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REVIEWS!**

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851E/W**

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Sunfire XTEQ 12

Subwoofer

Yamaha CD-S2100

CD Player

Marten Duke 2

Loudspeakers

Pro-Ject 1Xpression

Turntable

Bose QC 25 NC

Headphones

XD TESTED!

How good is Cambridge Audio's
unique crossover displacement circuit?



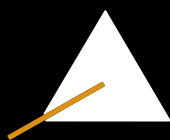
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New, easy, low-cost
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Bose QC 25

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headphones!





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EDITOR'S LEAD IN

Spotify, statistics and... well, you know the rest...

A confession. I now have a Spotify account... and not a paid one. I have the free one. Mind you, I'm not exactly happy that I have a Spotify account at all, because the technical standard of its streams (320kbps... and less on the free version!) is not up at the quality level I want, but I wished to hear some music from a band I'd been told I would like and it turned out that I had to have to have a Spotify account to hear their stuff because that's the only place I could get to hear it. And it's that which intrigued me. I had been under the impression that the only people who made money out of Spotify were the Spotify's owners and the record labels. It turns out that I was wrong. And in the process of finding that out, I also discovered that for musicians, Spotify is probably the best chance of making money they've ever had in their lives... which has to be a good thing. There is only one trick musicians need to keep in mind when loading their music onto Spotify: they need to arrange their business affairs so that 100 per cent of their Spotify royalties goes directly to them, which means they must own master recording and publishing rights—both mechanical reproduction and performance—and they can't have any labels, distributors or other agents in the way. Otherwise, Spotify's payouts will be hugely reduced.

While investigating Spotify's business model, I learned several depressing facts. The first was that only 45 per cent of Americans buy music at all. The rest don't buy music, listen for free or steal it. The second was that those who do purchase music spend only \$55.45 per year. The third depressing fact I learned was that Spotify pays artists only around half-a-cent 'per play'. (The company says that on average, it pays between \$0.006 and \$0.0084 'per stream'.) Which means that even with their streaming income, most musicians will still be found working behind bars, waiting tables and driving taxis.

The fourth depressing statistic I discovered was that Spotify does not actually pay a fixed royalty, so you may not even make 0.6 cents when someone listens to one of your tracks. It instead first applies a formula that works out the country to which the music was streamed, whether the person to which the music was streamed had a free or a paid subscription, and a further metric Spotify identifies as 'the relative premium pricing and currency value in that country.' I have no idea what that last one means, but I'd take a stab that it means that even if every single inhabitant of Bolivia was streaming your music 24/7, you'd still only be making a dollar a day in Spotify royalties.

Which is not to say that some artists don't make money. According to Spotify, its current top-streaming song (*FourFiveSeconds*) is earning Rihanna the grand sum of \$16,000 per day. (I did email her to ask if this was true, but she hasn't yet replied, so until she does, we only have Spotify's word for it.) The 200th-most streamed track is Bruno Mars' *Treasure*, currently earning \$1,470 per day. But the most-streamed song in Spotify's entire history is Avicii's *Wake Me Up*, which earlier this year passed the 200 million streams mark (total), which translates to royalty payments from Spotify to the Swedish D.J. of around \$1,680,000... so long, that is, as they weren't all streamed to Bolivia. 

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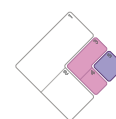
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'A highly refined transducer with a consistent set of satisfying qualities across important performance criteria, namely, detail, transient speed, soundstage and tonality.'

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HIGH END 2015 WRAP-UP

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OUR FRONT COVER:
Cambridge Audio's 851E preamp and 851W power amp feature Douglas Self's unique crossover displacement circuit. Full review page 20.

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Nicholas Ripley, HiFi+ magazine (UK)

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YBA Heritage D100 DAC

The D100 is the first YBA product to include DSD 128. It features three digital inputs plus Bluetooth 4. The

D100 has a coax digital output together with both RCA and XLR analog variable output options and upsampling if desired. Available in either black or silver.



SPEC RSA-M3EX Real Sound Amplifier

"If you're interested in an amplifier with the beauty, tone colour, timbral naturalness, and rich stereoscopic musicality of the best vacuum tube designs in a non-fussy and classy solid-state design, I suggest that you listen to the SPEC RSA-M3 EX amplifier. You may very well decide it is one of the best amplifiers out there regardless of price. At least that's my take on the SPEC, and I suspect it'll be yours too if you get a chance to give it a listen." Jeff Day, jeffsplace.me



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TELOS 360+ MONOBLOC

Goldmund has released the latest incarnation of its famous Telos 360+ monobloc power amplifier. The Telos 360 dates back to 1982, when it was first introduced by this famous Swiss manufacturer. *'Although the schematic diagrams for this new Telos 360+ are very similar to the original Goldmund model, they do show refinements implemented*



by nine generations of Goldmund engineers,' said Boris Granovsky, of Absolute HiEnd, which distributes Goldmund in Australia. 'Each one of those nine iterations has brought the amplifier closer to perfection, with the internal circuitry of this model improved over the Telos 350+ to provide the strongest "Driver Control" ever achieved, resulting in surprising clarity and exceptional dynamics.' A particularity of this new model is that it runs much cooler than previous versions, despite having a rated power output of 300-watts continuous. Frequency response over the 20Hz–20kHz range is $\pm 0.06\text{dB}$. Output stage protection has been extended to make it ultra-safe in case of short circuits and the Telos 360+ is equipped with the latest version of Goldmund's Alize 6 converter, so it has both analogue and digital inputs. Finished in Goldmund's unmistakable anodised aluminium finish, with its adjustable metal pointed mechanical grounding feet, the Telos 360+ measures 380x310x225mm (WDH) weighs 20kg, costs \$26,990, and is available in Australia right now.

For further information, please contact Absolute HiEnd on (04) 8877 7999 or visit the website at www.absolutehiend.com

MOLA-MOLA MAKUA & KALUGA

The Mola-Mola Makua Control Amplifier and Kaluga Monobloc power amplifiers are now available from Pure Music Group. The Mola-Mola Kaluga Monobloc amplifiers use the latest generation Hypex Class-D N-Core amplifiers that Mola-Mola says it has modified for use in the Kaluga, which it rates with a power output of 400 watts into 8 Ω and 800 watts into 4 Ω . *'They will drive pretty much any speaker load with a finesse usually only found in single-ended triode tube amplifiers,' said Warwick Freemantle, of Pure Music Group, 'and weighing only seven kilograms each and with a footprint no bigger than a shoebox, they are the most user-friendly of amplifiers.'* The Mola-Mola Makua is a fully balanced analogue line preamplifier that has the shortest signal paths possible to ensure a transparent gain stage and a routing matrix that is programmable via USB or Bluetooth. Vinyl-lovers can option-in a phono stage that has adjustments for gain and impedance, along with circuits for equalisation and bass shelving. *'The see-through transparency and lack of colouration these products exhibit amazes customers,' said Freemantle. 'The bass is extremely tight, textured and fluid, without the bloat often found with some valve and solid-state amplifiers.'*

'Mola-Mola really defines the term "neutral" and listeners are experiencing a whole new level of information being recovered from their recordings.' The Makua Line Preamplifier sells for \$12,000 and the Kaluga monoblocs at \$18,000 per pair. The optional phono stage retails for \$2,300.

For further information, please contact Pure Music Group on (04) 0950 4805 or visit www.puremusicgroup.com



PATHOS AURIUM HEADPHONE AMP

Pathos has released its Aurium headphone amplifier, which has a Pure Class-A valve preamplifier stage, a MOSFET power stage with zero feedback, and adjustable output impedance (16 Ω –1k Ω). *'The Aurium delivers the performance that audiophiles have been accustomed to when listening to Pathos components,' said Nigel Ng of Advance Audio, which distributes Pathos in Australia 'exquisite musicality, transparency, dynamics and a total lack of listening fatigue. It's also packed with innovative circuit ideas, such as the use of a high-precision Burr-Brown device to adjust volume, rather than an ordinary potentiometer.'* The Aurium has four line inputs (one of which is balanced), and a pair of balanced outputs (XLR) and unbalanced outputs (RCA) and is rated with a frequency response of 10Hz to 80kHz, and THD of less



than 0.1%. A pair of 6922 valves is used in the pre-amp stage that can deliver up to 3.6W into 32 Ω loads. *'The use of both valves and MOS-FETs results in the Aurium having a delicious and insightful midrange, with a bass that boasts power and grip, pulling you in to give you a taste and experience of music as it is meant to be heard,' Ng told Australian Hi-Fi Magazine. 'So don't let your headphones lose their power, ramp it up and give them the right juice with the Pathos Aurium headphone amplifier, which will give you a more powerful sound than you can ever imagine.'* Available now, the Pathos Aurium sells for \$1,995.

For further information, please contact Advance Audio on (02) 9561 0799 or visit www.advanceaudio.com.au

DYNAUDIO

DYNAUDIO FOCUS XD

Danish loudspeaker specialist Dynaudio has released a new range of powered wireless loudspeakers with inbuilt DACs. Focus XD is a series of actively-powered speakers that accepts high-resolution digital signals up to 24-bit/192 kHz. *'The Focus XD represents more than just a new high-end loudspeaker; it redefines the hi-fi system itself,'* commented **John Davies**, of Sennheiser Brands, which distributes Dynaudio in Australia. *'Focus XD allows a simplified audio system that merges high-end sound performance with a new level of convenience, with only a music source needed, because all models in the Focus XD series contain extremely powerful digital amplifiers, high-performance DSP, and a digital volume control, as well as digital and analogue inputs.'* The Focus 200 XD is an active-compact two-way speaker rated at 300-watts that retails for \$8,999; the Focus 400 XD (\$13,999) is an active three-way floor-stander rated at 450-watts and the Focus 600 XD is an active four-way floor-standing speaker with dual woofers rated at 600-watts that retails for \$17,999. *'All models in the Focus XD range use first-class Esotec+ woofers and tweeters made by Dynaudio which employ extremely lightweight aluminium voice-coils, specially-developed MSP membrane materials, and silk-fabric tweeter domes with precision coating,'* said Davies. *'Dynaudio also developed a completely new, ultra-long-throw 18W54 Esotec+ woofer specifically for the top-of-the-range Focus 600 XD model.'* The Focus XD models are available in satin white and satin black lacquer as well as in rosewood and walnut real wood veneer finishes. The remote control used to operate the speakers is made from black aluminium.

For further information, please contact Sennheiser Australia on 1800 648 628 or visit en-au.sennheiser.com



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FINAL AUDIO EARPHONES



Final Audio Design has released a line of high-end in-ear 'phones that not only sound good, but are styled in such a way that they resemble no earphones you've ever seen before: They wouldn't look out of place as exhibits in a museum of modern art. The flagship model is the Final Audio Piano Forte X, which retails for \$3,299. It uses a 16mm diameter dynamic driver, and has a sound quality that Final Audio says is influenced by the vibratory characteristics of the material used to make the housing: a chrome/copper composite. 'This material allows the listener to feel the pleasing sensation of sound notes lingering naturally,' said **George Poutakidis** of BusiSoft, which distributes Final Audio in Australia. The Final Audio Adagio V (\$263) uses 8mm driver units in a stainless steel housing to remove unwanted resonances.

Final Audio says the housing has been designed to optimise air flow, while the distinctively designed ear-pads enhance sound isolation. Other models in the range include the Heaven IV (\$263); Piano Forte IX (\$1,527); and Piano Forte VIII (\$1,139). 'Featuring a unique sound signature, the Forte VIII is an all-metal design with an impeccable sound quality, designed to seduce the most astute music lover,' said Poutakidis. 'Consisting of a 16mm dynamic driver, the Piano Forte VIII in-ear headphones are housed in a brass enclosure, with a brass ear pad that contains air pressure vents and a pressure ring. This optimises the listening experience by managing the air pressure around the diaphragm resulting in precision and clarity, taking your listening pleasure to the limits.'

For further information, please contact BusiSoft on 1300 888 602 or visit the website at www.busisoft.com.au

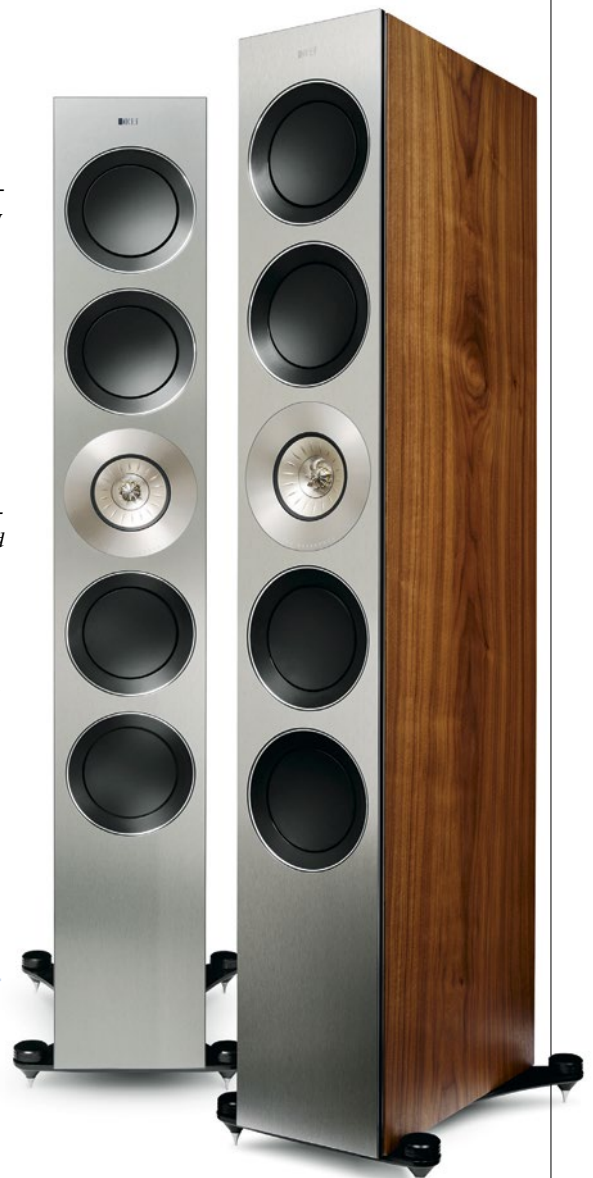
KEF REFERENCE SERIES

KEF's new Reference Series loudspeakers are available in a range of luxury finishes that includes Blue Ice White and Copper Black Aluminium. The KEF Reference 1 (\$15,799 per pair) is a small bookshelf/standmount speaker that couples a brand new 165mm alloy cone bass driver to one of KEF's unique Uni-Q driver arrays, which has a 25mm aluminium dome tweeter mounted coaxially within a 125mm midrange driver. 'These speakers have to be seen and heard to be believed,' said **Michael Di Meglio**, of Advance Audio, which distributes KEF in Australia, 'because they create a compellingly realistic sound stage that's out of all proportion to their size.' Their frequency response is specified at 45Hz to 35kHz $\pm 3\text{dB}$ and sensitivity at 85dB SPL (2.83V at 1 metre). The KEF Reference 3 floor-stander (\$23,999 per pair) uses the same Uni-Q MF/HF driver array as the Reference 1, but marries it with a pair of 165mm-diameter alloy-coned bass drivers, with the three drivers mounted MTM-fashion. 'Thanks to the combination of the D'Appolito driver configuration and the Uni-Q's broad inclusive dispersion characteristics, everyone in the room can enjoy the same rich and spatially precise acoustics while also being put right at the heart of the original performance, letting you feel its soul,' Di Meglio told Australian Hi-Fi Magazine. 'With the ability to generate intricate and natural sounds, outstanding fidelity across the midrange and treble, with seamless transitions over the crossover points, plus a truly

three-dimensional soundstage, the KEF Reference 3 is a powerful performer whose sound will just blow you away.' The frequency response of the Reference 3 design is specified at 43Hz to 35kHz $\pm 3\text{dB}$ and sensitivity at 87.5dB SPL (2.83V at 1 metre).

At the top of KEF's new Reference Series is the three-way floor standing Reference 5 design, which sees four of the 165mm alloy cone bass drivers arrayed either side of the Uni-Q array to give a claimed frequency response of 40Hz–35kHz $\pm 3\text{dB}$. Sensitivity is rated at 90dB SPL and nominal impedance as 8 Ω (3.2 Ω minimum). 'The Reference 5's four bass drivers produce lows with consummate agility and control, and fluidly integrate with the Uni-Q output to create an all-enveloping sound field of spine-tingling accuracy and depth,' said Di Meglio. 'And thanks to the drivers, the Reference 5 is capable of delivering 116dB SPL into the listening room with almost no distortion.' Available now, the KEF Reference 5s retail for \$28,999 per pair. Every speaker in the KEF Reference Series is available in Deep Piano Black, Satin American Walnut and Luxury Gloss Rosewood finishes. The KEF Reference 3 and 5 are also available in Blue Ice White and Copper Black Aluminium finishes.

For further information, please contact Advance Audio on (02) 9561 0799 or visit the website at www.advanceaudio.com.au



SONUS FABER

SONUS FABER CHAMELEON COLLECTION

Italian loudspeaker manufacturer Sonus faber has released a range of speakers with interchangeable side panels, so you can change the colour of your speakers as your moods change. There are three models in the Chameleon range, and the side panels of all can be fitted with White, Black, Metal Blue, Metal Grey, Orange or Red side panels. The smallest of the three is the Chameleon T, a two-way bookshelf/stand-mount speaker with a 150mm bass/midrange driver and a 29mm fabric dome tweeter. It's rated with a sensitivity of 87dB SPL, a nominal impedance of 4Ω and measures 315×185×283 mm (HWD). Chameleon T is a three-way floorstanding model with two 180mm bass drivers that are crossed at 250Hz to a 150mm midrange driver, which in turn crosses to a 29mm fabric dome tweeter at 2.5kHz. Rated with a sensitivity of 90dB SPL and a nominal impedance of 4Ω, Sonus faber specifies the frequency response at 38Hz to 25kHz. It measures 1060×270×355 mm (HWD). A centre-channel (Chameleon C) is available for those who wish to use the speakers in a multi-channel system. 'With this new Chameleon speaker collection, Sonus faber brings all the iconic elements that this Vicenza-based company is known for to a wider, contemporary audience,' said **Philip Sawyer**, of Synergy Audio Visual, which distributes Sonus faber in Australia. 'Chameleon embodies all of the iconic design elements of Sonus faber while offering a level of customisation previously unattainable in this market segment: the entire cabinet is covered in leather; driver flanges are embellished with aluminium trims; the side walls house the exchangeable side panels via a system of pins which allows for their simple removal and replacement. Thanks to this design, choosing a finish is no longer a permanent decision. Instead it becomes something that can evolve together with customer's taste, so owners have the freedom to select the most suitable style for their environment and interior design.' Although the Chameleon Series is currently available with six colour options, Sonus faber says it will be adding new colour options in the coming months.

For further information, please contact Synergy Audio Visual on (03) 9459 7474 or visit the website at www.synergyaudio.com



FABULOUS SOUND! SUPERIOR NOISE CANCELLING!

40 YEARS OF KNOW-HOW have been packed into the exciting Music for You (M4U) series high-performance headphones. Fold'em up into the protective travel case and you'll never be far from true hi-fi listening. There's even a thoughtful touch of dual input connections on either side of the headphones meaning no more crossed wires.

Have a listen to hear why the M4Us have taken home all these accolades.



- Noise cancelling
- 3 modes of operation
- 2 way gyro-suspended ear pads
- iPhone mic for taking calls
- NOW AVAILABLE IN WHITE!

M4U 2

ONLY \$499 RRP



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NAIM MU-SO WINS AWARD

Naim's Mu-So one-box Wireless Music System has won a prestigious Red Dot Award for Product Design. **Simon Matthews**, Naim Director of Design, commented: 'The Red Dot Award is welcome recognition of the

countless late nights spent by the team at Naim in making the Mu-so music system a gateway to a deeper, more intense experience of music for a wide audience.' The Mu-so is an elegant one-box wireless music system that puts six speakers and 450-watts of amplification in a single, compact enclosure whose connectivity includes high-res music streaming, AirPlay, Spotify Connect, Bluetooth (aptX), internet radio and app control. 'Combining Naim's expertise in streaming, amplification and loudspeaker technology, Mu-so is the stage music deserves, bringing users closer to the songs that inspire their lives,' commented **Chris Murphy**, of N.A. Distributors, which distributes Naim in Australia. 'A single Naim Mu-so is powerful enough to fill a large room with music, and you can link multiple units to deliver music through your entire home.' The Naim Mu-so retails for \$1,699 with differently coloured grilles available for it. Additional grilles in other colours are \$170 each (RRP). The unit pictured is fitted with a Burnt Orange grille.

