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World Radio History



# welcome

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Neal Gibbons  
Steve Green  
John May



After countless hours of listening, measuring and general poking and prodding around, *Hi-Fi World* is able to exclusively reveal that yes – in some ways – hi-fi has never been better, but *no* – in others – nothing beats a classic design from yesteryear...

The research we've put into this issue has confounded two myths; first, that everything new is automatically better, and second, that everything old is automatically better.

Take Chord's (new) Blu/DAC64 CD transport/DAC, for example. This is – in my opinion – one of the very best ways I've ever heard to play Compact Discs. It's a beautiful, intelligent, sophisticated and utterly alluring product – both to look at and listen to. But when we put it against the top from twenty years back – Cambridge Audio's venerable CD1 – it didn't comprehensively outclass it. The Chord is amazing, and the Cambridge deeply flawed by today's standards, but still there was something the oldster had that the new boy didn't.

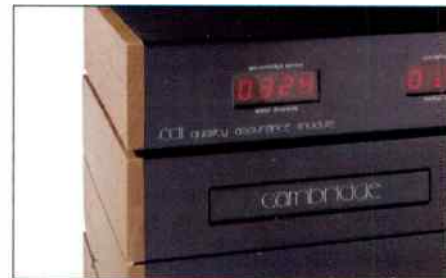
Then there's our loudspeaker group test; we lined up a range of weird (and sometimes wonderful) floorstanders, and then listened to Spendor's classic BCI (over thirty years old now), and although the best of the new speakers greatly impressed, you still couldn't quite deny the appeal of the oldie.

This whole issue is devoted to this very thing; hi-fi past, present and future. The conclusion we reach is that in many ways, audio has never been better. There are some seriously interesting and innovative products reaching the market now that, frankly, have arrived not before time. But still we see classic products, such as Audio Research's D150 tube power amplifier, proving so breathtakingly capable despite being made three decades ago, that we wonder just what the industry's been doing in the meantime!

For ages, yours truly has been banging on (to any designer who will listen) about how great loudspeakers with big bass units can sound, if done properly. The answer is always that 'there's no market for this sort of thing', with the dreaded 'spouse acceptance factor' being cited as the reason why not. Well, in this issue, Peter Comeau publishes a design for a serious loudspeaker that dares to be different – and the result is 'big audio dynamite'.

And finally, I'd like to take this opportunity to wish all our readers 'a classic Christmas and a happy hi-fi new year!'

David Price, editor



## verdicts



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**EXCELLENT**  
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## 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.



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### SHOWTIME!

Hi-Fi World will be at the Northern 2006 Sound & Vision Show at Radisson SA, Manchester Airport on 28th-29 January 2006 - see you there!



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# temptation



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# news



## LITTLE WONDER

Meridian Audio's DSP3100 is the company's newest compact digital loudspeaker. Replacing the existing DSP33, it's intended for use as a bookshelf or standmounter. Specially designed aluminium stands are available that can be sand filled for maximum stability and minimal impact on sound quality. The vertical units also include Omnimount/ universal wall bracket mountings for additional flexibility in location. The horizontal centre unit (Model DSP3100HC) is designed to sit on a shelf and is magnetically shielded; a stand is also available. The speakers are tonally similar to other Meridian DSP loudspeakers and as a result they are ideal for use as surrounds for a Meridian DSP-based system. They are suitable for use in smaller standalone systems, can be used as second zone speakers in a Meridian multi-room environment, or as high-end computer loudspeakers or for studio monitoring applications, particularly as near-field or surround monitors in recording and mastering facilities, where they can accept digital audio data at standard digital recording sample rates up to 24bit, 96kHz operation.

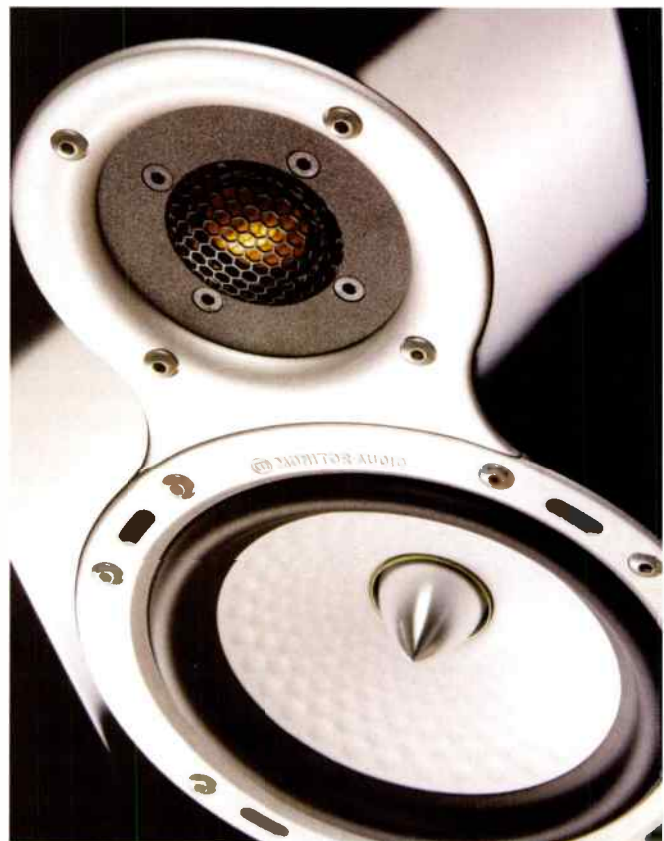
The speakers feature long-throw 6in (160mm) (vertical model) or dual 5.25in (120mm) (horizontal model) bass drivers with doped carbon fibre cones and cast alloy baskets, and the DSP3100 also includes a high quality 1in (25mm) Meridian piston treble drive unit with doped fabric dome. The drivers are powered directly by independent high power, low feedback amplifiers fed from an audiophile-grade power supply with a substantial toroidal transformer. The DSP power in the DSP3100 is provided by a Motorola 56367 running at 150MHz, while dual 24bit multibit delta-sigma converters handle D/A conversion. The vertical units feature a 2-way rear-ported design, while the horizontal centre is a 2-way closed box design. The DSP3100's cabinet is made from braced MDF with piano-lacquer ends and aluminium side panels bonded for rigidity. Cosmetic finishes available are black or silver, matching Meridian's G Series components (bead-blasted, chemically brightened and anodised). Exterior wooden surfaces are piano-lacquered. A pair of vertical units retails for £2,595, with stands at £330 per pair. The horizontal centre unit retails at £1,565, with the stand at £190 (all prices are suggested recommended retail and include VAT). For more details, click on [www.meridian.co.uk](http://www.meridian.co.uk).

## SIGN HERE

One of *Hi-Fi World's* favourite big bangers of the past couple of years has been the Monitor Audio GR60, and now we hear news of its replacement. The Gold Signature series is the company's new flagship, for which is claimed "unprecedented standards of design, innovation, performance, technical excellence, build quality and value in its class". The new six model line-up comprises a stand-mounting speaker, the GS10; two floorstanding speakers, the GS20 and GS60; a dual-mode surround speaker, the GS-FX; a dedicated centre-channel speaker, the GS-LCR; and a 1000W (RMS) active subwoofer, the GSW-12.

The company says that while the ethos of the original Gold Reference series has been preserved, wholesale improvements have been made in the construction and quality of materials used. Anti-resonance build: driver chassis' are held rigidly in place by an innovative zinc alloy clamp system. The cabinet is made more rigid by the use of traditional tongue and groove construction and extensive vertical and radial internal bracing. The plinth for the GS20 and GS60 is also now made from a rigid cast alloy with a discreet aerofoil profile.

New drivers are used (6.5" diecast aluminium chassis bass and bass-mid) with a new Rigid Surface Technology RST2, C-CAM alloy cone profile. A new 1" C-CAM gold dome tweeter has been developed to propel high frequency performance to beyond 40kHz. The cabinets are finished with smooth radius edges and selected premium quality wood veneers in Santos Rosewood, Walnut, Cherry and Natural Oak. Piano black and piano silver gloss finishes are also available. Prices are £800 for the GS10, £1,500 for the GS20, £2,000 for the GS60, £500 each for the GS-LCR, £900 for the GS-FX and £1,000 for the GSW-12. For more information, call 01268 740580 or click on [www.monitoraudio.co.uk](http://www.monitoraudio.co.uk).



## ENTER ASTIN

ASTINtrew is a new British audiophile electronics manufacturer, with an interesting new range of quality amplifiers, CD player and mains power management. The company claims to, "design great sounding, good looking audiophile equipment with real world features and sensible prices - sold through retail partners with dem-room facilities". All the products are designed in the UK and manufactured under licence in the Far East. The first AT range includes two power amplifiers, preamplifier, integrated amplifier, CD player and a mains distribution/conditioner, all using solid-state and valve technology.

The AT product range is distinctively styled using a modular approach. The products are mostly constructed from etched matt anodised aluminium – both the 6mm thick front fascia and the sides are extruded. A remote control is supplied with the preamplifier and CD player. The AT1000 Valve preamplifier (£599) is a line level design based around ECC82 valves from Electro-Harmonix. The front illuminated fascia sports a motorised Alps volume control and push buttons for mains on/off, 5 line inputs - including an MP3 input, through a fascia mounted 3.5mm jack socket. At the rear there are two outputs (for bi-amping) and a tape output, along with the input sockets, all of which are gold plated RCA phono type. Remote control is supplied.

The AT5000 Hybrid power amplifier (£645) is a dual-mono single-ended design using ECC82 valves from Electro-Harmonix together with MOSFETs. Each mono power supply uses a 300VA transformer, Schottky diodes and quality capacitors offering a large 44 joule capacity per channel. Output is conservatively rated at 50W into 8 ohms, 100W into 4 ohms. The fascia sports a mains on/off switch and to the rear, there is one input, RCA phono type, and two speaker outputs (bi-wiring option) for both bare wire and 4mm banana plug connections. The AT2000 integrated amplifier (£999) offers all the features of the AT1000 and AT5000 amplifiers, but uses a single downsized power amplifier transformer. Remote control is again supplied. The AT3000 CD player (£599) uses a valve output buffer amplifier. The AT8000 Hybrid power amplifier (£850) puts out 90W per channel, while the AT6000 Power distribution (£350) is a 5 way distribution unit with equipment

dedicated outputs. For more information, call 01491 414494.



## ULTRA VIVID, SEEN

The new Vivid Audio VI is said to offer a compact two-way loudspeaker solution for a wide variety of situations. Employing a single C125 driver to cover the mid to low frequency band, and a D26 tweeter above 3kHz, the VI maintains the pistonic drive philosophy found throughout the Vivid Audio range of products. In order that time alignment be perfectly preserved between the frequency bands, the D26 is mounted at the apex of a shallow waveguide which further benefits dispersion continuity through crossover, and raises the efficiency to no less than 98dB/W (claimed). Both drivers are compliantly mounted in an enclosure cast from carbon fibre-reinforced filled polyesters and smoothly contoured to minimise edge diffraction effects, particularly around the high frequency waveguide. The VI is available in three mounting options, bracket mount (VIw), desktop/stand (VIp) and horizontal mounting (VIh). The product will be supplied in pairs or singly, and finished in Graphite, Oyster Grey, Sahara Beige, Copper or Metallic White. Prices are £3,950 to £4,500. For more information, click on [www.audiography.co.uk](http://www.audiography.co.uk), or call 01444 235872.



## RADIO GAGA

According to the latest RAJAR survey, radio listening via Digital Radio receivers (DAB) has, for the first time, overtaken combined listening via digital television (DTV) and the Internet and total listening hours via DAB has grown by 165%. The findings are revealed in a RAJAR survey into listening via platform, undertaken in August and September last year. In addition, the number of radio listeners, who claim to own a DAB receiver or listen to the radio via DTV or the Internet, has increased by 4.7 million or 25% when compared to a RAJAR survey undertaken a year ago. Total listening hours via DAB have grown by 165% during the past year, substantially more than DTV (42%) and the Internet (84%). DAB also recorded the largest increase in reach (95%), when compared to that of DTV (28%) and Internet listening (30%). Results from this survey, when equated to the main RAJAR survey, suggest that 10.5% of all radio listening is now via digital platforms.

Sally de la Bedoyere, managing director of RAJAR, commented that, "the findings of the latest RAJAR Listening Via Platform Survey make encouraging reading for the digital radio industry in the UK. While listening via digital, DTV and Internet receivers has been gradually increasing over the past year, listening via DAB has grown by a staggering 165%. Interestingly, this figure mirrors the latest sales of digital receivers as published by the Digital Radio Development Bureau (DRDB), which reported an increase of 257% in sales last July.

She added that, "the results also show a major shift in radio listening from analogue to digital receivers. Indeed this growing shift can also be seen in data reported by RAJAR just over three weeks ago (October 27, 2005) which revealed that home ownership of DAB sets rose from 4.5% in September 2004 to 10.5% in September 2005. Clearly, this is a trend which is gathering pace as access to digital receivers increases and it is one RAJAR will continue to monitor."

Ian Dickens, chief executive DRDB said, "RAJAR's Platform Survey findings very much match the DRDB's own research, which shows sales of DAB digital radios more than doubling year-on-year. Consumers are delighting in the new, unique content available on DAB stations, both commercial and BBC, and this is translating into rapidly growing listening figures. The DRDB believes this trend will continue and forecasts DAB digital radio set penetration of 40% of UK households by 2009."



## CHINESE CRACKER?

The brand new Chinese built, Chinese designed Qinqu A-8000 mk II integrated amplifier sports an undeniably handsome aluminum chassis, with "innovative Class A-AB circuitry", running Sanken A1215/C2921 output transistors, a Burr-Brown OPA604 op amp and Alps volume control. The result is a claimed power output of 100W per channel (into 8 ohms, half as much again into 4). It's a big and heavy beast, measuring 482x300x196 mm and weighing in at 20.5kg. How does it sound? Well, you'll have to wait for the next issue of *Hi-Fi World* for that, but in the mean time, if you want more information, call Shadow Distribution on 01592 744 779 or click on [www.shadowdistribution.co.uk](http://www.shadowdistribution.co.uk).

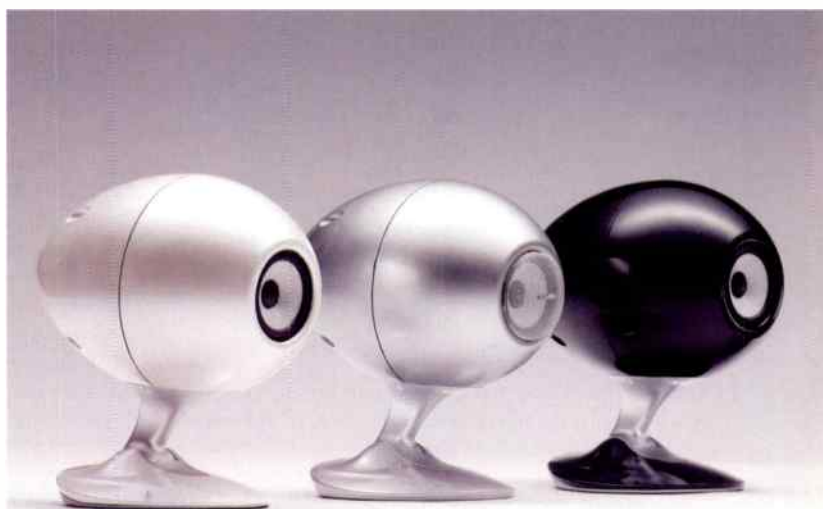


## SINGLE LIFE

Nordost's new Heimdall 'Micro Mono-Filament' interconnect uses four 'Micro Mono-Filament' silver plated oxygen free copper conductors, each helically wrapped in an FEP 'Micro Mono Filament' thread and extruded within an FEP tube which reduces insulation contact with the conductors by more than 80% and provides extreme mechanical stability. This design means that signals are transferred more efficiently and at extremely high speeds, says the company. The cable is terminated with high quality WBT NextGen gold plated copper connectors, which provide the perfect low mass connection between the cables and the equipment. By combining four Micro Mono filament conductors with the excellent WBT NextGen plugs, Heimdall is said to "offer a substantial upgrade over Nordost's Baldbur interconnect whilst maintaining a very modest price" of £369.95 for two metres(!) Interestingly, there's the option of a tone arm cable, to allow complete cable synergy from phono cartridge to loudspeaker. The Heimdall tonearm cable is dual shielded with dedicated drain wires for grounding and uses four conductors with Nordost's Mono-Filament technology for superb musical fidelity. The cable is terminated by a high-grade 90 degree mini DIN tonearm connector and Neutrik professional grade RCA or XLR connectors. Price is £249.95. The cable is also available for speaker applications, where it consists of 24 OFC conductors with an extruded silver surface at £954.99 for a two metre pair. All Nordost cables are tested before they leave the factory and carry a limited lifetime warranty. For more information, call Activ Distribution on 01635 291357.

## TIME AND SPACE

The princely sum of £1,200 will buy you a pair of Eclipse TD510 Time Domain Monitors, replacements for the *Hi-Fi World* fave rave TD512. If they're anything like their predecessors, they'll be stunningly well built and exquisitely finished, and the company also claims a plethora of improvements, including extended frequency response, higher sensitivity and wider dynamic swing along with the self-same superb imaging and lack of colouration. There's a new flexible table/wall/ceiling mount and also new optional floor stands which add £600 to the price. For more information, call 020 7328 4499 or click on [www.eclipse-td.com](http://www.eclipse-td.com). The first public showing is at the Bristol Show, one of this magazine's favourites. Bristol Sound and Vision, the UK's largest hi-fi and home cinema show, runs from Friday 24th to Sunday 26th February 2006. For details, click on [www.bristolshow.co.uk](http://www.bristolshow.co.uk).



# Walrus



11 New Quebec St, London W1

Have we got turntables? Do bears... no, forget that. Of course we have!



We don't have a problem with turntables at all (some shops seem to have - how much choice do you see in your local hi-fi store, that is if they even sell proper hi-fi any more). This venerable way to reproduce music in your home still happens to offer the most realistic sound quality of anything available today. You can spend a fortune on the latest digital components to still only get a fraction of what even a relatively modest cost vinyl front end has to offer. You probably already have the "software" for it tucked away in a corner somewhere, assuming you're not a vinyl user already. And, the best thing is, it's not going to become obsolete - you won't have to worry like the digital aficionados do about the next miracle format and having to repurchase everything again! Provided you look after them, those vinyl discs contain an almost unlimited amount of information, and as you gradually upgrade your front end, you get to hear ever more of it.

Our advice on turntable/arm/cartridge matching is second to none (provided, obviously, you purchase from us!) and our subsequent building of your turntable will ensure you get the full performance from it (we see quite a few turntables purchased elsewhere or second-hand which aren't working properly). We also don't forget about you after you walk out the door, it remains important to us to keep your deck working to your satisfaction over the years. Just thought we'd remind you that vinyl playing is still our priority!

## However...

Even we have to face the fact that more and more of (to us) people tell us they visit us for digital for analogue. Er, yes. So, we have to be very making some absolutely superb digital products example. Consonance also make some wonder-(pictured) is the latest wonder from this company. also a complete departure for this price range (the upsampling DAC and a valve output stage, all in a



you want decent digital disc spinners, and ironically players specifically because of our enthusiasm careful what we choose. The Chinese have been lately, you've all seen the success of Shanling, for ful products, and the Consonance Droplet 5.0 Not only does it sound excellent, the styling is Droplet costs £1995). You get a 24 bit / 192k unit which weighs just under an astonishing 30 Kg.

But it's not only the Chinese who're making digital waves, as it were. Our own home-grown favourite, Musical Fidelity, have come out with an astonishing two box player, a new model in their acclaimed KW series, the DM 25 transport and DAC. The digital and analogue sections are both effectively "dual mono", and although you can buy the units separately, there are very few other makes you can use them with because they connect using the esoteric dual mono twin cable system, a method only one or two far more expensive units use. The outcome is sound quality well ahead of what you might expect of the price tag - both units together cost £3995. And, in case you were wondering, those things sticking out the top of the transport are levelling adjusters for the unique isolating feet, nothing more sinister!



Even when you hear them playing full orchestral music, or even rock, they are very special. Instruments sound as they were meant to, voices are utterly natural. These are a must hear design if you are a "serious" listener.

And, just a little reminder about the superb Stirling Broadcast LS 3/5a loudspeakers. Now, we know these are about as unfashionable as it gets. Modern speakers are supposed to be big, bold, full of high-tech drivers, and with a multi hundred watt power handling tag. And indeed, most modern designs are just fine for purely electronic music, where tonal accuracy, subtlety, and even soundstaging take second place to sheer grunt. For acoustic music and spoken voice, though, these BBC designed mini monitors are absolutely unparalleled.



Finally, we now have the fantastic Hyperion HPS-938 loudspeakers on demo - sorry, no room for a piccie - book now for a listen.

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# Blue Velvet

**Compact Disc has had a long and chequered past, but here's a CD player that really pushes the format feet-first to the future. Noel Keywood auditions the silky sounding Chord Blu/DAC64 transport and DAC combination...**

**H**ow could you not be attracted by a product as visually arresting as this one? Well, it could be repelled by cynicism: "this is hi-fi as domestic trinket, with little of value beneath the gloss", but it didn't turn out this way. Chord Electronics Blu transport and DAC64 were quite revelatory. And little did I know, as I intercepted them whilst awaiting photography, that what I was about to hear wasn't as new and glossy as it looked either - nor entirely unknown to me. Hi-Fi World reviewed its spiritual ancestor many moons ago; it was the DPA Enlightenment. We raved about the DPA and little has changed since then, except my age! No one who heard this new combo was anything other than amazed by it.

Let me run this review back to front by talking about sound quality first, because you could package this DAC in used fish'n'chips paper and it would make not one jot of difference to what I thought about it. The major reason is DAC64 just about achieves

what I thought was fundamentally impossible with 16bit digital audio: an almost-analogue sound. Subtly implausible yet surely real was the utter smoothness of its delivery, completely free of the harshness and flatness of digital as we know it, and a sense of dimensionality that I had never heard before from CD. Valve output CD players offer a good and pleasant take on this, but the Chord Electronics DAC64 is the real deal.

I thought I had heard enough CD players and Digital-to-Analogue converters to know that in spite of consistent claims to have achieved an analogue sound, after a time you find that the truth falls some way short of reality. Progress has been much slower in CD, as is to be expected from such a constrained technology, than it ever was with analogue. Modern players are clean, and even of a sweet tonality in the case of Shanling's CD-T80, but they have always seemed unable to break out of the straight jacket of 16bit digital. That means a sound that is quite obviously proscribed, especially





rear of Chord CD Player

after a few hours listening to a decent moving coil cartridge which, by way of contrast, seems freer in its delivery, with an easy sense of spaciousness that has eluded CD in the 30 years or so of its existence - and isn't as evident as I had hoped in DVD-A or SACD either.

With this experience forming my view of CD, one that's been tested enough times over the years, I was a little perplexed by hearing DAC64, initially hooked up to a CD player. It is, as the manufacturers state, something that hits you just about immediately. "This doesn't sound very digital" I thought to myself and wondered what trickery was afoot, under the pretty exterior.

It was when I read about an innovation called the Watts Transient Aligned filter within Chord's literature that two plus two suddenly equalled six in my head, or even more! Was this Rob Watts, ex Deltec and DPA, whose innovative and impressive products we reviewed in the 1990s?

It was, which seemed to explain it all, as Rob Watts was responsible not only for designing impressive sounding DPA digital convertors, but for manufacturing them too. Designing is different to manufacturing however and of the two he eventually decided to pursue the former rather than both at the same time, turning to consultancy within the EU on emerging electronics technologies. Even some of the curious styling of the DAC64 convertor is explained by this fact, as Chord Electronics was forced to use pre-programmable silicon chips to build the special digital filters needed. Having done so they decided to put them on display through those Nautilus windows. Chord Electronics have artfully illuminated the inside with leds, to add extra interest, especially in a dimmed room.

Few companies, if any, design and build their own dedicated integrated circuits these days. Such things come in neat sets from suppliers such as Burr Brown, Wolfson Semiconductor, Cirrus Logic and Texas Instruments.

It's tacitly accepted that they have the research, engineers, knowledge and - especially - fabrication plants able to produce high performance digital circuits at relatively low prices. It consigns everyone else to the status of that perjorative soubriquet: box stuffers!

Recently I tested a group of CD players and three had absolutely identical performances - a sure sign they use the same chipset. This approach has the peculiar effect of bringing most benefit to a particular strata of players priced to accommodate a high quality chipset and support parts, but priced no higher. Higher price players often use ritzier parts, but the same basic technology. No wonder that their sound isn't radically better.

This is where DAC64 is worlds apart and why it sounds so different. I'll avoid long descriptions of Mr Watts' technology which, by definition, I don't understand. You are best advised to visit the Chord Electronics website if you want to read about it. But haven't we all read and heard that this, that or the other CD player is radical, brings an analogue sound to digital and

good and natural relation to all else. In truth though, measurement shows things are not quite as per usual here. Treble output starts to roll down relatively early for CD and, measuring -3dB or so at 20kHz the total energy loss at high frequencies is quite severe. Due to this fact alone DAC64 (and Blu transport of course) cannot display the same tonal balance as other players, most of which measure pretty flat to 20kHz these days.

Even with the reservations that arise after measurement borne in mind, at the end of the day this product passes one serious test like no other - it makes CD enjoyable. No one seems to object to it and everyone seems to enjoy it. In the office it was cooed over.

At a sheer practical level the Chord Electronics combo catch the eye and satisfy the senses. Hewn from solid aluminium, with sculpted in detail, such as countersunk machine heads screws, operating buttons, vents, lights and badges, there's little like it. Only Shanling are so obsessed about machining from aluminium billet. If all that were not enough, there's more - much more. The Blu CD transport has a clamshell lid that is manually lifted and, when you do so, a ring of blue leds light around the periphery of



rear of Chord DAC

is the best thing since the wind up gramophone? Few do, but this one just about does.

Why the equivocation? Well, at the end of the day, digital is digital and this is 16-bit, which isn't intrinsically so clever. It is 1970s technology after all, the first coding scheme to find widespread use - and things have moved on. That DAC64 manages to sound so open and spacious, yet easy and relaxed is a revelation within this context. It seems almost characterless in itself; the presentation lacks grain, having a serenity that just isn't digital. There's none of that depressing flatness that is so difficult to either explain or subjectively pinpoint to an uncritical listener. DAC 64 lays out a sound field that stretches forward and back with ease. Gone is that sense of hard, jittery digital treble; high frequencies are there, seemingly in

the mechanism well. Hermetic sealing and CD clamp come within this set up. Unlike so many modern CD players, for reasons unknown to me, the transport reacts quickly to commands. Track and time displays are bright, fluorescent blue, large and clear - so no nonsense here either. A complete absence of screen printed legends was a surprise though, especially with so many outputs and switches to select or set.

At rear the Blu transport has upsampling outputs, including a 176kHz option with balanced digital output via two BNC connectors. On our setup this ran through two short cables to DAC64. Optical and electrical SP/DIF outputs are fitted and AES/EBU balanced digital outputs. Dither can be switched in, to smooth old digital recordings, Chord suggest.

DAC64 has balanced XLR analogue outputs, unbalanced phono

SECOND THOUGHTS

The £6,190 Chord Electronics BLU/DAC64 combination has singular purpose, to just play CD, with a beautiful advantage – it has tactile clarity. Precisely the size it needs to be, yet beyond the lazy default of form following function; the BLU and DAC64 are conspicuously well considered and flawlessly built. With the discontinuation of the £12,000 Linn CD12, this Chord combo, similar in manufacturing philosophy to the Linn with machined from solid aluminium engineering, is the most attractively designed CD player in production that I have yet to see. Even the inside of the manual lid is gorgeously profiled and up-lights only when open.

The sound quality of the BLU/DAC64 is also rather special. Although the £4,195 Chord BLU does not have bespoke transports like the Linn CD12 or £9,000 Esoteric X-01, its Phillips PRO 2 mechanism cannot be sniffed at when compared with the majority of ROM drives used in many new CD players, even some high-end ones. The BLU as a transport provides a stunningly low-noise and deep canvas to music in my opinion. It is so finely sophisticated, that through immediacy, 'The Hand That Feeds' by Nine Inch Nails, the cover of 'Night And Day' by U2 or Bach's 'The Well Tempered Clavier Book 2' played by Daniel Barenboim all sound slightly less exciting at first, when compared to a Rega Planet/DAC64 combination. But listen for a few moments and the sheer beauty of timbre, space around instruments and resolution comes shining through with exceptionally satisfying comportment.

Connecting a £500 Rega Planet 2000 to the £1,995 DAC64, the change was spectacularly different. The Rega now had a new kinetic lease of life, through excellent musical timing. The resolution, bass agility and upper frequencies were all radically superior. The icing on the Rega's cake was that this entire DAC64 detail enhancement program was done within a cohesive musical whole and musical effortlessness. This bodes well for lower to mid cost CD players like the Rega and as such the DAC64 isn't Chord's best seller for no reason.

Downsides, well the DAC64, subjectively at least, didn't offer the same level of improvement with a £1,350 Densen B-400Plus CD player. The DAC64 did enhance timbre and weight to instruments, but the wonderful spatiality, swagger and musical timing of the Densen that maintained its particular musical cohesiveness was a touch minimised. Indeed, though somewhat less sophisticated at detail and finesse level, my personal preference was to the Densen over the more costly BLU/DAC64 combination in my reviewing context, for the simple reason that, though less refined in comparison, the Densen kept the music more complete.

The DAC64 now in its eighth software update is a very beguiling instrument and it is still just about attainable, and attractively so, when musical synergy is realised. CV

outputs, AES/EBU XLR balanced digital inputs as well as optical and electrical SP/DIF inputs, all switchable. There is also a long time buffer, through which the digital stream can be re-clocked when switched in as recommended. It inserts a 4second time delay.

At switch on DAC64 glows blue internally, but when it locks, red leds light up as well, turning the hue to violet. It bathes the circuit board in a violet light, visible through the circular window. Although the two units together look bewilderingly unfamiliar and complex, I found them easy to use. There is a remote control of course.

There's no doubt in my mind that the Blu transport in conjunction with DAC64 offers a fantastic way to play CD. I have never heard such a smooth, cohesive sound, nor one so dimensional. You'll not hear such wonderful space around violins, such silky smoothness, nor such resolution of timbral properties anywhere else. These benefits extend downward to powerful yet supple bass, in easy proportion to all else.

At £1,995 for the DAC this has to be the most accessible and interesting unit of the two as far as upgraders are concerned. I used it with a variety of fairly ordinary CD players and always got fine results. It's difficult to know quite what to say about a play off between this product and a player like a re-valved Shanling CD-T80. No they're not the same at all, and there's a large price difference, but both have their own particular flavour and strengths, and both offer superb levels of entertainment from CD, well above normal expectations. I suspect the Chord Electronics combo is a must have item for those with pockets deep enough to afford it, as you'll not get such a presentation anywhere else. Beauty is more than skin deep with this product; it has been engineered in through and through, to produce CD player that is quite unique in every respect.

**VERDICT** ●●●●●

One of the best transport/DAC combinations yet made.

**CHORD BLU/DAC64 £6,190**

Chord Electronics Ltd.

+44 (0)1622 721 444

www.chordelectronics.co.uk

MEASURED PERFORMANCE

Frequency response shows a pronounced roll off at high frequencies, measuring -0.6dB at 10kHz at -2.5dB at 20kHz. If an amplifier measured like this its performance would be judged unacceptable in hi-fi terms. The sound would be described as warm or dull. I got the same result from balanced and unbalanced outputs. This will affect any subjective assessment of DAC64 and Blu transport. The impulse response showed the characteristic "pre-echo" of a linear phase filter.

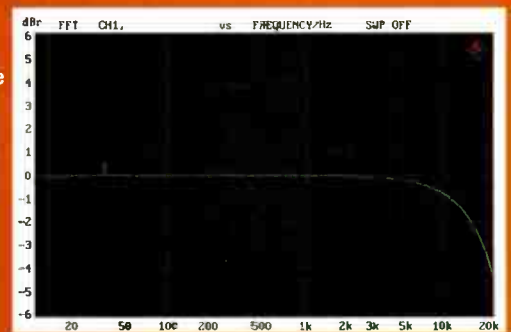
Distortion levels were extremely low throughout the entire dynamic range, measuring 0.0009% at -1dB through to 0.17% at -60dB. Although switching n dither visibly raised the noise floor displayed on our spectrum analyser, it did not lower measured distortion below -60dB surprisingly.

Measured noise levels were normal enough at -101dB unbalanced output (phono socket) and -103dB balanced (XLR), IEC A weighted. Output was very high at 3V from the unbalanced output and no less than 5V balanced.

With low measured distortion and a prematurely rolled off frequency response, but phase corrected impulse response, this combo measures unusually. I would expect a unique sound. NK

Frequency response (-1dB)  
CD 2Hz - 14kHz

Distortion	-1dB	0.001%
	-6dB	0.0009%
	-60dB	0.17%
	-80dB	8%
Separation (1kHz)		122dB
Noise (IEC A)		101dB
Dynamic range		111.5dB
Output		3V



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# Twenty Years Ago Today

**Channa Vithana pits Compact Disc's 'state of the art' from 1986, Cambridge Audio's CD1, against 2006's latest and greatest, the Chord Blue/DAC64.**

**T**hose with long memories will remember the Cambridge CD1 to be one of the very best Compact Disc players of the nineteen eighties. Launched around twenty years ago, and designed by Stan Curtis, it made its debut at the Las Vegas Consumer Electronics Show priced at a whopping £2,800 (which is at least twice as much in today's money). After a brief but glorious run, it was discontinued around 1989.

According to Angie Curtis who was the sales and marketing director of Cambridge Audio at the time, the CD1 used a metal drawer Phillips mechanism which was completed by a lead suspension/ support system. And thus, it (slowly) operates with a 'hewn from solid' assuredness. Consequently the CD1 weighs in at approximately 16kg, which is very heavy by current standards.

The slender component with three rows of red LEDs is called the Quality Assurance Module, and was designed to read the disc quality of playing CDs! The CD1 used a fourteen bit, four times oversampling digital to analogue converter made by Phillips, and rare for the period were three front panel filter settings for sound quality. There is also a variable volume control for connection to a power amplifier.

## SOUND QUALITY

The sound of the solo piano from Daniel Barenboim's 2005 'We'll Tempered Clavier Book II' was surprisingly nimble. The first few pieces from this recording are quite tricky to reproduce in that they can be quite intense in chroma, yet within the music, the CD1 had a rather good midband. The struck piano keys were

kept nicely under control but not stifled. The acoustic of the piano travelled around the listening room very well as the notes went from delicate to more intensified, the CD1 handled them ably.

Substituting the CD1 for the £6,190 Chord BLU/DAC64 into the £4,000 Quad QC-Twenty Four/11-Forty pre-power amplifiers and £2,000 Spondor S8e speakers, brought on a slightly less open sound in comparison. However, the music of the piano was subjectively much lower in noise and the dynamic range was accordingly much better. This helped the piano notes to have an even better acoustic decay. The sound was a touch warmer but in this instance, the piano had a more rounded feel to it.

No Doubt's 'Hella Good' from the 2003 'Singles 1992-2003' compilation is a stomping dub-pop delight and proved to be vast and spatially cohesive through the CD1. Gwen Stefani's vocals were also handled very well with a nicely rounded feel to her particular singing style. The bass was powerful, deep and enjoyably flabbily distended! This rather wayward bass would not normally constitute a balanced musical stance, but it was grin-inducingly good nonetheless. The Chord BLU/DAC64 handled the bass with authority and provided agility, definition and resolution in comparison.

The Balanescu Quartet's 'Maria T'

from 2005 was nimble and finely detailed in general by the CD1, however post immediacy; the overall sound was a little mid-forward in expression. The cello had decent timbre while the viola in the melodic parts was communicative with pleasant tonality. The sound was subjectively much quieter with the Chord BLU/DAC64 which invited higher volumes. Violins became more emotive and engaging while the cello gained in texture and weight. Interestingly the Chord duo was a little internalised compared to the CD1, and additionally there was a slight emphasis to the mid to low frequencies of the violins and cello.

## CONCLUSION

Overall, for an ancient CD player that has been untouched by servicing or refurbishment for many years, our CD1 acquitted itself rather well. Obviously, the newer, very expensive Chord duo was subjectively superior with dynamic range, resolution, timbre and melodic aspects to music making, but the CD1 on some occasions was more animated and exciting than its modern counterpart. The CD1, though idiosyncratic, with its use of Quality Assurance Module for example, remains a very interesting hi-fi instrument, and fully serviced and refurbished, it could be more so still I feel.



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# Speakers Corner

John May tries a brace of affordable floorstanding loudspeakers, and Noel Keywood listens in...

**B**ack in the 1970s it was not uncommon to see a 12" woofer along with any number of other drivers, stacked in an impressive array within a large floorstander. In those halcyon days you simply had to have a huge pair of speakers to do justice to your 'Saturday Night Fever' LP!

These days quality bass can be had from smaller loudspeakers, but the large floorstander retains its attraction. It's still true that a big floorstander can thunder, but many do not - for a variety of reasons. And even those that do may not sound so good for other reasons. The 12in woofer followed the woolly Mammoth into extinction because it wasn't well adapted to a new environment, one where stereo imaging was becoming important.

These days smaller bass units are stacked vertically to create enough cone area for satisfactory bass. Cleverly designed cabinets and bass ports play a vital role in determining the eventual quality of sound. The group of speakers we have on test this month use a variety of tricks in an attempt to provide quality bass. They don't kick like big ones, but there's enough to annoy the neighbours...

One area of loudspeaker design which has come a long way in recent years is cone material, which can have anything from a subtle to profound effect upon the sound. In this test we have a mixture of traditional paper cone drivers, polypropylene ones, metal-alloy drivers and so on. Each offers a slightly different colouration - which is best is open to argument, and depends upon how well the rest of the speaker has been engineered. Loudspeaker designers will casually flick and scratch a cone with their fingernail and listen to how it sounds. This gives some idea of what to expect.

Computer aided design packages have made it possible to design - on paper at least - a fundamentally accurate loudspeaker. As I found out here, however, a flat response is not necessarily a guarantee of quality; it is one component of it. What

we found with our measurements didn't completely describe what we heard in practice. And designers - like listeners - have their own musical preferences and tastes, often reflected in the varying approaches on show here. For example the Cain and Cain Abby has quite clearly been pitched at those who particularly value a strong midrange performance - and first-class imaging too. Not accurate, but intriguing.

Then we had the Acoustic Energy AELITE Threes which have been engineered to give a near textbook performance, but still had their own character. Somewhere in the middle reside the designs from the other manufacturers. Loudspeakers are forever difficult to decide upon and variation in these areas didn't make our life easy when making judgements.

Other factors made decisions even more uncertain. Speakers can sound radically different depending on the acoustic properties of the room they are in. In this instance I listened to the speakers in a total of three different rooms and they gave differing results in each. Bass varied most, according to the room and the 'speaker's position in it. A loudspeaker like the KEF iQ5 could have good bass or no bass - disconcerting! Final listening was carried out in a treated, optimised room with controlled decay times.

To drive the loudspeakers we used a Naim NAP250 power amplifier with matching NAC282 preamp, but also a Sugden a21a and Quad II-forty with QC-twenty four to provide a valve option. Interestingly, the valve amps matched all the floorstanders with the same apparent ability as the Naim. And as always we played a wide variety of Classical and Rock music, mainly from a Eastern Electric MiniMax CD player, but also a Chord Electronics DAC 64 and transport.

As with the CD player group test of last month, the results were surprising, and it didn't follow that the most expensive speaker sounded the best. Whilst there were no 12inch woofers, we heard good bass all the same - if not enough for 'Saturday Night Fever' fans!



## KEF iQ5 £400



## VERDICT

KEF iQ5 £399

KEF Audio (UK)

+44 (0) 1622 672261

www.kef.com

## FOR

- exciting dynamic sound
- super imaging
- value for money

## AGAINST

- lacks deepest bass

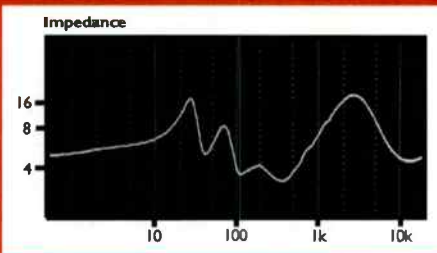
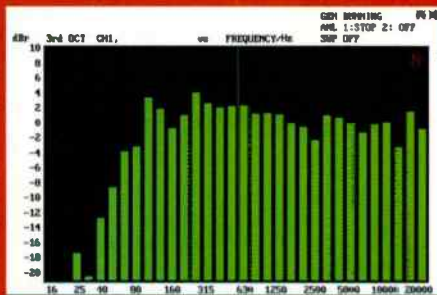
## MEASURED PERFORMANCE

The iQ5, like earlier Q Series, has a lower midband that's both smooth but raised by a few dB above overall tweeter level, our response analysis shows. The tweeter's frequency response undulates a bit, like earlier Uni-Q drivers, but output is maintained to 20kHz. All this suggests a sound that has 'body', is smooth and fulsome and satisfactorily detailed, but not overly bright. The tweeter will likely be characterful though.

Bass rolls down to 63Hz or so; the iQ5 looks a little lean here, as if wall standing is intended, or use in a small-ish room with strong room boom. In a situation like this the iQ5 will not over excite the room.

This loudspeaker is a highly reactive load, and also one that draws current from an amplifier, reaching down to 3ohms or so. Sensitivity was a normal 87dB. The iQ5 measures well,

except as a load; not all amps will give their best with it. Otherwise it should give a balanced and accurate enough sound, with light-ish bass. NK



The iQ5 is the entry-level floorstander in the ever-popular Q series of loudspeakers from KEF. It is handsomely finished indeed for the price, and is available in black, maple, dark apple or walnut. Dimensions are a wife pleasing 815x175x261mm. Weight comes in at 10.2kg. The iQ5 is a three-way bass reflex design, and features one 130mm driver for the low frequencies, another 130mm Uni-Q point source array cone for the mid, featuring the now-familiar 19mm aluminium dome tweeter at centre for improved imaging. The top of the cabinet features a curved section atop the main Uni-Q drive unit to aid the dispersion of the driver.

High quality crossovers are employed to provide a trouble-free transition between each driver. The speakers are biwireable, and come with impressive high quality gold-plated terminals. Also – uniquely for this group of speakers – the links between terminals for single-wire use (which is how we tested them) uses high quality wire instead of the commonly used and sonically inferior gold-plated metal linkages. Nominal impedance is quoted by KEF at 8ohms, and sensitivity is 88dB. Power handling is 15-130W which should render it usable by a wide variety of amplifiers.

## SOUND QUALITY

Considering the budget price of the KEF iQ5 I was surprised by its performance. The first track to test the KEFs mettle was 'Farewell Ride' from Beck's 'Guero' CD. I was very taken with their punchy, upfront sound. Detailing was exceptional for the price, and I loved the way the iQ5 imaged. The soundstage was uncommonly wide and sounds seemed to emanate from way beyond the extreme left and right of the loudspeaker boundaries.

String tone and purity on Tchaikovsky's 'Valse de Fleurs' was sweet and well detailed, with a pleasing hint of warmth which came as a welcome relief considering the often-unpleasant sounds one associates with metal dome tweeters. This treble unit has generally been well-integrated with the Uni-Q driver, and rather than an offensive brightness to recordings, this one instead served to accentuate details on rather than taking your head off like others in this test. It rarely drew attention to itself.

Turning the volume control of the Naim NAC282 to neighbour-annoying levels on Black Sabbath's 'The Wizard' revealed a speaker willing to give of its best for Rock music. Bass was both taut and exciting, though not particularly seismic in depth. The same traits were evident on Sly and Robbie's sublime 'Make 'Em Move'. There was a trace of midrange muddle when the going got tough at higher volume levels, but it didn't detract from the other positive things this speaker was doing.

Those seeking a more refined presentation might well find these speakers a tad uncouth and over-enthusiastic for their tastes. I loved every minute with them however - they are a fantastic all-rounder, and really excel at getting their teeth stuck into any variety of music. JM

## NOEL SAYS

The iQ5's burrow into the midrange of a performance with almost alarming energy, lifting vocals from a mix in a manner unmatched by most rivals. In this respect, as in so many others, the iQ5s are strong. Like all Uni-Qs they project focussed images on a clear, open sound stage - an impressive feat. At times I could hear the tweeter working through the mid cone, and on this latest iteration, there was a metallic sheen to strings that over lit them. Here the iQs were just a little too vivid; in the best sense, they shine. NK

## DALI IKON 5 £700

**T**he Ikon 5 is the entry-level speaker in the Dali Ikon range. They use a 'hybrid tweeter module' that combines a soft dome midrange unit with a ribbon tweeter operating above 14kHz.

