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- NEW DENON TU-1500AE & CLASSIC TU-260L COMPARED
- DIGITAL CODING FEATURE: WHY DAB SOUNDS BAD
- SOFTWARE DEFINED RADIO EXPLAINED
- NEW ARCAM AVR350 AV RECEIVER
- MICHAEL CREEK INTERVIEW
- TANGENT DAB TABLE RADIO
- SONY SRF-S84 PERSONAL
- TIVOLI SONGBOOK
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Is this the new 'golden age of wireless'? In twenty first century Digital Radio Britain, it's no longer a case of families huddling around the 'crystal set', all listening to the 'Home Service' together. Rather, radio's become yet another part of our modern 'lifestyle', something you dip into and out of at your leisure...

Radio, 2006-style, is diverse, dissolute, atomised and eclectic.

There's a massive amount of choice, from rolling news to classic comedy, music for twenty four hour party people and Proms goes alike. DAB – love it or loathe it – has moved us all from broadcasting to narrowcasting, giving listeners more say over the sort of sound they want to follow them around.

In principle then, I love Digital Radio – it has reinvigorated radio, and things will never be quite the same again. Trouble is, it has proved the mother of all missed opportunities - quite what BBC engineers were thinking when they chose that digital compression system, I'll never know. You see, DAB uses MP2, which only works anywhere near its best at 224kbps, whereas almost all stereo stations (in the UK) use 128kbps or less. Do the maths - the result is sonics little better than AM radio, and FM broadcasts from thirty years back sound far superior...

This issue looks right across the radio spectrum - so to speak - from the theory (DAB compression systems explained on p47 and Software Defined Radio detailed on p44), to the practice (no less than nine DAB hybrid and FM tuners tested on p15). On p10, we look at one of the best ways to play radio today, Magnum Dynalab's high end MD100T tuner, while p32 tells the story of one of the great secondhand tuner bargains, Creek's CAS3140, in the designer's own words. On p52, we re-examine Denon's budget classic TU-260L, and compare its brand new TU-1500AE replacement. Finally, we try Arcam's brilliant new AVR350 on p38, one of the only AV receivers available today with a serious tuner section.

If radio doesn't 'shake your aerial', then we've much more still. Impoverished audiophiles should see our comparative review of NAD's new 325BEE and Marantz's PM40010SE integrateds on p60. A new name in loudspeakers, Q Acoustic, gets its 1020 standmounter scooped on p66. Phonosophie's high end Impuls 2 CD player is auditioned on p56, and we have Monitor Audio's superb GS60 floorstander review on p68, which proves one of the great modern rock loudspeakers.

'Radiohead' or not, I hope you enjoy this issue!

David Price, editor

verdicts

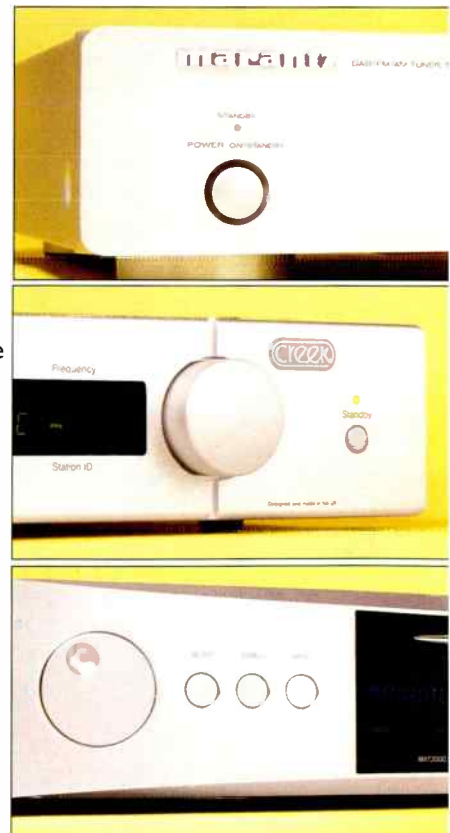


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This month's top cup deal rounds up the best of the best from 2006-2007.



Magnum Dynalab's MD1001 - the ultimate FM experience

analog FM TUNER



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ARCAM AV7850 - bright AV receiver with a superb FM tuner (too)



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Creek CAS3140 tuner - a brilliant budget second-hand tuner bargain.



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Travis SongBook End console - truly the best at the center



52

Denon TU-1504E is great only a bit of kit, but it's better than the old TU-2004?



RADIO SPECIAL ISSUE

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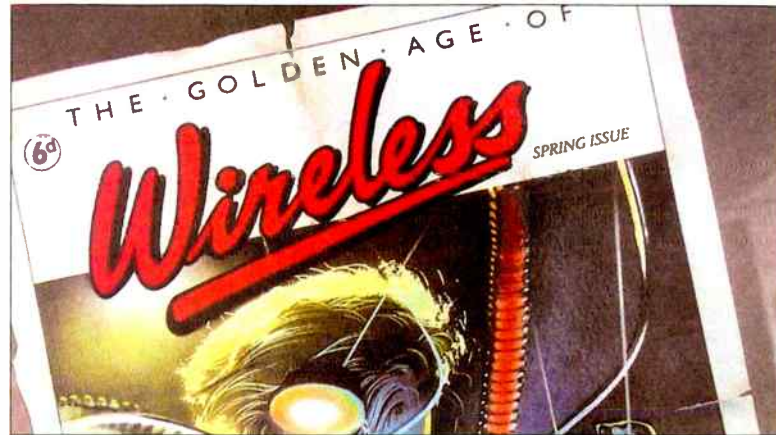
Replace the waddling in your loudspeaker

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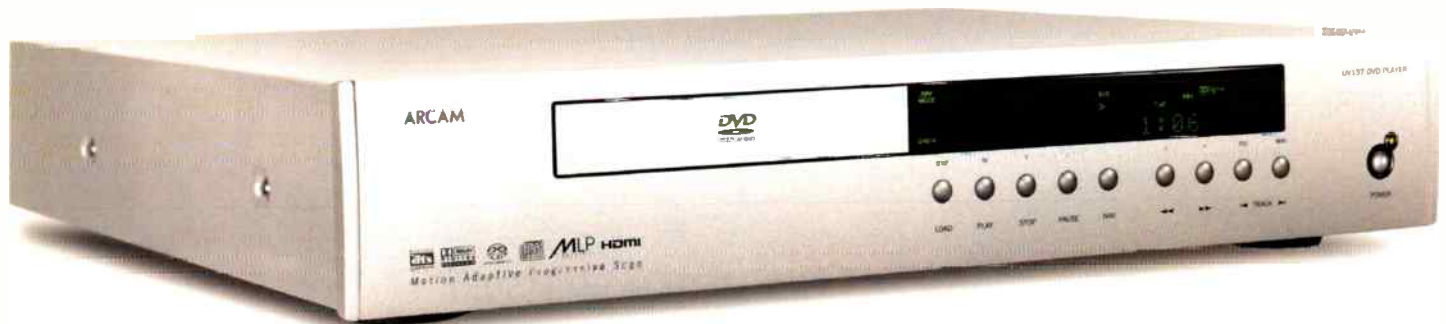


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UNIVERSAL SOLDIER

Arcam's brand new £1,200 DVI371080p Upscaling Universal DVD Player is said to be built for HDTV home cinema and audiophile music, and is also fully specified for custom install. It is claimed to be "one of the world's most advanced DVD players, offering astonishing near-HD picture quality from DVD, that easily outperforms more expensive players". This totally designed and built in the UK machine promises "a huge increase in CD playback performance and full support for DVD-Audio and SACD. Arcam's Charlie Brennan says, "The DVI 37 is the result of the most intensive development project Arcam has ever undertaken. The company's unique partnership with chipmaker Zoran, has allowed us to be first to the market with their brand-new processor. We can now deliver universal music replay, stunning overall video performance and even better CD sound quality." The latest generation Zoran Vaddis 888S core processing engine is a world first, with broadcast quality video circuitry and finest MPEG2 decoding, 'state-of-the-art' ABT1010 upscaling technology from Anchor Bay. The DVI 37 includes Arcam's 'Mask of Silence' EMC damping technology, an audiophile-grade toroidal transformer, optimised circuit board layout and a wealth of subtle tweaks and proprietary design techniques. For more information, click on www.arcam.co.uk.

ROUND AND ROUND

Thorens, and their UK distributor 'A' Audio, are signalling a further push forward in the UK market with the launch of a new suspended turntable, the TD350, and a new line in high end electronics. The TD350 turntable is a new ground-up design featuring double damped cantilever leaf spring suspension, an AC motor with two phase electronic power supply for super smooth operation and a one piece high mass platter. It's available in Maple wood, Bordeaux red and Ash black finishes and has a traditional appearance. The TD 350 shares the bearing, motor and electronic drive technology with the other less traditional looking products in the line: TD800/810/850 series and TD2010/2030 Acrylic series. All are available with a variety of arm options. Price for the TD350 with TP250 (Rega-based arm) is £1,875.



THE WEIGHTING GAME

For those wishing to know their stylus tracking pressure to the nearest decimal point, Origin Live bring you their new 'Arm Load Meter'. Normally, super accurate and convenient digital gauges are regarded as exotica, but in true OL style here's a product which competes with far more expensive designs for a very modest sum of money. Origin Live claim that the Arm Load Meter is as accurate as certain products at three times the price. The electronic stylus force gauge displays figures down to 0.001 gram on a large LCD screen to make for easy reading. The special transducer technology allows easy, repeatable and precise setting of cartridge tracking force. A spare battery is included. Price is £57. For more information, click on www.originlive.com or call Origin Live on +44 (0) 2380 578877.



FASHIONABLE ACCESSORY

Russ Andrews Accessories' new Kimber GQ Mini Cu interconnect is designed for use with iPods and other MP3 players. Using Kimber Kable's unique GQ Teflon coated four-conductor hyper-pure copper braid, RAA says the cable very effectively filters out airborne RFI interference, presenting as pure a signal as is possible from the iPod, mp3 player, Airport Express or other device. The GQ Mini Cu interconnect is available with either 3.5mm minijacks at both ends (for linking to such devices as Tivoli radios) or with 3.5mm jack and two Ultraplato phonos to enable connection to a full blown hi-fi system. Prices start at £54 for 0.5m, running up to £70 for 1.5m. It's available direct from Russ Andrews Accessories with a 60 day money back guarantee from www.russandrews.com or call 0845 345 1550.

LUSH LIFE

The new £119.99 Pure EVOKE-IXT Prestige is an exclusive luxury edition of the company's best selling DAB radio. The new Prestige Editions are said to be designed for radio listeners who appreciate the finer things in life. Hand-crafted from high-quality materials, they offer multiple finishes to match the finest interior décor, making for a uniquely refined, luxurious radio with an air of exclusivity. Available in Bird's Eye Maple, Burnt Redwood and Piano Black finishes, all in a high-gloss lacquered coat, these are created using more intensive manufacturing processes "to create a radio of perfect style". The IXT Prestige has easy-to-use DAB features such as station selection by name and scrolling text showing song titles, artist information, news updates and sports results. Outside, there's radius-edged veneered casework and a large, clear white-on-blue display. There are six station presets, a high performance speaker, a headphone socket and stereo line out for recording. The cabinet is bass ported for a richer more natural sound. Whether it's enhancements to the DAB standard or new features from PURE, the USB connector enables users to update their EVOKE-IXT Prestige from www.pure.com/support to get the latest software improvements. It also adds several enhanced features specifically for international users, including: Tri-band reception (Band III and L-band DAB) and FM with RDS) and support for a wide selection of European languages. For more information, click on www.pure.com or call +44(0) 1923 260 511.



THE SPORTING LIFE

Sennheiser has a range of seven brand-new original headphones built specifically for sports activities. All are said to be sweat resistant and water resistant, and designed to be washed after use. They boast unique secure fitting designs that won't fall off your head, are said to be tough, have almost unbreakable construction, and come complete with stylish and protective sports carry cases. The water-resistant earpieces have a cable that remains soft and flexible even at -10°C and the overall construction is both flexible and tough. The radical styling and ergonomics are by noted German industrial designers Susanne Ewert and Markus Hohl. Sennheiser's neodymium-iron drivers are used. The range includes the MX 70 Sport, MX 75 Sport and MXL 70 VC Sport. For more information, call 0800 652 5002 or click www.sennheiser.co.uk.



BEAM ME UP

O'heocha D2 Saturns, at £5,500 a pair, are described as "radical audiophile loudspeakers that are unique performance sculpture". The company says they are the result of intelligent design, using the most natural shape in the universe, the sphere, and were six years in the making, with three years of intensive R&D, highly advanced engineering and unique materials technology. Designer Aonghus O'heocha gained extensive experience of high-end engineering at BMW Motors, before starting O'heocha Design and is currently working on projects with the European Space Agency. Each speaker is hand-made with "the very best aerospace grade materials and the highest quality parts and components". Constructed from aircraft grade aluminium, they feature five drive units per channel, with twin eleven inch diameter isobarically loaded subwoofers built into the speaker bases, twin gas-flowed bass reflex ports in each speaker, aluminium composite sandwich drive unit materials, twin midrange drive units for three dimensional sound dispersion, stiffened structure using 10mm diameter bracing rods in horizontal and vertical directions, plus a radical new suspension system. They are compatible with O-Link Wireless Systems. For more information, call 0035 391 558 030 or click on www.oheocha.com.

PLAYING AROUND

TerraTec's new Noxon 2 audio is said to be "a new breed of audio player for your home or office". Wherever you can access your broadband connection via a WiFi or Ethernet network, you can listen to over 2,500 Internet radio stations from countries all around the world – or simply access your entire MP3 archive from your computer. Operating this portable, ergonomic jukebox using the integrated keypad is said to be easy, whilst the high contrast display gives you control over your music playback. An additional USB 2.0 port adds the finishing touch for complete music diversity: use it to connect your portable MP3 player, memory sticks or a portable USB 2.0 drive containing your personal play lists and listen to songs instantly. It can play MP3 and WMA9 audio formats at up to 320kbps using the software provided. Support for Digital Rights Management also guarantees that you can play songs bought online that have Windows Media DRM10 copy protection. The Noxon2 audio can play all around the home, via 54 Mbit wireless networks (802.11g) and can also be operated on 11Mbit networks (802.11b). The external antenna ensures optimal signal quality, whilst WEP and WPA encryption support provides secure data transfer from the sender to the receiver. There's an S/PDIF digital output for connection to a home hi-fi system. Price is £149.99, available from EuroTech, tel: 0870 458 4891 or online at www.euro-tech.co.uk.

FUTURE SOUNDS

Mobile phones offering generous data storage, enabled by small hard drives with ever-greater capacities, may soon allow the cellular handset to rival or surpass the portable MP3 player as the mass market mobile music device of choice, according to a new report by ABI Research. As the mobile phone becomes a multimedia entertainment and computing device, it has incorporated high-capacity storage similar to that of a PC. Samsung's SPH-V5400 was one of the first handsets to include hard drive technology, offering 1.5GB of storage back in 2004; since then we've seen Nokia's N91 with 4GB, and most recently Samsung's SGH-i310 with 8GB. "As the cellular handset becomes the one device that the world carries, the standalone MP3 player may well be left behind," says Alan Varghese, ABI Research's principal analyst of wireless semiconductor research. "What's important to many users is having one device that handles mobile music as well as the other functions—phone calls, digital photography, email, web browsing—now performed by mobile phones. At present, portable MP3 players still lead in their memory capabilities: high end devices can hold as much as 60GB. But Varghese believes there is a point of diminishing returns beyond which a user doesn't care whether the device can store 2,000 songs or 7,500. MP3 player vendors may try to defend themselves by offering even greater disk space, but over time they may still lose market share. Mobile operators are already setting up iTunes-like stores of their own to serve a public equipped with MP3-capable handsets. Additionally, given that most MP3 players are stocked primarily with songs from consumers' own music collections, rather than only those downloaded from an online music store, high-capacity MP3 handsets provide users with the flexibility of listening to those tracks on a device that's almost always with them.

STRIKING A CHORD

The Chord Company has two new additions to their Speaker Cable range - the Epic Twin (dual-conductor) and Epic Super Twin (twin dual-conductor). Chord have resisted referring to the Super Twin as a bi-wire cable because the conductors can also be paralleled together to produce "an outstanding speaker cable for speakers with only one set of inputs". The two cables are available now at prices of around £40 and £80 per metre respectively.

Epic is the result of combining elements of two of Chord's most popular cables, Odyssey and Signature. The company says that by taking the shielding system used on the Signature and adapting it to suit Odyssey, they've been able to produce a speaker cable that combines the strengths and benefits of both cables. Epic, like Odyssey, features two conductors each made up of 19 strands of silver-plated oxygen free copper conductors. Chord has always used multi strand conductors in their speaker cables but favour fewer, heavier gauge conductors over fine stranded rope weave designs. The overall diameter of each conductor is 2.5 mm. The two conductors which are twisted together are insulated by Teflon® and then surrounded by a silicon jacket. Epic has the addition of a dual shielding system applied to the outer silicone of Odyssey that is then surrounded with a special PVC jacket to further improve mechanical damping. The PVC jacket itself is extremely pliable and finished in a translucent grey with an overall diameter of 10.5mm for Epic Twin and 15mm for Epic Super Twin. Epic Super Twin uses four sets of the same conductors in twin twisted pair configuration. This makes for very consistent performance characteristics between the single and dual versions. For more information, call +44 (0)1980 625700 or click on www.chord.co.uk.



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SIGNAL

POWER



OFF

MUTE



OFF

FM

Surely one of the most underrated and overlooked high fidelity sound sources, FM radio is capable of superb results. Trouble is – as someone once said – not a lot of people know that. The reason is that most FM radio receivers are – literally – cheap as chips, and sound like it too. Given an extremely high quality, bespoke FM tuner such as Magnum Dynalab's MD 100T, says David Price, sublime results are possible.

Let's face it, most people's point of contact with FM radio is a car stereo. I'd wager that, whilst a few audiophiles take the trouble to purchase a decent hi-fi tuner – and some even erect a half-serious FM aerial – about 99% of our daily radio experiences come from something with an FM radio-on-a-chip, designed to fit inside a car dashboard and cost next-to-nothing.

This hardly bodes well for the medium. Car stereos, and the small portables which share the same chipsets, are thin, wiry and unpleasant sounding – giving sonics akin to 128kbps MP3 or less. This fact alone is why the depressing sound of DAB seems to have been accepted by the music listening masses – and I for one think it stinks.

Of course, there are obvious parallels elsewhere – CD has done a lot for lowest common denominator sound. CD doesn't have to sound bad if it's done seriously, but it rarely is and most manufacturers are of the opinion that cheap chipsets and flashy fascias make more money than top class componentry and meticulous design of digital and analogue

sections. The result is that people get accustomed to a certain (low) level of fidelity, and assume it's as good as it gets...

Technically, FM isn't brilliant. There's a stereo pilot tone at 19kHz that has to be cut out of the audio output, so all FM tuners roll off well before this, at around 15kHz. This is poorer than the already bandwidth limited CD (around 20kHz), and we all know about that format's middling treble performance. However, FM is analogue, and given meticulous attention to RF and audio circuitry, exceptional sound is still possible.

Ironically, most of what holds FM back in practice is the relatively poor quality emanating from most broadcasters. Commercial radio is compressed deliberately, to sound more punchy on pop music. The upside is that, yes, it's still possible to get very nice noises from certain BBC stations, and Radio Three's live broadcasts are legendary, for example. So if you have a taste for our national broadcaster's choice transmissions, and don't constantly seek out stations broadcasting 'wall-to-wall classic eighties pop hits', there's still a great case to be made

for a high end tuner such as this.

US based Magnum Dynalab is one of the very best tuner brands currently on sale. My experience of their products throughout the nineties is such that I'd happily mention them in the same breath as names such as Nakamichi or SME. We're talking serious, no-holds-barred attention to sonic detail, with aesthetic, marketing and commercial considerations coming second. Certainly, the MD 100T doesn't exactly impress in the way that a high end Japanese CD player does in tactile terms. It has the look and feel of a high quality, hand made measuring instrument, not a super slick slice of audio esoterica.

In a sense, this is a good thing. You can buy the very impressive Chinese made Marantz 7001 DAB/FM tuner for £300, and it works with the slick precision of any high end DVD player. The Magnum Dynalab feels very nice to use to be sure, but has a certain 'hand made' quirkiness to it that distinguishes it from the fray – in the same way that a TVR or Lotus, in absolute terms, doesn't feel quite as 'hewn from solid' as a VW Golf. Don't get me wrong – the MD 100T



doesn't feel cheap, but it's certainly distinct and oozes character, which is something you can't say for most black boxes...

What I like most about this machine is its tuning action; it's positive and the controls are tactile in a way that pressing an 'up' button on a cheap digital tuner can never be. There's a lightly weighted flywheel on the right, linked up to a warm orange LED digital display. There are no presets, and there's no remote as standard, so when you want to change channel you have to twiddle the knob and find it yourself. Push button presets and a scrolling backlit alphanumeric display are all well and good for DAB, but there's nothing like a large '94.3' legend in the centre of the tuner telling you you're tuned to Radio 4 to give you a sense of connectedness to what's really going on.

Better still, for me at least, are the two swing-needle analogue meters flanking the central digital frequency display, which light up with a soft yellowish orange glow. One is signal strength, the other tuning. It's 'old school', and works better than any other arrangement I know. There's a toggle switch on the fascia that makes the signal strength meter act as a multipath meter – another useful feature.

Despite the digital display, this is an analogue tuner – in the sense that it has an analogue front end. I've not heard a digital synthesiser FM tuner than comes close to a

top analogue one, and so – in my book – this is just how it should be. There is a microprocessor inside, which I presume is for the optional remote control and preset package (£350, no less!), however. Beneath the meters is a row of toggle switches. Again, these are high quality items, but lack the slickness of the best Japanese designs. They perform power on-off, mute on-off, mono/ stereo selection, signal strength/ multipath meter selection and selectivity selection (curiously labeled BW1/BW2, but meaning 'wide/ narrow').

Around the back, there's an IEC mains input, and aerial input, and audio outputs. The aerial download needs an F-plug with screw thread rather than the traditional coaxial socket, while the audio outputs come in unbalanced phono or balanced XLR flavours. There's also a small jack socket and toggle switch associated with the remote control.

Inside the pressed steel casework lurks a smattering of decent quality passive components, a largish toroidal transformer and matched Philips military grade 6922 tubes in the amplification stage. Thick printed circuit board is used, with Kimber Hyper-Pure copper wiring in the audio path. The MD 100T's 4-stage RF front end is designed in-house, and features a 'custom Auto Blend RF circuit', which constantly monitors and varies the stereo separation for optimal stereo quieting. For my

"FM still has a lot of life left in it, and this tuner shows why..."

money, this is an interesting move, as 'Hi-blend' circuits, which trade off stereo separation for noise performance, were never terribly well thought of in the golden age of FM tuners (i.e. the nineteen seventies). The antidote to this, of course, is a high quality FM aerial, such as Magnum Dynalab's own ST-2 (right). Magnum Dynalab says that the front end and IF (intermediate frequency) amplifiers are precision aligned, which guarantees that all specifications are met. This is not possible in a digitally tuned tuner, as they are dependent on the tolerances of the components.

SOUND QUALITY

The Magnum Dynalab MD 100T is not the world's most sensitive tuner, so those expecting to pull in, for example, LBC from the Shire counties would struggle, unless they have an exceptional antenna. However, the MD 100T is certainly not in the realm of Leak Troughlines, which require you to live next door to the transmitter for decent noise performance. Rather, this tuner inhabits the 'less sensitive than average' side of life – see MEASURED PERFORMANCE - so the optional ST-2 antenna is most



optional ST-2 antenna does a great job with minimal mounting woes...

**"A little champ of price/quality ratio:
available at an affordable price, especially for a
tube amplifier of more-than-usual power."**

AUDIO REVIEW Italy, July 2004, Claudio Checchi

**"PrimaLuna ProLogue One is now my
'affordable reference amplifier'. With
apologies to various British and Italian
geniuses, this amplifier has to my ears-
no equals at its retail price."**

HI-FI NEWS and record review, July 2004, Ken Kessler

**"A refreshing change from the transistor
competition with a captivating presentation.
Excellent finish and build quality makes
for a package strong on value."**

HI-FI WORLD, August 2004, Dominic Todd



PrimaLuna

Music is a pleasure not to be denied. So, too, the beauty of music reproduced by valves should be accessible to all. To make available to a wider audience the seductive, silky sound of the vacuum tube, PrimaLuna has developed a range of all-valve amplifiers with the construction, power and sonic performance of high-end electronics, but with one unique, inimitable feature: prices that can only be described as 'entry level'!

Since the arrival of the Prologue One, the audio community has been unable to contain its joy nor reign in its praise because PrimaLuna has revolutionised the concept of 'affordable audio.' With a pair of integrated amplifiers with prices more typical of mundane, solid-state products, PrimaLuna showed other manufacturers that compromises in fit and finish, styling and facilities are unnecessary.

Now PrimaLuna can offer the pride of ownership of true separates to aficionados on a budget. As promised, PrimaLuna has expanded the range upward with three exciting new models for users whose requirements demand separates rather than integrated amplifiers.

To meet these needs, the music lover can now consider the Prologue 3 dual-mono valve preamplifier with four line level inputs, and a choice of two matching stereo power amplifiers. The Prologue 4 provides 35W/channel from EL34 valves, while the Prologue 5 delivers 40W/channel courtesy of the classic KT88 tube.

And there's more good news: PrimaLuna has also announced retro-fittable auto bias boards for the Prologue 1 and 2, and a moving-magnet phono stage for the Prologues 1, 2 and 3. Additionally, there is now a choice of optional gold or silver front panels in place of the standard finish.

Audition the full range of Prologue models at the Pistol Music dealer of your choice. And prepare your wallet for a pleasant surprise.

**PISTOL
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58 Durham Road, London SW20 0TW

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welcome, because it's a nice, simple, elegant solution. It's easy to mount, and gives the MD 100T a good, strong signal that's enough for most people's needs. DX'ers will want more, but if you're just wanting good noise-free reception of your local Beeb and commercial stations, the ST-2 is all you'll ever need.

The MD 100T's signal strength meter is a little on the generous side; you can still get a bit of noise even when it's quite high up the scale. Still, the tuning meter seems accurate, and the multipath meter is a godsend for anyone trying to set up an aerial seriously. The switchable selectivity is also an essential – and is well worth using judiciously as the right setting dramatically improves the sonic performance.

How then does it sound? Well, the bad news is that it sounds so good that it tells you, in no uncertain terms, how bad so much of today's FM programme material is – and that, I'm sorry to say, includes the Beeb. Conversely, give it something decent to play with, and the Magnum Dynalab MD 100T is capable of stunning results – results that put almost any digital source I've heard to shame...

Essentially, it still sounds like a transistor tuner; don't go thinking it's an amazingly rich and romantic device such as the Leak Troughline, because it's not. Rather, you get a very smooth, even, matter of fact sound with just a *soupcou* of warmth from that tubular audio output stage. In fact, I'd say the tubes do more to give the tuner weight and power than artificially 'warm it' – the sound is clear yet powerful and confident, as opposed to being fluffy and sepia tinted.

First off, I tried BBC Radio 4's 'The World Tonight', and was instantly impressed by the warmth and dimensionality of Brian Perkins' voice, but as the news finished and the programme switched to the main presenter Robin Lustig, the sound became thin and sibilant and a tad nasal. This was something I was to wrestle with all the time during the Magnum Dynalab's tenure in my system – the audio quality coming from different studios, even on the same channel and in the same programme, proved tremendously variable. Of course this wasn't the MD 100T's fault, and merely existed to highlight the tuner's superb incision.

Ron Cook on 'Book at Bedtime' was worse still – bright, forward and sibilant, it sounded little different to a cheapo tuner with a piece of wet string. But then in desperation

I switched to Mark Radcliffe on BBC Radio 2, and suddenly the soundstage expanded, the presenter fell back behind the speakers and there was real smoothness and depth to the proceedings. On music, the MD 100T's performance was no less exacting; poor recordings sounded poor, good ones could be quite stunning. Again, there's a touch of low end warmth, or weight, to jolly along the proceedings, but the bass articulation is superb – it's brimming with power and pomp which sounds eerily 'untunerlike'. Again, it doesn't sound artificially rolled off or unnaturally voiced, it's just big and bouncy.

This is an important point, because the midband is exceptionally transparent. I'd say it isn't quite as incisive as the classic Naim NAT-01, but it lacks the latter's occasional 'wiry' quality. It's not quite as dazzling on leading edges, but is still very, very good indeed and the overall impression is of an excellent window into the recording, and more importantly, the music. Soundstaging is also excellent – the MD 100T has no problems pushing images wide out into the room, and hangs instruments in space like no other tuner I've yet heard, with the notable exception of the hissier and more temperamental Leak Troughline. It's quite uncanny really, because you're subconsciously simply not used hearing music that someone else is playing sound so similar to the music you buy and play on your own high quality, high end replay systems. It's this natural musicality – born from transparency allied to dimensionality and tonal accuracy – that's what distinguishes the MD 100T from lesser (but excellent) budget tuners such as the Creek Classic.

CONCLUSION

For me, Magnum Dynalab's MD 100T was a fascinating product to review, as I come across few designs which are so distinguished in their particular field. Superb, high end turntables and CD players seem ten a penny these days, but it's rare to hear a tuner that rises above its cheaper rivals so dramatically.



Despite the tube output stage, it's not a fat, bloated ponderous blast from the past, but nor is it relentlessly incisive to the point of being tiring or unpleasant to listen to). Rather, the Magnum Dynalab gives the best of both worlds – it's clean, open, dimensional yet warm and fulsome. Best of all is its innate musicality; I don't listen to much music off air, but the MD 100T changed all that, and got me into artists and genres I'd otherwise have overlooked. As such, it justifies its considerable purchase price - FM has a lot of life left in it, and this tuner shows why.

REFERENCE SYSTEM

- MF Audio passive preamplifier
- World Audio K5881 power amplifier
- Yamaha NS1000M loudspeakers
- Black Rhodium Tango speaker cable

VERDICT

Superlative audio performance allied to charming – if quirky – ergonomics makes this a wonderful radio experience.

MAGNUM DYNALAB

MD 100T £1,895
 Audiofreaks
 ☎ + (0)208 9484153
 www.audiofreaks.co.uk

MEASURED PERFORMANCE

Smooth frequency response, with shelving upper treble - visible in our response analysis - is sufficient to give this tuner a smooth sound, free from sharpness. Distortion was low at around 0.2% at 50% mod and 0.4% at 100%, mostly second harmonic. There was more hiss than expected, measuring -69dB (stereo, IEC A), considerably worse than the high 80dB quoted. Maximum separation, 50dB as quoted, was surprisingly achieved with BW2 (narrow IF); it was 30dB with BW1(wide), but both figures are acceptable for good stereo. Whilst 1.2V was available from the unbalanced (phono) output, as quoted, only 85mV was available from both balanced outputs, way below spec. - an odd problem.

The signal strength meter has been scaled to impress, registering nearly maximum (8/10) from a weak 1uV, rising little to 8.8/10 for full quieting (400uV) - it reveals little about aerial effectiveness.

Switching from Wide IF (BW1) to Narrow (BW2) reduced adjacent channel interference little too. The MD100's basic performance is fine, but ours had a few funnies and failed to meet the handbook specification. NK.

Frequency response (1dB) 30Hz-10kHz	
Stereo separation (wide/narrow)	30/50dB
Distortion (50% mod.)	0.2%
Hiss (CCIR)	-69dB
Signal for minimum hiss (p.d.)	0.42mV
Sensitivity	
mono	1.7µV
stereo	24µV
signal strength meter:	8/10 = 1µV



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Tuner Fishing

Steve Green goes in search of the best affordable audiophile tuner, trying models from Sony, Denon, Harmon Kardon, Pure, Marantz, Creek, Arcam, Vincent and Myryad, ranging in price from under £200 to over £800...

Digital Radio has revitalised not just the radio world but the hi-fi tuner market. New chipsets are arriving every month, it seems, and there's now an impressive range of models from all the major manufacturers, offering both DAB and FM functionality.

This month's group test tries to put them all in perspective. With models spanning £200 to £800, it's no surprise that the pricier items will outperform the cheaper ones, but we found that it's not quite that simple...

DAB offers variety - no end of stations are available - but in spite of the claims, it does not offer great sound quality. It's good, but switch from DAB to FM when the same programme is going out on both - and there's no contest. If you don't want swimmy sounding violins in a melifluos sounding orchestra, or a band's cymbals going 'bonk' when the 'bit pool' runs out bits to throw at it, VHF is the one. There's no reason not to have VHF and DAB of course, but then choice becomes a bit more complicated. Our report looks in depth at what is available.





SONY STSDB900 £183

Atidy looking DAB/FM/AM tuner with RDS on FM, this tuner has a silver front-panel with a wide display at its centre and three small buttons either side. The display is easily readable from distance and from wide angles. The Sony can store up to 99 preset stations on DAB and 30 on FM, and entering stations into the presets and recalling them was simple using the remote control. The tuner stored the list of DAB stations in multiplex order rather than the usual alphanumeric order, which made searching for stations confusing. Like the Pure, the Sony lets you perform an autoscans for all FM stations at once, which it then stores in alphanumeric order so that you can scroll through a list of station names like you can on DAB. It strikes me as being odd that the Sony can store FM stations alphanumerically, yet doesn't provide this option on DAB. When the tuner was functioning correctly, it scrolled rapidly through the list of station names or presets on DAB and FM when commanded by the remote control. On the rear panel the Sony provided separate DAB, FM and AM aerial connectors, phono outputs and an optical S/PDIF digital output. Reception quality on FM was good, and reception quality on the Frontier-Silicon Chorus DAB chip was good but not spectacular, with the occasional 'bubbling mud' sound present on the weakest DAB multiplex I can receive.

SOUND QUALITY

Generally, the sound quality of the Sony was excellent, and certainly belied its status as being the cheapest tuner in the

group test. With a lively and open sound, delivery of both classical and world music on Radio 3 was precise and detailed. The sharp sound of the tuner also complemented the sound of Classic FM to produce a pleasantly rich and engaging performance. Sonics were also very good on the better sounding pop, rock and middle-of-the-road music stations on FM, with the bright sound producing a very energetic delivery. In comparison to the £100 pricier Marantz however, the Sony occasionally sounded a touch thin and harsh on FM, and the Marantz produced a more authoritative and dynamic sound overall.

Performance on DAB was excellent, with the tuner's bright

sound improving the typically dull sound of DAB music stations no end and allowing the better-sounding DAB stations to be delivered in a detailed and lively manner. The tuner performed well with speech radio on both DAB and FM, with presenters' voices sounding accurate and neutral. Overall, the Sony provides very good sound quality, performs well on both FM and DAB and offers excellent value for money. My first review sample was faulty, which raises a question mark over the reliability of the software, however, and the user-interface wasn't as user-friendly as on some of the other DAB/FM tuners, but this shouldn't detract from its sonic capabilities.

MEASURED PERFORMANCE

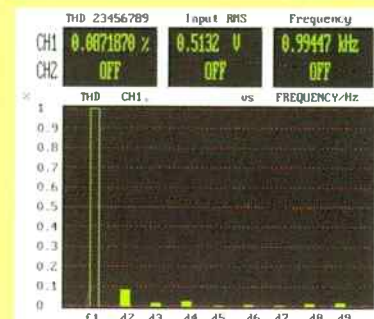
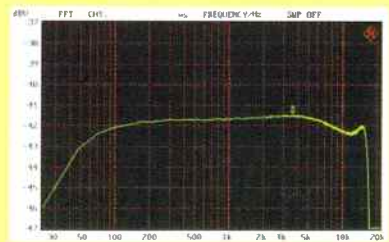
The most noticeable and unfortunate aspect of this tuner's performance is a bass roll off below 200Hz that is likely to cause the sound to appear weedy and lacking body. Tuners rarely suffer this, as a quick comparison with the others on test will show; most run flat down to 10Hz or so. There's a presence lift at 5kHz then a slow roll down further up the band as the pilot tone filter takes effect. Mediocre termination accuracy results in the small peak visible at 14kHz.

There was a little more hiss than expected from a Sony at full quieting. It measured -68dB IEC A weighted, not the best result, but not so bad either. Distortion levels were a bit variable, the mono sum signal being very low in distortion, which is encouraging. The tuner should sound clean enough.

Output was healthy at 1.3V, so the Sony will match any amplifier.

The ST SDB900 was a little disappointing for a Sony, as this company's products are usually spot on technically. The sound will lack both warmth and bass. It is likely to sound a little thin and bright. **NK**

Frequency response	70Hz-16kHz
Stereo separation	40dB
Distortion (50% mod.)	0.08%
Hiss (IEC A)	-68dB
Signal for minimum hiss	0.85mV
Sensitivity	
mono	6µV
stereo	67µV



VERDICT

The Sony's lively and open sound produced an excellent performance on FM and helped the sound quality of the DAB stations no end.

SONY STSDB900 £183
Sony UK
 +44 (0)1932 816000
www.sony.co.uk

FOR

• great sound quality

AGAINST

• user-interface
 • plain looking
 • possible software bug



DENON TU-1800 £190

The Denon TU-1800 is a DAB, FM and AM tuner with RDS on FM, and priced at £200. The tuner has a slim black front panel with an easy-to-read two-line display, and is one of the most attractive of the DAB/FM tuners here.

It allows up to 100 stations to be stored in presets for both DAB and FM, and entering and recalling the presets is simple using the excellent remote control. Tuning between stations using the remote control is rapid, with the display changing instantaneously following the press of a button, and keeping the button pressed down scrolls rapidly through the list of stations. The operation of the tuner is like that of the Marantz, as they seem to be using either the same or very similar user-interface software. Stations on DAB can be sorted alphabetically, by multiplex order, or by programme type (PTY), and the usual DAB text information is available. RDS text on FM allows the station name and scrolling text to be displayed. Connectivity provided on the rear-panel includes separate connectors for DAB, FM and AM aerials, optical and coaxial digital audio outputs, phono outputs and an RDI optical digital output for transferring data from the tuner, although no devices have emerged that can take advantage of this as yet. FM reception was good. DAB reception on the SBK Telecom chip was average with occasional bubbling mud sounds on the weakest multiplex I can receive, but like all of the other DAB/FM tuners, all of the other multiplexes were received without any problems.

SOUND QUALITY

In terms of the group average for hybrid tuners, this wasn't unpleasant to listen to, but nor was it particularly distinguished on FM. The delivery of classical music on Radio 3 and Classic FM lacked the precision and vibrancy that most of its peers displayed, and the tuner sounded warm and flat in comparison. Rock, pop and middle-of-the-road music stations on FM also sounded a touch muted and lacked the attack and dynamism that the other DAB/FM tuners delivered (apart from the Harman Kardon, which performed similarly to the Denon in this respect). The Denon was a little unforgiving when it was presented with audio that the radio stations hadn't taken care of very well, the livelier sounding tuners managing to

squeeze more detail from the signal. Speech on Radio 4 sounded very pleasant though, as the sound of the tuner lent voices a pleasantly rich tone, which is welcome at this price.

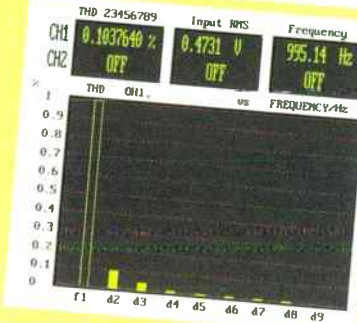
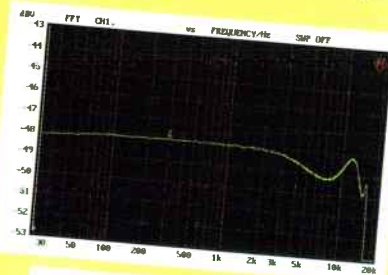
Given its performance on FM, the performance on the better-sounding DAB stations was better than I expected, however. This could be explained by the tuner's slightly fatter sound covering up some of the high-frequency audio artefacts that the brighter-sounding tuners would uncover. The tuner did little to help the duller sounding DAB music stations, though. Overall then, it's a very attractive, easy to use and well designed bit of kit, but the sound wasn't quite up to the standards of most of the other DAB/FM tuners here. Good at the price, all the same.

MEASURED PERFORMANCE

The TU-1800's vhf section is very similar to that of the TU-1500, also in this issue. In particular, the same filter mistreatment inserts a slow roll down in higher frequencies to add a little warmth to the sound, something that has served Denon well in the past, giving the budget TU-260L a well deserved reputation that made it first choice for many first time buyers. The 1800 does, however, produce less distortion than the TU-1500, but not by a degree that would be easy to notice, I would have thought. Neither hiss nor sensitivity were any better, so the TU-1800 isn't a world away from its sibling. With distortion levels down to less than 0.1% at 50% modulation and around 0.2% at full modulation this is a tuner that will sound clean, but since most tuners produce predominantly second harmonic in any case, which sounds innocuous, I am not sure this is much of a real life issue.

The TU-1800 had a good measured performance, its strong point being very low distortion. Like the TU-1500 it will have a warmish balance with good bass, NK

Frequency response	9Hz-14.5kHz
Stereo separation	41dB
Distortion (50% mod.)	0.1%
Hiss (IEC A)	-70dB
Signal for minimum hiss	0.6mV
Sensitivity	
mono	mutes at 11µV
stereo	34µV



VERDICT £

Great design and fine facilities, with strong DAB sound, but FM performance is average here.

DENON TU1800 £190

Denon UK
+44 (0) 1753 680568
www.denon.co.uk

FOR
- easy of use
- attractive

AGAINST
- FM sound



PURE DRX-702ES £199

This DAB, FM and AM tuner can now be bought for as little as £200. It uses a Frontier-Silicon chip and a 24bit/192 kHz stereo DAC for DAB reception and DAB audio output, respectively, while FM is implemented using analogue circuitry. I find the slim front-panel with the blue display at its centre very attractive, but the latter gets progressively harder to read the wider the angle you view it from, which isn't an issue for the higher-contrast white or green text on black background displays. One feature that I liked that only the Pure and Sony tuners have is that you can perform an autoscans on FM to find all the stronger FM stations, and it then allows you to cycle through the list of station names in alphanumerical order just like you can on DAB.

The Pure provides 99 presets for both DAB and FM, and entering and recalling the presets is very simple using the remote control. Also, cycling through the list of station names on both DAB and FM was very quick, with the display changing almost instantaneously after you've pressed a button on the remote control, and keeping your finger pressed down on the button cycles rapidly through the list. The remote control was responsive, but the up/down rocker button that you press to scroll through the list of stations was small and slightly fiddly to use.

Connectivity on the rear panel includes separate aerial connectors for DAB, FM and AM, coaxial and optical SP/DIF digital audio outputs, an optical RDI data output, and as well as the normal phono outputs it has a pair of loop-through phono inputs, which allows you to loop the output of an FM tuner

through these inputs if you've run out of input connectors on your amplifier. Reception quality using the Frontier-Silicon Chorus DAB chip was good, but FM reception was a little poor in comparison to most of the other tuners in the group test.

SOUND QUALITY

As my experience of FM on Pure's portable radios hasn't been particularly good up to now, I was surprised at just how good FM was on this latest sample I tried. When the broadcast audio source was clean and of high quality, such as classical and world music on Radio 3, the Pure sounded excellent and delivered a highly accurate and lively rendition. On the other music stations on FM, the DRX-702ES produced a bright, lively and open sound with bags of

energy. In comparison to the tuners I've ranked above it, however, the slightly brighter sound of the Pure occasionally made it sound a touch harsh and thin, and the Marantz in particular produced a more authoritative and dynamic sound. Still, this shouldn't detract from the excellent overall performance.

The Pure also worked very well on DAB, its vivid sound benefiting those stations that sound a little dull, as well as its open delivery complementing the better sounding stations. Speech on Radio 4 sounded precise and open on both DAB and FM and was a pleasure to listen to. Overall then, the Pure DRX-702ES is a highly capable tuner, with very good sound quality on FM, also makes the most of stations on DAB. At under £200, it gives a lot of sound per pound.

MEASURED PERFORMANCE

The vhf section has no mpX filter. As a result it has extended treble, to 18kHz no less, but also a lot of pilot tone output at 19kHz, at -42dB more than the others in this group. Upper treble is a little peaked too, so the DRX-702ES will sound brighter than rivals; perhaps Pure were trying to subjectively match it to DAB, so the two do not seem too different, as switching from DAB to VHF/FM may otherwise cause consternation.

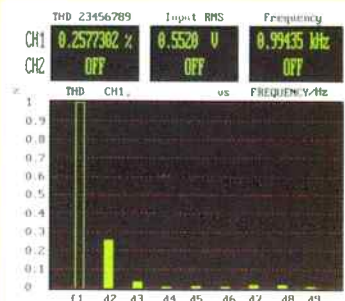
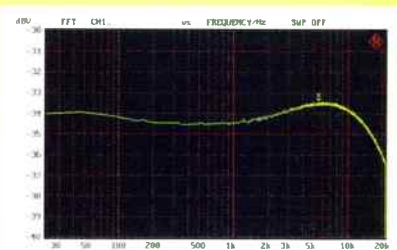
The DRX-702ES suffers a little more hiss than the best rivals, but this is only likely to be audible during Radio 3 silences. Distortion levels were acceptably low right up to full modulation and there is plenty of output too at 1.4V, so matching will not be a problem.

Sensitivity was on the low side, so this tuner is not ideal for weak stations.

