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exposure



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Twenty five years since its launch, Compact Disc sales are in decline, down by 9.3million per year since CD's high watermark in 2004 [source: BPI]. This is just in the UK, where sales of the little silver Frisbee have proved unusually strong. Globally, it's in freefall, down 34.8% from 2000 to 2006. Fascinatingly though, it's not DVD that's doing for CD, but a new type of audio-buying experience – downloads...

Whereas the LP disc kicked shellac 78s into the long grass, and Compact Cassettes usurped LP, CD isn't being replaced by SACD or DVD-Audio, but a 'non-physical' medium. The singles charts, always a taste of what's to come, show this in no uncertain terms. In 2004 there were 5.8 million downloads and 26.5 million discs sold, whereas now it's 53 million and 13.9 million respectively.

Sooner or later then, we'll be writing CD's obituary. I suspect it will be later, as there'll be a strong residual demand. But who'd have thought that CD would one day go the way of the Dodo?

What should worry CD fans is that right now in 2007, there's nothing particularly loveable about storing 650MB of music data on a 12cm optical disc. Vinyl couldn't be in a more different position, with 7 inch single sales going in the opposite direction to those of CD, and a buzz surrounding the format that's meant more new turntables launched this year than CD spinners! Vinyl is perceived as cool - part of pop, rock and disco and dance cultures - while CD is now most synonymous with computer data storage.

With more than 90% of all singles now digitally downloadable, and a whole new wave of mobile phone or PDA-based music players on the market, my hunch is that 'physical media' (as it's now being called) is going to revert to vinyl before we might imagine.

This is a shame, not least because of what it's going to do to high street music retailers, but at least it means we'll be freed from the constraints of CD's antiquated 16bit, 44.1kHz coding system. Ten years ago, on announcement of DVD-Audio, a leading industry designer told me that 32bit, 384kHz would struggle to equal the sound available from high end vinyl. Perhaps with the advent of high quality downloads (such as those being pioneered by Linn) and the promise of better to come, one day this will be possible?

David Price, editor



testing

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

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

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

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



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Distributed by Seymour Distribution Ltd 86 Newman Street London, W1T 3EX Tel: +44 (0) 20 7396 8000 Printed by St.Ives, Plymouth Tel: +44 (0) 1752 345 411
Our Agents in Malaysia Millennium Hi-Fi & AV Simon Chang Showroom & office, 500-1-3 First Floor Wisma Indah (Shen Court), Jalan Tun Razak 50400 Kuala Lumpur, Malaysia
Tel: 603 9283 8171 Fax: 603 9281 3762 e-mail: info@millennium-audio.com

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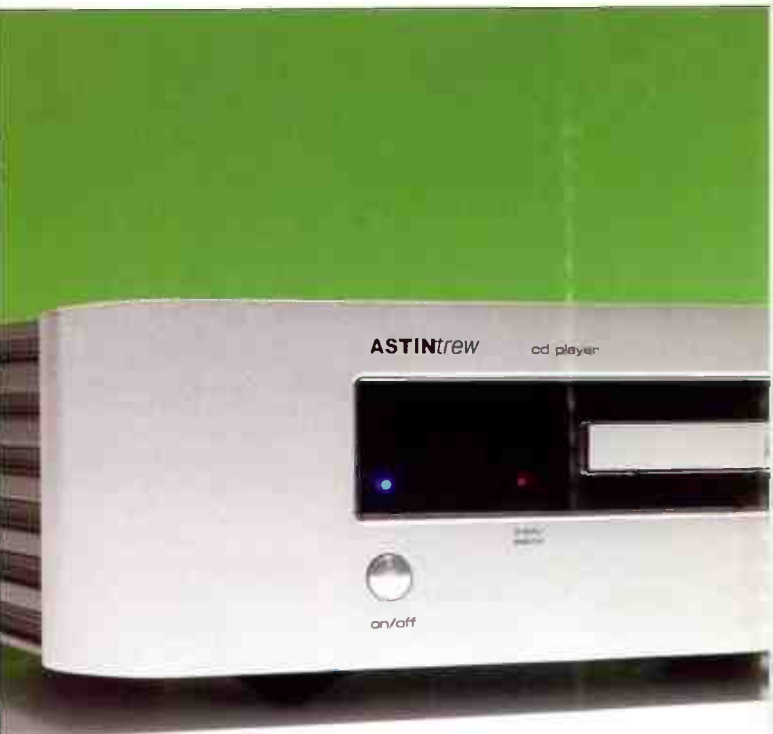
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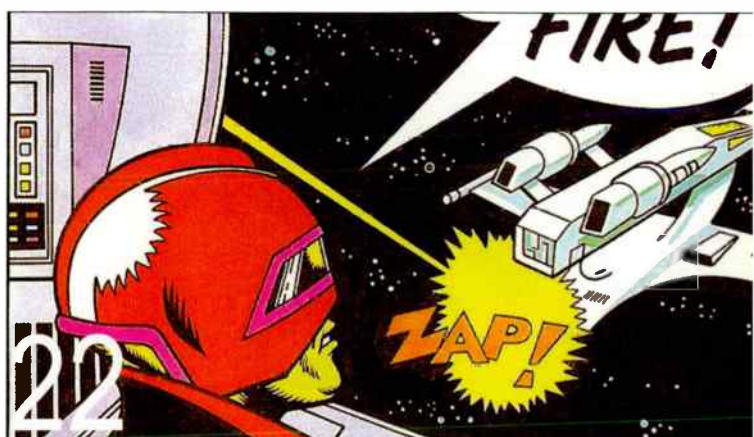
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THE FINAL CUT

News comes from across the pond of Denon's first High Def players, now on sale in the USA but not scheduled to reach us until November. Costing \$2,000, the DVD-3800DB Blu-Ray player is BD-ROM

PROFILE I version 1.1 compliant – Blu-ray's 'Final Standard Profile'. Denon says that, "on November 1st when this standard becomes mandatory, every other Blu-ray player on the market will effectively be rendered obsolete". The company also claims that its are the first Blu-ray players where performance has been the driving motivator in the design process, rather than low price or speed to market. Both the DVD-3800BD and DVD-2500BT (the transport-only version of the former) offer interactivity and enhanced content such as movie trailers, games, etc., plus firmware updates for the future.

In keeping with BD-ROM Profile I version 1.1, both Denon players incorporate a secondary audio and video decoder for simultaneous playback of secondary audio and video tracks for interactive audio and commentary, and for picture-in-picture capability (respectively). Additional information (subtitles, audio streams, camera angles, trailers, games, etc.) can be downloaded from the Internet via computer and stored on a SD card that either player will accept. This content can be played with the original content of Blu-ray Discs.

On the audio side, the DVD-3800BD also uses Denon's Advanced AL24 processing, plus HD Audio and DDSC-HD, with decoding of Dolby Digital Plus, Dolby TrueHD and DTS-HD Master Audio. It is capable of outputting both 7.1-channel analogue signals and PCM audio via the HDMI output. Naturally, the machine features "massive high-end construction designed to thoroughly suppress vibration and circuit design to enhance performance" with a multiple-box layout to isolate circuits and minimise mutual interference, discrete layout of audio, video and digital and analogue boards, multiple power supplies for audio, video and digital and analogue circuits plus a double layer lid, triple layer bottom and heavy transport structure. For more information, click on www.denon.co.uk or call +44 (0)1 234 741 200.

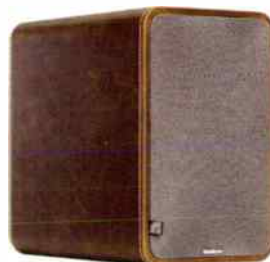


HIDEBOUND

Audio Pro offers a range of products finished in stunning leatherbound cabinets. The Mondial range of leather clad speakers sport "high performance drivers, including the latest super tweeters, and elegantly curved



Audio Pro Mondial



cabinets for visual as well as aural impact", the company says. At only 16cm high and 11cm wide, the super-compact M1 monitor is easy to place in a room and works well with the Sub 1 active subwoofer for a full range sound system. Available in either Classic Black or Antique Brown leather cabinets, the M1 sells for a very reasonable £149 per pair. Meanwhile, the £250 Porto music system is a dock with a difference, sporting so-called "EmbracingSound" technology to deliver "astounding bass weight and true stereo imaging from a single, portable, unit". It's ostensibly an iPod dock, but has two 3.5mm stereo line level inputs for other sources, and a built-in FM RDS tuner. A high power rechargeable battery is supplied for go-anywhere entertainment, and there's a choice of classic Black or striking Red leather cabinets. For more information, click on www.audiopro.com.



Audio Pro Porto

FAT FIGHTER

From the maker of the award-winning iTube valve iPod dock comes "the mother of all vacuum tube amplifiers", the £5,000 Fatman Mothership. This 200W monster comprises the iTube Controlroom preamplifier and a pair of iTube Engineroom monoblocks. The preamp comes equipped with six "premium quality" valves and "exceptional components", while the monoblocks boast "eighteen perfectly matched, lovingly assembled vacuum tubes to achieve a shared goal of audio excellence", no less, with the motive power coming from KT88s. Vital statistics are 340x290x160mm and 12kg for the Controlroom and 3380x390x185mm and 51kg (!) for the Enginerooms. For more information, click on

www.fat-man.co.uk.





IN TUNE

No stranger to the high performance, low price tuner, NAD have just launched the C425 which is claimed to offer a quality of reception "as good as or better than the quality of today's broadcasts". A new RF Front End has improved sensitivity for cleaner reception in fringe reception areas, and there's an improved user interface via a 24-position rotary encoder knob to more quickly tune stations or select preset stations. Thirty presets are available, and there's RDS for ease of operation - RDS PS (Program Service) will automatically indicate the name of the radio station you are listening to while RDS RT (Radio Text) displays additional information broadcast by the radio station. Price is around £200, on sale now. For more information click on www.nadelectronics.com



STAGING A COMEBACK

As the vinyl bandwagon rolls ever faster, Russ Andrews is the latest company to jump aboard with news of two brand new phono stages. The PH-1 is claimed to outperform many of the standalone phono stages currently available, and is based on the Terry Bateman-designed Rega Fono product. However, Russ has extensively upgraded the internal components with the very best quality components available and also made some modifications to the circuit. Power for the stage is provided by a new version of the Russ Andrews PowerPak. Two separate models are available, for turntables fitted with moving magnet or moving coil cartridges. They come in a black extruded aluminium case, fitted with an oak fascia and measure 180mm wide, 50mm high and 145mm deep. A two year guarantee is included with each model, and prices range from £399 for the PH-1 MM to £599 for the MC PH-2, with a fourteen day home trial and money back guarantee if not entirely satisfied. For more information, click on www.russandrews.com or call 0845 345 1550.

HIGH TIMES

Not long after *Hi-Fi World's* rave review of the newly refreshed Linn Sondek LP12SE comes news that the deck has been awarded the prestigious "European High End Audio 2007-2008" category gong by EISA. On bestowing the award, the EISA Jury commented, "When Linn introduced the LP12 in 1972, a legend was born. After several previous upgrades, now the LP12SE marks a new chapter in the history of this landmark product. The LP12SE assumes a place among the world's best vinyl players, providing one of the most impressive high-end audio experiences available". The Linn Sondek LP12SE is only available from specialist Linn Retailers worldwide, details of which can be found by calling +44 (0)141 307 7777 or click on www.linn.co.uk.

ON THE MOVE

TSource, distributors of Plinius and Heed Audio equipment have just moved to new premises and they can now be reached on +44(0)1452 858269. Their website remains the same, at www.tsource.co.uk

Leema Acoustics have begun to distribute their products directly, so anyone wishing to find out more about their fine range of electronics and loudspeakers should now call +44 (0)1938 811900 or click on www.leema-acoustics.com.



SYSTEM ADDICT

Myryad's stunning new RS ('Radio System') will doubtless win many friends, thanks to its drop-dead-gorgeous looks and high build quality. Said to be much more than just another DAB radio, the RS is a stylish stereo DAB/FM radio that's claimed to "deliver class leading sound quality from its left and right 'midrange/tweeters' and single large downward facing bass unit". Said to be "wonderfully simple to operate", it can also be used as an amplifier/speaker for iPods or other devices, connected either via the supplied 3.5mm cable, or in the case of an iPod, with the optional 'Music Pack' which includes a special cable and an aluminium remote control which will both operate and also recharge the iPod while it is connected to the 'RS'. A second optional accessory, in the form of a small 'Bluetooth' receiver, will be available soon. It will plug into the rear of the 'RS' and enable people with stored music on their blue tooth phones, etc., to hear the music wirelessly through the RS. For more details, go to www.myryad.co.uk.



BUDGET BRUISER

Marantz's new CD6002 CD player claims a performance that five years back would have cost upwards of £1,000, no less! This £269 machine plays CDs and CD-R/RWs plus MP3 and WMA encoded data discs, and borrows an audio circuit section from the award-winning £1,000 SA-15S1 Compact Disc player, plus a 24bit/192kHz Cirrus Logic delta sigma DAC. "The best components, such as high-grade electrolytic film capacitors and rectification by Schottky barrier diodes", are used along with proprietary Marantz designed Hyper Dynamic Amplifier Modules operating as a buffer amplifier and as a Low Pass Filter. Factor in an "oversized" transformer for stable power supply, a separate rectifier circuit for the analogue and digital sections, a low-noise LC display that can be turned off, and it's a well specified bit of kit. The slimline all-metal chassis comes in a choice of black or silver, and includes a solid anodised aluminium front panel and heavy-duty metal baseplate. For more information, click www.marantz.co.uk.

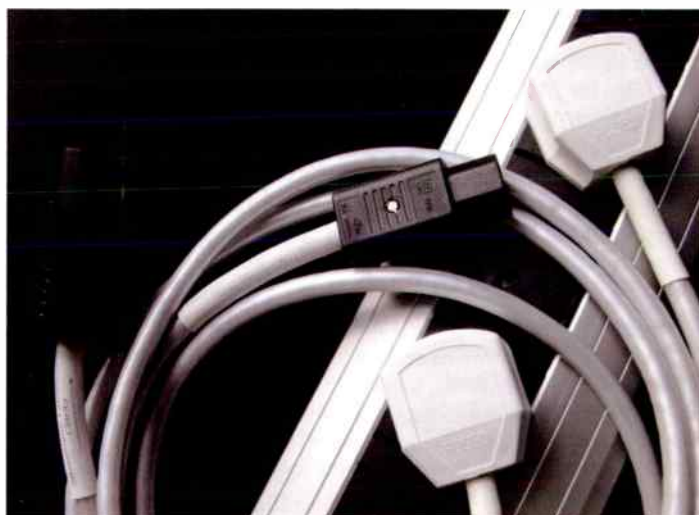
VINYL DEMAND

Sonneteer's new £650 SedleyUSB is a phono stage with a difference – as the name suggests it plugs straight into a computer, permitting easy transcription of your classic vinyl to silver disc or MP3. The unit also lets you play sounds from your computer, like internet Radio or the music now stored on your hard drive, back through your music system for maximum enjoyment. For more information, call +44(0)1483 566990 or point your web browser at www.sonneteer.co.uk.



STROUD AND CLEAR

ATC Loudspeaker Technology's new SCM16A Compact Active Loudspeaker is a rugged active desktop monitor designed for stereo and multichannel sound applications in small to medium sized rooms, and – says ATC – could even be regarded as the ultimate MP3 PA system! The Gloucester-based company's new speaker boasts freshly developed driver technology and improved amplifiers. The solid, curved, cast aluminium enclosure is built to withstand the rigours of professional sound environments, and claimed to be exceptionally rigid and acoustically inert. Its compact 16 litre trapezoidal design is finished in high gloss silver-grey but can be custom coloured by special order to any shade required. The SCM16A features a new neodymium 25mm soft dome tweeter with an ATC precision-engineered aluminium faceplate for better and smoother HF dispersion. ATC's new Constrained Layer Damping (CLD) technology has been utilised for the 150mm mid-bass driver. The upgraded onboard amplifier pack provides 200watts to the mid/bass driver and 50watts to the 25mm soft dome HF driver, operating in Class A up to two thirds of output. ATC claim continuous sound pressure levels greater than 108dB. The electronic crossover offers an exceptionally smooth and even frequency response, says the company. Vital statistics are 448x270x330mm and 17.5kg, while price is £2,203 per stereo pair. For more information call +44 (0) 1285 760561 or click on www.atc.gb.net.



SILVER STANDARD

South England-based Silverman Laboratories has a new range of premium mains cables out. Clarity 1 features six separate silver plated conductors in a screened configuration, and is available terminated in high quality IEC and figure 8 connectors. Clarity 2 incorporates nine conductors and is fitted with the highly acclaimed Furutech F115 IEC connector. Clarity 3 is similar to Clarity 2 but uses the excellent Furutech F11363 13 amp mains plug. All Clarity cables are available with optional PNE (Passive Noise Eliminator) for exceptional performance in all video applications. Retail prices range from £60 to £150, plus £15 for the PNE option. For more details, call 08707 747480 or click on www.capitis.net.

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"the SuperNait distinguished itself with a wonderfully dextrous piano sound"

its brilliance at cutting through the mush of the mix. Treble was a joy too – both amplifiers proving extremely couth in this respect.

Alphonse Mouzon's 'By All Means' again had the SuperNait singing its heart out. The song starts as a gentle jazz-rock groove that slowly builds in intensity, until you find yourself amidst some serious nineteen seventies jazzers going for it on all fronts, bashing it out like an early jam song. The Naim kicked out a beautiful piano and bass guitar sound, with the Sugden making things just a little more tonally lustrous at the expense of a slight lack of body. Advantage Salisbury then, but then Heckmondwike struck back by throwing out a superior soundstage. The SuperNait really likes to cast big bold images, almost into your lap with some discs, but it was slightly less expansive than the A21SE left to right, and tended to bunch the sound into either speaker rather than pushing out a wider spread. This made the Naim sound far more 'up close and personal' than the Sugden, but was arguably a little less accurate.

Moving to its digital input via a Quad 99 CDP-2's coaxial digital output, and some classical music in the shape of Chopin's Piano Concerto I (Nikolai Demidenko, Hyperion), and the Naim showed an even greater sense of connectedness to the music. Here we had a vast, vibrant string sound, wonderful depth from the cellos and an excellent sense of space. Admittedly, the Sugden (via the Quad's onboard DAC) possessed a touch more atmosphere and space, but there was very little in it – a remarkable result for the Naim.

Again, the SuperNait distinguished itself with a wonderfully dextrous piano sound, lilting and brooding in feel. Best of all, the Naim was peerless on transients – as the orchestra swelled, the SuperNait

caught its full weight with a combination of relish and total ease.

CONCLUSION

Despite its modest rated power output, Naim's SuperNait gives away little to anything in average UK listening rooms, proving able to drive difficult speakers to high levels on demanding bass-heavy electronic dance without breaking into a sweat. However, it has genuine subtlety and poise, keeping up with what I regard to be one of the very best integrateds around, the Sugden A21SE, in this regard. The secret to the amplifier's sound is its sensitive musicality allied to a broad shouldered and muscular stance that's well able to dish it out whenever called upon so to do. Add what is genuinely quite a silky, velvety texture and we have an amplifier that covers a lot of audiophile bases at the price.

I came away delighted with the sound of the SuperNait – feeling it to be head and shoulders above the already very capable Nait 5i – but what surprised me even more was just how well it worked as a package. I can see that many people with little or no interest in the workings of the hi-fi world, or indeed of hi-fi itself, would migrate

towards the SuperNait as a highly flexible one-box audiophile solution.

With computer audio and network music player outputs, Sky boxes and Freeview – not to mention DAB, MD or DAT – I also feel the digital functionality is a great feature. And it's been implemented very well too - it's a serious, high quality option and not just a marketing gimmick. Overall then, a true audiophile amplifier in a box – high end hi-fi without tears.

REFERENCE SYSTEM:

Michell GyroDec/Tecno Arm/vdH The Frog turntable
 Note Products PhoNote phono stage
 Quad 99 CDP-2 CD player
 Sugden A21SE integrated amplifier
 Yamaha NS1000M loudspeakers

VERDICT ●●●●●

State of the art integrated amplifier offering a peerless mix of sonics, style, connectivity and functionality.

NAIM SUPERNAIT £2,350
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 www.naim-audio.com

FOR
 - musicality across genres
 - power, control, finesse
 - build quality and finish

AGAINST
 - stereo imaging

MEASURED PERFORMANCE

This is very much a Naim, measuring exactly -1dB down at 20kHz - a relatively low frequency - and with low damping factor and unusually high input sensitivity. These are traits of Naim Nait's - as well as most other Naims. An early response roll-off is usually used to ensure the power amplifier does not run into slew rate limiting and transient distortion, although it isn't really a problem nowadays with fast transistors. Such a roll off also guarantees mild sounding treble as the roll off begins down at 8kHz or so. Since most modern loudspeakers exhibit considerably more roll up, the SuperNait provides a small amount of corrective equalisation for them.

Another interesting feature under measurement is a total lack of crossover distortion at high frequencies. This will also contribute to smooth sounding treble that's easy on the ear.

The SuperNait is very powerful - much more so than Nait's of yore: I once remember measuring 20 watts from one. The SuperNait delivers 78 watts into 8 Ohms and 121 watts into 4 Ohms, so it will go very loud. The power supply has good regulation but output impedance is high, meaning damping factor is low at 15, similar that of a valve amp. The contributes to fulsome bass.

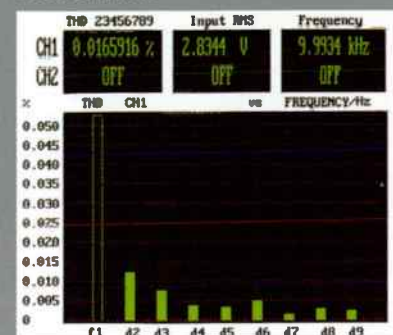
And finally, an extremely high

input sensitivity of 88mV, which suits a Leak Troughline, is another unusual feature, it means the amp will go loud very quickly as volume is turned up; it also means any source can be accommodated.

The SuperNait measures well in every area. Its measured performance is idiosyncratic, but entirely justifiable. NK

Power	78watts
CD/tuner/aux.	
Frequency response	8Hz-20kHz
Separation	90dB
Noise	-88dB
Distortion	0.012%
Sensitivity	88mV
Damping factor	15

DISTORTION



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The Brit Pack

Since Compact Disc's inception, the British hi-fi industry has been driven by the affordable audiophile CD player market, with our specialist brands distinguishing themselves with cleverly designed and voiced products. With this in mind, David Price decided to line up silver disc spinners from Arcam, Astin Trew, Cambridge Audio and Cyrus – and throw in a very Japanese Marantz for good measure...



Regular readers will know that I'm not exactly Compact Disc's best mate. I'll unashamedly admit that I rather relish the chance of knocking the poor old silver Frisbee, so who better than that one of its most vocal critics to line up this country's staple CD players and knock them down, one by one? Well, that was the idea, anyway...

In truth, I couldn't help but be impressed by every machine tested here – to a greater or lesser extent. It showed me – a relatively infrequent user of the format, and writing from the rarefied position of a vinyl junkie whose house is brimming with top gear – that twenty five years after CD was foisted on us, it's actually in rather rude health.

Cheap CD players like

Cambridge Audio's fine (£300) 640C make a nice sound, but for me there's simply too much there to remind you you're listening to dreaded digital. At the other extreme, if you spend twenty times that on the likes of Chord's Blu/DAC64 then CD really starts to fly – suddenly there's eerie depth and dimensionality, coupled with a superb 'hear through' midband and strong propulsive bass. The problem here though is the price – it's prohibitively expensive for all but lotto winners and football stars.

That's where these machines fit in – for around £1,000 you can get something that breaks out of the confines of 'digital audio' and becomes music (of a sort). All the machines here did this, providing a good level of fidelity that would – should you not like the sound – have me pointing the finger of blame

elsewhere in your system. However, even in this group spanning £750-£1,150, there were some remarkably different sounding machines and no small number of surprises, so use this supertest as a guide, then go listen for yourself and pick the one you prefer!

THE CONTENDERS:

CAMBRIDGE AUDID 840C	£750	p16
ARCAM DIVA CD192	£849.90	p17
CYRUS CD8X	£1,000	p18
MARANTZ SA15-S1	£1,099.95	p19
ASTIN TREW AT3500CD	£1,150	p20

REFERENCE SYSTEM:

QUAD 99 CD+2 CD PLAYER
BLACK RHODIUM POLAR DCT INTERCONNECTS
NAIM SUPERNAIT INTEGRATED AMPLIFIER
YAMAHA NS-1000M LOUDSPEAKERS
BLACK RHODIUM TANGO SPEAKER CABLES



CAMBRIDGE AUDIO 840C £750

An Audio Partnership brand, run by James Johnson-Flint (Julian Richer's partner in Richer Sounds), Cambridge Audio products have been designed in Britain and manufactured in China for nearly a decade now.

The now well established 840C is decently well made with a thick 7mm aluminium front panel and extruded sides. The paper-white backlit LC display is bristling with information, but over the top for some. What really got me excited is what's inside - Adaptive Time Filtering, which is asynchronous upsampling technology developed by Anagram Technologies of Switzerland. This system intelligently interpolates 16bit/44.1kHz CD data to 24bit/384kHz data via a 32bit Analog Devices Black Fin DSP (digital signal processor). Such serious state-of-the-art upsampling makes it the most impressive here, from a technological perspective.

Around the back, both unbalanced RCA and balanced XLR outputs are fitted, and two digital inputs are also provided which allow the upsampling and playback of other sources via the Azur 840C - a nice touch. In addition, a digital output can allow bit-for-bit data or upsampled data at 48, 96 or 192kHz to be recorded by a suitable device. The supplied aluminium remote control is superb, as anyone who's ever used one will know.

SOUND QUALITY

Through the superb Naim SuperNait amplifier and my reference Yamaha NS1000M loudspeakers, I wasn't prepared for how good this, the cheapest CD player in the group could sound. Set to upsampling,

it proved delightfully creamy and wonderfully spacious across the midband, with superb depth perspective and a gentle yet infectious musicality.

The opening bars to the Doors' 'Riders on the Storm' were a treat. The sound effects were tremendously convincing, and as the tune kicked off a proper with Jim Morrison's deadpan, the Cambridge responded in kind with a dark, sultry, brooding portrayal. Although not quite as explicitly rhythmic on the snare and hi-hat work, lacking the last one tenth

in terms of capturing the sticksman's accenting, the 840C nevertheless was as able as any here to impart the feel of this song.

Most striking was the width of this player; the digital equivalent of the Michell GyroDec, it pushed out far left and far right like no other player I've heard at the price. Allied to this was a spectacular cymbal sound which took you into the sound of the instrument better than any machine here. At the other extreme, bass was nicely warm, lyrical and well defined. Overall, a brilliant result at the price.

MEASURED PERFORMANCE

The 384kHz, 24bit upsampling of this player had little effect on the basic results from standard 16bit encoded test signals. The test tones of our Philips disc, at submultiples of the sampling frequency, induced the same sort of high order products as more conventional players. However, that is not to say the Azur 840C was not linear, especially at high levels. Overall, it is close to the best in terms of distortion, if not measurably ahead.

There was little deviation from flatness in the player's frequency response, our analysis showing an absence of any treble peaking or roll off. There was a small amount of low frequency lift measuring +0.2dB below 100Hz and output extended down to 2Hz, so the 840C is unlikely to be short of bass.

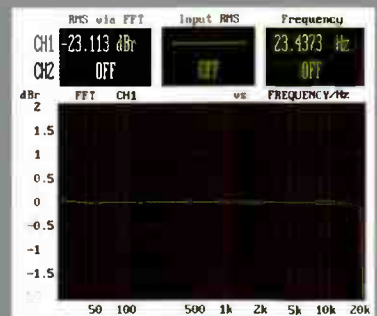
The digital output possessed a little more noise and broadband jitter than the best players, programme related components measuring 30pS, with some low frequency noise exceeding this. The 840C was worse here than the Cyrus or Arcam by a small margin, but better than the Astin Trew - and still good by general standards.

The 840C measures well in all areas. Disappointingly, its upsampling does not confer any measurable benefit, but that is not to say it will not affect sound quality. NK

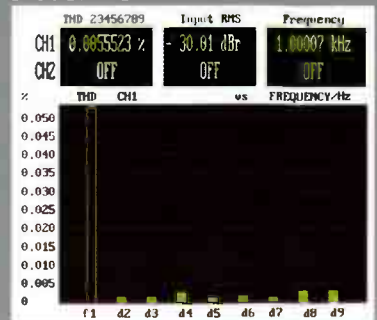
Frequency response (-1dB)
CD 4Hz-20.8kHz

Distortion (%)		
0dB		0.0003
-6dB		0.0004
-60dB		0.21
-80dB		2.6
Separation (1kHz)		128dB
Noise (IEC A)		-113dB
Dynamic range		111dB
Jitter		30pS
Output		2.2V

FREQUENCY RESPONSE



DISTORTION



VERDICT

Silky and beguilingly musical sound, especially at the price. A real audiophile bargain.

CAMBRIDGE AUDIO 840C £750

Cambridge Audio

+44 (0)845 900 1230

www.cambridgeaudio.com

FOR

- easy, relaxed musicality
- expansive stereo imaging
- silken treble
- DAC functionality

AGAINST

- depth perspective
- cluttered display



ARCAM DiVA CD192 £849.90

Arcam is the brand name for Amplification and Recording (Cambridge) Ltd., which John Dawson started some thirty years ago – indeed, their first product (the A&R A60 amplifier) got its first review by a fresh faced Noel Keywood! It really established itself in the eighties, with its Alpha and Delta series CD players, which were deft reworkings of Philips 16bit machines.

These days Arcam's digital staple is the CD192 silver disc spinner, top of their entry-level DiVA range and the culmination of the company's close relationship with Wolfson. It sports four WM8740 DACs per channel, giving 24bit, 192kHz oversampling. A chunky toroidal transformer and upgraded power supply powers the very neat multi-layer circuit board, complete with high quality op-amps from Analogue Devices and Burr Brown, plus Stargate and Oscon decoupling capacitors and WIMA low dissipation factor polypropylene capacitors in the output filters.

At 430x290x85mm and weighing a sylph-like 4.6kg, the CD192 makes all the other full width machines here look positively portly. Built in Huntingdon near Cambridge, the machine is completely designed and made in the UK. Round the back, it's just basic RCA audio outputs and a coaxial and optical digital out – no fancy DAC inputs here, which is maybe missing a trick.

SOUND QUALITY

This machine is almost supernaturally even-handed with all musics – its sophisticated and courtly nature never impeding enjoyment or stifling the feel of a track. Still, in being all things to all men, it lacks character – you can't help thinking the thrill quotient is a little down over

some of the others here.

Kicking off with the Doors track, and the Arcam immediately put what I had hitherto thought as a sublimely sweet sounding player in its place – the hi-hat sound on 'Riders on The Storm' was even more impressive than the already very silky Cambridge. Indeed, the Arcam was exposing the Cambridge as precisely that – feintly airbrushed. Indeed, the CD192 added a touch of extra insight and front to back space to the CD840C's long list of pluses, but there were also minuses too...

On 4hero's 'Another Day', the CD192 delivered a deliciously warm and fruity rendering of this

well recorded track, but seemed to struggle with rhythmic impetus.

This was down to a slightly soft bottom end which made 'Riders on The Storm' a joy, but in this piece of modern jazz-funk with heavy synthesised basslines, seemed just a bit too leaden. The upside was superior depth perspective to the 840C, which by comparison seemed to be pushing everything up too close to the plane of the speakers. In left to right imaging, the Arcam beat the reference Quad, but sounded less expansive than the Cambridge Audio – then again, everything else did too! A very slick, smooth and sweet player – nice, not naughty.

MEASURED PERFORMANCE

Arcam have equipped this player with a slightly flatter frequency response than earlier models, although there is still none of the peaking that is slowly becoming more popular, and which gives a bright sound. All the same, this player will not sound dull or warm as it measures flat within fractions of a dB from 2Hz to 20.7kHz. That makes the CD192 deadily accurate but on the right side of the fence with regard to balance.

There was little distortion over the available dynamic range of CD. A good result at -60dB is largely responsible for this player's exceptional 112dB EIAJ dynamic range value, meaning the Arcam gets as much usable performance from CD as possible.

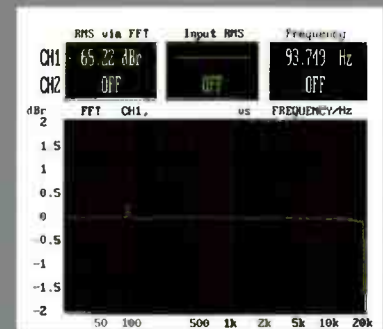
Like the Cyrus, there was absolutely no detectable jitter on the digital output, random or programme related, level measuring around 10pS or less.

Like the Cyrus, Arcam's CD192 is a tightly engineered player that achieves a fine measured result in all areas. NK

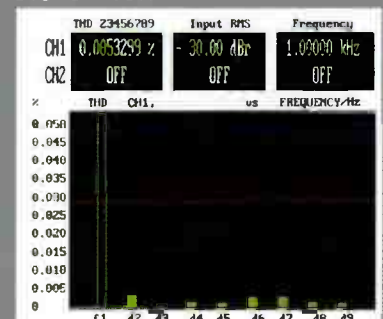
Frequency response (-1dB)	CD	2Hz-20.7kHz
Distortion (%)	0dB	0.0013
	-6dB	0.001
	-60dB	0.22

-80dB	2.2
Separation (1kHz)	122dB
Noise (IEC A)	-112dB
Dynamic range	112dB
Jitter	< 10pS
Output	2.2V

FREQUENCY RESPONSE



DISTORTION



VERDICT

Consummately courtly with a smooth and spacious sound, this classy machine is best suited to jazz and classical.

ARCAM DiVA CD192 £849.90

Arcam

+44(0)1223 203 200

www.arcam.co.uk

FOR

- fine tonality
- even handedness
- treble resolution
- design, ergonomics

AGAINST

- bass lacks agility



CYRUS CD8X £1,000

When I first saw the Cyrus name on the famous Henry Azima-designed Mission Cyrus One integrated amplifier of 1983, and so successful was it that it spawned a whole range of electronics, which then became a company in its own right run by Peter Bartlett.

The CD8x uses a half width (73x215x360mm, 3.5kg) aluminium case. Things are pretty tightly packed inside - the transport sports a monolithic glass laser assembly and the DAC is a 24bit current output type. A remote reclocking circuit is fitted, with close-tolerance crystal VCO located at the DAC threshold to maximise jitter rejection. Packed into the chassis are two separate toroidal power transformers, one feeding the electronics of the disc-reading mechanism and motors, the other dedicated to supplying DAC and filter stages. A £400 PSX-R power supply may also be connected to power the motors.

SOUND QUALITY

In some respects the most 'high resolution' machine of the pack, the Cyrus CD8x was peerless in the way it could tell you where the left, right, front and back walls of the vocal booth were in 4hero's 'Another Day', for example. It was also very good at conveying the tonality of Ursula Rucker's voice. At the same time, it kept a tight rein on the basslines, meaning it didn't slow the track down in the same way as the Arcam had.

Like the Cambridge, it pushed all the instruments up close to the plane of the speakers, but seemed able hang images back better. It wasn't quite as spacious from left to right, but still did very well, sounding obviously more expansive than the reference Quad and a tad wider than the Arcam. Rhythmically, the Cyrus

was interesting too - it had nine tenths of the Quad's liting musicality and a similar ability to spotlight dynamic accenting - but threw in a host of improvements over the Quad, not least the wider soundstaging.

A focused all round performer, closest in nature to the reference Quad, it struck a subtly different balance which seemed to win the day on one track, then lose on points on the next. For example, just when I thought the Cyrus had the Quad's measure, the 99CDP2 would deliver

a blistering rendition of Prefab's Sprout's 'Bonny', with more midband detailing, a more insistent rhythmic performance and the ability to emote better. Still, I'd say the Cyrus was the more technically correct machine, and its treble sound swung my overall preference to the CD8x - the hi-hat work on 'Riders' had greater resolution, and the spaces between the notes were darker. Factor in slightly more explicit detailing and it just about tipped it - but some may disagree!

MEASURED PERFORMANCE

There is a slight frequency response lift from the fairly sharp filtering used in this player, our high resolution analysis shows. This will be just enough to give the CD8x some top end bite and, as a result, it will not sound either soft or warm. Low frequencies extended downward smoothly to a low 2Hz.

Measured distortion levels were low throughout the dynamic range of the Cyrus player, starting out at a low 0.0005% at full level, increasing to 0.19% at -60dB. This is a low value, right up to modern standards, and is largely responsible for the high EIAJ 111dB dynamic range figure. As a result the CD8x is up with the best players in this area and will not sound coarse or gritty.

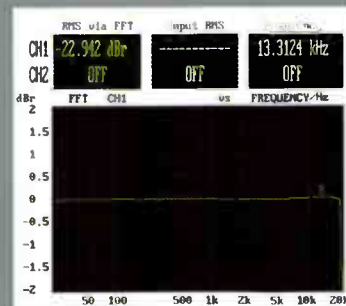
The digital output was completely free of jitter, so it has likely been reclocked, and so has the signal feeding the internal D/A converters, giving an immaculate performance with jitter noise residues at 10pS or so, programme related jitter being undetectable. The Cyrus was far better than most players in this respect.

The CD8x measured well in all areas. It has been tightly engineered to give near perfect measured results and will sound good as a result, but expect a bright or fast sound. NK

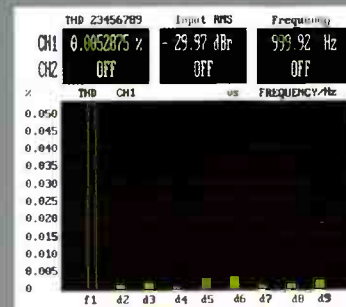
Frequency response (-1dB)
CD 2Hz-21.2kHz

Distortion (%)	
0dB	0.0005
-6dB	0.0006
-60dB	0.19
-80dB	2.4
Separation (1kHz)	126dB
Noise (IEC A)	-110dB
Dynamic range	111dB
Jitter	<10pS
Output	2.2V

FREQUENCY RESPONSE



DISTORTION



VERDICT ●●●●●
Truly accomplished all rounder with polish, poise and punch. Stylish and upgradable too.

CYRUS 8X £1,000
Cyrus Audio Ltd.
+44 (0)1480 435577
www.cyrusaudio.com

FOR

- excellent all round sound
- taut, incisive, musical
- treble finesse
- style, build
- upgradability

AGAINST

- depth perspective
- fiddly buttons



MARANTZ SA15-S1 £1,099.95

Our Japanese 'wildcard' in the pack, in truth it's hard to pin Marantz down to one country, as it's a truly international brand. It started as the baby of Saul B. Marantz in the USA fifty years back, but became a wholly owned subsidiary of Eindhoven-based Philips. Now owned by Japanese-listed D&M Holdings, the SA15-S1 is the brainchild of Ken Ishiwata and made in Japan.

It is better made than all the Brit players here, and with its vital statistics coming in at 440x419x123mm and 13.5kg and is unusual for being an SACD player, rather than just spinning CDs. Inside its vast expanse of casework is an EI transformer, plus a Crystal CS4397 DAC and some high quality passive componentry typified by Elna capacitors. The SA15 S1 makes full use of Marantz's excellent HDAM output devices, and there's a high quality, low jitter clock. In addition to the RCA phono sockets there are both optical and coaxial digital outputs round the back.

SOUND QUALITY

The Marantz had a quintessentially big, sharp, widescreen Japanese sound. Kicking off with Prefab Sprout's 'Bonny', and there was obviously more treble information, giving the song an airiness that wasn't present in any of the Brits. This is great for perking up dull systems, but should be avoided in bright budget setups.

Compared to the Cyrus and the Quad, it proved just a tad less smooth and less organically musical. The snares were impactful on the CD8x through the inky-black spaces between them, whereas

on the SA15-S1 they made their point through brute force. The Marantz seemed to 'uplight' the midband more, making the already questionable CD mastering of 'Bonny' seem a tad brittle, whereas the Brits all took the zing out of it. It also missed the fluidity of Paddy McAloon's lead guitar playing, imbuing it with a mechanical quality.

This was also apparent on 'Riders' by The Doors. The big picture

was very impressive – a wonderfully wide presentation with powerful bass lines and impressive depth perspective. However, rhythmically there was something slightly opaque about the SA15-S1 – it seemed to do everything right, but just didn't quite hit the spot like the Quad or Cyrus. Even the Cambridge seemed to move me more, with gentle, easy relaxed musicality that the Marantz couldn't beat.

MEASURED PERFORMANCE

This player offers a smooth, ripple free response with CD, plus good bandwidth extension to 21.25kHz our convolved impulse analysis shows. This will give an even tonal balance with CD, with no apparent softening of upper frequencies. Marantz tend to a brighter balance and I'd expect that to be obvious here. SACD, as usual, does roll off at high frequencies, in contrast to CD. However, it is well above the conscious hearing limit, the -1dB point being at 40kHz, an octave higher than CD. Output then rolls away smoothly to measure -14dB at 100kHz. This roll down keeps supersonic noise levels – a problem with SACD - in check.

Again in line with the results usually achieved by good players, distortion from SACD was up to ten times less than CD, with just 0.38% at -80dB against 4.3% from CD. This is one reason why SACD sounds so silky smooth in contrast to CD. With a miniscule 0.0003% distortion measured at -6dB, SACD provides great results on this player.

Distortion levels on CD were as low as is possible and within a hair's breadth of the best, giving a high EIAJ dynamic range figure of 111dB.

There was a trifle more uncorrelated jitter than the best players, with peaks reaching 25pS or thereabouts, up to 20kHz. This is a satisfactorily clean performance all the same.

Much as expected from Marantz, the SA-15S1 turns in a good measured performance in all areas. It's a well designed player. NK

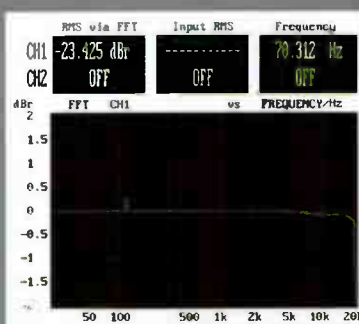
Frequency response (-1dB)

CD	4Hz-21.25kHz
SACD	2Hz-40kHz

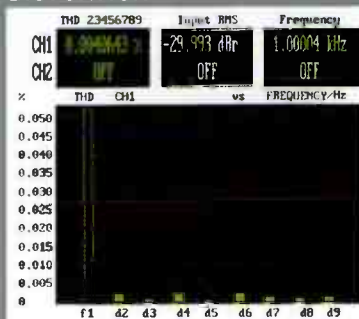
Distortion	CD	SACD
-6dB	0.001%	0.0003%
-60dB	0.24%	0.04%
-80dB	4.3%	0.38%
-100dB	-	2.2%

Separation (1kHz)	120dB
Noise (CD, IEC A)	-110dB
Dynamic range (EIAJ, CD)	111dB
Output	2.1V

FREQUENCY RESPONSE



DISTORTION



VERDICT ●●●£

Superlative build and finish shame Brit rivals, but sonically slightly off the pace nowadays.

