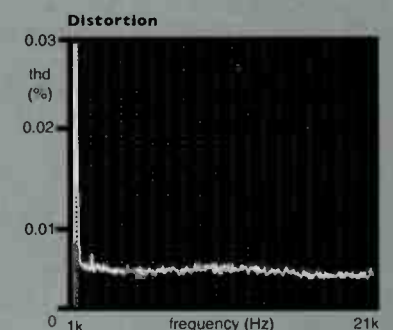
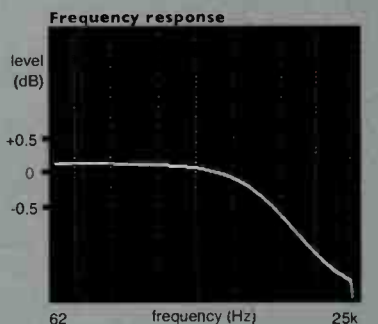
Unfortunately, the review sample had a frequency response that reached just 1.8kHz (-1dB) before rolling down, attenuating high frequencies strongly, our analysis shows. This will give the unit an obviously warm, soft sound, most noticeable with inherently bright discs possessing lots of treble energy.

Output was a low 1V, but apparently the review DAC had been set like this for other reasons.

Looks like this DAC needs a minor tweak to get response right, then it should perform nicely. NK

Frequency response	2Hz - 1.8kHz
Distortion	
-6dB	0.0009%
-60dB	0.2%
-80	2.6%
-80 dithered	1.9%
Separation	
1kHz	102dB
20kHz	91dB

Noise (IEC A)	-98dB
Dynamic range	112dB
Output	2.2V



# On TACT

From a value for money standpoint, Tact Audio's SDA 2175 'semi-digital' power amplifier is remarkable. Thanks to arguably the best implementation of Class D to date, it offers stunning – and unique – sound per pound. Over the next seven pages Noel Keywood auditions it, measures it and details the technology in depth...

**M**y brush with digital amplifiers has, to date, only served to strengthen an inbuilt scepticism about so much that's digital. It was a Sharp digital amp I seem to recall, from which the distortion and switching products streamed in gush of electromagnetic transmission. It barely knew whether it was an amplifier or a transmitter and there was no redemption to be had in sound quality, which sounded like shattering glass. So the Tact SDA-2175 I'm reviewing here went onto the test bench with no great enthusiasm. But as the measurements stacked up, my interest picked up, until at the end I was eager to hear just what this unusual beast could possibly sound like. It was both fascinating and impressive: the SDA-2175 is a fine hi-fi power amplifier, whichever way you look at it.

Semi-digital doesn't sound very promising - a bit of a half-breed perhaps? Tact are Danish and perhaps their use of the description "semi-digital", implying that this amp is half-digital is a little misleading, for which they can be forgiven. I would have called it a composite amplifier, because in principal it's a full blown, no holds barred digital amplifier in that it has a Pulse Width Modulation output stage with output filter, a bandwidth that is load dependent as a result and, on an oscilloscope, tell tale r.f. carrier, in this case at 384kHz - Long Wave in other words.

No doubt then, this is a digital amp in the way it drives the

loudspeakers - but it gets across the promise of PWM, rather than the pain. Where the SDA-2175 isn't digital is its input stage, which is entirely conventional analogue, via twin phono sockets or, alternatively balanced XLR sockets. The idea is you get a real digital amplifier that will slot into a conventional analogue hi-fi system. The only proviso here is that with a low 2V input sensitivity you will need a preamplifier.

Why use a digital amplifier? Until this amplifier appeared I'm not sure you would want to. The primary benefit of Class D digital is high conversion efficiency; the output stage turns 95% or so of the power it consumes into audio energy. At present this excites manufacturers of portable equipment because it means longer battery life - and of course they can make the claim that their gadget is "digital", that is 'modern and better' to the average man on the street. In truth with digital amplifiers the drawbacks are so great it normally means "worse" in practice;

Tact  
AUDIO

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POWER

SDA 2175 Semi Digital Amplifier

even experienced amplifier designers have been cautious about the future of Class D in high quality applications, serving to harden my scepticism toward them.

Class D digital amplifiers produce so little heat they need little heat sinking. The SDA-2175 is a good example of just how little; it has shallow heat sinks down either side just 1cm deep, yet under test this amp swung a massive 220W into 8ohms and 360W into 4ohms - and it barely got warm! At 15.5kgs the unit is heavy, but at 450mm wide it's reasonably compact for such high power. And for this Tact are asking £775...

Looking at it from a hi-fi perspective, the claims made by Tact for this new digital power amplifier ring sympathetically in my ear. Being an arch-cynic, they would have met the usual wall of doubt had the SDA-2175 not measured so darn well, but it does and so the bull is, for once, not bull. Tact seem rather more willing than many to take on board the notion that feedback by its very nature can't be a good thing, since if an amplifier needs it then by



definition it wasn't adequate for its purpose in the first place.

It isn't easy to see how a digital amplifier has non-linearity, but the SDA-2175 conversion stages certainly do and the SDA-2175 has two sets; input analogue-to-digital convertors (from Burr Brown), a PCM-to-PWM convertor and the output PWM stage of course. Tact say they linearise the amplifier, presumably meaning these items, before applying a reasonable 30dB of feedback. They also claim there's no crossover distortion and no lessening of feedback at high frequencies, both of which I can confirm as very true. It was this that peaked my interest on the test bench; via a distortion (THD) meter there was no sign of crossover right across the audio band and spectrum analysis showed third harmonic always dominated. Very promising!

And it got better. Not only did the SDA-2175 completely avoid the sins of the standard analogue output stage, it also showed no signs of transfer function skewing with level, load or frequency changes. This means it will not change its dynamic characteristics, imposing a modulation pattern upon the distortion it produces. So this is one incredibly consistent and stable amplifier in terms of its dynamic characteristics - unusually so. Everything Tact claim I found to be true. Nowadays there are plenty of conventional power amps around

that can match the SDA-2175;

Musical Fidelity and Cyrus both produce amps that measure 0.005% distortion at 10kHz to the SDA-2175's 0.007%, so they're equal on paper, if very different under the skin.

Because of the need for output filters digital amps do change their frequency response according to loudspeaker load and this is one reason why most designs can't adequately cope with the wide range of loads presented by commercial loudspeakers. The SDA-2175 had an upper bandwidth limit of 30kHz into an 8ohm load that slid down to 20kHz into 4ohms, but this isn't much of a problem. Down at low frequencies it reaches down to a 0.3Hz limit set by input blocking capacitors; the amp is in effect direct coupled. It seems Tact use loop feedback to aid loudspeaker matching, effectively reducing output impedance, and they say the SDA-2175 is specifically unaffected by

"everything Tact claim I found to be true".

loudspeaker reactance, something that can unsettle conventional amps. Texas Instruments, who use Tact's Tocatta technology, say ideally amps like this should see an inductance (i.e. rising impedance), rather than a pure resistor, but I presume they mean well above 20kHz.

As I lugged the SDA-2175 onto the bench though, a healthy smattering of high voltage warning symbols caught my eye. At first I thought casually "no problem, it's a full balanced bridge amp with live positive and negative terminals", but

then the balanced distortion analysers started flashing warnings furiously and I thought again. Oh shoot! There's 35V d.c. on both loudspeaker lines. This isn't common by any means, but the differential between the two terminals is a normal enough 7mV or so, and the Tact switched on and off without any thumps or cone movements. Tact claim the output is fully protected so although the amp seems a little hairy scary by current standards it's not a lot different in threat level to a normal direct coupled amp which has the same potential to cause damage should anything go wrong, moderated solely by protection circuits. I did in the end short out the terminals by mistake, by connecting up a scope in the listening room, and just got a fast clicking sound; the amp worked perfectly afterward - no probs. at all.

Tact have built the SDA-2175 well. It's normal enough to look at but they've deliberately made the casing as non-magnetic as possible to avoid hysteresis distortion (and improve RF screening!), using aluminium and even a stainless steel transformer fixing bolt. This amplifier

is well thought through in all its detailing, so necessary if you are to come up with a real hi-fi product. Hi-Fi is about getting everything as right as possible; it's a craft skill as well as a science. Tact have spent some goodly time and effort on the SDA-2175 in this regard, which is reassuring.

With a fully balanced output it only makes sense to offer a fully balanced input. It seems that hi-fi is slowly moving toward this method of connection, which offers a degree of noise and interference cancellation.



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To take advantage of this you should, ideally, have a fully balanced preamp and source. Otherwise, the SDA-2175 is simple enough to connect up and use. Digital it may be, but you don't actually see that it is so. Unlike other digital amps - bizarrely so some might say - this digital amp has no digital input. It is strictly for use in an analogue system, so you can hear all the benefits digital has to offer (cough!). Well, happily Tact show that digital, done properly, can possess

dynamic here, but also smooth and svelte.

What seemingly works with Classical doesn't always suit the demands of Rock but I had no reservations here either. However, the wider band nature of Rock, its more demanding transients and its less certain nature - I mean, what does an electric guitar really sound like? - made the SDA-2175's performance here more questionable. Not to me, I have to

Tact's SDA-2175 is masterfully composed, even handed and unflappable in use. But this also means that in a demo, or at home, pyrotechnics are not on the menu. It doesn't have gargantuan bass, nor searing treble, so if you do want to hear what this digital amplifier sounds like, be prepared not to be shocked. But you are likely to be surprised; with Rock because it does a wonderful job with even the raunchiest, from Steve Earle through to Steve Winwood Tact claim their more expensive products offer much more and I imagine, not having

heard them, that there's a little extra bottom end drive and midband lucidity to be had, but as it stands the SDA-2175 lets the more sensitive of us get out from behind the settee and start enjoying music again. This is one silky sounding amplifier, stable as hell in its delivery, detailed and dynamic across the midband, and with superb imaging and staging. It's one of the few amps I've come across for some time worth a full bag of Worlds - that's five of 'em - for engineering effort and achievement, and most importantly of all - sound quality.

#### THE EDITOR SAYS

Hearing the Tact against the most musical solid-state integrated on sale - Sugden's A21SE - was fascinating. The Tact is superbly smooth, well proportioned and insightful. It has tremendous detailing, and an eerie ability to let one strand of the mix not interfere with another. Its treble is silky (like Japanese high end) and spacious, its mid-band refines the concept of 'glass clear', bass is strong and tuneful. It goes loud effortlessly, shows no sign of strain at any level and is always genteel and finessed, even when the preamp volume knob is recklessly wielded. At the price, I have heard nothing - but nothing - that approaches this blend of competencies. Only the Sugden, three times as expensive, truly exposes its weaknesses, but to be fair they're not so much failings as its 'essential character', which is 'tidiness' in the extreme. The Sugden is bouncier and more engaging, as if you're in the stalls of a new wave gig back in 1979. The Tact is more like a plum seat in the circle, watching the LSO in your best suit. The SDA2175's sound is so refined, even handed and essentially flawless that you're left wanting a touch more 'raunch', more emotional commitment. With no nasties to speak of, only those seeking a characterful sound (Naim NAIT 5x, Prima Luna Prologue One, Sugden A21a) should look elsewhere. Partner it to a good preamp and you'll have a massively powerful, neutral, open and refined pre-power that will do justice to any source and drive any speaker for under £2,500. That's really saying something. DP

"this is one silky sounding amplifier..."

benefits, but then, that is digital: easy to get wrong and wrong much of the time - just look at DAB - but pretty impressive when it's right. This applies to digital amplifiers too; most can't make it past Europe's stringent electromagnetic interference standards, as they transmit from the loudspeaker cable!

#### SOUND QUALITY

I don't have kindly feelings to solid-state amps and certainly not digital ones, so I decided to run the SDA-2175 alongside my own much beloved 300B valve amp. If this wasn't the butterfly it claimed to be, then it was about to lose its wings!

The SDA-2175 isn't an ultimate valve amp, but it is surprisingly - almost magically - calm and easy on the ear. Creamy smooth and almost silky I settled with it in an instant. No screech, no sharpness, no glassy 'clarity'. No sterility either. Not bad for a start. That marked out the SDA-2175 from most competition immediately, which these days seem to be eager to engage in sonic warfare. Violins were timbrally convincing - not rich perhaps, but lacking that hard and at times sterile sound that just won't leave modern amplifiers. There was smoothness to bowed strings that was both unusual and satisfying, without any sign of blandness, strong resolution of detail painting a convincingly realistic picture. It didn't take long to realise the SDA-2175 was masterful with classical music, an absolute first choice for anyone upset by the unhappy coupling of violin and transistor. Kettle drums sounded convincingly large and somorous, if not thunderous. There was a nice push from the brass section of the Philharmonia, and I noticed the same as massed violins of the London Symphony Orchestra reached a crescendo with Rachmaninov's Piano Concerto No.2. The amplifier has real midband shove; it's very lively and

say: I felt it was smooth, truthfully dynamic and possessed an evenness that was both unusual yet also very relaxing. But here I can see certain hi-fi expectations not being met. The Tact doesn't have tuned or inflated bass to the point where it seemingly lacks character; it does its job serenely and, I think, correctly. To me it makes other amplifiers sound coloured, but I could see a counter argument where those who value heavy Rock dynamics over all else may well find the SDA-2175 not so much 'polite', but over refined. In particular, the powerful, striding bass at the start of Tina Turner's 'Break Every Rule' didn't burst from the loudspeaker, as it can. This is a great track start, a real classic, and the SDA-2175 was a little too restrained. Keeping up the pressure I put on Steve Earle's 'Copperhead Road' and the explosive start shook the room convincingly, but there was a bit more due I feel.

Shockingly, the Tact stood comparison with my 300B valve amplifier. No they weren't the same. With few electronic components inside, all of them specials, and no feedback, the 300B has a clarity that's unmatched by solid-state, including the SDA-2175. However, the PWM amp had the temerity to suggest there was some wiriness coming from the 300B, which is quite likely. It's called distortion, of which there's quite a lot. In tonal balance and sound staging both were masterful and not dissimilar.

Faced with this, especially a smoothness I found barely credible from a solid-state amplifier, let alone a digital one, I decided to take the SDA-2175 out of the system and measure it again, just in case I had missed something obscure, like high level, high frequency compression. But it was perfect. What it offers is truthful, but it certainly isn't what we are used to and it wasn't what I had expected, based on past experience.

# Beast to Beauty...

...or how one of audio's most gruesome technologies, the digital amplifier, finally came good. We may all be listening to them tomorrow, thinks Noel Keywood!

**T**raditionally the Class D digital amplifier has, like so many things digital, sounded dreadful. So bad, so measurably and obviously bad that even the most optimistic engineers involved with them tended to speak with caution. As design engineer Doug Self notes: "in a world of tightening EMC legislation it is not at all clear that switching a 200kHz high power square

problems in one sweep, to a degree that could even see it legislated into use, rather than out of use because of any rivalry with Draitwich. I'm not talking sound quality here, but power usage and dissipation: Class D wastes little power and, in classic iteration, it draws current smoothly from the mains using a switch-mode power supply, not in pulses like most amps - something that annoys electricity providers. But let's look at the

audiophile side of things first.

Distortion within Class D amplifiers has been reduced to minuscule levels, around 0.007%. Great, but then it has in ordinary amps. With Class D though, there's no crossover distortion nor any rise in distortion at high frequencies. In practice, with an amplifier like the SDA-2175 above 6kHz or so high frequency distortion actually starts to fall, just as we'd all like -

not pattern. Conventional amplifiers produce differing patterns of distortion according to level, frequency and load and, additionally, back emfs from the loudspeaker enter the feedback loop too, further complicating matters. Their constantly varying distortion patterns are more audible than the distortion itself.

Class D avoids these problems. Granted, if you push a Class D too hard it will go bananas, but realising this, chip manufacturers incorporate massive amounts of protection circuitry and in practice this 'catches' the amplifier before harm can occur, either internally, or externally to the loudspeakers. This might sound dramatic but it is no more so than any conventional amp which equally has enormous potential to wreak havoc with your loudspeakers; these days we accept belt-and-braces protection as part of the landscape.

Frequency response is another area where Class D has seemingly been constrained by unruly behaviour of the output filter that is central to its method of operation. Again though, this has been satisfactorily overcome; some slight peaking can occur, but at +0.3dB at 20kHz or so it is small. What you have to bear in mind with Class D is that the output filter that causes all the problems is also responsible for some of its major benefits, especially the total absence of high frequency distortion of any sort. However, Class D amps at present commonly reach little past 20kHz-30kHz, so they're arguably not the best choice for high bandwidth digital like 96kHz or 192kHz sample-rate PCM. Front-end anti-alias filters will attenuate SACD supersonic noise, so there might be a better argument for compatibility here, especially since SACD is slightly more linear within the audio band than DVD, a benefit good Class D should resolve. Zetex Semiconductors told me that whilst their current working prototypes switch at around 400kHz they expect

CLASS D AUDIO

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wave is a good place to start". Not only do you get a Long Wave transmitter in your lounge, but one that distorts badly too.

All the same, in spite of these and other problems, Class D digital has such overwhelming potential benefits it has undergone sustained development over the last decade by major electronics companies like Texas Instruments, to the point where, now, it exists in cheap, readily available, off-the-shelf chip form that I suspect will overwhelm us tomorrow. The problems are largely solved, the benefits are considerable.

The good news is that Class D digital, done properly, is an audiophile dream - not the nightmare it once was. In fact, Class D solves nearly all

and quite unlike ordinary amplifiers. This is because an output filter removes all frequencies above 20kHz. Better, Class D amplifiers achieve this with less feedback than conventional amps., having an inherently more linear open loop performance. It hasn't always been so, but intensive development has brought it to this state.

The distortion pattern in a good Class D amplifier like the Tact SDA-2175 I have tested this month remains unusually stable at all output powers and frequencies, into low and high loads. In other words, no matter how hard you push an amp like this, its performance remains not just good, but consistent. There are some small changes in distortion level, but

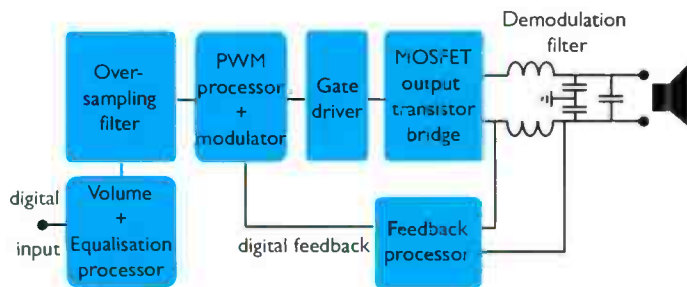
to move up to 800kHz switch frequency, giving 85kHz analogue bandwidth by 2006 so, developmentally, PWM is already on the move. Down at low frequencies a Class D amplifier can in theory reach down to d.c., but will usually be bandwidth limited to 1Hz or so, as are all amplifiers.

Class D amplifiers offer massive

power at high frequency; basically the output stage is a square wave generator feeding a low pass filter. The output stage relies on special devices and circuit blocks that have challenged the abilities of the big silicon manufacturers, but this is their territory. It is not ground hi-fi manufacturers occupy. At the front-end of a Class D amplifier you also

for the big semiconductor manufacturers, seeing a future need within Consumer Electronics, to research Class D in order to overcome its problems. At present this is a happening place CE wise and likely a subject we'll all hear much more about in the near future. Zetex felt there was no alternative to this route too; PWM is unarguably the future as far as amplifiers are concerned.

An enduring obstacle to progress with Class D is its impersonation of a radio transmitter. Switching a high power square wave at 200kHz-500kHz, meaning somewhere in the Long Wave band, and trying to ensure resultant radio frequency radiation doesn't swamp internal circuits, jam nearby radio receivers, overheat the loudspeakers or microwave the cat is something engineers have mused upon long and hard. There are treatises on all this, within which the subject of special loudspeaker cables arises - interesting, huh? In practice I notice that the commonly used PWM switch frequency of 384kHz has been neatly placed within a gap between the upper end of the Long Wave band at 280kHz and the start of



**Zetex are currently demonstrating this PWM digital amplifier, which uses both analogue and digital feedback to achieve a bandwidth that reaches 85kHz, with 0.005% distortion. Like other one-bit systems this one utilises noise shaping and has a high clock rate, in this case 108MHz...**

power from a small case. Whilst early designs have produced 30W or so, nowadays we are starting to see hundreds of watts. Although a Class D amplifier does in theory get into difficulty if either the input and output are overloaded, in practice this is dealt with by limiting and protection circuits. Massive output powers make output overload academic, except perhaps in P.A. work.

Whilst both low damping factor and high noise have been a concern in the past, both are now entirely satisfactory for hi-fi requirements.

There have been some interesting driving forces behind Class D's development. Consumer Electronics is a growing commercial force worldwide and quality audio features highly. The rise of home cinema and surround-sound has produced a demand for multi-channel amplifiers which, using conventional circuits need big heatsinks, transformers and casework. This makes indirect costs high too, namely transportation, storage and packaging. Class D can slash all these costs, by making heatsinks almost unnecessary, transformers much smaller and chassis small and light.

Then there's the rise of battery driven portables. High efficiency amplifiers prolong battery life, and in this role Class D is already taking hold as the most effective solution.

Class D amplifiers rely upon high performance FETs to switch high

need to either generate a PWM signal from an analogue input using a special modulator, or convert PCM (Pulse Code Modulation, which is what comes out of your CD player) to PWM (Pulse Width Modulation, which is what Class D is all about).

Again, this is a specialist problem, already fully dealt with by the big electronics boys. Texas, for example, in their TAS5518 eight-channel PWM processor chip for surround-sound receivers have put all the multi-channel processing you could possibly think of, including tone controls, loudness compensation, compressors onto one chip, together with PCM-PWM conversion to drive their TAS5142 100W per channel PWM output stage. It has made sense

#### CLASS CONFUSION

If you see or hear digital amplifiers described as analogue, Class I from Crown, Class T from Tripath or Class Z from Zetex, just smile politely and pay no attention. Even Zetex, responsible for the Class Z moniker, admit it is a variant of PWM, which in turn is usually thought of as quintessentially Class D, which in turn is widely regarded as meaning digital, even though it is a general category for switching amplifiers, rather than digital amplifiers. Confusion surrounds this subject. The difficulty is that no one can agree on what a digital amplifier really is. Some manufacturers have added to the confusion by adding digital stages to analogue amplifiers, to use the description digital, when to most people they are not. Tact add an analogue input to the SDA-2175, use analogue feedback and therefore modestly call it Semi-Digital. To me it looks like hardcore digital!

Or is it? PWM is something akin to Frequency Modulation. Although it samples a signal into discrete parts, they aren't accorded a digital value in terms of bits, but instead a pulse duration, or width, which is an analogue value. You may be surprised to learn that this is, effectively, a one-bit coding scheme, similar to SACD. The fantastic attraction of PWM is that it needs no Digital-to-Analogue converter as we know it, just a relatively simple analogue low pass filter comprising a few coils and capacitors that connect to the amplifier's output terminals. This turns the digital back to analogue, and it happens just before the loudspeaker, or even within the loudspeaker itself, using the inductance of a voice coil. Which is pretty neat.

PCM can be converted to PWM in the digital domain - and that's good enough for me - it's digital! But it isn't that simple. Best to smile politely and just accept that it's digital enough to be called digital, and there's no alternative that's more digital.



Medium Wave at 531 kHz. There will be images at multiples of 384kHz, but they will be weak. In any case, with voltages around 500mV across the loudspeaker, transmitted power is, these days, low at 60mW or so and

existence. Class D amplifiers draw less current from the mains and what little they do take, they take smoothly. Zetex tell me their solution makes less strenuous demands upon the PSU so the standard capacitor-

“turning from a beast to a butterfly. It may well turn out to be an audiophile dream.”

heating within the loudspeaker itself equivalently low. All the same, radiation can be reduced by the use of screened loudspeaker cables and these could well start to appear in future, especially as switch rates creep into the Medium Wave band. The issue of loudspeaker cable performance takes on extra significance with Class D.

Amplifiers must comply with stringent EMC (electromagnetic compatibility) and EMI (electromagnetic interference) rules, within Europe, Japan and Canada/U.S.A. This has been another stumbling block for Class D but one that again is being surmounted. Ironically, although in this area Class D seems politically unacceptable, in the long run it may well prove the opposite. As Europe in particular introduces ever more legislation to reduce pollution and conserve energy Class D looks such a convincing solution it could even find itself effectively legislated into

input supply will do, but I won't be telling anyone in Huntingdon about this. With E.U. legislation on mains usage impending, the digital amplifier looks set to meet all requirements, being greener than any other type of amplifier by a considerable margin. Low weight keeps shipping and storage costs down, conserving fuel and packing materials. At present the output inductors account for up to 30% of total cost, Texas Instruments say, but this would likely fall greatly as manufacturing volumes increase. In compensation Class D amplifiers need less expensive heatsinking and their mains transformers can be smaller and cheaper. Cost benefits outweigh disadvantages.

Once an interesting idea with a rotten reputation, it looks as if the Class D digital amplifier is about redeem itself, turning from a beast to a butterfly. It may well turn out to be an audiophile dream. It's certainly looking that way...

#### CLASS D - A HISTORY

In his excellent book entitled 'High Performance Audio Power Amplifiers' (1996) Ben Duncan goes into some detail about the genesis of PWM. Surprise, surprise, it seems to be a result of The Huntingdon Effect (well, Cambridge). The first commercialisation is attributed to designer Gordon Edge, working for Clive Sinclair, back in 1964. Price was £5-19s-6d in old money and power output said to be a shaky 2.5W or so. The idea pre-dates this product though, being described by Mullard of Holland in 1960 and also by Fitch in the Journal of the IEE back in 1947.

Pulse Width Modulation, however, was patented by Englishman Alec Reeves in 1937. Often quoted as the inventor of digital coding, he happened to come up with PCM at the same time. We know this as digital audio, but to Winston Churchill - one of its first users - it was the way his phone conversations were scrambled. So today's PWM amps use an idea firmly rooted in the UK, one the British have been wrestling with for a long time too, it seems.

In the 1970s Infinity Systems of the U.S. developed The Swamp amplifier, an exertion that nearly broke them, PS Audio say (see [www.psaudio.com](http://www.psaudio.com)).

After this PWM's history begins to firm up. In 1983 English engineer Brian Attwood delivered a paper to an AES Convention entitled "Design parameters important for the optimisation of very high fidelity PWM audio amplifiers", and that seems to have been the starting gun. Within a short time Harrison in the UK, and Peavey, Crown and Tripath in the USA launched amplifiers based on his ideas. Sony got in on the act with their TAN-88.

From the early 1990s onward development seems to have been slow and likely painful, until in 2000 U.S. semiconductor giant Texas Instruments bought Tocatta Technology from Tact in Denmark to get a leg onto the PWM bandwagon. Ironic, since they had been working with PCM since the early 1950s; PWM is quite different though.

If you are at all interested, read the heartening and, for me, slightly surprising audiophile views, simply but clearly stated, on PWM by Brian Attwood at [www.pwmsystems.com](http://www.pwmsystems.com). Now living in California, this Brit. clearly states PWM amps are fundamentally linear and that any proper high fidelity amplifier must be so before feedback is applied. Nice one. He also talks about Kilowatts and Megahertz, which sort of tells you where PWM is going! It's an easy, non-technical read from an early pioneer of the digital amplifier who knows more than a thing or two about what lies just around the corner in high fidelity for all of us.



# MEASURED PERFORMANCE

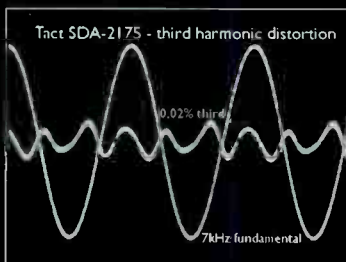
The lightning signs around the loudspeaker terminals of this amp are to be taken seriously. It's the only amp I have ever encountered where both negative and positive terminals measure 35V d.c. with respect to ground. By normal standards this is hairy scary engineering; by digital amplifier standards though it is normal enough. Protection circuits act to prevent blow up if either terminal gets shorted to ground. The d.c. differential on the output was a normal enough 7mV on one channel and 3.5mV on the other, so as far as the loudspeakers are concerned there's no problem.