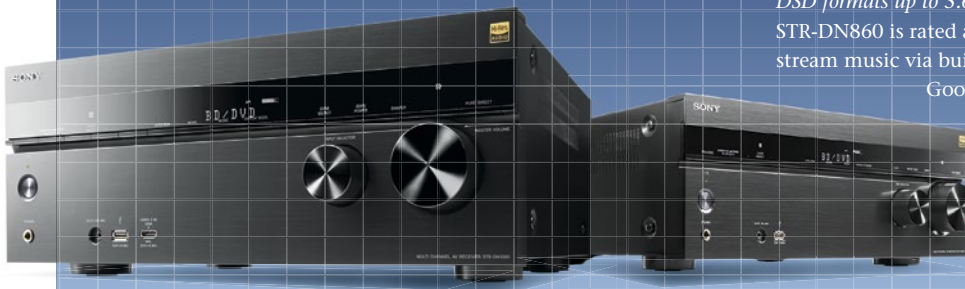
For more information, contact N.A. Distributors on (02) 8005 0670 or visit the website at www.nadist.com.au

SONY STR-DN1060 AV RECEIVER

Buoyed by the success of its STR-DN1050 and STR-DN850 AV receivers, Sony has released two new models that have improved analogue and digital circuitry, as well as built-in Google Cast. The two new models, the STR-DN1060 and STR-DN860 are both 7.2-channel models, and both have a Pure Direct mode to enable the highest quality signal path in stereo mode. The STR-DN1060 7.2-channel AV receiver is rated at 165-watts per channel and has built-in Wi-Fi, Bluetooth, AirPlay, Spotify Connect and Google Cast. It also has 4K with HDCP

2.2 upscaling and pass-through, ten high-definition inputs, and support for two separate powered zones, as well as full Smartphone connectivity options with MHL 3.0 and Screen Mirroring. 'Supported by the largest capacitors and transformer in its class, its legendary Sony sound really connects the listener to the sound experience,' said **Abel Makhraz**, Head of Video, Sound & Tablet, Sony Australia & New Zealand. 'Both new A/V receivers also showcase the highest formidable build for high quality multi-channel audio reproduction and support for hi-res audio, including DSD formats up to 5.6MHz over USB and Network.' The 7.2-channel STR-DN860 is rated at 150-watts per channel. It has the ability to stream music via built-in Wi-Fi, Bluetooth reception and transmission, Google Cast for Audio and AirPlay. Available now, the Sony STR-DN1060 retails for \$1,299 and the Sony STR-DN860 for \$1,099.

For further information, please contact Sony on 1300 720 071 or visit the website at www.sony.com.au



MARANTZ AV8802 FLAGSHIP AV PRE-AMPLIFIER

Marantz has launched its new flagship 11.2 channel AV pre-amplifier, the Marantz AV8802. This new pre-amp is based on Marantz's highly-acclaimed predecessor (the AV8801) and features unique 3D-sound options, plus nearly unlimited connectivity and flexibility, with Wi-Fi and Bluetooth both built in, along with Dolby Atmos, Dolby TrueHD, Audyssey MultEQ, Audyssey DSX, DTS Neo X, HDMI, with DTS:X surround to be offered as a software update.

The AV8802 has audiophile-grade 32-bit/192kHz DACs onboard plus the latest HDMI version with 4k 50/60Hz 4:4:4 resolution along with HDMI scaling 1080p, 4k 50/60 Hz. It can handle most digital audio file formats, including MP3, WAV, AAC, WMA, AIFF, along with HD Audio streaming (FLAC 192/24, DSD, ALAC) with gapless playback. It also connects to the Internet and comes with support for Spotify, Flickr, and Internet Radio. It comes with a 'set-up assistant' and an advanced GUI, plus you can load Marantz' Remote App on your iOS or Android device to control it. At present, about the only

thing the Marantz AV8802 can't do is play back copy-protected 4k Ultra-HD content, for which it requires an upgrade to HDCP2.2. According to **Ralph Grundl**, of Qualifi, which distributes Marantz in Australia, it will be available soon. 'Owners of the AV8802 can be assured that full HDCP 2.2 (on all 8 HDMI inputs) will be supported via a soon to be available hardware upgrade,' he told Australian Hi-Fi Magazine. 'Customers who wish to perform the HDCP 2.2 upgrade should get in contact with their Marantz retailer.' Available now, the Marantz AV8802 sells for \$6,490 (RRP).

For further information, please contact Qualifi on 1800 242 426 or visit the website at www.qualifi.com.au



BANG & OLUFSEN BEOLAB 20

Bang & Olufsen's wireless active loudspeaker, the BeoLab 20, is now available in new colours and with a back-illuminated metallic logo. Bang & Olufsen recently commissioned Danish fashion designer **Stine Goya** to add a colourful flair to several of its products, including this new wireless version of its active BeoLab 20 loudspeakers. The company has also incorporated in the BeoLab 20 a technological innovation that allows it to shine light through aluminium to back-illuminate the company's logo. Stine Goya chose four new colours for the range—'midnight' green, 'rumba' red, 'forged iron' grey and 'driftwood' beige—but if you prefer a 'classic' look black and white continue to be available. Fitted inside each BeoLab 20 are four 160-watt Class-D amplifiers, a dual-coil 254mm bass driver, a 127mm midrange driver and a 19mm tweeter whose output is delivered by B&O's iconic 'Acoustic Lens' which B&O claims spreads high frequencies evenly

around the room in a full 180-degrees compass. To ensure high bass levels without risk of woofer damage, the BeoLab 20 incorporates Bang & Olufsen's Adaptive Bass Linearisation circuitry, which constantly monitors and adapts the low frequency output. For maximum placement flexibility, each speaker can be optimised to its immediate surroundings via a manual position switch. *'With its minimalist lines and relatively small footprint, BeoLab 20 gives little indication of the expansive power that lies within,' says Marie Kristine Schmidt, of B&O, 'but turn up the volume and even the most discerning music aficionados can discover just how good their favourite tracks can actually sound.'* Available now from Bang & Olufsen stores, the BeoLab 20 speakers are available individually or as pairs, at \$7,475 each.



For further information, please contact Bang & Olufsen on 1800 818 238 or visit the website at www.bang-olufsen.com

KRONOS SPARTA 0.5 TURNTABLE

Canada's Kronos has released its Sparta 0.5 turntable, which is optionally able to use the company's patented suspended dual-platter counter-rotating technology, which it claims reduces vibration and improves the quality of music reproduction. *'Kronos has received multiple international audio*

press awards since the technology was introduced in 2012,' said Boris Granovsky, of Absolute HiEnd, which distributes Kronos in Australia. Louis Desjardins, Kronos' CEO and designer, told Australian Hi-Fi Magazine that in its basic form, the Sparta 0.5 is a single-platter design, but by adding the Sparta Upgrade Kit, can be converted to a dual counter-rotating platter design. 'We are very excited to offer this new option to the audiophile market,' he said. 'Our goal has always been to provide high-performance turntables that utilise innovative engineering solutions.'



'We are committed to building turntables that will stay with our customers through time. The Sparta family of turntables is fully modular, and thus offers a solid long-term investment.' The Kronos Sparta 0.5 retails for around \$20,000 and the Sparta Upgrade Kit for around \$10,000.

'The Kronos Limited Edition PRO turntable will remain the flagship model in the Kronos turntable line-up,' said

Granovsky, 'and will continue to deliver the superlative level of performance sought after by the world's most discriminating audiophiles and leading audio industry engineers. It's no wonder the late Harry Pearson said it was "the best turntable he's never heard", and also stated that it was "a masterpiece of design and sound".'

For further information, please contact Absolute HiEnd on (04) 8877 7999 or visit the website at www.absolutehiend.com



EXPOSURE 2010S2-D

Exposure has upgraded its mid-range 'twenty series' integrated amp, the 2010S2-D, by changing one of the six line-level inputs to a direct, fixed-gain AV input, to enable easy integration within

a surround sound system. As with all models in Exposure's 'twenty' series, special high-quality capacitors are used in the signal path and the circuit topology has been mapped with a view to keeping signal and power supply paths short, and high-performance Toshiba bipolar output transistors are used as output devices.

The power supply in the 2010S2-D comprises a bespoke 200-watt toroidal power transformer that feeds two reservoir capacitors, with cascode circuitry to improve immunity to noise and ripple on the power supply rails. Although the 2010S2-D does not come standard with a phono stage, Exposure provides the option to fit either a moving-magnet or a moving-coil phono stage, for \$289. Exposure rates the power output of the 2010S2-D at 75-watts per channel and the frequency response at 20Hz–20kHz ± 0.5 dB. The signal-to-noise ratio is specced at more than 100dB (A-weighted). Available now, the 2010S2-D retails for \$2,499 (RRP). It comes with a three year warranty and is distributed in Australia by RVM Audio.

For further information, please contact RVM Audio on (08) 9417 9944 or visit the website at www.rvm.com.au

CAMBRIDGE AUDIO CX SERIES

Cambridge Audio has announced a new CX series that it says offers a unique combination of class-leading sound, advanced networking capabilities, large colour displays and exceptional build quality and design. There are six products in the new Cambridge Audio

series: CXN network music player, the CXA60 and CXA80 integrated amplifiers, the CXC CD transport and the CXR120 and CXR200 AV receivers.

'The new range is the result of Cambridge Audio's long tradition of hi-fi excellence and culmination of over 40 years digital expertise, and is designed to fit modern life beautifully and simply, while at the same time delivering class-leading audio performance,' said Philip Sawyer, of Synergy AV, which distributes Cambridge Audio in Australia. 'All models in the CX series enjoy a unique 'floating' aesthetic and uniquely bevelled base, plus a low-resonance chassis to enhance sonic performance.'

The CXA60 (\$1,199) and CXA80 (\$1,599) integrated amplifiers are rated at 60-watts per channel and 80-watts per channel respectively both have digital interconnectivity thanks to the provision of the same high-quality Wolfson WM8740 DAC that's used in Cambridge Audio's award-winning DacMagic, to handle digital-to-analogue con-



version and via optical and coaxial digital inputs, plus there's the option of add aptX Bluetooth streaming. The CXA80 adds an asynchronous USB audio input to further enhance its digital credentials, with the USB enabling streaming of 24-bit/192kHz studio

master quality files directly from your PC or MAC. *'Both new models feature a radically new amplifier design, high-grade components and versatile connectivity coupled with extensive performance testing and listening by the in-house engineering team at Cambridge Audio ensure that the CXA models deliver significantly more than you'd expect at this price level,' said Sawyer. 'The CXA80 features an oversized low-flux toroidal transformer with completely independent dual mono windings, and fully symmetrical dual mono Class A/B amplification circuits capable of delivering 120 watts RMS into 4Ω with a sound quality whose clarity and lack of noise is simply stunning, and the sonic performance of the CXA60 is virtually identical, with the only real difference being a slight reduction in power output.'* Both models are available now, and both come with a two-year warranty.

For further information, please contact Synergy Audio Visual on (03) 9459 7474 or visit the website at www.synergyaudio.com

The Purity of Valve Sound

The Audiospace Reference Power One is the beautifully built and styled power amplifier that is designed and engineered to deliver the pure musical sound demanded by today's discerning listener.

Combining the highest quality components, delicate circuitry and ingenious workmanship the Reference Power One is built to meet the exacting standards expected of an audiophile amplifier. And like other award-winning Audiospace high fidelity products, it delivers.

- Output Power: 60W/Ch.
- Output Impedance: 4, 8 and 16 Ohm.
- Input Impedance: RCA>100K Ohm, Bal-600-22K Ohm.
- Input Mode: RCA or Balanced
- Frequency Response: 20Hz-20KHz -1dB
- T.H.D.: <5% 20Hz-20KHz (Ref. Output)
- S/N: >87dB (Hum Noise<2mV)
- Weight/CH.: 31.5kg (N.W.)/ 37.5kg (G.W)
- Vacuum Tubes/CH.: 300Bx4, 6N9P(6SL7)x2, 12AX7(ECC83)x1, 12AU7(ECC82)x3.

To find out more about the Reference Power One and other wonderful Audiospace products visit our website at:

www.audiospace.com.au



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POWER SOUND AUDIO IN OZ

Deep Hz Audio is now the exclusive Australian distributor for Power Sound Audio (PSA Speakers), which is owned by Tom Vodhanel and **Jim Farina**. *'Tom and Jim know a thing or two about designing subwoofers and hi-fi and home theatre loudspeakers,'* said **Peter Thompson**, of Deep Hz Audio. *'After all, it was Tom who, with Rod Stimpson, founded SV Subwoofers (now SVS)—and used the initial letter of both their surnames to name the company, while Jim worked with Tom at SVS for eight years, where he held various positions, including head of research and development for SVS.'* Power Sound Audio says that one of the many performance characteristics of its range of speakers that differentiates them from all others is their efficiency. Whereas most loudspeakers have sensitivities of 90dB SPL or lower, Power Sound Audio's range of 'High Efficiency' loudspeakers has sensitivity ratings of between 94dB SPL and 98dB SPL. *'High efficiency loudspeakers allow you to comfortably drive them to loud levels of playback using only a home theatre receiver,'* Thompson told Australian Hi-Fi Magazine. Vodhanel said of his company's new range: *'This is really the only loudspeaker design I've been associated with where I am genuinely excited for audio enthusiasts to give them a try. Not that the speakers in the past were poor value or anything like that. Just that this is the first time Jim and I really had complete creative control over a design.'*

One of the first PSA models to go on sale in Australia was the MTM-210 design, which can be configured as

left- and right-channel speakers, or as a centre-channel.

The MTM-210 uses a 25mm titanium compression driver loaded by a cast aluminium exponential horn in combination with dual 254mm high-efficiency bass/midrange drivers.

Claimed frequency response extends from 70Hz to 18kHz $\pm 3\text{dB}$ and sensitivity is rated at 98dB SPL/W/m. They're available now, at \$2,700 per stereo pair or, for a single centre-channel, \$1,350. Also available is the MT-110, which uses the same tweeter as the MTM-210, but has only a single 254mm bass/midrange driver. It retails for \$2,100 per pair or \$1,050 for a centre-channel.

For further information, please contact Deep Hz Audio on (04) 3455 0782, email sales@deephzaudio.com or visit the website at www.deephzaudio.com



"Stereo Topics"

by Tom Manning May 2015

What makes record playing so pleasurable?



The sound quality is just one of the sensory treats on offer when the black starts to spin. With carefully chosen components, the music is often better than other formats.

Most who've heard the finest phono systems would agree that the best of vinyl just sounds better than bits and bytes. The most rewarding performances don't always need the most expensive equipment.

The vinyl experience is a little like the thrill of spotting wild creatures in their natural space, rather than on a trip to the zoo. The digital equivalent, a little like a sleek nature documentary, often lacks the richness and warmth. Pretty, but a bit thin.

It's the musicality that matters. It can be elusive, but you know it when you're hearing it. You don't need the expensive audio jewellery you hear at the annual Munich High End show; simple phono systems with carefully chosen components can have you up way too late playing records, as many of our customers do. A good vinyl system can touch you in a dimension beyond the audible.

Have you ever heard of a group of mates getting together to play a few CDs one night? Thought not. Vinyl nights are fun, with the social usually subsuming the audible. Records are tangible, tactile, palpable and desirable. They're fun to look at and play, they sound great and there's that nervous excitement every time the needle meets the groove.

I'm not an audiophile in the conventional sense and I don't really speak their language. I rarely make the time now to enjoy my superb vinyl collection but the idea of taking the black for a spin still excites me.

At Speakerbits, we repair, service and maintain turntables. I prefer the specialist brands as they're more satisfying to work on but we also repair older, middle range Japanese turntables with the same dedication. Many hundreds of turntables have passed through our workshop over the decades, but we're always ready to learn about more.

Ortofon, for audibly obvious reasons is the only cartridge brand we ever fit. I will discuss this in a later article but in the meantime, drop me a line if you have a turntable, cartridge or speaker concern. That's what we do at Speakerbits. You are always welcome!

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accuracy in sound

ICON AUDIO CDX2 VALVE CD PLAYER

British-based valve specialist Icon Audio has replaced its first CD player, the CDX1, with the CDX2, which is said to deliver comparable sonics at a substantially lower price. The new Icon Audio CDX2 has a 192kHz/24-bit upsampling DAC, but according to Icon's founder and chief designer **David Shaw**, it's the use of a valve output stage that allows him to avoid what he refers to as 'the mechanical and soulless presentation that some CD players have.' To achieve that end result, the CDX2 uses an all-triode Class-A output stage using either special quality TJ Full Music or original Mullard 12AU7 valves. All digital and analogue circuitry is hand-wired using full-sized high-quality components. 'The aim was to craft a CD player with real warmth and dexterity...with that magical vinyl sound, in other

words,' Shaw told Australian Hi-Fi Magazine. 'I wanted a more musical presentation, with more warmth and colour... something incredibly easy to listen to.' The CDX2 has a top-loading mechanism, avoiding the usual slide-out drawer and thereby improving rigidity. A heavy alloy clamp also acts as a flywheel to increase rotational stability during playback. Unlike many CD players, Icon Audio says everything in the CDX2 is serviceable, replaceable and, if you want, upgradeable. Upgrades are also offered pre-purchase, with Icon offering a range of 'David Shaw Signature' upgrades including Jensen copper foil oil-in-paper capacitors and premium 'new old stock' valves. Available now from Australian distributor Decibel HiFi, the Icon Audio CDX2 sells for \$2,275 (RRP).



For further information, please contact Decibel Hi-Fi on (07) 3344 5756 or visit the website at www.decibelhifi.com.au

DEF TECH SYMPHONY 1 'PHONES

Definite Technology's new Symphony 1 active noise-cancelling headphones have six microphones: four dedicated to noise-cancelling, and two dedicated to voice, plus they also feature Bluetooth. According to Def Tech, the Symphony 1s automatically sense and adjust their noise-cancelling levels, and can operate in noise-cancelling mode for up to 10 hours, but in the event of an exhausted battery, you can continue to keep listening in passive mode. Also, because the Symphony 1s have over-ear seals, there's a degree of passive noise attenuation even when the active noise-cancelling circuitry is inactive. Thanks to the inclusion of Bluetooth, plus handy on-ear controls, you can easily control volume, change tracks, turn noise-cancelling on or off, plus answer

your phone without having to touch it. 'Thanks to the use of dual microphones, the Symphony 1s deliver outstanding voice reception when using them during a phone call,' said **Nigel Ng**, of Advance Audio, which distributes Def Tech in Australia, 'but sound reproduction is also extraordinary, thanks to the use of 50mm drivers, which deliver a rich soundstage, a detailed midrange and full-fidelity deep bass for an exhilarating listening experience. The Symphony 1 is the ultimate headphone for the most discerning audio aficionados.' The Definitive Technology Symphony 1 'phones come with a robust protective case with a silk liner and a soft travel pouch and retail for \$699 (RRP).

For further information, please contact Advance Audio on (02) 9561 0799 or visit the website at www.advancedaudio.com.au



SENNHEISER HD 630VB

Sennheiser has launched its first closed-back audiophile headphone model, the HD 630VB. Uniquely, it has a rotary bass control built in to allow wearers to customise the bass response according to their personal preferences. 'The HD 630VB is a milestone product for Sennheiser,' said **Axel Grell**, of Sennheiser. 'For the first time, we have translated our long-standing experience in the field of high-end audio into a closed-back design. It combines the brilliant sound of open audiophile models with excellent ambient noise attenuation, so the new headphones deliver an impressively spatial sound image, while allowing for the users to enjoy their listening experience without any distractions.' Sennheiser developed a new proprietary high-performance transducer specifically for the HD 630VB whose voice coil is wound with aluminium wire. According to Sennheiser total harmonic distortion is less than 0.08 per

cent at a sound pressure level of 100dB (at 1kHz) and has a frequency response that extends from 10Hz to 42kHz. 'It's thanks to the coil wire made from pure aluminium that the HD 630VB achieves an unaltered sound image with a precise reproduction of voices and instruments in the mid-ranges and brilliant treble,' said Grell. The HD 630VB has a collapsible design that makes it easy to transport, and has been crafted from lightweight materials, including aluminium on the ear cups, headband and sliders to ensure they're light-weight and easy to wear. 'We chose these robust materials to ensure maximum durability,' said Grell. 'Additionally, we made sure the ear pads are exchangeable and easy to replace.' The right earcup has a remote control and a microphone is integrated into the high-quality OFC cable, so users can control music



and take calls when the headphones are used in conjunction with a Smartphone. Available now the Sennheiser HD 630VB headphones sell for \$799.95 (RRP).

For further information, please contact Sennheiser Australia on 1800 648 628 or visit the website at en-au.sennheiser.com

HEOS STEPS OUTSIDE

Denon has released the totally portable HEOS 1 as part of its established series of HEOS wireless multi-room sound system components. It becomes the first product offered in the HEOS line-up that has been designed specifically for indoor/outdoor operation. 'We are thrilled to introduce HEOS 1 as our entry-level wireless multi-room sound system,' commented **Joe Salamanca**, HEOS Product Manager for Australian distributor, Qualifi. 'When combined with the HEOS 1 Go Pack the water-resistant design and added Bluetooth capability allows users to listen to their HEOS 1 in their back yard, at the local park and anywhere a wi-fi connection is not available.' As with other models in the HEOS series, the HEOS 1 features audiophile-grade synchronisation, so users will find great stereo imaging when using two HEOS 1s as a stereo pair. It also offers state-of-the-art audio DSP optimisation, as MaxxAudio by Waves, a sophisticated sound enhancement suite customised to provide top-of-the-line sound quality for an optimised listening experience, is built in. 'The easy-to-use free HEOS app, available for iOS, Android and Kindle Fire, means you can be listening to great sound within minutes indoors or outdoors,' said Salamanca. 'The HEOS 1 is the perfect speaker for any smaller space in a home and part of a system that delivers your favourite music from the world's leading music services like Spotify, Pandora, Deezer and TuneIn, along with music from local smart devices, PCs, Macs or NAS drives on any home network. It instantly gives users multi-room audio control at their fingertips so you can command music in every room from any device, group several rooms together to play the same song, or play a different song in every room for a true wireless multi-room audio experience.' The HEOS 1 Go Pack is an accessory pack consisting of a rechargeable battery, a Splashguard, and a Bluetooth-USB adapter that enables



the HEOS 1 to provide up to six hours of music, renders the HEOS 1 splash-resistant to the IPX4 standard, and adds Bluetooth functionality. Besides the HEOS 1 and HEOS 1 Go Pack, the Denon HEOS series includes three other wireless multi-zone music players: HEOS 3 (\$529), HEOS 5 (\$689), and HEOS 7 (\$999). The HEOS Amp (\$899) and HEOS Link (\$599) allow you to integrate legacy systems.

For further information, please contact Qualifi on 1800 242 426, visit Qualifi's site at www.qualifi.com.au or go direct to the local 'HEOS by Denon' website at www.heos.com.au

Streaming and SACD/CD playback makes this the only source you'll ever need.