Midrange domes give 'wide dispersion' and this, according to Dali, means a full stereo image a great deal wider than with other loudspeakers is achieved. Midrange domes do image well, ensuring substantially better sound across a larger area within your listening room.

In addition to this module the biwireable Ikon 5 uses two 5" bass drivers which – they say – feature 'lightning fast' response characteristics for a more realistic mid-band and bass performance. Below these sits a flared bass port.

The Ikon 5s measure 81 x 15 x 25.8cm, and weigh approximately 11.8kg. The finish on the low-resonance cabinets is a little disappointing in comparison to the others here, featuring a vinyl wrap wood-effect finish instead of the real thing. The silver-finish front baffle also looks a little dated to these eyes, but some may like its looks.

## SOUND QUALITY

With Wagner's Prelude Act III 'Lohengrin' I was taken by the see through quality of the midband, amazing sense of acoustic space and detailing present in the treble region. Seldom have I heard music sound so open before - it was quite eerie at times! I was also considerably impressed with the Ikon 5s sense of scale and their expansive sound stage. 'Wide Dispersion' philosophy proved to be more than mere marketing hyperbole.

Trumpets highlighted an incisive brightness and forward quality that rather spoiled the magnificent work being done higher up the audio band. Tilting the loudspeakers back by removing rear spikes helped things here, evening up the response a tad. The overall quality of the drivers used was evident from the sheer sense of speed and dynamic attack of this Wagner piece, but a lack of body and a slightly thin presentation were pronounced blemishes.

Rimsky-Korsakov's 'Scheherazade' displayed an impeccable resolution of detail, creating a real sense of spacial ambience. Again though, musical enjoyment was hampered by the sometimes strident upper-midband. Raising the volume on this piece only served to highlight these traits.

On the positive side the sound staging was of a very high standard, and indeed on certain tracks was quite holographic in nature.

In a bid to funk things up a bit and check out the bass performance I turned to Sly and Robbie's 'Language Barrier' CD. It was apparent that the Ikon 5s were not happy with this. The basslines sounded diffuse and one-note in nature – I sensed the cabinet causing problems here. The midband was again veiled and too far back in the mix, which accentuated the piercing upper midband glare. A brief spell with Alicia Keys and Lampchop merely served to reinforce these findings.

Quite clearly the Ikon 5s have some major strengths but need further work to better exploit their potential. Our measured performance analysis shows quite clearly where their problems lie. We feel they are best summarised as 'flawed gems'. **JM**

## NOEL SAYS

**Wow! Fantastic projection and clarity from a superb midrange dome, but lacerative treble from a ribbon that needs reigning back and divorced, soupy bass. We tried hard too get the Ikon 5s to balance and sing, but could not, which was disappointing. NK**



**VERDICT**   
**DALI IKON 5** £700  
**DALI**  
 ☎ +44 (0) 845 644 3537  
 www.dali-uk.co.uk

### FOR

- glass clear treble
- superbly clear midband
- good imaging

### AGAINST

- recessed lower midband
- upper midband glare
- diffuse bass performance

## MEASURED PERFORMANCE

A cloth dome tweeter supplemented above 14kHz by a small ribbon super tweeter gives the Ikon, when measured on-axis, a flat, extended response from 20kHz down to 800Hz our analysis shows (Dali say the ribbon reaches 30kHz). Vertical dispersion was inevitably variable, with peaking above axis suggesting excess energy and a bright subjective balance.

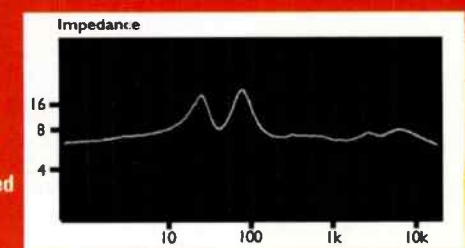
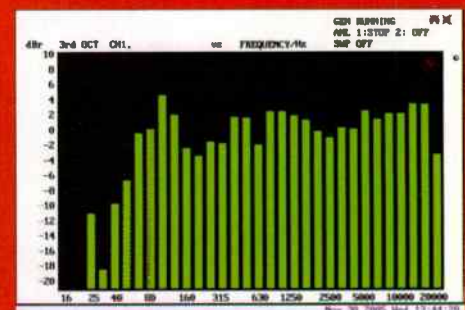
Below 800Hz there's a sudden step down in response that coincides with a peak from port output, suggesting an internal box resonance is causing a forward cancellation.

Below this region, midrange and low frequency output are a few dB down relative to the tweeter assembly, making the Ikon sound light against competitors.

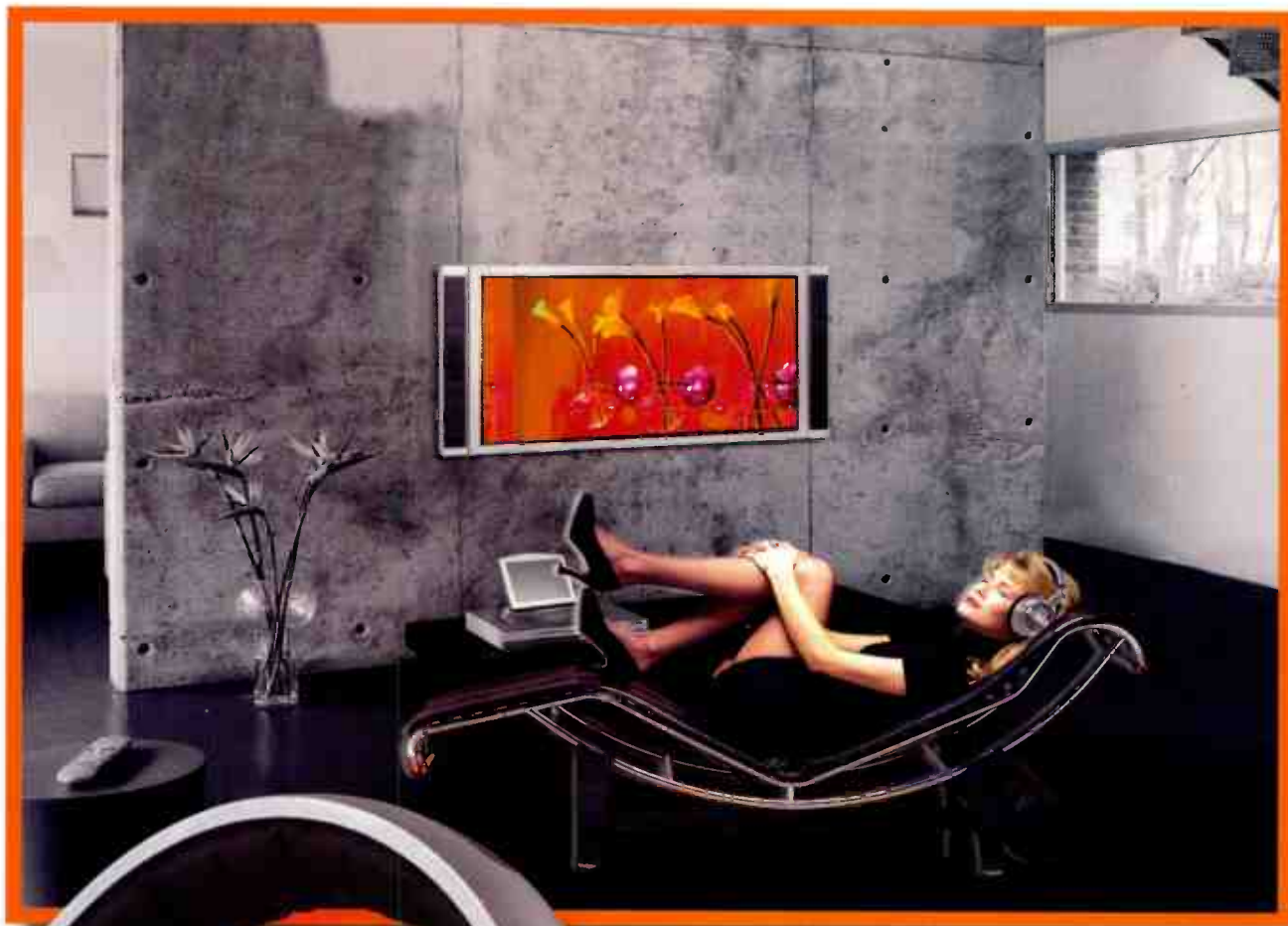
At 84dB sensitivity was low, partly due to an almost perfectly resistive 8ohm impedance - high for a modern 'speaker. It will need a powerful amplifier.

The Ikon may well be very

revealing. But weak low frequency cutput suggests near-wall placement will be necessary to support bass, and the box has a modal problem. Overall, the Ikon looks 'distinctive' under measurement. **NK**



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**beyerdynamic**

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

**T**he Acoustic Energy AELITE Three was the heaviest of the speakers on test here weighing a back-straining 18kg each. They are also pretty bulky as well at 230 x 920 x 297mm. Fit and finish and attention to detail are all first class, as you'd expect from such a well-regarded brand as Acoustic Energy.

The AELITE Threes feature rigid anodised alloy cones – a radical departure from the majority of other speaker manufacturers, with the exception of Monitor Audio. These, they say, offer perfect piston action, and in turn also act as a heatsink for the bonded voice coil.

The treble unit has a neodymium magnet and a silk fabric dome. All drivers are magnetically shielded so they are 'AV safe' for TV use. Acoustic Energy claim their drivers offer exceptional levels of transparency, dynamics, clarity and power handling ability.

The AELITEs possess three back firing, low turbulence bass reflex ports and 22mm thick MDF front panel for rigidity. Attention to detail also extends to the internal wiring that is high quality OFC. Internal crossover components are also high quality items chosen with ultimate fidelity in mind. Sensitivity is a quoted 89dB, and impedance 8ohms. Loudspeaker terminals are biwireable.

## SOUND QUALITY

I pitched the AELITE Threes in at the deep end with 'The Wizard' by Black Sabbath. From the off, dynamic ability was really quite awesome, but tonal colour a little monochromatic. The music failed to break out from the speakers.

Repositioning of the speakers helped a little, as did further running in, tightening up the bass and opening up the sound a little more. Bass was quite fulsome in nature, but didn't quite plumb the depths, in spite of cabinet size. I felt the AEs would impress those looking for an uncoloured and upfront sound from Rock music, especially those that prefer their music played a little louder than the norm.

How would these loudspeakers fare with Classical? Rather well is the answer. My attention was arrested by the huge soundstage launching itself from those drive units. As with the Dali Ikon 5 there was an almost eerie sense of acoustic space. Notes emerged and decayed away into a real acoustic rather than simply disappearing without a trace. The rasp of a bow on violin strings was beautifully captured, as was the odd cough and turning of score pages! This insight also revealed a rather strident treble at times, but one which offered plenty of insight. Tonal colour was again rather on the muted side, resulting in a cerebral performance rather than an intensely emotional one.

Plucked guitar strings on the aptly titled 'Spanish Guitar' by Toni Braxton came across as beautifully clean and crisp, sounding as if they were in the room in front of me. Ms. Braxton also sounded as if she was there as well, which was rather pleasing! Her voice was uncannily clear and free from any kind of artifice that can result from lesser cone materials. I would still have preferred a little more tonal colour and warmth, but it was still a fundamentally even-handed performance, which the measured performance clearly showed. There was no strain here, which is so often the case with female vocals on less accomplished designs. **JM**

## NOEL SAYS

It took a lot of work to run in the AE3s to reduce edginess and hardness across the midband. When they did bed in they proved very revealing of source components and quite obviously well balanced too. The tweeter was a bit obvious though. Still, a big performer. **NK**

# ACOUSTIC ENERGY

## AELITE THREE £750



**VERDICT**   
**ACOUSTIC ENERGY**  
**AELITE THREE** £750  
 Acoustic Energy Limited  
 ☎ +44 (0) 1285 654432  
 www.acoustic-energy.co.uk

### FOR

- detail retrieval
- dynamic ability
- lifelike scale

### AGAINST

- monochromatic tonally
- obvious treble

## MEASURED PERFORMANCE

The striking feature of these loudspeakers is their smooth, flat frequency response, one exception being a slightly enthusiastic contribution from fill-in bass drivers that produces some 100Hz peaking, near field analysis showed.

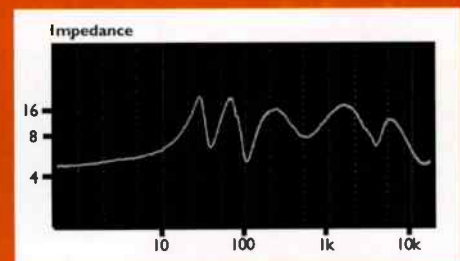
Although the AE3s have plenty of bass they still do not go very low, barely managing 50Hz (-6dB), our analyses showed. Obviously, a room modifies this considerably. The smoothness suggests even tonal balance, lack of colouration and good sense of cohesiveness.

The tweeter rolls up smoothly around 10kHz, so treble will be pronounced, if not sharp. This will add some brightness to the sound.

The load characteristics were unusual, being reactive, with impedance holding to 8ohms. Sensitivity was a normal 87dB, so not a lot of power is needed.

The AE3s are well

engineered and should give an even sound with strong, but not excessive, lows and highs. They look good technically. **NK**



## NEAT MOTIVE TWO £850



**VERDICT**   
**NEAT MOTIVE TWO** £850  
 Neat Acoustics Ltd  
 ☎ +44 (0) 1833 631021  
 www.neat.co.uk

**FOR**

- even-handed performer
- build quality
- shines with Classical

**AGAINST**

- bass sometimes vague

**N**eat Acoustics have been manufacturing quality loudspeakers in the UK since 1989, and it was with the Neat Petite they really made a name for themselves. It remains a popular and accomplished little loudspeaker to this day. The two-way Neat Motive Two reviewed here is their entry-level floorstander, and is the most diminutive model in this group test at only 765x160x200mm in size. This speaker is a little different to the norm in that it is angled backwards slightly on its base to project upwards by a few degrees. Visually at least I think it makes for a nice change.

The speaker is nicely finished and is available in Maple, Natural Oak, Cherry or Rosenut finishes to order. A quick knuckle test revealed a very inert cabinet enclosure constructed from 15mm thick MDF and internally lined with a damping material to reduce panel resonance. The speakers are consequently pretty hefty for their size at 24kg per pair.

Minimalist and close-tolerance crossovers are used, employing high quality components and – as is the norm these days – the speakers are biwireable.

The Motive Two features a 134mm coated paper bass cone which is inverted, as is the “NMT” titanium treble unit. In a break from convention the bass port is built into the underside of the speaker, firing at the floor. The net result is – Neat claim – a speaker possessing outstanding dynamics and a clean and fast bass response.

**SOUND QUALITY**

The strings on a superb DDD recording of Vivaldi's ‘Largo From Winter’ were undeniably on the dry side of neutral, but were refined and had a satisfying sense of real instruments being played rather than some over-analytical and robotic performance. As with some of the other speakers on test here, there was that slightly metallic sheen which often points to a metal dome tweeter, but the plus side was an open and airy feel to the music. The treble never over-stepped the mark, though those with bright-sounding amp or CD might be best advised to look elsewhere.

Midrange was even-handed and very sure of itself. Whilst not as crisp, punchy and exciting a listen as the KEF iQ5s, the Motive Twos acquitted themselves well with Sly and Robbie's ‘Make ‘Em Move’. The slightly dry presentation to the music diluted the impact of this track a little, but the added refinement resulted in a more cerebral and mannered approach to this classic number that some listeners might well prefer. Bass was better extended than the KEFs, though a little on the ‘polite’ side which robbed Rock music of its ability to get the adrenaline really flowing.

The laid-back strains of Lampchop's ‘Low Ambition’ suited the Neats down to the ground. It's the kind of sound which creeps up on you and beguiles the senses over a period of time rather than grabbing you by the scruff of the neck straight away. I found myself listening to the entire album and marvelling at the interplay between musicians and Kurt Wagner's wonderful conversational vocal style. A specialised loudspeaker then which I suspect will find favour with those that prefer a more laid back sound, where it excels. **JM**

**NOEL SAYS**

**A balanced package, it was a smooth, clean and basically honest performer, albeit a little dense yet restrained in the bass and with an obvious treble zing from the tweeter that could easily and usefully be cured I felt. Small size and a tidy delivery make this a good all-rounder, but not for heavy metal fans. NK**

**MEASURED PERFORMANCE**

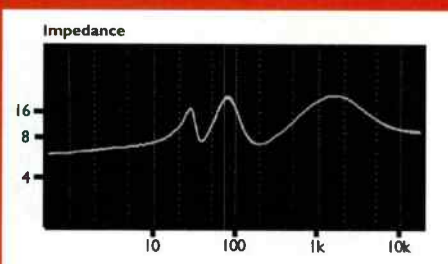
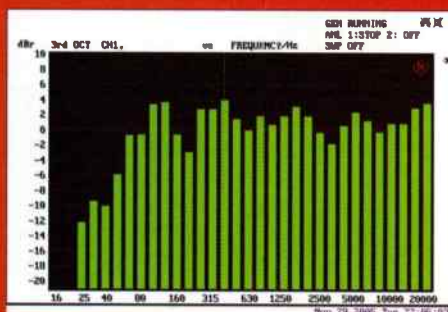
The Motive 2's frequency response has a flat trend, suggesting it will exhibit good basic tonal balance. Output from the tweeter moves up strongly toward 20kHz though and this sort of trend is usually audible as a bright ‘spit’ to treble.

Bass rolls down steadily to 50Hz, the port working at 40Hz. Neat peak bass output a little, characteristic of underdamping, to provide a sense of heft, but the Motive 2 doesn't go very low. So it should sound fulsome enough, if not seismic.

This loudspeaker is largely resistive as a load, making it amplifier friendly. A high impedance of ten ohms relegates sensitivity to a low 84dB, so to go loud quite a lot of power will be needed. An impedance characteristic like this suits valve amps down to the ground.

The Motive 2 looks well balanced. Response undulation suggests some

colour, but otherwise this loudspeaker measures well and should sound good, although I suspect tinged by ‘obvious’ treble. **NK**



# CAIN AND CAIN ABBY £1,399-£1,599

It's always nice to find a speaker which looks a little different from the norm, and the Abby from Cain and Cain is about as different in size and appearance as you can get. It is an exceptionally tall loudspeaker, and could quite easily dwarf a listening room with its 228 x 228 x 1778mm! After a day of lugging speakers between rooms it was a relief to find that these were far lighter than they looked, and easily moveable!

The Abby is a high sensitivity design at 95dB, and features a single Fostex horn-loaded driver per speaker in a Voight pipe arrangement. Such an arrangement should bode well for imaging, though frequency extremes might be a little curtailed as a result. This is partially addressed by an optional Alnico horn tweeter available for an extra £200. This – they say – results in an increased HF extension. In addition, a sub-woofer – 'The Bailey' – is available to boost the LF response accordingly. For this test however we used the standard model.

The attractively finished cabinet is made from light yet rigid plywood, which they favour for its contributing to a 'taut and colourful bass' and 'perfect clarity'.

## SOUND QUALITY

I wasn't prepared for the lacklustre and papery sound that emanated from the drive units, or the high levels of background hiss. All pointed towards a mismatch between the high power Naim amplifier and the high sensitivity loudspeaker. A Quad II-forty was wheeled in and – for the sake of thoroughness – an Atma-Sphere Model S-30 valve power amplifier and associated preamp.

Ahhh - that's more like it! The Abby sounded like a different loudspeaker. Toni Braxton's 'Spanish Guitar' had a holographic way with imaging. Her voice hung ethereally in the air before me, smooth as silk, and quite beautiful to behold. The bass was reasonably tight and tuneful, but to be honest not in the same league as the best of the rest here.

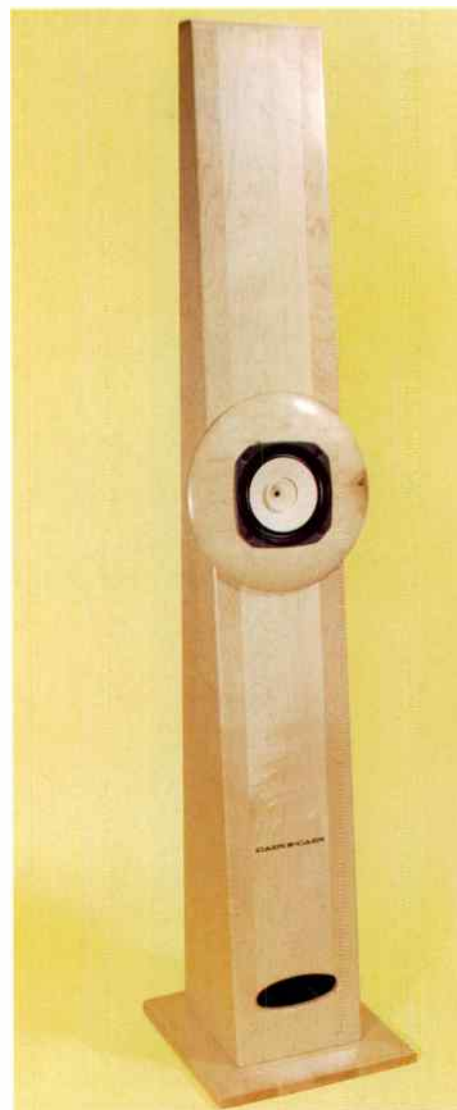
Piano was similarly well represented on one of Rachmaninov's concertos. It was warm and weighty and similarly holographic in nature. String tone was inoffensive, but there was that unmistakable colouration which comes from using paper-coned drive units, which results in a – well it's the perfect description for it – papery sound!

Rock music didn't really prove to be the Abby's forte, and the funk of Sly and Robbie showed the Cain and Cains were out of their depth here. There was a sense of the Abbys struggling to keep up with the music.

Whilst a somewhat coloured performance, I can see why certain people would go ga-ga over this kind of sound. It is exceptionally beguiling and quite unlike music played on more conventional systems. The issue of frequency extremes is best skirted over – this speaker is all about that glorious midrange. If you're a fan of female vocals in particular or laid back Jazz, the Abby is suitable. But a low power, high quality valve amp is almost mandatory. **JM**

## NOEL SAYS

I can see why people get hooked into the sound speakers like this produce. They are so revealing and projective across the midband you really can only use a single-ended valve amp; the Abbys apply a magnifying glass to solid-state that sends output transistors scampering for cover. However, in conjunction with a Single-Ended Triode (SET) you could well be transported to audio heaven, but you would not find me there. I like a bit more balance and certainly more heft. All the same, the Abbys are impressive in their own unique way. **NK**



**VERDICT**   
**CAIN & CAIN ABBY £1399-£1599**  
 (depending on finish and optional rear-firing horn tweeter).  
**The Cain and Cain Company**  
 (UK Distributor)  
 ☎ +44 (0) 1923 352 479  
 www.angelsoundaudio.co.uk

### FOR

- liquid midrange performance
- exceptional imaging

### AGAINST

- poor frequency extremes
- musically dependent

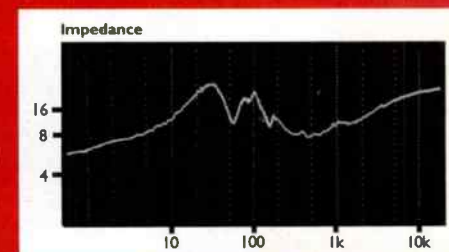
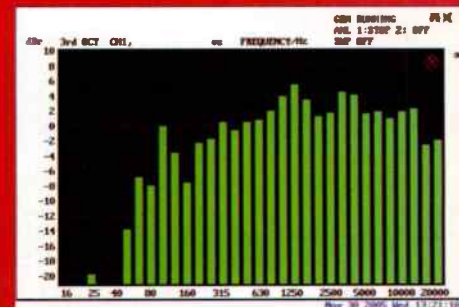
## MEASURED PERFORMANCE

Using a single Fostex unit, the Abbys predictably have a somewhat uneven response that peaks up around 1250Hz, an effect that will help push vocals forward. Output remains within acceptable limits all the same, from 200Hz up to 12kHz – good for a single drive unit, albeit equipped with parasitic centre cone. Upper treble rolls down a bit however.

Sensitivity was extremely high, again as expected, measuring no less than 92dB from just one watt of input power. This is quite a feat considering impedance measured a very high 11.4ohms overall.

The penalty invariably paid for all this is weak bass output. Near field analysis showed output started to roll down below 200Hz and far field analysis confirms this. The speaker is a little more than -6dB down by 80Hz and -14dB down at 40Hz, where conventional designs are 6dB down.

The Abby will go loud from little power and is meant for low output valve amplifiers. Bass output is weak. **NK**



# OPERA SP CALLAS £1,695



**H**ere's a beautifully crafted, handsome loudspeaker that hails from Italy. With its neatly finished real-wood cabinet to the leather front baffle, to the sturdy binding posts at the rear, the Opera says "high-class!" All loudspeakers in the new Callas range have been designed – Callas say – to "recreate the emotion and pleasure of listening to music; to provide a stable and focused musical soundstage in three dimensions with correct timbre, dynamics and detail; and to do this with no listening fatigue". Lofty claims to be sure.

How do they go about achieving this in the Callas Super Pavaroti then? First of all the cabinets are extremely inert – a rap of the knuckles proves that. Dimensions are a room friendly 1000x146x260mm, and weight is 17.5kg each. The cabinets contain two 4.5" bass drivers manufactured from polypropylene, one 1" forward radiating fabric treble unit, and a 1" rear radiating treble unit which is again a fabric type, with a neodymium magnet. Frequency response is quoted as being 40-20,000 Hz, and sensitivity at 88dB. Nominal impedance is 4ohms.

## SOUND QUALITY

The Callas SP proved to be an exciting match for the Naim power amplifier, with its punchy and upfront sound. Sly and Robbie's 'Make 'Em Move' had the sort of bubbly character which makes listening to music a lot of fun. It might not have been strictly accurate, but it engaged me with the performance, which is a quality rare in many designs. There wasn't a great deal of real low-down bass grunt, but what was there was both taut and tuneful.

Treble was a little on the bright side – which seems to be quite a common occurrence these days – but it did increase the adrenaline on rock music and dance in particular. Black Sabbath's 'The Wizard' sounded wonderful through the Callas SP and had my feet tapping all the way through the song. The rasp of the harmonica at the beginning of this track was very realistic and imaged out of the speakers quite splendidly.

It was the same situation with Toni Braxton's 'Spanish Guitar'. Her voice was lovely and smooth, with just a hint of cone coloration to mar things slightly. This manifested itself as a slightly 'cuppy' quality on vocals, but by no means stole my attention from the positive things this speaker was doing elsewhere. Again upper bass was nice and taut and propelled the song along nicely.

Classical wasn't quite as successful. For the most part it was still an enjoyable rendition, but that treble could impart an unpleasant peakiness to stringed instruments on Wagner's 'Lohengrin', and trumpets could sometimes verge on the shrill side. The presentation was a tad on the thin side, highlighting a somewhat recessed midrange, and could have done with more body and a little more tonal colour. For the most part though string tone was generally on the sweet side unless the going got rough. **JM**

## NOEL SAYS

Initially, the Opera Super Pavarotis came across as the best balanced loudspeakers within our group. With supple but fulsome bass that went satisfyingly low, they really delivered a bass tune, without the huffing and puffing we encountered from others when faced by Sly and Robbie. There was a warm midband that sounded clean and easy, if a little wreathed by the slight murk that characterises plastic cone drivers. Initially, treble was obviously pronounced but tolerable. As listening extended though I became less comfortable with the intrusiveness of the tweeter - especially on high energy Rock. If this was tamed, the Operas would truly sing. **NK**

**VERDICT**   
**OPERA SP CALLAS** £1695  
**OPERA LOUSPEAKERS**  
 +44 0039.0422.633547  
 www.ukd.co.uk

- FOR**
- great with Rock/Dance
  - taut upper bass
  - timing
- AGAINST**
- treble brightness
  - slightly 'cuppy' presentation

## MEASURED PERFORMANCE

There's a large crossover dip in the frequency response of this loudspeaker, that will mute lower treble, softening the sound. This will lessen detailing but make for an amenable sound.

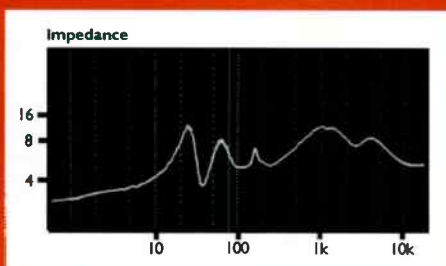
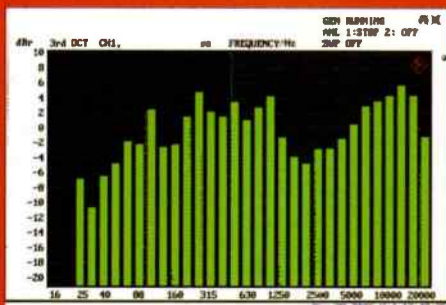
However, the tweeter peaks up at 12kHz by no less than +6dB above midrange level and this will certainly be audible as a sense of divorced sharpness.

Bass output rolls down relatively slowly compared to the other loudspeakers, reaching down to 40Hz (-6dB) in our test room, low enough to stimulate a 25Hz mode. Near field analysis confirmed the lower rate of roll off and good bass depth.

As a load the Operas were largely resistive, varying between 6ohms and 8ohms, definitely amplifier friendly in nature. Sensitivity was a little low at 85dB so amplifiers with some power will be needed

The Opera SPs will sound midrange warm / smooth, have sharp treble, but also good

apparent bass extension. I wonder whether the dip and peak is deliberate or due to drive unit variability. **NK**





# conclusion

**W**e had an interesting collection of different design philosophies and price points in this group of loudspeakers - and the results were surprising. All the same, there were no clear-cut winners and losers. Hi-fi is a subjective area at best, and depends entirely upon the musical preferences of the end buyer, their partnering equipment, and individual taste. As I noted in the introduction, the listening room also plays a dominant role in defining the end result, and this should always be borne in mind; you could hear things differently to us. Having said that though, we have an assured acoustic environment that gives balanced results.

The Acoustic Energy AELITE Three was a bit of a mixed bag subjectively, though paradoxically it measured unusually well. I was most impressed with its sense of speed and clarity, but this was tempered by a rather take it or leave it attitude towards the music. It is an undeniably fast sounding loudspeaker though, and I can see those that might be in love with its type of presentation - Rock or Dance lovers for example. My feeling is that the AE Threes would probably shine as part of a fully decked out surround-sound system, either playing SACD or DVD-A music or movie soundtracks.

The Dali Ikon was an interesting speaker in many respects, and in some quite astonishing. That ribbon tweeter and fabric midrange unit resulted in an unbelievable sense of space and almost frightening levels of resolution. It was a pity that the treble was so overpowering at times, and that the bass was a little on the boxy one-note side. It sounded to me like the drivers were not integrating well with one another, with each one vying for attention. Frustrating, as with a bit of re-tuning I'm sure this would be a rather special product.

The Cair and Cain Abby was the most charismatic performer in this test, and I can see it going down very well for those with a

penchant for female vocals, Jazz or Classical music. It lends itself very well to quality valve amplification, or a lower-powered transistor or Class-D jobby like the Sugden A21a or (dare I say it) the little Sonic T-amp. Imaging is quite splendid and I can see people going for them as a result. They are a specialist item and need to be treated as such, rather than a pair of speakers that will work well on the end of any amplifier.

The Neat Motiv Two impressed with its even-handed and civilised presentation of music. These little floorstanders represented the middle ground between the characterful sound of the Cain and Cains and the colder, more cerebral reproduction of the Acoustic Energys. They are an accomplished all-rounder, which would probably work best with a warm and rich sounding amplifier to give of their best.

The Opera Callas SPs scored highly for their feisty way with music making. I'd rather have this and suffer a bit of colouration that some technically amazing speaker that measures perfectly, but sounds less so. Again a fine all-rounder, which sounded particularly at home with Rock and Dance music, but which could still beguile with Classical fare as well. Treble was a bit peaky though so - as with the Neats - partnering equipment is best used which errs on the warm side.

The speaker which impressed me most also happened to be the cheapest. At £400 the KEF iQ5 offers terrific value for money. It's certainly not without its flaws, but these are - subjectively - balanced well enough that I never found my attention distracted by them. Music sounded vital and alive, with the sound staging being particularly good. True, they were a little rough around the edges at times, and lacked a little civility on some music, but I found their enthusiasm for all genres of music highly infectious. For that reason they were my personal preference within this group - and they were the least expensive, which must be good news!



#### REFERENCE SYSTEM:

Naim NAC282/NAP250/Hi-cap amplifiers  
 Quad II-forty pre/power amplifier  
 Atma-Sphere S.30 tube pre/power amplifiers  
 Eastern Electric Minimax valve output CD player  
 van den Hul, Chord & Linn cabling

# Broadcast

**David Price traces the development of the famous Spondor BC1 loudspeaker...**

**L**oudspeaker design isn't the black art its practitioners often claim. Speakers aren't above and beyond the laws of physics; indeed, it is precisely these that determine the sound of any given product. Put simply, there's the cabinets to get right, the drive units, and the interplay between the two. This done, any given box will have a fighting chance of making music. For this reason, a loudspeaker is only as good as its drive units. The success (or lack thereof) of these is critical to the finished product...

Each generation of loudspeakers tends to use similar, or the same, drivers. Even when the units are bespoke ones made by the speaker manufacturer itself, it's fair to say that similar philosophies, materials and production processes are used. This is precisely why, generally speaking, nineteen seventies speakers tend to sound very different to those two decades on, for example.

Sometimes, however, a 'speaker arrives that rewrites the rule book in some respect, and produces a sound quite different from those that came before – and Spondor's BC1 was such a product.

For several decades, the BBC was a force behind loudspeaker design, and back in the sixties it had spent considerable time and money investigating alternative cone materials to the then ubiquitous paper pulp bass units. Plastics were the obvious answer, and eventually a new drive unit material, Bextrene, appeared in the BBC LS5/5 studio monitor. As a laboratory technician, Spencer Hughes was intricately involved in the process of plastics research and development.

Hughes duly decided to make a drive unit "in the home environment". In his journals, he reveals how, "with the aid of an electric fire, a compressor working in reverse and an old iron bedstead, the first vacuum former was built." An eight inch drive unit was eventually produced, "which turned out to be the first commercial eight inch Bextrene driver, and still

arguably one of the best".

The very first pair of BC1s was made with these very drivers, plus the respected Celestion HF1300 tweeters. Hughes wrote that the cabinets were smaller than "the now famous commercial product". However, the initial listening tests indicated that the performance could be improved by an increase in size, and development continued. Spencer Hughes found that this was beginning to impinge on the terms of his BBC contract, so the BC1 had to be offered to them. However, "fortunately the 'pop' era had just started and the main request was for more power, so the BC1 was turned down".

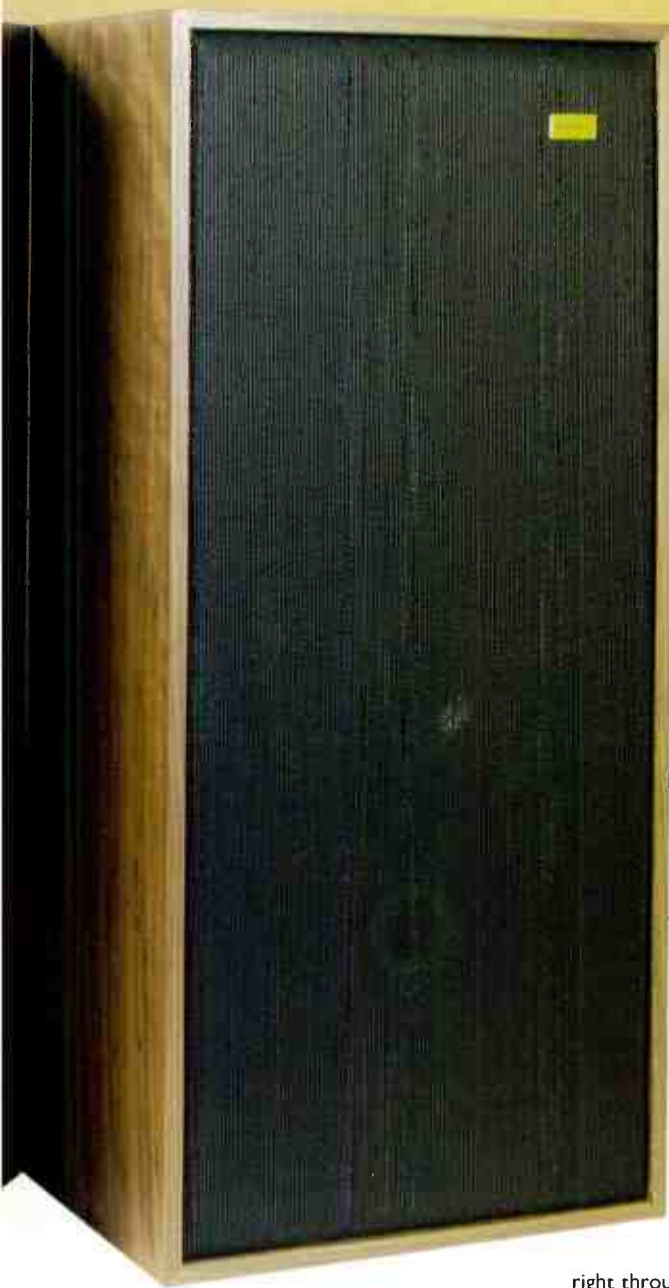
Still, the Beeb was looking for

a pair of speakers about the size of the BC1s, and so Spencer Hughes began work in "an official version", the LS3/6. This was eventually offered to Rogers, then under the control of Jim Rogers.

Soon after, the BC1's were fitted with an amplifier mounted in the back panel and the 4001G super tweeter added. This addition brought improved dispersion characteristics and, "from the broadcasting angle, it made the detection of any 625 line breakthrough more easily



# Quality



detected" (!). Spondor was born, and the company began production of the BCI in 1969, offering a royalty to the BBC in recognition of the work Hughes had done on the loudspeaker whilst still employed by the Beeb.

The speaker became a huge commercial success, at least as far as high-end designs were concerned, and was nothing less than a sea change in nineteen seventies loudspeaker design. It gave hitherto unheard levels of clarity, and freedom from distortion.

By today's standards, Bextrene leaves something to be desired, but it was so successful against generic

nineteen sixties paper cones (which many manufacturers used right through the seventies and even eighties) that it started a wholesale move to plastic. In absolute terms, plastic cones are relatively heavy – which makes for poor attack transients – and prone to a curious 'quacky' tonality. This is obviously audible against modern drive units, but against the old generation of paper cones, their obviously lower colouration and distortion proved a real civilising influence, giving a very even, couth and finessed sound (you can see why the Beeb liked them!).

The BCI was the first, and arguably the best exponent of Bextrene, although there followed a number of accomplished designs,

from the BBC LS3/5a and Linn Kan to the KEF 104ab and Linn Isobarik. All of these were characterised by a smooth, even tonality, low distortion, plus relatively 'sedate' transient ability and middling efficiency – distinctive characteristics of plastic drive unit cones.

These days, Spondor BC1s are enduring favourites with their owners; they appear for sale surprisingly rarely, as those who use them love them. They're extremely accomplished for those wanting an expansive, neutral 'monitor' sound, best attuned to classical music, and a big, open, fulsome bass. It's quite interesting to see how Spondor's latest 's' range offers such similar characteristics, despite using loudspeaker driver technology that's vastly more up to date – "traditional values in a modern setting", one might say.

## BUYING

Despite the understandable popularity of the BC1s, and their long production run, they remain relatively scarce on the secondhand market due to the fact that their owners often struggle to find something that comprehensively outclasses them – unless truly big money is available. However, they do crop up from time to time, at prices from £200 to £600 depending on condition. Even at the top of this range, they represent superb value for money, at least if you put openness, neutrality and scale above pace, rhythm and timing.

## TECH TALK

The Spondor 'Bextrene Cone 1' loudspeaker is essentially a three-way system with crossover points at 3kHz and 13 kHz. The 8" mid-bass driver uses an inverted rubber surround similar to the KEF B200 or SP1039. Above 3kHz, the Celestion HF1300 tweeter takes over right up to 13kHz, where it hands over to a three-quarter inch plastic dome Coles 4001 supertweeter. The cabinet measures 300x300x637mm, with an internal volume of 38.5 litres. The front baffle and rear panel is 12.3mm Baltic birch, while the side panels are 10.5mm Baltic Birch with 10mm lightweight bitumen impregnated Masonite damping pads. 30mm thick polyester foam is used on all internal panels except the front baffle. The port is tuned at 28Hz.

## THANKS TO:

The stunning, 'new old stock' pair of Spondor BC1s (with original packaging) used in this review is on sale from German specialists *HiFiClassics*. The speakers are currently in storage in west London. If you're interested, contact the seller direct: *Marcus Jung, Mittelstrasse 75, 66287 Quierschied, Germany (tel: 0049 6897 600587, mobile: 0049 0173 6720871, email: webmaster@hificlassics.de)*.

# SEVENOAKS

## SOUND & VISION

### Winter Sale

STARTS 17 DECEMBER 2005

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in our fabulous Winter Sale

For information on all the latest offers, visit [www.ssav.com](http://www.ssav.com) or call your nearest store on Freephone 0800 587 9909

### Christmas & Sunday Opening

Many of our stores are open on Sundays during December and January. For up-to-date information, please call your local store or visit our website.

**SUNDAY 18th DECEMBER**  
MOST STORES OPEN

**CHRISTMAS DAY**  
ALL STORES CLOSED - HAPPY CHRISTMAS!

**BOXING DAY**  
ALL STORES CLOSED

**NEW YEAR'S DAY**  
ALL STORES CLOSED - HAPPY NEW YEAR!

**SUNDAY 8th JANUARY**  
MOST STORES OPEN

Due to local variations, please call your local store or visit our website to verify opening hours before travelling.



### Specialist hi-fi & home cinema

Contemporary hi-fi is constantly setting new standards in sound reproduction and design. Whatever you listen to, Sevenoaks can recommend separate components that will bring your music collection to life and complement your home. We're enthusiasts and experts, passionate about helping you build (or upgrade) a system that will delight for years to come.

The recent growth of DVD has led to a huge rise in demand for home cinema equipment - DVD players, AV receivers, projectors and plasma screens but, with so many options, it's not easy to know which ones will suit your needs. Indeed, in the face of this quickly evolving and often bemusing array of products, we aim to assist you in assembling a home cinema system to be proud of - one that achieves outstanding picture and sound quality.



### Rotel

The 02 Series is Rotel's entry-level range. The RCD-02 CD player combined with either an RA-01, RA-02 or RA-03 integrated amplifier represents true audiophile performance at an affordable price. For increased high-end performance, the RC-03/RB-3 pre/power amplifiers are available. The RT-02 tuner completes the range.



### Roksan

Roksan designs and manufactures some of the most acclaimed hi-fi equipment currently available. All Roksan products are carefully evaluated by experienced engineers at every stage of the design process with the emphasis on performance and build quality.

### B&W

The focus of Bowers and Wilkins Loudspeakers has always been to offer the best possible musical experience. With a combination of the latest R&D techniques and a passion for music, B&W produces a diverse range of products befitting the largest audio manufacturer in the UK.

### Cyrus

If you've enjoyed listening to music before, try listening to it through a Cyrus system. With every product tuned by ear, Cyrus represents a quality of sound, which is rare at any price. Invest in a Cyrus system and you'll be rewarded with a wealth of sound you wouldn't have thought possible.

### Audiolab NEW 8000 Series

Audiolab's new 8000 series offers a definitive and genuine hi-fidelity performance from a no-nonsense approach to engineering. These famous products have all been re-engineered to create a complete two channel range, including the 8000S, 8000Q, 8000M and 8000P models plus a all new CD player. A 7.1 channel pre and power amplifier completes the range.



### Project

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.



Winter Sale



## Quad

Founded in 1938, Quad's history is one of audio excellence. Today's range includes both electronics and speaker systems.



## Monitor Audio

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, SILVER RS, BRONZE** and **RADIUS** speakers, plus the exciting new **i-Deck** docking station, an excellent any-room companion for your iPod.



## Wharfedale

### Diamond 9.1

"Wharfedale has been updating and tweaking its Diamonds for 20 years - and rough they're not! Tight bass, clear midband, and sparkling treble for not a lot of cash."



### Diamond SW150

"Considering the price, the detail and definition to the bass are controlled and cohesive - equally adept with movies and music."



Silver RS1

## Digital Radio

With Digital Audio Broadcasting (DAB) capability, these high-quality tuners deliver more stations and offers pure, distortion-free, CD-like sound, while providing useful radio and data services.



Pure DRX702ES & NEW Denon TU-1800DAB

## KEF

Replacing the highly successful Q Series, KEF's New iQ line-up comprises eight models from the entry-level iQ1 bookshelf to the impressive iQ9 floorstander. All models incorporate KEF's Uni-Q driver technology and are available in a variety of finishes.



Other KEF ranges include XQ, KHT and the Award-winning KIT100 Home cinema system.