Producing a massive 220W into 8ohms and 360W into 4ohms, the SDA-2175 nevertheless stayed cool under rigorous testing, even though it has shallow side mounted heat sinks of low thermal capacity and dissipation. Efficiency appears very high, in line with expectations from Class D digital. Beyond the reach of the spectrum analysers, but



measurable using an oscilloscope, lay 384kHz carrier wave at around 400mV, rather more than Tact's claimed 100mV. It looked reasonably sinusoidal, meaning higher harmonics are of considerably lower amplitude.

Unlike all digital amps I've come across to date this one wasn't riddled with hideous distortion. Quite the reverse in fact, it produced predominantly third harmonic, as our Total Harmonic Distortion (THD) analysis shows,



but little above this. The maximum measured was 0.02% with a 7kHz fundamental at full output, due to the 24kHz bandwidth restriction imposed by the low pass filter. This was impressive.

Because the low pass filter acts to suppress harmonic distortion above 7kHz, I used a two-tone CCIF

intermodulation test to assess high frequency non-linearity. With 1kHz spaced tones third-order sidebands measured -77dB below the test tones, our analysis shows. Below the summed tones (10dBV or 3V) each sideband's level measures around 0.01%, so intermodulation distortion is low too. This held right up to full output into 4ohms. I saw no extra noise in the noise floor, except with tones placed at multiples of 8kHz, which is a sub-multiple of 384kHz, so there is some slight fold down of noise, but it is small. It is certainly no worse than that of CD, when test tones are not at sub-multiples of the sampling frequency.

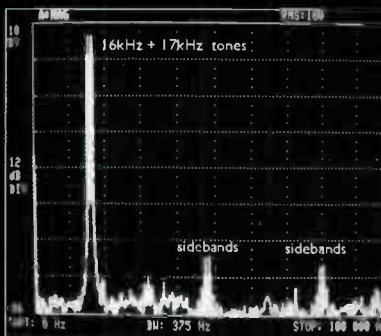
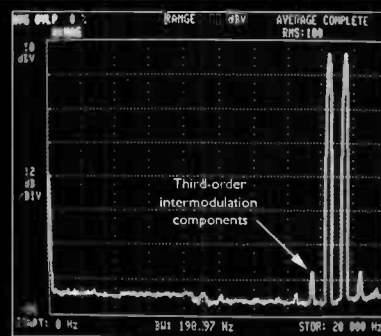
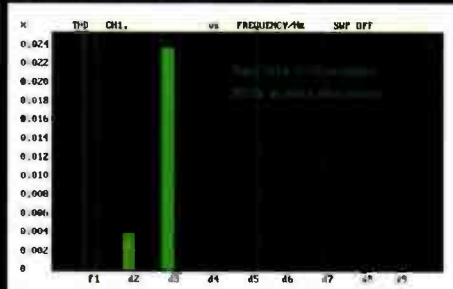
Frequency response was again unusual, running from 0.3Hz up to 30kHz (-1dB). Output lifted slightly into 8ohms, by +0.5dB, before roll off, but into 4ohms it was flat, reaching 24kHz (-1dB). Our analyses clearly show both situations. The SDA-2175's Butterworth output filter is optimised for 4ohms this measurement suggests; higher loads will give a slightly brighter sound, but the effect will be small; feedback suppresses this potential problem.

Although the amplifier didn't like being asked to deliver white noise at any power, it delivered pink noise at full power without any sign of upset. This is a pretty rigorous test and a good enough representation of real life conditions.

Finally, a spectrum analysis to 100kHz shows clusters of sidebands, as expected with PWM. Again, CD produces plenty of rubbish above 21kHz there is nothing unusual about this either. Levels here were low too. This might be a one-bit system but it doesn't suffer out-of-band noise from noise shaping, like the DSD of SACD.

With massive power and an unusually stable and likely easy going distortion characteristic the SDA 2175 should sound very smooth to say the least. NK

Power	220watts
Frequency response	1Hz-30kHz
Separation	88dB
Noise	-94dB
Distortion	0.004%
Sensitivity	2V
dc offset	7/3.5mV



**VERDICT** **£**  
Supremely smooth and well balanced in every respect, this amplifier starkly shows what other solid-state does wrong. Brilliantly engineered, it's nothing less than an epoch-making audio product.

**TACT SDA-2175 £775**  
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www.tactaudio.co.uk

# T TIME

**Sonic Impact's T-Amp is a tiny battery powered 'Class T' integrated amplifier that's causing a stir amongst online audiophiles across the world, some claiming that it's better than amps at nearly one hundred times the price! Lucio Cadeddu listens in...**

**T**he Sonic Impact T-Amp is a so-called Class T integrated amplifier, based on Tripath's TA 2024 chipset. The chip uses 'Digital Power Processing - Class D digital amplification by any other name - with high rate switching properties. You can view the official TA2024 datasheet, with detailed tech specs, power and distortion measurements at the Tripath website. In fact, the Sonic Impact T-Amp is nothing else than a pure and simple application suggested by the chipset datasheet. No magic, then...

The interesting thing for audiophiles is that Tripath makes other more powerful chipsets, used for example by BelCanto Design for their Evo2 power amplifier (\$3,200) and by Audio Research on the 150.2. Also Teac makes a three channel power amp with the very same kind of chipset. The TA2024 delivers around 6W on an 8 ohm load and 9-10W on 4 ohms. Forget the optimistic 15W claim, since this refers to the max power on 4 ohm at a 10% distortion rate! It can be powered by eight 1.5V AA batteries or via an external 1.2 amp/13V AC adapter (not supplied) available at \$20, only for the US market.

The T-Amp has just one mini-jack line input and 2 spring clip speaker posts that barely can accept real hi-fi cabling. A volume knob - that works also to switch the unit on - is the only human interface. There's no input selection, tone controls, mute

or remote. A red LED lights up when the unit's on. Build and finish are 'cheap as chips'!

## SOUND QUALITY

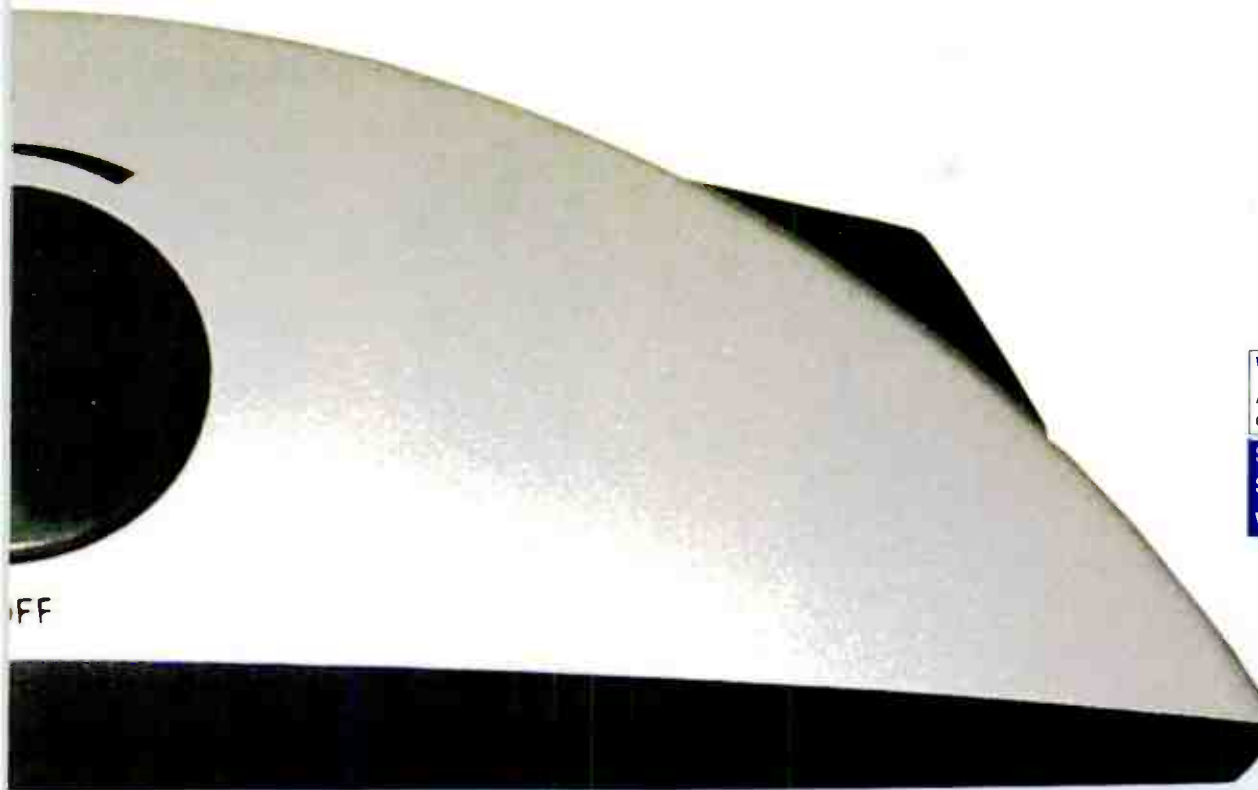
First things first: this baby delivers 6W, so low efficiency loudspeakers owners beware - if your speakers have less than 90dB sensitivity and/or your listening room is large, this amplifier is not for you. However, for an amplifier that costs little more than a double CD, this thing quite remarkable. At this price, it should deliver a multimedia-like sound and shouldn't even be considered on a hi-fi magazine, but it doesn't and is! It isn't easy to describe how a £20 amplifier performs, as it has no natural competitors - the cheapest integrated I can think of costs six times as much. But this is irrelevant, as by any standards it's a capable performer and at the price it's remarkable. In terms of tonality, dynamics, 3D imaging, transparency and detail it's real hi-fi. The tonal balance with AA batteries tends to be on the warm side. It shifts towards neutrality when powered with an external AC adapter. I've not tested it with external batteries so I can refer to stock alkaline AA batteries versus AC adapters (of various sizes). I've always found the AC adapter power supply better than (fresh and new) alkaline batteries. Thus, my listening notes refer to a T-Amp powered by an external AC adapter.

First listening suggests the

midband and treble is harsh and sterile, but this changes over time as break-in proceeds. Many suggest at least one hundred hours, and my experience concurs with this. After this period, the early harshness disappears and what you get is extreme transparency and detail in the mid and high ranges. Voices in particular appear crystalline and natural. Even tiny details, such as the sound of opening lips, are revealed effortlessly. There's a sense of presence that is simply stunning at the price.

Overall performance on voices was the first of my main concerns. I expected a kind of harsh and metallic reproduction, considering the target of this product but I had to change my mind quickly. Male and female voices and even choirs do possess a realism that belongs to high class amplification only. I'm not referring to a particular price range here, I'm talking in absolute terms. Only from time to time, especially when pushed hard to deliver all of its power, the T-Amp reveals traces of hardness and harshness. The very same kind of transparency helps in reproducing stringed instruments such as violas, cellos, violins and guitars.

Audiophiles used to the ubiquitous warmth and smoothness of low powered tube amps may initially find strings on the T-Amp too metallic. Actually, in real world and most of the times, strings are made out of metal, rather than silk and wool... What I hear through


**VERDICT** ●●●●£

A true audiophile amplifier for the cost of a Compact Disc.

**SONIC IMPACT T-AMP** \$39  
 Sonic Impact Technologies  
[www.si-5.com](http://www.si-5.com)

the T-Amp are extremely realistic strings, rich in harmonic content and low in harshness. And this was my second main concern: normally, inexpensive components do add unnatural coloration to stringed instruments. They make those artificial, almost electronic. You lose the harmonic content of the notes and find it difficult to detect if it's a real acoustic instrument or a synth that produces those notes. Hence, I was prepared to experience the very same effect with the T-Amp. I was wrong, for the second time in a row – as transparency, presence and realism are in top class.

The T-Amp delivers a tight and fast bass with excellent extension and impact, of course, within the 6W limitations! The natural decay of the bass drums is so realistic, with clean attacks and decays, grooving electric bass tunes, all deep, powerful and tuneful. Within its power constraints, the dynamic performance of this amplifier is impressive: perhaps not as fast and punchy as the best things out there but in a blind test with mid-to-high sensitivity loudspeakers (say, above 92-93dB), you'll still be surprised at the slam and speed.

With more conventional speakers, the T-Amp can still pump much life into music, in a very natural way. For me, best of all is the way this little plastic thing reproduces a huge soundstage, especially in terms of width. Hard to believe again, but the width is on a par with serious hi-fi amplifiers. Height and depth are

still extremely good, with distinct virtual planes, fine focus and geometrically realistic proportions.

### CONCLUSION

This is something everyone should own or at least audition at least once in lifetime. It certainly rewrites your value perspective. I'm not saying sell your Mark Levinson, Audio Research, Halcro or Jadis, but this little amplifier truly is a wonder, something

that can cause serious trouble even to proper, full price hi-fi amplification.

### BUYING

Sonic Technologies, is a San Diego (USA) based Company, though production is located in China. The manufacturer's website sells it online for \$39 but can be bought at other online stores for much less, even as low as \$19.45 (at [www.ecost.com](http://www.ecost.com))! Worldwide shipping may be a problem though. The only website that deals with international orders I know of is [www.thinkgeek.com](http://www.thinkgeek.com) (\$25). Certain websites list it as Sonic Impact (or SI) Model 5066: it is exactly the T-Amp, not a different version.

### TWEAKING THE T-AMP

Try everything to get the best out of this tiny marvel. First of all, a decent oversized power supply is necessary. Sonic Impact's AC adapter should be capable of 1.2-1.5 amperes max on 12 Volts but is available for 120 Volt only. You need something more. For example, any good stabilised 13.5 Volts - 5 Amperes power supply will make the T-Amp sing. And it can power up to 2 T-Amps simultaneously for passive bi-amping. Don't judge the T-Amp with batteries or with cheap cables, especially the one supplied, as this gem can sound much better - so use your own interconnects, buy a minijack-RCA male-female adapter. If possible, avoid switching power supplies to limit RF garbage going through the mains. Warning: on the DC inlet there's no indication of the correct polarity: the central pin is positive (+). The T-Amp is extremely light, so heavy cables can make it fall or flip upside down. Four, small drops of Blu-Tac will help keeping it stable. Break-in and warm-up are strictly necessary. The TA2024 chipset is hyper-protected so there's no risk of burning it up with excessive heat, but try to stay far from clipping as excessive voltages can kill it. Max voltage should be 13.2. Mine is playing at 13.8 and is doing well. I've even tried 12V but I tend to prefer 13.8. If you are thinking to bridge it in order to get a mono amp with more power then forget it, as the T-Amp can't be bridged!

### SPECIFICATIONS:

OUTPUT (BATTERIES): 9W @ 4 ohm, 6W @ 8 ohm, 15W @ 4ohm (10% THD)  
 OUTPUT (AC ADAPTOR): 15W @ 4 ohm  
 THD: 0.04% (@ 1 kHz, 9 watt, 4 ohm)  
 DYNAMIC RANGE: 102dB  
 WEIGHT: 300g without batteries  
 SIZE: 160x100x80mm

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# GLASS ACT

Channa Vithana auditions Waterfall's exquisite AV2 high end 5.1 surround sound speaker system.

**W**aterfall is a French company specialising in elegantly crafted glass loudspeakers, and latterly aluminium bodied satellites for multichannel. Profused with a technological engineering language, Waterfall uses acronyms such as ADT, Acculinear, Heatstream, and Smarthorn (amongst others) to describe its loudspeakers. This AV2 Pack consists of 2 Victoria 'TWN' floorstanders (£1,999.99) and Hurricane 3.1 sub/sat system (£1,499.99).

The Victorias are made using complex CNC machinery with laser cutting for consistent glass surfaces. Glass jointing, especially at right-angles is exceptionally difficult, not just for alignment but the assemblage of visible surfaces has to be exacting to avoid unsightly air bubbles. Accordingly, individual glass sheets, post machine super-finishing, are hand-crafted with strong, clear and attractive joints creating a stunning right-angled, bevelled glass panel cabinet. Silhouetted, Victorias are standard floorstanders, but transparently offer beautifully lateral, ghostly alternatives. Sans acoustic-foam, the drive units attach suspended, exactly, within the front baffle. A stark visual presence results, cleverly sublime, since there is nothing to hide.

Impressive details include drive units controlled by the Acoustic Damping Tube (ADT) which, "allows the proper functioning of a driver in a non damped structure such as a glass enclosure". The ADT positioned at the rear of each mid/ bass driver (with domed foam insert) "limits the return of the back wave on the cone". The company says ADT has three main properties: that of damping of medium high frequencies, the 'hydraulic damping' for the LF controls excessive cone movement, reduces distortion and increases power handling, and of the mechanical uncoupling of the mid/bass driver and glass structure. The Victoria is rear ported at the base. The wiring is ingenious, running

down from the tweeter, doubling up with each driver and terminating with gold-plated speaker sockets for single-wiring.

The Hurricane's drive units are housed within atypical crescent profiled aluminium casework (behind glass surrounds), designed for maximum heat dissipation via coupling the neodymium magnet of the voice coil to it designed to provide high-power handling (Heatstream). The fixed (Smarthorn) grill is said to provide, "higher efficiency and better control of directivity (and) also cancels the diffraction between the front panel and the grill". The Hurricanes are flexible, being on-wall, stand and in-wall mountable. The in-wall solution uses a unique Waterfall cast aluminium frame fitted within the wall structure while the Hurricane can be stylishly slotted flush afterwards without damage. The Hurricane Active Subwoofer is solidly made from MDF with side-firing driver. At the rear it has volume control, adjustments for active crossover to tailor room acoustics, phono sockets to connect another sub, spring clip terminals, phase invert and overload toggle switches, heat sink and a large port.

## SOUND QUALITY

The Waterfall AV2 pack is staggeringly good as a multichannel speaker system, integrating exceedingly well, despite the size difference between the Victoria and Hurricane. They imbue an enjoyable explicitness, requiring just a slight bass lift with the sub with some music. The Victorias in isolation as a stereo pair are quite exceptional, because they have refined 'hi-fi' sensibilities yet attack and slam when the music demands, conveying incredibly tuneful mid/bass frequencies giving them true 'musicality' also. The Hurricanes in multichannel mode are stunning



because they divert from their genre with an excellent treble with amazingly revealing communicative skills. In 2.1 with their Sub, the Hurricanes are also becoming as a genuine stereo speaker system. So the Waterfall AV2 pack performed excellently and the Hurricane satellites are indeed a very pleasant surprise, surpassing their genre with ease. Considering their elegant design, build and performance, they outshine the bulky, ugly, norm of AV speaker packages. The Waterfalls are not superfluous design folly; rather they succeed by being beautiful both inside and out, combining elegance and superlative engineering rigorously as an aesthetic expression. Wonderful – but dreams cost!

## VERDICT

An exquisitely engineered and individually styled surround sound system whose high price is justified by superlative results

**WATERFALL AV2 PACK** £3,499.99

Waterfall Audio  
 ☎ + (0)208 863 9117  
[www.waterfallaudio.com](http://www.waterfallaudio.com)

**FOR**  
 - elegant, beautiful, rigorous  
 - applied technology works

**AGAINST**  
 - handle with care!

## QUOTED SPECIFICATIONS:

**Hurricane Subwoofer:** 240x420x460mm, amplifier power 125W; frequency response  $\pm 3$ dB 35Hz-200Hz, 210mm bass driver, active crossover variable from 50Hz-160Hz; weight 15kg

**Hurricane:** 190x70x280mm, 2-way Bass Reflex (shielded); recommended power 50-200W, impedance 4ohms, efficiency 87dB; frequency response  $\pm 3$ dB 130Hz-20kHz; mid/ bass 100mm Neodyne driver, 20mm Neodymium tweeter; weight 1.8kg

**Victoria:** 215x215x995mm, 2-way Bass Reflex (unshielded); recommended Power 30-200W; Impedance 4ohms; efficiency 90dB; frequency response  $\pm 3$ dB 45Hz-20kHz; 2x150mm (Triangle) mid/bass drivers; 20mm Neodymium Tweeter; weight 15kg

# Bridging the Gap



**A nice piece of convergence technology drifting from its Mac-based origins towards Plays-For-Sure land? Patrick Cleasby gets the point...**

Everything in hi-fi is gradually moving towards increasing computer convergence, but if you don't want to spend several hundred pounds on a digital music file-playing hi-fi component, the option is to spend one or two hundred on a device to link the music library on your computer to your hi-fi. In this day and age, Ethernet connections are almost old hat, and few people have bothered to CAT5-out their house properly, so these solutions are almost inevitably Wi-Fi based.

So it is that the Roku Soundbridge, which has been prominent on American A/V sites for some time (it actually pre-dates Apple's competing Airport Express), is now widely available in this country, and the Wi-Fi card which was previously an option is now a 'free' inclusion. The card in question is an 802.11b Compact Flash card, of which more later. The other landmark development is that a device which started out with more of a Mac leaning is now a firmly, and convincingly cross-platform product.

The clearly laid out box art somewhat erroneously (since the advent of Airport Express) claims 'the only network music player that automatically works directly with iTunes!' But that is printed on. More recently stuck-on are the most obvious indicators that the Soundbridge functionality is heading PC-wards – the advert for the included free 1 month Napster trial (PC-only of course) and the trumpeted support for Windows Media Connect, Windows Media DRM 10 and Windows Media Player 10.

So does it 'Play For Sure'? The acid test is the standard, obstinate, I-know-best, refuse to RTFM approach. The gear is well-packaged in the box – you simply whip the Wi-Fi CF card out of its anti-static bag, remove the correct end of the Soundbridge tube (left, as you look at it) and insert the card. Care is needed to depress the locators of the plastic end when removing it, but once you've got the hang of it, it is easy enough. The other end conceals the DC input, the gold analogue stereo phono outputs,

the optical output, and as a useful Express-beater, coaxial S/PDIF output. The accessories are the pleasingly ergonomic remote control, complete with batteries, and a rubberised indented rest for the Soundbridge Cylinder. Finally there is a standard issue gold-plated connector phono pair to stereo 3.5mm jack cable, for connecting the analogue output to cheapo analogue active speaker setups, if you must. Optional extras include a mounting kit for wall-mounting the device, the rear of which already contains mounting holes. You can also get ears for rack-mounting if required, although these may well be US market only.

To give you some idea of the test-bed I was introducing the Soundbridge in to, the network in my house previously ran wirelessly 802.11g only, with several Macs attaching via Airport Extreme to a common-or-garden Belkin wireless router/ ADSL modem. The reason it was 802.11g only was that I had found that mixing 802.11b and 802.11g caused performance

problems, so my ordinary-Airport-only G4 is now relegated to direct CAT5 connection to the router. For testing purposes there is even the option of letting the trusty Dell play, either 802.11b or 802.11g! This was my concern about the 802.11b nature of the Soundbridge – how could I make it work in my faster network!

The only way to find out was to try. The first obstacle was the remembrance that my network is closed (on first boot-up the Soundbridge looks for open networks). Straight into the configuration options on the unit! I was able to intuit my way around the definition of the SSID for my network using the remote (taking care to observe case sensitivity), and once it was entered the Roku rebooted itself. It was then that, as expected I found that it still could not get onto my 802.11g network. No matter, it was simple to flip the network back to mixed 802.11b and 802.11g. The Roku was then able to get on the network, and its next issue was 'no music libraries found' (with the helpful offer to assist - 'why?' in brackets, answers suggested: network configuration or library setup – no shit, Sherlock!). Well, it was obviously the way that the Roku 'sees' iTunes libraries, which is that you have to switch iTunes sharing on. Once all that was sorted my iTunes library was visible to the Roku.

Additionally, once you're connected to the network, you have the option of initiating a version level update directly from the Roku, using the internet connection on the network. This unit shipped as 2.0.28 (the level which enabled most of the Windows compatibility), and was updated to 2.1.20, which introduces Real Rhapsody support (little use outside America) and standalone internet radio playback. The update really was a joy to do and completely intuitive. Once that version was on it was simplicity itself to 'tune' to 'Virgin Radio UK'. What did I hear first? 'All Right Now!' Quality was slightly 'swooshy', but surprisingly listenable on the Denon AVC AISRA through a pair of Monitor Audio GR20s.

Unsurprisingly, on the first attempt to play the motley collection of DAB radio recordings and Lossless CD rips on my iBook the more awkward formats like MP2 and Apple Lossless were not able to be played. Best not try all the 24 bit options, eh!! Even 16/48 AIF seems to cause the need for rebuffering...

Even so, when using more

#### SYSTEM REQUIREMENTS:

##### Windows:

iTunes users: Windows XP or 2000, iTunes 4.0 or later

Windows Media Connect users: Windows XP with Service Pack 2

Rhapsody users: Windows 98 or later

Musicmatch users: Windows 98, SE/Me/XP/2000 (SP3 or above)

Slimserver users: Windows 98, Me, 2000, XP, NT

500 MHz Pentium class processor or better

128 MB RAM minimum, 256 MB RAM recommended

##### MACINTOSH:

iTunes users: Mac OSX v. 10.1.5 or later, iTunes 4.0 or later

400 MHz G3 processor or better

128 MB RAM minimum, 256 MB RAM recommended

standard consumer file formats it really was amazing how smoothly the whole experience went. Test machines were a 1GHz G4 iBook with inbuilt Airport Extreme (802.11g) and the usual antiquated Dell PIII laptop with a Belkin USB 802.11g adapter. The Roku could see both iTunes libraries, and it was extremely easy to flip between the two. Athlete's album was faithfully reproduced from the iBook library once converted from Lossless to 192kbps AAC, and on the PC my David Sylvian 'I Surrender' test files worked successfully right up to WAV level. The only downside in all cases was a muffled but audible thump through the S/PDIF connection to the Denon amp each time a track completed its quick buffering step on the Soundbridge, just before playback. I was not able to test any of the non-iTunes PC music server options due to my antiquated setup, but once you are forced to dig into it, the extremely well put together book does seem to have an in-depth port configuration guide, for those yet to see the joy of iTunes.

Those with poorer eyesight or a preference for the larger gadget should also be aware that there is an

identical larger brother to the M1000 available. The M2000 is 7 inches longer, appears to have a much more prominent display, and functions just like its smaller sibling. The only thing is it costs nearly twice as much, so the value of the upgrade is debateable to all but the most myopic. These larger two models have Vacuum Fluorescent displays, while the currently-unannounced-in-this-country M500, similar in size to, and priced marginally below the M1000, has an LCD display.

So is the M1000 worth double the Airport Express price for the display and remote capability? Well, most obviously, it is not tied to iTunes, with the concomitant downside of no .m4p playing capability as it stands at this moment in time. But that notwithstanding I would suggest that the Soundbridge's currently unique abilities, (and for some, the addition of coaxial digital), make it a pretty desirable toy. For those who have an interest in such things, the internet radio capabilities may also be useful. Roku will need to watch their behinds though, as there have already been intimations from Apple that more advanced Airport Express functionality is inevitable.

#### VERDICT ●●●●

A very attractive and well-thought through device, and the indications are that Roku Labs are well aware of all the directions they need to take it in to keep it bang up to date, and what's more they have the architecture to support this aim.

#### ROKU SOUNDBRIDGE £179

Roku Labs

+1 408 848 2548

Developer Web:

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

UK Sales Web:

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

Dealer Search Web:

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

#### FOR

- display capability
- cross platform
- excellent remote

#### AGAINST

- audible clunk
- no iTMS?!
- getting Microsoft-y!



# Cable

Audioquest Diamondback

**Channa Vithana gets connected with five affordable audiophile interconnects from Audioquest, Chord Company, Monster, TCI and Van den Hul...**

It's easy to get exasperated when buying cables. If you want to know the chances of being able to audition all your potential purchases against one another, then

start at zero and work downwards. So you end up take a leap in the dark, and it's often an expensive one.

The simple truth is that there are lots of over hyped, overpriced interconnects on the market, and their manufacturers aren't exactly shy about making claims that ultimately they can't substantiate... And how come they have so much money for glossy adverts and fancy promotional literature, when electronics manufacturers are far more sparing in their largesse? Well, as industry insiders have often pointed out to us, there's plenty to go around when you're charging £100 per metre for wire that leaves China for one thousandth of that...

Not all cable manufacturers are dastardly charlatans of course, and good brands do products whose difference is demonstrable – and even dramatic. For this reason, we thought we'd round up five affordable interconnects which we consider to be sound as a pound. Still, despite the fact that they all have excellent provenance and similar purchase prices, we heard big, big differences... One qualification though: use this

group test as a guide, and only that. The cables are listed in descending order of preference (our favourite at the top), but our order may not be yours – it depends on your system and your tastes. The following is a useful rule of thumb; nothing more.