The Pure DRX-702ES isn't the very best of vhf tuners, but gives decent results all the same. NK

Frequency response 5Hz-18kHz
Stereo separation 36dB

Distortion (50% mod.)	0.25%
Hiss (IEC A)	-67dB
Signal for minimum hiss	1mV
Sensitivity	
mono	95µV
stereo	12µV



VERDICT ●●●●£

Well made, ease to use and sporting very good sound on both FM and DAB, this is an excellent budget buy.

PURE DRX-702ES £199

Pure Digital

+44 (0)1923 260511

www.pure-digital.com

FOR

- fine sound
- ease of use
- attractive

AGAINST

- FM reception quality



HARMAN KARDON TU970 £250

This £250 tuner offers DAB, FM and AM, with RDS on FM. The TU970's front panel consists of black rigid Perspex, which is separated from the silver-finished metal beneath by a thin line of buttons. The name of each button is illuminated in royal blue using backlit LEDs, and on the right side the usual tuning knob has been replaced by a tuning ring with the same royal blue coloured light illuminating the inside of the ring. At the centre of the black Perspex is a two-line white-on-black text display. I found the overall effect to be the most attractive of the DAB/FM tuners in this group test. The tuner provides 30 presets on FM but, oddly, only 10 presets on DAB.

One area of operation where this tuner performs poorly, however, is the time it takes to scroll through the DAB stations using either the remote control or by turning the tuning ring on the tuner. I timed how long it took to zip through the whole list of around 35 DAB stations and it took no less than 1 minute 11 seconds on the Harman Kardon, whereas it took just 5 seconds on the Marantz! In contrast, using the remote control to scroll through the FM presets was much quicker, although it still wasn't as fast as the Marantz or Sony in this respect. The rear panel sports optical and coaxial S/PDIF digital outputs, phono outputs and separate connectors for DAB, FM and AM aerials.

Reception quality on both the Frontier-Silicon Chorus DAB chip and on FM was excellent, and it had the best reception quality out of all the DAB/FM tuners in the group test. It was interesting that it provided better DAB reception than the other tuners that also used the Frontier-Silicon Chorus DAB chip, and this shows that there's more to

DAB reception than just the chipset itself, such as RF shielding. On the DAB multiplex I can receive that has the weakest signal, once the TU970 had locked onto the multiplex signal there was no hint of the bubbling mud that accompanies poor DAB reception, whereas all of the other tuners suffered from this to a greater or lesser extent.

SOUND QUALITY

On FM, the tuner wasn't as bright or lively as most of the other DAB/FM tuners here, and instead it had a fuller and more mature sound. In particular, the TU970 delivered a commanding and detailed performance of both classical music and 'The Late Junction' on Radio 3. The tuner was well suited to Classic FM as well, delivering a rich and smooth sound, and speech on Radio 4 was very pleasant to listen to for

the same reasons. The sound of the Harman Kardon was less well suited to the pop, rock and middle-of-the-road FM stations, though, as it lacked the sparkle and dynamism of many of its DAB/FM counterparts, delivering a slightly over smooth performance.

Unfortunately, despite the very good reception quality on DAB, the tuner's softer sound didn't do the sound quality of DAB stations any favours, and it was one of the worst performers here, where it sounded vague and unengaging. Overall, the tuner's pleasant delivery of classical music and speech radio along with its excellent reception quality on both DAB and FM were marred by slightly lacklustre delivery on the other music genres on both bands and a slow, obstructive user-interface. An interesting design for sure, with some obvious strengths, but not a consummate all rounder.

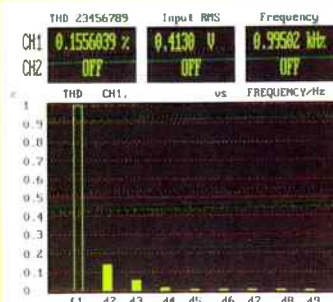
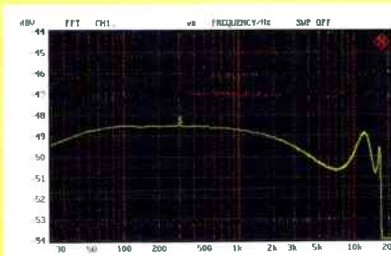
MEASURED PERFORMANCE

Our frequency response analysis shows the TU 970 has a peculiarly humped characteristic, with both low bass and high treble roll off. There is a -1.5dB dip at 7kHz. This will make it sound warm and a little light in its balance. Above 10kHz there are the classic ripples of mp3 filter mistreatment, likely due to component variation - not confidence inspiring. However, although this suggests standards are low, the TU 970 managed well elsewhere. It produces little hiss, at -72.5dB IEC A weighted it managing better than most. It is sensitive too. The stereo IHF -50dB sensitivity figure was 38uV and with mono it achieved the same result with just 3.4uV from the aerial.

Distortion at full modulation was an acceptable 0.5%, mainly second harmonic. This fell to 0.15% at 50% modulation, again second harmonic as our analysis shows.

The TU 970 isn't too accurate in basic tonal balance, but its warmish sound will not be unpleasant, especially as all other parameters measure well. NK

Frequency response	18Hz-13.8kHz
Stereo separation	48dB
Distortion (50% mod.)	0.14%
Hiss (IEC A)	-72.5dB
Signal for minimum hiss	0.85mV
Sensitivity	
mono	3.4µV
stereo	38µV



VERDICT

Great FM and DAB reception, but soft and indistinct sound plus an obstructive user interface detracts.

HARMAN KARDON
TU970 £250
Harman Kardon
www.harmankardon.com

FOR
- DAB and FM reception
- attractive design

AGAINST
- sound quality
- slow operation



MARANTZ ST7001 £275

This covers the DAB (Band III and L-band – the latter only being used in Europe), FM and AM bands, and is currently priced at £279.

The attractive front panel consists of brushed metal with rounded corners and a two-line bright white text on black background display at its centre. To the right are three traffic light coloured LED indicators and a tuning knob.

On RDS FM, both station name and scrolling text are displayed, and a multitude of text options are available on DAB. Stations on DAB can be sorted alphanumerically, by multiplex order or programme type (PTY). There are 100 preset slots for each of DAB and FM. This was the joint easiest-to-use tuner in the group test along with the Denon, due to its excellent responsiveness from the well designed remote control – the station name on the display changed instantly after a button had been pressed.

On the rear panel there were separate aerial input sockets for DAB, FM and AM, along with optical and coaxial digital outputs, phono outputs and an RDI digital optical output for transferring DAB data from the tuner, although there are no devices available that support this yet. Reception quality on FM was good, while Digital Radio reception on the TBK Electronics DAB module was average, with occasional bubbling mud on the weakest of the DAB multiplexes I can receive. Reception was good on all of the other DAB multiplexes I can receive, though.

SOUND QUALITY

Sound quality on the ST7001 is stunning for its price. The best sonics are of course on FM, and on this band the Marantz delivers a vibrant, open and

dynamic sound, with a sharp – but not overly so – top end and a tight bass. Overall, the sound was punchy yet precise. Most of the DAB/FM tuners also provided a similarly lively and precise sound, but where the Marantz stood out was with its authoritative delivery and its ability to give instruments more vitality. Radio 3 was exquisitely detailed, with a very lively and engaging sound. Classic FM sounded similarly impressive.

The Marantz also performed very well on the rock, pop and middle-of-the-road (MOR) FM stations, where it had an outstanding ability for squeezing bags of detail from the signal and lifting instruments out from the general soundstage. Its inherent dynamic sound made some of the more mediocre sounding FM stations

more listenable than on some of the other tuners, giving them a vitality that is often otherwise not present. Speech radio was very sharp, too, with the presenter's voice standing out from the stereo image.

On DAB, the Marantz gave a refined, detailed and open delivery of Radio 3 and Classic FM, albeit lacking the precision and vitality apparent on FM. On the other DAB music stations, the Marantz's dynamic and powerful sound allowed the better-sounding stations to shine and it greatly benefited the poorer sounding stations as well. Overall, the excellent dynamic sound quality on FM, very good performance on DAB and its ease of use makes this Marantz a top class tuner that is very highly recommended.

MEASURED PERFORMANCE

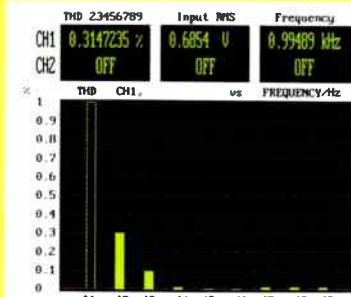
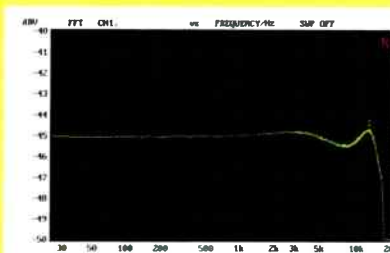
The slight peaking seen in this tuner's pilot tone filter extends output up to 15.5kHz, a high upper limit; the best filters get no further than 16kHz. With level output at low frequencies too this gives the ST 7001 one of the widest audio bandwidths within the group. It ran flat from 12Hz to 15.5kHz within 1dB, as good as it gets from VHF/FM. So although the Marantz isn't as flat as the Myrrad or Creek, in practice it is still an effective rival, as our response limits are quite tight at 1dB and the published analysis is of critically high resolution from very accurate RF test equipment.

Distortion at full modulation was on the high side at 0.8% (L+R) and similar on the difference channel. At 50% modulation this fell to 0.3% or so, acceptable but still worse than most rivals. There may be a little more congestion in the sound than other tuners as a result, especially with stations using heavy compression and high modulation to sound loud.

With hiss at a low -70dB (IEC A weighted) at full quieting, and this achieved down to 0.6mV from the aerial, the ST 7001 should appear satisfactorily sensitive in use.

The ST 7001 measures well, except for distortion, where it lags rivals. NK

Frequency response	12Hz-15.5kHz
Stereo separation	44dB
Distortion (50% mod.)	0.3%
Hiss (IEC A)	-70dB
Signal for minimum hiss	0.6mV
Sensitivity	
mono	22µV
stereo	42µV



VERDICT ●●●●● £
Superb FM sound allied to an ability to get the most from DAB, makes this a true audiophile bargain.

MARANTZ ST7001 £275
Marantz
+44 (0) 1753 680 868
www.marantz.co.uk

FOR
- excellent sound
- makes most of DAB
- ease of use

AGAINST
- nothing

ARCAM



ARCAM DT91 £450

The most expensive hybrid (DAB/FM RDS) tuner at £450, the Arcam's also notable for being the only design that implements FM using Software Defined Radio rather than traditional analogue circuitry, so the same 24-bit Wolfson DACs are used for the audio from both DAB and FM. The S/PDIF digital audio output can also carry either analogue or digital radio signals, which is also unique. The front-panel has the archetypical clean Arcam look, with the black strip inset into the silver panel. Central to the front panel is a large tuning knob, and to the right is a two line high contrast green text on black background display that was the most attractive of all in the group test.

Using autotune to change FM stations was slow due to the tuner stopping at too many stations along the way, and scrolling through the list of DAB stations using the remote control also could have been quicker. Using the tuning knob on both DAB and FM was much quicker and easier than using the remote control, however. The tuner provides 16 presets in total that must be shared between both DAB and FM, and each preset can store either a DAB or an FM station. Storing the presets was easy, but the idiosyncratic way of recalling the higher numbered preset stations was a little confusing, although you might get used to this over time.

The DT91 provides two pairs of phono sockets on the rear panel, along with optical and coaxial S/PDIF digital outputs and a single 50 Ω F-type aerial socket that you have to use for both DAB and FM aerials – Arcam recommend the use of an RF 'combiner' to combine the signals from both DAB and FM aerials. Personally, I prefer to have separate sockets

for DAB and FM aerials. FM reception quality was disappointing – I'll go into more detail below. DAB reception was also relatively poor, as it had the most difficulties receiving the DAB multiplex with the weakest signal in my location, although there were no problems with reception on any of the other multiplexes.

SOUND QUALITY

The (software defined radio) FM section had a sharper sound than the others here – it was always clinical and could be slightly harsh at times, but it was also very detailed, open and lively. It also had the ability to extract slightly more detail from the signal than most of the other tuners when the audio wasn't particularly clean. An interesting performance, then! A negative consequence of receiving FM digitally on the Arcam, however, was the 'digital noise', which consisted of a high-frequency whine

combined with a fizzing sound. The high pitch of the digital noise made it very grating to listen to, and it was far more intrusive to the listening experience than the analogue hiss you hear on weaker FM stations. It was most perceptible on Radios 3 and 4, which all of the other tuners received with a quiet background or very faint hiss at most. Hopefully the second generation of software-defined radio FM receivers will solve this problem.

In complete contrast to its performance on FM, the Arcam's performance on DAB was absolutely excellent, providing a detailed, open and vibrant sound, which greatly benefited the sound of all DAB stations. As it bettered all the DAB designs here, this is very probably the best way to receive DAB there is right now, which makes it more of a shame that there's a problem with the digital noise on FM – this blots an otherwise perfect copybook.

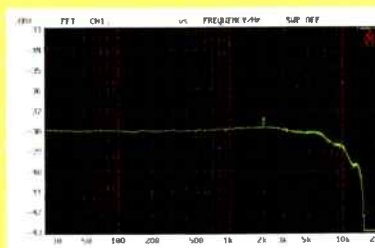
MEASURED PERFORMANCE

This is a "digital" vhf/fm tuner, one that turns the basic radio signal into digital before number crunching it into shape in a fast processor, a technique known as Software Defined Radio. The convertor results in a lot of noise, no less than -58dB in this sample, as bad as analogue cassette; an earlier sample managed -63dB, so there seems to be considerable variation here. The distortion spectrum was extended and digital in nature, but the frequency response rolls down to help give a softer sound. Channel separation was very high at low mod. levels, if not at full modulation. Sensitivity was very high too, if not as high as the earlier sample.

The DT-91 will display audible hiss no matter how much signal it gets from the aerial. The distortion pattern can make it sound a tad glassy too. Otherwise it works well. NK

Frequency response 10Hz-10.3kHz
Stereo separation 36dB
Distortion (50% mod.) 0.25%

Hiss (IEC A) -58dB
Signal for minimum hiss 0.06mV
Sensitivity
mono 1.9µV
stereo 27µV



VERDICT

A handsome tuner with excellent DAB and fine FM, although sensitivity could be better.

ARCAM DT91 £450

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

FOR
- fine DAB performance
- looks

AGAINST
- poor FM reception
- user interface

Walrus



11 New Quebec St, London W1



Shanling

Some of the most stunning products in recent years have come from this small specialist manufacturer, from the flagship limited edition CD-T300 "Omega Drive" at £3999 to the humble but extremely popular (and superb sounding) CD-T80 at only £650. All their products use valves for a natural but exciting sound, and, in this age of "plastic" products, all feature sturdy metallic construction finished to a very high standard irrespective of cost.



Solid Tech Radius

It looks like other smart modern stands do, until you realise that virtually concealed between shelves and frame is a cunning and flexible adjustable suspension system which really does isolate individual components from each other, and from the outside world!



Solid Tech

What we really don't need is another brand of equipment stand! Agreed, unless it's very special as we believe Swedish made Solid Tech to be...

Solid Tech Rack of Silence

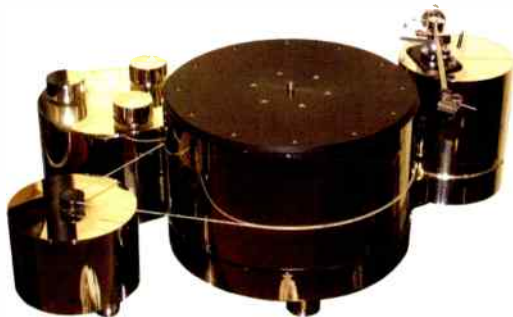
The ultimate in equipment isolation. No solid shelves to resonate, and up to three stages of isolation.

A totally modular design which can be expanded as your needs grow. There is no better stand.



Hørning

The Hørning SATI Ultimate Transference turntable, only just available in the UK shows what can be achieved by a dedicated specialist manufacturer when not constrained by price. As well as being highly exclusive (it is only possible to make very small numbers) this turntable is one of the finest we have ever heard, having a neutrality coupled with incredible detail retrieval which has to be heard to be believed.



The Hørning Sati 300B amplifier (one chassis is the amp, the other the power supply) is equally impressive. Even jaded cynics (like ourselves) will be hugely impressed by the refreshing neutrality (a Hørning trademark) together with the insight available into the performance. We really are very pleased to be able to demonstrate these superb products!

A2T

We have the amazing A2T Mezzos on demo now. These beautiful French made compacts (with a studio pedigree) offer wonderful detail levels whilst sounding utterly natural at a price lower than the performance would suggest. These just might be the answer to all your speaker problems!



Funk Firm

The new Funk V (V means Vector, not "five") is a stunning looking and affordable turntable (£750 without arm) that some of us have been waiting eagerly for since the sad demise of the designer's previous company, Pink Tr..! Looks are striking, performance is stunning, well worth waiting for. Come and hear it now whilst it's still easily available.



What else is Hot right now?

Stirling Broadcast 3/5a, marginally updated version of the classic BBC monitor
Tannoy Autograph Mini, a delightful scaled down Autograph, only 14" high!
Graham Phantom tonearm, proving itself one of the top arms in the world
Audio Aero's latest CD and SACD players are absolutely stunning
Bocchino cables, outrageous interconnects from the well known plug manufacturer

We deliver by Citylink 24hr service (subject to stock availability), and internationally by DHL or TNT.
Major credit/debit cards accepted, even known to take cash on occasions!
Please visit our website for more info (even if we don't update it often enough!).

a2t
air tangent
amazon
amplifon
apollo furniture
argento
audible illusions
audio aero
audio physic
black rhodium
bocchino
breuer dynamic
brinkmann
cartridge man
cawsey
clearaudio
consonance
decca london
duevel
dynavector
ear yoshino
funk firm
goldring
graham (tonearms)
graham slee
hadcock
heart
heed audio
horning
hyperion
incognito
isolda
jadis
kr electronics
klimo
koetsu
lavardin
lyra
magneplanar
mcintosh
michell engineering
morch
musical fidelity
nordost
nottingham analogue
opus 3
origin live
ortofon
pro-ject
rega (turntables)
revolver
ringmat
roksan
shun mook
shanling
shelter
sme
solid tech
something solid
sonneteer
spendor
stax
stirling broadcast
sugden
sumiko
tannoy
tci cables
tom evans
townshend audio
transfiguration
transparence
trichord
van den hul
voodoo
wireworld
xlo

tel: 020 7724 7224 fax: 020 7724 4347 contact@walrus.co.uk www.walrus.co.uk



CREEK CLASSIC £550

An FM/AM/LW tuner with RDS on FM, this is part of Creek's newly tagged 'Classic' range of products. The tuner costs £550 (superfi.co.uk), which makes it the second most expensive here. It's solidly built with a brushed-metal silver front-panel, with six buttons to the left of a green text on black background display. To the right of the display is a tuning knob and an on/off switch on the far right-hand-side with a power LED above it. The instruction manual only consists of two sheets of A4 paper stapled together, and the RDS feature doesn't have the scrolling text that most of the tuners offer.

When setting up the tuner, an odd feature of the Creek is that the brightness of the display varied according to how weak or strong the signal is of the frequency you're tuned to. This can also make searching for stations slightly confusing, because when there is no signal present the display goes dim, so it is quite difficult to see the frequency. Also, entering stations into the presets wasn't as easy as it could be. However, navigation between stations is very quick and simple using the responsive remote control, and for all receivable stations the green LEDs are very bright and the display is easy to read from a distance or from an oblique angle.

Overall, I found the combination of the six buttons, the relatively small, well-proportioned green-on-black display and the brushed-metal finish of the front-panel to have the best aesthetics out of all of the tuners. The Classic also provided the best FM reception quality out of all of the tuners in the group test. The performance of the tuner on MW and LW was as can be expected for these bands.

SOUND QUALITY

The sound quality of the Classic was phenomenal - a very highly defined sound with an overall bold, dynamic and masterful delivery. It provides a step-change in FM performance compared to all of the DAB/FM tuners in the group test. On classical and world music, the delivery was exquisitely detailed, very precise, energetic and an enthralling listen. Although not up to the standard of the Creek, some of the DAB/FM tuners in the group test were also able to provide a highly accomplished sound on Radio 3, but where this tuner really stood above the DAB/FM tuners was its performance on the pop and rock stations. The big, bold and dynamic yet highly detailed sound of the Creek provided an electrifying

delivery, and it even came close to matching the Myryad's performance.

Possibly the most impressive thing about the Creek was its ability to squeeze as much detail from the signal and deliver a dynamic sound when presented with audio that the radio stations hadn't engineered very well. In contrast, some of the DAB/FM tuners occasionally floundered when presented with such material.

Overall, the Creek Classic provides a step-change in sound quality compared to the best FM performance on any of the DAB/FM tuners, and unlike many of the other tuners in the group test, was very much an all-rounder, providing high quality across all music genres as well as on speech. This tuner comes very highly recommended.

MEASURED PERFORMANCE

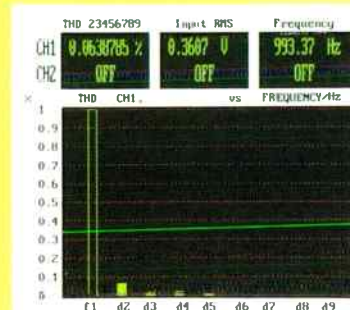
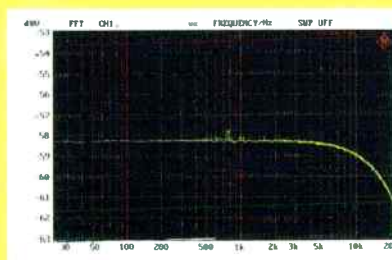
A strong feature of this tuner is its well controlled frequency response, quite obviously tailored to give a smooth, accurate sound. It runs flat from 20Hz to 11kHz (-1dB) our analysis shows, and is free from the perturbations seen in most rivals. Creek, like Myryad, tend to work like this, consistently achieving a good result, beyond even the Japanese these days. For not only is the Creek accurate, it also houses a quality vhf/fm chip set that provides ultra low distortion at 50% modulation, where thd measured around 0.07%, and at full modulation where it hovered at 0.1% - amazing figures. In view of this I was a little disappointed by the mediocre -68dB IEC A weighted noise figure, but all the same I would not expect hiss to be easily discernible even on Radio 3.

Full quieting (i.e. minimum hiss) was available down to 425uV from the aerial, a low value some indoor ribbons manage when close to a transmitter. The stereo IHF -50dB noise sensitivity was a good 34uV, but the tuner mutes at 5uV before the equivalent mono value can be reached.

The Classic lives up to its name. Measurement shows it offers a classic performance, common when VHF/FM was in its prime and high quality took

precedence over low price. NK

Frequency response	10Hz-11kHz
Stereo separation	34dB
Distortion (50% mod.)	0.05%
Hiss (IEC A)	-68dB
Signal for minimum hiss	0.4mV
Sensitivity	
mono	mutes at 5µV
stereo	34µV



VERDICT

Big, sumptuous, dynamic sound provides a step-change improvement over any FM/DAB hybrid tuners. Superb.

CREEK CLASSIC £550

Creek Audio
 ☎ +44 (0)1442 260146
 www.creekaudio.co.uk

FOR

- superb sound quality
- excellent reception quality
- looks

AGAINST

- nothing



VINCENT STU-2 £599

This interesting German built hybrid FM RDS/AM tuner sports a solid-state tuner section and valves for the audio output circuitry. One look at the Vincent's front panel and you know you're dealing with a quality piece of kit, the centrepiece of which is a glass 'porthole' window showing a valve behind it that can be illuminated to varying degrees (or turned off altogether) by a set of orange LEDs behind either side of the window! The overall effect is certainly, erm, individual...

The tuner provides 30 presets, although the method of storing/recalling preset stations is idiosyncratic. One feature I found useful that was unique to this tuner was that you could enter the frequency of the FM station directly. Searching in frequency using autotuning was also the fastest out of all of the tuners in the group test – this makes it a little odd that tuning by entering the desired preset number was so slow. The remote control on its own was a work of art. The case of the remote control is made of the same material that the silver front panel is made of and has small circular buttons. The very solidly built remote is quite heavy but well balanced, and it feels and looks much better than the plastic remote controls provided with the other tuners. Sensitivity of the FM reception was also very good.

SOUND QUALITY

Classical music on Radio 3 sounded luxuriant yet highly detailed and with a very open soundstage, making for a highly engaging experience overall. Jazz on Radio 3 was also extremely impressive, being smooth yet exquisitely detailed. On Classic FM, the tuner's mellow sound

was very pleasant to listen to. After the classical music stations, the velveteen sound of the Vincent was best suited to the radio stations playing MOR music, such as Radio 2, and its sound perfectly complemented the cool jazz and soul played on Smooth FM.

Delivery of the pop and rock music stations by the STU-2 was a bit of a mixed bag, however. The big but mellow sound of the tuner wasn't as well suited to the style of music these stations play, and although some tracks were very pleasing to listen to, rock tracks in particular, and loud tracks in general, were not handled as well as they could be, with the

tuner providing an overly rich sound. In particular, the Vincent is quite unforgiving when it is presented with audio that the radio stations haven't taken a great deal of care with (which is unfortunately a fact of life with many pop and rock stations), and most of the other tuners in this group test were more forgiving in this respect.

Overall, the impressive Vincent STU-2 provides superb sound quality on classical music and middle-of-the-road radio stations, it is gorgeous to look at, easy to use and it has the best quality remote control I've ever seen, but if you like rock or pop music then you'd be better buying one of the other tuners in the test.

MEASURED PERFORMANCE

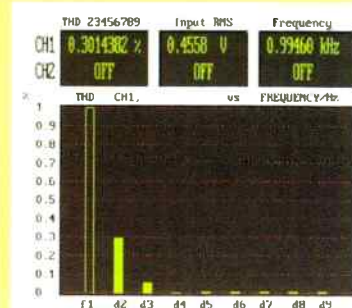
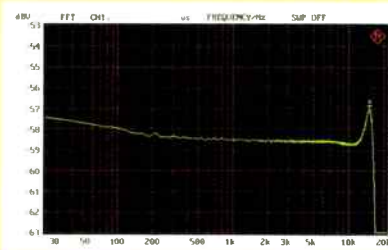
The unusual downward slope in this tuner's frequency response, amounting to a -1dB fall from 20Hz up to 200Hz, is enough to give the Vincent STU-2 a feeling of solid bass and good but not excessive warmth. The effect will be subtle, but that's best. An mpX filter kicks up sharply at 16kHz, or so it appears, but all the same at -45dB there was a fair amount of pilot on the output, if no subcarrier. In all the STU-2 has a wide measured frequency response and will likely sound obviously better balanced than the many of the tuners in this issue.

Distortion levels were reasonably low at 50% modulation, comprising mostly second harmonic in the mono sum channel, our analysis shows. Channel separation, again at full modulation, was also good. This is a fairly quiet tuner too, hiss measuring -70dB IEC A weighted. Like many modern tuners this state (full quieting) was maintained down to 0.6mV p.d. across the aerial input, before hiss started to rise. Consequently, the STU-2 will stay quiet even with modest aeriels. Ultimate (IHF) stereo sensitivity was good at 42uV for 50dB of hiss when receiving stereo.

The STU-2 should meet all expectations for sound quality. It should

have strong bass and a fulsome sound in use, with negligible noise. NK

Frequency response	11Hz-16.3kHz
Stereo separation	32dB
Distortion (50% mod.)	0.3%
Hiss (IEC A)	-70dB
Signal for minimum hiss	0.6mV
Sensitivity	
mono	11µV
stereo	42µV



VERDICT

Excellent sound quality on the classical and middle-of-the-road radio stations, but its sound doesn't suit rock or pop music

VINCENT STU-2 £599

Vincent Audio

+44 (0) 1702 601410

www.vincent-audio.com

FOR

- sumptuous sound
- fast tuning
- individualistic styling

AGAINST

- not suited to rock/pop



MYRYAD MXT2000 £800

As you'd expect from the most expensive tuner here, this very heavy and solidly built analogue-only device has a tall silver front-panel with a curved taper at the top and bottom and an attractive single-line royal blue text on black background display at its centre. The display also contains backlit red text indicators for stereo, RDS, tuning and the frequency band you're tuned to, and the silver-coloured metal strip inset at the top of the display is actually the on/off button, which is touch-sensitive rather than needing to be pressed, which gives the tuner an air of sophistication. The overall look of the tuner is attractive.

The tuner has space for up to 75 FM preset stations, and entering the stations into the presets was simple. One aspect of the user interface that could be improved upon was that it was far too sensitive – a slight touch of the remote control button or rotation of the tuning knob to tune to the next preset station would usually make it overshoot. Other than that, the user interface worked well and scrolling through the list of presets using either the remote control or the tuning knob was rapid.

On the rear panel the Myryad provided phono outputs, separate connectors for FM and AM aerials, and a pair of phono sockets for Myryad's proprietary 'Smart My-Link' for connection to a Myryad amplifier. Reception quality on FM was good, but sensitivity could have been better for a tuner of this price, although you would be wasting this tuner's talents if you don't feed it with a signal from a good rooftop aerial, if possible; failing that installing an aerial in the loft would be beneficial.

SOUND QUALITY

The Myryad displayed the best sonic performance on the classical music stations out of all the tuners in the group test. Classical music simply sounded more realistic on the Myryad than on the other tuners – all of the other tuners sounded more 'electronic' in comparison. The soundstage was also the most open and best defined by a significant margin, and instruments were very highly detailed, precise and well separated. The tuner's highly detailed sound and open soundstage also hugely benefited rock, pop and middle-of-the-road music stations. This was especially the case when the broadcast audio was clean

– i.e. well engineered by the radio station – as the tuner was able to deliver greater precision than all of the other tuners, with an excellent top end and tight bass. Speech also sounded excellent on the Myryad, with delivery of presenters' voices being pin-sharp and natural.

Overall, the Myryad provided the best sound quality of all the tuners in the group test as a result of its highly detailed sound and open soundstage. The only drawbacks were that sensitivity wasn't as good as it could be and the user interface was overly sensitive – but the most important factor is sound quality, and on that basis the Myryad wins outright.

MEASURED PERFORMANCE

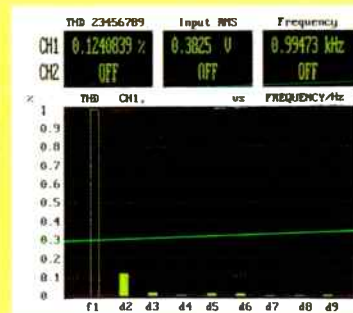
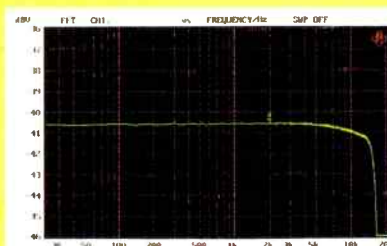
Myryad products usually measure well; the company don't use cheap, compromised modules. The smooth, extended frequency response of this tuner, flat to 15kHz without a filter ripple, is testament to that and will give the MXT2000 a balanced sound. It will seem a little brighter than those with falling upper treble, but also more detailed and smoother.

Distortion was low at 50% modulation but rose to around 0.4% or so close to full output (100% modulation). Channel separation was good and noise would have been low but for a peculiar low level tone at 500Hz. Spurious tones like this are usually a result of complex intermodulations from pilot or outside broadcasts, or overload. However, re-tuning, turning off the stereo pilot and altering signal strength made no difference. Consequently, the IEC A weighted noise figure is high at -65dB; it sank to -70dB once the tone was notched out by our R&S UPL analyser, and that's the underlying noise figure, but not what users will experience.

Sensitivity was good and output normal at a useful 1V.

The MXT2000 was the best of the group in measured terms, ignoring the peculiar tone afflicting ours. NK

Frequency response	10Hz-15kHz
Stereo separation	37dB
Distortion (50% mod.)	0.12%
Hiss (IEC A)	-65dB
Signal for minimum hiss	N.A. mV
Sensitivity	
mono	2.7µV
stereo	38µV



VERDICT

Deliciously smooth, open and three dimensional sound makes this a brilliant audiophile buy, and a worthy group test winner.

MYRYAD MXT2000 £800

Armour Home Electronics

+44 (0)1279 501111

www.myryad.co.uk

FOR

- superlative sound

AGAINST

- FM reception
 - over-sensitive user interface
 - price

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David Price - Hi-Fi World January 2006

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NUFORCE - THE CARTRIDGE MAN - GRAHAM SLEE - HADCOCK - ACOUSTIC SOLID - USHER AUDIO

This was an intriguing group test to do, not least because by sweeping the whole tuner market from under £200 right up to £800, we've managed to put all the different models available in proper context. Of course, the budget tuners aren't going to match the better ones, and so there's no implicit criticism of the cheaper ones for not matching the pricier designs. What it does do is let you know precisely how much improvement you'll get by spending more, and how the hybrid DAB/FM designs stack up against the bespoke analogue only products. It's a fascinating way to assess the respective value for money of all these bits of kit...

I'll rank the tuners in reverse order, based mainly on sound quality. As the best audio quality is on FM, the performance of the tuners on this band is the most important factor, although performance on DAB is also important where applicable.

At the bottom of the list is the Harman Kardon TU970. In its favour, it had very good reception quality on both DAB and FM, it was attractive to look at and it gave a pleasant delivery of classical music. But performance on the other genres of music was lacklustre on FM due to its relatively flat sound, and its sound did no favours to radio stations on DAB either. Another negative point was that it took a long time to scroll through the list of stations on DAB.

Next up is the Denon TU-1800. Like the Harman Kardon, it displayed slightly disappointing sound quality on FM, which was also as a result of having a quite flat sound, but it was better suited to the non-classical music stations than the Harman Kardon was. Also in its favour was that it performed better than the Harman Kardon on DAB, and it was the joint easiest-to-use tuner in the

using software-defined radio for FM reception, which made listening to Radios 3 and 4 very grating despite the fact that I don't have a weak signal on either of these stations.

Next is the Pure DRX702ES. I was surprised how well this tuner performed on FM. It provided a bright and lively sound that suited all genres of music, and the only slight criticism with the sound quality was that it could sound a little thin and harsh at times. Performance on DAB was also good, with its bright sound benefiting the dull-sounding DAB stations, and it was relatively easy to use. The only negative point against this tuner was that FM reception wasn't particularly good.

Ranked next is the Sony STSDB900. Like the Pure, the Sony has a bright, energetic and detailed sound that's well suited to all of the music radio stations. The main point it differs from the Pure is that it provided a slightly more detailed sound on FM and was less prone to sounding thin and harsh, although this does occasionally occur. FM reception on the Sony was also better than on the Pure and DAB reception quality was good, but not fantastic. Again like the Pure, the Sony's bright sound benefited the dull-sounding DAB stations. A couple of negative points against the Sony, however, were that the list of DAB stations couldn't be stored in alphanumeric order, and there is a question mark over the reliability of the user-interface software. Overall though, the Sony slightly outperformed the Pure in terms of sound quality, which is the most important factor.

Next up is the Marantz ST7001. What I liked about this tuner over the Sony was that instead of the bright sound the Sony displayed, the Marantz provided a more dynamic and authoritative sound, which was more engaging to listen to. FM on the

Ranked third overall is the Vincent STU-2. This tuner performed superbly well on the classical and middle-of-the-road music radio stations, with its velvety and mellow sound providing a smooth and luxuriant sound, although it wasn't as well suited to the pop and rock stations as most of the other tuners, however. Other positive aspects were that its design was very attractive and individualistic and it was the only tuner that allowed you to enter the frequency of the radio station directly, which I found to be the fastest way to tune into a station out of all the various methods possible.

Second best sounding in the group test is the Creek Classic. Its big, bold and dynamic sound provided an electrifying delivery of the classical and non-classical stations alike. The Creek also had the best FM reception quality and I considered it to have the best looks of all the tuners in the test...

Unsurprisingly however, the winner of the group test is the Myriad MXT2000. The tuner made classical music sound more realistic than its peers, and the sound quality across all genres of music was delivered with the most detail and the most open soundstage out of all the tuners in the group test. As a result, it comes heartily recommended for those who want the best FM sound possible, without going up to superfi designs such as those from Magnum Dynalab.

"the Creek's big, bold and dynamic sound provided an electrifying delivery..."

group test along with the Marantz.

Following the Denon is the Arcam DT91. It was difficult to know where to rank this, as it provides very good audio quality on most FM stations and it was the best performer on DAB. However, as mentioned above, the best sound quality is on FM, and the Arcam has a problem with noise as a result of

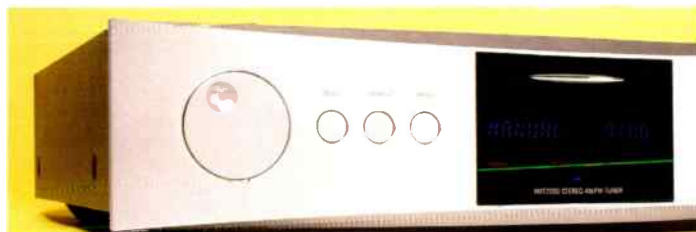
Marantz was especially good across all music genres, but it performed very well on DAB as well, making the most of the sound quality presented to it on the better and worse sounding stations alike. The Marantz was also the joint easiest-to-use tuner in the group test along with the Denon, as it had an intuitive and highly responsive user-interface.



Marantz ST7001 - best value for money choice



Creek Classic - best sound per pound by a mile



Myriad MXT2000 - best outright; superb, but expensive

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Tuner Surprise

One of the best kept secrets in the budget tuner world was Creek's CAS3140, which offered genuinely high end performance at an extremely affordable price. Who better then to tell its story, than designer Michael Creek himself...?

"I have had a genetic interest in radio, since my father got into consumer electronics when he was a boy, and then joined the RAF as a wireless operator and technician during World War 2. I made my first tuner while working my apprenticeship with him at the Wyndson Recording Company in 1973, which used a modular front end, RCA CA3089 IF and Motorola MC1310 decoder. It also had a Sanyo AM circuit and used a compact air-spaced tuning capacitor.

When Creek first started in 1982, my customers requested a tuner to match our first product, the CAS4040 amplifier, and thus was born the 3040 tuner in 1983. The 3140 replaced this, also a conventional non-synthesised tuner. It was analogue because, at the time, it was far more complicated to make a synthesised tuner. The simple chipsets

that make it easy now were not available then and required several chips and lots of interference, due to the complication with mixed frequency oscillators. There was also a lot of digital prejudice in 1983. Even if I had made it with a Phase Locked Loop 'digital' front end, consumers were warned against it by the press and trade alike...

The 3140 used a Philips three chip family solution. This enabled the 3140 to be built more easily than if I had used a combination of discrete circuitry for the front end and RCA

respect for Philips radio ICs which were developed in Germany in the Valvo factory. Unlike many other UK companies, Creek made the wideband front end itself. It was then, and is now, more common to buy in a module...

The great advantage of the TDA1574 was its buffered double balanced mixer and buffered oscillator output, which could be used with a conventional frequency counter to display the wavelength and frequency. It also had keyed automatic gain control by use of a

"although it is more common to buy in a module, Creek made the wideband front end itself..."

and Motorola chips for the IF and decoder, which was quite common at the time. I have a long held trust and

field strength output driving a pin diode to attenuate the RF input. In later models Creek also used its



regulated output voltage to improve the frequency stability. The 3140 used a discrete IF gain stage with three multi-pole 10.7 MHz ceramic filters to provide a very sharp wide band IF response. One of the filters was 180kHz which could be switched in and out as required for Dx operation, and the other two were 280kHz types for good stereo separation.

The TDA 1576 IF was particularly good as it produced very little distortion with a single quadrature discriminator coil, although the 3140 used two, to fine-tune the pass band. It also produced DC reference voltages to connect to the stereo decoder to smoothly blend the left and right channels when the signal to noise was poor. The TDA 1578A decoder was probably the best available at the time. It used a pilot cancelling system of rejecting 19 and 38kHz tones, which meant that it had excellent pilot rejection and could therefore work easily with a first filter frequency at 26kHz, which meant it could reach 19kHz before rolling off, which was a significant sonic benefit.

The 3140 was designed to be as simple as possible to use, so it included some hidden features such as variable display brightness to indicate maximum signal strength and a ten-turn potentiometer to tune

the four stage vari-cap diode tuning circuitry.

In 1986, Creek changed the colour of its front panel printing to green on black and the logo style was also changed to the type used today. At the same time, the 3140 was updated to the T40. We changed the position of the tuning knob slightly to line up with the volume control on the matching 4040 amplifier; otherwise there was little or no electrical difference, just cosmetic. Later on, the T40 was modified to improve the tuning stability, by using the in-built band-gap reference diode in the front-end together with a better AFC circuit that was temperature compensated differently for one each end of the dial.

Sales performance of the Creek tuners was never as strong as the amplifiers; the rule of thumb then was four amplifiers to one tuner sale. If memory serves me correctly, the total 3140 sales, together with the earlier 3040 and later T40 combined was about 10,000. In 1984 we were regularly making 500 per month. I think the one tuner I have the most affection for was the 3140, but would have to say that the later Creek T43, which also used a newer Philips chipset but had a built in PLL, and was operated by a microcontroller sounds better and of course doesn't

drift. It is the daddy of the current T50 and Classic Tuner we now make.

I'm not an expert on other makes, but I know there were many Japanese and American tuners that produced excellent performance, especially if they used open vane capacitors with up to six tuned circuits for good selectivity. Valve tuners are especially good when it comes to overload margin in the mixer. I always dreamed of making a six tuned circuit FM tuner using a valve RF and IF and semiconductor decoder. Unfortunately, I never found the time and now the demand for FM is so small it would be a commercial flop, more's the pity!"

BUYING

If you're after serious radio sound for peanuts, then Creek's 3140 is peerless. Unlike the Leak Troughline, it's modern enough to work straight out of the box, with no need for new decoders or huge aerials, but it still gives a taste of that classic tuner sound. It's very warm, smooth, open and dimensional, but detailed and defined too. The downside is noise – you'll need to be reasonably near a transmitter if you're to get away with a 'pinch of wet string' for an antenna, otherwise there will be some hiss intrusion. Either way, a decent four element roof or left aerial will work wonders. The 3140 is an amazing bargain secondhand – excellent boxed examples can be had for under £100, which is a lot of sound per pound. DP



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Alternative



TIVOLI ISONGBOOK £269.99

We all know the Tivoli story – the Model One pretty much single-handedly revived the table radio market several years back. It was beautifully designed, well made and just did the job with the minimum of fuss. The iSongBook is a sort of ‘iPod convergence’ product, and although definitely not like a Model One, it’s still quirky, charming, impressive and unmistakably a Tivoli.

First, build is a little disappointing. It’s not bad by any stretch of the imagination, it just looks and feels a little plasticky. Still, it is not flimsy, and all the bits (knobs, buttons, etc.) seem like they’ll last the distance. What you can’t help being impressed with is the design. Essentially it’s an FM/AM analogue radio, which has an additional stereo speaker that clamps in place if needed, or indeed can be cited several metres away to really fill a room with sound. The cable of this retracts inside the auxiliary speaker, so it’s all really neat and easy to live with, however you choose to use it (or not).

On the other side of the iSongBook is a little hatch which swings down to reveal an iPod dock. My Nano just slotted straight in, but for those with older Pods, there’s a host of docking adaptors supplied. The radio itself has a central selector switch which gives the choice of OFF, FM, AM or IPOD (or aux). When switched to iPod, the aforementioned digital audio portable charges in situ, and is fully remote controllable via

the supplied credit-card type remote. Round the back, there’s a battery compartment for six AA batteries; if rechargeables are used (they don’t come as standard), then the iSongBook will automatically recharge them. Playing time is a useful fifteen hours or so. The radio has a large, somewhat cheap looking non-alphanumeric LC display with switchable backlight. Five presets are available for AM and FM, plus an alarm, a sleep timer with a 20 minute countdown, and a digital volume knob that runs from 0 to 30.

The joy of the iSongBook is that it works with no fuss, and sounds really rather good as portables go. There’s a decent, out-of-the-box sound, no artificial bass boom and a crisp, clean midband. Place the extra speaker about a metre away, push both it and the iSongBook up against a rear wall, and even those used to high end hi-fi will find it perfectly listenable. It’s not brilliant, but it gives, clean, smooth, couch sound at surprisingly high volumes. True, it’s a little pricey, but it’s a great crossover product that’s very endearing and yet effective all the same.

SONY SRF-S84 £39.95

If you’re going to have a personal radio, then you might as well have the smallest, which is where all the DAB designs, even from the kings of miniaturisation themselves – Sony – stumble and fall. Compared to the SRF-S84, every single DAB personal yet made feels somewhat akin to the latest Nokia mobile in the palm of your hand up against one of those bizarre, massive eighties

brick-like contraptions. In short, this baby AM/FM personal is brilliantly useable, whereas even Sony’s latest Digital Radio equivalent isn’t.

There’s nothing magical here – three simple figures form the equation. First is the price, which can be as low as £29.95 (from www.simplyradios.com), although your local Sony centre will charge you a tenner more.

Second, there’s the small matter of its weight, which is a sylph-like 59g, and third is diminutive dimensions – it’s the radio equivalent of Kate Moss at 425x80x165mm. Half decent headphones are supplied, but you’d do well to invest in a pair of Sennheiser MX550s.