**KEF KIT100** "Creating a virtual surround sound experience has never been simpler or more effective, thanks to this two speakers plus subwoofer concoction from KEF."



### KEF iQ5

"The iQ5s are little stars, providing stunning scale and authority from discreetly sized towers..."

The iQ5s are fully deserving Products of the Year."



## Acoustic Energy

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.

"The legendary AE1 lives on in this groundbreaking new version... It sets a new standard for small speakers."



### KEF KHT1005

"The KHT1005 is an ideal first-time buy, and will suit those looking to 'downsize' to a more living-room friendly style of speaker."



## 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.



## ESSENTIAL ACCESSORIES

The right accessories can make or break your system. Our carefully selected range, including QED, SOUNDSTYLE and GRADO, will ensure you get the very best performance from your system.



**Arcam Solo Music System**  
"Excellent all-round sound combined with the convenience of a one-box product."



## Marantz

Marantz is introducing a host of new products ranging from high-end hi-fi to HD-ready DVD players and AV receivers. The two main products groups are the 'premium' and 'range' series.

The SR9600THX Ultra2 AV receiver offers seven channels, each 140w, and features HDMI inputs. The groundbreaking DV9600 is one of the first DVD players capable of upscaling images to 1080p and is fully prepared for the high-definition future.



NEW MARANTZ SR9600 AV RECEIVER



A3.5 SERIES

## Musical Fidelity

Musical Fidelity's A3.5 Series amplifier, using circuitry closely related to A5's, and upsampling CD player combine high end performance, visuals and finish at a competitive price.

**PLEASE NOTE** Some products/brands are not available at all stores. Please call to confirm or visit our website before travelling.  
Special Offers and Sale Offers - Not in conjunction with any other offer. Advert valid until at least 12/01/2006, E&OE.

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or call your nearest store on Freephone **0800 587 9909**  
for the latest prices and information.

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## Denon

Denon, Japan's oldest audio company, has established an enviable reputation for the performance of both its hi-fi and home cinema products, winning numerous awards and accolades over the years. Its stylish systems have succeeded in becoming the benchmark by which all others are judged.

**WHAT Hi-Fi? SOUND AND VISION AWARDS 2005**  
PRODUCT OF THE YEAR  
DENON DVD-15XV

**WHAT Hi-Fi? SOUND AND VISION AWARDS 2005**  
SOUNDTRACK APPRECIATION  
DVD & DVD-VIDEO  
DENON DVD-15XV

**WHAT Hi-Fi? SOUND AND VISION AWARDS 2005**  
TECHNOLOGY  
DENON DVD-15XV



**WHAT Hi-Fi? SOUND AND VISION AWARDS 2005**  
PRODUCT OF THE YEAR  
DENON SMART LIFE S-301



**DVD-A1XV** "The most obvious winner of any category this year has to be Denon's evolutionary step in DVD deck design, the landmark DVD-A1XV... An astonishing piece of kit that has no equals."

**AVC-A1XV** "It's not often we can't find fault with a product, but as we said in our review, "It not only expands the home cinema envelope, it shreds it and then nukes it for good measure." HOME CINEMA CHOICE • AWARDS 2005

**WHAT Hi-Fi? SOUND AND VISION AWARDS 2005**  
PRODUCT OF THE YEAR  
YAMAHA DVD-S2500



## Yamaha

Yamaha is recognised as a world leader in the fields of musical instruments and audio equipment, and in more recent years, home cinema. New models for 2005 include upgraded AV receivers, amplifiers, and DVD players plus the innovative YSP-1 virtual surround speaker.



YAMAHA'S DVD-S2500, DSP-AX7575E & RX-V4600

## Harman Kardon

Harman/Kardon's high quality audio, audio/visual and multi-room products are more than just boxes with knobs on, they are declarations of passion for music and movies. Producing pure, realistic sound with ever smarter engineering and simpler design.



Harman/Kardon products delight both the audio purist and the film lover around the world. We invite you to experience the unique combination of artistry and engineering that is Harman/Kardon.



## REL

In a market packed with subwoofers claiming to deliver the ultimate bass experience, only one brand of sub-bass system can prove its supremacy. With a record of review success stretching back over a decade, REL is acknowledged as the leading provider of deep, clean bass frequencies.



## M&K

Enjoy cinema as the director intended with a speaker system that is genuinely designed for surround sound. Every Miller & Kreisel surround sound system is designed around the highest quality centre speaker available and partnered with two identical main speakers, producing seamless panning across the front soundstage, combined with remarkable clarity and effortless dynamics.

## Onkyo

"A Dinky design that offers a vigorous listen, plus reassuringly solid build... Onkyo's CR-505DAB is a fab buy."



Onkyo DS-A1 iPod Connector Deck



## Pioneer

Pioneer's AV amplifiers and receivers are sound-tuned by the world-famous Air Studios to perfectly recreate the natural sound and energy of the original performance. The result is powerful, pure and crisp. Coupled with HDMI and iLink digital connectivity, as well as a connection for your iPod and PC, the audio adventure is even more absolute.



## DVD Recorders

Although making digital recordings of TV broadcasts isn't new, the choice, versatility and quality of recorders keep getting better. Our product selection includes DVD only, hybrid DVD/hard-disk and multi-format models.



**WHAT Hi-Fi? SOUND AND VISION AWARDS 2005**  
DVD & DVD-VIDEO  
PANASONIC DVD-R110

### ESSENTIAL ACCESSORIES

The right accessories can make or break your system. Our carefully selected range, including QED, SOUNDSTYLE and GRADO, will ensure you get the very best performance from your system.

### £ PRICING POLICY

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.

### FLEXIBLE FINANCE OPTIONS\*

Spread the cost of buying. Flexible finance options are available on the majority of products we stock. \*Written details on request. Licensed credit brokers. Minimum balance £400. Subject to status.

### PLEASE NOTE

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Winter Sale



## Specialist home cinema

At the heart of any home cinema is its screen: Sevenoaks Sound & Vision can put you in the picture with a selection of flat-panel displays and projection systems. LCD and plasma screens are just a few centimetres thick and come in sizes from a 13inch portable to over 60inches.



## Sharp Aquos

Only Sharp Aquos LCD TV offers so much perfection. With supreme styling, the appeal of the Aquos range is obvious. The Titanium Series combines Sharp's sixth-generation LCD panel with stunning, angular-styling, titanium colour-finish and superb build quality to produce a premium class of LCD idTVs

### TITANIUM SERIES LC-45GD1E LCD TV with integrated FREEVIEW

"Sharp's mammoth 45in LCD TV is a testament to the growing viability and performance of large-scale LCD. Its 1,920 x 1,080 resolution panel allows high-definition pictures to be viewed without compromise and when exploited to its full potential, the results could see this screen hung in a gallery. Images are so crisp and sharp, it almost makes reality look dull. We think it's inspirational. Go pay homage." HOME CINEMA CHOICE • AWARDS 2005

FREEVIEW channel and service subject to coverage. Aerial upgrade may be required.

## Loewe

### Concept L32 32" LCD TV

With its minimalist, functional design, slim profile and ease of operation, the Concept L32 exudes all of the classic Loewe virtues.

"This HD Ready set boasts 1366x768 resolution and plenty of inputs, including HDMI, component video and two Scarts. It also packs an integrated digital TV tuner, and - as ever with Loewe sets - its speaker set-up is a cut above most rivals... The Concept L32 is immensely attractive: it deserves to sell very well indeed."



### 32WLT58 LCD TV

"All in all, this is a great set. The twin HDMI inputs lift it a step above the current competition, while the performance could easily grace something far costlier."

WHAT VIDEO • XMAS 2005 #301

## Toshiba LCD TV

These super-slim screens will take your breath away. Each model has been moulded from a stunning blend of cutting-edge design and state-of-the-art technology to create the ultimate audio-visual sensation. The collection comprises LCD screen technology, offering unrivalled combinations of image quality and sophistication and a variety of screen sizes and options, including integrated digital tuner

# SEVENOAKS

SOUND & VISION



## Pioneer

Following its highly successful '5' series, Pioneer has unveiled its sixth generation of plasma TVs. The 43" PDP-436XDE and 50" PDP-506XDE models include built-in digital tuners plus dual HDMI inputs.

### PDP-436XDE PLASMA TV

"Pioneer's latest is also its greatest: this is a truly wonderful HD-Ready TV."



## Samsung Milano LE40M61B 40" LCD TV

Samsung's New 40" LCD TV (LE40M61B) was honored with an EISA award for its premium display technology in terms of contrast ratio (5000:1), color expression (6.44 billion colors, 92% color gamut for NTSC), viewing angle (178°) and response time (8 ms). Also the model's simple body design focuses the viewer's attention on the screen. On the front of the minimalist design, the speakers are hidden from view in the bottom bezel and nothing distracts from the superb image quality



## Panasonic Viera

There seems little doubt that the future of television is flat, and the future of flat is the award-winning VIERA range from the world leaders in screen technology, Panasonic. The VIERA range consists of both LCD and Plasma televisions. New additions to the range include 37, 42 & 50in PV500 models with support for both high-definition and IMPEG-4 recording.

### TH42PV500 PLASMA TV

"All told, Panasonic's new TH42PV500 is a stunning set that's clearly the new class leader."



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# Winter Sale

STARTS 17 DECEMBER 2005

## Projection

If you'd prefer to measure your screen-size in feet, how about one of the new generation of projectors? The latest designs are delivering superb results at increasingly affordable prices - and they're more home friendly than previous projectors, too.



## ScreenPlay

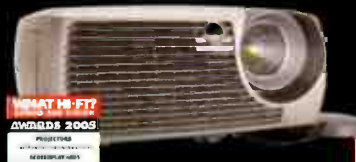
From the worldwide leader in digital projection technology and solutions, InFocus® ScreenPlay™ DLP™ projectors are changing the face of home cinema offering market-beating performance, specification and value at every price point.

**SP7210**

"The new projector's picture is just phenomenal... Looks like ScreenPlay's success story is set to continue."

**SP4805**

"Another stunning success from ScreenPlay - there's never been a better time to take the big-screen plunge."



## Sim2

Sim2 Multimedia is a world-leading manufacturer at the forefront of home cinema technology and a name synonymous with high-end home cinema projection.

**HT300E** "Spectacular, in a word... Another terrific projector from Italy's finest." WHAT VIDEO • ISSUE 292



## Themescene

Since its launch, the multi-award winning ThemeScene™ brand has rapidly established a five-star reputation for uncompromised image quality.

**H30A** "There are so many good points it's hard to know where to start... Just how much better can budget DLP projectors get?!" WHAT VIDEO • ISSUE 292



## DVDO iScan™ VP30

The iScan™ VP30 is a high-definition video processor and AV hub that converts standard or high definition from your DVD player, VCR, PVR, HD set top box, game console, or PC to any output resolution between 480p and 1080p, including popular HDTV resolutions such as 720p and 1080i.

## £ PRICING POLICY

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.

## FLEXIBLE FINANCE OPTIONS\*

Spread the cost of buying. Flexible finance options are available on the majority of products we stock. \*Written details on request. Licensed credit brokers. Minimum balance £400. Subject to status.

## PLEASE NOTE

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## Product Selection

Listed below is a small selection of our extensive product range. Please note: Some products/brands are not available at all stores. Please call to confirm or see the brand locator at [www.ssav.com](http://www.ssav.com) before travelling.

### TURNTABLES

Goldring GR2	£ SALE
Linn RANGE	£ SALE
Michell RANGE	£ SALE
Project RANGE	£ SALE
Roksan Radius 5	£ SALE

### TUNERS

Arcam RANGE	£ SALE
Cyrus FM X	£ SALE
Denon TU260L MKII	£ SALE
Harman Kardon RANGE	£ SALE
Linn RANGE	£ SALE
Marantz RANGE	£ SALE
Pure DRX-701ES DAB	£ SALE
Pure DRX-702ES DAB/FM	£ SALE
Rotel RANGE	£ SALE

### CD PLAYERS

Arcam RANGE	£ SALE
Audiolab RANGE	£ SALE
Cyrus RANGE	£ SALE
Denon DCD485	£ SALE
Linn RANGE	£ SALE
Marantz RANGE	£ SALE
Meridian RANGE	£ SALE
Musical Fidelity RANGE	£ SALE
NAD RANGE	£ SALE
Quad RANGE	£ SALE
Roksan RANGE	£ SALE
Rotel RANGE	£ SALE

### CD RECORDERS

Yamaha CDR-HD1500	£ SALE
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### AMPLIFIERS

Arcam RANGE	£ SALE
Audiolab RANGE	£ SALE
Cyrus RANGE	£ SALE
Denon PMA355	£ SALE
Linn RANGE	£ SALE
Marantz RANGE	£ SALE
Meridian RANGE	£ SALE
Musical Fidelity RANGE	£ SALE
NAD RANGE	£ SALE
Quad RANGE	£ SALE
Roksan RANGE	£ SALE
Rotel RANGE	£ SALE
Yamaha AX396	£ SALE

### HI-FI SPEAKERS

Acoustic Energy Aegis Evo One	£ SALE
Acoustic Energy Aegis Evo Three	£ SALE
Acoustic Energy Aelite RANGE	£ SALE
Acoustic Energy AE1 MKIII	£ SALE
AVI Neutron IV	£ SALE
B&W RANGE	£ SALE
KEF RANGE	£ SALE
Linn RANGE	£ SALE
Meridian RANGE	£ SALE
Mission RANGE	£ SALE
Monitor Audio RANGE	£ SALE
Quad RANGE	£ SALE
Ruark RANGE	£ SALE
Wharfedale RANGE	£ SALE

### HI-FI SYSTEMS

Arcam Solo Ex Speakers	£ SALE
Denon RANGE	£ SALE
Linn Classik Music Ex Spks	£ SALE
Monitor Audio i-Deck	£ SALE
Onkyo CR505DAB Ex Spks	£ SALE
Teac RANGE	£ SALE
Yamaha CRX-M170 Ex Spks	£ SALE

### DVD SYSTEMS

Denon RANGE	£ SALE
KEF KIT100 Inc Speakers	£ SALE
Teac RANGE	£ SALE

### MULTI-ROOM AUDIO

Cyrus Link RANGE	£ SALE
Living Control RANGE	£ SALE
Yamaha MusicCast RANGE	£ SALE

### DVD PLAYERS

MAKE & MODEL	REGION 2	MULTI REGION
Arcam RANGE	£ SALE	£ SALE
Cyrus RANGE	£ SALE	£ SALE
Denon RANGE	£ SALE	£ SALE
Denon DVD-A1XV	£ SALE	£ SALE
Harman Kardon RANGE	£ SALE	£ SALE

Marantz RANGE	£ SALE	£ SALE
Meridian RANGE	£ SALE	£ SALE
Panasonic RANGE	£ SALE	£ SALE
Pioneer RANGE	£ SALE	£ SALE
Samsung DVD-HD950	£ SALE	£ SALE
Toshiba SD350	£ SALE	£ SALE
Yamaha RANGE	£ SALE	£ SALE

### DVD RECORDERS

MAKE & MODEL	REGION 2	MULTI REGION
Panasonic RANGE	£ SALE	£ SALE
Pioneer RANGE	£ SALE	£ SALE

### AV AMPLIFIERS & RECEIVERS

Arcam RANGE	£ SALE
Audiolab RANGE	£ SALE
Cyrus RANGE	£ SALE
Denon AVC-A1XV AV Amplifier	£ SALE
Denon RANGE	£ SALE
Harman Kardon RANGE	£ SALE
Lexicon RANGE	£ SALE
Marantz RANGE	£ SALE
Onkyo RANGE	£ SALE
Pioneer VSX-1014s AV Receiver	£ SALE
Pioneer VSX-2014i AV Receiver	£ SALE
Pioneer VSX-AX5Ai AV Receiver	£ SALE
Pioneer VSA-AX10Ai AV Amplifier	£ SALE
Pioneer NEW RANGE	£ SALE
Rotel RANGE	£ SALE
Yamaha DSP-AX757SE AV Amplifier	£ SALE
Yamaha RX-V357 AV Receiver	£ SALE
Yamaha RX-V557 AV Receiver	£ SALE

### AV SPEAKERS & PACKAGES

Acoustic Energy Evo 3B	£ SALE
Artcoustic RANGE	£ SALE
Audica RANGE	£ SALE
B&W RANGE	£ SALE
B&W Mini Theatre RANGE	£ SALE
KEF KHT1005	£ SALE
KEF KHT2005.2	£ SALE
KEF Q7 AV	£ SALE
M&K RANGE	£ SALE
Mission M Cube	£ SALE
Mission Elegante RANGE	£ SALE
Monitor Audio RANGE	£ SALE
Mordaunt Short Genie	£ SALE
Quad L-Series	£ SALE
Wharfedale Diamond 9 HCP	£ SALE
Yamaha YSP RANGE	£ SALE

### SUBWOOFERS

B&W RANGE	£ SALE
M&K RANGE	£ SALE
MJ Acoustics RANGE	£ SALE
Monitor Audio RANGE	£ SALE
Quad L Series	£ SALE
REL RANGE	£ SALE
Wharfedale Diamond SW150	£ SALE

### PLASMA

Fujitsu RANGE	£ SALE
Hitachi RANGE	£ SALE
LG RANGE	£ SALE
Loewe RANGE	£ SALE
Panasonic RANGE	£ SALE
Pioneer PDP436XDE 43"	£ SALE
Pioneer PDP506XDE 50"	£ SALE
Samsung RANGE	£ SALE

### LCD TV

Hitachi RANGE	£ SALE
LG RANGE	£ SALE
Loewe RANGE	£ SALE
Panasonic RANGE	£ SALE
Philips RANGE	£ SALE
Samsung RANGE	£ SALE
Sharp Aquos RANGE	£ SALE
Toshiba RANGE	£ SALE

### PROJECTORS

Optoma RANGE	£ SALE
Screenplay RANGE	£ SALE
ScreenPlay SP5700 (REFURBISHED, LAST FEW)	£ SALE
Sharp RANGE	£ SALE
Sim 2 RANGE	£ SALE
Sim 2 C3X	£ SALE
ThemeScene RANGE	£ SALE

### ACCESSORIES

We have a wide range of Accessories from QED, Soundstyle, Grado, Goldring and more...



# Who are Sevenoaks?

Established as Sevenoaks Hi-Fi in 1972, we have grown steadily onto one of the leading independent home entertainment specialists in the UK, earning a reputation for outstanding service, choice and value for money. In 1995, reflecting our commitment to the emergent new technologies in home cinema, our name was changed to Sevenoaks Sound & Vision. We now have 49 stores across the land stocking a broad range of exceptional equipment and accessories.

## How to shop at Sevenoaks

When it comes to making big decisions about what to buy, there's no substitute for actually road-testing your prospective purchases - seeing, hearing and experiencing the products in action, with the benefit of our expert knowledge and guidance to help you choose.

## Hi-Fi & Home Cinema Guide

### New 2006 Edition

Pick-up a copy of our new **68 Page Guide** at your nearest Sevenoaks Sound & Vision store or order a copy via our Website. The brochure will be posted to you (UK mainland addresses only) **FREE OF CHARGE**.



## New Sevenoaks Website

The fully re-designed Sevenoaks Sound & Vision website has news and information on the Sevenoaks group and detailed pages to help you locate your nearest store. You will find all our fabulous **WINTER SALE** offers and, in addition, hundreds of **STOCK CLEARANCE** items available from our stores nationwide - many with savings of up to 50%. To find out more, just click on [www.ssav.com](http://www.ssav.com)

**WITH OUR CUSTOM DESIGNED INSTALLATIONS**, your home entertainment choices become as convenient as they are clever. We can help transform every room and every home, whatever your requirements and budget.

Our installation experts are trained to the highest standards in all areas and provide a prompt, reliable and totally professional service. Rest assured also that our commitment to service doesn't end once your equipment is in place. Sevenoaks staff will continue to support you and your kit long after your initial visit to one of our stores.



**Custom Installation**

# SEVENOAKS

SOUND & VISION

## NATIONWIDE STORE GUIDE

- ABERDEEN** 01224 252797  
● 57 CROWN STREET *OPEN SUNDAY*
- BEDFORD** 01234 272779  
● 29-31 ST PETERS STREET
- BRIGHTON** 01273 733338  
● 57 WESTERN ROAD, HOVE
- BRISTOL** 0117 974 3727  
● 928 WHITELADIES ROAD, CLIFTON
- BROMLEY** 020 8290 1988  
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- NEWCASTLE** 0191 221 2320  
● 19 NEWGATE STREET
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● 29-29A ST GILES STREET
- NOTTINGHAM** 0115 911 2121  
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● 41 ST CLEMENTS STREET
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# Loudspeakers:

Cone drive units appeared nearly seventy five years ago, but have changed relatively little since then, says Noel Keywood, as he traces the development of loudspeakers past, present and future...

**T**oday's loudspeakers are tuned up versions of what our dad and grandad was listening to. The cone drive unit we use today appeared in 1932, courtesy of Rice and Kellogg of the USA. Ribbons, arcs and electrostatics were contrived earlier, in a frenzy of optimistic Edwardian invention that followed the development of radio. Ignoring digital loudspeakers under development, the only totally new technology since Rice Kellogg is NXT, about which we hear little. So why is it that loudspeaker technology seems to have stagnated? What is happening in loudspeakers?

The Rice Kellogg cone adequately suited its purpose of reproducing both speech and music until the notion of high fidelity took hold after

the Second World War. Until that time there was little need to worry about quality. Cones were made from stiffened paper or fibrous pulp. Goodmans, Wharfedale and Tannoy were prominent names in the pre-war market, using such materials. Gilbert Briggs, founder of Wharfedale, suggests the variability and natural ageing of paper and fabrics, as well as attacks by mice, mould and mites, were problems that occupied the minds of engineers of the day, especially when they exported overseas to climes unmoderated by air conditioning.

The introduction of the microgroove LP in the late 1950s was a sufficiently large stimulus for improved quality that manufacturers started looking at how they could improve the cone loudspeaker. Not for no reason that new names sprung up then, like KEF for example. Founded in 1961 by ex-Wharfedale engineer Raymond Cooke, its loudspeakers were amongst the first to exploit new plastics using, in KEF's words "foil-stiffened, vacuum-formed, expanded polystyrene diaphragms with Melinex or Mylar tweeters.

Cooke was always looking for new materials at this time and, in fact, settled on Bextrene as a solution, as its lightweight plastic sheet-like properties were flexible enough for shaping and the material remained stable under varying temperature and moisture conditions". Note the last words: whilst UK enthusiasts worry about sound quality, manufacturers also worry about consistency over time and temperature, degradation and predation from pests even.

Leak were interested in better cones too, using new synthetic cone materials. They introduced the famous Leak Sandwich in 1961. It used super light expanded polystyrene sandwiched between layers of aluminium foil. Harold Leak claimed it was the first loudspeaker to provide true pistonic motion. It's an interesting claim, based upon a common belief at the time that true

pistonic motion was a goal worth achieving. The upcoming 1970s saw an end to that...

Leak was sold to the Rank Organisation in 1969 as the importance of high fidelity as a leisure time interest grew. Under the name Rank Leak Wharfedale, research continued into cone behaviour, by now using laser interferometry. It clearly showed that the dream of pistonic motion was in reality just that - a dream. In truth cones behaved unpredictably, acting as pistons only at low frequencies. As frequency rises, progressively less of the cone area is responsible for producing sound until, at the upper frequency limit it is the dust cap that radiates, acting as a dome tweeter in effect, situated at the bottom of the cone. Look at KEF's Uni-Q coaxial drive unit and you see it is a clever extension of this principle, the dust cap being replaced by an active tweeter.

As lasers revealed the complex patterns of behaviour exhibited by cones under the considerable forces exerted by the voice coil motor, attention turned to overcoming them using improved materials and structures. It was Leak again that produced an interesting design in the large three-way 2060. Its midrange unit used a white plastic cone with lines of radial holes punched in to act as wave breaks. "Think of them as acting like the wave breaks you see at the sea side", said chief engineer Alex Garner.

This illustrates how thinking was beginning to change about how cone loudspeakers could be improved. The vibrational behaviour of cones needed to be modelled in a valid manner if a meaningful picture was to be seen, and this meant seeing the parts in terms of the mechanical impedances, vibrational properties and termination behaviour. What it meant in practice is that materials and parts needed careful design in subtle areas, such as glues and profiles used, if they were to behave

## Early synthetic cones

### LEAK SANDWICH A MAJOR LOUDSPEAKER INVENTION



Harold Leak demonstrates immense stiffness of piston action 'Sandwich' diaphragm which supports his weight below plate glass square.



*An early use of plastics was Harold Leak's well publicised Sandwich cone. Light expanded polystyrene was sandwiched between thin aluminium foil in a construction technique taken from the aircraft industry. Leak claimed true "pistonic motion". The cone had a treated natural fabric surround though, as our close up shows, that can deteriorate with time in some environments, and the tweeter reportedly had a ragged response that compromised sound quality...*

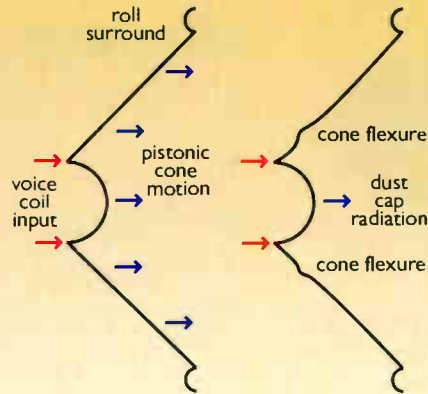
# then & now

as predicted.

Drive units have seemingly changed little in appearance over the last decade as a result. They have been tuned progressively. Unfortunately, whilst steady improvement should be the outcome of all this, it has barely happened. There is still a lot of variability in loudspeakers, much of it attributable to the personal whims, tastes and views of the designers, rather than technological constraints.

Nowadays, much of the early work has been incorporated into computer design programs, so information can be manipulated quickly and accurately. Drive units and cabinets are easily and quickly optimised, and crossovers too.

We can, nowadays, easily produce loudspeakers based on various operating principles, able to give a flat forward frequency response, low colouration and a fair approximation



at decent bass. We still cannot drive the air load of a room well, however, until someone can work out how to push a large volume of air without using a big drive unit.

This is a difficulty facing NXT. It uses very recent ideas on material behaviour and modelling to provide fascinating results, but NXT panels must be paired with standard cone bass units if low bass is to be produced without the panel becoming unacceptably large. Then all the usual matching difficulties suffered by bipolar panel radiators, such as

electrostatics, arise. Dipole panels and monopole bass units don't work happily together in real rooms unless attention is paid to polar radiation conditions at crossover.

To date, the room a loudspeaker must work in has been considered beyond the control of the loudspeaker designer. Automatic room correction may be a way forward here, using a small radio microphone at the listening position communicating with a small microprocessor positioned in the signal chain. This is a complex

*Laser interferometry, first used in the 1970s, showed that pistonc motion of a cone, where the whole cone moves as one, shown at left in our diagram, occurs only at low frequencies (below 500Hz or so). As frequency rises so does acceleration, but displacement decreases. Radiation moves progressively toward the base of the cone, interferometry revealed, coming mainly from the dust cap; it effectively acts as a tweeter. B&W say this behaviour is best managed to occur smoothly, through careful choice of cone material and construction, for best performance. Pistonic motion does not occur at all frequencies.*

## LASER INTERFEROMETRY

Laser interferometry was pioneered in the 1970s by Dr Peter Fryer, working at Rank Leak Wharfedale. It was applied to Leak loudspeakers. Now at B&W loudspeakers, here is example of how Fryer's work has been applied by them to improve drive unit behaviour.

"Let's compare the impulse response of two drivers. They are identical apart from the cone material. The first has a plastic cone. The second driver has a cone of woven Kevlar®, treated with a resin to control the stiffness and a PVA compound to add damping and seal the fabric.

The laser interferometry images at left show conditions just after the signal has been applied. In both cases, just the centre of the cone has started to move. With the plastic cone at the top, a circular bending wave has started to spread out from the centre of the cone. However, with the Kevlar® cone below, the wave front has begun to assume a square shape, imposed by the weave.

When these bending waves reach the joint between the cone and surround, some of the energy is reflected back into the cone and some passes into the surround. When these reflected waves reach the centre of the cone, they are reflected back out again and so on, until damping in the materials eventually dissipates the energy.

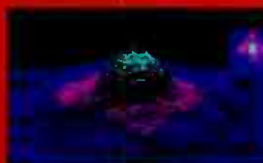
Because the wave front in the plastic cone is circular,



these repeatedly reflected waves set up the pattern of concentric rings shown in the top right image and radiate delayed sound to the listener that adds to and colours the initial sound received.

Although reflections do occur with the Kevlar®, they happen at different times around the edge and the movement pattern of the cone is more random, as shown in the bottom right image. In this case, the total area of the cone moving forward at any given time is more balanced by the total area moving backwards and far less of this delayed energy is actually radiated as sound to the listener; the air just shuffles across the surface of the cone."

The end result is that the Kevlar® cone sounds significantly clearer and can deliver more fine detail.



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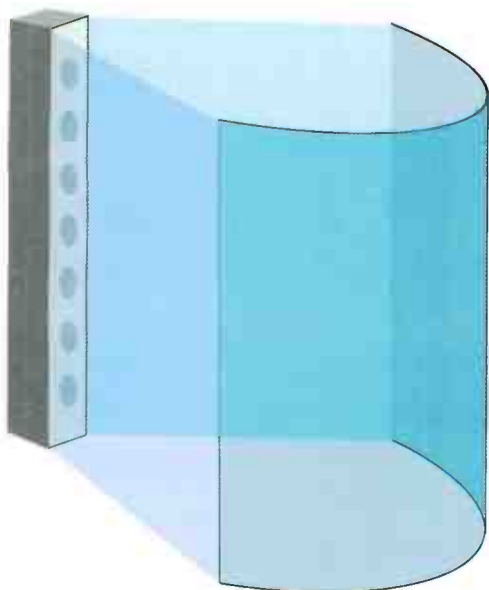
solution that to date optimises at one point only, whilst increasing cost and complexity sharply.

It may be possible to tidy up today's loudspeakers to give better results in real rooms by deciding what it is they should be doing, then ensuring they do it. The little discussed line array loudspeaker, which projects a cylindrical wavefront into the room, may well give more even and predictable results in real

homes than an untidy design subject to electronic correction. Bose have a lot to say on this with regard to their interesting Panaray public address loudspeaker and Dali produce the MegaLine for domestic hi-fi use.

At present we are using speakers of the past, in the present. Rice Kellogg drivers have reached their limit of development, but how to supersede them is not at all clear. Ribbon drive units of increasing

ability are appearing from, for example, the American Technology Corporation, as well as China of course, but they do not produce bass. And the true digital loudspeaker is an idea that has been floating around for the last decade or so, without seeing the light of day as a working device. It will be some time yet before we get a loudspeaker our dad and grandad wouldn't recognise...



#### THE LINE ARRAY

*The vertical line array loudspeaker (left) is used for Public Address purposes, because its sound falls off with distance less quickly than an ordinary loudspeaker, -3dB when distance is doubled, compared to -6dB. That's because it produces a cylindrical radiation pattern (except at low frequencies), as our diagram shows, instead of a hemispherical one. In a room, sound is not fired at floor or ceiling and can be better directed to the listener.*

*Dali exploit this in their 6ft+ tall top-of-the-range MegaLine (right). It uses stacked ribbon tweeters and multiple bass units.*

*This principle could show promise - and it lends itself to tall, slim loudspeakers.*



#### THE BASS PROBLEM

The produce powerful bass you must move a large volume of air. This can be achieved by a large cone moving a small distance, or a small cone a large distance. Of the two methods, the expression "there's nothing like a good big'un" pithily summarises which is best. A small drive unit does not couple to the air load of the room efficiently, whilst a big one does. The measurable difference between the two is the coupling efficiency (electrical power input against acoustical power output) and the amount of distortion they

*The Linear Array Transducer (right) from Tymphany, a new way to shake the home...*



produce. Big drive units are better at both. Small bass units thrash around and usually sound soft, lacking real 'slam'. Because they are inefficient, a lot of electrical power must be fed in, which can result in burn out or mechanical damage.

This is an intransigent problem that currently seems insoluble, and it affects loudspeaker design deeply. Quality loudspeakers must reach down to 40Hz, the lowest note (approximately) on a bass guitar and plucked acoustic double bass. Synthesisers and large cathedral organs reach down to 16Hz and there's no shortage of electronic 'events' that put energy in the 20Hz-40Hz region, from bands like the Pink Floyd for example. Listeners may expect to hear this if they are buying an expensive loudspeaker. But whilst there is no shortage of high quality drive units, like domes, ribbons and NXT panels, able to handle high frequencies, few are able to produce the long wavelengths and acoustic power needed for lifelike bass reproduction.

Currently, there is no alternative to reproducing this with a standard

cone loudspeaker, usually in a box. That is not to say people are not trying. Californian company Tymphany have produced the L.near Array Transducer that, they claim, can produce high power down to 10Hz. Whether it can match a Tannoy Yorkminster we have yet to see.



*Tannoy Yorkminster - the traditional route to big bass.*

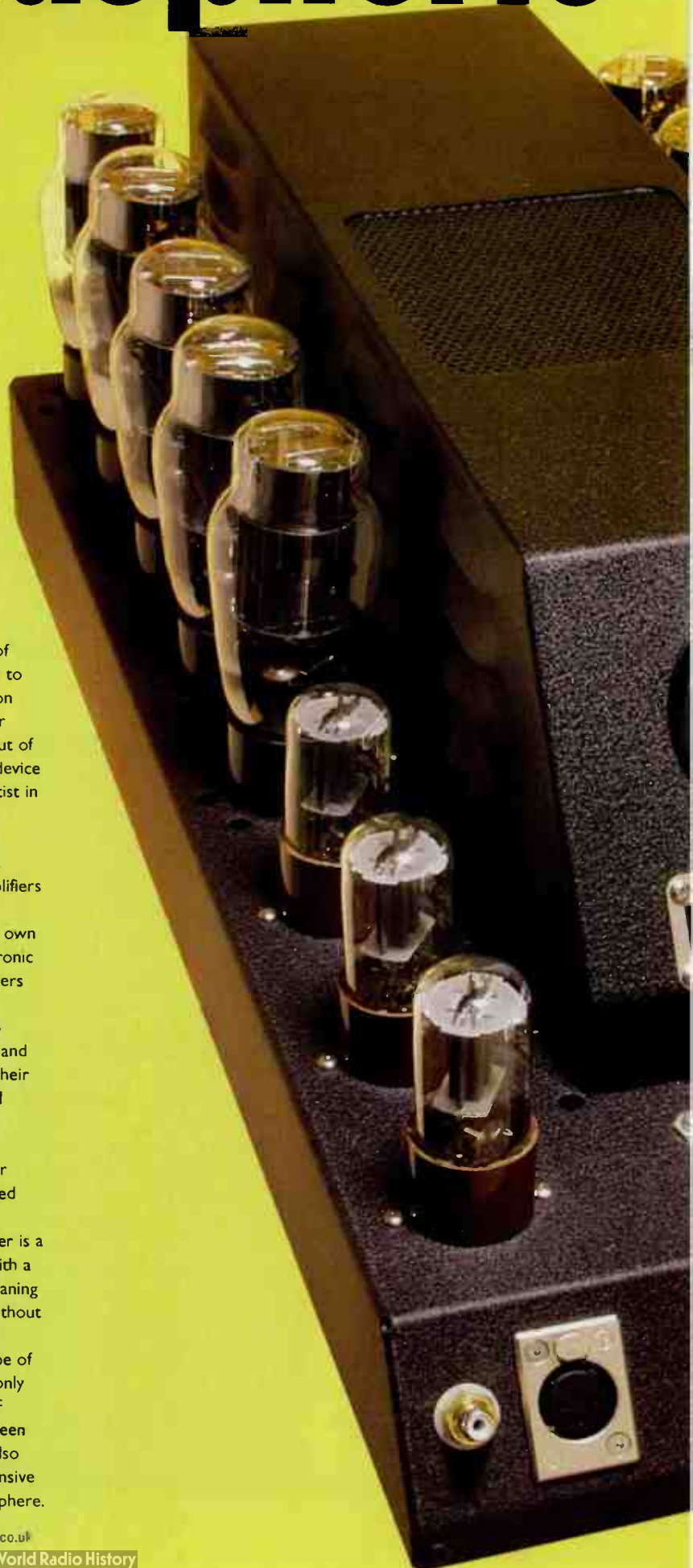
# Atmaspheric

**Is this amplifier designed for crazy scientists, asks John May? If so, then they'll enjoy it, he thinks, because the Atma-Sphere MP-3 preamplifier and S-30 MkII power amplifier are as special as they look...**

**I**n our look at old versus new within this issue, here's a fascinating pair of products that are both - and neither! From the black crackle finish paintwork to the old-school toggle switches, the multi-faceted front panel lights on the power amplifier to the gloriously out of date meter, these two devices are sure to appeal to the retro-hip crowd of fashion conscious audio-nuts! To me the power amplifier looks like it comes straight out of an episode of Quatermass - the only device it lacks is a Tesla coil and a crazy scientist in a white lab coat!

Atma-Sphere Music Systems Ltd are the oldest manufacturer of Output Transformerless (OTL) and Triode amplifiers worldwide, and have been in business some 27 years. They make use of their own patented version of the classic Circlotron circuit [see box] in their power amplifiers which - they say - offers the simplest route from your source component to loudspeaker, with minimal degradation and distortion of your precious music. All their products follow a 'Balanced Differential Design' philosophy, which allows for balanced and single-ended inputs. Only three patents have ever been issued for OTL designs; two of these are registered with Atma-Sphere.

The £2,995 MP-3 Music Preamplifier is a fully differential all-tube preamplifier, with a direct-coupled high current output meaning that long runs of cable may be used without any signal degradation. Low impedance 600ohm balanced-lines are known to be of superior quality than the more commonly used single-ended, possessing lower RF noise. The use of balanced cables between the preamplifier and power amplifier also means that the need for horridly expensive exotic cables is diminished, say Atma-Sphere.



Setting up is relatively straightforward, so long as you have the necessary space for the power amplifier that is! Although big it is fairly lightweight, however, as there are no output transformers. The usual warnings are given out about placement of valve-based equipment i.e. most have adequate ventilation and be vibration free. The instructions for the MP-3 mention that it must be switched on and left to stabilise before the power amplifier is turned on.

Failure to do so could result in damage to your speakers due to excess DC generated

by preamplifier during to the stabilisation process. Atma-Sphere say that the MP-3 may be left on at all times for better sound, though valve life on the 12AT7s will be reduced to around 3-4,000 hours (approximately 5 months).

The gorgeous £2,595 S-30 Mk.II power amplifier hosts an awesome array of vacuum tubes. A total of three pairs of 6SN7GT driver tubes are used, with five pairs of the audiophile's favourite 300Bs taking care of the output duties. Those looking for an amplifier which doubles as a room heater may well have found the perfect amplifier for them! No cage is supplied either so care must be taken to avoid any singed digits or flame-grilled pets!

### SOUND QUALITY

This amplifier may look like it belongs in a 1950s design museum, but its sound is anything but dated! Though it may not be a Naim NAP250 it still displayed a fabulous grip on the Spondor S8e loudspeakers – you wouldn't know this was a valve amplifier - until you hear vocals through it. Sade's 'Smooth Operator' was just that, and showed just what a good valve amplifier is capable of when it comes to the nuances of the human voice. She was practically in the room with me (...which was

nice!) and there was nary a hint of grain to intrude upon things. Those used to solid-state equipment may well feel that something is missing.... until you realise what you are missing is that thin veil of grain which seems to plague most transistor based equipment. Listening to music through the Atma-Sphere combo is like a swim in tropical waters, rather than a murky stint in the Thames! However, unlike some poorly designed valve amplifiers there was also bass punch present here – it didn't quite kick you in the guts like the aforementioned Naim, but I'd wager it was tonally a tad more accurate and possessed of a tangible sense of reality.

I noticed immediately that my toes were taping away merrily on this CD – heck I was enjoying the music rather than just 'going through the motions' in order to get a review written! Any piece of equipment that can get me involved in the music rather than merely observing it, as it were, gets extra Brownie points in my book, and you'd be surprised how much equipment fails to do that.

There was a delicious see-through quality to the music that really brought the performance alive for me. Again this was undoubtedly due to the lack of solid-state grain and the benefits of direct coupling of the loudspeakers. All instruments were possessed of real tonality, at least on good quality recordings that hadn't had the life squeezed out of them. Piano on this well recorded CD was exceptionally well reproduced – it had weight, superb tonal quality and body, and the notes decayed away into a real acoustic space just as they should. There was also a lovely 'sparkle' to the sound – not to be confused with brightness – which really brought things to life for me. Bass was also well represented and unusually tuneful. All too often I find bass guitar submerged in the mix, or it suffers from the dreaded one-note syndrome. On the Sade track 'When Am I Going To Make A Living' one could almost see the bassist bending the strings and again the word which appeared on my listening pad was 'organic', as in the instruments were real and tangible – not synthetic in the slightest.

Soundstaging was beautifully realised on an original recording of Henry Mancini's 'Pink Panther' theme song. This was probably recorded on valve equipment in the first place and complimented the Atma-Sphere's presentation down to the ground. Like the Sade CD there was a tangible lack of any solid-state



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Customers say we make some of the **BEST SOUNDS** they have ever heard, so you know we can do the same in your home. Our advice will take account of your best components and guide you where change is needed, in stages you can afford.

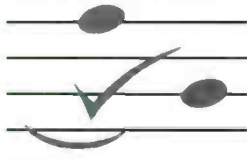
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**NOEL SAYS ...**

There's no doubt that this amplifier seemingly possesses one of the clearest windows into music that you could wish to hear. I felt there was a small hint of glassiness, in contrast to the usual velvet glove of delivery from conventional valve amps., but otherwise the absence of grain or colour was extreme. We ran S-30 MkII power amplifier with a meter attached to ensure overload wasn't approached. It was easy to turn up volume enthusiastically and hear cymbals go "crunch" though, so beware that 2W must be treated with care. Do this and you are rewarded with a sublime sound. NK

grain, and a real clean and clear window onto the performers. Images projected well out of the periphery of the loudspeaker cones, and when the horn section blasted in I couldn't help but smile broadly – this thing just loves making music!

What of the downsides then, I hear you cry? Well 2.2 watts isn't much power, unless you happen to own a pair of Tannoy Westminsterers. Playing a few tracks by Steve Earl at louder listening levels resulted in

a hardening up of the sound, and a painful brightness. The presentation just sounded 'wrong' to my ears. The measured performance that Noel mentions is to blame for this – distortion being dependant upon power output. Backing off the volume control a tad bought things under control, but diminished the power of this piece. The story was the same with my Beck and Black Sabbath CDs. Performance was perfectly adequate so long as a tight reign was kept on the volume levels.

**CONCLUSION**

Okay, so this is a low power valve amplifier that measures very badly by just about every modern standard, is incredibly loudspeaker dependent and doesn't like being driven hard. It also brings music alive in a way I've seldom heard before and strips away those layers of grain that are usually there with solid-state amplifiers. How much of this is due to the third harmonic distortion Noel measured is, however, open to debate, but I have to say if I hadn't seen the measured performance I wouldn't have any qualms about this design at all. Assuming you have the partnering equipment to do justice to these amps, and pockets deep enough to stand the strain of buying new valves when the time comes, you'll have a blast with the Atma-Sphere. I thoroughly enjoyed my time with them, and going back to a transistors is going to be hard work...

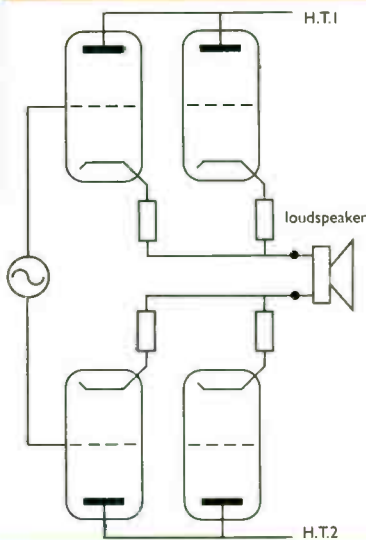
**DIRECT COUPLING**

Direct coupled valve amps have a fascination for most valve engineers, as the output transformer of conventional valve amplifiers is a heavy and expensive item that also seemingly limits performance. Valves are high impedance devices though, that don't drive low loads happily, especially loudspeakers, without current slewing and the production

of strong amounts of third harmonic distortion that arises from waveform triangulation. This is a consistent problem, tackled here not altogether successfully by paralleling up low-ish impedance 300B triodes. At £80 a pop, or far more if you fancy Western Electrics, output valve replacement on this amp will set an owner back a staggering £800 minimum, or £3000 at most. Phew! A Range Rover is cheaper to run. And for that you get just 2W or so before severe distortion sets it. The importers say it needs high loads, preferably higher than 8 Ohms, but these days loudspeakers with an impedance higher than this aren't so common.