## THE TEST

What's not in doubt is that all five interconnects here are dramatically superior to the bundled 'bell wire' cables that come with CD players or tuners, in terms of sound and build.

Indeed it's important to bear in mind the construction, especially with the plugs as they take the brunt of the push-pull into the equipment back panel. Another practical issue is flexibility and length, it is important to have a long enough lead to go from component to component and also to be flexible enough to bend down/around equipment supports without much bother. Otherwise there will be twisting and stretching putting extra strain on the connection between the signal conductor and the plug, which will reduce the life span and performance of the cable. The Audioquest, Chord Co. and Monster are directional cables and marked going away from the source as they are designed to work at their best in this manner by their respective manufacturers. Finally all the cables benefited greatly from decent running-in periods.

With the music used for the assessment, I wanted to cover all the basics such as timing and structure and then into the textural and resolution qualities of elements like bass, mid and treble. The first CD was No

Doubt's 'Greatest Hits', which has Gwen Stefani on vocals. She has an amazing though high-pitched vocal which can be difficult to reproduce properly and is subsequently very demanding to get right. No Doubt play a ska/pop hybrid and thus their music contains copious amounts of bass and rhythm with an accessible pop sensibility. The second CD is Garbage's 'Version 2.0' which has the equally superb Shirley Manson on vocals who is also a discerning talent requiring a system to portray her multi-textural delivery. Garbage play mostly electronically aspirated rock with electric guitars, drums and plenty of synthesised beats, again

Chord Company Cobra 3



# Talking

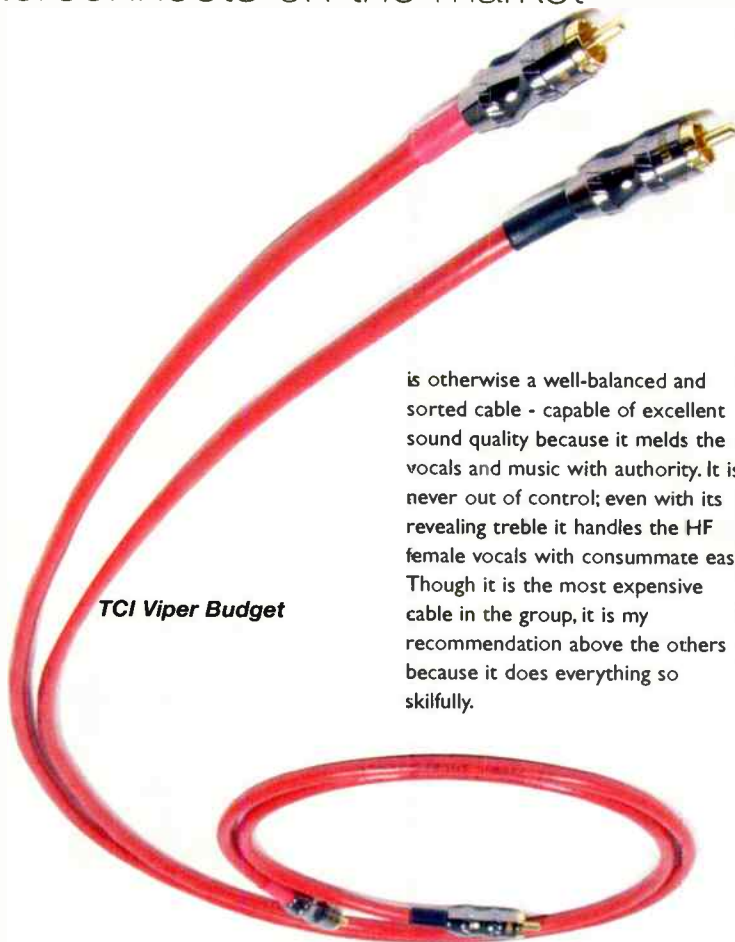
within an accessible musical formation.

## AUDIOQUEST DIAMONDBACK £95/M

This has the most complex cable geometry here with sophisticated construction. The main cable has an outer black and blue nylon braid. Then going from the outside-in it features: PVC jacket, foil/ Mylar/ foil shield, 3 x 22 AWG 'PSC' (Perfect Surface Copper) conductors for the signal - each insulated with a polythene air tube for "equally low

distortion paths" and a single 22 AWG silver-plated drain-wire for the return. The blue plugs are easily the best designed of the group (reflecting the higher price) being superbly made. They are silver plated featuring a direct welding process that fuses the conductor to the plug which according to Audioquest, "puts any solder to shame". The Diamondback has a discerning and revealing treble with good timing and separation. It has a slightly dry overall tonality but

"the simple truth is that there are lots of over hyped, overpriced interconnects on the market"



**TCI Viper Budget**

is otherwise a well-balanced and sorted cable - capable of excellent sound quality because it melds the vocals and music with authority. It is never out of control; even with its revealing treble it handles the HF female vocals with consummate ease. Though it is the most expensive cable in the group, it is my recommendation above the others because it does everything so skilfully.



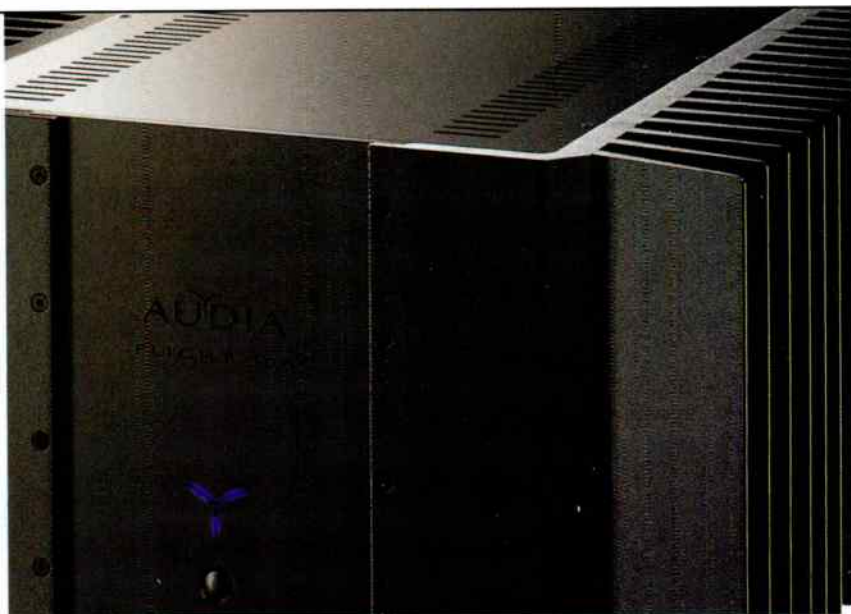
**Monster Interlink 250**

## CHORD COMPANY COBRA 3 £60/M

The Chord Company has a longstanding reputation for producing high quality, high performance cables at real-world prices and the Cobra 3 is no exception. It comes in the familiar Chord Co. design used for their budget cables with a simple but well made outer sleeve within which it contains a dual balanced twisted pair of oxygen free copper conductors. These conductors are covered with a foamed polythene dielectric for insulation, which according to Chord is in-between PVC and Teflon in performance - with Teflon being the best. The Cobra 3 has a "High coverage lapped shield system" over the conductors and gold-plated Chord Co. RCA plugs. This was the most neutral of all the cables assessed. It has an unflappable quality, which at first would seem to be undynamic but this is not the case. Its neutrality preserved the fragile high frequency of the No Doubt vocals on 'Hella Good' which is quite remarkable for the price while not sacrificing one iota of timing. Looking at individual characteristics such as treble, mid and bass - they were all handled well and with above group

To hear the fine detail you some times need a little *muscle*

AUDIA



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HDMI



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SCART



ANALOG

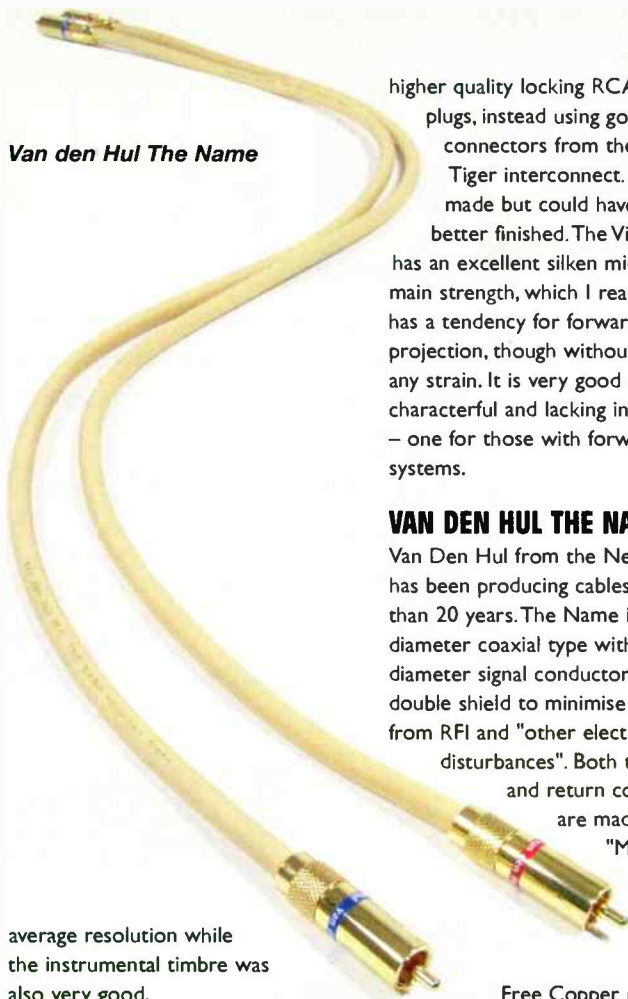


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**Van den Hul The Name**



higher quality locking RCA phono plugs, instead using gold-plated connectors from the cheaper Tiger interconnect. It is well made but could have been better finished. The Viper Budget has an excellent silken midrange - its main strength, which I really liked. It has a tendency for forward vocal projection, though without revealing any strain. It is very good if a little characterful and lacking in neutrality – one for those with forward budget systems.

**VAN DEN HUL THE NAME £40**

Van Den Hul from the Netherlands has been producing cables for more than 20 years. The Name is a 7.3mm diameter coaxial type with a 1.1mm diameter signal conductor. It has a double shield to minimise pollution from RFI and "other electromagnetic disturbances". Both the signal and return conductors are made of "Matched Crystal

Oxygen Free Copper (OFC)" connected to VdH's proprietary plugs said to be "...non-magnetic, having Teflon internal insulation and being layer-plated with copper, silver and finally 24 carat gold...". It is covered in VdH's bespoke 'Hulliflex 4' outer jacket which gives "an optimal protection against chemical (corrosive) attack from the outside world and ensure a very long life-span". This cable is extremely well made and finished – therefore it is absolutely superb value for money for this reason alone. The Name produces a slightly warmer balance and has a lush and smooth character with excellent vocal and instrumental resolution, which was manifest in the treble, mid and bass and I adored its resolution especially for its low price. However the music's timing sounded slower because the bass - although weighty - was dislocated compared to the other cables over long term listening when considering the music structure. It would therefore be most suitable for fast, brighter systems to bring balance and thus it is limited in its appeal.

average resolution while the instrumental timbre was also very good.

**MONSTER INTERLINK 250 £20/M**

Monster Cable from the US is one of the most famous hi-fi cable companies and is usefully sold in two popular high street electrical stores in the UK. Its Interlink 250 has twisted pair balanced construction with foil shield "...for rejection of EMI and RFI interference..." It has Monster's proprietary 'Turbine' phono plugs with 24K gold plating which are well made and helpfully have rubber rings aiding insertion and removal. The Monster has excellent timing, with good bass and is thoroughly enjoyable in use. Being very critical it has a tendency to strain with Shirley Manson's higher pitched vocals and understandably at the price its resolution isn't as high as the others. However, considering its low cost there is little to criticise and is thus a brilliant upgrade over standard 'bell wire'.

**TCI VIPER BUDGET £50/M**

The red Viper Budget has (copper, tin and nickel) alloy conductors and is a "balanced twisted pair construction with a foil screen covered by a plated braided screen". It has an outer PVC cover with polythene core insulation and quoted 75ohm impedance. It differs from the (£20) more expensive Viper by omission of

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 - cohesive musical whole

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**AGAINST**  
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 - good bass, timing  
 - well made

**AGAINST**  
 vocal ability

**VERDICT** ●●●●●  
**True Colours Industries Products**  
 ☎+44 (0)771 0196946  
 www.true-colours.com

**FOR**  
 - silken midrange

**AGAINST**  
 - finish  
 - indistinct sounding

**VERDICT** ●●●●●  
**Van den Hul UK**  
 ☎+44 (0)1235 511166  
 www.vandenhul.com

**FOR**  
 - excellent build quality  
 - warm, lush, smooth  
 - vocal resolution, price

**AGAINST**  
 - timing

**REFERENCE SYSTEM**

- Consonance Reference 2.0 SACD player (£1,995)
- Consonance "Billie" Interconnect (£140)
- Eclipse A502 single input integrated amplifier (£875)
- Chord Company Odyssey 4 loudspeaker cable (£340)
- Waterfall Victoria loudspeakers (£2,000)

# ACTIVE,

Meridian's DSP7000 is more than a visually arresting, exquisitely built lifestyle statement – it's an exhaustively engineered active digital loudspeaker. Who better than unreconstructed analogue addict David Price to put it through its paces?



It may not have escaped the notice of eagle-eyed readers of Hi-Fi World magazine that yours truly is hardly a reluctant cheerleader for that wondrous luxury of life I call 'analogue audio'. For this reason, it might seem a little odd for me to have volunteered to suffer life in the digital domain with a pair of Meridian's latest DSP7000 digital active loudspeakers.

Well, sometimes you just have to take your shoes and socks off and get wet in the name of journalistic enquiry, taking a walk on the wild side that – in normal circumstances – you'd frankly have turned the corner to avoid. I know, the prospect of Meridian personally installing twenty five grand's worth of ultra-high end hi-fi is an unpleasant one, but someone had to do it, and to keep the 'trustworthy sword of truth' sharp, that someone had to be me...

Now I've got your sympathy, I hope that you'll indulge me the odd nostalgic reminiscence about being able to listen to my prized turntable without it first being sliced into 24bits no less than ninety six thousand times every second, because I did miss the world of pure, unadulterated

# LIFESTYLE

analogue. But for that precise same reason, I have to say I was more than slightly impressed with what the DSP7000s were doing with digital.

If you think about it, anyone listening to their music with a conventional CD player (and/or DVD-A, SACD), amplifier (pre-power or integrated) and speakers is getting the worst of both worlds. Think of the signal path: the original analogue music is converted to digital in the studio, pressed onto silver disc, played on a CD player and converted back into analogue, which then gets amplified by a factor of several by a tenuous assemblage of level controls and gain stages, then gets pushed through long, lossy runs of wire and squeezed into loudspeaker crossovers, where it's chopped and changed by a bunch of heavy duty filters before it emerges out of your drive units. So much for 'source direct'...

Active digital loudspeakers short-circuit so much of this: the analogue is converted to digital, where it travels from a CD player to the speakers down some coax cable, where it's split digitally into signals appropriate to each drive unit, then it's converted into analogue and amplified right 'in front' of each driver and err, that's it.

As such, if you're going to do digital then surely you should do it this way – i.e. actively? Just as a turntable feeding a small single-ended tube amp and super-sensitive loudspeakers is positively entrancing (because of its brilliant simplicity), so an active digital loudspeaker system fed by a silver disc spinner can romp away from the aforementioned clumsy assemblage of separates converting this to that and back again after a fashion? That is the thinking behind the Meridian DSP7000, and even without spinning a disc in anger, it makes perfect sense to me.

## UP CLOSE

The DSP7000 is a four-way digital signal processing active loudspeaker, effectively a self-contained audio system, sporting four custom drivers,

four amplifiers, three digital converters, digital crossovers and sound-shaping DSP technology. The heavy (70kg) cabinet uses curved pressure-laminated panels, each using multiple layers of selected woods and metal to provide high stiffness and damping. Its narrow, tapered shape promises optimum dispersion across a wide listening area. It is constructed with extensive bracing, and the 1050x 348x 458mm speaker stands on triangulated adjustable machined foot assemblies with provision for floor spikes or skids.

Finished in silver piano lacquer (other hues are available), I have to say that I found these Allen Boothroyd styled beasts one of the most stunning looking loudspeakers I've ever set eyes on. They're beautifully crisp and clean, nicely proportioned and have a touch of nineteen sixties 'sci-fi modernism' about them. There's no other word for the finish; immaculate. It's as deep and flawless as a Jaguar paint job, and then there's even a touch of XJ40 dashboard about the supplied Meridian System Remote. Perfectly

weighted, shaped and spaced buttons, automatic backlighting (via daylight sensing) even the ability to change the templates should have won it a Design Council Award.

Each DSP7000 has a small front window between the midrange driver and bass units, for a green matrix display and an infrared remote control sensor. Control over source, volume, bass, treble tilt, listening axis, time-compensated balance and absolute phase is given at the touch of a button. The remote interfaces seamlessly with the

speakers themselves (thanks to an abundance of IR senders/sensors), and suddenly 'pointing the plastic' at your CD player instead of your speakers seems completely counter-intuitive...

Still, the fact that these Meridians are incredibly easy to use is to completely miss the point; this is a welcome bonus of the active digital operation, but the real deal is what the design confers in terms of sound. The 25mm aluminium-dome tweeter (silver wired, short horn-loaded with protective grille) and 160mm polypropylene midrange driver are mounted in a separate acoustic enclosure. These two, which cross over at 2.6kHz, are driven by independent 100W low-feedback power amplifiers, boasting 'optimised magnetic design', star earthing and fast output devices, all powered by a substantial toroidal transformer feeding high-quality audiophile-grade

"if you're going to do digital then surely you should do it this way – actively?"

capacitors. The DSP7000 then crosses over at 200Hz to two 200mm long-throw bass drive units, again aspirated by suitably appropriate power amplification, optimised for bass (as opposed to treble or midband) duties.

Before the four amplifiers (which power the four drive units) lie four 24bit, 96kHz, 128x oversampling digital-to-analogue converters, surface mounted onto partitioned 6-layer printed-circuit boards. These DACs in turn feed from a FIFO memory buffer input for the lowest

## GOING LIVE:

The joy of the DSP7000 is the easy way they connect up. Granted, as you're spending £16k then there will doubtless be a man from your local Meridian dealer in your home to do it for you, but it's impressively, elegantly, simple all the same. A long, thin, Meridian sourced coaxial cable runs from your digital disc player or digital preamp to the 'master' DSP7000. This then runs another length of coax to the 'slave'. The both are configured via the MSR to know who's who and, if you'll pardon the pun, "Bob's your uncle"! The DSP7000s accept any digital signal and then resample it to the highest possible sampling frequency they can work with, up to 96kHz (i.e. 44.1 becomes 88.2, 192 becomes 96). Of course, the DSP7000s are most elegant when working with a Meridian digital spinner or preamp, where there's seamless integration with the MSR, but even a £50 Freeview box will feed them.

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possible jitter from almost any source. Interestingly, at the other end of the chain, just before the drive units, Meridian say there is a small, subtle degree of analogue filtering – some things, confesses a company spokesman, can be done better in the analogue domain...

Round the back, there are two S/PDIF digital inputs supporting 32kHz–96kHz sampling rates at up to 24 bit; Meridian says that a future software update will enable support for 192kHz. There are also rear-panel controls for power, MSR and an RS232 port.

## SOUND QUALITY

This is one of the most interesting sounding loudspeakers I've yet set ears on, and given my recent run of greats that's no small beer. The DSP7000's most obvious character is that of 'cleanliness' – they're almost antiseptic in their remarkably pure and unsullied nature. They have electrostatic levels of clarity; indeed I'd say they're even more revealing than my regular (£6,000) Quad ESL989s, especially in their airy treble and upper mid band. Same goes for the bass, whose massive controlled punch also puts the 989s to shame.

In another area where the Quad electrostatics are famous, the Meridians also shine with solar intensity – they image startlingly well, with an eerie dimensionality which – quite frankly – I've only ever come across twice before. One was in Peter Quortrop's all tube Audionote home system (using vinyl and AN-E loudspeakers), the other in Max Townshend's all solid-state home system (using vinyl and Sir Galahad loudspeakers). For one who's never heard a Red Book CD sound so sublimely spacious, it came as a real

## STEREO ACTIVITY

Active loudspeakers couple power amps directly to the loudspeaker's drive units, so if there are three drivers, for bass, midrange and treble, there will be three power amps, usually within the loudspeaker itself. Bass, midrange and treble signals for each are derived by electronic filter circuits placed before these amps, not in a crossover after them – that's the main distinguishing feature of an active loudspeaker.

There are many advantages, plus some disadvantages, but they can be somewhat academic in real life. For example, three power amps are needed per loudspeaker, a potential disadvantage, but this is of little consequence if each costs little. Electronic filtering allows significant performance gains, and allocating a power amp to a specific drive unit opens up a whole host of interesting and unusual possibilities. Equalisation can be applied to the bass amp, for example, to give an extra octave of bass, something Meridian do within the DSP7000. For a specific cabinet size, this enables an active speaker to go lower than a passive, driver cone excursion and power handling permitting. Also, motional feedback can be applied but, being problematic, it rarely is.

In practice active loudspeakers generally sound very clean and well controlled, as they are of course. There are practical benefits too. Only a small and compact preamp is needed, connected to each speaker by a signal cable.

The whole arrangement lends itself to digital, since all signal processing can be done digitally, before final conversion to analogue through digital-to-analogue converters that feed each power amplifier, but with a three-way loudspeaker this means six power amps and D/A converters in total – expensive.

It makes sense to incorporate digital processing within each loudspeaker to control its behaviour, from switch on and protection, to equalisation, as Meridian have done with the DSP7000s. You end up with a complex, self-powered, 'intelligent' loudspeaker at which you must wave a remote control for set-up. Trouble is, active loudspeakers soon get very complex and very expensive – frighteningly so. They are strictly too-end as a result and, if you don't like how the loudspeaker sounds, the whole shebang must be changed; there's little flexibility.

Digital PWM amps benefit from being coupled directly to a drive unit, so they're ideal for active speakers, making for a lighter, cheaper and better product. And, in future, if digital drive units arrive, they will almost certainly need total integration with a digital power amplifier in order to work at all. Then we'll all be using active loudspeakers.

had been remastered for cooking Compact Disc. The opening piano cadences showed the incredible clarity of these speakers; there was a real, tangible sense of the piano's tonality, texture, timbre – something that 16/44 usual just stamps on top of and marches right over. Next, as the drums and vocals kicked in, what struck me was how the keyboards didn't fade into the mid-distance;

something that lets the Quad ESL989s down in turn.

Now we're into mid-song, 'Breakfast in America' is sublime. The soundstage hangs back, behind the plane of the speakers, across what seems a thirty foot wide recorded acoustic. There's tremendous incision; you feel you can hear right to the back door of the recording studio and into the control room. There's

"they're deeply special; wonderful depth, dimensionality, space, insight, clarity, texturality and finesse allied to a truly enrapturing musicality..."

shock. The only caveat is that you certainly have to be 'on axis'; maybe I've been spoiled by Quad electrostatics which hang the music out on a very long line, but the DSP7000s have to be toed in at you very precisely to switch from 2D to 3D.

An interesting illustration is Supertramp's 'Breakfast in America', recently remastered (very well) on CD. It was also a great recording on vinyl (if a tad topsey) and the DSP7000s showed just how well it

they were they as strong as ever, despite the extra strands of the mix competing for the listener's attention. For me, this went on to define one of the things that most impressed me about the DSP7000; its grace under pressure. Every time music gets louder, pushes to a crescendo, then the Meridians shrug it off with nonchalant, effortless ease, maintaining their impeccable repose. It's one of the defining characteristics of my Yamaha NS1000Ms, and

amazing insight into the 'grain' of the singer's voice, not to mention the phrasing and breathing. The instruments behind him are immaculately defined, locked in space with utter precision, while the busy hi-hat flourishes (hey, it is 'prog rock' after all, is it not?), timed with metronomic certainty. Indeed, this is another joy of the DSP7000s; the treble is not only tonally sweet and silky but has brilliant definition and a rarely heard sense of rhythm. It's an interesting



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Wilson Benesch ACT 1 finished in Cherry	£3995
Wilson Benesch Actor	£2295
Triangle Antal ES	£595
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Project 2.9 wood with Ortofon 510 cartridge, in cherry as new	£350
Michell Orbe SE boxed as new	£1595
Tom Evans 'The Groove' phono stage, boxed as new	£1900
Trichord Delphini 4 box dual mono phono stage, cost new	£1995
Project RPM6 SB 10 months old, boxed, includes cartridge	£395
SME 10A, boxed	£2495
Linn LP 12 Itok, very high spec	£795
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### Miscellaneous

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Stax SRS 4040 tube system	£695
Ecosse Legend SE 1m interconnect	£195

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point for me; often it's rough sounding tweeters that seem to time best (because of the edge they add to the music), but the DSP7000s are both luxuriously smooth and svelte, yet start and stop with rifle bolt precision.

After so much fun with Supertramp (and those two things certainly don't always go together), I moved to a favourite reference disc of mine, 4hero's 'Two Pages'. 'Spirits in Transits' is a wonderfully lilting listen on good systems, and the Meridians did themselves no harm at all. As the track started, that multi dimensional soundstaging was immediately obvious, then the brilliant, shining clarity of the midband and treble and the effortless 'velvet punch' of the bass. Then I found myself listening to the delicious tones of the cello and cor anglais, the sound of the wooden drumsticks hitting the snare rims, the soaring violins and viola and the sheen of the hi hat cymbals. Despite their prodigious pace, explosive power and biting clarity, let no one say the DSP7000s are brutal. Neanderthals? Quite the reverse. In fact, this is the key to these loudspeakers – they offer the sort of power and grip that you'd expect from the best pro monitors, but real, unadulterated subtlety and finesse that only the best electrostatics aspire to. Quite a combination...

Impressive as they are on rock and acoustic 'new jazz', the Meridians possess an ideal combination of attributes for both classical acoustic music and electronic. Debussy's 'Prelude a l'apres-midi d'un faune' (Poloarts, Kakhidze) showed that brilliant midband in all its glory, along with breathtaking air and space. Once again, as the music drew to a

crescendo, the DSP7000s displayed immaculate control – never once slipping out of time or buckling under the load. Kraftwerk's 'Tour de France remixes' confirmed this; these speakers capturing this album's essential, 'architectural' quality like almost no other passive analogue amp-

speaker combination I've heard. Strands of the music that went unheard on £12,000 of Marantz/Musical Fidelity/Quad gear were lit up almost as if by spotlight via the Meridian. Best of all was the way that the kick drum that permeates most of the album cut through the mix with the sharpness of a scalpel; on my reference system, whenever it came up against another instrument, its definition was somehow lessened, its impact softened.

After such a long eulogy to these great loudspeakers, can I possibly raise any objections? Well, yes. I'm sure Bob Stuart has not played much 'urban R&B' of late, but the heavy, sequenced electronic bass lines of Twister's 'Slowjamz' showed how the DSP7000 can be just a little loose down below. Now, I'm aware that dealers can actually get into the 'BIOS' of the DSP to compensate for room resonant modes, but I'm still not convinced that the 7000s have the binaristic 'on-off' quality to the bass that they so obviously display further up the frequency range. This isn't to denigrate the bass; by and large it's superb – it's fast by any standards and displays wonderful ease and speed allied to a ferocious 'thwack' when called upon so to do, but it's still not the match of the breathtaking midband and treble – which is why I raise it as a criticism.

Secondly, we have the obvious point about the DSP7000s not being 24/192 compatible right now. Obviously, this will be offered as an upgrade when it's available, but right now you're stuck with MHR (Meridian Hi Res?) at 24/96. Interestingly, a 24/96 DVD-A disc of Foreigner's 'Waiting for a Girl Like You' showed not a huge difference between 16/44 - which shows just

how effective all the signal processing that ye olde CD is getting is. In practice, most people's digital music collections are on CD, and the key point is that with this, the DSP7000 veritably shines.