Arcam's CDS27 - SACD/CD/Network Streaming Player offers outstanding performance from all forms of compatible audio media. Music from SACDs, CDs and your network are delivered with outstanding quality to the very highest standards currently available. Using Arcam's unique and hard won engineering expertise, the CDS27 delivers a truly exceptional performance, regardless of the media used.

For more information visit arcam.co.uk or call 1800 648 628.

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Cambridge Audio

851E and 851W

PREAMPLIFIER AND POWER AMPLIFIER

If I had a dollar for every time someone told me *'there's nothing new in amplifier design'* I'd be rich. Yet all the people telling me that are wrong. On the contrary, there's so much new in amplifier design that it's very difficult to keep up with everything that's going on in the field. Anthony Barbetta's work on wideband, current-sharing, MOSFET power amplifiers with multiple

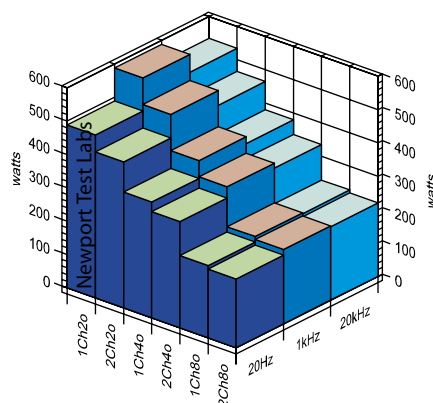
feedback loops has been ground-breaking. Mark Alexander's current feedback audio power amplifier is very thought-provoking. Then there's Douglas Self's innovative crossover displacement circuit, for which he was awarded British Patent GB2424137.

Self's new circuit has been commercialised by Cambridge Audio under the trademark 'XD' (short for cross-over displacement,

which describes what the circuit does) and features in several of the company's amplifiers, including in the Azur 851W power amplifier reviewed here. (For those readers removed from the heady world of audio amplifier engineering, Doug Self is one of the finest amplifier designers working in the world today, as well as the author of several textbooks about electronic design, the most recent of which is

the sixth edition of his most-famous classic work, 'Audio Power Amplifier Design' which is regarded as an essential reference work for amplifier designers. Self currently works for Audio Partnership, which owns Cambridge Audio and Mordaunt-Short. (See Break-Out Box on page 24.)

Self's 'XD' circuit addresses that *bête noir* of audio power amplifiers, crossover notch distortion, which is a distortion caused by the audio signal transitioning from one output device to another in a Class-B output stage. In Self's XD circuit implementation, the



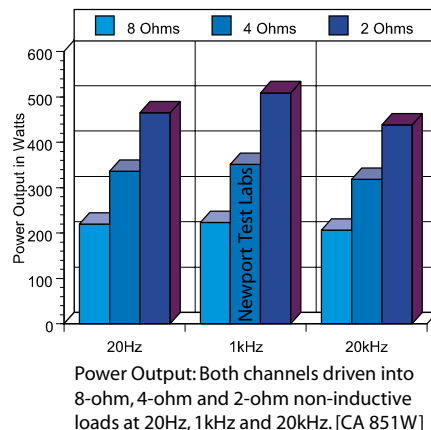
Power Output: Single and both channels driven into 8-ohm, 4-ohm and 2-ohm non-inductive loads at 20Hz, 1kHz and 20kHz. [CA 851W]

amplifier operates in Class-A at low signal levels and Class-B at high signal levels, (better known as a Class-AB design) but when operating in Class-B mode, instead of the transition between the two devices taking place at the same position in each cycle, as in conventional Class-B designs, it is instead constantly being moved around to different positions in the cycle by what Self calls a 'displacer' circuit.

The degree by which the displacer circuit shifts the transition point varies with the amount of current flowing in the output stage. First developed in 2005, the 'XD' circuit has undergone several iterations to improve its performance over the original.

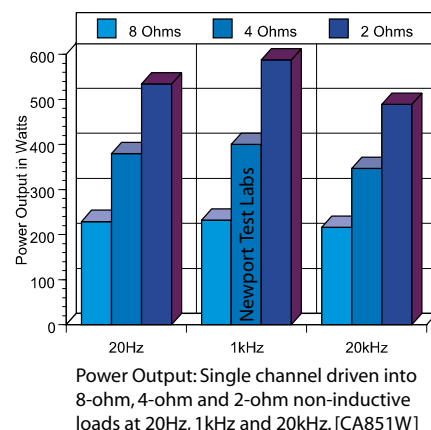
AZUR 851W POWER AMPLIFIER

Visually, the Azur 851W has a dual personality. If you look at the amplifier from directly in front of it, you see an extraordinarily clean 'space-age' layout with a pristine alloy front panel that's broken only by a large window that hides LEDs that indicate operating status, and a single standby/on power switch. I have to say of this front panel that it reminded me of the spaceship in the movie '2001: A Space Odyssey'.



However, if you look at the amplifier from the sides, or look down on the top of the amplifier, the chassis' lines are broken by a criss-cross of diamond-shaped holes punched in the alloy: small holes on the sides, larger holes on the top edges and differently sized holes again—and this time in black anodized aluminium alloy, rather than silver anodized—over most of the top surface of the amplifier. In short, the Azur 851W is truly sculptural in appearance.

I personally loved the industrial design of the 851W and the duality of its visual appearance. Someone should have won an award for it. (Yes, I know the 851W *has* won awards,



but to the best of my knowledge, all of them have been for sound quality and/or performance... not for industrial design!)

The left and right channels of the 851W each have three LED indicators—'Output', 'Protection', and 'Clipping'—and all shine blue. The 'Output' LED glows blue whenever there's a signal at the speaker output. The 'Clipping' indicator glows blue whenever the level of the input signal has resulted in the voltage at the speaker terminals exceeding the maximum power output capability of the

851W—basically a warning that you should turn down the volume to avoid damage to your loudspeakers.

As for that Protection LED, well its purpose is obvious (to indicate that a protection circuit has triggered), but what isn't obvious is the comprehensiveness of the protection Cambridge Audio has put at your disposal. Called 'CAPS' protection (because it offers five main protection methods), it will protect against d.c., over-temperature, excessive voltage and/or current, short-circuits and the aforementioned clipping.

Directly in the centre of the front panel are two LEDs labelled 'Mono' and 'Bridged'. As the names would suggest, the 851W can be used as a conventional stereo amplifier, in which case neither LED would glow; as a

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LAB REPORT

Readers interested in a full technical appraisal of the performance of the Cambridge Audio 851E Preamplifier and Cambridge Audio 851W Power Amplifier should continue on and read the laboratory report published on page 26. Readers should note that the results mentioned in the report, tabulated in performance charts and/or photographs should be construed as applying only to the specific sample tested.

Lab Report on page 26



■ **Absolutely everything about this Cambridge Audio 851E/851W duo screamed 'quality' with a capital 'Q'**



bi-amplified 'monobloc' amplifier, in which case 'Mono' would glow, or as a dedicated mono amplifier, with the outputs of the left and right channels bridged into just a single channel, in which case the 'Bridged' LED would glow and you will benefit from a substantial increase in output power (up from 200 watts to 500-watts according to Cambridge Audio's specifications, but rather more according to bench testing conducted by *Newport Test Labs*).

The rear panel of the 851W is beautifully laid out, with both unbalanced (via RCA) and balanced (via XLR) inputs, plus switching to select between them, trigger in/out/through facilities, a control bus (input/output) for linking with compatible Cambridge Audio units (such as the 851P, for example) for power on/off/standby synchronisation, plus a stereo/mono mode switch, and a mono mode switch (bi-amp/bridged). Two pairs of speaker terminals are provided for each channel.

AZUR 851E PREAMPLIFIER

Don't be tricked by the paucity of controls on its front panel into thinking the Azur 851E doesn't offer any features: on the contrary, it is a *very* full-featured preamplifier. Firstly, it can accommodate up to eight source components, three of which can deliver their signal to the 851E via balanced or unbalanced connections. After you've connected a source, and selected a connection option, you can re-name the input from its default (Source 1, Source 2, etc) to reflect the actual component you've connected, so if you plugged Cambridge Audio's Azur 651C CD player into Source 1, you'd simply rename it 'CD', or '651C'... or anything you like really. After you've renamed the input, you can then use the 851E's volume trimmer to adjust the sensitivity of that input so that when you switch from it to another source, the volume levels

of the two sources will match, eliminating any need to adjust volume when switching. Once you've done all this, source selection is accomplished simply by pressing the buttons arrayed vertically either side of the front panel display (or via the remote control).

The display itself is very cool... literally... it's black type on a champagne screen that's really easy to read. In the centre is a volume level display that can be switched between displaying the level in two different ways: in decibels referenced to rated output or in arbitrary display units. You can adjust the display brightness across two levels or turn it off entirely (in which case it illuminates briefly whenever you use a control to confirm that control's operation). The display can also show channel balance and when switched to do this (via the 'Mode' button) the volume control then acts as a balance control while you're using it, after which it will revert back to being a Volume control (the reversion being initiated by five seconds of inactivity on your part).

The bass and treble controls on the Azur 851E are really clever. First, they can be pushed back into the front panel so they don't protrude. Second, you can bypass them completely by using the Azur's 'Direct' mode. Third, you can set the controls differently for each input, so that when you select that input, the Cambridge will recall the exact bass and treble settings for it (or remember that you want to use the 'Direct' mode for that input). This makes the bass and treble controls enormously useful.

Although there is no muting function on the front panel of the Azur 851E, there is one on its remote control. The remote is a 'multi-use' one that will operate all components in the 851 series, as well as Cambridge Audio's 'Stream Magic' components, so it has rather more buttons than you'll need unless you


own other 851 Series components. Of the 65 buttons on the remote, only 16 of them are used to operate the 851E.

One thing I particularly liked on the 851E was that Cambridge Audio has provided a full-sized 6.35mm headphone socket for a standard 6.35mm plug. I prefer this larger, more traditional, plug because it's mechanically and electrically superior and means that when using good-quality headphones there is no need to use a headphone adaptor.

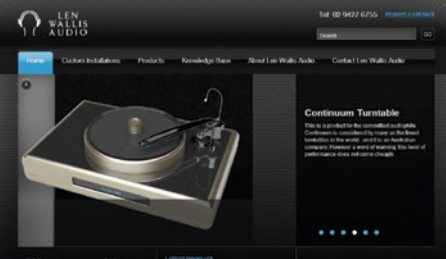
IN USE AND PERFORMANCE

Absolutely everything about this Cambridge Audio 851E/851W duo screamed 'quality' with a capital 'Q', basically from the moment I unpacked them. When making the connections using interconnect and speaker cable, even the fittings to allow this were high quality, and Cambridge prints all the connector labels 'right-way-up' as well as upside down, so you can easily identify which input is which no matter what angle you're viewing the rear panel from (though the printing is rather small... verging on tiny, in point of fact).

Then, when it came to setting up these two components to match my other equipment, it just got better and better, from the ability to name and trim all the inputs to best-suit the output voltages of my other components to the fact that I was able to do it individually for each one. And when I was making these adjustments, the 'feel' of all the controls and buttons, as well as the information shown in the front panel display while I was doing it all, was absolutely fabulous... with one exception: the volume control. It's actually a rotary encoder that instructs a software volume control, and not a standard analogue potentiometer, and I found it had some 'flex' in its mounting so I could wobble it by applying firm pressure, which I found



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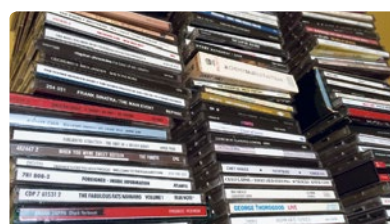
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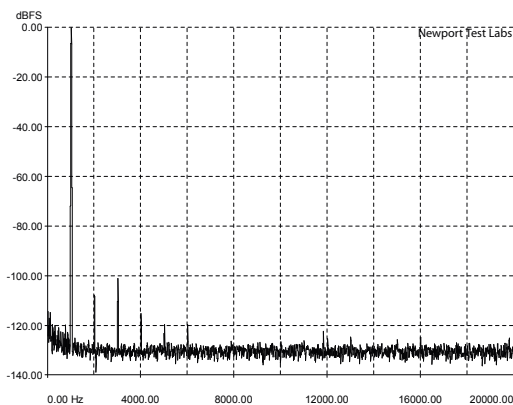
CONTINUED FROM PAGE 24

LABORATORY TEST REPORT

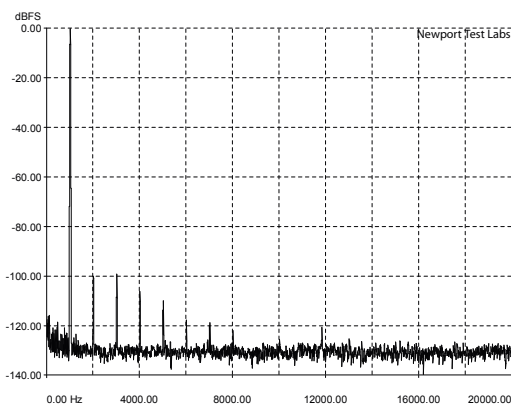
Newport Test Labs' tests of the Cambridge Audio 851W's power output showed that it certainly isn't shy on power delivery. On the test bench, with both channels driving 8Ω loads, the 851W was able to deliver 223-watts (23.5dBW) of power at 1kHz and only slightly less at 20Hz (220-watts/23.4dBW) and at 20kHz (206-watts/23.1dBW). When driving 4Ω loads, it delivered 351-watts per channel with a 1kHz test frequency, but slightly less at 20Hz (336-watts) and 20kHz (318-watts). The amplifier proved to be perfectly stable into 2Ω loads, and able to deliver over half-a-kilowatt (509-watts) at 1kHz with both channels driven into 2Ω. Newport Test Labs tested the power output of the 851W in its bridged mode as being 650-watts into 8Ω. The complete set of test results is tabulated in the accompanying table (Power Output Test Results) and shown graphically in the accompanying bar graphs. The clipping indicators came on right at the onset of clipping, so they will accurately indicate when clipping is occurring (unlikely though this may be, given the amount of power on tap).

The Cambridge Audio Azur 851E and 851W are obviously both very wideband devices. Newport Test Labs measured them together, and in this configuration they delivered a frequency response of 6Hz to 460kHz ± 0.5 dB. The -3 dB down-points of the response were measured as being 3.5Hz and 561kHz. Since that high-frequency response is a tad over half a megahertz, it's what I'd call an extended high-frequency response.

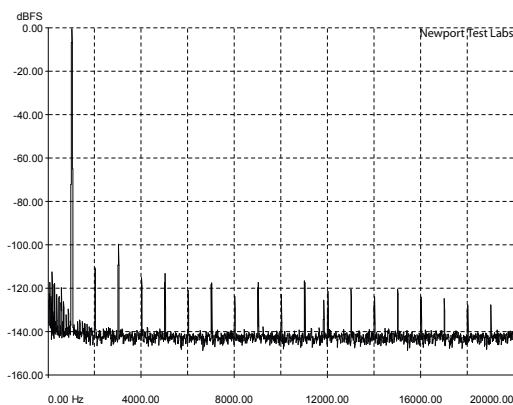
Perhaps because of this extension, the channel separation of the duo was only fair, averaging more than 70dB across most of the audio band (a best of 77dB at 1kHz) and diminishing to 66dB at 20kHz. Despite me identifying this performance as 'only fair', this level of separation is far more than required to ensure perfect audible channel separation and stereo imaging. And, on the imaging front, this would be enhanced by virtue of the balance between



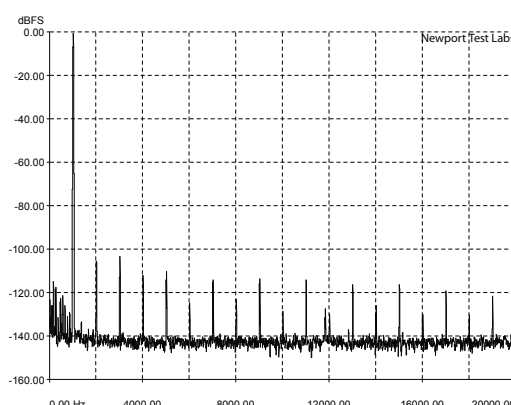
Graph 1: Total harmonic distortion (THD) at 1kHz at an output of 1-watt into an 8-ohm non-inductive load, referenced to 0dB. [Cambridge Audio Azur 851E & 851W Pre/Power]



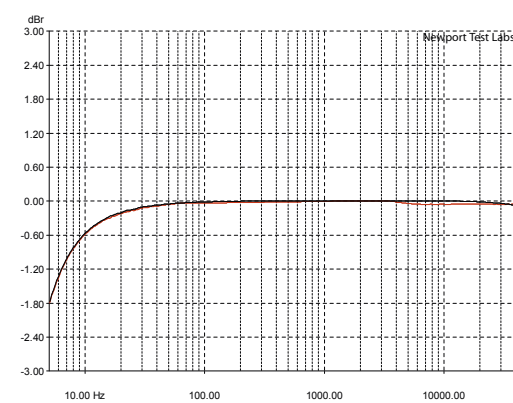
Graph 2: Total harmonic distortion (THD) at 1kHz at an output of 1-watt into a 4-ohm non-inductive load, referenced to 0dB. [Cambridge Audio Azur 851E & 851W Pre/Power Amps]



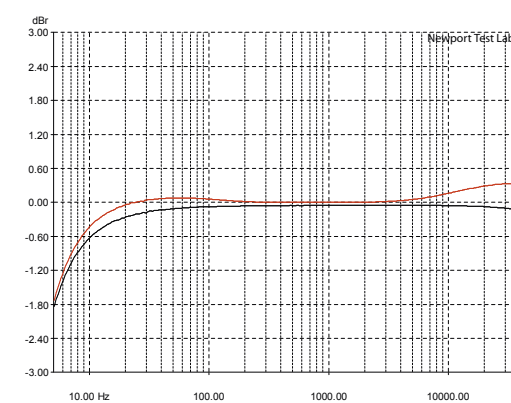
Graph 3: Total harmonic distortion (THD) at 1kHz at rated output (200 watts) into an 8-ohm non-inductive load, referenced to 0dB. [Cambridge Audio Azur 851E & 851W Pre/Power]



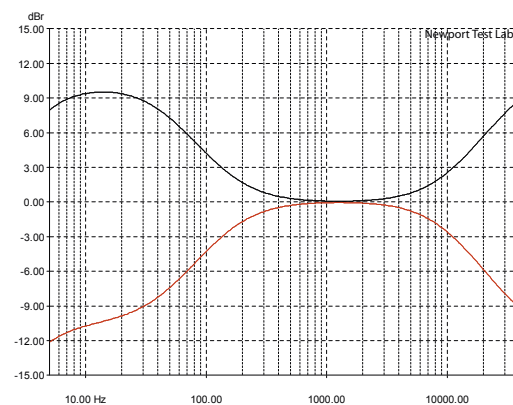
Graph 4: Total harmonic distortion (THD) at 1kHz at rated output (350 watts) into a 4-ohm non-inductive load, referenced to 0dB. [Cambridge Audio Azur 851E & 851W Pre/Power]



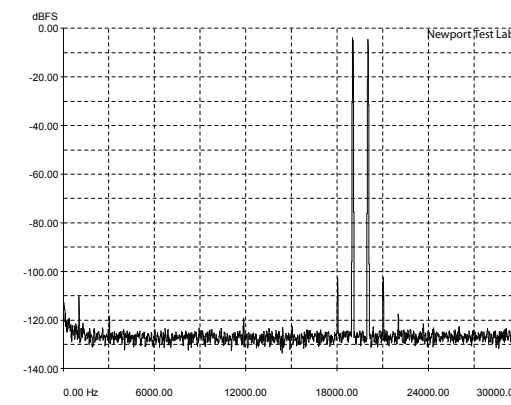
Graph 5: Frequency response of line input at an output of 1-watt into an 8-ohm non-inductive load (black trace) and into a combination resistive/inductive/capacitive load representative of a typical two-way loudspeaker system (red trace). [Cambridge Audio Azur 851E & 851W]



Graph 6: Frequency response of line input at an output of 1-watt into an 8-ohm non-inductive load with 'Direct' mode (black trace) engaged, and with tone controls in 0dB position (red trace). [Cambridge Audio Azur 851E & 851W Pre/Power Amplifiers]



Graph 7: Tone control action ref to 0dB at 1kHz. [Cambridge Audio Azur 851E & 851W]



Graph 8: Intermodulation distortion (CCIF-IMD) using test signals at 19kHz and 20kHz at an output of 1-watt into an 8-ohm non-inductive load, referenced to 0dB. [Cambridge Audio Azur 851E & 851W]

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the two channels being so outstandingly good: an imbalance of a mere 0.0025dB between the two channels. Phase accuracy was also good, though curiously higher at low frequencies (6.53° at 20Hz) than at high frequencies (1.68° at 20kHz), which is the opposite of what I usually see. Either way, these interchannel phase errors are too low to be audible.

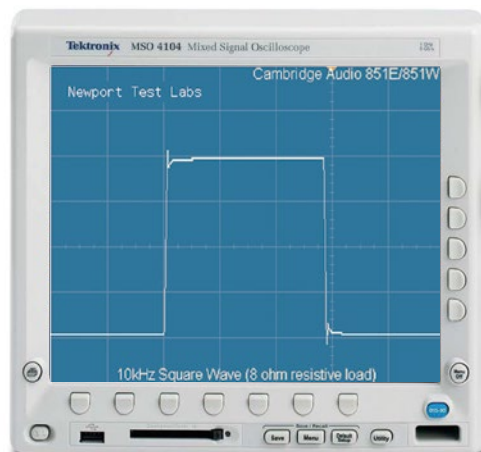
In-band frequency responses are shown in Graphs 5 and 6. You can see that across the audio band, the response of the Cambridge Audio 851E and 851W is almost ruler-flat, irrespective of whether the 851W is driving a standard non-inductive laboratory load (the black trace on Graph 5) or a load that simulates that of a two-way loudspeaker system (the red trace on Graph 5). The fact that there's so little difference means the Cambridge 851W will 'sound' the same no matter what loudspeakers you use with it. It also means a very high damping factor (Newport Test Labs measured DF as being 571 at 1kHz), so the amplifier will exert excellent control over even the largest-coned bass drivers, and won't allow any unwanted inertial cone movement.