The Cain & Cain Abbys reviewed this month suited quite well though and are the type of loudspeaker to go for.

In real life direct coupling of a valve amp with 500 or so volts kicking around it's electrodes is a recipe for total extinction of the loudspeakers should anything go wrong it, plus any humans that foolishly intervene. So capacitor coupling is the norm. Our outline circuit (above) shows just one outline variant of the famous Circlotron, where no such safety concerns have been addressed. The Atma-Sphere S-30 MkII power amplifier needs occasional d.c. balancing, hence that retro meter on the front panel to give users guidance. NK



**VERDICT**

A wonderfully clear sound free from grain, and with firm bass is an audio delight. Low power and expensive to run though.

MP-3 MUSIC PRE AMP £2,995  
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**AGAINST**

- loudspeaker dependent
- ultra low power
- measured performance

**MEASURED PERFORMANCE**

The Atma-Sphere produced 2W into an 8ohm load using a 1% distortion limit, or 9W at 3% distortion; it doesn't like 4ohms at all, output sinking to 0.8W for a 1% distortion limit. So this is a very low power beast, strictly for loudspeakers of high impedance right across the audio band. This makes loudspeaker choice critical, highly efficient designs from Lowther or perhaps Tannoy being most suitable.

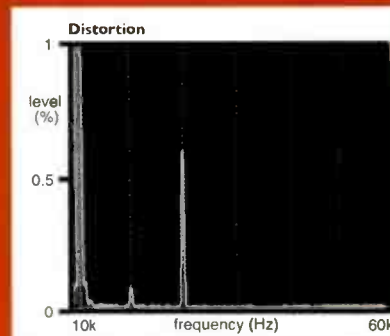
Distortion was primarily third harmonic in nature, increasing steadily up to severe triangulation (5% thd, 12W output) before output clipping occurred. So distortion is dependant upon power output and can be any figure from around 0.3% third harmonic at 1W output up to 3% at 9W output, at which level the 'sharpening' effect of third is plainly audible. High frequency distortion was much like that in the midband in both level and structure, so the amplifier is consistent.

Input sensitivity was normal enough for a power amp at 0.8mV.

With five 300Bs aside, each costing £80 or more, this amp delivers some of the most expensive watts in

the business. Dominant third harmonic distortion will make them seem fast, clean and hard in outline, if excessive volume is used, but at low volume the Atma-Sphere will likely shine. NK

Power	2.2watts
Frequency response	4Hz-58kHz
Separation	75dB
Noise (IEC A)	68dB
Hum	12mV
Distortion	0.3%
Sensitivity	800mV



# Big Style



David Price looks back at one of the most impressive tube power amplifiers ever made, the massive, mighty and monstrous Audio Research D150...

**T**here's an old joke that asks, "Which is the shortest book ever written: the Australian book of culture, the Italian book of war heroes or the American book of self-denial?"

Well, back in the nineteen seventies – if the Audio Research D150 is anything to go by – the great

American hi-fi buying public was certainly not minded to deprive itself of audio excess. US audiophiles were obviously not believers in the credo, "less is more". With the D150, more was more, and more than enough, too...

This is one of the most remarkable tube amplifiers I've ever seen (we'll talk about the

sound later). It is vast; it makes two seriously chunky, stacked Musical Fidelity kW separates (sitting in the office about a metre away from the D150) look like a Denon microsystem. At over 60kg, it requires three men to lift it with any degree of safety.

More impressive still is its context. You see, although Hi-Fi

"this amp is testament to the fact that if something is done properly, it never dates..."



World is nowadays full-to-brimming with tasty new tube designs every month, back in 1975 (when Audio Research launched this), valve amplifiers were about as fashionable as a 'short back and sides' in a barber's shop, or drainpipe jeans at a disco. Then again, Audio Research was never a company to follow the fleeting vagaries of fashion...

Indeed, it is one of the oldest continually operating manufacturers in American audio. The company was founded in 1970 in Minneapolis, and has grown steadily over the last quarter-century. It now occupies a 48,000 square-foot production plant and administrative headquarters in Plymouth, Minnesota, where approximately 75 technical, assembly and support staff guide the product line

from concept to finished goods. A research-only facility has also been established in Palm Desert, California. Its founder and president William Z. Johnson began designing custom audio electronics in the early 1950s, and also operated a specialist audio shop until the mid-1960s. He was a big name behind the renaissance of 'tube' audio in the US.

Many industry observers consider Johnson one of the true originators of the entire concept of "high-end" audio as it exists today. The company is particularly famous for its after sales service - its technicians can still repair, refurbish and restore any product ever manufactured during the company's quarter-century history.

The D150 was instrumental in the company achieving this reputation; made in a very limited production run of just 200, it cost a whopping \$2,685 (the price of a 'compact' car). Rated power output was 150W RMS per channel, and there are 4, 8, and 16ohm taps. The tube complement comprised four 12AX7, eight 6FQ7, and MP6550 (the latter very much an Audio Research favourite). Internal construction is quite sublime. There's one massive mains transformer, two massive output transformers and huge steel girders running left to right (secured to the side panels by hex bolts), housing racks of glowing valves. Along with the fan cooling, it rather looks like a very early supercomputer...

Externally, this thing is no less arresting. The chunky 6mm brushed aluminium front panel houses three meters; two for power and one for mains voltage. The idea is to use the central voltage knob to select the voltage setting (100, 110, 220, 240) that comes closest to the meter reading (in our central London office, the volt meter read 231v). The group of three knobs either side are used for cathode current bias adjustment.

### SOUND QUALITY

That the Audio Research sounds as it does today is surprising, but to have heard it back in 1975 must have been remarkable. This is absolutely nothing like the British breed of valve amplifiers of that time whatsoever.

Where a Quad II was soft enough to be the audio equivalent of an eiderdown, and the Leak Stereo 20 was at least rose-tinted and woolly around the edges, the D150 is sharp as a knife and hard as steel.

Of course, absolute comparisons aren't fair, as this massive 'Yank tank' was almost ten times the price, but it's still a fascinating counterpoint to Brit valve amps of yore. The speed, power, attack and insight of this classic has to be heard to be believed. It makes an original Naim NAP250 (yes, the hard sounding one!) seem slow and ponderous, with massive transient swings of power and incredible midband insight. It's quite unlike anything you'd traditionally associate with valves in this respect.

Kate Bush's 'Moving' was breathtaking; tremendous bite and wallop from the superb seventies rock drumming, allied to a glass-clear midband that seemed to scythe through the fairly warm 'analogue' mix of her first album like a hot knife through butter. The bass guitar grip was vice-like, the cymbals sparkling and spacious, Kate's vocals dreamy and chilly and haunting. Going to an all-digital recording of Stravinsky's 'Right of Spring' showed the recording's brittle quality in a way that even the Quad II-forties can't manage. This amplifier is relentless in the way it dissects a recorded acoustic, warts'n'all. Indeed, to some ears it might be a just a tad on the bright side, but that's very much down to personal taste. What few will object to, however, is the dizzying speed and sheer motive force of this behemoth. This gives it a tremendous physicality - in a barrel-chested way, it blasts music out with incredible self-assurance. It is not afraid of any loudspeakers, and it shows.

### CONCLUSION

The Audio Research D150 is an amazing product for its day, offering truly top line fidelity with no down sides, about from its imposing presence in your listening room and the frightening prospect of ever having to move it again. I can't help but feel that, if the UK hi-fi press of 1975 had been just a little more receptive (ideologically) to products such as this, then we would never have seen valves fall out of favour in the eighties (and the ensuing valve revival of the nineties, for that matter). It is a resolute two fingers aloft to those who think valves are nothing more than an audiophile's 'comfort zone', and testament to the fact that if something is done properly, it never dates.

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# Classic Value

Although Naim Audio has made quite an impression with its entry-level '5' series of late, its 'Classic' range of high end electronics goes from strength to strength, as its latest NAC282/NAP250 pre-power amplifier combo shows, says Channa Vithana...



**W**ith the new '5 series', there's no doubt Naim has impressed a great many reviewers and customers alike. It sounds superb (whilst retaining the distinctive Naim character), is made (in England) beautifully and offers superlative ergonomics and style.

Yet the company has also been busy updating what it calls its 'Classic' range – the big, pricier, preamplifiers, power amplifiers and power supplies. Having used the £2,945 NAC 282 preamplifier, £2,400 NAP 250 power

amplifier and £960 Hi-Cap 2 power supply upgrade (for the NAC 282) as a valued review tool over the past few months, we decided to take a closer look.

At £6,305 all in, this system is not cheap, but is less than half way up the Naim upgrade ladder when compared to the £12,235 NAC 252/SuperCap/NAP 300 and £24,925 NAC 552/NAP 500 amplifier combinations! Still, it faces stiff competition; at this sort of price point, it's up against deliciously smooth tube kit from Quad and svelte and massively powerful

transistor fare from Musical Fidelity, for example, not to mention the crisp and lyrical Densen B-250/B-330 [see box].

## THE PREAMP

The Naim NAC 282 preamplifier measures 87x432x314mm and comes complete with a separate NAPSC fully regulated power supply for its digital and control circuitry. Naim say the benefit of using the NAPSC for preamps is enormous, as it supplies current for the relays, logo, indicator lights and control circuitry. This allows the premier supply, for

instance (a Hi-Cap 2 or SuperCap), to provide supplies with the lowest possible noise for the audio circuitry, giving what the company calls, "a performance leap in sound quality". The NAPSC has a claimed 18V output, weighs 2.1kg and measures 57x121x187mm.

The NAC 282 says Naim, features "carefully matched, precision rotary potentiometers with precious metal wipers (that) are used to ensure long-term stability and preserve music integrity". The signal input of the NAC 282 uses relays said to have been designed for one billion operations and are filtered within the relay control circuit to negate an influence on the selected audio signal.

Then the audio signal is buffered and filtered before the volume control using Class A 'single ended' circuits developed by Naim, "to ensure unwanted high frequency signals are not sent to the preamplifier's gain stage and ultimately to the power amplifier". Also the filter is optimised using this design which Naim says is important "...for minimum time distortion, a critical factor in persevering the perceived musical energy and timing".

The NAC 282 volume potentiometer is mounted on one rigid point of contact within the chassis casework as Naim thinks this positioning is critical. Naim prefers to use low mass wires to electrically connect the potentiometer because unlike a PCB link, the "wired connection ensures microphonic noise is not transferred to the potentiometer's wipers". After the volume control, the NAC 282 uses a five transistor low-feedback Naim designed gain stage.

The NAC 282 has six listen or record inputs, two of which are selectable with either Naim's preferred DIN or phono sockets which bring the NAC 282 to a wider set of source connections outside of a Naim system. One input is AV, suitable for a Naim AV2 multichannel processor or similar. The NAC 282 also features NARCOM remote, RC5 wired remote control socket for "complex installations", and space for optional RS232 socket for "full home automation systems". Finally the NAC 282 can also power Naim's Stageline or Prefix phonostages.

Naim state that they, "pioneered the use of separate, remotely located power supplies, minimising supply noise for sensitive hi-fi components, such as preamps". The Hi-Cap 2 power supply used here to upgrade the NAC 282 is designed to output two independent 24V upgraded

supplies (also suitable for a variety of other Naim components). Naim says that each power supply has its own centre-tapped, secondary winding on the 400VA transformer, its own bridge rectifier, reservoir capacitor and regulator circuit. And further, that the "very large" transformer in the HiCap allows it to fully recover from the current taken from the output supplies at the peak of the next available mains cycle. The large reservoir capacitors need to be charged from a large, high power transformer. The Hi-Cap 2 measures 87x207x314mm and weighs 7.35kg.

## THE POWER AMP

The Naim NAP250 has been in production over two decades now, and so these days its reputation precedes it. For many transistor power amplifier addicts, it is the ultimate in musicality. We know it's not the most powerful, but its fans would argue it can still punch beyond its weight, and with such dexterity too.

Although it was once the company's top stereo power amp (the NAP135 monobloc being the only thing further up the upgrade ladder), the latest NAP 250 is situated behind the £5,085 NAP 300 and £12,350 NAP500 power amplifiers. This, the latest incarnation of the NAP250, uses a new circuit design with improved earthing arrangements, built on "a very high quality" anti-resonance main audio circuit board. The NAP250 uses the same 007 transistors that were custom-designed for the NAP 500. Naim claim that these each provide up to 80 amps and 350 Watts, negating the need to use parallel pairs of transistors (which always have a negative effect on sound, says the company). Additional 007 transistors are used in the fully regulated power supply. The NAP250 uses a large toroidal transformer that has a 400VA rating and says Naim, "is stable into any load". It is rated by its maker at 80W into 8 ohms and measures 87x432x314mm.

The NAC 282, NAP 250, Hi-Cap 2 and NAPSC all feature exemplary build quality, with very solidly made continuously sleeved aluminium outer casings that house the internal circuit chassis. They are better built than the previous 'olive' Naim series with better quality damped switches, control and volume knobs and solid fascias instead of the flimsier plastic style of yore. They look purposeful and solid in design too with some nice textured brushed detailing to the two sides of the fascias of the NAC 282 and NAP 250. The

middle section of their frontage has a smooth satin finish that matches the Hi-Cap 2's face which is a nice design detail. I would have preferred the NAPSC to have the same satin finish also but instead it has a textured surface. Thus with superior build quality, many would prefer this current Naim style, however in my estimation, the previous 'olive' series, though less well-built in comparison looked more modern, without the latest crescent Naim logo and less fussy styling, they had a distinguished and peerless 'dark industrial' beauty.

## SOUND QUALITY

Chuck Berry's 'Mabellene' from 1955 was very capably rendered through the Naim NAC282/NAP250/Hi-Cap2 system. All the elements were finely revealed, creating a believable and cohesive overall sound. There was stunning attack and definition to guitar and vocals. Chuck Berry's vocals were of very high-resolution with superb leading edges and never fatiguing; rather, they were clear, linear and beautifully extended.

On the 'Bach Arias' LP, Janet Baker's vocals were nicely rounded and therefore presented with very good definition through the delicate passages in the opening section to 'Bist Du Mir' and then further into the recording with great control as the Naims were able to handle the demanding peaks and crescendos very well. The harpsichord/chamber organ had some nice definition with clear phrasing, as did the rest of the stringed instrumentation.

### DENSEN B-250/B-330 COMPARISON:

Putting the £6,305 Naim 282/250/Hi-Cap2 system up against the £6,000 Densen B-250/B-330 amplifiers was most interesting, with the former excelling in some respects, and the latter in others. With the Densens there was more midband 'bounce' to 'Mabellene' by Chuck Berry, and the music had a slightly more free-flowing attitude, where the instruments and vocals had better balance within the musical structure and less sense of forwardness. Spatiality was better than with the Naims, with a more open feel to the music. However, the Naims were better with certain details such as Chuck Berry's voice, which was more extended than on the Densens. The Brit pack was also obviously superior in the lower to mid bass frequencies, where the Naims had heaps of muscle to bring forth a powerful musical stance. The music and vocals on the 'Bach Arias' seemed superior via the Densens, as Janet Baker's vocals had more space around them and combined with the instruments the acoustic decay was better thus enunciating a more three-dimensional feel to the music without losing out on impact or dynamics. The Frankie, Willie Nelson and New Order LPs also showed the Densens to be spatially superior, whereas the Naims again impressed with bass grip, speed and drive. Both combos proved deeply impressive, and only an audition will convince potential purchasers which is for them.



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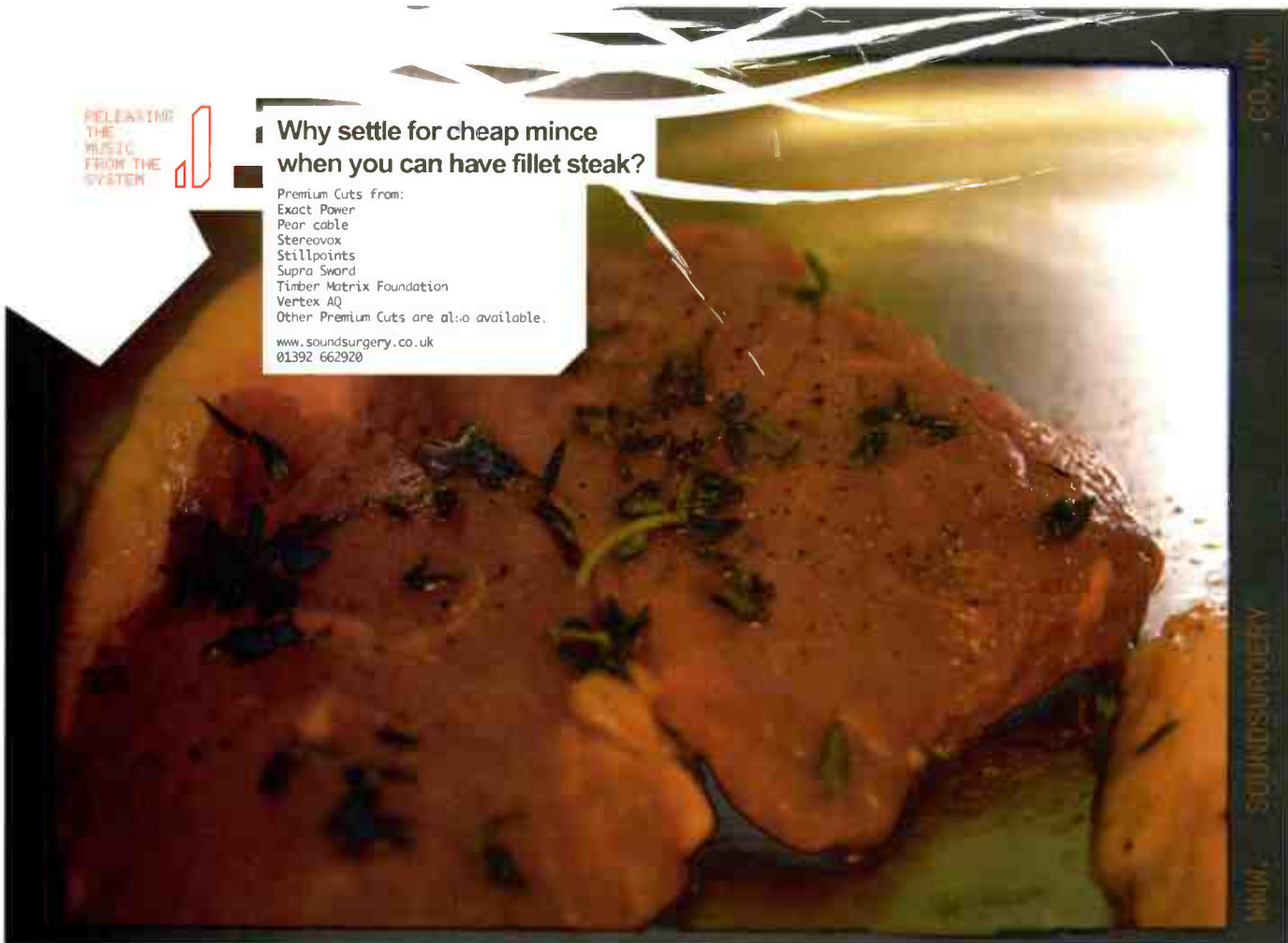
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Frankie Goes To Hollywood and their 'Two Tribes' from the 1984 LP 'Welcome To The Pleasuredome' sounded kinetically cohesive and enjoyable through the Naims. Holly Johnson's vocals and the instruments were animated and musically exciting with stunning focus. Holly Johnson was very convincing, his vocal phrasing and expression coming through superbly. The musical structure and whole was enjoyably ferocious yet never once strident. On 'Relax', Holly Johnson's vocals in particular were beautifully rendered and the grand synthesiser swathes were excellent, enabling the decadent and hedonistic feel of the song to be faithfully expressed.

Bass dexterity and extension was superb, with powerful definition and without an ounce of unmusical flab that masquerades as deep bass extension in some hi-fi designs. As the brilliantly deconstructed version of 'War' appeared, the Naims propelled the music with power and exciting levels of timbre, while the excellent bass dexterity and extension produced a hewn from solid feel.

On 'Overtime' from the 2004 LP 'It Will Always Be' by Willie Nelson, he duets with Lucinda Williams rather beautifully where the music is defined within a languid but soulfully melodic aesthetic. And as such the sound from the Naims was generally well rounded and communicative as a whole. Both vocals were superb with convincing high-frequencies and emotive qualities. The plaintive feel of the song via the Naims did not mutate itself into being flaccid or warm.

New Order's 'Jetstream', from the 2005 LP 'Waiting For The Sirens' Call', was solid and appealing through its musical structure as the Naims ably revealed the excellent Stuart Price/ New Order production. The sound was high-resolution and very powerful in the mid to upper bass regions. The instrumental and vocal separation was excellent and with the generally cohesive nature of the representation by the Naims, the music was dynamic also. As with the previous recordings used, the Naims proved particularly adept with both Bernard Sumner and Ana Matronic's vocals. Here the texture of their vocals was impressive.

Only against the most able similarly priced competition (such as the Densen B-250/B-330 amplification; see left) are any criticisms of the Naim's infectious sound exposed, and even then many will regard it as merely a different emphasis than any kind of failing. Essentially, the Naim

combo has a strong, explicit, architectural sound that begins and ends with the bass (especially the upper bass/low midband). This region is exceptionally articulate and engaging, but running further up the midband, the Densen duo shows the Naims up as just a little constrained – the Densens are obviously more liquid and open in the midband, giving a more fluid sound, but then they lack the tauter, tighter bass of the Naims. As ever, you pay your money and takes your choice.

**CONCLUSION**

I thoroughly enjoyed the £6,305 Naim NAC 282/NAP 250/Hi-Cap 2 amplifier combo, which proved an extremely entertaining and exciting listen. These current Naim amplifiers are indeed different to the previous 'olive' iterations in both visual and musical approaches. I have listened to the models preceding the NAC282 (the NAC82) and NAP250 amplifier in different systems, and now having heard these latest versions can say that they retain much of the powerful rhythmical low-frequency stance of the past.

Now however, in my subjective opinion, the latest Naims are superior in treble timbre and high-frequency detailing, and as such vocals especially were extended and a joy to hear - as the past 'olive' versions did have an occasionally bright quality in the high-frequency regions. Furthermore, I found the £2,400 80W



**MUSIC**  
 Chuck Berry 'Mabellene' (1955)  
 Janet Baker/Marriner 'Bach Arias' (1976)  
 Frankie Goes To Hollywood 'Welcome...' (1984)  
 Willie Nelson 'It Will Always Be' (2004)  
 New Order 'Waiting For The Sirens' Call' (2005)

NAP250 a phenomenally powerful sounding amplifier, offering subjectively more punch than several designs boasting considerably more power on paper.

Of course, no specialised product such as this will prove all things to all men, despite the fact that the latest Naim 'Classics' are much more so than ever before. Some will find, the Naims lacking the Densens' wider spatiality and freer midband flow. Still, by any standards, they were never less than brilliantly musically engaging. As such, they come heartily recommended; if you know what you like - and what you like is a certain kind of taut, tight, propulsive transistor power - then nothing compares.

**VERDICT** ●●●●●  
 Superlative pace, punch and poise makes this one of the most musical solid-state amplifier combos money can buy.

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**MEASURED PERFORMANCE**

The NAP250 power amplifier produces 88W into 8ohms and 150W into 4ohms. Regulation is very good, as expected, with little voltage drop into a low load. There's little measurable distortion in the midband, level hovering around 0.004%, according to load, with second harmonic predominating, always a good sign, as it sounds innocuous. At high frequencies some classic higher order crossover distortion appears, as our analysis shows, but levels remain low at 0.02%. Maximum input sensitivity is extremely high at 80mV for full output, so all sources are catered for. As usual with Naim, bandwidth is restricted at both ends of the frequency spectrum, a practice that can be justified technically. The upper -1dB limit is just 23kHz. The Naim NAC282 and NAP250 measure well, very much in classic Naim tradition. NK

Power	88watts
CD/tuner/aux.	
Frequency response	8Hz-23kHz
Separation	89dB
Noise	-115dB
Distortion	0.05%
Sensitivity	80mV

THD 23456789    Input RMS    Frequency

CH1 0.0319070%    3.115 V    9.9928 kHz

CH2 OFF    OFF    OFF

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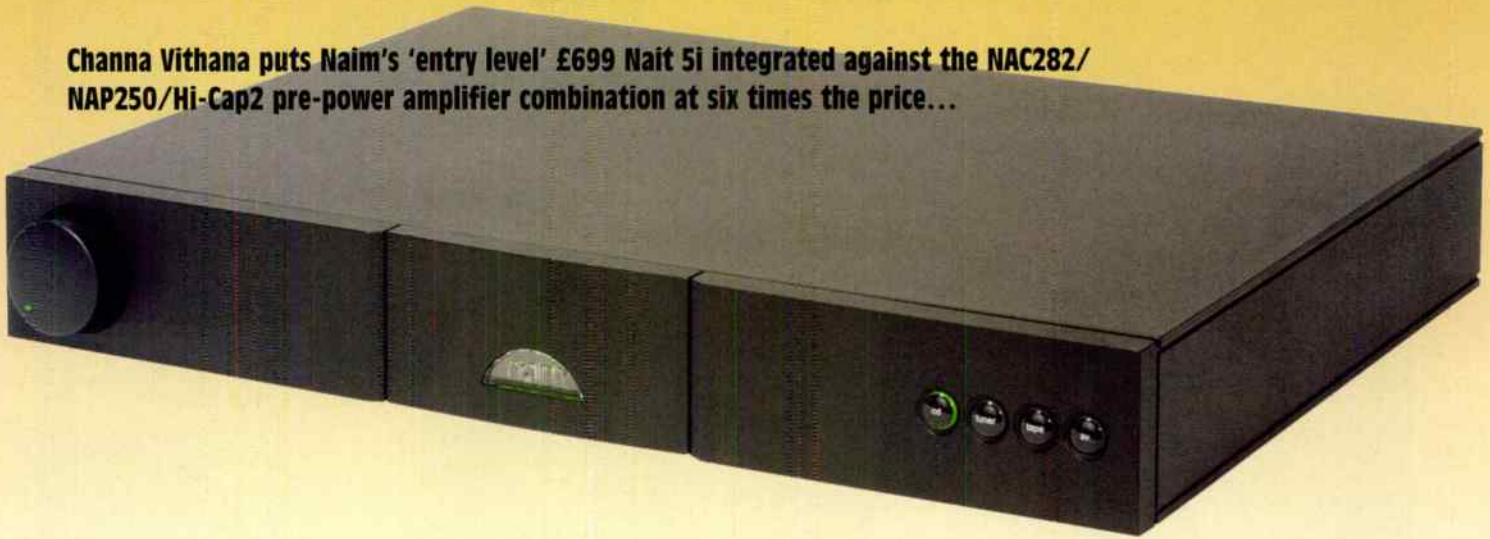
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# Relatively Speaking

Channa Vithana puts Naim's 'entry level' £699 Nait 5i integrated against the NAC282/NAP250/Hi-Cap2 pre-power amplifier combination at six times the price...



**S**urely the strength of a manufacturing company lies within their base models and not their high-end ones? It is, of course, much harder to do a superb product when you're counting the pennies, rather than designing a 'cost no object' statement product... The Nait 5i is the lowest-cost execution of a company's philosophy, so can only be as important as any flagship version.

Here we have an opportunity to probe within the realms of Naim's own upgrade philosophy by comparing their lowest-cost base model, £699 Nait 5i integrated amplifier to the £6,305 NAC 282/NAP 250/Hi-Cap 2 system.

The remote controllable Nait 5i has a 50W output. It has four inputs, two of which are assignable to DIN or phono sockets. There are physical differences between the low cost Nait 5i and the high-end NAC 282 for instance, where the Nait 5i uses the same textured finish from casework to fascia, the NAC 282 has delineated fascia surfaces with finely brushed textures contrasting with satin-smooth inlay. The Nait 5i also has a noticeably noisier electronic Alps Japan Blue volume potentiometer and in comparison it does not move with the silken precision of the NAC 282's volume knob.

In the listening sessions with the Nait 5i, on Chuck Berry's 'Mabellene' I could clearly identify the enjoyable solidity of the music that attracted me to the more expensive 282/250/Hi-Cap 2 combination. However, the scale and resolution was dramatically reduced when changing over to the Nait 5i. The sound was rather nimble

though, ostensibly unencumbered by the massive amounts of musical information on offer from the more expensive Naims but beyond a briefly enjoyable immediacy, the Nait 5i struggled with its reduced scale and ability to portray similar levels of control and definition. Gone too was the enormously powerful structural stance of the high-end Naims which had provided power and precision to the lower frequencies.

Interestingly there was a less marked difference in quality with the 'Bach Arias' LP, as the Nait 5i did not sound compressed through lack of scale, nor was it brittle. However, further listening to Janet Baker's vocals and the stringed instruments showed a less than stunning timbre and musical eloquence through the Nait 5i, where it was less able to handle the more demanding notes or crescendos with authority.

The music from Frankie Goes To Hollywood was really enjoyable through the Nait 5i. However, there was a slightly exaggerated forward hardness to all the frequencies giving a discernibly more brittle sound in comparison. Gone too was the powerful underpinned structural quality from the NAP 250 power amplifier.

On the Willie Nelson LP, the overall sound was also enjoyable with good dynamics and expressive timbre to the instruments. However, as the music progressed, Lucinda Williams' vocals though rather good, had lost the depth and resolution of the expensive Naims. As did Willie Nelson's vocals, though communicative, they also lost some acuity and in particular were a

little strident when he went for the high-frequency intonations. The slide guitar playing also had a touch of stridency through chromium plated sheen. Still, the Willie Nelson LP was well-recorded, and the Naim was, in general, able to exploit its higher fidelity.

With 'Waiting For The Sirens' Call' by New Order, the Nait had a powerful sound but was immediately internalised in comparison to the 282/250/Hi-Cap 2. Bernard Sumner and Ana Matronic's vocals were more laboured through the Nait 5i, as if they were strained and not timing in the same strata as the music. Thus vocals through the Nait altered the balance of the musical whole somewhat. Instrumental separation was just as excellent on the Nait 5i as with the 282/250/Hi-Cap 2, which was a welcome surprise!

Despite all these failings (in absolute terms), the little £699 Nait 5i proved itself surprisingly adept in such a seemingly perverse comparison to the £6,305 282/250/Hi-Cap 2 combination. Firstly, it showed that Naim do indeed have a cohesive sound aesthetic - that while it gets even better as you upgrade, the intrinsic house style is not altered and therefore does not lose the Naim identity. Secondly, you can start to appreciate where the extra performance of the higher end instruments are warranted as a result of better preamplifier and power amp stages, finely toleranced components and superior current delivery and power supplies. The Nait 5i is a great start, but Naim have so much more on offer...

# Our Motives are clear



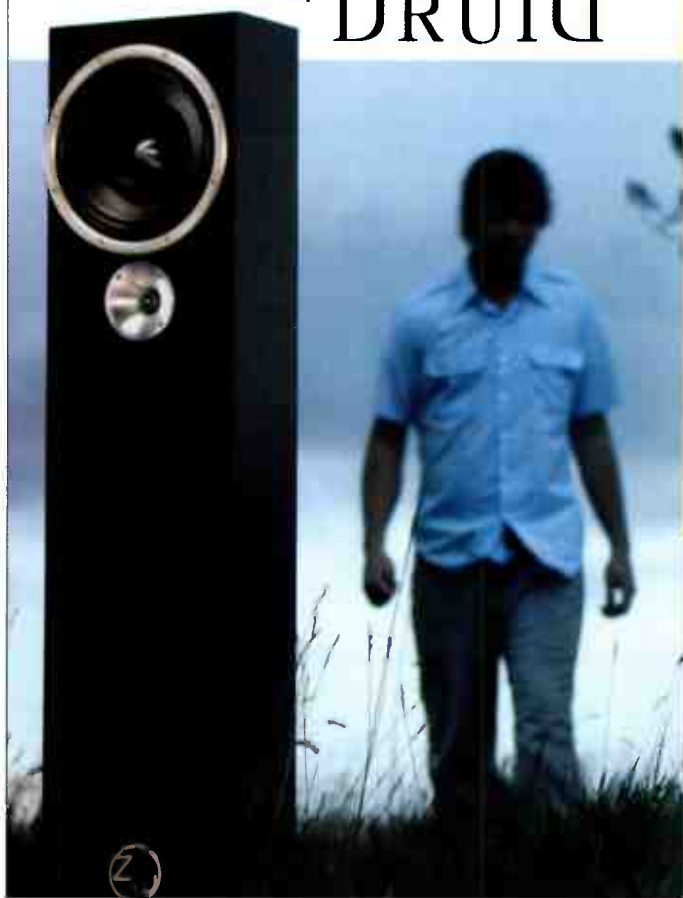
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# Head Master

Handmade in Germany since 1980, the beyerdynamic DT880 is, in its latest iteration, both stylish to own and comfortable to wear, thinks Channa Vithana...

It's different for headphones. Whereas mainstream hi-fi manufacturers update their CD player, amplifier and speaker ranges almost yearly, it's perfectly possible to see headphones remain on sale for decades, virtually unchanged. At most, often they're subtly revised.

Such is Beyer's DT880; of course it's not the same as the seminal 1980 version – it's had plenty of evolution since then – but there are still links to the past, and considering it's been a glorious one (the '880 has won a great many friends over the years), that's no bad thing. Attractively designed and well made, the DT880s are described as semi-open types and fit around, rather than on the ears. The 3M signal cable connects at a single point to one earpad. This is less satisfactory than having directly connecting cables to each earpad, but it is a more practical option that allows easier movement and helps avoid the usual twisting nature of Y split signal cables. Consequently, the extra wire to the other ear pad is tidily encased within a soft button-attached cushion that folds across the headband.

The earpads themselves are exceptionally soft, and made of a grey velour-like material and when seated are one of the most comfortable headphones I have yet to use, with the £310 Grado SR325i coming second. Resembling inverted wishbones, attractively designed brushed aluminium holders locate and affix the earpads and are stylishly different in approach with their more complex than standard curved aluminium forms compared to the generic designs that some headphones take on. The outer finish to the earpads is also particularly attractive with a fine mesh grill and the 'beyerdynamic' logo located slightly below centre. The DT880 weighs 270g.

## SOUND QUALITY

Connected directly to a £1,350 Densen B-400Plus CD player via a £250 Creek OBH-2ISE headphone

amplifier, the £199.95 beyerdynamic DT880s had a very stable and controlled sound on the Vivaldi 'Concerto per Flautino' from 'Baroque Recorder Concertos', 2004, by Pamela Thorby and the Sonnerie chamber group. The large drive units provided a weighty sound and the overall presentation was smooth and slightly warm. Recorder, violin, viola, cello and harpsichord all had nicely defined qualities, where they were firmly within the mix and clearly expressed with good timbre. The first piece in the 'Concerto per Flautino' is dramatic and dynamic, where the layering of the instruments is rather breathtaking. And as such the DT880s produced a pleasingly deep and lush sound which was agreeable. The more expensive £310 Grado SR325i on the other hand was, due to its higher price, more involving with instrumental timbre and musical timing, providing a dynamic synergy with the Vivaldi piece.

However, the DT880s proved to be rather better matched on the infectiously elastic pop-groove of 'Erase/Rewind' by The Cardigans via 1998 release 'Gran Turismo'. Here they were able to reproduce some superb low-frequency expression that solidly underpinned the music with a weighty sound. Basslines in particular resonated enjoyably and were easy to follow. Nina Persson's vocals were finely textured and expressed in her particularly delicate yet melancholic style. The upper and lower frequencies were handled well, negating harshness or stridency.

The Grado SR325is were more open and widescreen to the DT880's lush and deep sound. The Grados while better at timbre and resolution were not quite as good on the bass dexterity or extension as the DT880s.

Sleaze metal group L.A Guns sounded thoroughly enjoyable via the Beyers with 'My Koo Ka Choo' from 1991 release 'Hollywood



Vampires'. The DT880s produced a smooth, compliant and weighty sound to the raucously extended guitar and horn firestorm from 'My Koo Ka Choo' where they allowed the dynamic swing of the musical structure to be appreciated while still being able to reveal Phil Lewis's vocals convincingly within the mix. The Grado SR325is had a more open spatiality and illuminated stance, with superior musical timing, providing a more revealing sound, yet the cheaper DT880s in this instance, had more viscera and yet unflappable control also, so were preferable with L.A Guns.

## CONCLUSION

The DT880s are especially comfortable and smoothly listenable over long periods. They excel with a commendably tangible bass dexterity and extension which imbues music with a surefooted solidity. I felt they were better suited and sympathetic to the pop sensibility of the Cardigans and hard rock stance of the L.A Guns than the high-resolution recording of the 'Baroque Recorder Concertos'. They would make a fine upgrade to budget and midprice headphones and devotees of stable, controlled and smooth sound quality. Still great after all those years!

## VERDICT ●●●●● £

An extremely smooth sounding, well engineered and comfortable pair of affordable audiophile headphones.

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## FOR

- design
- build and comfort
- weighty sound

## AGAINST

- too smooth for some

# Tube Tweaks

**Would better valves improve the sound of Shanling's excellent CD-T80 CD player?  
With an all-week pass to better sound quality, John May took the tube...**



I have good news for you: if you happen to have bought the Shanling CD-T80 CD player I reviewed so enthusiastically in the December 2005 issue of this magazine, it can be upgraded for less than the price of a decent interconnect!

As I mentioned in the review a couple of months back, the 6N3 valves in the output stage can be replaced by other types, offering the promise of even better sound quality. We decided to try several NOS (New Old Stock) types, as well as a more modern set, and just for good measure a pair of Cryogenically (frozen) treated valves which have been making the press recently with their promise of better sound quality.

NOS types are often considered of better quality than moderns, due to their tighter manufacturing tolerances, generally better reliability (just check out the Mullard GZ34 against any modern alternative for proof of this) and the sheer fact that

— back then — valve manufacture was a large-scale business and not the 'for audiophiles only' situation which exists today. That's a bit of a gross generalisation of course, and today there are undoubtedly many fine valves being produced, it's just a little harder to find ones that match the reliability and tonal quality of the finest NOS items.

Listening kicked off with the highly regarded NOS Tung Sol 5960 tubes from the USA. This is a half-height-type valve — the internals being packed into a very compact enclosure. A positive side effect of this is that the valve should be less susceptible to microphonics than larger valves. The Tung Sol resulted in a dry performance playing Mercury Rev's 'Chains'. There was a detached quality to the sound, as if the valves were saying, "here's the music fellas — take it or leave it"! Treble was also a little on the splashy side, but was nice and detailed all the same.



*Tung Sol 5960*

Alicia Keys' 'Harlem Nocturne' displayed the same kind of dryness to the sound. There was a lack of 'snap' and crispness, which robbed the music of its ability to get the toes tapping. They fared better with classical music, but there was still that sense of matter-of-factness that

robbed the music of its power to enthrall the senses.



Jan Corp 5670

The Jan Corp. 5670 valves are again half-height types. Playing the same tracks I found the sound to be on the sluggish side. There was a lack of sparkle in the treble, and the words that appeared on my notepad in capital letters were "slow and turgid". An extra day of running in didn't seem to help either. Bass response was also lumpy and ill defined. Not recommended!



Russian 6N3

Moving onto the 'full height' current manufacture Russian 6N3P next, there was still a lack of sparkle in the treble which resulted in a stereotypical 'Old Skool' valve sound which some people may actually favour. Vocals on the Alicia Keys CD sounded quite grainy and cold however, almost solid-state. Detailing was a little vague and I found the bass over-blown and detached from the mid and treble performance, but it did result in a highly exciting performance with Rock and Dance music all the same.

Next into the B9A sockets was the NOS half-height Swedish-made CV4013 from Ericsson. This valve

represented the polar opposite of what had preceded it. Treble was clearly etched, and on the bright side. Bass was also on the light side, a little two-dimensional and without



substance. Alicia Keys' vocals were again a little on the grainy side but the detail levels were impressive and one could see 'into' the mix with little difficulty.



Frozen Cyro

The 'Frozen Audio' Cryo treated version of this valve was next on the listening list. In a nut-shell, Cryo treatment – as the name suggests - subjects the valve to a freezing process which is said to toughen the molecular structure of the metal structure inside the tube, reducing stresses and strains and improving the sound quality and reliability. Inserting the cryo treated version of this valve resulted in a slightly smoother presentation to the music. Treble was still to the fore, but less fatiguing to listen to in the long run and opened up the music nicely. The grain on Alicia Keys' vocals was also absent as well. Music was more dynamic and pacy than with the stock items. Bass was also improved upon by a small but worthwhile degree.

Last contender was the NOS RCA 5670. I knew that these sounded

fantastic from the get-go. The sound was well balanced, with a silky treble, liquid and highly detailed midband, and a startlingly powerful bass response. Music had real snap and pace, and made the Shanling sound similar to my Naim CDI in terms of sheer dynamic ability. Piano at the beginning of the Alicia Keys CD had wonderful body and harmonics to it. Her voice was also a delight



NOS RCA 5670

highlighting the best traits of the 'valve sound' in tandem with modern digital technology. The RCA was quite clearly the best of the bunch here in terms of its performance in the Shanling CD-T80.

### CONCLUSION

This was a fun little test to conduct and showed how individual components can be changed to subtly but usefully alter sound quality. That's the beauty of being able to change tubes like this – the unit can be tailored to suit the user and his/her system at a reasonable cost. It should be noted at this point that just because a valve may have performed badly in this test,

this is in the context of the Shanling's circuit design - it may shine in other applications. For the cost of a few CDs the performance of the Shanling can be substantially upgraded, making it better value for money than rival players. Now... what would the Shanling sound like with better quality op-amps to compliment the new valves... Stay tuned!

VALVE PRICES (PM Components Ltd)	
Russian 6N3	£9.95
RCA 5670 (USA)	£10.95
Raytheon Jan 5670 (USA)	£11.95
Tung Sol 2C51 (USA)	£12.50
Ericsson CV4013 (Sweden)	£13.50
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For more information on Cryo treatment of valves please visit the following site:  
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**WHAT HI-FI?**  
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# Great Universal

**Universal DVD players aren't unusual these days, but Marantz reckon their new DV7600 goes one step further. By combining universality with quality hi-fi engineering they believe they're on to a winner. Dominic Todd puts it through its paces...**

It's no secret that Marantz have shown themselves to be 'a bit tasty' at sub £1,000 CD spinners, but the company hasn't quite got the reputation for DVD machines. Until now it has usually been Pioneer or Denon that have scooped the accolades.

It comes as little surprise, then, to find that when developing their new £600 universal DVD player, Marantz decided to take a long hard look at the opposition. Indeed, they went so far as using the Denon DVD-3910 [see box] as the benchmark that the DV7600 had to beat. Furthermore, having decided that the Denon's picture was hard to better, they decided to use exactly the same Analog Devices ADV7310 216Mhz/12-bit video DAC and its proprietary NSV low-pass video filter.

Yet, despite this, the DV7600 is no clone. On the audio side Marantz have gone their own way and provided an impressive specification. No fewer than six Cirrus Logic 192/24bit audio DACs form the basis of the audio side of the player. Unlike most of the competition who use single or twin DACs, using one DAC per channel should provide enhanced audio accuracy and put the DV7600 at an advantage musically.

As you'd expect from Marantz, the DV7600 also uses their unique HDAM output op-amps. These are

designed to improve dynamics and, in effect, clean up the output. Before we get too carried away, though, it's worth noting that the DV7600 is no high-end player and, as such, is built to a price. The construction, whilst adequate, could hardly be described as being of the battleship variety.

Returning to the video front, the DV7600 uses a video upscaler claimed to give near-High Definition standards of reproduction from standard DVDs. Moreover, the 10bit interlaced to progressive conversion gives a claimed four times higher resolution than the 8bit converter used by many current rivals.

When it comes to socketry, it's difficult to see how anyone could be left wanting. SCART, component, SVHS and two composite terminals are all that's needed for analogue transmission of video signals.

Digitally, the HDMI socket will please enthusiasts, even though it is to be expected these days. Both optical and coaxial digital audio outputs are provided and tie up a list that, perhaps whilst par for the course, offers up no oversights or slip-ups.

Finally, as this is a universal player it will of course play both SACD and DVD-Audio formats. Unlike some other Marantz players, it's also worth noting that the DV7600 will output SACD in full multichannel and not

just stereo – a 5.1 audio output is provided for this very purpose.

## SOUND AND VISION

In terms of picture quality it appears that Marantz has done the right thing. Using the HDMI output via a Hitachi 42PD7500 plasma TV, I found the images near faultless given the price. The depth of colour was beyond reproach and images had a wonderful sharpness without being aggressive. Strong blacks led to excellent contrast levels and, overall, I found the DV7600 to possess a technically proficient yet natural picture quality. If one was being critical there were areas where there could have been a little more detail and shading, but this would only become apparent when compared with much more expensive rivals. Switching to the analogue component output brought about, if anything, an initially more impressive picture.