My final aside is (and here it's a case of "my name's Ben Elton, bit of politics..."), there's no SACD playback. Of course, the 7000s play the CD layer (brilliantly) but I for one am more convinced by the SACD releases to date (despite the format's theoretical inferiority to 24/192 LPCM). It would have been nice to hear Peter Gabriel's 'Solsbury Hill' on SACD through the Meridians.

## CONCLUSION

At £16,175 these loudspeakers are way beyond the means of most people, but when you consider that the DSP7000s effectively replace almost every part of a hi-fi system

## REFERENCE SYSTEM

Marantz CD63KI DP CD player  
Musical Fidelity kW500 integrated amplifier  
Quad ESL989 loudspeakers  
Townshend Maximum Supertweeters

and/or:  
Meridian 808i digital disc player/preamp

(DAC, preamp, power amp, speakers), then they're not quite so crazily priced. Certainly, put against an equivalently priced separates system [see REFERENCE SYSTEM], the Meridians make a powerful case for themselves, sacrificing almost nothing and bringing a number of obvious sonic benefits – providing you're already using a digital source, of course.

Sonically, they're deeply special; wonderful depth, dimensionality, space, insight, clarity, textuality and finesse allied to a truly engaging – enrapturing even – musicality. Factor in effortless power, firecracker dynamics, stunning aesthetics, ergonomics and build and even at the price of decent family saloon, you certainly get your money's worth. Meridian is an interesting company, it's never followed fashion and has at times been just plain quirky. For this reason, many have lazily dismissed the products as being a little 'leftfield' and not for them. The DSP7000 is certainly the former - unusual and innovative – but one listen will instantly convince any doubter as to the wisdom of Meridian's approach.

SEE DP COL p78

## VERDICT

One of the most effective loudspeaker systems get made, the DSP7000 offers incredible insight into the recording. Wilfully unconventional and all the better for it, it's a masterpiece of audio engineering.

**MERIDIAN DSP7000 £16,175**

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**BECK**  
**GUERO**  
**(DVD-AUDIO: 24/48 STEREO  
24/48 MULTI-CHANNEL)**

After all that Universal bashing last month over the non-appearance of any Universal Dual Discs over here, at least it was a pleasure to see that they echoed the US release of Beck's new album as a special edition CD/DVD-Audio dual pack, with the CD including some worthy additional tracks and remixes, all packaged in a high quality attractive book form. If you've been tracking the eclectic and unpredictable moves of Beck's recent career you may know that his last release was a morose set of relationship breakup songs called 'Sea Change'. Firstly I must say that although we have never featured either the European SACD or the US 24/88.2 DVD-Audio of that album here, if you know and love that album, or if that kind of one note mood is your thing, you should eagerly seek out what is one of Elliot Scheiner's most restrained and sympathetic surround mixes.

The good news here is everywhere. Beck returns to the Dust Brothers production team which made 'Odelay' such a landmark record, and the sounds here are similarly diverse and lively. Mr. Scheiner weaves his surround magic once again, and 'Guero' is second

only to his Flaming Lips mix in its audacious extremity, with the funky breaks, scratches and voices of 'Que Onda Guero' coming predominantly from the rears, a pattern which continues throughout. 'Restrained' doesn't come to mind, but 'sympathetic' certainly does. This is also the first DVD-Audio I have seen that Universal have designed with an interface which is anything but static – this one is a work of art! It really doesn't matter that 'Guero' is 24/48 (most likely the resolution of the recording) as the sound is gloriously rich and frequently sample based anyway. I can't recommend 'Guero' highly enough, firstly as a brilliantly fun record, but equally as a standout DVD-Audio. Go out and find yourself a copy!

**DAVID BOWIE**  
**REALITY**  
**(DUAL DISC: 16/48 STEREO  
DD 5.1 MULTI-CHANNEL)**

When I reviewed the David Bowie 'Heathen' SACD a few months ago I threatened to get hold of 'Reality' on SACD. I may have been a bit too lackadaisical, as of all the Sony surround titles which were SACDs and are now Dual Disc, the 'Reality' disc seems to be the one that is rare as the proverbial hen's teeth... I will really regret it if I never get hold of a copy, as the surround mix on

'Reality', once again performed by album producer Tony Visconti, is an interesting one, although 'Heathen' is both the more powerful album and the more suited to the surround treatment. 'Reality' is not densely layered in the same way, and although it is interesting to hear Bowie's voice soloing in the centre speaker on the likes of 'New Killer Star', it does seem to break up the smooth balance of the stereo mix version.

This being a dual disc we have that stereo as both Red Book(ish) 16/44.1, and DVD-Video 16/48 LPCM. It may be my imagination, but the 48kHz track does sound marginally better, but that could be because I had rigged up by lovely old Toshiba SD900E (just to see if, as rumoured it would have compatibility problems – alas, for the doubters, it played both sides fine). Also with the Dual Disc we have the dubious advantage of some videos, either presented in isolation or as part of a half-hour 'Reality' film, artily cut, preoccupied with 'culture', but with some dodgy MPEG encoding and some to camera narration by Bowie in which he is really starting to show his age! Alongside this you get playback with lyrics options and the usual biography, discography and photos. Just like a studio album on a DVD-Video in fact, which, after all, is what it is.



**DESTINY'S CHILD**  
**DESTINY FULFILLED**  
**(DUAL DISC: 16/48 STEREO**  
**DD 5.1 MULTI-CHANNEL)**

Sony surround man Thom Cadley has done enough Destiny's Child-related multi-channel work (The 'Survivor' album, Kelly Rowland's album, Beyoncé's album, DVD-Videos) to know what he is doing with their material and so he proves again on this reworking of their latest album. Once again this is an impoverished Dolby Digital 5.1 US Sony Dual Disc. Much like the Beyoncé SACD it can be hard to advance beyond the first two standout single tracks. Much like the Bowie the CD side sounded fine, and the use of this disc in this month's testing allowed me to benchmark the Dolby Digital performance of the venerable, 2001 vintage 'best DVD Player In The World' SD900E against the more modern players. The Toshiba ran away with it! The insistent bass pulse in the centre of 'Lose My Breath' was firmly anchored and deeply rich, with the heavy surround synth events and rear vocal and breath sounds being utterly convincing. It would almost have been possible to forget I was listening to Dolby Digital, but not quite. When will Sony see sense and at least add DTS to the mix?

'Soldier' continued to demonstrate how exciting these

mixes are, and you get the videos for these two great singles as well as other bonuses. If you have a decent Dolby-performing DVD player there is no reason to not give some of these Sony discs a go, as they can be obtained from cheap-cds.com for less than a tenner. As I mention in my column this month both of these Sony Dual Discs suffer from the idiocy of Sony encoding the DVD side as Region 1, which makes no sense at all. Just remember that if one of the workarounds to CD sides not playing in certain CD players is to clone to CD-R, just remember the same idea can be employed on the other side, and region codes can be removed!

**GENE SIMMONS**  
**\*\*\*HOLE**  
**(DUAL DISC: 24/96 STEREO**  
**24/96 MULTI-CHANNEL)**

A real curate's egg this one. How you take Simmons is down to whether you have any legacy of teen Kiss fandom (as I do!) or whether you can take his larger than life cartoonish personality with the requisite pinch of salt. Which ever way you look at it he was the main driver behind a huge cash making machine in the seventies, and for some reason he's still peddling his music. The main reason for selecting this one from Silverline's ten-strong list of European launch

titles is that most of the rest of them are the familiar classier end of their inventory, redone as Dual Discs, whereas this one debuts in the new format, and the disc has been done well. The surround mix is a 5.1 Entertainment in-house job, and although there is nothing stunning, it does add an open, rich feel to the strange mix of music found on the album, and the stereo track, mastered at 24/96 is a vast improvement on the really quite flaky sounding 'CD' side.

The variety of music might not be such a surprise to those familiar with the rock and love song mix of Gene's twenty seven year old debut album, the second best of the four solo efforts the group released in 1978. 'Black Tongue' is even more strange, containing a similar mix of rockers and ballads, an almost totally redundant and sacrilegious cover of 'Firestarter' (guitar by Dave Navarro, fact fans), an old unearthed slowie, co-written with Bob Dylan, and most bizarrely a track called 'Black Tongue' which collages legacy recordings of Frank Zappa's voice and guitar into a diverting surround presentation. I'd love to know the story behind it... If you have any interest in Kiss, or multi-channel rock music in general this one is worth checking out. There's even a dire video for 'Firestarter'!

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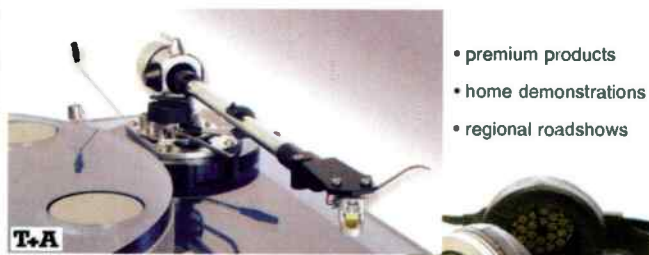
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STAX

“from a valve perspective, solid-state amps have little chance of sounding good, just from their configuration...”



## noel keywood

It's true that transistor amps have advanced little over the years, the last thirty years in fact! And modern designs, all based on the same tried and tested topology, don't do much for me. Instead, I use a valve amplifier which contains proper audiophile components throughout, and is so good in itself that it doesn't need corrective feedback. I'm not disdainful of solid-state or unappreciative of what it can do. In fact, I'd love to have the time to spend experimenting to see just what can be wrung from it to make an amplifier easier to listen to than most of today's crop. But from a valve perspective, solid-state amps have little chance of sounding good, just from their configuration.

In the UK, Europe and most places around the world except America it seems, amplifiers use a similar circuit topology where feedback is applied in a loop from output back to input, in the power amp at least. This makes them all "tail chasers" as I'd put it. For feedback you need gain, and for gain you need transistors, so you are putting more devices in the signal path, which means more distortion, noise and general degradation, to correct the sins of the ones already there which, because you need feedback, aren't working satisfactorily in the first place! Clever? Hardly. Virtuous – never!

In essence this approach is simple, cheap and gets the job done. That's why it's universally popular. All the same it is contrary to what some designers are happy with and there is underlying concern that the sonic results aren't what they could be or should be. In other words, solid-state amps as configured don't sound very good. You could buy a Krell or Halcro from the U.S. where they are able to put a lot more

money and effort into solid-state design and find a large enough market to justify it all. But at £10,000 a pop for this sort of thing it doesn't look like good value this side of the pond...

Not much heard about or discussed here are solid-state amplifiers that use feedback servos outside the main signal path to develop the gain needed to linearise a stage. This technique allows an amplifier to be split down into individual linearised blocks, making loop feedback unnecessary. Whilst all circuitry, even the power supply, is effectively in the signal path, if seemingly outside it physically, this approach still allows correction signals in the output interface to be kept within the output stage, and not be fed back around the entire amplifier. Then there are error feedforward circuits that attempt to do the same thing.

Alternative approaches like these are neither new nor novel. The interesting Halcro amplifier uses output stage linearisation that does not rely on the application of loop feedback. They isolate stages physically with screening and ensure that each stage can feed the next without difficulty (i.e. the output impedance is appropriate, right across the audio band). They also use a switch-mode power supply to draw current smoothly from the mains, pointing out that in the E.C. this will be soon be mandatory. The point Halcro make, one I agree with, is that every part of an amplifier needs close and serious consideration in the quest for good sound quality.

As Halcro note, the capacitor-input power supply that just about every UK amplifier manufacturer is so unquestioningly happy to use is actually so bad it is to be outlawed! Pulsing the mains supply is pretty

crude thing to do. Those giant reservoir capacitors you sometimes see hyped up as a sign of good sound are in truth the opposite: they're one reason for bad sound. But they are cheap compared to better alternatives. Linn use Switch Mode power, as do Chord Electronics, and Musical Fidelity use a choke in their CR amplifiers that should smooth current draw, but otherwise all is gloom on this front.

Much the same lack of interest exists in the use non-magnetic case materials. Kenwood showed a long time ago that hysteresis effects in steel add detectable distortion, and the Japanese have been copper plating their up-market products ever since. I'm not aware of any UK manufacturer who does this. Aluminium alloy cases are a better alternative and now that aluminium is the same price as steel, all-aluminium amps should appear, but somehow I doubt it. Exceptions are Naim, who have always used all-alloy casework, and Cyrus too.

What else characterises British amplifiers? Toroidal mains transformers, to a very last one. Funny that, because at World Audio Design, where transformer performance is everything, we totally rejected toroidals in favour of quality E/Is. Must be a different planet...

I'm sure solid-state amplifiers could be much, much better than they are today. Rigidly constrained by a simple but effective basic topology and cost cut parts list that, when it does increase, just gets a microprocessor added (doh!), so little imagination is used it's depressing, and the parts are awful. No wonder then that today hi-fi amplifiers all sound much the same - and not so good either. ●

“all-analogue can be sublime, all-digital can be sublime, but it's when you mix the two that the compromises start showing through”



## david price

It may not have escaped your notice that we at *Hi-Fi World* are not pro-digital. For this reason, some manufacturers, who read the magazine less than avidly, have concluded that we are anti-digital. This, as any student of either logic or the English language will tell you, is not correct: one does not follow from the other.

In truth, what we are - and have been - is a vociferous critic of digital. This is because we love music, and we remain unconvinced that it's the only way to listen to it - because it isn't. What digital is, is an easy and convenient and cost-effective way. And a way that, of late, seems to be making serious strides towards being a high fidelity medium to boot.

As any digital audio engineer will tell you - and any fool know, in fact - digital is neither good nor bad. It ain't what you do, it's the way that you do it.

What I'm beginning to see now are various products which are both digital and musical. And that goes for almost everything we've tested in this month's digital special issue. Digital can make music brilliantly, although don't fool yourself that it's perfect, because as soon as you hear a well sorted analogue system, you realise it isn't.

For me, inviting the Meridian DSP7000 active digital loudspeaker system into my living room was something of a leap into the dark. I'm well aware of how well Meridian can [a] do active loudspeakers (I had, briefly, a Meridian 101B IMCOS/M3 active system from the early eighties, which I loved) and [b] CD players (ditto the Meridian MCD Pro, the company's first CD spinner). But I

was nervous as whether I'd like the DSP7000 which is both active and digital.

Well, as it turned out, I was bowled over by it. Now, I'm not saying it's the best sound I've ever heard, but (just as with the TACT power amp), it did some things so damn well that it put almost all analogue to shame.

My overriding conclusion is that, if you use digital as your primary source, there is relatively little logic in not having a digital active loudspeaker system such as the DSP7000. As with anything worthwhile in life, if you're in for a penny, you're in for a pound. By which I mean that a system like the DSP7000 cuts out so many potentially troublesome factors out of the equation, that suddenly it seems ludicrous not to do digital this way.

Of course, it's not truly digital - as there's the small issue of music being analogue, and our human music receptors (i.e. ears) too. So you're going to have to convert to and from the digital domain. The question is where and how; and that's where the DSP7000s make an awful lot of sense.

All that troublesome pre and power amplification via a network of spaghetti-like cabling is eliminated at a stroke: feed the DSP7000s a digital signal and they do all the D-A conversion right where it's needed - right in front of the (analogue) power amps which in turn are right in front of the (analogue) drive units. By contrast, the standard CD player (with D-A convertor onboard), line level preamp, power amp, speaker cables and then passive analogue crossover and then drive units seems needlessly complex. It's kind of like buying

your flat pack IKEA furniture then assembling outside in the car park, before you squeeze it into the car, let alone get it through your house's front door.

The results of doing it the Meridian way are oh-so-obvious when you listen, and then there's graceful convenience and lack of wires, boxes and general hi-fi paraphernalia which I loved when I was twenty one, but can't abide nearly twenty years on...

However, when you put your turntable, Leak Troughline or Nakamichi through them, things aren't as happy. Even with the superb A-D convertors in the 808i CD preamp that Meridian kindly provided for me for the review, you feel you're losing something. It's actually very hard to pin down, and by almost any measure it still sounds superb - but compare it to an all-analogue system (with CD player switched OFF, as all vinylistas should do when listening to LP) and it just doesn't have that effortless, beguiling, other-worldly 'ease' that anyone with a serious analogue source recognises instantly.

My point is this: all-analogue can be sublime, all-digital can be sublime, but it's when you mix the two that the compromises start showing through. Now, there's one counter to this. Simply put, if there's something you don't like about the DSP7000's sound, there's little you can do about it (given the fact that you've set them up properly). However, if you're still running a CD player, amp and speakers, then you can start chopping and changing individual bits to tune the system to your taste. That's the only problem with digital active loudspeaker systems, as far as I can discern. ●

“whereas a Sony Walkman Pro would justifiably be called hi-fi, the same could not be said of an Apple iPod Photo...”



## dominic todd

**A**s I mentioned in last month's column, 2004 proved a phenomenal year of growth for portable MP3. The signs are that, whilst 2005 won't show the 572% increase of last year, it will still be another bumper year for the format...

Yet, there are those within the industry that curse the format for dumbing down hi-fi and for taking attention, and hence sales, away from other hi-fi components. They certainly have a point. Even with a high quality Codec using a high bit rate, MP3 type players never sound as good as uncompressed components. True, you can record onto the portable players via an uncompressed signal, but few do and, in any case, the quality of the built-in DACs and headphone amps' is very poor. Let's face it, whereas a Sony WMD6C Pro Walkman could justifiably be used as a hi-fi component, the same could not really be said of an Apple iPod 60GB Photo, even though, time aligned, they would have cost about the same. Furthermore, with the cost of some players tipping the £400 mark, that's £400 that the hi-fi separates market may have missed out on, as that SACD player goes on hold or, more likely, isn't even registered as a "must have" product in the first place.

Yet, whilst all the above has some truth in it, I can't help but feel that the good outweighs the bad. Let's face facts. Most of the people that are buying portable MP3 players wouldn't have ever bought a hi-fi separates system in the first place. Judging by how many of the ubiquitous white headphones I see on my travels, I should think that there's even a good number who'd never even have bought a personal hi-fi for that matter, either. So, whatever else can be

thrown at the MP3 revolution, that of not introducing more people to music can't be one of them! Surely, generating an interest in music can only be a good thing for the hi-fi industry in general.

As I mentioned last month, there are already accessory companies that have hugely benefited from latest trends. Even the wiser hi-fi companies are becoming involved with companies as diverse as Naim and Bose offering Apple iPod based products of some sort or another. And this, I foresee, is where a good deal of business is going to come from over the coming years, for the more enlightened hi-fi manufacturer. Evidence of this was clear at this year's Bristol show. Those who weren't bemoaning the rise of MP3, were demonstrating, or at least mentioning, new products that will be able to take advantage of the format.

Perhaps, as ever, the 'speaker companies have it the easiest of all. After all, if one was cynical about such matters, you could say that all they need to do is produce a white 'speaker with active amplification and a fancy name, and they've an instant hit on their hands. You only need to look at various Internet sites to see that such products are everywhere but, surprising as it may seem, some of them are actually rather good. For a reader of this magazine I would particularly commend Focal's new iCub. It's fair to say that Focal have a pretty decent reputation for their 'speakers and this iCub does the whole hi-fi meets MP3 generation thing, particularly well. Essentially it's an active sub with three digital amplifiers a DAC, digital and analogue inputs and outputs for the matching Sib satellite 'speakers. At £450 it seems to be perfectly pitched at what Focal call the "iPod generation", and is just the sort

of crossover component other hi-fi manufacturers should be looking at. An opportunity does, however, appear to have been missed by only offering the design in a matt black finish...

Never one to miss an opportunity, Onkyo is leading the MP3 assault from the electronics quarter. Those at the Bristol show may have noticed Onkyo's smart new "33" separates system with RI (Remote Interactive) remote control. What they won't have seen, however, is a soon to be launched iPod docking station that allows this, and most of the other remotes Onkyo have produced in the last ten years, to remote control an iPod as part of a full system. Onkyo have even considered the possibility of incorporating the dock directly into their amplifiers, making it even more convenient for Apple users. Whilst this is great for bringing the worlds of hi-fi and MP3 together, it does rather assume that the market is entirely Apple based which, of course, it's not. Despite this issue, though, this is exactly the sort of integration that hi-fi separate companies need to be looking at. Whilst it isn't realistic to produce docking stations for every MP3 player out there, universal remote controls and built-in USB and Firewire ports can't be beyond the ability of most hi-fi manufacturers.

*Hi-Fi World* has long had the foresight to see the integration of hi-fi and computer audio and to see that the two most certainly are not mutually exclusive. Until recently, it has been the computer industry that has done the gap bridging but at last, and thanks to the success of the portable MP3, we're finally starting to see the hi-fi industry taking a more active interest, too. Linn or Naim portable MP3 player anyone? ●

"the new B&W tweeters shone like a good deed in a naughty world"



# Ijk setright

**T**he fact that I dislike all loudspeakers – with two or three exceptions I hate all loudspeakers – did not stop me from dutifully attending a recent demonstration of B&W's best, laid on by my friendly local dealers. In particular, I was encouraged by them to hear the latest diamond-dome tweeters.

Diamond? Is the hi-fi industry, like the racing-car business and a gunmaker or two who talk glibly but secretly about 'diamond-like coatings', finding new ways to abuse the language and obliterate our distinctions? Yes, it is even so; the material in question is actually a form of pyrolytic carbon – but that fact served to make me feel better about the prospect. I first encountered this material a decade ago, when investigating the work done on artificial heart-valves and other pieces of medical engineering by a subsidiary company of the Fiat Group. It is a story that runs back half a century.

At that time, before the political activists intervened, the world was excited by the prospects of nuclear power as the source of all our industrial energy requirements. In the 1950s the Fiat Group was accordingly taking a very active interest in nuclear power. The scientists then involved were learning to use graphite in large quantities (it was used for moderating or controlling the nuclear reaction within the atomic pile) and in the course of their work they hit upon a means of making normally soft carbon (which is all that graphite is) into something hard.

Very hard. Diamond is also carbon, though in another form which makes it the hardest substance known, with top rating on the elderly and non-linear Mohs scale which classifies all minerals on a hardness scale of 1 to 10. The corunda - things such as ruby, garnet, oxides of alumina, merely one-third as

hard as diamond – rank next with a rating of 9, and even the hearts of commercial recording engineers have never been known to rate higher than 2. But this new form of carbon, which was called pyrolytic carbon, earns a rating of 9.5; and, even after half a century, there is only a handful of outfits in the world who can create it.

Making pyrolytic carbon is a process involving all manner of extremes, notably of temperature and pressure. By about 1990 Fiat had evolved a process for transferring it, once it has been made, atom by atom onto materials that could never stand such heat. In a continuous coating mere tenths of a micron thick, this stuff can be made into coatings that will adhere to all manner of substances such as the filters and stitchings in heart-lung machines, or formed into rigid shells of gossamer weight that are at the heart of the most advanced state-of-the-art heart valves. Such medical applications were given priority because pyrolytic carbon is uncommonly blood-friendly; today, though it is still far from cheap, production has enlarged enough to meet other industrial demands, where other of its many remarkable properties are sought.

Thus, at a premium which only puts the price up by roughly £1,500 (roughly, because at this level there is no point in trying to be precise), it has found its way into the best B&W tweeters. Here the advantages sought were maximal mechanical stiffness and minimal mass, and they have been achieved in a one-inch dome of the most perfectly piston-like behaviour yet encountered in a tweeter of such negligible mass. To back up the 'diamond' marketing hyperbole, a pale and faintly glittery surface has been devised (in a heart valve the stuff looks like polished obsidian), and the general structure of the B&W tweeter lends itself to a drive which

reciprocates this insubstantial but practically undistortable shell with commendable accuracy.

When eventually I was able to listen to some music played through a couple of B&W's best 800-series loudspeakers, proper music (Rachmaninov's *Symphonic Dances*, for instance) on discs that I knew, having the same in my own collection, I noted with approval the blissful fluidity, and the absence of screech and strain, at the very top of the frequency range. B&W claim an upward extension of 5KHz within the 3dB window, and very much more (up into supertweeter altitudes) within 6dB, and I am quite willing to believe them.

It was just a shame that as one paid attention to the frequencies below, the lower one listened the more smudged it all sounded. I suspect that these speakers were not meant for sensitive musicians' ears, which is why my listening came late in the evening's proceedings. Prior to that, a vast array of noise-makers, operating in even more Naim-driven channels than walls have ears, had been engaged in supplying nonsensically loud sound-effects, most of them bearing little relationship to the action, to support a vast and vulgar screenful of film that seemed to concentrate on car crashes. I refuse to subject my ears to such abuse, and was marginally content to hear these absurdities in the next room with the intervening door closed and somebody intelligent from B&W with whom to converse.

It is such a pity, that hi-fi should come to this. Those tweeters shone, however, like a good deed in a naughty world. I can imagine more uses for pyrolytic carbon in hi-fi – in headphones, in turntable and arm bearings, cartridges, maybe even whole arms, and in the loudspeakers that I still hope one day to hear and love. ●



"I really want Dual Disc to succeed - it is the most likely opportunity for the DVD-Audio format to survive, albeit in a watered down variety..."



## patrick cleasby

I am sure that if you have been tracking my musings you will not be surprised to hear that I really want Dual Disc to succeed. It is, after all, the most likely opportunity for the DVD-Audio format to survive, albeit in a frequently watered down variety.

First, the good news. I attended the European Dual Disc launch event which was held in Dolby's London offices in early March. The actual presentation was compered by the CEO of 5.1 Entertainment (Silverline label et al), John Trickett, who strongly put across the message of a successful launch in the States, with a figure of over one million units sold (largely accounted for by the single inventory Dual Disc launch of A Simple Plan's album). John's presentation style was well-briefed and affable, displaying the confidence of someone who later confided privately that, "it's like that feeling of having a hit record on your hands". I have to admit that at the time the vibe did seem very positive, despite some other attendees going rather overboard on the perceived absence of the UK labels (some of whom did materialise later).

The issue of European labels is key here – it is all right for Mr. Trickett to present the concept of Dual Disc as a united front across the major labels and himself, but as I pointed out at the time, while that applies in the States, it may not necessarily apply here. To whit, have there been any non-Silverline European Dual Disc launches announced? No. Trickett said the other labels would announce in their own time. I have been able

to elicit some record company responses, and they are ambivalent at best. Olivier Robert-Murphy at Universal, who looks after new formats as well as DVD-Video told me, "All under evaluation whilst we speak." Regarding the imminent single inventory Dual Disc launch of Bruce Springsteen's new 'Devils And Dust' album in the States a contact at Sony was able to tell me unofficially, "the Dual Disc version will not be released in Europe. Instead, all the content from the Dual Disc will be included on a separate DVD packed with the album. This will include the 5.1 mix." Attempts to get comments from EMI and the BMG side of the Sony BMG axis did not get replies. None of it seems to indicate a passion for the fledgling format which equals Mr. Trickett's. I sincerely hope things improve, and soon...

Secondly, the bad news. I am not going to lose sleep over Sony's decision to not do the single inventory Dolby Digital 5.1 Dual Disc thing for Bruce Springsteen over here, nor the fact that the second true 24/48 MLP NIN Dual Disc seems unlikely to street here too ("As far as we know, there is no set date for the launch of the Dual Disc in Europe"). In fact the UK labels may be being shrewd here, as my testing experience this month leads me to believe that despite very low return figures being cited at the launch, if my experience is anything to go by those figures may well rise.

Also, from the point of view of the audiophile, it concerned me that notwithstanding the fact that all Silverline discs have MLP DVD sides, the potentially high

resolution aspect of the DVD side was strongly downplayed at the launch. As we know, Sony are the fly in the ointment here, not adopting MLP surround DVD sides for their Dual Discs, which are appearing in the States in increasing numbers (Duran Duran's 'Astronaut' in Dolby Digital 5.1 anyone?). It remains to be seen to what extent their coupling with BMG will stifle the early attempts of the latter to do proper DVD-Audio, and MLP Dual Disc, albeit downsampled. But it was only recently, having received David Bowie's 'Reality' and Destiny's Child's new album on US Dual Disc that I realised quite how stupid Sony have been. They have region coded the DVD-Video side as Region 1! Why? To be even vaguely analogous to a DVD-Audio the DVD side should be region free – after all, there is no staggered movie release window issue to attempt to overcome is there? Admittedly there are many ways around this issue, but it is just another sign of lack of thought.