Graph 6 shows that even when the bass and treble tone controls are in their 'detent' positions, they still have a slight influence

on the 851E's frequency response. I doubt anyone could perceive the resulting minuscule 0.1dB boost at around 80Hz, or that 0.3dB lift at 20kHz, but if you can hear it, simply select the 'Direct' mode and you'll get the ruler-flat response shown by the black trace on Figure 6.

Harmonic distortion was very low. At an output of one watt into 8Ω (Graph 1), five harmonic distortion components are visible above the noise floor, but all are more than 100dB down: a second harmonic at -110dB (0.0003162%), a third at -101dB (0.0008913%), a fourth at -115dB (0.0001778%), a fifth at -119dB (0.000122%) and a sixth at -120dB (0.0001%). Distortion increased slightly when load impedance was reduced to 4Ω (Graph 2), but all individual harmonic distortion components were still more than 100dB down. Overall wideband THD+N was measured at just 0.0022% at 1-watt, as is shown in the tabulated results.

Distortion remained low at rated output for both 8Ω and 4Ω loads, as you can see in Graph 3 (200-watts into 8Ω) and Graph 4 (350-watts into 4Ω). Although there are now many more harmonically-related distortion components visible above the noise floor, all are still more than 100dB down (0.001%).



Cambridge Azur 851W Power Amp — Power Output Test Results

Channel	Load (Ω)	20Hz (watts)	20Hz (dBW)	1kHz (watts)	1kHz (dBW)	20kHz (watts)	20kHz (dBW)
1	8 Ω	229	23.6	232	23.6	216	23.3
2	8 Ω	220	23.4	223	23.5	206	23.1
1	4 Ω	380	25.8	400	26.0	347	25.4
2	4 Ω	336	25.3	351	25.5	318	25.0
1	2 Ω	534	27.3	588	27.7	489	26.0
2	2 Ω	465	26.7	509	27.1	438	26.4

Note: Figures in the dBW column represent output level in decibels referred to one watt output.

Cambridge Azur 851E/851W Pre/Power Amps — Lab Test Results

Test	Measured Result	Units/Comment
Frequency Response @ 1 watt o/p	6Hz – 460kHz	-1dB
Frequency Response @ 1 watt o/p	3.5Hz – 561kHz	-3dB
Channel Separation (dB)	74dB / 77dB / 66dB	(20Hz / 1kHz / 20kHz)
Channel Balance	0.0025	dB @ 1kHz
Interchannel Phase	6.53 / 0.24 / 1.68	degrees (20Hz / 1kHz / 20kHz)
THD+N	0.0022% / 0.0016%	@ 1-watt / @ rated output
Signal-to-Noise (unwghted/wghted)	87dB / 93dB	dB referred to 1-watt output
Signal-to-Noise (unwghted/wghted)	100dB / 106dB	dB referred to rated output
Input Sensitivity (Balanced Input)	576mV / 810mV	(1-watt / rated output)
Output Impedance	0.014Ω	OC = 2.4985V 8Ω = 2.4945V
Damping Factor	571	@1kHz
Power Consumption	0.65 / 202.33	watts (Standby / On)
Power Consumption	206.69 / 690.80	watts at 1-watt / at rated output
Mains Voltage Variation during Test	238 – 252	Minimum – Maximum

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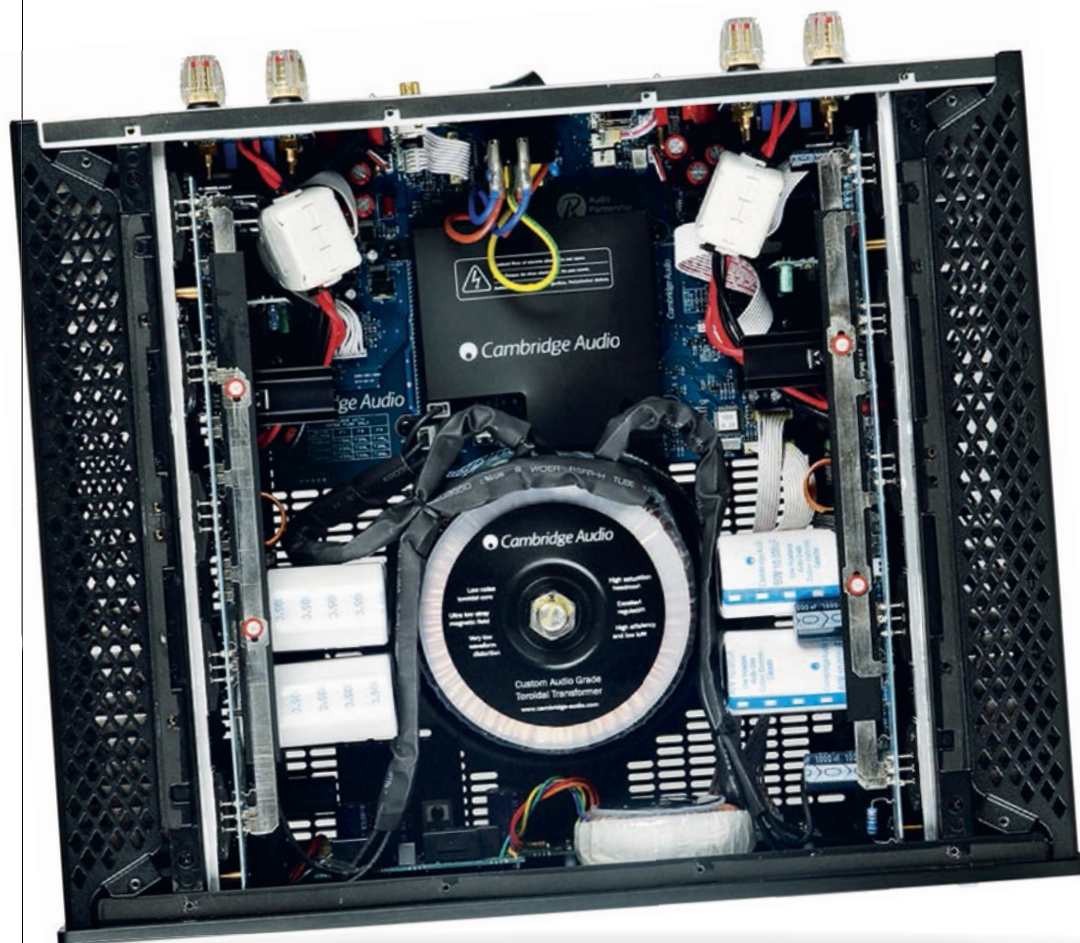
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■ Superbly flat and superbly extended frequency response, impressively high power output into all tested loads, vanishingly low noise levels, and ultra-low levels of distortion... and all from a bomb-proof circuit design. Bravo!

Again, overall THD+N at rated output was measured at 0.0016%.

Intermodulation distortion was also very low, as shown in Graph 8. There are two IMD sidebands at 18kHz and 21kHz (either side of the twin-tone IMD test signals at 19kHz and 20kHz), but both are 104dB (0.000631%) down. The unwanted signal regenerated down at 1kHz is at -110dB (0.0003162%), where it would be completely inaudible.

The graph showing tone control action shows that the bass tone control will have a more audible effect than the treble control, as it offers more boost and cut over a much wider range of audible frequencies than the treble control, which effectively gives only 3dB of boost and cut at 10kHz. Unusually, the treble control's boost action appears to be unshelved, so if you use it, high frequency boost will get greater at higher frequencies, which could potentially cause issues with your tweeters if ultrasonic information is present in the audio signal. As such, I would recommend leaving the treble control either at its 'detent' position or programming the 'Direct' mode for all inputs.


Signal-to-noise ratios were good, rather than being excellent, with *Newport Test Labs* measuring the 1-watt SNRs as being 87dB unweighted and 93dB A-weighted. These figures are undoubtedly slightly higher than they might otherwise have been were it not for

the fact that this Cambridge Audio duo has such a wide operating bandwidth. Also, the excellent-looking results of 100dB unweighted and 106dB A-weighted referenced to rated output must be viewed in the light of the 851W's very high power output, which gives it a leg up in the 'Signal' part of the signal-to-noise ratio equation. (It is worth noting that all the signal-to-noise ratios measured by *Newport Test Labs* exceeded Cambridge's own specifications.)

Reproduction of square waves was excellent. The 100Hz square wave shows the tilt I'd expect as the result of a frequency response that does not extend down to d.c., but there is no bending that would have indicated l.f. phase shift. The 1kHz square wave is magnificent, looking for all the world like it came straight from the square wave generator, rather than through two components and a length of interconnect. The 10kHz square wave is also excellent, with a very fast rise-time, as you'd expect from the 851W's 3dB h.f. down-point of 561kHz, but there is some slight overshoot that would seem to indicate a 'not-quite-linear' response at ultrasonic frequencies.

The square wave showing the 851W's performance into a highly capacitive load (one simulating that of an electrostatic loudspeaker) shows that the 851W will be unconditionally stable into such loads, but

there is a half-wave-height overshoot and some ringing. Speaking of stability, *Newport Test Labs* tested all aspects of the 851W's protection circuitry and found it worked perfectly to protect the amplifier against all the specified fault conditions. The amplifier simply shut down gracefully and then, once the fault was removed, started up again as if nothing untoward had happened.

Power consumption, as you'd expect, was very high, with the Cambridge duo pulling more than 200-watts from your mains power supply during normal operation, and nearly 700-watts when you're listening at high volume levels. Although stand-by power consumption is shown as being 0.65-watts, slightly above the legislated Australian standby consumption maximum, this measurement was the combined consumption of both the 851E and the 851W, so had they been measured individually, they would both have consumed less than 0.5-watts and come within the standard. As you have no doubt already gathered, the performance of the Cambridge Audio 851E and 851W pre and power amplifiers was outstanding, with the pair delivering a superbly flat and superbly extended frequency response, impressively high power output into all tested loads, vanishingly low noise levels, and ultra-low levels of distortion... all from a bomb-proof circuit design. Bravo! 

Steve Holding



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Sunfire XTEQ 12

SUBWOOFER

Although Sunfire is now owned by CoreBrands, which in turn is owned by Nortek, the Sunfire company and brand was established by none other than Bob Carver, one of the most controversial audio electronics designers in America. *Home Theatre Review* magazine dubbed him “one of the five most influential people in the history of audio” (but regrettably failed to mention the names of the other four!) His claims to fame are many, but include the fact that ‘way back in 1972 he designed what was then the world’s most powerful hi-fi amplifier (the Phase Linear 700); and was responsible for inventing the auto-correlator, the symmetrical charge-coupled detector, the magnetic field coil amplifier, sonic holography, and the tracking down-converter amplifier, one of which is found inside Sunfire’s XTEQ 12 subwoofer.

THE EQUIPMENT

It is the use of a tracking down-converter amplifier that enables the Sunfire to bestow the XTEQ 12 with an amplifier power rating of 3,000 watts, far more power than would be possible with a conventional Class-AB amplifier or, quite possibly, a Class-D amplifier. Carver’s tracking down-converter amplifier is a variant of the Class-H amplifier topology.

To understand how Class-H works, you need to understand that in amplifiers that use conventional power supplies, the designer uses a power supply with a voltage high enough to deliver the maximum power of which the amplifier is capable. So, for example, if the amplifier were to be rated at 100-watts per channel into 4Ω, the power supply would need to deliver 20 volts ($P=V^2/R$ so $50 = 400/4$). The problem is that when the amplifier is not operating at its

maximum output, and instead is delivering, say, only 1-watt, which requires only 2 volts, the power supply will still be delivering 20 volts, so the remaining 18-volts is turned into heat, rather than sound, and thus effectively wasted. This isn’t a problem with low-powered amplifiers, but as power output increases, the cost of building power supplies becomes prohibitive, and it also becomes expensive to remove the heat (by means of heatsinks and/or fan-cooling).

In Class-H designs the voltage of the power supply is varied depending on the power output required at any given moment, so that if you’re playing at 1-watt, it would supply only 2-volts, since this is all that’s required. If you turned the volume up to 4-watts, the power supply voltage would increase to 4-volts. At an output of 50-watts, the power supply would deliver the full 20-volts.

This means there's nothing wasted, therefore almost no heat—and so no need for heatsinks and fans—but it also means that the power supply can be made relatively cheaply.

The difficulty in designing Class-H designs lies in the designer ensuring that the power supply is always 'one step ahead' of the output stage, so that it's always ready to deliver the full voltage required, and Carver's tracking down-converter was a innovative way of doing this inexpensively and with very few components... indeed it was sufficiently innovative that he was awarded a patent for it—US Patent 4,484,150. (Incidentally, Carver's own patent application cites more than thirty previous patents where inventors were trying similar approaches to the problem, so he was well aware that he didn't 'invent' Class-H, but he did invent a unique and very practical implementation of it, and one that's been so successful that it's still being used thirty-five years later—a point Carver's critics conveniently seem to overlook.)

All of which rather begs the question of why you'd want a 3,000-watt amplifier inside a subwoofer anyway. The answer to that is partly physics and partly marketing. In order to extract maximum performance (that is, good low-frequency extension, low distortion, and high volume levels) from a subwoofer, you need a large enclosure. The problem is that very few consumers want a large enclosure in their living space. So manufacturers build enclosures that are smaller than optimum, and whenever they do this, they have to settle for either reduced low-frequency extension, increased distortion, or lower volume levels: in other words, 'something's gotta give!'

However, there is one work-around to the getting bass out of a small cabinet conundrum, and it's one that hinges around the fact that the only reason the volume drops off is that when a cone is mounted in a small enclosure, the amplifier has to work harder to push that cone, which requires more power... lots more power. In the past, it was simply not practical to include a sufficiently high-powered amplifier in small subwoofers—they simply cost too much to build. But Carver's tracking down-converter amplifier broke the rules: it could deliver enormous amounts of power very cost-effectively, and it was this that enabled Sunfire to build such small subwoofers... and this new Sunfire XTEQ 12 is certainly small, indeed at 330×330×310mm I would normally have called the XTEQ 12 a 'tiny' subwoofer, except that I can't do that because the two other models in the XTEQ range are even smaller.

As with all things Sunfire, the model numbers actually mean something. The 'XT' stands for eXtended Throw, because the roll-surrounds fitted to the drivers in these

models have Sunfire's so-called 'Asymmetrical Cardioid Surround' geometry, which the company says: *'enables them to travel over a very long throw without distorting.'* The 'EQ' stands for Equalisation, except that in this case, the equalisation is automated. Each subwoofer comes with its own microphone and has a signal generator and measurement circuitry built in that can be used to measure the output of the subwoofer in your room, after which it can then automatically adjust the frequency response of the subwoofer for best performance in that room. It does this at four frequencies: 35Hz, 49Hz, 64Hz and 84Hz. (And if, for any reason, you don't like the result of the automated circuitry, you can over-ride it, and instead set the equalisation 'by ear'.)

As for the final numbers in the model name, that's good ol' imperial inches, showing that the XTEQ 12 has a 12 inch (305mm) diameter bass driver. And yes, that's driver singular... there is only the one driver, and it's on the left side of the subwoofer as you're looking at it from the front. The circular thing that *looks* like a driver on the opposite side to the woofer (that is, on the right side of the subwoofer as you're looking at it from the front) is actually a passive radiator—that is, although it has a cone and suspension, there is no voice coil and no magnet. The passive radiator's motion is created entirely from it moving in and out in response to differences in air pressure inside the cabinet created by the movement of the bass driver: which is the reason some people call passive radiators 'drone cones' (but they're also known as auxiliary bass radiators, or ABRs). Whatever you decide to call it, Sunfire is at least honest enough to point out that it is a passive radiator. Some manufacturers don't mention this at all, presumably hoping you'll think you're getting multiple drivers.

Although you can't see it, the magnet fitted to the bass driver inside the XTEQ 12 is absolutely massive: 190mm in diameter and 90mm deep, it weighs 5.5kg. This magnet is essential to the operation of the XTEQ 12 because if you were to use a 3,000-watt amplifier to drive a conventional bass driver, with a small magnet and a large voice coil, you'd simply burn out the voice coil. Sunfire's use of a high-power amplifier plus a high back-emf driver ensures the voice coil never 'stalls' in the gap.

The rear panel of the Sunfire XTEQ 12 has both unbalanced (via RCA) and balanced (via XLR) inputs as well as two line-level outputs. The line-level outputs can be a simple pass-through (unaffected by any of the subwoofer's settings) or high-passed through an 85Hz high-pass filter, using a switch located between the left and right output terminals.

There are also 'Slave Input' and 'Slave Output' terminals, which allow you to link multiple XTEQ 12 subwoofers together. By using the 'Slave' links to do this, all the settings you make on the 'Master' subwoofer will be replicated on the 'Slave' subwoofers, which greatly simplifies operation if you are using two or more subwoofers. Using dual subwoofers is a classic way to solve issues you may have with room modes, plus it's also an easy, efficient and cost-effective way of increasing bass levels in larger rooms.

A rotary control is used to adjust crossover frequency, and is adjustable from 30Hz to 100Hz. The phase control—also rotary—is continuously adjustable between 0° and 180°. The level control is rotary, with calibration markings only for 'Min', '0dB' and 'Max'. There are several fittings for use with the automatic equalisation circuitry, including an EQ LED, a 'Start' button, an EQ on/off switch and a microphone input.

SUNFIRE XTEQ 12 SUBWOOFER

Brand: Sunfire
Model: XTEQ 12
Category: Powered Subwoofer
RRP: \$3,199
Warranty: Two Years
Distributor: Qualifi Pty Ltd
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LAB REPORT

Readers interested in a full technical appraisal of the performance of the Sunfire XTEQ Subwoofer should continue on and read the LABORATORY REPORT published on page 114. Readers should note that the results mentioned in the report, tabulated in performance charts and/or displayed using graphs and/or photographs should be construed as applying only to the specific sample tested.



Lab Report on page 114

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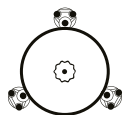
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Yamaha CD-S2100

CD PLAYER (...AND SACD PLAYER... AND DAC)

It's great to see a major multi-national company such as Yamaha is still waving the flag for all us die-hards addicted to shiny silvery discs, though with its latest CD-S2100 Yamaha is laying off its bets by including both digital SPDIF and USB inputs on it, so those of you who prefer to listen to the streams of 0s and 1s stored on your computer's hard drive (or NAS) can do so using the CD-S2100 instead of a DAC. Yamaha is also supporting early-adopters who lent their support to the SACD format, because although Yamaha calls the CD-S2100 a 'CD Player', it's actually an SACD player, because it will in fact play back SACDs as well as CDs... albeit only in two-channels.

THE EQUIPMENT

The first thing you'll notice when you see an S2100 'in the flesh', so to speak, (the 'flesh' in this case being your choice of either silver brushed aluminium or black anodised aluminium for the chassis, with beautifully lacquered real wood panels at either side) is the gorgeous half-silvered front panel display that turns into a mirror when it's not being used.

The second thing you'll notice is the ultra-thin disc loading tray below that display. No, it's not a slot-loader, what you're looking at is the same super-thin custom aluminium disc tray that Yamaha developed for its \$7,499 flagship CD player, the C-3000, which it's now fitting to the CD-S2100. And no, it's not a trickle-down, or a re-build, it's exactly the same mechanism and drive that's used on the top-line machine.

It's great to see that all the transport controls you'll need are right there on the front-panel, so you won't ever be hunting for the remote control in order to use the player. The 'Play', 'Pause', 'Stop', 'Track Skip (Forward/Reverse)' and 'Fast Forward/Reverse' controls are all there at the right-hand side of the front panel. At the left of the front panel, alongside the 'Power On/Standby' switch, are buttons marked 'Pure Direct', 'Source', and 'Layer'. The first of these, the 'Pure Direct' button, improves sound quality by deactivating all non-essential internal digital processing plus it also turns off the front panel display (though it will momentarily turn back on whenever you use one of the player's controls, either on the front panel or via the remote control).

Why then is it switchable? Because it also switches off the CD-2100's digital outputs, and in some system implementations you might want these to be active.

The 'Source' button lets you choose which digital source you want converted into analogue and presented at the CD-2100's analogue outputs (after which that signal will appear at both the unbalanced—RCA—and balanced—XLR—outputs). The switch cycles through 'Disc', 'USB', 'Optical' and 'Coaxial'. This means that you can choose to listen to 'Disc' (CD or SACD), USB from your computer, or an SPDIF input delivered optically or coaxially (so you can have two SPDIF inputs if you wish). The USB option permits multiple sampling rates (up to 192kHz), but your computer must have Yamaha's own Steinberg USB driver software loaded. This driver is available for Windows (Vista, 7 and 8) and MAC (OSX 10.5.8 to 10.8.x) as a free download from Yamaha.

Switching between these digital sources can be a bit frustrating because whenever you switch to a particular input, the switch operation is suspended while the player 'looks' to see if there's actually a source available at that input.

■ ***The 'fit n' finish' of the CD-S2100 is exceptionally fine. I particularly loved those lacquered real-wood end panels, which add a definite touch of class to a component that already looks a million dollars.***

So, for example, when you switch to 'Disc', if there isn't a disc in the tray, the player tries to load one, even though there's not one there. This means you need to wait nine seconds before you can press the button again to switch the player to the USB input. The same happens when you select the USB input: the player will look for a digital signal input for six seconds, after which it displays a 'No Cable' warning in the display. Once again, while it's doing this you'll be 'locked out' of player operation and be unable to skip through to either of the Optical or Coaxial inputs digital inputs. If you switch inputs often, these delays become slightly annoying, but if you listen mainly only to the same source, it won't be an issue.