Brightness levels improved, but further viewing showed weaknesses in edge detailing. In short the picture was less natural if more vivid. Given the choice I'd stick with HDMI, but those without the facility on their TV won't be too disheartened by the analogue output. By comparison with rivals, it's still above average and, most importantly, a great improvement upon previous Marantz DVD players.



# *The colouration's in the finish*



# *Not in the music*





Moving to CD and Kate Bush's, 'Sunset', and it soon became apparent that the DV7600 has a lightness of touch and subtlety that's lacking in many. The vocals were well focused and free from excessive sibilance. That having been said, the Marantz's rather laid back, if coherent, sound quality won't suit everybody. Against a rival Philips DVP9000S [see box], the overall sound was rather timid. It didn't have the same upbeat kick from the upper bass or quite the presence of sound, especially with the piano. In the longer term I would image that most would prefer the deft touch of the DV7600, but it's a trait worth remembering if your system is already on the smooth side of neutral.

With Daft Punk's 'Harder, Better, Faster, Stronger', the Marantz was again a little reluctant to really let its hair down. It wasn't quite as

and cohesion worked wonders. There was a sense that, by comparison with other players, the orchestra was simply more polished. Violins lacked the edginess of some and the fluent manner in which the music flowed made the Philips, in particular, sound a little stilted. Rather like the picture with HDMI, the DV7600 seemed to major on depth and a natural presentation rather than a more superficially impressive sound quality. Again I couldn't help but think, though, that if partnered with an overly warm amp and 'speakers, the overall effect could prove too syrupy.

If anything, this refinement became even more apparent with SACD. Vocals sounded especially true to life and both the staging and separation of instruments improved upon CD. That having been said, whilst the DV7600's grip on the on music was hard to criticise, the timing proved to be a little stodgy – especially against better CD players at the price.

Multichannel DVD-Audios showed some benefits over CD, but they were far from universal. Fine staging and focus were both positive attributes, but over all I found the presentation a little compressed and lacking in life after both CD and SACD (in both stereo and multi-channel modes). Clearly if you're unsure about the benefits of SACD versus DVD-A, you'll favour the former after a listen to the DV7600.

**CONCLUSION**

The Marantz DV7600 is a frustratingly difficult



**VERDICT** ●●●●● £

A dedicated CD player will still sound better, but this is still an excellent effort by Marantz. Refined sound and natural picture both impress

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explicit as it should have been in punching out the tight electronic beats. Nevertheless, the integration and cohesive manner of the music couldn't be faulted. Again the balance was smooth, but not overly to the detriment of the timing, which remained taut and precise. Bass, whilst not reaching down quite as low as I'd have liked, did at least sound to be part of music rather than detached from it – as can be the case with lesser DVD players.

Unusually for both a Marantz and a universal DVD player, the DV7600 seemed most at home with Classical music. Here the sense of refinement

**MEASURED PERFORMANCE**

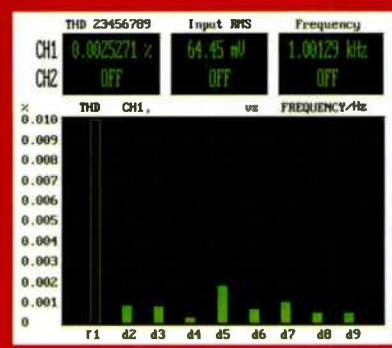
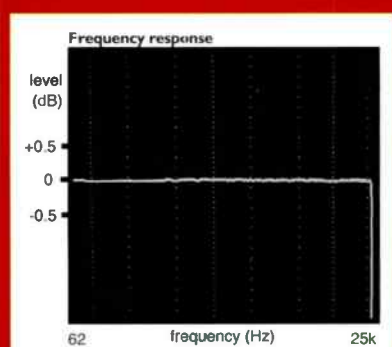
CD frequency response was unusually flat and wide, our analysis shows, with extension to 21.8kHz - a high figure. Expectedly, SACD reaches much higher, measuring -1dB at 46kHz and -15dB at 100kHz. That's higher than usual, meaning the player also produces stronger supersonic noise than others. DVD-A doesn't suffer this problem. It can reach 100kHz too, but in this player the -1dB point is 38kHz, with a sharp roll off above this frequency. So DVD-A was curtailed.

Linearity was good enough with CD but disappointing with SACD and DVD-D, both of which normally do better. Distortion values of 0.36% for SACD and 0.23% for DVD-A are five times higher than expected.

Otherwise, the DV-7600 measures normally enough, although output was low with CD and SACD, but not with DVD-A.

Most universal players, including those from Marantz, measure better than this one. I wonder if the imminent arrival of Blu Ray is taking affect. NK

-60dB	0.24%	0.23%	0.36%
-80dB	4.5%	12%	3.5%
-100dB	-	28%	36%
Separation (1kHz)			110dB
Noise (IEC A)			-111dB
Dynamic range			109dB
Output			1V



Frequency response (-1dB)	CD	DVD	SACD
	2Hz -21.8kHz	2Hz -38kHz	2Hz -46kHz
Distortion -6dB	0.0005%	0.0003%	0.0003%

**THE RIVALS**

Marantz rather stuck their neck out by using the Denon DVD-3910 as a benchmark. The £900 Denon not only costs half as much again but also happens to be one of the most formidable players below £1,000. Amazingly, in my opinion, the DV7600 does indeed match the DVD-3910 in terms of picture quality – at least when using HDMI. What it can't do, however, is create the same sense of solidity of sound that the Burr Brown equipped DVD-3910 so effortlessly conjures. The DVD-3910 still reigns supreme and still has the ability to impress more of the people more of the time – at a price.

At the other end of the price scale, Philips' excellent new DVP9000S shouldn't be ruled out. It can't match the Marantz's picture quality, but it's still exceptionally accomplished with CD. Thanks to DSD upsampling it gives a more forthright and involving sound than the DV7600. By comparison it's perhaps a little rough around the edges, but given that its £200 cheaper, it's still a formidable opponent. The lack of DVD-Audio may, however, count against it.

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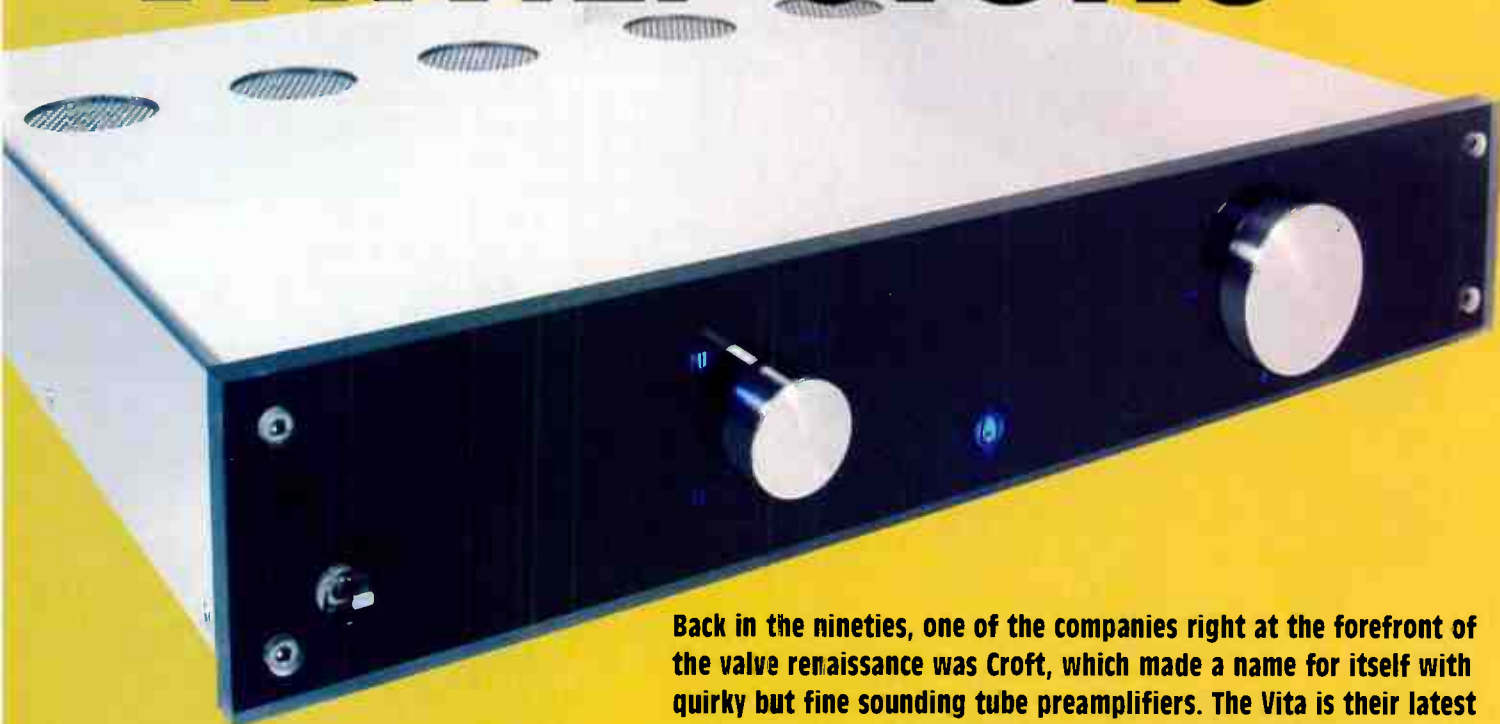
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# VITA(L) SIGNS



**Back in the nineties, one of the companies right at the forefront of the valve renaissance was Croft, which made a name for itself with quirky but fine sounding tube preamplifiers. The Vita is their latest and greatest, combining classic values with very modern industrial design. David Price listens in.**

**W**arp back to 1995, and the world was quite a different place. A youthful Tony Blair bestrode British politics with the swagger now shown by David Cameron, Britpop vied with Princess Diana for headlines (Blur vs. Oasis was on everyone's lips) and 'Gazza' was England's great white soccer hope.

In hi-fi, we were besieged by a welter of black pressed steel-cased transistor amplifiers and CD players; Audiolab's 8000a reigned supreme on the showroom floor, and the talk was of a new format called 'HDCD'. Valve amplifiers, thanks in no small part to this magazine, were slowly beginning to creep back into public consciousness, but still regarded with extreme suspicion and no small amount of amusement by their many doubters.

Amidst all this, one small British company was making an extremely focused, oddball preamplifier called the Micro, which offered quite superb performance for the price, and – shock, horror! – it used valves! I remember hearing one driving a rebuilt Leak Stereo 20 tube power amplifier and Heybrook HB1s (designed by Peter Comeau, see p89)

and being amazed by the musicality issuing forth from the system. It was tight, fast, propulsive, gutsy and fun.

Now, in 2006, tubes are flavour of the month, year and decade. I'd wager that more valve amps are coming out of China than there are transistor ones coming from Japan – an amazing situation. What was once – in so many doubters' minds – considered an archaic joke – has almost become the norm. To its credit, Croft has played a part in this.

The £990 Vita is the company's latest, and looks – in a way – ultra modern. Its largish (100x400x300mm) case is beautifully polished chrome with a black Perspex front, blue illuminated legends and big silver volume and source selector knobs. At the back, there's a welter of gold plated phono socketry, including four line inputs, a phono input (with standard tube MM stage) and a single preamp out.

Inside, it is hard wired, the bulk of the wiring being used, according to Croft, "in Broadcast Applications and in Abbey Road Studios". The solid flat OFCC copper on the negative of the PSU caps together with the bypass is said to be specifically 'tuned', and the selector switch is a high quality gold plated Palazzo switch. Pots are Alps Blue types, but made specifically

for Croft (the company says they're slightly sweeter than Alps Blue).

The 6SL7 valves are specifically chosen for their natural warmth (for example Mullard (non military) ECC35 - the military versions may last longer, but the audio valves sound better). "The VT 229 classic valve is usually, fast and accurate. The Sovteks are fitted because they are clean, naturally warm, and have good frequency extension", says Croft.

Although I was genuinely impressed by Croft's choice of materials for the Vita, I can't say it was screwed together quite as well as many rival manufacturers. Although the Vita was totally reliable during the review period, there's a certain fragility to its feel that you don't get from Japanese products of the same price, for example. The switches are a little noisy, and I can't say I was happy about how microphonic the whole casing was; a rap from the knuckles produced a thud through the speakers. In the end, I put a Sound Dead Steel isolating sheet on top, which pretty much cured it, but at £990 it should be properly damped already...

## SOUND QUALITY

What with the Vita being almost in a 'gang of one' of tube preamps

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- Kandy MkIII CD**  
HI-FI CHOICE Bronze award 2004 Awards
- Kandy MkIII integrated amplifier**  
WHAT HI-FI? SOUND AND VISION Winner 2003 Awards
- Kandy MkIII integrated amplifier**  
WHAT HI-FI? SOUND AND VISION Winner 2002 Awards
- Kandy MKIII integrated amplifier**  
Five Stars  
WHAT HI-FI? SOUND AND VISION October 2003
- Kandy CD**  
Five Stars  
WHAT HI-FI? SOUND AND VISION First test July 2003
- Kandy MKIII integrated amplifier**  
Five Stars  
2003 SUPERTTEST WINNER (5 Star Gold)  
WHAT HI-FI? SOUND AND VISION May 2003
- Kandy Integrated amplifier**  
Five Stars  
2002 SUPERTTEST WINNER (5 Star Gold)  
WHAT HI-FI? SOUND AND VISION Feb 2002
- Kandy CD player, Amplifier & Speakers**  
Five Stars  
WHAT HI-FI? SOUND AND VISION January 2001
- Kandy Integrated amplifier**  
Five Stars  
WHAT HI-FI? SOUND AND VISION April 2000
- Kandy CD**  
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WHAT HI-FI? SOUND AND VISION March 2000

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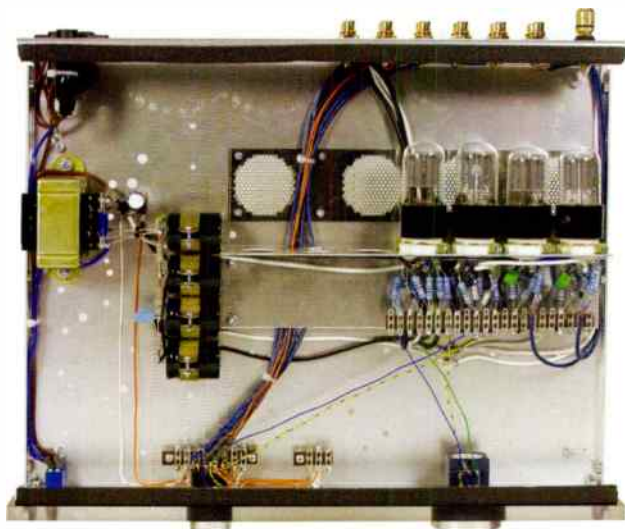


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# KANDY

For everyone





at this price, I couldn't help but start listening through the optional MC stage (MM is standard). The next problem surfaced; the MC phono stage is a little noisy. At high volumes, there was a very slight hum on one channel, and a bit of hiss too. Now, I know that you'll never get solid-state levels of noise suppression with tube phono stages, but I was still slightly disappointed.

Fortunately, this didn't last for long, because as soon as the needle hit the groove, I found my gripes disappearing in double quick time. I was impressed; this is a serious sounding preamplifier whose phono stage (noise notwithstanding) runs almost all one thousand pound purpose-built phono stages ragged. It won't win prizes for precision, detail or depth, but it's seriously musical and a pleasure to hear.

If you're schooled on the cool precision of taut, tight, clinical and detailed transistor phono stages, you'll find the Croft warm and woolly. There's no point pretending otherwise. Bass is full and loose, and lacks any real grip of the leading edges. The midband is quite two-dimensional, with poor fine detail resolution – forensic it is not. Treble isn't by any stretch of the imagination open and airy. Oh, but I forgot to mention that it's about ten times as musically convincing as your average high quality, high end transistor design. Put simply, the Croft shows

real rhythmic élan; it has a natural feel than makes solid-staters sound frigid and mechanical. Music ebbs and flows as naturally as the tide; it's a joy to listen to.

The Lover Speaks' 'No More I Love You' showed a vast, expansive soundstage with great left-to-right staging. It's truly widescreen, in the best sense of the word. Maybe it's not quite as architecturally correct as a transistor phono stage, but that's to miss the point. The Vita is euphonic sounding, and none the worse for it. This makes music truly uplifting, and also underlines what tubes can do. Interestingly, despite the loose bass, rhythmically it's very convincing. That's because the midband is truly lucid. It's able to string a sequence of notes together in a way that's rare, and all the better for it.

Jazz is where the Croft does best; Herbie Hancock's 'The Prisoner' has a wonderful sense of pace, and really shows the musicians playing together empathetically. The Vita really emotes, and shows the point of the music, if not every last minute technical detail. Again, the bass is rich and warm, and the treble smooth and sweet and a little soft. The midband is a tad woolly and imprecise, with mediocre front to back staging, but the pace the Croft brings to the proceedings is a joy.

Classical is surprisingly good; although you'd expect the clinical precision of my Whest Audio

phono stage running through a MF Audio Passive Pre to be more convincing (total cost over three times that of the Croft), strangely it isn't. The music seems to float forth from the speakers, with a lovely, organic feel. There's a lovely timbre to strings in my Deutsche Gramophon recording of Beethoven's Pastoral Symphony (Karajan conducting), the Croft conveying the sense of being there better than it has a right to.

On the line level inputs, it's more of the same. There's a lot less 'hear through' detail than the (admittedly more expensive) MF Audio Passive Pre, but again the Vita seems little – if any – the worse. It gives a large and bracing sound that pulls you into the vocals and midband melodies, which is where the Croft excels. It's an old cliché, but this is where tubes excel. The obverse is that it's a little noisy, a little hissy, and a little loose and coloured; that's where valves fall back.

**CONCLUSION**

So near yet so far, the Vita is nearly a revelation. It does some darned impressive things, things which the MF Audio Passive Pre cannot, and throws in a fine phono stage too. No one would ever be disappointed by its musicality and its lovely 'tone'; but few would ever be impressed by the noise floor or the precision with which the Croft's controls work. For this reason, I can't recommend it as a universal panacea in the great world of hi-fi preamps. However, if you want something with obvious strengths and weaknesses, and accept both, it's a fine buy. Interestingly, many tube amplifiers are far superior to the Croft in some (aforementioned) aspects, while the Vita remains a charismatic product that you love, warts and all. Almost a blast from the past, you could say.

**VERDICT** ●●●●

Flawed genius; the Croft Vita offers a truly musical performance but isn't without problems.

**CROFT VITA** £990

Eminent Audio Ltd.

+44 (0)1902 716804

www.eminentaudio.co.uk

**REFERENCE SYSTEM**

Michell GyroDec/ Michell TecnoArm/ Ortofon Rondo Bronze turntable

Whest Audio PS.20/MsU.20 phono stage

MF Audio Passive Preamp

World Audio Design K5881 valve power amp

Quad 989 loudspeakers



This year's model is without doubt the portable Digital Radio, a handy way of accessing the many new DAB stations. But are they all much of a muchness, or dramatically different to one another? Steve Green tries Pure's Evoke-2 XT and Roberts' RD27...

# Today's



what you're listening to, and then resume from where you left off. PausePlus is simple to use, with a button for pausing and turning the tuning knob anti-clockwise or clockwise to rewind or fast-forward, respectively. PausePlus starts working in the background as soon as you tune into a station, and

to see the domes of the tweeters beneath. Dark wood on the sides and beneath the speaker grill rounds off an attractive, modern-looking unit. It has a two-line black-on-orange display, separate treble and bass controls, and the five preset buttons allow five DAB and five FM stations to be stored.

Both units can be powered via the mains or by batteries. The RD27 takes six D-type batteries, and the Evoke-2 XT requires six C-types. Claimed life for a set of alkaline batteries was 15 hours and 25 hours for the RD27 and Evoke-2 XT, respectively. The Evoke-2 XT can also be powered by Pure Digital's ChargePAK, which they sell separately for £29.99, and provides 15 hours of use per re-charge.

Pure Digital informs me that XT models of the Evoke family have new "hi-fi quality" drive units and active audio filtering, and performing a quick A-B comparison between the Evoke-1 and the Evoke-2 XT showed that the XT model does indeed produce a more detailed sound.

The Evoke-2 XT produces a sound that is very bass-heavy and with too little top-end for my liking, and even setting the tone control to maximum doesn't change this situation much. Music generally sounds rather dull, lifeless and a little gritty.

In contrast, the RD27 has a surprisingly dynamic and open sound for such a small portable radio, offering much better levels of detail than the Evoke-2 XT. With the RD27, vocals and instruments stand out and are natural and clear, whereas the Evoke-2 XT sounds very closed-in and compressed, and vocals and instruments are just part of the overall sound with little separation.

The Evoke-2 XT is much better with speech than it is with music, though, with the bassy sound adding weight and warmth to the speaker's voice. But again, I preferred the more natural sound of speech on the RD27.

The Evoke-2 XT can sound nice with music when the audio quality of the broadcast is very good, but it is precisely with material at this level of

**P**ure Digital have dominated the DAB portable radio market ever since they released their Evoke-1 in the summer of 2002 – which went on to become the highest-selling portable radio of all time. So it's been interesting to compare products from the new kids on the radio block with the old hands at this game, Roberts Radio, who, according to their website, have been producing portable radios since 1932.

The two radios are in the upper price-bracket of DAB portables, with the Roberts RD27 costing £105 (appliance-direct.co.uk) and the Pure Evoke-2 XT being £135 (empire-direct.co.uk).

As with most DAB portables coming onto the market these days, both radios also have FM, which is an encouraging development compared to the early days of DAB when they were virtually all DAB only.

The main difference between these receivers in terms of features – and which belies the price difference – is that the Roberts RD27 has a PausePlus function.

The PausePlus function – unsurprisingly – allows you to pause

for a typical stereo station it will store the previous 17 minutes 30 seconds of audio into memory, or 35 minutes for a typical mono station.

The PausePlus function isn't as advantageous for radio as a PVR is for TV due to the nature of radio listening usually being continuous. But as people become accustomed to having this feature I would imagine that some people will start to use it for skipping through adverts.

The Evoke-2 XT's styling continues with the same general design as the Evoke-1, having wood on the top and sides and a silver front. The Evoke-2 XT's most appealing feature is its attractive three-line white-on-blue display, which shows the time in low power mode when the unit is switched off.

The Evoke-2 XT has six preset buttons, which can store six stations each for DAB and FM, a tone control, and it also has a countdown timer and alarm clock function. On the back of the unit there's sockets for an S/PDIF digital output, headphone, line in and line out.

The RD27's casing consists of a silver, slanted top that houses the controls, with a dark-grey speaker grill across the front that allows you

# programme

quality where the RD27 excels.

The sound on the RD27 was excellent for such a small portable radio, but comparing it with FM on a relatively powerful portable CD stereo clearly demonstrated that moving up in size can provide a large improvement in sound quality.

All of the above descriptions of the sound quality of the radios themselves are based on listening to good quality broadcast material, but of course that cannot tell the whole story where DAB is concerned, and nor FM for that matter due to interference issues.

The real problem on DAB is the 128 kbps music stations, and as these account for almost 80% of all the stations on DAB in the UK, a review of any DAB receiver cannot overlook the performance with these stations.

Music that would sound mediocre or poor on a hi-fi system usually benefited from the RD27's open sound, while the more subtle nasties were well hidden by the limitations of its small speakers. Unfortunately, however, when presented with very poor quality material the sound sometimes descended into an atrocious mess, although I don't consider this to be the fault of the radio itself.

The Evoke-2 XT's sound, on the other hand, was more even: the mediocre and poor quality material didn't benefit as much due to the duller sound of the radio, but the worst-sounding material didn't sound quite as bad as it did with the RD27 – I suppose that's the price the RD27 has to pay for its more open and detailed sound.

Routing DAB audio via the SP/DIF digital output from the Evoke-2 XT and via the line out from the RD27 to my hi-fi unsurprisingly laid bare to all the more subtle – and not so subtle – nastiness that makes DAB so unappealing to listen to on a hi-fi system, and which portable radios cover up so well as a result of their audio quality limitations.

The performance on FM was a mixed bag: as you would expect, the highest audio quality available was on FM stations with a strong signal,

but the reception quality wasn't as good as I'd expected. In particular, I was expecting the RD27 to pick up some of the weaker stations without hiss, because it implements FM reception using software-defined radio techniques rather than using traditional analogue circuitry. But when I tested the reception quality in the most difficult room for reception, where radio signals have to travel through at least two walls before they reach the aerial, the RD27 performed no better than the FM reception on my 8-year-old Philips portable stereo.

The Evoke-2 XT uses a traditional analogue receiver for FM, and its FM reception quality was significantly worse than both the RD27's and the Philips portable stereo's. FM on the Evoke-2 XT was also at a far lower volume than on DAB, whereas this problem was not apparent on the RD27.

Overall, there's room for improvement with the FM receivers on both radios, but in particular on the Evoke-2 XT.

As well as these products being manufactured by the two leading UK portable radio manufacturers, the radios use DAB modules designed by each of the leading DAB module/chipset design companies, Frontier-Silicon and Radioscape – Pure Digital devices use Frontier-Silicon's Chorus chip, which has a 70% share of the DAB receiver market, and Roberts use Radioscape's modules, with the RD27 using the RS200L module.

Testing the radios where radio reception is weakest showed that both could receive the three strongest DAB multiplexes without any problems, but neither radio could consistently receive the local DAB multiplex, which has

the weakest signal of the multiplexes I can receive. Placing each radio in different locations around the room (DAB reception is very sensitive to the position of the aerial) showed that the RD27 was significantly less likely to suffer from the intermittent burbling noises that accompany poor DAB reception than the Evoke-2 XT was, and I would therefore expect the RD27 to perform better in weak signal areas.

If you're in the market for a DAB/FM portable costing around £100 then I would thoroughly recommend the Roberts RD27. When it is fed with high quality broadcast material it provides an excellent sound for a radio of such a small size, and it manages to make the most of mediocre-sounding DAB broadcasts.

I was disappointed with the Evoke-2 XT though, but I'm sure that Pure Digital will bounce back with a better product in the near future. But Roberts have hit back at the young pretenders of the portable radio business with a radio that steals the show.

**VERDICT** ●●●●£  
Decent sound, good build and useful facilities make this fine value for money.

**PURE DIGITAL**  
**EVOKE-2 XT.** £135  
Pure Digital  
☎ +44 (0)1923 260511  
[www.pure.com](http://www.pure.com)

**VERDICT** ●●●●£  
Excellent sounds and great feature count make this an excellent buy.

**ROBERTS RD27.** £105  
Roberts Radio Ltd.  
☎ +44 (0)1709 571722  
[www.robertsradio.co.uk](http://www.robertsradio.co.uk)



# Reel Living

**Buying classic hi-fi is a risky business, but it's good to know that thanks to the specialists at Bowers & Wilkins Ltd., Nakamichi cassette decks will run and run, says David Price...**

**C**ompact Cassette, launched back in 1983, is not – nor ever has been – a respectable high fidelity music carrier. Thanks to its low (1 7/8 ips) tape speed and tiny track width, it never wowed the world with shimmering sonics, although the buying public still took to it in droves thanks to its (at the time) unparalleled convenience. So much so that in 1988, it became the best selling prerecorded music carrier in the UK, surpassing even LP's greatest year (1975, Mike Oldfield's 'Tubular Bells', et al.).

There was one exception to the rule however – Nakamichi. This company more or less singlehandedly made the format a serious, audiophile music carrier, and left the rest of the world (Revox, Sony, Pioneer, Tandberg, etc.) to play catch up. As far back as 1972, it was making Compact Cassette recorders that could equal most open reel machines, running at least up to a highish 7 1/2ips speed.

Nakamichi Corporation was founded in Japan in 1948. It was the brainchild of Etsuro Nakamichi, a tape magnetics research engineer whose dream was to design superior quality reproduction equipment. Although they first started manufacturing radios, tonearms and loudspeakers, Etsuro was fascinated with the idea of reproduced sound through tape, and in 1951 started manufacturing open reel decks for other hi-fi companies.

Throughout the fifties Etsuro continued his development work, and in 1957 a major breakthrough occurred when he was able to produce a superior tape head with reproduction capabilities from 20Hz to 20kHz. During the 1960s, Nakamichi were manufacturing both open reel and cassette decks, but it wasn't until 1972 that the first Nakamichi branded cassette deck was launched. The 1000 was also the world's first three-head deck, and it was this product and the beautifully

designed 700 which were instrumental in elevating cassette tape to become a serious music medium.

In Britain, it took a long time for Nakamichi to gain its well deserved reputation for excellence, and even then it was solely down to the cassette decks; the accompanying turntables and electronics rarely got a look in, in the UK press, despite being of the same superlative quality. But by the early eighties, a Nakamichi cassette deck was a badge of audiophile excellence for any serious British sound system, sitting right next to the Linn turntable and Revox open reel.

It was at this time that B&W made an agreement with Nakamichi to distribute their loudspeakers in Japan. As a result, B&W's John

Bowers quickly built up a friendship with company president Niro Nakamichi and the following year there was a reciprocal arrangement for their decks to be sold in the UK. A joint-venture company - Nakamichi B&W UK Ltd - was established, with Niro and Osamu Nakamichi as the Japanese directors, and John Bowers and Paul Wilkins as the UK directors. John Bowers had always thought Nakamichi cassette decks to be special. As Paul Wilkins, Managing Director of Bowers & Wilkins Ltd, notes, "he had used Nakamichi decks throughout the time when he was designing the first Bowers & Wilkins loudspeakers."

Thus the link between Nakamichi and B&W loudspeakers was begun, and then the original Bowers & Wilkins retail shop from where B&W





loudspeakers sprang from, duly took over the spares and servicing in the UK. Like the shop, the Nakamichi servicing facility continues to this day, and it makes an enormous difference to buyers contemplating buying one of what is

Steve Pawson says, "Most of the problems are caused by motors failing, or belts and rollers becoming worn. This causes the transport functions to become erratic or stop altogether, but this is a problem with all decks, not just Nakamichi! Also, decks can drift out of alignment over a period of years and this can cause deterioration in the quality of the music being recorded. Many Dragon users and others like us to have their decks every four or five years for a general clean up and realignment, just to make sure they are continuing to get the best out of the deck."

Paul Wilkins adds, "the last agreement we reached with the Nakamichi Corporation was for Bowers & Wilkins to continue servicing the decks in the UK after they withdrew from the European market



thought to be around 130,000 Nakamichi cassette decks sold in the UK over a twenty five year period.

Not to put too fine a point on it, without serious spares support, any cassette deck from any manufacturer - no matter how expensive - becomes a worthless, useless piece of junk when something as minor as a rubber belt or grommet perishes. This is why buying any secondhand cassette deck is fraught with danger; and why you should not pay serious money for anything if it isn't still supported. And it's sad to say that, knowing the Japanese, it's likely that it won't be. It's also why there's such a strong demand for Nakamichi cassette decks secondhand, and why such high prices are paid; this is thanks to Bowers & Wilkins shop, and its service facilities.

What goes wrong with cassette decks? It's important to remember that they have a lot of moving parts, which rely on very careful alignment to fine tolerances to give acceptable (let alone excellent) performance. Bowers & Wilkins service manager

in 1996, and this agreement is still in force today. In fact our service now extends to Belgium and Holland as Transtec, the former Dutch distributor for twenty-five years, no longer supports Nakamichi. We are now getting decks back from all over Western Europe as we are one of the few places that has genuine spares."

Specialist tape recorder service engineers will tell you that there are still quite a few spare parts for many makes of machines sloshing around on the market, often held as 'new old stock' in warehouses, or on shelves in repair shops all around the world (the internet is often a good place to start trying to locate tape recorder bits). However, Bowers & Wilkins were fortunate to be able to acquire all the spare parts (stocks of which, in most cases, are still good) from the previous distributor, and used its separate warehousing and distribution facility in Lancing, close to the B&W factory, for storage. The result is that whereas purchasing a classic Sony, Aiwa or Pioneer cassette deck (all of which did superb high-end products, approaching Nakamichi quality) is hit-and-miss in terms of spares support (i.e. only if you can find them), Bowers & Wilkins have very solid support for Nakamichi indeed - hence those high secondhand prices!



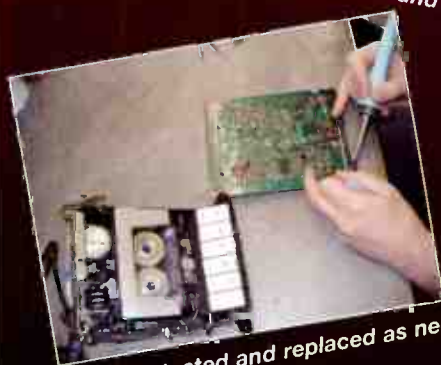
deck is unpacked, the accessories logged



the casing is carefully removed



the transport is stripped and rebuilt



circuitry tested and replaced as needed



deck is aligned as per Nakamichi specs



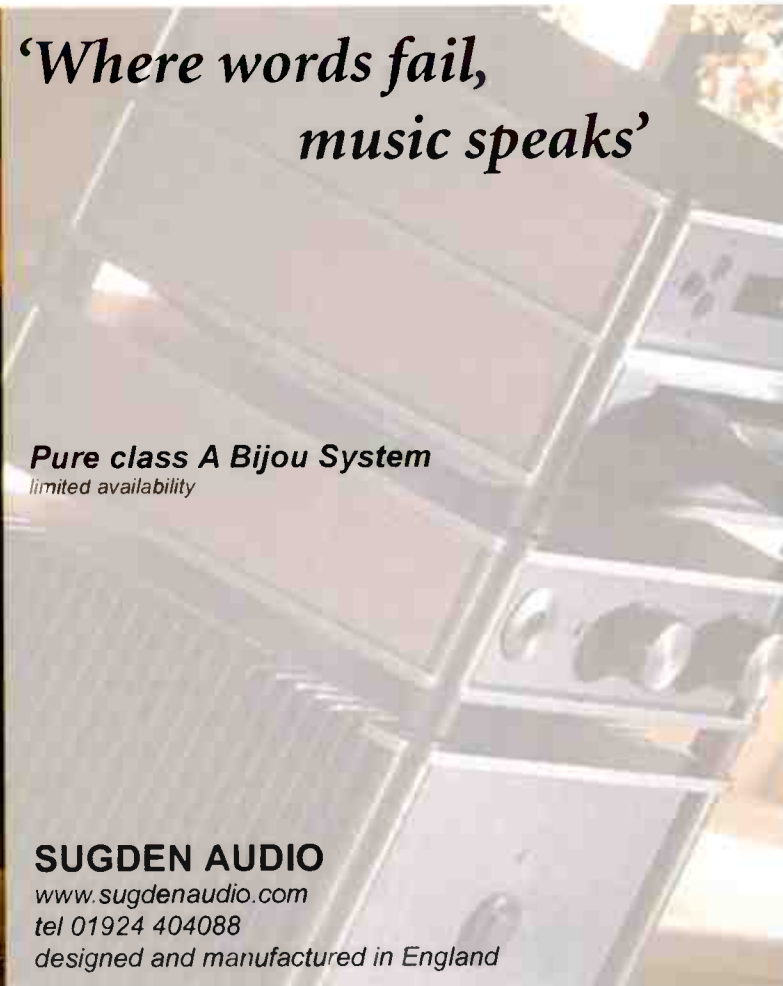
then reassembled and reboxed



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**SERVICING**

Although Bowers & Wilkins has the expert knowledge to work on every classic Nakamichi cassette deck, spares are dwindling for some older models, such as the 600 shown in this feature, for example. That's why it's essential to contact them direct with your questions about servicing, with your specific problem. However, they do give a general guide to the cassette decks they can and cannot support:

**SUPPORTED****Dragon**

480 / 481 / 482 (including "z" models)

580 / 581 / 582 (including "z" models)

660ZX / 670ZX / 680ZX / 681ZX / 682ZX

BX-1 / BX-2

BX-100 / BX-125 / BX-150 / BX-300

LX-3 / LX-5

ZX-7 / ZX-9

RX-202 / RX-303 / RX-505

CR-1 / CR-2 / CR-3 / CR-4 / CR-5 / CR-7

Cassette Deck 1 / Cassette Deck 1.5 / Cassette Deck 2

DR-1 / DR-2 / DR-3 / DR-8 / DR-10

MR-1 / MR-2

**NO LONGER SUPPORTED**

250 / 350 / 500 / 550

410 / 420 / 430 / 530 / 610 / 620 / 630 / 730

580 before serial number 10101

600 / 600 II

700 / 700 II / 700ZXL / 700ZXE

1000 / 1000 II / 1000ZXL

**ON THE BENCH**

*Paul Wilkins describes exactly what happens when a Nakamichi cassette deck is serviced by Bowers & Wilkins.*

"When we receive the deck, it is immediately unpacked and checked, then logged into our system with a note of any accessories that have been returned, such as remotes, cables, tapes or manuals. This is to ensure that nothing is left out when we return the machine.

About ten days later, when it comes to the front of the queue, any specific faults pointed out by the customer are noted by the engineer. The transport mechanism is then stripped down and rebuilt with many parts being cleaned and bearings relubricated. We then replace any worn pressure rollers, drive belts and idler pulleys plus any failed indicator lamps. Following that, we fit any modifications that may have been introduced during or post-production, sometimes including our own mods.

Set-up and realigning the transport is next on the agenda, after which we can recalibrate the electronics to specification or better.

We can calibrate the deck to the customer's specific tape choice if required. The deck is then wrapped in protective polythene and bubble-wrap and reboxed, often using a new carton to ensure its safe return.

To do this work, we use original Nakamichi test and alignment tapes, and other jigs that have been supplied by Japan. The benches also have the Nakamichi T-100 Audio Analyser - a powerful diagnostic instrument which checks specifications and control settings, and without which our job would be almost impossible. Having these things makes sure that Bowers & Wilkins are able to provide the complete service. It is perfectly possible for a customer or service engineer to change a belt or a roller, but set-up can never be completely satisfactory.

As original parts become harder to source, we are having to obtain some things from alternative suppliers and then modify to suit our requirements. We have so far been able to do this without any sacrifice in reliability, performance or sound quality. However, heads and certain specific Nakamichi designed and produced items may cause us problems in a few years time. Meanwhile we are very resourceful, and Steve has a fix for almost every problem. We are very proud that of the eighty or so models that were made, we can still service all but the very earliest ones."

**CONTACT:**

Bowers & Wilkins,  
Becket Buildings,  
Littlehampton Road,  
Worthing  
West Sussex BN13 1QA

**e-mail:** info@classic-nakamichi.com

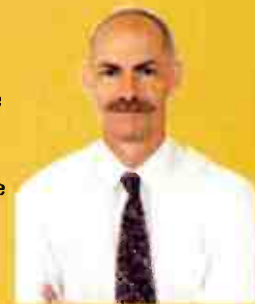
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**THE NAKAMICHI LEGEND**

*Paul Wilkins explains what made the brand so special:*

"Nakamichi's cassette decks were built with a design philosophy of 'performance first, convenience second'. Hence sonic performance was always put first and this resulted in design features such as discrete three-head technology - three heads that are physically, electrically and magnetically independent allowing accurate individual alignment for optimum results.



These were combined with Nakamichi's dual capstan "asymmetrical diffused resonance transport" which offered excellent speed stability whilst minimising head-to-tape contact irregularities. To improve this further, a pad lifter was fitted to the play head to push the cassette tape pressure pad off the head, thus reducing "scrape flutter", and allowing the transport to control tape tension and head-to-tape contact.

Add to this electronics that allow individual adjustment of left and right channels for both record and bias levels for all three tape positions, switchable EQ and Dolby B-C and this resulted in exceptional frequency response, headroom and distortion figures and overall sonic performance with the minimum use of signal processing (Nakamichi never used HX-PRO or Dolby-S). You can then understand what sets Nakamichi cassette decks apart from their rivals. No bells and whistles; just sound design and engineering.

There has been much debate about the ultimate Nakamichi deck. Some people will contend that one of the early computing decks, the 1000ZXL in its huge wooden cabinet was the best; certainly it is the most complicated. But in the end, for sound quality it comes down to a straight choice between the Dragon and CR-7. There were a couple of turntables such as the Dragon-CT, but these never had the same appeal as the cassette decks and very few were sold in the UK. We did have some success with amplifiers and, indeed, later on with CD players, but it was definitely the decks which made Nakamichi the legendary name it has become today.

Quality variation was never an issue. Towards the end, the high labour cost made it impossible to produce some of the budget models in Japan, and production was transferred to Malaysia and Singapore. But these were proper Nakamichi factories, supervised by engineers sent from Japan, and this ensured that the quality was maintained. Actually, the only quality problems we found were with some of the cheaper CD players, where the soldering was not so precise.

1996 was the last year of production of the DR-Series, and then things went quiet for a while. There was a brief reincarnation in 1999 in the form of the DR-8 and DR-10, but this only lasted for about eighteen months. No decks have been built in the last five years.

Only Nakamichi know why they stopped production, but Niro moved to California to concentrate on developing computer-related technology, and they seemed to lose interest in the audio market. It is a great shame of course, and I am sure we would still be selling decks today, although paradoxically, it is probably because they stopped that has turned the name into the legend that it now is. As a result, demand for second-hand Dragons and CR-7s has never been higher.

The Dragon is, of course, the most famous cassette deck ever produced, and may get the purist's vote, probably because it offers you more flexibility with its manual calibration system, bi-directional transport and auto-azimuth correction. But my own personal favourite has to be the CR-7, because of its auto-calibration system, playback azimuth control, real-time counter, wireless remote control and overall sonic performance."

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**NAD**

# Wi-Fi Fidelity

**It's rare that a British company is first to market with cutting edge new technology, but Acoustic Energy has done it with the world's first Wi-Fi Radio, says David Price...**

If you'll pardon a rare moment of understatement, Acoustic Energy's new Wi-Fi Radio is fairly important in the great scheme of radio things. It is the world's first bespoke radio 'receiver' that gets its 'signal' from streamed internet audio (in a variety of formats), rather than plucking it from the airwaves with an antenna.

What then does this mean? Well, first, you'll not have to install an aerial; the AE attaches wirelessly. Second, and rather more profoundly, because it's not subject to the British government's view of what you should (and should not) listen to digitally, it can pick up literally thousands of radio stations; if you believe AE, it's around 10,000! I counted no less than 382 stations in the UK alone.

This is heady stuff; a vast amount of radio content from some 120 countries (and counting) isn't to be sneezed at. Better still, its quality is not (in theory) determined by what Tony Blair and Gordon Brown (and their minions) deem 'adequate', in terms of bitrates. On the internet, the sky is the limit.

In practice, it isn't quite so sublime, as the bitrates for BBC stations streaming over the internet are – at the moment – awful. Whereas most Beeb stations via DAB broadcast at a colossal(!) 80-128kps, they're streamed online at a miserable 44kbps. Here and now, that's very bad, but there are two big mitigating factors. First, that 44kbps is only determined by the Beeb's server capacity right now (and could well go up – right up to, for example, 512kbps, one day; DAB on the other hand is finite and unlikely to increase) and second, the codecs that the AE Wi-Fi radio uses are varied (RealAudio, Windows Media and MP3), and not – unlike DAB – limited to MP2, which as anyone knows – was designed to run at least 192kbps and more if possible. This means that, although streamed internet radio is currently awful, it has far greater



theoretical potential...

So what is this thing you see before you? Put simply, it does what every Windows or Mac computer does, which is to play streamed audio over a broadband connection. The difference is that it's a totally self-contained, standalone unit that doesn't even need your computer to be on. If you have a wireless broadband internet connect (and many do), then it's free 24/7 subscriptionless radio, playable in any room of the house, that receives vast numbers of stations from all around the world. Importantly, right now it's unique and it's completely British designed using the brand new Receiva chipset; Acoustic Energy designed the radio around the chip and did the acoustics.

## IN USE

The first thing that impresses about AE's radio is its design; it's a very nice looking bit of kit, and well built with a sturdy plastic frame (it measures 120x120x170mm. The back and sides are made from one piece of black plastic, about 3mm thick, with rounded edges. At the back there is a panel with DC input and headphone sockets. The front panel has a silvered finish and consists mostly of the speaker grille. Towards the top it curves over to join with the sloping top panel that has a Liquid Crystal display, a large rubberised control knob and numerous buttons lined up neatly in two rows. These are functionally well arranged (read: 'ergonomic') and there's a thick rubber base plate

# Absolute Demos

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- future proof - can be updated anytime
- optional 'Media Adapter' can play streamed content from Mac/PC
- computer doesn't have to be switched on

that allows the unit to sit firmly on any surface. All controls fall easily to hand and the display is crisp - the LCD panel has a pale blue backlight with black (or dark) characters. On standby it displays a large digital clock.