Speaking of which, during this time of Dual Disc deliberations I also won a small personal victory in the field of true DVD-Audio. I learnt from a DTS contact that the 5.1 version of the new Porcupine Tree album was destined to be a CD and DTS DVD-Video dual pack. I couldn't believe my ears, and complained strenuously to label, band and management alike. Thankfully authoring had not been completed and at the time of writing I believe it will see the light as a true 24/48 DVD-Audio. Which just goes to show shouting your mouth off can occasionally be worthwhile... ●

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For more power, we also offer 300B in Push-Pull (PP) form. The 300B PP monobloc shares the same look and chassis as the 300B PSE monobloc. The 300B PP kit has been created for those who prefer a bit more power. With a pair of 300Bs in push-pull configuration providing 26 watts output, they will drive most modern loudspeakers to perfection. Andy Grove's design is totally feedbackless, using a 6AU6 pentode as the input valve and a 5687 as the phase splitter. The power supply uses a Russian 5U4 for rectification. The kit is constructed by hard wiring, so some experience is required. 300B PSE owners do have the option to buy the conversion kit for £250.00 to turn their monoblocs to push-pull status. Each monobloc weighs 23kg.

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Kel84 weighs 10kg. External dimensions with valves are 300mm(w) x 270mm(d) x 150mm(h). Single input version also available at £285.



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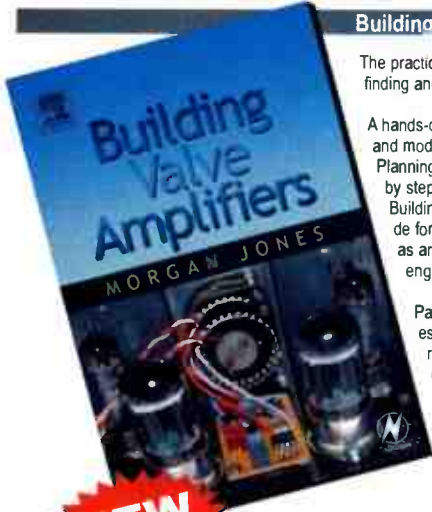
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**£285**

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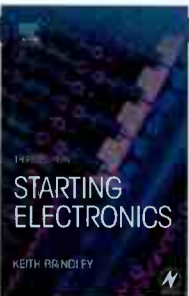


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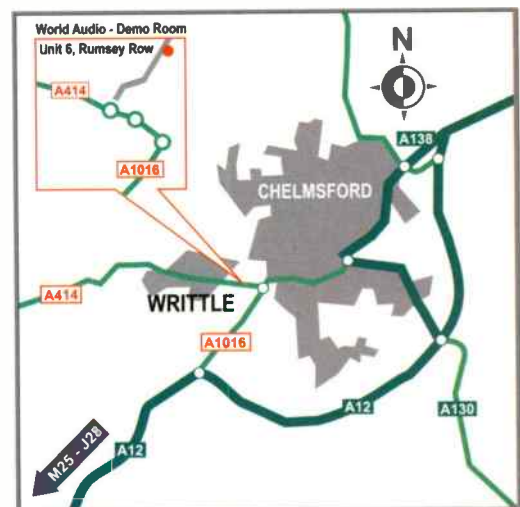
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# diy supplement

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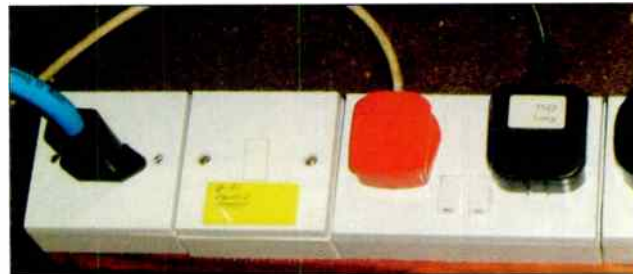
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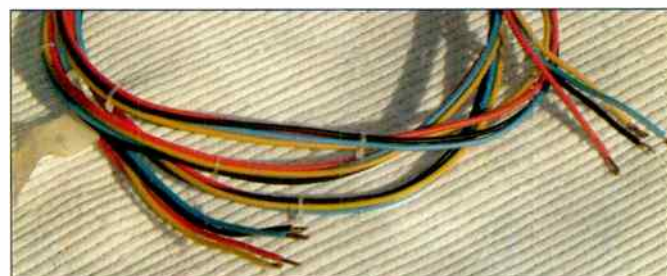
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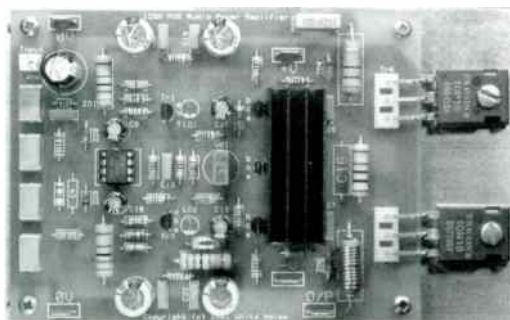
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# DIY Top Tips

BY MIKE BALLANCE

**H**ere's a collection of useful tips for constructors. Essential reading if you're about to embark on a new DIY project. I hope even the more experienced constructors will find something useful on this page.

## METAL

Be careful - metal bites! Clamp your work tightly. If you're drilling you really should use a stand drill. Not everyone has one of these, so if you don't, your choice is between asking a friend who does have one and using a hand drill. The most difficult drill to control is a hand-held electric type. Very popular for making holes in walls, furniture, etc, these are not so easy to hold if the work you're making a hole in is very small. The usual safety advice about thick gloves and goggles cannot be over-stated.

In my experience, the most important thing is to take your time. Actually drilling that hole will probably take a lot less time than the preparation. If you're not experienced in metalwork, it will certainly help to have some scrap to practice with. It's surprisingly easy to make triangular holes in metal and surprisingly difficult to make neat, round holes in exactly the place you marked out so carefully.

## WOOD

Wood is not so scary as metal. The main problem is bits flaking off everywhere as wood is not a uniform material. Chipboard for example has many different wood particles held together by a glue. In fact, that's not as bad as it sounds. Working with plywood has its own problems and long splinters can come away from the wood if you have the wrong type of blade to cut it with.

When you're making speakers, a clean cut is essential, as the edges are where you join the sides to the front, etc. I give up trying to make a neat job and go to the local wood

merchant who has an enormous circular saw. Last time I made some speakers I gave him all the dimensions and returned home with a kit of parts.

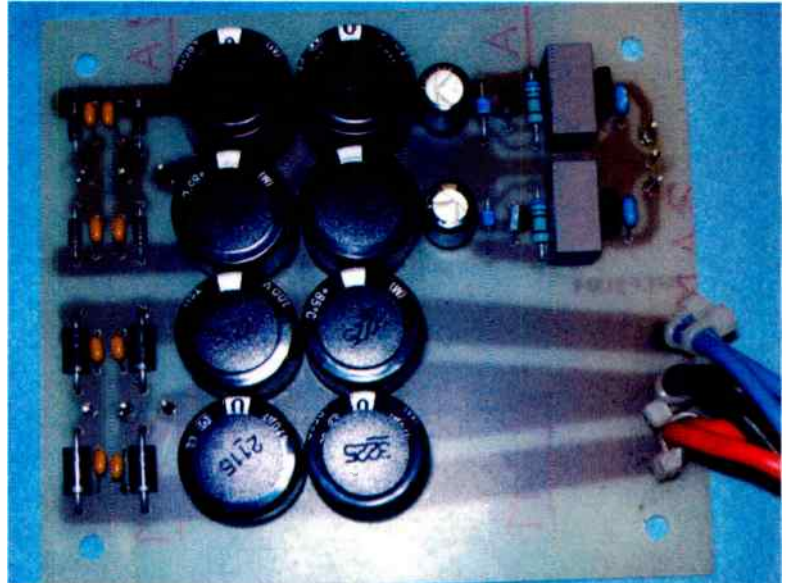
It was still necessary to be careful in fitting the pieces together and holding them at the correct angles while I applied the correct amounts of glue. It was worth it, even though I didn't try to veneer the final boxes. I just wanted to know how they sounded, so I painted them. What an admission!

## TRANSISTORS

Now you've finished making the box, you've got to make the electronics that goes inside. Don't panic if you've not done electronics before. You will certainly need to learn to use a soldering iron. That alone can take time to be sure you have made good quality joints. Strip board with rows of holes used to be very popular and is still excellent for experimental work. But if you're building a circuit that has already been published in this magazine, a printed circuit board is much the smartest way to do it.

The picture shows the power supply to a phono stage I built some years ago. The board contains a split rail supply of 55 volts each for the phono stage - no ICs with that voltage! There's also another supply in case I wanted to add an active stage to it later. On the right you can see the cables that connect to the second PCB with the RIAA equalisation amplifier on it. Each amplifier has its own set of three cables - good design practice.

It was easy to make the PCB from a UV light box, a sheet of copper-clad board and some chemicals to etch away the unwanted copper. All these parts came from Maplin.



## VALVES

Ah - the best bit and I've kept it to the last. Of course valves are the most dangerous of all. First you have to make (or buy!) the metalwork. Then you have to assemble the components, which are admittedly rather larger than usually found in transistor circuits. The problem comes when you try to test it. There's LOTS of volts in valve circuits! If you've only ever played with transistors before attempting a valve design, you're probably quite used to poking your fingers around inside, knowing that the mains is carefully insulated and you can't touch it. Mains? That's only 230 volts - most valve supplies are higher than that! You have been warned!

Another important thing to remember with valves is capacitors. They hold their charge for a surprisingly long time. Does that mean you can switch off, make and drink a cuppa and then assume it's safe to prod around inside? No, it doesn't - you could get a dangerous shock if you touch the wrong bit. Wait half an hour at least and/or fit discharge resistors for your safety.

None of the above should put you off DIY. Just take your time, be methodical, prepare carefully and exercise great caution when cutting wood or metal and again when switching on for the first time.

# Cut that

David Marsh builds a mains filter to clean up the supply to your system...

**N**oise on the mains supply is now common place. It is not the clean sine wave that you might expect but has broadband noise from KHz and well into the GHz region with transient spikes sometimes above 1000V. Computers with switch-mode power supplies, large domestic appliances like cookers and washers and industrial machinery all pollute the mains supply to various

impedance path to earth for any noise on the ring which it is plugged into and act as a local voltage clamping device for spikes. Typical mid priced units are normally feed-through designs that supply the equipment with filtered mains at an output. The high end units also feed the equipment with clean mains like the mid priced units but may also make use of isolation transformers on the output. The very best systems, and as a result the most expensive, re-generate the mains sine wave rather than clean up the source.

Many audiophiles now invest in audio-grade mains cables. These are typically twisted pairs which have some RFI attenuation and are screened to shield the mains conductors from RFI. In fact the use of heavy duty screened mains leads and twisted pairs is common practice in large computer environments and industry running machinery. These audio grade mains cables can be limited on their own without some real mains filtering before them. The reason why is that you are plugging in your 1m audio grade mains lead into a regular wall socket. Are you considering what is behind that socket? Your house or building is full of twin and earth grey mains cable. This is a standard, not 'high grade audio', copper cable which is buried beneath the plaster in the walls and under floor boards and pretty much covers your entire house in a loop and acts like a giant aerial. Now a few inches of plaster and wood are not going to stop noise getting into this aerial from various sources. Noise generated inside the building directly onto the conductors, noise from other sources on the same ring and RFI noise again from inside and outside will all be 'received' by this aerial. This is not even taking into the consideration the many miles of mains cable in your area and in other buildings nearby on the same phase of the mains before your local sub-station. Noise should be removed just before audio-grade mains cables are used by a mains filter circuit. The filter acts as a barrier between the circuit

of your house and that of your Hi-Fi system.

## SOME THEORY

Noise is classified into two types depending on the conduction mode. The first type is differential noise (Figure 1) which is conducted on the supply line and the return line in opposite directions to each other. The second type is common mode noise (Figure 2) which is conducted on all lines in the same direction. The arrows in the diagrams show the noise path, along with the methods normally used to suppress it. A good mains filter design should use a combination of methods to eliminate noise. X-Class capacitors are normally connected across live and neutral to suppress differential mode noise. Y-Class capacitors are connected between live to earth and neutral to earth to remove common mode noise. To prevent high voltage spikes from entering equipment at least one varistor is required at the input of the filter. Chokes can also be used to form PI type networks along with the X and Y-Class capacitors of the filter for much better noise rejection.

## A DIY FILTER

Figure 3 shows a dual stage mains filter circuit using X and Y class capacitors with common mode chokes in PI configuration. X-Class capacitors are specially designed to be connected across the mains supply and Y-Class between the supply lines and earth. Y-Class types are double insulated. The choke has its two coils wound in opposite directions so noise is cancelled out. The resistor at the end in the circuit discharges the capacitors when the unit is switched off. The parts are available from suppliers like RS Components and Farnell. The capacitors and varistors should also be available from Maplin. It is possible to wind the chokes yourself on a ferrite core of about 30-40mm diameter using enamelled copper wire but the chokes recommended are potted and very well made, making the construction easier.

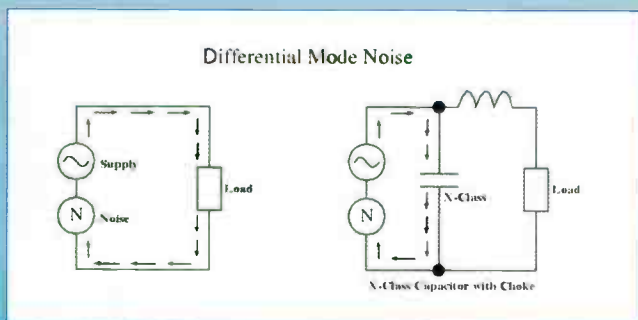


Figure 1. Differential mode noise.

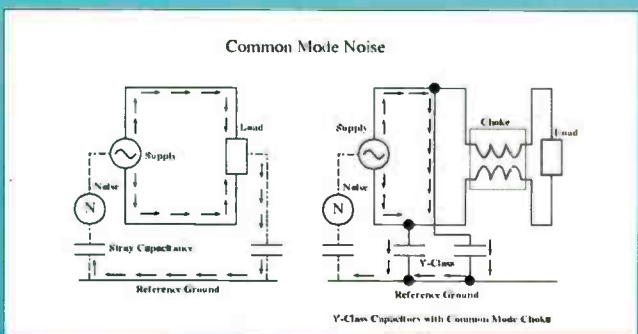


Figure 2. Common mode noise.

degrees. They generate noise when running and are capable of producing very high voltage spikes at switch-on and switch-off. This does not make an ideal supply for any high quality audio or video system. Such noise can get through the power supply section in even the most well designed piece of equipment and end up in the 'heart' of it and affect its performance. High voltage spikes can also damage the unit over time.

Audio mains filters on the market range from about £35 upwards. You can expect to pay £35 for a very simple plug in box that is placed near the noise source but does not feed the equipment. These provide a low

# Noise!

## AN EASIER DIY ROUTE

You could go ahead and build this circuit on tag strip for example and mount it inside a case as shown in Figure 5 but there is another way to make this. RS and Farnell sell a number of self contained industrial chassis based RFI filter units. These filter boxes vary in cost from about £12 for a single stage design. The intended market is for industrial applications but they work extremely well as an audio mains filter. The types do vary and some are more expensive since they feature slightly more complex circuits and sometimes an earth line choke.

The chassis filter recommended for this project is made by Roxburgh (Model RES5). It is a single stage filter but is very inexpensive and features a large common mode choke compared to other chassis filters at the price. Being single stage you need to purchase 2 and place them in series to complete a dual stage filter. You will also need to solder 1 or 2 varistors at the input tags of the first filter. By mounting these filters in a case and feeding mains in and taking clean mains out, the work needed to build a DIY filter is drastically reduced. The other advantage of these filters is that they are in metal cases and so are fully screened once the earth tag is connected. The cost should be no more than taking the full DIY route if you include the cost of buying a separate quality common mode choke. Figure 4 shows the chassis filter current rating to suit your own setup. The 8 amp version is a good choice that will cater for 99% of systems giving plenty of headroom. The Roxburgh filters are available from 3 amp rating upwards. My own uses the 5 amp (5mH choke) version from RS and this powers a CD player, tube pre-amp, two 300B mono-block tube power amps and a tuner for example.

All the earths should be connected together. That is, the earth of the mains lead input, the earth tags on the chassis filter boxes and the earth at the mains output. The

easy way to do this is to use a star earth point. By using a screw and nut with some solder tags create a point inside your case where all the earth wires connect. If you are using a metal case then this is most important, making sure the case itself is earthed. If you are using a plastic case then you may common all the earths at the earth solder tag on the first filter block.

You can mount the chassis filters in a standard plastic ABS case from RS or Maplin or go for a higher quality instrument case. You could cut a hole in your case to mount a single, dual or triple wall type mains socket which does look very professional. However, the easiest method is to purchase a standard multi-way trailing socket and connect this as the output from your filter box as shown in Figure 5. If the multi-way has a long enough mains lead at the input you can cut this in half so the plug end will form the input lead to your filter and the remaining socket end the output. This saves buying extra mains flex and a plug.

## SOUND QUALITY

Whichever method of build you choose, the full DIY or the easy DIY route, the general improvements are that the music sounds much cleaner and smoother, especially the top end extending down into the upper mid band. Typical feedback from those who have built this are that stereo imagery is more solid and focused, the whole sound is more musical, natural sounding and easier on the ear. Low level detail is improved making it easy to pick out background information which was previously masked.

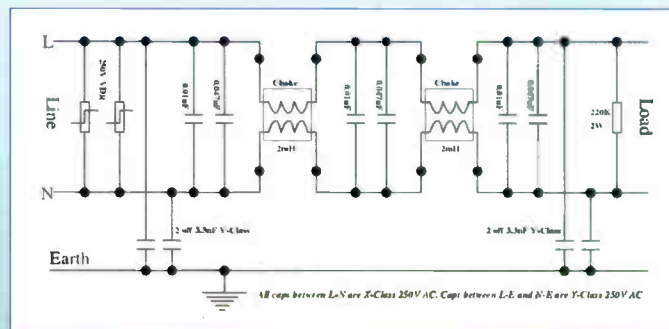


Figure 3. Full DIY circuit.

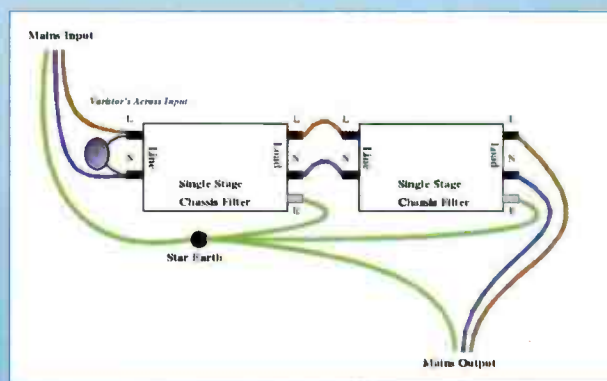


Figure 4. Chassis filter layout.

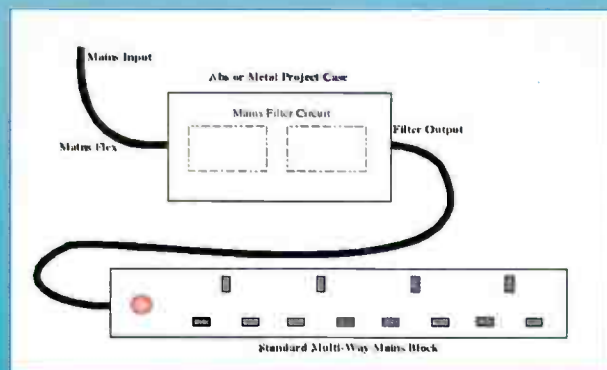


Figure 5. Case layout.

## PARTS LIST

### Full DIY Build Parts List

- RS 441-9521 Capacitor X1 Class 0.01µF (10 in pack)
- RS 441-9537 Capacitor X1 Class 0.047µF (10 in pack)
- RS 441-5892 Capacitor Y Class 0.0033µF (10 in pack)
- RS 188-9040 Roxburgh C210 10A Potted Common Mode Choke (Order 2) (Farnell 552896)
- RS 214-2263 2W Power Oxide Resistors, 220K (10 in pack)
- Tag Strip for Circuit Assembly (Vero-Strip is not ideal due to current demand)

### EASY DIY BUILD PARTS LIST

- RS 386-4065 Roxburgh 8A RES Chassis Mount Filters (Order 2) (Farnell 137212)
- (Note : Farnell do not stock the Roxburgh Filter under 8A)

### PARTS LIST COMMON TO BOTH METHOODS

- RS 238-621 Varistor 275V RMS AC 61J Clamping Energy (5 in pack)
- Varistors are also available from Triode Systems, see [www.triode-systems.com/shop/](http://www.triode-systems.com/shop/)
- RS 186-7848 M4/3BA Solder Tags for Star Earth (if using a metal case)
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EZ80	MULLARD	5.00	ECC82/M8136	MULLARD	17.50	7308	SYL	5.00
GZ33/37	MULLARD	25.00	ECC83/CV4004	MULLARD	40.00			
GZ32	MULLARD	25.00						
5Z4G	BRIMAR	7.50	AMERICAN TYPES			E88CC	TESLA	4.00
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# the cable run

You can make your own amplifiers, so here we show you how to make your own cables from a kit, or by buying the cable and plugs to suit your requirements. Mike Ballance gets out his soldering iron.

I have assembled a collection of cables to play with and been busy with my soldering iron. Making your own cables is easier than making a valve amp. No chance of catching a nasty shock from that big capacitor that stored its charge for longer than you thought it would... In fact all you need is a soldering iron and a source of hot air. You'll need more of that than you will find in the editorial offices, in fact a special hot-air gun is best. Failing that, I have been known to use a hair dryer and even the tip of a soldering iron. These last two will not make such a neat job and the hot air gun is so useful to have.

## CABLE SELECTION

The plan is to make up some cables that come in kit form from The Missing Link and also assemble some cables by getting the parts separately. For this part I chose some Musiflex cables from Connectronics with Eichmann Bullet plugs, also used in the Missing Link kits. Finally, some cable and plugs from Maplin were included to make this a fairly all-encompassing test.

## CONSTRUCTION OF THE MISSING LINK CABLES

The Silver Surfer cables were each 1m long. The instructions are very detailed and it is important that they

are read through completely before you start. If you've not used a soldering iron before take note that you can burn yourself if you pick up the wrong end, as I did once many years ago while at school. You will only do that once! Stripping the outer sleeve is a fiddly job. If your grip is not strong enough, you will tear the outer rather than strip it. But grip too

hard and you will pull off some of the outer screen, as I admit I did.

Soldering the supplied Neutrik plugs with the supplied silver solder was the easiest phono cable job I have ever done. I was surprised at the large diameter of the heat-shrink cable, but it had no trouble going small enough to make a tight fit, both on the cables and on the plugs.

The Alaquia cable is described as a pseudo balanced cable and I must take issue with this. A balanced cable is one used in professional audio. There are two conductors and a

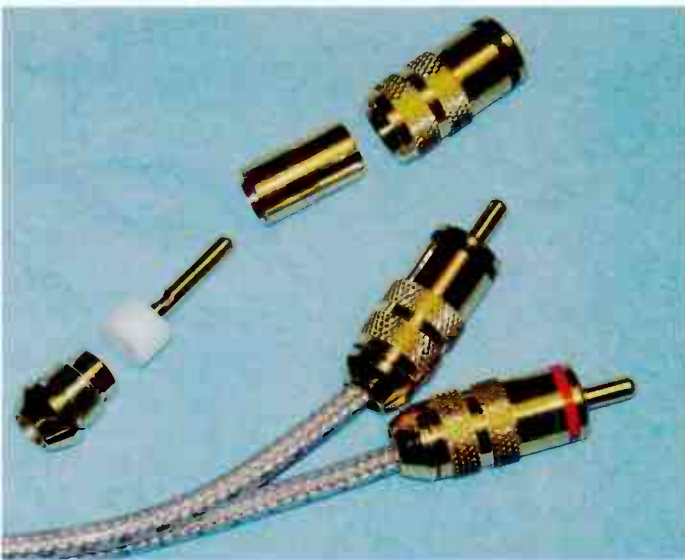


Assembled pairs of Missing Link cables.

separate screen. The connector plugs (usually XLR type) have three pins. There is, however, an engineering advantage to having two equal conductors, one for the signal and one for the return and this is what the Alaquia cable has. With this type of construction, the signal and return cables are exactly the same type with the same physical characteristics. This makes for a better cable than a single-core which uses the screen as a return. It is better to have a two-core cable, but it still needs to be screened, hence this style of construction. It is essential that the screen is connected at only one end and this is well explained in the instructions. However, they fail to mention that the screen must be connected to the 'sending' end - the CD player or pre-amp output, for example. Once completed, I marked my cables for directionality. Some commercial cables are thus marked and this is very probably because the cables have a similar two-conductor and screen construction. The Missing Link cables are also available in DCT form. The company uses 195below to freeze their cables for customers. The Missing Link are very happy to



Braided Maplin cable and gold plugs.



Maplin cable assembled.



Shark cable and plugs.



Superior shielding on the Shark cable.

freeze your own cables of any manufacture at the 195below facility.

**MUSIFLEX CABLE**

Musiflex cable has been around for many years, although not always in exactly the same form as the present construction. This is another two-core cable with an overall bare copper screen. In this case the screen is a semiconductor material. As this would be impossible to solder, a thin bare wire, known as a 'drain' lies alongside the two cores. Being bare, it is in permanent contact with the screen along the length of the cable and is also easy to solder.

This cable is used professionally to carry microphone and other balanced signals, but here was used as a two-conductor cable, with the screen connected to the return conductor at the sending end only - same as for the Missing Link Alaquia cable described above. For some reason the conductors are yellow and black. For me, the black was the obvious 'return' conductor, but why could they not be red and blue, or red and white?

Musiflex was by far the easiest cable to work with in this comparison. A pair of wire strippers will easily pull off the outer brown covering, together with the semiconducting screen, which is in effect, part of the outer cover. Next strip off a few millimeters each of the black and yellow inner conductors. As with the Alaquia, twist the stripped black cable with the copper screen at the sending end only. At the other end, cut the screen right back, making sure that no loose strands escape and can cause a short at the plug.

The Missing Link instructions apply to all cable construction, especially when they ask the constructor to check, and check again, that there are no loose strands of the screen. A short circuit here could damage the output stage of a CD player, preamplifier, or whatever, so be careful!

**MAPLIN PLUGS AND CABLES**

These cables are both twin figure-eight style, i.e. left and right channels of a stereo pair are laid side by side. Each cable is a well-screened single conductor. One cable, Maplin ref XS93 has a transparent sleeve, one for each channel, over a screen that appears to be an interesting mixture of tinned copper and untinned copper. Channel identification is by a series of + signs along one of the cables.

The other, made for Maplin by Shark is their Maplin ref XS39. This

one has a blue outer sleeve and a superb screen construction inside it. There is a high density copper braid covering another thin foil shield over the centre conductor - very comprehensive screening! Identification is by the colour of the centre conductors, one is red and the other white. Curiously, between the two channels there is a drain wire which could be connected to an earth point, for example on a preamp there is often a point for connecting the screen of a record deck cable.

I used Maplin connectors for these cables, JZ09 (black) and JZ10 (red) for the smaller cable and the blue pair AQ56 for the larger diameter blue cables. Both of these cables were difficult to connect. Preparing the outer screens was very time consuming. The JZ09/10 plugs can be connected without soldering, by a push action, so long as you strip off exactly the correct amount of sleeve and screen. I was easier to solder them, I found. The blue Shark connectors were much better, being very similar to the Neutrik plugs supplied by The Missing Link.

For ease of use, I would recommend the Musiflex cable with either Neutrik or Shark plugs, but if you are a patient constructor, and take care over the many strands of copper in the shields of the other cables, you will get good results.