MARANTZ SA15S1 £1,099

Marantz

+44 (0) 1753 680868

www.marantz.com

FOR

- build and finish
- powerful, expansive sound
- SACD functionality

AGAINST

- can sound mechanical



ASTINTREW AT3500CD £1,150

It's rare that you hear of British 'start-ups' in hi-fi, but Astin Trew is precisely this. Two years back, the company arrived from nowhere, offering an impressive range of mid-fi separates. With UK design overseen by founder Michael Osborne and manufactured in China, Astin Trew follow the increasingly popular Cambridge Audio approach.

The brand new £1,150 AT3500CD is the company's most high end product to date, and boasts a number of strategic tweaks including a very high performance clock with dedicated power supply, Class A biased DAC filters and upgraded power supplies with expensive passive components including Auricap capacitors. The player itself is centred around a Phillips VAM1202 transport and CD711 servo. A Burr-Brown PCM1738 DAC is powered by the expensive 'C core' transformer. This is the only machine in the test running tubes in the output stage, specifically the ECC88 double triode valve. This 430x340x110mm machine is the second largest in the group behind the Marantz, and heavy at 9.1kg.

SOUND QUALITY

If ever there was any doubt about this 'Johnny Come Lately' to the CD player market, it was assuaged after two bars of 'Riders' by The Doors. The Astin Trew threw out a massive soundstage, better than all others including the superb Cambridge, and (in the case of the latter) instead of hanging everything around the plane of the speakers, it was cavernous front to back, as well as left to right. The smiles didn't end there either, as the AT3500 duly went through each other player's strengths, delivering them a nonchalant cuffing. In some cases, it didn't so much beat them, as whip them without breaking into a sweat.

This new CD player showed me what the (admittedly cheaper) Arcam had been trying – but failing – to do with 4hero's 'Another Day'. It threw out a lovely sumptuous Fender Rhodes keyboard sound in the opening bars, and a big fat bass sound, but never lapsed into ponderousness. It ran the Quad and Cyrus up to the finish line on rhythmic alacrity, proving just as fleet of foot as the best here, but adding altogether superior tonality and stereo imaging/depth perspective. Like the Marantz, it give an expansive, punchy rendition of Prefab Sprout's 'Bonny', but avoided the SA15-S1's slightly wooden

rhythmic quality and instead turned it into a highly poignant musical event.

Although the AT3500 didn't throw low level detail out like its life depended on it, it was all there to behold. In this way, it reminded me of the Cambridge Audio – you could almost think of it as an 840C on steroids, with extra depth, subtlety and power for your £400. Best of all, the Astin Trew seemed very relaxed and in control of whatever it played, making the likes of the Cyrus and reference Quad (admittedly £150 cheaper) sound like they were trying just a little too hard. A blistering new contender.

MEASURED PERFORMANCE

The AT3500 has just a trace (0.1dB) of low frequency lift across a band, starting at 400Hz or so. Although low in spot level, its broadness may be sufficient to perceptibly increase energy by a small amount, just sufficient to give this player some extra body to its sound. As high frequencies roll down above 17kHz there should be no brightness to the sound. Results were identical at 44.1 or 96kHz upsampling.

Distortion levels were higher than usual at high levels, but second harmonic only in nature, so this will be inaudible. That the Astin Trew is linear is borne out by its fine -60dB result, responsible for an excellent dynamic range value of 111dB.

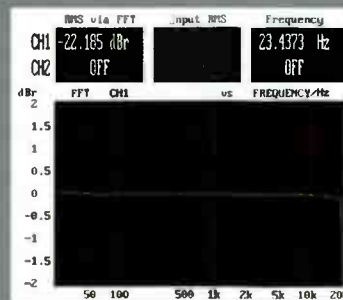
The only area of concern in this player lies in the jitter that exists on the digital output and is likely to affect analogue stages, as it measured a high 300pS random, and up to 600pS with programme - high values. Better relocking is needed.

The AT3500 measures well in all areas except jitter. To what degree this impacts sound quality, in balance with positive factors, can only be assessed by listening tests. NK

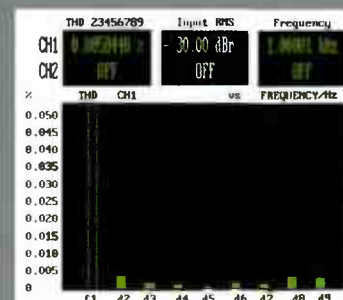
Frequency response (-1dB)	
CD	4Hz-21.1kHz
Distortion	(%)
0dB	0.042

-6dB	0.02
-60dB	0.22
-80dB	3
Separation (1kHz)	115dB
Noise (IEC A)	-110dB
Dynamic range	111dB
Jitter	500pS
Output	2.4V

FREQUENCY RESPONSE



DISTORTION



VERDICT ●●●●●
Compellingly musical and sumptuous sounding machine that's class of the field at this price.

ASTINTREW AT3500CD £1 150
Astin Trew
+44 (0)1491 414494
www.astintrew.co.uk

FOR
- expansive, powerful sound
- superb tonality
- engaging musicality
- build

AGAINST
- display

Having spent too much time of late chanting the mantra that Compact Disc players aren't really any better than they've ever been, it was 'cards on the table time' for yours truly. Here we had a *Hi-Fi World* fave rave in the shape of Quad's 99 CDP-2 set as a benchmark against the latest and greatest Brit machines, and where did it come? Top, like all the other times it crossed lasers with its closest rivals? Errm, no...

It didn't come bottom of the group though, because that is where you'll find the Marantz cowering. This is such a shame because it's the machine I most wanted to like. How so? Well, in terms of build, finish, ergonomics and sheer style it beat all the others here into enough of a pulp to bottle them as a smoothie. It wasn't so much better than the Quad, for example, as a damning indictment of British hi-fi construction values (whether they're assembled in Huntingdon or Guangdong). The beautifully finished, sculpted fascia, subtly floodlit and with a gorgeous action to the buttons was the proverbial Lexus to the Quad's Reliant Robin... I know I'm being harsh, but it's to make a point. Why can't UK Hi-Fi PLC do better?

Still, the Brits had the last laugh, because the Marantz simply sounded too mechanical. There was something about its timing that just robbed it of a sense of ease that the Cambridge Audio had in spades. Allied to a slightly brightly lit upper mid and a feeling of opaqueness (despite being superficially detailed), it just didn't pass muster. Still – I did like its big, brawny, broad-shouldered nature that's so reminiscent of Japanese high end, and couldn't help feel that there was a superb player struggling to get out (SA11-S1, perhaps?).

Next came the Arcam. This was a lovely machine in so many ways, with a truly couth, sophisticated sound that, for many listeners, would be all they could ever want. It's a fraction on the warm side – again no bad thing – and it makes every type of music sound nice. Therein lies its problem, because it's a tad too saccharine to my ears. Such euphonic tendencies aren't always what's needed with some programme material, such as techno and R&B/urban which suffered from loose bass. Still, full marks for superb ergonomics, fine build and neat styling – more of this please, Britishers!

The first machine I started listening to was the Cambridge 840C,



and I can still remember my surprise when The Doors' 'Riders on the Storm' began to play. This remaster is done to superb standards, and the 840C told me so in no uncertain terms. There's something very, very right about the 840C – and I just can't quite put my finger on it. In the same way the Marantz just doesn't seem to time naturally, so the Cambridge seems to time uncannily well. It isn't the frenetic ferret-down-a-drainpipe that is the Quad, but instead has a lazy calm about it that makes it a joy to listen to – kind of like riding a big Harley Davidson motorbike with enough torque to uproot a tree stump.

There's more – the Cambridge's expansive left-to-right soundstage is a joy, and makes the reference Quad and Cyrus seem a tad shut in. It's not brilliant in depth perspective, but that wonderful widescreen view more than makes up for it. The 32/384 upsampling, I would suggest, is no gimmick and in some respects it had a clarity and tonal rightness that none of the others were able to match. Still, the DAC and digital filter package is, I'd venture, one of the best in the business and all it needs now is a slightly grippier transport and a sweeter, more natural and three dimensional analogue section to make it the best £1,500 machine ever – 940C perchance?

Spending £250 over the £750 Cambridge 840C does not buy you a better machine, just a different one which on balance justifies the price differential. If that sounds like an awfully roundabout way of saying nothing, then my apologies, but I'm just trying to say that the £1,000 Cyrus and reference Quad machines are slightly better all-round but fail to comprehensively outclass the Cambridge.

Both provide a slightly tauter and more explicitly rhythmic sound to the Cambridge, and both have better front to back depth perspective (albeit slightly compressed left to right) and fractionally stronger bass for more visceral impact – all of which justifies the extra cash (just). Of the two, the reference Quad

gets more down and dirty with the music's percussion, and offers fractionally better accenting too. This makes for a more enjoyable sound in some respects, but not in others.

The Cyrus is also more rhythmic than the Cambridge, but it's a fraction less taut than the Quad and a fraction better at resolving the overall mix of the music. In this respect, it feels like the Quad has a better transport, and the Cyrus a better DAC/analogue output stage. It is more extended up top, and marginally more tonally fulsome with a slightly wider tonal palette. A well deserved second place to the Cyrus then, but remember to hear it against the Quad if you possibly can.

And the winner is... the Astin Trew AT3500. This surprised me frankly – although we all liked its cheaper AT3000 brother here at *Hi-Fi World*, it's one thing doing a good £600 machine and another mixing it with this lot. In the AT3500, we have – basically – the best of all worlds. It has the width and sweetness of the Cambridge Audio, the depth of the Cyrus, the rhythmic drive of the Quad, and the wide shouldered bombast of the Marantz. The result

"in the Astin Trew, we have the best of all worlds..."

is an extremely listenable bit of kit that has virtually no weak points and plenty of strengths. Whatever music you play on it is big hearted yet subtle and sweet too.

Although sticking a couple of tubes on the end of a CD player can work wonders – let's face it, they're bound to sound better than most bargain-basement op-amps – the Astin Trew AT3500 is more than just an also ran machine with a euphonic output stage. It has the grip, detail, depth and width of the best of the rest here – and adds superior tonality and texture and an altogether bigger hearted and more musical performance. A great result for such a new brand, and one that surprised even me. Even after twenty five years of trying, with CD it seems, things can only get better!

Light Years

It was twenty five years ago today that Philips and Sony helped the world to play – the Compact Disc. David Price recalls one of the greatest hi-fi stories ever told...



The world was a very different place in 1982. Music was sold on either on vinyl or Compact Cassette, but vinyl was regarded as the only serious way to play music. LPs were found everywhere from London broadcast studio turntables to the local youth club music centre – the world's universal music carrier.

Still, microgroove records were over thirty years old, and as with every other consumer product, nothing lasts forever - sales were down to 57.8 million in the UK [source: BPI] from 1975's high watermark of 91.6 million. As less money was being made, record companies had been steadily 'taking the quality out'. Whereas early seventies albums were exquisite pieces of work, pressed on fresh vinyl, bagged in non-scratch polythene inner sleeves and slid into thick card gatefold sleeves, early eighties pressings were done on the cheap. Flimsy, often warped and pressed on recycled vinyl, they alienated ever more music buyers. In 1982 alone, sales dropped 9%. What the world needed now was a high quality, fault-free music carrier, and Compact Disc was it.

NEW ORDER

Inscribed upon the first prototype players that appeared in autumn 1982 was the legend 'Compact Disc Digital Audio', denoting its two key components – a small optical

storage disc, and a digital datastream representing audio. Work on both the disc and digital audio theory had been going on for many years in a variety of locations, but it took the coming together of two of the biggest consumer electronics companies the world has ever seen to synthesise the technologies and turn them into a viable music carrier.

CD hit the headlines in 1982 but, as far back as 1967, Japan's NHK Technical Research Institute had publicly demonstrated a digital audio recorder running 12bit resolution and a 30kHz sampling rate. Before the decade was out, Sony had a 13bit machine running at 47.25kHz.

These were but the latest and greatest applications of theoretical mathematics that had arguably begun in 1841 when Augustin-Louis Cauchy first proposed sampling theory, and later in 1928 when Harry Nyquist provided proof. Alex Reeves proposed pulse code wave modulation (PCM) as a way of storing audio in 1937, then work at Bell Labs in 1948 yielded arguably digital audio's most significant breakthrough. John Bardeen, William Shockley and Walter Brattain's bipolar junction transistor - which made compact digital circuitry a reality. Finally, I.S. Reed and G. Solomon's work on error correction codes in 1960 gave us the technology that would be directly applied to Compact Disc twenty two years later.

On the disc side of things, the year zero was surely 1958, when C.H. Townes and A.L. Shawlow invented the laser. This was but the prelude to Dutch physicist Klaas Compaan's work using a glass disc to store black and white holographic images using frequency modulation at Philips Laboratories in 1969. Four years later, Philips engineers began to plan an audio application for their prototypical videodisc system – this ran a 44kHz sampling rate through a 14bit digital-to-analogue converter.

All this came together at the 1977 Tokyo Audio Fair, which saw Sony, Mitsubishi and Hitachi all demonstrating digital audio discs,

and then the next year Philips joined its software subsidiary Polygram to develop a world audio standard, which it demonstrated in early 1979. Matsushita having declined an invitation to join the standard, Sony signed up in 1980 and in June of that year the famous 'Red Book' specification was formally proposed. A year later, Sharp successfully mass produced the semiconductor laser, making CD a commercial reality.

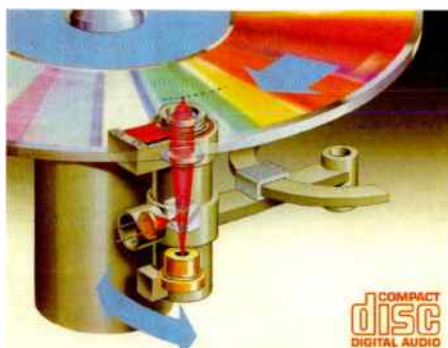
The original target storage capacity for a Compact Disc was one hour of audio, and a disc diameter of 115 mm was sufficient for this, but in the end Philips and Sony agreed a 120mm disc capable of holding 74 minutes of 16bit, 44.1kHz PCM music. This change resulted in a disc able hold all of Beethoven's 9th Symphony whilst fitting inside a man's suit pocket, which was – as legend has it - demanded by Sony President Norio Ohga!

The world's first CD was manufactured at a Philips' (Polygram) factory in Germany on August 17, 1982 - Abba's 'The Visitors'. By the time CDs were introduced in November 1982, a catalogue of around 150 titles had been produced. Meanwhile, in November 1982 the first CD players were introduced in Japan, including Sony's CDP-101 and Philips' CD100, although US and European audiences had to wait until March 1983.

By 1983, over 1,000 titles were



1982 - CD is launched to a waiting world...



Ray of light - CD's laser optics were the stuff of science fiction.

available, with a retail price of around £15 in the UK. Record companies worked pretty closely with the hardware providers to celebrate the joys of "digital sound", and Dire Straits new album 'Brothers in Arms' became one of the first all-digital (DDD – digitally recorded, digitally mastered and digitally delivered) releases, and the first to sell over one million copies.

In the UK, initial sales were slow – doubtless due to the high hardware prices (Sony's CDP-101 retailed for over £800 in 1983, more than £2,000 in today's money). It was initially marketed as a specialist audiophile pursuit, and the UK hi-fi press duly took up the mantle, being effusive about the first production machines and praising CD's clarity, dynamics and lack of surface noise.

Not everyone was convinced however, and key UK hi-fi industry figures moved against it. "That claim of 'pure, perfect sound forever' was untrue, misguided and misleading," argues Linn's Ivor Tiefenbrun. "At its launch, CD sounded very disappointing. It soon became apparent that the early machines were 14bit rather than 16bit, that the discs were not indestructible and that reissues and new digital material didn't exploit the claimed full 16bit dynamic range. Comparisons with vinyl caused real anxiety amongst music lovers who wanted to maximise reproduction quality."

Marantz being a wholly owned subsidiary of Philips at the time, the company's brand ambassador Ken Ishiwata was actually involved in determining the basic CD specification. "We had to define specs based on available technology and what progress we could make in few years. In other words, 16/44.1 was the maximum specification we could define knowing how much a CD player would cost in a few years' time. This was the way the specification was discussed and defined between Philips and Sony, but I don't think anyone really had any idea how it would sound", he told *Hi-Fi World*. How it sounded actually came

down to a multitude of factors, from the mastering to the machines themselves. Certainly, the hardware market soon divided into two camps – Philips machines running 14bit, 4 times oversampling and the Japanese 16bit, 2 times oversampling machines. In the specialist audio press at least, the Philips machines were praised for their more natural sound, and the Japanese ones derided. As Ken Ishiwata explains, "most Japanese machines had a brick wall filter at 20kHz, which meant non-linearity in time domain, already starting from the mid band frequencies - this was the specific reason why the Philips chipset had a 4 times oversampling digital filter. Despite the fact it had only a 14bit DAC, it sounded much better because they didn't have such a filter in the analogue stage."

Malcolm Hawksford, professor of psycho-acoustics at Essex University, talks of this "hard and aggressive character which proved so tiring" being in no small part down to the limitations of the analogue to digital convertor technology right back at the mastering stage. But Ishiwata thinks it was more down to recording techniques used for vinyl not translating to digital. "Most of the time, it was recording problems that accounted for poor CD sound quality. Because of the compression effect of LPs, recordings were made with very close microphone set ups, but digital has no such issue so if you keep the same microphone distance, such systems reproduce far too harsh a sound – that's exactly what happened!"

For the hi-fi journalists of the day, it was hard to account for the format's variable performance. Philips had justified its famous description of CD as "perfect" by pointing to its 20Hz to 20kHz frequency response and low measured distortion. "The problem was in terms of normal distortion and frequency response measurements, CD appeared better than vinyl (and FM) so the subjective problems were hard to justify", adds Hawksford.

CD's supporters pointed out that it was highly convenient, seemingly more durable and sounded 'clean'. This was even articulated in the specialist hi-fi press, many of whom turned a blind eye (ear?) to what was often a hard, metallic upper midband and grating treble. However, one that didn't was The Flat Response, where a certain Noel Keywood did what no other technical journalist (or Philips engineer, so it seemed) had thought to do – measure CD's distortion at low levels. The meter went off the scale, and at a stroke he had

explained much of the reason for the format's hard sound.

Still, this made little odds to the buying public - freedom from the then awful pressing quality of vinyl, plus convenience and longevity was enough to get the buying public onboard. "For normal consumers CD was seen as perfect, and only a very small number of people knew of its shortcomings. It's pity, but it's a fact", adds Ken Ishiwata.

CD player prices soon tumbled - whereas the first Yamaha CDX1 had cost £600 in 1983, by 1986 the CDX2 was down to £300. In turn, this drove software sales, and – strange as it may seem now – the Compact Disc found itself embroiled in the eighties 'lifestyle' culture. Along with Filofaxes, Oxford Brogues, red braces and Hugo Boss suits, CD was a 'yuppie' fashion accessory and the CD sales charts reflected this, with slick, polished pop music from the likes of Sade's 'Diamond Life' and Roxy Music's 'Avalon' heading it up.

SALES SPEC-TACULAR

As software sales leapt, hardware manufacturers had to attract ever more buyers, and a numbers race broke out based on the number of bits and/or the number of times the signal was oversampled. To wit, the new second generation Philips machines possessed 16bit, 4 times oversampling, which out gunned the 16x2 Japanese machines. In 1986, Sony duly replied with 18bit, 8 times oversampling (actually just running a number of Philips 16x4 chips in tandem), but the promise of better sound – which is largely all it was – put ever more customers through showroom doors.

The advent of Bitstream in 1989 was a milestone in digital audio, if not in Compact Disc *per se*. Whereas a 16bit DAC required sixteen transistors, one for each bit, to switch on an off in combination



Two tribes - Philips 14x4 CD100 and Sony's 16x2 CDP-101 first generation machines...



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EMULATING TUBE AMPS IS OUR GOAL. No kidding. When our KingRex T20 integrated amp garnered the Blue Moon Award "for heart-warming tube sound from a cold-running Class-T amp" from 6moons.com in July, 2007, we know we're not daydreaming anymore. Based on Tripath T2020-20 DPP chip, the KingRex T20 is capable of 2 x 20 watts at 4 ohms with 80% efficiency. Add the KingRex PSU for enhanced musicality and expansive soundstage. What a nice way to take some of the heat off tube amps.



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to describe any one of 65,536 possible current values, Philips' new Pulse Density Modulation (PDM) 'Bitstream' system transformed the 16bit samples into a high speed one bit datastream, oversampled 256 times, which was then converted into analogue by a digital single-bit converter. It eliminated the distortion indigenous to multibit machines and – crucially – was cheap.

With its greater compactness, lower current consumption and cheaper chip cost, Bitstream made Compact Disc possible (almost) anytime, anyplace, anywhere. In hi-fi, it proved yet another reason to get buyers into shops, especially those who'd been waiting to 'upgrade' from early first generation machines. Without a doubt, Bitstream designs were smoother and more even sounding, and finally banished CD's once-universal chromium plated upper midband.

This year wasn't just a good year for the technologists. In the UK, CD sales overtook those of vinyl for the first time. 37.9 million LPs sold that year, to CD's 41.7 million. (Ironically though, the headline news was the sales of prerecorded cassettes, which reached their high watermark of 83 million!) The die was cast, LP was on its way out and CD was the 'great white hope' of the music industry. Three years later, it had knocked cassette off the top spot and became Britain's favourite music carrier.

The early nineties were halcyon days for Compact Disc. In the UK, the best selling hi-fi CD player was Marantz's CD52SE which shifted bucketloads, providing surprisingly good sound for just £250. But for audiophiles the arrival of HDCD (High Definition Compatible Digital) in 1995 showed that a quart could be squeezed from a pint pot. Clever processing enabled the system to encode to the equivalent of 20bits worth of audio data. The system, developed between 1986 and 1991 by Keith Johnson and Michael Pflaumer of Pacific Microsonics Inc., was acquired by Microsoft in 2000. Linn Records and Reference Recordings have been the main software providers to this day, with artists as diverse as The Grateful Dead and Van Halen appearing on the 4,000 or so titles.

Had HDCD arrived earlier, it might have achieved far greater notoriety, but by the time it hit the shops, all the talk was of a new 'super CD'. As it happened, two rival formats came along in 1997, in the shape of DVD-Audio and SACD (Super Audio Compact Disc), the latter being CD's true spiritual

successor thanks to its dual CD/SACD layer design and independence from video (unlike DVD-A). Ironically though, SACD uses a completely different coding system to CD's PCM system. Instead, one bit 'Direct Stream Digital' is employed, giving a similar 100kHz bandwidth, albeit more noisy, than DVD-A. Its one great advantage – and the reason why so many audiophiles seem to prefer it – is its lack of the 'brickwall filter' that PCM requires to keep noise at bay. This seems to offer subjective benefits, even if its measured performance isn't as good as 24/192 PCM from DVD-A.

"I think SACD is an excellent format, technically interesting if done properly," says Malcolm Hawksford, "but since most recordings are mastered in PCM, then the true potential is often lost. DVD-A should be better than CD on paper, but there are a number of problems in practice – the navigation needs a visual display, you're never sure of the actual format (i.e. sampling rate and bit depth, the medium is just too flexible!), the format is compromised by the quality of the player electronics, and jitter and other distortions are just as significant as with CD only players if not more so", he argues.

FUTURE SOUNDS

Now in 2007, the advent of Blu-ray and HD-DVD are making both SACD and DVD-A look positively old hat, and there is much talk of the demise of both. Ken Ishiwata says that, "rumours about the difficulties SACD is having do not reflect at all the worldwide reality. SACD has never been a mass market format – it's a niche format associated with high-end audio and dedicated to audiophiles".

There's certainly a lot of fondness for SACD, and there's still a vibrant release programme from some classical labels such as Chesky, Pentatone, Channel, LSO Live, and 2L, with BMG, Telarc, EMI, Harmonia Mundi, Tacet, Alia Vox and Arts continuing to support the format too. Malcolm Hawksford adds, "Hopefully both formats, especially SACD, will not completely die as there is a need for a specialist disc format to reflect those few studios which do produce excellent recordings, especially multichannel".

Now though, the real news is the demise of Compact Disc itself – global sales are in freefall, down 34.8% from 2000 to 2006. Still, according to Matt Philips of the British Phonographic Institute, the UK is (as ever) proving a peculiar

market in world terms. "Our market remains one of the strongest in the world for physical sales, with music fans buying more CDs per head (2.7) in the UK than anywhere else in the world. Indeed, UK album sales volume grew by 6.3% over the same period, showing that Compact Disc remains the format of choice", he told *Hi-Fi World*.

The question is now not whether CD will die, but when. Unlike LP it (currently) lacks any style cachet, or strong cultural associations (as in vinyl's connection to DJ culture), and is increasingly thought of as a cheap data storage medium, a sort of twenty first century ticker tape.

This is a shame, because generally CD hardware and software has never been better. Experience has taught audio engineers how to finesse the format to give of its best, and the results can be impressive. "I thought CD would last about twenty years and that has proven not to be too wide of the mark, but it has lasted longer and we can now get a better sound than I imagined was possible", adds Ivor Tiefenbrun.

Digital downloads will surely be the death knell for Compact Disc, as the world moves increasingly to 'non-physical' media. Perhaps then we'll begin to look on the little 12cm disc with nostalgia, as the world's first taste of digital. What we'll never forget is its popularity – a format that started out as a whiz-bang technology for 'early adopters' and which then became a Yuppie status symbol, has now become massive, a truly universal music carrier. UK music fans have an average of 47 CDs each, with 2.86 billion purchases made [source: BPI], and globally over 200 billion have been sold.

Lucas Covers, Philips' Senior Vice President puts this into perspective, "Since the first CD was pressed, if all CDs ever produced were piled up (even though a single CD is only 1.2 mm thick), the stack of CDs would circle the earth six times."

Thank you Compact Disc, it's been fun – you were once the shape of things to come but now music is moving on. For me, CD will ever be rooted in 1982, where for a moment at least it offered the promise (if not the reality) of "pure, perfect sound forever".



Style counsel - CD initially sold as a Yuppie lifestyle accessory.



TWO PAIRS OF LEEMA'S SUPERB XERO MINI MONITORS WORTH £680 EACH TO BE WON IN THIS MONTH'S GREAT COMPETITION!

Here's your chance to win one of two pairs of Leema Xero stand-mounting loudspeakers, which David Price enjoyed so much in the October 2007 issue of *Hi-Fi World*. Here's what he had to say...

"The £670 Xero is essentially a downsized Xen – it's slightly smaller at 220x140x206mm and lighter at 10kg (still a lot for a speaker of this size). Although the Xen's metal front baffle looked beautiful, certainly the Xero doesn't seem any less well built and appears just as robust. Internally, there is extensive damping from a double layer of bitumastic lining. The Xeros feature a 1-inch (25.5mm approx.) Vifa Tymphany fabric dome tweeter that uses high-flux neodymium magnets and ferro-fluid damping, plus a new bespoke 100mm magnetically screened mid-bass

driver marked 'Leema Acoustics'. The crossover uses hand-wound, air-cored inductors, high quality capacitors and PCBs with thinner multi-track copper than a typical fatter single layer. Whereas the Xen ran two semi-restrictive bass ports on the front baffle, the Xero has a single fluted rear mounted 25mm affair. The wood veneer was of excellent quality and comes in a choice of Cherry, Birds Eye Maple, Black, Ebony or Black Ash.

Their basic sound was very clean, open and detailed in the greatest tradition of BBC mini monitors. Considering they run bass drivers the size of beer mats, these loudspeakers are extremely convincing in the low frequencies. They don't compress the sound even at quite high levels. Insight from the Xeros wasn't noticeably less than my reference Mel Audio Horamas, which are approximately five times the price. Indeed,

there's a degree of transparency here that you'd be happy to get from any speaker of any size costing £670, let alone these pint pots.

Troy Overwater's 'Op' SACD, a jazz/classical fusion recording of stunning clarity, showed the Leemas to be able far beyond expectation. The striking dynamics from the drum kit and double bass, allied to some beautifully silky tenor sax sounds showed these speakers at their best. They boast a winning combination of musicality and couthness - the Xeros are blessed with an Acoustic Energy AE1-style *joie de vivre*, yet they remind me of the Harbeth HL-K3ES in their civilised demeanour. The Leema Xeros produced a superb sound in their own right, and during the audition period I had to constantly remind myself that I was listening to a sub-£1,000 pair of loudspeakers. At £670 they are, to all intents and purposes flawless."

If you'd like the chance to win one of two pairs of these superb loudspeakers, all you have to do is answer the following four easy questions on a postcard and send your entry by 31st October 2007 to: **November 2007 Competition, Hi-Fi World Magazine, Unit G4, Argo House, The Park Business Centre, Kilburn Park Road, London NW6 5LF.**

RULES AND CONDITIONS OF ENTRY

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

QUESTIONS

[1] The Leema Xero is a downsized what?
 [a] Leema Xen
 [b] Sendor BC1
 [c] Rogers LS3/5a
 [d] Wharfedale E90

[2] What is inscribed on the mid/bass driver?
 [a] 'Leema Acoustics'
 [b] 'Porky's Prime Cut'
 [c] 'Eat to the beat'
 [d] 'Born to run'

[3] How many bass ports does the Xero have?
 [a] 1
 [b] 2
 [c] 3
 [d] 4

[4] According to DP, they boast a winning combination of what?
 [a] "musicality and couthness"
 [b] "snobbery and decay"
 [d] "death or glory"
 [c] "fish and chips"

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entries will be accepted on a postcard only

**AUGUST 2007 DENSEN BEAT B-410 CD PLAYER WINNER:
 Nigel Clarke of Leicester**

The Long Run

Noel Keywood traces the long play of Compact Disc...

After many years of predictions about its imminent demise, the latest sales figures for the venerable Compact Disc show that it is finally on the way out. A combination of the great (that ingenious laser optical read system) and the not-so-great (the primitive 16bit PCM coding system), it proved a massive retail success worldwide over its twenty five year lifespan. Here's a brief sales history of the world's first silver disc.

Our sales graph, compiled from BPI and IFPI figures, gives the complete picture. Launched in 1983, worldwide sales of CD raced upward in the late 1980s. Britain simply followed the world sales trend, with sales taking off one year after those elsewhere, likely because of our dire economy at the time. Then Chancellor Nigel Lawson's economic boom hit us in 1986 and CD sales raced ahead...

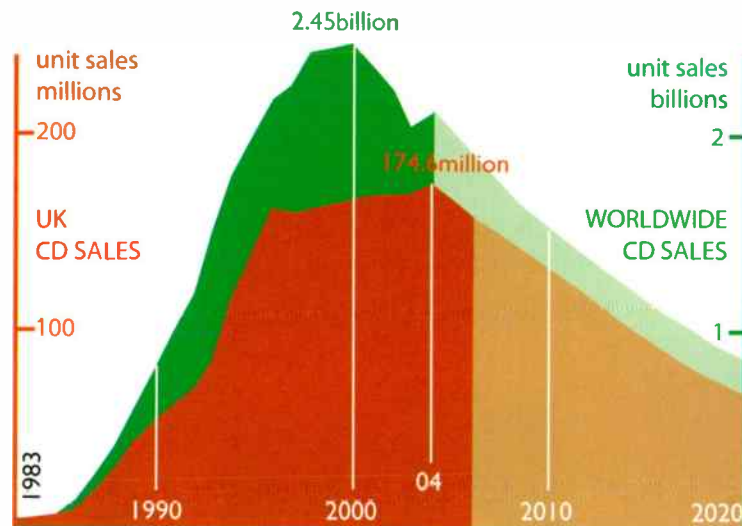
It wasn't long until boom was followed by bust and the economic pain of a slowdown can be seen in the UK's CD sales figures, but not elsewhere around the world. The slowdown was all over by 1993 as far as CD was concerned and sales again bolted upward, passing 160 million by the year 2000. This is nearly double that of the LP, which peaked at 91 million, so Philips and Sony's little wonder did much to boost the fortunes of the music industry, not only in the UK but around the globe.

There's no doubt the CD is more consistent and durable than the LP. It's also lighter and smaller, which makes it cheaper to transport worldwide, and from warehouses to retailers. Customer returns from faulty LPs could wipe out any profit; the CD largely overcame this problem, so financially it was a big step forward for the music industry.

Other formats have come and gone, namely Digital Audio Tape (DAT), Digital Compact Cassette (DCC), as well as MiniDisc (MD) and now both DVD-Audio and Super Audio Compact Disc (SACD), all

whilst the CD has continued onward merrily! Of course, cynics might point out that CD has been so good for retailers that they do not want to stock alternatives and suffer the financial burden of allocating floor space to duplicated material. This reluctance has been instrumental in killing off other formats, I suspect.

Whilst retailers in particular are entrenched in their love for the dear old CD, out in the wider world larger forces are at play. Irrespective of all else, a marketing expert once explained to me, products have a finite lifetime. Their sales graph follows a bell curve and, sure enough, our graph of CD sales shows this phenomenon clearly. You can see the slow take off, steep rise and then gradual flattening out of CD sales in the UK. Global sales peak more sharply, but that's related to our graph's scaling, as the IFPI's sales graph looks more bell-like than ours, due to its differing proportions. What this means is that the death of CD is an inevitability neither the music business nor retailers can escape. It's going to happen, so they might as well face the inevitable and



rise. Many also like to think disc storage is an idea that's had its time, because discs lull buyers into thinking they own the music, contrary to the music industry's view that they have merely purchased a revocable right to listen to it. Downloads that time out are preferred, but Apple got in there first and spoilt this scenario.

It's possible the physical disc will die, but somehow I doubt it. It's more likely the scenery is changing, becoming considerably more fragmented and complex. Once we simply had one or two ways of purchasing and storing music; now we have many.

Against newer technologies like the iPod and DVD, the CD is looking one dimensional and tired. Even the

"globally, Compact Disc is fast running out of time..."

work out how to cope.

Globally, Compact Disc is fast running out of time. Sales peaked in the year 2000 in all three of the world's largest markets: USA, Japan and Germany. The UK is the fourth largest and, likely for economic reasons, crawled to a sales peak four years later. It was only a matter of time for UK sales to follow global sales.

So what next? The music industry is desperate to believe that people will purchase ever increasing amounts of music - quite likely in my view as leisure time and disposable income

LP, with its large, colourful sleeves holds more charm. DVD offers video as well as audio, and a wealth of bonus content at a low price. The iPod offers portable style and access to any music you want.

The CD is still easy to use, but that's not enough to save it, sales figures show. As sales go into decline the future looks uncertain. Yet whatever disc player we do get one thing is certain: it will always play CD. The first silver disc, whatever its shortcomings, will forever be remembered, for it sold in greater quantities than any other format.



Play For Today

As the CD hardware market gradually declines, so a new generation of network music servers, playing compressed and uncompressed digital audio and video, arrives. David Allcock put one such example, Helios Labs' new X5000 through its paces...

Looking like a large first generation DVD player, Helios Labs' new X5000 network media player not only plays back CD and DVDs, but also runs server-based software to play compressed and uncompressed audio, plus standard and high definition video. Instead of the cheap injection-moulded plastic cases you see on the likes of Roku's Soundbridge, you're greeted by a well finished metal case on a solid chassis measuring 430x95x365mm and weighing 9.5kg. Indeed, the Helios feels as solidly made as a good mid-price CD player.

The X5000 is essentially a DVD player, albeit a scaling one with both component and HDMI outputs, allowing regular DVD to be scaled up to 1080p, the highest resolution HDTV offers currently, along with playback of regular CDs. When connected to a network however, the X5000 can play MP3, FLAC lossless, OGG/Vorbis, WMA, AAC and uncompressed WAV audio files, whilst supporting video files in MPEG 1, 2 and 4, WMV, WMV-HD, DIVX 3.11, 4, 5, 6 and HD along with TS (transport stream, a format often used for high definition programs on line) and VOB.

The front panel looks like any other DVD player, featuring a centrally mounted disc tray with display beneath it and transport controls to the left, whilst on the right hand side of the case is a USB 2.0 connector. On the back panel there is a second USB 2.0 connector, a CAT 5 10/100 network connector and a reverse SMB socket for the Wi-Fi stub aerial. Also around the back panel are composite and S-Video outputs, component outputs on RCA phono connectors, an S/PDIF digital output (no TosLink optical is present) and a stereo pair of RCA phono outputs, whilst a large heatsink then dominates the rest of the back panel with an IEC power inlet on the far right hand side.

It's a pleasant surprise under the hood - unlike the Imerge S3000 reviewed a few months ago, the X5000 uses a more expensive power supply with a large 'R' core transformer device and six power taps to feed the various low voltage stages in the player, which then feeds a rectifier and filter stage - so the power supply at least should be quiet. The brains of the machine is the Sigma Designs EM8620L, a device which handles all the decoding of the

various formats and a chip made with high definition video in mind, and audio is care of a Wolfson WM8728S DAC - typically found in high quality PC soundcards. The DVD drive is a PC device, an LG GDR-8164B, popular in budget PCs.

SOUND QUALITY

At just £349, the Helios X5000 was never going to worry the high end CD separates market (in terms of sonics, at least), nor is it much more than a flea on the back of the likes of Linn's £9,600 Klimax DS. However, it manages to create a respectable sound for a digital device at the price, and this is all the more impressive given its fine build and easy setup.

Its defining characteristic is one of warmth - a good one for a budget digital product. Sophie Ellis Bextor's 'Me and My Imagination' was rendered in an agreeably smooth and sumptuous style which let me enjoy the music, without exactly giving me a sonic white knuckle ride. In absolute terms, the X5000 throws a silky veil over the music, making Sophie's vocals sound a tad too rich. Compared to my reference Shanling SCD-T200, it felt like a little of the music's energy had been removed.

X5000 HD NETWORK MEDIA PLAYER



MUSIC

Sophie Ellis Bextor, 'Trip the Light Fantastic'
Dave Brubeck Quartet, 'Time Out'

High frequencies were enjoyably smooth and open, the Helios making pleasant noises alright, but there was little of the incision of a good hi-fi separate CD player at a similar price, such as Cambridge Audio's 640C. I could hear a slight hardening of sound on brass and strings, as though upper midrange notes were being forced and pushed a little. Dave Brubeck's Piano on 'Strange Meadow Lark' showed fine lateral imaging, with very precise placement and focus within the stereo soundstage. Whilst stage depth was good, the delineation of layers was not up to the standards of a Cambridge, so, whilst I wouldn't consider the internal DAC's performance poor (indeed it's obviously more musically communicative than the Imerge S3000), it's fair to say that you're not going to get class leading separates performance with all that flexibility you've just bought

yourself...

Connect it up via an external hi-fi DAC though, and it's a different story. I fed the digital output to my trusty Perpetual Technologies P-3A Signature and the sound was dramatically improved. The soundstage was now far better developed, with images placed not just beyond the outside of the speakers, but outside the physical boundaries of the room. Also, the warmth which had pervaded the sound previously was now removed completely, giving a much clearer, cleaner and transparent view of the musical event. The talents of the offboard DAC were such that it told me in no uncertain terms that the use of MP3 compression, even using the best encoder and a high data rate, still does irrevocable damage to the music with the soundstage collapsing and sense of space being removed from the recording. I would strongly recommend restricting ripped music to either uncompressed WAV

SETUP

Unlike the Linn Klimax DS reviewed last month, the X5000 is very much a home install jobbie. The Wi-Fi setup was quickly accomplished (although I'd advise a hardwired connection if you want to stream high definition video from a server) and gave no problems with uncompressed digital audio. The Neolink software which needs to be loaded is currently only available for PCs, and whilst it's very easy to configure, I did run into a problem with its inability to handle .iso format DVDs. This was rectified with the WIZD freeware software which can handle .iso format files along with the images and audio formats handled by Neolink - this is also available for Mac OSX based systems allowing the use of the X5000 with a Macintosh, something currently not supported by Helios...

or FLAC lossless format in order to attain the very best performance from this player and your music collection.

CONCLUSION

So far, the X5000 is one of the most polished streaming clients I have had the pleasure of using. Its video performance is truly excellent at the price, as is its ability to handle a wealth of high definition formats. Sonically it's less successful, but succeeds through sins of omission - as it smooths things out and lends music an artificially relaxed but perfectly pleasant quality. Hook it up to an external DAC though (Russ Andrews' £600 DAC-I USB would be ideal) and it flies.

This done, you've got a sub-£1,000 upsampling streaming client which offers incredible flexibility, ease of configuration and an outstanding picture on high definition video. I am happy to recommend this device as one of the best built streaming clients I've seen to date at a highly competitive price.

VERDICT ●●●●●

Well designed, user-friendly streaming media client with decent sound and super vision.