Setting up is very easy indeed - providing of course you have the requisite wireless broadband internet connection. Switch on, and press the 'Select' button and you're up and running. If your network uses WEP (Wired Equivalent Privacy) or WPA (Wi-Fi Protected Access) data encryption, then you have to enter your password to connect the radio to the network, however. In this case the display will automatically enter the password entry mode, which allows you to use the 'knob' and 'select' button in turn to enter the password characters.

Once on the network, the display will show 'Stations'; if you select this you can then tune in using 'Location' or 'Genre'. Twisting the 'knob' alternates these on the display. If you select 'Location' it goes through Continents, Countries; when you have made your choice it shows how many stations are available in each country. As you rotate the 'knob' the stations are identified in alphabetical order. When you reach the one you want, press 'Select'. After a short pause while the buffer is loaded the display shows the station and the music, or whatever, plays...

The manual really does give comprehensive, step-by-step instructions and seems to cover everything you want to know. Of course, it has presets as well as other functions such as, listen again (some stations only) and playing files stored on a networked computer via Windows Media Player.

**SOUND QUALITY**

Unlike DAB, the AE Wi-Fi radio's sonics are as much a function of the codec as the bitrate. The AE is the only thing that plays MP3, RealAudio and WMA, and obviously

the three formats have differing degrees of sonic prowess at differing bitrates. Still, we're talking - generally - low bitrates (of all internet radio streaming, around 30% of it is done in MP3, 40% in RealAudio and 30% in Windows Media Audio).

As previously mentioned, the Beeb networks are currently streaming at a risible 44kbps, so

don't expect sonic fireworks here. But there are some networks, such as Blue Grass Radio (from the US) coming in a 128kbps, which sounds most pleasant. Again, we're not exactly talking 'Last Night of the Proms' on Radio 3 FM quality here, but the AE Wi-Fi Radio makes a nice noise through its internal speakers (don't forget these are bespoke AE-designed items, and not 'cheap as chips' fare from your friendly local OEM).

The unit itself has a nice tone, easily as good as anything portable from Pure Digital (which is actually saying something). It's not up to the standards of Roberts analogue table radios, which - as your granny will tell you - sound 'lovely', but given the fact that it's digitally disadvantaged (i.e. running low bitrates) it's impressive stuff. It also seems to offer better sound than DAB portables running identical bitrates (with MP2 compression). Of course, quality varies with the stream, but generally the quality is excellent for a portable, having a full deep sound when tuned to a 'good' station. It isn't exactly a ghetto blaster but the volume range is quite adequate. Reception does vary a bit, but most of the UK stations are very acceptable.

Most interesting is when

streaming media from your own computer hard drive. The AE Wi-Fi radio will act as a player from your own PC or Mac, playing streamed media via your own wireless network. Here, you can play higher quality MP3 or AAC songs ripped from your hard drive, and really get decent sound through the inbuilt speakers, although it's DRM compliant, meaning you won't get past the Digital Rights Management encryption; put simply, if you download a rights-protected AAC file from the iTunes music library, for example, it won't play through the AE.

**CONCLUSION**

This isn't the future of hi-fi, but it gets its world's first review in *Hi-Fi World* because we regard it as a small but significant step in the development of radio. As a portable audio device, it's excellent and almost faultless; you could bemoan its lack of

"it can pick up literally thousands of radio stations; if you believe AE, it's around 10,000!"

hard disk (for storing programmes), its lack of battery functionality, its lack of SD card, and the fact that there's no digital out. But in the end Acoustic Energy wanted to do a 'plug and go' product for under £200, and it succeeds admirably in this respect.

**TECH SPECS**

- Supports Real Audio, MP3 and Windows Media streams.
- Uses 802.11 b and 802.11g Wi-Fi connectivity.
- Offers 128-bit (max) WEP security.
- Supports HTTP protocol.
- 'Reply Key' enables future interactive features.
- Uses Linux OS Kernel.
- iTunes adaptable as future software upgrade

I'm in no doubt that other variations on the theme, some biased more to portability, will appear soon.

More important perhaps is what it represents, which is a genuinely multi-format radio 'receiver' that's not limited to DAB's terribly judged trade off between the number of stations and the quality; because it uses the internet as its transmission medium, it has far superior potential, even if the reality right now is that there are squillions of stations broadcasting in poor quality. The Acoustic Energy Wi-Fi radio is a brilliant box of tricks; maybe someday all radios will be made this way?

**VERDICT** ●●●●●

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We firmly believe that the way to get the best performance from any MC cartridge is to use a high quality step up transformer. It is for this reason that we stock a range of designs, from the new **Note Products Step-Note** at £200 (pictured left), the **Audio Note** range priced between £390 to £4,500 and the **Music First Audio** copper or silver wired designs which start from £1,500 and offer a variety of ratios and impedances via front mounted switches.

### Noteworthy Audio

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# PRO TIME

Trust Russ Andrews to come up with a tweaked version of the already impressive Xitel Pro HiFi-Link external USB soundcard, says Channa Vithana!

**T**he Pro HiFi-Link is a compact external USB soundcard with a twist, because in inimitable Russ Andrews Accessories style it has been upgraded from the standard Xitel unit into one using a superior power supply. It is housed within a small, curved silver-coloured plastic case measuring approximately 85x90x25mm. It has an unspecified 'Precision DAC' with electromagnetic isolation. On one side there are a set of gold-plated phono and electrical digital outputs along with a capped optical connection. The other side has the USB connection and on this upgraded version, a socket for the external power supply.

Russ Andrews says the Pro HiFi-Link can connect to a PC (post Windows 98SE) or Mac (via its supplied USB cable). It also comes with a CyberLink Power DVD software CD-ROM, thirty feet of 'Studio Grade' optical cable, thirty feet of "fully shielded, high definition coaxial digital cable with gold plated jacks" and thirty feet of similar quality cable with phono sockets. This supplied Xitel cable isn't meant to compete with hi-fi audio brands but it is a very good value for money feature, and well thought out, as you can hook-up from afar. The connectivity is excellent as you can link up to your amplifier through the phono sockets or a DAC

via the digital outputs.

Additionally for DVDs, the digital outputs can provide Dolby Digital or DTS 5.1 audio to a surround processor/AV amplifier. This upgraded version comes complete with a Russ Andrews PowerPak I power supply for £129.95. The PowerPak I is a 'Class T' digital switch-mode power supply which presents 12v DC via a fixed cable. The PowerPak I has an IEC mains input to fit an optional mains cable. Russ Andrews supplied an optional £89.95 one-metre Kimber Timbre interconnect and a one-metre £29.95 Yello power cable. The RA Pro HiFi-Link works by taking only the signal from the USB and separate power from the PowerPak I, while circumventing the computer soundcard. It can output simultaneously from all the sockets.

## SOUND QUALITY

When comparing the standard computer soundcard to the RA Pro HiFi-Link, on the György Ligeti 'String Quartets And Duets' Edition 1 CD, there was a massive drop in subjective noise. The sound was quieter and much better in resolution. The 'String Quartet No. 1, Metamorphoses Nocturnes' gained in deeper timbral body, there was dynamism and a better sense of decaying notes was prevalent, which added to a more three-dimensional sound. The string

quartet's more demanding interpretations were rather thrilling as it wasn't sparsely rendered unlike the computer soundcard. It did not sound stifled through over zealous noise reduction either. It made listening to Ligeti from a computer very enjoyable. The inherent hiss level from the noisy computer soundcard was almost completely eradicated, providing a very stable platform for the music.

On the Love/Hate 'Let's Rumble' CD, I could easily discern a much quieter background to the disciplined, short-fused hard rock music which simply allowed more musical information to come through. Bass dexterity and extension was far superior, while there was extra space and depth around Jizzy Pearl's vocals, allowing an even more enjoyably gritty stance. The best thing about the difference and superiority over the computer soundcard was the combination of higher resolution and the extinction of a rather nasty brittle distortion.

## CONCLUSION

The Russ Andrews Pro HiFi-Link is a superbly simple yet versatile device for an instant upgrade from budget or OEM soundcards. Your computer will start to output real music instead of a brittle, harsh and lifeless excuse for one. As such, it comes highly recommended.

## VERDICT ●●●● £

A surprisingly serious attempt to get hi-fi sound from computer audio.

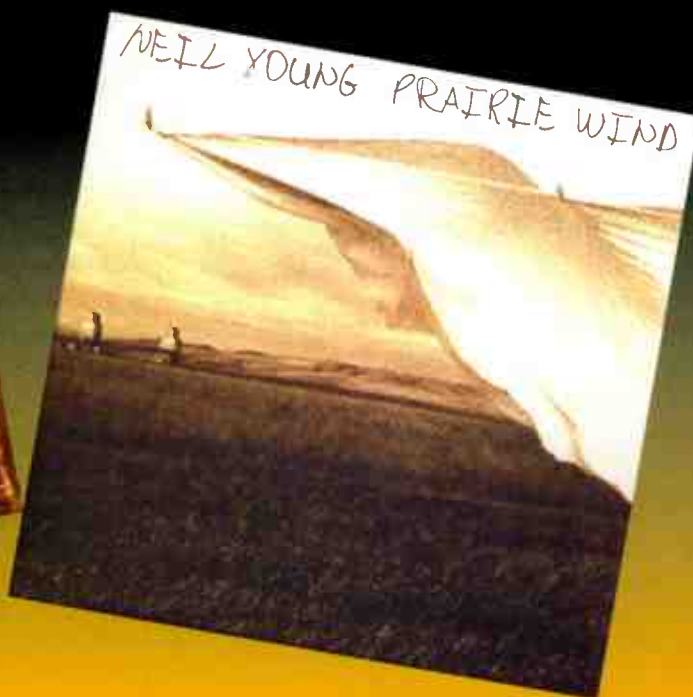
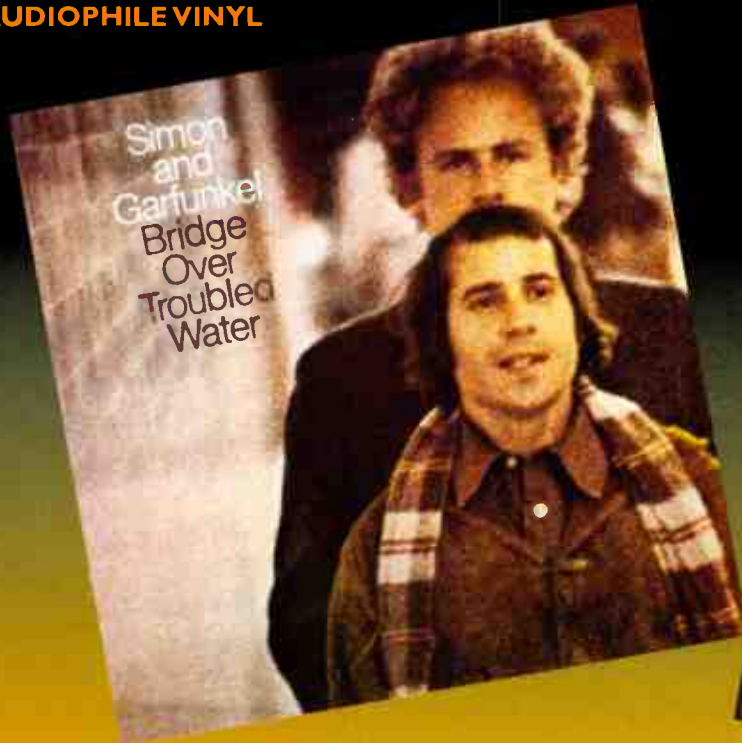
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**SIMON AND GARFUNKEL**  
*Bridge Over Troubled Water*  
Classic/Columbia

The introduction of the '45' format for albums has been an initially surprising yet certainly welcome technological enhancement. The basic premise is that the vinyl is cut – and played – at the higher speed to facilitate improved sound quality. Classic has further enhanced the luxuriant nature of the technology by placing the album on four, single-sided, disks. The reason? The vinyl retains extra rigidity and the grooves, which are set wider apart because of the nature of the 45rpm can thus be cut deeper which, in relative terms, reduces the inherent noise of the record. Finally, because of the extra speed of the vinyl rotation, the music itself displays a greater degree of dynamics, there's more presence in the midrange, a wider sound stage and, in fact, an overall larger sound.

If any album needed a boost in terms of mastering quality it is this one. The original vinyl album was never deemed a total success, technically speaking, and, considering the high quality of the original vocal harmonies, was looked upon as a qualitative disappointment. The problems were manifold but mainly surrounded the scratchy and distorted nature of many of the songs on the original album. For example, the end of the title track succumbs to this fault as do most passages featuring expanded brass segments. The first CD transfers,

although adding some bottom bass and allowing you to feel that you're in amongst the performers, also transferred some excessive tape hiss to the new format – 'The Boxer' was an immediate victim. As for the orchestral backing, it remained overly bright.

Returning to the original master tapes, Classic has recut this album onto its proprietary Quiex SV-P vinyl recipe, at a weight of 200gm. Hence, immediately, the vast vocal dynamics have, for the first time, room to breathe. The hiss has gone, the bright orchestra has been corrected. This is now a sublime album. The only drawback is that only one of the four discs sits in the facsimile cover. The rest are bagged in hard, white cover sleeves with plastic inners. Why not box them up? However, this takes nothing away from this excellent release.

**NEIL YOUNG**  
*Prairie Wind*  
Classic/Warner

Neil Young's appearance on vinyl is no accident. As he said to Sound & Vision magazine, back in 2001, "CDs were a mistake from the beginning because of the sampling rate. At first, everyone was impressed - as I was - by the lack of surface noise, but shortly after that, I became aware of the lack of sound and the lack of everything you associate with the air. That's where the surface noise and the tape hiss lived: on the sound floor. It's not the loud stuff that gets

affected, it's the quiet stuff. When you take something like a long fade and turn that up on a CD, if you've got a big amp, by the time you get to the end of that fade, you're listening to the worst sound that's ever been sold."

This newly released album, 'Prairie Wind', finds Young in a sentimental mood. Which fits the format, as this vinyl release gives the music a warm, but never sickly sweet, feel that you just don't hear on CD. On this album Young displays more musical direction than he has for many a long year. The only downside will be the lack of edge on many of the tracks; this is not an album in which Neil rails against authority or protests against the world's wrongs. It can be highly introspective but never turns mushy.

The album's production is nothing if not top notch. The two, 200gm vinyl disks utilising a QUIEX SV-P vinyl mix are placed in plastic inners which sit in illustrated paper covers. Included is an 18 page 12" x 12" booklet which, says Classic, has "lyrics and photos printed with soy based inks on paper that is from sustainable forests and is Rain Forest Alliance certified. The LP mastering and cutting was done at Bernie Grundman Mastering in Hollywood by Chris Bellman using the original 1/2" analogue master tapes". The resultant playback gives the music every chance. As an added bonus, side four of the set is an interview with Neil discussing music and more.

# SPIROGYRA



If you wish to hear Neil Young, in his natural environment, vinyl is the only format in town.

## **SPIROGYRA** *St. Radigunds* **Akarma/B&C Records**

The band's debut album, this quality selection of folk rock, with prog tendencies, was a breath of fresh air at the time because it managed to avoid many of the overly covered folkie traditional numbers that other contemporaries were indulging themselves in, partly to hide their own inadequate song writing skills. All tracks on this album were written by guitar/vocalist, Martin Cockerham which allowed the band to blend so well via vocalist, Barbara Gaskin, Julian Cusack (violin/keyboards) and Steve Borril (bass) with, among guest musicians, Dave Mattacks of Fairport Convention, on drums.

The album is full of invention and, like most talented bands launching their first album, the writing talent gushes forth like the breaking of a dam. 'Time Will Tell' begins with a haunting violin piece that moves steadily into a thread of Gaskin vocals that shine with English purity. Both that and the next track, 'We Were A Happy Crew' exhibit a conglomeration of intricate time signatures that emphasise the prog elements in the album. The band are not afraid of their more traditional folk roots and the track 'Love Is A Funny Thing', is proof of that. Even here, however, the music is original and the structure,

whilst recognisably folk in origin, is melodic, simple and, above all, contemporary to the time – in this case, 1972.

Finally, do not mistake the 'folk' tag with songs alluding to daisy chains, scrumpy and lyrics with the occasional 'hey nonny no' tossed into the middle eight, nor be diverted by the fact that the band derives from Canterbury. The album is full of political and social comment: the futility of war and the issue of winners and losers and how we treat each other. Fans of this album should check out the band's other releases: 'Old Boot Wine', a calmer and melancholic effort plus 'Bells, Boots & Shambles' which contains longer, complex songs. Mastered on 180gm vinyl, the record is carried in a basic paper sleeve – a pity a polythene sleeve wasn't used here to cut down on micro-scratches but this can easily be replaced. The sleeve also holds a lyric sheet which is printed on what seems to be a plastic/vinyl-like paper material, for old fashioned sing-a-longs around the valve amp.

## **ROY GAINES** *I Got The T-Bone Walker Blues* **Groovenote**

Groovenote is a label that publishes music on DSD and SACD and 180gm vinyl. Their catalogue is filled with both new and re-issued releases – including this example via Roy Gaines. Born in 1937, Gaines has had a varied career, working with the likes of Big Mama Thornton, Jr. Parker (on

Driving Me Mad) and Bobby Bland (on both his *It's My Life Baby* and *Woke Up Screaming* albums) in 1955 plus Jimmy Rushing in 1954. Gaines also worked as a part of 1957's *Blues Wail* by Coleman Hawkins and played alongside the Jazz Crusaders (which later became the Crusaders), Albert King and the legendary T-Bone Walker, who was an early inspiration.

The album title, of course, is a dead give-away, this release is a tribute to T-Bone. A vinyl reissue, the original CD release was welcomed as an 'audiophile' release after its initial 1999 issue - this vinyl version doesn't disappoint.

Backed by a full band featuring the rhythm section from Rod Piazza's *Mighty Flyers* band (Steve Mugalion on drums, Bill Stuve on bass) plus tenor sax by Clifford Solomon and George Parker, Will Miller on trumpet and Andy Kaulkin on piano, this album projects Gaines's take on the T-Bone style to a tee. Despite this selection covering well known blues songs, Gaines still gives the music enough individual interpretation to make the old songs attractive and captivating. For example, the first track, *Stormy Monday*, is a real mover of a song but is then reprised at the end of side two in an alternative acoustic version. In fact, this acoustic version appears with *House Of Gold* as part of a bonus 45 RPM 'supercut', as the company describes it. Gaines also adds the Hank Williams' track, 'Honky Tonk Blues' – but sings it exactly as T-Bone would. Highly recommended for all blues fans.

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"during the eighties there was a notable decline in the build and finish of hi-fi..."



## dominic todd

**T**hey don't build 'em like they used to. When I worked in a hi-fi store, I lost count of the number of customers repeating this old adage to me and, by and large, they were right. During the 1980s there was a notable decline in the build and finish of hi-fi. Whilst internal circuitry was probably improving in most cases, the actual casings that the units came in used thinner metals and were lighter in weight. The understandable perception, therefore, was that the hi-fi wasn't as well built as it once was – no matter how much improved the internal electronic construction might have been.

If anything, as the '80s became the '90s this practice became even more widespread, with plastic replacing metal, and metal lids being so thin that they would bend under the weight of a tuner on top. I well remember the Pioneer A400 suffering from just this problem even though, in other respects, it was a first rate sounding amp'.

Another disappointment of the '90s was the Arcam Alpha range. The front panel of the later Alpha range was not only made of plastic, but plastic that was so thin it would splinter if struck. Of course, hi-fi separates aren't meant to be moved about, let alone struck, so manufacturers could hardly be blamed for saving on construction weight. Yet, what many didn't realise was the perception that many buyers have.

Rightly or wrongly, many feel that if something has well oiled controls, a sturdy, heavy case and is constructed from thick metal, then it's well built. It may be, but internally it could also be a bag of nails. Rather than trying to convince customers about this, and also pointing out that the lighter cases were saving them, the customer, money as well as the manufacturer,

companies finally started giving the customers what they wanted – solid build quality.

After some poor press, Arcam launched the FMJ (Full Metal Jacket) range as a direct response to previous criticism of 'lightweight build'. The Alpha range disappeared soon after and was replaced with the Diva range instead. Interestingly, although this was a little more expensive, it too had a 'full metal jacket', thus ensuring that Arcam's critics no longer had a reason for griping about build quality.

Arcam made these changes to external design some six years ago now, but others have taken much longer. Whilst conducting a couple of reviews recently, I couldn't help but notice a marked improvement in the external finish of both a budget Marantz and a mid-range Philips product. In the past both these manufacturers were seen as, at least at the budget end, making excellent sounding products but with rather plasticky finish. Certainly an equivalent Sony or Pioneer product from five or ten years ago would often have come across as being far better made – not so any more. Although Marantz and Philips are no longer joined at the hip, the two have independently made strides forward to improve their perceived build construction.

The entry level Marantz PM4001 (£180) that I tried recently was the first budget Marantz amp' with a metal front panel that I remember since the 1970s. It wasn't just cosmetic show, either. From what I could see the chassis thickness had been improved, as had torsional rigidity – i.e. the whole structure was less twisty than predecessors. Once again this may sound like an irrelevant property for a static product, but the fact that it improves

user confidence is undeniable.

The next product with which I saw a great improvement in build quality was the Philips DVP9000 DVD player. Like the Marantz it too had a thick metal front panel and a solid chassis. Compared to Philips CD players of the past, including some quite expensive ones, it was leagues ahead. Of course, whether or not these two new products from Marantz and Philips prove to be any more reliable or longer lasting remains to be seen, but they certainly give the impression they will...

If then we have new products from the same manufacturers that are better built but effectively cost less than their predecessors, there must be a catch, right? Well, not really. Both manufacturer and retailer profit margins are less than they used to be, but there's also the manufacturer's savour, China, to consider. Ever since NAD and then Cambridge Audio started building in the Far East, the industry has been forced to consider relocation, specialisation or, at the very least, sourcing parts from the Far East. I've lost count of the number of reviews that have praised the budget Cambridge Azur 540/640s solid construction and weighty remote control and this, amongst other things, must have spurred Marantz on to beef up build quality on their own budget equipment.

The next question is, of course, where do we go from here? Well, it seems to me that China still has huge labour capacity and is still making productivity gains and, therefore, I don't see it becoming a more expensive manufacturing base for some time yet. One day prices will have to rise, especially as environmental taxes of some sort or another kick in, but for now good hi-fi that's well made has never been so cheap. Make the most of it! ●

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"there's a net loss being made of £49.70 per DAB radio sold"



## steven green

Is DAB in the UK a success? The broadcasters' answer is a resounding 'Yes!' As proof they will cite the 1.85 million DAB radios sold since digital radio was kick-started by the BBC in 2002 with TV adverts promoting their digital-only stations. I'm more interested this month in the sales/advertising equation: Can genuine success – meaning a groundbreaking product taken up enthusiastically by the masses – be legitimately inferred from sales figures, when the product has had saturation advertising for four years?

As I write this, the BBC's annual run-up-to-Christmas TV advertising campaign for DAB has begun in earnest, and including all the campaigns for the individual digital stations, plus the campaigns for DAB itself, I make this the nineteenth BBC TV advertising campaign for DAB since the BBC launched their six Music digital station in March 2002.

One thing I've always wondered is how much these advertising campaigns would cost if they were shown on commercial TV. The only thing I could find out from the BBC was that the campaigns run for four weeks (although as I recall, last year's ran from late November through to the middle of January), so the rest I'll have to estimate.

First, I counted the total number of programme breaks on all the BBC TV channels in a 24-hour period, which came to 234. The BBC has five 24-hour TV channels (BBC3 and BBC4 time-share their channels with CBBC and CBeebies, respectively), so let's say there's a DAB advert shown every five programme breaks (which seems fair, because they seem to be

on all the time), which would mean there's approximately nine DAB adverts per channel per day.

ITV Sales helpfully provide a document (<http://tinyurl.com/957xo>) on their website that lists the price of adverts at different times of the day: £7,974 at 11 a.m., £22,328 at 6.15 p.m., £82,932 for the centre break of Coronation Street and £44,656 at 9.20 p.m. So I entered these figures onto a spreadsheet, reduced the figures when people go to bed, and reduced the price listed for Coronation Street, because it has a far higher share of viewing than other programmes at that time.

I then divided the advert prices by the ITV1 percentage share of viewing, listed on the BARB website ([www.barb.co.uk](http://www.barb.co.uk)), multiplied by the percentage share of viewing for each BBC TV channel to give a cost per advert for each BBC channel for each hour of the day. I then entered nine adverts distributed throughout the 24 hours, and multiplied the advert prices by the percentage share of viewing figures.

Summing all the figures gave a grand total of £219,143 per day – or an average of £4,870 per advert. Multiplying the cost per day by the number of days in the campaign (28) gave £6.136 million per advertising campaign. Multiplying the cost per campaign by the number of campaigns (19) gives a grand total of £116.6 million, which is the estimated total cost that the BBC would have had to spend if they had advertised DAB on commercial TV.

The estimate for the previous eighteen advertising campaigns comes to £110.44 million, and there have been 1.85 million DAB radios sold

from January 2002 to the end of September 2005, which would make the average advertising cost per DAB radio £59.70!

And that's just the TV advertising costs; each time there's a BBC TV ad-campaign for DAB there also seems to be one on commercial radio, and the commercial radio groups also fund their own DAB advertising campaigns on top. And commercial radio makes its living by selling air-time to advertisers, so all jingles that mention DAB would have to be factored into the equation.

And of course, to sell the products in the first place they have to be manufactured and shipped in from China etc, and I read earlier this year that the profit made by the radio manufacturers on each £99 DAB radio was £10. So only taking the estimate of the total TV advertising costs and the profit per radio into consideration, this would mean there's a net loss being made of £49.70 per DAB radio sold – or a net loss of £91.95 million on the 1.85 million DAB radios sold to the end of September 2005.

So, is DAB in the UK a success? Sales figures alone certainly fail to tell the whole story, and it's very hard to imagine a commercial product that has to pay for its own advertising costs ever being able to advertise as much as DAB has been up to now.

I conclude that DAB cannot be deemed to be a success, because without the BBC's TV advertising for DAB effectively pseudo-subsidising every radio sold to the tune of £60, sales figures would have been dramatically lower than they have been, and DAB would be deemed a failure by any standard. ●



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"loudspeakers are still little more than musical instruments..."



## noel keywood

It's great fun reviewing loudspeakers, they're such a challenge, but there is so much variability here I'm never sure that hi-fi slogans such as "the closest approach to the original sound" or "reference monitor" have any meaning at all. We are all fooling ourselves. Saying this whilst quoting Peter Walker of Quad I must ask the good Lord to excuse me, but all the same I think he would understand my contention here. Loudspeakers are so gloriously approximate that notions of science aren't valid; they're still little more than musical instruments. The basic reason is that there are just too many variables for loudspeaker engineering to be anything other than an art. Happily, it's an enjoyable one for many of us.

It isn't all down to the loudspeaker either. The final piece in the complex technological jigsaw that connects source to ear is your room, about which few say anything and fewer understand in any case - including many loudspeaker manufacturers! In my experience they are the ones most likely to sweep the subject under the carpet. "Room acoustics compromise our latest wonder creation?" Preposterous! Acoustically, rooms are totally random and unpredictable - a wild card in the replay chain. No matter how well engineered the loudspeaker, the room it works in mediates its performance, making what you hear at home uncertain.

We hauled all the loudspeakers in this month's group test around a variety of rooms and heard an interesting breadth of results. I am not going to say the room totally dominates the loudspeaker, so much as strongly influences what it does, mostly for the worst. But I am going off at a tangent by talking about the listening room, because loudspeakers

are also variable in themselves.

One feature, rarely mentioned, is that most loudspeakers display varying frequency response according to where you sit in relation to them. This is most obvious during measurement, where moving the measuring microphone results in very large measured changes. There is an unspoken convention that the measuring microphone is placed on the axis between bass/midrange unit and tweeter with a two-way design, and on the axis of the midrange unit in a three-way. All the same, I look at a range of points in real-time using pseudo-random noise and a spectrum analyser, and may average over a number of positions if this is necessary, which it may be with a highly variable loudspeaker like the Zu Druid. When listening, like loudspeaker design engineers I will sit at various heights to subjectively assess the impact of such variability.

Most loudspeakers work best if your ears are at the height of the bass/midrange unit, up to the tweeter unit maximum. Above the tweeter axis performance will start to go awry, except with a true point source, or a coaxial like the KEF Uni-Q or Tannoy Dual Concentric.

Loudspeaker engineers say drive units (and ports) "integrate in the far field". Your living room might not look like a field to you, but to every loudspeaker engineer it is a sound field over which they have no control.

To get repeatable measurements of loudspeaker frequency response another convention is that the measuring microphone be one metre distant from the loudspeaker. Again though, I tend to vary this to check that, for example, loudspeakers with multiple, widely spaced drive units do truly integrate at a distance. In a real room, as you move away from a loudspeaker, the sound of the

loudspeaker itself should become more cohesive. You can check this by turning volume down and listening in different positions close up to one loudspeaker, then doing the same whilst moving back. However, as you move back the direct sound from it decreases and reflected sound - the sound of your room - increases. At a distance of 6ft or so the loudspeaker should sound fairly cohesive in itself, and clear and dramatic. As you go further back its own character will wane as the room contributes progressively more to what you hear. At 9ft-12ft back the room will have a large influence on what you hear, something I control with acoustic treatment.

One point listening in different rooms raised is that the room, as well as the loudspeaker and listener position, significantly affects bass balance. I noticed this especially with the KEF iQ5 for example. Balanced for wall use, it sounded firm and controlled when placed against one wall whilst sitting near to the opposite wall. It lost its bass in a large room when used away from the wall. KEF have aimed to use the nodal gain of a room to support its low frequency output; it's not a big banger that will move any amount of air. This illustrates how a room can be used constructively to get good bass from a compact loudspeaker, and conversely how KEF have taken account of both room and position. But the loudspeaker must be used in an appropriate room in a suitable position. With the iQ5, that means not a large room (no more than 16ft maximum), and preferably near to or against a wall.

With so many variables affecting them, loudspeakers can vary wildly in their sound. Luckily this same variability means they can be adjusted for best results. Not a science then, but an interesting art. ●

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real depth and dimensionality... The Whest seemed to have dramatically lower distortion, a wider window on the world with greater depth of field.

The Crusaders' 'Rodeo Drive' was startling... Instead of the lead instrument coming out of the nearest speaker to my ears at any given time, it boldly hung midway in front of the plane of the speakers. Percussion seemed faster and more expressive (but) most significant to my ears was the Whest's tonality. It is utterly neutral.... Bass is strong and supple, but not boomy or overhung, midband glass clear (I never realised my Quad 989s could sound this open) and treble utterly delicious - sparkling, delicate and with breathtaking speed. Better still... the PS.20/MsU.20 has tremendous textural resolution.

Listening to saxophones is amazing... the Whest simply gave them the rightful, raw, 'reedy' feel - leaving you sure in the knowledge that it was as solid as a rock.

Overall, this is a deeply special phonostage - the best I've heard to date at the price - or anywhere close come to think of it. Its combination of dizzying depth, dimensionality, grip, speed and evenness, allied to tremendous textural accuracy can only be ascribed to its exceptionally low distortion. Brilliant stuff - make no mistake, Whest Audio is on the ascendant.

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"The package contains the PS.20 phono preamplifier and the MsU.20 power supply, connected to one another by an umbilical cord terminated by metal DIN plugs... The PS.20 is interesting inasmuch as it has a pair of RCA loading sockets. The idea is that you select the gain (MM or MC) on the rear-mounted switch and plug in the correct pair of loading plugs for your cartridge (which Whest supplies at the time of purchase).

The first LP I played was,

appropriately enough, Lynyrd Skynyrd's 'Nuthin' Fancy', the Whest sliced through the crud like a hot knife through butter, to reveal all sorts of hidden pleasures. There was a beautiful Rickenbacker guitar sound, some soft vocals (albeit with some hard Southern accents), some lovely seventies keyboard sounds and shock-horror, a three dimensional soundstage. The Whest projected the vocals amazingly, and hung the rest of the instruments back. Meanwhile, that mush seemed to dissolve away...

Moving to Zero 7's 'I Have Seen', a track I have played to death, and this rather grainy recording assumed a new level of finesse. It was no seventies audiophile extravaganza, but there was once again lots more detail, beautifully proportioned with

**QUESTIONS**

[1] The Whest Audio ps.20/MsU.20 is a what?

- [a] a phonostage
- [b] an amplifier
- [c] a pair of loudspeakers
- [d] a tea cosy

[2] according to DP, the Whest sliced through crud like what?

- [a] "a hot knife through butter"
- [b] "a racoon in a room full of rocking chairs"
- [c] "its very life depended on it"
- [d] "a bat out of hell"

[3] Zero 7's 'I have seen' is a track that DP has...?

- [a] "played to death"
- [b] "written all by himself"
- [c] "become obsessed with"
- [d] "lost his LP copy of"

[4] According to DP, Whest Audio is on the what...?

- [a] "ascendant"
- [b] "decline"
- [c] "wane"
- [d] "crest of a wave"

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**NOVEMBER 2005 PINSH ONE LOUDSPEAKERS WINNER:  
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# bass-ic instinct

For great bass in a small space, try an Aperiodic loudspeaker with a 10in bass unit, says loudspeaker designer Peter Comeau. Here, in the first of a three part feature, he describes a stunning new DIY loudspeaker kit, the WD25A, from World Designs...

## Part 1: Design ideas and theory

**'T**is often said in loudspeaker circles that a good big 'un always outperforms a good little 'un and this is certainly true when it comes to bass units. Today's loudspeaker industry, succumbing no doubt to modern 'lifestyle' pressures, is concentrating more and more on reducing the size of speakers and, therefore, drive units. The result is that nowadays a 6 inch bass unit is considered 'large'. If we look back to the '60s, however, an 8 inch bass unit was considered 'small' and, if you wanted real bass, there was no substitute for the 10 inch, 12 inch and 15 inch units that abounded in commercial speakers of the time. We wanted to recapture, or even improve upon the fine bass of these loudspeakers, with our first World Design project, WD25A. It is a speaker that harks back to a largely forgotten design that was hugely popular in the early '70s but has never been repeated...

To be fair, technology has marched on and we are not suggesting that a speaker with multiple 6 inch drivers could not produce bass levels that are certainly satisfactory, given a suitably powerful amplifier. And therein lies the rub – as the drive unit diameter goes down so does the efficiency.

To put this into perspective, it is relatively easy to create a loudspeaker with 90dB sensitivity for 1 Watt using a 10 inch bass unit. Drop down to a 6 inch and you would be hard pushed to achieve 84dB. This difference of 6dB may not sound much but it means quadrupling the amplifier power to achieve the same sound pressure level (each 3dB step requires doubling the power).

Many modern designs get round this by reducing the impedance. For a 2.83v input (specified because 2.83v into 8 Ohms is 1 Watt) you can, theoretically, improve apparent efficiency by 3dB by specifying a 4 Ohm drive unit. However this draws

twice the current of an 8 Ohm unit; not a problem if your amplifier has a good power supply and large output transistors, but it does place more of a strain on the amplifier overall.

And, of course, if you are currently residing with a (relatively) low powered valve amplifier this sort of current requirement is the last thing you need. There is also the factor of 'strain' itself. Those of us who do hark back to the 'golden' days of hi-fi will remember the sense of ease that efficient speakers applied to the reproduction of music.

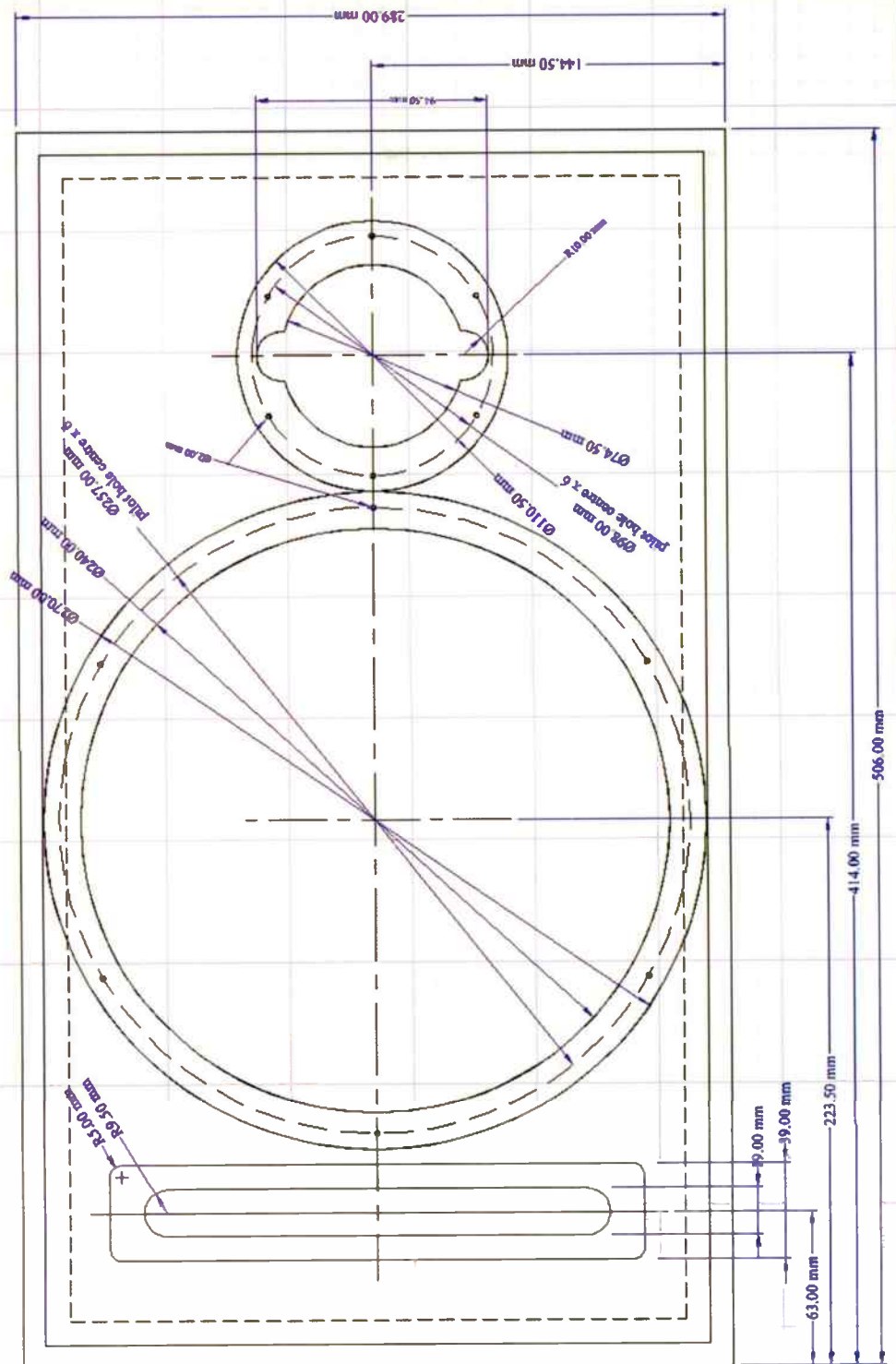
### DESIGN CRITERIA

Accordingly the primary design criterion for the WD25A speaker kit was to engineer an efficient 10 inch driver that had good midrange

qualities and yet produced high quality bass performance, in a not-too-large enclosure. The key here is cone and surround quality. Researching the archives brings up all sorts of horrors which resulted in many large bass units being consigned to three way loudspeakers. For example, the stiff and heavy cones and large motor systems which typify traditional reflex designs result in barely controllable and undesirable cone breakup modes in cone diameters over 6 inches, when accelerations become too great to maintain piston motion (see our loudspeaker feature on p34 in this issue).

We were looking, therefore, for smoothly performing drive unit designs which suited closed box





The front baffle needs bass unit and tweeter cutout, as well as vent. Use a jigsaw or router. The drive units must be mounted as close as possible to minimise phase error. We will be publishing larger woodworking diagrams next month.

parameters, when we chanced across a design classic of the early '70s, the Dynaco A-25. This unusual design by SEAS of Denmark, for Dynaco in the U.S.A., featured a soft coned, ten inch in a cabinet that wasn't much bigger than the drive unit itself. The key to its bass performance was 'aperiodic loading' – a formula for driver and cabinet design which has rarely had commercial success.

As very few of us are *au fait* with aperiodic loading it is worth taking a closer look at this type of cabinet design. At first glance the system looks like a damped reflex port and, in fact, some designs have approached

the loading in such a fashion with disastrous results. Actually, the behaviour of a well designed aperiodic loading speaker is closer to that of a well damped closed box of larger internal volume. And that's the key to it, to design the drive unit and cabinet parameters such that the combination behaves like an optimally damped closed box system.

However, there is an advantage to the aperiodic enclosure which is not, at first, apparent. A well damped closed box tends to sound exactly that – well damped. In other words the high degree of internal damping, usually arranged by a complete

stuffing of the enclosure volume with acoustic absorbent, seems to suck the life out of the midrange dynamics of the driver.

In the aperiodic enclosure the damping is performed by the resistive vent which, if correctly designed, offers a leakage path for pressure build up inside the enclosure at the large cone excursions encountered at low frequencies. The interior of the enclosure can therefore be fitted with a minimal amount of acoustic damping, just enough to cut down internal reflections, and therefore has less effect on midrange transient performance. In fact the 'tuning' of an

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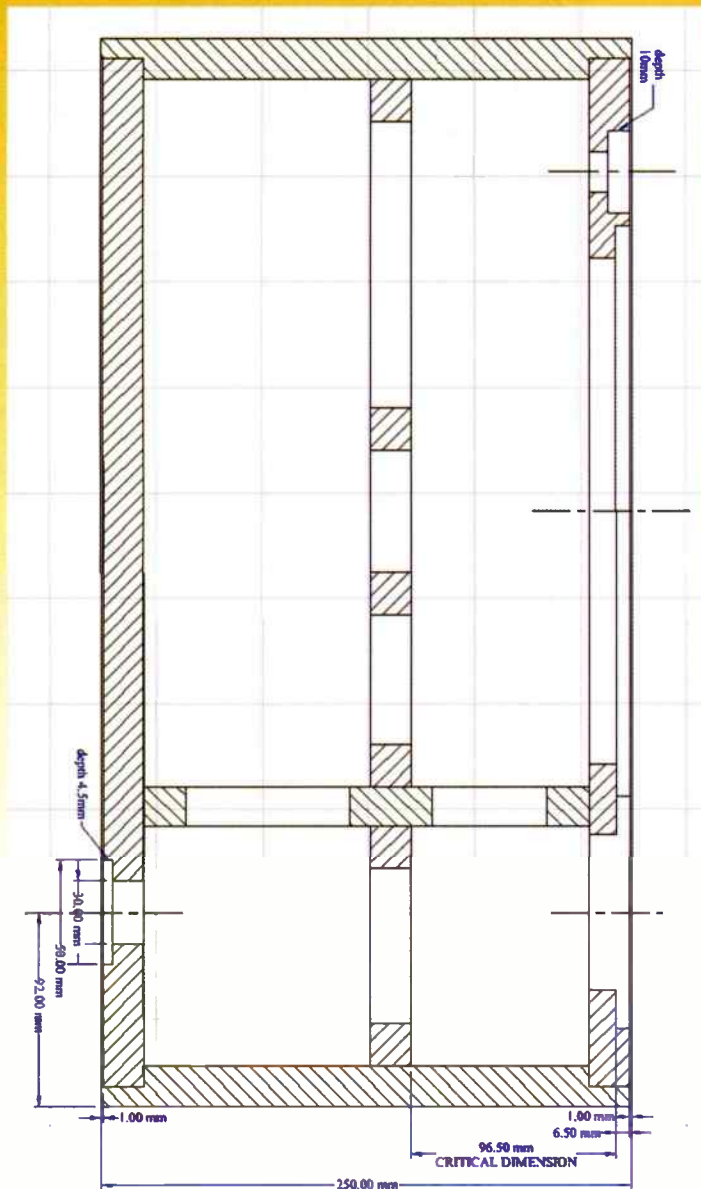
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*A cross section view of the cabinet showing drive unit and vent cutouts at right, internal cross bracing and joints. This is an overview; woodworking details will be published next month.*

aperiodic system is managed in such a way that the transient performance throughout the bass and midrange is optimal.

As for the drive unit itself who better to turn to than SEAS themselves? Our modern version of this design classic uses a soft paper cone and butyl rubber surround that produces beautifully controlled 'breakup' for excellent midrange qualities, combined with a motor system that ideally suits a 23 litre aperiodic enclosure. Good dynamic power handling is aided by a 39mm voice coil with a vented magnet, whilst the whole is mounted in a strong, cast chassis. Truly a modern classic driver.

Part of the key to the Dynaco A-25's success was its simple crossover technique. The bass/midrange unit

was so well controlled that it could be used without crossover, whilst the treble unit possessed a low enough fundamental resonance to be used with a single capacitor and variable L-pad resistor level control. We asked SEAS for a modern version of the original treble unit and two hf units were suggested, the 29TFF/W and the T29CF001. The latter is closer in theory to the ideal of low resonance and wide bandwidth, but its response with a single capacitor crossover gives a shallow roll-off which is not best suited to the required midrange crossover.