**SOUND QUALITY**

This article is about construction rather than sound quality, but that didn't stop this curious reviewer from trying out these cables. Using PMC OBI's at the front and the smaller DBI+ at the rear, I connected various sources, CD players, DVD (audio) player and a WAD KLPP-1 phono stage as well. These were all connected in turn to a NAD T742 receiver which I have configured for four speakers (centre and sub-woofer channels are sent equally to the front pair). I hope the editor isn't in a hurry for the return of his KLPP-1 phono stage.

I have to say the effects of the different cables are subtle. It is very much a case of you get what you pay for. However, as always the case with DIY you get a lot more if you make it yourself! Starting with the cheap and nasty interconnects provided for free with most hi-fi items, it was immediately clear that absolutely anything sounded a whole lot better! In my brief tests, the difference between the Maplin combination and the Musiflex was small. Both produced a more open sound. In

stereo mode with the rear speakers not in use the sound stage seemed wider. It almost goes without saying that the background seemed quieter. The natural place for the volume control was higher, so more 'clean' power gave the sense of moving closer to the musicians. It was in this area of quietness that the Musiflex cables excelled the Maplin offerings. This is to be expected as the Musiflex were provided as DCT cables - they had been cooled to a very low temperature by the Deep Cryogenic Treatment process, which is becoming very popular for all sorts of items. I've heard that valves are being frozen, too...

Best of all these cables was definitely those from The Missing Link. To be fair, these were quite short cables and required me to move some of my kit around to enable them to reach the connectors. The Maplin and Musiflex cables were cut to greater lengths which might have made a difference. After all, if cable length could be reduced to zero, the effects - good or bad - contributed by a cable would also be reduced to zero. I'm sure that the shorter your cables the better they will sound. At least that is true if you want cables that don't introduce noise or distortion due to acting as aerials for radio signals. And I don't just mean 'radio', I am including here the very high voltage nasty spikes that float around from things being switched on and off (fridges, microwave ovens, even passing vehicles). A good cable will screen these out, resulting in a perceived lower noise, compared with a poorer cable with less adequate screening.

This is certainly what seemed to be happening with these cables. As well as a better sound stage, the Missing Link cables also appeared to produce a cleaner, less distorted sound with deep and powerful bass and very smooth treble that you could listen to for ages without tiring. Mind you,

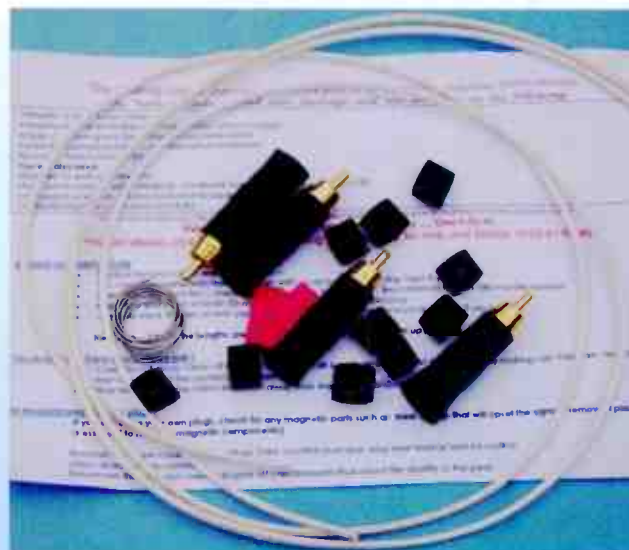
these effects are minimal. A valve amp would have a much bigger sound quality difference - but at a cost of many hundred pounds, you would expect more improvement than just changing the cables!

From an engineering viewpoint I do have a slight problem with the Eichmann Bullet plugs. Yes, they're very popular and well loved, but the earth contact is tiny. Only a minuscule area of metal is in contact with the phono socket. The Neutrik plugs supplied with the Missing Link Silver Surfer kit impress me far more. They have the usual full circle of contact. Even better, the plugs have small slits along the earth contact, which give a good tight connection. The Maplin plugs have a similar arrangement, with the slits at an angle, very much like the Monster plugs, which are my favourite from an engineering point of view.

Do plugs make a sound quality difference, just on their own? Would the Silver Surfer cable sound any different if I replaced the Neutrik plugs with Eichmann? That's the subject of an in-depth article to be written by someone else. If there is a difference it will surely be very small.

### CONCLUSION

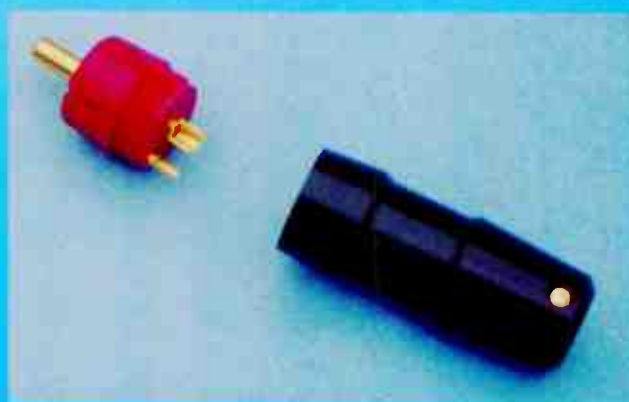
It's horses for courses. If you don't have a branch of Maplin near you, get your cable and connectors from their website. CPC will sell you a reel of Musiflex cable, which is probably rather more than anyone would need. However, Connectronics will sell you shorter lengths. But for the best sound from a home-made, and thus money-saving, cable setup, why not measure up the exact lengths you need for each type of connection you have, CD to amp, amp to speakers, etc, and ask the helpful people at The Missing Link to quote for your choice of cable and connector. You probably can't do better than that - unless you ask them for the additional cost of DCT cable!



Missing Link Silver Surfer cable.



Missing Link Alaqaia cable.



Eichmann Bullet plug.



Musiflex cable from Connectronics.

The Missing Link are 4 Farwells Close, Old Basford, Nottingham NG6 0GJ.

Te 01158 770 089 07967 859 333.

Write to them at the [missing.link@ntlworld.com](mailto:missing.link@ntlworld.com) or visit them at [www.the-missing-link.net](http://www.the-missing-link.net) on the web.

Maplin is at [www.maplin.co.uk](http://www.maplin.co.uk) or you can place an order by calling 0870 295 000.

195below have a website at [www.195below.com](http://www.195below.com) but they do ask that you make contact via The Missing Link if you want cables frozen by them.

Connectronics products can be obtained from CPC at [www.cpc.co.uk](http://www.cpc.co.uk) or call them on 08701 202 530. Alternatively, Connectronics are at [www.connectronics.co.uk](http://www.connectronics.co.uk) or 07000 422 253

# BUILDING VALVE AMPLIFIERS

BY MORGAN JONES

REVIEWED BY MIKE BALLANCE

In the last Supplement, April 2004, I looked at Morgan Jones' book entitled 'Valve Amplifiers'. That's the first book you will need to get going with your own designs. Full of theory presented in a very easy to understand form, the book stops at the point where having got your design, you now need to start the construction.

That's where this new book comes in. To quote from the Preface, "However, the author assumes that you are holding this book because you want to know how to build a valve amplifier that is significantly better than you could afford for the same price ready-made." Enough said. That's what our *Hi-Fi World* Supplement is all about, is it not?

The book comes in two parts, Construction and Testing. Naturally, the first chapter is all about planning. There's a lot to remember before you start cutting and drilling that metal chassis. Where should you put the holes for the valves? It's not a good idea to have them too close to each other, partly because there will not be enough space underneath for all the components and partly for reasons of heat given off.

On the other hand, if the valves are spaced too far apart, there will be long wires joining everything together and bearing in mind the very high impedances present in valve circuitry, a good chance of picking up Radio Moscow or even worse, oscillation - guaranteed to test your tweeters to beyond destruction at switch-on.

Chapter Two is concerned with metalwork and there is a great deal about safety. Yes, I too have suffered from the effects of letting go of the metal and the dismay as it rotates at the speed of the drill until you can stop it. Take great care with the metalwork. The extra time this takes will result not only in greater safety but also in a smarter end product.

Different types of layout are considered and these include neat rows of components on a tag strip, direct connection of at least the smaller components to the valve bases and even printed circuit boards.

Morgan Jones does say you should never use PCB tracks for the heaters. The current is too great and you can't twist pairs of tracks together on a PCB. They also get in the way of the audio tracks. Not only is the current higher than I would consider wise on a PCB, but also remember the voltages in use, and the high impedances as well.

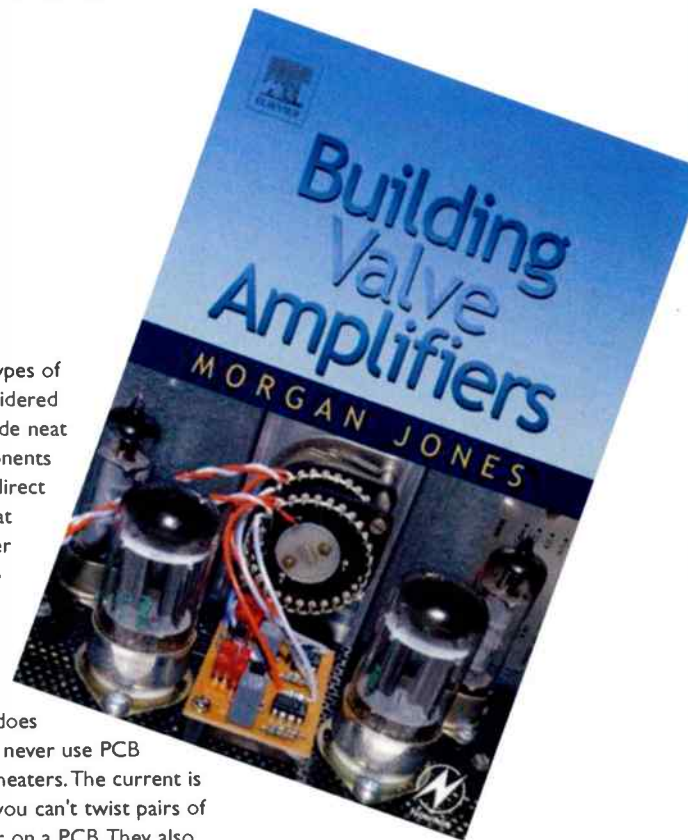
The second part of the book, Testing, starts off with a very useful description of measuring instruments and how to use them properly. There is a lot here about moving coil meters and oscilloscopes. Perhaps more than is really needed to use them, but you'll learn a lot anyway! There's a good description of some of the additional features found in the better 'scopes, like delayed time base operation.

Functionality and fault finding for when it doesn't work first time follow a list of essential points to check before switching on. The author admits to still being nervous at the moment of switch-on for the first time. Has everything really been considered? With valve amplifiers, the designer still tends to stand well back and expect smoke, perhaps more than the transistor amplifier designer. There's a good description of the different types of smell that damaged or destroyed components produce!

If it doesn't work, did it once work? If so, and it's an old amplifier, chances are a resistor has gone high value or a capacitor (condenser as

they used to call them...) has gone leaky. It's a well to use a Variac if you have one (a big knob atop a transformer that varies the mains voltage from zero to a little above normal). Capacitors that have not been used for a long time need to be re-introduced to the idea of electricity gradually. Of course, if your brand-new circuit refuses to work, it's not likely to be ageing in components, just look for an incorrect component value, or one soldered to the wrong place. The colour codes used on resistors can be confusing as there are several different colour codes in use. If you're not sure, measure your resistors before soldering them in place.

This most useful book concludes with information about measuring the distortion of a completed amplifier. A good read and recommended for those who have a sketched out circuit diagram they now want to convert into a real amplifier.



**BUILDING VALVE AMPLIFIERS BY MORGAN JONES.**  
Published by Newnes, Elsevier.  
First edition 2004.  
ISBN 07506 56956  
Available from WAD.



# the mains thing

Albert Lee builds a budget mains distribution unit...

Imagine a 10-way socket with its own isolating switch, equipped with an IEC socket for the main input. I can almost hear the weeping of frustration, "But professional 10-way sockets cost up to one hundred pounds!" With *Hi-Fi World*, we can build one for less than thirty!

## WHAT WE NEED

We first need a base, which measures 108 mm by 940mm. I used shuttering plywood, which is one inch in thickness and takes hours to rub down to a smooth surface. The cost is usually less than two or three pounds. I recommend 18mm hardwood ply, as it is easier to mount the sockets, due to the relative thickness of the timber.

Next, we need five double 13-amp sockets, either switched or unswitched. These can be bought for as little as two pounds each. To support these we also need five double patresses. Mine cost me less than a pound each!

We also need two single patresses, at 50p each, one for a single blanking plate and one for an isolating switch. I always buy double pole switches as the action of the switch completely removes the equipment from the mains supply when it is switched off. A neon indicator would be useful for checking if 240 volts are present. The switch cost six pounds. The next component to purchase is a chassis IEC socket from suppliers like Maplin. Finally we need some cable to wire the sockets together. I use a 2.5mm PTFE sheathed cable for jobs like this. Don't use solid core cable. Multi-strand is the way to go. All this cost me less than twenty-two pounds! Remember this does not include screws to locate the patresses, so you will need these and finally some heat shrink tubing of 3mm in diameter.

## BUILDING IT

The first step is to mark the socket positions on the timber board. Use masking tape, which we apply to the

top edge and the left-hand side. Next mark a line 10mm from the top and 10mm from the side. This is the guideline to position the sockets, so make sure that you can see this line on the bench.

After we have decided on the layout we can make some holes in the patresses to lead the cable through. Now we mount the patresses to the supporting board. With a 2mm drill bit, make three pilot holes through the first patress guide holes into the base. Repeat for the other patresses. Remove the masking tape and screw the patresses firmly into place.

We use a blanking plate to fit the IEC chassis socket. Place a couple of strips of masking tape vertically with the blanking plate holes to the left and the right of the masking tape. Next we mark with a ball pen the size and position of the holes. The square hole measures 29mm by 20mm. I found that the socket is best mounted slightly below the centre of the panel, so that the panel has a great deal more strength. We now cut four holes at the corners of the marked hole. These are aided if we cut pilot holes first and then cut the main holes, which should be 7mm in diameter. Remember to don goggles or put your glasses on! When we have cut the holes we can now cut the sides and the top of the hole. I used a jigsaw, but it would be a great deal safer if we can use a fine keyhole saw and warding files to finish the work with. Now we can mount the IEC socket into the hole, and using pilot drill and then a 4mm drill bit we can cut the retaining holes.

## HOW TO WIRE IT

Now that I have warned you about the imminent end of your life we can continue. We now need to solder the sockets up. First cut each cable to the required length. Put red heatshrink over the cables to be connected to the Live terminals marked "L", blue or black over the cables to be connected to the Neutral terminals marked "N" and



Professional looking, but home made!

green/yellow heatshrink over those to be connected to the earth terminals marked "E" or with a ground symbol. Then remove 10mm of insulation from the ends of each cable. Make an additional earth lead for the ground post inside each patress. We can now screw the socket tops and switch down to the patresses with the supplied screws. At the end of the job we should have a rather large socket block which looks almost industrial. Congratulations we have made a ten way switched socket array, for less than twenty-two of our British Pounds!

## HOW DOES THIS AFFECT THE SOUND?

I used a standard IEC mains interconnect at first to check whether this mains block really was an improvement over a conventional four way strip. It certainly works very well, and the sound quality has definitely been improved. Stereo imaging is firmer with more bass delivery both in weight and depth. Surprisingly the treble also improved to the point of allowing me to listen for hours to pre 1950s recordings with no listening fatigue! A very worthwhile improvement, so sharpen your tools and get building!



Blanking plate marked for IEC socket.



IEC socket fitted.

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## Letter of the Month

### A BIT OF WHAT YOU FANCY

A correspondent a few issues back seemed to be chasing his tail trying to get the best sound from his equipment. The suggested incremental upgrade approach, cautiously changing one item at a time, is obviously the correct one - if only to avoid early bankruptcy - but I would like to suggest a further possibility which has served me well over the years. Once you have found a piece of equipment whose sound you feel comfortable with, why change it, why not just improve it? It doesn't have to be complicated either.

Many years ago Deflex panels in a pair of Monitor Audio speakers had a highly beneficial effect on tightening up the focus; likewise substituting a decent cable for the flimsy wiring inside a pair of Mission 751s.

Most recently I acquired a Cambridge Audio 640C, the intention being to replace a 'dead' CD player in the study. I tried it with my main system and was so impressed with the dynamic sound - your initial review was spot-on - that I left it in the system as a temporary measure. My amps by the way are an Audiolab 8000C and 8000Ps - yes I know you don't like them! - but I've run different Audiolabs for years and am quite happy with the detailed analytical sound they produce; the build quality is also excellent. So sad that the Tag-McLaren takeover destroyed the market for a great company's products by pricing its traditional customer base out of the market.

Anyway, having saved up hard earned cash to buy a more suitable 'higher-end' player, I thought long and hard about choices. It then struck me that I really liked the basic sound of the Cambridge player and the fact that, despite its price, it is a really elegant piece of kit - the remote alone puts many £1,000 players to shame. What I wanted was a deeper soundstage and a more-detailed mid-band. So I decided to contact Colin Thorogood, CPT Acoustics about fitting a Trichord 4 clock and asking about other possible mods., given my budget. A week later, for a relatively modest extra outlay, in addition to the clock, and with mods to IV buffer, analogue filter and output

stages, I had a machine which sounds better - to my and other ears at least, than machines I have heard costing sometimes two and three times the price of the modified machine. The deep soundstage, mid-range and the level of detail released are such that you lose yourself totally in the music and the equipment becomes transparent, dare I say it nearly analogue!

Which neatly brings me to my other point, a contribution to the CD/Vinyl debate. On the vinyl front I have a well-fettled Michell GyroDec SE with Ortofon M25L cartridge, to play a large record and CD collection, classical and pop/rock, assembled over many years. The assumption made that analogue is good, CD equals bad in A-B comparisons strikes me as oversimplified and sometimes simply wrong. Whilst many of the records in my collection - especially well-recorded pop/rock material, undoubtedly do sound better - there are others where the poor-quality mastering or especially pressing quality from the 70's and 80's leave the CD way out in front.

This seems to apply particularly to classical recordings. It must not be forgotten, that classical music collectors were early adopters of the CD medium, because of the lack of background noise and pops and clicks which appeared despite the most careful of handling, even if the records were well presented in the first place, which they often weren't. I recall in the 70's, taking three copies of an opera back to the shop before I could get satisfactory one.

Recently with a musical friend, I spent a happy afternoon, listening to classical CDs and the analogue originals. The results were interesting and sometimes surprising. A comparison of the Solti Ring - the opening of die Walkre - the ultimate classical test for

system bass, produced a win for the analogue, but the CD was not far behind - the cellos and double-basses were just as deep but the sound on analogue was more 'truthful' and coherent.

However, many of the classical recordings we heard were disappointing on vinyl, and above all the most recent CD remasterings of older recordings, for instance in the HMV Great Recordings of the Century series and similar from DG and Phillips, do an infinitely better job of encompassing the dynamic range and delicacy of the recording than the analogue original - listen to 'soave il vento' from The 1963 HMV Cosi fan tutte by Karl Bohm - if the hairs on the back of your neck do not stand on end, you have no soul - likewise the remastering of the famous Barbarolli Tallis Fantasia from the same era produced a win for the latest CD. Listen to Beecham's L'Arlesienne suite, and you cannot believe it dates from 1957.

These older recordings often had a very simple microphone set-up and lend themselves well to sympathetic remastering - in their latest guise they are also a distinct improvement on the first CD versions issued in the 80s and on the vinyl. It strikes me that the comparison that is often made is a theoretical one: given a well-recorded and well-pressed record, it will sound better than a CD. This ignores the reality, especially for classical music pressings - and I don't think I'm the only one who has doubts as to the capacity of analogue pressings to cope with the dynamic range required for these.

**James Whelan  
Wirral**

Thanks for that James. Your experiences tuning the Cambridge CD player are fascinating.



modded Cambridge Audio 640C runs LP ragged?

I have in the past bought many duplicate copies of both CD and LP for direct comparison and agree with your views: CD can be better than LP. The argument is a little hypothetical, perhaps driven by the experience of just how good vinyl can sound when everything is right, which for me means a 12in single on a Garrard 401. Dynamite! However, for much of the time, in normal life as it were, the CD can be clearer and more detailed, if also a tad hard and sterile. Personally, I suspect we have much better to come when 24/192 gets up a head of steam, but it's all agonisingly slow at present, studios having become fixated with surround-sound mastering it seems. When front-end 24/192 analogue-to-digital converters become common in the recording business then I believe we will start to hear intricately detailed digital recordings that will demonstrate the drawbacks of both LP and the early digital of CD. Until then, either can sound best, but of course CDs possess the great advantage that they fly better when used as Frisbees. **NK**

Hi James – couldn't agree more. Of course it's far too simplistic to simply assert that 'LP is better than CD, period'. Its overriding virtue is the fact that it's analogue, and therefore not a lowish, fixed resolution digital format that slices music up and then has to glue it back together again on the fly. However, despite what I regard to be the theoretical superiority of analogue over digital, LP suffers all sorts of practical compromises that CD is pretty much immune to – simply because by converting things to the digital domain you can get a grip and eliminate them consistently. The LP cutting process, of both the lacquer and the discs themselves is immensely prone to problems, and has to be done by someone who's as much a craftsman as an engineer; it truly is an art, and any compromises here (due to cost, time or lack of expertise) will torpedo the LP's chance of outperforming CD, as evinced by those tragic nineteen seventies pressings you mention. Then there's the small matter of vinyl transportation, storage, playback (several 'War and Peace'-worths of stuff to write here) and system matching. Still, despite all the hassle, in my experience - buy a copy of Fleetwood Mac's 'Rumours' (original seventies pressing) from a junk shop for 50p, give it a slosh of isopropyl alcohol and distilled water

– and it beats the bits off the latest 24/96 hi res DVD-Audio pressing... **DP**

### NO REGRETS

*I have no wish to be controversial, but I started my modest adventures with recorded sound in the late 60s. With names like Garrard SP25, Leak Stereo 30 and Wharfedale Linton. Continually improving in small steps I eventually ran a CD player, in parallel with a modest Moving Coil cartridge analogue set-up, which I abandoned three years ago.*

*Does anyone now remember the downside of buying new mass-market LPs in the 1960s-90s? That is, the number of new discs that had to be rejected in the shop or returned as badly pressed, warped, out of centre, with damaged labels and with surface noise. On many occasions I had bought records whilst traveling, and returned home to find that the discs had faults that could not be detected at the point of sale. On one occasion I bought a sealed double album at a shop 30 miles away from home and found I had bought sides 1 & 2 and sides 1 & 2. These were not cheap products in their time.*

*Yes, vinyl sounds different and for those that like tinkering with turntables, and the rituals of vinyl it is very satisfying. But!*

*I now have over 600 CDs, bought over twenty one years. One was replaced after several years of ownership because of the dreaded creeping 'brown stain' fault. All the rest are physically and digitally perfect... And now I have no turntable. And no desire to return to the past. And, considering the cost, am completely satisfied with my £750 worth of digital reproduction equipment. And the music that it reproduces without fuss.*

**Richard Bond,  
Powys**

When, in the early days, we sold LPs at Hi-Fi World the issue of returns was paramount. A small, but all the same significant, number of discs were faulty, producing a steady flow of returns. There wasn't enough profit in the original items to cover the cost of returns, and I suspect that once labour had been factored in, the service made a steady loss. I wasn't happy to stop it, but the returns also caused customer dissatisfaction which then reflected back upon the magazine. We were also faced with the need to stock large and heavy items in special racks, and storage is always an issue, especially in London where space is expensive. I began to understand why the music

business wanted to get rid of the LP. As you say, the LP was flawed, disastrously so in an economic sense. All the same, I treasure my own vinyl collection which has brought me enormous pleasure in the past. And no matter how bad some tracks might really be in a technical sense - how about left and right mono Beatles! - the CD is never the same. **NK**

My greatest vinyl horror story was a warped second disc on the two disc set of 'Saturday Night Fever', bought on my twelfth birthday in 1978. Cycled six miles to the nearest town to buy it on the day of release, six miles back home to play it and boing-boing-boing... I was gutted! If CD had been invented on that day, I'd never have bought another piece of black plastic... **DP**

### ARGUING WITH THE BOSS

*My name is Masri from Malaysia. My current system consists of an Arcam Alpha 7 CD player, an ageing Naim NAC62/NAP90 pre-power amplifier as well as old Castle Chester floorstanders that I bought when I was studying at UK in 1995. I now work in a small company here in Malaysia as an Extra Low Voltage System Integrator that supply, install, test and commission A/V systems, P.A. systems, etc.*

*The Chesters have a tweeter placed on the left/right side of the cabinet, below the bass/mid driver. I placed the speaker so that the tweeters are in the inner position of the pair in my living room. For my ears, I am very pleased with the sound they reproduce. But, I'm very curious and wonder why the people at Castle Acoustic placed the tweeters in such a way, not just for the Chester, but for the Harlech as well as the Howard. Can you explain to me the advantages/disadvantages of placing the tweeters in the inner position as opposed to placing them in the outer position?*

*Another reason of why I'm asking this question is when it comes to the speaker arrangement at the places that I need to supply Sound Reinforcement System. Often the space for the speaker installation is limited so that I need to place the 'speakers horizontally instead of vertically. When this happens, I prefer to place the tweeter in the inner side of the pair, following the arrangement of my Castle. My boss will always argue with me because he wanted to place it on the outer side. Having no strong points and reasons to fight him, I will always surrender to him, follow what he wants and lastly becoming dissatisfied with the sound*

they reproduced. The sound feels empty in the middle of the pair.

So, hopefully you can help me on this matter and give me some strong technical explanation so that sooner or later he will surrender to me.

**Masri**  
**Terengganu,**  
**Malaysia**

Your ears don't deceive you Masri, and your description of what you hear is accurate enough too. Placing the tweeters on the inside minimises disruptive cabinet reflections that affect the direct sound to the ear - see the diagram. Doing this stabilises and embodies central images, making the sound stage seem more solid. Cabinet surface reflections used to plague old style speakers with wide cabinets and a centrally mounted tweeter. It looked smart enough but didn't help the stereo image. Where a cabinet must be large, placing the tweeter close to the inner edge offers a good solution to the problem, and beveling the edges also helps. It's surprising how sensitive the ear is to all this, something I discovered first hand when designing World Audio Design loudspeakers.

**NK**



**oh no, not another flipping turntable special...**

### BLACK HOLE

Oh no! You've done it again! Another record player special - all that effort on your part and this guy is complaining! Well, if you were like me and had no records, you too would flick past page after page with boredom. I mean, all those decks (ho-hum), cartridges (yawn) and phono stages (zzzzzz). Despite your editorial comment that it leaves plenty of articles for the rest of us, I would disagree - except that three of those articles were of particular

interest, so ultimately the issue is acceptable I suppose, if a bit thin.

And another thing. In January's issue the Ming Da MC-7R pre amplifier received five globes, despite the fact that it was not compatible with the power amplifier used until it was modified. In March a letter asked for advice with the same issue, but none was given. If I was a referee there would have been a whistle and a red card. The least one should expect when replacing hardware in a system is that it is compatible, and just because it's cheap does not remove this issue. The DIY supplement you regularly publish does not mean that we all know a resistor from a transistor and can modify amplifiers as required.

So does this seem like a moaners letter? I suppose it does, but I shall continue to read your magazine because when the balance is right it's an excellent read. Not too much retro, not too much vinyl and I shall be much happier. After all, just three years ago I remember stating that I never wanted valves in my system. Largely as a result of reading your magazine my power amp is all valve, my pre-amp also has some valves, and come to think of it, the CD player has them too. Oh well, never say never. And I think there are some LPs in a cupboard somewhere nearby.

**Bob Last**

The reason we're theming issues is that I want to do more than scratch the surface of any given topic.