The 'Layer' button on the front panel allows you to elect whether you want to listen to the 'Super Audio' layer of a hybrid SACD or the lower-quality CD layer... though why anyone would listen to the CD layer of an SACD is beyond me. It's true that some SACDs have content in their CD layer that is not available in the SACD layer, but my guess is that only a dozen or so such discs are available. As for why you'd want to listen to SACDs rather than CDs, that's because SACDs have better sound quality than CDs, due to their more extended frequency response (up to 50kHz, more than twice that of CD), their higher signal-to-noise ratio and their lower levels of distortion. But in addition to their technical advantages, most SACDs sound better than their CD counterparts simply because the recording and mastering engineers took more care when producing SACDs than they did when producing CDs. SACD's other advantage over CD—the ability to deliver a 5.1-channel surround signal—isn't able to be realised by the CD-S2100... it's strictly a two-channel playback device, as I've already mentioned.

In addition to the ability to play both commercially-available SACDs and CDs, the

Yamaha CD-S2100 can also play CD-R and CD-RW discs that you've recorded yourself on your own computer, either with 'Red Book' digital data or by creating MP3 or WMA files. (However, if you play back MP3 or WMA files, many of the CD-S2100's more advanced 'trick' playback modes cannot be used.)

Yamaha uses ESS's ES9016 DAC to decode digital data from disc and the SPDIF inputs. The ES9016 is a very tasty upmarket 32-bit, eight-channel device whose DACs operate in double differential mode, so you're essentially using two DACs per channel connected differentially for improved conversion precision. However, if you're listening via USB, you're instead using a custom low-jitter DAC developed specifically and exclusively for Yamaha that supports digital audio up to 24/192 as well as DSD.

The Yamaha CD-S2100's remote control not only imbues the ability to control the player remotely: it also provides access to additional functions not available from the front panel, including dimming the front-panel display and changing what information is displayed on it (you can choose between showing elapsed time of the current track, remaining time in that track, or total remaining time on the disc) and programming tracks for playback in a pre-determined order. It also allows so-called 'trick' playback modes (repeat track, repeat disc, repeat programmed sequence, play back tracks in random order. Perhaps most importantly, the remote has numeric keys that allow you to access a track directly, by entering a track number rather than having to skip through tracks, which enables instant track access.

As to whether it will fit on your equipment rack, the CD-S2100 measures 435x157x463mm (WHD) and weighs 15.6kg. It comes with a very generous full five year warranty, which is made even more generous by the added condition that if anything goes wrong within the first 12 months of the warranty, Yamaha will take back the faulty player and give you a brand new one. But I can't leave this section of the review without mentioning the 'fit n' finish' of the CD-S2100, which is exceptionally fine—I particularly loved those lacquered real-wood end panels, which add a definite touch of class to a component that already looks a million dollars.

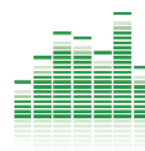
IN USE AND LISTENING SESSIONS

My listening sessions didn't start so well when I mis-loaded the very first disc I tried to play, which resulted in the player not working when

I pressed 'Play' and the Yamaha's display telling me there was 'No Disc' inside. When I opened the disc tray again to see what I'd done wrong, my this-time closer examination of the custom-made disc drawer of the CD-S2100 revealed that it uses four small soft silicone 'arms' to help you correctly position any disc you load. Unlike the hard plastic grooves that usually perform this function, the soft arms don't give any kind of tactile or aural feedback (the 'click' sound of the disc dropping into place on the hard plastic). The use of a soft material is no doubt much kinder to your precious discs, but does make it a tad easier to accidentally mis-load CDs and SACDs in the tray.

YAMAHA CD-S2100 CD PLAYER

Brand: Yamaha
Model: CD-S2100
Category: SACD/CD Player
RRP: \$2,999
Warranty: Five Years (+ One year replacement warranty, see copy)
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LAB REPORT

Readers interested in a full technical appraisal of the performance of the Yamaha CD-S2100 CD Player should continue on and read the LABORATORY REPORT published on page 40. Readers should note that the results mentioned in the report, tabulated in performance charts and/or displayed using graphs and/or photographs should be construed as applying only to the specific sample tested.

Lab Report on page 40



However, once I realised what was going on, it only took a little extra care when loading discs to ensure that it never happened again... which it didn't. The disc-loading process is, however, a little slow, with the CD-S2100 taking around 15 seconds to load an SACD and 20 seconds to load a CD. Fair enough, I thought, it's reading a lot of data when it loads any disc (particularly an SACD), but I don't know why it takes around 10 seconds to unload a CD or SACD. Maybe spinning the discs down slowly extends the life of the drive motor. I was a little surprised to find the CD-S2100 doesn't display CD-Text when this is recorded on a CD, but I suppose you can't have everything.

One of the first discs I played was Rhianon Giddens' solo debut album 'Tomorrow is my Turn' (she's much better known for her work with Carolina Chocolate Drops, a band she founded, and in which plays violin and banjo as well as sings). It's a nice clean recording (produced by T Bone Burnett) with lots of beautifully-recorded instruments, and on the quieter tracks (one of which is *Black is the Colour*, a traditional song she's re-written to reference her husband who, rather confusingly, is actually a ranga!) I was struck by how quiet the backgrounds were... no hiss, no hum, just perfect silence. Yet this lack of noise was not the soulless 'digital black' silence that mars the sound from some CD players, but one that became an organic part of the track's own ambience, and in so doing, sounded completely natural. (It's not generally recognised that a complete lack of noise is absolutely crucial for those 'spaces between the notes' if the music being replayed is to sound truly realistic. Most people just think it's to ensure improved dynamic range—which it also does, of course.)


The Yamaha CD-2100's tonal purity was exceptionally good... perfect in fact. When I listened to the sound of Gabe Witcher's fiddle on *Angel City* (a very nice track written by Giddens herself), as well as to Mike Bub's acoustic bass, not to mention Giddens' own vocals, I was more than impressed not just by the clarity of the sound, and the articulation, but also by how tonally 'correct' everything sounded. The spectral balance is amazingly good. I just loved listening to the slack-stringed sound of the double bass in the right channel on Jacques Wolfe's *Waterboy*, as realised by Giddens (she also covers songs made famous by Dolly Parton, Patsy Cline, and Charles Aznavour), because it was just, so right to the ears.

Indeed the string sound was so right to my ears that I pulled out Move's 'Unfold' album, which has the Kreutzer Quartet playing the works of 'Australian' composers Don Banks, Nigel Butterley, Richard Meale and Felix Werder. The music on this disc is mostly confronting (I love that the liner notes say '*some of the works continue the tradition of cohesive playing*'), but the 'sound' of the disc (as distinct from the 'music') is absolutely wonderful, thanks mainly to Jonathan Haskell of Amazing Sounds, and the acoustic of the Aldbury Parish Church in Herfordshire. And as usual, the playing of the Kreutzer Quartet is stunningly good... but it might have been nice if the CD cover had identified the individual members of the Quartet (Peter Sheppard Skærved, Neil Heyde, Mihailo Trandafilovski, and Morgan Goff) rather than not naming them at all. A strange omission indeed! The Yamaha delivers the sound of the strings of all four players' instruments perfectly, from the deepest funda-

mentals of the cello to the highest harmonics of the violins, with a fidelity that will have you questioning whether there's any call for a higher-res version of this recording (there is one available, apparently, but I have as yet been unable to track one down). One thing I couldn't make up my mind about, even after weeks of experimentation, was how to best go about 'tuning' the DAC inside the Yamaha for best performance. The ES9016 uses a digital phase lock loop to generate internal clock signals to ensure correct synchronisation with any incoming digital signal, and Yamaha has fitted a seven-setting control that allows you to manually adjust the bandwidth of this loop (from 'lowest' to 'highest' with the default setting at 'medium-low') to get the most 'accurate' conversion.

When playing back music from disc (SACD or CD), I found it difficult to hear any differences between any of the seven settings, whereas when playing back SPDIF signals from external sources, I could nearly always find one setting I preferred over the other six (though that setting did—rather annoyingly!—vary from source to source!). You may have more success tuning the Yamaha than I did (or not, but either way you'll have fun trying it out). While I was tuning, I was also able to determine that the CD-S2100 is not only an excellent SACD/CD player, it is also a truly state-of-the-art DAC, so if you have a need or an application for such a device, why not kill two birds with the one stone?

CONCLUSION

I feel remiss for not making it clear previously in this review that the main reason for buying an SACD player—even if you don't own any SACDs to play on it!—is that SACD players give higher-resolution playback of ordinary CDs than standard CD players: strange but true! So if you have a CD player, I'd recommend upgrading it to Yamaha's CD-S2100 SACD player, which has so much going for it that you'd be mad not to.  Jutta Dziwnik

■ **The main reason for buying an SACD player is that they enable higher-resolution playback of ordinary CDs than standard CD players: Strange but true!**



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LABORATORY TEST RESULTS

Overall, the Yamaha CD-S2100 performed brilliantly on the test bench, returning excellent results in most areas of performance tested and perfect results in others.

Distortion levels were low right across the board. Graph 1 shows THD+N with a 1kHz signal (CD standard) at a recorded level of -10dB and you can see that there's a second harmonic distortion component at -132dB (0.0000251%), a third harmonic at -110dB (0.0003162%), a fifth at -133dB (0.0000224%) and that's pretty much it, with the noise floor down at -140dB. Outstanding!

Graph 2 shows distortion with a test signal recorded at -60dB and although there is distortion present (due to the fact the test signal hasn't been dithered) it's all more than 120dB down, or 0.0001%. This performance is repeated at -80.59dB—as you can see in Graph 3, again without dither, but this time you can see from Graph 4 (a -80.70dB signal this time with dither added), the addition of dither (dither is present on all commercial CDs, but only sometimes on test CDs) removes all distortion components completely, and the noise floor, although slightly elevated due to the dithering, is still hovering down around -140dB.

Reducing the level of the test signal yet again, to around -90dB (as shown in Graph 5 and Graph 6) demonstrates the superb performance on the part of the CD-S2100 at these low levels. In Graph 6 (THD+N for a signal recorded at -90.31dB), no distortion components are visible at all and the noise floor is still down around -140dB. The overall total THD+N result was 0.0018%, as shown in the tabulated result table.

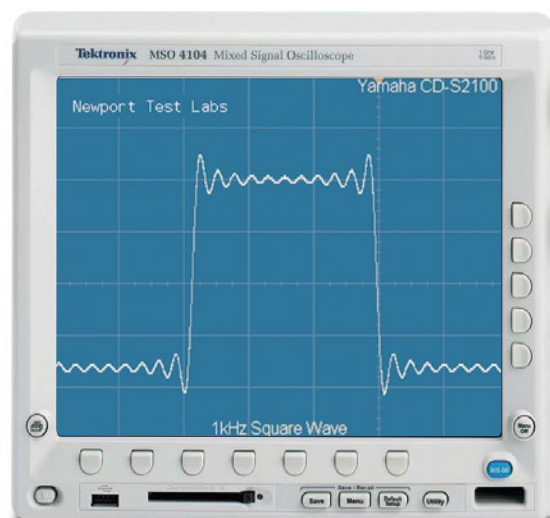
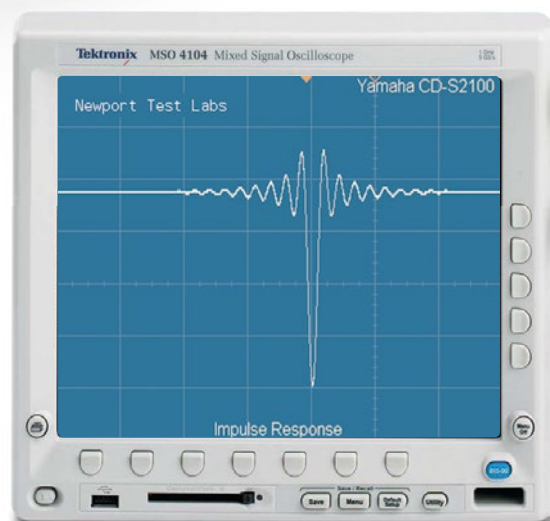
THD+N was also measured for the DAC section of the Yamaha CD-S2100, and the results are shown in Graph 11, with measurements at a level of -1dB (red trace) and -20dB (black trace). You can see that distortion

Overall, the Yamaha CD-S2100 performed brilliantly on the test bench, returning excellent results in most areas of performance tested and perfect results in others

levels are very low at both test levels, and almost completely uniform across the tested frequency range. At -1dB, distortion is mostly less than 0.001%. THD+N is plotted against recorded level in Graph 12.

Intermodulation distortion was also extremely low, as you can see from Graph 7. The two test signals (at 19kHz and 20kHz) cause the player to generate sidebands at 18kHz and 21kHz, but they're around 108dB down (0.0003981%). The unwanted signal regenerated at 1kHz was around -117dB down (0.0001413%), where it would be completely inaudible. Note, too, the lack of spurious ultra-sonic frequencies above 21kHz. There are some present, as you can see, but they're all more than 110dB down (0.0003162%). The same is the case with Graph 8, which shows a 20kHz test signal at 0dB. The signal at 40kHz that is 100dB down (0.001%) is the second harmonic, the others are spurious.

The frequency response of the Yamaha CD-S2100 was outstandingly good in all operating modes. When playing back CD sources, response extends from 2Hz to 20kHz ± 0.5 dB, with the lower and upper limits being the lowest and highest frequencies recorded on the test CD. When playing back a test SACD, the Yamaha CD-S2100's frequency response extends from 0.5Hz to 50kHz ± 1.5 dB. When tested using an external digital 24-bit/192kHz frequency sweep, the frequency response extended from 0.5Hz to



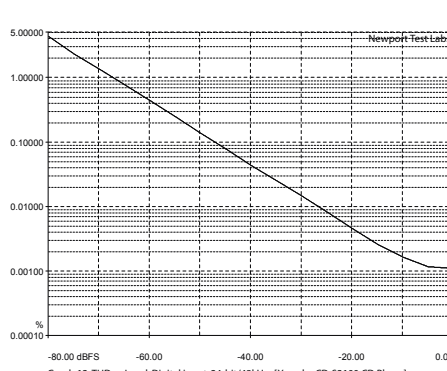
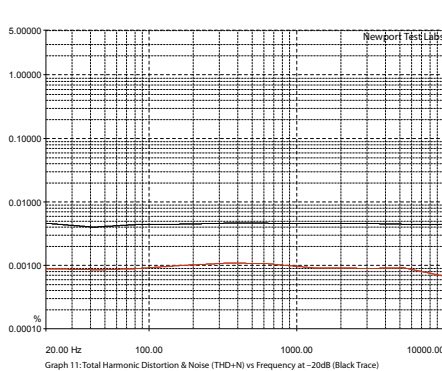
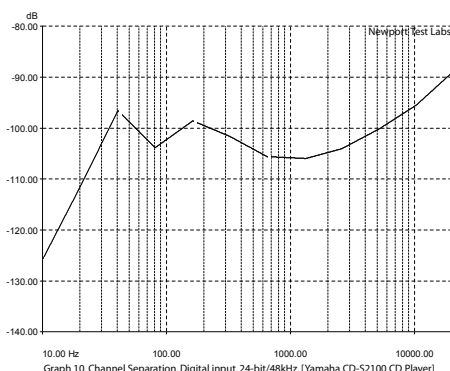
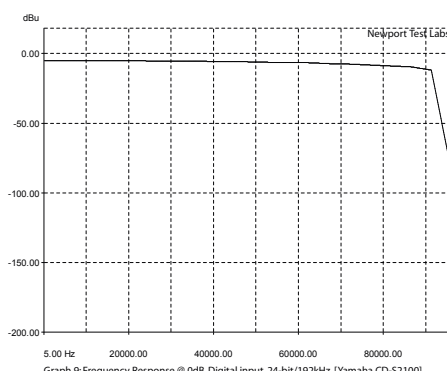
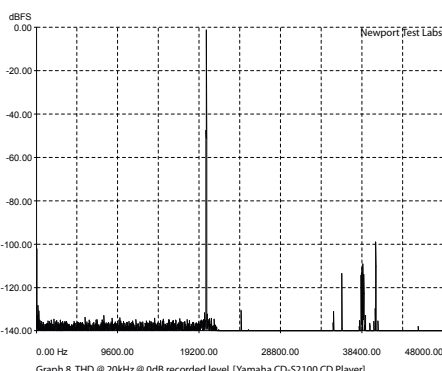
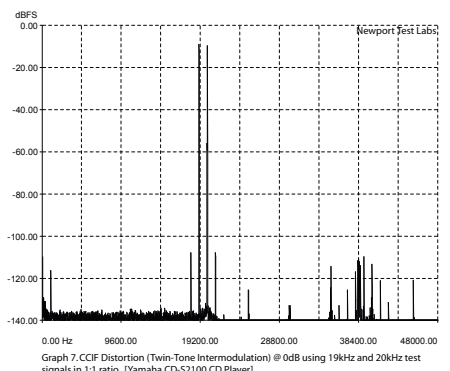
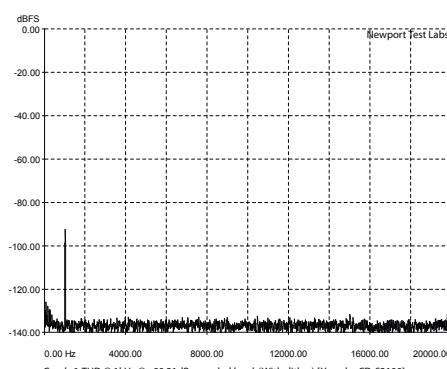
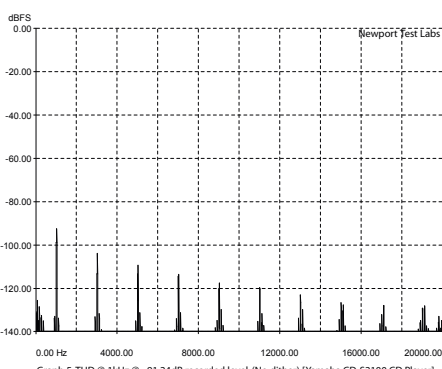
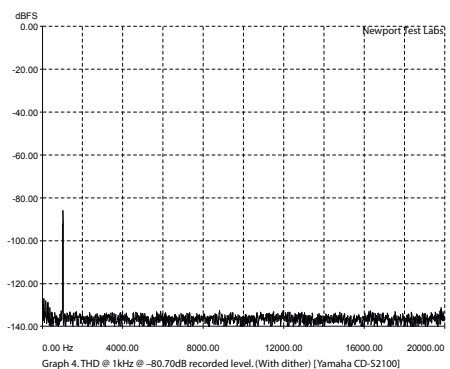
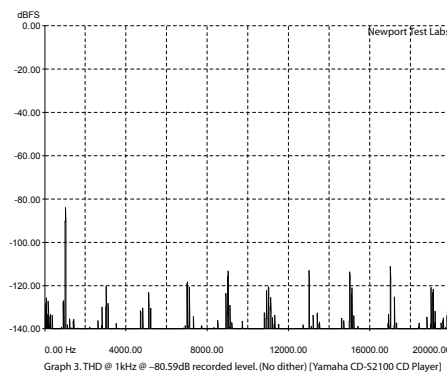
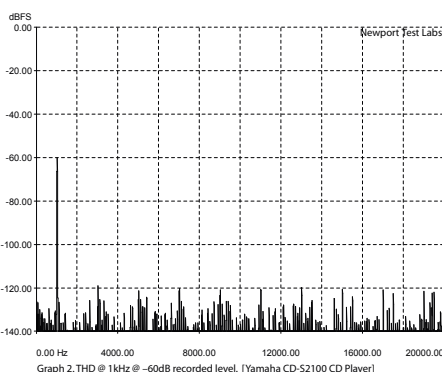
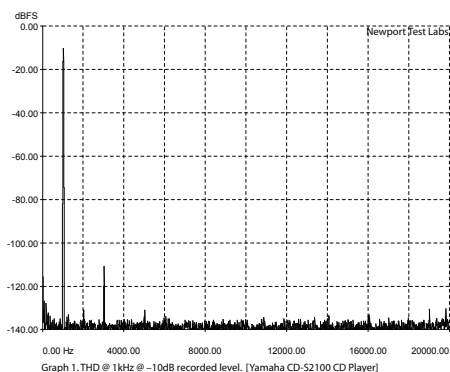
a little over 90kHz -3dB . It is this trace that's shown in Graph 9.

Channel separation was equally good, but varied a little depending on which source was being used for the test. Separation with a CD was excellent, returning a best result of 121dB at 1kHz and diminishing to only 96dB at 20kHz. As you can see from Graph 10, per-

formance with external AES-17 standard test signals was not quite as good, with separation at 1kHz of around -112dB , diminishing to 90dB at 20kHz. These differences would not be audible, since all are far below the limit of the human ear's ability to detect them.