HELIOS LABS X5000 £349
Kaga Electronics B.V.
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www.helios-labs.com

FOR

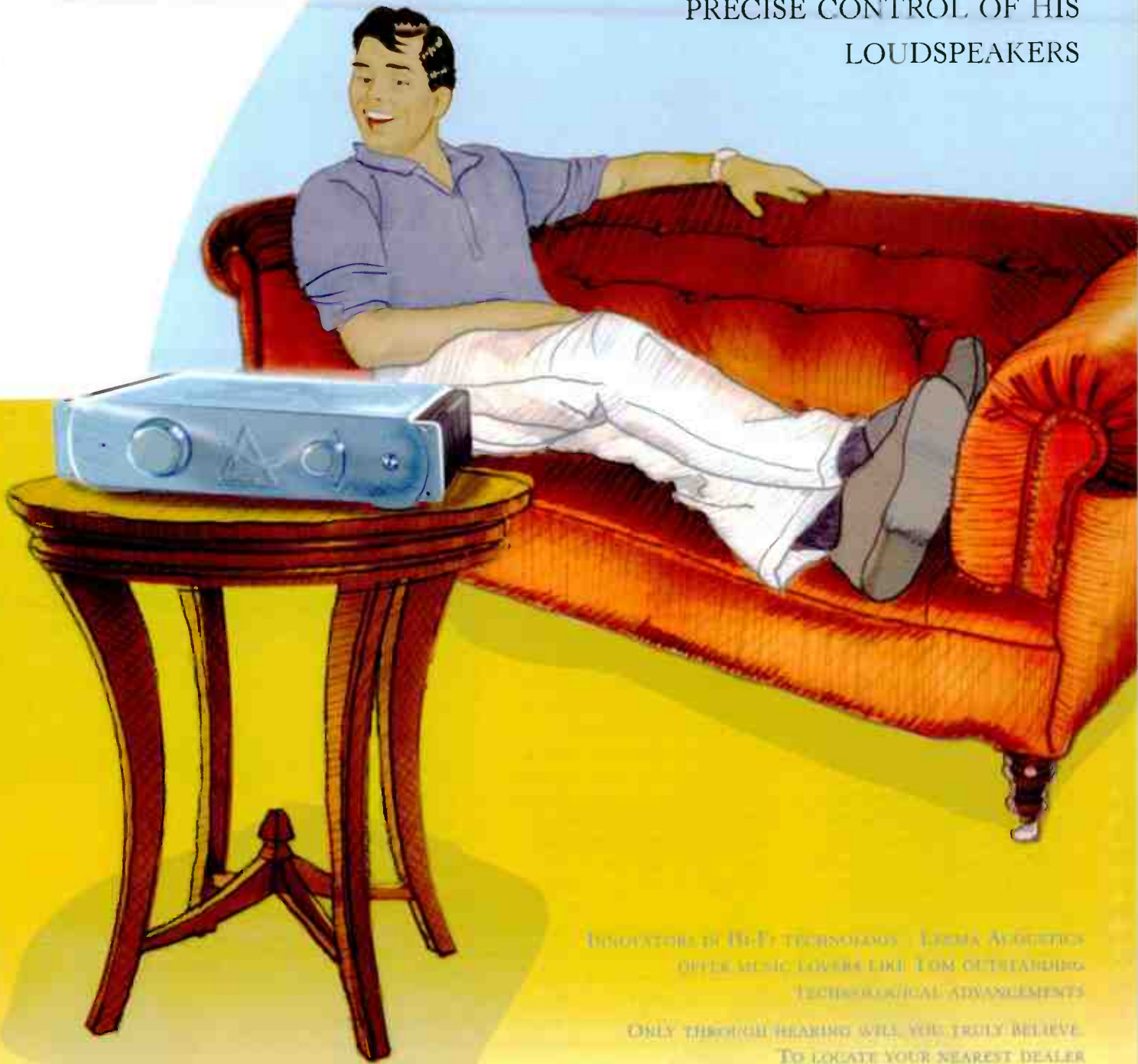
- build quality
- easy setup
- format diversity
- video quality

AGAINST

- opaque midband
- diminished dynamics



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



INDICATORS OF Hi-Fi TECHNOLOGY - LEEMA ACOUSTICS
OFFER MUSIC LOVERS LIKE TOM OUTSTANDING
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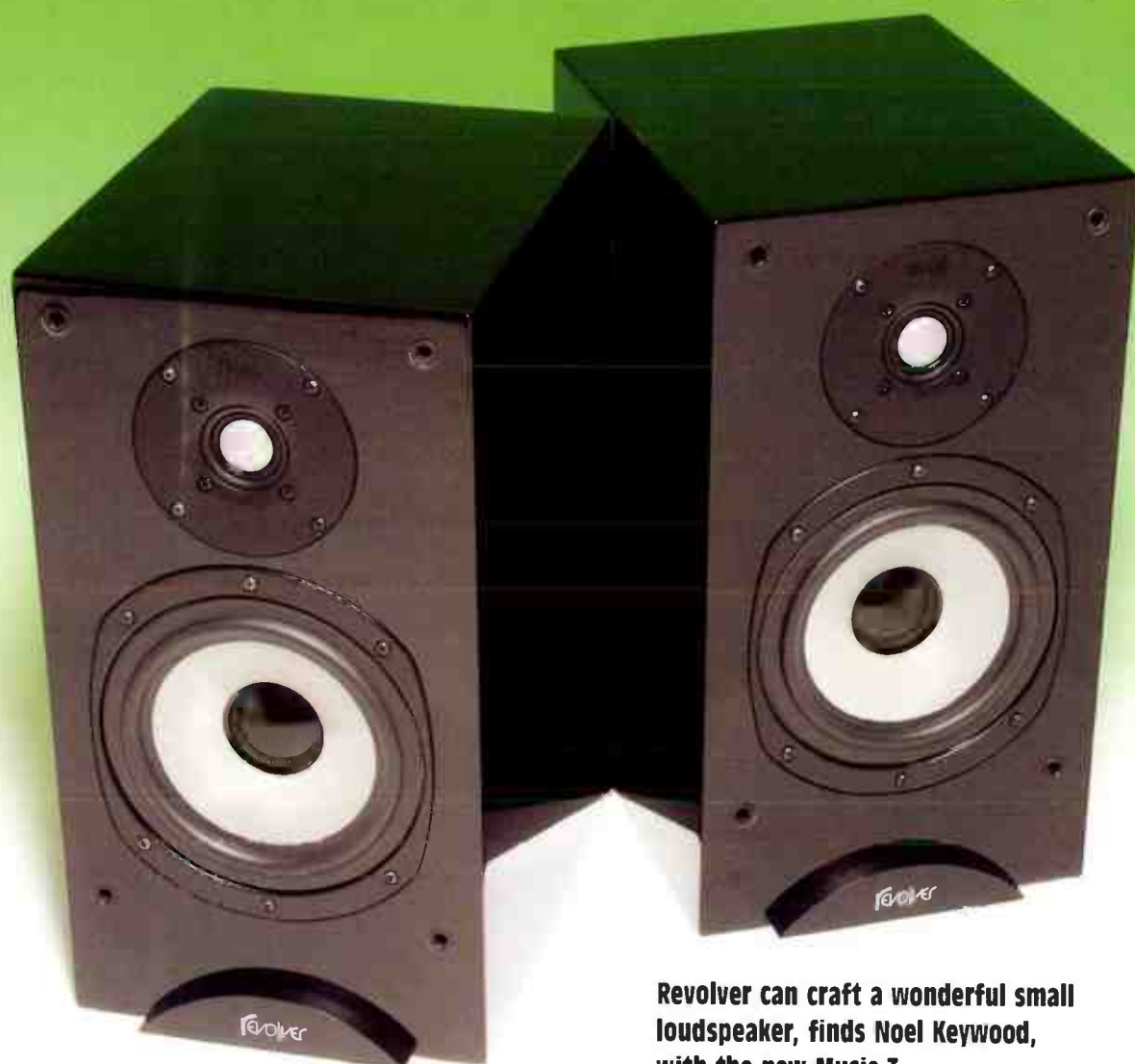
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BEAUTIFULLY ENGINEERED SOUND

Music Maestros



Revolver can craft a wonderful small loudspeaker, finds Noel Keywood, with the new Music 3...

Big loudspeakers are hit-and-miss affairs; some work well but many reveal how difficult it is to overcome drawbacks like box boom and smeared imaging. Small loudspeakers may not have the bass but score highly in most other places - as Revolver's new Music 3s reminded me. This svelte little loudspeaker, from a company known for its ability to squeeze top quality results out of products that are affordable - in this case £649 - demonstrates just how far the art of the small loudspeaker has progressed.

In Revolver's case the loudspeaker is an art, because they design all of it themselves, including the drive units. And Mike Jewitt, who is responsible for this side of the business, is one of those deeply

experienced engineers who knows a thing or three of the subtleties of design, as well as the requirements of the marketplace.

The Music 3s illustrate this well in the quality of their black gloss finish and compact dimensions of 390x212x300mm (HxWxD). Dimensions like this make them candidates for stand mounting. This is a loudspeaker that looks smart in the home, I found. It is intended for near wall mounting, with a small gap of 15cms to 30cms or so I would suggest, so the Music 3 should fit into a lounge easily. For those who don't like black boxes, Light or Dark Cherry are available, as well as Maple and even a silver finish.

The front grilles are removable and beneath them lie a 165mm (6.5in) bass/midrange unit, with a 25mm (1in) aluminium dome tweeter

above. The black surrounds of both drivers match the black front baffle nicely, giving a modern, unified appearance. The glassfibre bass/midrange cone and aluminium dome tweeter contrast with the baffle, providing visual interest if the covers are left off.

At the rear lies a bass port and, beneath it, gold plated bi-wiring terminals that can accept spade plugs which the Americans prefer, 4mm banana plugs for us in the UK, and bare wire through a large diameter hole in the threaded terminal pillar. To bi-wire, connecting links between woofer and tweeter must be removed.

Interestingly, Mike Jewitt told me that by further developing their bass/midrange unit so that it rolled off smoothly he found it could be used full range, so there

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is no crossover network between this drive unit and the amplifier. The tweeter just fills in. That means the full electrical damping of the amplifier isn't compromised by the usual series inductor that normally interposes itself between drive unit and amplifier.

Add in the fact that acoustic damping is quite high to compensate for near wall mounting and you have a loudspeaker that is well damped by current standards, meaning there is no bloom in the bass. Exactly what you get depends upon the amplifier and the source material, bringing me into the thorny and never quite resolvable issue of system matching and symbiosis. Some products work well together, others conflict subjectively. Changing amplifiers in front of the Music 3s showed they are relatively sensitive to the amplifier in their low frequency delivery.

SOUND QUALITY

Using a crisp yet grippy Marantz SR6001 surround-sound receiver to deliver stereo, with CD, DVD-A and Blu-ray 24/96 PCM sources, generally their bass was crisp and fast, unhampered by overhang. The Music 3s have plenty of speed and upper bass punch, if limited low bass as you might expect. They are grippy and fast, delivering the Scissor Sisters 'Music is the Victim' with Olympic pace.

"they combine the freshness of modernity with the sophistication of experience..."

Generally, well damped loudspeakers get up and boogie when given a good dose of power from a solid-state amplifier and the Music 3s responded well to the firm hand of the Marantz (I tried a valve amp and an Arcam P35 power amplifier but neither were ideal). This wasn't the area that most impressed me however. The Music 3s deliver pinpoint stereo images across a broad and well defined soundstage, with a wealth of detail attached to each instrument and every singer. They also look right into a performance. Putting these properties together delivers intense and vivid stereo that I found captivating. The Music 3s are wonderfully refined and capable here, and I should mention they achieve this without artificial emphasis; there's no treble peak to sting the ears, nor any plateau lift to produce the glassiness displayed by so many modern loudspeakers.

The sparkling clear live concert of Chris Botti, on Blu-ray in 24/96

PCM, shows how modern digital recording technology is progressing and, with this carefully recorded and balanced high quality material, the Music 3s shone. The prominent plucked double bass in 'When I Fall In Love' was handled adeptly, each note cleanly formed and fleet of foot, the woodiness of the instrument's body clearly audible too. I did find, however, that not only had the loudspeakers to be close to one wall, I also had to be reasonably close to the far wall 16ft away to perceive a natural bass balance. Botti's trumpet was smooth and tonally convincing, projected strongly into the room. The drum kit had plenty of body and good dynamic punch, although again there were no floor-shaking subsonics.

There's something about the Music 3s that tells me they suit modern, high definition recordings: the good ones that is! It is their lack of tonal colour and seeming neutrality, together with a sense of lucid insight that can almost be embarrassing to any signal fed in that is less than perfectly burnished. Santana's 'Supernatural' album on DVD-A - another complex 24/96 recording that's brimming with Latin American percussion, horns and backing vocals behind the guitar work - was spread across the room in a lush panorama before me, each instrument sharply defined, not in

boomy bass, just an easy speed and fluency of delivery that comes naturally to them.

CONCLUSION

The Music 3s have a modern vivacity of portrayal that's forensically revealing, whilst at the same time being easy on the ear. They also have more intense and precise imaging than I am used to, a strength that hit me straight away when using them. Balanced to sound tight and clean, there was no bass boom at all with the Marantz SR6001, but with an Arcam P35 power amplifier the bass filled out a little, at the expense of a little boxiness; I suspect this directly attributable to lower damping factor.

All of this suggests the Music 3s demand a good modern amplifier with appropriate characteristics, like a Marantz. Then they sing beautifully, giving a performance that suits a modern high definition system perfectly. The art of the small loudspeaker is very much alive with these highly polished gems; I was very impressed by the sheer sophistication of their detailed engineering, and the wonderful sound that resulted.



VERDICT ●●●●

Superb levels of insight from a smooth and refined design. Impressive.

REVOLVER MUSIC 3 £649

The Acoustic Partnership

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www.revolveraudio.co.uk

FOR

- great insight
- smooth treble
- well defined imagery

AGAINST

- light upper bass
- limited low bass
- amplifier-sensitive

simple outline but as a richly painted image brimming with musical vigour.

In contrast to this the Scissor Sisters first album sounded well formed but hardly in the same quality league, whilst Steve Winwood singing 'Roll With It' (1988) seemed to come from another era altogether, where the art of recording music was positively Neanderthal. The Music 3s are brutally revealing, that's for sure, which is why they are unreservedly modern, but happily without the usual rough edges. Their strength is to combine the freshness of modernity with the sophistication of experience. There's no screaming treble, nor

MEASURED PERFORMANCE

The Music 3s mark something of a departure for Revolver in that they do not feature their usual rise in treble output towards 20kHz. However, they still remain very flat up to this point and so should still be nicely detailed with plenty of top end sparkle.

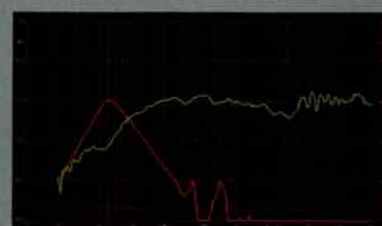
Below this, there is something of a drop in level in the midrange, which may rob a little atmosphere, but the lift in level above this should add good upper mid and treble detail.

Bass rolloff is surprisingly early for a reasonably-sized enclosure, heading floorwards from above 100Hz and reinforced by the port which is tuned to a quite high 60Hz. As a result the Music 3s may sound a little shy at the bottom end but should be reasonably punchy.

Electrically, the Music 3s are averagely well damped and they do have an unusual rise in impedance towards 20kHz which may unsettle some amplifiers. On the positive side though, they are a nice easy load, with an average impedance of 9.4 Ohms, dipping to a minimum of around 6 Ohms.

Combined with an excellent sensitivity of 88dB, The Music 3s are very easy to drive and should be a good partner for low powered valve amplifiers. AS

FREQUENCY RESPONSE



Green - driver output
Red - port output

IMPEDANCE



Hot Stuff

The new STP-80 integrated amplifier is Shanling's first valve integrated amplifier for the UK market, and David Allcock has nothing but glowing praise for it...

Chinese specialist Shanling has forged an identity for itself like no other in today's hi-fi market. Its combination of quirkiness, performance and value for money is something no Japanese company could offer, for example, as Shanling is small enough to cater for a growing band of audiophiles who want something different to what's come before, yet don't want to pay for the privilege!

Having made a name for itself with tube-based CD players and mini systems, now the company is moving into the amplifier market proper with the STP-80, which is a full size valve integrated - without the price tag to match. At 19kg, the £1,190 design is heavier than its compact dimensions (455x175x310mm) would suggest. The casing is finished to Shanling's usual fine standard, with brushed stainless steel on the chassis and silver coloured shrouds on the top plate covering the power supply and output transformers. In absolute terms, it's not as well finished as Onkyo's Japanese built £1,000 A-1VL for example, but not far off and certainly better than Chinese made Marantz integrations retailing for not much less...

The top plate houses three 6N3P valves whilst four EL34s are shrouded with steel frames - each pair of Electro Harmonix EL34s is configured in a push/pull circuit giving a claimed 35W [see MEASURED PERFORMANCE]. At a replacement cost of only £20 per pair this is an economical valve amplifier to run, and of course its performance can be improved further by 'tube rolling' - I've heard that Mullard EL34s can improve its speed and transparency should you wish to experiment.

The top plate is also home to four buttons; one pair selects the input and the second pair controls the volume, whilst the front panel has a single vacuum fluorescent display which shows input and volume. The back panel has three binding posts per channel, with both 4 and 8 ohm

taps being available, and a single IEC power input and four pairs of RCA single ended inputs. A pair of preamplifier outs for a power amp are also provided, should more power be required.

This unit is fully remote controlled, and comes with a handset which feels like it should have a Krell or Meridian badge rather than Shanling. The remote is stainless steel, and is actually a full system remote, designed to control both Shanling CD players and the STP-80. The hard plastic buttons are a little smaller than I'd like to see, but the feel is especially gratifying given the modest cost of the STP-80.

In use, this integrated proved incredibly versatile - it drove PMC GB-1, Hyperion Sound Design HPS-938, Leema Acoustics Xavier and Xone speakers, plus my Martin Logan Vantages, with ease. At no time did it sound strained or lacking in power, although predictably the Xaviers were the least comfortable as they're designed for big solid state amps like my reference Brystons, and sounded less controlled and precise as a result. I eventually settled on the HPS-938 and ML Vantages for this review.

Even for a valve amplifier the STP-80 runs hot, the EL-34s giving off lots of heat, so they need to be run with plenty of ventilation around them. Still, other than this, the STP-80 acted to all intents and purposes like a modern solid-stater in terms of operational stability.

SOUND QUALITY

The first thing you notice about this amplifier is just how quiet it is - like a good solid-state amplifier, such as my own Bryston, in this respect. And once music starts flowing, you realise that for a mere 35 watts it has an incredibly sizeable sound. By this I don't just mean loud, but large in scale - regardless of which loudspeakers it was driving - and it's this characteristic which defines the new Shanling integrated.

With enough width to seemingly throw stereo images through the side

walls, it's an expansive performer alright, but don't expect the sort of rock-solid precision within the recorded acoustic that you get from serious transistor amplification. Against solid-state power amps like Nuforce's Reference 9SE, the images are realistically scaled on the stage but not as accurately located. Still, it gave a great sense of front-to-back depth, and I found that listening to the STP-80 often gave the sensation of having your sofa in the actual recording studio. On 'Mary's in India' by Dido, her lead vocals hovered majestically in the listening room, giving a remarkable sense of the space to the recording.

The Shanling is 'transparent', but not in the obvious transitory sense of the word. It doesn't etch the leading edges of the notes on the front of your cranium, nor is it explicit enough to turn everything into a sea of disjointed detail. Instead, the STP-80 gives a fulsome but direct and highly communicative sound. Although it imparts a large amount of information, you're not aware of it. Instead, it simply draws you into the recording to the point where you actually don't worry about the mechanics and the electronics of the recording and playback chain and just want to keep listening to your music.

Dynamically this amplifier stunned me. I was not expecting 35W to impress, but the power on tap pinned me to the sofa, the bassline of 'Sadness' from Enigma's 'MCMXC a.D.' positively exploding from the HPS-938s. Subtle shifts in weight and emphasis were in no way overshadowed by the brawn of this push/pull amplifier, the visceral energy in the lower registers not preventing a delicate rendition of David McAlmont's interpretation of 'Diamonds are Forever'. The orchestral brass section seemed to go from nothing to full tilt in a heartbeat, such was the dynamic power this amplifier is capable of.

Whilst you'll never hear the vice-like grip of a Naim Nait 5i in the Shanling's lower registers, the STP-





REFERENCE SYSTEM:
 Shanling SCD-T200 SACD player
 Aesthetix Calypso line stage
 Bryston 3B-SST power amplifier
 Hyperion HPS-938 speakers
 Martin Logan Vantage speakers

VERDICT ●●●●●
 Sumptuous, expansive and powerful sound allied to fine build and keen pricing make this a great mid-price integrated amplifier buy.

SHANLING STP-80 £1,199
 Real Hi-Fi
 ☎ +44 (0)870 9096777
 www.realhi-fi.com

80 still proved excellent. The dual 8" drivers of each of my reference Hyperion loudspeakers were well controlled without diminishing their innate accuracy. The infectious driving bass line of 'Me and My Imagination' from Sophie Ellis-Bextor's 'Tripping the Light Fantastic' showed the Shanling's fine timing, whilst the kick drum (synthesised, as is everything on this track) was delivered with dizzying speed.

The Shanling continued to impress in the midrange, and whilst tonally this amplifier had a touch of extra warmth in the lower midrange, this does not impair the clarity or intelligibility of vocals. Rather, it gives female vocals just a touch extra body and imparts a little more richness into them, as the velvety quality of Dido's voice in 'Mary's in India' showed. High frequency extension proved excellent, not only showing great delicacy and transparency, but it was also highly resolving. At no time could I hear a loss of information compared with my solid-state references, and there was only a lessening of transient attack

on cymbals and triangles, giving away the fact I was listening to valve rather than transistor.

CONCLUSION

Despite generally preferring high power solid-state amplification, I was well impressed by the Shanling STP-80, and ended up seduced by the sound of this interesting integrated amplifier. With full remote control and Shanling's super build and finish, it also proved a pleasure to use. Whilst I would have liked to have seen the option of balanced inputs at this price, I can't fault its overall performance at the price.

Obviously, there are pure Class A solid-staters and hybrids from the likes of Sugden and Vincent (respectively)

which offer more clarity and power (respectively), but the Shanling counters with a big, warm and engagingly musical sound that many will prefer. Superb value for money, and an amplifier many will adore.

- FOR**
- musicality
 - build quality
 - operational quietness
- AGAINST**
- nothing at the price

MEASURED PERFORMANCE

I expect just over 30 watts from EL34s: more than 34 watts means they are being over-driven, shortening life; less than 30 is okay but doesn't sell so easily. The STP-80 produced exactly 32, so is spot-on in this respect. You actually get 30 watts into 4 Ohms because of lower coupling efficiency from using half the 8 Ohm winding, but as overload is slow and progressive, there seemingly being little feedback, this isn't detectable as less volume.

Distortion levels in the mid-band were on the high side at 0.34% at 1w levels, comprising second and third harmonics. It is possible to get much lower than this at 1 watt, and innocuous second harmonic only. At high frequencies results were good though, being little different from the midband, likely due to low feedback, so here the STP-80 looks fine.

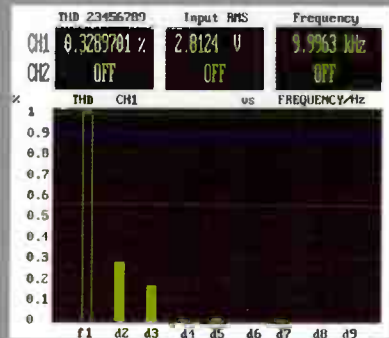
There's plenty of gain, input sensitivity measuring 277mV, so the amp will match most sources.

Damping factor was unusually low at 1.35, hence my suspicion there is little feedback. Best to use sensitive floorstanders that are acoustically well

damped (i.e. tight sounding, not boomy). The STP-80 measures well. It is a standard EL34 design, well executed and of course with every modern accessory. NK

Power	32watts
CD/tuner/aux.	
Frequency response	20Hz-60kHz
Separation	80dB
Noise	-87.5dB
Distortion	0.34%
Sensitivity	277mV
Damping factor	1.3

DISTORTION



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You need to make sure you keep the weekend of 13-14th October free to ensure you hear the likes of the truly amazing **NAIM 500** system driving the awesome **Dali** Mega Line loudspeakers. This is a system that may just change your thoughts on how good a hi-fi system can be. There will be a resurgence in vinyl from **The Funk Firm**, showing how good your old records can sound. Alongside the Funk Vector turntable will be a fully "funked" Linn LP12 so you can decide if the reviews on this controversial mod are as good as the hype makes out. We think its very special. See if you agree!

Impish young upstarts **Anatek Acoustics** will be showing their brand new class A integrated amplifier along with their amazing Phono stage. Come and check out this new and innovative company with a big future.... Kings of the "tiny loudspeaker with a big sound" **Totem Acoustic** will offer demonstrations using the latest improved versions of their highly acclaimed products on the end of the Germany **Einstein electronics**. This promises to be a bit special. So make sure you get to listen in this room!

Pro-Ac will be showing their "lets break the laws of physics" new speaker the Tri-Tower. Again this promises to be a real crowd stopper, as these speakers are just too small to produce the copious amounts of light controlled bass they are capable of! Come and check them out especially if lack of space is a problem.

Naim will showboat their ground breaking new integrated amplifier, the Super Nait. Here is a simple one box amplifier that has real world power output, analogue inputs as well as digital inputs, making it ideal to be the heart of any future proof system in any home! Superb Naim quality

and sound in a unique package for the new generation of ipod audiophile and more. **SUGDEN** and **Focal** will be generating lots of interest in their products as well as debuting the world renowned **Siltech** cables that Sugden now distribute. Here are three company's that each take their responsibility to their customers very seriously. More than hifi, it's a way of life...

Indeed this show promises to be the best yet, UKD will show an array of European products from the likes of **Unison Research**, **Pathos**, **Finyl**, **Graaf**, **Dlaponson** and **Triangle** to name only a few. There is always something special on show in this room, and so should not be missed or ignored.

Pure Sound will be keen to show their latest valve designs playing into the **Heco** loudspeakers. There has been for the last few years a real interest in the resurgence of the single-ended triode valve amplifier, and the designs that Guy Sargeant is currently pursuing seem to offer incredible performance along with ultra stable reliability. For sure, once again this will be a room you simply must visit.

Of course the mighty **B&W** have been finding fans with their latest refinement in the 600 series loudspeakers, and sure enough we will be showing these alongside some of their more discrete designs. Want an elegant slim floor stander for music and cinema? Look no further than the XT 4 from this fabulous British speaker maker.

For those of you who have been reading about the new **Marantz** top of the range hifi electronics, the show will definitely be the place for you. We will demonstrate the might of the SA7 S1, to show just what you have been missing from your cd collection. In fact so far all who have listened have been smitten by this player, so if you're thinking of a digital upgrade, forget freeview, and go **MARANTZ SA7 S1**.

Indeed this show is so jam packed with real specialist hi fi, we cant fit it all into a half page. There is so much high quality gear on display, that you may just have to come on both days to fit everything in!



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World Radio History



DNM STEREO SOLID CORE PRECISION SPEAKER CABLE £18/M

When the original DNM Solid Core speaker cable was launched, the world was getting excited by talk of the new Bond movie, 'A View to a Kill', while girls swooned over the best boy band of the moment, Duran Duran. Thinking about things in these terms shows you how old the product is, and how so many things have moved on in life as well as hi-fi since 1984...

Still, DNM cable has endured. Despite being one of the oldest designs around (surely only QED 79-Strand precedes it?), people still know and love what this wire does to an audio signal, or – more accurately – doesn't do. And what it doesn't do is to rob music of its essential speed and power, as DNM cable – in true eighties 'flat earth' style – captures the music's attack transients like few (if any) other cables.

In the intervening years, the cable market has moved on apace. Indeed, you could almost say it's been the most successful of all hi-fi product lines. DAT recorders, DCC and MiniDisc have all come and gone, but the demand for high quality cables remains. Profits are big, marketing is all-important, and magazines get money from ad spend. So where does this leave DNM?

Well, given that Denis Morecroft is not one of the world's greatest self publicists, and nor does he have big bucks to hire sharp-suited PR people, it leaves him selling a small but steady amount of the cable to those in the know, simply on the grounds of performance.

In the past, I've used it in my system to get very specific results. I know what DNM Solid Core does and what it doesn't do, and if it's suitable for the job in hand, there

are few cables that come close. If you have a slow, stodgy and musically unengaging system which is possibly a little on the warm side, then this is your cable.

The new DNM Stereo cable takes everything from the 1985 design and builds on it. As per the original, its object is to provide a stable magnetic performance along with a balanced capacitance, inductance and resistance. It is 18.7mm wide and 2.2mm thick, which is about the same size as the original DNM Solid Core, but within this is a dual cable assembly that can be used to connect a pair of stereo speakers, or to bi-wire. It comes as a long ribbon, which you can 'unzip' to provide single mono wires or not (as the case may be) to give bi-wire.

As with the original Solid Core, it is directional. If you buy the terminated version, don't expect chintzy plugs that look like 'male jewellery' – the plugs are plastic bodied, as per DNM's philosophy. "Using a cable so carefully designed to minimise magnetic effects with a large chunk of metal soldered on the end would be self-defeating", says Denis Morecroft.

Driven by a selection of transistor power amps, the new DNM cable proved a fascinating counterpoint to the Black Rhodium Tango (£15/m) that I normally use. The Tango has proved a tremendously impressive product, one that's stood up to cables at five times the price, but it couldn't beat the DNM Stereo – merely offering a 'different' presentation. The DNM cable had an obviously faster, tighter, tauter and grippier nature that

revelled in electronic dance music such as Kraftwerk's 'Tour de France' outing, and also the eighties power-pop of Blondie's 'Atomic'. The Stereo cable brought tremendous urgency to the music, pushing it along apace and giving a thrilling, seat of the pants listening experience.

Interestingly, this is pretty much what the older Solid Core had done too, but the new Stereo cable added a good deal of extra transparency, giving DNM solid core more universal appeal. I found it tonally a little starker than the more euphonic, cossetting nature of Black Rhodium's Tango, but the difference was less pronounced than before. Indeed, Stereo gave an impressively clean and neutral rendition of Neil Young's 'Heart of Gold', proving surprisingly smooth and devoid of edge. By comparison, Tango was just a tad softer, warmer and cloudier.

A truly interesting and impressive product then, and one well worth consideration at a relatively modest £18/m. Most people should find it far more accessible than the original DNM Solid Core, while some folk with some systems and certain tastes will regard it as the best cable ever made. **DP**

[Contact: DNM Design on +44 (0)1480 457989 or click on www.dnm.co.uk.]

THE THEORY

DNM's Denis Morecroft believes that "once the cross-sectional area of a cable exceeds a certain size, things begin to go badly wrong with the sound. Complex interactions between the cable and the magnetic fields generated by transmission of an electrical signal cause circulating eddy currents, which also generate significant magnetic fields that oppose the original signal - the result is distortion. In short - smaller cross-sectional area gives greater clarity". He argues that amplifiers sound better when driving through a resistive or inductive load, undermining the low resistance of big, thick multistrand cables. "Large diameter high-capacitance cables connect the amplifier's sensitive feedback control system to a short circuit, a type of load that invariably worsens the amplifiers sound quality", he has said. DNM claim that their smaller diameter cables with higher resistance and inductance help to isolate the amplifier's feedback control system, improving clarity throughout the frequency range.

SOUNDBITES



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Tower Power

Adam Smith takes a listen to the newest flagship loudspeakers from Latvia's RRR - the mighty FS100s.



As I have mentioned on these pages before, I have long felt that nothing beats a good, large loudspeaker when it comes to dynamics, scale and sheer clout, and the design of such beasts has come on in leaps and bounds from the large, resonant boxes stuffed full of shoddy drive units that were sadly too common in the 1970s.

When one considers the likes of the Revolver Cygnis, Mowgan Audio Ogma, and right up to the B&W 801D, these are all thoroughly well designed and superbly constructed modern units that firmly consign the past to the dustbin. All use high quality, high technology drive units

and fit them into superbly engineered cabinets that offer the rigidity that such an item needs in order to perform at its best - let us not forget that the 801D, for example, tips the scales at around 120kg and a good portion of that is cabinet!

The downside of all this technology and construction is, of course, price. The B&Ws are £10,500 and the Mowgans and Revolvers around the £7,000 mark. Consequently, when a huge pair of loudspeakers laden with drive units arrives in the office, boasting a price tag of a mere £1,055, should we be worried?

Well, with a pedigree like RRR behind them, possibly not. RRR was founded in Latvia in 1927, manufac-

turing radios, and has a long and illustrious history of technological innovation. Briefly diversifying into the repair of submarine navigation equipment under Telefunken during the Second World War, RRR returned to the audio side of things during peace time, and claimed such innovations as the first Soviet radio/record player and first Soviet transistor radio in 1961.

Nowadays, RRR is a large and thriving company, helped greatly by them snapping up their main competitor, VEF, a few years back, thus becoming VEF Radiotekhnika RRR, and they manufacture virtually everything they make in-house, as well as making components for other manufacturers. Indeed, production of the FS100s was apparently delayed a little by the factory's machines being tied up making items for a large European audio manufacturer...

The FS100s are right at the top of the new range and they're big at no less than 1,230x300x430mm, and weigh an impressive 43.5kg per speaker. As can be seen, they also do rather well on a drive unit to price ratio, offering five per loudspeaker. Starting at the bottom are two eight inch (200mm) bass drivers, each in its own enclosure, with the bottom driver ported to the front and the top driver to the rear. Moving up are two four inch (100mm) midranges, bracketing a one inch (25mm) soft dome tweeter.

All cones are paper-based, and manufactured using a special process, exclusive to RRR, that dates back to the 1940s. This involves using a special cellulose made from hundred year old Spruce trees to obtain fibres of a very precise nature. The cones consist of several layers, the middle of

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Right: Designer
Dr Shelley Katz



Top: Podium 1 (£4995)
Bottom: Podium .5 (£3699)

VERDICT ●●●●

Podium Sound

Full-range super efficient flat panel loudspeakers

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- no electrostatic devices
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- no large amplifiers necessary

The Stereo Times, June 2007. Clement Perry wrote:

" The Podium 1 loudspeaker created a certain sonic portrait that's unique even among panel designs because of its faithfulness to sounding closer to real-life. This auspicious first showing was in many ways the highlight of this years show. The result were simple: this loudspeaker is destined for glory. "

Podium Sound

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which is perforated by small holes. A cocktail of preservation and damping materials that include Californium are allowed to soak through these holes, making the orbital rings visible in the outer paper layers. This helps with providing good cone damping and sound propagation from the drive unit, according to RRR.

Cabinet finish is absolutely outstanding - it would not look out of place on a loudspeaker many times the price. Our review samples were finished in an immaculate Mahogany veneer with black front panels, but the FS100s can also be ordered with a Silver front panel, and Beech, Black or Silver cabinets. An additional plinth is supplied with the loudspeakers, that screws to the bottom of the main cabinet, and to which their spikes are inserted.

SOUND QUALITY

Auditioning of the FS100s actually started with a bit of a hiccup, as their

lifelike and reproduced in a very intricate manner. Leading edges of notes were solid and razor-sharp, with the FS100s adding a nicely judged decay to the trailing edges. Orchestral material was very impressive, with violins and brass instruments having just the right amount of 'edge'; to their presentation, but without becoming either screechy or raspy. Moving to more energetic material, however, the crescendos from Elgar's 'Pomp and Circumstance March No.1' were mightily impressive, with real explosive feeling.

At the top end, the FS100s were a little more choosy, their measured rolloff removing the very top end shimmer from performances. Never dull-sounding, they had no problems extracting every ounce of detail from the treble, but effects in this area could end up rather further back in the mix than would normally be expected. Cymbals were rendered

each note from the next, something which some designs struggle to do with material such as this.

So, not only will dance and reggae fans in particular love the FS100s, but I also suspect that if you were to use them as front loudspeakers in an A/V system, you could happily save some money by not needing to buy a separate subwoofer.



"the FS100s offer huge reserves of solid low end grunt..."

low impedance [see MEASURED PERFORMANCE] upset the Red Wine Audio Signature 70 amplifiers we have been using, resulting in a noticeably distorted top end. Fortunately, Anatek Acoustics came to the rescue, and their new A50R integrated stepped up to the block quite happily to rescue the day (watch this space for a full review).

Playing some background music for a few days, as we do with all review equipment, the FS100s showed that sense of ease and effortlessness that big loudspeakers do so well. With the radio playing quietly, definition was superb and bass notes could still be quite clearly heard. Strangely, these are fine loudspeakers for low volumes, just don't expect your neighbours to believe you when they see you carrying them into your one-bedroom flat!

However, cranking the wick up somewhat, the FS100s continued to impress - personally speaking, they offer exactly the sort of performance I love. They really do offer a truly walk-in soundstage that gives uncannily large images. Spinning 'Damn it, Rose' from Don Henley's 'Inside Job' album, the vocals were projected into the room in a quite remarkable manner, with the backing acoustic guitar placed firmly behind in the soundstage. The RRRs gave one of the most large-scale renditions of this track I have ever heard.

Instruments were incredibly

very intricately by the FS100s but were missing the ultimate metallic gloss that is imparted on them by a really insightful tweeter. Another thing I also found was that the FS100s are quite axis-sensitive. Treble performance was best with the tweeters firing directly at your ears, and off-axis they tended to roll off quite rapidly, making a fixed seating position for serious listening quite essential.

Finally, and I expect many of you will have been waiting impatiently for this bit, the bass. Fortunately I am pleased to report that, not only do the FS100s have plenty of it, but it is tight, fast and detailed. Those weighty cabinets are clearly well designed and very sturdy, as there was no hint of boxy boom at all during auditioning. The FS100s offer huge reserves of clean, solid low end grunt, Bob Marley's 'Waiting in Vain' sounding utterly sublime. Through the FS100s this track offered serious bass impact and spot-on timing, but the loudspeakers were still easily able to separate

CONCLUSION

It can often be difficult to successfully tie together a large number of drive units but listening, as well as measurement, shows that RRR have done an excellent job with the FS100s. The five drivers in each loudspeaker integrate superbly well and the RRRs turn in a very impressive performance.

Whilst true that they are a difficult load to drive and that they could do with a tweeter that offers better off-axis performance, they remain superb-sounding and incredibly well engineered loudspeakers at an almost absurdly low price. Just make sure your floorboards will take their weight!

VERDICT ●●●●£

Fine example of how to do a large loudspeaker really well, with magnificent pace, space and bass at the price. Superb value for money.

RRR FS100 £1,055
Distributed by AAP Tech
+44(0)141 585 6381
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FOR

- huge soundstage
- fabulous bass
- excellent driver integration
- design and construction
- price

AGAINST

- difficult load to drive
- treble directionality

MEASURED PERFORMANCE

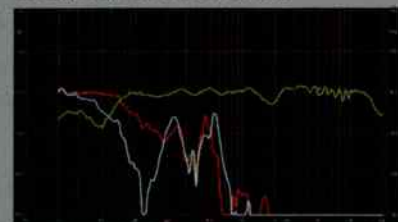
The FS100's measurements show a well designed loudspeaker. Output is very even across the full bandwidth with a generally flat trend. The only exceptions are at around 2kHz, where output dips by 3dB or so, which may rob a little atmosphere in the midhand but should mean that there is no harshness in this area. High frequencies roll off gently above 15kHz, to finish 5dB down at 20kHz so the FS100s will have something of a softness at the very top.

Bass output is very healthy indeed, as might be expected. The two eight inch drivers work down to 70Hz and both ports are tuned to a very low 25Hz and cover a wide bandwidth, so the FS100s will not lack low frequencies by any means. Electrical damping is good, so this low end should not be loose, either.

Electrically, the FS100s are not an easy load, measuring an average of 4.4 Ohms, but dipping to a minimum of around 3 Ohms, so they will need a healthy current supply from a partnering amplifier. That said, however, all those

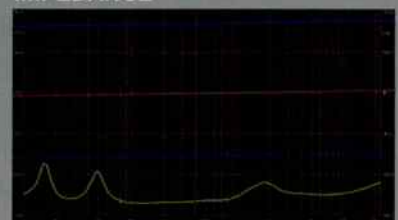
drive units working away give an impressive sensitivity figure of 92dB, so 30 watts will be plenty to make them sing. AS

FREQUENCY RESPONSE



Green - driver output
Red - front port output
Blue - rear port output

IMPEDANCE



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Square Deal

Adam Smith unboxes REL's R305 subwoofer...

When subwoofers crop up in conversation, the name that usually springs to mind is REL. Named after founder Richard Lord,

REL have gained a firm reputation as builders of fine "sub-bass systems" as they prefer to call them. Now under the umbrella of USA's Sumiko, modern RELs are nevertheless still designed in the UK

There are three models in the 'R' range, the smallest being the R205 which features a ten inch driver and a 200W amplifier and the range topper is the R505, using a 500W amp and twelve inch driver. Sat in the middle, the R305 has a ten inch driver, but is powered by a 300W digital amplifier. The R series marks the first use of a digital amplifier by REL, as they previously stated that they had not found a unit that met their standards.

A sealed box design, the R305 is very compact, measuring just 370x320x340mm (HxVxD), and finished in an immaculate gloss black. Inputs are provided at high level through a Neutrik Speakon connector (REL supply a 10m lead with bare wires at the other end) and at low level via phonos for Line and LFE. Separate volume controls are provided for the Line Level and High Level inputs, which can be run simultaneously, as well as crossover adjustment and phase switching. All of these are on the front of the unit, in a small box mounted beneath the main enclosure, normally covered by a very swish frosted glass plate.

SOUND QUALITY

Connected up to a pair of 75th Anniversary Wharfedale Diamonds

and sited well away from the corners of the room, contrary to REL's instructions, the R305 took a good hour of positional adjustment and fine-tuning of settings on its control panel in order to integrate successfully. Measurement shows that its filter operation is not ideal and this meant more effort than usual had to be expended in order to set it up properly.

However, this done, the R305 proved quite a beast. Starting with action and DVD material, low frequency effects were superbly powerful and pounded out with real weight. Explosions were pummeled forth with power and verve. This neat little unit more than transcends its compact dimensions.

Moving to music, the REL proved equal to this task as well, underpinning the Diamonds' low end without becoming overblown. The R305 kept up with fast bass lines and

pounding dance beats without any booming and its timing, although not the best I have heard, never gave a noticeable lag to bass notes behind the rest of the mix.

Spinning Grace Jones' 'Slave to the Rhythm' album, the REL picked up the very lowest notes hidden in the mix that rarely come through without a subwoofer, and hammered out Underworld's 'Jumbo' with gusto. Slipping on one of my favourite bass testing tracks, Bela Fleck's 'Flight of the Cosmic Hippo' however, the R305 added superb weight to Victor Wooten's sublime fretless bass playing, but lacked low end detail, meaning that each note blurred into the next.

One of the best REL subwoofers I have heard to date, the R305 works very nicely indeed on both music and movies when properly set up, but its poor filter arrangements make this harder than it really should be. Worthy all the same.

MEASURED PERFORMANCE

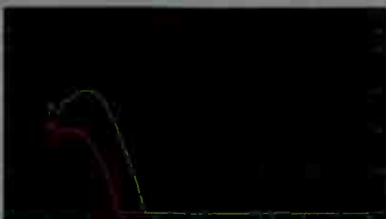
Measurement shows that the R305 offers a very healthy low end output, being 3dB down at around 25Hz with the filter control set to maximum. Unfortunately reducing the filter control's cutoff frequency also drops the overall output, giving a difference of 4dB below 30Hz.

Not only that, but REL's figures on the crossover control itself do not tally with the measured figures, the printed range being from 25 to 100Hz, but measurement showing a more realistic range of 50Hz to 80Hz at -3dB - not a great range of adjustment. This will also preclude the R305 from being used with satellite speakers that are limited to 100Hz or higher at the bottom end, as

there will be a 'hole' in output between the satellites and the subwoofer.

All in all, the R305 will not lack in serious low end grunt but may require some effort to integrate successfully with matching loudspeakers. AS

FREQUENCY RESPONSE



Green - crossover at maximum
Red - crossover at minimum

VERDICT

Musically adept and impressively punchy compact subwoofer that offers fine performance, once set up properly.