The answer is a simple, one capacitor crossover for the basic version that uses the 29TFF/W and a more advanced crossover for the luxury version using the T29CF001. The latter unit is part of



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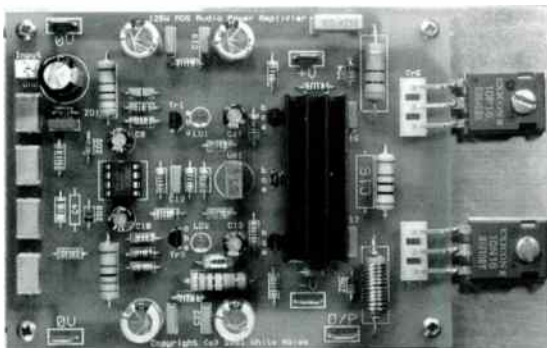
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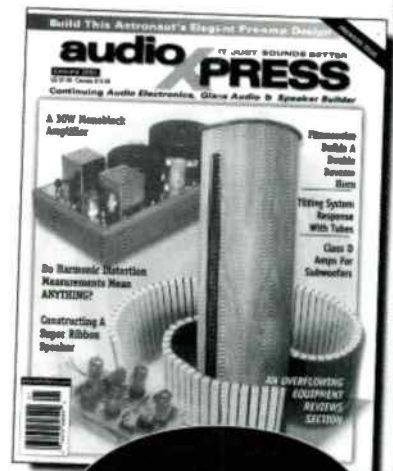
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the SEAS Excel range and utilises a Neodymium magnet system surrounding an underhung voice coil to provide a motor system of extremely low distortion. This is coupled to a SONOMEX fabric dome and housed in a precision machined aluminium front plate with a zinc injection moulded rear chamber. As you can imagine this is a luxury treble unit for this project for those who want the ultimate

performance.

Audiophiles used to tinkering with different components can also try their own combinations of crossover components. We will detail these options in the next article along with how we developed the crossover and what affects the resulting subjective performance. The final article will give you all the construction notes and drawings necessary to build up the kit.

For those who can't wait, or just want to get on with it now, the full construction details are given with the drive units and crossover kit available from World Designs. There is also the option of a cabinet kit as well for those who don't feel up to the woodwork!

**Next month - Part 2: Crossover and measurements.**

#### APERIODIC LOADING

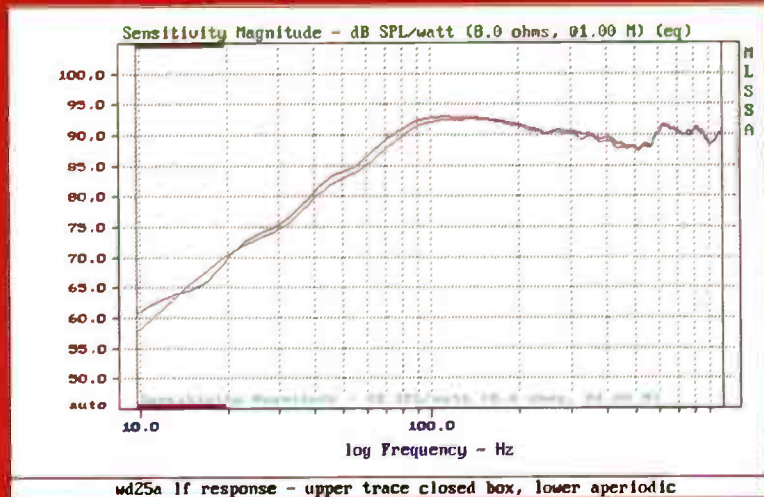
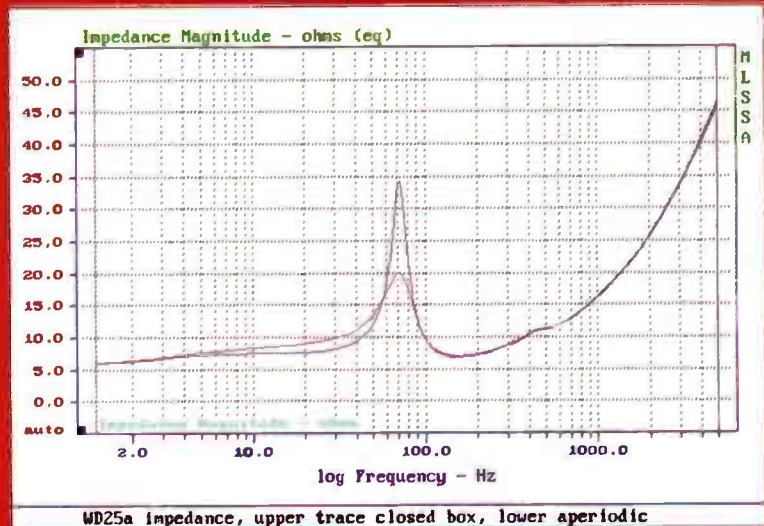
'Aperiodic' actually means 'without periodic repetition' and, in the case of a loudspeaker, defines a system which has optimally damped resonance control. In the case of a closed box or reflex 'vented' box loudspeaker the primary resonance of the speaker driver in the box is high 'Q', in other words as the frequencies fed into the speaker get close to the primary resonant frequency they easily excite resonant behaviour.

In a poorly damped system what you hear from this resonance is a 'boom'; many of the early reflex loudspeakers were called 'boom boxes' for this reason. It is generally left to the amplifier to control this resonance, though some help through damping is applied by stuffing the cabinet with absorbent, by damping the speaker using the amplifier's negative output impedance or 'damping factor'. This demands considerable instantaneous current flow from the amplifier to apply a 'braking' effect to the drive unit as it starts to oscillate – all well and good if you have a high power amplifier but not ideal for low power or valve amplifier users.

The Aperiodic enclosure applies resistive control of airflow in and out of the cabinet to effectively help damp out the primary driver resonance. You can see the difference in Graph 1. This is a plot of driver impedance and is the load the amplifier 'sees'. You can see the primary resonance at 70Hz in the closed box 'blue line' as a sharp, high 'Q' peak. The high impedance at this point shows that the drive unit needs very little input in order to produce a large output, i.e. the driver is resonating in its box.

Compare this to the aperiodic plot (red line). This is the same driver in our optimally damped aperiodic enclosure. The high Q peak at 70Hz has been dramatically reduced. The flattening of the impedance curve also means it is an easier load for the amplifier.

Now look at the difference in response curves (Graph 2). The blue line is the response in the closed box. Due to resonance it exhibits a relatively sharp knee in the response through the 80-100Hz region before it falls away. Compare it to the red line of the aperiodic system. The 'knee' is reduced and the bass response is given a little more subjective extension at very low frequencies, albeit with the loss of about 1dB at 70Hz. A reflex 'vented' system would give greater LF extension but, again, you would be back to



the highly resonant behaviour. The only drawback to the aperiodic system is that, at subsonic frequencies, cone movement is higher than that experienced in a closed box system. This won't be of concern when using CD or other subsonically 'clean' sources, but turntable owners should ensure that their arm/cartridge/suspension system is not prone to resonance itself and avoids exaggerating record warps (this warning applies equally when using reflex speakers).



World Designs loudspeaker designer, Peter Comeau, started his design career in 1978 when he founded Heybrook Hi-Fi. Peter remained as technical director of Heybrook for 15 years producing such notable designs as the HB1 and the Sextet. In 1999 Peter joined Mission as Director of Acoustic Design and is responsible for modern classics such as the 773e, 780 and 782, not to mention the crowning achievement of the Elegante e8 series prior to Mission's takeover by IAG. In between Peter has jumped in and out of journalism writing and reviewing for a number of computer and hi-fi magazines including *Hi-Fi World*.

**To order loudspeaker kit see page 124**

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# world classics

In this heavily revised section, you'll find the great and the good from audio's glorious past. Most are seminal designs which have earned their place in hi-fi history, but you'll also see some oddities which aren't classic as such, but are great used buys. The year of introduction is given, alongside the original UK launch price. Think we've overlooked something? Then write in and let us know!

## DIGITAL

**CAMBRIDGE AUDIO CD1** 1986 £1500  
Inspired Stan Curtis redesign of Philips CD104, complete with switchable digital filter. Lean but tight and musical performer.

**CAMBRIDGE AUDIO CD4SE** 1998 £200  
A touch soft in the treble and tonally light, but outstanding in every other respect.

**LINN KARIK III** 1995 £1775  
The final Karik was a gem. Superb transport gives a brilliantly tight, grippy dynamic sound, albeit tonally dry.

**MARANTZ CD73** 1983 £700  
A riot of gold brushed aluminium and LEDs, this distinctive machine squeezed every last ounce from its 14x4 DAC -super musical



**MARANTZ SA-1** 2000 £5,000  
The greatest argument for SACD. This sublime Ken Ishiwata design is utterly musically convincing with both CD and SACD, beating most audiophile CD spinners hands down.



**MERIDIAN 207** 1988 £995  
Beautifully-built two-box with pre-amp stage. Very musical although not as refined as modern Bitstream gear. No digital output.

**MUSICAL FIDELITY TRIVISTA** 2002 £4000  
When playing SACDs, the sweetest, most lucid and lyrical digital disc spinner we've heard. Old school stereo, pure DSD design. CD sound is up in the £1000 class, too! Future classic.

**MERIDIAN MCD** 1984 £600  
The first British 'audiophile' machine was a sweeter, more detailed Philips CD100. 14x4 never sounded so good, until the MCD Pro arrived a year later.



**NAIM CDS** 1990 £ N/A  
Classic Philips 16x4 chipset with serious attention to power supplies equals grin-inducing sonics.



**SONY CDP-101** 1982 £800  
The first Japanese CD spinner was powerful and involving. Brilliant transport more than compensated for 16x2 DAC, and you even got remote control!

**SONY CDP-R1/DAS-R1** 1987 £3,000  
Sony's first two boxer was right first time. Tonally lean, but probably the most detailed and architectural sounding machine of the eighties.



**SONY CDP-701ES** 1984 £890  
Sony's first ever bespoke high end audiophile machine used a 16x2 DAC to provide a clinically incisive sound; supreme build quality allied to the pure unadulterated luxury of a paperback-sized remote control.

**YAMAHA CD-X1** 1983 £340  
Nicely built 16x2 machine with a very sharp and detailed sound; sometimes too much so. Excellent ergonomics, unlike almost every other rival of the time.

## COMPACT DISC TRANSPORTS

**TEAC VRDS-T1** 1994 £600  
Warm and expansive sound made this a mid price hit. Well built, with a slick mech



**ESOTERIC P0** 1997 £8,000  
The best CD drive bar none: TEAC's Tokyo boys pushed the boat out in style. Brilliantly incisive, ridiculously over engineered.

**KENWOOD 9010** 1986 £600  
The first discrete Jap transport was beautifully done and responds well to re-clocking even today.

## DACs

**CAMBRIDGE AUDIO DACMAGIC** 1995 £99  
Good value upgrade for budget CD players with extensive facilities and detailed sonics.



**DCS ELGAR** 1997 £8500  
Extremely open and natural performer, albeit extremely pricey - superb.



**DPA LITTLE BIT 3** 1996 £299  
Rich, clean, rhythmic and punchy sound transforms budget CD players.



**PINK TRIANGLE DACAPO** 1993 £ N/A  
Exquisite; the warmest and most lyrical 16bit digital audio we have ever heard. Clever plug-in digital filter modules really worked!



**QED DIGIT** 1991 £90  
Budget bitstream performer with tweaks aplenty. Positron PSU upgrade makes it smooth, but now past it.

## TURNTABLES

**ARISTON RD11S** 1972 £94  
Modern evolution of Thorens' original belt drive paradigm, Scotland's original super-deck was warm and musical, albeit soft. Still capable of fine results today.

**PIONEER PL12D** 1973 £36  
The beginning of the end for the British turntable industry. When vinyl was the leading source, this brought new standards of noise performance and stability to the class, plus a low friction S-shaped tonearm. Later PL12D was off the pace compared to rivals



**DUAL CS505** 1982 £75  
Simple high quality engineering and a respectable low mass tonearm made for a brilliant budget buy. Polished, smooth and slightly bland sound.

**GOLDRING Lenco 88/89** 1963 £15.65  
Simple, well engineered middleweight with soft, sweet sound and reasonable tonearms. Good spares and servicing support even today from specialists.

**LINN AXIS** 1987 £253  
Simplified cut-price version of the Sondek complete with LVX arm. Elegant and decently performing mid-price package. Later version with Akito tonearm better.

**LINN SONDEK LP12** 1973 £86  
For many, the Brit superdeck; constant mods meant that early ones sound warmer and more lyrical than modern versions. Beguilingly musical but now off the pace.



**TECHNICS SP10** 1973 £400  
Seminal Japanese engineering. Sonics depend on plinths, but a well mounted SP10/II will give any modern a hard time, especially in respect of bass power and midband accuracy.

**MARANTZ TT1000** 1978 £ N/A  
Beautiful seventies high end belt drive with sweet and clean sound. Rare in Europe, but big in Japan.



**MICHELL GYRODEC** 1981 £599  
Thanks to its stunning visuals, this bold design wasn't accorded the respect it deserved until recently. Early examples sound cold and mechanical, but now right on the pace. Clean, solid and architectural sound.

**REGA PLANAR 3** 1978 £79  
Brilliantly simple but clean and musical performer, complete with Acos-derived S-shape tonearm. 1983 saw the arrival of the RB300, which added detail at the expense of warmth. Superb budget buy.

**GARRARD 301/401** 1953 £19  
Heavy metal - tremendously strong and articulate with only a veiled treble to let it down. In many respects, better than the seventies 'superdecks' that succeeded it.



**ROKSAN XERXES** 1984 £550  
Supposedly the first to 'better' the LP12. Super tight and clean sound, with excellent transients. Less musical than the Sondek, but more neutral. Sagging plinth top-plates make them a dubious used buy.

**THORENS TD124** 1959 £ N/A  
The template for virtually every 1970s 'superdeck', this iconic design was the only real competition for Garrard's 301. It was sweeter and more lyrical, yet lighter and less impactful in the bass.



**TOWNSHEND ROCK** 1979 £ N/A  
The product of academic research by the Cranfield Institute, this novel machine has an extremely clean and fluid sound. Substantially modified through the years, and capable of superb results even today.

**TRIO LO-7D** 1978 £600  
The best 'all-in-one' turntable package ever made, Trio/Kenwood threw their 'engineering best practice' book at this one with startling results. Clean, powerful and three-dimensional sound, ultimately limited by the tonearm.

**TONEARMS**  
**ACOS LUSTRE GST-1** 1975 £46  
The archetypal S-shaped seventies arm; good, propulsive and involving sound in its day, but ragged and undynamic now.

**AUDIO TECHNICA AT 1120** 1978 £75  
Fine finish can't compensate for this ultra low mass arm's limited sonics - a good starter arm if you've only got a few quid to spend.

**ALPHASON HR100S** 1981 £150  
First class arm, practically up to present-day standards. Buy carefully, though, as there is no service available now. Totally under priced when new, exceptional.



**SME 3009** 1959 £18  
Once state of the art, but long since bettered. Musical enough, but weak at frequency extremes and veiled in the midband. Legendary serviceability has made it a cult, used prices unjustifiably high.

**GRACE G707** 1974 £58  
This early Japanese example of the tonearm art has a smooth, lyrical sound. Imported by Linn, fitted to early LP12s. Sonically way off the pace now, though.

**REGA RB300** 1983 £88  
Inspired budget esoterica. Detailed, tight, neutral sound but tonally grey sounding in absolute terms. Responds well to tweaking, and its cheaper RB250 brother better still.



**SME SERIES III** 1979 £113  
Clever variable mass design complete with Titanium Nitride tube tried to be all things to all men, and failed. Charming nonetheless, with a warm and inoffensive sound.

**HADCOCK GH228** 1976 £46  
Evergreen unipivot with lovely sweet, fluid sound. Excellent service backup.



**LINN ITTOK LVII** 1978 £253  
Arguably the first 'superarm'; Japanese design to Linn specs made for a muscular, rhythmic sound with real dynamics. Now off the pace, but the final LVIII version worth seeking out.

**NAIM ARO** 1986 £875  
Truly endearing and charismatic performer - wonderfully engaging mid-band makes up for softened frequency extremes.



**TECHNICS EPA-501** 1979 £ N/A  
Popular partner for late seventies Technics motor units. Nice build and Titanium Nitride tube can't compensate for middling sound.

**INTEGRATED AMPLIFIERS/COMBOS**  
**DELTEC** 1987 £1900  
Fast, dry and with excellent transients, this first DPA integrated is the real deal for eighties obsessives. Ridiculously punchy 80W per channel from a tiny, half-size box. Radical, cool and more than a little strange.

**ROGERS A75** 1978 £220  
The prototypical Audiolab 8000a – lots of sensible facilities, a goodly power output and nice sound in one box. The later A75II and A100 versions offered improved sonics and were seriously sweet and open to listen to.

**EXPOSURE VII/VIII** 1985 £625  
Seminal mid-eighties Exposure pre-power, offering most of what rival Naim amps did with just that little bit extra smoothness and sweetness. Still, it's by no means 'sweet' by today's standards, being lean, punchy, musical. It's also possessed of that quintessentially eighties look – frumpy black steel boxes with rough silk screened logos!



**SUGDEN C51/P51** 1976 £130  
Soft sounding early Sugden combo with a plethora of facilities and filters, complete with seventies-tastic DIN socketry. A sweet and endearing performer as you'd expect, but lacking in power and poor load driving ability, so partner carefully.

**VTL MINIMAL/50W MONOBLOCK** 1985 £1,300  
Vacuum Tube Logic was one of the Europe's biggest tube names in the eighties, and it shows. Rugged, professional build and finish allied to a lively and punchy sound (albeit with limited power) make them an excellent used buy.

**A&R A60** 1977 £115  
Sweet and musical feature-packed integrated; the Audiolab 8000A used its blueprint to great effect.



**CREEK CAS4040** 1983 £150  
More musical than any budget amp before it; CAS4140 loses tone controls, gains grip.

**AUDIOLAB 8000A** 1985 £495  
Smooth integrated with clean MM/MC phono stage and huge feature count. Extremely reliable, too. Post '93 versions a top used buy.



**MCINTOSH MA6800** 1995 £3735  
Effortlessly sweet, strong and powerful with seminal styling to match.

**SUGDEN A21** 1969 £ N/A  
Class A transistor integrated with an eminently likeable smoothness and musicality. Limited inputs via DIN sockets.

**MISSION CYRUS 2** 1984 £299  
Classic eighties minimalism combines arresting styling with clean, open, lively sound. Further upgradeable with PSX power supply.



**MUSICAL FIDELITY AI** 1985 £350  
Beguiling Class A integrated with exquisite styling. Questionable reliability.



**NAIM NAIT** 1984 £350  
Superb rhythms and dynamics make it truly musical, but tonally monochromatic. Fine phono stage. very low power.

**NAD 3020** 1979 £69  
Brilliantly smooth, sweet and punchy at the price and even has a better phono stage than you'd expect. The archetypal budget super-amp.



**MYST TMA3** 1983 £300  
Madcap eighties minimalism, but a strong and tight performer all the same.

**ROGERS CADET III** 1965 £34  
Sweet sounding valve integrated. uses ECL86 output valves, even has a half useable phono stage. sweet, warm a good introduction to valves



**ROTEL RA-820BX** 1983 £139  
Lively and clean budget integrated that arguably started the move to minimalism.

**PREAMPLIFIERS**  
**AUDIOLAB 8000C** 1991 £499  
Tonally grey but fine phono input and great facilities make it an excellent general purpose tool.

**AUDIO RESEARCH SP-81982** £1,400  
Beautifully designed and built high end tube preamplifier with deliciously sweet and smooth sound. Not the last word in incision or grip, but that didn't matter to those who aspired to it.

**CONRAD JOHNSON**  
**MOTIV MC-8** 1986 £2,500  
Minimalist FET-based preamplifier from the Yank valve specialists is brilliantly neutral and smooth with a spry, light balance in the mould of Sugden high end stuff. Something of a curio, but worthwhile nonetheless.

**CROFT MICRO** 1986 £150  
Budget valve pre-amp with exceptionally transparent performance.

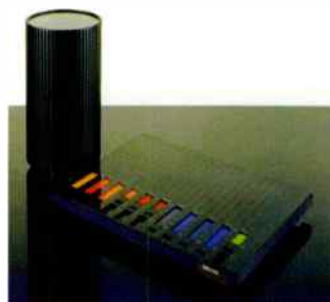
**LEAK POINT ONE STEREO** 1958 £ N/A

Good for their time, but way off the pace these days. Use of EF86 pentode valve for high gain rules out ultra performance. Not the highest-fi!

**LINN LK-1** 1986 £499  
A brave attempt by the Glasgow boys to bring remote controlled user-friendliness to hair-shirt audiophile hi-fi. Didn't quite work, but not half bad for under £100.

**NAIM NAC32.5** 1978 £ N/A  
The Salisbury company came of age with this, their classic high end pre. Brilliantly fast and incisive sound that's a joy with vinyl but a tad forward for digital.

**LECSON AC-1** 1973 £ N/A  
Amazing styling courtesy of Allan Boothroyd can't disguise its rather cloudy sound, but a design classic nonetheless.



**QUAD 22** 1958 £25  
The partner to the much vaunted Quad II monoblocs - cloudy and vague sound means it's for anacrophiles only.

**QUAD 33** 1968 £43  
Better than the 22, but Quad's first tranny pre isn't outstanding. Responds well to tweaking/ rebuilding though...

**POWER AMPLIFIERS**  
**LEAK STEREO 20** 1958 £31  
Excellent workaday classic valve amplifier with decent power and drive. Surprisingly modern sounding if rebuilt sympathetically. Irrepressibly musical and fluid.



**LECSON API** 1973 £ N/A  
Madcap cylindrical styling alluded to its 'tower of power' pretensions, but it wasn't. Poor build, but decently clean sounding when working.

**MARANTZ MODEL 9** 1997 £8000  
Authentic reproduction monoblocs still more than cut the sonic mustard. Highly expensive and highly sought after.

**MICHELL ALECTO** 1997 £1989  
Crisp, clean and beautifully controlled with gorgeous styling. Partnered with the £1650 Orca this sounds delicious!

**LEAK POINT ONE, TL10, TL12.1** 1949 £28  
Early classics that are getting expensive. Overhauling is de rigeur before use, using original parts if possible. Surprisingly crisp and musical sound, that's far more modern than Quad IIs. Deeply impressive when in fine fettle.



**MUSICAL FIDELITY XA200** 1996 £1000PR  
200W of sweet smooth transistor stomp in a grooved tube! Under-rated oddity.



**RADFORD STA25 RENAISSANCE** 1986 £977

At the time, very possibly the least cool amplifier on the planet – and we're not talking heat dissipation here. This reworking of Radford's original late sixties design was possessed of a wonderfully rich, old school valve sound with enough power (25WV) and lots of subtlety.



**QUAD II** 1952 £22  
The all-time classic valve amplifier, with a deliciously fluid and lyrical voice. In other respects though, it sounds hopelessly dated. Low power and hard to partner properly.



**QUAD 405** 1978 £115  
The first of the current dumpers is a capable design with smooth, effortless power and a decently musical sound. 606 and 707 continue the theme with greater detail and incision.

**QUAD 303** 1968 £55  
Bullet proof build, but woolly sound. Off the pace, but endearing nonetheless. Some pipe smoking slipper wearers swear by them!

**KRELL KMA100 II** 1987 £5,750  
Ludicrous monoblock version of the giant KSA-100 is one of the seminal eighties transistor power amplifiers. Massive wallop allied to a very clean and open Class A sound makes this one of the best amplifiers of its type, ever.

**PIONEER M-73** 1988 £1,200  
Monster stomp from this seminal Japanese power amplifier, complete with switchable Class A and Class B operation. Clean, open and assured sounding, albeit a tad behind the pace on high speed dance music. Rosewood side cheeks and black brushed aluminium completes the eighties-tastic experience.



**PHONO STAGES**

**CREEK OBH-8 SE** 1996 £180  
Punchy, rhythmic character with oodles of detail makes this a great budget audiophile classic. Partner with a Goldring G1042 for an unbeatable budget combination.



**LINN LINNK** 1984 £149  
Naim-designed MC phono stage built to partner the original Naim NAIT - yes, really! Fine sound, although off the pace these days.

**MICHELL ISO** 1988 £ N/A  
This Tom Evans-designed black box started the trend for high performance offboard phono stages. Charismatic, musical and punchy - if lacking in finesse.

**TUNERS**

**MARANTZ ST-8** 1978 £353  
Marantz's finest radio moment. Warm, organic sound plus an oscilloscope for checking the signal strength and multipath.



**CREEK CAS3140** 1985 £199  
Excellent detail, separation and dynamics - brilliantly musical at the price. T40 continued the theme...

**NAD 4040** 1979 £79  
Tremendously smooth and natural sound allied to low prices and good availability make this budget analogue esoterica. Needs a good antenna to work properly, however.

**NAIM NAT03** 1993 £595  
The warm, atmospheric sound is further proof of Naims proficiency with tuners.

**PIONEER TX-9500** 1976 £295  
Another of the serious classic solid-staters. Boasts the usual high end Jap package of fine sound, brilliant sensitivity and superb build.

**LEAK TROUGHLINE** 1956 £25  
Series I an interesting ornament but limited to 88-100MHz only. II and III are arguably the best-sounding tuners ever. Adaptation for stereo easy via phono multiplex socket. Fed by a modern outboard decoder they're deliciously lucid with true dimensionality.



**YAMAHA CT7000** 1977 £444  
Reputedly the best of the classic Jap analogues, this combines sleek ergonomics, high sensitivity and an explicit, detailed sound.

**QUAD FM4** 1983 £240  
Supreme ergonomics and styling allied to a pleasingly lyrical sound with plenty of sweetness and detail made this one of the best tuners around upon its launch.



**REVOX B760** 1975 £520  
More of a semi-pro machine than a domestic bit of kit, the Revox offers superlative measured performance although the sound isn't quite as staggering as the numbers. Fine nonetheless, and surely the most durable tuner here?

**NAD 4140** 1995 £199  
Brilliant affordable digital tuner has a smooth, detailed musical sound plus sensible real-world facilities.

**ROGERS T75** 1977 £125  
Superb mid-price British audiophile design, complete with understated black fascia. Fine sound in the true Rogers mould – smooth and sweet with fine dimensionality.

**SANSUITU-9900** 1976 £300  
A flagship Japanese tuner designed to steal sales from the likes of Accuphase and Revox, it boasts superlative RF performance and an extremely smooth and lucid sound, along with very fine build and finish.

**SONY ST-5950** 1977 £222  
One of the first Dolby FM-equipped tuners, a format that came to nought. Still, it was Sony's most expensive tuner to date, and boasted a very good sound quality allied to brilliant ergonomics.



**TECHNICS ST-8080** 1976 £180  
National Panasonic's specialist hi-fi brand was a big hitter back then, and this is no exception. Superb FM stage makes for a very clean and smooth listen with lots of detail and depth.

**ANALOGUE RECORDERS**

**YAMAHA TC-800GL 1977 £179**

Early classic with ski-slope styling courtesy of Mario Bellini. Middling sonics by modern standards, but cool nonetheless!



**AIWA XD-009 1989 £600**

Aiwa's Nak beater didn't, but it wasn't half bad nonetheless. Massive spec even included a 16x4 DAC!

**NAKAMICHI CR-7E 1987 £800**

The very best sounding Nakamichi ever - but lacks the visual drama of a Dragon.



**PIONEER CTF-950 1978 £400**

Not up to modern standards sonically, but a great symbol of the cassette deck art nonetheless.



**REVOX A77 1968 £145**

The first domestic open reel that the pros used at home. Superbly made, but sonically off the pace these days. B77 better, but couldn't match the Japanese.



**SONY WM-D6C 1985 £290**

Single capstan transport on a par with a Swiss watch, single rec/replay head better than most Naks. Result: sublime.



**DIGITAL RECORDERS**

**SONY MDS-JE55SE 2000 £900**

The best sounding MD deck ever, thanks to awesome build and heroic ATRAC-DSP Type R coding.



**PIONEER PDR-555RW 1999 £480**

For a moment, this was the CD recorder to have. Clean and detailed.

**MARANTZ DR-17 1999 £1100**

Probably the best sounding CD recorder made; built like a brick outhouse with a true audiophile sound and HDCD compatibility.



**KENWOOD DM-9090 1997 £500**

Serious and sophisticated sound thanks to well implemented ATRAC 4.5; surprisingly musical MD recorder.

**SONY TCD-8 DATMAN 1996 £599**

Super clean sound makes this an amazing portable, but fragile.

**LOUDSPEAKERS**

**ACOUSTIC RESEARCH**

**ARI8S 1978 £125**

Yank designed, British built loudspeaker became a budget staple for many rock fans, thanks to the great speed from the paper drivers, although finesse was most definitely not their forte...

**BBC LS3/5A 1972 £88**

Extremely low colouration design is amazing in some respects - articulation, stage depth, clarity - and useless in others (both frequency extremes). Came in wide variety of guises from various manufacturers building it under licence. Partner with Rogers AB1 subwoofers for an extra two octaves of bass!



**LOWTHER PM6A 1957 £18**

**EACH**

This seminal full-range driver is still manufactured. High sensitivity, as fitted to many classic horn designs.

**TANNOY WESTMINSTER 1985 £4500**

Folded horn monsters which certainly sound good if you have the space. Not the last word in tautness but can drive large rooms and image like few others.



**JR 149 1977 £120**

Infamous cylindrical speaker that was ignored for decades but now back in fashion! Based on classic KEF T27 / B110 combo as seen in the BBC LS3/5a. Doesn't play loud, needs a powerful transistor amplifier, but rewards with fine clarity in imaging.



**SPENDOR BC1 1976 £240**

Celestion HF1300 tweeter meets bespoke Spendor Bextrene mid-bass unit - and the result is a beautifully warm yet well focussed sound. A little bass bloom necessitates careful low-stand mounting, but these prove that the seventies did have some fine designs after all!

**QUAD ESL57 1956 £45 EACH**

Wonderfully open and neutral sound puts box loudspeakers to shame. Properly serviced they give superb midband performance, although frequency extremes less impressive. Ideally, use in stacked pairs or with subwoofers and supertweeters.



**KEF R105 1977 £785**

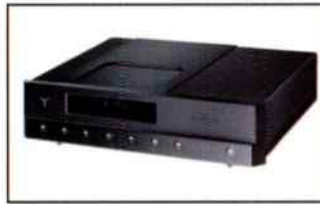
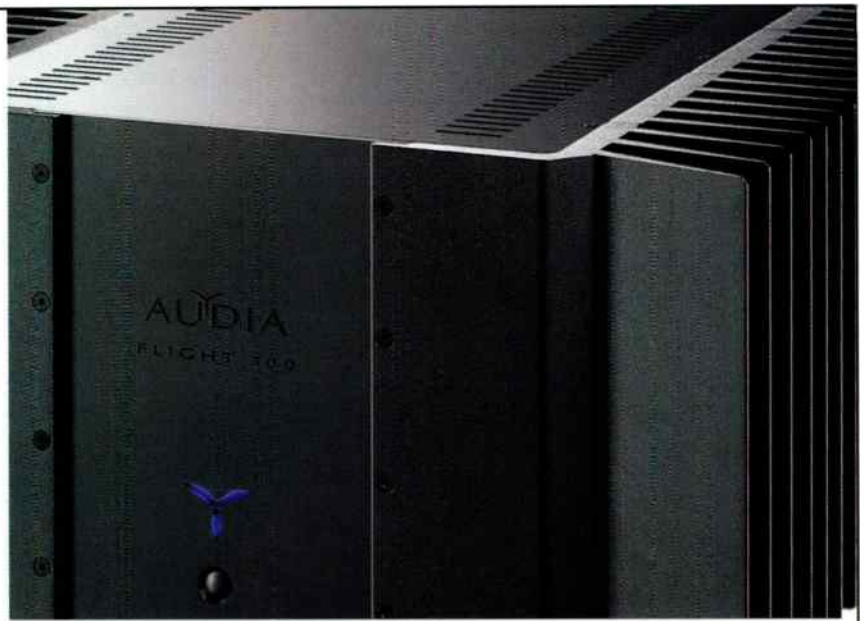
Three way Bextrene-based floorstander (complete with castors!) gave a truly wide-band listen and massive (500W) power handling. A very neutral, spacious and polite sounding design, but rhythmically well off the pace. The quintessential nineteen seventies loudspeaker.

**IMF TLS80 1976 £550**

Warm and powerful nineteen seventies behemoth with transmission loading and a mixture of KEF and Celestion drive units. Impressively physical wideband sound but rhythms aren't its forte.

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

**AUDIA**



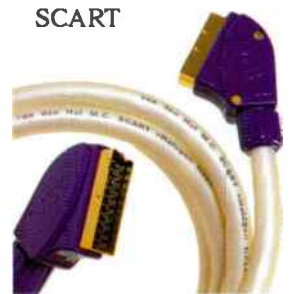
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**MAGNEPLANAR SMGA198X £800**  
 Technological loudspeaker with genuinely musical abilities; fast, smooth, open, dry.



**MISSION 770 1980 £375**  
 Back in its day, it was an innovative product and one of the first of the polypropylene designs. warm, smooth, clean and powerful sound.



**MISSION 752 1995 £495**  
 Cracking Henry Azima-designed floorstanders combined HDA drive units and metal dome tweeters with surprisingly warm results. Benign load characteristics makes them great for valves.

**HEYBROOK HBI 1982 £130**  
 Peter Comeau-designed standmounters with an amazingly lyrical yet decently refined sound. Good enough to partner with very high end ancillaries, yet great with budget kit

too. A classic.  
**CELESTION SL6 1984 £350**  
 Smallish two way design complete with aluminium dome tweeter and plastic mid-bass unit set the blueprint for nineteen eighties loudspeakers. Very open and clean sounding, albeit course at high frequencies and limp in the bass. Speakers would never be the same again...



**LEAK SANDWICH 1961 £39 EACH**  
 Warm sounding infinite baffle that, with a reasonably powerful amplifier can sound quite satisfying.



**QUAD ESL63 1980 £1200**  
 An update of the ESL57, with stiffer cabinets. Until the 989, the best of the Quad electrostatics.



**YAMAHA NS1000 1977 £532**  
 High tech Beryllium midband and tweeter domes and brutish 12" woofers in massive sealed mirror image cabs equals stunning transients, speed and wallop allied to superb transparency and ultra low distortion. Partner carefully!



**MISSION X-SPACE 1999 £499**  
 The first mass production sub and sat system using NXT panels is a sure-fire future classic - not flawless, but a tantalisingly unboxy sound nevertheless!



## One Decent Wallshelf

*Thoroughly Recommended - David Price, Hi-Fi World Jan 06*

**featuring:**  
 steel frame with multipoint fixing  
 upto 25mm thick 1/2 metre acrylic isolation platform  
 tuning pack for system matching  
**available:**  
 hdw - £129  
 odw (pictured) - £249  
 odwt (2 shelf) - £349  
 all in either silver or black



Wallshelves, Isolation Platforms, Digital Tracking force scales, Interconnects and Tonearm cables - Decent Audio 0845 6019390

# kit & component suppliers

## COMPONENT SUPPLIERS

### Audio Synthesis

PO Box 50 Nottingham, NG9 1DX.  
Tel. 01159 224138 Fax. 01159 229701. Email  
salesinfo@audiosynthesis.co.uk. Website  
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VISHAY BULK FOIL RESISTORS - unquestionably the world's finest resistor for audio applications. Thousands of VSRJ 0.3W 300V 5ppm 1% values in stock at the lowest possible prices eg. values up to 20K at £3.50+vat.

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### Audio-Links

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Suppliers of a selected range of audiophile valve kits and components. Including the Stoetkit range of valve amplifiers, Audio Note one times oversampling Dac Kit 1.1 and Lowther drive units. Plus a range of components and accessories from Eichmann, Furutech, Wonder Solder, Caig and many more. For a list of the extensive range of manufactured products and the special offers we stock please see our website or call for details. We are open from 9.30 to 5.30 Tuesday to Saturday, with demonstration stock of our kits available - please call in advance to book an audition.

### White Noise

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Tel: 0141 942 2460  
Fax: 0141 587 7377

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## Letter of the Month

### DOME ALONE

I have wasted enough hours building speakers with dome midrange drivers to glean some insight into these devices. I have also owned speakers with dome mids such as the Celestion 551. I have built speakers using Dynaudio, Cabasse and other less well known dome mids.

These things are very good at spreading the sound but quite poor at focusing it into a meaningful sonic picture. Voices, for example, are very hard to locate within the soundstage and tend to sound too big. You end up shifting your head from side to side, trying to get a meaningful image.

A friend with two pairs of Yamaha NS1200 speakers [similar to the NS1000], has replaced the impressive looking alnico magnet dome mids in these with Fostex cone drivers and the imaging has been vastly improved. This poor imaging must be a function of the dispersion pattern because when Dynaudio D54s are used in an Edgar mid horn they image quite precisely. It is also interesting to note that manufacturers such as Focal and Accuton are using cone tweeters. Many others are using ring radiators or ribbons rather than dome tweeters.

Recent praise for digital type amps does not surprise me. I have heard some of these including the Bel Canto, Sonic Impact and Nu-Force [described as analogue]. I suspect that these things sound pretty good however not because they have some new fangled circuitry but because they simply don't use transistors.

There is nothing new in this however. I own an Optonica SMS200 integrated amp that must be twenty five years old. It uses a single STK46-6 amplifier chip, a fair sized transformer, and not much else. This thing never fails to shock hardened audiophiles who hear it. It sounds pretty similar to the best of these digital type amps, but with a good deal more valve type organic clarity. I have never heard a transistor amp that sounds better than it, and it takes a seriously good valve pre-power

combination [like Supratek] to beat it. Like valve amps however, it sounds best with easy to drive efficient speakers.

**Jon Thompson.**  
**Western Australia**

Your observations about midrange dome image muddle are new to me, Jon, and interesting. I am a little sceptical though. Here is why. To date I have found mid-domes to sound very open, and to project a sharply defined sound stage. This is their main attraction subjectively, yet it seems at odds with your experiences. But domes also exhibit wide dispersion, so more sound gets bounced off sidewalls. In a hard walled, reflective environment more energy would return to the listener from these boundaries and you would hear more muddle than a cone unit. This could explain why a cone will sound better in some circumstances. The fact that you are moving your head suggests you are receiving reflections, if not off sidewalls, then a rear wall, or even the ceiling.

As a reviewer, my rooms have damped boundaries to kill reflections, so mid domes would not introduce the reflective muddle you are hearing. So perhaps domes are worse in normal living rooms. Its an interesting point.

David Price, our Editor, swears by his Yamaha NS1000Ms, as everyone knows, so he seems unperturbed by the problems you describe, as do others who praise

this loudspeaker.

There is an argument that we would be better served by listening to loudspeakers with narrow forward dispersion, to reduce the sound directed at walls and ceiling. Its an interesting point, one few have yet experimented with in hi-fi.

The problem with domes, as I understand it, is that to go low enough to cross over at a reasonably long wavelength to



**A midrange dome does it for DP!**

avoid phase problems, the dome must be reasonably big, and then it starts to fail above 6kHz or so, meaning a tweeter must be used. Also, early break-up often causes large domes to sound hard and

edgy when pushed to produce high sound levels. These days, simpler and less expensive two-ways do a good enough job. **NK**

Ho hum Jon; I think you're describing the problems of getting dome mids to work in rooms, rather than any inherent problems with dome mids. In my experience, they image well, and – crucially – they're phase-coherent with the tweeter, so they behave very similarly with every excursion. By this, I mean that with every musical transient, you don't get differing acceleration rates, or if you do, they're much more consistent in their differences. This makes perfect sense to me. One problem though, as Noel rightly points out, the dome needs to be big, which obviously means a large front baffle (as per every seventies speaker!), which in itself causes 'issues' with imaging. As for your Optonica amp, I am intrigued (and not a little surprised). That range of separates from Sharp (1978-79) was a fine one, with some great turntables (see pic) and cassette decks too. Still I wouldn't bet an NS1000 crossover component (let alone its dome mid) on the matching amplifiers being brilliant, all the same, as Jap transistor fare from that age was mostly very 'grey' sounding. Each unto their own! **DP**

### LIFE IN THE LOFT

*I want to build a nice old fashioned hi-fi system in my loft/office based around Wharfedale's little Diamond 8. Is But here's the rub, the wife's left me with very limited resources to play with and I was hoping you might be able to help me by suggesting appropriate partnering equipment?*

*I'm looking for a turntable, amplifier, CD player, cassette deck and tuner to go with the Diamonds to achieve the best sound I can in a difficult room! The space is quite small with a low triangulated ceiling forming three sides of a pyramid. The speakers will be wall mounted on the fourth side which is a vertical flat brick wall. The Diamonds seemed to be the easiest solution to accommodate in the circumstances given their diminutive size, shallow cabinet, suitability for wall mounting and apparent sonic potential! As mentioned, I'm operating on a very tight budget so lowest cost is a major consideration but to balance this I'd be more than happy to seek out second-hand items.*

*Firstly the turntable. I'm not sure whether to play safe and buy a second-hand Dual or reach for the stars with something a little more risky [and ancient!] like a Thorens TD150 mk2? I'm an avid reader of your 'olde worlde'*

*reviews section having dabbled with hi-fi on and off for more than 25 years and I have to say the tweakability of the latter is something that appeals but I'd be interested in your thoughts and or suggestions for other alternatives I might consider.*

*Regarding the amplifier, I'm really struggling here! Given the speakers are ported and I'm looking for a vinyl source I'll presumably need to ensure the amplifier has a phono stage with warp filtering to avoid 'cone flap'. I was thinking of perhaps a second hand Marantz PM66 SE or similar but I'm not sure how well this would match*

*Diamonds I'd like to capture a flavour of the same propulsive, rhythmic and organic quality I fondly remember [before the Nytechs went pop, the Xerxes armboard terminally sagged and the Sara's were attacked by a toddler!].*

*The cassette deck should be easy, people can't seem to give them away at the moment and I thought I might pick up a nice two head Nakamichi for less than £100 - a BX125 or something similar.*

*On the tuner front I'm torn between the safe convenience of something like a Denon 260 mk2 with RDS or looking out for a late 70's Japanese behemoth*



**Goldring GR2: top tackle for paupers.**

*the Diamonds. It's really difficult to find information on such details as warp filtering on phono stages [come to think of it I've only ever heard it mentioned in Hi-Fi World]! Suggestions please?*

*I thought I might stick to a Marantz CD player, possibly a CDS2SE if I can find a nice one. I don't want anything too harsh or brittle sounding but I'm looking for a bouncy rhythmic sound that really boogies! My brother's had a number of mid price CD players over the years and I always thought his Marantz sounded by far the best [I think it was an early CD65 or something similar!].*

*To give you some idea of the sound I'm looking for, back in my carefree youth I had a pair of Linn Sara's fed by a Roksan Xerxes and Nytech tuner/pre and power amp and while I know I'm never going to emulate that sound with*

*analogue jobby which might be infinitely more fun and sound better into the bargain.*

*Any pearls of wisdom on the best way to make my Diamonds sing on a shoestring budget would be very gratefully received. Keep up the good work, especially on the Olde Worlde front for the sake of impoverished hi-fi enthusiasts everywhere!*

**'CS'**

*No need to spend serious money either CS. You'll get a clean, crisp presentation from a Cambridge Audio 540A - and the good news is it will set you back just £200. The optional phono stage will raise that a little, but it comes with a warp filter, so you are home and dry on this one.*

*Wharfedale Diamonds will work nicely when placed close to a rear*



**NAD 521BEE - tasty budget CD spinner.**

wall, or even on it. Imaging loses its sharpness in this position and the stage will not seem to hang in the room, but you must expect some compromises. Linn Saras had a large KEF B200 bass/mid unit, and a good kick behind them as a result. I suspect you will find the Diamonds less weighty, and their excellent imaging will be compromised by wall mounting. Spare a thought for the new KEF iQ5s tested in this issue. They are meant for use in smaller rooms, working close to a wall and may get you closer to the Saras in terms of drive.

On the LP front I feel your

can assure you, and plenty dynamic enough too.

If you can get a Nakamichi at an attractive price - and I see an almost new DR-1 on ebay for \$260 - then do so if you have a cassette collection. This is a recent twin-capstan, three-head model - and that is what you should go for. Top dog was a CR-7E; the Dragon was fascinating but did not sound quite so clean and forceful. I have a ZX-9 carefully stored away and a ZX-7 does a great job.

On the tuner front: KISS - Keep It Simple Stupid! Buy a Denon TU-260MkII, then climb out of your loft

speakers are biwired band run under the carpet.