Doing a magazine with a brace of CD players, a few amps, turntables and speakers all seemingly included for no other reason than they're 'new products'

(hey wow!) seems a bit hollow to me. We're not all just shopping for new kit, and even if we were then surely some of us would want to know more than how product X compares to product Y according to reviewer Z. Rather, what is a magazine for if it isn't to bring a degree of information, perspective and (oh my gawd) detail to a subject? I realise that many CD'ers aren't going to be particularly interested in whether the Koetsu Red is more musical than an Ortofon Kontrapunkt c, but there's other stuff that might pull them in,

like affordable 'starter' turntables too. Let's not forget, it's all about playing music, and anything (regardless of format) that gets you closer to the recordings (either from the point of view of fidelity or just being able to buy the software) is surely worth exploring? I do hope that HFV regulars won't just dismiss an issue by saying something like, 'oh, it's on speakers this month, and I've just bought some, so I'll give it a miss'. This is because whatever you've bought or haven't, knowing more about a subject never hurt nobody, and may well save you money later on down the line. Still as I'm still waking up with stylus guards in my duvet and getting bias weights stuck between my toes when walking down to get the post every morning, I'm in no hurry to do another vinyl special. I am looking forward to next month's tuner issue however - should be fun! **DP**

Watch they don't jump out and bite your leg Bob! **NK**

### NEVER THE TWAIN?

I have been staring at page 74 of your March 05 edition for a considerable time now. Why? Because the Series 1 I modular preamp kit really intrigues me. I currently use a Naim 72 preamp and a pair of early silver edged Naim 135 monoblock power amps driving SBLs (bless). Sources are an up-to-date Linn LP12, Circus, Trampolinn'd and all that, Ekos with a Koetsu Black + a recently purchased, (new) CDX2IXPS2 CD player, a Naim Nat01/NAPST tuner with Ron Smith aerial on the roof of course, and for off-air recording needs, a Nakamichi CR7E tape thingy. You will deduce from the aforementioned preamble that I am a Naim orientated fellow, but here it comes now - I want to jump off the totally Naim orientated merry go round and look to a slightly different direction, like adopting a new religion, music wise that is. I've already made a start with headphone listening. I use MF's (round) Can V2, MF PSU and linking those two the XD-10's, headphones are Grado RS225, I'm saving up for Rs-1s.

My No1 system is supported on Torlyte, except for the Linn which is sited on a modified OL Ultra stand. Tried using glass and metal but overall presentation wasn't to my liking (saved myself the great expense of a Naim Frame have I not?). I have replaced the perished rubber feet of the older Naim components with Russ Andrew's large oak feet, jumbos for the 135s and the results work for me, 'nuff said. A current project is the construction of an

air suspension platform, for the CDX2 only, made from oak and a slate platform, but I don't know if this will work but you have to try don't you? By the way, electrics arrive by a dedicated spur to avoid household contaminations.

There's a junior system of oldies (like me) consisting of Arcam 170 clock 3, highly souped up QED digit DAC and my original speeks, Linn Kans. Believe it or not, the amp is a Creek CAS4040 (a knighthood for Mike Creek please!), all sited in a bijou home office. This second system makes me wonder why its necessary to spend mega bucks to get an enjoyable result. I like my jazz and classical music from vinyl, red book CDs, FM radio and tape... I even scat sing in the shower! Now to the point of all this, at last you say!

A recent phone conversation with Mark of World Audio Design informed me that the marriage of WAD Series 11 modular preamp and phono stage and my Naim 135s could work. Could you give me your take on this, or would I be completely wacko to even consider this as an upgrade route? To continue the Naim route would be costly, very costly, and from a recent bad customer relations experience with the almighty of Salisbury I don't want to go that route.

Please let me know your thinking on the aforementioned. Also, any difficulties to encounter such as connections, compatibility, would the lot blow up on switch on, what do you expect the system to sound like (good I hope)? Your thoughts and musing on the subject would be much appreciated.  
**Ron Edley**

Technically, there's no problem here Ron. Any valve preamp should give an enormous output swing and the WAD Pre II does. It also has industry standard gain (x4) and a low output impedance line driver transformer. It's potentially an interesting combination, although one I have no experience of. So perhaps I shouldn't say anything - but I can't help feeling that the Naim power amp would be nicely tamed if you now don't want the classic Naim sound. Ironically, the latest Naim amps have changed quite

substantially in nature, wrapping slam in a silk glove. It's a more amenable yet still quite obviously impressive sound. **NK**

#### **KLIPSCH K.O.**

As an occasional reader of Hi-Fi World I am writing in the hope that you might help me solve a dilemma. This relates to a recent loudspeaker upgrade which, though very exciting, is causing me a certain amount of head scratching.

My system consists of a mixture of old and new, gathered mostly second-hand over the last 15 years. Sources include a Garrard 301 turntable, SME 3009 arm, Shure V15III cartridge, Sony ST88 tuner and Marantz CDS2 MkII CD player (bought new in 1993). Control is via a Quad 44, power courtesy of Quad II valve amplifiers (running Mullard/GEC valves) and finally we come to the 'speakers. For the last few years, I have happily been using a pair of Lowther Acoustas fitted with the square chassis PM6A units. A near ideal match for the Quads, working equally well with LPs and CDs.

Personally, I could never see what all the fuss was about in the LP v CD debacle. When CD came out I soon grew to like and admire its virtues of apparent clarity, silent, inky black background, good detail, etc. Things that, to me at the time, made it all the more convincing against LP. So much so that over the last twenty or so years the number of CDs in my collection has steadily outgrown the number of LPs.

So we come to my query. I recently purchased a pair of Klipsch Heresy speakers through that weird and wonderful boot fair in the sky otherwise known as e-bay. I remembered reading about Klipsch horns way back as a teenager when I first became interested in hi-fi matters and the opportunity to discover the legend for myself at a near rock bottom price was too good to resist.

Well, since hooking the Klipsches to the Quads, there just hasn't been enough time to listen to music! LPs sound absolutely amazing, huge soundstage, incredible detail. Little did I know how much spatial information and other minute details were being held in those high frequencies, something I was completely missing out

on with the Lowthers. Perhaps the most baffling characteristic is the ability that these same high frequencies have to absorb surface noise into the overall sound spectrum, who would have thought?! Mono recordings sound incredibly detailed, big and spacious while 78s positively come to life. Alfred Cortot suddenly playing in the room - the immediacy is actually quite moving.

So what am I complaining about? Well it's the CDs. What I previously thought of as nonsense, i.e. the format sounding hard, clinical and lifeless well, sadly, it is now all too obvious. Nearly all CDs in my collection (from the likes of Decca, DG, et al) sound nigh on unlistenable if I crank the volume up (which I like to do!). Only a handful, obviously superior recordings or very good transfers, can be listened through without anyone getting listener's fatigue. Ask the cat.

I simply can't go on without listening to CDs as recordings from new artists (esp. classical & jazz) simply don't make it to LP these days. So I have two options: sell the Klipsches and revert to the Lowthers or keep the Klipsches and look at possibly upgrading speaker cables (currently bog standard 79 strand OFC) and change the CD source.

Naturally, I would rather go with option 2. But is there any CD player out there that will come close to the sound I get from the Garrard set up? I appreciate the preamp might be a bit long in the tooth as well but I do like its flexibility - and needless to say I am now thankful for those tone controls, which make CDs listenable for the time being. So your advice for a new CD front-end would be most welcome, be it an external DAC, one of the new fangled SACD machines, anything. Please help!

**H Gabriel  
Kent**

The Klipsch horn has an extended but smooth treble response, unlike the Lowther's parasitic cone that gives a pretty approximate rendition of highs. I'm surprised all the same that CD is all but unlistenable with the oh so sweet Quad IIs you have, and I would confirm the Marantz CDS2 is best replaced, as you

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suggest. But what with? \ Shanling make some amenable sounding players that measure well and all have valve output stages as an option to their conventional solid-state output. Otherwise, try an Arcam player, since they to have a mild delivery that's easy on the ear.

NK

I'd recommend the Musical Fidelity A5 CD (£1,500) for this particular task; it's smooth and even with an unusually amenable treble. Factor in superb build and genuine musicality too, and it's an essential audition.

DP



Smooth sound for Klipsches? MF's A5 CD to the rescue...

## DOG'S DINNER

It seems from the contents of the letters pages recently that an increasing amount of readers have been having ebay nightmares, spawning dogs dinners of systems with piles of bad buys lodged underneath sofas and hidden away in cupboards.

To this end I was wondering whether you've ever considered expanding your excellent magazine to give more guidance to the hapless e-buyers amongst us. There must be a large and ever expanding group of people out there who are getting their fingers burnt.

I've come up with a few ideas to get the ball rolling. Classic Systems - a straightforward expansion of World Classics/World Standards to recommend both new and classic hi-fi systems. Second Hand Buyers Guide - extensive review of secondhand equipment with guideline prices. Secondhand vs. new equipment value for money comparisons. Most of us have a figure in mind of, say, five hundred pounds for a component. I think a lot of people are trying to weigh up questions such as: would a new midrange integrated amplifier be a better buy than a second-hand pre-power combination of yesteryear?

I can see that your advertisers may have a problem with these sort of ideas as they all need to flog new gear. However, I think e-bay has provided a huge and increasing market for this sort

of thing, and personally I'd find it a great help.

Whilst were on the subject of help, my motivation for this letter has come from my attempts to buy an amp on e-bay, which has left me with the current system - Garrard 301, SME3009S2, Goldring 1042, Trichord Dino, Black Rhodium Illusion, Marantz CD63Mk2KISIG, Van den Hul the Ultimate, Sugden Headmaster, Van den Hul D102MKIII, Audiolab 8000P, Tannoy Revolution R3 and QED Silver Anniversary Bi-Wire.

I've always wanted what I'd describe as a gutsy, soulful, sound with an extended bass - dynamic and yet natural. Whilst my system certainly

sounds good, with CD its a touch tight and metallic as opposed to soulful, and the bass is not as full as I'd like.

I play a variety of music from The White Stripes to Johnny Cash, Hip Hop and Dance. I also play an increasing amount of classical music, so ideally I need an all rounder that's as happy with Schubert as Lee Scratch Perry.

Before my e-bay dabbling began I started off with an Arcam Alpha 6+ amp in the above system. I then moved on to an Audiolab 8000P & 8000Q (which crucified my CD player and is now in a bin bag under the sofa).

Ideally I'd like to concentrate on getting my amp right. I want to make sure that the format wars have settled before upgrading the CD. I have about £1000GBP to spend and have been considering auditioning a Quad 909 or ditching the pre-power pretensions and trying out a Prima Luna Prologue Two. However, I've recently been wondering whether I should first spend some money on a sub-woofer to get the bass I've always craved.

**Steve Appleby**

Your system woes are attributable, I believe, to a combination of the Tannoy R3 which, in spite of its size, doesn't have especially extended or good quality bass, driven by an amplifier that's dry sounding and a little hard, plus short on depth.

I sort of understand why ebay can seem great. I became deeply

addicted and found myself sitting in front of the computer at 2 a.m. trying to outbid someone half way round the world. In the end I spent a lot of money, got some great bargains and some really esoteric items (test equipment!), ebay is good if you know what you want and why, but less so otherwise, as you have found out. In particular, most of what I bought was of little value to its owner, but of great use to me, but only at the right price. For example, a Hewlett Packard distortion analyser, all shiny and (almost) new (£6k or so) was purchased for just £400. However, it almost never gives the right answer! But I knew this and didn't want it for measuring distortion, so much as for its completely floating, balanced signal generator and similar input amps. The point here is that to the seller it was likely useless and he just wanted to offload it onto some mug; you have to bear in mind that's a common motive for selling on e-bay.

We commonly get asked for second hand prices, but these are set by the market and can vary wildly. Not being a dealer in touch with all this on a daily basis I do not know second hand prices and can make no useful estimate. I also fear being blamed for any loss seemingly made by under-pricing. In the end, part of playing the market is knowing how to price an item, which is the responsibility of the individual seller, and not one that can be usefully transferred to outsiders such as us. I know enough about the second hand market to know I don't know. It's not our gig Steve.

Our experience of older items, and often our reasonably good knowledge of their strengths and drawbacks is about as good as it'll get for the time being I suspect. I understand this market and sympathise with your position, but equally a lot of overpriced tat is changing hands and even the good stuff, such as Quad IIs and ESL-57s are often outrageously priced, when compared to modern kit.

High second-hand prices and demand for obsolete product does, in the long run, buoy the market and improve any manufacturer's reputation. Jaguar realised this some time ago in the car market and it applies equally to old hi-fi. So although a few shorter sighted manufacturers aren't excited by the ebay thing, most are happy enough to hear that people still value what they have produced in the past. In fact, by reviving things that would

otherwise remain very dead ebay might just be stimulating the market.

In your case I feel that whilst you have done well enough with some of your purchases, you can't include the amplifiers or speakers amongst them. Sell 'em on ebay in my advice! By all means get a Prima Luna Prologue 2, plus loudspeakers of better ability than the budget R3s. Look at some of B&W's floorstanders which are very good value, or Mordaunt Short 614s. **NK**



**Buying hi-fi on internet auctions – heaven or hell?**

Well, I have to say that my ebay experiences haven't been so happy. Selling can be fraught, because winning bidders often don't complete on the sale for a number of reasons, sometimes in the 'dog ate my homework' league of (in)credibility. Stuff I've bought in the past has often turned out to be in far poorer condition than described, and there are number of what can only be described as 'barrow boy' online audio sellers trying to hype up, for example, crap budget Hitachi direct drives as being 'classics', sometimes even (incorrectly) quoting Hi-Fi World! It may be superficially very convenient, but things get complex when you bid over the odds for (what transpires to be) a lemon, or get dimwits win your auctions when they've come back from the pub, bidding on things they never intend to buy... Oh, by the way, Hi-Fi World classifieds ads are much better for serious buyers and sellers – but then you knew I was going to say that, didn't you? **DP**

### GETTING THE BLUES

*I have acquired a Decca London Blue cartridge and wondered if you think it worth my while trying to get it up and running? I have heard that they, even when new, can cut into the record's surface. There also appears to be very little clearance between record and*

*Decca's body, is this correct? I also have an Ortofon SL15; I think it's a moving coil. I did try this one, I cannot remember the setup, but I know it sounded very dull and smooth.*

*The rest of my system: Rega Planar 3 ("S" shaped tone arm), Sugden A25B amp, B+W DM602 S3 speakers. My usual cartridge is an Audio Technica AT-OC5 MC (nearly new) connected to an Audio Technica AT 630 transformer. Vinyl noise is very low and records I thought were worn out sound OK with*

*this set up, I think because the stylus is playing deep untouched vinyl, but the sound is very sterile, almost cheap CD player style. I have considered putting all the cartridges on e-bay, and buying something more modern, but still with a very fine line stylus, any advice would be most welcome.*

**Mike**

Mike - just do it! And don't play the Blue. I once did this and the records sounded fine

until I swapped back to a conventional cartridge then, as I had been warned, they played the damage that had been caused and it was a shock. The modern Decca Gold tracks well but the old Blue does not. Low clearance is correct: you can hardly see the stylus peeking out from the lateral coil of a Decca.

Sounds like the SL15 might be worn, and as for the AT-OC5 plus dreadful AT 630 transformer - ugh!

Modern cartridges are streets ahead; curiously they are still improving fast. Any half decent unit from Goldring, from the 1006 up to the 1042 will suffice to give you a decent sound. Otherwise, consider a new Stanton 680EE or better. Ideally, you need a better arm before going any further. My advice is: do not buy old, used cartridges on e-bay. New ones are in a different league. **NK**

### CLASSIC PURCHASES

*Congratulations on the February issue - once again Hi-Fi World has demonstrated its unwavering commitment to promoting high quality gear, regardless of age. I particularly enjoyed reading DP's frank editorial on the value of so-called expert advice provided by many magazines, retailers and manufacturers. This brought me back to my student days in the early 90s, when I set out to assemble my first decent stereo system. For the total sum of \$600 Australian (250 quid?) I*

*acquired a 1970s Luxman pre / power combo, a Thorens 166 MkII, and a pair of Yamaha NS500 speakers (essentially baby versions of the NS1000s, featuring a beryllium tweeter). I thought it sounded great, but countless experts (magazines, store owners, well meaning friends) would indicate that a 1970s stereo like this could not really compete with the flash new equipment they were all trying to sell me, whenever I needed advice. Yet to my ears the presentation, detail and smoothness of this stereo far exceeded that of many systems costing thousands. The outcome, I soon learned to stop paying attention to what the experts advised, and put a bit more faith in my ears.*

*Memories of my first system, lead me to a comment on NK's excellent guide to buying classic hi-fi. In addition to recognising tried and true performers - Quad, Tannoy, Leak, Nakamichi etc - I do think there is some value (and fun) in paying small amounts of money for more unusual, yet high quality older equipment. These components may not have the same prestige as the aforementioned classics, yet may still perform admirably in the right system. As you are aware, many quality components (often Japanese) have suffered bad reviews, or escaped notice altogether, and as a result may have never been truly understood during their day (the NS1000s are an example of these) or for many years afterwards. As a result the judicious purchase of less popular, albeit high quality, components can produce surprising results, and bargain basement prices mean that you can have very little to lose.*

*Here are two examples of recent purchases that have surprised me. Firstly, about a year ago I purchased for \$100 a Harmon Kardon ST7 turntable, which features a Rabco linear tracking system. Those who know this early attempt at linear tracking usually reel back in horror at the complex mechanical drive system for the tonearm, and start relating stories of constant fiddling and adjustment. No doubt some of these criticisms hold true, but I have found that once set up carefully (and it did take some time) this turntable has proved reliable and conjured a solid musical image through my system, with timing, control and detail. Suffice to say, I am so hooked that my usual Thorens TD 124 MkII / SME 3012 combo has gone into storage for the past year.*

*Another purchase worth a mention is a pair of eighties Sony ES series APM (Accurate Pistonic Movement) loudspeakers I recently picked up for \$100. Now before you*



laugh, yes these do have those daggy square flat panel drivers that were all the rage in the 80s, but no, they don't sound terrible. In fact attached to decent smooth solid state or tube amplification, these speakers image beautifully, with a crisp transparent presentation of music. Sony spent squillions developing them, and the high-end versions are built like tanks, so they should not sound too bad - indeed I think in Japan some versions are revered. Certainly, after recently testing out a range of new bookshelf speakers for my mother-in-law's A/V system, (including some nice KEF Uni Q speakers) I can honestly say that I would take the APMs any day.

So, the moral of the story: there can be some benefit in trying out quality lesser known hi-fi, just don't spend too much, so that you can avoid disappointment!

**Dinesh Wadiwel**

Funny that amongst the disappointment lies a lot of satisfaction. The APM80s did have - err - a credibility gap to fill. Perhaps they were good, but they were also victims of excessive styling that was at odds with their purpose. The all-white Volkswagen Golf Cabrio was also all the rage in the late 1980s and I see certain similarities! NK

### STERLING ADVICE BRIDGE IT

Just like to thank you for your help regarding the change of amplifier from Parasound to Musical Fidelity. As I was waiting for the reply on my question I actually changed the Parasound A23 power amp for a bargain Primare A30 (£700 ex demo) and was really pleased with the results. All was well with the system - Shanling CDT200, Primare A30.1, Spondor S6s Cleanline and rack. No more shouty, in yer gob nasties.

Then came your reply that I should get a listen to the XP200 power amps from Musical Fidelity and bridge them with the Shanling CD player. I thought "how could this improve on an award winning £1,500 integrated?", and thought "sod it, I'm happy the way things stand".

Right? Wrong!

As always the grass seems that little bit greener on the other side, so off I go and get a demo. Sadly, the shop I went to only had one XP200 so I could not hear them in bridge mode as you had advised. I was a little bit disappointed but set up my CD player and speakers and demoed the single power amp. Wow! honestly there was no contest! The XP200s romped home and left the Primare looking like Paula

Radcliffe in Athens!

Anyway, I bought the XP200 and am loving it. I am of course saving for the other XP200. I don't know what level of upgrade this will bring, but if it's even a little better it will be money well spent. Hats off to Musical Fidelity for their superb efforts and commitment to sound value for money, and superior sounding and looking products. Other makers should sit up and listen. Being the most expensive isn't always best.

built second hand.

I would like to know what models you would recommend around the £600-£700 mark, either new or secondhand; though I could probably stretch my budget a bit, I would prefer to spend what money I have on records rather than expensive hardware! I only have one other source: a venerable CD player which gets only occasional use, so facilities are not important beyond the ability to cope with both phono and



### Less is more: Musical Fidelity's mini marvels.

thanks for your sterling advice.  
Ron Ferris

Hi Ron - a second XP200 makes a big, appreciable difference, bringing lots of extra power, dimensionality and ease. Glad you like the non-bridged combo; I actually borrowed my review pair back from Mr Michaelson, so nice a noise it is making in my second system... DP

### PREAMP PROBLEM

I have reached a point of indecision with my system and would appreciate your advice on how to proceed.

My system consists of a Pink Triangle PT TOO/IRB300/Reson Recca, Audiolab 8000A (used as a pre-amp), WAD KEL80 monoblocs and Mission 752s. The equipment sits on a 3-tier Atacama Equinox stand and is wired together by a variety of OFC cables. I am looking to upgrade my Audiolab to a dedicated pre-amp. The obvious choice, of course, is your own modular valve pre-amp since I want to build an all-valve system. However, though I can wield a soldering iron with relative competence (I have built a variety of simple Maplin kits), I have no real understanding of electronics nor can I read a circuit diagram. In fact, my own WAD monoblocs were bought ready-

line sources. I listen to a lot of post-rock (Constellation, Kranky, Thrill Jockey) and alt. country (Mojave 3, Jayhawks, Low) as well as harder alt. rock (Matador, Flying Nun, Sub Pop etc) and prefer a rich, warm, clear and fatigue-free sound. I look forward very much to your response,

**Kelvin Meek,**  
London

Hi Kelvin. EAR, Audionote and others make valve preamps, with valve phono stages, but of course they are not cheap and hardly within your budget. Creek OBH-15 or 18 phono preamps may be a good choice, but putting solid-state into the system may not be your idea of heaven, since you obviously seem to have grown used to the easier presentation of valves. They will just about drive your KEL80s to full output at maximum volume, so strictly speaking preamplification isn't required; a passive pre-amp (i.e. volume control) will do. The Pro-Ject Tube Box is perhaps more suitable, and with 40dB of MM gain it has a little more output than the Creek, but again a volume control is needed. Otherwise, a Croft Micro springs to mind, but you have to find one first.

The KEL80s, 80W monoblocs using parallel EL34 output pairs, are quite sensitive, needing 400mV input for full output. Most preamps can manage this, but there's little available, believe it or not, that meets your requirements other than the World Audio Design Phono II and Pre II. It might be best to try and get someone to build it for you. **NK**

### AUDIO ALCHEMY

I'm a new reader of *Hi-Fi World*, although I read hi-fi magazines (Greek, British & U.S.) for the last 25 years. I liked very much your style, your focus on traditional two channel high end, your reviews, as well as the opinion and mail columns. The latter especially is the best I've encountered so far. I would like more classical music as a reference input to your reviews, but that's a matter of taste.

I enjoyed your world classics list at the March 2005 issue. The absence of any of the Alchemist amplifiers triggered me to write this e-mail. I'm a happy owner of an Alchemist Kraken APD6A integrated amplifier, with the upgraded (twin) transformer box. The reputation of this amplifier is still very good among local audio enthusiasts who found it an excellent performance/price value (better than the Forseti for most of them). What was its acceptance in the UK market? I'm aware that the company is closed, but do you know where I can find technical information, like schematic diagrams, service manuals, tweaking instructions etc. for the Kraken?

At the excellent Joel Goodmans website <http://www.alchemisthifi.info> I read a copy of your original September 1992 review on the Kraken. There, NK measured clearly that does not match with low impedance speakers. I feed a pair of Elac 207.2 loudspeakers (I owe you for providing me the first

motivation to hear and buy them). This combination sounded to me, my friends and even the people at the audio showroom (I brought the Kraken with me for the listening tests), as exceptionally good, even in large-scale orchestra works (e.g. Bruckner 9th symphony, Mussorgsky Pictures, Dukas The sorcerers apprentice, Bach Matthaues Passion etc.). I also didn't notice any difficulty to drive my previous speakers, the Chario Constellation Delphinus, which were also 4 ohms designs.

Speaker (bi-wiring) cables are Straightwire Sextet. The digital path is TEAC P-700, Parasound DIAC I 100, with Kimber cables. The analogue path is VdH MC1 Special, Moerch DP-6, Thorens TD321, MF XLPS v2/XPSU with VdH cables. All of them are powered through the Power Wedge filter.

**Damianos Dimitriadis**  
Athens,  
Greece

The Elac 207.2 loudspeakers are as fine as it gets in many respects. Elac's Jet ribbon tweeter is smooth but revealing and the overall standard of engineering in the 207.2 is up with the best. As you seem to be finding, a good ribbon is revealing and needs a decent amplifier in front; the Kraken is a suitable choice, but since Alchemist ceased trading in 2001 it isn't a model I would have considered recommending, although it was well regarded in its day.

How an amp responds to a low impedance load depends upon how hard it is driven - and this is an imponderable to any designer, or reviewer, depending entirely upon the user. With a large and fairly sensitive floorstander like the 207.2, and with your interest in Classical, I'd guess you are not a 'headbanger'

(don't know how that translates into Greek!) who listens at high volume, so your amp is not being asked to deliver high current. When reviewing I have to consider heavy users, who want to play Rock music very loud; then the Kraken may not suit. Contact CF (Chris Found) at the website you talk about if you want more info. He may be able to help you. **NK**

We'll be doing an Alchemist retrospective just as soon as I've got round to writing one, so hold your breath (well not literally, as that might be dangerous unless your lungs are the size of the Millennium Dome...) for this one. I really rate Alchemist stuff; it was a brave and interesting brand and joins Myst in my all time Weird Hi-Fi Top Ten. DP

### EMOTIONAL COUPLING

I have one question for you. My turntable is Technics SL Q2. I have it last 25 years and I'm emotionally coupled with it. Before one month I buy it Ortofon MC 15 Super and I wasn't satisfied at all with this cartridge. Today I have lot of details, mid and high are very good, but bass is poor. I expected a warm and sweet sound from my turntable and today I don't have it. My old Technics moving magnet cartridge EPC 207 have better bass and poor mid and treble. I'm thinking about Ortofon MC 25 FL, Goldring 1042 and Denon 103 I?? As I told you I expect warm and sweet sound with deep and rich bass. Please recommend me a new cartridge. My other components are Marantz PM 80 MkII amplifier, Marantz 67 SE CD player, tuners Pioneer TX 9800 and F 91, deck Akai GX 95 MkII and Pioneer CT 93 and AR 16 loud speaker. I'm satisfied with other components.

**Dejan Pislar**

Know the problem well Dejan. In spite of measuring brilliantly Ortofon's budget moving coils leave me cold. Even the M25 FL isn't great in my view. The lowest price Ortofon MC that offers real MC benefits, notably superb clarity and sweet treble starts with the Supremes in my view, of which the MC20 Supreme is a good compromise between the overly smooth 30 and the slightly edgy but dynamic 10, but at £500 you do have to pay for quality. Goldring's 1042 is nothing other than a fantastic bargain, with a superb Gyger stylus that retrieves abundant high frequency detail, a clear midband and quite strong, but not overblown



Alchemist: weird and wonderful

bass, all for £140 or so. Dynavector cartridges are a fave with David Price, our editor, and I also respect and enjoy using Stantons. I hope this little list helps. **NK**

### OUT OF TUNE

*As of a couple of weeks ago my budget tuner, a Denon TU-260, has started to die and so I have been looking into what to replace it with. Now although there are plenty of reviews around, none seem to be able to answer my basic question!*

*Which one of the combined DAB and FM tuners will sound as good on FM as my existing Denon did? Every magazine seems to explain why DAB is awful and why FM is better, but the fundamental thing is that FM will be killed off eventually and a buyer looking for a new tuner must allow for this.*

*After trawling through the reviews and looking for the adverts for the new combined tuners I was wondering if*

the latest MkII version. At only £130 or so you can hardly quibble about the cost. It's a done deal really.

The reason I am steering you away from a combined unit is that the whole digital radio thing is starting to go a little wobbly in a most surprising - even alarming manner. Basically radio broadcast throughout Europe seems to be moving into political turmoil as various groups struggle to promote their solution and, of course, their income stream. Even the future of DAB is in doubt as its embarrassing and insurmountable limitations become obvious to an increasingly sceptical public across Europe.

Symbolically, in one German state DAB is being removed. The UK is slowly sinking into farce in this area and it is difficult to predict what the outcome will be. The situation right now is daft and will only get worse. BBC radio stations are transmitted

technologically it is hopelessly out of date (mp2 for heaven's sake - and who's using that any more!).