REL R305 £800
REL Acoustics
+44(0)1656 768777
www.rel.net

FOR

- bass weight
- musicality
- compactness

AGAINST

- low end detail
- filter operation

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World Designs' amplifiers can be heard driving Tannoy Heritage loudspeakers in the Icon Distribution room. Peter Comeau of World Designs and Adam Smith, Assistant Editor Hi-Fi World will be there, or thereabouts.



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Golden Arro

Adam Smith takes a listen to Totem's diminutive Arro floorstanders.

Those of you who, like me, have been a regular at the Bristol Sound and Vision Show for far too many years, may well have become familiar with a certain room, that manned by Joenit distribution of Belgium. Their room is always tastefully and subtly decorated and with pride of place given to a dreamcatcher, the Native American Indian artifact that was believed to catch both good and bad dreams - storing the bad ones until the morning sunlight would burn them off, and holding the good ones to return and be dreamed again another night.

For me, not only was this room noticeable for this decoration, but also for the consistently good sound that emanated from it. From year to year other manufacturers and distributors have tended to vary in their quality, but Joenit's room has always seemed to make very pleasing noises, to my ears at least. After a little more research I have come to the conclusion that this is thanks in no small part to the loudspeakers they distribute in Europe - those made by Totem Acoustic.

Founder Vince Bruzzese (who started Totem in Montreal in 1987) was originally qualified in anatomy and then spent some years teaching science and mathematics. However, as a keen fan of music, he put his scientific knowledge to work in modifying old hi-fi equipment in order to obtain the very best from it. It was at this time that he became convinced of the importance of the loudspeakers in the reproduction chain, eventually coming up with his own approach to design and launching the cunningly-named Model One in 1989, after two years of research.

The design and build methods that Vince uses are unusual in a number of ways. Firstly, no measuring system is used throughout the development process - all loudspeakers are designed solely by ear. Secondly the stains for the cabinets are carefully chosen, and they are applied inside as well as outside each enclosure.

It can thus be inferred that Vince treats the enclosure as a complete part of the loudspeaker, rather than just a box to hold the drive units. As he puts it, "Antonio Stradivari would understand"! In fact, so important is the enclosure to the finished loudspeaker, that Totem founded their own cabinet construction firm, Mani-Tech, which produces exclusively for Totem. As part of this, all veneers are specially selected by Mani-Tech and the search for the correct items can cover many thousands of miles.

The Arros are the smallest floorstander in the Totem range and are an incredibly dinky two way design, measuring just 880x130x180mm (HxWxD). Driver

lineup consists of a four and a half inch (115mm) bass unit, although this is measured across the extremities of the chassis and the active area of operation is closer to three and a half inches according to my ruler. Above this is a three-quarter inch (19mm) soft dome tweeter with a low resonant frequency, allowing the crossover point to be at a reasonably low 2.4kHz.

The Arros are supplied with a base plinth upon which to stand them, which adds both stability and spikes. No grilles are supplied as standard but can be purchased for an extra £49, and the plinth can be upgraded to Totem's 'Claw' feet that are supplied with models higher up the range: three of these sit on the underside of each loudspeaker and interface with the floor using a large diameter ball bearing. They are expensive at £200 per set but are very stylish, claim to bring further sonic improvements and will not damage floor materials, unlike spikes.

SOUND QUALITY

So, the first obvious question would seem to be - have all these interesting technologies worked together successfully? In a word, yes. If you were to hide the Arros behind an acoustically transparent screen, I think I can confidently say that any listeners would never guess their diminutive dimensions correctly. The Totems bring forth a soundstage that is magnificently 'out-of-the-box' and offer a beautifully lit midrange with bags of detail. There is no sense of colouration and they have a remarkably clean mid and top end.

The rather uneven frequency response, as suspected, can be heard and this is what gives the Arros their signature sound [see MEASURED PERFORMANCE]. The top end is indeed bright and dynamic, with high frequency content well revealed, and offering a magnificent metallic nature to cymbals. I recently attended a live concert in Chichester Cathedral (The Nigel Kennedy Quintet, incidentally - highly recommended!) and was sat at the front and right beside the drummer - it is quite a while since I last heard real, unmiked cymbals up close and the Totems instantly brought the intensity and impact of these items right back to me; they really do like to project the performance at the listener and do not miss anything within the recorded acoustic.

This dynamic nature can be something of a downside as well, however. I found that the Arros were quite sensitive to partnering amplification and, as might be suspected,

they seemed happiest on the end of a valve amplifier. With a solid state unit that has the classic transistor sound they could be too forward and hard. As an example, playing The Corrs' 'Only When I Sleep' through the Plinius 9200 amplifier reviewed last month was quite an ear-splitting

"the Arros pick up very well on the intricacies of each individual instrument"

experience and the Arros were much more pleasant when driven by the Melody SP9.

Spinning instrumental discs showed that the Arros pick up very well on the intricacies of each individual instrument and reveal their nature well. There was no need to wonder, "Is it live, or is it Memorex?" to use the old slogan, as the Arros told you quite clearly. Vocalists were equally well reproduced, however the Arros did sound a little thin in this respect - they did not quite project singers truly out into the listening area; something which, again, could be gathered from measurement by noting the dip in their output at around 800Hz-1kHz.

At the low end, the Totems impressed once again, as they have an astonishingly punchy and solid low end. Double basses had a lovely woody bloom to them and electronic bass lines pounded out with great enthusiasm, starting and stopping with alacrity - an advantage of a small drive unit with a comparatively low moving mass. The downside of this small unit, however, was that it does not take too much provocation to make the unit hit its end stops with an alarming crack, thus limiting the ultimate loudness levels that the Arros can offer.

CONCLUSION

The Totem Arros are very interesting little loudspeakers. Astonishingly dynamic and forthright, with commensurate levels of get-up-and-go, they have a speed and dexterity that can leave you breathless at times. They dig out details from recordings and present them as they should be;

REFERENCE SYSTEM
 Eastern Electric MiniMax CD player
 Pioneer PLC-590/SME M2-10/Ortofon Rondo Bronze turntable
 Anatek Acoustics MC1 phono stage
 Melody SP9 amplifier
 Plinius 9200 amplifier

without any colouration or hesitation. They really do offer a performance that transcends their physical size and can make more 'normal' sized loudspeakers sound ponderous by comparison.

Where they fall down slightly however, is also a result of this physical size. That small drive unit that gives such dynamics and speed is ultimately limited in its travel, meaning that the loudspeakers are equally limited in the loudness levels that they can generate - despite their deceptive sense of scale, they will not be ideal for filling large rooms with sound. They also have a quite forward balance and are quite sensitive to the nature of partnering equipment as a result.

That said however, feed them with a decent amount of power from a smooth amplifier, and they could be just what you've been looking for, if you want to pep up a small listening room.

VERDICT ●●●●
 Dynamic and forthright loudspeakers with surprising scale and bass, all wrapped in a positively petite package

TOTEM ARRO £995
 Distributed by Joenit
 ☎ 0032 155 285 585
 www.totemacoustic.eu

- FOR**
- superb scale
 - good bass weight
 - excellent dynamics and pace
 - neat and stylish

- AGAINST**
- slightly 'thin' vocals
 - limited loudness
 - can be strident

MEASURED PERFORMANCE

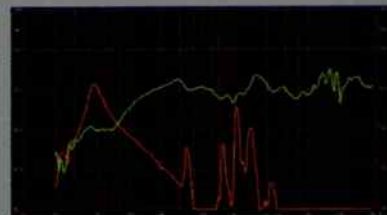
The frequency response of the Arros is not the flattest we have ever measured, but all is not lost. Most noticeable is the rise in high frequency output above 6kHz, which will add brightness and detail to the sound. This is joined by another rise in output at around 1.5kHz and a subsequent dip above. This will mean that the Arros are likely to have a brightly lit midband but should not be harsh, as the dip is right where the ear is most sensitive.

Bass from the Arros rolls off quite early, as might be expected from the small driver, but the port has good output to reinforce this down to its tuning frequency of around 40Hz. The response does have something of a gap between the driver and port frequencies which may rob some detail.

Electrically the Arros are well damped with no nasties in the impedance curve. Average measured impedance was 5.6 Ohms, dipping to a minimum of around 3.5 Ohms, so the Totems are a genuine 4 Ohm load. Their sensitivity of 85dB means that they will require at least 50W or so to

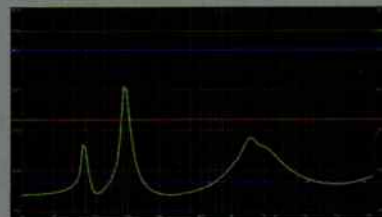
give of their best but I would expect them to turn in a punchy and dynamic performance.
 AS

FREQUENCY RESPONSE



Green - driver output
 Red - port output

IMPEDANCE



Ping!

No, it's not an ancient Chinese puzzle, but the name given to Consonance's new all-in-one system, the Forbidden City Ping. Adam Smith listens in...

Cast your minds back for a moment if you will, to the good old nineteen seventies. Often referred to as the "decade that taste forgot", I'm sure it will bring back pleasant memories of Worthington Party Sevens, Ford Cortinas and Space Hoppers, and somewhat less happy ones of three day weeks and the "Winter of Discontent". The hi-fi industry of this time also had good and bad memories. Although there were a few shining beacons that have attained cult status, like the Technics SL1200 turntable and Yamaha NS1000 loudspeakers, for many people, their tunes were provided through a good old music centre.

For those of you young enough not to know these beasts, they were all-in-one units, usually featuring an amplifier, cassette deck and a turntable which would often be either made by BSR (bad), Garrard (better) or Dual (better still). These were all laid out horizontally, with primary controls on the top surface and sometimes some secondary ones along the front. With the exception of a few high end units, including

are bringing the convenience of multiple sources in one box to the modern market, whilst banishing memories of the aural wounds some of the old timers used to inflict.

The latest unit is from Opera Consonance and forms part of their 'Forbidden City' range, named after the Chinese Imperial Palace in Beijing. The range itself consists of a turntable, two CD players, two amplifiers and the Ping all-in-one system considered here.

The Ping itself is based around the innards of the CD120 Linear CD player, reviewed in *Hi-Fi World's* August edition and features that unit's 16bit non-oversampling DAC with no digital filter, that can be switched between 44.1 and 88.2kHz sampling rates. Also under the bonnet is an FM/AM tuner with nine presets and a 100W amplifier, making use of Consonance's 'Cool Class A' technology, which they claim offers the same "linear sound performance" as Class A but without its high power consumption.

Spare socketry is also provided round the back for an auxiliary input through phono sockets, as well as a

is supplied with a weighty and solid metal remote handset in a pleasing black aluminium finish.

In use, the Ping proved something of a mixed bag. It is quite simple, with not too many buttons, but has a couple of quirks that are learnt the hard way. Firstly, you can only insert or remove a CD when the unit is actually in CD mode and, secondly, the tuner does not appear to have an auto-seek mode. Tuning is accomplished by scanning up and down the wavebands manually until you reach the frequency you desire (which you obviously need to know beforehand).

SOUND QUALITY

Tuning manually up and down those wavebands, however, does elicit a good result from the Ping. FM was pleasingly clear and free from mush and interference, with radio announcers having good depth and clarity to their voices, and the atmosphere of the studio they were in picked up on very well. The measured bass rolloff [see MEASURED PERFORMANCE] was audible, however, making performances rather more lightweight than normal. Whilst not obviously 'tinny', this did tend to remove the impact from rock music and classical crescendos.

Loading up the CD player was more successful, as music sprang forth from the loudspeakers and it was immediately clear that the Consonance means business. The Forbidden City Ping has a fantastically dynamic presentation that positively grips music and really powers it out of the loudspeakers.

Most noticeable was the

"the Ping was able to pick up every inflection and project it through the mix..."

those from Bang and Olufsen, most weren't much good - with cassette mechanisms, loudspeakers and those BSR turntable units generally being the weak points. The arrival of the rack system in the eighties consigned these items to memory, and we moved on...

Until recently, it seems. It now appears that the humble music centre has undergone something of a reincarnation and has resurfaced in the 'noughties', boasting higher technology, better build and superb sound quality. Units of the likes of the Arcam Solo, Linn Classik and, of course, the lovely Shanling MC-30

USB 1.1 connection to a computer, which allows the Ping to reproduce your audio files from an external source. Consonance have also built into this a feature they call "SpAct" memory architecture, which recovers the audio clock from the incoming signal and thus is able to reproduce it with minimum jitter.

The Ping is very sturdily built from solid blocks of aluminium, accounting for its impressive weight, and is available in a number of finishes. Our sample had the grey panel with grey detail squares, but black and red versions are also available, the latter very striking! It





bass performance, which is super tight and deep - much better than on FM. Consonance quote a damping factor of 'over 1000' for the amplifier which is very optimistic, but even the measured value of 68 is reasonably high and this can be heard as the Ping had no problems in keeping the rather underdamped Sendor S8es in a grip of iron. No matter whether it was a pounding dance beat, a thunderous tympani or a thumping kick drum, the Ping remained tight, fast and incredibly deep.

No less impressive was bass detail, the Ping making light work of following the complexities of bass lines. Upper bass was dextrous and fast with the Ping able to pick out every inflection in this area and project it well through the mix. Simply Red's 'Sad old Red' is a track I often use to check out such aspects of bass detail and the Ping made light work of it, revealing every layer of the recording.

At the top end, the Consonance offered a very spacious and clear treble, again picking up on every high frequency detail to ensure that none were lost. Never veering towards harshness, the Ping had an unerring ability to cut through recordings and pull them right out into the room.

Now, if at this point you are thinking that this sounds like one of those solid state units with deep bass, clear treble and not much rest to speak of in between, then rest assured this is not the case. To fill in between the top and bottom ends, the Ping has a lucid and expressive midrange, offering almost thermionic levels of insight, but ultimately lacking that last hint of ultimate valve magic. Nevertheless, vocalists were rendered in a very natural manner, whilst instruments were incredibly lifelike. The Ping could pick up easily

on the inflections that make one type of guitar sound different to another, for example.

No less impressive was the soundstaging. Spinning the Icicle Works' 'Blind' on LP through the auxiliary input, I noticed that the image was nicely deep and wide beyond the boundaries of the loudspeakers, but mainly I was struck by just how tall it was. Ian McNabb seemed to be almost towering over me, his guitar flailing somewhere around my head as he attacked his solo with great gusto.

Finally, auditioning a few MP3s though the USB input showed that the Ping makes a very good job of reproducing these as well, its dynamic nature adding pleasing verve to recordings. The downside here was that it was able to reveal the limitations of the source, with material lacking the superb soundstage experienced through the CD player.

CONCLUSION

The Consonance Forbidden City Ping is a fine all-in-one system and offers a dynamic and large-scale performance on all sources, all wrapped up in a stylish and very well built package. Although its performance on FM could be a little better, for those who want top quality performance but lack space, this is a welcome addition to the market.

FOR

- superb bass
- impressive grip and control
- capacious soundstaging
- build and styling

AGAINST

- tuner could be better
- some operational quirks

VERDICT

A stylish and sturdy unit that turns in an impressive performance.

CONSONANCE FORBIDDEN CITY PING £1,495

Distributed by Alium Audio

+44(0)1273 325901

www.aliumaudio.com

MEASURED PERFORMANCE

The amplifier section of the Forbidden City Ping delivers nearly 200 watts into 4 Ohms and is very powerful, so the Ping will drive just about any loudspeaker to high volume in any size room. Distortion levels were low, primarily second and third harmonic our analysis shows, so this is not crossover. Damping factor was high at 68 and, coupled with good power and a wide frequency response, I would expect a punchy sound. However, this comment does not extend to the tuner, as bass starts to roll off at 130Hz and is -6dB at 40Hz - not good. Otherwise, tuner response is flat to a high 18kHz, because there is no mp3 filter to eliminate 19kHz pilot tone, again not so wonderful.

The CD player exhibits a flat measured response, but produces more distortion than expected nowadays, measuring 1.8% at -60dB instead of the 0.3% that might normally be expected, resulting in a very low EIAJ Dynamic Range value of just 96dB, against the better than 106dB figure expected.

The Consonance is a little inconsistent in what it does. It will always sound tonally even, but the CD player and VHF tuner have measurable limitations that need not exist, as they are not cost related. NK

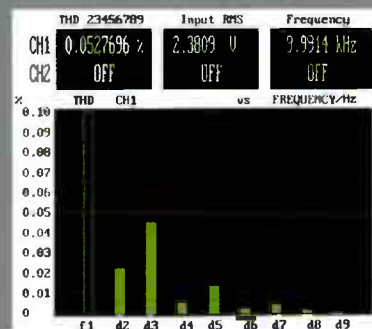
Power 122watts
Frequency response 3Hz-55kHz

Separation	88dB
Noise	-96dB
Distortion	0.04%
Sensitivity	210mV
Damping factor	68

CD	
Frequency response	10Hz-18.2kHz
Distortion	(%)
0dB	0.2%
-60dB	1.8%
Noise (IEC A)	-98dB
Dynamic range	96dB

TUNER	
Frequency response	130Hz-18kHz
Stereo separation	40dB
Distortion (50% mod.)	0.17%
Hiss, stereo (IEC A)	-68dB
Signal for minimum hiss	775µV
Sensitivity, stereo	40µV

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Air Smiles

Roberts' new Gemini RD-55 is one of very few DAB/FM radios with MP3 playback for under £100. Steve Green tunes in...

Just when you thought the world couldn't take another £90 DAB/FM portable radio, the Roberts RD-55 arrives. But there's a twist – it's one of the only sub-£100 designs that supports SD memory cards for MP3 file playback and MP2 recording, making it to all intents and purposes a modern radio/cassette.

An attractively styled bit of kit, available in black or white, it has a clean, modern look. The casing material is rigid, and the unit feels robustly made whilst also being relatively light – suitable for a truly portable radio.

In addition to MP3 playback, the SD card also enables one-touch recording of radio programmes on DAB, which are stored in their native MP2 format, and the radio can, of course, play previously recorded programmes. The radio cannot be set up to perform timed recordings, however, which I found surprising. Files can also be transferred between a computer and the SD card via the small USB socket on the top of the unit (which has a rubber cover over it to protect against moisture getting inside the radio), although the transfer speed is low.

The other main feature supported is the ability to pause and rewind live radio, and the radio can be paused for up to seven minutes and thirty seconds when listening to a typical stereo station, and up to fifteen minutes for a typical mono station. Further features include an auxiliary input (which allows the connection of an MP3 player for example), a line output, a headphone socket and the radio provides five preset locations for each of the DAB and FM bands. The Roberts can be powered either from the mains or by six C-type batteries.

The RD-55 was easy to use, as the tuning knob scrolled rapidly through the list of DAB stations

or MP3 files, making it quick to locate what I wanted to hear. MP3 playback and the pause and rewind function worked reasonably well using the small silver buttons on the front of the unit in conjunction with the tuning knob on the side. The display was easy to read both from a distance and from a wide angle, and a nice touch was that the tuning knob was tapered inwards so that it sat comfortably between the thumb and forefinger. One minor gripe was that, when cycling between the radio bands, the radio paused for several seconds to read which tracks were on the SD card.

SOUND QUALITY

DAB reception quality on the RD-55 was excellent most of the time, although it seemed more sensitive to where it was positioned than many of the other radios I've used. In contrast, FM reception was very poor, but all DAB radios that I've tried in recent times perform this badly on FM, so relative to its peers this isn't a black mark against this model.

Sound quality was superb when playing high bitrate MP3 files – the RD-55 revealed an astonishing level of detail for a device with such small (2.5in diameter) speakers. Instruments were well separated, with vocals in particular shining through, and the sound was simply of a higher fidelity to the true signal than you come to expect from a portable radio. However, the quality when playing MP3 files was sometimes marred by slight technical glitches, as on some tracks there were audible clicks that weren't present on the MP3 files themselves.

These clicks weren't present when listening to DAB or FM, though.

On the better sounding DAB stations, the RD-55 produced a dynamic, detailed and open sound, and the sound quality was very impressive when the audio had been cleanly encoded. One issue however, was that the Dynamic Range Control (DRC) was set to '1' by default (or after a factory reset), so Radio 3's dynamic range will be compressed unless you switch DRC to zero in the radio's settings.

The revealing nature of the RD-55 did no favours for the sound quality of the more mediocre sounding DAB stations though, but this was more the case of the heights that this radio could ascend to being much higher than the norm, so listening to the poorer stations was more of a let down rather than it performing worse than other DAB radios.

FM was effectively unlistenable due to the poor reception quality unless the radio was switched to mono to eliminate the hiss. If you want to listen to stations on FM, you would be advised to buy an analogue-only radio, because DAB portable radios are too insensitive on FM.

Overall, the RD-55 performs excellently most of the time, and for the features it provides it is good value for money. However, given the issue with the clicks when playing back MP3 files, I would suggest people wanting to purchase an RD-55 do so from a store with a good returns policy to be on the safe side.



VERDICT ●●●●£

Excellent sonics, fine styling plus handy SD card support make this a top budget buy.

ROBERTS RD-55 £90

Roberts Radio Ltd
(+44 (0)1709 571722
www.robertsradio.co.uk

FOR

- excellent sound quality
- SD card support
- value

AGAINST

- technical glitches on MP3
- FM reception

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Soavo & Sophisticated

The raffish Mr. Adam Smith spends some quality time with Yamaha's standmounting Soavo 2 loudspeakers...

There's often a tendency for people to assume that giant multi-faceted corporations that can turn their hand to the design and production of virtually anything are inevitably jacks-of-all-trades but masters of none. Whilst this may sometimes be true, there is the resultant downside that when they turn up something of a cracker of a design, it may be unfairly overlooked.

Yamaha have certainly suffered a little of this over the years. When you think that they manufacture pianos, keyboards, P.A. equipment, jet skis, motorbikes and car engines amongst others, you realise that this is a company with a wealth of technical knowledge and design ability to their name. However, ask the average hi-fi enthusiast to recommend you a pair of loudspeakers and you'll be

most likely to hear names like KEF, B&W, and Tannoy, with maybe the odd Mordaunt Short, PMC or Neat thrown in for good measure, all of whom are loudspeaker specialists. Respond with, "What about Yamaha?" and you'll most likely receive an "Oh, yes..." type response!

As editor DP's review back in the April 2007 issue of *Hi-Fi World* showed, it would be a mistake to gloss over the company's modern audio output, as the floorstanding Soavo 1s are a superb pair of loudspeakers. As a result, we were keen to know if Yamaha could pull off the double, with the Soavo 1's smaller sibling, the standmounting Soavo 2.

The Soavo 2s share the family styling with their larger brethren, and actually look like someone has lopped the top off a Soavo 1 to

make them, which is no bad thing! The nicely sculptured cabinets have the added advantages of no perpendicular sides, which reduces standing waves inside the enclosure, and they have a couple of additional features to minimise the possibilities of the cabinets affecting sonic performance. The first of these is three way-mitred joints on all mating surfaces to ensure rigidity at these critical points, and the second is an aluminium baffle plate covering the top of the front panel, onto which the tweeter is mounted, thus isolating it from vibration and reducing colouration.

The tweeter itself is a one inch (25mm) aluminium dome with integrated voice coil and below this sits a six and a half inch (160mm) bass/mid driver. This latter item uses Yamaha's A-PMDC (Advanced Polymer-injected Mica Diaphragm) cone



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material, that they claim provides "very fast response time, as well as excellent midrange clarity and bass response". The two drivers are mated using high quality crossover components which are all hard wired without the intervention of any PCB.

Available in Dark Brown, Brown Birch, Natural Birch and Black finishes, the Soavo 2s are very well constructed and finished, and Yamaha also offer a pair of matching stands, the £399 SPS-900s. These are made from highly polished MDF, and painted with a metallic finish. The undersides of the Soavo 2s' cabinets have appropriate fixing holes to allow the loudspeakers to be securely bolted to the stands - always a good idea.

SOUND QUALITY

As suspected, the family resemblance to the Soavo 1s can indeed be heard, but the Soavo 2s never sounded like just a shrunken or simplified version of their larger siblings. Every now and then a standmounting version of a larger loudspeaker comes across as slightly poorer relative of the larger designs, ideal for those that want the performance of the bigger units but cannot afford or accommodate them. The Soavo 2s did not fall into this trap, however, and make a superb case for themselves in their own right.

Set up on Sound Organisation Z1 stands and positioned around twelve inches from the rear wall, the Soavo 2s impressed initially by offering up and mightily impressive and weighty bass for their relatively compact dimensions. Low frequencies were confident and taut, and the Yamahas romped along with difficult or complicated basslines without ever falling over themselves. The rear-mounted port assisted greatly here, with a smooth output that never intruded on the overall performance, and the Soavo 2s responded particularly well to a spot of fine-tuning through positional adjustment.

Spinning 'Intuition' from Frances Black's 'Talk to Me' CD, the Soavo 2s captured the dexterity and tone of the upright bass used on the track perfectly, interplaying it perfectly with the conventional bass guitar also used. All too often, these two instruments can end up rather jumbled together and on top of each other but the Yamahas ensured that they remained expertly delineated.

Bass handed over nice and smoothly to the midrange and the Soavo 2s continued to impress here. They have a lovely silken nature to their presentation that has a pleasing ability to dig into the heart of the

music and extract every nuance but without ever forcing it at you. In this manner they are somewhat different from those other classic Yamaha standmounters, the NS-10Ms, who would pick absolutely everything out of the music in a similar manner, but launch it all out at the listener with, at times, almost unbearable enthusiasm!

Through the Soavo 2s, however, vocalists were very well presented, located firmly centre-stage and with a pleasing sense of spaciousness to their performances. Norah Jones could easily have been sat in front of me when singing 'Feeling the Same Way' and the Soavo 2s gave superb feeling and depth to Rachel Diggs' vocal performance on David Diggs' track 'Why', from his 'E-klek-trik' album.

The sense of space and solidity continued with classical material, as the Soavo 2s spread out 'Spring' from Vivaldi's Four Seasons with great accomplishment. The soundstage stretched well back behind the loudspeakers. All instrumentalists were clearly positioned within the soundstage and the Yamahas were able to capture each change in pitch and tempo with great dexterity.

I was wondering if I would find a few issues with the treble, owing to its rather unusual measured response but to my relief the Soavo 2s turned in a very pleasing performance.

Anyone still harbouring memories of the aforementioned NS-10Ms and their top end that was, well, rather exuberant shall we say, will be relieved to hear that the Soavo 2s can expunge these memories with ease. Their high frequency drop-off did mean that they lacked the very last *souppçon* of top end sparkle but this actually meant that the treble remained smooth and matched very well with the rest of the frequency range, giving the overall presentation a commensurate sense of integrity and smoothness.

As a result, high frequencies were very well revealed and were reproduced with excellent levels of detail and clarity. The Yamahas also offered a magnificent silky smoothness to the upper reaches of the frequency range, meaning that they

are unlikely to ever offend in harshness terms but will still never miss out on any information. Yamaha have rendered their balance very well indeed in this respect.

CONCLUSION

Yamaha have followed up the fine Soavo 1s with a highly capable pair of standmounting brethren in the Soavo 2s. They are a beautifully balanced design across the frequency range, and they have a silken smoothness to their presentation that makes some other loudspeakers at the price sound rather rough and ragged. That is not to say, however, that they are in any way soporific as they can boogie with the best of them, but their composed nature means that they should offer consistently good results with a wide range of partnering equipment. The Soavo 2s make a fine job of reproducing whatever sort of music you care to throw at them, without imposing any particular unwanted character onto it.

Yamaha - remember that name, as it is one that is well and truly back in the heart of the loudspeaker game.



VERDICT

Stylish and well designed loudspeakers with fluidity and composure lacking in so many designs at the price.

YAMAHA SOAVO 2 £1,200

Yamaha Electronics UK Ltd.

+44(0)1923 233166

www.yamaha-uk.com

FOR

- impressive bass weight
- silken midrange
- superb integration
- build quality

AGAINST

- slight lack of top end sparkle

MEASURED PERFORMANCE

The Yamaha Soavo 2s exhibit a very similar response characteristic to the Soavo 1s, which bodes well if a multi-channel setup using both models is considered.

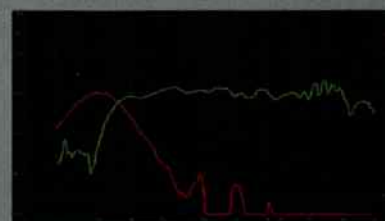
Output is very smooth across the entire spectrum with just a hint of a dip in the midrange where the ear is most sensitive and a slight rise above 5kHz. Both of these aspects should mean that the Soavo 2s have fine upper midrange presence and detail, but without any associated harshness. Upper treble does drop off somewhat towards 12kHz before recovering in level, which may rob some very top end sparkle from the sound.

Bass output is healthy, with the main driver rolling down at around 70Hz and the port tuned to 45Hz, so the Soavo 2s should have good weight for their size.

Electrically, the Soavo 2s are not so well damped at the bottom end, so an amplifier with a highish damping factor would be a good idea in order to obtain taut bass. Average impedance is 7.3 Ohms, dipping to a minimum of around

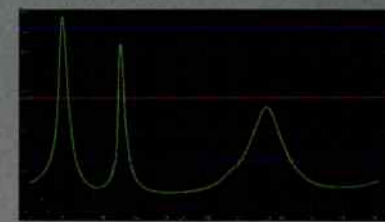
5 Ohms, so they do not present too difficult a load. Combined with a good 87dB measured sensitivity, the Soavo 2s should work well with 40W or so. AS

FREQUENCY RESPONSE



Green - driver output
Red - port output

IMPEDANCE



East Life

Channa Vithana visits London-based Derek Harris, owner of a high-end Linn/Naim system with a twist...



Sweet dreams are made of this: Linn and Naim esoterica.

Normally when faced with a high end Linn/Naim system, one tends to find a suitably large (and commensurately priced) pair of matching loudspeakers at the end of it - Naim's SR_/NBL/DBL series and Linn's Isobarik spring quickly to mind. However, Derek Harris has a different and less obvious answer, in the shape of the smaller £2,500 B&W 805 Signature standmount loudspeakers. Indeed, his set-up has evolved into one embodying the classic nineteen eighties source-first philosophy, but it avoids the extreme eighties 'flat earth' sound that's so reviled by the pro-valve, anti-Naim brigade...

Derek's hi-fi evolution started with an attention-grabbing turntable that he calls "the oil rig" (thanks to its welded tubular construction). It was made especially for him by long-time family friend Graham White, and still runs an S-shaped tonearm with Ortofon 510 cartridge. In 1980 however, this was replaced by a

Pioneer direct drive turntable, and an integrated amplifier that shall remain anonymous, plus a pair of Monitor Audio MA352 loudspeakers and a set of Naim NAC A4 loudspeaker cables. In 1984 Derek changed his Pioneer for a Rega Planar 2 turntable complete with R200 S-shaped tonearm and P77 cartridge. The mysterious integrated was soon supplanted by an A&R Cambridge (Arcam) A60, replete with wooden casework and chunky input selector buttons, he recalls...

In 1987 the MA352s were replaced by a pair of Linn Kans, which cost Derek £300. Subsequently he changed his Rega deck to a Linn Basik/Akito turntable/tonearm combination procured from Grahams Hi-Fi, and the Naim NAC A4 to a set of twin and earth mains cables. Though still a rebelliously popular choice for some hi-fi enthusiasts, Derek's twin and earth didn't stay for too long and the Naim cable returned. The Linn Basik endured though, being a dramatically cost-cut

LP12 running three silicone rubber mounts (instead of springs) which were similar but simplified to the ones found on the Axis turntable. The sleekly dimensioned deck used the LP12's diecast aluminium platter and motor, but sported a one-piece plinth and a manual speed change via a stepped pulley.

In 1999 Derek finally went digital, and purchased an Arcam Alpha 8 CD player, and then in 2000 an Alpha 8 integrated amplifier from Hi-Fi Leisure in Tottenham Court Road, London followed. Not content, in that same year he upgraded his Alpha 8 with a matching Alpha 8P power amplifier from Grahams, which each cost around £500. His spending spree continued later that year, when he swapped his 8 series Arcams for the more up-market Arcam FMJ 'Full Metal Jacket' CD23 CD player (the one with the outstanding Ring DAC and HDCD compatibility) and matching integrated amplifier for about £1,200 each.

Not surprisingly perhaps, Derek was happy with this system and managed to keep away from a hi-fi dealer for a whole two years. However, a visit to Rayleigh Hi-Fi in Essex saw him springing for a Naim NAC82 preamplifier/SuperCap power supply and NAP 250 power amplifier to replace his Arcams. He later upgraded to the superb NAC52 preamplifier, and his CD player upgrades were more 'hardcore' as he went from the brilliant, original CDX to CDX2 to CDS3 and ultimately the CD555 which costs over £14,000 new!

During 2002 Derek built a dedicated listening room to house his ever expanding hi-fi anthology. Solidly constructed from brick walls and concrete floor with thick felt underlay and carpet, it's relatively small (approximately 2.5x3.5m) but - as we shall find out - this was no hindrance to sound quality...

In 2004 Derek obtained the B&W 805 Signature loudspeakers for £2,500 which are located onto special £500 HNE slate stands, because he preferred the sound of these to B&W's dedicated 805 versions. Apart from its lustrous six-

coat high-gloss lacquer (with each coat requiring one day for curing and rub-down), the more expensive 805 Signature also featured many engineering improvements over the standard £1,400 805, including moving the crossover frequency up to 4kHz (rather than 3kHz), fitting a new tweeter that went up to 50kHz and a new Kevlar mid/bass driver with a larger magnet for better control. All this certainly did the trick for Derek, and he has stayed with the B&Ws ever since.

The following year he added a Linn Lingo power supply, Ekos tonearm, Akiva MC cartridge and Linto phonostage to his LP12 (which had replaced the Basik turntable) from Grahams. Then in 2006 Derek purchased the high-end £2,500 Stax Omega & 007T headphone system. Coming up to date in 2007, Derek has replaced his 'olive' Naim amplifiers with a £13,000 combination of NAC 252/SuperCap2 preamplifier/power-supply and two-box NAP 300 stereo power amplifier and power supply.

Being an enthusiast, Derek has tried to tune his system with varying degrees of success. In 2005

he acquired a Whest DAP.10 Discrete Analogue Processor for £850 which sadly "made no difference", and also unsuitable were the extremely expensive and much-vaunted Nordost Valhalla cables which failed to ignite Derek's enthusiasm. Eventually, he was happier

with Chord Company Signature loudspeaker cable (about £115/m), plus Naim's £495 Hi-Line interconnects and LAT International mains cables costing £132/1.2M.

SOUND QUALITY

Before I went to visit Derek, Howard Popeck (formerly of hi-fi dealerships Simply Stax and Listen Carefully) told me that, when confronted with Derek's system with a view to upgrading it, he couldn't think of anything superior to sell him, as it was so finely balanced already! With this in mind I was intrigued to test out Howard's observations...

Consequently, we ended up

listening to quite a wide variety of recordings on both CD and LP. Starting with gentle soul-pop from the eponymous Lauren Wood album, the music was wonderfully finely balanced, with a highly revealing and clear sound. The 'Midnight Caller' theme tune from 'TV Themes USA' was an unusual but musical choice, and was reproduced with thrilling dexterity, resolution and detail.

Next we played some LPs, including the eighties pop-soul of Najee ('Day By Day') and pop-rock from 'On The Beach' (1986) by Chris Rea and the deliciously tuneful bass leapt out at me, although with plenty of rich guitar timbres. Listening to the soul classic 'Just My Imagination' from 'A Hint Of Motown' was outstanding, with a deep and expressive musicality that had me riveted to my seat. An excellent Mobile Fidelity Recording Edition LP pressing of 'Sheffield Steel' by Joe Cocker had a clean and uncoloured sound that robbed none of the raw power of Cocker's distinctive vocals.

We then tried some classical music and heard Neville Mariner, 'The Academy In Concert' (1974) where the vocals and music were not only clear and smooth but had an effortlessly lyrical quality. Handel's Water Music and piano music played by Bruno-Leonard Gelber illustrated Derek's system reproducing beautifully played instruments that had real, convincing timbre and outstanding instrumental separation. Every layer and subtle nuance in the phrasing of the music was there to hear, clear as day.

CONCLUSION

Given that this system costs many thousands of pounds, it should sound good and indeed it does. Interestingly though, I've heard a number of far more expensive systems sound a lot worse, and therein lies the moral of the story – there is method in Derek's madness. He has very carefully upgraded his components, auditioning each new purchase thoroughly at respected local dealers, rather than doing what so many correspondents to *Hi-Fi World's* letters pages do – chop and change seemingly at random, buying in haste and repenting at leisure!

This high-end, source-first Linn and Naim system with B&W 805 Signature standmounters is certainly a little off the beaten track as far as 2007 systems go, but it really works. This is because the B&Ws are the right size for Derek's relatively small but fantastic sounding purpose-built listening room. Accordingly, he says that the 805 Signatures drive the



Mysterious DIY 'oil rig' turntable...

room better than floorstanders and I agree, as the system reproduces superbly tuneful, controlled, extended bass from pop, rock and classical music alike.

Some hi-fi cynics perceive Naim as only good for rock music, and this is something I cannot agree with, because a well set-up Naim system (of any vintage) can also play classical music beautifully. As such, the 805 Signatures provide the resolution and depth I am accustomed to via B&W's past designs, but also the free-flowing musicality that their latest, more



Yet another visitor is enchanted by Derek's system...

expensive Diamond 'D' series offer.

Combine them with the full-bodied yet wonderfully lyrical Linn LP12/Akiva/ Ekos/ Linto/ Lingo front end, barnstorming Naim CD555 CD player and high resolution Naim amplifiers, and you have synergy and musicality across all sources and musics. Derek isn't sure whether to upgrade his turntable or not, but in the meantime enjoys the gobsmacked expressions of his teenage children's friends (who are usually accustomed to brittle-sounding MP3) when they listen to properly reproduced music via his system – surely an education they won't forget!

THANKS TO:

Howard Popeck at <http://blog.listencarefully.co.uk>
 Brian Morris at www.houseoffinn.com
 and Zoë Ryan & Stephen Wheatley at www.bowers-wilkins.com.

Shine On

First presented as a marvel of modern technology that was immune to the outside world, Compact Disc has nevertheless proved almost as vulnerable to the outside world as vinyl. David Allcock rounds up some choice silver disc preservatives...

In 2007, we all know the notion that CD offers perfect sound is wrong, yet still many digiphiles treat the idea that it can be tweaked and improved with suspicion. This little look at some of the most effective Compact Disc cures shows that people need not worry – these really do work. CD tweaks generally fall into four categories:

The first is isolation - changing a CD player's feet from the factory-supplied items, often selected for cosmetic and cost reasons, to feet designed to optimise coupling between the player and support, can often yield considerable improvement. It should also be mentioned that CD players will

never perform at their best if they are directly stacked on other components, or if transport and DAC are stacked on each other, so if you use a two box solution you should ensure that both components sit on their own shelves.

The second category is disc treatments, such as fluids to prevent static build up, cleaning products, and treatments to both disc tray and the edges of the disc to prevent light diffraction. Whilst light diffraction is often doubted as being a problem, it is worth bearing in mind that the actual information reflected by the disc is held in an analogue stream until it is picked up by the laser head, so is still prone to corruption and errors, and the lower the number of

errors in the stream, the more actual disc information you'll hear.

Disc stabilisation is another area, and whilst, increasingly today, digital sources are streamed off the internet and hard drive, actual optical discs vibrate when being spun. This means the laser assembly has to continuously refocus as the disc wobbles, putting extra load on the power supply and increasing the potential for errors. Disc damping products have a real, beneficial effect.

Finally we come to the issue of contacts and mains. The performance of any audio component will improve from clean audio and mains connectors not behaving as a diode due to dirt and oxidation on contacts.

MARIGO LABS ORPHEUS STEALTH MAT £59.95

Hi-Fi For Sale
+44(0)870 241 2469
www.audiophilecandy.com

One of the most expensive items here, the Marigo labs mat (and its more expensive Signature model at £129.95) can be used on both CD and DVD, and not only damps the micro vibrations of the disc during playback, but also absorbs stray laser light which would otherwise bounce off the disc's top surface and around the disc tray. The disc also has fine wires inside it to help disperse static.

It has not only consistently been the best performing stabiliser I've heard, but the most dependable, giving exceptional results on every player I've tried to date. This disc brings about big improvements in imaging, which becomes not only larger but offers far better focus, more extended bass with enhanced midrange transparency and vocal liquidity, whilst high frequencies are far cleaner and more highly resolved without undue forwardness or exaggeration. Whilst I would like to report this is the ultimate, the Signature at £129 is even better, but at double the price it should be. However, if you want the ultimate performance, then this is the one you need.



L'ART DU SON CD/DVD CLEANER £39.95

Loricraft Audio
+44(0)1488 72267
www.garrard501.com

Keeping discs clean is crucial in extracting the maximum performance from your CDs and your player. It is generally accepted that even error correction harms the sound quality of your digital discs, and in the case of larger errors where your CD player cannot read the data, your player will either mute or use a 'best guess' principle to interpolate the data.

I have tried numerous cleaners at various prices, and found this one of the best - and safest. It is an organic, non-toxic solution, so you can use it around children or animals in complete safety, it emits no noxious fumes and it is totally stable, so it doesn't react with CD inks or plastics. This cleaner removes any grease or dirt on CD or DVD media, and works as well on game console and PC discs, making this a genuinely useful product to have in the home. If you want to ensure you are hearing your discs at their best, this should be in your system.



ISOTEK PREMIUM MAINS CABLE £59.95

Activ Distribution
+44(0)1635 291357
www.activdistribution.com

With the damage that both EMI and RFI (Electro Magnetic Interference and Radio Frequency Interference) can do to the sound quality of your system, and the increasing amount of both types of interference in today's world, preventing either of these entering your system will be of benefit to the overall performance. The increasing number of people who choose to live in city centres, along with the rising level of RFI in suburban areas means this is an increasingly pervasive problem. Most standard mains cables supplied with equipment are unshielded, and act as aerials channelling this noise into component power supplies. The Isotek Premium is a double shielded mains cable which uses high purity copper conductors and high quality connectors. This cable brings a lower background noise, smoother presentation, more extended bass and a more openness. The good news is that the effects are cumulative - if this cable works on your CD player, it is well worth trying one elsewhere in your system such as your amplifier.