The radio is made in cheap plastic, and it scratches easily, or the paint just rubs off (who cares, it’s £29!), so don’t go thinking you’ll be using this for the next twenty years – indeed you’ll probably lose it out and about some day soon and have to buy another, but that’s what happens in life on the road. The key point is, it works very well, gives decent sound and is cheap, tiny and ultra convenient. It takes radio out on the road in a breezy, fuss-free way – letting you enjoy sporting events, plays, music or whatever else is your cup of tea, whilst walking, running or commuting. At this price, who could ask for more?



Music

For many, the joy of radio is more than just the choice of content it offers, but the listening flexibility it affords. David Price tried four ways of tuning in...



PURE OASIS £119.95

As a self confessed radio-head, I think this is the strongest thing Pure has done since the original Evoke-1. What we have is, essentially, a very basic, bog-standard DAB-only radio, but housed in a case that makes it brilliantly portable and therefore suitable for everything from picnics to garden parties – and thanks to its clever design, rain never stops play.

Yes, the Oasis is waterproof, or at least showerproof, and comes wrapped in a sturdy aluminium frame complete with rubber 'bump' strips. This latter detail is important, because you get the feeling you can sit the Oasis on your garden fence, stone wall or even dump it in the rockery, and it won't be damaged or scratched. Better still, it has a built in grab handle that's part of the radio's aluminium exo-skeleton, so you can lug it around and just leave it anywhere.

At 155x230x140mm, it's hardly the smallest of portables, but at least it's big enough for a decent 4" mono speaker which gives strong, punchy sound loud enough for any garden party. This radio really does

push out large volumes, and doesn't do what most rivals manage when the volume's turned up, which is to distort horribly and self-destruct their own loudspeakers. It's not the most subtle sound you'll hear – the iSongBook has much more finesse, for example, but it's still fine for an outdoor blast.

Three central main controls (volume, power, tuning) make it a breeze to use, and the rubberised buttons feel tough yet tactile. There's an auxiliary line input which is handy (although again the iSongBook is a far better sonic solution), and a headphone out. The green backlit two-line display looks classier than the Tivoli, although it's not exactly over endowed with information.

What really completes the Oasis is the inbuilt rechargeable battery, which gives nearly 15 hours between charges via the supplied mains adaptor. It means you can charge it up, move it around indoors and out, listen to radio all day and most of the night, then put in on charge and you're off again for another. Again, it's this 'accessibility' that makes this so good. If you want a tough, useable, flexible, go-anywhere ticket to Digital Radio, this is the one.

TANGENT DAB TABLE RADIO £169.95

As I've said, there's something so right about Tivoli's Model One. It set the blueprint for small 'table radio'; great styling, nice build, consummate ease of use. The problem was, when the world went DAB, how would Tivoli do it. The resultant Tivoli Model DAB wasn't as successful, in my view, offering the One's excellent analogue tuning dial user interface, plus a load of buttons and a digital display 'bolted on' to do DAB duties.

Well, this is where the Tangent comes in – it attempts

to do everything the Tivoli Model One did for analogue, but for DAB. It offers a very nice, Tivoli sized case with more modern, radiused edges, and the same high quality faux wood outer sleeve. The front panel is a model of Scandinavian simplicity; two large knobs (volume and tuning), plus a row of five presents, and a decent display. Basically, marry the Model One and Model DAB together seamlessly and you've got the Tangent.

The sound quality is good – big and strong and a nice rich deep tone (akin to the Tivoli Model One, in the sense that you almost get the feeling that the bass has been artificially boosted). It's not going to win any hi-fi prizes, but it's decently clean and detailed. On FM, the radio works very well, picking up Radio Four, for example, nicely and there's even a signal strength function on the display, if you press the appropriate button. On DAB, it's much of a muchness, which is to say that it's okay. The real issue is reception quality, and here the Tangent isn't especially sensitive – you certainly need to extend the telescopic aerial from where I am based, in Bristol.

Overall then, here's a great halfway house between DAB and analogue Tivolis – with a good feature set and a lovely clean user interface. Build is decent, if not outstanding, and the machine simply does the job it's designed to do with relatively little fuss. Indeed, it makes the latest rivals from Pure and Roberts look a little awkward, and should prove a big seller.





Warm Reception

Arcam has just replaced its celebrated AVR300 with the new AVR350 7.1 AV receiver. Will the addition of super-fast electronics, necessary to support switching the High Definition Multimedia Interface, compromise its sweet sound? Patrick Cleasby decides...

The recent launch of not one, but two innovative products in Arcam's DiVA range will have set Anglophile hi-fi enthusiasts pulses racing in the last couple of months. Regrettably the AV receiver side of the equation, the £1,500 AVR350, seems to have arrived slightly ahead of its companion universal player the £1,250 DVI 37 (with the heartening addition of SACD capability), but we will soon supply our findings on the player as well.

At keen Arcam retailers the AVR350 has been flying out without even reaching the demo room – it is apparently sufficient to demo an AVR300 and merely point out that for the extra £200 the new version adds the all important HDMI video switching capability. In the last couple of years HDMI has been in rapid ascendancy, driven by necessity, as all the HD Ready hoo-hah means that HDMI is essential if we wish to view premium HD content once broadcasters (and blue laser disc players) flick the HDCP (High bandwidth Digital Content

Protection) switch to on.

But although the HDMI standard can now support hi-res multichannel audio, Arcam echo the concerns of others over its quality (jitter is a significant issue for HDMI-borne audio) and have sensibly decided to eschew the concept of HDMI audio being extracted and used by the amp as the digital audio source for any HDMI-connected component (it would have cut down cable clutter though!). However, if the component is providing audio it is passed by the switching arrangement to the HDMI-connected output component (TV or Projector), although this has little bearing as you will almost certainly be running a mute TV with audio provided by the AVR350.

A careful reading of the excellent manual is to be recommended, if for no other reason than to gain an understanding of the plethora of routing permutations possible for both audio and video. If you're not sure, get it installed for you, but careful planning ahead of set-up will prevent many cable nightmares. Arcam's recommendation as far as audio is concerned is that every

component should have both analogue and digital connections made. This really only applies if you are intending to use analogue tape or VCR loops, or to use the two 'extra' (if you are running a 5.1 system) speaker outputs for a 'Zone 2'. This also applies to analogue video, for the same reason – provision is not made for the conversion to digital of analogue sources and there is no digital Zone2 routing.

My test set up is geared around digital connectivity with the option of component video for HD sources due to limitations on HDMI switching. The interface may be relatively young, but it is now all-pervasive in an HD and HDCP-protected world. I already have three HDMI capable components in my rack, and as the AVR350 only offers two HDMI inputs and one monitor output, to run everything HD I am forced to use the three-to-one component switching that has carried over from the AVR300.

As usual I employed a 5.0 Monitor Audio GR20 speaker set-up, a universal Denon DVD-A11 for disc-based playback, and for High



Definition sources I used a Telewest TVDrive box and a cheap 1080i upscaling Toshiba DVD player for true HDMI (as well as 1080i from the Denon's HDMI-adapted DVI-D output). Comparisons are made with reference to a Denon AVC-A1SRA receiver against material recently used on the same set-up.

SET UP

When you've set up a few AV receivers, ideally it should become second nature to switch the huge array of connections necessary for speakers, multiple hi-fi and AV components from one receiver to another, and then ferret out the menu settings necessary to perfect your multi-channel environment.

One of the joys of setting up the AVR350 is that it was ridiculously easy to do so. For me this consisted of connecting three HD-capable component video sources in (but also being able to try alternatively routing them via HDMI for the first time), along with their associated optical S/PDIF or coaxial digital connectors, with analogue interconnects for the high resolution multi-channel audio. Provision is made for 7.1 hook-up, which will come into its own if the true 7.1 capable High Definition disc formats ever catch on (or more pertinently if your wife ever lets the extra *2 / 3.1 / 5.1 speakers in the house (* delete where applicable)).

Once everything is connected up, the AVR350 has a relatively straightforward way of assigning audio or video connections to a source. If your set up is standard you should

find the existing connection labelling of DVD/ SAT/ PVR, etc., perfectly adequate as they are, but there is the flexibility to switch things around. This functionality is also available from the menu buttons on the front of the unit, which is important if you are running HDMI connections, as the on screen display does not work over HDMI.

From my point of view what is missing is the Denon-like easy option of flicking between analogue and digital audio connections for the same source at the touch of a button. But this is more of a 'tester' (or inveterate fiddler) consideration, and once set up this should be a configuration your other half could operate without confusion. The great CR-80 remote should aid that, as it is simply reprogrammable with remote codes from its own manual – even the Telewest TVDrive HD STB/ PVR works given the source Scientific Atlanta machine's code – record button and all (it's the highest numbered code TVDrive fans... there aren't many!). Individual button mapping on top of code settings is also possible.

A couple of hints – look up volume locking in the CR80 manual to make the volume button work for the AVR350 whatever component you are controlling (the default of volume working for each unit individually seems silly). Also 5.1 users should ensure that the Large/ Small speaker settings are correctly made, as the default seems to be all 'Small' which makes things weedy on a proper set-up.

"This is an AV receiver with the emphasis on the audio..."

SOUND QUALITY

So on to the main event – how does it sound? Well, in a word – brilliant. You know you're onto a winner when you use this for what it is designed for (TV viewing / listening) in place of your usual 'hub' (the AVCA1 SRA), and little things make you sit up and take notice unbidden. For my sins I am made to watch 'Springwatch', and with the TVDrive connected using analogue interconnects the jaunty Celtic folk of the theme just seemed to have more life, particularly in the bass area, than it had done previously



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Push Pull Integrated Amplifiers

There are two models in this range. The VP16 (12 watts per channel) and using 6V6 valves. Price £450. The MP60 (20 watts per channel). And using 5881 valves. Price £800 Both these models are very conservatively rated and will drive most loudspeakers.



Single Ended Integrated Amplifiers

There are three models in this range The MP15 (15 watts per channel) and using KT94 valves. Price £750 The MP2A3 (8 watts per channel) and using 2A3 valves. Price £850 The MP30B (ten watts per channel) and using 300B valves. Price £999



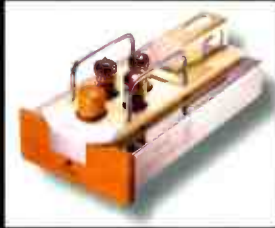
Headphone Amplifier

The MP5 is an amazing bargain. Not only is it a headphone amp but also a 13 watt integrated with a line stage input and a USB input. So you can link it to your computer or your MP3 player. Best of all it costs just £250



Preamplifiers

The SL2090A is a remote control line stage Price £450. The SL2000 is a phono preamp with a line stage and an mm phono stage. Price £425



Power Amplifiers

There are two mono block power. Power amplifiers in this range. VP20 amps are 18 watt push pull designs with outboard power supply. Price £750. The VP300B amps are 10 watt SE Designs with outboard power supply. Price £950



Reference Power Amplifiers

There are three SE Reference mono block amplifiers in this range. The DV Ref 300 B amps are 22 watt SE designs with 300B valves. Price £3250 The DVRef 845 are 36 watt SE designs with 845 valves. Price £2750 The DV Ref 805 amps are 60 watt SE designs with 805 valves. Price £3000



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by optical S/PDIF connection on the usual receiver. The customary Dolby ProLogic II option can also enhance the enjoyment of such programming or the odd football match by adding surround ambience convincingly.

Once you move onto deliberate testing listening, the AVR350's strengths become all the more apparent. Despite the relatively low bitrate broadcast MP2 stereo of the Razorlight video the sound was lively and full-bodied. Chord Prodac Pro coaxial digital connected CD playback from the DVD-A11 was a joy – the impossible complexities of 'Three of a Perfect Pair' were elucidated effortlessly by the Arcam, with Tony Levin's bass and Stick being given a wonderfully deep, warm and woody tone.

Moving onto Steve Reich's 'New York Counterpoint' the interlocking clarinets positively danced around the soundstage – sounding thick but retaining great detail and clarity, tremendously faithful in tone. Multichannel SACD too had an involving tone, the glorious analogue synths of Goldfrapp's 'Supernature' occupying the full frequency range with great character.

Steely Dan's 'Morph the Cat' is a test kit in itself – flawless CD is bettered by magical 24/96 stereo, surround is there if you want it, and for the first time (I have noticed) on a Warners DVD-A the DTS is the 24/96 variety. The Arcam can decode this via optical, and although it betters the core DTS, it still lacks the true pristine beauty of the MLP surround version. In general, surround music on the AVR350 cannot match the power and delicacy a behemoth amp can provide, but for half the price of the big beasts it is very respectable.

Finally, an AV receiver test would be pointless without a little bit of crash, bang and wallop, and the opening sequence of 'Tomb Raider' provided just that in Dolby Digital 5.1 – for me the multichannel analogue inputs just edging the receiver's own Dolby decoding, sounding less brash. The full bitrate Dolby 5.1 on the HD 'Planet Earth' however was only available via optical on the TVDrive, and High Definition with the enveloping surround is the only way to watch this landmark programme. The AVR350 coped quite happily with HDMI switching, with no sign of any corruption of audio fidelity – God bless the Arcam 'Mask of Stealth' technology, which screens the whizzing HDMI-related ICs from the (audio) business end of things.

Lastly, the FM tuner does indeed have a super sound, and merely



banging up the supplied ribbon antenna produced a signal which made Russell Davies's show sound just as good as it did through the TVDrive, more open, with only a slight hint of more noise – with a proper FM antenna it must sound excellent. It's certainly the best FM tuner I've ever heard bundled into an AV receiver.

CONCLUSION

Arcam are building on solid foundations here – the AVR300 was a class leader, and the AVR350 seems destined to follow it. First and foremost this is a surround sound receiver with the emphasis on the 'A' in AV – perfectly acceptable for creating a sweet sounding surround set-up, where it really comes into its own is with its musical, beguiling way with all flavours of stereo source – particularly good old analogue, and especially notable with its own fine FM tuner.

Not only that, but its neat and simple looks just tell of its innate class, and the operation and set-up, while not having all the bells and whistles of Japanese ingenuity, is adequate to provide a convenient watching and listening environment once correctly set up – aided in no small part by the really excellent CR80 remote. I find it difficult to imagine that any AV-interested audiophile would not be most content to base a system around the AVR350 as its hub.

Video-wise, it is simply not possible to compete in this marketplace without HDMI connectivity for video at least, and Arcam have integrated the interface with some aplomb here. They are also clearly hoping that the AVR350's new addition of HDMI will help it build acceptance faced with the Japanese

competition in the installer market place, and while UK product-favouring installers and customers may appreciate the unit's sleek attractiveness, some may find the HDMI switching to be a limiting factor at only two in, one out.

But the bigger Japanese behemoths which offer maybe one more HDMI input are also huge, complex beasts, while the AVR350 retains a modest enough profile to pass as a lifestyle offering to the behemoth-averse, and is easy enough to set up by yourself if you plan carefully, know what you are doing and are prepared to spend a couple of days getting it right. Partner it with the 1080p upscaling DV137 universal player and you will be ready to play just about anything you throw at a simple two-unit setup – including all those dodgy download formats!

REFERENCE SYSTEM:
 Denon DVD-A11 DVD player
 Denon AVC-A1SRA AV receiver
 Monitor Audio GR20 loudspeakers
 Chord interconnects
 Telewest (Scientific Atlanta) TVDrive

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- FOR**
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 - modern connectivity
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 - superb tuner section
- AGAINST**
- minor feature omissions

MEASURED PERFORMANCE

The AVR's power amplifiers produced 84W apiece under measurement, into an 8ohm load. This rose to 144W into 4ohms. As loudspeakers these days hover around 6ohms nominal, Arcam's claimed 100W maximum output per channel is near enough. As there are seven channels, that's no less than 700W in all, distributed through seven loudspeakers. That's a lot of acoustic power.

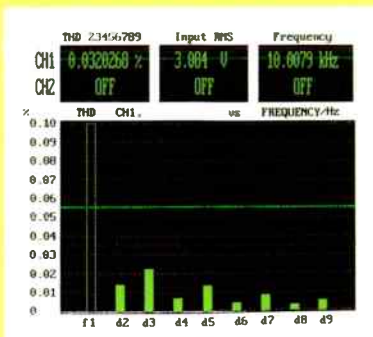
Distortion levels were very low in the midband, irrespective of load. At high frequencies distortion rose to 0.03%, as our analysis shows, but this is still small. This model should sound as civilised as the last one, which was a cracker. Bandwidth measured 5Hz to 50kHz, right for DVD-A and SACD, and input sensitivity was high at 230mV, for good matching.

The vhf/fm tuner is, a little surprisingly, a very high quality all-analogue affair, not a Radioscape SDR radio jobbie (see our DT-91 review this month). It gave excellent results, better than stand alone tuners! This suggests Arcam have decided to ensure the AVR350 displays no weaknesses in sound quality, an area where their last receiver excelled against Far East product.

The AVR350 turns in a fine measured performance. Arcam seem

to have decided to capitalise on past success here. NK

Power	84watts
CD/tuner/aux.	
Frequency response	5Hz-50kHz
Separation	82dB
Noise	83dB
Distortion	0.03%
Sensitivity	260mV
Tuner	
Frequency response	10Hz-15kHz
Stereo separation	43dB
Distortion (50% mod.)	0.1%
Hiss (CCIR)	-70dB
Signal for minimum hiss	0.85mV
Sensitivity	
mono	5µV
stereo	48µV



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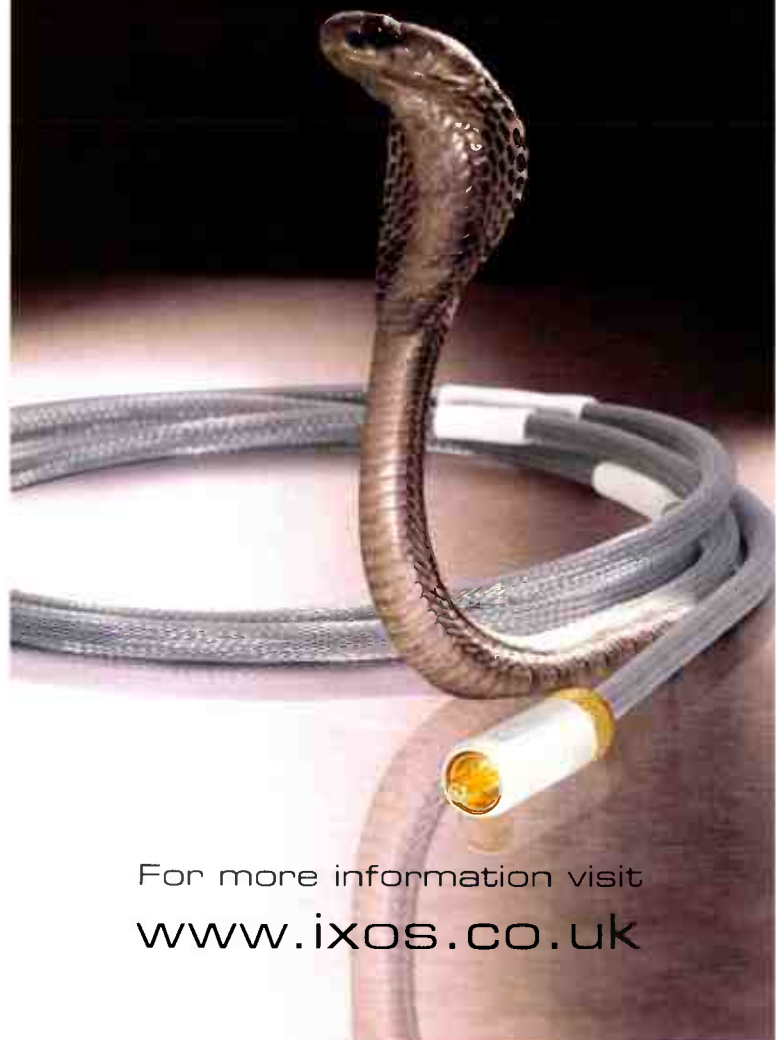
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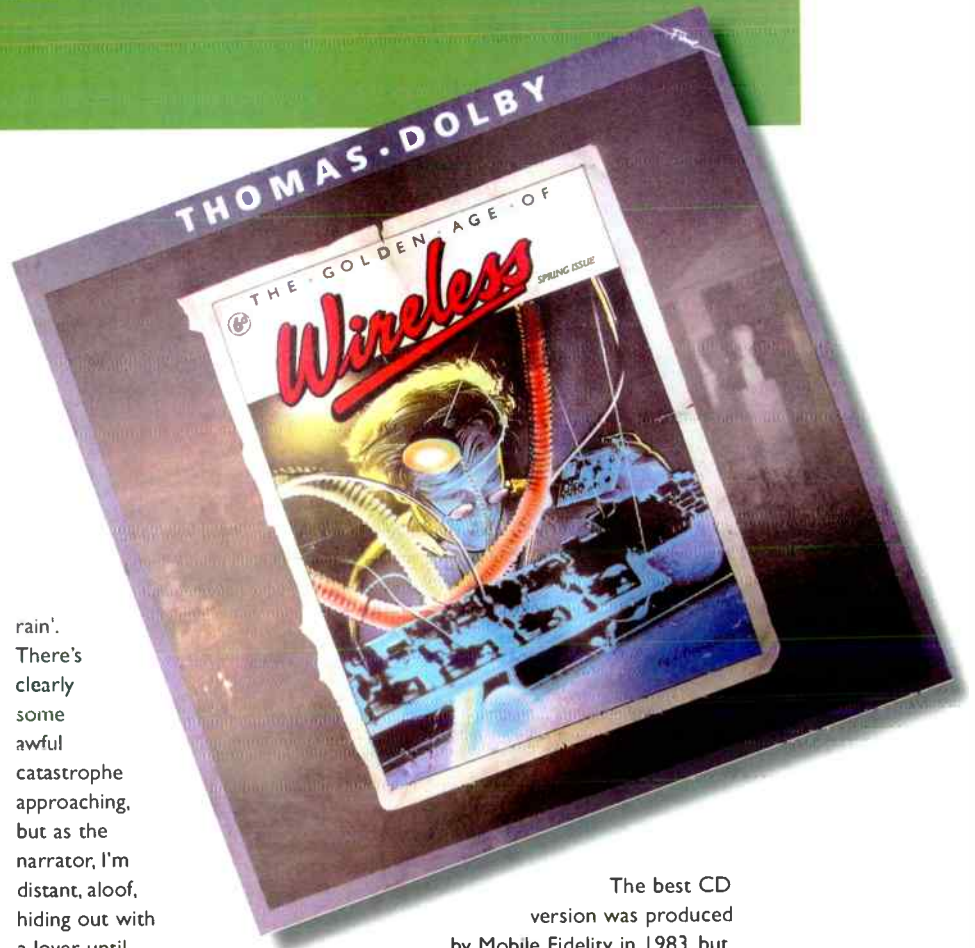
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THE GOLDEN AGE OF WIRELESS

THOMAS DOLBY

1982



Even before you played it, one look at the cover art of this album told you that you were in for a treat. The image of a slightly mad Victorian professor, surrounded by technology, hair unkempt, eyes full of possibilities – that was Thomas Dolby, at this time in his career. Dolby, or Thomas Morgan Robertson as he was known to his mother, received his 'Dolby' moniker from his school friends. They thought he dabbled with his tape deck too much for his own good... The 'Morgan' bit originated from EM Forster's middle name, the famous author and family friend from way back.

This album has a unique sensibility, a blend of the old and new. Dolby's own eccentric leanings, his artistic urge to draw from the past and his unfailing wonder – which he still holds to this day – of gadgets. At the time of the release of this album, gadgets meant synthesisers which reflected Berlin-era Bowie in synth-pop manner. To illustrate, take the album track, 'Airwaves', a sweeping, melodic ballad of sorts that is strangely uplifting. Dolby recalled its creation, "I wrote it late one night in my studio in a huge and grim Victorian industrial building, with snow falling on the railway tracks outside, and me surrounded by short-circuited machines hacked together by a man called Igor. It conjures up a strange, futuristic world whose ecology is rotting while the sheer overload of broadcasted data is nearing saturation point. I'm standing 'knee-deep in water under a pylon' trying to take it all in, while 'the copper cables all rust in the acid

rain'. There's clearly some awful catastrophe approaching, but as the narrator, I'm distant, aloof, hiding out with a lover until morning." Which tells you a lot about Thomas, just there.

Dolby is forever associated with one of science's great, beloved eccentrics. Dr. Magnus Pyke had a late, short, but intense media career appearing on TV, contributing to science-related programs. People were partly enraptured by Pike because of his vast knowledge but doubly so by his physical presence. When speaking, he had a habit of flailing his arms around during explanatory talks, his head would roll and his voice would be loud and expansive. You can imagine the raised eyebrows, therefore, when it was learned that some kid called Dolby, wielding those fancy new synthesisers, was also going to feature Pike in a single! Despite the excellence of 'She Blinded Me With Science', it was Pike's appearance on the video that made Dolby's career. "...even at the time of writing 'Science' it angered me - that I'd let it go that far and 'Science' was almost taking it to its extreme," remembers Dolby. "Saying, 'Right, if it's so important to have a public face, let's go completely over the top, to the extent of getting Magnus Pyke into it. Let's really throw caution to the wind!'"

The best CD version was produced by Mobile Fidelity in 1983, but finding a copy could prove difficult as it's not generally available. The standard CD re-release you can find in the shops is a decent master, however. It is when you get to the vinyl version that problems occur because there were five versions of the album produced for both UK (two versions) and US (three versions) markets – and they're all different.

The tracks: 'Flying North', 'Weightless', 'Europa' and the 'Pirate Twins', 'Commercial Breakup' and 'Cloudburst At Shingle Street' are common to all versions of this album. 'Wreck of the Fairchild' is only available on the UK first release, 'Leipzig' and 'Urges' are only available on the US first release whilst 'Airwaves', 'Radio Silence', and 'Windpower' are available in varying editions of different lengths or as 7" versions. Meanwhile the single, 'She Blinded Me With Science', along with its b-side, 'One Of Our Submarines', can only be found on the second edition of the album in both the UK and USA! Dolby fans will need to search the Internet or your local record shop or fair to collect the full set – but it's well worth it, and you don't have to be a radio fanatic to hear why... **PR**

Soft Machines

One of the last provinces of analogue, that of FM radio, is now being encroached upon by digital, as Software Defined Radio becomes ever more popular. Steven Green explains what it is, why it is and how it works...

From the moment digital mobile phones began replacing those old analogue behemoths the size of a house brick, digital circuitry in radio receivers has been encroaching into the territory that was once the sole preserve of analogue. Now, with software defined radio (SDR) becoming increasingly popular, this trend shows no signs of abating – in fact quite the opposite. So what is it, and what might it deliver in the future?

To understand SDR, we first have to go over some basics. Figure 1 below shows a diagram of a wireless digital communication receiver. The radio-frequency (RF) signal is first received by the antenna, which passes this onto the RF 'front-end' circuitry. The RF front-end's job is to filter out all radio signals other than the signal that you want to receive and 'downconvert' the signal from the very high radio frequencies (e.g. 200 MHz) to a far lower frequency (e.g. 10 MHz), called an intermediate frequency (IF), so that the analogue-to-digital converter (ADC) can digitise the signal. The ADC then passes the digitised signal to the digital 'baseband' circuitry, which uses digital signal processing (DSP) techniques to extract the data from the signal.

Performing the baseband DSP

processing in mobile phones can be performed in one of two ways: in hardware or in software. In hardware this usually amounts to using ASICs (application-specific integrated circuits), which, as their name suggests, consist of ICs (integrated circuits, i.e. silicon chips) that have been designed to perform a specific function, such as performing the baseband DSP processing for a specific mobile phone standard.

The line between hardware and software is quite blurred, however, because ASIC chips now commonly contain microprocessors inside them, but to avoid confusion it is easier to think of ASICs as being hardware, because they have been designed to

networks, etc. – and adding support for these new standards would require adding further ASIC chips to the mobile phone circuitboard, which increases manufacturing costs, size of the circuit board and power consumption.

SOFT TOUCH

Because of the problem of having to add new ASICs to allow support for new standards, there has been a trend towards using software defined radio (SDR) techniques, which means that software is used to extract the transmitted data from the digitised received signal. The rationale for using SDR is that instead of having to use multiple ASICs to support the

SDR should also allow better FM reception quality than when analogue circuitry is used...

perform a certain task and cannot be modified.

The problem with the hardware approach however, is that there has been a proliferation of wireless standards in recent years – such as GPRS and 3G mobile phone standards, Bluetooth for short-range communications, Wi-Fi for home

multiple wireless standards, software (i.e. computer programs) can be written to perform the baseband DSP processing for each standard, and the appropriate software can then be run on a single DSP microprocessor depending on which standard is being received at the time.

A good example of this is the UK DAB chipset design companies, Radioscape and Frontier-Silicon, who have quite recently implemented FM reception using SDR. Radioscape in particular has recently released a single RF front-end chip that can handle all of the following formats: DAB, FM, MW, LW, SW and the new digital radio standard DRM; and the appropriate software for the standard being received is then run on a single DSP microprocessor.

SDR should also allow better FM reception quality than when analogue circuitry is used. For instance, if the same RF front-end that has been designed for DAB is also used for FM this should increase the sensitivity for FM, because DAB RF front-ends

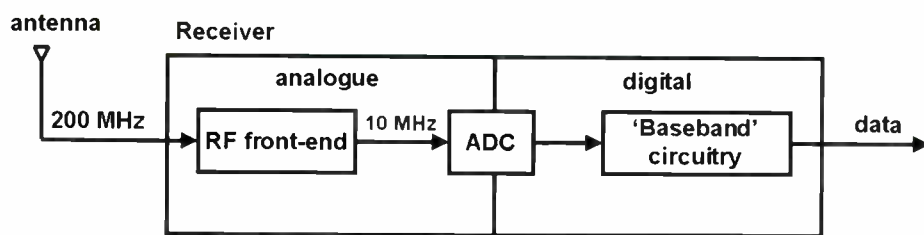


Figure 1. Wireless digital communication receiver

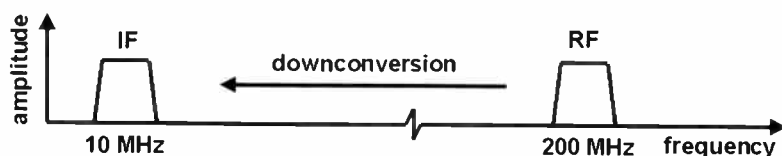


Figure 2. RF downconversion

have to be designed to be very sensitive to allow DAB reception. Selectivity should also be drastically improved, because digital filters can easily be designed to have extremely steep roll-offs whereas the roll-off of analogue filters is much gentler. Post-processing is also possible to clean the FM signal up further.

Another advantage of using software defined radio is that some of the functionality of the RF front-end can be performed digitally, thus saving on expensive RF components. For example, for technical reasons the downconversion process used to be commonly performed in two stages: the received radio signal was first downconverted to a first intermediate frequency (IF) and then downconverted again to a second, lower IF. SDR allows the second downconversion to be performed in software, so the RF components that were used to perform the second downconversion are no longer needed, which reduces component and assembly costs.

In fact, one of the longer term aims of using SDR is to move the ADC closer and closer to the antenna so that as much RF functionality can be implemented in software as possible to save the cost of even more components. However, something called Nyquist's Sampling Theorem requires that the ADC sampling frequency must be at least twice the value of the analogue bandwidth at the input of the ADC, so a filter must be used in between the antenna and the ADC to limit the bandwidth to allow practical sampling frequencies.

This vision is called 'pure software radio', and with current ADC conversion speeds it is already possible to do this for some of the lower frequency radio standards, such as DAB and FM, but for RF performance and cost reasons it is currently unfeasible.

Another of the ambitious long term plans for SDR is that software for new wireless standards will be downloaded over the airwaves. For example, if your phone only supports UK standards and you travel to America, which uses a different 3G standard to the one used in Europe, the mobile phone will download the software for the American standard, which will then be loaded and you will be able to use the American 3G system on your phone. In fact, over-the-air software downloads are already used on the Freeview digital terrestrial TV system, although only the 'higher level' software, such as that used to display digital Teletext, can be upgraded in this way, and

downloading new wireless standards is a much more difficult proposition.

CLEVER THINKING

The most ambitious of all plans relating for SDR however, is something called 'cognitive radio'. Currently, certain bands of radio

frequencies are allocated for a specific purpose. For example, FM is transmitted in the band of frequencies between 89 – 108MHz, and no other application is allowed to transmit in this band. However, this is not a very efficient way to manage the use of spectrum, because if you looked at the spectrum of the FM band in any given location you would find that a significant part of it looks to be unused. The reason parts of it appears to be empty is that in order to avoid interference there has to be a relatively large distance between transmitters using the same frequency. A good example of this inefficient use of spectrum is the BBC national radio stations, which each consume around 2.2MHz of spectrum because they're each transmitted on multiple frequencies across the country. But in any one location you only need to receive it on one frequency, so the large majority of the 2.2MHz in any one location is effectively wasted. And this inefficient use of spectrum is by no means only a problem with FM, because it is a problem with the vast majority of radio applications.

Supporters of cognitive radio believe that this apparently unused spectrum could be used by other applications, just so long as they don't interfere with the existing users of the band, and this would require radios to have some intelligence programmed into them – hence the name cognitive radio – so that they can sense which spectrum is unused and whether transmitting in that band would be possible. For example, if a pair of cognitive radios wanted to communicate with one another, the radios would first have to find a suitable unused part of the spectrum, and then agree on a set of transmission parameters, such as transmission frequency and power, what wireless standard to use and so on, and then transmission can begin.

Proponents of this technology suggest that it would put an end to the current shortage of spectrum,

which may be a bold claim, but not wholly unreasonable given the amount of spectrum that is effectively wasted at present.

Although it might sound like the radio equivalent of the wild west, the rules that cognitive radios use to come to the decisions about what

"the intention is to make radios more sensitive, cheaper to produce, and more intelligent too..."

transmission parameters to use would likely require approval from the spectrum regulators first. But the FCC, which manages the spectrum in America, isn't against the idea in principle, and America has already seen a spat between Intel, who supports the use of cognitive radio and argued against the TV spectrum being ring-fenced solely for the use of TV, and the TV broadcasters, who want their precious airwaves all to themselves.

The first deployment of cognitive radios will likely be on short-range systems that use very low powers, such as on a forthcoming system called ultra-wideband (UWB), which is meant to provide very high data rates (up to 500 Mbps) over short distances within the home. But higher power applications will likely come over time as the technology gains acceptance, and it could be one of the technologies that enables ubiquitous wireless broadband access, which I would suggest is an inevitability in the long-term given the phenomenal growth of the Internet and mobile communications over the last ten years.

We're already seeing early implementations of software defined radio in tuners such as Arcam's excellent DT91, and you can bet a long run of coax cable that we'll soon see more. The intention is to make radios more sensitive, cheaper to produce, and more intelligent too. It's early days yet, but you can bet there will be a SDR radio revolution someday. How long it will take is entirely another matter, however..

Arcam's DT91 tuner is one of the first commercial audio implementations of SDR...



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De-compression

Love it or loathe it, compressed audio is everywhere these days, from DAB to MP3. Steven Green explains why it's necessary, how it works, and why it's not quite as bad as you think...

Compressed digital audio has acquired a very poor reputation for audio quality, which is deserved in some cases, but undeserved in others. The basic reflex reaction of any audiophile is that it's automatically the enemy of music, as it's 'data reduction' - and that goes against all our highest principles, doesn't it?

Yet there's no denying that, by doing what it does, it has brought more music to millions of people sooner than would have otherwise happened (imagine an iPod Nano with just 15 songs worth of storage capacity!) It also makes DAB possible, at least in its present format. Without compressed audio, Digital Radio may not have happened until much later, with far fewer stations available.

How then does it work? Well, the 'bit rate' (or data rate) of a digital audio stream determines the bandwidth (i.e. frequency range) required for the stream on broadcasting systems, and also the amount of memory required to store audio on a PC or MP3 player. Unfortunately, 'uncompressed' audio, such as the PCM (pulse-code modulation) format used by CD, uses a bit rate of 1,411 kbps (thousand bits per second). Such a high bit rate rules out using uncompressed audio for some important digital audio applications. For example, even if the highest capacity possible on a DAB multiplex were used, then only one uncompressed radio station could be carried on a multiplex! And as UK radio listeners can typically receive 4 DAB multiplexes, this would mean they could only receive 4 radio stations in total...

Also, applications such as storing record collections on PC hard drives, portable MP3 players, legal music downloads and file-sharing networks simply wouldn't have been feasible until very recently if only uncompressed audio could be used - 'iTunes' would have been 'myTune'! Clearly, a step-change reduction

"without compression, the maximum number of stations available on Digital Radio would be four..."

in the bit rate used for digital audio was needed. Early forms of compression were not very successful, however, and they only managed to reduce the bit rate to around 1,000 kbps, still far too high. These early compression schemes used 'lossless' compression, where the datastream at the output of the decoder is identical to the original audio datastream. The major breakthrough came by taking a radically different approach to compressing audio. This involved abandoning lossless compression in favour of 'lossy' compression - the original and final datastream do not have to be identical - and taking the way the human hearing system actually works into account, which is the field of psychoacoustics.

IN THE MIND

Psychoacoustics is the study of human auditory perception, ranging from the biological design of the ear to the brain's interpretation of aural information. One of the main concepts central to psychoacoustics is the minimum threshold of hearing

(MTH). The minimum threshold of hearing is, as the name suggests, the sound pressure level threshold below which tones (a sinewave at a certain frequency) are inaudible.

The minimum threshold of hearing can be seen in Figure 1 below as the vaguely U-shaped curve that runs from 20Hz to 20kHz, which is the bandwidth of human hearing. One thing the curve shows is that human hearing is very sensitive to sound at frequencies between around 1kHz and 6kHz (where the curve is the lowest) and is insensitive at high and low frequencies. For example, a tone at 20Hz would need to have an amplitude that is approximately 65 dB higher (over 3 million times higher!) than that of a tone at 1kHz for both tones to be barely audible. The figure also shows a 40Hz tone (dashed arrow on the left side of the figure) that has an amplitude below the minimum threshold of hearing, and is therefore inaudible.

The other central concept to psychoacoustics is 'amplitude masking', or just 'masking' for short. Masking is the process whereby a

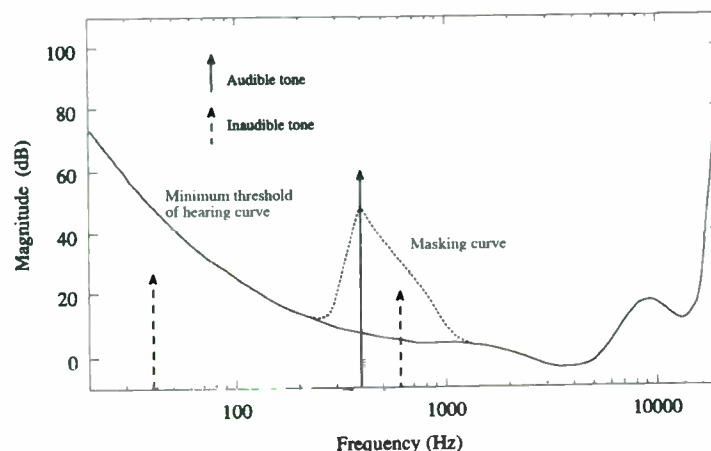


Figure 1. Minimum threshold of hearing and masking curves

stronger tone at one frequency can make a weaker tone inaudible that is nearby in frequency.

Researchers in the field of psychoacoustics painstakingly measured the amplitude across a range of frequencies when a tone became just audible when a strong tone was also being played. This led to the concept of the 'masking curve', and researchers became able to predict whether tones at different frequencies will be audible depending on whether the amplitude is above or below the masking curve. An example of a masking curve can be seen in Figure 1, where the high amplitude tone at a frequency of 400Hz (solid black arrow), referred to as the 'masker', has generated the triangular-shaped masking curve surrounding it. The tone at 600Hz has an amplitude that is above the minimum threshold of hearing but below the masking curve, which means that the 400Hz tone has made the 600Hz tone inaudible.

Masking also occurs over time as well as over frequency. For example, if you sound two tuning forks in quick succession that are both tuned to the same frequency, and you sound the first louder than the second, you will only be able to hear the first tuning fork.

Real audio signals are of course far more complex than the combination of a handful of tones, but what researchers found was that by applying these masking curves to real audio signals, whole sections of the audio spectrum were being 'hidden' by strong masking tones, and the information in the inaudible parts of the audio spectrum could be discarded without significantly affecting the perceived audio quality of the signal. Most important of all, this method of discarding inaudible information allowed the bit rates to be reduced to around 256 - 384kbps (between 3.5 and 5.5 times lower than the bit rate of uncompressed audio) while maintaining good audio quality.

PERCEPTUAL AUDIO CODING

This new method of audio compression was called perceptual audio coding, due to the fact that only the information that humans can perceive is kept, and it forms the basis of all reduced bit rate audio codecs (codec stands for enCOder/DECoder) that have emerged since it was first developed in the mid 1980s.

As Figure 2 shows, perceptual audio encoders work by first sending the input audio signal to a 'psychoacoustic model' that tries to mimic the way the human hearing

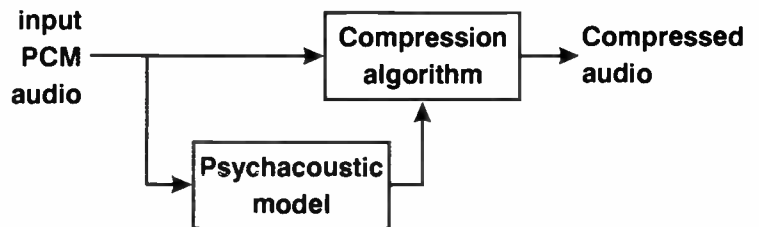


Figure 2. Simplified block diagram of a perceptual audio encoder

system works by generating masking curves for all of the tones present

the signal is usually represented by 2,048 'spectral lines', which for a

"AAC provides the same level of audio quality at 96kbps as DAB at 192kbps..."

in the input signal. Following analysis of all of the masking curves, the psychoacoustic model informs the compression algorithm which parts of the audio spectrum are audible, and only these frequency bands will be encoded – the data representing the inaudible parts is discarded. The compression algorithm's job is then to represent the audible information as accurately as possible given the number of bits available.

TWO TRIBES

There are two types of perceptual audio codec: subband codecs and transform codecs. The fundamental difference between these two is that subband codecs compress the audio waveform data (the amplitude versus time signal), whereas transform codecs compress the data that makes up the spectrum representation (the amplitude versus frequency representation) of the audio. This difference between the two types of codec has a major influence on their performance, which is as a result of differences in their 'frequency resolution'.

Subband codecs, such as MP2, only split the input signal up into 32 equal-bandwidth subbands. This means that for an input audio signal with a sampling frequency of 48kHz each subband is 750Hz wide, which is the frequency resolution of MP2 (the audio bandwidth is half the sampling frequency, because of something called Nyquist's Sampling Theorem).

Transform codecs take their name from the fact that the input audio is transformed to the spectrum representation, and a positive by-product of changing to the spectral view is that the frequency resolution is hugely improved. Using the example of the AAC audio codec,

sampling frequency of 48kHz equates to a frequency resolution of 23Hz. The advantage of having a very fine frequency resolution is that inaudible information can be discarded on a far finer scale, which means that significantly more inaudible information can be discarded overall.

Looking at it from the opposite perspective, the more inaudible information that is discarded the less information there is left to encode, so for a fixed bit rate level, the remaining information can be encoded more accurately, because the accuracy depends on the number of bits used to represent the value. And the higher the accuracy at which the information is represented the higher the audio quality will be, which is why transform codecs provide higher audio quality than subband codecs when they're used at the same bit rate level.

Another way of looking at this is in terms of 'compression efficiency', which is the bit rate required to provide a set level of audio quality. Transform codecs require a lower bit rate than subband codecs to provide the same level of audio quality, so transform codecs are generally much more efficient than subband codecs. For example, AAC, which is a transform codec, provides the same level of audio quality at 96kbps as MP2 (a subband codec) provides at 192kbps.

SOUND ADVICE

Of the commonly used codecs, only MP2 (which is used on DAB) is of the subband variety, and MP3, AAC (Advanced Audio Coding), HE AAC (High Efficiency AAC, also known as AAC+), Ogg Vorbis and Windows Media Audio (WMA) are all transform codecs. With the

exception of HE AAC, which is only used at very low bit rates, all of the above transform codecs can provide near CD-quality at bit rate levels of around 128kbps, whereas MP2 needs to use a bit rate level of 224kbps to provide near CD-quality.

However, it is universally true that, for a given audio codec, the higher the bit rate used the higher the audio quality will be, so it is recommended that bit rates of 192kbps and above are used with the transform codecs listed above for compressing your own audio at home or for an MP3 player – AAC provides the best audio quality, but apart from Apple's iPod it isn't supported by many MP3-playing hardware devices such as MP3 players and car stereos, whereas MP3 has universal support on such devices.

The importance of using a good quality encoder also cannot be overstated, and the best AAC/AAC+ and MP3 encoders currently available are the Nero and Lame encoders, respectively, which are free and can be downloaded from <http://tinyurl.com/pp6d> and <http://tinyurl.com/d9mnds>. However, these are 'command-line encoders', so they're not recommended for beginners, and they're best used in conjunction with a 'front-end' application, such as Exact Audio Copy or similar programs. If ease-of-use is more important to you, try the iTunes and Razorlame applications for AAC and MP3, respectively.

"when AAC, MP3, WMA9 or Ogg are used at high bit rates, they're capable of quality very close to CD..."