I am in the market for an upgrade for my system, and my better half would like me to buy a Cyrus system because of how small the system looks and they make a nice racking system for it, so that it looks neat and tidy. I would probably get a Cyrus CD8 with PSX-R upgrade with an X power amp and preamp. Or should I get the Cyrus CD8 and the Cyrus 8 amplifier, both with the power supply upgrades. Is the X power worth the worth the extra money?

Now this is the other big problem, she hates the size and the looks of the Linn speakers, I got her to like some Sonus Faber Crematorium [sic] Auditors speakers, but she did not like the stands and she fell over at the price - for that matter so did I. She would like some small Bose speakers, but this is not going to be an option, my foot is firmly on the ground about that. So do you have any ideas about speakers? I fancy some large Monitor Audio GR60s, but at the price would Revolver R45 be a good compromise? I am also not worried about buying second-hand.

The other option I need your help with is - are there other systems I can have which are small like the Cyrus and can go nicely on a rack? May be a new AVI system?

I mainly listen to prog rock and jazz with a bit of classical and dance thrown in.

Please help me sort out my better half, she just does not get beautiful sounding hi-fi; I say listen to the car CD player, then listen to my hi-fi and she can tell it sounds better, but she does not like the size of high end hi-fi and all the cables, and she thinks it is not worth the money with diminishing returns for your money the more the hi-fi costs.

**Graham Burnett**

Hi Graham - surely you mean Cremona Auditors! I somehow don't think your cause will be advanced by asking your other half to listen to Crematoriums - she'll find their sound too dead. But as you rightly feel, that's no reason to choose Bose, who aren't really in the same market, shall we say...?

As you already have a REL subwoofer, surely you just need a good small one like KEF's iQ1 or iQ3, or even expensive XQ1. All of these - especially the XQ1 - are subjectively shiny, but fast, focussed and furious.

Monitor Audio have an increasingly wide and respected range that are in some respects the spiritual successors to Saras. They don't sound the same, but Lin fans usually like their clean, firm presentation, one that is unquestionably entertaining - and they have the



**Cambridge Azur 640A - superb sound per pound.**

budgetary constraints are best met in the long term by a modern deck fitted with Rega RB250 arm and Goldring cartridge, so get a Goldring GR2 fitted with Goldring 1012GX cartridge. The Gyger profile will give wonderfully separated treble, instead of the smudge that issues forth from other budget cartridges. And Goldring's Pocan body is rigid enough and sufficiently well damped to support pleasingly firm bass. In the forever excellent Rega arm you will get a fine, bang up-to-date sound for little more than two hundred and fifty notes. I would leave DIY until later and I am by no means convinced older means better, even though I choose to use a Garrard 401, SME312 and Leak Troughline working through valve amps. Ironically, LP replay has improved more markedly than CD over the last decade, so purchasing new makes sense.

Marantz CD players tend toward fast and sharp, albeit clean and clear. Your taste, as you state it, might be best served by an NAD 521BEE. If you can try and listen to it alongside a Marantz of your choice, and also consider a Cambridge 640C v2. Should your budget develop a little elasticity after negotiations with the missus, take a naughty peep at a Shanling CD-T80. Your wife is likely to like this one and you can re-value it and re-IC it later on to satisfy your DIY interest. Its a cracking player, I

window and put up the biggest VHF/FM aerial array you can manage - or better, get an aerial installer to do it, as you've got enough to do without learning to fly. **NK**

Hi 'CS' - Noel's answer is spot on if it's new kit you want. This is the easiest and safest route, as it's all guaranteed and in perfect condition. However, if you want even better sound for less money, you'll have to buy second-hand. There are myriad possibilities, but here's what I'd come up with for around £350 (as always, go for mint, boxed examples with one owner if possible): The turntable should be a secondhand Rega Planar 3 (£90) with new Goldring 1006 (£40). The amp should be a Mission Cyrus 2 (£100). CD player should be Marantz's CD52SE (£70). Cassette deck should be a Nakamichi 480z (£80 - but prepare to get it serviced by Bowers & Wilkins sooner rather than later). Tuner should be a NAD4020 (£30). **DP**

### **WOMAN TROUBLE**

*I have woman trouble with my hi-fi! She wants small equipment and small wall mounted speakers that look sexy. I do not mind having small equipment as long as it sounds good. I have at the moment a Marantz CD17 Mk2 KI Signature, AVI s2000m integrated amp, Linn Sara speakers, REL Q150e sub, Audioquest Quart x3 Hyperlitz cable for the CD-amp connection, and the*

Radius range which was designed to look good yet be unobtrusive. Er, yes, GR60s will undoubtedly get you to where you want to go, but don't blame me if your other decides shed rather be somewhere else...

Cyrus products do fit into the home beautifully and they are lovely to use, with full remote control and that lovely start up sequence. Funnily, I find racking these products into one large monolith at odds with the basic design idiom, that of a compact, unobtrusive yet solidly built gem. I see them neatly lined up on a thick glass wall shelf, supported by aluminium struts or similar. B&Q make super strong brackets for kitchen shelves that must support the weight of pots-and-pans; you might like to check these out. Why not get Cyrus off the floor and onto a solid wall, looking good, with a small clip-on spotlight perhaps. I think this would please your other - and it will also free up floor space. You will need PSX-R - it makes quite an appreciable difference. This little lot should put you in heaven, not the crematorium.

**NK**

### WORLD PATTERNS

*I really enjoy your magazine and consider it the most interesting and relevant publication on hi-fi. I do have one minor gripe about the presentation which is sometimes very difficult to read if, like me, you have less than perfect eyesight. In particular, the December issue has some text written on a coloured and patterned background which is attractive but is very hard work to read. Is this a ploy to ensure we concentrate on the editorial wisdom of your regular writers who's text is printed in no nonsense black and white?*

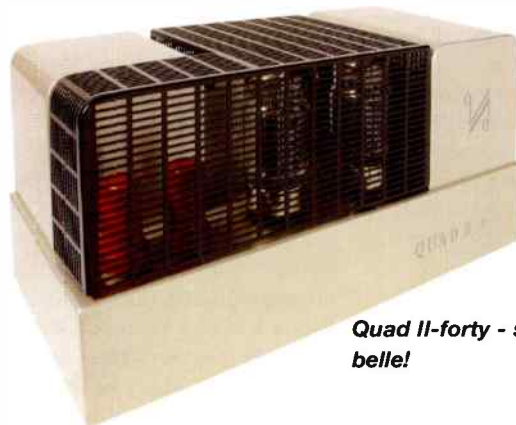
*I really value the emphasis on sound quality and the continued interest in a variety of equipment, especially valves and vinyl. I use a Townshend Rock Mk2 and Audionote ANE speakers and hope to have a valve amp soon to replace my Roksan Caspian. Please let me know if you have any suggestions here?*

**Mark Armitage**



**Sonus Faber Cremona  
Auditors shall never rest in  
peace...**

I must apologise for our enthusiasm for placing type over patterns. The best excuse I can make is that its legible on an RGB screen, but not as ink on paper. But we should have foreseen this problem. I now keep a close eye on everything to



**Quad II-forty - sublime tubular  
belle!**

ensure it does not happen again. Your complaints have been noted and taken to heart.

Valve amps are steadily becoming more numerous. The Chinese in particular are keen fans, as anyone visiting Hong Kong will see, and so we are getting increasing numbers of affordable designs from the People's Republic. Shanling make some fine examples, as do Audio Research from the States, but my money is on the Quad II-forty KT88 equipped power amp, in conjunction with the QC-twenty four preamp. This is one of the best, with thermionic rectification from 5U4Gs (no bridge rectifiers here), superb output transformers and Peter Walker's patented cathode feedback scheme. KT88s always did sound nice - fast, clean and open - but in this amp they're given full reign and sound extraordinary; EL34s and 6550s are revealed as flawed by comparison. Although I have my heart's desire in amplifiers, I am still thinking of buying this set up. It's a bit like having a top Nakamichi - there's nothing to compare. It appears to be in your price range, and certainly in your quality niche. You can't not give this amplifier a listen. I guarantee it will bring a smile to your face. **NK**

### SIZE MATTERS

*Interesting debate about the relative merits of modern and vintage loudspeakers! I am hoping that when you revamp World Classics you will find space to mention the legendary Spondor SP2. I recently used a pair of PMC TB2s, and excellent though they were, they did not persuade me to replace my Spondor*

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### Lounging around affects your sound...

SP2s. Taking the cost of new against second-hand into account, I would recommend these veterans without hesitation.

Excellent editorial in the November issue, and taking Noel's point about room size into consideration you could actually push the point. The size, shape, and acoustical properties of the listening room are a vital to synergy. Unfortunately, this does not make for headline news. But over the years I have come to believe the room is almost as important as the equipment for real musical pleasure.

**Mark Ralph.**

Obviously, I couldn't agree more. The more time (and money) I spend on room treatment the more I find it to be crucial. The sound of our systems is heavily mediated by the room; if a room sounds bad, because of amplitude distorted, time delayed reflections for example, then that's how the hi-fi sounds. It can't fight its way through this crud and listening becomes tiresome as the brain fights to interpret what it is hearing.

I find that as a raw room is progressively treated, what the hi-fi is doing becomes steadily more obvious and, in most cases, increasingly impressive. Most hi-fi sounds better than we know in other words! As a reviewer I must listen to the system, not the room, but at the same time I find an acoustically balanced room is a comfortable place to be too.

You don't have to surround yourself with egg boxes either! Bookcases in corners act as bass absorbers I find (get Billies from Ikea and fill them with Hi-Fi World). Treat yourself to a luxuriously thick carpet from John Lewis and get only the thickest, heaviest lined curtains, covering a lot of wall and window. The foam within large settees also absorbs bass and can totally suppress room boom I have found. Check out DFS here and treat yourself. The missus may well think you've suddenly become domesticated; no need to reveal the real agenda! You end up with total relaxation and happiness all round. NK

### ONE LAST THING

My stacked Quad ESL57s want some replacement treble panels in the near

future. You had a review some time last year about a version of the 57s by One Thing Audio. Would you advise me which replacement panels to get: the German "Quad Musikwiedergabe" ones which are made to original spec or the "One Thing Audio" ones? And could I combine them temporarily as one pair had a



**One Thing Audio Quad ESL57 - one of the best loudspeakers DP has ever heard...**

Quad service just before they went bust and still sound great?

**Fred Schuetz  
Llanelli, S. Wales**

Hi Fred. We have not tested the German Quad panels so cannot pronounce on them directly. If you want to keep the ESL57s original then they would seem the best choice. The One Thing panels are greatly improved and have an extraordinary measured performance, so if you favour performance over originality they would seem like the best choice. As you have stacked Quads I suspect you want the best possible, which would seem to bias you toward One Thing. It was David who reviewed these and he found them extraordinary, as top electrostatics can be. NK

Absolutely; I never really took to the original 57s, as I found them too compromised (albeit a beautiful design), but the One Thing Audio rebuilt speakers were stunning. I can still remember their sound now (on the end of an Audio Research VSi55) and I was gobsmacked by their speed and intimacy, not to

mention bass that puts modern 989s to shame. In fact, almost every aspect of their performance was wonderful. Wonderful stuff; I'd recommend them without a moment's hesitation. DP

### GO FOR GOLD

I would like your suggestions for an upgrade of my current speakers. I have been upgrading my system over the last 3 years and now almost exclusively play vinyl - my CD player being virtually redundant. My system is made up of a Michell GyroDec SE with HR PSU, TecnoArm A, Music Maker III running through a Naim Nait 5 and Stageline both powered by a Flatcap 2. This system has evolved through many guises

from a Rega P3 and Brio. With the original set up I had purchased B&W 602 S3s on B&W stands and now I feel its time to upgrade these to something



**Howard's way - carbon fibre cones for a deep, dark sound.**

with more refinement. My system is now set up in a reasonably large room (7m x 5m) and I am now perhaps thinking that I should be using floorstanders.

My music tastes are late nineteen seventies to present day Rock, reggae and Nu Jazz. As you can imagine the recording and production quality of my musical tastes varies considerably. The potential budget ranges from £1,000 to £2,000 maximum, and I am looking for speakers that will provide me with a bright sound, rhythm and pace - and very deep bass. I have been wondering about the B&W 703s, but these are at the upper reaches of my budget so I would appreciate your opinion on my options, and for that matter any areas of upgrading you would recommend in my current set up.

**Anton Galowski**

Monitor Audio Gold Reference 10s or 20s may well suit; they are fine

overly sycophantic - at least not at this stage!

My current system is essentially a work in progress and comprises a mixture of budget and mid-price to low 'high end' equipment, with some obvious imbalances and weaknesses which I would like to eliminate. The vinyl end is Origin Live Aurora Gold with Encounter tone arm, Goldring Elite MC cartridge, Dino/Dino+ phono stage and DNM interconnects. CD is Ah! Njoe Tjobe Reference player with Cable Talk Monitor interconnects.

The amp is an Icon Audio Stereo 40 integrated. I cannot fault my amp in terms of sound per pound. It has a mixture of Siemens/Mullard input tubes and Mullard power tubes and is connected to Tannoy 611 MkII speakers (which I have been looking to change for years) by Chord Odyssey 2 speaker cable. As you can probably tell I have been taking note of at least some of

hearing what a wonderful system the editor has (if I knew where DP lived I would immediately engage the services of his local Rent-a-Burglar franchise!). While I am impressed by his obvious breadth of knowledge I am curious to know what a beguiling cartridge does (wink at you coquettishly, entice you into an alleyway and show you its cantilever, perhaps?). Keep up the good work and stay independent.

**Ian McDade**

If it did that, David would marry it!

I think your trouble revolves around the Goldring Elite moving coil and - perhaps - the Trichord Dino. MCs can sound flat and disappointing when not quite right; the Ortofon MC25FL is another example. You need to move up the quality scale to really appreciate what a good MC can do and I always felt the Ortofon Supreme range was the absolute minimum quality/price wise. David will have other suggestions here. I currently use an Ortofon Kontrapunkt b and can confirm it is an awesome experience. In conjunction with the equally tidy and precise Cyrus Phono X with PSX-R it easily outran CD, whilst at the same time giving an intriguingly similar sense of control and accuracy. LP at this level is a jaw-dropping, breathtaking experience though, one few people have sadly experienced - especially in the hi-fi business where things that aren't obviously commercial are to be avoided. So I would encourage you to take one little step further and get blown away. You too may end up dreaming of long cantilevers and naked diamonds... **NK**



**Cyrus PSX R - a brilliant way to get the best out of Cyrus separates.**

for Rock and have good bass. And they are not dull, shall we say. On the softer side is the massive Castle Howard, which has tremendous bass in a reasonably large room. I greatly respect them, even for Rock, but not everybody gets it. The Howard uses carbon fibre cone drive units that are clean and controlled in what they do, lacking the zing of metal, making their dark, neutral sound less immediately appealing but easier over long listening periods. Or finally don't forget the KEF Reference series. They are quite bright but have good bass too. **NK**

### MOJO RISING

I'm looking for some advice on upgrading my system - a process which has been going on in theory for some time but which, in actual practice, is determined by availability of funds, lack of auditioning opportunities and sheer indecision. I have been a subscriber to your mag for a couple of years now and look forward to each issue with anticipation. However, unlike some contributors, I do not intend to become

your recommendations.

The turntable is on a Target wall shelf and the rest on an old Target 4 shelf stand. I am rather restricted in space and siting is a problem with two doors on one wall of my listening room, which effectively reduces the actual listening area, the room being a thoroughfare between the kitchen and the rest of the house. Room size is 13ft 6" x 13ft x 9ft 6" and I am looking for upgrade recommendations in the short term for the cartridge, interconnects and speakers, preferably floorstanders for efficiency's sake as I use the amp exclusively in triode mode, which do not mind close to wall siting and which will reduce the somewhat boomy bass I occasionally have to endure.

In the long term I am open to suggestions bearing in mind that I'm not over keen on telephone number price tags but neither am I miserly. At present (to my ageing ears) the CD side (£900) is beating the vinyl side (£2,500) by a short head which surely can't be right?

Overall, I am a fan of your publication and think it the best in the market but am getting a bit tired of

So when do you intend to become 'overtly sycophantic', you big tease, you? As for my definition of 'a beguiling cartridge', well it would start the evening to the strains of Barry White and the Love Unlimited Orchestra, proffer some chocolates and small talk, crack open a bottle of Krug from the chiller, dim the lights down low and... Ermm no, what I mean is that it should seduce the listener, appeal to his (or her) heartstrings rather than their preconceptions about what hi-fi should sound like.

I hate to say this, but I don't think CD is truly able to beguile (because of its coding system), but vinyl - at its best - is. It shouldn't assault the senses (it should be able to make even the hard Teutonic strains of Kraftwerk's 'Musique Non Stop' sound as soft and sweet as side A of 'Victorialand' by The Cocteau Twins), yet should never be less than musically enrapturing. Not many of



*Leak Delta 30 - a great new face for Sonic Impact's frumpy looking T-Amp...*



these around, I'm afraid, but Koetsus, Supexes and Dynavectors seem particularly adept at 'getting their mojo working'.

As for your system's predicament, I'd agree with Noel completely. The Goldring Excel is about as sexy as a gas bill on a damp doormat, and not anything to get excited about. Indeed, I'm pretty sure it's holding the turntable back big time. Again, Noel's quite right to say you've got to spend a bit on an MC to get real results. Ortofon's Rondo Bronze (£500) is about the cheapest serious MC I've heard; it's not as romantic as the aforementioned Koetsus et al (which are surely the vinyl equivalents of Bryan Ferry in a tux), but has charisma and a certain endearing enthusiasm for the job in hand. It's not seductive or beguiling, but it's certainly fun. **DP**

### THE BODY BEAUTIFUL

*Thank you so much for the article on rehousing the Sonic Impact T Amp. It has given me ideas! I have an old Leak Delta 30 amplifier which wasn't very good in its day and by today's standards is frankly awful. It has been under the stairs for thirty years, but I have never been willing to throw it away because I love the look of it. Teak casework, thick aluminium fascia, nineteen seventies beige and chrome knobs, retro styling at its most individual and not out of place in modern decor. It was a simple job to remove its innards, a little bit of work on the sockets at the back and on the volume pot, and there is plenty of space in there for the T-Amp chip to breathe if it needs it. None of the switches and knobs on the fascia work now, but it looks good and sounds remarkable. Argue with that and stay trendy...*

*Visitors who aren't in the know are amazed; I get comments like, "I didn't think those old amps were any good, but that sounds incredible". When I ask them to feel the weight they are even more astonished; it appears to be empty casework. The possibilities are endless. I am almost afraid to tell you about this*

*for fear of pushing up the price of old tat on ebay.*

*On a more serious note, is the reason the Sonic Impact T-Amp is not readily available in this country because the hi-fi trade are frightened by the implications of such cost effective technology? Hi-fi World is the only magazine to publicise it. Even allowing for the limitations of Class D amps, this is so obviously the technology of the future surely we will have to 'lie back and enjoy' it. It has happened before with the introduction of CD. Here we go again!*

**Phil Jesson**

Well, steady on there Phil! I do think the T-Amp is special, and interesting, and fun to play with, and if you happen to be a whiz with power supplies and have very efficient speakers, it really is a gem, but I don't think it's going to transform the hi-fi world as we know it, not least because it's a hobbyist thing, and your average Joe in the High Street wants something a little more, shall we say, 'accessible'. I think you're half right about Class D digital amplification; done right it offers stunning value for money, but don't think that because it's digital and seems immune from so many Class A or B bugbears, it's perfect. As you know, we've made

a big song and dance about the TacT/Lyngdorf Audio amps this year, and rightly so, because they really do sound special. But still there are problems; Sugden's humble A2.1a is musical in a sense that the Lyngdorf SDA12175 isn't; one is brilliantly accurate and powerful, dimensional and svelte sounding, the other one is unremittingly funky. Still, I think Class D is going to transform budget amplification, while the high end will stay with Class A and/or valves. In a sense, it's Class A/B and B amps that have their cards marked. I'd love to see your Class D Leak Delta 30 – that would be fun – so please do send us lots of pics. **DP**

### LOSS LEAD-ER!

*I read with excitement and glee, John May's description and findings of the Shanling CD-T80 CD player in last month's HFW. I have been using a CD-T80 for about five months and I agreed with every word Mr May had written. However, I have to admit that I feel a little cheated. I did not receive such an elaborate mains cable as the one described by Mr May. In fact, the one included with my CD-T80 was of typical giveaway fare. I contacted Real Hi-Fi immediately who informed me that some batches of players had the good cables with them and some just a bog standard one.*

*I did feel very sympathetic towards the gentleman on the other end of the phone, as it would appear that his supplier's lack of continuity has placed him in a bit of a predicament. Unfortunately, he did not have one of the better mains leads to give me. Whilst I am in possession of an excellent CD player I cannot help wondering if it could be even better with the mains cable that was supplied with your review sample. I was wondering if anyone out there in hi-fi land is experiencing the same? I call upon Shanling to compensate myself and people in the same position with the better mains*



**Shanling CD-T80 CD player responds handsomely to tube rolling!**

cable. This would appease anyone who has read last months fabulous review and would allow them to know that they have exactly the same CD player in their systems as the one John May used in his.

**Anon.**

Well, we in the biz know what a lovely bloke Real Hi-Fi's (i.e. Shanling's UK importer) Matthew Jameson is – so (considering that the last Hi-Fi World campaign to get Denon to import their DPI300 direct drive turntable bombed) I think it's time to nominate another 'good cause'; namely to get this guy a decent bit of wire. Yes, readers, doesn't this modest Shanling buying man (one who was too shy to even sign his name), a decent man, a good man, a man who's decent and good enough to buy the more than decent and good Shanling CD-T80, deserve something better than the piece of string he currently has? We say so, and we hope Matthew thinks so too! If any readers agree, please send emails to HYPERLINK "mailto:editorial@hi-fiworld.co.uk" editorial@hi-fiworld.co.uk with 'go on Matthew, give him a posh lead' in the subject line and they'll duly be forwarded. **DP**

I had a quick listen to this special lead against a standard one and differences weren't vast in our system.. It seemed to clean and smooth the sound a little and improve focus slightly. But in the overall scheme of things I would not worry too much. Both John May and I liked the Shanling CD-T80 enough to feel it would benefit from tuning, hence this month's article on different valves for it (see p52). **NK**

**DISH OF THE DAY**

Unfortunately, due to the busy life that me and the missus lead, I usually do most of my listening whilst doing the dishes and she baths the kids. She often

complains that it takes me hours to do them as I'm a vinyl fan and each side of an album is over before you know it. Most of my time is wasted selecting the next album before resuming with the task. Drying the dishes is the best part as I can walk into the music room whilst drying.

Anyway, I love my music but can't help feeling I don't enjoy it as much as I should, considering the money I've spent (maybe not much to some audiophiles, but far too much for the likes of myself). I have a Michell GyroDec V with a Tom Evans GyroDec DC power supply (which is excellent), Dynavector DV20x HO, a Schroeder Model 2 tonearm, and Graham Slee Era Gold V phono stage, going to a Musical Fidelity A3 CR pre-power amp and to PMC FBI+ speakers.

I feel the music needs more weight or body to it and thus provide me with more emotion. I feel my system is a little thin sounding. It's hard to describe but in isolation the bass is good but doesn't

texture and muscle.

I'd like a non-fatiguing sound with smooth mids and highs I can immerse myself in. I feel my amps are the things which are the key and was therefore considering the much reviewed Prima Luna range, even the Prima Luna3/5 pre and power amp. I know my speakers are capable of really low bass and I don't feel the amps, although rated at 100W per channel are pushing them enough. I was thinking of buying the Cartridge Man Musicmaker or the Orbe Platter upgrade but feel these may only make incremental changes to the sound.

I am looking to spend around £2,000 maximum on an integrated amp or pre-power amp pair and am considering going the way of tubes. I'd appreciate any advice you can give me in relation to which route to take. New amps or should I just invest in a dishwasher?

**Mick Jones.**



**Bland mid-price hi-fi sound? Another job for the Audio Research VS155...**

convey the warmth or texture that I know is in the music. The top end is a little too forward for my liking. I'm not overly concerned about macro and micro details, whatever they are, but want emotion and body. When I play one my many reggae albums I'd like bass, with

Hi Mick, I am a little surprised your speakers and amp don't give satisfactory bass - it is the last thing I would have expected. And although I use valve amps and both expect and get great bass, they are not famous for this. You need a good one with

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meaty output transformers and, if you don't use big Tannoys, plenty of power, meaning 40W or more. The FBI+ is sensitive enough to work with this in a medium sized room. You also say nothing about the room and the positioning of the loudspeakers in it. For maximum bass both the loudspeakers and you need to be close to walls. Try this if you have not already done so to see if it gets you closer to what you want, then adjust progressively; as you move the loudspeakers away from the walls bass will seemingly reduce. **NK**

No – don't get the dishwasher just yet. Your front end is excellent (although could be usefully upgraded by the addition of an Ortofon Kontrapunkt b in due course). You're right to identify your amps as the first 'port of call' in the upgrade route – the MFs are fine in their context, but they're a little transitory in the great scheme of high end hi-fi (which is where you're going), and a tad bland dynamically too. I'd suggest saving up an additional £800 or so and investing in an Audio Research VSi55 tube integrated amplifier. I really do think this is a superb product, with loads of vim and power, but real subtlety and smoothness too. You'll find it really does 'whet the whistles' of your PMCs – something they'll respond to in spades. Start saving. **DP**

### HAIR TODAY...

*I have read Hi-Fi World since its launch and Noel before that, when he had hair. I too have little hair left!*

*In those days, NK saved FM broadcasts to tape, and later to his Nakamichi cassette recorder. As an oldie I could cope with the resolution of tape described as cps, or cycles per second.*



### Lost cause? Digital Radio runs at roughly one tenth of the resolution of FM...

*Nakamichi claimed 20-20,000 cps on the best tape formulations. What I cannot understand, despite you giving exhaustive coverage to DAB, is how many kilobits per second (kbps) equals the best FM broadcast, or a MiniDisc digital recorder's resolution?*

*I welcome Steve Green as a writer*

*on Radio and the points made in December's issue which most of us by now agree with, but I find it difficult to believe that you devote so much space and support to MP3 and AAC as PC files and/or via mobile players, which are just as low in resolution as the poor old Beeb's DAB MP2. Have you not flogged the DAB criticism to death whilst supporting other digital carriers?*

**Alan Wells**

Hi Alan. Think of kbps as the amount of info left after most of it has been chucked away, on the basis that you can't hear it in any case - a contentious claim. DAB claims to have 16bit resolution and 20kHz bandwidth, like CD, so its basic data rate  $16 \times 44100 \times 2 = 1.4\text{Mbps}$  (Megabits per second). This is 1,400kbps approx. The sum comprises bits per channel, multiplied by 2 as there are two channels in stereo, multiplied by the sampling rate, which will be roughly double the analogue bandwidth. If 10:1 compression is applied, a common value with mp2 / 3, you end up with 140kbps. Common values are 192kbps (high quality) and 128kbps (standard), which you can see lie either side of my nominal value. I hope this explains how the figures are derived.

The best performance I have measured from VHF/FM is 76dB hiss level, with a bandwidth of 16kHz. This is roughly 13bit resolution (6dB per bit). Multiplied by 32,000 cps(!) sample rate, and 2 for stereo, you end up with 832kbps. That is, roughly speaking, what VHF/FM provides. As a data rate it is seven times higher than DAB or mp3 at 128kbps and, comparing the two, differences are quite obvious. DAB gives a stark simulacrum of the music, where VHF/FM, at best, sounds real and

more modern and aurally successful codec, and AAC (Advanced Audio Coding) the top of the tree, subjectively. That's why we are not too hard on mp3 and AAC. Hopefully, as transmission bandwidths increase - and 24Mbps download is around the corner - compression ratios might well decrease. Look out for Lossless compression in future - that is the Holy Grail. **NK**

### SONS OF PIONEER

*Could you possibly supply any information on an old integrated amp by Pioneer? The model was the A858 Reference Stereo Amplifier. I am trying to find out if it is worth purchasing, as I've heard a rumour saying that it had two massive transformers/ dual mono design and quality capacitors, decent circuitry.*

**Mark**

Well, it was a decent-ish mid-fi amp that sold for around £600 some ten years ago, although it didn't sell well at that price and most ended up being punted out through Hyper-Fi at half price. It was a reasonable buy for this, but nothing amazing. It was a typical decent Japanese amp of this era; chunky power supplies, big watts, smooth and clean sound, but unemotional and slow sounding. I'd save your pennies for the likes of a Mission Cyrus 2 with PSX. **DP**

### TOADY-ING AGAIN

*Being a contrary person in some ways, I got a hankering recently to play audio cassettes again a few weeks ago. I duly used ebay to get a few (very) cheap tapes of some of my fave albums not collected so far on vinyl and had dug out my old Walkman. Then I read the latest issue of your mag and read the review of the new issue of 'Songbird' by Eva Cassidy. I have liked her music but not actually bought any albums, just getting the tracks I had heard individually. Only the next day, I passed a shop and saw a secondhand copy of this very album on tape for the humble sum of £2.49 and bought it without a second thought.*

*Playing it on the Walkman was a great experience that night. I had inherited my brother's old Aiwa dual tape deck as part of my system. Come to tonight and I thought I would play 'Songbird' on it. It was a revelation. My rather rag-tag system (NAD 3020, said tape deck and Celestion Ditton 22 'speakers and budget wire) just showed how much that listening to music is the only reason to get this kit. The tape had a lovely warm full sound, the speakers handling the bass well. Not too much treble because of Dolby, but I heard everything playing, in it's place and it was just so nice!*

natural. Only last night, listening to Mojo from Freeview, I was intrigued at how peculiarly jittery, coarse and thin Santana sounded, compared to the CD version.

The Musicam mp2 compression system of DAB is archaic and poor. But DAB is stuck with it. mp3 is a



*Ye olde analogue cassette tape – 'nice'!*

I hope I got my meaning across. Firstly because of my brother's encouragement, the enjoyment of reading your mag and advice of your good selves I got to this point. I will make steps to improve my system as money allows, but will listen to the music more, not just the equipment. Many thanks gents, past and present and I look forward to reading your mag for as long as it goes on.  
**Paul Clewlow**

Thanks Paul – nice anecdote (and I couldn't agree more), but you ain't going to win 'letter of the month' with such obvious sycophancy as that. Next! **DP**

#### **SQUEEZE ME, PLEASE ME?**

My system consists of a Marantz 6000 OSE CD player, Rotel RA 1062 amplifier, Celestion A1 loudspeakers with Cambridge Audio Pacific and QED Silver Anniversary Biwire cables. I listen mainly to rock and dance music, anything from Bob Dylan to the Chemical Brothers. Typically stuff like Bob Marley or Fleetwood Mac. I wish to avoid an overly bright or hard sound. I have several questions regarding playing music stored on my computer, through my hi-fi. I have a wireless network set up at home and am considering getting a Slim Devices Squeezebox2 to link my computer to my amp. The computer is close enough to the amp to use a cable, if necessary. I have converted most of my 200 or so CDs to MP3s (256 kb VBR using EAC and lame) but have started using the FLAC lossless format (and a large hard drive) for new CDs and old favourites.

Are there any other devices similar to the Squeezebox2 that I should be considering? I feel reassured by the Squeezebox2's upgradeability and use of open source software. Should one expect the sound quality from the Squeezebox2s analogue out to be better than the sound quality from a budget CD player? Should one expect the sound quality from a DAC fed by the digital out from the Squeezebox2, decoding

FLAC files, to be as good as the sound quality from the same DAC fed by a good transport playing a CDs? When the Squeezebox2s digital out (or the digital out from a soundcard) is used with a DAC, are problems associated with jitter irrelevant? And if so, does that make a difference to the choice of a DAC? What DACs would you put on a shortlist in the 500 price range, give or take a few hundred quid?

**James Macfarlane**

Hi James - the SqueezeBox II has been replaced by the MKIII version,

see [www.slimdevices.com](http://www.slimdevices.com) for more details. Essentially it's just a repackaging of the MKII with some minor internal changes. An alternative to the SB would be the Roku SoundBridge, see [www.rokulabs.com](http://www.rokulabs.com), then there is the MPI01 from [www.netgear.com](http://www.netgear.com). In my experience the SBII analogue output is very good, I would place it well above budget CD players and happily compared it to CD players in the £400 region. FLAC is lossless, meaning the data is reconstructed exactly as it was before compression, there is no degradation in quality so a good external DAC will improve things even further. Jitter is a time-dependant error that is of significance at the D-A conversion stage. There are some very good low jitter DAC's available such as the DAC1 from Benchmark Media. However, the DAC1 is about £1,000, for £500 I would look towards the Musical Fidelity X-DAC v3 which can be usefully improved with the X-PSU. Otherwise go second-hand where choice will be greater. With regard to DIY DAC's there are a number of choices available, Scott Nixon gets good reviews for his well regarded DacKit, try a Google search for further information. **NG**

# hi-fi WORLD

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Linn Numac2 £225  
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Accuphase DP55V CD Player x-demo	2999	1999	Sonus Faber Concerto Home, Walnut x-demo	999 699
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Meridian G08 CD S/H	2250	1899	Cardas Neutral Reference 1m RCA-BNC S/H	550 375
Musical Fidelity Nu Vista CR 3D Player S/H	2999	1699	Cogan Hall Intermezzo EMD 0.75m RCA S/H	N/A 199
Orpheus labs One DAC with anagram x-demo	3150	1799	Kudos S50 60cm Stands S/H	199 79
Primare V10 CD/DVD Player x-demo	795	499	Nordost Valkyrja 1m RCA-RCA interconnect x-demo	1469 795
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Theta Pro Basic II DAC with Oscom/Balanced S/H	2990	995	Madrigal MDC1 1m AES/EBU 110ohm Digital Cable new boxed	420 249
			SAP Audio Relaxa MKII Floating Isolation Platform x-demo	299 199
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<b>Analogue</b>			Siltech SPO18M 4m Mains cable IEC-Shuko x-demo	495 295
Audio Research PH3 Phono Stage x-demo	1699	1099	Siltech SPX30 Classic 3m Mains cable BNIB	710 369
EAR The Head MC Transformer S/H	N/A	399	Siltech SPO18M 2.5m Mains cable IEC-Shuko x-demo	345 169
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Koetsu Black 100 hours only S/h	995	599	Siltech FT12 G3 2x0.8m Silver Speaker cable x-demo	540 275
Kuzma Stabi/Stogi S Turntable New& Boxed	N/A	1399	Siltech LS38G3 2x2.5m Silver Speaker cable x-demo	800 399
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Audio research LS25 MKII Valve Preamplifier S/H	4999	2999	Spectral MI-330 15ft Interconnect RCA-RCA x-demo	800 499
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Spectral DMC15 Preamplifier S/H	4800	3250	<b>Tuners &amp; Tape decks, power supplies</b>	
TAG McLaren AVR30RSL7.1 T2 processor S/H	2300	995	Accuphase PS1200 Conditioner x-demo	5995 3995
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Audio Research VT60 Re Valved S/H	1999	995	Nakamichi DR3 cassette deck S/H	N/A 149
Accuphase E530 Class A 30watts Integrated S/H	5995	3299	Quad FM4 Grey/Phono Tuner S/H	N/A 249
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ATC Active SCM10 SL x-demo	1650	1199		
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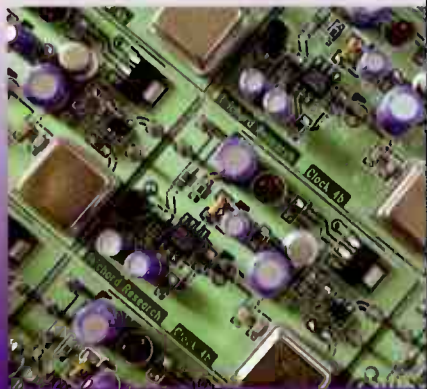
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**GOOD NEWS AND  
BAD NEWS!**

I referred last time to a number of the excellent AVI units that I recommend, but one thing that has been missing from AVI's portfolio of speakers for some time, has been a replacement for the excellent floor standing Positron. The good news is that the larger and more expensive Trio and Brio, have been joined by the Duo (2 way), which looks very similar, just smaller, and at a sensible price of around £1500. I haven't heard these yet, but expect to have in stock by the time this advert appears. The sad news is that Eslab, who I also referred to last time, have stopped production of their excellent digital amps due to lack of interest, though why I shall never understand, as they sound excellent. I still have the newer styled pre/power, and an original S4 in gold, plus an S8 (but I'm unlikely to sell that), so anyone interested while they are still available, please ring. I will be investigating the Danish Lyngdorf semi-digital and digital equivalents, which complete with their room correction ability, were one of the very few interesting items at the recent Heathrow Show. Also of interest were the new Chapter Audio Integrated amp, and some very good value French speakers by Davis, being demonstrated by Ultimate Sonics. Also expected for evaluation is the Electrocompaniet EC4.7 pre and AW220 power amp, which is a 70w/ch stereo amp, but bridges up to 220w/ch mono for a mere £1400. Do ring!

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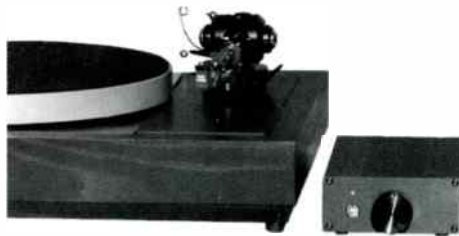
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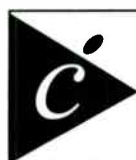
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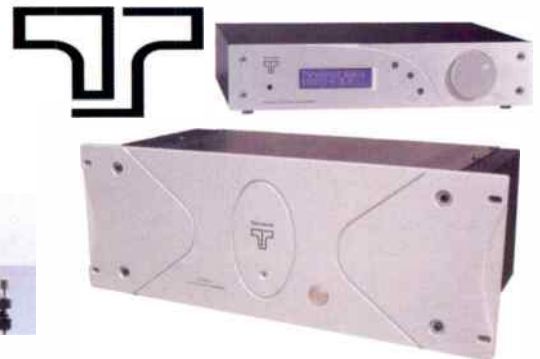
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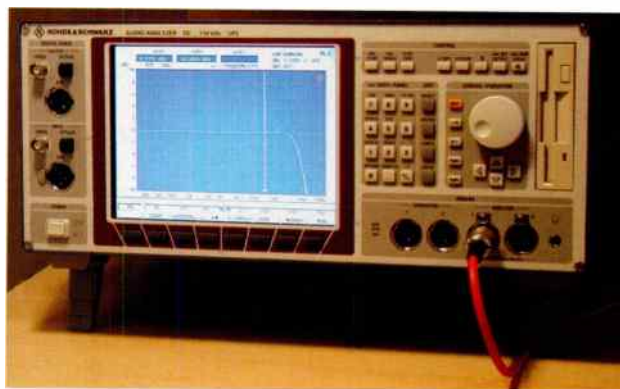
Hi-Fi World measures all incoming products before sending them out to reviewers and is unique in having such a rigorous vetting system. It reflects our dedicated approach to assessing audio equipment. Nothing gets by before thorough scrutiny.

In-house measurement is costly and time consuming, yet it has always been central to our belief that both readers and manufacturers deserve it, because there is no alternative if complex technologies are to properly assessed.

Measurement achieves many things. It ensures a product is working properly before it is subjectively auditioned. We pick up problems like loudspeaker drive units wired out-of-phase by accident, digital filters that roll-off in a bizarre fashion due to design error, a transmission line loudspeaker with no bass (!), amplifiers with excessive d.c. offsets, excessive jitter and all manner of other funnies.

Manufacturers published data is then checked against our measurements. There is usually little problem here.

The reviewer is then given the results. This gives useful guidance on what to watch out for in listening tests. For example, if three CD players use the same chip set they may well sound much alike in their basic attributes, if not identical. This is useful information for a reviewer.



Hi-Fi World uses a range of test equipment from around the world, including a Rohde & Schwarz UPL for testing CD and DVD players. Amplifiers are tested with 8903B Audio Analysers from Hewlett Packard. Loudspeakers are measured with a Bruel & Kjaer measuring microphone and Hewlett Packard 3561A spectrum analysers. We use three of these for basic test work and to ensure our listening room and conditions are balanced. Tuners are measured with a Leader 30125 Lab generator and Marconi 2015 RF generator, plus external MPX filters and equalisation.

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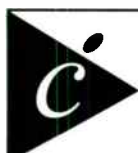
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**NEXT MONTH**

# ADDICTED TO ANALOGUE

Yes, it's that time again! March's Hi-Fi World is all about analogue. After many months of digital delectations, we're taking time out to look at what - for many people - constitutes real hi-fi. We'll be tracing the history of the record from its very beginnings to the present day, reviewing a wide range of analogue exotica and bringing you exclusive news on a very special new product indeed... Here is but a small selection of the analogue themed reviews we hope to bring you, but there will be plenty for CD player, amplifier and speaker lovers too:

- Roksan Radius, Marantz TT-15S1 and Pro-ject X-Pack turntables
- Ortofon Rondo Bronze and Zyx Moving Coil cartridges
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- Olde Worlde: Revox B795 - classic parallel tracker
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# THE JAM

## SOUND AFFECTS

### 1980



**T**he Jam, a trio who generated undiluted energy and anger. Despite their mod affiliations, they arguably best represented the true punk ethic and showed the 'movement' in its most positive and effective light. Not here the in-fighting and petty squabbling of the Sex Pistols or the drug addled casualties of The Clash or the endless stream of one-hit wonder wannabees who jumped aboard the passing bandwagon with more energy than ideas, more magpie thievery than genuine talent, using Punk like Robson and Jerome look-alikes and R'n'B clones use the 'X-Factor'.

In 1980, The Jam were still at the top of their creative curve. Although, there were problems in the band. As Paul Weller explained to the music and film magazine, *Uncut*. "I was constantly stressed. I'm a natural writer but though it comes easy, you've still got to work at it. So there was always that deadline: I've got to make the album by this time.' Much more so in them days. I was always under pressure, and I really didn't feel like I had much support from the other two [Foxton and Buckler], either, when the chips were down."

'Sound Affects' was written by Weller alone and is the first Jam project that consciously moves away from the punk ethic. Hence, the album sits in The Jam oeuvre with some element of discomfort or even self-awareness. It is largely unlike the typical Jam production. It was more experimental, whereas Weller had

always worked in traditional forms. With 'Sound Affects', there are more influences from Joy Division, Wire et al; more pop-art approach to sound, if you will. The basic production is improved too, compared to earlier albums, which helps the experimental side of the work flower and that, in turn, leads to a crispness and clarity in all of the songs. Songs that, it has to be said, also exhibit a greater degree of variety, when looked as a whole, than any of the previous albums – within that Jam sound framework.

The key track is the hit single from the album, 'That's Entertainment'. Wonderfully melodic with sing-along harmony breaks, the briskly strummed acoustic guitar belies a streak of humour running through the song that is inky black: "A smash of glass and the rumble of boots / An electric train and a ripped up 'phone booth / Paint splattered walls and the cry of a tomcat / Lights going out and a kick in the balls / That's entertainment".

The song also triggers heartfelt feelings of nostalgia: "A hot summers' day and sticky black tarmac / Feeding ducks in the park and wishing you were faraway. In contrast, 'I'm Different Now' and 'Start!', a subsequent chart topper, as a contrast, are higher energy rockers, inserted to show fans that Weller 'still can'.

"Sound Affects is my favourite," Weller confirmed. "I quite liked the style I wrote in them days, which was me trying... I was trying to write how

I spoke, almost like some conversational style, putting stuff in that were just every day images, that was unusual for the time."

All of which is brightly conveyed on the album itself. Weller's rage fails to blow, the listener is no longer hit by pieces of shrapnel as was often the case during earlier releases. What the band's energy does on 'Sound Affects' is much more dangerous – it simmers. It's there, it's palpable but the expectation is scarier. The end product is an album that keeps the mood flowing over a sustained period. Think of this album as Weller's Alfred Hitchcock period. It's what you don't see (or hear, in this case) that thrills you.

To discover or rediscover this album, the CD, in a remastered form, is readily available from your local High Street or Amazon, online. Dedicated collectors might want to search out the Japanese import which adds nothing except exotic packaging and the mid nineties release from Mobile Fidelity which expands the original 11 tracks to a healthy 23 by, in addition, squeezing the album, 'All Mod Cons', onto the same disc. It reportedly features superior mastering, but I failed to uncover a copy for testing. Seekers of the black vinyl, however, can grab an original vinyl copy by popping over to specialist record dealer, Vinyl Tap ( [HYPERLINK "http://www.vinyltap.co.uk/shop/artist/Jam.aspx"](http://www.vinyltap.co.uk/shop/artist/Jam.aspx) ) [www.vinyltap.co.uk/shop/artist/Jam.aspx](http://www.vinyltap.co.uk/shop/artist/Jam.aspx) ) where good quality copies can be had for £10 or less. **PR**



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