CAIG DEOXIT / DEOXIT GOLD £13.95/£13.95

Chemical Records
+44(0)1179 714924
www.chemical-records.co.uk

Dirty contacts are more than just a cosmetic problem, they stop acting as a pure conductor and become a semiconductor, behaving like a diode instead of a contact and impairing the performance of even the best cables. A biannual spring-clean of your connectors will yield a

surprising and Caig Labs some of the best cleaners I've found. Whilst available best if you use them as a pair, with DeOxit being used as a contact cleaner, followed by DeOxit Gold (formerly known as Pro Gold) acting as a contact enhancer to both improve conductivity and offer long term protection to the connector. Even a small bottle of these products will last for years, and I have never had any corrosion or wear problems on any of my equipment using them. Once both of these have been applied there is an enhanced sense of openness and transparency in the system, and whilst the effects are subtle, they are easy to discern.



HALF SQUASH BALLS £7.99

Millet Sports
+44(0)8452 702 011
www.milletsports.co.uk

Incredibly cheap - and certainly a better use than pointlessly hitting them against a wall - these squash balls, when cut in half, are excellent supports. You don't want to overload them, so a good rule of thumb is around 3kg per half ball, but on a current sub-£300 player you will find a touch of extra warmth in the lower registers, an opening up of mid-range instruments and massed voices, and a smoothing of high frequencies. Whilst not a high end means of isolation, on cheaper equipment this is an excellent means of cost-effectively improving the performance of your digital front end.



NORDOST ECO 3 £25.95

Activ Distribution
+44 (0)1635 291357
www.activdistribution.com

Possibly the most bizarre concept here is the treatment of CDs against static build up. The theory is that as the disc spins, it builds up an electrostatic field which impairs the performance of the laser assembly. You spray Eco 3 on the label side only, and each application lasts about 10 to 20 plays depending on humidity. Whilst there is a definite improvement in clarity, it is the reduction in background noise which I found most surprising. Application to mains cables, interconnects and speaker cables can also yield a subtle but noticeable sonic improvement.



AUDIOPRISM CD STOPLIGHT £19.95

Hi-Fi For Sale
+44 (0) 870 241 2469
www.audiophilecandy.com

Of all the tweaks here, this is the one I was initially most sceptical about. The idea of coating the inner and outer edges of a disc with green ink to improve sound quality seems dubious at best, but the ink is designed to absorb stray reflected light and internal diffracted light to prevent them from combining with the reflected light carrying the audio stream and introducing errors. This seems to work with varying degrees of success, in some players its effects are pronounced, in others negligible. Modern high end designs seem to see the least benefit, but players using older laser assemblies and lower cost players seem to benefit most. Expect to hear improved soundstaging, better bass with transient improvements, and smoother high frequencies. The Audioprism pen is formulated to not react with inks and plastic used in CD production, and whilst it has become increasingly difficult to source, if you can locate one, it is well worth using.



CLEARLIGHT RDC 2 CONES £29.95

Activ Distribution
+44(0)1635 291357
www.activdistribution.com

An excellent investment, not just for CD but also amplification components, the construction of these cones is an amalgam of six materials at the opposite ends of the elasticity modulus which is suspended in an epoxy resin. The resulting material is incredibly neutral in its resonant behaviour, and as a result it does not emphasise any area of the frequency range. When you mount a CD player on these cones, you immediately hear an improved sound stage, a cleaner midrange, tighter, punchier bass and enhanced clarity in the upper range. I cannot find either a downside to their performance, or a CD player under £3,000 which these cones do not improve. At their modest price, I would strongly recommend trying a pair under your CD player initially, then try them under amplifiers and even speakers.



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PUTTING SOUND INTO FOCUS

Show Time

David Price visited the world's largest consumer electronics fair in Berlin, the Internationale Funkausstellung (IFA)...

Although not at the top of every audiophile's list of 'must see' events, IFA is the only global gathering able to make Las Vegas's massive annual Consumer Electronics Show look like an audio jumble held in your local church hall. In short, it's a momentous occasion and a chance to see the latest and greatest in audio, video and just about everything else that works on mains or battery power.

Held from August 31st to September 5th in the cavernous Messe Berlin, it had a record 1,212 exhibitors from thirty two countries in 2007, with expected sales of over 2.5bn Euro. The year before, over 6,500 journalists turned up from seventy four countries - and they didn't come just for the beer. In fact, there were plenty more mouth-watering attractions - from high end audio and video to cameras and computers. Here's a roundup of the most tantalising hi-fi titbits...



It's great to see a major Japanese name like Pioneer back in specialist two channel separates, especially with such a strong range. The brand new A9 amplifier, D9 SACD player and F6 DAB/FM tuner were looking superb together and promise even better sonics than those from the '6' series we reviewed recently...



One of the most impressive mini systems on show was this Bernstein, sporting two large output tubes glowing either side of its central, Tivoli-style tuning knob. Look further back and you'll find a universal iPod dock, making this a multi-source machine. Sound was good but extremely old school - about as warm as a pair of Quad IIs driving corner mounted Tannoy Dual Concentrics!



Following last month's glowing review of its smaller brother in HFW, it was interesting to see Onkyo's new TX-SR875 THX-Ultra2 certified AV receiver, complete with DTS-HD Master Audio, Dolby True HD and Dolby Digital Plus playback. Even Onkyo's worst enemies are privately mumbling about how good this year's range is, and this 1,499 Euro receiver won many admiring glances.



Picture courtesy of Grundig Intermedia GmbH

Who'd have thought that Grundig's classic early nineteen seventies Audiorama loudspeakers would find themselves back in production thirty five years later? Each sphere sports two mid/bass drivers and a tweeter firing into a 360 degree soundfield, providing a most interesting listening experience. Although previewed at IFA, they're not out until February 2008.

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Although the headline news was Sharp's Super Slim LCD TV, which is a mere 20mm thick over the main display section, this writer's eye was caught by Pioneer's latest Kuro plasmas – which looked in a class of their own.



Could this be what our deputy ed AS does at weekends, when he's not rifling through audio jumbles or ogling classic Land Rovers? The Tensor, top of the enigmatically named Adam loudspeaker range, qualified for my official 'biggest box of the show' award, and we hear that one of the company's smaller designs, the Adam S3a, was used to master The Beatles' latest release, 'Love', at Abbey Road recently...



Another show stopper was Denon's superb DVD-2500BT Blu-Ray player, sporting HDMI 1.3a compatibility and stunning build and finish. Unlike a number



If there's one man who can upstage a range of beautiful looking high end Marantz separates (as reviewed in HFW two months back), it's Ken Ishiwata – who was sporting a rather nice salmon pink satin jacket and standard issue Karl Lagerfeld ponytail. We're just disappointed that the jacket wasn't copper lined – unlike his hi-fi...

of machines from rival manufacturers, this one shows serious attention to detail from an audiophile perspective.



It's great to see the Japanese majors taking CD seriously again, as the brand new Yamaha CD-S2000 Compact Disc spinner (top) proves. A sturdily built highish end



Unlike the Munich High End show, which has more turntables than a pottery making convention, IFA was sadly bereft of toys for the black stuff – although this little bit of kit gave some light relief. Sporting a remote controlled CD player and radio with amp and speakers for just a few hundred Euros, it makes your £10,000 Linn LP12SEs of this world look positively average value!

affair, it sports impressive all metal construction, Burr Brown DACs and a price tag of 1,299 Euros.



Oh well – it wouldn't be Germany if we didn't have massive piano gloss black and aluminium finished loudspeakers with more drivers than a bus company... Canton's 509DC floorstanders seem superb value at 620 Euros, and they're coming to the UK soon...



Audio Technica are back with a vengeance. Always popular in their native Japan as purveyors of small, high quality transducers (microphones, headphones, phono cartridges), the company was showing a new range of headphones impressive enough to glve Sennheiser food for thought.



Designed by Peter Larsen (Chief Engineer for Vifa, Scan-Speak and Dynaudio in Denmark for many years), the new Microlab range of loudspeakers made



At the end of a busy weekend hearing the latest and greatest in audio, there's nothing a hard working journalist likes more than to relax with a nice cold glass of, ermm, apple juice...

a nice noise – look out for them in Britain next year...



Control Freak

Adam Smith remembers Bang & Olufsen's classic 1980s stack system, the Beosystem 5000...

It's said within the car industry that the new 'toys' that appear on a top of the line Mercedes today will be featured in the average family saloon five to ten years down the line. If this is true, then I suspect that Bang and Olufsen are the Mercedes of the audio world, as they have definitely set more than a few trends over the years...

The receiver at the heart of the Beosystem 5000 could 'talk' to all the other components, powering up and selecting them as required, as well as featuring two way communication to the remote handset that would continually monitor the status of the main settings and display them on request. Good stuff, but even more amazing when you consider that all this technology hit the market nearly twenty-five years ago.

HISTORY

Originally released in 1983, the Beosystem 5000 comprised a receiver, turntable and cassette deck, with the matching CD player arriving in 1985, as it took B&O a while to come up with a design with which they were happy.

Starting at the top, the Beogram 5000 is a radial-tracking belt drive turntable that offers fully automatic operation, including sensing of record size and speed, although the latter can be over-ridden for twelve inch singles. Originally fitted with an MMC4 cartridge, the stylus is not replaceable separately, necessitating a complete cartridge change. The Beogram 5000 was replaced by the linear-tracking Beogram 5005 in 1985 which is an equally good deck, although more complex.

Next down is the heart of the system, a Beomaster 5000 receiver. This has an FM/AM tuner with nine presets and a 55W per channel amplifier section. It has full remote control and inputs for phono, aux and two tape decks, each input duplicated in phono sockets and B&O's preferred DIN sockets. Unlike its successors, the 5500, 6500 and 7000, the 5000 does have basic controls on a flap-down panel, but you still need a remote control to fully explore its capabilities.

On the remote side, there are two options. The main one is the Master Control Panel 5000, which is huge, impressive and has a compre-

hensive display panel at the top of it. This controls all the components of the system and also displays their status at any point, by pressing the 'status' button. A smaller alternative is the Terminal 5000, a normal-size remote that covers just basic functions.

Moving back to the main stack, next down is the Beogram CD50 CD player - based around an Aiwa transport which requires the disc to be inserted upside down, this often catches out the unwary! A 16bit, 4 times oversampling design, the only controls on the front are for play, standby and open/close and so one of the system remotes is required to use the unit fully.

Finally, down the bottom is the Beocord 5000 cassette deck. A drawer-loading design, this features Dolby B, C and HX-Pro, auto tape type selection and the option of locating tracks on the tape and commencing play from a predetermined point.

The system was often supplied with Beovox S55 loudspeakers and, although competent enough, these do not set the world on fire. Unless you can afford a good pair of Beolab

Pentas, I would stick with third party loudspeakers - my own Beosystem 5000 is currently powering a pair of TDL Studio 0.5s to great effect.

SOUND QUALITY

In a word, superb. Bang & Olufsen worked hard to give each component within the system a similar sonic signature so you need not fear that it will excel with one source and dismay in another.

The overall sound is pleasant and beguiling, with an open and detailed midrange allied to a superbly sweet treble. The system is not the last word in top end insight, but is never muffled and nor does it become tiring to listen to. Bass is decently weighty and with excellent pace and verve.

The Beogram 5000 and 5005 handle records very well, and they really aren't far off the quality offered by a good modern budget design like a Rega P2 or Project Debut III, trading these items' insight for a touch of sonic sophistication. Fully automatic operation makes life simple, even if the 5000's weight-based size sensor does occasionally get confused by heavy, modern seven inch singles on thick vinyl, thinking they are twelve inchers and dropping the stylus accordingly!

The Beogram CD50 was a well respected player on its release and continues to impress today. Obviously it is an early design and is definitely more diffuse and laid back than a modern silver disc spinner but, once again, it is never less than enjoyable to listen to.

The Beomaster's tuner section is sensitive and locks onto signals with ease, although it can also be tuned manually if required. Announcers are clear and with good image solidity, and the amplifier's sweet nature takes the edge off ragged compressed pop stations very well. Finally, cassettes are no less impressive. B&O always could throw together a decent cassette deck and high quality heads, combined with the HX-Pro system mean that record levels can be pushed well into the +dB region with metal and chrome cassettes.

BUYING SECONDHAND

As mentioned, the Beosystem 5000 components are quite plentiful so you should not have to wait too long to find a good system. Naturally, however, as with all equipment over twenty years old, there are a few things you should know, luckily *Hi-Fi World* is here to help you out!

Starting at the top again, the Beogram record decks are generally reliable. Both units were belt drive

and the automatic mechanism on the 5000 is quite simple and robust. The 5005 is more complicated as its linear tracking arm is motor driven, so check this works and follows the grooves of a record properly before buying.

The biggest problem with both units are cartridges. B&O-approved replacements are made by Soundsmith in the USA (www.soundsmith.com) but these start at \$150 plus shipping for the SMMC4 up to \$600 for the SMMC1. Consequently, the value of the decks depends on the cartridge fitted and its condition. Budget on up to £150 for a 5005 with a good MMC4 and around £80 for the 5000 with same. However, a 5000 with no cartridge can be had for as little as £30, and a good secondhand MMC4 on its own can fetch £80, so it is clear where the money bias lies!

The Beomaster 5000 receiver is another solid and reliable workhorse. Its chief problems tend to come from the tight packing of technology into its slimline case and the associated heat problems that follow. A fan is fitted for when things get too warm and if this fails the unit will shut down. As with all older B&O gear, electrolytic capacitors can fail, giving erratic operation and sometimes meaning that the unit will not come out of standby. The receiver does have basic controls on its flap-down front panel but these can become unresponsive after a few years due to the rather flimsy flexible connection lead that connects them to the internal PCB becoming intermittent. Again, check everything works before committing yourself.

The Master Control Panel 5000 should really be bought in conjunction with the Beomaster as it is the only way to fully operate both the receiver and the whole system. With nothing really to go wrong, the MCP5000 is reliable unless its impressive weight causes someone to drop it! However, visible damage should be fairly obvious if this happens. As mentioned, the smaller and rarer Terminal 5000 remote handset is more basic, but more wieldy to operate - think of it as a 'nice to have' rather than an essential. A Beomaster plus Master Control Panel should cost you around £150 in good working order.

The Beogram CD50 tends to be most troublesome, in my experience, with it being quite common to find a unit with either drawer loading problems or an inability to read the disc. The former usually means a new belt and the latter, although giving symptoms of a failed laser, nearly

always means that the grease in the spindle motor has hardened. The result is that it spins the disc up, but not quite fast enough for the laser to obtain focus lock. The cure is a strip-down and rebuild of the motor, but this is a fiddly job. However there are quite a few specialists out there who can do it in their sleep, so don't be disheartened! Budget around £150 for a good, working unit.

Down the bottom, the Beocord 5000 is far less popular than the 5500, 6500 and 7000 decks that followed it, and is something of an undiscovered gem, in my opinion. The later items featured auto reverse, which was good, but also automatic record level setting, which is not, even though B&O's system works reasonably well. As a result, a good working Beocord 5000 can be bought for as little as £30 - a ridiculous bargain as far as I am concerned, and the reason why I currently have two! Watch for worn heads and belts, although replacing the latter is less of a nightmare than with many decks as long as you know how to take the thing apart (this holds true for most B&O equipment!).

One final note to make is that all components will work with other equipment, bearing in mind that their connections are mostly through DIN plugs and sockets. B&O use 7 pin types, the extra pins facilitating the communication between each item, but the extra two pins are removable with a small screwdriver, allowing the use of 5 pin DIN to phono adaptors. The only exception to this is the CD50 CD player, as it requires a 'Beogram CD Terminal' set to work on its own, consisting of a dedicated remote handset and a small PCB that must be internally fitted - these are extremely rare. Otherwise, it can only be operated via the Master Control Panel.

CONCLUSION

The Beosystem 5000 is a lovely piece of machinery to look at, use and listen to. Superbly built and with a beguiling and addictive sound quality, it will not disgrace itself as a main system, even twenty-odd years on, but it makes a perfect second system for somewhere else in the house. Mine's in the dining room - where will you put yours?



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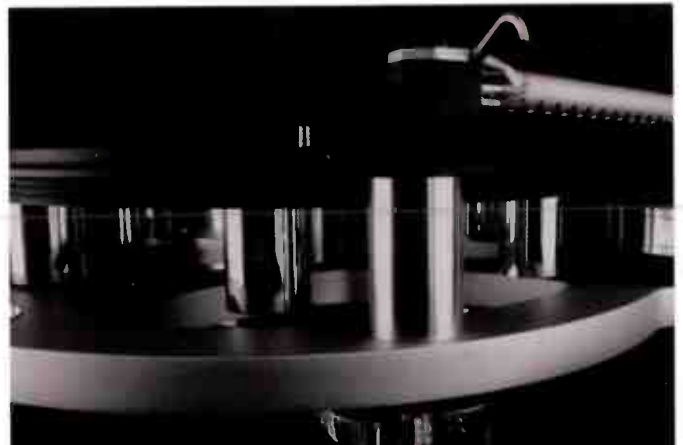
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"I'm still rather uncertain about the whole point source theory..."



adam smith

There has always been a certain amount of controversy and discussion amongst the audiophile community with regard to loudspeakers and, specifically, their size. Many people, like me, swear by a nice big loudspeaker, whilst others maintain that smaller is more beautiful.

In many ways this can be true. As mentioned on these pages before, the audio past is littered with rather dismal big boxes that are best left to the annals of history. Uninspiring paper woofers found themselves mated to waffly tweeters and often with one or two squawky midrange drivers thrown in for good measure. (Incidentally, why does no-one use the official term "squawker" for a midrange, when we all use "woofer" and "tweeter" regularly?)

So, of course, the obvious way forward would seem to be the small loudspeaker, with its advantages of smaller, stronger cabinet, minimal physical footprint for that all-important aesthetic appeal, and the smaller baffle which means that the sound emanates from a smaller area, thus helping to approximate the 'point source' behaviour that so many people hanker after.

The problem is, it isn't quite that simple. Many devotees will talk about their small loudspeakers in terms of how wonderfully they image and how magnificent their midrange and top end, whilst admitting that they really don't have much bass. I have a problem with this, in that, if a part of the frequency spectrum is missing, then part of the music is missing, it's as simple as that. Be it a small box with no bass, a big full range driver with curtailed top end or a strangely balanced design with a big midrange

suckout, I am afraid I have never been able to live with any loudspeaker that only sounds good on one-sixteenth of your music collection, because "it has no x but just listen to the y"

I should also confess at this point that I am still rather uncertain over the whole 'point source' theory. While I realise that the sound emanating from a single source does indeed make for a stability and uniformity to the soundstage, I can't help but be reminded of the late, great John Peel's quote regarding vinyl. "Somebody was trying to tell me that CDs are better than vinyl because they don't have any surface noise. I said, "Listen, mate, life has surface noise."". Whilst, obviously, totally agreeing with his theory, I believe it can further be extended to loudspeakers as I think it is equally true that life is not a point source!

Consequently it is always large, multi-unit loudspeakers that have really made a lasting impression on me. Fortunately, the situation with regard to the design of these behemoths changed long ago. Today, well designed drive units are fitted securely into sturdy, well braced and heavy cabinets, minimising the likelihood of all the boomy, wallowy low end mess that so often seemed to be the norm.

My first memory of really vivid imaging came from a hi-fi show years ago and the seemingly largely forgotten Mission 767 loudspeakers. Top of Mission's range in the late 1980s they featured tall cabinets, each containing two actively driven bass units, plus two midranges and a tweeter, and I can still recall the utter amazement I felt at closing my eyes when sat in front of them and just 'seeing' this huge face in front of me. Ever since then I have remained

utterly convinced of the necessity of a big, well designed loudspeaker to obtain a really vivid walk-in soundstage and, if I ponder my all-time favourite loudspeakers, I think only one of the top ten is under four feet tall.

All of these thoughts sprang to my mind this month, as I have tested three pairs of loudspeakers in this issue, all around the £1,000 mark, but all completely different in their technological approach and resulting sound. The first of these, the petite, standmounting Yamaha Soavo 2s were an absolute delight of composure and superb integration across the frequency range. They showing the advantages of a well designed small enclosure and proved, even to a sceptic like me, that small loudspeakers can indeed sound very impressive.

The second items, the Totem Arros, were more of a slightly leftfield design. Although small floorstanders, their cabinet volume is more akin to that of a standmounter and they use a small main drive unit. What was so remarkable about these loudspeakers was the sheer verve and soundstage scale they brought to performances, when operating within their slightly limited loudness capabilities.

Finally, there were those behemoth RRRs. They have a perfect mix of superb build quality and that vast, walk-in soundstage that only a big box does. The RRRs offer exactly the sort of sound that I love and, although they are not quite perfect, if the thumbscrews came out and I was forced to choose between the Yammies, the Totems and the RRRs, it's the big fellas that I would take home - provided I could get them into the car, of course. ●

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EDITOR'S CHOICE

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 Marantz CD7 £1995
 Marantz SA15-S1 (£1100) £795
 McIntosh MCD201, CD/SACD (£3400) £2795
 Micromega CD132 (£849) £595
 Musical Fidelity KW 2505 (£4999) £3795
 Musical Fidelity DM25 DAC and Transport (£4000) £3395
 Sony SCD-1 SACD player (£5000) £1995
 Theta Chroma DAC £295
 Union Research Unico CD (£1250) £895
 Vincent CD 3 CD player (£800) £649

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 Audionet 5AM V2 Integrated (£2400) £1495
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 Cairn 4810 Integrated (£2700) £1795
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Flying Mole PA-S1 Digital Pre (£999) £795
 Gryphon Diablo Integrated amplifier (£6400) £4995
 Icon Audio MC34 (£650) £399
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 Krell KAV 250P pre amplifier (£2495) £1095
 Manley Labs Neo Classic 309b (£5895) £3495
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DACs may not be fashionable, but represent some of the greatest hi-fi bargains out there...



dominic todd

You might think that the worlds of high fashion and hi-fi are two of the most disparate you could ever find. After all, fashion is about money, glitz, glamour and hype. Conjure up an image of the hi-fi industry and it's more likely to be of thoroughly decent chaps in cords and jumpers, with steady gaze fixed towards an oscilloscope. It can occasionally be glamorous, but let's face it, it's rare for decent hi-fi to get so much as a look in the latest issues of *Vogue* or *Elle*.

Then again, perhaps the two aren't so different after all. We too have our own stylish Italians – think *Pathos* and *Opera*. Traditional British tailoring may be all the rage on the catwalk, but classic British brands of Linn, Naim and Quad are held in just as high esteem around the world. Then of course there are the Germans. Solid, conservative and made to last – Hugo Boss and T&A could so easily be related. Then we have the staples; the items that never go out of fashion. The Linn LP12 could easily be that little black dress, whilst Quad's electrostatics are every bit as enduring as the classic Oxford brogue.

Yet, just as with clothing, fashions for hi-fi come and go. Indeed, sometimes fashions go and seem destined to return never again. I was reminded of this recently when testing a NET Audio Sonance DAC. All was well until I tried to find some rivals to pit it against. In short, with the exception of the Cyrus DAC X and other, rather more obscure or expensive designs, I pretty much drew a blank. What makes this extraordinary is that in the early nineteen nineties there were literally dozens of DACs on the market with a number of mainstream manufac-

turers even producing a range of them.

Of all the DACs that spring to mind it was probably the Arcam Black Box range that was the most prolific. I'm sure there were at least six of the things. Yet Arcam were far from being the lone British mainstream producer of DACs – Audiolab, Meridian, Linn, Mission, Roksan, Cambridge Audio and even QED all produced DACs at some point during the nineties. The Japanese majors were there too. Sony and Pioneer regularly produced typically over-engineered products, with the likes of Teac also featuring strongly. Then came the super-brands. Wadia, DPA, Stax and PS Audio were just four amongst a range of seriously high end brands with equally serious prices. It wasn't unheard of to fork out around £5,000 for the latest slice of digital nirvana – and that was fifteen years ago!

With such prolific activity it's a wonder that the trade in separate converters died so abruptly, but died it did. What did for the separate DAC was that the quality of integrated CD players became so good that, by around 2000, there really was little demonstrable improvement to be made by splitting the transport and DAC. Far better, as Naim had always upheld, to split the power supply from the main CD. Perhaps this is why even the earliest Naim CD players still fetch good money, whilst transport and DAC models of a similar vintage are less well thought of.

Still, fashion's loss is the bargain hunter's gain, and this has never been as true with DACs as it is today. Don't forget either that the technology used may have moved on but the sound quality isn't necessarily inferior. What sounded good back then will still do today. If you're after

something cheap and cheerful then a QED Digit, Cambridge DACMagic or even an early Arcam Black Box can all be had for under £50. Though hardly state-of-art, each of these should provide a welcome boost to an elderly budget CD, or even DVD player.

Move on to the £150 price mark and you can now pick up what used to be well-respected mid priced gear. Arcam's Black Box 500 was the last separate DAC they made and, by the time of its launch in the mid-nineties, was already facing a seriously declining market place. Despite its wonderful flexibility and custom-made 20bit Sigma Delta DAC in discrete logic, it never sold well. In fact, those in know said it was 500 by name and 500 by nature – as in that was the quantity it sold! Still, with its multiple inputs and revealing sound quality, this makes a great buy for a complex hi-fi/home cinema system today.

As an alternative there's always the Meridian 203. Using the popular DAC7 of the early nineties, the 203 gives a livelier presentation than the Arcam and, of course, comes from one of the most respected names in digital hi-fi technology. If you've really got the DAC bug and, preferably have a separate transport, then around £500 gives access to all sorts of exotic models. From Pink Triangle's wonderfully versatile Da Capo, in which you can swap filters, to a previously £3k worth of Theta or Wadia American esoterica.

Okay, so a DAC may not be the latest thing, but even as a means of improving the sound from an Apple TV, they can still prove highly effective. At today's prices, DACs may not be fashionable, but they probably represent some of the greatest hi-fi bargains out there. ●

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"the idea that everything has now been reissued on CD is absolute rot..."



paul rigby

The popular misconception, which says that all the music ever created for record companies has now been reissued on CD, is absolute rot.

There are plenty of original vinyl titles which have yet to see the light of day on Compact Disc. Of course, this gives you an extra excuse to support your local record fair and to shuffle through market traders' boxes of second-hand vinyl to pick up a lost goodie. Many major record labels simply do not know what they have got stored within their temperature-controlled archives. Nor are they sure about the validity of publishing them because they don't want to make a loss.

Then there are the numerous examples of master tapes, whose original records were published by a major record company, which now reside on the top shelf of a spare room in the drummer's house in Clacton. There were a smattering of forward-thinking musicians who took it upon themselves to either buy back the original master tapes or simply remembered to ask for them back after the contract term for label ownership had lapsed. Also, there are masters which have been presumed lost but are found in a dusty attic.

Finally there are records out there which are highly regarded, whose masters have been lost many moons previously but, for both cultural and historical reasons, warrant copying and restoring and reissuing. Such has been 'Mi Generacion', the excellent West Coast-influenced album released via the Spanish record label, Wah Wah, reviewed in my Audiophile Vinyl section this issue. Another example can be found surrounding the

aftermath of the short lived American psychedelic rock group, also featured in the Audiophile Vinyl Column, The Flat Earth Society - an apt inclusion to a hi-fi magazine, don't you think?

Erik Lindgren, the man who 'rescued' the original master tapes from Fleetwood, the band's original record label, revealed why, but also explained the extraordinary circumstances in which this band of youngsters - all of which look no older than nine years old on the record sleeve - came to record this unique and well regarded album. "In 1967-1968, there was a competition for Waleeco - a popular candy bar in the USA at the time," began Lindgren. "An Ad agency called Quinn Johnson actually initiated a talent search and held a competition to find a band that would create a jingle for them with the Waleeco candy bar as its central theme."

However, the winning band would not only get to record a jingle, "They would also record an album," added Lindgren. "It was to be a professional job too. The band who rose to the top of the pile was a folk group called The Flat Earth Society from Lynn, Massachusetts. They wrote an impressive jingle and subsequently won that competition."

However, when the album was recorded and eventually 'released', the band were pretty upset. Why? Because the record was not available in stores. Imagine - you create your magnum opus, run through the creative gamut of emotions in its gestation and production. Record the thing in a professional record studio, take a well deserved beer as reward only to be told that you won't see it actually on sale...

The reason was down to marketing, as Lindgren explained.

"Every single Waleeco candy bar around at the time included a coupon. The idea was that if you bought six bars and then sent six coupons - plus a dollar - to Fleetwood Records you then received your record. That was the only way you could get the album."

After this rather traumatic time as a creative entity, The Flat Earth Society, staggered on for a bit longer but then broke up. After all, in the cold light of day, the guys were little more than marketing pawns and the band itself wasn't going anywhere. But there was to be a postscript to the band. "A couple of the Flat Earth guys moved to England to form a band called Cottonwood, becoming a huge touring outfit from 1970 till 1972."

They actually signed to Chrysalis, so in effect they had made the big time with a major and popular record label. However, the band never quite crossed the finishing line. "Cottonwood never actually released anything despite recording many demos. In style, they were a sort of folk-rock group and were very popular as a live outfit in the UK. They even had Procol Harum opening for them."

The bottom line is, however, that while Cottonwood had no vinyl legacy to speak of, there is apparently a lot of music still residing in the Chrysalis tape vaults, just waiting to be exploited.

It makes you wonder what else is there - and other vaults around the country, Europe and the world. Hence I give my wholehearted support to the growing number of small, yet passionate, vinyl record labels out there who are doing their best to unearth the Flat Earths out there - more power to them. ●



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steven green

I've read a few articles over the last few years which say that, due to the popularity of MP3 and music downloading, the general public isn't interested in high audio quality any more, and some suggested that the SACD and DVD-Audio formats were doomed to failure before they even began. Personally, I don't see it this way at all.

I think the main reason why some people have formed the above conclusion is that MP3 has become synonymous with providing low audio quality. But is such criticism justified? It used to be so when MP3 was first taking off (which mainly consisted of teenagers downloading music for free over the Internet), but MP3 encoders have improved significantly in the intervening years, and more advanced audio formats are now commonly used, such as AAC.

I've also seen quite a lot of evidence to suggest that the majority of people are now using much higher bitrates for MP3 and AAC – 192 to 256kbps – than were used at the beginning of the decade when 128kbps was the *de facto* standard. In the last couple of years there has been a sharp increase in the use of lossless audio compression, which doesn't degrade the quality at all.

The quality of high bitrate MP3 and AAC audio today is of similar or better quality to that provided by MiniDisc, which itself uses a perceptual audio codec (called ATRAC) that is similar to the one that MP3 uses. My recollection is that MiniDisc didn't have a bad reputation for quality [certainly this was the case by the time ATRAC generation 4.0 arrived in 1997 – *Ed.*], and I think the widely held view that MP3 provides poor quality is underestimating the performance of the format when it

is used at high bitrates. Compressed audio also offers an unprecedented level of portability, and this played a major part in it becoming so successful, so I think this should also be factored into the equation rather than concentrating on the audio quality it provides.

Moving to the issue of SACD and DVD-Audio failing to take off, personally I don't think these formats were given anything like the level of support they needed from their backers to make them successful. Admittedly, it was never going to be easy to dislodge the CD in the first place because it is such a ubiquitous technology, not to mention the fact that the large majority of equipment doesn't support the 96kHz audio bandwidth that both formats use. But given these circumstances, I have to say that the "let's not tell anybody they exist" marketing strategy for these formats wasn't good enough.

Compare the lack of promotion of these formats with the amount of TV advertising DAB and Freeview received from the BBC. In total, the BBC broadcast nineteen high-impact TV advertising campaigns for DAB, and if anything I would say there were even more TV adverts for Freeview. Sky also heavily promoted its HDTV service that launched last year, which led to it becoming Sky's fastest selling "additional TV product" ever. With 244,000 subscriptions being sold in its first ten months of operation, despite the £300 cost of the Sky HD receiver, the £10 per month additional subscription charge and the necessity to own an HD-ready display – it would appear that quality does sell, but only if you tell people about it...

Another big problem has been the lack of content available for the high-definition audio formats. For

example, there have only been around 4,650 SACD titles released since it was launched in 1999, whereas there are 26,000 CDs released in the UK each year.

The main reason why so few SACD titles have been released will have been due to the far higher manufacturing costs compared to CD, as this would have required the record companies to take a significant hit on the profit they make per disc sold. However, disc manufacturing costs are predominantly dependent on volume, so if the major record companies had co-operated with one another to release all of their titles on hybrid SACDs (so that they would be backwardly compatible with ordinary CD players), this would have vastly increased the volume level and brought the costs down towards that of producing CDs. If they had then put stickers on the cases saying "SACD compatible" this would have significantly increased the level of public awareness, which would have reduced the amount of advertising required to make the format a success. But of course, things weren't quite as simple as that, because there was a competing format in DVD-Audio.

If the record companies could agree on a single high resolution format, release all of their content on backwardly compatible discs in that format and, importantly, give it the promotional push that these things require, I think it would make it into the mainstream. But given the half-hearted attempt at pushing the high-resolution formats we've seen up to now, it's no surprise that they didn't make it. However, that shouldn't be taken as a reflection on the general public's taste in audio quality – they didn't even know the formats existed! ●



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



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"digital audio will come right in the end,
it's just taking a long time..."



noel keyword

Compact Disc could have been worse. Luckily, at the time of its introduction the world was a simpler place, so we got the first ever digital format as nice straight-forward digital, meaning 16bit PCM - uncompressed. It was all that digital-to-analogue convertors could handle at the time, being based on 1970s technology - and often sounded awful. But even then I thought that one day it would all come right and that day is just coming into sight. We are, I am told, about to get a new audio disc.

Ironically, original CD sound isn't so bad when done properly. That means better recordings, when analogue is converted to digital; involving better studio processing where data word truncation, jitter, noise and other nasties can blemish the sound, and better playback in domestic CD players to avoid adding even more distortion and jitter.

Early digital recordings suffered terribly from digital distortion, due to poor convertors and a simple belief that as digital was perfect and had a fantastically wide 96dB dynamic range, music could (and should) be recorded way below peak level, to avoid possible overload. Classical recordings suffered most, violins swimming in seas of digital distortion. I had never heard anything so bad - from something said to be so perfect!

CD these days is, technically, a tamed animal. Much of the jittery distortion has gone, due both to greatly improved analogue-to-digital convertors at the recording end, and improved digital-to-analogue convertors in CD players. It has been a long time now since I measured distortion levels in players much above that inevitable from 16bit digital code, with its limited

resolution. Thumbing through a May 1991 issue of Hi-Fi World I see Arcam's Black Box 3 was managing 0.7% distortion and 105dB dynamic range. By 1990 a Philips DVD960 had brought this down to 0.4% and 110dB dynamic range, whilst today Arcam's DV-139 manages 0.23% and 112dB dynamic range.

You can see from these figures how CD distortion, which in the 1980s could measure a highly audible 1%-2%, has been steadily reduced to almost inaudibility. It has taken a surprisingly long time. Other improvements have been the use of dither noise to further linearise low levels, and a reduction of jitter throughout the signal chain, especially in studios. Nowadays, a good modern recording on CD is very listenable, with much of the harshness of yore gone. However, it still isn't a patch on SACD or DVD-A, both of which manage distortion levels ten times lower than CD, our measurements show. And you can hear the difference too; CD sounds almost barren and mechanical against the best from DVD-A and SACD, but neither of these formats seems to have a future.

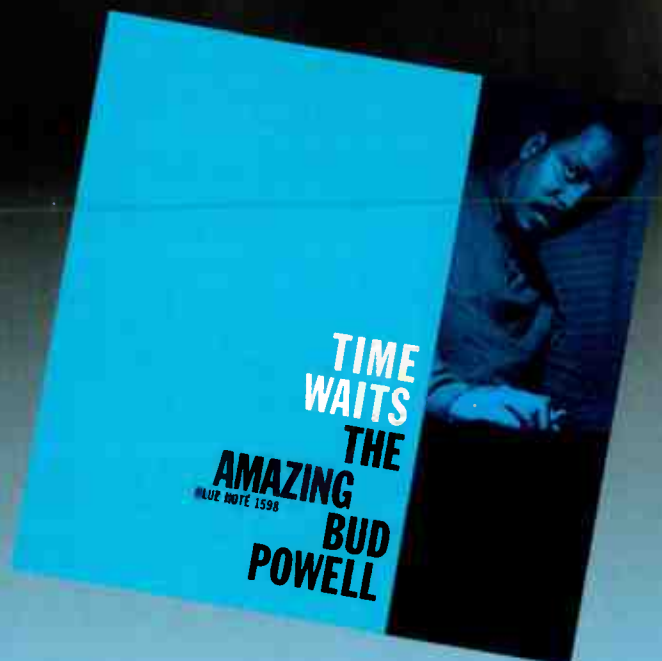
Ironically, as CD finally came good technically in the late 1990s it seems the world was about to fall out of love with it. As the new millennium started, first Germany reported falling CD sales, then the USA - both large markets. At first this was taken as a blip by a worried music industry, partly because in the buoyant UK market, CD sales held steady, peaking at 174 million in 2004. However, globally, IFPI figures clearly show CD sales peaked in 1996 and started a rapid decline in 2000. The world didn't need CD any more, other technologies like DVD and iTunes contributing to an inevitable

downturn.

Once a technology goes into decline like this, there's no saving it. Sales typically follow what is known as a bell curve, with slow start, rapid rise and short peak (five years for CD). After that it's downhill all the way, at first slowly but the decline soon speeds up. Knowing this, the big Consumer Electronics manufacturers like Philips, Sony, Panasonic, Toshiba, Samsung et al. like to have a replacement ready. Unfortunately, DVD-A and SACD - both possible saviours - never sold in any great quantity.

Now, in their place come HD-DVD and Blu-ray. Along with them comes renewed interest in high quality audio. Both formats have a tremendous audio specification, exceeding DVD-A. I am very impressed by my best DVD-As, like Santana's 'Supernatural', for example, which seems to avoid the hardness of much 24bit/96kHz digital. Okay, it's a pig to load, with thirty seconds or so of inane graphics, but its sound shows just how much better high definition digital can be. The Chris Botti Live Concert on Blu-ray is another 24/96 jobbie and is awesome, even if it is music for the living dead. Both overwhelmingly improve upon CD - and we've yet to hear what 24/192 can do, so the future for high quality audio looks rosy I feel.

It is about to get better, because I learnt recently from an industry source that the Blu-ray group are finalising a specification for an audio Blu-ray disc. Quite what this will offer we will have to see, but the fact that CD now appears to be getting a high definition successor is great news. Digital audio will come right in the end, it's just taking a long time to do so. ●



MI GENERACIÓN
Mi Generación
Wah Wah Records

One of the joys of vinyl is making musical discoveries - I strongly feel that you're more likely to take a chance on a strange new release because it's on black plastic (the impact of the cover art, the font used for the cover titles...). Vinyl is big enough to make a visual impact that can lead you to think, "hmm... maybe"! This album, from Spain of all places, was one such find and boy am I glad I took the trouble to listen to it. If you like Crosby, Stills & Nash, you are going to adore this creation, the band's rare (originals fetch 500-600 Euros each) LP from 1971, originally released on the Palobal label from Barcelona. What you get in this package is the original LP album, a second disc of rarities plus a 7" single, individually packaged with its own colour artwork.

Restoration was difficult because masters were unavailable. As Marc from the Spanish record label, Wah Wah, explained, "With Spanish

reissues, we find too often that the masters haven't been kept. It seems like they just had the copy they sent to press and once the record was done the attitude was somehow, "What do we do with the tape? - Oh, just throw it in the trash can, the album has already been released". Hence, this album was copied and remastered from one of the last remaining original vinyl copies. There is still a little bit of hiss here and there and compression is evident. Too much processing, though, would have harmed the music quality - processing is all about balance. However, the second disc in this set was unreleased and the masters were saved. The end product is superb and a testament to the passion of the music fans at Wah Wah.

BUD POWELL
Time Waits: The Amazing Bud Powell Volume 4
Classic Records/Blue Note

Recorded in 1958, for the uninitiated this release can prove slightly

confusing if viewed 'head on'. This vinyl is entitled 'The Amazing Bud Powell' but it should have been subtitled, 'Volume 4' on the cover and spine or, if not, the plastic cover and not just on the rear of the sleeve in the top corner. That minor quibble aside, this is an excellent selection of tracks from one of jazz's piano greats, on 200gm vinyl utilising Classic Records' excellent QUIEX SV-P vinyl mixture which is perfect for jazz pieces because it shows just how quiet this vinyl formula can be.

Powell was a tragic figure in a jazz world full of tragic figures. In this case, Powell suffered a lot from mental problems. He had many severe headaches and mental breakdowns which meant that he spent more than his fair share of time in hospitals and, unfortunately, meant that he was to die too soon - in 1966. Reportedly, Charlie Parker is supposed to have told Miles Davis that he would not hire Powell because "he's even crazier than me!" This album was recorded in 1958, a period of time when Powell seemed

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to be tackling his problems and finding a new lease of life. This would be extended immediately after the release of the album with a stint in Paris which, as a result, produced many fine albums from this period. 'Time Waits' features all his own compositions with the accompaniment of Sam Jones on bass and Philly Joe Jones on drums. The rhythm section is absolutely masterful at the slow and medium tempos that Powell had come to favour, with Jones often prodding the pianist into releasing more energy. This is the finest of Powell's later recordings.

DEAD KENNEDYS Fresh Fruit For Rotting Vegetables Cherry Red

Cherry Red is fast approaching its 30th anniversary and so this iconic punk album vinyl re-release is an ideal tribute to an important British label. That this album exists at all, in its reissued form, is probably more of a testament to Cherry Red's and the management's diplomatic skills than anything else because, well, let's just say that the band themselves don't necessarily get on with other. And yet, "This is our best selling album of all time," declared Adam Velasco, Cherry Red's MD, explaining why this rare vinyl outing by Cherry Red was selected, "and continues to sell consistently well. In fact we originally released the album."

The masters had been baked a few years back when the label released the album as a CD. A copy of the masters was taken at that time

and this vinyl issue was derived from that baking process copy. The band themselves were involved, in fact the band's lead guitar player, East Bay Ray, did the actual mastering in San Francisco, USA. He was credited as Production Assistant on the original release.

To that extent, Cherry Red didn't actually get involved with the engineering, the band had total control of the mastering and delivered it when they were happy with the sound – which is unusual in this day and age. Cherry Red basically had nothing to do with that part of the project "apart from paying the bill," added Velasco, wryly. The whole production is a duplicate of the original: no heavyweight vinyl, no heavy gauge sleeve, a simple diecut paper inner. Mastering to the punk ethic perhaps? The sound? Well, credit to the band, the mastering is energetic, lively and in yer face – a good job and a cracking album.

FLAT EARTH SOCIETY Waleeco Lightning Tree Records

An interesting album that derived from a bizarre situation (see my column on P71 for more details), 'Waleeco' was reissued with the help of Erik Lindgren at Arf Arf, a US-based record label. Erik supplied the master tape and was involved in the upgrade from the original. Erik is a key figure in US garage/psych reissues and actually worked for the original record label that released 'Waleeco', Fleetwood. "I was working there around 1978-79, I used to enjoy

rummaging around their tape vaults of old material and found the Flat Earth Society master tapes. Nobody really cared so I, er, 'liberated' them."