It is also recommended that you use VBR (variable bit rate) mode when you are compressing audio at home. This is due to the inherent variable nature of audio. For example, when a single instrument is being played there may only be a relatively small number of frequencies that are audible, so these frequencies can be encoded with relatively few bits. If more instruments begin playing, more frequencies become audible and these also need to be encoded, so more bits need to be used to maintain good audio quality. VBR mode allocates the appropriate – variable – number of bits in order to provide a constant level of audio quality, which the user chooses in the

encoder options.

It should also be said that when AAC, MP3, WMA9 or Ogg Vorbis are used at high bit rates, they're capable of providing audio quality very close to that of a CD. For example, if you played a high bit rate compressed audio file through a good quality DAC into a decent hi-fi system, I think many of the sceptics who write-off audio compression as being of generally poor audio quality would be very surprised at how good it can be – comparing the audio quality of a compressed audio file played back through a low quality DAC (e.g. a computer sound card or an MP3 player) with the quality produced by an expensive CD player is an unfair comparison, which shouldn't be a surprising result, but this is often overlooked.

DAB = BAD

As I've just discussed, when audio codecs are used as intended they are capable of good results. DAB in the UK, however, is an example of how not to use an audio codec! The overriding problem is that the broadcasters are using grossly insufficient bit rate levels for the inefficient MP2 audio codec that is used on DAB – 98% of all stereo stations on DAB in the UK are using 128kbps, when the MP2 codec needs to be used at a bit rate of 224kbps to provide near CD-quality.

Audio on DAB uses the constant bit rate (CBR) mode rather than the more efficient VBR mode, and this combination of using CBR at an insufficient bit rate level results in the quality degrading the more complex the audio is to encode. This means that while audio that is very simple to encode can sound good, examples being some smooth jazz and speech, anything other than simple to encode audio will sound poor or dreadful.

The best example of dreadful sounding audio on DAB is rock music, especially during parts of tracks when the electric guitars and drums are being played simultaneously and loudly. The problem with such material is that it has a

wideband and high amplitude audio spectrum, so very little inaudible information can be discarded. This results in the available bits being spread so thinly that the accuracy at which the waveform is represented is very low, which drastically reduces the quality and definition of the music. Also, the lower the accuracy at which the signal is represented the higher the level of 'coding noise' will be – coding noise is the difference

"DAB is a prime example of how *not* to use an audio codec..."

between the uncompressed and compressed signals, and at high bit rates it is inaudible. So you have a 'catch 22' situation, where both the low accuracy and the coding noise conspire against the audio, providing a very ill-defined, dull and messy sound.

Another problem with the MP2 codec is that it is limited to using a 'joint stereo' coding technique called 'intensity stereo'. Joint stereo coding is a method that audio codecs use to save bits by encoding both the left and right channels simultaneously rather than separately. All the modern audio codecs can use the 'mid/side' joint stereo technique that is lossless, which means that no information is destroyed. Intensity stereo on the other hand destroys the phase information between the left and right channels, which frequently leads to either the total collapse of the stereo image or to the stereo image being variable and unstable – this is why many pop and rock stations appear to be virtually mono. As well as being a very inefficient codec, MP2 is also particularly bad at representing high frequencies, and this situation is exacerbated when an insufficient bit rate level is used, resulting in a metallic splash-splish kind of sound.

Overall then, high quality modern codecs used intelligently (i.e. at decent bitrates) really aren't that bad – it's just the old, obsolete and inefficient ones like MP2 in Digital Audio Broadcasting that let the side down. Digital audio compression can be a great 'enabling technology', or an audiophile's bad joke – depending on which system you use.

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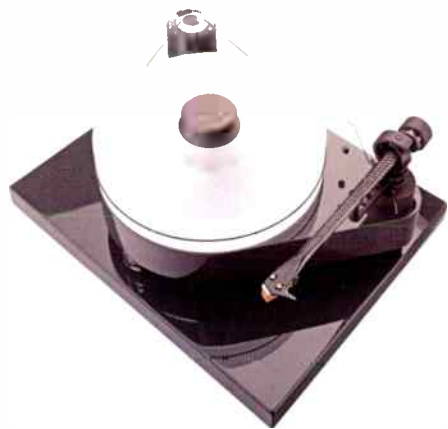


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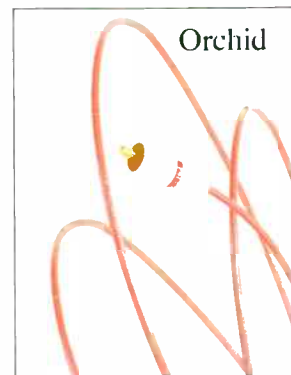


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Radio Days

There's no doubting the brilliance of Denon's TU-260L – it was the budget tuner to have for the best part of fifteen years. Now, the new TU-1500AE brings sharper looks to the price point, along with a welter of welcome facilities. How though does it compare with the oldster? Steve Green finds out...

Denon's TU-260L is one of those great budget products that worked far better than it had a right to. It wasn't the world's sexiest radio receiving device, nor did it suffer a surfeit of features, and it was annoyingly insensitive, so you always needed a decent antenna, but boy did it sound good! With this in mind, the company had a hard act to follow when it came up with its new entry-level tuner, the £120 TU-1500AE.

Looking back at the old TU-260L Mk I (the Mk II is still on sale at some online retailers for £108, by the way), and it's typical late eighties fare. Available in any colour so long as it's black, the front panel has crude

squared edges as opposed to the more curved styling you see today. On the left of the slimline fascia is a basic fluorescent display, which shows the frequency that is currently tuned to, as well as the current station's preset number, if applicable. The text is rather thin and relatively dim compared to many of the displays on today's tuners, making it difficult to read from anything more than a couple of yards away, but it can be read from an oblique angle, which was a problem that a few of the tuners in the group test suffered from.

The second line of the display has small text indicators to show whether the station you're tuned into is in stereo, the current mode the

tuner is in, and which of the A or B groups of preset stations is currently active. These are too small to read from anything but short distances, however. To the right of the display are two narrow buttons for entering stations into the preset memory slots and for changing between automatic and manual modes, respectively, and beneath this, running towards the right, are a row of eleven thin buttons, ten of which are to select preset stations 1 – 10 (group A) or 11 – 20 (group B), and the eleventh button is to shift between groups A and B. On the far right-hand-side are up and down buttons to change frequency and a button to change between the AM and FM bands.

As you'd expect, the styling



of the new TU-1500AE is very contemporary, and the curvy silver front-panel looks a lot sleeker than the TU-260L's more boxy shape, even though the heights of the two tuners are very similar. At the centre of the TU-1500AE's front panel is a two-line white text on black background display with much brighter text than on the TU-260L – although it can be dimmed if required. The thickness of the lettering is also broader, which makes the text much easier to read from a distance. The top line of the display shows the station name for FM stations that use RDS or the current frequency otherwise. The bottom line of the display shows the RDS scrolling station text, which can also be turned off if desired.

To the left of the display are two red and one bright blue LED indicators to show whether the station is tuned, in stereo and whether it uses RDS. To the right of the display are four small circular buttons for dimming the display, changing between AM and FM bands, commencing 'auto preset' tuning and for accessing the menu. On the far right of the front-panel is the tuning knob, which is much narrower than usual, and it is also tapered towards the end so that it fits the shape

"the TU-1500AE will take up the TU-260's mantle of being the benchmark entry level tuner to beat..."

of the user's thumb and forefinger better. This ergonomic design has certainly worked, because it is much easier to turn than the traditional broad and untapered tuning knobs usually found on tuners.

The TU-1500AE can store 100 preset stations altogether, and each preset can store either an FM or an AM station. Entering stations into the presets is simple using the remote control, and tuning into stations by scrolling through the list of presets is rapid using the remote control. The remote also has larger up and down buttons for scrolling through the presets, which makes it easy to use for this purpose, although some of the other buttons are a bit too small and fiddly to use. The TU-1500AE also provides an 'auto preset' tuning mode where the tuner searches for all stations that have a significant signal strength and automatically stores these as presets in ascending

frequency order. However, when I tried this function the tuner stored far too many frequencies compared to the actual number of stations I can receive, and I found storing stations in the presets manually to be much the better option.

Unfortunately, the TU-260L doesn't have RDS, so station names can't be displayed, and neither does it have a remote control. The missing RDS feature was addressed with the launch of the TU-260L II a few years ago, but you'd have to say that not having RDS nor a remote control makes the original TU-260L very basic in terms of features by today's standards.

The connectivity provided on the rear panels of the TU-260L and the TU-1500AE are identical, with both offering separate connectors for FM and AM aerials and a pair of phono connectors. Reception quality of the TU-260L wasn't as good as on almost

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all of the tuners in the group test, whereas the TU-1500AE had significantly better FM reception quality than the TU-260L - and was up to the level of most of the tuners in the group test in this respect.

SOUND QUALITY

The most interesting and surprising result of auditioning the TU-260L was how well it stacked up against modern tuners, as it sounds similar to the Sony DAB/FM tuner on FM, which was one of the best sounding DAB/FM tuners in the group test. The Sony gets the nod over the TU-260L in terms of sound quality, though, as it provided a slightly more refined, accurate and lively sound, but considering that the TU-260L is an entry-level tuner that was launched around fifteen years ago, it is no mean feat that it almost matches up to one of the best modern tuners released only recently!

On Radio 3 and Classic FM, both tuners were pleasant to listen to in their own ways. The TU-1500AE provided a richer and warmer tone than the TU-260L, whereas the TU-260L sounded more dynamic and lively, with a more pronounced high frequency response. Overall, I preferred the brighter sound of the TU-260L, as it provided a more engaging listen. I also preferred the sound of the TU-260L on the rock, pop and MOR stations, because the more energetic and vibrant sound suited the dynamic range-compressed audio these stations usually produce better than the warmer tone of the TU-1500AE. Still, many will plump for the new machine, with its impressively refined and couth sound - especially with jazz and classical music. Both tuners performed very well with speech radio on Radio 4, with both providing a well-defined delivery, with the TU-1500AE sounding slighter richer.

Overall then, the TU-1500AE is a worthy successor to the 260. In most respects it's obviously better, whereas when sound is considered, it's more a case of it being different. This richer, smoother sound will delight some, but leave others less impressed. What's less arguable is that the newbie is far better equipped for modern users, with RDS and a remote

control that the TU-260L lacks, and it is much better on the reception front as well. The TU-1500AE's provides super sound for a £120 device, and if

Denon are discontinuing the TU-260L MkII I would expect the TU-1500AE to take up the mantle of being the benchmark entry level tuner to beat.

MEASURED PERFORMANCE

DENON TU-1500AE
 A small degree of mismatch between mpx filter and termination gives the TU-1500 a -1dB dip 8kHz, our analysis shows. Output peaks back up at 12kHz or so, but all the same the net effect will be to add some warmth to the tuner's sound. Low frequencies extend downward smoothly, so the TU-1500 should sound smooth, full bodied and even a tad warm.

Distortion levels were low both at 50% modulation and at 100%, the latter not being unusual these days from stations desperately trying to sound louder (and more dynamic) than rivals. Where this is the case the TU-1500's average of 0.3% second harmonic may well result in a cleaner sound. Many tuners hit 1% or so distortion at 100% modulation.

Hiss was low enough at -70dB to be just inaudible. This is comparable with other good tuners, anything lower than -70dB being barely acceptable for serious Radio 3 listening.

Full quieting was maintained right down to 0.6mV from the aerial so hiss does not rise until the signal starts to get weak. Sensitivity was good too, as expected, measuring 34uV (p.d.) stereo and 3uV mono.

The TU-1500 is a balanced package, measurement shows. It

has low distortion, low hiss and will sound comfortably warmer than most I suspect. NK

Frequency response	10Hz-14kHz
Stereo separation	42dB
Distortion (50% mod.)	0.19%
Hiss (IEC A)	-70dB
Signal for minimum hiss	0.6mV
Sensitivity	
mono	3µV
stereo	34µV

MEASURED PERFORMANCE

DENON TU-260L
 The TU-260L (for Long Wave!) was a firm favourite for a whole slew of good reasons. Compare its performance against that of any modern tuner and it stands up. One reason is that VHF/FM tuners have deteriorated in quality over the years, especially since DAB arrived. Now VHF is seen as old technology, so little is spent on it. DAB is complex and expensive to implement, so this is where the money goes. Yet in its day this budget Denon managed well, so it looks just as good now, against declining standards. It has a fine measured performance. Just look at its distortion for example: our analysis shows a figure of 0.07% at 50% modulation. Frequency response too has that characteristic roll down of Denons, just enough to give a smooth and ever so slightly warm sound.

With low hiss (-70dB), wide channel separation, good sensitivity and selectivity the TU-260L gives away nothing to today's tuners. The reverse in fact: it still betters a lot of them. NK

Frequency response 80Hz-16kHz
 Stereo separation 39dB
 Distortion (50% mod.) 0.07%
 Hiss (IEC A) -70dB
 Signal for minimum hiss 0.5mV
 Sensitivity
 mono 2µV
 stereo 28µV

VERDICT ●●●●£

Superb entry-level tuner with rich tonality, good sensitivity and fine user interface. The budget tuner to beat.

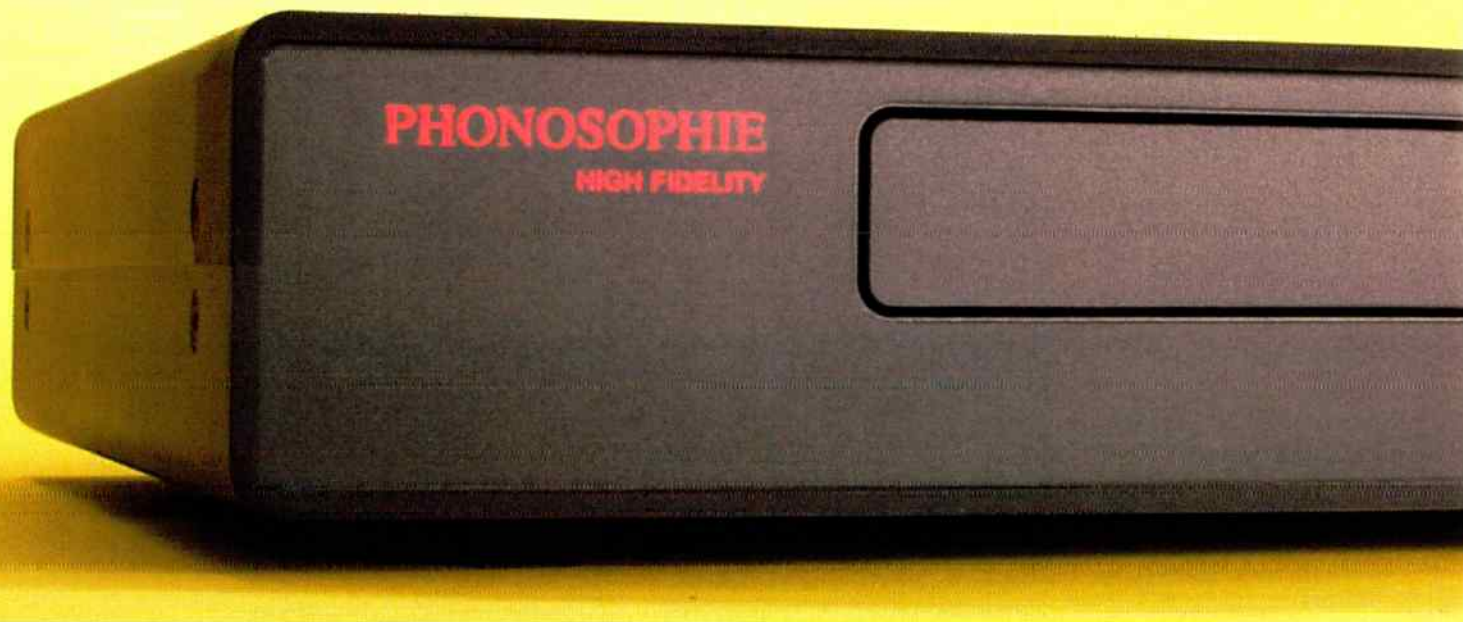
DENON TU-1500AE £120
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FOR

- smooth sound
- ease of use
- value-for-money

AGAINST

- nothing



Impulse Engine

Another day, another high end CD spinner. So what does Phonosophie's sleek Impuls 2 bring to the party? Channa Vithana finds out...

Formerly the German importer of Naim Audio, Ingo Hansen created a new company called Phonosophie which has produced distinctive hi-fi since 1985. After more than twenty years in business, Phonosophie have amassed a complete and impressively thorough range of components that encompasses the analogue and digital replay system, including turntables, tonearms, cartridges, amplifiers, loudspeakers, complete hi-fi cable looms, hi-fi accessories, equipment stands and a range of upgradeable CD players under the Impuls banner.

The Impuls series is available at four different price/performance levels. The Impuls 1 CD player (£2,975) is the entry level model and was the best CD player, accumulating five globes along the process, in a comparative test in our June 2005 issue (p40). The Impuls 1 can be systematically upgraded to Impuls 1.5 (£4,125), Impuls 2 (£5,275) and all the way to the super high end Impuls 3 (£14,500). Upgrading requires a premium for labour and shipping – please check with UK distributor, Überphon. All Impuls models use a silent-running Phillips 12.3 CD transport, 1bit NPC SM5872 DAC and hand-wound transformers made by Toroid (Sweden) with higher levels

of specification as the model range extends upwards.

For this review, we are looking at the £5,275 Impuls 2. Phonosophie says the difference in electrical design up to the Impuls 2 from the Impuls 1 is as follows; the Impuls 1.5 "uses faster and higher-grade voltage control circuits for both current and filter stabilisation. This dramatically improves both the signal dynamics and the timing of the player." The Impuls 2 player improves on the 1.5 as it "has further advancements in the output filter stage, blue LED illumination of the disc for superior data-read and processing which results in less error correction processing downstream. In addition to a more stable and more powerful internal power supply".

Silhouetted, the Impuls 2 does bear comparison to the old 'olive' Naim 3 series idiom; which is one of my favourite casework designs as it combines low-slung elegance with a modernist simplicity. The charcoal-black Phonosophie casework is 4mm thick aluminium with a fascia panel framed within and attractively refined in the flesh. The casework is designed specifically with the electrical components within for sound quality reasons. Thus, Phonosophie say "in contrast to the heavy armour wrapped around common high-

end audio components, this (4mm casework) does not suffer from vibrations caused by retained energy trapped between thick metal sheets". I think this is one of the most elegant hi-fi solutions to vibration/resonance control, as it is a fantastically damped enclosure despite its 4mm thickness and slender proportions.

The Impuls 2 comes supplied as standard with Phonosophie cables: PK2 DB55 DIN interconnect, Powercord CU mains lead (copper plated contacts, normally £130 separately), FBI remote and Digiplug AG (Silver) - which I found effective in reducing a noticeable layer of noise from music as it shields the BNC digital output when not in use. The Powercord CU can be substituted for the silver-plated AG (normally £195) for the price difference of £65 and is worthwhile as I preferred its performance upgrade for the price rise. The Impuls 2 has DIN outputs as standard, while the WBT phono sockets at the back panel need to be electrically linked at the factory instead as a no cost option. The DIN output on the Impuls 2, which Phonosophie prefer for better sound quality, was used with a PK2 DB52 DIN to BNC/RCA interconnect utilising BNC to phono adapters for non DIN/BNC amplifiers. BNC-Phono adapters according to



Phonosophie provide matched 50 Ohms to the BNC from the DIN while a direct DIN to Phono lead is unmatched. This rather convoluted connection method is still superior to opting for the WBT phono socket outputs say Phonosophie.

Also on the rear panel are an IEC mains input with switch, phono socket remote connections and a switchable 'int/ext' DIN connection which can accept an upgrade power supply such as the 400VA Power Control 2 (£1,750) or the 1150VA Power Control 3 (£4,250) via PK3 (£150) or PK3 Mk2 DIN-DIN (£450) power connect cables. These upgrade power supplies and cables say Phonosophie "provide an increasingly precise and stable platform for the player's analogue circuitry to perform most effectively."

The Impuls 2 is designed to be left on and its display is recommended to be selected for 'sleep mode' for the best sound quality in order "to avoid interference with the music signal" where it activates upon command briefly before powering down. The logo is dimmable through a hidden button behind its location on the front panel. Finally there is an adjustable output level via the display accessed through the remote. The Impuls 2 measures 447x70x340mm and weighs 7kg.

SOUND QUALITY

The violin playing of Diana Yukawa was reproduced vibrantly with high resolution, its timbre having great body and articulation. There was excellent phrasing, and the delicacy of the playing was skilfully balanced with the more dynamic crescendo parts, as the tonality changed in expression to suit the shifting emotions of the music. The accompanying piano was similarly portrayed with a deft touch,

as there was a very good sense of scale and depth with convincing timbre and no discernible colorations through my Densen/Waterfall reference system.

The opening bass lines to 'Private Life' by Grace Jones were well extended and tuneful, which is a particularly rewarding combination as not all hi-fi instruments seem to reproduce these two musical qualities successfully, even some high end ones. The music was delivered with superbly high resolution and a very clear and silent musical backdrop, which provided a good level of spatiality and excellent instrumental separation. Frequency extremes were taut yet tunefully communicative as there was no flabby bass overhang or harsh, dissonant midrange/treble. The Impuls 2 presented the Grace Jones music with composure, control, refinement and a good level of dynamic rhythmic ability.

Deep Purple's 'Burn' had very good rhythm, as the guitar power chords blasted through the opening sequence. Instrumental separation and detail retrieval were excellent, and the Impuls 2 had a clear insight into the depths of the recording. The rawness of hard blues-rock was capably handled. The rhythm section, guitars and twin-lead vocals made for an enjoyable and exhilarating rendition via the Impuls 2.

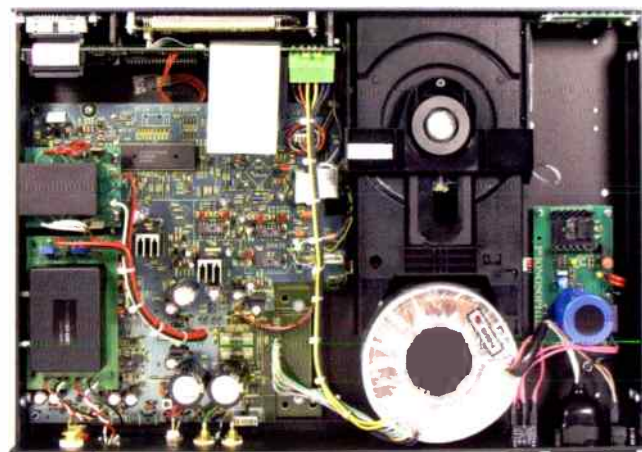
Producer and DJ Stuart Price, the *faux* Frenchman Jacques Lu Cont of Les Rythmes Digitales, created some wonderfully recorded retro futurist dance music, using synthesisers and keyboards

from 'Darkdancer'. Accordingly, the throbbing and exhilarating electronic beats were superbly reproduced with a dynamic and powerful expression. Nick Kershaw's vocals on 'Sometimes' were well-extended and replicated within the listening room with great dimensionality. Instrumental separation was first rate on 'Sometimes', and the main chorus was skilfully enunciated by the Impuls 2.

I compared the Impuls 2 at £5,275 to my lower-priced reference Densen B-400Plus CD player which

"a strong and credible music maker with a cohesive and animated sound..."

costs £1,400. I used the same (£195) Phonosophie Powercord AG mains lead and a Chord Company Chorus interconnect (approximately £215) as Densen eschew DIN sockets. Overall, timing via the combination of rhythm, melody and harmony was superior with the Densen on all the



T+A

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UPGRADE STRATEGY

Compared the entry level (£2,975) Impuls 1, the difference was palpable when reproducing Diana Yukawa's violin. With the Impuls 1, the entire piece sounded compressed and the violin no longer had the same level resolution or radiant timbre. The accompanying piano sounded initially more full-bodied with the Impuls 1 but it was quickly apparent that it was somewhat bloated and ill-defined in comparison to the more expensive Impuls 2. There wasn't as much of a dramatic difference between the two Impuls players on the Grace Jones material, because the timing quality of the music considering the cohesive relationship of basslines, guitars, drums and vocals remained pretty much intact. However, there was a significant, encompassing layer of resolution missing from the Impuls 1 which meant the dimensionality of the instruments, and the composition as a whole, was minimised.

The powerful, rhythmic bass lines - while impressively taut - did sound more 'one note' on the Impuls 1, and there was a dramatic, instantaneous difference when I played 'Burn' by Deep Purple, where the Impuls 1 sounded narrower. Interestingly, timing wasn't quite as good as the more expensive player, the music sounding a little slower with a slight but tangible dislocation of frequencies. Instrumental separation and detail retrieval were also lessened via the lower-cost player. The portrayal of the energetic beats and rhythms from 'Darkdancer' by Les Rythmes Digitales was similar between the two Impuls players, and thus the music was still enjoyable, as were Nick Kershaw's vocals on 'Sometimes' which remained composed and finely rendered. What was minimised, though, was the enveloping and quite substantial dynamic headroom that the Impuls 2 provided, which made the Impuls 1 sound a lot narrower. There was a big difference between the two, which reflects their respective retail prices.

music used. Also the Densen had superior spatiality, giving the music a more free-flowing, lyrical rendering. However, it was the details that highlighted contrasts and thus Grace Jones' vocals sounded more severe and less rounded while the guitar parts sounded less timbrally expressive with the Densen.

The violin from Diana Yukawa's 'Elegy' was not as vibrant or as rich of tone while the accompanying piano, though still enjoyably tuneful, sounded lighter. There was a noticeable level of recorded hiss at the beginning to 'Burn' by Deep Purple compared to the Impuls 2, and while the instrumental separation was good via the Densen, it wasn't quite as accomplished. Nick Kershaw's vocals on 'Sometimes' from 'Darkdancer' were also a little fierce in comparison to the Impuls 2.

CONCLUSION

The Phonosophie Impuls 2 doesn't quite have the outstanding timbral qualities of the £2,200 Tube Technology Fusion (HFW June 2006, p60) or the sophistication of the £2,918 North Star 192/Extremo (HFW May 2006, p42) and the Chord Electronics Blu/DAC64 at approximately £6,190 (HFW February 2006, p11). However, in comparison to those three CD

players, the Impuls 2 is superior in timing and rhythmical aspects, and provides a more cohesive sound quality overall - it doesn't have any dislocation of frequencies to cause one's attention to be diverted. As a CD player, the Impuls 2 has a radiant ability to reproduce richly-textured instrumental and vocal timbre within a cohesive and well-rounded sound. It has impressive detail retrieval and instrumental separation along with powerful and tuneful low frequencies for convincing bass lines. It provides a very silent backdrop for the music, so it can reveal more of what is going on.

In operation, the Philips transport is near silent compared to the majority of manufacturers, especially those who use CD-ROM drives. Personally, I really like the aluminium casework design and slimline proportions,

MUSIC

- Diana Yukawa, 'Elegy' (2000)
- Grace Jones, 'Private Life: The Compass Point Sessions' (1998)
- Deep Purple, 'Burn (30th Anniversary Edition)' (1974/2004)
- Les Rythmes Digitales, 'Darkdancer' (1999/2005)

REFERENCE SYSTEM

- Densen B-250 preamplifier (£3,000)
- Densen B-330 power amplifier (£3,000)
- Waterfall Victoria loudspeakers (£2,000)

VERDICT

A CD spinner with wonderful timing and detail retrieval, and an excellent upgrade path - but you pay for it. Measures badly.

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IMPULS 2 £5,275
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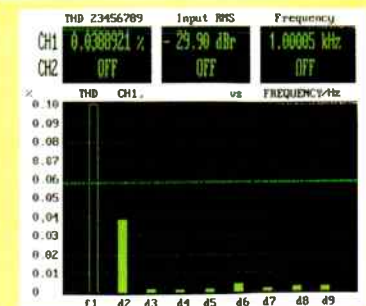
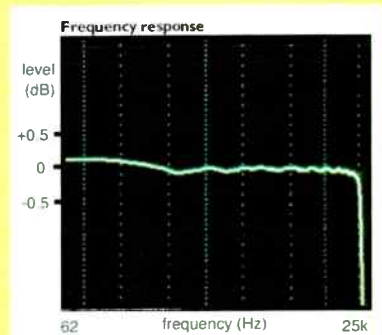
- FOR**
- distinctive aesthetics
 - timbre, detail retrieval
 - well rounded, cohesive sound

- AGAINST**
- high end cost
 - expensive to upgrade

which elegantly and very effectively minimises vibrational resonances. The Phonosophie upgrade path, though very costly, was compelling when comparing the Impuls 1 and 2, and it therefore makes long term sense to upgrade with Phonosophie than lose value by selling an Impuls 1, for example. The £5,275 Impuls 2, albeit at high-end cost, is a strong and credible music maker with a cohesive and animated sound quality. It's a superb CD player then, one deserving serious attention from those seeking the ultimate from 16bit. If you're in this category, an audition is mandatory.

MEASURED PERFORMANCE

A high resolution impulse analysis shows a small amount of plateau lift below 500Hz, just enough to be subtly audible as extra body to the sound.	-60dB	0.04%
Distortion reached a massive 1% at 0dB (peak output), at full volume. Reducing volume lessened the problem. Even at -6dB distortion measured 0.6%, but by -30dB, a typical average music level on CD, it was a reasonable, if not exceptional 0.04%. Unfortunately, at lower levels distortion rose significantly; this is not a linear player. It may well not sound so clear and open as good rivals.	-80dB	12%
Output was normal at 2.16V, channel separation was high and noise low too. EIAJ Dynamic range was inevitably limited in view of raised distortion at -60dB. Programme related jitter measured around 80pS at 1kHz, higher than usual.	-80dB dithered	2.1
The Impuls 2 suffers quite heavy distortion at high and low levels. It doesn't meet modern standards in this area, but is otherwise acceptable. NK	Separation (1kHz)	-110dB
	Noise (IEC A)	-108dB
	Dynamic range	105dB
	Output	2.16V



Frequency response (-1dB)
 CD 6Hz - 20.8kHz

Distortion	CD
0dB	1.02
-6dB	0.6%



Balance Of Power

The entry-level integrated amplifier market is a fiercely contested one, so NAD's new C325BEE has to be special to cut it. What better rival than Marantz's well respected PM4001OSE to put it against, then? Channa Vithana does the honours...

Most people spending £250 or so on a piece of 'hi-fi' are likely to want a CD player, tuner and amplifier in a box the size of a paperback with the speakers thrown in. In terms of the global audio market then, there isn't a massive market for budget amplifier separates any more. Therefore, by its very nature, the entry level integrated market is specialist – it appeals to a very specific type of buyer and in turn demands a particular set of abilities on the product's part.

That's why you won't find gaudy power meters, vast shiny fascias and millions of facilities on Marantz's PM4001OSE or its new rival, the NAD 325BEE. Indeed, the latter is a direct descendent of the product that invented the very category in question – that of budget super-integrated. Back in 1979, in a world of big, pumped up, button festooned Japanese behemoths, NAD's 3020 arrived with a dour grey plastic fascia and only a modicum of facilities, and since then – in this market sector – 'twas ever thus the way...

NAD 325BEE

The brand new bit of kit can trace its lineage all the way back to the NAD 3020, introduced nearly thirty years ago. The BEE designation stands for Bjorn Erik Edvardsen, the man behind many of NAD's amplification

designs, some of which are patented. This budget NAD has a claimed 50W/8ohm power output rating and features 'PowerDrive' which NAD claims adds "huge reserves of dynamic headroom without adding cost, by ingeniously matching the amplifier to the speaker load. This is fully automatic in operation and adjusts the power supply parameters of the amplifier to best cope with the actual musical signal and specific speaker loading characteristics." There is also a BEE Clamp which "employs sophisticated real time monitoring of the output transistors' load and drive and 'clamps' the base drive to prevent saturation when necessary, thus improving amplifier stability and waveform fidelity". NAD says the C325BEE can instantly recover from overload, reducing both the amount and the duration of distortion, regardless of load impedance.

NAD has also implemented some design solutions gleaned from their new high-end titanium-grey Master Series amplifiers into the 325BEE. It uses a DC Servo to eliminate sound degrading capacitors in the signal path. A patented distortion cancelling circuit employs feedback and 'feed forward' to "reduce distortion and improve amplifier stability". NAD uses surface mount components within the circuitry for reduced signal paths and also to lower distortion in NAD's proprietary Class A gain

modules, while the tone controls are said to be hand trimmed for perfect response characteristics.

There is a good quality SR 5 system remote control which can operate volume or select one of its seven, relay switched, line inputs (two of which are tape). A switchable (Disc/MP) 3.5mm input socket, labelled MP, is included, and can connect an MP3 type player or other portable from the front panel. Other functions include a headphone output socket, switchable 'soft clipping' to prevent nasty amplifier overload sounds if the NAD is driven beyond its rating, 12V trigger output, power amplifier inputs and pre outs, tone defeating treble/bass controls, balance, IR in/out and main power switch at the rear (while a standby button is on the front panel). This latest NAD still employs a plastic front panel with metal folded sheet behind which though solid and well-screwed together, isn't the best finish at the price. The look is clean and minimalist despite being fully featured, and while it may look rather unprepossessing, I do like its simple, businesslike sobriety. The 325BEE has a single set of loudspeaker binding posts, weighs 8kg and measures 435x100x290mm.

MARANTZ PM4001 OSE

The standard PM4001 amplifier retails for £180, however here we are looking at the OSE (Original



Special Edition) version which shares many of the essential design fundamentals of the basic model. And as such both PM4001s have claimed power outputs of 40W/8ohms and 55W/4ohms, measure 440x117x341mm and weigh 6.6kg. A fully functioning Marantz RC4001PM remote is included, which does input switching, mute, CD player controls, on/off and volume. There are six inputs, one usefully being an MM phono, and two sets of switchable loudspeaker binding posts enabling biwiring or two-speaker connectivity.

For the PM4001, Marantz says that, to achieve the best possible audio performance, signal paths are short, direct and mirror imaged. This topology, it is claimed, provides precise, improved stereo imaging by implementing a symmetrical right and left channel layout. Meanwhile, the tone defeat ensures the shortest signal path by removing the tone control circuit board completely from the signal. Finally, there's a low noise preamplifier stage with "sophisticated input switching technology and premium, high-grade components". The Original Special Edition mod package to the PM4001 brings an enhanced power supply, tweaked circuit layout, and extensive use of customised capacitors. The latter involves proprietary components that are specially manufactured specially for Marantz. High-quality Elna and Silmic II capacitors are liberally sited across the circuit boards, which is impressive at this price.

The features include tone defeat, record selector, tone controls, balance, and loudness. To the left is the input selector knob and on the right is the volume control knob, both well-weighted and smartly fabricated in metal. Above the tone controls is a centralised and delineated dark plastic source indicator panel. All the controls have super Marantz build quality and are

precise and well-weighted in action. Though the bottom row of knobs and buttons are plastic, they remain nicely finished and each control is

of duPré's cello playing.

Queensryche's 'Promised Land' was powerfully expressed with solidity to the low frequency rhythms

"both amplifiers are excellent, offering a surprising amount for – what in real hi-fi terms – is very little..."

set discretely and attractively within individual openings of the anodised aluminium fascia. There is also a headphone socket. The overall finish is good for the price; however, I preferred the design of the (visually almost identical) PM4400 which preceded the PM4001, as it did not have the fussy looking plastic panel in the middle and instead featured discrete LED indicators indented within its fascia.

SOUND QUALITY

For me, the most surprising thing I got from this comparative review was that both amplifiers were capable of genuinely pleasing sounds, even when partnered with expensive ancillaries. But I was also interested to hear just how different two seriously capable budget amplifiers could sound – there was a lot of 'clear blue water' between them.

Starting with the new NAD C32SBEE, and the Barbirolli/ duPré 'Elgar Cello Concerto' burst forth with a harmonically astute and well-rounded quality. As such Jacqueline duPré's cello playing had deep and expansive timbre, as did the rest of the instruments within the orchestra. Here the particularly adept midrange from the NAD emphasised body into the lower-frequencies. The phrasing of the cello was emotive and superbly portrayed for an amplifier at this price. The music was controlled yet did not stifle the emotive quality

from the bass guitar and drums. The production on this track is a busy mix of hard rock and intricately crafted tribal-like percussion, and the NAD proved entirely composed and balanced with every element, from the instrumentation to Geoff Tate's vocals. There was not a hint of hardness or strain, even as I turned the volume higher. The usually rather bright and grainy sound quality of the original OMD 'Best Of...' from 1988 was rendered with a reassuring robustness - bass lines were wonderfully defined and extended while having excellent tunefulness. The vocals and main chiming melody of 'Electricity' were not harsh or grey, as they can be on some systems, but sounded balanced and powerful.

Michael Jackson's vocals were beautifully reproduced within the opening of the ballad 'I Just Can't Stop Loving You' from 'Bad'. Jackson's delicate vocal phrasing was excellent with a finely textured timbral palate expressing the quiet, trembling notes to the more dimensional mid frequencies in his voice. Seidah Garrett's accompanying vocals were equally finely layered and expressive while the music was dynamic and powerful, as the song built up to and reached its final set of compositional codas.

Moving to the Marantz PM4001 OSE proved an ear-opener, as the music from the Barbirolli/ duPré 'Elgar Cello Concerto' came

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VERDICT

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McIntosh MA6900 integrated amplifier (£4549)	£895
McIntosh C2200 Valve pre amplifier (£4318)	£449
Hovland Radia Power amplifier - as new (£7995)	£895
EAR 864 valve pre amplifier, boxed as new (£2k)	£3595
Bryston 4BSST-C series, power amp, black (£2750)	£3295
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Musical Fidelity kW750 power amplifier (£5999)	£695
McIntosh MC501 Monoblocks(pair), ex-d (£7800)	£995
Graaf GM50 Integrated Valve Amp (£4000)	£995
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McIntosh MA2275 valve integrated (£5773)	£2195
Audio Innovations 2nd Audio Monoblocks (£3000)	£2495
Hovland HPT100 pre+built in phstage (£5350)	£695
Hovland HP200 + phono stage (£7325)	£995
McIntosh MA2275 valve integrated (£5773)	£1449
Audio Innovations 2nd Audio Monoblocks (£3000)	£1395

Amplifiers

JVC AXU1 Integrated, Pure Class A (£2000)	£995
Consonance Cyber 800 Monoblocks (£3000)	£1995
Musical Fidelity A5 Pre and Power Combo (£3000)	£1995
Bryston BP25 and 4BSST pre/power, silver (£4200)	£1995
EAR 859 Integrated, mint condition (£2440)	£995
Marantz PM15S1 integrated, 1 owner (£1099)	£799
AVI Lab Serles amplifier, boxed as new (£1500)	£995
Pathos Inpol2 Integrated, only 6 months old (£5650)	£4395
McIntosh MC252 Power Amp, boxed as new (£3812)	£2795
Qinpui A1.0x, ex What HiFi review model (£300)	£230
Croft TS1 with Epoch Pre, ex-dem (£3000)	£1795
Qinpui A-8000 MK II, ex HiFi World review model (£1295)	£895
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Eastern Electric M520 Int amp, What Hi-Fi 5 star review	£1199

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Audion Silver Night 300B Valve integrated	£2195
McIntosh MA6900 integrated amplifier (£4549)	£895
McIntosh C2200 Valve pre amplifier (£4318)	£449
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Croft TS1 hybrid power amp, ex-d, unmarked (£2000)	£695
Pass Labs X350.5, supplied by us new (£7600)	£795
McIntosh MA2275 valve integrated (£5773)	£2195
Audio Innovations 2nd Audio Monoblocks (£3000)	£2495
Hovland HPT100 pre+built in phstage (£5350)	£695
Hovland HP200 + phono stage (£7325)	£995

Loudspeakers

JAS Audio Orsa, ex HiFi Plus review model (£1399)	£1149
Living Voice Auditorium, maple (£2100)	£995
Kef Reference 1.2, black, 2yrs old (£1350)	£495
Hyperion 938, gloss piano black (£3750)	£2895
PMC IB2 in cherry, immaculate condition (£6995)	£4295
Living Voice Avatar II in maple (£3000)	£1995
Merlin VSM MM in exc condition 10/10 (£8000)	£2395
Living Voice OBXR2 speakers, as new, ex-dem. (£4400)	£2495
JAS Audio Supertweeters, review pair (£649)	£549
Gershman Acoustics Avantgarde speakers (£7900)	£2995
ATC SCM-35, one owner, cherry, boxed as new (£1999)	£1395
Wilson Benesch Discovery, 5 months old (£5700)	£3695
PMC FB1+ (recently upgraded to full + spec), cherry	£895
PMC OB1 speakers in cherry, boxed as new (£2700)	£1695
ATC SCM-20A.5 (active) Tower spkrs, walnut (£5177)	£1995
Ref 3a Dacapo, boxed as new in maple (£2700)	£1650
REL Q400E subwoofer in premium maple (£1200)	£695
Wilson Benesch ARC's with stands, silver finish (£2.5k)	£1699
Living Voice Auditorium II in Cherry (£2195)	£1495
ATC SCM-50ASL, in Cherry, 4months old (£7947)	£4895

Wilson Benesch Curve speakers, 4 mnths old (£5000)	£3495
Dali Helicon 400, boxed as new (£3300)	£1995
Quad 989 ESL Vintage, new £5000	£3600
Quad 988 ESL in Nouveau, cost new £3750	£2999

Analogue

EAR 834P Signature phono stage, MM/MC (£750)	£395
Michelle Gyrodeck, Origin Live Tonearm, Trichord	£995
Never Connected PSU+DC motor (£2000+)	
Linn LP12, Lingo PSU upgrade, Ittok Arm, including Klyde cartridge	£1295
Cyrus Phono X, black (£700)	£395
Wilson Benesch Full Circle, boxed as new (£2100)	£1495
Trichord Dino + never connected power supply	£495
Bluenote Bellaria Reference Tonearm (£1500)	£795
Mark Levinson JC-1 phono stage, very very rare	£1495
Krell KPE Reference Phono Stage	£1395
SME 10, boxed AS NEW (£2800)	£1895
SME 20/2a + SME V tonearm (£5695)	£3695
Nottingham Analogue Spacedec	£695
Trichord Dino - silver front	£199

Miscellaneous

Pioneer PDP436-XDE 43" Plasma with stand. Brand new sealed box. Must sell! (£2900)	£2400
Cyrus PSXR in silver, 1 year old, immaculate condition	£249
Isotek Gil Vision mains conditioner (£595)	£495
Townshend Super Tweeters in Titanium matt	£650
Nordost Valhalla 0.6m interconnect, as new condition	£849
Isotek 2K Qube2, boxed, one owner. (£1595) in silver,	£695
JAS Audio Supertweeters, this is the actual HiFi World Review pair	£549
PS Audio P500 power plant with latest Multi-wave 2 plus module fitted (£2400), boxed new	£1695
Nordost Vishnu 2m mains lead (£450)	£349
Musical Fidelity X-Cans v2, upgraded to v3	£149
Musical Fidelity X-10v3 Tube buffer stage	£195
Nordost THOR mains conditioner (£1799)	£995
Vertex AQ Roraima Plus, mains lead + filter (£490)	£395

THE RIVALS
 The following amplifiers are similarly priced to the NAD and Marantz and have been well received for their sound and build: Cambridge Audio's Azur 640A features a slightly better and more attractive top/side panel construction and superior (claimed) power at 65W. However, it still uses unattractive oval control knobs that Cambridge should have redesigned, and its labels and logos do not quite inspire the same level of visual confidence that the Marantz does. The Rotel RA01 does not come with a remote control, but has an otherwise comparable specification to the Marantz with 40W output and MM phono input. Some may also prefer its even sleeker lines, as it is 72mm high compared to the 117mm of the Marantz or the 100mm of the NAD.

across with more control than the NAD. The phrasing of Jacqueline duPré's cello was very good, and I could follow the emotional content of the meandering melodies well. However, I found that the Marantz was rather too controlled with the 'Elgar Cello Concerto' overall as the orchestrations were a little recessed and not so free-flowing or timbrally convincing as the NAD. The high frequencies were a Marantz strength on this recording and thus the leading edges of violins and the cello were very good.

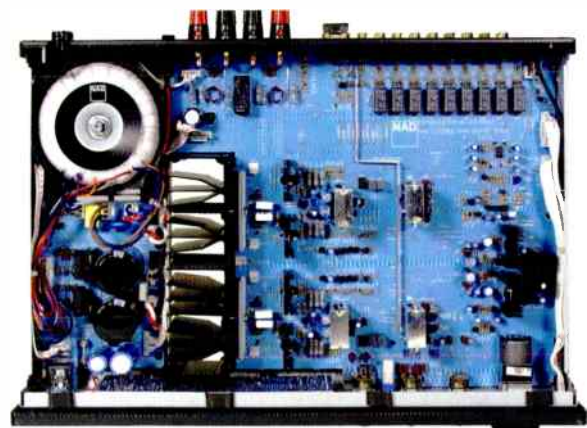
Detail retrieval from Queensryche's 'Promised Land' was superb, where percussion and drum tracks were explicitly revealed. Instrumental separation was also better than the NAD with a cleaner, clearer insight into the busy instrumental and vocal mix. However, in comparison, the Marantz was less musically assured overall on the Queensryche recording - sounding too guarded and not quite as powerful or free-flowing. Rhythm and speed, however, were slightly but discernibly better through the Marantz than the already good NAD on the OMD 'Best Of...' compilation. Thus, the beat and melodies to 'Electricity' had greater precision in the rendering of the music. The instrumental separation and high frequencies were also very good via the Marantz in comparison, where it imbued the music with a sophistication that is the milieu of a higher-cost amplifier design.