The performance with a square wave was typical of a standard oversampling filter, but

the performance with a pulse showed that the Yamaha CD-S2100 inverts absolute polarity. There is considerable debate in the audiophile community as to whether inverted polarity is audible, and since the absolute polarity of recordings is not guaranteed anyway, establishing an answer is not only difficult, but also shows that worrying about





Yamaha CD-S2100 SACD Player — Test Results (16-bit/44.1k)

Analogue Section	Result	Units/Comment
Output Voltage	2.0960 / 2.0920	volts (Left Ch/ Right Ch)
Frequency Response (CD)	2Hz – 20kHz	–1dB
Frequency Response (SACD)	0.5Hz – 50kHz	–3dB
Channel Separation	117 / 121 / 96	dB at 16Hz/1kHz/20kHz
THD+N	0.0018%	@ 1kHz @ 0dBFS
Channel Balance	0.016dB	@ 1kHz @ 0dBFS
Channel Phase	0.02 / 0.00 / 0.09	degrees at 16Hz / 1kHz / 20kHz
Group Delay	+180.0 / –14.4	degrees (1–20kHz / 20–1kHz)
Signal-to-Noise Ratio (No Pre-emph)	109 / 122	dB (unweighted/weighted)
De-Emphasis Error	0.003 / 0.012 / 0.20	at 1kHz / 4kHz / 16kHz
Linearity Error @ –60.00dB / –70.00dB	0.00 / 0.06	dB (Test Signal Not Dithered)
Linearity Error @ –80.59dB / –85.24dB	0.01 / 0.04	dB (Test Signal Not Dithered)
Linearity Error @ –89.46dB / –91.24dB	0.03 / 0.00	dB (Test Signal Not Dithered)
Linearity Error @ –80.70dB / –90.31dB	0.01 / 0.01	dB (Test Signal Dithered)
Power Consumption	0.27 / 28.86	watts (Standby / On)
Mains Voltage During Testing	239 – 251 volts	(Minimum – Maximum)
Digital Section	Result	Units/Comment
Digital Carrier Amplitude	87.98mV	Audioband
Digital Carrier Amplitude	1.14V / 1.09V	Differential / Common Mode
Audioband Jitter	1.9 / 0.011	nS (p-p) / UI (p-p)
Data Jitter	1.9 / 0.011	nS (p-p) / UI (p-p)
Deviation	+23.9	ppm
Frame Rate	44101.056	
Eye-Narrowing (Zero Cross)	10.0 / 0.056	nS (p-p) / UI (p-p)
Eye-Narrowing (200mV)	20.3 / 0.114	nS (p-p) / UI (p-p)
Absolute Phase	Inverted	Normal / Inverted
Bit Activity at Digital O/P	00	Where Fitted

Yamaha CD-S2100 (AES-17 Standard using 48kHz/24-Bit)


Digital Section	Result	Units/Comment
Out of Band Spurious Components	–117.554dB	
Suppression of Imaging Components	–106.345dB	(Worst Case)
Level Dependent Logarithmic Gain	0.037dB	
Intermodulation Distortion (1)	–113.064dB	18kHz/20kHz 1:1 Ratio
Intermodulation Distortion (2)	–114.797dB	41Hz/7993Hz 4:1 Ratio
Low Level Noise Modulation	2.730dB	Worst Case
Idle Channel Noise	–124.44dB	CCIR-RMS weighting
Signal-to-Noise Ratio	–124.297dB	CCIR-RMS weighting
Power Line Products	–118.349dB	50Hz
Non-Linear Interchannel Crosstalk (a)	–127.298dB	3kHz (2nd-order ref 17kHz/20kHz)
Non-Linear Interchannel Crosstalk (b)	–128.524dB	6kHz (3rd-order ref 17kHz/20kHz)
Non-Linear Interchannel Crosstalk (c)	–128.876dB	10.040kHz (2nd re 40Hz/10kHz)
Non-Linear Interchannel Crosstalk (d)	–110.779dB	10.080kHz (3rd re 40Hz/10kHz)
Absolute Phase	Inverted	Normal/Inverted

absolute polarity is pointless. If you do want to preserve absolute polarity when using the CD-S2100, you would have to swap over the wires at each of your speakers. (That is, move the wire going to the (+) terminal of the left speaker to the (–) terminal of the left speaker, then move the wire going to the (–) terminal of the left speaker to the (+) terminal of the left speaker. Then do the same for the right-channel speaker.) This will restore absolute polarity. Personally, I wouldn't bother.

Output voltage was about industry average, at a little over 2 volts, but the balance between the two channels was far better than average, at 0.016dB. Channel phase error was also very low, in fact at 1kHz there was absolutely no phase error between the channels at all.

Channel phase error was also very low, in fact at 1kHz there was absolutely no phase error between the channels at all.

De-emphasis errors were also very low, plus also show that Yamaha has correctly implemented the de-emphasis circuitry inside the CD-S2100. Many manufacturers omit (or fail to activate) this circuit, since modern CDs do not require de-emphasis. (But if you have CDs manufactured prior to around 1988, their sound will certainly benefit from de-emphasis circuitry.) Linearity errors were very low, as you can see in the tabulated result table, with the Yamaha returning perfect results at –60dB and –91.24dB and a worst-case error of only a tiny 0.06dB at –70dB. Mains power consumption is a fairly low 28.86-watts when the unit is operating, whilst in standby, it meets the current Australian standard by drawing only 0.27-watts.

To conclude, I can only reprise what I wrote in the very first paragraph of this test report, which is that overall, the Yamaha CD-S2100 SACD player performed brilliantly on the test bench.  **Steve Holding**

HEADLINES

The Newsletter of Len Wallis Audio

Winter 2015



TRIANGLE TOUCHES DOWN!



PANASONIC 4K
New Ultra HD TVs arrive

HEOS MULTIROOM
New wireless smarts for your home

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NAD'S NEW D3020 Hybrid Digital Amplifier has already received numerous accolades for its sound quality, feature set and amazing value for money. The sound experts at What Hi-Fi? Sound and Vision also recently awarded it five stars, saying the D3020 is unlike all other amps in its class.



Their comments included:

"A truly hybrid stereo amplifier, the D 3020 is an inviting prospect for anyone whose sole music system is a laptop or smartphone and has been too intimidated to join the world of hi-fi."

"It's a delightful, toe-tapping performance that really communicates the essence of the song."

"It attempts to deliver the best possible performance it can, and that's what makes the NAD such a likeable amplifier."

"Whether you're looking for a budget way to play your digital music, or want to take that first plunge into hi-fi armed with just a smartphone, the D 3020 is the ideal machine to drive your tunes."



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TRIANGLE NIGHT!
August 25th

Our special event will introduce this fine French speaker brand to our customers. Join us at our showrooms to hear what all the fuss is about!

See p19

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Full details on these fine French speaker ranges
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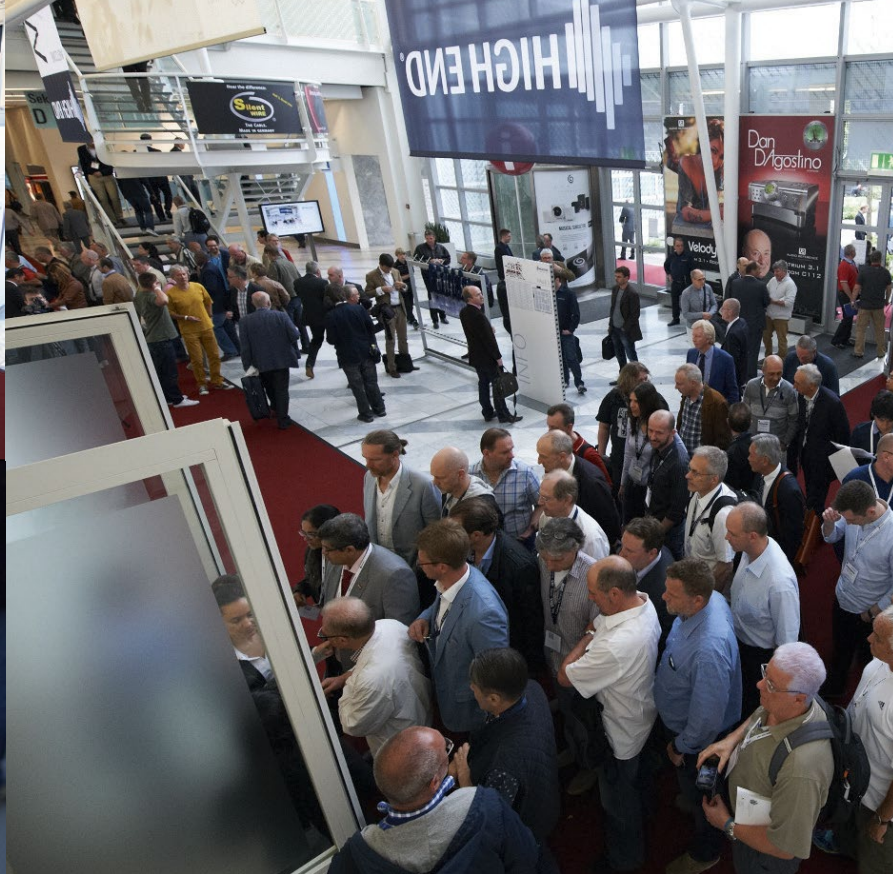

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LEN'S TRAVEL'S ABROAD



Munich High End

For years I have been hearing about the High End audio show in Munich, and this year I had the opportunity to attend. To say it was an eye-opener would be an understatement. Firstly the venue is ideal. Spread over three levels, the two upper levels feature spacious rooms where it was possible to get the best performance out of the equipment. If any of those systems weren't sounding up to scratch (and there were a few of them), they could not blame the venue.

Secondly I was blown away by the amount of quality equipment out there that I have not been exposed to. Despite my 40+ years in the industry there must have been a couple of hundred brands that I have never heard of. Admittedly there were some very weird and wonderful designs represented (and I predict that a proportion will not make it to next year!), but there were some extremely exciting offerings as well.

“

Many were cost-no-object designs – if you were looking for a \$50,000+ turntable you were spoilt for choice...

”

I was also impressed by the attendance. It was a large show, and it was very busy. On the second day (it was a four-day show) it was impossible to get into many of the rooms.

There were fewer surprises regarding the popular themes at the show. There was a plethora of new headphone and headphone amplifiers on show. Turntables were everywhere, many of the new brands being cost-no-object designs – if you were looking for a \$50,000+ turntable you were spoilt for choice.

Streaming was, predictably, the other hot technology, with numerous newcomers being added to what is becoming a crowded market. The vast majority of the rooms were using either digital music or vinyl as the source. The one technology that did take me a little unawares, though, was the continued re-emergence of the use of reel-to-reel tape machines as a source. While not prolific at the show, there were enough to stand out.

Show highlights

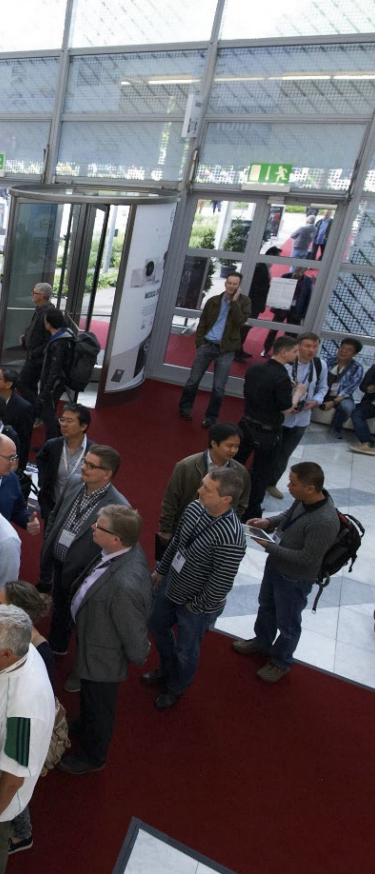
It was impossible to enjoy quality time in all of the rooms, but there were a few stand-outs in the ones that I did get the opportunity to spend time in (and there were a lot of them). The Meridian demo of their upcoming MQA decoding system was excellent – they took a 1950s' recording of Frank Sinatra and made it sound like he was in the room.

I realise that they are not yet available in Australia, but the new Response K8 speakers from British manufacturer Pro-Ac were superb. A very traditional design done very well.

For me the best sound came from a couple of unlikely sources. Both were open baffle speaker designs, the first from a company I had never heard of – Perfect8 Technologies – with their €100,000 loudspeaker called The Point. I was not overly taken with the design, and I am still trying to come to grips with the price – but the sound was excellent.

The other was from Australia's own Kryon Audio who were demonstrating their AU\$100,000+ Kronos system. Being newcomers to the show they were stuck in a small corner room on the ground floor, but they still produced one of the best sounds at the show. I can only imagine how they would have sounded in the larger rooms upstairs.

This was a very encouraging show. It highlighted the trend back to quality audio listening. The entire show was about music, with very little Home Theatre or Architectural Audio on display. This is a trend which is also being reflected here in Australia.





Enjoy the advantages of balanced headphone designs – or use a normal headphone plug... Musical Fidelity's new MX-HPA allows either connection.

Balancing Act

Over the years, Musical Fidelity has turned small format 'add-on' hi-fi components into an artform. Think X10D, X-Can, V-LPS, etc. – these and dozens more mini components like them have all offered small-form products that have achieved great success.

Musical Fidelity has recently announced an upgrade for its 'M1' Series, called the MX Series, and once again these are housed in smaller than traditional component-sized chassis – although this time the shape is a little more conventional. The first to arrive is the **MX-HPA** (above) – a fully balanced

headphone amplifier. While not many people have been exposed to balanced headphones, the technology has been around some time – US manufacturer Blockhead released a balanced headphone amp back in 2001, and a handful of others have followed suit since.

Balanced headphones are also thin on the ground, so Musical Fidelity is releasing the **MF-200B** (the B being for balanced) model. This will coincide with the release of a second balanced headphone amp, the lower priced **V90-BHA** – a new product which will join the even smaller, and very popular 'V' series of products.

In case you are concerned that the MX-HPA will not suit your existing headphones, MF has been smart enough to ensure that it will also accept conventional 6.5mm plugs.

The MX-HPA is due to be joined by the **MX-DAC**. Musical Fidelity has built a very enviable reputation for producing high quality yet very affordable DACs. Musical Fidelity was probably the first hi-fi company in the world to make a DAC, and has been making them ever since, but this is their first DAC with DSD. Like the MX-HPA above, Musical Fidelity has also embraced balanced technology with this unit, featuring both balanced input and output – along with RCA. The MX-DAC (left), like the MX-HPA above, sells for \$1,399, and represents exceptional value.



Finding a balance – Musical Fidelity will be releasing two balanced headphone amplifiers, the MX-HPA (above) and the V90-BHA, pictured here with the new MF-200B balanced headphones.



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Panasonic's 2015/6 TV range

If you have had any doubt about where technology trends in televisions are going, then wonder no more – 4K, or Ultra High Definition, is the future. It will continue to expand its dominance as the market continues to favour this new format.

We've seen this trend with all the major players in the last 12 months, and now with the arrival of the 2015/6 models from Panasonic in our showroom, it's more obvious than ever that 4K Ultra HD is clearly where the new baseline standard for televisions is headed.

In fact this year, for the first time, 4K models make up the majority of Panasonic's new range. There are 23 models across eight specification levels for 2015/6 and 60 percent of those come with Ultra High Definition!

CX models

As we drill down through the models, the big news among the new range relates to the CX models. Everything

with 'CX' in the model designation is 4K, including the CX700, and the show-stopper, the CX800. And there have been some key advancements over last year's models that give Panasonic some significant points of difference beyond the excellent picture that the company has been renowned for.

For the first time Mozilla's Firefox OS appears, as does quad-core processing, as do 800Hz/1000Hz refresh rates, which arrive on the more varied CX700 in a 50-inch (\$2359), 55-inch (\$2699), 60-inch (\$3299), and 65-inch models (\$3999).

Of course all of these CX models are a little different, each bringing different specs, sizes, and a separate sense of style to the series. The CX700 boasts an 800Hz Backlight Motion-Rate panel running at the UHD 3840x2160 resolution, as well as Panasonic's colour system "HEXA Chroma Drive", support for 4K over HDMI, and even with two HD tuners found inside the TV — you remember, for those of us who still like to watch free-to-air.



NETFLIX

The launch of Netflix internet TV and movie streaming in Australia hasn't missed the attention of Panasonic's product planners. Internet-connected Aussie entertainment lovers will no longer be forced to watch from the sidelines as their favourite shows premiere overseas and slowly make their way to our shores. The Netflix App is available right across the range of Panasonic VIERA Smart TVs. Panasonic users will have the best seat in the house, with a curated selection of popular movies and TV shows in high-definition, or even 4K where available, at their fingertips.

For the CX800 model there is an even faster refresh rate, jumping to 1000Hz and with a few more features aimed at making 4K look even better when you're upscaling, while also adding support for Bluetooth ancillaries. The CX800 is available in 55 and 65-inch sizes. We await word on pricing for these models, and availability – it's likely the CX800 will become available in August at the earliest. It will be an especially interesting television to experience, as the specifications claim to deliver an image quality closer to the ideal motion picture makers are looking for, using algorithms that are based on those used by Panasonic's film-based Hollywood Laboratory.

One promise is for more detailed blacks across scenes that are both light and dark via the 4K Studio Master Drive technology present in current models.

All of the 4K range will benefit from Panasonic's colour management technology, the HEXA Chroma Drive claiming to offer a much wider colour gamut, and using technology called "Super Bright Panel

There's also a potentially powerful 'TV Anytime' function, which lets you watch broadcasts (or recordings you've made on your television) using a smartphone or tablet app from anywhere around the world.

The speed also powers the new operating system for these televisions, developed in partnership with Firefox. In Panasonic land the operating system is called Firefox OS. This delivers all the applications you'd expect in a forward-looking Smart TV, including Netflix, YouTube, and a host of others. These apps can be easily mapped to your main screen *à la* smartphone or tablet.

Weather information? Yep, that can be shown at the top of the screen. True multi-tasking such as browsing web pages in a split window while you're watching TV? Done. This new picture-in-picture mode can also align two different sources to show video side by side, while a directional frame Panasonic calls 'Info Frame' allows you to view related TV shows, web pages,

weather and more, simply by pressing up, down, left or right with the remote.

Meanwhile, back in a 1080p world...

Although there has been a big push in the development of 4K format, Panasonic hasn't neglected the 1080p format, with some extensive updates here as well. All models in Full HD

1080p are designated as 'CS' models, including the CS650 available in 40-inch (\$1499), 50-inch (\$1799) and 55-inch (\$2199) sizes.

Even more price-friendly models are available with 'CS610' models landing with a 40-inch (\$1399), 50-inch (\$1499), 55-inch (\$1899), 60-inch (\$2499), and even a 65-inch (\$2999). There are even new smallish models available with the C400 delivering high-definition 720p in the 32-inch \$499 model, while the 40-inch is Full HD for \$899.



4K BLU-RAY ON THE HORIZON

It was a classic example of putting the cart before the horse – producing a technology, in this case 4K TV, which was so good that no-one had developed a source capable of feeding it. Admittedly there has been a limited amount of 4K material available from streaming services like Netflix and YouTube – which has not been much use to us living in Australia.

It appears that this may soon be rectified. The Blu-ray Disc Association has finally announced that it has completed the specifications for Ultra HD Blu-ray (4K) discs. This leaves the door open for manufacturers to start development of the players, and Panasonic has already announced that it has a unit in development.

The really good news is that for once there are no competing formats, a problem which seems to stifle the development of any new format in our industry. The players (you will need to invest in a new unit to play 4K discs) will be backwards compatible – i.e. they will also play standard Blu-ray, DVD and CD discs. Out of necessity the discs themselves will also be upgraded with the storage capacity being increased to a maximum of 100GB (compared to the maximum 50GB on Blu-ray).

The cry 'who cares' has already gone up – but we believe that there is a rosy future for this format, particularly as the software industry appears to be getting behind it. Online streaming of 4K will be difficult at the best of times, but given the delays in rolling out the NBN in Australia it is obvious that not many people could take advantage of the service even if it was available. Bandwidth caps will also be an issue – watching a season of a series such as 'House of Cards' will use up around 75GB of data. Plus given that most existing HD streaming broadcasts are compressed it is safe to assume that the same will apply to online 4K delivery. Finally none of this takes into account the enhanced sound formats that will be available on the disc.

We have our fingers crossed for delivery of units in time for Christmas.



Plus" to deliver stronger brightness without a higher consumption of power – the contrary, in fact.

Quad-Core and Firefox

Quad-core processors are in Panasonic's TVs across the CX range, their processing power supporting a highly refined 4K picture and faster, more powerful smart TV processing for a smoother user experience. The promise is to better enable users to enjoy high-quality, detailed images whether they are from web streams, broadcasts, Blu-ray or 4K feeds.



HEOS – a new evolution

The fascinating rivalry between SONOS and HEOS looks set to continue with the release of some compelling new products from Planet Denon. HEOS has unveiled a wireless multi-room speaker, a soundbar and subwoofer solution, and the HEOS Drive Multi-room Amplifier – and that's not all.

Bluetooth for all

A drill down through the specifications reveals that you can now add a USB to Bluetooth adaptor to almost any of the products in the range, and this allows for direct streaming from any Bluetooth-

The HEOS Drive offers eight channels of power to run four separate zones of HEOS music streaming, all from this single unit. It gives HEOS a presence in the custom install market.

endowed smart device. This is a significant development for the HEOS camp as prior to this you could only operate over Wi-Fi or Ethernet through the dedicated HEOS App. The addition of Bluetooth reception will allow HEOS owners to use absolutely any music app of their choice and beam the results point-to-point to a HEOS unit. Existing HEOS owners should be able to upgrade once the new firmware and USB dongle become available... no word on the price of this yet.

Go anywhere with the HEOS 1

The HEOS 1 will be the smallest of the HEOS ecosystem that began with the HEOS 3, 5 and 7 last year. This compact contender is available in black or white and weighs in at just 1.42kg.

This is where things start to get interesting and potentially difficult for its obvious competitor, the SONOS 1. The HEOS 1 has an optional "Go Pack" – which is HEOS-speak for a battery pack and splash-guard cover for the open connections AND complete portability too! This means you can take the speaker wherever you like – the 2600mAh battery will give a claimed six hours of playback. The HEOS 1 is also pairable with another HEOS 1 to run as stereo left and right channels just like the HEOS 3! No word on pricing yet but we expect it to be sub-\$400.

“
HEOS has unveiled a wireless multiroom speaker, a soundbar/subwoofer solution, and the HEOS Drive...
”





Sounds like a bar...