If you must use DAB go for Sony or Cambridge, who incorporate good VHF sections. Personally I listen to Mojo a lot on Freeview, but at 128kbps it's quality is grotty and there's little point in trying to wreak any improvement. It's a great pity, because much of what they play could sound terrific, but instead you just get a crude sounding representation of the original. It's sad that great music, often in great recordings, can be so emasculated.

**NK**

### ROOM FOR IMPROVEMENT

*I wonder if you could offer some comments or suggestions on tweaking the sound of my system. The way I listen to music has changed significantly in recent years. It used to be all about rhythm and drive, most often at higher volume levels, but now most of my listening is at lower volumes. I prefer to just sit back with a sound that's much more beguiling and seductive. At the same time, in a recent house move, I've switched from open-plan living to a more conventional layout, which means the sound has to fill a much smaller space 14x10ft, with 8ft ceilings.*

*At low volume levels the sound I'm getting seems harsh and aggressive. And in the smaller room the midband and the vocal performance in particular seems to have disappeared into the background. Overall, it's not something that's pleasant to listen to. Yet crank up the volume and move to a different room, or ideally upstairs, and everything sounds fine again. Unfortunately, cranking up the volume and leaving the room isn't the ideal solution.*

*My primary sources are a Linn LP12/Ittok LVIII/Sumiko Blue Point and a Marantz CD6000K1, feeding a Linn Pretek/ Powertek combination which drives Quad 11Ls via Chord Odyssey cable.*

*I'm hoping the Quads are still up to the job. I know from experience that they're capable of sounding great, and they look fantastic. I bought them as replacements for vintage Linn Kans when I first went down the open-plan route. I've wondered whether the Kans would be better suited to the new, smaller listening environment, although I don't remember them as being a particularly relaxing listen, so I'm guessing they wouldn't suit my current needs.*

*My sources probably aren't the last word in refinement these days, but I'm pretty happy with them. Is the real problem here the amplification? If so, is*



**Arcam's DT-91 on DAB: not as good as FM, but a class act all the same ...**

*your team could review the following, this would at least allow me to narrow down the listening list to manageable size! Combined tuners are TEAC T-H300 II, Pure DRX-702ES, Sony STSD 900, HK TU970, Cambridge Audio 640T. My basic requirements are to have a combined tuner which, on FM, sounds at least as good as my dying Denon but will have the ability of having a reasonable sound with DAB also. I assume many other readers will be thinking the same thing at present so the results would be very useful. Any suggestions you have will be greatly received.*

Andrew Burtchaell

**Bath**

The literal answer to your question is none, but if you want a good second best, then it's the new Arcam DT-91. And now over to **NK** for the philosophical answer... **DP**

I'm tempted to suggest you sort of forget digital radio for the time being, and have faith in the continuance of VHF/FM for long enough to make it worthwhile getting another Denon TU-260L, but

at a higher data rate and, therefore, better quality via Freeview. Whilst their DAB data rates have sunk to around 128kbps, 192kbps is the norm for BBC Radio through Freeview. My benchmark for quality with something like mp3 compression is 256kbps, by the way, and this is what the BBC use for television sound. So radio is way below even reasonable quality level by hi-fi standards, but TV sound is not. The commercial radio stations use even lower data rates where they can get away with it, on DAB and Freeview.

Under increasing pressure to raise sound quality or see DAB sink altogether in the UK, the BBC now wants more bandwidth for higher rates, but it's all a bit late. The public at large haven't been hoodwinked by the hype; there's a wide perception that DAB offers poor quality and is no real substitute for VHF/FM. So you really are best off at present getting a Denon TU-260L MkII, plus a Freeview receiver. I'm afraid to say it doesn't matter how hard hi-fi manufacturers try to squeeze the best from DAB, it's a lost cause, as

the issue simply the age of the Pretek/Powertek combination, in which case could I get the beguiling sound I'm after with a straight swap for a contemporary Linn integrated or a Naim, or even from something like a Marantz PM7200K1 running in class A mode? The Marantz would be a nice visual match for the CD6000, and I've seen it quoted as being a good musical match for the Quads. However, I've also seen reviews of the PM7200 that suggest it can sound a bit harsh. Actually, I have a suspicion that all these options would represent an incremental improvement rather than a complete change in presentation.

A low(ish) cost fix I've considered would be to try a Musical Fidelity X10-D between the pre-amp and power-amp, or swapping out the Pretek for a Musical Fidelity X-Pre. The type of sound you frequently describe the Sugden A21a as having is exactly what I think I'm after, and the budget would just about stretch to that. It's certainly on my list of products to audition.

But what else might do it for me? The Exposure 3010 is another integrated amplifier you describe as having a clear, sweet midband, and again is just about within budget. A further option I've considered is a Linsley Hood designed DIY kit from Williams Hart plus an appropriate pre-amp, although that's all a bit more difficult to audition. Or am I sounding like an ideal candidate for valves?

Or is the issue not the amplification at all? Any suggestions would be greatly appreciated.

**Mork Simms  
Tonbridge,  
Kent**

Mark, your description of the sound sounds exactly like that caused by early returns from the nearby walls of your new, smaller living room. You are accustomed to the more damped sound or a large room, where energy reflected from side walls and ceiling is considerably more attenuated than what you are now having to suffer. Large rooms usually give a clean sound. The increased proportion of reflected sound in your new room will make for a more confused presentation, the proportionate loss of direct sound from the speakers making singers and main instruments seemingly move back. Expect some general harshness or roughness too.

One solution is to treat the side walls to lessen reflected energy, using soft furnishings. I like a well damped "warm" room and use full height (9ft), full width (16ft) lined

curtains, for example, to help here. How the sound improves when they are drawn! I also use brightly coloured rugs hung on rear and side walls.

You can alternatively use books in a large bookcase to diffuse the sound. This gives a brighter balance by randomly scattering high frequency energy, rather than absorbing it.

Note that you do not have to cover an entire wall with an absorber or a diffuser, only the area where, if you hung a mirror, you would see an image of your loudspeaker from the listening position.

And don't forget the floor, which must at least have a good, thick rug.

Sort it out properly and you'll get a great improvement in sound quality as well as a more comfortable room. You will always be aware that it is a smaller room though, especially with an 8ft ceiling. Ideally, this needs some absorption too, to subjectively move the ceiling up.

If you are thorough about this then you will find the room sounds generally less bright, especially if you absorb the sound rather than diffusing it. You may well then find yourself more satisfied with what you have. **NK**

#### DAH DAVID!

As you stated in your April 2005 edition, keyboards would be ablaze in response to your vinyl special, and whilst there will no doubt be the few who question "Why wasn't X or Y turntable included", my major gripe is nothing to do with this. It is due to David's comments in his opinion column. He states, "Any of the group test candidates featured in this

magazine would eviscerate a similarly priced digital player, DVD-A / SACD or no DVD-A / SACD". He then goes on, "Even the Roksan Xerxes X, which for reasons of synergy and set up, didn't walk this months test, is a truly delicious sounding device, and frankly a Musical Fidelity X-RAY v3/Naim CD5i (et al) wouldn't stand a chance."

Dah David! Of course they wouldn't stand a chance, they're in a completely different league. Factor in over £1,500 worth of arm and cartridge, plus a phono stage, and the price is almost three times the CD players mentioned. Let's face it, you wouldn't put a cheap arm and cart on a £1k plus deck would you? It would be interesting to hear your opinions on the above turntables compared to a NAIM CDX2 or a Shanling SCDT200C. All I ask is fair comparison. A Rega P3 is, for example, in the upper price range of the CD players you mention, after factoring in the essential items required to play the black stuff, so maybe another feature in future?

Unfortunately I'm of that 'lost in the 80s' age where I have equal amounts of CDs and LPs of the same albums, and as a new turntable is on the cards to partner my Cyrus CD7Q/ PSX-R at the front end, I want to make sure I am not having to spend twice as much to get the same musical fulfillment!

**Anon.**

Fair point well made sir, but I still think that a Rega P3 with Dynavector DV-20XH (£700), properly fettled, would claim the scalp (or should that be laser) of any similarly priced CD spinner, so I think my original point stands, unless you read Channa's CD vs. LP piece in this very issue, which makes me look a pedigree chump... Thank you and good night! **DP**



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Arcam DIVA DV88Plus S/H	1200	399	JM lab SW900 Subwoofer Cherry S/H	1200	599
dCS Elgar 24/192 1998 Version (non-firewire) S/H	8500	3299	KEF HTS 2001 5.1 Surround Package S/H	799	449
Densen Beat400+ x-demo	1295	979	Martin Logan CLSII Anniversary Electrostatics 7 months Old S/H	6700	4295
Marantz CD17KI Signature S/H	1295	699	Mordant Short 902 S/H	249	99
Mark Levinson No31.5 Transport S/H	9999	4999	Naim Audio Intro Black Ash S/H	875	499
Mark Levinson No360s DAC S/H	7500	2999	Peak Consult Incognito Rosewood x-demo	7500	5799
Meridian G08 CD S/H	2250	1899	ProAc CC1 Response Centre Speaker Black Ash S/H	599	299
Naim Audio CD3 S/H	980	449	Quad 12L Mahogany S/H	500	279
Primare V10 CD/DVD Player x-demo	795	499	Quad ESL 63 Brown just serviced with stands S/H	N/A	1499
Theta Generation V Balanced S/H	6290	1999	Quad ESL57 Black with 1 thing stands S/H	N/A	599
Theta Pro Basic II DAC with Oscom/Balanced S/H	2990	995	Rega ELA Cherry X-demo	749	579
<b>Analogue</b>			<b>Cables and Accessories</b>		
Avid Diva/RB300/Grado Silver S/H	1350	899	BCD Engineering 1m UK-IEC Main cable x-demo	99	69
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Dynavector XV1s 200hrs S/H	2900	1699	Madrigal MDC1 1m AES/EBU 110ohm Digital Cable new boxed	420	199
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Musical Fidelity XLPS V3 2 months old S/H	249	175	Spectral MH-750 20ft Speaker cable x-demo	2100	1199
Ortofon Kontrapunkt A MC 50 hours S/H	350	199	Spectral MI-330 15ft Interconnect RCA-RCA x-demo	800	499
Project 2 Turntable S/H	299	99	Spectral MI-330 3ft Interconnect RCA-RCA S/H	500	329
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Rega Cursa Preamplifier Black x-demo	598	429	Accuphase	• Krell	
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Arcam A85 Integrated Silver S/H	800	399	Avid	• Nagra	
Arcam P85 Power Amplifier Silver S/H	600	299	bel canto	• Primare	
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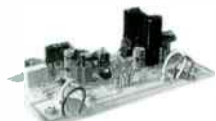
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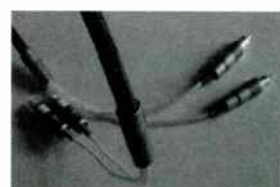
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## LOUDSPEAKERS

B&W 801 MATRIX S2 ANCHOR STANDS GOLDMUND CONES (£8000 NEW)	EXCLT £2795
DYNAUDIO CONTOUR 1.3 MK2 BIRDS EYE MAPLE	EX DEM/BOXED £1095
ART-2 PRECISION MONITOR FLOORSTANDERS PIANO BLACK (£6000)	MINT £3295
TOWNSEND GLASTONBURY LOUDSPEAKERS	MINT £1295
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RED ROSE SPIRIT RIBBON LOUDSPEAKERS	MINT £750
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ALR-JORDAN NOTE -5 SUPERB LOUDSPEAKER IN EXCLUSIVE BOBINGA WOOD FINISH	EX.DIS/DEM £1295
MARTIN LOGAN CLS2z	MINT £2895
SOUNDLAB MILLENIUM 3 LATEST SPEC EX DEM (£9300+ NEW)	MINT £5495
KLIPSCH LEGENDARY CORNER HORNS BIRDS EYE MAPLE VENEER	EXCLT £3750
PROAC STUDIO 150 CHERRYWOOD	EXCLT £895
AUDIONOTE ANE-D ROSEWOOD	TBA £795
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KELLY KT-3 HIGH 95 DB SENSITIVITY CHERRY VENEER	MINT/BOXED £750
CASTLE HOWARD-2 IN PREMIUM BEECH FINISH	EXCLT £695
CASTLE AVON	EXCLT £395
ACOUSTIC ENERGY AE-109	EXCLT £225
REGA XEL ROSEWOOD	EXCLT £495
EPOS ES-14 WITH STANDS	MINT £395
ACOUSTIC ENERGY ASW FB-110 SUBWOOFER	AS NEW £350
REL STORM-1 SUBWOOFER	VGC £450
CELESTION A-6S SUBWOOFER	NEW/BOXED £375

## SOLID STATE

AVI S200 MM MONOBLOCS	MINT/BOXED £750
AVI S2000 MA POWER AMP	EXCLT/BOXED £495
AVI S2000 MP PRE AMP AND SYSTEM REMOTE	MINT/BOXED £450
AVI S2000 MC CD PLAYER	VGC/BOXED £475
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GRYPHON SONATA ALLEGRO 2-BOX REFERENCE PRE AMP WAS £12000	MINT/BOXED £6495
PIONEER ELITE REF.SERIES VSX-95 AMP/TUNER & CLD-95 CD/LD PLAYER	(LOVELY) £1095
TOCA SECA (COLIN WONFOR) CLASS A POWER AMP	EXLT £1250

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MONRIO 18B DAC SEPERATE PSU	EXCLT £375
PIONEER PD-91	MINT/BOXED £395
AVI S2000 MC CD PLAYER	VGC £475

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TALK BREEZE PHONO STAGE (RETAIL £500?)	NEW £275
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## VALVE AMPS

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AUDIONOTE DEDICATED STANDS FOR ANE LOUDSPEAKERS	AS NEW £175

## LOUDSPEAKER CABLE

MIT TERMINATOR-6 3 METRE PAIR	£275
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TARA LABS PRIME 1800 18 FEET!! PAIR BI-WIRE AS NEW BOXED ETC	£795
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Micromega	Optic - nr mint, budget into the delights of Micromega	129
Mission	PCW7000 - Fab of the 80s	
Musical Fidelity	X Act - nr mint boxed	119
Musical Fidelity	X10 v3 - nr mint, boxed	199
Myriad	T20 - black, nr mint, boxed, remote, bargain!	279
NAD	C541i - nr mint, boxed with remote	199
NVA	The Transparent Statement - vgc, crated, ultimate NVA	1749
Quad	77 - ex, remote	799
Quad	99CDP - nr mint, boxed, remote	799
Rega	Planet - ex, black, well reviewed	199
Revelation	CD50 - nr mint, boxed	1099
Roksan	Caspian M series - ex, dem, save £350!!!	749
Rotel	RDD980/RDP980 - nr mint, transport and dac very rare with remote	449
SAT	CD7ix - nr mint, boxed, dedicated remote, superb	699
Sony	MDP8500 - nr mint, later date, VCD, CD, PAL, NSTC	149

## Amplifiers

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Arcam	Alpha 7 - ex	119
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Audiolab	8000S - nr mint	329
Audiolab	8000Ms - nr mint mono blocks	899
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Audiolab	8000P - nr mint, boxed	429
Audiolab	8000A - ex, boxed, grry, mm/mc	199
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AVI	SC2000MP - ex, line level pre	279
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Primare	A20 - nr mint integrated	179
Quad	405 - ex	179
Quad	33/303 - nr mint	249
Quad	50D - good, pair mono blocks	299
Rega	Mira 2000 - nr mint, boxed	299
Roksan	Caspian M Series - ex, dem, pre and mono blocks - stunning	799
Roksan	RC995 - nr mint remote pre	249
Rotel	RB9708X - ex, black, stock of grant	119
Rotel	RB9608X - ex, black, rock n roll	99
Rotel	RC9708X - ex, black, quality pre	279
Shearwater	Phase 2 - nr mint, boxed, blue marble styling	329
Shearwater	Phase 2 Reference - as above, with phono stage etc	329
Sugden	AU41 pre/power - ex, black	499

## Speakers

Acoustic Energy	AE1 - ex, black grilles	399
Acoustic Energy	AE1 mk2 - ex, black grilles	449
Acoustic Energy	AE2 - ex, c/w dedicated stands	299
AVI	Nu Neutron - vgc, amazing baby	1499
B&W	500 - vgc, black floorstand	249
Celestion	500 - vgc, ribbon standmount	249
Dynaudio	Audience 50 - nr mint, black boxed c/w dedicated stands	299
Epos	M15 - nr mint, light cherry, boxed	79
Epox	ES11 - good, dedicated open frame stands	199
Heybrook	HB100 - vgc, superb vfm	449
Heybrook	Quartet - nr mint, boxed c/w matching open frame stands	229
JPW	200 - new, baby bookshelf, save	299
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KEF	Reference 104/2 - ex, rosewood	699
KEF	Q10 - nr mint, boxed	89
KEF	Qado 9 - ex, rosewood	129
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Mission	70 Centre - ex display, boxed	69
Mission	77c - ex display, boxed	69
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Mission	77z - ex, rosewood	99
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QUAD	111 - nr mint, boxed, birds eye maple	249
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REE	QSO - ex, black	199
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TDL	Studio Monitor - Ex, large standmount	219
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Triangle	Titus 202 - good, boxed	249
Vienna Acoustics	Strauss - ex, stunning floorstanders in beech	2249
Wharfedale	Pacific P130 - nr mint boxed, light cherry, excellent	299

## Tuners and Tape

Cyrus	Original Mission, tuner - vgc	79
Nakamichi	BX125 - ex, boxed	99
Nakamichi	CR4E - vgc, black	125
Nakamichi	CR4E - vgc, black	125
Quad	FM2 - vgc, just back from QUAD	425
Quad	FM4 - nr mint, grey	249
Rotel	RT02 - ex display, boxed, silver	199
Sugden	DTFM - gc, rare, matches A85mi-3 etc	179
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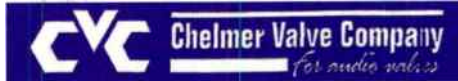
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ATC SCM 20 active towers, new £5850, snip at £2000 ovno. ATC pre-amp SCA-2, new £4000. grab it for £2000 ovno. Tel: Geoff 01922 477 682 (Walsall) (Jun)

AUDIOMAGIC STIs £1500. Neat Ultimatum Centre £1800. Neat Ultimatum MF9s £7000. 3x Bryston 7Bs £5000. Bryston 14B £3000. TAG AV32 £1000. Resolution Opus 21 £1800. Pioneer 50" HDMI Plasma £2700. Tel: 01423 566 916 evenings only (Jun)

FOR SALE; Linn LP12 With Valhalla. Ittok Dynavector 23R excellent condition £750. 300B amplifier with interstage transformers. Professionally built. 5 Wpc. As New Condition. £400. Rotel 965Bx SE discrete CD player. Very good condition £300. 300B parallel feed amplifier excellent condition. 7 watts per channel, £400. Kef Special Edition LS3/5A finished in piano black. Includes Partington Stands (very high mass) £950. Tel: 01253 853789 (Jun)

QUAD 33/405 pre-power £395. Quad FM3 tuner £95. Quad 66 CD player £295. Marantz HD583 loudspeakers £75. All super condition, boxed, one owner from new. Call Bruce Harrison on 01932 853 693 (Jun)

QUAD ESL 63 speakers, brown cloth, fine condition, serviced by Quad with Quad speaker cables £750. Nordost SPM Reference speaker cables, 4 metre pair, offers please. Tel: 01993 883 523 (Jun)

QUAD ESL 57 electrostatic speakers recently purchased from Classique Sounds refurbished by One Thing. New treble units, black cloth fronts, fantastic sound, perfect condition, cost £1100, accept £750 ovno. Tel: 07905 320 220 (Jun)

TOM EVANS new design Super Triode - Linear 'A' pure Class 'A' 25 watts. like new warranty £3195 (£4000 new). Audio valve Balfour 70. Class 'A' Triode monoblocks, truly amazing, like new, black. £2150 (£3195 new). Tel: 07919 211 332 (Jul)

SYNN AP900 stereo valve integrated amplifier, 40wpc, spare valves, manual, very good condition, only 2 1/2 years old, fabulous sound £200. Tel: 02380 274 494 (South Hampshire) (Jun)

NAIM CDX CD player + XPS power supply. Both in excellent condition complete with Burndy cable and Chord Co. Anthem interconnects + remote, £1200. Tel: 02380 274 494 (South Hampshire) (Jun)

MARANTZ CD94/CDA94 two box CD player, may separate (£1600) £450 ono. Matching PM94 amplifier, superb! £450 ono. Original QLN One speakers £125 ono with stands. Tel: 01773 826 170 (Jun)

GARRARD 401 turntable, recent rebuild plus new motor £400 spotless. SME 309 tonearm, superb! No packaging £350. EAR 834 M/C-MM phonostage £350 unmarked. (buyer collects) Tel: Brian 020 8841 5782 (Middlesex) (Jul)

LEGENDARY LEAK Troughline 3 tuner, internal decoder by G.T.Audio. £170. Technics STG70 tuner £80. Tel: 01302 730 488 (Jun)

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B&W NAUTILUS 804 floor-standing speakers on HNE granite plinths. Great reviews, exceptional sound, excellent condition, dark cherry, £1650. Tel: Julian 01455 212 362 or 07795 671 932 (Midlands) (Jul)

ADVANTAGE I-200 integrated amp £1395. Piega P5 floor-standing speakers (32kgs each) (new £2200) £900. (buyer collects) TAG McClaren Calliope speakers with stands blue £800. Arcam Alpha 9 CD £400. Email: robert.courtneidge@osborneclarke.com (Jun)

QUAD 99 CDP CD £600. Quad 99 pre £400. Both mint condition, boxed with instructions and remotes. Pure DRX-701ES DAB tuner £100 (black). Mint condition, boxed, selling due to upgrade's. Tel: 01487 824 418 (Jun)

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NOTTS ANALOGUE Spacedeck, Rega RB600, Reson Etile M/C, latest thicker platter spec, Living Voice mat, Michell clamp, immaculate (£1950) £1100. Audio Note ANV 1m silver interconnects (£220) £100. Tel 01453 544 050 (Jun)



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Turin Breaks	Jackinabox	£TBC
Various	New Thing (Soul Jazz label)	£TBC

## LP OF THE MONTH

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## REISSUES:

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Brian Auger	Definitely What (Earmark)	£TBC
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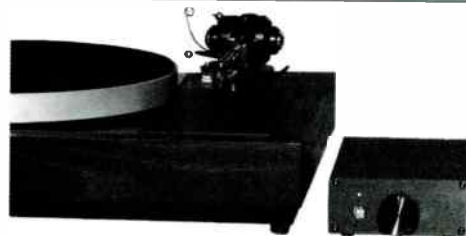
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**WANTED: SERVICE Manual for Akai GX-747 DBX reel to reel or where to obtain one. Tel: 07752 426 369 days or Email: robert\_webb54@hotmail.co.uk (Solihull, West Midlands) (Jun)**

QUAD ESL57, black, pair, vgc, serviced £550. Naim CD1, vgc £500. Gamma Rhythm Reference 211 single-ended, integrated valve amplifier, vgc, serviced £650. Tel: 01234 852 675 or 07905 476 446 (Bedford) (Jun)

WORLD AUDIO KAT6550 amplifier with upgrades. Any trial (now built 300B monoblocks) £475. Quad 44 pre-amp excellent condition, boxed £225. Quad FM 3 tuner, nice condition £60. Tel: 01246 810 851 (Jun)

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NAIM CDX CD player in excellent boxed condition £1295 ovno. World Audio Design Kit6550, 40wpc valve amplifier with upgraded components £390 ovno. Tel: Len 01492 516 875 (Jun)

CROFT VITALE pre/power amp, recent service £350. Tel: 07793 453 299 (Jun)

WANTED: GOODMAN'S 'Midax' speaker (1960s vintage) Tel: 01307 830 310 (Jun)

WANTED ACRYLIC platter for a Townsend Rock II turntable. Good price offered for a mint example. Tel. 01793 656734 (W) or 01793 618921 (H). (Jun)

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WANTED: NORDOST Blue Heaven, 1 Metre Factory Din To Din Interconnect (Boxed). Tel: David Greenwood 07834 665914 (Jun)

ATC SCM 20 active towers, new £5850, snip at £2000 ovno. ATC pre-amp SCA-2, new £4000. grab it for £2000 ovno. Tel: Geoff 01922 477 682 (Walsall) (Jun)

QUAD ESL 63 speakers, brown cloth, fine condition, serviced by Quad with Quad speaker cables £750. Nordost SPM Reference speaker cables, 4 metre pair, offers please. Tel: 01993 883 523 (Jun)

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**NEXT MONTH**

# THE **GOLDEN** AGE OF WIRELESS

July's Hi-Fi World looks at the best way to play radio today. We compare the latest and greatest in digital with the best modern analogue designs, and throw in a certain mystery tube tuner too!

We round up five of the best classic solid-state designs from the 1970s, pit Digital Radio portables against each other, try a brace of Freeview tuners and look at the state of UK radio broadcasting today. Here's just some of the kit we hope to bring you:

**DAB:** ARCAM DT91, CAMBRIDGE AUDIO 640T, SONY ST-D777ES  
**FM:** UNISON RESEARCH UNICO R, NAD C422, DENON DT260L  
**CLASSIC:** YAMAHA CT-7000, SANSUITU-9900, REVOX B-760, KENWOOD L-01T, PIONEER TX-9500II



plus:

- Denon DVD-A1XV/AVC-A1XV high end home theatre
- Inca Design Katana CD-S2 CD player
- Cyrus Phono X/PSX-R phonostage
- Mission e82 loudspeakers

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# Strange Fruit

Until the advent of Kenwood's DP-X9010 transport, CD player buyers had little choice about how they listened to digital disc. Players came with onboard digital-to-analogue convertors, which you either liked or lumped. David Price looks back...

**N**ever let it be said that Kenwood is not an innovating company. The Japanese marque has been responsible for no small number of great products through the ages, such as the L-07D turntable featured in the April 2005 issue of *Hi-Fi World*, and the DP-X9010 is also one of its best.

In truth, it doesn't look so remarkable today because – just like any grand design – its unique practices soon become everyone's convention. Indeed, in many ways, the DP-X8010 brought nothing new to the party. Looked at from outside, it's just another slice of mid-eighties Japanese high end. Beautifully built, with a tactile silkiness that you'd associate with names like SME, it presents itself (according to the front panel legend) as a 'Compact Disc Player'.

Only when you look behind that you spy something different. The rear panel is devoid of the usual assortment of gold plated RCA phono and XLR socketry, and instead carries a single TOSLINK and a single coaxial digital output – and that's your lot.

Strange as it may seem, this was a revolutionary concept in the late eighties when the DP-X9010 first appeared on its home market of Japan, because until then, CD players had been sold part and parcel with digital to analogue convertors, digital filters and analogue output stages. The Kenwood had none of these, because it was a CD transport.

Now, remember that this launched was before any kind of domestic digital recording technology became commonly available, so it hadn't been designed with any kind of recording or copying activity involved; it was simply to give audiophiles the chance to choose the digital to analogue convertor that best suited their tastes.

Of course, there were other benefits; a dedicated power supply feeding the transport was not to be sneezed at, as was the fact that the partnering DAC would have this too. The additional electro-mechanical isolation afforded by putting them in separate boxes was also a significant plus. Inside the *de rigueur* eighties black box, the Kenwood was beautifully hewn. A very high quality Japanese sourced transport (from a time when

they were truly built to last) was rigidly mounted in an anti-vibration casing, with very well executed power supply arrangements.

The result is a transport that sounds, even by today's standards, very impressive. It predates the days when jitter was truly understood, so cannot be considered as good (in this respect) as more modern designs, but still boasts a detailed, powerful and commanding sound with notably strong bass. Better still, the DP-X9010 provides an excellent platform for re-clocking, and companies such as Net Audio (tel: 01487 8146, [www.netaudio.co.uk](http://www.netaudio.co.uk)) specialise in this.

The advent of DVD has meant that almost all high end manufacturers have gone off chasing hi res, which asks different things from a transport. Many, rightly in my view, believe that bespoke CD transports give the best results with CD (regardless of what DAC is used), and the Kenwood to be one of the best of its type. A largely overlooked, underrated, future classic, if you look hard enough, a mint example can be had for around £250. It's worth every penny – and then some.

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