As I ran through my music collection, a pattern began to emerge - the NAD was consistently more musically engaging. This was down to both its more

muscular character, which seemed more relaxed driving loudspeakers (especially at higher levels), and also its warm, fulsome bass which is a classic NAD characteristic. The Marantz was by contrast more detailed, faster and more 'crisply etched' across the mid and treble, and ostensibly more transparent - but didn't quite have the naturally musical ebb and flow of the NAD.

CONCLUSION

The Marantz PM4001 OSE integrated amplifier is an impressive product because it offers a crisp and sophisticated sound, with excellent vocal and instrumental phrasing that belies its £250 price. It also bettered a past design, the PM6010 OSE in direct comparison, showing that Marantz have moved forward with superior sound quality at this budget level. The NAD 325BEE has a more effortless real world speaker driving ability, especially through my demanding Spendor S9e floorstanding loudspeakers - all the more impressive as these big boxes had previously proved a tough load for a 100W amplifier costing £1,000! The NAD may not have been quite as sophisticated as the Marantz in terms of instrumental separation and in one instance, with pace. However, the NAD confidently and articulately reproduced all the music used with dynamism, and wonderful timbre to reveal the identity of a musical instrument and voice; while the Marantz, in comparison was a little minimised

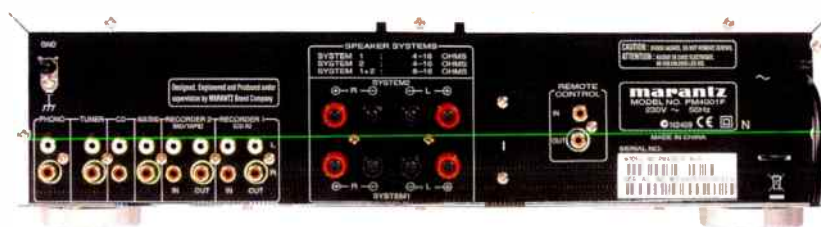
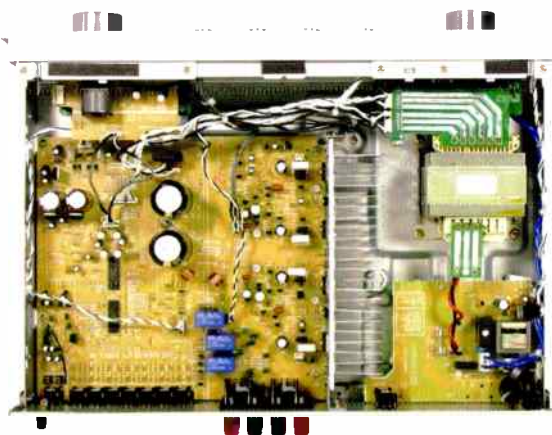


above: rear and internal pictures of the NAD325BEE

MUSIC:
 Barbirolli/duPré, 'Elgar Cello Concerto/Sea Pictures' (1965)
 Queensryche, 'Promised Land' (1994/2003)
 OMD, 'The Best Of...' (1988)
 Michael Jackson, 'Bad' (1987/2001)
 Palladian Ensemble, 'Bach Trio Sonatas' (1995)
 Madonna, 'Confessions On A Dance Floor' (2005)

in this respect.

Overall, both of these products offer a surprising amount for - what in real hi-fi terms - is very little. I personally found the NAD the more musically convincing and therefore would be my choice, but the Marantz compensates with a more neutral, and balanced sound and superior build. As always, you pay your money and make your choice!



above: internal and rear pictures of the Marantz PM4001OSE

VERDICT ●●●●●

Smooth, powerful, muscular sound with real speaker driving prowess makes this the most musical entry level integrated.

NAD 325BEE £250
 NAD Electronics
 +44 (0)1908 319 360
 www.lenbrook.co.uk

FOR

- powerful and rhythmic
- free-flowing and engaging
- instrumental timbre

AGAINST

- lacklustre finish

VERDICT ●●●●●

Superb value package with an impressively finished sound plus great build and finish.

MARANTZ PM4001OSE £250
 Marantz UK Ltd.
 +44 (0)1753 680 868
 www.marantz.com

FOR

- first-rate phrasing
- insightful detail retrieval
- build and features

AGAINST

- slightly analytical sound



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Howard Popeck

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Denon		ADC XLM Mk III £17
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DL 110	£79 £69 EX N/A	AN2, AN 70 £15
DL 160	£95 £83 EX N/A	Aiwa AN11 £13
DL 304	£210 £190 EX N/A	Dual DN 145 E, DN 165 E £17
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Argo	£795 £635 EX N/A	Pioneer PN 210/220/240 £13
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MARANTZ PAST & PRESENT

I was able to directly compare the new 2006 PM4001 OSE with a 2000 Marantz PM6010SE which cost approximately £230 six years ago. The older PM6010SE was somewhat mid-dominant in comparison. The violin from the 'Bach Trio Sonatas' wasn't as natural or free flowing as on the PM4001OSE, while the music as a whole was less engaging also. With Madonna's 'Hung Up' there was marginally more bass extension with the PM6010 OSE, but the midrange was once again more dominant. Here the PM6010OSE expressed the groove and rhythm more forwardly while Madonna's vocals were not as beautifully revealed. On Megadeth's 'Symphony Of Destruction', there was a pronounced midrange from the PM6010OSE, while Dave Mustaine's vocals were not quite as well-rounded or expressive; they sounded rather flat. Bass was a little more extended though on the PM6010OSE and in particular the bass guitar and drums. With the lead guitars and vocals however, there was a slight strain to solos and crescendos when they were played and sung within the composition via the PM6010 OSE. The Tony Bennett & K.D.Lang 'What A Wonderful World' was even more starkly differentiated where the vocals were this time pushed forward while the instruments appeared further behind instead of an insightful and musically sophisticated presentation as on the PM4001 OSE. And so with the older PM6010 OSE, the music from 'A Wonderful World' sounded a tad forced.

NEW ACOUSTIC DIMENSION

David Price remembers the one that started it all – NAD's classic 3020 integrated amplifier...

Buying a decent budget amp back in the late seventies wasn't easy. The market was swamped by brushed aluminium fronted Japanese designs plastered with tone controls and power meters. As so little of the purchase price went towards the audio circuitry, the sound these things made was at best bland and inoffensive, and at worst downright painful. Sensing the need for something different, a young company stepped in with the NAD 3020. An unfashionably compact design, it put out a modest 20W per side and had none of the bells and whistles of its oriental rivals. Worse still, its plasticky front panel was finished in dour dark grey – hardly the height of fashion at the time. Just as well then that on its launch in 1979 it sold for a mere £59.95...

So unprepossessing was it that the 3020 could easily have disappeared, never to be seen again. But to those who heard it, it was obviously special. Inside was a cracking circuit design with an extremely generous power supply. There was also a switch marked 'Soft Clipping', a NAD innovation which let the amp run at full power without endangering its loudspeakers – ideal for student parties and proof of NAD's brilliant understanding of the market they were catering for.

On audition the 3020 was quite unlike anything near the price. One of those epochal products that comes along from nowhere and shakes down the market, it sounded like a high power, high quality, high priced integrated. No mean feat for any amplifier, but for less than sixty quid it was nigh-on unbelievable. Although undeniably coloured – with a fat, sumptuous bass, a warm bloom across the midband and an artificially silky treble - it was surprisingly dynamic and punchy. This meant that, given a cheap turntable and middling budget speakers to work with, its musicality and warmth could shine through, yet it seemed to hide the front end's limitations. Used with a top quality source it did the opposite, and made the most of the turntable's power and detail.

The NAD's big-hearted sound was thanks in part to its excellent real world speaker driving ability, which totally belied its modest 20W (into 8ohms) rated power. Its beefy power supply could really pump current when needed – a fact borne out by measurements which showed it quadrupling its output power into 2ohms. Tales of it out-punching various Japanese 100W super amps abounded, and some reviewers even tried it with nightmare loads like Linn Isobariks with some success! For several years it swept the board, stealing sales from all over the place and picking up every award in the business. DP

MEASURED PERFORMANCE

NAD 325BEE

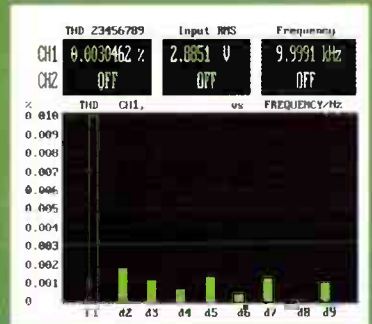
With 84W into 8ohms and 144W into 4ohms the modest 325 BEE has plenty of welly. Current limiting protection circuits started to kick in with a 4 ohm load and I suspect it is not an amp to be pushed hard into a load of this value or lower. I doubt that this will be of much consequence in practice though, as modern loudspeakers can barely use such power. Really consequential - and very rare - is this amplifier's distortion behaviour. No matter how hard it is pushed it delivers small amounts of second harmonic. There are higher harmonics on high frequency signals and our analysis shows them; in the time domain this is classic crossover. Second harmonic still dominates though and this is always a good sign. I'd expect a consistently smooth sound, even when under pressure. The 325 BEE is unlikely to have any bite, and minimal 'sheen', let alone coarseness.

NAD choose to curtail the subsonic response to 8Hz, likely to ensure there's plenty of room for the d.c. servo. It should keep bass sounding reasonably supple.

Input sensitivity is high enough to allow matching of old tuners, cassette decks and such like

The NAD 325 BEE measures very well. It is obviously carefully engineered all round. NK

Power	84watts
CD/tuner/aux.	
Frequency response	8Hz-125kHz
Separation	78dB
Noise	-110dB
Distortion	0.005%
Sensitivity	320mV
D.C. Offset	0.2mV / -3mV



MEASURED PERFORMANCE

MARANTZ PM4001OSE

The small PM4001 isn't powerful by solid-state standards, but 50W is good enough to get high volume, providing you don't listen at really high levels, or use very insensitive loudspeakers. Into a four ohm load the figure rises to 72W so in most circumstances the amplifier will be able to produce something between these two values as a maximum.

The distortion behaviour was encouraging, with just small amounts of second harmonic being produced into an 8ohm load, even at high frequencies. Our analysis at 1W, 10kHz shows just 0.01% into a low 4ohm load. Most of the time distortion measured lower than this, around 0.005%. There was no sign of higher order harmonics from crossover within the residual, so the PM4001 shouldn't sound harsh or coarse.

Surprisingly for a budget Japanese design, Marantz have added a warp filter to the phono stage, allowing it to peak usefully by +0.8dB at 30Hz in order to give a little boost to deep bass. There was some useful attenuation at 5Hz too,

to suppress record warps. The stage was well engineered in every area and should sound tidy enough.

The little PM4100 measured well in all areas. It should give good results in use. NK

Power	50watts
CD/tuner/aux.	
Frequency response	3Hz-53kHz
Separation	81dB
Noise	-104dB
Distortion	0.005%
Sensitivity	230mV
D.C. Offset	2mV / -4mV



Q, Here

Another day, another £130 budget box – but Q Acoustic claim their 1020 mini monitor is something special. Dominic Todd decides...

As an industry expert recently told me, “new loudspeakers are easier to make than ever before”. He’s right of course – with a profusion of parts manufacturers and access to a huge Far Eastern labour market, designing and manufacturing ‘speakers is now easier and cheaper than ever before. What that doesn’t guarantee, however, is that they’ll sound any good...

Enter then the Q Acoustic 1020. On the face of it, they appear to be yet another £130 bookshelf speaker. Dig a little deeper, and you discover that they’ve been voiced by Karl-Heinz Fink, a speaker designer whose reputation precedes him [quite literally, as he did last month’s superb Audica active minis – Ed.]. Even on a simple physical level, the 1020s offer a surprising amount for the cash. Most impressive of all is that both drive units are bespoke designs. Whilst the polyester weave dome tweeter and dense fibre woofer look conventional enough, Q Acoustic

years ago, a £130 ‘speaker wouldn’t have been anything like as well made as this. Moving back inside the 1020s you’ll find a biwirable, fourth order Linkwitz-Riley crossover. Very briefly, this type of crossover is unusual in that both drive

"what this speaker does well, it does very well – which is to sound smooth, couth and big..."

assure us that they’ve been carefully developed specifically for the new 1000-series.

The cabinet shows similar potential. The baffle is constructed from twin layers that are damped by a foam driver. This allows for seamless driver mounting and a bowed face – likely to improve imaging. The total thickness of the MDF baffle varies from 15-20mm. Not bad for a £130 ‘speaker, especially when matched by the 18mm thick cabinet walls! More brownie points are awarded for the internal bracing, rounded edges and excellent finish. Ten or fifteen

units are in phase at all frequencies. There should be an absence of peaks or dips, meaning a seamless frequency response.

For those wanting to wall mount the ‘speakers, there are optional brackets available for around £23 that also tilt. As ever, we’d recommend stand mounting the ‘speakers if you’ve got space, and also removing the rather thick grilles. Actually, the latter of these recommendations is contrary to the Q Acoustic literature that oddly states, “do not remove the speaker grilles unless absolutely necessary”!

SOUND QUALITY

This price point brings no shortage of opposition, with some of my favourites being the Wharfedale Diamond 9.0 (£100), Mordaunt Short MS902i (£150) and, if you can stretch to them, the ALR Jordan Entry S at £199. So the 1020 has a tough job on its hands, and the good news is that it’s tough enough to do it.

Serious small ‘speakers always surprise with their dynamic power,



smooth, even handed nature of the Q Acoustic was also a joy – again, this would work unusually well with sharper sounding ancillaries. The key to the 1020 is the big sound per pound – it's larger than its small stature suggests, sonically, physically and in terms of quality of finish too.

CONCLUSION

What the Q Acoustic 1020 does well, it does very well – which is to sound smooth, couth and big, even with modest partnering equipment.

For this reason, it's an excellent entry level buy. There's no doubt that in the areas of dynamics, staging and even transparency, these loudspeakers are very impressive. To my ears, I did find them a tad too dispassionate – they're not quite as musically engaging as, say, Wharfedale Diamond 9.0s, although they're more accomplished all round, all the same.

Overall then, the 1020s are a welcome addition to the entry level loudspeaker market; they raise the game in worthwhile areas. Although a new name in 'speakers, Q Acoustics can teach old hands a few tricks, the 1020s suggest.

VERDICT

Exceptionally clean and expansive sound at the price makes this a welcome new entry to the budget loudspeaker fray.

Q ACOUSTIC 1020 £130
 Armour Home Electronics Ltd.
 ☎ +44 (0) 1279 501111
 www.qacoustic.co.uk

FOR

- imaging
- refinement
- finish

AGAINST

- treble
- timing

and the 1020 is one such design. With Tipper's 'No Dice', I was instantly met with a powerful, full-bodied sound that belied the size of cabinet. Although lacking real bass, as any 'speaker of this size does, the upper-bass and lower-mid combined to provide a substantial foundation for the music. Treble was less effective, to my ears. Whilst it was undoubtedly smooth and well integrated, it lacked the precision of some rivals, especially the metal domed MS902i, for example. Some of the higher notes weren't quite as defined, although to be fair this suits the sort of budget ancillaries it's likely to be used with better than most. Soundstaging was even better than a decent mini should be – superb, with the 1020 imaging holographically, giving that wonderful quality of the speakers disappearing behind a wall of sound.

Kate Bush's 'Somewhere In Between' saw the crossover doing its job by keeping the frequency response seamless, with excellent bass and treble integration for a

budget box, although there was some congestion in the midrange which made Kate's vocals sound a little cloudier than they could have been. Timing wasn't quite as sharp as, say, the pricier Jordans – clearly, the 1020s suited the synthesised music better than this acoustic mix. Dr John's 'Hen Layin Rooster' sounded impressively dynamic, but the piano lacked some body and also the textural quality you get from boxes at £50 or so more expensive.

Max Bruch's 'Scottish Fantasia' saw the solo violin sounding a little shut in, yet for all this the 1020s did have some really appealing qualities. There was good detail and fine transparency, and once again that wonderfully expansive soundstage impressed. The innately

MEASURED PERFORMANCE

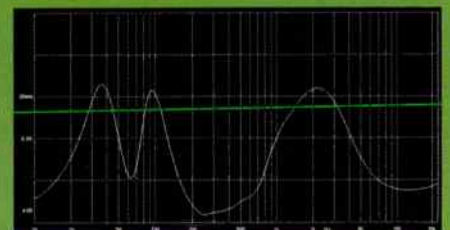
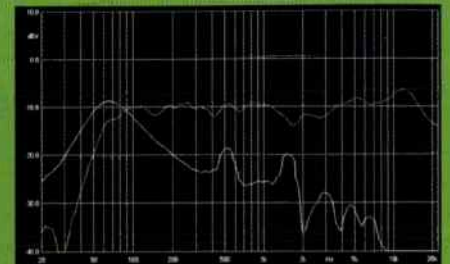
The small Q Acoustics 1020 is an accurate loudspeaker, our measurements show. Its bass/midrange unit is impressively even in output, from 60Hz up to 1kHz. Above this frequency there is a little plateau reduction that may just pull vocals back a bit, before the tweeter's rising output reaches that of the bass/mid at 4kHz. Above this frequency, which is subjectively quite high as far as the ear is concerned, the tweeter's output lifts a little, by +4dB at 12kHz, enough to add some brightness at times, when programme material contains a lot of high frequency energy. All the same, this is a pretty accurate loudspeaker and should sound balanced, although a little dry unless placed close to a rear wall.

Q Acoustics claim extended bass and the 1020 does perform well in this respect for its size, reaching down to 55Hz (-6dB). Don't expect large bass though; it is quite strongly damped. The ports are tuned to 65Hz

Sensitivity was normal enough at 87dB for one nominal watt of input, good for the

cabinet size and a measured nominal impedance of 6ohms. The bass unit's DC resistance was 4ohms, as are most these days, which is how the voltage sensitivity is maintained.

This is a neatly engineered package. Expect a clean, dry and accurate sound, likely low on colouration, but with a touch a treble sheen. NK



Rock with



Right now, there's no shortage of £2,000 loudspeakers on the market, so competition is strong. At this level, you're moving out of 'jack of all trades, master of none' territory and into speakers designed to do particular things particularly well. In the case of Monitor Audio's outgoing GR60, it was about a big, powerful, punchy rock sound, with visceral speed and power that made it a joy with modern popular music. The brand new GS60 is its replacement, and has much to live up to...

This, MA's flagship model, is a real eye catcher. Standing 1080mm high on its plinth, it isn't an object to be missed, and in modern homes I guess the styling is going to go down well. I like it - and the standard of finish is superb too. Those bright metal surrounds are slickly finished castings and the front port at bottom has intriguing internal vanes, designed to control air flow, Monitor Audio say.

The veneer is conspicuously real, with a deep grain that can be felt when touched. Monitor Audio apply a high gloss finish that doesn't smooth over this surface, so the loudspeaker survives close inspection. It looks good from all angles too. Weighing 27kgs (60lbs) the 'speakers are heavy, but moveable. The big cardboard packing cartons contain cast alloy plinths that bolt on, into which are screwed adjustable spikes or feet, accompanied by a small toolkit.

What you see here is basically a two-way loudspeaker, comprising gold C-Cam tweeter allied to a bass/midrange driver, augmented by twin fill-in bass units sited just below. The bass unit within the upper two-way assembly is loaded by a sealed cabinet. The two bass drivers are loaded by offset tuned reflex enclosures, each with its own port. One sits on the rear baffle, the other on the front. Monitor Audio's drive units are well developed, the tweeter having a dual layer dome whilst the three 6in RST2 mid/bass drivers have dimpled surfaces to add stiffness and disperse surface waves, benefiting from Finite Surface Analysis, the company say.

This type of drive unit arrangement is becoming increasingly popular, for good reason. The upper

You

Monitor Audio's Gold Reference 60 loudspeaker garnered a fine reputation as a clean, fast and punchy rocker, aimed at those who want a modern sound from modern recordings. Now, the new GS60 promises more of everything. Noel Keywood listens in...

two way is easy to optimise, giving great results across the audio band, together with focused imaging. I prefer a two-way like this to the more diffuse sound of a D'Appolito.

The main drawback is bass power handling. To generate high levels cleanly, and survive high power inputs, a lot of cone area and coil area is needed respectively. Having said that, the GS60s are pretty sensitive our tests showed, managing 89dB from one nominal watt of input. In small to medium sized rooms, of 16ft maximum approximately, 60W should be more than enough, whilst 100W will do for bigger spaces. I used a 40W Quad II-40 in a 28ft square room and had plenty of headroom to spare, but whilst I sometimes play loud I don't play deafeningly loud. The rear carries two pairs of stout gold plated terminals, with removable links for biwiring. The screw terminals accept bare wires, spade connectors or 4mm plugs.

SOUND QUALITY

Warm, soft and laid back the GS60s are not; our measurements show they have an upper midrange lift and treble peak that, respectively, give great forward presence, plus a wispy top end that doesn't sting so much as add obvious emphasis to cymbals, hi-hats and metallic percussion instruments in general. The upside is that Monitor's drive units have a sparkingly clean, clear delivery

that puts it all together in a way that makes most rivals sound dull and challenged in just about every respect. I heard right into recordings, detail being thrown into my lap. The sudden muting of ride cymbal in Scissor Sisters' 'Lover in the Back Seat' was suddenly a major event, and in the following track my attention was drawn to the way the drummer again used short stabs on cymbal.

Vocals were beautifully clear too, with very precise enunciation that gives the GS60s a sense of precision that is impressive. The balance suits clean modern rock; James Blunt's performances on 'Back to Bedlam' were wonderfully presented, full of detail and life. In spite of this basic balance the GS60s have a smooth dynamic that brings life and scale, whilst at the time sounding analytically clear. At times I heard a small amount of box character, likely provided by the front port, but it was small, to the point of being barely detectable. There also remains a slight amount of cone colouration too, barely consequential with rock but more apparent with classical, where the GS60s are a little less convincing.

As the large choir enters

in grand manner at the start of Beethoven's Missa Solemnis (Berlin Philharmonic) it's obvious that the presentation is both forward and seemingly a little compressed at higher frequencies; I heard much the same effect with massed strings of the Berliner Philharmonic again, this time with Rachmaninov's Piano Concerto No2. Vivid the GS60s certainly were, and smooth too, but a tad more forward than I believe is real or convincing once you sit down to listen to an orchestra. The drama of the GS60 was a little overplayed here. Piano had a slightly light ring too, the expected richness of tone being a little muted. Here, I felt the balance of the loudspeaker wasn't especially appropriate to the music: they're voiced for rock and are vivid with it; classical listeners may have reservations. In the history of loudspeakers this is

THE EDITOR SAYS:

By the time you've got to the stage of paying two thousand pounds for a hi-fi loudspeaker, you've earned the right to know what you like and go out and get it. For this reason, those looking for soft, soothing jazz loudspeakers should look elsewhere. Likewise, classical music listeners seeking unremittingly uncoloured, characterless boxes wouldn't be best pleased with the GS60s. Fans of good old fashioned rock music however, and indeed not-so-old fashioned techno and electronica, look no further. The old GR60 was big, bad and tremendous fun, and the GS60 adds a dash of extra detail, sophistication, depth and finesse – plus (interestingly) an ever-so-slightly brighter, more challenging sound. It's superb – I love the GS60 – and it is a genuinely capable, high resolution tool that has the power and poise to extract the drama from music. But don't be complacent – you'll have to get the ancillaries right, and that means a very smooth front end and a 'big game playing' power amplifier. I personally would also add vinyl to equation; this takes the MA's pronounced upper midband down a touch (after all, CD has the very same characteristic) and really lets the GS60s get into the groove. Matched with care, these are superlative rock transducers. DP





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I picked up straight away, having spent countless hours in this aspect of loudspeaker design myself and knowing the benefits. The GS60s display the company's grip on engineering here.

A promise fulfilled comes from the bass performance of this big and visually assertive loudspeaker. The bass drivers knit smoothly together, measurement showed, and there is no low frequency boost to warm things up. What you do get is massive low end heft and a good sense of grip, almost vice like in fact, depending upon amplifier, I found. There's an almost dry quality, a lack of slop and waffle, that's going to be appreciated by most listeners, but that is not to say there's any restraint of dynamic. Quite the reverse, the GS60s are fluid and dynamic at low frequencies, but also well damped and controlled; this is the sort of sound so many audiophiles crave, I believe: fast, tight and punchy. They go low too, but remember that I used a 28ft x 28ft room that allows this. Only big Tannoys do it better. Large solid-state amplifiers, like the NAD M3 I used, work well, although for most listening I relied as usual on a Quad QC24 pre-amp and II-forty power amplifiers, which the GS60s worked well with.

It is fairly obvious the GS60 has a very high quality crossover, making it translucent to amplifier quality and revealing of same, so it needs to be partnered carefully. There's little masking of source and budget amplifiers are not a good choice, as

I found the greyness, flat imaging and tizzy top of solid-state was all too apparent when a budget jobby was hooked up. Best not to use a sharp sounding CD player too; an Eastern Electric Minimax worked well at the inexpensive end, and Chord's DAC64 at the top end. I used both.

CONCLUSION

Monitor Audio's GS60s are clear, fast and detailed like little else. Wide open and spacious sounding, there are few that will get past them in any comparison. Better, in spite of their slightly enhanced balance, shall I say, they have a smoothness, togetherness and sweetness that allows long term listening. I had no problem here, where often treble emphasis persuades me I have other things to do. With strong, tightly controlled bass that reaches down low, coupled with a supple dynamic and you have one of today's finest rock speakers at the price. From my own experience designing loudspeakers I know the GS60s are very thoroughly developed, not just from measurement but by their subjective sense of smooth 'oneness'. With classical music their balance is less convincing perhaps, but this is best assessed personally during audition.

Like the GR60 that went before, but more so, the GS60 is a class act that I can only award top marks for the totality of its engineering, superb finish and great price. If you want to hear one of today's best fast rockers, this is the one. Its an addictive listen, and at the price a snip too.

hardly uncommon of course: it's a dilemma every 'speaker engineer faces; accuracy can be improved upon - and if you don't do it then your rivals will...

The GS60 will shade most price rivals in any straight comparison using rock because of its astonishingly vivid upper midband, but it isn't strictly a neutral performer.

Measurement shows the drive units have been knitted together rightly by the crossover and this fact, allied with the use of similarly voiced materials in cone and dome make for a sense of smoothness and cohesion that again leaves rivals gasping. Top marks to Monitor Audio here too; you will hear this as a sense of tidiness, something

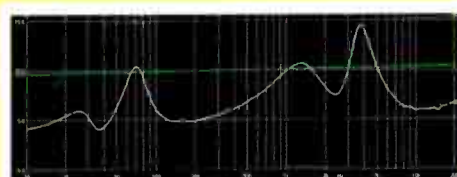
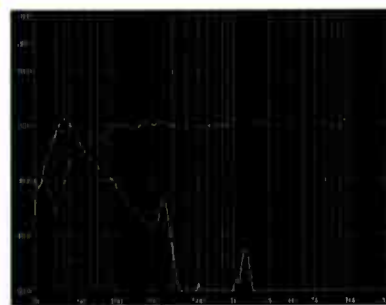
As expected from Monitor Audio, the GS60 has been tightly engineered to offer an even frequency response right through the audio band. It stays within tight limits of a few dB from 100Hz up to 20kHz, although there is plateau rise at high frequencies that will introduce brightness. Additionally, a peak in treble output of +4dB at 12kHz that is liable to add some hiss or wispieness to treble. There is no bass lift to add warmth to the sound; on the contrary, bass falls away to -5dB at 40Hz, but the lower port works down to 30Hz. In larger rooms bass will likely sound dry, well controlled and deep.

Impedance measured 5.5ohms overall, a fairly low value. The impedance curve has the usual rise due to voice coil inductance and is not too reactive. Sensitivity was good, as hoped from a large floorstander, coming in at 89dB from one nominal watt (2.84V) of input, so amplifiers

of modest power, no more than 60W or so, should normally be adequate.

The GS60 is neatly engineered and measures well. It should sound tight, bright and clean, with fairly dry, unemphasised bass. NK

MEASURED PERFORMANCE



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Football wasn't the only attraction in Germany this summer, as Munich's High End Hi-Fi Show proved, says Jason Kennedy...



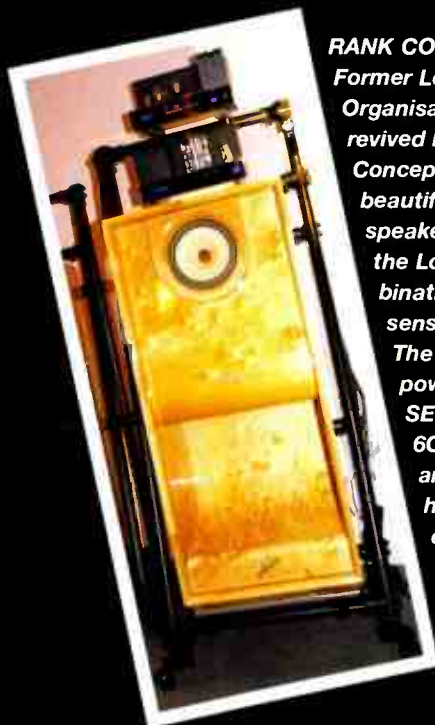
QUAD GMBH
While Quad (UK/PRC) was showing its new 2805 and 2905 metal framed ESLs, Quad Germany

(the ESL refurbisher)

revealed the first new ESL57s to be made since the seventies. Quad Musikwiedergabe GmbH has been using the original bass and treble panel making machines from Huntingdon to rebuild this classic loudspeaker. The ESL57 price is £6,300 with a rebuilt ELS 63 in the pipeline for £7,500. The company has also been rebuilding the original Braun LE 1 electrostatic designed by Marcel Breuer of Bauhaus fame.



THALES TONEARM
Michel Huber has built a novel hybrid tonearm that uses two pivot points to produce a cartridge platform that keeps the stylus at the correct angle in the groove all the way across the vinyl. It doesn't track in a linear fashion but rotates a pivoted headshell so that the stylus can track the groove at the same angle as a linear tracker. Dubbed Thales the arm is shown on Brinkmann LaGrange turntable and will cost £6,000.



RANK CONCEPT
Former Leak owner Rank Organisation's name has been revived by German Rank Concept, which showed this beautifully veneered horn speaker design based around the Lowther PM6A, a combination that claims 98dB sensitivity and costs £6,900. The matching ZN-3306 power amp is an 18watt SET monoblock using a 6C33C-B output tube and the ZL-607P preamp has balanced and single ended MC phono inputs and some of the coolest styling to be found on a valve amp.

CABASSE LA SPHÈRE
French speakers were out in force and Cabasse delivered more force than most with its La Sphère, a four way coaxial design built into a substantial epoxy sphere. An outboard crossover has a built-in delay system to compensate for the fact that the 55cm bass driver is behind a 21cm upper mid-range, 12.5cm midrange and 25mm tweeter. For those with a penchant for the extreme the price is £120,000 including six monobloc amps...





HALIEATUS FIREBIRD & BOOSTER

French newcomer Halieatus has literally applied rocket science to the world of hi-fi with its patented acoustic nozzle technology. Developed by the University of Paris and the European Space Agency the nozzles are said to give small loudspeakers the firepower of much larger ones, apparently the nozzle shape is "essential to make the sound waves propagate without turbulence". Let's just hope they don't take off next time someone plays 'Rocket Man'...!

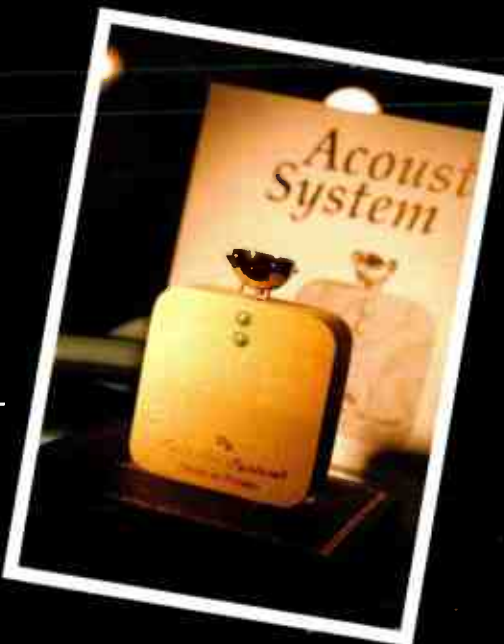


KEF & ANDREW WATSON
KEF ran the most mysterious dem of the show by hiding an unfinished engineering exercise beneath black cloth tubes. KEF's Andrew Watson explained that these two metre high behemoths may not go into production but they showcased what the company can do when it puts its mind to it. They incorporated a new Uni-Q driver with a shallower cone profile and new tweeter that gives supertweeter style

extension from a two part dome with a ventilated pole. Powered by two Chord SPM 14000s aside these concept KEFs delivered one of the best sounds at the show.



EBONY AND IVORY!
Renate Paxa, Head of Press Department at the High End Society GMBH, together with Hi-Fi World Director Sharon Mehlhorn.



ACOUSTIC SYSTEM RESONATOR

No show is complete without some unusual accessories and my Munich favourite is the Acoustic System Resonator, a block of wood about 50mm high that supports a little metal chalice that when placed on a wall is said to make it disappear, acoustically speaking. At £200 each they'd make a very cost effective listening room extension, if they worked...

EMT JPA-66

The EMT brand, long associated with heavily engineered professional turntables, has been resurrected by Jules Limon who has controversially launched a preamplifier as its first product. This heavily vinyl oriented design has four phono inputs each individually adjustable for impedance and level with global adjustment of equalisation and RIAA turnover point. It is of course tube powered and includes scratch filtering, mono switching, 'highly optimised' subsonic filtering and output circuitry that is "capable of driving ANY type of power amplifier", retail in Europe is £15,500 but UK distribution is being sought.





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"Apple's market dominance hasn't been seen since Hoover became the generic name for vacuum cleaners..."



dominic todd

It's hard to believe that it's now seven years since the MP3 portable market took its first tentative steps. I remember, myself, in that pre-millennium year the ripple of excitement caused by the format. Yet, sales were slow, and the excitement was very much generated by technology enthusiasts and not the wider public - a public who took to DVD more swiftly. Since then, of course, much has happened and the MP3 player has proved almost as much a sales success as that of the record breaking DVD format.

The statistics are staggering. Legal music downloads were up 150% in the first three months of 2006. A recent survey has shown that almost three quarters of the UK population aged 16-45 now own an MP3 player of some type. In the wider world, Apple's sales of iPods were up a phenomenal 220% to the end of 2005 and 61% up in the first quarter of 2006. Given the huge success of the iPod last year, the later figure is perhaps the more impressive.

More impressive still, though, is Apple's complete dominance of the format, even against electronics superpowers of the likes of Sony. iPod now has an entry in the Oxford dictionary. Its very name has been influential in countless other fields. First we had the *i-this* and the *i-that* (note the *i* is never capitalised), then we were inundated with iPods. In the past few years we've seen pod houses, pod caravans and, of course, the highly successfully podcasts. Apple's marketing people must be pretty chuffed with themselves; this type of market dominance probably hasn't been seen in the electricals world since Hoover became the generic name for vacuum cleaners.

Take a look at the current range of iPod players and you can see why

the brand has been so successful. The original iPod looks sharper than ever and is slimmer than before. Its 30 and 60GB storage limits are class-competitive and the addition of video has further gnawed into any advantage that rivals may have once had. It even comes in black now, which for a product that many see as a fashion accessory, can't be discarded as an irrelevant matter. At the other end of the scale, the iPod Shuffle provides access to the hallowed brand for less than fifty quid. No doubt this will bring young buyers into the brand that, once they've discovered the joys of Apple, will be hooked for life. Between these two models lies the Nano. Despite some durability issues, with Apple themselves admitting that 0.1% of models suffered from dodgy screens, the Nano has been a huge success. Its 1, 2 and 4GB storage isn't the greatest but the combination of super-slim styling and a colour display instantly made the previous iPod Mini appear like something from the arc.

Rivals have, once again, been caught on the back foot, but they are now finally starting to catch up. One of my personal favourite MP3 brands has long been iRiver. Their newly launched E10 model offers pretty much everything the Nano can but with a few extra features to boot. For starters, there's an FM radio built-in, but of perhaps even greater interest is the 6GB memory. No doubt we can expect a rival 6GB Nano from Apple any time now...

Yet, as solid and indomitable as the iPod appears, Apple must have concerns over its future. Apple has been working hard to improve their range of products across the spectrum of audio. They see their future direction as taking a wider share of an accessory market that has hitherto been something of a

free-for-all. We already have the iPod Hi-Fi, and you can expect to see more Apple branded products soon, perhaps even squeezing out the likes of Bose and Monitor Audio from the official Apple sites.

Apple must realise, however, that it's not rivalry from traditional contenders that it needs to worry about, but that of the mobile phone manufacturers. We've heard for sometime now of mobile phones with ever growing MP3 capability, but it's only the recent launch of the Nokia N91 that, I think, has really hit the nail on the head. Its 4GB capacity matches, at present, the largest Nano but, of even greater importance, it actually looks and functions like a good MP3 player. The pull down cover contains a proper play, pause, ff, rewind control group and there is, of course, a decent colour screen. Although I've not listened to one myself, I've heard that, providing you chuck out the original headphones, the sound quality is pretty good. Worryingly for Apple it will even en/decode AAC and AAC+ files, in addition to MP3 and WMA, etc.

It does beg the question why anyone who carries a mobile phone and MP3 player and, let's face it who doesn't these days, wouldn't want to downsize to a single unit? To follow the logic through, then, Apple is either going to have to continually develop the iPod so that it always remains a few steps ahead of the MP3-equipped phones, or develop an iPod mobile phone of its own. For Apple to develop and sell this independently would take colossal effort, and it's hard to see them succeeding without the help of an existing phone manufacturer. Nevertheless, the advent of an iPod mobile phone hybrid could well materialise soon. Podphone anyone? ●



June 2006 marks the launch of some long-awaited products.

INTRODUCTION After almost three decades in this industry I have some perspective, and I can say that the high-end is not a shrinking industry; and in terms of quality and value we are living in the Golden Age of Hi-Fi! Real Hi-Fi has always been the pursuit of the enlightened and minority; today's iPods are bought by yesterday's owners of rack systems. What I find surprising is the commercial success in Britain of the usual suspects. If you look just a little beyond the magazines and the High Street, the same money buys crafted and calibrated products with pride of possession, long-term currency, value and most of all pleasure.

We are very happy to offer a premium no-frills mail-order service; indeed we think ours is the best in the land: with no grey imports, no phantom products, six month guarantees on Hi-FiShop.com, what you see is what you get. Two floors up from our bargain basement, (or clearance cellar!) The Audio Salon's spacious Victorian Drawing Room people travel from near and far to hear, for example, the fabulous Gryphon Poseidon system, which redefines the state of the art.

In Tom Brown's schooldays, six of the best was to be avoided at all costs. This month we proudly debut Hi-Fi that redefines investment opportunities, and getting in before the rest!

ATC SCM-40 Launched in May 2006 at £1,999, this speaker by ATC asks (if there is anybody out there; yes Pink Floyd are among ATC users) why spend two grand on a hyped or second-hand loudspeaker when you can cut to the chase and hear your music the same way most musicians heard their recordings in the studio.



Esoteric X-03se TEAC decided to keep UK customers waiting for the special edition at no extra price for the stiffened power supply and other refinements. It has been worth the wait. This is a combination of VRDS precision engineering and painstaking audiophile refinement. At £4,995 it has to be the high-end bargain of the decade.



Ayre Acoustics MX-R

There is a well-founded rumour that Charles Hansen knows a thing or two about amplifier design, and when his amps outperform behemoths costing more than double, you wonder what his forthcoming £11,590 monoblocks will do. At a product launch in Amsterdam, a Hi-Fi manufacturer said to Hansen, "These are simply the best amps I have heard." And he has heard most. The MX-R revises what you expect from amplifiers. And yet it is so small...



JPS Labs Jilt your girlfriend, divorce your wife if she moans about "a bit of wire that costs two grand." Is she deaf or something? The Aluminata range from JPS reflects the company's commitment to spend less than 5% revenue on advertising (ie. your money) and avoid off-the-shelf materials which make an ordinary product. The new SC-3 interconnect is available on sale-or-return; a nasty trap for the unwary. Barely legal.



Brinkmann Oasis Mr Brinkmann has come up the fast lane to produce turntables with a vengeance and a long waiting list too! They are the best. And untypically they are affordable, but now they are a bargain. The Oasis at £3,495 (launched in May 2006) employs the same precision engineering but without the costs of belt drive. This new revolution (intentional pun) has been made possible by a wholly new motor which redefines direct drive. Do not expect quick delivery. Do not buy anything else.



Pathos Endorphin And then there comes along the long-awaited Italian CD player and it gives you the goose bumps. Comparisons with Alfa Romeos and Ferraris convey the excitement that a product of passion; stimulating and absolutely sensational. Do not waste £4,500 on ... What you were about to buy!!!



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steven green

The mobile phone network operators and manufacturers see mobile TV—TV delivered to your mobile phone—as being both a “killer application” that will drive 3G take-up and a highly lucrative subscription service to recoup some of the billions they’ve spent on 3G licences.

Up to now, the mobile TV services offered by some of the mobile phone networks, such as Orange and ‘3’, have been using spare capacity on their 3G networks, and each viewer receives an individual transmission of the channel they want to watch. This is an inefficient way to distribute TV, and in the next few years, as more people migrate to 3G, there will be insufficient capacity to deliver mobile TV as well as phone calls, web browsing and so forth.

To solve this problem, a number of new broadcasting systems have been designed specifically for mobile TV, and which use different spectrum to 3G. The best known of these new systems are DVB-H (Digital Video Broadcasting – Handheld), DMB (Digital Multimedia Broadcasting) and DAB-IP (DAB – Internet Protocol). These systems are simply extensions of existing broadcasting standards: DVB-H is an extension of the DVB-T (DVB – Terrestrial) standard that is used for Freeview in the UK, and DMB and DAB-IP are virtually identical extensions to the DAB standard. All three systems add stronger error correction to the base standard to enable the relatively difficult task of video reception on a mobile phone, and modern, high-efficiency video and audio codecs are used to minimise the bandwidth required per TV channel.

The main obstacle in the way of introducing these systems has been the lack of available spectrum. For instance, DVB-H was primarily

designed for use on UHF Band IV/V spectrum that is used for analogue and digital TV, and it is not envisaged that there will be any free spectrum in these bands until after analogue TV has been switched off, which will happen in 2012 in the UK. In response to lobbying, however, the EU announced in May that spectrum would be found for mobile TV across Europe within the next couple of years. Furthermore, the EU now seems to be backing the DVB-H system, presumably because it is a European-designed system, which will be a major blow to the South Korean-based DMB and BT’s proprietary DAB-IP system.

Some other countries have already found spectrum for DVB-H, though, with this year seeing the launch of national services in Italy and Finland, and the beginning of the rollout to the thirty largest US cities. The first the UK will see of any of these systems will be Virgin Mobile’s service that will use DAB-IP. This service will launch later this year and is to be transmitted on the Digital One national commercial DAB multiplex.

One major problem with Virgin Mobile’s service, however, is that they are only using a bitrate of 59kbps (thousand bits per second) per TV channel. Even taking into consideration the very small screen-size on mobile phones, this is a ridiculously low bitrate for a channel that consists of both video and audio. In contrast, the numerous DVB-H trials around the world have typically been using bitrates of 300-350kbps per TV channel (usually 48-64kbps for the audio channel and the rest is used for video), so the picture and audio quality of the channels on this Virgin Mobile service is effectively guaranteed to be absolutely diabolical.

Also, Virgin Mobile’s partners in the venture, BT, want to launch

five instead of the currently possible three channels, but this will require the legislation that limits the percentage of capacity that can be used for non-audio services on DAB multiplexes to be changed from 20% to 30%. The Department for Culture, Media & Sport is currently holding a public consultation on this issue (<http://tinyurl.com/ruz96>), which closes on 12th June, although judging by previous public ‘consultations’ in this area, whatever is proposed goes through irrespective of how many people express opposition...

If five channels are launched, two stereo radio stations on the Digital One multiplex will have to be reduced to 1960s-style mono, although transmitting music stations in mono is actually already quite common on DAB in the UK – Ofcom is clearly doing a superb job of maintaining high standards on DAB.

And there are two other new systems that can be used for mobile TV: MBMS (Multimedia Broadcast and Multicast Service), which is an extension to the 3G standard, and MediaFLO, which is a proprietary system designed from scratch by American communications giant Qualcomm.

For some reason, all the prospective service providers in the UK favour different - and incompatible - systems: Virgin Mobile has chosen DAB-IP; O2 favours DVB-H; Orange is trialling MBMS; and BSkyB is to trial MediaFLO. It’s all a bit of a mess!

Hopefully, the EU will be true to its word and make sure that spectrum is made available for mobile TV in each country as soon as possible, because the current services over 3G and the forthcoming service over DAB-IP threaten to give mobile TV a very poor reputation for picture and audio quality before the decent systems have had time to launch. ●



A NEW RANGE OF KITS FOR THE AUDIOPHILE from WORLD DESIGNS

WD25T Aperiodic Floorstanding Loudspeaker Kit

Based on the WD25a Stand-mount design this extension to a floor standing loudspeaker brings new benefits to the aperiodic principle.

The larger enclosure offers a second chamber coupled through a resistive vent to the driver enclosure to achieve an aperiodic performance with bass extension and clarity that would be typical of a very much larger cabinet. The impedance is a smooth 6 Ohms which, together with the high sensitivity of 89dB, gives an easy drive load which suits all types of amplifiers.