We were speculating about a HEOS sound bar when the original three HEOS devices were released last year, but the HEOS team was tight-lipped about any expansion in this space. We now know that the HEOS sound bar will be part of a package, with the inclusion of a wireless subwoofer – to be known together as the HomeCinema. It will offer all the HEOS music streaming abilities, adding decoding on board for soundtracks in Dolby Digital, Dolby Digital Plus and DTS, although interestingly it is configured to run in 2.1 configuration. Will they include a 5.1 set-up with two rear speakers in the future?

HEOS Drive – a multiroom amplifier

The HEOS Drive network multiroom amplifier is a four-zone, eight-channel multi-room amplifier which will cover

multiple HEOS zones with a single 2U-tall profile, rack-mountable chassis – this thrusts HEOS firmly into the custom install market. It offers similar capability to the HEOS Amp and HEOS Link and is spec'd for Class D amplification, includes active cooling, wired Ethernet input and pass-through and, given its capabilities, is super compact! It can operate four separate HEOS zones, all controllable from the HEOS app on smart devices. The 70W amp channels can be bridged for higher power, while extensive inputs (two optical, two coax digital, four analogue and four USB) are made available throughout the HEOS network. RRP of the Drive will be \$3490.



HEOS HomeCinema, a sound bar and subwoofer combination that retains all the music streaming abilities of other HEOS units.



Home Theatre Excellence on Sydney's North Shore

Creating bespoke home cinema entertainment solutions that fit within almost any room is something we've been doing for a long time at Len Wallis Audio. Whether it's concealed screens that

drop from the ceiling, a screen that emerges from cabinetry or a full-blown dedicated theatre room, our motivation is always the same – transform a space into the ultimate media complex, complete with sublime audio clarity and ultra-sharp

visuals that are elegantly installed so the client can enjoy that 'night (or day) at the movies' experience in the comfort of their own home.

This transformation journey was especially significant for the pictured home theatre installation that we recently completed at a residence on Sydney's North Shore. Our Senior Customer Division Consultant Alberto Vangi worked closely with the client, builder, architect and interior designer over almost two years of consultation, construction and refinement – this installation is an excellent example of what can be achieved.

There are a number of challenges to overcome in an installation such as this, and as is the case with all our projects, we apply the principles of careful design, planning, pre-testing, installation management and client consultation.

Room preparation is key to achieving a great cinematic experience. You can spend large amounts on equipment,



but it can all be wasted if you do not treat the room correctly first. For example, in this project a product called 'Wavebar' was used between the walls that lead to other areas of the house – this is a noise barrier material that offers superior acoustic transmission loss. Internal walls also had concealed acoustic panels, as did the ceiling, which has its own acoustic timber design of panelling for improved room acoustics.

On the visual side, a 4K projector was used in conjunction with a premium Schneider anamorphic lens. A Stewart StudioTek screen surface (widely recognised as a reference for home theatre systems) was used as the viewing panel.

The attention to acoustic room treatments allowed us to engineer incredible sound realism with the sound system. Part of the cinema magic comes from paying special attention to the positioning of the speaker locations so that they align correctly with prime seating positions. The sound system is extensive and comprises five front speakers (main left, right and centre, and also two upper effects for the left and right speakers). We then installed six rear effect speakers, plus two subwoofers at the front and two subwoofers at the rear.

The effect is true three-dimensional soundstaging – equal to some of the very best commercial configurations. You can tell you've done good work when the client says "I had goose bumps within seconds of playing a scene from a film" for the first time!

Control of the room is managed by iPad with Savant control systems installed. We included some clever features such as an "Anamorphic" button in the control interface to raise the screen masking and slide the lens into place, also adjusting the vertical stretch accordingly – essential for different format viewing. Just like it happens at the cinema.

Friendly features to improve usability are also important. We programmed a 'Movie Start' button which dims lights while closing windows and blinds. A 'Popcorn Break' button pauses the movie and ramps up the step lights to provide a path to the bar. And a 'Movie Finish' button turns on the house lights and opens the blinds.

As you can see from the photos, anything is possible with careful planning, design and installation. Talk to our custom installation team about an expertly designed home cinema experience tailored for you and your home.



The iPad control for this home theatre uses the Savant control system with special buttons for 'Movie Start', 'Popcorn Time' and 'Movie Finish'. The main equipment is kept out of sight (below) in a high-quality rack with ease of service access.





Spotlight on Stax

The current resurgence in headphone sales continues unabated, with people now gravitating to better and better units, and many discovering for the first time how good headphone listening can be. A general rule of thumb is that a good pair of headphones will give the same performance as a pair of speakers costing 10 times their value.

Coupled with this rise in popularity is a raft of new brands coming onto the market – many of them at the top end of the food chain. Despite this the undisputed performance leader is a company that

has been around for close to a century. The company Stax was formed in 1938 – although, in its early days it was a manufacturer of microphones, moving on to phono cartridges, tone-arms and then speakers.

The first electrostatic headphones from Stax were released in 1960 with the SR-1. Since then Stax has continued to redefine headphone performance. The good news is that over the last few years Stax has continued to push the boundaries of quality – but at the same time prices have fallen in real terms. Each set of Stax headphones, or ‘Earspeakers’

as Stax prefers to call them, consists of two components – the headphone itself, and the driver (or amplifier). While the components are interchangeable from model to model, Stax promotes a number of combinations or systems, of which we carry the four below.

1. SRS-2170 Basic System

This \$1,299 combination of the SR-207 Earspeaker and the SRM-252S driver (above) must be one of the best value-for-money headphones on the market.

2. SRS-3170 Classic system

A \$2,149 combination moving up to the SR-307 Earspeaker paired with the SRM-3535 driver.

3. SRS-4170 Signature system

A \$3,149 consisting of the SR-407 Earspeaker and the SRM-006tS vacuum tube driver. This is one of the most popular products that Stax produces.

4. SRS-007 MK2

This top-of-the-range pairing at \$6,999 consists of the SRS-007 Omega Mk2 Reference Earspeaker (far left) and the SRM-007t Mk2 vacuum tube driver with balanced outputs.

5. SRS-009 Reference

Beyond even the SRS-007, the astounding SHR-009 Reference Earspeaker sells for \$5,999, and can be paired with the SRS-007t Mk2 drive unit for an exceptional headphone experience.

We have long held the belief that few people who own Stax headphones actually intended to buy a pair. Most have simply had a listen out of a sense of curiosity – only to fall in love with them. Not convinced? Drop in and have a listen for yourself – but you have been warned!!

In the round – the very top ‘Earspeaker’ models depart from the classic Stax rectangular headshell. Left: the SRS-007 Omega Mk2, and right, the SHR-009 Reference model.



Triangle is here!



There must be something in the water (or wine!)

in France. They really know how to produce a very fine audio product. For decades we have been extolling the virtues of Focal loudspeakers. We have recently come across yet another great speaker brand to come from the same shores — Triangle.

Like Focal, Triangle is no newcomer to the audio scene. The company has been operating for more than 35 years (winning no fewer than 18 gold Diapason awards), but has undergone a recent change in ownership, and the new owners are pouring a small fortune into research and development. This has resulted in a number of new and very impressive designs, with more to come. And despite their obvious quality, the new ranges are also surprisingly well priced.

THREE SIDES OF TRIANGLE

While the brand has previously been available in Australia in very limited numbers, the new local releases are all models that we have not seen before. The initial release consists of three ranges: Magellan, Signature and Esprit. >>



Triangle Magellan

The pinnacle of the Triangle offering is the Magellan range, which includes these five models.



Cello

A 3-way 4-speaker floor-standing model. The finish quality of this range is impeccable.

\$19,990



Quatuor

Also a 3-way floor-standing speaker, this time featuring two tweeters in a bi-polar arrangement (one faces the rear of the room) and three bass drivers.

\$29,990



Concerto

The largest of the Magellan range to come to Australia. This is a seven-driver, three-way design, with both a tweeter and midrange driver facing the rear in a bi-polar array.

\$54,990

Duetto

A very high performance two-way bookshelf speaker.

\$9,990 (stands not included)



Magellan Voce

The matching centre channel for the other models here. Like all Magellan models, it's available in high-gloss black, high-gloss white, mahogany and bubinga (African Rosewood).

\$5,490



HORN TECHNOLOGY

Horn-loaded speakers have been around since day dot – Triangle have been utilising the technology for many years, they use it in all designs currently on the market, and we believe that they are the ones who use it to the best advantage. They have managed to present the openness that horn-loaded tweeters are renowned for, without the harshness that can be associated with it. The big advantage of horn-loaded designs

is efficiency, i.e. on any given amplifier the speaker will sound louder than a less efficient design. This means that it is not necessary to purchase an amplifier with a lot of power to get the best out of them. While like all good speaker designs it is still important to have a good quality amp, it means that high quality reasonably priced amplifiers like Musical Fidelity are ideal (this is a combination recommended by Triangle). They are also an ideal speaker to use with valve amplification.

The Triangle factory tour

Following the High End Audio show in Munich this year, I had the opportunity to visit the production plant of Triangle loudspeakers in Soissons in northern France. I believe that you can learn a lot about the soul of a product by seeing it in production.

Like many good speaker companies the premium models in the range are still produced in their own premises – in this case the Signature and the Magellan series. All other series are produced in China, with one important difference being that Triangle has their own staff based there to oversee production.

Even more impressive is that all development is still done in Soissons – no development work is outsourced, something that is becoming something of a trend at the moment. Triangle also designs all of their own drivers, something they have been doing since 1985. They believe that this gives them far greater control over the end product, rather than trying to make a combination of sourced drivers work in their designs.

I had the opportunity to watch the manufacture of some of these drivers. While it may seem a little old-fashioned, all the drivers for the Signature and Magellan ranges are very meticulously hand-built – the drivers they were working on at the time took 40 minutes per driver!

The most impressive aspect was the attention to detail. If you ever receive a faulty pair of Triangle speakers I would be very surprised. Every driver is individually tested (not one in 10, or one in 20, which is the normal practice) not only to ensure it works, but also to measure its frequency response. Every box that comes off the production line is also measured, and there are numerous tests in between those two events.

Triangle is one of a handful of speaker manufacturers with their own anechoic chamber. They believe this to be an invaluable asset. While not all manufacturers have access to an anechoic chamber, most major designers do, but in many cases this is a third-party chamber which has to be

booked on an hourly basis. When doing crossover design there is no greater luxury than time – things don't always fall into place as quickly as you may hope.

Another interesting part of the facility was the museum. Triangle has been at the forefront of speaker development for decades. For example their first speaker with the tweeter mounted on top – something very common today – was back in 1983. They were using curved sided cabinets back in 1990, and there was even a prototype of a baffle-less speaker from decades ago, a design that I found so appealing at the Munich show.

We have been lucky to watch the development of some local speakers over the years, including the excellent Axis 'S' Voicebox. But it was something of an eye-opener to witness the care and attention that one of the majors goes to. It is easy to assume that everything is mass-produced these days. With Triangle, nothing could be further from the truth.



"It is easy to assume that everything is mass-produced these days. With Triangle, nothing could be further from the truth."

Triangle Signature

While still being a relatively expensive range, the Signature speakers represent superb value for money, with much of the technology being a trickle down from the Magellan range. The Signature series consists of four models.



1
Theta
A high-performance two-way bookshelf design.
\$5,999

2
Gamma
The matching centre channel for the Signature models.
\$2,999

3
Delta
A four-driver, three-way floor-standing design. This speaker offers exceptional value, and internationally is the bestselling model in this series.
\$9,999

4
Alpha
The flagship of the Signature range, this is a five-driver, three-way floor-standing design.
\$13,995



Triangle Esprit

A brand new range, and obviously one that showcases the future direction for Triangle. This is an exceptionally well designed series, yet it is very competitively priced. There are six models in the range.



1
Titus EZ
Two-way bookshelf design.
Walnut \$1,399; High Gloss Black or White \$1,699

2
Comete EZ
Two-way bookshelf design.
Walnut \$1,899; High Gloss Black or White \$2,199

3
Heyda EZ
A wall-mount version of the Titus.
Walnut \$1,399; High Gloss Black or White \$1,699


 TUESDAY
AUGUST 25

TRIANGLE EVENT NIGHT – AN INVITATION

Triangle loudspeakers have arrived at Len Wallis Audio! We would like to invite you to our Showroom on the evening of **Tuesday the 25th of August from 6.30pm**, when we will be holding a special event to introduce the much-awaited French-manufactured Triangle loudspeakers.

The night will feature demonstrations of the best from this phenomenal-sounding loudspeaker product range, including the Triangle Esprit EZ, Magellan & Signature Series.

It would be an understatement to say that when we unpacked these gems and listened to them for the first time in our showroom we were unprepared for the impact. Every detail has been meticulously thought through, with each component being made from the finest raw materials resulting in a perfect marriage of technology and aesthetics.

Even better, the owners of Triangle also have a special partnership with famous French winery, Chateau Jean Faure. Special tastings of their wine will be available on the night.

We hope you will join us for excellent French wine and nibbles while you experience the Triangle loudspeakers.

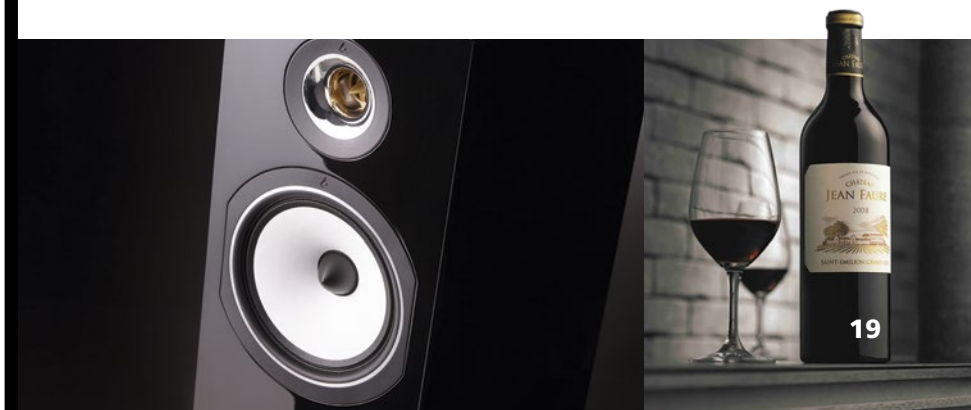
We will be restricting numbers, so please RSVP ASAP to meenak@lenwallisaudio.com.au or phone us on 9427 6755



4
Antal EZ
Three-way floor-standing design.
Walnut \$4,199:
High Gloss Black or White \$4,699

5
Gaia EZ
Three-way floor-standing design.
Walnut \$3,199:
High Gloss Black or White \$3,699

6
Esprit Voce EZ
Centre-channel speaker to suit the Esprit range.
Walnut \$999:
High Gloss Black or White \$1,199





Outside, a private dirt bike stunt track.
Inside, this superb two-channel hi-fi...

Two-channel Dream System

This recently-installed two-channel system for a client really was a 'dream team' combination of different components.

This client has always had a strong passion for music. He has enjoyed a variety of different systems in his time, and upon moving to a new property, one of the first jobs on the list was to build his ultimate

dream two-channel hi-fi system (although he has other interests as well, and an equal priority was building his own private dirt bike stunt track!).

The first piece of the music puzzle was the Naim HDX music server. The customer

had previously owned an Olive HD6. After bringing it in for a service one day we took the opportunity to see what new alternatives were about. The Naim HDX proved ideal, as the customer wanted a system that could store and play his extensive CD collection without requiring a traditional computer or even home network to set it all up.

After a brief time playing with the HDX, the customer was convinced by Naim's legendary quality. It wasn't long before we included the Naim NAC552 pre amplifier as well. Combined with the NAC552PSU, this was the top of their line at the time (only recently being dethroned by the Statement S1, featured in our last *Headlines* publication). Combining the preamplifier with the HDX (also with its own external PSU, the XPS Mk2), this created what we believe to be one of the best digital front-ends we'd ever had the pleasure of playing with.

For the power we wanted something capable of the speakers we had chosen (see opposite), and with the headroom to step up if required. So we went to the best. We looked at the Evolution 402e from Krell, but with a change on the horizon, we decided to wait for the new





COMPONENT LIST

Speakers: Focal Maestro Utopia III. Handcrafted in France. 'Imperial Red' finish. 116kg each.

Pre amp: NAC 552 pre amplifier with NAC552 PSU power supply.

Main source: Naim HDX: bit-perfect CD ripping to an internal 2TB hard drive and 24-bit/192kHz music streaming.

HDX power supply: Naim XPS Mk2.

Power amps: Krell Solo 575. 575-watt Class-A design utilising Krell's latest iBias technology. We have run dedicated 15amp mains circuits to power these.

Power supply: Torus CS16AVR regulated power supply. Power conditioning, voltage stabilisation and surge suppression.

Line filters: Dana Digital F1 15A AC line filters.

The rack: Finite Elements Pagode Master Reference. Walnut finish. Fitted with Cerabase isolation feet.

Amplifier plinths: Finite Pagode. Matching walnut, and also fitted with Cerabase isolation feet.

Cables: AudioQuest WEL Signature speaker cable. Solid perfect surface silver cable. 1.5m pair: AudioQuest WEL Signature DIN-XLR cable custom-made in the USA. Second custom-made AudioQuest WEL Signature DIN connector for the HDX to the Pre.

Mains cables: 4 x Dana Digital 15-amp with Dana's Silentpower block filter fitted to each

Solo 575 – the company's top-of-the-range 575-watt Class-A mono blocks.

The decision paid off. In his home we ran dedicated 15-amp circuits for these power amps and included two dedicated single-channel mains filters from Australian manufacturer Dana Digital. Handmade Dana Digital 15-amp mains cables were also used throughout this power section.

Music Maestros please

Our client had purchased his first set of Focals some years ago – a small pair of Chorus 705v standmounters (\$699) for the bedroom. He was impressed with their quality and performance, and told us that in the back of his mind he knew that French 'squiggle' of a logo would one day adorn his reference system.

We started looking at the Focal Scalas, but his change of property lent the luxury of a larger room. So we did the only rational thing to do in a situation like this – we jumped up to the Maestros. At 1.5m tall and weighing in at 116kg each, these are amazing speakers. And finished in 'Imperial Red', as here, they truly are things of beauty.

For the cables, the decision was easy. The client wanted something that would not only expose the true potential of the system, but would also be suitable for whatever level of equipment we might explore down the track. Basically, our thought was 'do it once, do it right'. So again we went straight to the top, with AudioQuest WEL Signature cables all round. And we had AQ custom-build the interconnects to utilise the DIN connectors favoured on the Naim equipment.

The rack to support this system was one manufactured in Germany by Finite Elements. This sculpture of a rack is built with fine detail and engineering, including one of the most amazing natural walnut finishes we've ever seen, while each shelf is supported from the main struts with a series of pin points, and each usable surface being an independent plinth of walnut, again floating on its own isolation spikes. Beneath each foot is Finite's Ceraball base, a miniature isolation device in itself. Each foot contains a series of ball bearings, making the overall contact between ground and system minute.

We are still exploring the options for a suitable turntable... the build continues!





Bose CineMate

We've recently refreshed our Bose line-up in the showroom and it's been enjoyable to familiarise ourselves with the CineMate range.

Bose has really set the bar high with this line-up. There is literally a model and price point for everyone. All of these units in the CineMate range take up very little space, are easy to hook up and sound absolutely superb.

Bose is known for its ability to almost magically create big sound stages from tiny systems – it's all part of the appeal. We have to remember, of course, that Bose is a research and development company, not just a company that concentrates on selling. They believe that the premise is to enjoy sound as well as convenience and ease of use.

The **CineMate 520** 5.1 surround sound system is one such unit which really performs well beyond the sum of its parts. There are five precisely angled speakers to fill your room with true surround sound. They utilise Bose Direct/Reflecting technology, and the angle of the transducers in the speaker

makes them sound like speakers many times their size. The speakers are compact and take up very little space – in fact they now feature a slimmer profile and can be mounted flush to the wall, so they match flat-panel TVs.

There is a wireless Acoustimass bass module, a small control console and a universal remote. This unit is flexible and future-proofed, so if you own an Ultra HD TV or upgrade to one in the future, you can easily add Bose sound. Also of interest

is the optional 'SoundTouch' wireless adapter which allows you to stream Internet radio, music services and your music library at the touch of a button over your home Wi-Fi network.

At just \$1999, this system is ideal for those looking for a home theatre solution that provides management of their entertainment ecosystem and a true surround-sound home theatre experience. Drop into the showroom to try the Bose CineMate range today!



The Bose CineMate 520 system – an entertainment ecosystem delivering true 5.1-channel surround sound.



The SoundLink Mini II
– same dimensions, easier
connections, added abilities.

Bose SoundLink Mini Bluetooth speaker II

Bose has a long history of unique and innovative audio products, and when the SoundLink Mini Bluetooth Speaker launched in 2013, it proved to be no exception.

From the time of launch it was a sterling sell-out success worldwide and very quickly became one of Bose's bestselling products in the company's history.

Even the most jaded of audiophiles could be impressed by what this little device could deliver. The sound quality and volume simply trumped everything else in the category by such a margin it really was the only choice for a quality sub-\$300 portable Bluetooth speaker.

Enter the MkII

Fast-forward to present day and the new SoundLink Mini II is surely going to continue the success of the original. Dimensionally it is identical to the original – the same go-anywhere compactness and

top-notch audio wrapped in a sleek 700-gram package, clad in scratch-resistant anodised aluminium.

However, Bose has included some welcome updates to the original design. The Mini II now works as a speakerphone when connected to your Bluetooth smartphone – a key function many thought was missing from the original. This makes it extra useful for home-office users and business travellers alike.

“
The SoundLink Mini II now works as a speakerphone when connected to your smartphone...
”

Even better, advancements in battery technology have boosted play time up to ten hours, and the Mini II can now be recharged using most USB power sources, as well as using the neat charging cradle that comes included.