A good thing because the tapes would undoubtedly have been thrown out otherwise. What Erik found is an intriguing album of psychedelic rock in which has been cruelly underestimated by some areas of the music press, "When the album was recorded, it was done in glorious wide stereo but when the original mastering engineer completed his work he blended the two sides together to form a mono signal. So I wanted to release it in its original untainted form – stereo, as it should be, for the first time. If you listen to the track, Satori, you get crazy panning effects. You can even hear the dirt in the phasers as they're creating the effects in the studio! All part of the trip, eh?"

If you're a fan of The Doors or Jefferson Airplane, you should check it out. The album has its frenetic moments but the band are not afraid to pull back on the reins and explore the more psychedelic aspects of their music, pondering musical moments via languid keyboard solos, for example. An excellent release, both Lightning Tree and our Erik should be congratulated in restoring the album to its original glory. PR

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Designing Speakers

Part 12 - Introducing WD20T

Our latest speaker project is far from ordinary. Peter Comeau explains.



Last month set a bit of a 'tease' in showing an advance picture of this latest project, WD20T. The reason it was a tease is because WD20T turns out to be far from conventional in its

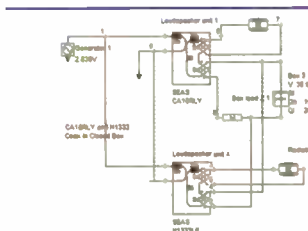
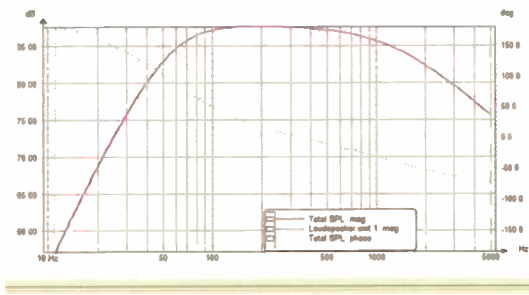


Fig. 1 - Predicted Bass Response of H1333 and H1217 in parallel in a 35 litre enclosure

driver arrangement and enclosure. Congratulations if you guessed from the photo that I had chosen a coaxial driver, but there are a few other aspects to the design of the WD20T that might surprise you.

Starting a speaker design based on first principles usually just leads to the standard 2-way or 3-way system, done to death in a multitude of commercial designs. Occasionally innovation strikes and the result is something totally unexpected, something that you just won't see in the shops.

Such was the case for the

WD25A. This was a case of 'they said it couldn't be done', in that case marrying a 25cm (10") bass unit with a 25mm treble. But it had been done already, as WD25A was based on the much earlier Dynaco A25.

So, when I sat down to think of a design for a closed box solution, the first idea was to gain inspiration from earlier designs, such as the AR1, the first 'small box' acoustic suspension system.

But, actually, other than being a closed box system utilising a bass unit with a low resonant frequency that used the springiness of the air in the box to stabilise its mechanical operation, it is not a design which would break new ground in modern times.

Actually the design of the WD20T came from another direction entirely. I had often wanted to work with a co-axial driver, one where the treble unit is in the centre of a midrange cone. You'll have seen these, most famously as the Tannoy Dual Concentric, and also as the KEF Uni-Q.

The advantage of having both

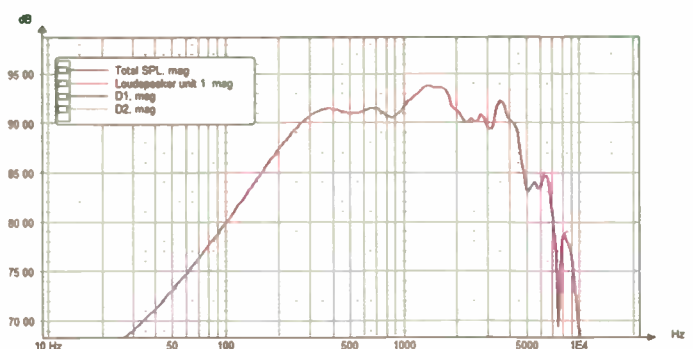


Fig. 2 - Midrange response of H1333 + H1217 in parallel

drivers based on a concentric axis is one of coherence of performance across a wide listening axis. With conventionally spaced drive units arranged one above the other on a baffle the frequency response will change depending on whether you sit down, stand up or lie on the floor. Usually this does not matter as the designer can align the speaker to sound at its optimum when you are in the normal seated position. But it does mean that reflections from floor and ceiling betray a different 'character' of sound to that arriving directly to the listener.

In addition, phase coherence between the drivers is sometimes difficult to manage as the path lengths from a dome treble unit (slightly forward of the baffle) and the centre of the bass/mid cone (recessed into the baffle) to the listener's ears are markedly different at the crossover frequency. A little juggling in the crossover design can usually 'cure' this, but it would be nice not to have to do it at all.

So the coaxial unit appears to have it all? Not so! Burying a treble

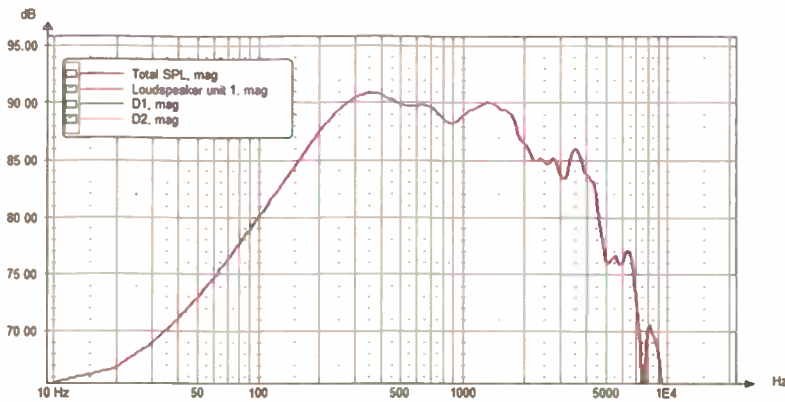


Fig. 3 - Parallel drivers with series 0.6mH inductor only.

dome inside a bass cone is asking for trouble. The bass cone will act as a partial horn or waveguide for the output from a classic dome driver, at best restricting off-axis performance, at worst causing considerable coloration and uneven sound output through the lower treble. What is worse is that this 'waveguide' is moving in relation to bass frequencies and this has the possibility of modulating the output of the treble unit in undesirable ways.

What to do? Using a coaxial driver – the SEAS H1333 is one of the few available to the home builder – in a conventional bass reflex design exposes the cone to large displacements at low frequencies, just what we don't want for that moving waveguide problem.

Unfortunately the low F_s of H1333 (26Hz) and low Q_{ts} of 0.26 do not lend this driver to give good bass in a closed box ($Q_{es}=0.31$ and therefore $EBP=83$ indicating optimum performance in a bass reflex cabinet). So, what is the solution?

Looking at the relative sensitivities of the TPX bass/mid cone of H1333 and its treble section indicates that the mid output is around 3 - 5dB below the average treble level. Obviously this can be solved by attenuating the feed to the treble unit in the crossover, but why not think the other way round? It seems a shame to reduce sensitivity, so why not boost the bass/mid output instead?

2.5 WAY

Now the obvious way to do this is to design what is commonly called a 2.5 way system, one where the bass/mid unit is given support in the bass area by the addition of a second bass driver run in parallel. The reason it is called a 2.5 way is because the bass 'helper' unit has its own crossover in the upper bass to avoid interference with the midrange at the crossover frequency.

But does it necessarily have to interfere with the crossover? This

was the BIG question. If, and it is a big IF, we could run two units in parallel for both bass AND midrange then we would obtain our 3dB improvement in sensitivity, actually rather more because the drop in impedance will drag more current from the power amplifier.

Plugging a range of suitable drivers into LspCAD6 Lite allowed me to experiment with bass driver alignment before building a prototype. Just by entering the TS parameters I can play with alternative drive units and cabinet volumes to see which would work in a closed box system.

Two drivers almost demand a floor standing cabinet. However the cabinet can be slimmer than that required by one large bass driver, though not so slim as to throw away what advantage I would gain from two drivers through the losses due to the baffle step. (By the way if the mentions of 'baffle step' and 'EBP' baffle you then you'll have to read the earlier issues of this series – you can sign up for this series at www.speaker-parts.eu).

I settled on 25 to 35 litres as an ideal size. Not too tall to look out of proportion for the 17cm drivers, not too wide or too deep to look oversized in a domestic environment. And one of the first bass 'helper' drivers I turned to, the H1217, proved itself immediately up to the task.

As we mentioned last month the H1217 is fairly flexible in its requirements for cabinet volume and loading. In combination with H1333, working into the same volume, it gives an extended response to below 50Hz in 35 litres (Fig. 1). Even allowing for the baffle step from a 250mm wide baffle the overall sensitivity works out at 90dB, a good 5dB up from the H1333 on its own!

COMPOSITES

For the cabinet construction I wanted to move away from MDF to a composite material that I developed some years ago. (I won't go into

the reasons here because of space considerations, but you can catch the full explanation on my Blog at www.speaker-parts.eu).

This material is a composite of a thin MDF 'skin' and an inner layer of particle board. It gives the ideal combination of scattered panel resonance and resistance to transmission of sound from inside the cabinet. The outer MDF skin adds rigidity and an easy surface to finish or apply veneer to.

Unfortunately this material is not readily available but you can make it yourself by laminating 6mm sheet MDF to 13mm particle board for 18mm thick walls, or 12mm MDF and 18mm particle board for 30mm overall thickness. So good is this latter combination that you won't need any extra internal cabinet bracing, but 30mm wall thickness does reduce internal volume considerably!

You will need to do your own calculations but, for this project, I judged that 32 litres from a cabinet 250 x 210 x 950mm with 18mm wall thickness and three internal braces gave me a superior bass roll-off than the 25 litres offered by the 30mm thick material.

Luckily I was able to find a cabinet maker with which I could develop both the box and its material, and all thanks go to Arcaydis Loudspeakers for making this project a reality. The result is a floorstanding cabinet that buries its own character in the general noise floor leaving the drive units to reveal their true qualities.

Again thanks to Arcaydis we can offer builders of this kit a fully built cabinet to which they just need to add the driver and crossover kit if they don't want to build their own woodwork. Either way all details are provided with the World Designs WD20T kit at www.world-designs.co.uk.

As with all tower speakers there is a dominant top to bottom standing wave that would result in a clear

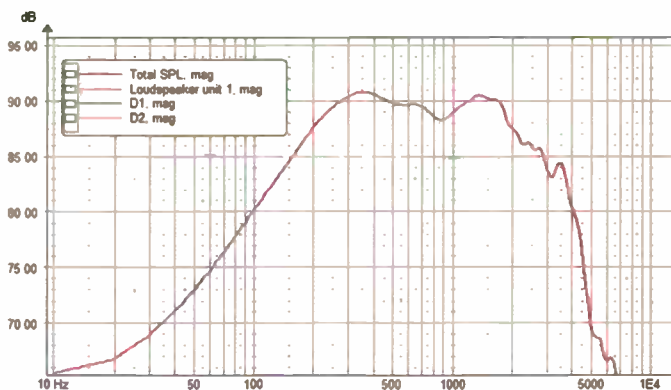


Fig. 4 - Parallel drivers with 2nd order crossover.

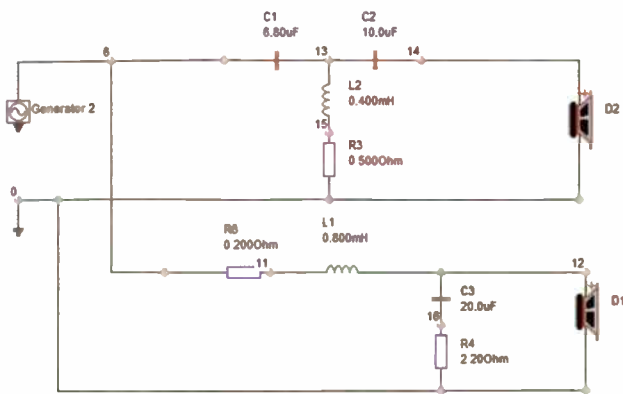


Fig. 5 - Initial evaluation crossover schematic.

'boom' at mid bass frequencies if left unchecked. By fitting a brace half way up the cabinet that is 'ported' rather than open, to provide a resistance to such standing waves, the resonances at such frequencies are effectively quelled.

The bracing breaks the vertical panels up into unequal areas, thus making sure that the fundamental panel resonances are distributed over a wide range of frequencies and so are not audibly obvious. All this is fundamental design engineering but it is surprising how often it is forgotten in the rush to create a working model!

Overall the bass drivers and cabinet look, on paper, as though they will deliver considerable bass power and punch from 50Hz to 500Hz with superb linearity and freedom from the peaks and troughs that indicate an uneven balance between instruments.

CROSSOVER INTEGRATION

Above 500Hz, of course, we are at the mercy of the integration between the drive units and the performance of the cones up to the crossover frequency. What really surprised me with this experiment was how the two bass-mid cones gelled so superbly into a coherent whole, so much so that all ideas of a 2.5 way were immediately discarded!

So this design was starting to break all conventional rules and is all the better for it. Such is the cohesive performance of the two drivers working together that it was fairly simple to construct a 2-way crossover maximising the efficiency of having two bass-mid cones working in tandem.

Certainly there had to be precautions. This system only works because the treble dome is coaxial with the top bass-mid cone and so is close enough to the bottom bass-mid cone so as not to cause any cancellation effects. But the crossover frequency has to be a fairly low 2kHz to rule out interference effects and

the crossover slope also has to be fairly rapid too.

Again, luckily, the combination of the two bass-mid drivers gives a relatively smooth natural roll-off from 4kHz (Fig. 2). By the way ignore the response below 300Hz as, due to gating out the floor reflections from the MLS measurement, the very low frequency area is not an accurate indication of the true performance. The drivers' acoustic output, when combined with a standard 2nd order electrical crossover slope, equates to a fourth order Linkwitz acoustic roll-off. But I'm jumping ahead of myself here and, before you start getting worried about the terminology, I'll show you how I worked this crossover out.

Our first step is to measure the drivers and import them into LspCAD6 lite. LspCAD's 'Just MLS' will take care of the measurement, as I've shown in previous articles, so you only need the one piece of software in conjunction with your computer and a suitable microphone.

As the bass-mid drivers are working in tandem we can treat these as one drive unit with a combined frequency response and impedance, the former measured on the treble dome axis.

Next we start adding a crossover circuit in LspCAD's Schema window. First insert a series coil with the bass driver to find a suitable value that will equalise the midrange and bass levels. You can use your own judgement here but around 0.6mH looks about right to me (Fig. 3). Don't forget that, as well as adding an inductor in LspCAD's Schema window you should also add a series resistance which is the DC resistance of the coil (Fig.5).

Immediately this looks promising, but the peakiness at 3.5kHz is going to present a problem to integration with the treble unit. So, to control this, we add a capacitor and resistor in series with the bass unit. Even with the value of these set to 10uF and 1 Ohm we can see that a natural crossover frequency of 2kHz is developing (Fig.4). The 'hump' at 1 to

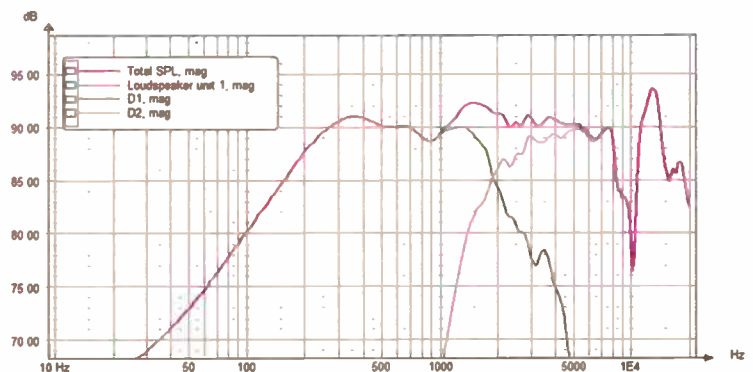


Fig. 6 - Initial results using a third order crossover look promising.

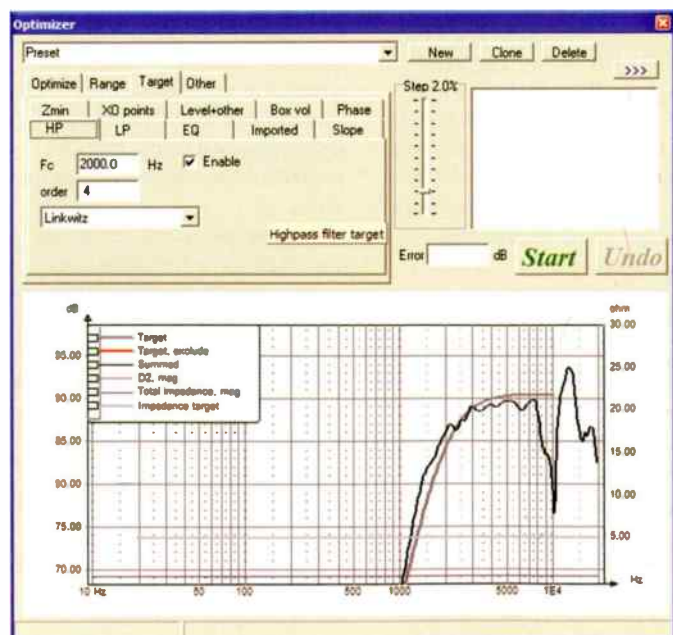


Fig. 7 - Initial actual response versus target response for the treble crossover in LspCAD's Optimizer.

2kHz is easily equalised by increasing the series coil value to 0.8mH.

Common sense ought to tell you that, with a low crossover frequency of 2kHz, you will not be able to use a gradual slope for this treble unit. As it has a fundamental resonance at just over 1kHz we are actually going to have to use a fast roll-off to avoid this resonance, even though it is heavily damped, making itself heard.

So it makes sense to start off with a third order electrical crossover, again not forgetting to put a resistor in series with the inductor for its DC resistance value (Fig.5). (This is more of a necessity here as we will be using an air cored inductor with a relatively high resistance which cannot be ignored!).

Juggling the values of these components (just click on a component and use the up and down arrow keys to quickly move between values) shows that we won't have too much of a problem finding a good crossover slope. With even some fairly standard values (C1 6.8uF, C2 10uF and L2 0.4mH) we can see good integration with the bass driver(s) (Fig.6).

By the way if the dip and peak around 10kHz looks frightening it really isn't. This is an inevitable consequence of burying the treble unit in a bass cone and is a straight-forward reflection effect which is only visible directly on axis at 1 metre. Move off axis and further away from the unit and it smooths out. At such high frequencies it is hardly audible and really only affects the top overtones of instruments. If it really bothers you we have a solution, but more of that next month.

So far so good, but at this point it is worth having a listen as the balance of the two units looks promising. I can tell you that the listening result was more than promising! Immediately obvious was the bass power and articulation which spread right into the midband giving a real sense of body to male vocals, piano and woodwind. Even at this stage these speakers delivered an excellent projection of sound to the listener.

However all was not quite right through the crossover region. The hump at 1 – 2 kHz provided an unwanted lift in the presence region giving a lispiness to female vocals and an unnecessary bite to string instruments. Also the stereo image did not gel in the way one would expect from a coaxial, point source, driver.

Not to worry. Back to LspCAD6 lite and let's see what we can do to iron out these inconsistencies. First

off is to look at the actual crossover slopes to see how far from a target response they are. So into LspCAD's Optimizer to see how close we can align the crossover slopes.

OPTIMISE

One aspect of the Optimizer to remember is that you need to set the target values first. We will start with the treble section and just a quick flick through the Target slopes shows that our 3rd order electrical crossover, in conjunction with the roll off of the treble unit, creates a 4th order acoustic slope. So we set the Target/HP (High Pass Filter Target) to 2000Hz with a 4th order Linkwitz slope and adjust the Level to our overall speaker sensitivity, in this case 90.5 dB (see Fig.7).

Now we can see the Actual response versus Target and, although it is close, there is a little bit of tweaking we can do. You can, if you wish, do this fine tuning by ear. In this case I actually did a little bit of both. As there are just three components which will have an effect – C1, C2 and L2 – I found about three combinations of different values which gave me a close match to the Target and then gave them a listen. What I ended up with was C1=6.6 uF, C2=8.88uF and L2=0.38mH (0.5 Ohms DCR). This gives the result in Fig. 8 which you can see is much closer to the Target.

Why do we need to be so finicky? Wasn't the original close enough? Well, it all depends on how keen you are to achieve good phase integration between the drivers. I'll show you what I mean when we've tackled the bass crossover in the Optimizer.

So, on to the bass section. Select drive unit D1 to Optimize, and change the Target to LP (Low Pass Filter Target) and 2000Hz, 4th order Linkwitz slope as before. Note that this is the final acoustic slope. The electrical crossover can remain as 2nd order because we will use that, plus the natural roll off of the drivers, to achieve our 4th order slope.

We can see (Fig. 9) that, although the initial part of the slope after the crossover point looks promising, there is a change in the slope above 2.5kHz which is likely to mar the integration with the treble unit.

My initial listening tests showed me that the series inductor value was about right in determining the balance between bass and midrange, so I don't want to mess about with that too much. The obvious contenders, then, are C3 and R4 and it didn't take much juggling of their values to produce the results in Fig.

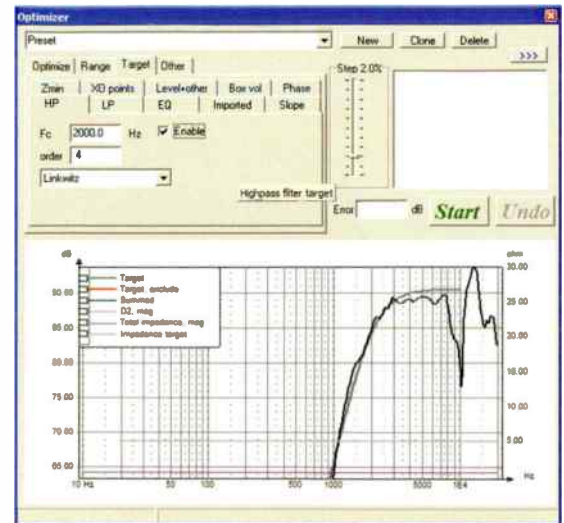


Fig. 8 Tweaked component values give a closer match to the target response.

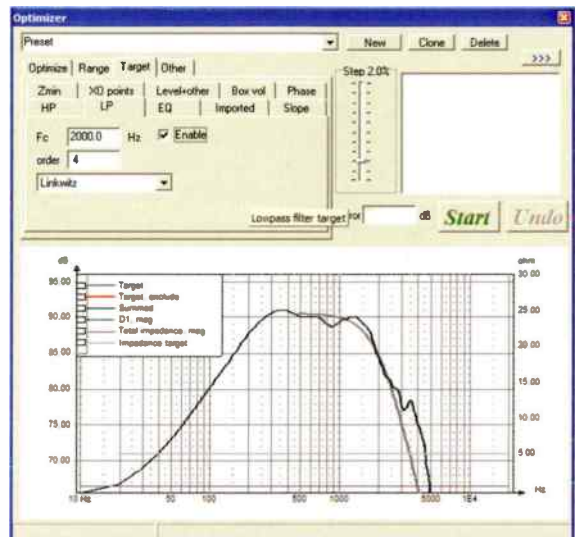


Fig. 9 - Initial results of the bass crossover in LspCAD's Optimizer.

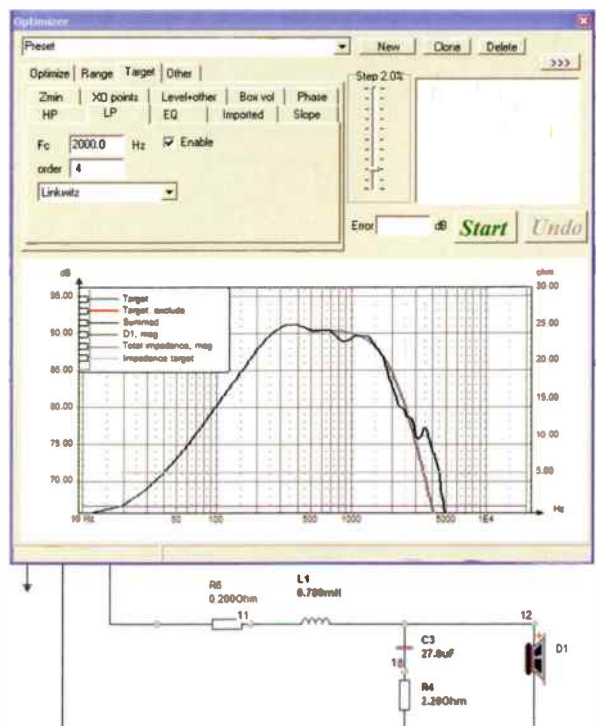


Fig. 10 - Once again, a spot of adjustment of each component's value gives a good match

Some decisions are just so simple

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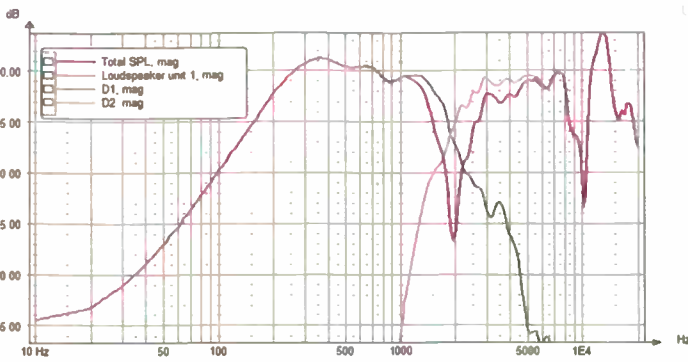


Fig 11 - The resulting crossover with phase reversed. The deep notch is good, but the drop in level between 2-5kHz is more of a concern.

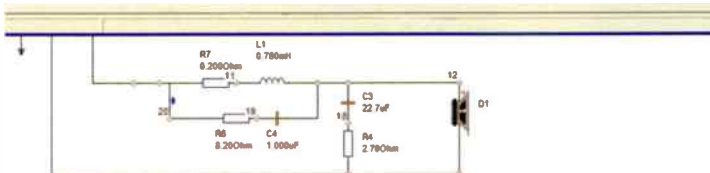
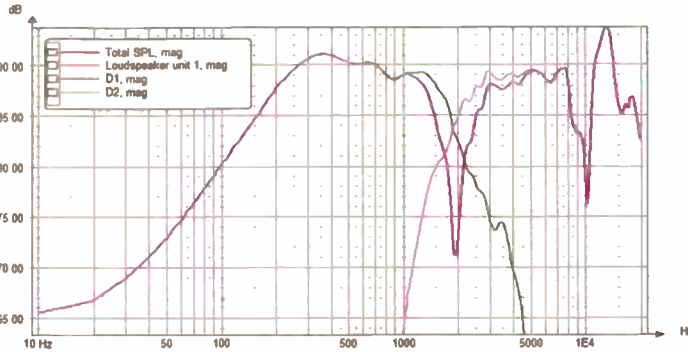


Fig 12 - Final crossover with notch filter added in and phase still reversed - the 2-5kHz region may only look subtly improved, but the results will be audibly noticeable.

10 (you can see the values I came up with in the circuit below the graph).

Here I have a better match right through the range, and you'll see that the hump between 1 – 2kHz has now levelled out, with the exception of the step in response above 3kHz. Now as this is some 18dB below the main level you might not think this is worth worrying about. But, if we switch back to our main graph, there is a way of seeing the effect this has on the treble integration.

OUT OF PHASE

We talked earlier about optimising the crossover slope and how this might affect the phase integration of the drivers. We can see this easily in LspCAD6 lite just by reversing the phase of one of the drivers. Take a look at Figures 11 and 12.

In Fig.11 we have reversed the phase for this latest crossover. It looks as though we have good phase integration at the crossover point (the ideal would be a deep notch here). However we can also see that the treble area between 2 – 5kHz is also diminished. This shows that the bass unit is contributing a significant

level of treble output here which will blur, and possibly add coloration, to the treble performance.

Ideally we want the out of phase 'notch' to be centred on the crossover point with as little as possible cancellation between the drivers either side of the crossover frequency indicating that there is very little overlap between the drivers.

In Fig. 12 I have added a damped notch filter element (C4, R6) to take out some of the energy from the

bass drivers above 3kHz. The little push button you can see before R6 is a switch I have added in the Schema window. Just by clicking on this I can switch the notch filter in and out of circuit to see, in real time, the effect it has, (that is a neat trick that LspCAD6 lite has up its sleeve). You will also see that, by putting this extra filter element in, I have had to juggle the values of C3 and R4 to maintain the target slope (see Fig. 13).

By comparing the two graphs you can see that the out of phase 'notch' in the response remains but it is a better shape, a better balance either side of the crossover frequency. I know it is only a small difference, and you have to look hard to see it, but this is what 'fine tuning' is all about.

Of course the real test is in the listening. Our overall response, as shown in the graph in Fig.14, is now looking nice and smooth. How this translates into real world listening we will reveal next month where I will show the construction of these speakers and the results of the tests at Hi-Fi World Headquarters!

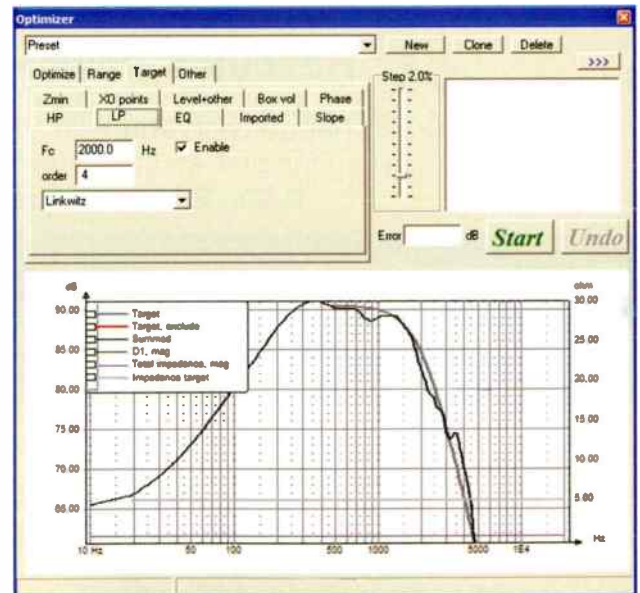


Fig. 13 - Additional notch filter and fine tuning aligns the actual response to the target

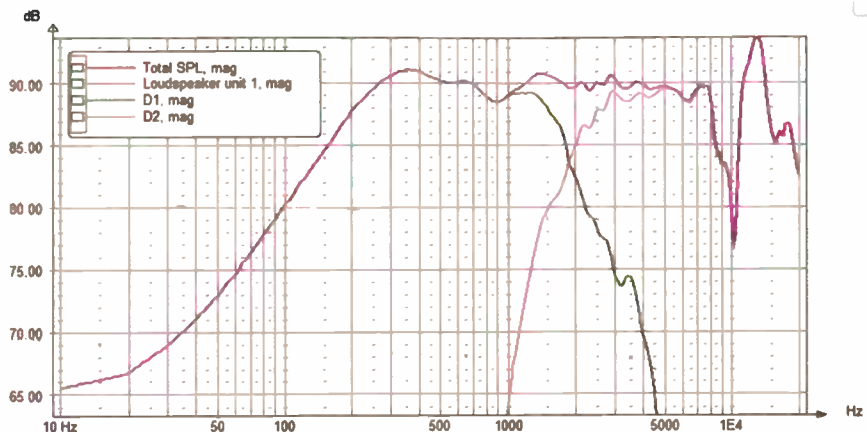
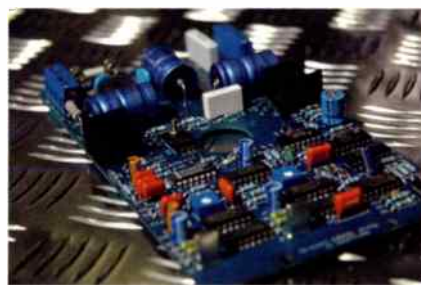


Fig 14 - The final result - a pleasingly smooth response that should translate into a very fine sounding loudspeaker.

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Adam Smith reviews the so-called 'people's record cleaning machine'

CLASSIC HENDRIX

Star of the recent Classic Records vinyl release schedule is volume two of the 'Jimi Hendrix Classic Singles' box set. It features ten 7" singles including 'Purple Haze', 'Hey Joe' and 'Wind Cries Mary'. Each single arrives in a colour picture cover along with a paper

inner. With a total of twenty songs, each is presented in glorious mono. The Hendrix suitcase image is taken from the real example on display at The Rock and Roll Hall of Fame in the USA. Also available, on 200gm vinyl, is Lou Donaldson's 'Blues Walk' – in stereo and mono versions, available separately.



DYLAN ON WAX

Sundazed has just re-released the seminal Bob Dylan album 'Nashville Skyline'. Originally released in 1969, it was the last of a series of classic releases from Dylan which covered eight albums and six years – before the turmoil of 'Self Portrait' (1970) and 'Dylan' (1973).

On this blatant country/rock album, full of steel guitars, Dylan sings smoothly over such classics as 'Lay Lady Lay'. An excellent production, both in mastering and packaging.



BLACK WIDOW RELEASES

Direct from Italy, record label Black Widow specialises in rock with an edge. New from them is a Delirium live album, 'Vibrazioni Notturme'. Recorded in 2006, it sees the prog rock group harking back to their 1970s pomp. The band perform jazz-tinged, free-form compositions with a definite King Crimson feeling. Packaging is superb: a colourful gatefold with photo-packed inners, the release also features two, full-sized colour glossy photo pages fixed into the gatefold. Also look out for Jacula's 'Tardo Pede In Magiam Versus' (1972) – a strange outfit, as many of the band members dabbled or frankly wallowed, in the occult. Dominated by an over-amplified church organ, this has to be one of the scariest albums ever produced!



TARKUS

No, not the album from Emerson, Lake & Palmer – this is one of the rarest, collectable records of all time! Only fifty copies of this heavy rock album were produced as part of a promotional campaign. Tarkus derived from Peru and produced their self-titled debut – and only – album in 1972. It has now been re-released via Get Back and spouts Spanish lyrics.



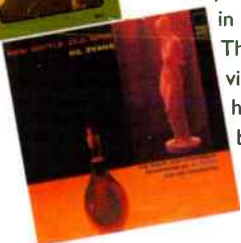
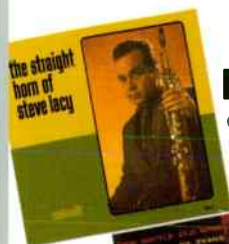
CLUSTER

Published in 1974, this is arguably Cluster's best album, partly because it changed the musical direction of the band from the electronic free form jamming style to more electronic pop. 'Zuckerzeit', now re-released on 180gm vinyl via Lillith in Russia, features very early drum machine program patterns.

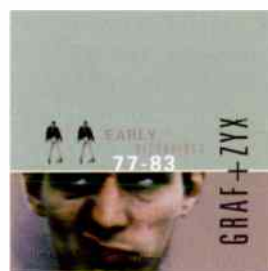


PURE JAZZ PLEASURE

One of the most important and least appreciated soprano sax players in history, Steve Lacy's 'The Straight Horn Of Steve Lacy' was his best album in his long career. Produced in 1960, this album covers tunes by Cecil Taylor, Thelonius Monk and Charlie Parker. Also out, via Gil Evans, one of the best arrangers in jazz history, is 'New Bottle Old Wine'. One of his best albums, his second as leader, the album includes contributions by Cannonball Adderly. Both are superbly packaged and mastered.



GRAF + ZYX



A long-standing avant-garde electronica duo direct from Austria, the outfit has re-released their early tracks as 'Early Recordings 77-83'. Spanning such a length of time, it's no surprise that the musical stylings have changed and evolved over time: from poppy Throbbing Gristle, to the more metallic sounds of DAF to particularly goth-like vibes that resemble Cabaret Voltaire. With that lot as references, you get the general idea of the feel of the album which has been re-released via the German record label, Vinyl-On-Demand, in a limited quality of just 600. PR



M Factor

Ortofon's brand new 2M Bronze and Black moving magnet cartridges sound very different to one another, and indeed to the other 2Ms, finds Noel Keywood...

Only the other day a DVD case was tossed casually onto my Garrard 401 plinth by my young son, sliding to a halt beneath the Kontrapunkt b stylus. It missed by a hair's breadth. I don't know how this stylus has managed to survive for so long; it's avoided its seemingly inevitable fate with

stylus is quick and affordable. To make choices in this somewhat limited field easier, Ortofon have just released yet another two brand new high quality moving magnet cartridges that satisfy such a role: the 2M Black priced at £350 and the 2M Bronze at £200.

Regular readers will know I'm fond of Goldring's 1000 Series cartridges, for their accuracy coupled

against this cartridge that Ortofon are pitching their new Ortofon 2M Bronze, as its price is close. Neither is a big spend by modern hi-fi standards, yet this is about as good as moving magnet cartridges get.

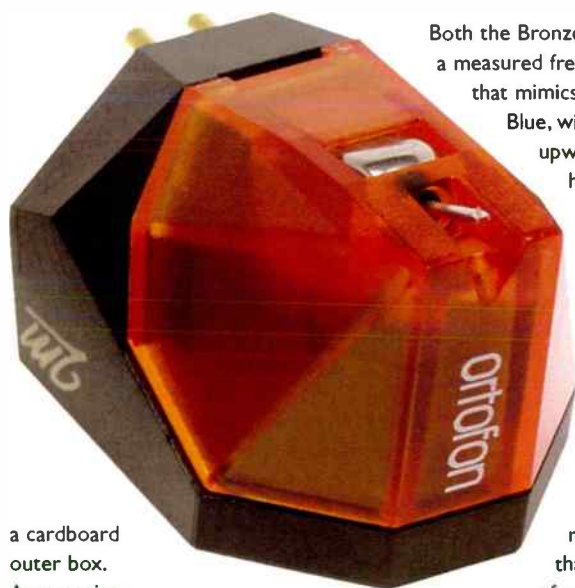
At least, that was the case until Ortofon decided that above the Bronze, with its Fine Line elliptical nude diamond stylus, they would place the Black, tipped with a Shibata nude diamond stylus, as used on their £1,100 Jubilee. The stylus change comes with quite a price hike - to £350 no less.

Both cartridges come in modest packaging, by Shure and Stanton standards anyway. The cartridge itself is screwed to a thin, moulded plastic base, protected by a push-on clear cover, this package being protected by

"the 2M Black is a masterful design for anyone keen to get the best from LP..."

the adroitness of a nine-life cat. If you want to avoid the financial fear of replacing a Kontrapunkt stylus, a quality moving magnet cartridge is perhaps the answer, as replacing its

with fine dynamics and exciting presentation. The top 1042, price £165, with its Fritz Geiger S stylus has been a favourite of mine for years, but it's an old design now. It is



a cardboard outer box.

Accessories

included are a simple plastic stylus force gauge, stylus fluff removal brush, mini screwdriver and small instruction book. The only screws with ours were those holding the cartridge to the packing, which were just long enough to be used in a Rega arm. As the cartridge has tapped, blind fixing holes 5mm deep, screw length must be chosen carefully to span headshell thickness and accommodate this hole depth. So with a 3mm thick headshell a screw of 6-8mm would be needed - no more and no less.

Weighing 7gms, the cartridges are light, but safely within the common headshell weight range of 5-10gms, so all arms will accept these units and balance out. Parallel sides aid alignment in the headshell, critical in keeping distortion down, but the small front face is little help in this process. A clunky looking oblong body like that of Nagaoka's MPI 1 is best in this respect, but Ortofon would doubtless prefer to avoid 1970s design functionality.

I was a little surprised to be told that the Bronze and Black have higher cantilever hinge compliance (22um/mN) than the less expensive Blue and Red (20um/mN), which I reviewed in our May 07 issue, so lower tracking force must be used: Ortofon recommend 1.5gms optimum, and a range of 1.4-1.7gms. It's usually best to err on the higher side; I used 1.7gms.

I used these cartridges in a new Rega RB300 chosen to adorn my little Vestax turntable mod. on p92 of this issue. I wanted an RB300 for this project because it is still a great arm, with fantastic stereo staging and clean, well defined low frequencies. It is arguably less impressive in the midband, where SMEs are smoother and dimensionally deeper, all of which I mention because these characteristics are relevant when running the 2Ms.

Both the Bronze and Black have a measured frequency response that mimics the Red and Blue, with a steady upward trend toward high frequencies.

This is unusual and results in a distinctive presentation that gives swathes of detail and seemingly impressive insight, but also a sound diametrically opposite to that of yore; instead of warm and cuddly,

you get a brightly lit midband that isn't kind to old, worn discs in particular, nor to older recordings, although the Black curiously transcends this basic characteristic of the Red, Blue and Bronze, I found.

Spinning a new 180gm pressing of Elvis singing 'It's Now or Never', with the Bronze in place, I was struck not so much by the depth and expressiveness of his voice, but by a lightness of balance and sense of hardness in the recording. Okay, it was recorded back in 1960 and the Bronze is actually picking up on the deficiencies of the recording equipment, but I have never heard Elvis presented like this before; we likely all think of Elvis as having a rich, mellow voice, but the Bronze wagged its finger at me and suggested otherwise.

Playing the same track on my Garrard 401 + SME312 combo fitted with the Ortofon Kontrapunkt b (that I am eternally happy with!) was interesting. Yes, the recording is a bit clanky, but not that clanky, it told me; the richness and warmth of his voice returned. The emphasis of the Bronze didn't flatter Elvis.

Alright I know, you don't listen to Elvis - your mum does. But it was the same result with Marianne Faithfull singing 'Sweetheart', from her 1981 LP 'Dangerous Acquaintances' and an even less catholic song, 'Down in the Sewer', from the Stranglers' first LP, 'Rattus Norvegicus'. This track resolved the issue. Jean Jacques Burnel's driving bass line was well resolved but tonally lightened by the Bronze; the Kontrapunkt b restored its power and - especially - the richness of the

instrument. In its favour, the Bronze clearly picked out the background percussion work; successive short, quick drum rolls across the sound stage were deftly portrayed. This was partly down to the RB300, which is brilliant in this respect, unlike my long SME312 arm with Kontrapunkt b, but it also underlined how the Bronze lifts details from a mix, which can be more forensic than flattering.