Based around a 10 inch bass unit with soft paper cone and butyl rubber surround, the WD25t marries this, using a high performance, hard wired crossover, to the advanced XL treble unit from the SEAS Excel range featuring a 29mm SONOMEX fabric dome driven by a powerful Neodymium magnet system.

Kits are complete with bi-wire, gold plated terminals fitted to an oval terminal panel that carries the crossover PCB. Crossover components have been chosen for optimal performance to match the drive units and feature high power resistors and inductors and low loss polypropylene capacitors. LC-OFC cabling is used to connect to the drive units.

All internal damping materials, cabinet damping pads, aperiodic vent foam, screws and gaskets are supplied with all kits.

The optional cabinet kit is fully machined in oak veneered, high density MDF with precision internal grooving for easy assembly. The veneer is ready to be stained and lacquered to your colour preference using readily available wood finishes. Alternatively use a furniture oil for an easy maintenance, natural oak finish.

www.world-designs.co.uk
Tel: 01832 293320



For more details, please check our website:

www.world-designs.co.uk

WD25t STD kit	£279 per pair
WD25t XL kit	£459 per pair
Cabinet kit	£398 per pair

"when it comes to perceptual coding schemes, people don't see the wood for the trees..."



noel keywood

Much is made about the 'science' of audio compression, something I find amusing - because there isn't any. It's more biology than science and biological systems are notoriously imprecise as far as the hard sciences, such as electronics are concerned. This really puts a cat in amongst the chickens before they're even hatched, but amusingly engineers seem blind to the situation...

This fact impacts lossy compression systems of all types - but especially those in radio, where serious amounts of compression are needed. It makes all of them, in theory, open to the accusation that they degrade sound quality. Whether they do or don't depends entirely upon the listener, and what a listener thinks is by definition subjective. We've been through this argument before with CD and now, with a new generation of radio engineers we are going through it again with today's super whizzo transmission systems.

The 'science' of compression is an interesting fallacy. Audiometric testing shows that humans vary in their cognitive capabilities, as we're all aware: some have great eyesight, others don't. And so it is with hearing. It is possible to define limits of ability out of which humans rarely stray, but this still only applies to those phenomena we can easily identify, define and test, notably masking and the hearing threshold. As apparently scientific systems that manipulate data to exploit these cognitive processes are, what no one ever admits is that there is only one acceptable method to test them - listening.

This is one of those gloriously obvious but totally ignored facts that everyone misses in the complexities of the argument. In other words, when it comes to perceptual coding schemes people don't see the wood for the trees. If the ultimate test of such schemes is subjective, as it has to be, then the schemes themselves are not 'scientific'. They follow a carefully worked out scheme that offers a useful working model of how the human ear and brain work, up to a certain limit of accuracy we simply cannot know about. Because despite all the work done on the human hearing process there are still mechanisms we do not understand.

This in particular dogs the area of high fidelity I work in, and Hi-Fi World readers are well aware of it. A perfect example exists in this month's Mail section, being a letter from a reader who has taken to SACD, CD's successor, and finds he can't easily go back. There's an ever broadening constituency who find this, notably that SACD offers a richer, smoother and altogether more convincing sound than CD ever did. This raises a variety of interrelated issues that illustrate just how difficult it is to pin down what constitutes good sound and how we can, or more pertinently, cannot measure it.

That a large number of people confidently assert SACD sounds much better than CD and - importantly - that this is important to their enjoyment (i.e. the differences are consequential) is quite significant. It valuably demonstrates in the only way that is important - subjectively - that CD quality is limited and can be improved upon. It is here we run into the woeful limits of our understanding of how any scientifically measurable

parameter of the sort that concerns engineers such as myself impacts the subjective experience.

There are numerous interactive and conflicting variables, many of which are disturbingly non-linear. For example, a small emphasis in high frequency energy appears to direct the ear/ brain to concentrate on this region. In the short term, events are highlighted, from cymbals to the presence of distortion, and in the longer term this sort of focussing produces fatigue, in the same way we get fatigued after any concentrated activity. So one small electrical phenomenon can trigger a whole series of subjective phenomena and if the end result is biological rejection of scientific item, then the science fails the biology. The science is inferior to the biology too; it does not and cannot stand on its own without reference to the biology.

Since compression schemes are assessed subjectively in listening tests, inevitably the way those tests are conducted is crucial to the validity of the assessment. We have never solved this difficulty at Hi-Fi World and there's endless argument even today about how you can get humans to perform usefully in listening tests. Whatever way it is done there will remain argument about the audibility of artefacts within lossy compression schemes. This is an inevitability in any system that has to be judged subjectively. It isn't scientific, it just uses the parameters we know about and can manipulate to come up with a simulacrum of music. How good those parameters are are eternally up for debate. So when compression schemes are billed as perfect, you can be assured they are only as perfect as CD once was. ●



THE WHO
The Who Sell Out
Classic Records

Audiophile fans should be made aware of an exciting new deal forged between Classic Records and EMI. What is described as an “extensive series of titles” is being made available for reissue by Classic beginning this summer, in which the original masters will be used and pressings will be placed on 200gm vinyl with authentic gatefold packaging and art. Mastering will be completed via Classic’s specialist tube-based analogue system. And so to The Who, and a thoughtful reissue by Classic of this essential rock album which mimics the antics of a pirate radio station, complete with between track jingles. Why thoughtful? Because Classic has decided to release it on separate mono and stereo versions. In fact, the original album was originally released as Track 612002 (mono) and 613002 (stereo) on December 15th, 1967.

Both originals emphasise the bass, so were never the best masters. Classic’s reissues are far superior. The mono version was mastered and cut using that very same tube analogue mastering system, mentioned above, using the original master tapes provided by The Who. The resultant sound still maintains that hard edge. However, the mastering isn’t perfect with some ‘balance’ concerns. The mono version does sound a little

off centre. Like many other bands of the ‘60s the stereo version of this release differs from the mono. The mono version of ‘Odorono’ removes the lead guitar and the vibrating vocal at the end of Mary Ann With The Shaky Hand is also removed. Also there is an alternative guitar track on ‘Our Love Was’. The album features the classic ‘I Can See For Miles’ (voted by Pete Townshend himself as one of the best singles The Who ever released but was sadly neglected by the paying public at that time) in addition to others like ‘Mary Anne’, ‘Can’t Reach You’ and ‘Rael’. It also features a faithful reproduction of the original ‘psychedelic poster’ which is so hard to find, even within original second-hand pressings.

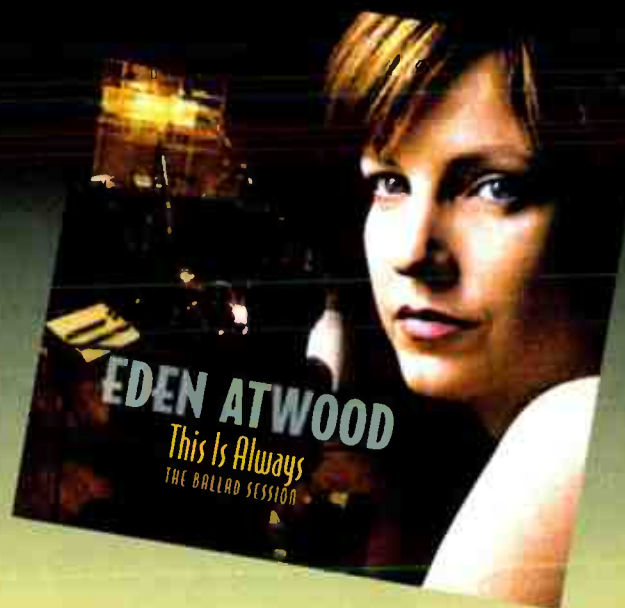
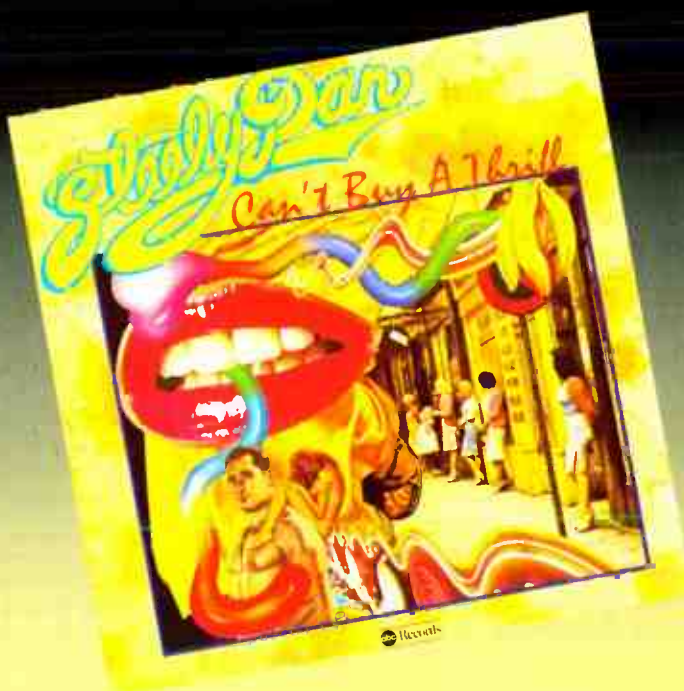
JACINTHA
The Girl From Bossa Nova
Groovenote

Jacintha Abisheganaden is a Singapore-born singer and actress who has spent the past several years honing a style based in classic torch tradition. She was discovered by Groovenote’s founder and CEO, Ying Tan – also the co-founder of the famed Classic Records in the USA. Jacintha’s signing to the label was partly a result of Tan’s decision to move away from the Classic policy of majoring on audiophile reissues.

“Usually Ying and I work on songs and concept for a new album, sometimes a year before we record,” said Jacintha. “But I must say they are

his concepts and for the most [part], his song selection. What I do is confirm what works for me and what doesn’t. The time before recording helps the album breathe, gain emotional momentum and clarity. Ying is able to match the psyche of a song with the psyche of the singer at hand. Even more interesting, as we work over the years, is that he is able to sense the changes and put that into the song selection. Because of this, he’s very generous if I change my mind on a song.”

The 10 songs all, of course, have a Bossa flavour with the creations of Antonio Carlos Jobin, famed Bossa nova artist, to the fore. Jacintha’s own influences are aimed at the classic vocalists and interpreters, “You cannot be a singer of slow songs without being influenced by Streisand. As a pre-teen in Singapore, I was obsessed both with her voice and her eyeliner. In her early work, her arrangements with a full orchestra were so exciting.” Ying Tan believes that 45rpm editions are the best way to reproduce music. He realises that the 45 edition is much more expensive but that, for the sake of his own pride and professionalism, if nothing else, 45rpm only will do. In this day and age it is refreshing to hear of a label boss with such audiophile principles. This release is intimate, warm and natural. The pressing flat and quiet with a sound quality that is, quite frankly, state-of-the-art.



STEELY DAN *Can't Buy A Thrill* Speakers Corner/ABC Records

Long out of circulation, the 1972 debut album from Steely Dan, was a polished and cultured release including the hit single, 'Do It Again', plus 'Reelin' In The Years'. Working as hired songwriters by day, apparently 'Dan co-founders, Donald Fagen and Walter Becker, rehearsed this debut in executives' offices by night. Featuring the sharp and bright lyrics from David Palmer the music blends classic '70s rock with Latin gloss. The original issue sounds good but this reissue is even better. As Donald Fagen, Dan co-founder, confirmed, analogue is a favourite of the group, "I grew up and learned analogue and I'm an analogue geek. It's not that I'm kicking digital but analogue has a much better sound. When you are able to A/B analogue and digital there's simply no comparison. The top end is so sweet and beautiful. I've never heard anyone say about digital, even at 24bit/96kHz or 192kHz: 'Isn't the top end as sweet and beautiful as you've ever heard?' You don't because digital just doesn't sound that way. Analogue changes something in the sound," he elaborated, "but I think it does something good. By contrast, digital is pristine and sterile."

Walter Becker was at pains to point out that the medium alone can't deliver great sound, as he originally stated to Sound On Sound

a few years ago. "It's a question of how good analogue sounds if you happen to have a great engineer and a great bunch of musicians in the room. Analogue has all sorts of problems... along with the potential to sound very good. You have to get the most out of the creative possibilities that analogue offers. Just walking into a studio with analogue tape machines isn't going to buy you anything." 'Can't Buy A Thrill' is an admirable album – not perfect, there are a couple of chugging tracks included, but it did spawn a bedrock band. This edition is a superb audiophile reproduction of the original, in a gatefold, without any modern codes or barcodes infecting the sleeve or vinyl. Mastering is top-notch with no surface noise and the dynamics are full blown.

EDEN ATWOOD *This Is Always* Groovenote

This is an album of classic American Songbook ballad tracks and more sung by a young lady with an infectious voice. The album features a host of classics such as Gordon and Warren's title track, Hezman and Levant's 'Blame It On My Youth' and Arlan and Mercer's 'Come Rain Or Come Shine'. Most believe that any great audiophile album hinges on how the master was created, managed and treated. But I think it's most important to have placed upon that album someone who

can actually sing. If the singer is poor or if the singer is good but has not approached the session with care and attention, it can have disastrous effects on the final recording. The mastering engineer and your expensive hi-fi are then fighting a losing battle. The studio and your hi-fi has a better chance to portray great sound if the singer has bothered to 'turn up' in the first place – what was that about 'garbage in, garbage out'?

"The open throat is key and the focusing of the sound in the facial mask to help direct the sound," explains Atwood. "I try to get the most resonant tone possible while giving equal time to all the words so that nothing is taken for granted and every word is understandable. Also, really shifting all tensions to the abdominal area for diaphragmatic singing. The low singing came about as a response to singing a hotel gig in Singapore where I was singing in a smoky joint six nights a week... four sets a night (a scene I would do for over a year in Singapore, Hong Kong, Bangkok and Shanghai). I lowered everything and liked it. It sounded more natural and less 'singer-ry'." And, as a teacher herself she does, "encourage all my students to develop the low range." Atwood's singing is dramatically enhanced by excellent mastering and the fact that this album is a 45rpm edition with enhanced dynamics, the one album being spread over two disks.

CONTACT

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www.vivante.co.uk

Speakers Corner
020 89773739
www.purepleasurerecords.com

Upgrading Your



PART 1 – The Enclosure

Upgrading any speaker can be managed by anyone who feels capable of removing their drive units using a screwdriver or hex key.

Just by upgrading the internal components you can eliminate bass boom, reduce midrange coloration and increase midrange and treble detail. Peter Comeau shows you how.

will honour the guarantee if you send a faulty drive unit back for replacement.

Before you start thinking about components you need to find out exactly what is inside your speakers. The first thing to do is to carefully remove the drive units. Drive units are normally held onto the front baffle by screws. These may be wood screws or they may be bolts that screw into nuts held on the other side of the baffle. The bolts or screws should be tight, so be careful when you choose a tool to undo them. Use the correct size Hex key for hex headed bolts, or a screwdriver with the correct head for Pozidriv or Philips cross head bolts.

With the speaker on its back locate the tool firmly in the screw or bolt head and undo with a firm but light downward pressure. Make sure you don't slip or the screwdriver may puncture or scratch the drive unit surround or diaphragm. If you are undoing a bolt then do not apply too much downwards force or you may push out the nut fitted to the inside of the baffle. These 'T' nuts have spiked collars which hold them on to the baffle as the bolt is tightened but easily push out when the bolt is being undone.

After having removed all the screws you may find that the drive unit lifts out easily if you are lucky. Usually, however, the drive unit is a tight fit in the baffle and the gasket between the drive unit and baffle may be slightly sticky. Don't be tempted to try and lever the drive unit out using a screwdriver around its edge. One slip with the screwdriver and you will damage both cabinet and drive unit!

Often the simplest way of removing a 'sticky' drive unit is to put two bolts into opposing screw holes and tilt them sideways whilst lifting. In any case you should be able

to lever some tool or other into the screw holes which will enable you to lift one edge of the drive unit so that you can get your fingers underneath it. Don't get frustrated at this stage, just take your time and think about what you are doing and you will get the drive unit out cleanly and without damage.

Place the drive unit on a piece of card on the baffle whilst you remove its connecting wires. These may be connected using push-on tags or they may be soldered. Be careful when removing wires from treble units as the tags are usually held in plastic mouldings. These easily break if you apply too much force, or easily melt if you apply too much heat with a soldering iron. Some tags are of the 'lockable' type and you can remove these by using a small screwdriver with a fine tip to lift the locking strip which locates into a hole in the centre of the tag.

Make a note of which colour wire goes to the tag marked with a + or red spot on the drive unit. When you re-connect the drive unit later you must make sure you connect them with the correct polarity.

CABINET DAMPING

Having removed the drive units you can now take a look at the inside of the cabinet. You will probably be greeted with white fibre or grey foam, or perhaps a mixture of both. The white fibre is commonly known as BAF (Bonded Acetate Fibre) and is fairly good at absorbing midrange frequencies. The foam is normally used to line the walls of a speaker and acts in two ways. One is to absorb some of the midrange frequencies and stop them getting through the cabinet walls. The main reason for using it, though, is to 'damp' the bass resonances inside the enclosure.

There are two types of foam

You can expect commercial speakers to be built down to a price, not necessarily up to a quality. The market for loudspeakers is a highly competitive one and manufacturers often take the path of least resistance to achieving sales - low price. As a result the parts you see on the outside might look expensive but the parts you don't see on the inside are often purchased on the tightest possible budget.

So you can usually upgrade your speakers just by replacing many of the internal parts with higher quality components. These won't change the specification of the speakers at all - you can still keep true to the designer's blueprint - but you will improve the sound. Bear in mind that you may invalidate the manufacturer's guarantee as they don't like the idea of users 'modifying' their products. On the other hand the only bits in loudspeakers that can fail are the drive units and most manufacturers

Loudspeakers

commonly used. The cheaper type feels stiff and rough to the touch. This is useless as it is too stiff to do its job. The other is soft and spongy to the touch and is fairly good at its job.

Again, note down how the fibre/foam is distributed inside the speaker before removing it. The speaker designer should have experimented with the placement of the foam/fibre inside the speaker, so you will need to replace it exactly as it was positioned in production.

Sometimes you find nothing, or not very much fibre/foam, inside a speaker. This may be because the designer was trying to encourage bass resonance or it may be that the manufacturer was a cheapskate! If you want to improve your speakers because the bass is lumpy or overblown in character then this is the first area to attack.

Improving the cabinet damping material can result in a reduction of bass boom, and a corresponding increase in bass clarity, and an improvement in midrange clarity and detailing by removing coloration caused by internal reflections.

Remember that the cabinet damping foam or fibre is there to do two things - act as an acoustic absorber for the sound swilling around inside the cabinet, and to damp low frequency resonances.

PANEL DAMPING

With all the internal foam/fibre removed we can now attend to resonances in the structure of the cabinet. If the manufacturer and designer have done their job well then the structure of the cabinet will be damped by either internal bracing or bitumen lining or both. You can easily check the effects of cabinet resonances by tapping the sides of the cabinet. If any of the panels produces a resounding woody 'boing' then these need treatment. Don't forget that the noise you produce from tapping an empty cabinet will sound 'hollow' due to the empty, coffin-like, box. What we are looking for is woody resonances in the panels, so ignore the hollow sounds emitting from the drive unit holes.

Any large, unbraced, parts of the cabinet structure are ripe for damping treatment. We use the

Soniqs PDC - a 6mm thick, self adhesive, bitumen based mass damping medium available from World Designs - to 'kill' panel resonances. Alternatively you can try automotive shops to find panel damping sheets. Usually these are quite thin - they are designed for metal, not wood - so you may need to layer them to build up the mass.

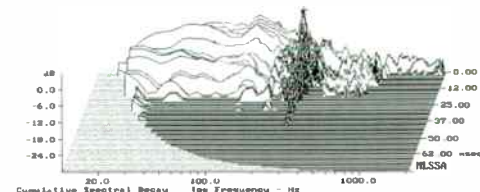
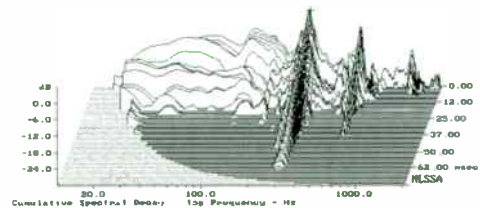
This type of panel damping works by lowering the frequency of the resonance, to make it less audibly obvious, by increasing the mass of the panel and then damping it by resistive flexure in the material itself. Bitumen based pads have the advantage of high mass combined with resistive pliability. They do need to contact the wood panel securely, though, so remove any loose dust from the panel first and then, if not self-adhesive, glue down with an all-purpose glue and press firmly into place.

You will need to cover around two thirds of the central part of the area of any large, unsupported panel. The Soniqs PDC compound comes in a roll which is 150mm wide, so it is easy to use strips to cover any interior panel surface requiring treatment.

BASS REFLEX

In a bass reflex cabinet - the type where the enclosure is 'ported' through a pipe or a slot opening from the inside of the cabinet to the outer air - the damping/absorbent is normally arranged around the walls of the cabinet. Sometimes there may be a light filling in the middle. The reason for this is to allow unrestricted air flow, or pressure waves, between the drive unit and 'port'. If you impede the air flow by too much stuffing between the drive unit and port you will reduce the efficiency of the port. (Occasionally this can be a 'good thing' if the bass is overblown).

It is a good idea to have all the cabinet walls lined with 25mm (1 inch) thick foam. A better alternative is heavy carpet felt - you may need to glue this in place as it is not self supporting unlike foam. This thickness of foam or felt will cut down the transmission of sound through the cabinet walls as well as



Panel resonance before (top) and after (bottom) application of Panel Damping Compound

reducing reflections from the internal enclosure structure.

If there is a filling in the main volume of the speaker, for example a filling of BAF, then this is better replaced by a loose fibre such as long haired wool. The particular type of long haired wool that is best used in speakers is difficult to find now because of health regulations. An equivalent is SONIQS CDF - a cabinet damping fibre that has been specially formulated to behave like long haired wool. This fibre has a very good absorbency of sound across a wide range of frequencies and is ideal to reduce midrange coloration, especially when placed behind the drive unit.

CLOSED BOX

For a closed or sealed box design, often called 'infinite baffle', the damping rules are slightly different. Here, as well as absorbing sound at the inside cabinet walls, there is an advantage in sound absorption and bass wave damping throughout the main enclosure volume. So when you look inside the box you may find a layer of foam around the interior walls and something lighter, like BAF wadding, in the middle part of the box.

Whatever you fit to the walls of the cabinet has the same effect as described above, namely it reduces transmission through the cabinet panels. So here you can use foam or heavy carpet felt to good effect.

In the main volume of the cabinet the damping has to do two things.

DAMPING IN THEORY AND PRACTICE

For those who want to know a bit more about why damping material is best placed behind the driver, let's have a closer look at what is happening inside the cabinet.

In any enclosure there is a primary standing wave, or resonance, which is dictated by the longest cabinet dimension. The frequency of this primary standing wave is where the longest internal dimension is half a wavelength long. So, for example, a floorstanding cabinet of 1 metre height (internal height 95cm) would have a primary resonance at 180Hz.

Because this is a standing wave the air particle velocity forms a pattern like an open vibrating guitar string e.g. the velocity is at a minimum at each end and at a maximum in the middle of the enclosure height. So to damp this resonance there is minimal effect from the damping material next to the enclosure walls.

Obviously the best place to put the damping material is therefore in the middle of the enclosure. In fact this is very valid for a tall, thin, cabinet like a floorstander where the primary resonance is a serious source of honk in such loudspeakers. You can kill this honk or upper bass bloom quite effectively by placing a 50mm thick piece of acoustic foam to block the centre section of the cabinet. (Bear in mind what we said earlier about blocking the path from drive unit to port, however!)

But what about the other standing waves which occur due to the front to back and side to side dimensions. Clearly the damping material in the centre of the cabinet isn't going to help with those.

To effectively damp all the standing waves you need to position the damping material all the way down the central portion of the cabinet. The usual, time-honoured, method of doing this is to use a roll, or, better still, a spiral of damping material in this position.

However, as we have pointed out, the primary resonances are only part of the problem. We must remember that the cabinet walls are practically transparent to frequencies that encourage their natural panel resonances. So, for example, a cabinet rear panel made of MDF might have strong panel resonances at 150Hz, 280Hz, 350Hz, 440Hz and 560Hz. The output from the rear of the drive unit would pass straight through the panel at those frequencies as though the panel wasn't there.

So we do need to put damping materials on the surface of the cabinet interior to help absorb those frequencies too. We can also help damp the panel resonances using our bitumen panel damping compounds.

But the worst leakage of all of sound from inside the cabinet getting out is the speaker cone itself. Just as the speaker cone can radiate frequencies produced by the movement of the voice coil, so it will radiate frequencies caused by the trapped sound inside the cabinet.

Now what happens if we place our damping material behind the drive unit? First of all it will help absorb the sound radiated from the rear of the driver before it gets into the main part of the cabinet. Then it will have the same effect for sound resonating inside the cabinet trying to get out again through the cone. In other words, but putting the damping material behind the drive unit you get a double whammy effect - the material has two goes at absorbing the sound - twice the damping for only one bit of material!

So, to sum up, you need to put the heavier damping material around the inside walls of the cabinet to damp panel resonance and absorb sound trying to get out of the cabinet. You also need to put damping material behind the driver to absorb its rear radiation. And you may need to put some absorbent in the middle of the cabinet to absorb the primary resonance in a floorstanding cabinet.

NEXT MONTH – TACKLING THE CROSSOVER

One is to absorb midrange sound from the rear of the bass/midrange unit and so lower coloration. Again the most effective place is behind the drive unit.

It is not commonly realised that the drive unit is 'transparent' to the same sound it emits. So a drive unit that has a particularly clear and strong midrange output will also have a cone that lets through that same strong midband energy reflected from the inside of the box. Because the sound from inside the box is delayed in time, we don't want to hear it! So we need to absorb it as best we can.

In addition the interior of the cabinet is subjected to large bass pressure waves. The bass unit works with the mass and compliance of the air in the cabinet so that the pressure of the air acts as a restoring force on the bass unit diaphragm. Imagine it as a spring and the moving parts of the bass unit as a weight on the end of the spring. We can help control the oscillations of this weight/spring mechanism by the damping effect of whatever we put in the main volume of the enclosure.

Ideally the damping material here should be a loose filling that can let air particles move through it but form a resistance as they do. Filling the entire enclosure will lower the resonant frequency as well as damping the resonance. A light, fibrous tangle is the sort of thing we are looking for.

Soniqs CDF is very good at absorbing sound across a wide range of frequencies and can be easily teased out to form the fibrous tangle that we need. In other words it is just great as our main cabinet volume filling. You can add a lot of Soniqs CDF if you want to damp down a boomy bass performance, or use a light to medium filling if you want an extended and powerful bass output.

Start off by using the same amount of filling as the manufacturer then add more if the bass is too boomy or reduce it if the bass is too weak and lifeless. You'll easily hear the difference in practice.

TRANSMISSION LINES

Transmission Lines and Quarter Wave Pipes are both special types of cabinet loading which demand extra care with the distribution of damping material.

Those of you who know something about electronics might think that you need as much damping as possible in a Transmission Line. Unfortunately, if you do this, you will kill the low frequency extension so

beloved by TL enthusiasts.

This is because a speaker Transmission Line is usually developed as a cross between a Quarter Wave loaded pipe and a reflex port, albeit a very long one. So let's deal with the QWP cabinet first of all.

The concept behind Quarter Wave loading is to place the drive unit at the end of what is, figuratively, an organ pipe. The pipe has an open end and will have a primary resonance where its length is a quarter wavelength.

In practice this produces strong resonant output at the frequency desired, plus output at other harmonics of that frequency. Some of these harmonics can be controlled by placing the drive unit one third or halfway down the pipe, but the resonance in the pipe may still give a lumpy and honky bass response.

Quarter Wave Pipes are commonly used to encourage bass from full range drive units, and here the maximum efficiency is required from the pipe. So adding damping will reduce the resonant effects, in this case to the detriment of the strength of bass response.

Transmission lines are a cross between the Quarter Wave Pipe and damped reflex principles. The pipe is still tuned to a quarter wavelength but is strongly tapered and often damped down its length to reduce the lumpy resonant effects. Generally the damping is arranged as a lining to the pipe, (remember what we said about maintaining a free path between the driver and a reflex port), but in the earlier 'Bailey' designs the pipe may have a light filling of long haired wool.

If your Transmission Line is of the Bailey type then leave the damping in the pipe alone. The most significant area to improve any Transmission Line is to add, or adjust, the damping right behind the driver. This doesn't mean you should block the line, so arrange the damping so that it is on the top and rear part of the chamber behind the driver and leave a path from the driver down the line. The use of damping here is to help reduce the resonances in the upper part of the line as seen by the drive unit and so improve the upper bass performance.

Adding damping at the far 'port' end of the line can help absorb some of the resonant harmonics too. But adding too much damping will adjust the very low frequency output of the 'port'. You can do things here to change the balance of low bass to upper bass, but generally it is best to leave things well alone in this area.

WD88VA Part 3.

Choosing the components

Peter Comeau discusses component quality on the WD88VA KT88 40W kit amplifier. Fine tuning makes a big difference.

For a high quality amplifier like the WD88VA you don't want to skimp on components. On the other hand putting together an amplifier kit with the best components money can buy could end up with an amp that was hugely over specified. The law of diminishing returns always applies to components, especially if you move out of the mainstream commercial supplies and into the realms of specialist, low volume, products. So what we have done with the WD88VA is specify components for the standard kit which offer excellent performance without breaking the bank. We will also be giving advice on the more expensive 'boutique' components that you can fit on an 'upgrade' basis.

First consideration in our design was the layout of the chassis and the material to make it from. We decided early on that the layout would be based on tag boards and hard wiring. Not only does this enable good ventilation round the components but also enables you to use a wrap and solder wiring technique. This has a double benefit – it makes an electrical connection that does not rely on the solder as a conductive path, and the mechanical connection can cope better with the thermal stress provided by the heating and cooling of the valve bases. In addition those of you who like to fit special components will find it easier to make room in the chassis for them.

Traditionally Hi-Fi World amplifier kits were based around a steel chassis as this material is both strong enough to support transformers and is highly cost effective in production. When mounting both the power

supply transformer and output transformers on the same sheet of steel, however, you have to take considerable care to minimise magnetic transfer between transformers and magnetically induced eddy currents in the chassis. A superior alternative is to use aluminium. This has low magnetic permeability but is still conductive, and so can shield the circuitry, thus avoiding any magnetic problems. To support the considerable weight of the transformers the aluminium thickness has to be increased over steel, so the chassis cost is higher but, in our opinion, it is worth it for this amplifier.

Talking of transformers we have not skimped here either. The power transformer is oversize for the power required to avoid any overheating problems in long term usage. Output transformers are wound using high purity copper on fine silicon steel, grain oriented laminations to make sure we had a wide frequency power bandwidth. A nice cosmetic touch is the heavy chrome plated transformer covers which match the front panel knobs.

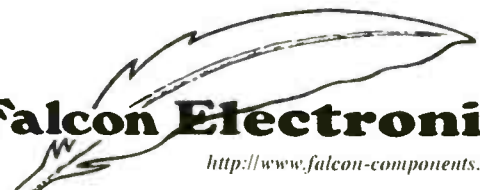
The valve complement is based around a first stage ECC83, 5687 driver and, of course, KT88s for output. The choice of ECC83 is not difficult – the JJ ECC83 is produced in the Tesla factory to the original Telefunken specification and features low noise and microphonics, exactly

what we need for a first stage. The 5687 is no longer in production but there are high stocks of NOS types. We chose the JAN Philips type as the best of its breed – gutsy with excellent bandwidth. For the KT88 the choice was close between the Svetlana and EH. Both have their attributes but the Svetlana is our preference because of its robust, reliable construction.

As regards other components, for the electrolytic capacitors we have made sure that we selected low ESR types from manufacturers like Panasonic, and have used metallised film types for the coupling capacitors. Small wattage resistors are metal film; 1 Watt and above are metal oxide. Wiring is silver coated, high purity copper with Teflon insulation except for the power supply wiring which is stranded copper in high temperature PVC. The main power supply uses Ultra Fast Recover Rectifier Diodes in the main bridge to reduce power supply noise. Volume control is the Alps Blue Velvet type that we now use as standard.

Next month we will look at the input switching board and some of the component tweaks you can do.





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- Inca gold plated mains plugs: £20 each



- uninsulated 0.5mm pure silver wire: £2.50/M
- Deoxit contact cleaner/enhancer: £13.95
- B9A ceramic gold plated valve sockets: £2.95 each
- UX4 ceramic valve sockets (for 2A3/300B): £5.95 each



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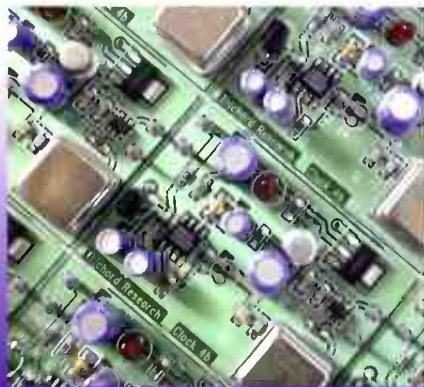
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Transmission, Live

David Price listens to World Designs WD25T loudspeaker and describes its sound.

Despite my being a dedicated follower of fashion, I cannot confess a love of small footprint loudspeakers. Although they're all the rage, the slim, tall, narrow baffled creations that adorn every style-conscious audiophile's listening room don't do much for me.

The trouble is that to shift serious amounts of air, speaker designers can either go for large diameter drive units, or two half size ones working in tandem with one another. Since the mid-nineties, the latter is where the market has gone, floorstanders such as Mission's 1993 753 starting the fad for multiple small drivers stacked up, one on top of the other, in a narrow front baffle. It might look cool and trendy, but – to my ears at least – it's not big and it's not clever.

The trouble is that although on paper, two long-throw four inch drivers may have the same surface area as a single six inch, in practice the mechanical inefficiency of the voice coil and the unpredictability of small cones at high excursions cause problems. Think of it this way – when you need to get large amounts of air through your lungs, rather than using the two small apertures in your nose, you start to breathe through a single large one – your mouth. Narrow baffle, multi-driver speakers are the same – it seems to me like they start straining when called upon to shift serious amounts of air.

The WD25T reflects this (what I think is 'common sense') thinking. Like a big American V8 car engine, its eight inch 'woofer' shows no signs of strain when asked to go for it, and at normal listening levels it's just cruising, with an effortless gait. Unless pumping vast amounts of air at high levels, the driver is barely moving, staying linear and composed at all

times, giving an even, accurate and 'easy' sound - yet with lightning fast attack transients due to the lightness of that paper cone.

Treble and mid/bass units meld seamlessly into one another, and the bass is even down to surprisingly low frequencies. The WD25T always sounds crisp and taut, but can 'rumble' menacingly, giving impressive physicality reminiscent of far larger boxes. Best of all though is the lack of lumpiness; there's no bass peak that I can hear, cynically engineered in for 'showroom appeal'. The result is a smooth, even bass that goes up and down the scale with ease, that's excellent with microdynamics (i.e. tiny accenting changes on double basses, for example) yet can really thwack you in the back when called upon so to do.

The midband is also special; it's very open, with masses of detail about the conditions of the recording (i.e. the studio or location's sound, etc.). The superb stiffness of that light, large diameter cone makes for a highly transparent sound with very little cone 'quack'. Imaging is superb – a big surprise, considering press propaganda about narrow baffled loudspeakers being the only ones that can project out of the box.

Treble is excellent, it's a nice high quality soft dome, and blends into the midband in an extremely couth and fuss-free way. There's no obvious hot spot, and the tweeter is, by and large, extremely inconspicuous. Cymbals have a lovely crisp quality and are devoid of grain or zing. Female vocals don't screech or shout, and there's a surprising amount of atmosphere to the proceedings, something that suits the even, incisive midband down to a tee. This all goes together with great speed, to make for a superbly musical speaker that catches every last rhythmic and dynamic accent.

My only quibble with what is – by

any standards – a remarkable loudspeaker at the price is its tonality. This loudspeaker isn't the most warm or indeed tonally vibrant around. Thanks to the paper mid/bass unit, the WD25T sounds quite dry. By this, I don't mean it's tonally barren (it certainly isn't), but you don't get the richness and warmth that large Spendors, for example, exhibit. Rather, this speaker sounds something akin to a twenty first century Heybrook HBI on steroids. Those who remember this classic Peter Comeau design will still think fondly of its speed, rhythmic alacrity and musicality. The WD25T has all this in spades, plus far greater insight and much better extended bass – and also the HBI's subtly 'dry' feel. The happy news is that if you add a touch of colour (from a well chosen tube power amp, for example), you get a wonderful double act.

Overall then, the WD25T is a fascinating combination of old and new. It has the big, visceral presence of nineteen seventies loudspeakers, yet none of their many problems (bass boom, vagueness, diffuse imaging). It projects like the best new floorstanders, yet has a relaxed, easy nature that lets the music ebb and flow like big speakers of yore. A modern floorstander with a twist. **DP**



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Tony Bolton, Hi Fi News July 2006

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world classics

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

DIGITAL

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

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

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

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



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



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

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

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



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



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

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



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

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

COMPACT DISC TRANSPORTS

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



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

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

DACs

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



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



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



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



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

TURNTABLES
ARISTON RD1 IS 1972 £94
Modern evolution of Thorens' original belt drive paradigm, Scotland's original super-deck was warm and musical, albeit soft. Still capable of fine results today.

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



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

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

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

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



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

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



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

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

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



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

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



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

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

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

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

ALPHASON HRI005 1981 £150
First class arm, practically up to present-day standards. Buy carefully, though, as there is no service available now. Totally under priced when new, exceptional.



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

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

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



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

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



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

NAIMARO 1986 £875
Truly endearing and charismatic performer - wonderfully engaging mid-band makes up for softened frequency extremes.



TECHNICS EPA-501 1979 £ N/A
Popular partner for late seventies Technics motor units. Nice build and Titanium Nitride tube can't compensate for middling sound.

INTEGRATED AMPLIFIERS/COMBOS DELTEC 1987 £1900
Fast, dry and with excellent transients, this first DPA integrated is the real deal for eighties obsessives. Ridiculously punchy 80W per channel from a tiny, half-size box. Radical, cool and more than a little strange.

ROGERS A75 1978 £220

The prototypical Audiolab 8000a – lots of sensible facilities, a goodly power output and nice sound in one box. The later A75II and A100 versions offered improved sonics and were seriously sweet and open to listen to.

EXPOSURE VII/VIII 1985 £625

Seminal mid-eighties Exposure pre-power, offering most of what rival Naim amps did with just that little bit extra smoothness and sweetness. Still, it's by no means 'sweet' by today's standards, being lean, punchy, musical. It's also possessed of that quintessentially eighties look – frumpy black steel boxes with rough silk screened logos!



SUGDEN C51/P51 1976 £130

Soft sounding early Sugden combo with a plethora of facilities and filters, complete with seventies-tastic DIN socketry. A sweet and endearing performer as you'd expect, but lacking in power and poor load driving ability, so partner carefully.

VTL MINIMAL/50W MONOBLOCK 1985 £1,300

Vacuum Tube Logic was one of the Europe's biggest tube names in the eighties, and it shows. Rugged, professional build and finish allied to a lively and punchy sound (albeit with limited power) make them an excellent used buy.

A&R A60 1977 £115

Sweet and musical feature-packed integrated: the Audiolab 8000A used its blueprint to great effect.



CREEK CAS4040 1983 £150

More musical than any budget amp before it: CAS4140 loses tone controls, gains grip.

AUDIOLAB 8000A 1985 £495

Smooth integrated with clean MM/MC phono stage and huge feature count. Extremely reliable, too. Post '93 versions a top used buy.



MCINTOSH MA6800 1995 £3735

Effortlessly sweet, strong and powerful with seminal styling to match.

SUGDEN A21 1969 £ N/A

Class A transistor integrated with an eminently likeable smoothness and musicality. Limited inputs via DIN sockets.

MISSION CYRUS 2 1984 £299

Classic eighties minimalism combines arresting styling with clean, open, lively sound. Further upgradeable with PSX power supply.



MUSICAL FIDELITY A1 1985 £350

Beguiling Class A integrated with exquisite styling. Questionable reliability.



NAIM NAIT 1984 £350

Superb rhythms and dynamics make it truly musical, but tonally monochromatic. Fine phono stage, very low power.

NAD 3020 1979 £69

Brilliantly smooth, sweet and punchy at the price and even has a better phono stage than you'd expect. The archetypal budget super-amp.



MYST TMA3 1983 £300

Madcap eighties minimalism, but a strong and tight performer all the same.

ROGERS CADET III 1965 £34

Sweet sounding valve integrated, uses ECL86 output valves, even has a half useable phono stage, sweet, warm a good introduction to valves



ROTEL RA-820BX 1983 £139

Lively and clean budget integrated that arguably started the move to minimalism.

PREAMPLIFIERS

AUDIOLAB 8000C 1991 £499

Tonally grey but fine phono input and great facilities make it an excellent general purpose tool.

AUDIO RESEARCH SP-81982 £1,400

Beautifully designed and built high end tube preamplifier with deliciously sweet and smooth sound. Not the last word in incision or grip, but that didn't matter to those who aspired to it.

CONRAD JOHNSON

MOTIV MC-8 1986 £2,500

Minimalist FET-based preamplifier from the Yank valve specialists is brilliantly neutral and smooth with a spry, light balance in the mould of Sugden high end stuff. Something of a curio, but worthwhile nonetheless.

CROFT MICRO 1986 £150

Budget valve pre-amp with exceptionally transparent performance.

LEAK POINT ONE STEREO 1958 £ N/A

Good for their time, but way off the pace these days. Use of EF86 pentode valve for high gain rules out ultra performance. Not the highest-fi!

LINN LK-1 1986 £499

A brave attempt by the Glasgow boys to bring remote controlled user-friendliness to hair-shirt audiophile hi-fi. Didn't quite work, but not half bad for under £100.

NAIM NAC32.5 1978 £ N/A

The Salisbury company came of age with this, their classic high end pre. Brilliantly fast and incisive sound that's a joy with vinyl but a tad forward for digital.

LECSON AC-1 1973 £ N/A

Amazing styling courtesy of Allan Boothroyd can't disguise its rather cloudy sound, but a design classic nonetheless.



QUAD 22 1958 £25

The partner to the much vaunted Quad II monoblocs - cloudy and vague sound means it's for anacrophiles only.

QUAD 33 1968 £43

Better than the 22, but Quad's first tranny pre isn't outstanding. Responds well to tweaking/ rebuilding though...

POWER AMPLIFIERS

LEAK STEREO 20 1958 £31

Excellent workaday classic valve amplifier with decent power and drive. Surprisingly modern sounding if rebuilt sympathetically. Irrepressibly musical and fluid.



LECSON API 1973 £ N/A

Madcap cylindrical styling alluded to its 'tower of power' pretensions, but it wasn't. Poor build, but decently clean sounding when working

MARANTZ MODEL 9 1997 £8000

Authentic reproduction monoblocs still more than cut the sonic mustard. Highly expensive and highly sought after.

MICHELL ALECTO 1997 £1989
Crisp, clean and beautifully controlled with gorgeous styling. Partnered with the £1650 Orca this sounds delicious!

LEAK POINT ONE, TL10, TL12.1 1949 £28
Early classics that are getting expensive. Overhauling is de rigeur before use, using original parts if possible. Surprisingly crisp and musical sound, that's far more modern than Quad IIs. Deeply impressive when in fine fettle.



MUSICAL FIDELITY XA200 1996 £1000PR
200W of sweet smooth transistor stomp in a grooved tube! Under-rated oddity.



RADFORD STA25 RENAISSANCE 1986 £977
At the time, very possibly the least cool amplifier on the planet – and we're not talking of heat dissipation here. This reworking of Radford's original late sixties design was possessed of a wonderfully rich, old school valve sound with enough power (25W) and lots of subtlety.



QUAD II 1952 £22
The all-time classic valve amplifier, with a deliciously fluid and lyrical voice. In other respects though, it sounds hopelessly dated. Low power and hard to partner properly.



QUAD 405 1978 £115
The first of the current dumpers is a capable design with smooth, effortless power and a decently musical sound. 606 and 707 continue the theme with greater detail and incision.

QUAD 303 1968 £55
Bullet proof build, but woolly sound. Off the pace, but endearing nonetheless. Some pipe smoking slipper wearers swear by them!

KRELL KMA100 II 1987 £5,750
Ludicrous monoblock version of the giant KSA-100 is one of the seminal eighties transistor power amplifiers. Massive wallop allied to a very clean and open Class A sound makes this one of the best amplifiers of its type, ever.

PIONEER M-73 1988 £1,200
Monster stomp from this seminal Japanese power amplifier, complete with switchable Class A and Class B operation. Clean, open and assured sounding, albeit a tad behind the pace on high speed dance music. Rosewood side cheeks and black brushed aluminium completes the eighties-tastic experience.



PHONO STAGES
CREEK OBH-8 SE 1996 £180
Punchy, rhythmic character with oodles of detail makes this a great budget audiophile classic. Partner with a Goldring G1042 for an unbeatable budget combination.



LINN LINNK 1984 £149
Naim-designed MC phono stage built to partner the original Naim NAIT - yes, really! Fine sound, although off the pace these days.

MICHELL ISO 1988 £ N/A
This Tom Evans-designed black box started the trend for high performance offboard phono stages. Charismatic, musical and punchy - if lacking in finesse.

TUNERS
MARANTZ ST-8 1978 £353
Marantz's finest radio moment. Warm, organic sound plus an oscilloscope for checking the signal strength and multipath.



CREEK CAS3140 1985 £199
Excellent detail, separation and dynamics - brilliantly musical at the price. T40 continued the theme...

NAD 4040 1979 £79
Tremendously smooth and natural sound allied to low prices and good availability make this budget analogue esoterica. Needs a good antenna to work properly, however.

NAIM NAT03 1993 £595
The warm, atmospheric sound is further proof of Naims proficiency with tuners.

PIONEER TX-9500 1976 £295
Another of the serious classic solid-staters. Boasts the usual high end Jap package of fine sound, brilliant sensitivity and superb build.

LEAK TROUGHLINE 1956 £25
Series I an interesting ornament but limited to 88-100MHz only. II and III are arguably the best-sounding tuners ever. Adaptation for stereo easy via phono multiplex socket. Fed by a modern outboard decoder they're deliciously lucid with true dimensionality.



YAMAHA CT7000 1977 £444
Reputedly the best of the classic Jap analogues, this combines sleek ergonomics, high sensitivity and an explicit, detailed sound.

QUAD FM4 1983 £240
Supreme ergonomics and styling allied to a pleasingly lyrical sound with plenty of sweetness and detail made this one of the best tuners around upon its launch.



REVOX B760 1975 £520
More of a semi-pro machine than a domestic bit of kit, the Revox offers superlative measured performance although the sound isn't quite as staggering as the numbers. Fine nonetheless, and surely the most durable tuner here?

NAD 4140 1995 £199
Brilliant affordable digital tuner has a smooth, detailed musical sound plus sensible real-world facilities.

ROGERS T75 1977 £125
Superb mid-price British audiophile design, complete with understated black fascia. Fine sound in the true Rogers mould – smooth and sweet with fine dimensionality.

SANSUITU-9900 1976 £300
A flagship Japanese tuner designed to steal sales from the likes of Accuphase and Revox, it boasts superlative RF performance and an extremely smooth and lucid sound, along with very fine build and finish.

SONY ST-5950 1977 £222
One of the first Dolby FM-equipped tuners, a format that came to nought. Still, it was Sony's most expensive tuner to date, and boasted a very good sound quality allied to brilliant ergonomics.



TECHNICS ST-8080 1976 £180
National Panasonic's specialist hi-fi brand was a big hitter back then, and this is no exception. Superb FM stage makes for a very clean and smooth listen with lots of detail and depth.

ANALOGUE RECORDERS

YAMAHA TC-800GL 1977 £179

Early classic with ski-slope styling courtesy of Mario Bellini. Middling sonics by modern standards, but cool nonetheless!



AIWA XD-009 1989 £600

Aiwa's Nak beater didn't, but it wasn't half bad nonetheless. Massive spec even included a 16x4 DAC!

NAKAMICHI CR-7E 1987 £800

The very best sounding Nakamichi ever - but lacks the visual drama of a Dragon.



PIONEER CTF-950 1978 £400

Not up to modern standards sonically, but a great symbol of the cassette deck art nonetheless.



REVOX A77 1968 £145

The first domestic open reel that the pros used at home. Superbly made, but sonically off the pace these days. B77 better, but couldn't match the Japanese.



SONY WM-D6C 1985 £290

Single capstan transport on a par with a Swiss watch, single rec/replay head better than most Naks. Result: sublime.



DIGITAL RECORDERS

SONY MDS-JE555ES 2000 £900

The best sounding MD deck ever, thanks to awesome build and heroic ATRAC-DSP Type R coding.



PIONEER PDR-555RW 1999 £480

For a moment, this was the CD recorder to have. Clean and detailed.

MARANTZ DR-17 1999 £1100

Probably the best sounding CD recorder made; built like a brick outhouse with a true audiophile sound and HDCD compatibility.



KENWOOD DM-9090 1997 £500

Serious and sophisticated sound thanks to well implemented ATRAC 4.5; surprisingly musical MD recorder.

SONY TCD-8 DATMAN 1996 £599

Super clean sound makes this an amazing portable, but fragile.

LOUDSPEAKERS

ACOUSTIC RESEARCH

ARI18S 1978 £125

Yank designed, British built loudspeaker became a budget staple for many rock fans, thanks to the great speed from the paper drivers, although finesse was most definitely not their forte...

BBC LS3/5A 1972 £88

Extremely low colouration design is amazing in some respects - articulation, stage depth, clarity - and useless in others (both frequency extremes). Came in wide variety of guises from various manufacturers building it under licence. Partner with Rogers ABI subwoofers for an extra two octaves of bass!



LOWTHER PM6A 1957 £18

EACH

This seminal full-range driver is still manufactured. High sensitivity, as fitted to many classic horn designs.

TANNOY WESTMINSTER 1985 £4500

Folded horn monsters which certainly sound good if you have the space. Not the last word in tautness but can drive large rooms and image like few others.



JR 149 1977 £120

Infamous cylindrical speaker that was ignored for decades but now back in fashion! Based on classic KEF T27 / B110 combo as seen in the BBC LS3/5a. Doesn't play loud, needs a powerful transistor amplifier, but rewards with fine clarity in imaging.



SPENDOR BCI 1976 £240

Celestion HF1300 tweeter meets bespoke Spendor Bextrene mid-bass unit - and the result is a beautifully warm yet well focussed sound. A little bass bloom necessitates careful low-stand mounting, but these prove that the seventies did have some fine designs after all!

QUAD ESL57 1956 £45

EACH

Wonderfully open and neutral sound puts box loudspeakers to shame. Properly serviced they give superb midband performance, although frequency extremes less impressive. Ideally, use in stacked pairs or with subwoofers and supertweeters.



KEF R105 1977 £785

Three way Bextrene-based floorstander (complete with castors!) gave a truly wide-band listen and massive (500W) power handling. A very neutral, spacious and polite sounding design, but rhythmically well off the pace. The quintessential nineteen seventies loudspeaker.

IMF TLS80 1976 £550

Warm and powerful nineteen seventies behemoth with transmission loading and a mixture of KEF and Celestion drive units. Impressively physical wideband sound but rhythms aren't its forte.

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MISSION 752 1995 £495
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HEYBROOK HBI 1982 £130
Peter Comeau-designed standmounters with an amazingly lyrical yet decently refined sound. Good enough to partner with very high end ancillaries, yet great with budget kit too. A classic.

CELESTION SL6 1984 £350
Smallish two way design complete with aluminium dome tweeter and plastic mid-bass unit set the blueprint for nineteen eighties loudspeakers. Very open and clean sounding, albeit course at high frequencies and limp in the bass. Speakers would never be the same again...



LEAK SANDWICH 1961 £39 EACH
Warm sounding infinite baffle that, with a reasonably powerful amplifier can sound quite satisfying.



QUAD ESL63 1980 £1200
An update of the ESL57, with stiffer cabinets. Until the 989, the best of the Quad electrostatics.



YAMAHA NS1000 1977 £532
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MISSION X-SPACE 1999 £499
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Letter of the Month

THE CHINESE WAY?

The following are some of my recent experiences with two Chinese made amplifiers I bought via eBay. To start at the beginning I recently bought a pair of AKG K1000 headphones. They are low sensitivity and sound best when driven by a class A valve amplifier. I therefore thought I would try a low powered valve amplifier and decided to purchase two amplifiers I had seen on eBay, which seemed incredibly cheap for what was on offer.

One was advertised as a 300B single-ended amp using an EL34 driver, which I thought may be interesting and a little different to the normal 300B setup. I also bought another single-ended amp, this time with an 807 output valve. Both produce around 10 watts according to their spec., which I thought would be adequate for the AKGs. Payment via a personal cheque proved to be no problem, although there were high delivery costs from the Far East, typically around £65 -90 for surface mail, depending on weight.

The amps took around seven weeks to arrive, which seemed like ages. They arrived well packed. However, on opening the 300B amp, I found there was no EL34 driver valve but a 6P6P valve; this I subsequently found out is equivalent to a 6V6 valve. There were no instructions included as to where the valves should be fitted, nor to any change in the specification. Very similar problems were found with the other amp. Here the output valves were different to those specified. Instead of 807s they were FD422s which I later found out are equivalent to 2E22 valves, both valves using a top cap, but of very different dimensions.

I was a little disappointed by these changes in the spec and that I was not informed prior to them being sent to me and that there was no indication with the delivered amps. I subsequently sent an email to the supplier about these problems, and his answer was not very informative or helpful.

Now for the pluses. Both



False economy: not all 300B amplifiers are created equal...

amps were undamaged, with a full complement of valves mainly of Chinese origin, and both appear to be well made with a decent chassis, one being stainless steel the other being a chromium plated steel which looked particularly attractive with the black enamel transformer casings (bit like Art Audio).

Both amps are hard wired using what appear to be decent components including Alps pots, Elna and Wima caps. I suspect some useful upgrading here could prove to be interesting, perhaps some Black Gate caps. Socketry is good quality with WBT copy loudspeaker outlets and gold plated phono inputs. The front rotary controls feel solid and well made and smooth to operate. The volume control on the FD422 amp appears to have indented positions suggesting it is a discrete resistor type, which it obviously is not. Both amps worked perfectly when switched on with no real transformer hum or vibration evident even after several hours of use.

Now to the sound with the AKG headphones. The 300B appears to have less gain than the other amp with the volume control required to be around half to three quarters, depending on the recording level and my listening levels. With this amp the mid range is very

smooth and revealing, without any sense of grain particularly towards the top end. The bass is reasonably well defined but doesn't appear at the moment to be very tight - more of a warm rounded bass sound, but overall still an enjoyable sound.

The FD422 amp., being a pentode output was very different sounding to the triode 300B. The sound at first was much brighter, with more get up and go and with what appeared to be tighter bass and a wider stereo image (all probably due to more treble energy being available). I have now used both amps for probably around twenty hours or so and they are now sounding much more refined and smoother, in particular the FD422 amp which is now less bright but still very detailed.

Both amps give a very detailed sound from the AKGs with images well outside the head, particularly on well recorded discs. Overall, my initial observations are that with most CDs I prefer the pentode powered FD422 amp for driving the AKG headphones as it has more drive and better bass with a good open top end which generally makes for a good listening experience. Regarding the 300B amp., I think I will need to get into the highly efficient single driver loudspeaker territory, which I have been considering for a little while.

In general I have been well pleased with my purchases, even with the changes to the specification and would recommend this method to anyone who is considering doing the same, particularly at their current low prices, although as I found out you need to be aware that there are some problems when buying equipment from abroad which you can't see or hear before purchase.

Mike B

On my frequent visits to the Malaysia shows I have seen large numbers of valve amplifiers, all attractively finished in a style that's normally a direct copy of some Western amp or other, offered at knock-down prices. Most came from Hong Kong. I even considered, in the past, getting WAD valve amps made there, as we received no end of offers from eager Chinese manufacturers. But there were problems. Most of the stuff is derivative, a simple copy in effect, sometimes with cheap parts, quite often with a fantastic boutique finish, even down to perfectly arranged internal wiring looms and what have you. From measurements of imports to the UK I've found much of it limited by poor transformers, generally meaning it works reasonably well at low levels, but not when you start to push volume up. I even found WAD amps were being copied, by the way (!) and the brazen manufacturer, who also ran a textile factory that he admitted was a sweat shop when I asked to see it, demanded I sell him our transformers so our amps would work properly to maintain WAD's reputation in the region. It was interesting logic...

All of which is to say they do things differently in the Far East, as friends would gently remind when I was there, and that you need to be aware that your expectations of Western levels of service and accountability are a little naive. You are lucky to even get the goods, quite frankly. That they contain unobtainable Chinese valves doesn't surprise me. I suggest you try and contact a valve supplier in the region, notably Hong Kong, for replacements, if they are available at all. They may well be a common valve with the manufacturers own designation, perhaps because of some small internal variation in electrode structure, or change in pin-out. This would explain the fuse blowing, in which case the operating characteristics would have to be divined by measurement, an equivalent found and the socket rewired to accommodate it. It would be cheaper

to buy a new amplifier. I'm afraid your happiness may be short lived. There's not a lot of difference between this sort of kit and today's electronic gadgets that come cheap and break quick. You get what you pay for. **NK**

HEY RIG SPENDOR!

I have been reading your excellent magazine for just over two years and only wish that I had discovered it a couple of years earlier when, in 2002, I started to upgrade my system. However, as you will probably note from my system list below, I have purchased one or two items of equipment that have featured in various reviews undertaken by Hi-Fi World staff.

I am writing to seek your comments regarding two aspects, namely replacement amplification for my system and the pros and cons of a music server as opposed to a conventional CD player.

(or Denon TU-1800 or Pure DRX-702es). Four amplifiers were reviewed in the November 2005 edition of your magazine. This review included the Sugden A21a and the Lyngdorf SDAi 2175 both of which were given gongs by Channa Vithana. However, Channa did state that it is important to match the Sugden to sensitive speakers for best results. In addition to these two models, I've also been advised that the Lavardin IS amplifier is worth considering.

Noel Keywood reviewed the Spendor S8e in the December 2005 edition of your magazine. In his Measured Performance report he commented that the Spendor, "as a load is not the best". However, from the body of the review it appears that a Sugden A21a coupled with a Denon TU1800 were used in conjunction with the Spendors. Bearing in mind the comments from Channa and Noel in



Big Spendor S8e needs a shove to get it going...

My present system consists of the following: Quad 909 power amplifier/99 pre amp/99 CD-P/99 tuner, Michel Gyro SE deck/SME IV/Kontrapunkt B/Trichord Dino with upgraded power supply and connecting lead, Spendor S8e speakers. My main musical interest is rock/pop (Pink Floyd, Queen, Santana, Fleetwood Mac, ELO, Supertramp, etc.) with the occasional classical piece thrown in.

Currently I am giving some serious consideration to changing the Quad equipment for possibly a Sugden A21a/ Shanling CD-T80/ Marantz ST7001

their respective reviews, is it fair to say that the Sugden would be well matched to the Spendors or would the other amplification alternatives be better suited, especially the Lyngdorf with its huge power output?

I should mention that I have listened to the Sugden in my system and was very impressed, but before I make my final purchase decision it would be helpful to obtain your views on the issues raised regarding system matching or synergy, as you regularly call it, because I want to ensure I get the best

out of my music listening experience.

My second question concerns the replacement CD player. Again, I have auditioned the Shanling CD-T80 connected to the Quad and Sugden amplifiers and, in my view, it sounded better coupled to the Sugden - as, indeed, did my Quad CD Player! However, I'm thinking about possibly delaying the purchase of a CD player and, in the short to medium term, connecting my Creative Zen Vision MP3 player to my system, assuming I can obtain the correct cable.

There are two reasons for this. Firstly, I much prefer the option that the MP3 gives of playing random tracks from my whole CD collection, to me a more interesting way of listening to music. Secondly, I'm wondering whether the way to go in the future would be to purchase a music server rather than a dedicated CD player?

My main concern about taking this route would be that of sound quality produced by the music server as opposed to that of a dedicated CD player. The intention would be to utilise the Sugden (or other), GyroDec, tuner and Spondor speakers in my main listening room, with the music server connected for access to my CD-based music collection. At a later stage I would introduce one or two clients in other rooms of the house.

Perhaps you could provide me with your views on the advantages and disadvantages of each option discussed above, bearing in mind that I listen to most of my music via the radio or vinyl, with CD taking third place. I look forward to your response and, once again, thanks for a super magazine.

Jeff Dorset

The Spondors have a fairly dark presentation - some say dull but this isn't truly correct - that derives from their limited off-axis output. They generally benefit subjectively from being driven by a bright, clean sounding amplifier, as they are revealing of source and are both smooth and accurate in themselves. The Sugden meets these criteria and is a good match, as you have found out. It does lack power though, so compatibility comes down to how loud you listen. In my 16x14ft lounge and with modest listening levels there is no problem. If you expect to 'wick it' occasionally, then perhaps not. I'm afraid only you can answer this one. The Sugden largely avoids the harshness and flatness of solid-state; if you want something more powerful you might want to consider the JungSon Class A we reviewed recently - and David was so impressed by.

Shanling's CD-T80 is also the

brighter side of the fence, so I would steer you toward the Eastern Electric Minimax valve CD player, unless you really prefer a little top end zing. The Shanling is fast, beautifully clean and well ordered. I doubt very much whether CD players like this will be rivalled by a music server of any sort, but I think you understand that. The only way to play CD that has made me sit up and listen in the past is via Dolby Pro Logic IIx and thence onward through a full blown surround-sound system, but were in different territory here.

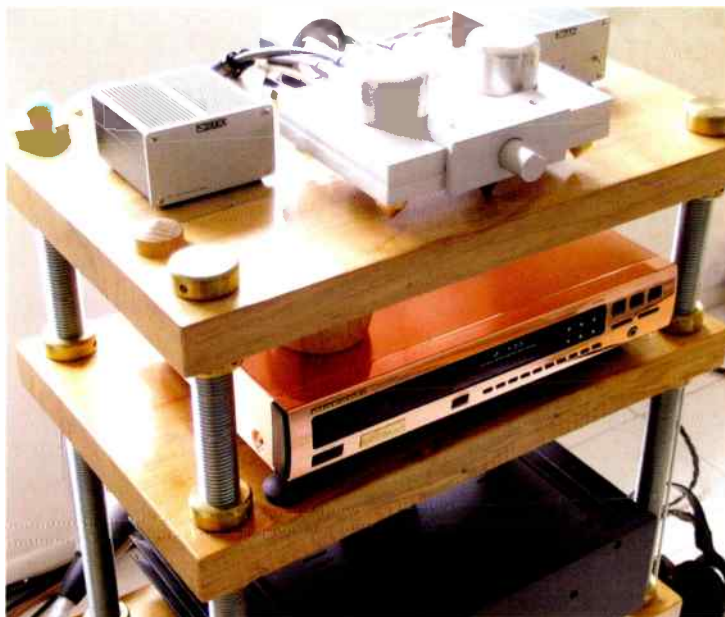
Finally, you say you rely mainly on radio and vinyl. Your vinyl side of things is fully sorted in my view. But you may be interested in our little tuner group test this month - and especially the Creek Classic. A fine tuner if ever there was one! But don't forget the aerial of course. **NK**

Hi Jeff - thanks for your kind words, but on a point of order - you're on a yellow card for toadying! It bores me stupid to read mags with their letters sections full of effusive praise for them; it all seems a bit too much to me. Still, if you want to send a separate email to Noel telling him what a great editor I am, I honestly

Passive Preamplifier in front of the 909 and it is transformed into a big, powerful, gutsy and decently musical performer. The 99 pre seems to surgically remove all signs of emotion from the music, and make it grey and thin sounding, too. This combo would work really well with your Spondors, especially if you treat it to some Black Rhodium Polar Opera DCT interconnect between the two, which is my current fave rave.

If you do want to go all out for musical enjoyment, then I'd say the Sugden A21SE is the one to go for. It's a bit expensive at over two thousand pounds, and less powerful than the Lyngdorf, but is much more musical. The SDA12175 is a brilliant do-it-all integrated, with a very svelte, big sound and oodles of poke, but the Sugden will get the hairs on the back of your neck tingling with its lucid musicality. The downside is that it's not going to stand in at your local nightclub, should their PA fail. The aforementioned JungSon 88D would, but lacks that last 10% of the Sugden's musical majesty, and would be a good halfway house between the Quad 909 and the Sugden A21SE. You pays your money and...

DP



Rare as hens' teeth - Marantz CD63 KI DP in action!

cannot object. I firmly believe in the right to free speech outside the letters section, if it means Noel might buy me a pint next time we have an, ermm, 'editorial meeting' down the local Dog and Bucket...

Okay, on to your 'substantive point', which is a tricky one (I'm always saying that, aren't I!), I can think of two different approaches. First, the worst thing about your Quad pre-power is the pre, by a country mile. I'm sorry, but the 99 is shamed by the 909. Put an MF Audio

CLASSIC GOLD

I instantly enjoyed Hi-Fi World's discussions of hi-fi classics, perhaps because my own equipment (and interest) is now entering that league. However, I have been looking in vain for my precious oldies, such as Audio Innovation 500, Voyd Valdi turntable with Orion arm, Snell Acoustics speakers (I have the E type). That equipment was the conclusion of my early journey into hi-fi in the late 1980s (after my B&O years). It started with the Rega

turntable, later followed by Systemdek, matched with Sugdens integrated class A amplifier and Snell J. But when I heard Audio Innovations 500 I had got to have it. It was upgraded with better components where possible, as this was always the cheapest way to raise the quality of music, as all equipment entail compromises to keep down the price.

Next, when I heard the Voyd, I just couldn't believe the soundstage it produced, outdoing anything else at that time, including Linn. So I had to have that as well, and then the Snell Es to match (yes, my favourite store was Peter Quortrop owned Audio Consult in Copenhagen, so their products became my favourites as well...)

I have lived happily with all this until recently, when the bass speakers needed to be replaced. I realised that my phonostage was not that good (also Audio Innovation). I put in the Audio Note AN S2 (copper wired), and the new Ortofon Rondo Bronze cartridge. It was very physical in its musical presence (drums, bass, midband), in a way some more sophisticated cartridges miss in my opinion.

In much the same vein, I prefer copper from silver cabling (although I mix a bit, having internal silver cabling in my Snell Es, and thick wired copper connecting cables to the speakers), as it seems to me that high resolution often is at the expense of dynamics, so important in jazz. As an amateur jazz pianist and dedicated live jazz listener I know how awesome are the dynamics of brass, cymbals, even a grand piano, which are very difficult to capture in hi-fi if you also want the highest resolution.

Finally, I replaced my beloved Audio Innovation with two other oldies: the Lectron model JH 50 power amp (totally renovated) and an old Stax integrated SRA-12S as pre-amp (two other classics missing on your list, the Stax from 1977 I think). That just sounds great: its open, dynamic and clean. Finally, I got myself the classic Revox 77A (on your list) for my old open reel tapes with lots of direct live concerts recorded from Danish Radio during the 1960s and 1970s on my then Tandberg. So for me it has been back to the classics when I upgraded, and so far I have found no

better new alternatives at the same price level.

My question is this - why has such a great turntable as the Voyd never figured among your classic turntables? After all, their suspended chassis with two (Valdi) and three (Voyd) driver units for the belt and independent power supply offered an incredible sound stage, and still does in my opinion. The new Funk Firm Vector (in the March issue) is based on the same principle, but with one driver unit only. To compare the two would be interesting.

Also, Audio Innovation 500 was historically important in making a good integrated tube amplifier accessible for the many at a decent price, as the Chinese products are now doing. And am I totally wrong in feeling and hearing decreasing dynamics with increasing resolution in both cartridges and cables, and sometimes even tweeters? In case, is there some law of physics to account for this subjective impression?

Kristian Kristiansen,



Snell Type-E - classic gold?

P.S. Speaking of DAB, you should note that the Swedish ministry of culture some months ago decided to close down Swedish Radio's work with DAB broadcasting (Swedish Radio, corresponding to BBC), and stay with FM until some better alternative arises in the horizon. But I have to admit that jazz on the net is something I have become addicted to when sitting at the computer: try Live 365, with something for every taste in music. I was happy with that decision, as I am still happy with my NAD 4300 tuner.

Hi Kristian - I too have never quite understood why other magazines have only ever seemed to concern themselves with the now. There's a lot that's good around at the moment, but that doesn't negate some forty or more years of hi-fi history. And you're right, the good news is that well chosen classics can do an awful lot indeed. In the case of the Voyd, you're right that it's an interesting design, but it's not my cup of tea - and so I haven't covered it. Given that motors are the source of turntable woes, I've never understood why three are less troublesome than just the one... Better in my opinion to drive turntables directly, or by the rim, or failing that by a single belt via the best, lowest noise motor available. Still, it's each unto their own! **DP**

Old classics, like valves, seem to be the in-thing these days. I motored down the A3 on a sunny Sunday recently and was amazed at the number of classic cars, mostly gleaming and much loved, bowling along the open road through beautiful countryside, their owners looking serene and happy. Okay, I've driven a few myself, like many Triumphs and a few old Healies and know that such pleasures can be short lived, courtesy of Joe Lucas electrics, but best to forget those bits!

Swedish radio have made the right decision I feel. As Steve Green explains elsewhere in this issue there are numerous new broadcast technologies for mobiles being considered at present, and now is not the time to be investing in new infrastructure as Britain has done with DAB. The worst feature of Britain's system is that its audio is not extensible, meaning it has a fixed and now very old fashioned specification that has been left in the technological dust. Sweden could well stay with VHF/FM for stationary domestic use, and upcoming cellphone technologies for streaming audio to mobiles. Heavens, my new mobile says it's a radio and mp3 payer as well as a

Seeing is

believing
audio visual

Sponsored by

hi-fi
WORLD

listening is

feeling
hi-fi

the
LOWDOWN
SOUND & VISION
park inn
show'06
22, 23, 24th Sept 06

camera, sat nav. unit, notebook, alarm clock, e-mail box - and can dance the fandango... I've just got find out how to turn it on. Swedes would be wise to use this sort of modern contraption, in conjunction with ye olde analogue radio to get the best from both worlds: quality and portability. **NK**

THE JUNG ONES

I was very interested by the review of the JungSon amplifier that appeared in the last-but-one issue of Hi-Fi World. I'm wondering whether it might be just what I need in my system to add extra bass impact or power and overall clarity to get my speakers singing. I've got an Exposure 3010 CD player connected with a Chord Chorus (or Rega P3) Gram Amp 2/ Chord Cobra 3 second source) to a Naim Nait 5i, running into PMC FB1+ speakers via NAC A5. I listen to a variety of electronica (drum and bass,

as all that grip, punch and visceral dynamics are just what you need to get Kraftwerk or Goldie going in the way mother nature intended. If you're really following this genre, I'd stick with the Naims and work in the direction of a NAP200 power amplifier. The JungSon JA-88D is better for jazz and acoustic rock, where its superb timbre really lets you hear into the recording's textural detailing. It's also very big and powerful sounding, but lacks that last 'nth' degree of transient speed that the Roland TB303 bassline synthesiser demands, even if it has the power to slam it out of your PMCs with more heft than a Nait 5i. An interesting compromise would be a pair of Nu Force 8.5 monobloc power amplifiers (£1,450) which have all the speed and attack of the Nait without any real power limitations, and are also cleaner and

another useful product for hi-fi nuts, the DCX2496 digital crossover. Perhaps you could consider reviewing one of these in the future. Please do more DIY projects. This I find the most interesting and believe most of your other readers also think so.

Mike Bearne

Thanks Mike. Believe me, I know what you mean and sympathise - but. Amateur electronics projects got the old practical electronics mags a bit of a bad reputation many moons ago; I remember seeing the apologies, corrections, etc., as well as the long arguments between various experts. My, it got heated!

The earlier projects you allude to came from industry experts who really knew what they were doing, which makes all the difference. They had to get through our own tests too. We became less rigorous in the interest of variety, but this did not really work - and I was a little uneasy with it. Now, we have ex-Mission and Heybrook chief designer Peter Comeau doing the honours, which he enjoys, and Andy Grove back designing the amps. You can't do better than this, so I hope now you are a happy man. If so, then you will be joining a lot of others, including me, since I love reading those old articles. **NK**

The problem is that we don't just slap any old thing in, and so the DIY projects we do carry are really serious, thoroughly conceived and engineered ones done by the best people in the business. As you might imagine, these aren't ten a penny, and take time to do - so please bear with us! The Behringer bits look interesting - I will investigate. **DP**

COPPER CLAD

Just a note to say that I'm the proud owner of a Marantz CD63 KI DP CD player, which I recently bought via a audiophile friend. I love it! It's so amazingly musical. While it may not be the most detailed or resolved digital I've ever heard, it's been causing my feet to tap every time I sit down in front of it. The copper chassis looks just great, and right up my street in terms of quirkiness!

George

Hi George - it looks great in your system, and I know exactly what you mean about its sonics; it's musical like no other digital I've heard. Digital hot-rodding fans might be interested to know that we're lining up a new round of mods for my Sony CDP-X33ES tweaked by Audiocom a couple of months back, with the



JungSon JA-88D - an electronica fiend's friend?

break beat, dub, funky stuff) and rock (mostly sixties, seventies, contemporary) plus some jazz, soul and funk, so rhythmic properties are very important to me, in addition to bass. I'd rather not lose any timbral accuracy either.

So my question is whether the amplifier is likely to work well in that system, adding bass impact and clarity without losing timing? Also, it was a bit disheartening to realise the interconnect and speaker cable you were recommending would cost more than the amplifier (for one ilc and a 4m terminated pair)! Are there any cheaper alternatives you could recommend? Thanks very much for your help - apparently there isn't any likelihood of me getting to hear the amp at all (let alone in my system) without buying one on a thirty day trial so I'd like to check out whether it's a good idea before I go ahead.

Chris Hewson

Mmmm, tricky. Naims are, in my opinion, one of the best amplifiers to listen to electronic music on,

*more texturally accurate through the midband too. **DP***

DO IT, YOURSELVES!

I have just bought your latest magazine and see you intend in the next issue to describe your new valve amp using KT88s. I hope this time the amp article actually materialises as several months ago you said you would in the then next issue describe a new valve amp using a 2A3 valve, what happened to this amp? I have not seen any apologies or other comments regarding it, as I was really looking forward to this as I thought it may drive my AKG1000 headphones well.

How about changing from the normal Musical Fidelity, Marantz type mainstream products and try something a little different like a Behringer DEQ2496. Its a DSP unit which I use between my CD McIntosh transport and Benchmark DAC to adjust the frequency for room resonances, etc. This unit, plus microphone required for the auto analyser, costs only as much as a good quality interconnect. They also do

intention of getting it good enough to face the KI DP off! Should be fun...
DP

FOUR WHEEL DRIVE

A few years ago I changed my Cyrus One into a new Cyrus set to support my Bowers & Wilkins DM 2A loudspeakers. I now have a Cyrus Quattro, SmartPower and a PSX-R that I have been quite happy with. My loudspeakers however are probably ending the end of their lives, and I would like to upgrade them, preferably to a high end B&W speaker like the Nautilus 801. My dealer, however, says that my system cannot support these speakers, nor can it really be upgraded - while I did buy the system for its upgradeability! I was also told getting a second SmartPower would not do the trick, either.

I have checked with a few other shops, but I do not get a clear answer. There was one shop who suggested I buy a set from Avalon, as these seem to require a less powerful amplifier. So I would appreciate your help with the following. I do not want to change the units I have, but can I upgrade and would that make sense? What is the best B&W set my system will be able to support?

Anon

A set up such as your Cyrus Quattro can drive a wide variety of loudspeakers. That isn't quite to say it will be an ideal partner for all of them, but quite frankly this is a difficult and contentious area, as there is a subjective element to take into account. Cyrus amplifiers are very smooth, civilised and tidy in their presentation, sophisticated in fact - and there's nothing wrong with that. Although sensitive, according to B&W's spec., the Nautilus 801s are built for large rooms and studio use, and have a reputation for needing power. This is likely why your dealer was hesitant. Technically, the big B&Ws will work with your amplifiers and probably give fine results, but subjectively you would likely get greater dynamic impact by using any one of a number of big power amplifiers.

As the 801s are expensive it seems to me you have plenty of choice. If you are absolutely set on 801s then the system will work as it stands, although doubtless they would benefit from more extravagant drive electronics. Wouldn't the new 802D be more appropriate? It is quoted as 90dB sensitive, so should not need oodles of power. As you are happy with B&W, money seems to be little object - lucky man! - and as they make a wide range of modern loudspeakers I can't help feeling your

difficulty is solvable. Why not phone B&W sales and ask them about dealers that offer a demo, or loan product for home evaluation? **NK**

Yes - I think there's actually no 'electrical' reason why the 801s won't work, and if they're what you want then you should absolutely go ahead. I think your dealer was right to point out that the Cyrus - good as it is - won't get the best from them, but then again I have to say that there are many £10,000 plus amplifiers that won't either. Actually, I've heard the little Onkyo A-933 integrated (£500 ish) make very nice noises with 801s, so I think you'll not be disappointed with the sound by any means - it's just rather akin to buying a Ferrari and only ever driving it under the national speed limit. What you'll need is the best possible cables you can afford - Black Rhodium's Tango at £15/m should do the trick nicely, and make sure your Quattro's placed well away from vibrations - an Audiophile Furniture Base SP01 isolation platform would be ideal to give the Cyrus a helping hand. **DP**

software coverage. Hi-Fi+ has far more music coverage with some good articles on vinyl collecting.

On the music theme your reviewers could use albums you agree as a bi-monthly reviewing standard, enabling readers to buy the music and hear if the effects described are readily apparent on their systems. I have to say that every month I try and just stick with Hi-Fi+, but invariably I also buy Hi-Fi World due to some interesting article or other. Now if you'd only expand your music reviews you'd help me resolve my ongoing dilemma!

All the same, I enjoyed the digital coverage this month; I had wondered where DAD came from! In my simplistic understanding I have tended to think of the kHz as the number of times a sample is taken in a second, and the bit rate as the resolution of the sample taken. The reference to dynamic range has therefore thrown me!

One option that is now more readily available is recording at higher bit and sampling rates. You can now buy solid-state recorders for about three hundred pounds. A few weeks ago I sang in a performance of Mozart's Mass in 'C' at my church. I took the plunge and



Cyrus Quattro - man enough to handle B&W 801s?

FOR THE RECORD

I've been wrestling with whether to save myself some money by limiting myself to one hi-fi magazine per month, and taking out a subscription. The choice is between Hi-Fi World and Hi-Fi+. Trouble is there are elements I like in each. I am hoping I might be able to persuade you to make Hi-Fi World expand the music pages, as this, for me is the telling point.

I am not going to be buying more and more hi-fi on a monthly basis, but I will be expanding my LPs, CDs and music DVDs. I really like the strengths of your magazine which, for me, include themed issues, reviews of old against new equipment, DIY articles, coverage of technology and exploration of upgrade tweaks. But, you are very stingy with

bought a recorder, a 4GB compact flash card and a mic. I recorded the concert at 24 bit 96kHz and then burned a CD and a stereo DVD-A, all using open source software. I've got to say that listening to the DVD-A via a Naim DVD5 - Benchmark DAC1 - EAR 864 - Art Skibos it sounds very good, although I could have set the recording levels higher. I am amazed at the recording quality a novice like me has got with some relatively cheap gear. The recorder also gives me options to archive my vinyl at higher bit-rates. DVDA is dead, long live DVDA!

Martin

Hi Martin. I'd love to solve your dilemma, but am unlikely to be able

to. Hi-Fi World doggedly pursues certain abilities, especially in-house measurement to a high standard using the latest test equipment and, of course, an agnostic approach that values old with new, stereo with surround-sound. It might seem a curious combination, but it does put a firm foundation under what we do, as guidance from measurement is often invaluable. Also, manufacturers feel a little happier if we know what we are doing and can tell them if a product has a wrinkle in its performance.

Music reviews are always popular and we once had them in depth, but in the end we felt the space was needed for ever popular DIY and the measurement blurb. Well, we've got to cut the other mags some leeway!

Whilst you were once interested in the hardware, now your interests have moved to software - perfectly understandable. But I am not sure it is really our province. There are good music mags that do it better and we leave it to them.

Kilohertz is a measure of frequency, used to describe analogue bandwidth, where it is the frequency of an electromagnetic or acoustic wave, or a sample rate. It so happens that a bandwidth whose upper limit is 20kHz needs a sample rate of 40kHz (i.e. double) to full describe its highest frequency.

Loosely speaking, the number of bits in a digital system describes dynamic range, as each bit approximately provides 6dB range. So a 16bit signal is said to have $6 \times 16 = 96$ dB dynamic range. Those are the links between these oft quoted figures.

If all was working well, then a DVD-A with 24/96 on it should sound good. I'm glad it all worked out. Perhaps other readers may be encouraged to experiment with this, now big open reels are long gone and even the cassette has passed away. These days recording is hardly encouraged. **NK**

Of course we're as mad about music as anyone else, but we take the view that comprehensive coverage would take page space away from hi-fi. Considering that there are some superb titles around, not least Record Collector magazine, for which our own Paul Rigby is a regular writer, we think it's better to stick - by and large - with hi-fi. Still, you'll see the odd feature about music (especially when its mastering and/or recording is key), plus a personal favourite of mine. Classic Cuts. Speaking of which, if you have any views on what should be included in this section, let us know! **DP**



REL's Strata III adds depth and space as well as bass.

LOW WOE

My system is: Marantz CD67se, Rega Planar 2 with Ortofon 510 Mk1 I, Quad 44/405-2 pre/power amplifier and Mission 733 loudspeakers. The 405-2 is currently in bits being modified with NET Audio boards and dual mono power supply. I wanted your opinion on my CD player and turntable. I've been reading about various modifications to both of these, and wondered if you felt my best option is to modify them to get the best from them, or to replace them? Have you any experience of modded Planar 2s and clocked CD67se? I like the overall sound of them, but feel they aren't quite fulfilling my requirements.

My second question is the issue of sound quality at low volumes. Before the Quad amplification I had a Cyrus Straightline. I parted with this a few months before buying the Quad, so it's a little hard to compare, but feel the Quad is better to my ears. Hopefully, more so once the modifications are completed. However, both these amps, with my Mission 733 speakers, only really come alive at moderate volumes, louder than my girlfriend and neighbours would like - although just right to me! When I listen at lower volumes I feel quite depressed as the sound is very flat and incoherent and I know that just a bit louder and I'm happy with the sound. What is the weak link causing this, and what can be done about it? I don't mind having two sets of speakers, one for quieter volume listening.

Graeme

I would be tempted to replace the Ortofon 510 MkII cartridge with something a bit more exciting in its sound and the usual choice is a Goldring 1042. The Rega will handle this well enough and do it justice.

From there on the world is your oyster these days, with no end of esoterica available, according to the depth of your pockets. Origin Live offer various Rega arm upgrades and Rega too are worth considering for upgrades.

The problem of a flat sound at low levels is not uncommon and is due both to the ear's hearing characteristic, where at low levels sensitivity at frequency extremes falls away, and to loudspeakers that tend to exacerbate the problem with their own tonal balance and - often - own inability to really convey transients. This appears to be a weakness of inefficient drive unit motor systems, with weak magnets, few turns inside the field and large clearances. High efficiency loudspeakers generally manage best in this area, and small budget jobbies worst. Having said that, the simplest workaround for you is to buy a decent powered subwoofer, such as a REL Strata III. It is quite surprising how a subwoofer can improve a system all round, seemingly making it seem more relaxed even. **NK**

ON AIR

Further to my previous e-mail expressing my discontent with the Yamaha HD1300 hard drive player recorder, I believe I have found a much cheaper, better solution to the hard drive music debate. I now use Apple Airtunes plugged into my amp, and a palm Liferdrive. Just plug Airtunes into the mains and your amp, your Apple network will detect it and go through the easy set-up procedure. Next download Mindola software's Patio Tunes onto your Mac/PC and open it. Now use a handheld Palm/PC to connect to the network and select your music.

You can even access iTunes radio, by dragging the station of your choice to the playlist section. Hey presto, no hard drive spinning noises distracting from your musical enjoyment. Possibly the death of hi-fi as we know it, all you need is an amp, a pair of speakers, a Mac and Airtunes!

The article on upgrading the quality of you CD collection by posting them away and having them remastered whilst enjoyable, seemed long winded. Why not buy a Yamaha external CD recorder (about £500) and use the audio master quality recording function to produce discs that sound like, and to my ears at least have the tonal qualities of, dare I say it vinyl. This is a lot cheaper and easier, and without risking the British postal system. That is if you really want to persevere with CD...

Whilst I'm here, what has happened to the computer audio section of the mag? Quietly dropped? And what about an article on Real World hi-fi, where people have to cope with wives, kids, furniture, etc., yet still pursue hi-fi as an interest? You could visit homes, hopefully by request, suggest mods and tweaks, and maybe pick up a few tips which can be circulated and may just help someone looking for a solution, such as those mentioned above. keep up the good work.

Steve

At present computer audio usually means compressed audio with limited play rights and this is a little anathema to most hi-fi buffs used to buying a CD and being able to play the thing without all the shenanigans introduced by computer DRM systems. Few of us are happy to be told our rights have expired after paying for something, irrespective of whether authors and the music industry think this is fair and normal. I found in the past iTunes, which uses AAC compression, is an excellent way to listen to music, but many

Macs and PCs later I'm not sure where all my tunes went and I'm not sure I care either.

Meanwhile my CD and LP collection continues to build. And as for the wireless network, many Linksys routers later (they expire after a year or two) at home my network has finally settled down and become reliable, except for the odd wireless router reboot needed every so often when the net suddenly disappears in a flurry of totally irrelevant warning notices. This is carried out by pulling out the power plug and putting it back in. Thankfully, my valve amps are much more reliable. Wireless networks aren't for everyone, I feel, only the computer savvy with plenty of time to donate to cantankerous equipment. All the same, we are continuing with computer audio as it is relevant, even though many readers complain about pages being wasted with it! **NK**

TUBULAR BELLE

I would like to thank Noel and all at World Audio for helping me to get my system back on track. Last year my

Chinese amplifier, a Cyber 10, blew a valve after other problems had been sorted and I lost faith in it. It was subsequently traded back in and I ended up with a Sonneteer Tripath digital integrated, a very smooth and detailed amp. However, after living with it for several months I was beginning to lose my enjoyment with most of my music collection. The only music to sound really good (to my ears anyway) were some very recent recordings; all else seemed canned and devoid of life. I've got an Inca Designs Katana CD player which I like a lot, and a Project 5 turntable which is pretty good for the dosh, but satisfaction was missing in abundance.

I decided valves must be the answer to my problem and ordered a World Audio kit. It took about two and a half days to build and test but the sound it produces is awesome. I would never have thought that those little EL84s could sound so revealing and powerful. Due to domestic restraint, floorstanders are apparently a no go so I've settled for a set of Quad 12 Ls on stands filled with sand.

I had reservations about the ability of a 15 watt per channel valve amp to



EL84s make David McCallum's system sing...

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drive these, but any doubt vanished as soon as I turned it up. This little amp really rocks: good bass and a live sound I'd previously thought would cost well over a grand. I really cannot recommend it enough. The lack of any valve noise or hiss is remarkable for an amp costing just over three hundred quid in my opinion. How is this possible?

For leads I'm using budget QED Mk2 bi-wire. Interconnects are Maplins silver coax at 15p per metre, plus the recommended phonos silver soldered. My speaker runs are quite long 7 and 10 metres, so cable choices are restricted by budget but any suggestions for improvement will be welcome. My next purchase will be a Goldring 1042 cartridge and I've ordered a White Noise headphone amp kit (I already use his phono stage powered by batteries to good effect). I tried to order previously from World Audio Designs with no joy, so it is great to have your most appreciated services available once again.

David McCallum

Hi David. Glad you like it. EL84s are known for their sweetness and that's a good reason to design an amp around them. In the past some designers have even run banks of them in parallel to raise output. KEL84 is a real beauty, and of course it has proper Andy Grove designed and UK built output transformers, which the rest of the world would die for. Winding the complex sections and layers of these transformers as an arcane craft skill, and taking out the wire ends and soldering them all up in correct combination and phase another challenge - one too great for most transformer winders. Just a few companies in the UK can - and are willing - to do this. WAD used all of them and now stick with the best, for a consistent high quality product that I believe isn't yet matched, although companies like Audio Research of the U.S.A. get close. By the way, don't forget to look at the World Design forum at www.world-designs.co.uk. World Design is now run by Peter Comeau of course, ex Heybrook and Mission. **NK**

THE PATH TO RIGHTEOUSNESS

I have been using Yamaha NS1000M loudspeakers on and off for twenty years and have always found the sound stage flat with little depth (but amazing clarity). A bit dry in the bass overall couldn't see what all the fuss was about in your magazine, but they do have something that other speakers don't. Then about nine months ago I started looking at Chinese amplifiers and associated bits and pieces. I have done a lot reading on the Internet about them.

One of my amplifiers I was using

at the time, which was a World Audio Design KEL 80 Monoblock (not bad) I took in for repair at Progressive Audio as it had a slight hum. After I gave the amplifiers over we began talking about the set-up of the system in the demonstration room. I sat down for a listen and was absolutely gob-smacked, I was only 4-5ft away from the speakers and I couldn't hear the sounds coming from them at all! I have never heard speakers disappear like that before. The speakers were probably half way down the room, toe'd in to cross over just behind the head.

I also noticed Cyber 800 power amps (not connected) sitting in the corner of the room and I cheekily asked

could walk around the sound stage. If this is not imaging then I don't really know what is!!

At the moment I am in the process of changing all the valves in the preamp to Mullard ECC81s and ECC83s and I would like to change all the valves in the CD player and power amps, but am not sure which ones I should change to for best sound quality? I have read on the Internet that the Cyber 800 can be run with 6CA7s (supplied) or 6550s, KT88s, EL34s. Is this true? If so, can I really buy sets of each and see which ones I prefer the sound of without having to have it re-set up (biasing) when I change from one type of valve to the other?

With regards to the NS1000Ms



Ian Lott's finally got his NS1000Ms working right!

if I could borrow them (whilst mine were in for repair). Result: one sale, plus Consonance Linear 2.2 CD player and Consonance 1.2 preamp - excellent. I also took away the room/ hi-fi setup used by Progressive, to get that sound stage. I bought the preamp ex-dem for £1,800 (excellent price) - unheard. I also use a Michell GyroDec, RB300 arm and Audio Technica ATOC9 cartridge. I know it's not an ideal combination, but due to be upgraded to Music Maker III and Hadcock arm.