The picture changed with modern LPs, like Kate Bush's 'Aerial' or the Scissor Sisters 45rpm 'Ta Dah'. Then the balance of the Bronze became far less obvious. It sat on the borderline with a new Led Zeppelin 'II' in 200gm Quiex SV-P vinyl; again there was a midband glare and some hardness I am not accustomed to, but also fantastic insight, Page's guitar work cutting through the room with a vigour few cartridges could muster.

The 2M Bronze is distinctive, that's for sure - and sounds unlike rivals. With modern LPs in particular, which are often on the warm side of the fence in terms of their balance, it is fast, detailed and insightful. Bass comes across as light but tight, although the Bronze largely missed the bass guitar line on Eric Clapton's 'No Alibis' from 'Journeyman', which left me unimpressed. With older LPs, or just heavily played ones, its strengths will suit dull hi-fi systems,

THE RIVAL

As the vinyl market steadily contracted, Goldring were alone in improving their excellent 1000 Series cartridges, to the point where little else came close, I felt. Okay, so the 1042 isn't as clear in the midband as a moving coil, but neither is it priced anywhere close. It's an easy listen with well defined bass and finely differentiated treble, courtesy of its Fritz Geiger S stylus. The treble can sometimes seem a bit detached, but at just £160 you can't expect perfection...

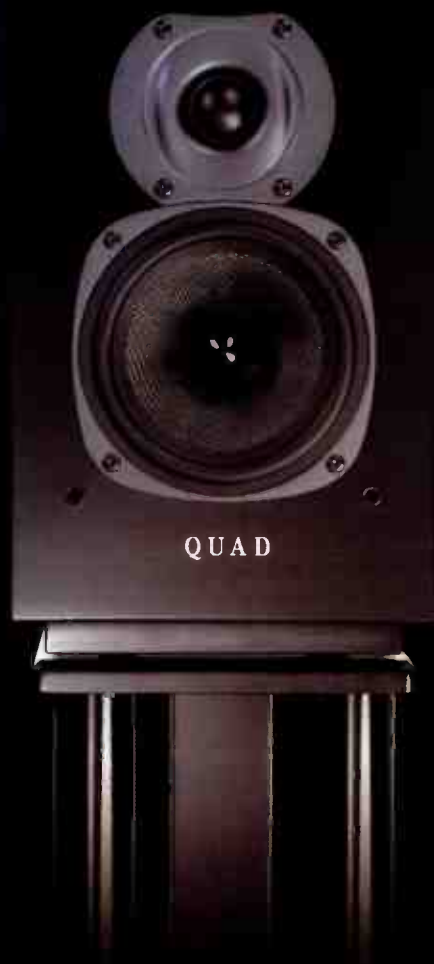
Ortofon's new 2M Bronze is seemingly competition for the 1042, but perhaps not. It is considerably more forward and detailed across the midband, as you might hope from a new breed of MM cartridge based on Neodymium magnets and better technologies. Less wire can be used in the field coils, reducing impedance, flattening response and clearing the sound. It's the sheer amount of mediocre copper wire in an MM that clouds the midband, as much as generator droop. But the Bronze doesn't have the 1042's bass, or its get up and go.

Further complicating the picture is Goldring's new 2400. This is another new-era MM, based on more effective magnetics - and you can hear it. I admire the 2400's tight-as-a-drum bass and translucent midband, but its treble is prominent and messy, being an unfortunate blemish on what is otherwise a fine landscape. I could not choose between the Goldring 2400 and the Ortofon Bronze; both are very strong in most areas, whilst at the same time possessing obvious character traits. This brings choice down to personal preference, the properties of the system they will be used in and even the LPs played.



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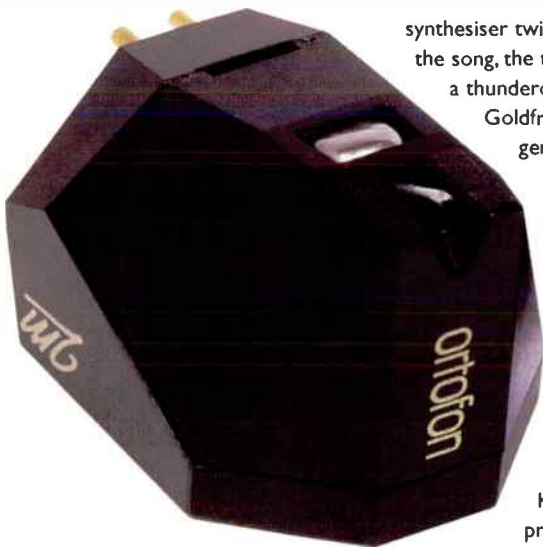
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synthesiser twisted sinuously through the song, the throbbing bass had a thunderous presence and Goldfrapp's voice had the gentle, caressing quality that makes this Dance track so hypnotic.

Apart from being finely detailed, silky smooth and completely engaging at a musical level, the Black also has the peculiar quality of sounding totally cohesive, just like the Kontrapunkt b. Specific properties don't stand out in relief; it operates as

but I don't think the Bronze is best suited to a modern, solid-state system with loudspeakers that, in themselves, have midband and treble emphasis. The clean midband of an SME arm will suit this cartridge a little better than the Rega too.

All this being the case, and taking into account the similarity between the Bronze and Black in measurement, I was expecting the Black to sound like the Bronze, but with better differentiated treble from improved stylus geometry. So I was taken aback by the difference between the two. The 2M Black has a silky smooth presentation with no glare or treble emphasis at all. In fact, its Shibata tip is, compared to Goldring's Fritz Geiger S, relatively

a whole and as such moves beyond simple reductionist criticism. Some might say it is too smooth, preferring more boom and ting, but I'd describe this cartridge's presentation as pure class, devoid of obvious weakness. It does not have the walk around dimensionality of a good moving coil, but it otherwise gets frighteningly close, at a fraction of the price. After running a Goldring 2400 I noticed also how I had to turn volume down when using the Black, so high is its output.

"the Ortofon 2M Black has to be one of the best moving magnet cartridges currently available

mild in its treble delivery - and very Kontrapunkt-like too. Suddenly, with the Black in the RB300, music started to flow with the liquid smoothness and sophistication I am used to from my Kontrapunkt b. I ran through the same list of albums mentioned so far and all slid by as masterful performances.

Elvis was back in human form, not as a clanky recording from 1960, Jean Jacques Burnel's bass strode masterfully through my lounge as the Stranglers put music to life in a sewer(!) and Alison Goldfrapp sounded as laconic and seductive as ever on the 'Supernature' album. Pressing the 45rpm button of the Vestax, I pulled out Goldfrapp's 'Ride a White Horse' 12in 45rpm single and got a fabulous result: the

The Ortofon 2M Black has to be one of the best moving magnet cartridges currently available, as well as one of the most practical, due to its high output, normal tracking force and weight. This is a masterful design for anyone keen to get the best from LP, without moving up to the complexities, cost and delicacy of moving coils - especially when your turntable plinth is seen as a convenient DVD shelf by another member of the family!

VERDICT ●●●●●

ORTOFON 2M BRONZE £200

Highly detailed and insightful, but lacking warmth and body. Clean but not powerful bass; more analytical than engaging.

FOR

- ease of fitting
- good tracking
- extremely revealing

AGAINST

- lacks warmth or body

CONTACT:

Henley Designs

☎+44 (0)1235 511166

www.henleydesigns.co.uk

VERDICT ●●●●●

ORTOFON 2M BLACK £350

Totally cohesive, smooth and easy sound with wonderful insight and dynamics - a blinder!

FOR

- ease of fitting
- good tracking
- classy sound

AGAINST

- over smooth for some?

MEASURED PERFORMANCE

At 1.7gms the Ortofon Bronze just cleared 300Hz lateral tracking test tracks, except the highest where it was marginal. At 1kHz it stayed in the groove at an extremely high 25cms/sec, although there were signs of mistracking on this cut. So its tracking is good and should sound assured in use. The Black was slightly better, but by little. Output of both is unusually high at around 8mV at 5cms/sec rms. Distortion levels were low, largely because the vertical tracking angle is set at exactly 22degrees (Black), so expect a basically clean, uncluttered sound. It rides low on a disc as a result, however.

Ortofon 2M cartridges, like most modern designs, don't have an upper midband roll off caused by rising generator impedance. Where the 2Ms differ markedly is in a broadband trend upward toward high frequencies that will give a brightish perceived tonal balance, but one that is also insightful. On outer grooves there is a small treble lift of around +1dB at high frequencies, which tracing losses on inner grooves convert to slight loss, our frequency response analysis show. The Shibata stylus shape of the Black suffers less from inner groove tracing loss (white traces on graphs). So the Bronze and Black offer an accurate sound from outer to inner groove. Both peak up and become brighter with extra capacitive loading, by the way.

The 2Ms are an example of precise cartridge engineering from Ortofon. They measure well in all areas. NK

BRONZE

Tracking force	1.5gms
Weight	7gms
Vertical tracking angle	23degrees
Frequency response	20Hz - 20kHz
Channel separation	29dB
Tracking ability (300Hz)	
lateral	88µm

vertical	45µm
lateral (1kHz)	22cms/sec.
Distortion (45µm)	
lateral	1.2%
vertical	2.1%
Output (5cms/sec rms)	7.9mV

BLACK

Tracking force	1.5gms
Weight	7gms
Vertical tracking angle	22degrees
Frequency response	20Hz - 20kHz
Channel separation	30dB
Tracking ability (300Hz)	
lateral	90µm
vertical	45µm
lateral (1kHz)	23cms/sec.
Distortion (45µm)	
lateral	1.2%
vertical	1.7%
Output (5cms/sec rms)	8.6mV

FREQUENCY RESPONSE 2M BRONZE



Red - Outer grooves
White - Inner grooves

FREQUENCY RESPONSE 2M BLACK



Red - Outer grooves
White - Inner grooves



True Blue

Adam Smith listens to a classic design brought superbly up to date, in the form of Audio Origami's PU7 tonearm...

Although the humble tonearm is an ostensibly simple construction, a brief mosey through the annals of tonearm history shows there have been many unusual designs. There is the Burne-Jones articulated arm, wacky Russian Korvet arm with its huge Glycerin-filled damping sphere over the bearing, right up to modern designs like the Cartridge Man's air bearing parallel tracker. Although far less wacky than any of these, thanks to Audio Origami's John Nilsen, when you specify your made-to-order PU7,

it can be made to stand out in a different way by having it anodised in virtually any colour you like, including black, silver and gold and purple, in addition to the magnificent blue of our review sample.

If you're thinking the PU7 looks a little familiar, then award yourself a pat on the back, because it owes its heritage to the good old Syrinx PU3, as Johnnie's audio history **actually** starts with Syrinx themselves,

It was back in the early 1980s that Johnnie had a friend who worked in the Syrinx factory and, through him, he ended up spending a lot of time at the factory and met many of the brains behind the PU2 and PU3 arms.

Johnnie describes this time as being, "like a kid in a sweet shop" and I can certainly identify with that - had a similar establishment been near me when I was younger, I doubt my parents or friends would have ever seen me!

It was this experience that prompted Johnnie to set up his own machine shop with high quality

tools and he has managed to collect enough precision equipment over the last twenty years to finally begin production of new arms as well as ground-up restorations of virtually any arm you care to think of. The equipment includes an anodising facility, thus explaining those funky colours, and just about every process is done in-house.

Johnnie says that he, "found that rewiring and repairing other makes of arm really helped with the PU7 development. I could see where others had made a good product and I could see how to make it better, as wire and cable quality has improved

"the Audio Origami PU7 is a very special product..."

so much in the last twenty years. The PU7 takes over from where my friends at Syrinx left off, although it would be wrong to describe it as a copy of a PU3, as I believe it has a bit of every arm that I admire in its design."

Each arm is fully hand made and making a single unit takes around 140 hours. You can order your PU7 in any



effective length from nine to twelve inches, and the arm tube effective mass can also be pre-specified to suit the your cartridge, coming in alloy or brass versions as a result. Consequently, the price of each arm varies, and the quoted £1,300 applies to our review item, with its nine inch length, blue finish and light alloy arm tube.

As might be expected, the fit and finish of the arm is impeccable and it comes complete with an excellent DVD of how to set it up, pairs of counterbalance and anti-skating

weights, a set of allen keys for adjustment, a strobe disc and a very well specified protractor that allows for alignment to Rega or Baerwald alignment standards. The PU7 can also be specified with a Rega or Linn mounting setup.

For auditioning, I installed the PU7 onto our Pioneer PLC-590 with an Ortofon Rondo Bronze cartridge, playing through the Anatek MC-1 phono stage and A50R amplifier, into our Spondor S8e loudspeakers.

SOUND QUALITY

From the moment the stylus hit the groove, it was clear that this is a special component, designed and built by someone who really knows his arms. It was quite startling to hear just how revealing the PU7 is and how utterly convincingly it performs on a good quality turntable.

The most noticeable improvement over the SME M2-10 that is usually resident on our PLC-590 was the bass. The PU7 is incredibly tight and detailed in the lower registers and underpins all music with a solid low frequency foundation. Drum strikes on the instrumental version of Grace Jones' 'Slave to the Rhythm' were superbly tight and fast, with real impact. The PU7's timing was impeccable and really captured the rhythmical flow of the track, allowing it plenty of space to charge along with gusto.

The Scissor Sisters' 'I Don't Feel like Dancin' is an old testing favourite of ours, as it is a very well pressed 45rpm double LP. However, it has been sat under some heavy gear for the last few months as the warp on the first LP has been becoming progressively worse (good old vinyl!). Fortunately this pressure treatment has done the trick and it's flat again. Under the PU7 this track positively

sparkled, pummeling out of the Spondors with real verve and vigour whilst maintaining a sense of clarity and composure that can sometimes slip with a less than couth pickup system.

Moving to something a little more subtle, the Icicle Works' 'One True Love' showcased the PU7's bass detail masterfully. This track features Ian McNabb singing, backed only by Chris Layhe's bass guitar and the Audio Origami arm allowed the two to interplay perfectly. The bass guitar's innate tunefulness was perfectly rendered, and the movements of Chris's hand up and down the

fretboard were superbly revealed - it takes a really good turntable combination to pick these out, but the PLC-590/PU7/Rondo Bronze setup managed this with ease.

Soundstaging was another highlight of the Audio Origami's performance. The PU7 has the ability to render a soundstage well beyond and behind the loudspeakers, offering an admirable scale and grandeur to material.

Eleanor McEvoy's vocals from 'Yola' floated in between the loudspeakers with almost mystical precision and every inflection in her performance was captured. The backing musicians were spread out within the recorded acoustic in a very solid manner, bringing the atmosphere of the studio itself that one elusive step closer. The PU7 really does have the ability to dig into the depths of music and pull out everything you need to hear without attempting to gloss over anything.

The Audio Origami's treble performance was equally adept. The PU7 takes its beautiful midband fluidity and melds it seamlessly into a remarkably uncoloured

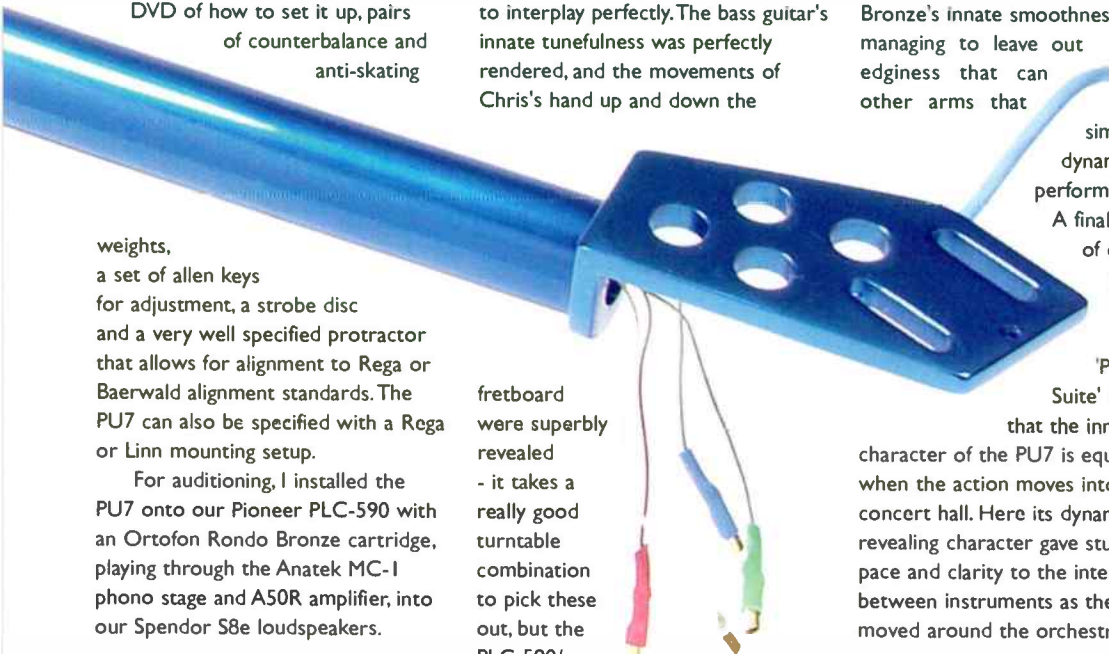
top end; one that offers up bags of high frequency detail without ever becoming ragged. As a whole combination, the PLC-590/SME M2-10/Rondo Bronze combination that we generally use here at World Towers works together superbly well, but we are aware that its composed nature can occasionally fail to offer the last word in ultimate excitement and glacial clarity. The PU7 remedies this impeccably and adds just the right amount of vigour to the Rondo Bronze's innate smoothness, but managing to leave out the edginess that can afflict other arms that

similarly dynamic performance. A final blast of classical material, courtesy of Holst's 'Planets Suite' showed that the innate

character of the PU7 is equally adroit when the action moves into the concert hall. Here its dynamic and revealing character gave stunning pace and clarity to the interplay between instruments as the action moved around the orchestra

CONCLUSION

The Audio Origami PU7 is a very special product. Expensive yes, but consider for a moment the heritage that begat it, the modifications that have gone into the original design and those 140 hours of labour that it takes to make each one. Then factor in the fact that you can specify your own arm length, mass, colour and mounting when ordering and top this off with the absolutely magnificent performance it gives Suddenly the PU7 seems like a veritable bargain.



MUSIC USED
 The Orb, 'Blue Room'
 The Blue Nile, 'Hats'
 Joni Mitchell, 'Blue'
 George Gershwin, 'Rhapsody in Blue'
 Gary Moore, 'Still Got The Blues'

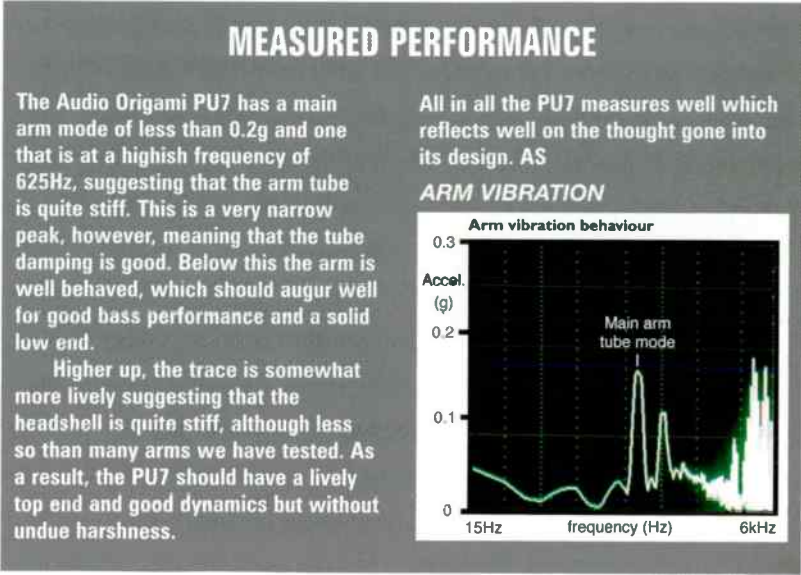
REFERENCE SYSTEM (MAYBE...)
 Blue Pearl Audio Jem turntable
 Ortofon Rondo Blue cartridge
 Blue Ice Z5000S amplifier
 Blueroom Minipod loudspeakers
 Nordost Blue Heaven Interconnects

VERDICT ●●●●●
 Superbly designed tonearm that offers a stunning performance in a stylish and well made package. Great range of colours as well!

AUDIO ORIGAMI PU7 £1,300 (as tested)
 Audio Origami
 +44(0)7967 690653
 www.audioorigami.co.uk

FOR
 - mid and treble detail
 - bass agility
 - soundstaging
 - build quality and colours

AGAINST
 - nothing at the price





Take a modern direct drive turntable, fit a decent tonearm and you end up with an unusual LP spinner, as Noel Keywood explains...

Direct, Live

The UK's resurgent vinyl market lacks a nice, sensible but effective direct drive turntable. It isn't solely a result of the market's slightly parochial distrust of them, but the fact that Japan Inc. stopped production promptly when CD arrived, way back in the early 1980s. 'Perfect digital' put a stake through the heart of this technology, which was based on the low speed d.c. motor.

MOTOR	DIRECT DRIVE
STARTING UP TIME	0.5sec (33 1/3rpm) 70"
STARTING TORQUE	2.7kg · cm
BRAKING SYSTEM	ELECTRONIC BRAKE
RUMBLE (S/N RATIO)	78 dB (IEC 98 WTD)
SPEED	"33 1/3rpm, 45rpm"
FINE PITCH	± 10% (100mm FADER)
ULTRA PITCH	± 50% (45mm FADER)
PITCH BEND	± 1,2,3,6 % (Front ⇄ Rear) ± 50 % (Right ⇄ Left)
WOW & FLUTTER	0.07% W.R.M.S.

Vestax PDX-2300MkII Pro technical specifications.

However, the less religious disco/DJ market took to DDs long ago and never let go, hence the continuing popularity of Technics' SL-1200 Series, which first hit the shops in 1972, no less. There are others in this market though, and we couldn't help but feel that the modern, £399 Vestax PDX-2300MkII Pro Direct Drive turntable reviewed in our February 2007 issue would also likely give good results as a hi-fi turntable - when fitted with a decent arm that is. So we duly enlisted the help of World Designs in order to equip it with a Rega RB-300 and found we had a nice little combo on our hands.

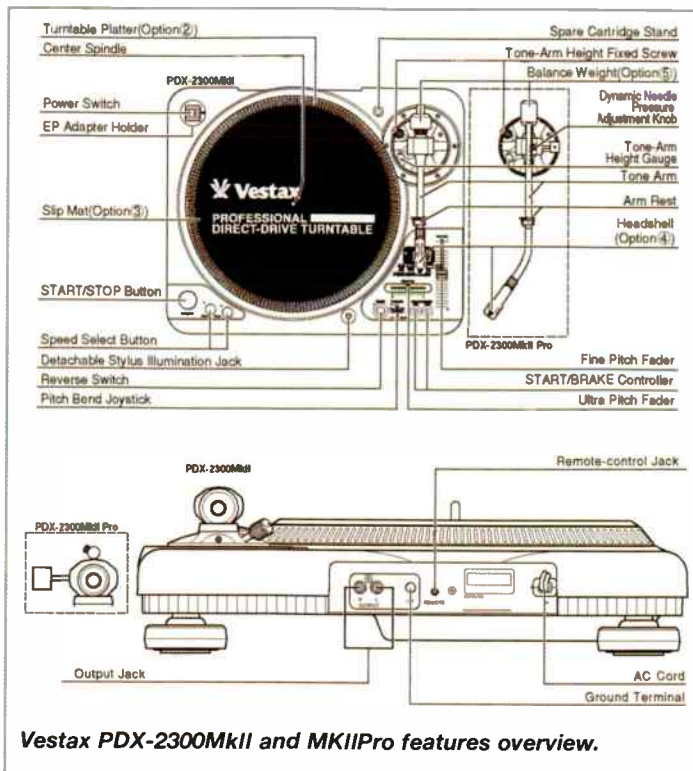
The Vestax has a modern, high torque motor and plenty of control flexibility if you want it. There are two speeds, 33rpm and 45rpm, plus adjustment of each up to +/-60%, with a stroboscope to set either to an exact reference. Both start up and braking are astonishingly quick, speed control being dealt with by a 32bit microprocessor: DD technology has

moved on since the 1980s.

The arm Vestax fit is none too impressive, being a fairly conventional design using an offset tube and a detachable headshell, with unremarkable bearings. Arms like this are built for robustness and typically sound imprecise at mid to high frequencies, giving LP a vague, mellifluous sound with curtailed dynamics.

I took a ruler to the Vestax and found their arm had an effective length similar to Rega's RB300, which could usefully replace it. It was sitting on a removable plate - so I removed it! This was simply a matter of undoing six Philips head screws holding the plate down. The bottom cover must also be removed; I snipped the signal leads, which are soldered to the phono outlets as the Rega has an integral cable terminated with phono plugs. Finally, the arm rest needs removing as well, as the Rega has its own integral armrest.

I simply measured the plate's



to low frequencies, avoiding the subjective contraction of sound stage with drums and such like. It also supports very tidy dynamics in the lower mid-band, bringing both tidiness and punch to short term events. Other arms commonly overhang and slur; the RB300 does not.

In many ways the Vestax is a perfect partner to the Rega as, when it is coupled to a deck that has a vicious ability to resist speed change you find yourself with a combination that sounds tight and responsive across the frequency range; belt drives can sound a trifle mellifluous in comparison. As I found with the unmodified Vestax, there's plenty of bass from this combo. The deck retains its bottom end power but the addition of the RB300 opens up the mid and treble superbly, taking the PDX-2300MKII Pro from sturdy DJ tool that happens to sound quite good, to a proper hi-fi contender.

mounting arrangement and asked World Designs to fabricate a plate able to accept a Rega RB300, the arm mounting hole being positioned to give 222mm spindle-to-arm pillar centre distance. The only small wrinkle is that the Vestax platter is relatively low, so to get the Rega arm sitting horizontal on an LP this plate cannot be made too thick. The arm pillar is still a few millimetres high but I like to use a thick rubber platter mat, as it damps both record and platter, and this results in the arm taking up the correct horizontal alignment. The Rega is a fairly compact arm with few overhangs, so it sits easily in the Vestax plinth.

Fitting the plate is straightforward: it simply screws in place using the original screws. Unfortunately, the Rega's arm pillar fitting nut

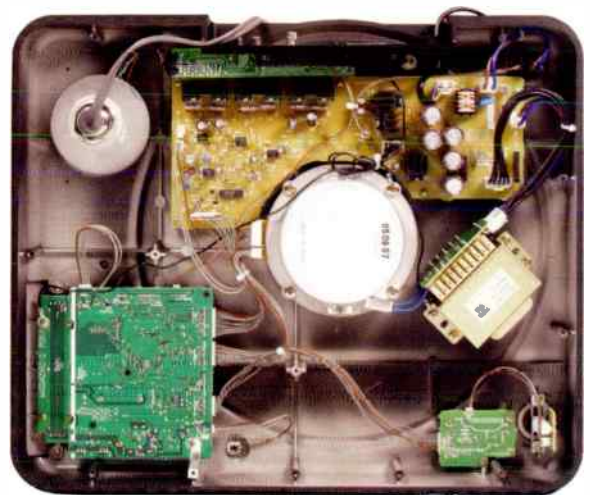
"performance is very impressive indeed..."

does not run the full length of its thread and will not clamp the plate without a couple of thick washers underneath. I found these at a local plumbers' supplier, as their internal diameter is a large 23mm. The Rega is set so that the arm tube sits parallel to the deck's edge; no special alignment is necessary. It will reach an LP's run out groove before being limited by its own stop. The arm lift works correctly too. I simply bent the phono socket mounting plate back a little to find an outlet for Rega's phono cable, but it could be fully removed if you prefer.

The Vestax platter is a light and slightly resonant aluminium casting with voids between strengthening ribs on its underside. These could well be filled with mastic. I prefer to use a heavy, thick and dead rubber mat from one of our Pioneer PLC-590 turntables. Possessing a label depression, this mat supports records well, including those that are dished. It also serves to damp the Vestax platter nicely. However, if you prefer not to use rubber, a 5mm thick Funk Firm Achromat would also do the job nicely.

SOUND QUALITY

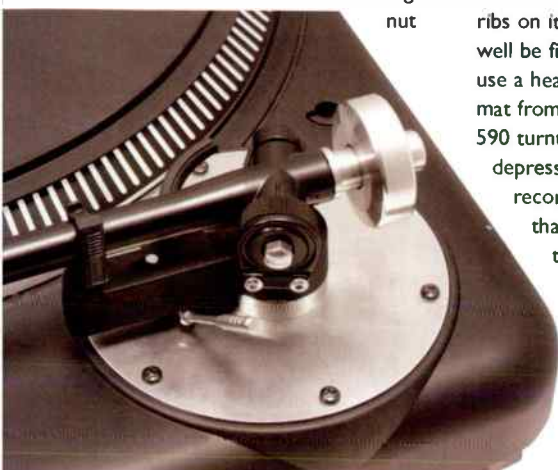
The performance of this combo is very impressive indeed, being more or less what I expected. I always enjoy listening to the RB300, which gives great stereo right down



The Rega's signal lead was simply routed around the rear plate holding the original phono output sockets.

CONCLUSION

Take a compact and sturdy turntable, procure a beautifully made adaptor plate and use this to fit in a superbly designed tonearm and you end up with a very impressive turntable combination. The Vestax has the bass grip and control that is missing from most decks at the price and the fitment of the Rega lifts it comfortably above its DJ contemporaries. Add in ease of use and you have an excellent combination that stacks up as a good, modern, fuss-free record deck able to adeptly spin 45rpm and 33rpm vinyl and do it real justice.



World Designs' arm mounting plate - the important first step in releasing the potential of the Vestax.

VESTAX	
PDX-2300MKII PRO	£399
Leisuretec Distribution	
+44 (0)1525 850085	
www.vestax.com	
REGA RB300	£188
Rega Research	
+44(0)1702 333071	
www.rega.co.uk	
ARM ADAPTOR PLATE	£29.50
World Designs	
+44 (0)1832 293320	
www.world-designs.co.uk	

Platter Matter

Adam Smith takes The Funk Firm's Rega Planar 3 Achroplat upgrade for a spin...

The Funk Firm are on something of a roll at the moment. Not content with making their own, very fine Funk and Funk Vector turntables, they offer a range of upgrades for the Linn Sondek LP12, as reviewed last month in *Hi-Fi World*, the Achromat platter mat in 3mm and 5mm thicknesses and a full range of modifications for Pink Triangle turntables. However, never one content to rest on his laurels, The Funk Firm's Arthur Khoubesserian has now turned his attention to another popular and numerous belt drive record spinner, the Rega Planar 3, and adapted the Achromat specifically for this model.

For those who are not familiar with the original Achromat, this is an item made from expanded polyvinyl, intended to mimic the material from which records themselves are made, as best as possible. The theory is that, as the stylus vibrates in the groove, it sends mechanical energy back into the vinyl (from Newton's Third Law of Motion, for those of you who remember school physics!). The Funk Firm state that materials such as glass, rubber, etc., allow these vibrations to bounce around the record's material, being picked up by the stylus again and thus muddying the sound. The Achromat allows this extraneous vibration to be dissipated, thus ensuring that the stylus is reproducing only the music.

The resultant new item is the Funk Firm Achroplat - a thicker version of the Achromat, suitably machined to fit straight onto the subplatter of a Rega Planar 3 and the correct 14mm thickness to mimic the height of the original glass platter plus felt mat. The Funk Firm supplied us with a good Rega Planar 3, complete with original RB300 arm

and Rega Elys 2 cartridge, along with an original glass platter and felt mat for comparison.

SOUND QUALITY

I spent a good day or so spinning records on the Funk Firm's Rega Planar 3, swapping between the original platter items and the new Achroplat, and their new baby really does make an impressive difference. As standard, the Planar 3/RB300/Elys 2 is a thoroughly enjoyable combination, offering detail, clarity and good bass weight along with a nicely rendered soundstage that stretches back beyond the loudspeakers in a very pleasing manner.

Swapping the platter for the Achroplat, however, keeps the depth of soundstage but brings the performance right out from beyond the plane of the loudspeakers and right into the room. Although not coming up with the sort of walk-in soundstage that the superb SME 10A turntable that David and I so enjoyed a few months back manages, the Planar 3 suddenly started doing a more passable impression of the SME, putting performers almost into your lap. Instruments were more firmly located within the overall recording and gained useful amounts of extra solidity and feeling.

The top end of the frequency range gained a good dose of improvement as well. Previously, Eleanor McEvoy's vocals on 'The Rain Falls' from her 'Yola' album, were emotional and sung with great feeling but, with the Achroplat in place she seemed to have cleared her throat a little and moved closer to the microphone. Sibilants were sharper and I really did start to feel that I was listening to the lady herself singing,

rather than a well-rendered recording.

The bass end of things was the only area in which I was less than one hundred percent convinced by the Achroplat. One of my initial listening notes was that bass seemed a little lighter, but I gradually realised that it was not quite as simple as this. Where the Achroplat really scored was in terms of improving bass detail and removing the blurring of bass notes. Bass instruments suddenly moved forward in the mix, tightened up and became easier to follow, improving rhythm and musicality as a result, but the Achroplat did occasionally seem to rob the very last ounce of bottom end grunt. I strongly suspect this is as a result of it being considerably lighter than the glass platter (500g compared to 2kg).

Both effects were quite noticeable on Deacon Blue's 'Dignity' where, on the plus side, the bass guitar became much tauter and tuneful, and no longer disappeared behind Ricky Ross's vocals, as it had a tendency to do with the glass/felt platter combo. However, there was definitely slightly less impact to the kick drum throughout the track.

CONCLUSION

Minor issue with the very lowest bass notwithstanding, I can confidently recommend the Funk Firm Achroplat. For the reasonable sum of £105 it makes some very prominent differences to the performance of the already highly competent Rega Planar 3 turntable and moves the deck's sound up a noticeable level in quality terms. What's more, you don't need any technical knowledge or tools to fit it.



VERDICT ●●●●£

Reasonably priced fit-and-forget upgrade that improves the Rega Planar 3's performance markedly.

FUNK FIRM ACHROPLAT £105

The Funk Firm

☎ +44(0)208 697 2705

www.thefunkfirm.co.uk

FOR

- impressive soundstaging
- superior bass detail
- greater clarity
- easy fitment!

AGAINST

- low bass lightness

Washi Washi

Vinyl junkie Adam Smith makes a splash with the help of the Okki Nokki record cleaning machine...



As any self-respecting vinylista knows, the importance of keeping your vinyl spotless and shiny is one of the major factors in obtaining an enjoyable listening experience. It's all very well shelling out thousands on vinyl replay equipment and then spending days in your listening room, wielding alignment templates, screwdrivers and strobe lights if, at the end of it, your precious new diamond has to fight its way through a thick layer of dust, sludge and cat hair to get at the information locked in those precious grooves.

As with so many aspects of hi-fi, there are various schools of thought as to how to go about this and I'm sure I am not alone in having spent longer than is probably good for me playing with a few of them. I have wet cleaned, dry cleaned, scrubbed, brushed and even experimented with those weird paint-on/peel-off-when-dry films that invariably leave more junk behind than they actually lift off. After a while I came to the conclusion that the carbon fibre brush and a good old Bib 'Groov-Kleen' dust bug was the best for day to day dust removal duties.

The problem is that, when you wander round as many record fairs and car boot sales as I do, the bargain vinyl you can pick up in these places is very often far more dirty than just a coating of dust, and needs more attention than a good brush. It is at this point that you really cannot beat a record cleaning machine. These are

often very expensive, however, so it's nice to find a good quality unit that doesn't break the bank.

The Okki Nokki is such an item, retailing at a very reasonable £275. For this you receive a compact metal enclosure supporting a twelve inch metal platter that can rotate in both directions, and featuring a vacuum cleaning nozzle that swivels out of the way for record fitment - the supplied item is for twelve inch records, and a nozzle for seven inchers is available for £25. Also supplied are a record cleaning brush and two bottles of concentrate that each make up to one litre of cleaning solution.

Cleaning the record is simplicity itself. First the record in question is placed on the platter and clamped, then the platter is set to revolve in one direction, the cleaning fluid applied and the brush held down firmly for two to three revolutions. The vacuum cleaning arm is then swung in and pressed down, and the vacuum motor turned on. The fluid will be sucked from the record, which should only be allowed to spin for a few revolutions until the record is dry. This process is repeated with the platter spinning in the opposite direction and, hey presto, you have record with one clean side.

The machine has its own internal tank for collecting the residual fluid, and it is stated that this must be emptied after every seven records. The process involves removing a small stopper from the outlet drain hose (which must always be in place when the unit is working) and

tipping the machine up to allow the used fluid to run out into a suitable receptacle.

Okki Nokki's instructions are quite clear and Ken White, the UK importer adds a few notes of his own with regard to experimenting a little with regards to the amount of fluid you apply, how long you let the record run for when brushing it, etc. As he points out, each record is differently dirty and all record cleaning machines do basically the same thing, so it's how you use them and the technique you develop that pays dividends in the end.

I found that three or four rotations with the brush applied were needed for really grimy records, and I also preferred one of my usual carbon fibre bristle record cleaning brushes over the felt pad one supplied by Okki Nokki with the machine. I found that the bristles cleaned better to the bottom of the grooves and extracted more gunge than the felt type, allowing the machine to suck more off the record.

However, after this experimentation, I found that the Okki Nokki was a very useful machine and did a good job of cleaning up the grubby old records that I have recently bought. Once into a rhythm, I whiled away a very pleasant Sunday afternoon cleaning my collection up a bit and enjoying the resultant clarity and reduced surface noise that resulted. On one record, the Okki Nokki even cured the top end distortion that I had been sure was down to groove damage - impressive!

OKKI NOKKI £275
Okki Nokki (UK)
☎ +44 (0)1579 363603
www.okkinokki.co.uk

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Letter of the Month

SILENT REVOLUTION

Dear David - I was delighted to finally read your article on the modified Technics SL-1200 turntable and very pleased to discover you had such good results. I have long been a fan and have started a similar programme of modifications to my own turntable following similar lines to you.

Replacing the arm, cartridge and phono stage will be the last steps in my upgrade as I want to examine how each modification affects the overall sound and want to save the best until last as I imagine the arm and cartridge will have a major impact; building slowly to the final result and sound. I am considering a slightly different path, going for either the Michell TechnoArm or possibly the Roksan Nima. I would be interested in your views on both these combinations.

Despite all of this, the Technics even in its unmodified state bristles with possibilities and promise and is fine value for the £300 to £400 pounds it costs.

After careful listening you cannot fail to be aware of the deck's speed stability, which is in a class of its own. Piano pieces are as solid as any CD in their representation. The wow and flutter figures for a good belt drive should be below 0.1% and 0.05% for a decent direct drive. I have not for many years seen such figures quoted for a belt drive turntable and know of only one turntable of any kind quoting a figure for this at an amount of 0.035% wow and flutter. The company is Technics and the turntable the SL-1200 MK II - impressive huh? Yet many highly regarded belt drive turntable manufacturers fail to provide such figures, could they be running scared?

It is difficult, if not impossible, to find another turntable that has such a low rumble figure with such precise speed accuracy at anywhere near the price of the Technics SL-1200, or even at many times its cost; that is how well this turntable was over engineered.

In my opinion the belt drive turntable has had an unfair advantage over DD due in part to a biased hi-fi press and that some cheap and badly



Technics SL1200 turntable - direct drive and proud!

designed DD turntables on the market in the 1970s and 1980s damaged the good name of the direct drive system, which was a shame as when it is properly engineered, as is the case with the SL-1200 system, it can compete with the best turntables around. It's easier and cheaper to engineer a reasonable sounding belt drive turntable than it is to produce a good quality direct drive machine which probably explains the popularity of the latter.

What has been forgotten by so many hi-fi journalists and enthusiasts is that when properly designed, engineered and manufactured, a DD turntable solves a great many of the problems and inadequacies inherent in most belt drive designs.

Despite this there are problems with a basic Technics SL-1200 such as the quality of the phono leads and plugs for audio output; the lead is fixed so cannot easily be changed, the poor quality arm, the bell-ringing platter and I should also add for those, unlike myself, who suffer with floor bounce, the turntable damping also leaves room for improvement.

The positives, however, are it does have a remarkably clear, detailed, punchy and highly musical sound. Smooth fine treble, well defined bass with a lack of distortion and that now famous FG Servo Quartz Direct Drive

which assures absolute speed accuracy. There is also the excellent signal to noise ratio, ease of set up, adjustable feet, very heavy and solid construction and feedback immunity. So, like a Caterham kit car, this turntable is the perfect donor machine from which to produce an exciting and magnificent sounding piece of hi-fi on a strict budget.

A cable replacement and disabling the strobe were overlooked or not thought to be viable in your modification. I am keen to investigate the Hydrawire cable replacement kit, details of which can be found at <http://www.hydrawire.com/technics.htm> and would be interested to know if you had considered similar modifications as part of your overall project. There's no better value for money turntable available than the Technics and suitable modification takes this humble piece of kit to a whole new level.

Garnet Newton-Wade

Thank you Garnet - an interesting letter, because we seem to have come to exactly the same conclusions, through listening, completely independently of one another! I think there was a lot of heavy marketing going on by UK Hi-Fi PLC in the late seventies, pooh-poohing direct drives and

celebrating belt drives. The idea that seemed to stick was that somehow the servo system on DDs ruined the sound, because the decks were never at the right speed. Well, they are never quite at the right speed, but they're blooming close, and belt drives are never right either, because the 'clutch' that drives them (i.e. the motor pulley and belt) is constantly slipping...

I think it wasn't British hi-fi journalism's finest hour to swallow this anti-DD propaganda hook, line and sinker (although we've had a few other dodgy moments when they rejected valve amplifiers wholesale whilst heartily embracing CD too!), and because turntables then went 'specialist', the belt drive vs. direct drive debate seemed to get kicked into the long grass. Well, I think Hi-Fi World has found the ball again! Suffice to say, I actually think the UK, with its particular (and unique) hi-fi market and history, is the aberrant one here - in Japan and the US, for example, there are many high end analogue addicts who wouldn't touch any belt drive deck with a barge pole...

In truth, as I'm always saying (yawn), it's not what you do, but how you do it. The fact that a turntable is belt, direct or idler driven is less important than how that particular drive system is implemented - just like which set of wheels pushes/pulls your car. Watch this space for more Technics mods - I haven't overlooked anything, it's just that I only had four pages and could have filled forty! Likewise, we hope to bring you a Rega tonearm supertest some day soon, putting the Michell, Origin Live and Audio Origami up against one another. **DP**

Hi Garnet. Can I make a few small technical observations here? When measuring Wow and Flutter, it's difficult to get much below 0.05% using a test disc, as the disc will possess intrinsic wow & flutter from the cutting lathe. So as you get to low values it is difficult to know whether it's the turntable or the lathe being measured.