All the Chinese Consonance equipment takes a hell of a long time to burn in - months not weeks. As shown in attached picture, you can see set-up is not as per normal, speakers sit 11ft from rear wall and 7ft apart, toe'd in to cross over just behind the head, as soon as I changed over to this Chinese equipment the system came to life, giving a three dimensional image. It's like sitting on front of the stage with the musicians all around you - and the speakers completely disappear. I've had a female friend ask, "is the sound now coming out of the amplifiers" and a mate who asked whether or not he

on the end of this system, they are truly superb; I have fallen asleep in front of them with quite high volumes listening to Pink Floyd to be woken up by the 'clocks in Time' - scary! I recently bought Madonna's latest album and the first track was extremely 'bright', but this was with my previous preamp, a Sonograph. So Madonna was resigned to the back of the cupboard along with all the other 'bright' CDs until I changed to the Consonance preamp. This completely changed from being too bright to 'what's all the fuss about'. So now all the CDs that were unplayable are now being dug out and are no longer bright.

I've always read that NS1000 midrange level pad should be turned down to -3 to compensate for brightness and a touch of hardness. Mine run flat with no hardness or brittleness. Bass is excellent too, which in my room (30ft x 14ft) goes down a lot lower with conviction than the spec sheets specify (-6dB at 40Hz).

Ian Lott

A good set of EL34s married to quality transformers, as in the

Consonance Cyber 800, will give good results. I think I am right in saying David uses a 20W K5881 WAD valve amp with his Yamahas, with some success. Paralleled EL34s in push-pull should give around 60W, depending upon how hard you push them, which in turn affects valve life and reliability.

The amplifier is likely to give best results with 6CA7s fitted. You could try other makes of EL34, but the other valves you mention aren't really the same at all and whilst the amp might work with them I doubt whether the results will be very impressive. Quad ESL57s are a loudspeaker that cost more now than when new. Upgraded by OneThing they are also arguably the worlds most accurate and correct loudspeaker. Work with valves too!
NK

Well, pictures speak louder than words – there they are, lo and behold, a pair of NS1000Ms with the level pads at 0dB (i.e. no treble or midband cut)! In my room, with my system, that would produce a bright sound, so your Consonance amps must be super rich. With my World Audio K5881, I'm running mine with the treble pads at -1.5dB and the mids at -3dB – and believe me that goes down further when solid-state enters the equation. Still, my room's quite zingy, so I suppose you must have a very dead acoustic. Incidentally, rumour has it that the Yams are flat at 0dB settings only in very dead studio conditions, so I'd expect normal households to demand a bit of level pad twiddling. As I've always said, these speakers are capable of blinding sound, but few people have the system/ knowledge/ room to get anywhere close. They're real 'old style seventies F1 racing car' speakers, in a modern world full of tiptronic, traction controlled, anti-lock braked Porsches...
DP

SUPER AUDIO

My current stereo configuration consists of a Marantz SA8400 player, a Harman Kardon Citation 21 preamp, two Harman Kardon Citation 24 power amplifiers (in bridged mono 1x200W mode) and a pair of Mordaunt Short Avant 908 speakers. To my ears this system sounds absolutely stunning with SACDs and I need nothing more to be happy. If I could switch completely to SACD and never look back on CDs again, I would do so without hesitation. But, even if my SACD collection is slowly reaching 150 titles, my CD collection is much richer and still contains lots of albums which I love and which are not available on SACD. The problem of

my system is that CD playback falls extremely short in comparison with SACD playback, and the differences are not at all subtle, they are quite huge, up to the point where I find it quite difficult to listen to CDs anymore.

My question is: what could I do to be able to listen to my CDs again (without impacting SACD performance in any way)? For a budget up to £1,000 is it possible to find a CD player on which CD playback comes very close to the SACD performance of the Marantz SA8400? For the same budget, instead of another CD player, should I consider adding an external DAC and use the SA8400 as transport only with CDs? If so, which DAC could come closer to the desired performance?

Adrian Matala

I understand your predicament Adrian. SACD sounds natural, relaxed and yet richly detailed in a way CD does not. I don't believe you will ever get CD to sound like it, because SACD is amazingly linear right down to vanishingly low levels, meaning it delivers the faintest signals cleanly, with absolutely no background slush. Our measurements clearly show it is slightly better in this regard, across the audio band at least, than DVD-A, and significantly better than CD. You just cannot match this with CD. All you can do is to tweak CD up to sound more entertaining, perhaps than it really is.

The latest crop of valve CD players from China, such as the Shanling CD-T80 and Eastern Electric Minimax, meet your budget and offer a very entertaining sound, spaciouly lifelike at least, and reasonably relaxing too. Over budget, but deliciously naughty in its sound, is Tube Technology's Fusion CD64, which is as rich as a fruit cake in its presentation, arguably a little too much so! It sounds amazing, and if you took to it, then even SACD might sound a little processed in comparison. It might be worth a listen, as the special WTA digital filters, also found in the gorgeous Chord DAC64, transform CD from that flat and slightly harsh sound to one with an easy spaciousness reminiscent of SACD, if a little barren content wise when compared to it, a characteristic of CD, not the player. I hope this helps.
NK

MEIXING RUCK

I recently purchased a MeiXing MC67HA preamplifier. For the price I found it surprisingly good as it has softened my system of Krell with Quad 63s. I know it's a bit of an odd mix, but it works well. My problem is that I wanted to change the rectifier valves but

can't find 6N6T [Chinese] replacements. I've tried the usual places but no one knows this valve. I've been told possibly 6H6 [Russian] might work but not definite and most people are advertising Mullard E182cc as its equivalent, but it's not. I bought four of these E182cc and they blow the fuse in the preamp. I've searched quite a number of internet sites and there are similar people looking for this valve. I have taken the preamp to a local shop to see if they can solve this problem. They said they won't do anything until they have a schematic drawing and pins numbered. As you can see, I'm not electronically minded so I don't know how to solve this. This is the first time I have tried valves in my own system and I am a bit reluctant to pursue a valve system in future if this is typical. I would be most grateful if you could give me some advice on this. Also, it might make a good article in the magazine to inform your readers about the pros and cons of purchasing items like this from abroad.
Jonathan Heyes

As you'll see from the previous correspondence and from my replies, buying low cost valve amps from China has its drawbacks. They work, sort of, for a limited time. It's a pity that valves are now becoming widely accepted as a real step up from solid-state, rather than simply old fashioned and soft sounding, neither of which are either useful or true descriptions, but Western manufacturers are just not taking up the challenge. Every manufacturer of solid-state amps in the UK should have some serious valve products, but they just will not do it. This is obviously driving a lot of enthusiasts into the arms of distant manufacturers, with some less than satisfactory results.

Ironically, as hi-fi manufacture moves to China and as Western engineers take their knowledge and quality standards with them, which the Chinese are eager to embrace by the way, we will start to see more sophisticated Chinese valve product. Just don't expect it to cost a few pennies. We regularly recommend Shanling and now Eastern Electric products, both of which I really respect (and use!). And of course the Quad QC24 and 11-forty valve amplifier combination I am wedded to in our offices is made in China, with Chinese valves but UK designed Andy Grove transformers. In other words, it's been engineered properly. For £3,000 this is, in my view, the one to beat. What we really need is a Quad valve phono stage; it's in the pipeline I know, but hasn't appeared yet.
NK

HIGH DEFINITION IN PICTURE AND SOUND

Sound had reached a pretty good standard some time ago, and it's easy to pretend that picture quality is less important, and indeed for some time I have been advocating the greater importance of sound, as if that's not right you won't enjoy what you are watching, whereas the opposite isn't always true. But that was before High Definition, and although DVD has to get it's act together, we do now have HD from Sky, and pretty spectacular it can be. Some of the programmes on HD channels aren't HD, but the BBC demo channel, with Bleak House/ Hannibal/ Galapagos / Jools Holland etc., looks really good, especially when blown up onto an 8ft. screen. It will be great having opera, ballet and music programmes looking so good that the enjoyment of the picture can equal that of the music!. So with projectors getting so cheap now that you can set up a projector/screen setup for around £2.5K, which is what a 42in. plasma will cost, there really is no excuse for looking at this option. The picture is more natural, and size really does matter! So do give us a ring and let us show you what can be achieved today.

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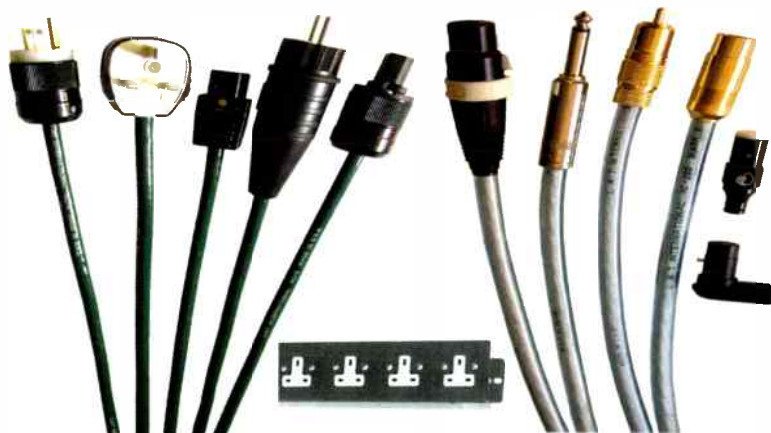
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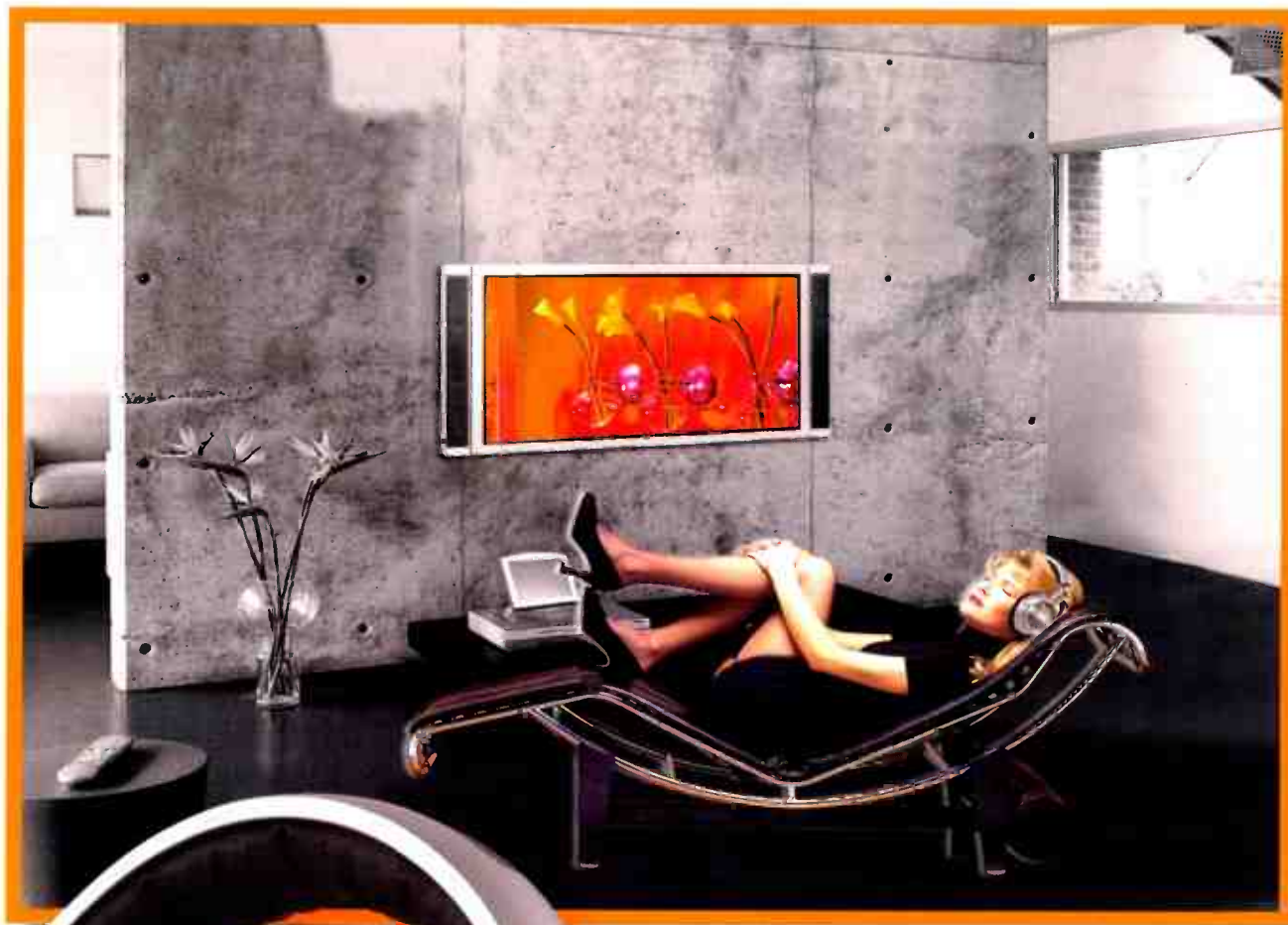
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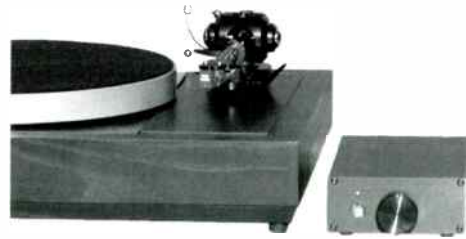
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PERPETUAL TECH/MODWRIGHT SIG.2 MODULAR PSU (LAST 1)
PERPETUAL TECHNOLOGY P1-A/P3-A/ PSU ALL SIG-2 LAST 1
AUDIO ALCHEMY DDS III CD PLAYER/TRANSPORT (NEW OLD STOCK)
AUDIO ALCHEMY ADC CD PLAYER/TRANSPORT
AUDIO ALCHEMY DDE VIII HODC DAC TOS/COAX/2s (NEW OLD STOCK)
AUDIO ALCHEMY DDE VI.2 HODC DAC TOS/COAX/AES EBU/2s (NEW OLD STOCK)
AUDIO ALCHEMY DDE VI.1 HODC DAC TOS/COAX (NEW OLDS STOCK)
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ALPHASON SONATA/SEPERATE PSU/HR-100 MCS ARM VD.HUL WIRED
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MOTH MM/MC PHONO STAGE
HADCOCK GH-242 INTEGRA (FEW HOURS USE)
FIDELITY RESEARCH FR-64 & MC-702 CARTRIDGE
AUDIO ALCHEMY VAC IN THE BOX (NEW OLD STOCK)
GRAHAM SLEE ELEVATOR EXP STEP UP/PSU (FEW HOURS USE)
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REGA RB-300

SOLID STATE

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SONY TAE-1 PRE & TAN-1 POWER AMPS (AWESOME)
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AVI 2000 PRE AMP 2 MONOBLOCS & SYSTEM REMOTE
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JEFF ROWLAND MODEL 5B POWER AMP
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MERIDIAN 562V PRE AMP
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VALVE AMPS

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STEREO 90 POWER AMP BOXED
CONRAD JOHNSON PV-5 PRE INC PHONO STAGE (SERVICED)
UNISON RESEARCH SMART 300B MONOBLOCS
UNISON RESEARCH B45 INTEGRATED (SUPER AMP)
UNISON RESEARCH C-5 REMOTE PRE AMP MM/MC PHONO STAGE (£1600 NEW)
GAAAF 50/50/POWER AMP
AUDION REFERENCE PRE AMP INC. PHONO STAGE (£2500+).N.O.S
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EGGLESTONWORKS ROSA
EGGLESTONWORKS FONTAINE II
EGGLESTONWORKS ANDRA II
SOUNDLAB M-3 BI-WIRE TOROIDAL TRANSFORMERS (£9300+)
SOUNDLAB M-3
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Orchid LWO speakers ex-demo £1995

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Mark Levinson No 26 Balanced £1250
Rotel RC995 Pre Amp £295
Conrad Johnson MC-10 Pre Amp £395
Musical Fidelity 3A Pre Amp £175
Mark Levinson 25S phono stage with PSU £2394
Naim Nac 92 with Nao 90/3 amp £595
Proceed PAV pre-amp £995

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Mark Levinson 383 Integrated Amp £3750
Jeff Rowland Model 5 Power Amp £1995
Mark Levinson 27 5 Power Amp £1695
Arcam Alpha 8P Power Amp £1995
Arcam Alpha 8R Integrated Amp £195
Arcam Alpha 8P Power Amp £195
Mark Levinson ML383 Integrated Amp £3750
Cyrus 2 Integrated amp £175
Mark Levinson 431 amp X-Demo £3850
Audio Research D130 Power amp £995
Perrux 20hp int amp £1095
Audonole Nitro mono-blocks £5495
Parasound HCA 1000A amp £345
Audonole Kegan mono's (new £28000) £11995
Advantage integrated amp £995

CD PLAYERS & TRANSPORTS

Arcam Diva CD82 CD Player £395
Mark Levinson 31.5 CD Transport £3995
Denon DCD 590 CD Player £60
Sonic Frontiers Transport 3 (GK new) £1995
Denon DCD 590 CD Player £60
Sony DCPM41 CD Player £60
Pioneer PD-S502 CD Player £95

COUNTERPOINT

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Mark Levinson 253 with PSU £2395
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I have the following items for sale. This is an assortment of ex demonstration (ED) or secondhand (SH) equipment. Most of the ex dem pieces will carry a warranty and are generally in pretty much as new condition. Secondhand items too are generally in as new condition. Please call to ascertain exact details. Unless otherwise stated items will be in original manufacturers packaging. If an item needs to be sent then the carriage costs will be borne by the buyer.

1. SME Model 20 Mk 1 V/Transfiguration.SH. One owner from new. £2950. No box.
2. SME Model 10. Brand new. Still in sealed box. Cancelled order. Special Price £2495.
3. Tannoy Dimension 12 loudspeakers. Cherry. ED. Virtually unused. £4500.
4. Innersound Eros 111 semi-active hybrid Electrostatic speakers. Maple side cheeks. Complete with 600 watt bass amp. Brilliant, Brilliant speakers. ED. (New price £7500) £5000.
5. Sugden Masterclass AA mono blocks. 150 watts Class A. Black. ED. £4500.
6. Sugden Masterclass pre amp. Black. ED. £1595.
7. Sugden Masterclass phono stage. Silver. ED. £950.
8. Tom Evans Vibe line pre amp. ED. £2700.
9. Unison Research SR1 hybrid valve amp. ED. £975.
10. Complete Chord Choral system including rack. Comprises Blu cd transport, DAC 64, Prima pre amp and Mezzo 50 power amp. Silver. ED. (Price new £11935) £9500.
11. Chapter Audio Verse 11 (NOT Plus) power amp. ED. £2250.
12. Roksan Kandy KA-1 Mk 11 integrated amp. ED. £225.
13. Roksan Caspian CD player. SH. Some minor marks. £450.
14. Densen Beat B-400 Plus (DAC upgrade) cd player. ED but never used! Black. £950.
15. Densen Beat B-200 pre amp. ED but never used. Black. £725.
16. Densen Beat B-340. Power amp. New. Albino. £1500.
17. Densen Gizmo. I have two of these - both brand new in boxes. £150 each.
18. Moon i5 integrated amp. Black. No remote. Remotes are available separately from importer or me. ED. £1950.
19. LFD L51 linestage pre amp. Black. SH. No box. £375.
20. Plinius SA 102 power amp. Black. ED. £2995.
21. Plinius M8 pre amp. Black. ED. £1600.
22. Red Rose Spirit amp. ED. £695.
23. Red Rose Rosette amp. ED. Brilliant - especially partnered with R3 speakers. £1250.
24. Red Rose R3 speakers. Maple. SH. £1750.
25. Red Rose R3 speakers. Maple. ED. £1995.
26. Red Rose Rosebud 11 speakers. Piano Rosewood. ED. £2250.
27. Red Rose Spirit speakers. Rosewood. ED. £650.
28. Red Rose Spirit speakers. French Afrosmosia. SH. £700.
29. Proac Tablette 2000 speakers. Walnut. ED. £475.
30. Acoustic Energy Reference AE1 speakers. Gloss Black. With stands. ED. Very little use. £1850
31. Musical Fidelity A3CR pre amp. Silver/Gold. ED. £650.
32. Musical Fidelity A300CR power amp. All Silver. ED (unused) £1500.
33. Musical Fidelity A3. 2 Integrated amp (last model) Unused. £650.
34. Consonance J5000 Plus 300B integrated valve amp. ED. £1095.
35. Consonance M100 Plus 300B integrated valve amp. ED. £1150.
36. Wadia 301 Mk 1 cd player. Variable output. Silver. ED. £2250.
37. Audio Synthesis Transcend Decade cd transport. Still up there with the best. ED. £2000.
38. Audio Synthesis Desire. Decade power amp with Black Gate capacitor upgrade. ED. £2250.
39. Avid Diva turntable. No arm. ED. £975.
40. Audio Analogue Maestro. An absolute monster of a integrated amp. ED. £1995.
41. Audinote Meishu Line 300B valve amp. New. 300Bs. One of my all time favourite amps !! ED. £1800.
42. DNM 3B Twin 2 box pre amp. SH (Cost new £3000) £1350.
43. Exposure XX111 pre amp. New. £995.
44. Exposure XXV111 power amp. New. £995.
45. Exposure XX11 CD player. New. £995.
46. Exposure 2010S CD player. New. £350.
47. Exposure 2010 (Not " S ") power amp. New. £275.
48. Exposure 2010 (Not " S ") integrated amp. New. £325.
49. Consonance Cyber 50 valve line pre amp. Mahogany top. ED. £725.
50. Consonance Cyber 40 valve phono stage for m/m and m/c. Cherry top. ED. £650.
51. Living Voice Auditorium speakers. Cherry. Black plinths. ED. £1250.
52. Audio Synthesis Passion phono m/c phono stage. £795.
53. Audia CD One cd player. Black/Silver. ED. £2750.
54. Audia Flight pre amp. Black/Silver. ED. £2750.
55. Audia Flight 50 power amp. Black/Silver. ED. £3000.
56. Vienna Acoustics Haydn speakers. Rosewood. ED. £400.
57. Vienna Acoustics Mozart speakers. Beech (one grille is broken) ED. £850.
58. Vienna Acoustics. Beethoven speakers. Black Ash. ED. £1500.
59. Anthony Gallo Reference 3 speakers. Black/Silver. ED. £1800.
60. Harbeth HL-Compact 7ES speakers. Birds Eye Maple. ED. £950.
61. Harbeth HL P3ES 11 speakers. Cherry. ED. £550.
62. Michell Technodek/RB250 turntable. New. £475.
63. Talk Electronics Thunder 3.1B cd player. Fixed output. Silver. ED. £1450.
64. Talk Electronics Hurricane 3.1B pre amp. Black. ED. £1350.
65. Talk Electronics Tornado 3.1B monoblock 200 watt power amps. Black. ED. £2150.
66. Veritas " 20 " speakers with matching stands. Piano Black. ED. £995.
67. Veritas H3 Floorstanding folded horn speakers. 102db sensitivity Gloss Black. ED. Paul Messenger rated these as one of his products of the year when he reviewed them (cost new £5995) £3500. No boxes.
68. Totem Model 1 speakers (not Signature version) Cherry. SH. £750.
69. Chord Co Signature interconnect cable (RCA) 1m. ED. £300.
70. Chord Co Signature interconnect cable (RCA) 1m. New. £350.
71. Alon 1 speakers. Light Oak (cost new £1295) ED. £650.
72. Alon Petite loudspeakers. Walnut (cost new £1295) ED. £600.
73. Origin Live Encounter tonearm. Little use. ED. £650.
74. Proac CC1 Centre channel speaker. Mahogany. Slightly marked. ED. £350.
75. PS Audio P600 Multiwave mains regenerator. ED. £1995.
76. Audinote ANE/SpX speakers. Light Oak. ED. With dedicated MAF stands. £1500 Incl stands.
77. Audinote ANK/SpX speakers. Walnut. SH. £550.
78. Audinote P Zero 8 watt push-pull valve mono block power amps. Never used !! £400.
79. Audinote AZOne speakers (the original design) Never used. £250.
80. Proac Response 1.5 speakers. Black Ash. ED. No boxes. £750.
81. Meadowlark Swift speakers. Light Oak. ED. £550.
82. Philosophy Audio Gold Series speaker cable. 5m Bi Wire terminated with banana plugs. This cable is one of the very very best. ED (Cost new £1875) £1200.
83. Audinote AN-Vx Interconnect terminated with AN-P Silver phono plugs. 2m set. ED (cost new £1024) £650.
84. Musical Fidelity X-80. New. £275.
85. Musical Fidelity X-150. New. £495.
86. Musical Fidelity X-PreV3. New. £495.
87. Musical Fidelity X-150. ED. Never used-displayed only. £450.
88. Musical Fidelity X-80. ED. Never used-displayed only. £250.
89. Wheaton Triplanar MKV11 tonearm. With fly lead terminated with RCA phono plugs. Brand new and unused. Complete with manual and gauges. £2750.
90. Pathos Logos hybrid valve amp. ED. £2150.
91. Shanling CDT100 valve cd player. ED. £1250.
92. IsoL-8 Powerstation 200 mains regenerator. 2 mains outlets. Perfect for cd players, phono stages and pre amps. Not for big power amps. ED. £995.
93. Quad ESL 63 electrostatics. Still a world class speaker. This pair are in Walnut, 25 years old but serviced by Quad within the last two years and in perfect working order. No boxes. SH. £750.

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Ex-demo and second hand items

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Digital			Martin Logan Aeon I Oak BNIB	3189	2500
Audio Synthesis DAX Decade 22 Bit Balanced S/H	3500	1799	Martin Logan Clarity Cherry 4 months old S/H	2498	1999
Audio Synthesis DAX Decade 22 Bit Single ended S/H	2999	1499	PMC FB1+ Black new tweeter upgrade	1900	899
Krell SACD Standard x-demo	3998	2995	Pen Audio Rebel 2 x-demo	995	699
Mark Levinson No390S CD Player (upgraded 39)	6500	2750	Sonus faber Ironwood Stands S/H	498	279
Meridian 206 CD Player S/H	N/A	379	Sonus Faber Leather Stands, fixed height, x-demo	310	199
Musical Fidelity Nu Vista CR 3D Player S/H	2999	1699	Spendor S3 Cherry S/H	599	399
Orpheus labs One DAC with anagram x-demo	3150	1799			
Primare V10 CD/DVD Player x-demo	795	499	Cables and Accessories		
Rega planet CD player x-demo	498	379	Atacama 50cm Sand filled stands S/H	179	69
Resolution Opus 21 CD player (Black) S/H	2850	1995	Audio Note 2x5ft bi wired AN Spa Speaker cable S/H		
Roksan DP 1/DA1/DS4 3 box system S/H	2000	649	Cardas Neutral Reference 1m RCA-BNC S/H	550	375
Sony CDP X940 SACD Player S/H	549	249	Cogan Hall Intermezzo EMD 0.75m RCA S/H	N/A	149
Theta Generation V Balanced S/H	6290	1599	JPS AC+ Power Cord 2.0m UK S/H	429	199
Theta Pro Basic II DAC with Oscom/Balanced S/H	2990	895	Kimber Illuminations DV75 1.5m digital 75ohm S/H	165	79
Wadia 861B x-demo	6500	5299	Kimber Monocle X 2x8ft WBT Spades Speaker cables S/H	587	295
			Kimber Select KS1121 0.5m RCA Interconnects S/H	596	299
Analogue			Madrigal MDC1 1m AES/EBU 110ohm Digital Cable new boxed	420	249
Crown Jewel Ltd Edition MC Cartridge 100hrs	2650	1499	Nordost Valhalla 1m Balanced Digital AES, EBU S/H	1680	899
EAR The Head Transformer S/H	N/A	299	Nordost Valhalla 1m Balanced S/H	2195	1299
Graham Slee Elevator EXP MC step up S/H	510	320	Siltech FT12 G3 2x0.8m Silver Speaker cable x-demo	540	275
Kuzma Stabi/Stogi S Turntable New& Boxed	N/A	1399	Siltech LS188 Classic 2x3m Silver & Gold Speaker cable BNIB	3950	2995
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Roksan Xerxes Alphason Xenon XPSII S/H	N/A	549	Sitech SPX20 0.5m IEC-Shuko Mains cable x-demo	199	95
			Sound Organisation Record Rack with CD insert S/H	N/A	40
Preamplifiers			Spectral MI330 2m RCA BINB	580	349
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Audio Research LS16 Valve balanced preamplifier S/H	2999	1799	Tara labs the 2 x \$ft Speaker cable S/H	1999	499
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Conrad Johnson PV14L Remote controlled valve x-demo	2399	1750	VDH CS-122 HYBRID 2x3m pair Speaker cable ex-demo	172	85
Densen B200 Preamplifier 2 weeks old S/H	1100	699			
Krell KCT Preamplifier X-demo	8998	5995	Tuners & Tape decks, power supplies		
Mark Levinson No380 Preamplifier S/H	4999	2499	Denon TU260 FM/AM RDS Tuner S/H	120	69
Roksan DS4 Black PSU S/H	449	199	Magnum Dynalab FT101A Etude FM Tuner S/H	1250	649
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Spectral DMC 30s Reference Preamplifier S/H	7600	4999	Marantz DVD400 DVD Player S/H	299	139
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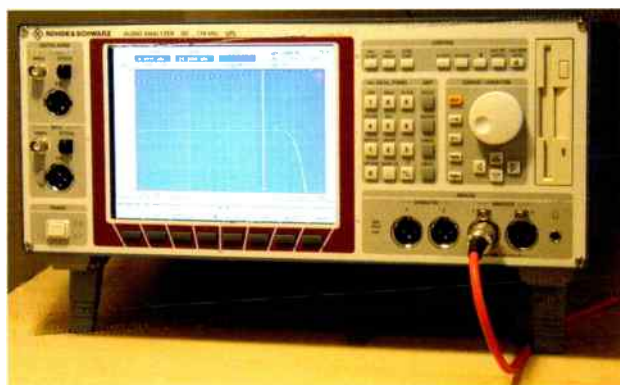
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In-house measurement is costly and time consuming, yet it has always been central to our belief that both readers and manufacturers deserve it, because there is no alternative if complex technologies are to properly assessed.

Measurement achieves many things. It ensures a product is working properly before it is subjectively auditioned. We pick up problems like loudspeaker drive units wired out-of-phase by accident, digital filters that roll-off in a bizarre fashion due to design error, a transmission line loudspeaker with no bass (!), amplifiers with excessive d.c. offsets, excessive jitter and all manner of other funnies.

Manufacturers published data is then checked against our measurements. There is usually little problem here.

The reviewer is then given the results. This gives useful guidance on what to watch out for in listening tests. For example, if three CD players use the same chip set they may well sound much alike in their basic attributes, if not identical. This is useful information for a reviewer.



Hi-Fi World uses a range of test equipment from around the world, including a Rohde & Schwarz UPL for testing CD and DVD players. Amplifiers are tested with 8903B Audio Analysers from Hewlett Packard. Loudspeakers are measured with a Bruel & Kjaer measuring microphone and Hewlett Packard 3561A spectrum analysers. We use three of these for basic test work and to ensure our listening room and conditions are balanced. Tuners are measured with a Leader 30125 Lab generator and Marconi 2015 RF generator, plus external MPX filters and equalisation.

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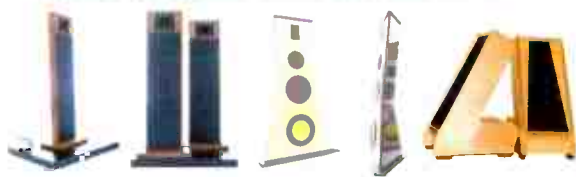
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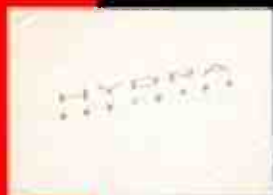
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The beginning of 2006 saw Creek Audio launch two exciting new ranges, EVO at entry level and its high end - Destiny. At the same time, Creek's most popular products in the past 5 years, the 5350SE amp, CD50mk2 CD player and T50 tuner are now badged as Creek Classics. The OBH miniature range completes this new Creek line-up.

EPOS ACOUSTICS

2 Avebury Court, Mark Road,
Hemel Hempstead,
Herts, HP2 7TA
Tel. 01442 260146.
Email: info@epos-acoustics.com
Website: www.epos-acoustics.com

Innovative design and superior sound distinguish EPOS speakers from other brands in similar price categories. Nine models in total including a 5.1 surround system. All available in 3 finishes. Supporting stands and plinths complement the speakers. In addition to its two channel appeal, Epos is now equally sought after in the fast expanding world of home cinema. -

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Tel. 01493 751100 Fax 01493 751155
E-mail: sales@falcon-acoustics.co.uk
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Monitor Audio designs and manufactures British loudspeakers of the highest quality. Since 1972 Monitor Audio has been developing and perfecting the implementation of metal drivers, innovative crossovers, and exemplary speaker cabinet construction and finish to further the ideal of achieving sound which to the original is "as close as it gets".

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Email: sales@promonitor.co.uk
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WIN REVOLVER'S SUPERB NEW 9W VALVE LOUSPEAKERS IN THIS MONTH'S GREAT GIVEAWAY!

Hi-Fi World gives you the chance to win a pair of great floorstanding loudspeakers in the svelte shape of Revolver's RW45i. With excellent sound quality allied to high sensitivity, they're perfect for valve amplifiers or solid-state alike. Here's what Noel Keywood wrote about them in July 2006's review:

"The original Revolver floorstanding R45 loudspeakers have a wonderful ability to get along with just about any amplifier, from the most anaemic 9W valve single-ended types through to solid-state powerhouses. This consistency is supported by a clean, concise sound that is sufficiently well balanced to be enjoyable - and survivable! So the question I was always going to ask about any replacement is: does it offer the same, but better? With the new RW45i reviewed here, Revolver have taken the original model and tweaked it. You still get what has now become a very popular drive unit/cabinet arrangement, where a basic two-way system is augmented by twin bass drivers operating in their own lower chamber. This has various subtle benefits. The simple two-way placed at the top of the array, at ear height, offers a focused sound with clean midband... Keeping the bass/midrange drive unit smallish helps keep both vocals and imaging tidy and clean, aided by the narrow

cabinet front. The RW45i uses an aluminium dome tweeter, protected by a metal mesh. The RW45is' black plastic dust caps remain unmodified, sitting in off-white bass fibre cones. Glass fibre mat is light, rigid and colouration free. The new RW45i comes with improved gold plated bi-wire input terminals and links, a more open tweeter grille, improved polypropylene capacitors in the crossover and silver plated oxygen free copper wiring to the drive units.

In many respects, the new RW45i was the same as the old R45, but different too... Where the originals were gentle, if quite specific in their delivery of highs, making cymbals obvious but not overwhelming, the RW45is bring a little more zest at high frequencies... The extra incision brought sharpened delineation of events, cymbals sounding harder etched but more concise. The other big difference comes down at the other end of the frequency spectrum. Revolver have pulled back bass output, giving an altogether drier, more damped and controlled bass



delivery. As there have been times I felt the R45 bordered on excessive at low frequencies I can understand this. The new RW45i is lighter, drier, faster and more insightful. It sounds less leaden and altogether more spry. Happily, this is still the loudspeaker that manages so well in all other areas, large and small, that make it such a good all-rounder. They are satisfyingly projective, setting up a large open soundstage that extends beyond the loudspeakers and has a good sense of depth. Here's a loudspeaker that is fundamentally right in what it does, and very easy to get along with too. With a broad range of real strengths, all in good balance, it remains a superb choice of budget floorstander."

If you'd like to win this superb prize then just answer the following questions and send your entries on a postcard by 31st July 2006 to:
August 2006 Competition, Hi-Fi World magazine, Unit G4, Argo House, The Park Business Centre, Kilburn Park Road, London NW6 5LF.

QUESTIONS

[1] What type of tweeter does the new RW45i use?

- [a] aluminium
- [b] titanium
- [c] magnesium
- [d] beryllium

[2] What type of internal wiring is now fitted?

- [a] silver plated oxygen-free copper
- [b] copper
- [c] gold
- [d] tin

[3] Revolver have done what to the bass output?

- [a] pulled back
- [b] pumped up
- [c] knocked off
- [d] ratcheted up

[4] He concludes by saying the Revolver is...?

- [a] "fundamentally right in what it does"
- [b] "a boat that won't float"
- [c] "a speaker without both oars in the water"
- [d] "one Mars bar short of a picnic"

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RULES AND CONDITIONS OF ENTRY

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The aperiodic enclosure offers the bass clarity and definition of a larger closed box, together with the efficiency and easy amplifier load necessary for users of valve amplifiers. In fact, the easy drive nature of this nominal 8 Ohm loudspeaker gives it a dynamic performance which far outperforms modern stand-mount speakers.

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Both kits are complete with bi-wire, gold plated terminals fitted to an oval terminal panel that carries the crossover PCB. Crossover components have been chosen for optimal performance with the drive units and feature high power resistors and inductors and low loss polypropylene capacitors. LC-OFC cabling is used to connect to the drive units.

The optional cabinet kit is fully machined in oak veneered, high density MDF with precision internal grooving for easy assembly.

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Kits come complete with full constructional drawings and details, drive units, crossovers and recommended internal damping material, in fact everything you need except the cabinets.

Cabinet kits are also available, as are the individual components. For more details, please check our website:

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WD25a Std kit £215 per pair

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Cabinet kit £179 per pair

private ads

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CHORD CPA 1800 pre amp. Black, boxed c/w instructions and balance of manufacturers 5 year warranty. As new condition, cost £2500, accept £895, no offers, will post. Tel: 01608 650 927 (Aug)

FOR SALE. Audiolab 8000C pre-amp, Audiolab 8000P poweramp. Tel: 029 208 67723 (Sep)

ZINGALI PAIR of loudspeakers Overture 3. Purchased Oct. 1999. Beech finish, 6 ohm, 93 dB sensitivity. Light domestic use only, superb condition. Original packing. Bargain £1,045. Tel: 01494 837 358 (Bucks) (Aug)

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WANTED: HI-FI WORLD magazine March 1991 to April 1992 inclusive. Please ring Peter Watson at 01837 840 544 or Mobile 07796 557 083 or Email: cpwat@btinternet.com (Aug)

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(Jul06)

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CLASSIC CONTACTS

When a classic goes 'poof' your troubles have just started, but there may be a good ending. Replacing failing parts can improve the sound, so here is a short listing of all those companies who specialise in getting a classic up and running again after its deposited a small ring of soot on your ceiling!

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NEXT MONTH

ULTIMATE LOUDSPEAKERS!



Large amounts of lugging have gone towards reviewing some of the world's best loudspeakers in September's *Hi-Fi World*. In a special, extended group test, Peter Comeau assesses JBL S4800s, Tannoy Kensingtons and Dali Megalines. Editor DP tries the latest and greatest incarnation of the ultimate studio monitor, B&W's stunning 801D, and we discuss the relative merits of horns, line arrays and omnidirectional designs.

We've also got a range of amazing ancillaries to drive them with, from the massive McIntosh MC275 power amplifier to Naim's stunning new CD555 CD player, which has good cause to claim 'the world's best CD spinner' mantle for itself. Here's what we hope to bring you:

Speaker Supertest: JBL K2 S4800, Dali Megaline & Tannoy Kensington,

Budget floorstanders: Crystal T3, Usher X-718 & Q-Acoustic 1050

Clearer Audio Silverline Optimus Reference loudspeaker cables

Usher Dancer 8571-II - Ship-shape supermodels with style!

Diamond life - B&W's new 801D

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AAD C550 - Phil Jones returns

plus:

- NAIM CD555 CD PLAYER ●
- MCINTOSH MC275 POWER AMPLIFIER ●
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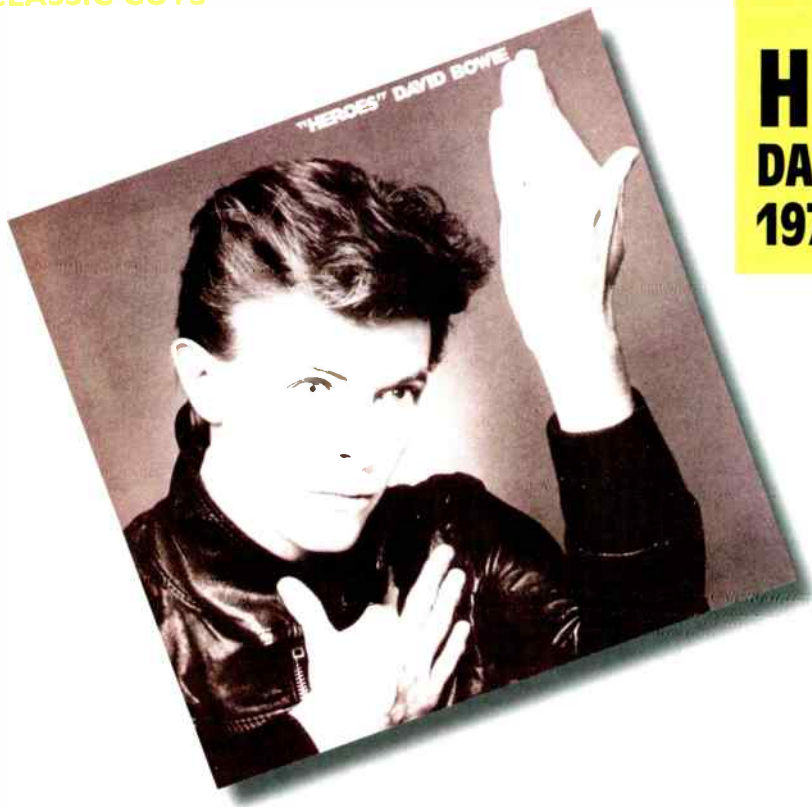
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HEROES

DAVID BOWIE

1977

Part of his 'Berlin' period, Bowie temporarily resided in Germany to partly recover and recuperate from his hedonistic lifestyle and partly to escape his family and business pressures.

"David wanted to shuffle the deck," said producer of 'Heroes', Tony Visconti. "His life was changing by the release of his previous album, 'Low'. He had divorced his wife and the relationship with his manager was ending and his funds were at a low point. The move to Berlin was almost out of necessity. Because of the state of Berlin in those days the rent was really low, which helped."

Bowie himself remembers that time in rather starker terms, "I was worried for my life at that time, I thought I was going over the edge." And then with no little irony, "So I ended up in Berlin...the Smack capital of Europe! I had no idea till I got there. And who did I take with me? Iggy Pop, who was trying to get off Smack!"

Recorded at the city's Hansa Studios overlooking the Berlin Wall, the studio was close enough to see the Soviet guards who perused their activities. The studio was enormous, built for symphonic work, it could hold one hundred and twenty musicians. The equipment was top notch too with a beautiful high ceiling reverb.

"It was a ballroom from hell," said Iggy Pop, "with a window from the studio that looked right at a guard, standing in a cheap uniform, with a rifle, who was supposed to

shoot anyone climbing over the Berlin Wall."

Bowie's writing collaborator on 'Heroes' was Brian Eno. "When I first met Eno, he was in Roxy Music," remembered Bowie "I thought he looked more effeminate than I did. He was wearing leopard skin and high-heel shoes. Not the professor we know today." The album was done off the cuff, improvised to an extent that any planned ideas tended to fizzle out in the studio where a new idea over-ride anything noted on paper. Eno's role was to change the fabric of the music. He wanted to move away from musician-based timing. "I remember walking into the studio one day and Brian was doing one of his counting systems," said Iggy Pop. "He said that all musicians break up time into bars, 4-beat bar, 3-beat, etc. He said, what about another sense of time to get out of that. He had a long piece of tape running and a metronome. He was counting time, '1...2...3...'. When I walked back in he was still going, saying '123...124...'. I thought, at that moment, that this is going to change everything."

The title track, a world-wide hit, began as an 8-minute demo. Everyone realised the track was special. Bowie starts all of his vocal tracks with a 'La, La, La' verbalisation from whence ideas spring. Apparently, from the 'La's he suddenly sang, "We could be heroes!" He then said that he thought he'd call the track Heroes. This is how most of the album came together. Eno added the shaky, shuddery synth tone with his suitcase synth controlled by knobs and a

joystick whilst Robert Fripp flew in to add the atmospheric guitar wash.

Fripp actually plugged his guitar into Eno's suitcase synth which made the guitar a live filter. Visconti recorded Fripp three times, layering each time to finalise the classic Heroes sound. "When the song was just a piano piece it didn't say much to me," added Bowie, "Fripp's plaintive guitar cry that went through it really triggered off something emotive in me. It was a song of triumph. It was a song to say that you can overcome some incredible odds."

As far as reissues go, and the following covers all Bowie releases, not just 'Heroes', Bowie's albums *per se* have received unwelcome attention from remastering engineers. The Bowie catalogue spent some time on the Ryko label which added unwelcome treble boost to the albums, which usually just sounds too bright. The EMI versions have an EQ boost in the high end as well. Combine that with the compression they also added, and the results sound harsh and annoying. Also, Ryko's gold, 'Au20 Series' removed much of the hiss. Trouble is, that's where much of the high end information lived including: room and reverb ambience, parts of cymbals and guitars. The best CD releases are the original RCA Bowie albums. Whilst not necessarily always sourced via mastertapes, the CDs are derived from flat transfers, which means that no information is removed. Check eBay for samples. As for vinyl? The original issues are your best bet. **PR**

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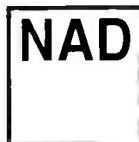
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