Also, disc eccentricity, from a hole punched slightly off-centre, dominates unweighted wow, so disc centring is vital. This can be minimised by using Weighted W&F values, which can go low. All the same, the many quality direct drives I have measured consistently return better figures than belt drive.

The motor servo feedback system was the part under suspicion on DD, some suggesting they 'hunted', producing higher rate and more

audible speed change effects than the low rate wow of belt drive. I never got to the bottom of this; I suspect it was just speculation. The bottom line as far as I was concerned was that direct drives sounded temporarily tight and controlled; superior speed stability was audibly apparent to me. But if people preferred the (slightly) temporarily vaguer delivery of belt drive, with its often undeniably clean midband, so be it.

At the end of the day I want LP to be easy to use and enjoy, and a heavy, solid plinth is my solution, to this, together with instant speed change between 33 and 45rpm. Generally speaking, I hear no major problems with DD decks able to provide this, compared to my rim drive Garrard 401 or belt drives, and neither does our resident turntable expert Adam. Perhaps I have heard only good DDs, but they have never justified demonisation in my view.

NK

CHOOSE NONE

Expect I'm not the first to point this out, but I'd be staggered if all the A/V amps in your recent test don't allow you to set the centre channel as 'None' and so automatically filter the centre track to the main left and right speakers, giving you your Quadraphonic. Certainly my Rotel A/V amplifier does, and far older Yamaha amps allowed for this as well.

Quite a few people say this is the best way to go for films and surround music (in the industry Russ Andrews and AVI's Ashley James spring to mind). I've played around with it, but overall found I preferred films much more so with the centre channel on, and as I listen predominantly to music purely in stereo the centre channel stays on all the time.

I agree with you about the height problem with the centre channel. One way to improve things is to make sure



KEF iQ5s - doing sterling service at the front of Matthew Mowle's surround sound system

the TV sits on a tall piece of furniture rather than the normal low A/V racks. If it's slightly above your seated eye line then the height the centre speaker can be placed at is far more satisfactory and much more in line with the main speakers (especially if like me your mains are not that tall - KEF iQ5s). Plus if you want to be impressed by a film you should always be looking up at it, as it is very difficult to be overawed by a T-Rex or Darth Vader if you looking down at them! Plenty of wooden A/V furniture comes like this.

Of course, if we're purely talking surround music then we should all have five identical speakers equidistant, but how that fits into a normal living room is anyone's guess. But I can vouch for the importance of having the same



Menu with None. Most quality A/V receivers will feed the Centre Channel into Left and Right if you select NONE for the Front Centre loudspeaker during Setup. This eliminates the Centre loudspeaker altogether, giving normal frontal stereo.

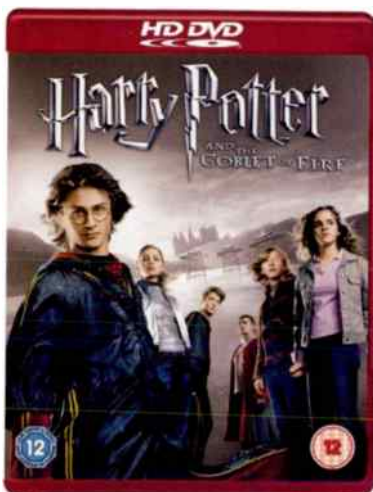
manufacturer for all three across the front, ideally using the same drive units. Many have different sizes between their stereo and centre models. I had a mismatch of manufacturers for years which sounded fine until I splashed out and bought a matching centre, and then I realised how much better the overall sound field became. The worst part of this is, whenever I get the urge to upgrade my speakers I know I'm always looking at finding a range that has a matching centre, which fits a 500mm space in my case, plus I've got to pay for all of them as well! As £1,000 floorstanders often have £650 Centres they're not cheap.

Another reason I tried to like just using the two main speakers for all three channels is that it opens up all sorts of stereo hi-fi loudspeaker pairs that I ignore at the moment. Ah well, at least I'm not spending any money!

I, like so many, have to compromise between my love of films and love of music but I'm really happy with my system at the moment (I just have to keep telling myself that).

I use my Rotel in conjunction with the surround amp, but not as you might imagine. I bi-amp KEF iQ5s and use the remaining power amp channel for the centre. The rears get driven by the surround amp. Not perfect balance but not noticeable to my ears, as what comes from behind your ears is never going to sound exactly the same as what comes from the front, especially as my rears are older KEF Q35s - and the difference to the iQ5s sound is astounding. I only did it a few months ago, having lived with them for a year or so without it ever occurring to me I could make use of the redundant surround amp channels. I was sceptical about how much difference it could really make but it only cost me a couple of splitters and it is the best upgrade I've had in years.

My system, which produces great music and movie sound, comprises



Dolby True HD Discs - now available in the high street.

Denon DVD 2900, Rotel 1055 surround amplifier, Rotel 1075 5 channel power amplifier, KEF loudspeakers. And then there's a huge mess of cables, Clearer Audio's Silverline making the most difference to the performance of the Denon. I am a reformed cynic on the importance of clean power, as I am on bi-amping!

Anyway, happy menu tweaking with your A/V amps! Who needs a turntable to tweak when you've got the combined 400 settings on a good universal player and surround amplifier?

Matthew Mowle

Hi Matthew. Yes, I should have mentioned the fact that with most receivers you can select 'None' for the Centre Channel to get the centre information added into Left and Right channels equally, giving a Virtual or Phantom centre image of the sort we hear with ordinary stereo. This is then a Quadraphonic system (cough!), to dare mention a now discredited 1970s technology. As you say, it means you can stick to buying loudspeakers in stereo pairs - a good point.

The other comment I made, based on my own visits to London's DVD megastores such as Virgin and HMV, is that there are few available TrueHD recordings. This isn't strictly the case. A look at Dolby TrueHD on Wikipedia shows that in fact there are many, it's just that much of this material isn't available on the UK High Street, where prices of HD-DVD and TrueHD discs are high and the available selection poor. In fact, they are worse than poor, they are pathetic - usually one narrow rack hidden in a obscured position, I find.

The big retailers really don't like new formats, and up to £27 for a Blue-ray or HD-DVD disc isn't just high, it's obstructive to the future of HD technology. Amazon currently charge around £17. The commercial logic here is bizarre, as these stores stock swathes of marginally profitable CDs and DVDs, now priced very low at £5-£12, whilst trying to strangle a future that is likely to be far better for them. As CD sales have been in decline around the world for many years now, retailers should embrace the future, but they refuse to. It's good news for the online guys I suppose, as this is where you will find TrueHD sound tracks. **NK**

OFF CENTRE

I understand your frustrations with today's home theatre receivers, which I sell and install for a living. Your views on centre channels are interesting. I've questioned the need for such things (other than the industry attempting to



Surround sound without the centre channel is just like good old Quadraphonic, says Noel!

avoid the whole 'it's quadraphonic all over again' concerns) since its inception. Two speakers in the front usually do a fine job of making my ears believe there is at least one other speaker between them with stereo sources.

On the Roger Waters 'In The Flesh' live concert DVD there are only a couple of minutes in the whole show where the center channel is used in the mix. Clearly someone else out there agrees for the most part.

Bernard Gibbes, California

And if the producer puts lead singer and drums into the Centre, you can end up listening to something resembling stereo. That's progress! **NK**

The best surround sound system I've heard to date had only two AudioNote Es, driven by an Ongaku tube amplifier and a high end turntable and phono stage. No centre and no rears, but it was a far more immersive experience than any multichannel digital system. **DP**

57 VARIETIES

Your review of the One Thing rebuilds to the dear old Quad ESL was particularly fascinating to me as I have just completed a little project... a full, ground-up rebuild of a pair of 57s, cosmetically, mechanically and electrically! My pair used all new panels, and many new electrical parts, as supplied directly from Quad UK, although I believe they are manufactured by Quad's German distributor (using the original jigs). By one of those bizarre coincidences, I was able to directly compare my Quads, rebuilt to original factory specification, with a reasonably recent pair of 'One Thing' modded 57s...

I have to be frank, the original 57, rebuilt with proper Quad parts, is a better sounding unit to my ears. Do readers really want a modded pair of 57s with quite serious frequency imbalances? No original pair of 57s ever left the factory with a 5dB treble lift! As Quad will also provide any new electric parts you need, surely readers should

know what is on offer. Some, no doubt, will like the changes offered by One Thing, and that firm should be warmly congratulated for keeping the flame burning all these years. But faced with the choice of a modded pair of 57s or a fully renovated pair using Quad original parts - and the Quad rebuild will cost if anything slightly less than the One Thing work - readers should at least know there is a choice (I won't complicate matters by mentioning future resale value).

If you want to hear what a rebuilt pair of Quads, using proper Quad parts, sounds like, feel free to drop round and have a listen. I can probably get a pair of One Thing modded 57s round for you to compare. They won't be the very latest version, but you will get the general idea. I might well be able to rustle up a pair of 63s and a new pair of 2905s, just to complete the picture!

Greatly enjoy your magazine. Clearly a lot of love, knowledge and hard work goes into it. Which is always a winning combination. I even like, and sometimes own, great big Tannoy's!

Peter Skinner

St. Leonards on Sea

Thanks for the view Peter, and the invite. Like most ESL-57 owners you are a true aficionado. Quads (electrostatics?) truly do offer an altogether higher standard of fidelity; it's just a pity that the low frequency end is so iffy and they are so large.

I cannot admit to ever hearing brand new standard-issue ESL-57s of the sort you have built; the ones I have heard have had many years under their belt. All the same, One Thing's version is impressive and I do not recall even my modded ESL-63s getting close to their sense of deep insight and analysis. It's an experience quite unlike and beyond that offered by any cone loudspeaker and One Thing's light film is likely the reason. The treble peak could, I suspect, be usefully tamed through simple electrical equalisation in the Thingamyjigs. Thanks for your broadening of the ESL-57 horizon though. It's nice to hear about the various options available. For another man's take on ESL-57s in the home, see the following letter. **NK**

CELESTIAL SOUND

Many thanks for Noel Keywood's article about Quad ESL 57s and 'One Things' restoration. I have that company to thank for supplying new treble panels for my 30 year old ESLs which by following their excellent notes, I was able to fit myself and have enjoyed the sound result ever since.

Noel Keywood mentioned the problem of floor space which the Quad



Reader Jim Bostwick offers a new slant on positioning Quad ESL-57s!

ESLs take up (also applies to any of their electrostatics). I overcame that by mounting them on the ceiling, originally for the safety of both the speakers and my young children and to end visitors trying to warm themselves in front of them! They have worked completely satisfactorily day-in, day-out ever since.

The only issues for mounting in this way, are: (1) locate where the ceiling joists are and (2) to get the geometry right, ensuring no trapping of rear sound-waves. Unfortunately, all subsequent Quad ESLs, cannot be accommodated in this way I am told, but the inspiration for so fixing them came to me from a memory of many years ago when a school-trip took us to the Science Museum in South Kensington at the time of the early experiments with stereo radio. Two Quad 57s were suspended by steel wires from the ceiling with demonstrations of stereo being broadcast from a studio nearby to a Quad FM tuner fitted with a bulky-looking decoder. It made a lasting impression, sonically and physically.

If you should also print the attached photo, keen-eyed readers will spot a Quad 909 power amplifier. Quad at Huntingdon fitted safety circuits to my ESLs before I dared use it when I upgraded from a trusty Quad 303.

Jim Bostwick

Hi Jim. I think we all looked at your set up in silent admiration, coupled with a bit of envy! **NK**

SHELL OUT FOR SHELLAC

I expect I am not alone in reading Hi-Fi World for its excellent coverage of all things vinyl. However you seem to start with the invention of the microgroove - how about some features on shellac? Perhaps an introductory article on the practical side of playing back 78s - specialist cartridges; those cartridges with styli to do both 78 & 33; suitable

arms; turntables suitable for more than one arm, turntables which can be adapted for just 78 or (more usefully) 65-80rpm; and preamp options (for those who can't afford a Graham Slee Jazz Club) - how about a few circuit designs for different EQ curves?

I'd like to think that I'm not the only one who would benefit from reading such an article, and you could consider advertising the issue in The Gramophone Magazine, where you may find a number of readers, like me, with 78s and nothing left to play them on.

Also, I was wondering what you think of the Bellari VP129 valve phono stage?

Richard Smedley

Well, despite you bringing back horrible memories of my thirty or so 78s taking a tumble and being completely smashed to pieces a couple of years back, I won't hold that against you, and will say that this might well make a good idea for a feature! I'll put my thinking cap on...

Regarding the Bellari, it would indeed appear that it has slipped under our radar but I have seen nothing but complementary reviews of it, so it would be well worth checking out. **AS**

CONNECTION CONUNDRUM

I would appreciate your advice on the best way to connect up a preamplifier with two outputs for left and right channels (4 in total) to two stereo amplifiers which sit behind each speaker (with short speaker cables)? Is it best to run four interconnects (3 metres each) or use two interconnects with some form of Y connection at the amplifier end? I assume that there are trade-offs between lead length, capacitance and impedance. I believe the preamplifier has parallel connections to achieve the two outputs per channel.

David.



Bellari VP129 budget valve phono stage - this one has slipped under the Hi-Fi World vinyl radar.

I assume you bi-amp each loudspeaker, their bi-wiring links having been removed. Most people would be tempted to run a heavy cable to the amp feeding the bass driver and a lighter one to the treble unit. However, there is argument about this and I would be tempted not to use radically different cables. Their capacitance will parallel up so each cable needs to have a relatively low capacitance, but most do, unless you are using a particularly long run. Most preamps have output buffers and can drive relatively long lines, however. I would avoid using Y-adaptors if you can, and as your preamplifier has two sets of outputs, then you might as well make use of them, running four cables in total to the amplifiers by the loudspeakers.

NK

GARRARD GRUMBLE 2

I was interested to read the letter from Mr. Woodford regarding the low frequency noise he is experiencing with his Garrard 301 in your September issue. I use a 301/Afromelia as well, with an Origin Live Illustrious arm and Ortofon Kontrapunkt b cartridge, and have also recently started to notice this sound on some pressings which sounds like a cartridge trying to track a small warp. It is intermittent and no one seems to be able to come up with the reason - not even a forum to which I submitted the problem. I can't believe it's rumble as it is not constant; the only change I have made to the system is to have my Leak 20s rebuilt and this connected to my ESL-57s and REL subwoofer produces very substantial bass. I think it's the system amplifying poor groove variations.

Stefan Herber

You could well be right, Stefan. It does seem that the combination of a Garrard deck and a subwoofer can cause low frequency issues, purely as a result of the amount of information that is being generated by the system as a whole. Once again, however, you do not say if your setup also involves wooden floors or the turntable being mounted on a floor-coupled rack, which may not help the problem. **AS**

I use a Kontrapunkt b with a Garrard 401 and experience no such thing. However, as Adam says, if you have the deck on a suspended wooden floor (i.e. wooden joists with floorboards nailed onto them), then feedback from the REL into the plinth may be occurring. The point where floorboard movement is minimal is along the walls into which the joists anchor: they run parallel to the lay of the floorboards.

Or look for vibrational dead areas, between side wall and chimney breast for example. This is where the deck is best placed to minimise floor bounce and subwoofer feedback. Keep away from corners, which are high pressure points where bass is a maximum. Keep away from the subwoofer too.

Mount the deck low, to avoid the swaying of a tall table, which amplifies small floor movements. I use a heavily built low TV table nowadays, with a giant marble slab on top. A solid wall shelf anchored to a brick wall and damped with sand (i.e. a sand box) is another good solution.

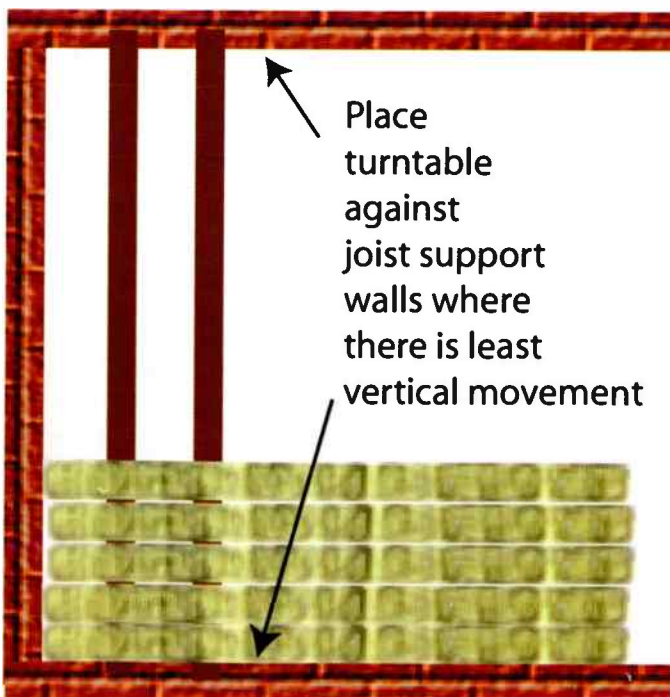
Of course, it could just be that your motor or idler wheel have somehow developed a fault, such as a flat on the idler. I would speculate this as a possibility if you switched off at the mains whilst leaving the deck switched On, with the idler engaged.

NK

SILVER DISC UPGRADE

I'm looking to upgrade my CD player and would like your advice. My system currently comprises a NAD C542, Musical Fidelity A5cr pre and power amps and Monitor Audio GR20s. Interconnects and speaker cable are all Chord Signature. The cables may be over specified but I had an opportunity to purchase them overseas at the right price and can I say they made a significant improvement (the speaker cable in particular, which replaced the Tara Labs Prism Nexa).

I also had a Musical Fidelity A5 Integrated for 6 months (which the dealer kindly let me swap for the pre) and was surprised at the level of improvement the pre/power combination gave. My room is 18' x 24', the GR20s are clear of rear and side walls and face



Paying attention to the arrangement of floorboards and joists can work wonders on isolating your equipment



The Esoteric X-03 gets Channa's vote as a very fine CD spinner

down the room which is well furnished with sofas, large bookcases and some plants. Music is mostly progressive and general rock of the late nineteen sixties to early nineties. Just about all my CDs are remastered, almost fifty of which are HDCD.

The players I am considering are the Naim CDX2 (and power supply), Esoteric X-03SE, Cary SACD or Mark Levinson 309S. I was favouring the CDX2 until Channa's reviews of the Esoteric in April's edition (and comparison with CDX2/PS555) and the CDX2 upgrade article in July. The pricing in Australia has the CDX2/PS555 combination a significant £3675 more expensive than the Esoteric (at £4,950). The CDX2/XPS2 combination is £2,000 (UK pounds) more than the Esoteric. Am I right in thinking that with these increased price differences over those in the UK, Channa would definitely suggest the Esoteric? As to the Cary & Mark Levinson, I have read good reviews but they don't seem to be quite up there with the other two.

One other consideration is my HDCD disc collection - King Crimson and Roxy Music are some of my favourite music but the great majority of my discs are standard Red Book (with a few SACDs). I don't think I can justify the expense of the PS555 and I

wonder if HDCD on the CDX2/XPS2 will be noticeably better than on the Esoteric? Any advice you can give will be well received as getting a listen of these machines at home is not easy here and I am cautious about the value of listening in a hi-fi store on a system quite different from my own.

David Minarik
Sydney, Australia

Hi David - you are right about being cautious when conducting listening sessions at a dealership - as these will only provide part of the real experience - whereas a home-based assessment within your system will always be better. I think the CDX2 and PS555 works at its best in an all-Naim system, but importantly, when connected with a Naim Hi-Line DIN-DIN interconnect in preference of its phono option.

Outside a Naim and Hi-Line system, the CDX2/555 is still a wonderful player but is, I think, bettered overall by the lower-cost Esoteric X-03SE. Within an all-Naim system, I still found the Esoteric to have more free-flowing musicality and yet it was able to maintain those revealing high-end 'hi-fi' qualities like outstanding instrumental and vocal separation to incisively cut deep

into the mix. Like the CDX2 with its DIN connections, the Esoteric sounds even better via its XLR balanced outputs when fed into a fully balanced preamplifier where the sound is revealed with greater dynamics - as I found out when connecting it to an Ayre K-5xe. The Esoteric is a first-class CD (and SACD) player which is worth every single penny of its £5,000 price-tag in terms of flawless build, finish and performance - it has re-established my confidence in the term 'High-End'...

However, this being Hi-Fi World, I can also recommend a few wild cards. The first two are the Densen B-410 and Quad 99 CDP-2 which are priced at around £1,000 each. Though they both have equally wobbly/flimsy disc-loading drawers, their sound quality is way beyond the realms of their relatively low-cost price. I found the Densen B-410 to outperform the £3,000 CDX2 in a non-Naim system and the Quad to work fantastically well in a high-end Spondor/Bryston system (see HFW August 2007). In a nutshell, the Densen has superb timing, spatiality and timbre, while the Quad has a taut, powerful sound unlike most £1,000 players. I wasn't able to compare the Densen, Quad and Esoteric in one go - but they are all worthy of a lengthy comparison.

Finally, you could go for the DAC route instead when accompanied by your NAD C542. How about auditioning a Chord DAC64 which can transform a good budget CD player into a giant killer, like it did when I combined it with a Rega Planet 2000, or perhaps a Musical Fidelity X-DAC V8 if your dealer has one? You have many options, take your time and audition carefully at home if possible. **CV**

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SOUND • SYSTEMS



The Funk Firm's upgrades work wonders on the good old LP12, says Adam.

IN A SPINN

Thanks for the Vinyl World review of the LP12SE. My system is over twenty five years old and consists of an LP12 [no Lingo or Cirkus], an Ittok LVII arm, Dynavector 10x5 cartridge and Harbeth Monitors MK2. I also have a Cambridge Azur 640C CD Player and I like the overall sound of the system with this as a source.

The LP12 is fine with jazz, acoustic and vocals but not so good at all with Rock. Your review has made me think about an upgrade, but which way to go? If I upgrade to the SE, along with the Lingo and Cirkus, this will cost me 5K+, which is unfortunately way outside my budget in one go.

Funk Firm do a full LP12 mod, and are now modifying the Ittok which they claim is a big improvement. This will all cost about £2150, the arm upgrade is about £600. This is closer to my budget. But will it still have that original LP12-ness that I like. Will the SE still have the underlying quality of the LP12 or is it a totally different sound? Maybe I should keep my LP12 as it is and go for a Michell! Any advice would be appreciated.

Steve Wright

Hi Steve, if you are a regular reader, then hopefully my feature in last month's magazine about upgrading options for an LP12 should hopefully have answered most of your questions for you, however I am happy to recap. Basically the upgrades I tested all improved the LP12 very successfully without inhibiting its natural "LP12-ness" that you, and many others, like so much. It sounds to me like you need a bit more grunt from your LP12 if it is lacking when playing rock music and, if your budget is more limited then that the £250 Heed Audio Orbe would fit the bill very nicely indeed. It really does impart the LP12 with a solid, detailed

and tuneful bass that is a bit lacking on the original.

However, if you can stretch your budget further, then the Funk Firm mods are definitely well worth splashing out for. I found that it was the motor repositioning facility of the Clarity Top Plate that made the most difference to the bass performance of the LP12, although I would heartily recommend the K-Drive PSU upgrade in tandem with this. At £939 the pair of them still come in well below the price of Linn's own upgrade route. If you can afford the whole Vector Link upgrade from the Funk Firm then I suspect this is also highly impressive, although I have not heard one yet. However, we hope to have one coming along fairly soon, so watch this space. **AS**

The LP12SE (i.e. Keel subchassis mod) really does keep that unique character of the Sondek, but distills it further into a grippier, tauter and more dynamic brew. The result is much of the power and punch of the best rival decks, but with the LP12's magic intact. Still, before you go ahead with any LP12 mod, you really should audition some other turntables, simply to convince yourself that you want to stay with the Sondek. I'm not in any way saying you shouldn't, it's just that there are a number of excellent designs at the £2,000 price point that give a dramatically different presentation that you might like more. My (obvious) suggestion would be the Michell Orbe, which comes in exactly on budget (and works very nicely with Ittoks, by the way). This has an altogether bigger, ballsier and more widescreen sound even than the LP12SE, however it is not as fluid with those 'inner rhythms' that we love so much in music and thus lacks the Linn's lyricism. Try hearing one of these and see if it's going in the

direction that you want to go - if not, get your Linn modded. **DP**

CHI-FI WORLD

I am thinking of buying a Shanling MC-30 all-in-one system that you rated so highly, but only for using as a CD player and tuner. I would like to know how to hook one up to my Musical Fidelity A5 integrated amp and what type of interconnects I would need? Also, have you heard of a French turntable mat formally called Spectra? I have one, may be before your time!

Ken Coffey

The MC-30 has a set of preamplifier outputs that can be plugged into any of the line level inputs of your Musical Fidelity amplifier via a standard pair of phono leads. You can thus treat it just like you would a normal CD player, although it is worth remembering that the Shanling's volume control will still be operative, so you will need to use this in conjunction with the MF's to set your listening level. Personally I would set the MF's volume control to wherever it would be for your normal listening, then set the volume to the right audible level from the Shanling, and then subsequently just use the MF volume control for adjustment. **AS**

Thanks Ken - I know that Adam and I might still look like we're in our early twenties, but we've been around the houses - in the turntable sense, of course! Adam reports hearing of one but not actually seeing it, whereas I can confess to owning one. Not bad, but I'd take the SDS Isoplatmat any time, merci beaucoup! **DP**

CHI-FI WORLD (SLIGHT REFRAIN)

As a dedicated reader but living here in far flung Australia, I wonder if you could possibly help me? I bought the JungSon J-88D Class A integrated amp on your recommendation and am thoroughly delighted with it, even though with its prodigious heat output it does nothing at



JungSon J-88D Class A amplifier - but what CD to put with it?



Shanling SCD-3000 SACD player - both Davids agree this is a good choice.

all to help the global warming situation. Now the question I am facing is which CD player to buy, and again it looks like 'Chi-fi' is the way to go.

Following your two recent reviews of Shanling models, I'm looking at either the revamped SCD-T2000 or the newer model CD-3000, which I understand is also available as an SACD version, the SCD-3000. If one is wanting balanced connections - the JungSon takes these and seems to need them, given its not so remarkable noise figures - would it be worth opting for the cheaper but newer designed SCD-3000, which offers these, or would it be better to go for the older, more expensive SCD-T2000 which Martin W was rapturous about but which unfortunately lacks balanced outputs? Your mag simply the best hi-fi read - keep the flag flying guys.

Graham Strahle

You're right about the Jungson, I have heard that model over here and it's fundamentally a very good amplifier, but the line inputs are sonically much weaker than its balanced input. In this specific circumstance, I would go with the balanced SCD-3000. I have heard both the SCD-T2000 and the CD-3000, and whilst the SCD-T2000 is an outstanding player (I own its predecessor, the SCD-T200), the CD-3000 is an incredible player and a true audiophile bargain. Whilst I have not yet heard the SCD-3000, I would be surprised if this is not an equally outstanding bargain, and I know Shanling balanced outputs are of excellent quality and are able to deliver outstanding results.

I would definitely try to hear both, but I think that you'll find the SCD-3000 / Jungson J-88D combination connected via high quality balanced cables will give the best sound. As good as the T2000 is, I don't think it's sonic abilities will be fully realised via the single ended connections on the Jungson, I found these to be lacking in tonal colour and to constrain dynamics, whilst the balanced inputs allowed the J-88D power stage to show just how good it is. Consequently, it would make sense to save the money, buy the cheaper player, and spend the balance on more music. **DA**

I'd go for the SCD-3000 as well, Graham, and run it balanced. Trouble is, if the Cambridge Audio 840C is anywhere near the price of the Shanling down under, I'd opt for that instead, as I regard it to be superior to the Shanling - especially via balanced outs. It's Bri-Chi-fi, designed here in London and made just up the road from you in Shenzhen. **DP**

INFLATED OPINION?

I just thought I would drop you a line in case you would like to check out the "Freefloat Inflatable Turntable Support", as it really works (and you don't even need an inflatable turntable to use one...). It operates best with a slab of something suitable between it and the turntable and could even be utilised on microphonic valve gear perhaps?

It is basically an X-shaped inflatable with a fatter section in the centre and at the end of each arm, tastefully finished in a faux suede effect with a few nice logos. They are mainly intended for DJ use, and come recommended by a variety of DJs, apparently. They are reasonably priced at £19.95 per pair and can be bought from Birmingham-based DJ and music gurus *Hard To Find Records* at www.htfr.com.

Their catalogue makes quite interesting reading as it also gives an illustration of the £8,500 Vestax VRX-



The Freefloat absorber provides a nice soft cushion for your turntable.

2000 vinyl cutting machine - seems quite reasonable when put up against some high end playback-only gear.

T. Reid.

As a member of HTFR's mailing list, I receive a catalogue every month and am also familiar with these

inflatable shock absorbing supports, having also pondered their efficacy on one or two occasions. What I didn't realise was that they are now available in black - the early ones were bright orange and definitely stylistically challenged! My only real concern, having worked my way through three inner tubes on my mountain bike recently, would be a puncture during a particularly heavily modulated section of groove, causing a catastrophic corner collapse and sending the stylus sliding across the record. I also suspect that if I attempted to plonk my lead-lined, solid wood plinthed Garrard 301



Vestax VRX-2000 vinyl cutting machine - surprise, surprise, Adam wants one!

onto one, it would burst before I even had a chance to cue up a record...

As to the VRX-2000, you have stumbled upon one of my long-held vinyl dream machines. Okay, so the frequency response of the cut records is limited to around 13kHz and each cutting head needs replacing after around a hundred hours of use, but I still love the idea of being able to turn the world on its head and record my CDs onto vinyl. **AS**

CONCRETE CAPERS

Looking through your great hi-fi magazine and seeing the complex and high tech DIY that can be done today, I just had to send the enclosed advertisement in to you.

It is taken from the July 1961 edition of "Do It Yourself" magazine (for the practical man about the house). Amongst the floor laying and telephone stool-making articles are endless British-made products, probably all long gone now, from firms that promise to turn your home into a feast of gadgets at a reasonable price.

However, standing out, there is this DIY loudspeaker kit comprising a Wharfedale drive unit and a concrete pipe. Perhaps you could print this and ask if anyone ever built one or if they still have it? Any thoughts on the best speaker cable and room positioning? I wonder if it came in stereo pairs?!

Dave McReynolds.

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Wharfedale drivers and concrete pipes - good quality and not too 'draining' on the wallet...

An excellent find - I love old articles like this! I would also be intrigued to know if any of our readers ever purchased and built any. From the size of some of the concrete pipes that can be seen by roadside sometimes, I suspect a modern version could be used to make one heck of a subwoofer, with a twelve or fifteen inch driver. I somehow suspect the old "wife acceptance factor" would be zero, however. **AS**

MUSIC FIRST

I have just been E-mailing Noel Keywood about his interesting review of the modded Quad 57s so, while the keyboard is still warmed-up, I will mention my concerns at your review of the Music First step-up. I know this unit, having listened to several of them over a great many hours (I live near the factory, although I have no connection with the firm other than that).

I hope you won't take offence if I suggest that your review was a little off-hand. The MF step-up is a complicated and subtle bit of kit. If you had been able to compare it with other, comparable, step ups, you might have got a more rounded feel for what it can do. For instance it sounds different depending on which loading and gain choices you make. As it was, you seemed to think that comparisons with the MC stage of a valve phono stage would tell you all you need to know. I think not!

Just in case you suspect that I don't value your observations, I own an Anatek MC phono stage and absolutely love it! But the Music First step-up is a complicated beast and I wish you had been able to spend more time, a lot more time, with it. I suspect the outcome would have been rather more positive. It really is very, very good, even compared

with step-ups at four or five times the price. I can sense that you are very busy, but the Music First seems to have slipped by you somewhat! Regards, and keep buying the turntables!
Peter Skinner

Peter, no offence taken and I appreciate your comments. However, I would point out that, firstly, I can assure you that I did take plenty of time to check out all of the settings offered by the MF Audio transformer and did indeed find that it offers a useful range of cartridge loading options, definitely one of its strengths.

However, regarding my comparison to the MiniMax, I have to say that I still do feel that this is valid. Not only is the MiniMax the reference that we generally use here and a product that I know well, but its MC stage is actually nothing more than a step-up transformer into the main valve MM amplification stage so I do believe it does merit a direct comparison.

Ultimately I found that the MF Audio is a good unit that offers excellent flexibility and a beautiful top end, but its blurring of complex dynamics, the fact that it still requires an additional active phono stage to be used, and the observation that the Eastern Electric is £500 less, even before you factor in the additional phono stage required by the MF, means that I personally struggled to make a watertight case for it. **AS**

ON A MISSION

I am looking for a suitable cartridge for an original Mission 774 tonearm and am lost in compatibility issues. Am I right in thinking Moving Magnet would be better? Budget is about £200, so I could envisage Goldring 1042, Denon 304 etc. This is for a rock oriented turntable (something different to the LP12/Ittok/Troika I have had for some time!) Thanks for any help you can provide.
Nigel Briggs

P.S. Who said vinyl was dead? I have not seen a new cassette device for 2 years or more but saw a turntable actually on sale in a duty-free shop in Helsinki airport two weeks ago!

P.P.S. I forgot the soft soap! Great magazine, the best overall balance in the UK - I have been subscribing for many years.

Hi Nigel. The Denon is a Moving Coil and will need a pre-amp, taking your budget way above £200. I don't advise on a budget preamp stage either; you simply end up wondering why moving coils are meant to sound so good. The Moving Magnet options are set more by their sound balance and its interaction with your system, rather than the arm. The modern MMs now available are the new Goldring 2000 Series and its direct rival, the Ortofon 2M Series. The Goldring 2500 and Ortofon Bronze are close in price and both have a forward, detailed, sound. The Bronze is highly analytical, the 2500 stronger at low frequencies. Or you could get a Goldring 1042, which is less lucid in the midband but nicely balanced, with fine treble and solid bass. **NK**

As to cassette, my recent CPC offers brochure shows a new double cassette deck with USB output for digitising your old tapes. The cassette is still clinging on by its fingertips! **AS**

RACY REMOTES

With respect to 'The Globies' in August's issue, and in particular the 'Most Racy Remote'. The Nu Force remote awarded the gong comes a poor second to the very superior remote supplied by Bow Technologies for their ZZ8 CD player. (A magnificent player in its latest reincarnation, by the way).

Bob Barnes

Thanks for the picture Bob, that is indeed a fabulous looking item and certainly ticks the 'black and shiny' box that appeals to my aesthetic sensibilities so much! However, I shall still have to reserve my judgement regarding its tactile loveliness in comparison to the Nu-Force item until I have had a chance to suitably fondle it... **AS**

Yikes - this magazine is suddenly turning into 'top shelf material'!
DP



A racy remote - Bow Technologies remote control for their ZZ8 CD player.

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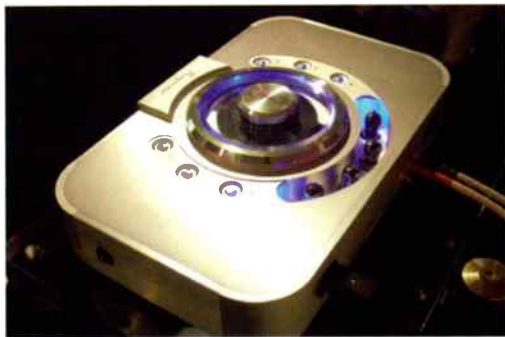
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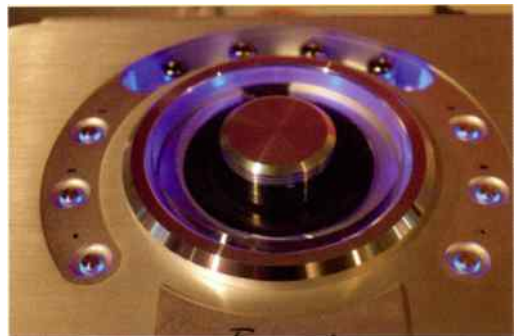
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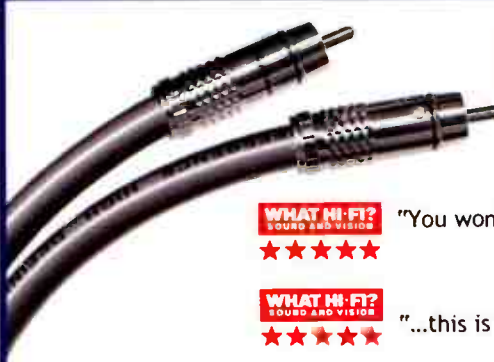

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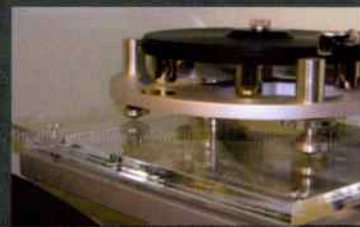
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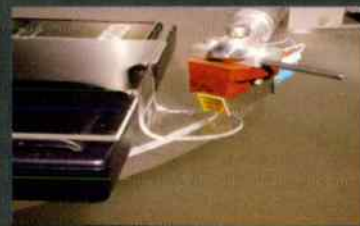
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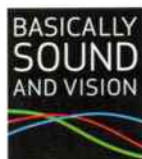
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WANTED - CD recorder needed for dubbing albums. Must be in working order. Pay around £60. Please phone 07944237991.

WANTED ORIGINAL or photocopy of review published in Hi Fi World December 1995 of the McIntosh MCD 7009 CD player. I have this player and would really love to be able to see the only known published review. Contact: coombs.philip@gmail.com



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CASTLE PEMBROKE floorstanding loudspeakers maple. Handmade cabinets real wood superb condition £150. Linn Nebula 100 watts per channel integrated amplifier £150 and matching Theta AM/FM tuner £100. Tel: 07758 218126

QUAD 33 /303 power amp and matching tuner, mint cond, valve like sound, £250. QED Flatline cable 4 lengths of 10m, the lot £30. Phone 003531 2954076.

WANTED:A (photo)copy of the circuit diagram for Radford amplifier STA 60 for our specialist repairman. J. Prescott: (020) 89403066 or johnprescott@avdv.demon.co.uk

MARANTZ CDA94 mint condition £350 ono. Trichord Genesis CD player mint with original box £275 ono. SME IV Tonearm mint condition £699 ono. Telephone Evenings/weekends 01603 443659.

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FOR SALE Krell KSA 50 Power Amp £700.00, Audio Research SP8 Pre amp £600.00 Audio Innovation S1000 pre amp £400.00 all in good condition contact Steve on 0208 776 0044, or e-mail on sj.verrier@ntlworld.com

MERIDIAN 206 CD player £75. Marantz PM80 integrated amp £75. SME 3009 Series III plus spare arm £150. Revox G36 reel to reel tape recorder £75. Tel: 020 8567 4518 (West London)

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NEXT MONTH

Autumn may be the season of mists and mellow fruitfulness, but it's also when every self-respecting audiophile settles down to some serious listening - and what better companion could there be than the next issue of Hi-Fi World? With all those tasty bits of kit launched in the September shows now filtering into the shops, we've harvested up the best for your perusal, and here's but a small selection of what we hope to bring you...



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DECEMBER 2007 ISSUE - 9TH OCTOBER 2007

JANUARY 2007 ISSUE - 8TH NOVEMBER 2007

BILL EVANS

EVERYBODY DIGS BILL EVANS

1958



"the best digital version of the album currently available..."

Orrin Keepnews, jazz producer, co-founder of Riverside Records, founder of Milestone Records and director of jazz A&R at Fantasy Records has, aged 84, put his name to a series of classic jazz records which all involved his talents as producer. Each record retains the original cover art, liner notes and initial recorded output, but each has experienced 24bit remastering via original master tapes. Alternative tracks and previously unissued songs also appear as bonus tracks.

Keepnews also includes new liner notes he regards as a "commentary" to the new reissue. Already released are Art Blakey's 'Caravan' and Flora Purim's 'Butterfly Dreams'. However, here, we are taking a closer look at his favourite Bill Evans album, 'Everybody Digs Bill Evans'.

As a producer, Keepnews was confident about his part in the creation of the album, as he revealed to *Hi-Fi World*. "We discussed such key issues as keeping this basically a trio recording (even though Bill had just concluded several months as part of the Miles Davis Sextet). The choice of a drummer he had worked and recorded with, and a bass player he had only played with on one record, was mutual. I recommended including a few solo piano pieces. Most of the repertoire involved agreement on material he was familiar with, while paying attention to effective variety of tempo. The on-the-spot decision to include the original later named 'Peace Piece', which developed from his efforts to develop a related-but-different solo introduction to the Leonard Bernstein ballad 'Some

Other Time', was of course his idea - immediately approved by me."

However, the skill of a good producer is to know when to make his presence felt, and when to leave well alone. Keepnews was adamant about what the producer should not do. "Since the artist - not the producer - is supposed to be the focal point," added Keepnews, "I quickly recognised that my key attribute has to be flexibility. The hell with my 'style', my job is to create the best possible circumstances under which each highly individual artist can create."

The producer's ultimate aim is to get the recording completed in the best shape possible. However, as with all creative musicians, the inner artist can sometimes get in the way. "Over the years he (Evans) grew more self-assured at times but these were also years in which his substance abuse problems grew considerably and introduced non-creative elements to the mix," said Keepnews. "Our working relationship was basically a good one; he seemed to honestly and consistently appreciate it. His drug-related matters were almost always substantially under control. The biggest problem periods were between recording projects - particularly when he needed money the company could not necessarily supply. However, for most of our working years, he was consistently creative."

In the case of an artist like Evans, who has become recognised as an artist of lasting major importance, the original masters for the album have received careful attention and a continual restoration over the years.

This release includes a single bonus track, 'Some Other Time'. "Various bonus tracks will inevitably have differing histories," said Keepnews, "in some cases, particularly with a label that has had a long and rather complex history, the originally unused material may have, for one reason or another, been lost. In other cases, such as this album, the bonus material came into existence under conditions that led to its being retained - and issued quite early in the reissue life of the album. 'Some Other Time' having been originally scheduled and only deleted in favour of what you might consider its offspring, 'Peace Piece'. We found it interesting to include the standard tune in a very early reissue."

However, not all the bonus tracks that appear on this CD series are wholly integrated within the original album, as Keepnews explained. "Where most or all of the original session tapes remain readily available, an exploratory, expansive reissue series like this one can provide an opportunity to initially release a take that - for one reason or another - has remained unissued. Such reasons might include an excellent solo in an otherwise flawed take or an originally rejected take that now seems well worth letting people hear, particularly since the artist is more appreciated than he was back then."

Whilst vinyl lovers need to check out their local second-hand record shop or record fair, as you may already guess, for CD lovers, this carefully worked reissue demands your attention and is the best digital version of the album currently available. **PR**

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