An improved connection chipset means the Mini II can now simultaneously connect to two devices, such as a phone and a tablet, while also storing the eight most recently-used Bluetooth devices in memory to avoid having to pair up a device freshly each time.

It's also easier to make that initial connection thanks to new in-built voice prompts that help with the connection process.

Finally the Mini II now comes in a choice of two different finishes – the normal Pearl or the new Carbon Finish, which we think looks rather smart.

It's on sale now for \$299, and we have the new model available to hear in our showroom display.

Inside the DRAGON SERIES V



'hi, fidelity!'

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New Blue

Bluesound's new Pulse Mini

Among the new wireless multiroom offerings, this brand continues to find favour with our clients (and apparently this is reflected world-wide).

“
Bluesound is the result of collaboration between NAD and its sister company, PSB Speakers.
”

It is priced above both HEOS and Sonos, but it is still affordable, and considering the quality of the brand's manufacture and performance, the additional price is more than justified.

Many people are not aware that Bluesound is the result of collaboration between NAD Electronics and its sister company, speaker manufacturer PSB. With a heritage like that it is little wonder that the brand performs as well as it does.

The Pulse Mini is Bluesound's new lower-priced speaker unit offering. It features Bluetooth (with aptX if your phone supports it), an IR sensor (use it as a TV soundbar!), and it retains all the full Bluesound streaming abilities, which includes being capable of playing 24/192 resolution files.



BLUESOUND VAULT

Do you own a CD collection?

If so, do you own a Bluesound Vault? If not, why not? – unless you have already taken the plunge and invested in a Naim system!

We realise that we have pushed this barrow before, but to be honest we believe the Bluesound Vault to be one of the outstanding buys in this industry. It sells for \$1,799 – but look at what you get:

- Record your CD collection to the 2TB drive in the Vault – and then store your discs in the garage. The playback quality is CD player equivalent, but equally importantly access to your music has never been easier - the Bluesound interface is second to none.



- The Vault also gives you access to any number of streaming services, including Tidal, which has around 25 million tracks in its library – and can stream them all at CD quality.
- The Vault also gives access to the vast number of Internet radio stations around the world. While the quality of this service may not be great, there is a lot of fun to be had discovering new blues stations in France, or jazz from Poland.
- Move your music wirelessly around your home with the addition of one of the Bluesound wireless speakers.

As with many innovative products, the Vault is best understood by direct experience – so if you're not yet convinced, drop in for a demonstration!



Sennheiser Momentum 2.0

Along with the general trend to higher quality headphones, there is also a trend to convenience – mainly wireless. Sennheiser recently revamped its range of ‘RS’ wireless phones, primarily aimed at the TV market, but have now followed this up with a wireless version of the very popular Momentum head-

phone – which, as a bonus, also includes noise-cancelling. This is a comfortable, high-performance and relatively lightweight headphone that sells for \$799.

I believe that the recent CNET review summed this product up nicely when they commented “*the Momentum 2.0 is an excellent and well-designed Bluetooth headphone with active*

News Flash

By the time you receive this newsletter we will have received the first of the new ‘50’ Series Yamaha Aventure A/V receivers. At the time of writing there is no information available on this new series, the sixth generation of this very successful range. The Aventure Series represents the pinnacle of Yamaha’s A/V offering, and we will be covering their latest offering in detail in our next newsletter. In the meantime contact us for a very special price on the last of the ‘40’ Series: we still have a limited quantity of the RX-A740 and RX-A840 models left.

noise cancelling which also offers strong wired performance.”

However I was surprised at their single criticism – the price, which they thought was too high. I do not know of an alternative at this price which offers the same performance. Yes there are less expensive alternatives out there but, like most things in life, you get what you pay for.



AudioQuest Nighthawk

Given AudioQuest’s attention to detail with their renowned cable range, it was odds-on that when they announced they were going to manufacture a pair of headphones, they would be something special. I recently had the opportunity to listen to the final production model at the Munich High End show – and they did not disappoint, far

from it. For someone whose roots are firmly in cable design and manufacture, they are a great headphone company!

I think the recent comment by Stereophile’s Herb Reichert sums the Nighthawks up pretty well – “*The Nighthawks had me choking back tears of musical appreciation.*” Their price is \$899.





downside is that all ceiling cavities are different, and far from perfect. So the Beale Street speakers come with their own back box – indeed they would perform as well as a free-standing speaker as they do as an installed speaker.

The secret, though, is that this is not just a back-box but an integrated tuned enclosure, which Beale Street has called 'Sonic Vortex'.

This is a variation on a Ported Transmission Line design optimising air movement, a design many audiophiles would be familiar with.

Because of the limitations that most in-ceiling speakers suffer, their sound quality is often not discussed – they are regarded as a 'lifestyle' product rather than performance items. This is the first time we have heard an in-ceiling speaker which could be compared to a traditional bookshelf design – unless we are talking of designs that cost upwards of 10 times the price of this range.

And we were all taken back by the prices – for example the top of the line IC8-BB, which is an 8-inch 2-way design with a titanium tweeter and a carbon-fibre bass driver, sells for \$899 the pair. This is an exceptional speaker for the money. And to emphasise that that these are not just impressive-looking but cheaply-made, the Beale Street speakers come with a lifetime warranty.

In-Ceiling Stunners

The term 'game changer' is used very loosely these days – so when Beale Street Audio announced that it was releasing a new in-ceiling speaker that was a 'game changer', my first thought was 'who needs another in-ceiling speaker anyway?'. But we have now had the opportunity to listen to these speakers, and they are right – these speakers are different on many levels.

Let's get the downside out of the way first. They are very deep – 220mm – so they will not suit every installation. But the design of the Beale range is unlike anything that we have seen before. And without doubt this is the best-sounding range of in-ceiling speakers we have heard within 'cooee' of these prices.

Closing the back

The vast majority of in-ceiling speakers are open-backed, and rely on the ceiling cavity to act as a back-box – similar to the cabinet of a traditional loudspeaker. The

The Beale Street speakers uses proper back boxes and are quite deep, using 'Sonic Vortex' technology to achieve their impressive sound quality from in-ceiling speakers at these reasonable prices.





KRELL iBIAS CLASS A AMPLIFIERS

The radical new Krell iBias power amplifiers combine the musicality of Class A with high energy efficiency. iBias technology eliminates crossover distortion producing the low level detail, subtlety and spatiality of traditional Class A designs with almost limitless dynamics that is the hallmark of Krell's sound.

KRELL
THE LEADER IN AUDIO ENGINEERING



BERKELEY REFERENCE DAC

The highly acclaimed Berkeley Alpha Reference DAC takes everything this company knows about digital to analog conversion to a new level.

New multi-stage clocking and isolation technologies used in the Reference Series produce unprecedented imaging precision, timbral purity and resolution. Music reproduction that has immediacy, presence and stunning realism.


BerkeleyAudioDesign®



MUSICAL FIDELITY NU VISTA 800

The Musical Fidelity Nu Vista 800 sees the return of the iconic and hugely successful Nu Vista name to the Musical Fidelity stable. This amplifier is the pinnacle of Musical Fidelity's art. The Nu Vista 800 employs the nuvistor sub miniature tube with state of the art circuit design, PCB layout, SMD technology and programming to deliver finely detailed sound quality and massive undistorted power reserves.

MUSICAL FIDELITY



STAX SR 009 ELECTROSTATIC HEADPHONES

Stax are recognised as the world leader in Electrostatic Headphones. The SR 009 is the finest example of their work ever produced. The SR 009 feature a new ultra-thin element and breakthrough multi-layer electrode technology in a precisely engineered rigid lightweight aluminium enclosure. Designed to partner with the Stax 007t Mk.2 high performance vacuum tube driver unit, these Stax models are the ultimate in headphone technology and performance.

STAX



Peachtree Specials

THE PEACHTREE NOVA 125SE: The Nova 125SE is a 125-watt/channel integrated amplifier, DAC and headphone amp all rolled into one. It features five inputs – one analogue, two Toslink optical digital, one coaxial digital and a 24-bit asynchronous USB input to connect with your computer or laptop. It also features a switchable valve pre-amp buffer stage (part of the reason that this range is renowned for its warmth of sound) and a high quality headphone pre-amplifier. Now \$1,999 in black (down from \$2,299) and \$1,899 in Cherry or Rosewood.



PEACHTREE DEEPBLUE²:

This Bluetooth speaker has finally made it to the Australian shores. We have been watching reviews on this product and its predecessor come in from overseas for a couple of years now – and they have all been glowing to say the least:

- *"The best sounding Bluetooth speaker we have ever heard, period". – Hi-Fi+*
- *"Almost too good to be true". – CNET*
- *"...after testing somewhere between 100 and 200 Bluetooth speakers, I can say the deepblue² is my favorite." – about.com*
- *"I truly don't understand why the DeepBlue² sounds so good — and frankly, I'm not sure I care. Take my word for it — it just does. Get one." Part-Time Audiophile*

Etc! There are hundreds of Bluetooth speakers on the market. Some of them are very good; most are very bad. Even among the very good offerings deepblue² shines – this is a very substantial speaker with impressive sound, impeccable build, and a surprising \$649 price tag (many of its competitors are priced close to \$1,000).

MARANTZ HI-FI STREAMING

Streaming is a hot category at the moment, and Marantz has embraced it with gusto. The NA7004 streamer (now discontinued) was released in 2010, and was one of the first units of its kind on the market. We currently carry the NA8005 (\$1,450) and the superb NA11 (\$5,490).



These have now been joined by the **NA6005** (\$990) – released to complement the very popular PM6005 amplifier and CD6005 CD player. While it may not

quite have the performance of the more expensive NA8005, it does have a couple of features over its larger sibling which will appeal to many – namely the addition of Wi-Fi and Bluetooth.

The NA6005 supports hi-resolution audio playback, including 24/192 FLAC/WAV files and DSD. It also supports DLNA and AirPlay, Spotify Connect, and features a quality headphone amp and DAC.

RECORD CLEANERS

Along with the resurgence in vinyl

it was inevitable that people would also need ways to clean (and keep clean) their records. We have carried the SpinClean record cleaner (\$149) for some time now, and it has been extremely successful.

The SpinClean has now been joined by the Record Doctor Series V. Unlike the SpinClean this is a vacuum-powered device. Vacuum record cleaners all have one thing in common – they are expensive. The Record Doctor gets around this by having you rotate the record by hand rather than having this process motorised. It uses the same vacuum motor and vacuum cleaning strip as some of the more expensive cleaners out there, but instead of costing \$thousands, the Record Doctor sells for \$319.



REGA ELECTRONICS

We have been long-time supporters of Rega turntables (35+ years long). It was only natural that we eventually gravitated to their Phono Pre-Amplifier, the Aria. This is designed for use with both Moving Magnet and Moving Coil cartridges. \$1,799.

Project Cork It

Turntable mats have been always a big discussion point –

how they influence the sound. Common felt mats give a smooth contact between record and platter but have a disadvantage with static – felt mats often collect dust which can then be transferred to the record. Also their damping ability is very limited, which can be a problem with metal platters. Thick rubber mats overdamp the record and have an isolation effect which leaves the static on the record, and audible noise clicks are the result. By using cork, resonances are damped more effectively than felt, they keep dust away and they have also enough conductivity to avoid static. This is a very cost-effective way to improve the sound and have less noise caused by static and dust. You can hear a difference for only \$29!





SPECIALS		RETAIL	SELL
Arcam	rCube - Portable iPod Speaker - display model	\$798	\$599
	rPAC - USB Digital-to-Analogue Converter	\$299	\$229
Australian Monitor	AMPCS60 In-ceiling Speakers	\$318	\$199
B&W	HTM61S1 Centre (walnut) - Display model	\$899	\$699
	DS8 Rear Speakers	\$6,999	\$3,900
Bose	SoundTouch 30 Series 1 Wireless Speaker	\$899	\$699
	SoundTouch 20 Series 1 Wireless Speaker	\$549	\$399
	SoundTouch Portable Series 1 Wireless Speaker	\$549	\$399
Cocktail Audio	X-30 Network and Music Streamer	\$1,899	\$1,299
Bryston	BDA-2 Digital-to-Analogue Converter	\$3,199	\$2,399
	28BSSTCSQS 1,000 watt Mono Block Power Amps (Pair)	\$32,600	\$22,000
Electro Companiet	PI-1 Integrated Amp - Display model	\$2,999	\$2,299
ERA	PL24 Speakers	\$1599	\$799
	PL28.5 Speakers	\$1,998	\$999
Focal	SW800v Subwoofer	\$1,999	\$1,599
	Cache IC206 In-wall Speakers	\$999	\$699
	Spirit One Headphones	\$299	\$199
	XS 2.1 (Display only)	\$699	\$499
Kaleidescape	CD/DVD/BluRay server	\$4,999	\$3,800
Krell	S275 Power Amp - demo	\$7,699	\$5,999
	S550i 275 watt Integrated Amplifier	\$7,995	\$6,895
	S-350 CD Player - ex-demo	\$3,499	\$2,999
Linn	Sweetspot In-ceiling Speakers	\$429	\$329
Lehmann	RhineLander Headphone Amp - Display	\$799	\$599
Loewe	Air Speaker iPod Speaker	\$1,199	\$699

SPECIALS		RETAIL	SELL
Loewe	Sound Vision iPod Speaker - Display	\$2,299	\$999
	Sound Box iPod Speaker	\$899	\$499
	Reference Electrostatic speakers/Reference Subwoofer - demo	\$11,998	\$3000
Meridian	DSP5000 digital active speakers - demo	\$14,500	\$7999
	Director DAC (Display)	\$799	\$599
Musical Fidelity	M6Pre/M6Pwr Pre and Power amplifier combination	\$8,490	\$7,299
	M6i integrated amplifier	\$4,295	\$3,495
	M3I Integrated Amplifier	\$1,895	\$1,595
	M1Clic Music Streamer	\$1,999	\$1,499
	M1 PWR Power Amplifier - Display	\$1,499	\$1,199
	XT100/PSU Amplifier/Power Supply	\$2,499	\$1,599
NAD	M2 Direct-Digital Integrated amplifier	\$6,999	\$4,999
	T175HD AV pre-amplifier - Display	\$3,999	\$1,999
	Viso1 iPod Speaker - Display	\$699	\$399
Panasonic	BDT-300 Blu-ray player - demo	\$399	\$199
Peachtree	Grand Pre - demo	\$4,199	\$2,699
	Nova Pre Preamplifier	\$1,499	\$1,099
	Nova 125 Integrated amplifier - Display	\$2,149	\$1,499
	iDAC Digital-to-Analogue Converter - Demo	\$999	\$699
	Music Box/MB3 music system - with free Bluetooth adaptor	\$999	\$699
Perreaux	SLX2 Line Stage Buffer	\$999	\$499
Proficient	AW830 Outdoor Speakers	\$1,199	\$899
	AW650 Outdoor Speakers - Black Only	\$799	\$599
	AW525 Outdoor Speakers	\$599	\$399

SPECIALS		RETAIL	SELL
Proficient	AW400 Outdoor Speakers	\$499	\$299
	R800 Sandstone 'Rock' Outdoor Speakers	\$795	\$499
	R650 Sandstone 'Rock' Outdoor Speakers	\$595	\$429
	C645 In-ceiling Speakers	\$849	\$499
	C625 In-ceiling Speakers	\$549	\$299
	C610 In-ceiling Speakers	\$399	\$249
	W850 In-wall Speakers	\$995	\$549
	W800 In-wall Speakers	\$899	\$449
	W670 In-wall Speakers	\$499	\$299
	PS10 10" 225watt Subwoofer	\$799	\$499
PS Audio	UPS1500 Power Supply - demo	\$1,499	\$950
Pure	Sensia 2000 DAB+ Network Radio - Demo model	\$499	\$399
	Highway	\$199	\$50
QED	MultiQ IS Multi-room System	\$1,696	\$499
Speakercraft	SLS One on-wall speakers (pr)	\$1,198	\$499
	SLS Two on-wall speakers (pr).	\$2,798	\$799
	Aim10 One 10" in-ceiling speakers	\$2,499	\$1,199
	Profile CRS3 in-ceiling speakers	\$449	\$149
	WH5.5R in-ceiling speakers	\$349	\$269
	Accufit CRS7 One slim in-ceiling speakers	\$499	\$349
	AIM7 MT One in-wall speakers	\$599	\$399
	Accufit IW7 One slimline in-wall speakers	\$550	\$399
	OE5One Outdoor speakers	\$499	\$299
	OE5Three Outdoor Speakers	\$699	\$499
	OE8Three Outdoor Speakers	\$1,099	\$799
	Ruckus 5 Outdoor 'Rock' speakers	\$599 ea	\$399 ea
Tantra	Model 1 speakers	\$498	\$299
	Triple LCR (left-centre-right all in one cabinet)	\$999	\$499
Tivoli	Networks DAB+ radio, including additional speaker - Demo	\$998	\$699
Yamaha	MCR-B142 (Green)	\$499	\$399

The above equipment is available as we go to press at special pricing – this includes units used for display and demonstration (as marked on the list below). Availability is limited, so call us first to avoid disappointment! – 02 9427 6755.

YES – THE PART THAT YOU'VE ALL BEEN WAITING FOR...



LWA is now on Youtube!

Where do you go to check latest happenings, unboxings, reviews and interesting things from the world of Audio, Visual and Home automation? To our new Youtube channel, that's where.

We'll also be kicking off with "Wired" – a channel within a channel where we'll be conducting one-on-one interviews with industry manufacturers and experts. Plus look out for segments on emerging developments, how-to videos, tech talk and much more.

Don't forget to subscribe to our channel.

www.youtube.com/user/Lenwallisaudio

Bluestream DAC for TVs



One of the few disadvantages of the current crop of next-gen televisions is that OEMs seem to be dropping analogue connections. All well good for some, but what about connecting existing gear?

The Bluestream DAC11AU is the answer. Designed to convert digital audio signals from coaxial or optical inputs, its outputs are simultaneous so audio can be distributed to multiple locations. The DIG11AU supports sample rates of 32kHz, 44.1kHz, 48kHz, 96kHz and 192kHz up to 24-bit resolution. Enjoy enhanced sound reproduction and an easy plug-and-play solution, all for just \$59!



Introducing the all-new

79 series

WIRELESS, LIMITLESS.



PANDORA

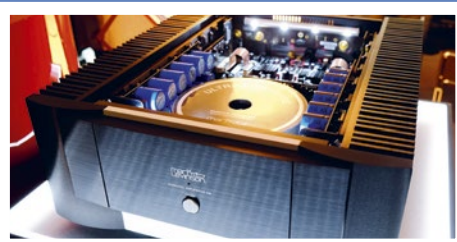
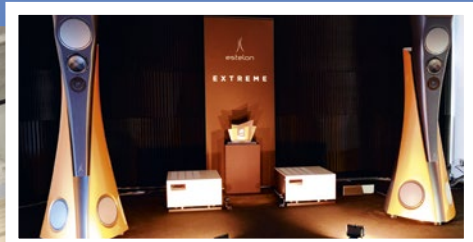


Bluetooth®



YAMAHA

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HIGH END 2015

Edgar Kramer reports
the latest news from
the world's greatest
high-end audio show



MARTEN DUKE 2 LOUDSPEAKERS

Ceramic speakers deliver
superb transient speed,
soundstage and tonality...

esoterica
ON TEST



MARTEN DUKE 2 LOUDSPEAKERS

The Scandinavians have always had a flair for unpretentious elegance, drawing in the eye with a seemingly effortless aesthetic simplicity. At one end of the scale is Sweden's Ikea, the mass-market homewares global success story, with its multitude of strangely-named, unfussy-design products. At the other end you have that country's jaw-dropping Koenigsegg Agera advanced supercar with its organically fluid lines, and devastating performance (0–100km/h in a mind-boggling 2.8 seconds!).

PRECIOUS CERAMIC

The two-way Duke 2 also features ingredients that take it beyond your run-of-the-mill stand-mounter. It's quite a deep design, with non-parallel cabinet walls all-round. The front baffle angles backwards while the sides are tapered inwards towards the rear panel, forming a trapezoidal shape.

Marten has been using high-quality ceramic-coned drivers from German manufacturer Accuton for some time now and the Duke 2 is no different. The ceramic driver concept goes back

to the early to mid-1980s when Bernard Thiel (no relation to the US-based speaker manufacturer of the same name), back then an engineer with Backes & Müller, designed his first drivers using hard natural materials such as corundum, a form of sapphire. Thiel subsequently went on to form his own company—Thiel & Partner

GmbH—which has evolved into what is now known as Accuton.

So here we have Accuton's 25mm diameter ceramic tweeter and a 180mm diameter ceramic mid/bass driver placed in a rather solid rear-ported enclosure constructed entirely from 23mm-thick medium density fibreboard (MDF), the outside of which—at least on my review sample—was covered with a stunning, glossy walnut real-wood veneer, but if you're not a fan of walnut, Marten offers a plethora of veneer options, with either gloss or matt finishes. The single speaker binding posts are high-quality

WBT models while internal wiring is from high-end cable specialist (and fellow Swedish manufacturer) Jorma Design.

Marten specifies the Duke 2 as having a frequency response of 38Hz to 40kHz $\pm 3\text{dB}$ —a respectable range for a stand-mount design. Sensitivity is quoted as 88dB SPL/W/1m while the impedance is said to be nominally 4 Ω ohms (3.7 Ω minimum), all of which points to ease-of-drive for a good-quality mid-powered amplifier of any technology. The second-order crossover point between the drivers takes place at 3kHz, and the crossover itself features high-quality components including low-loss copper-foil coils and silver/gold/oil Mundorf capacitors.

DUKING IT OUT

Accuton's ceramic diaphragms are extremely light and the implementations I've heard in a number of different designs have generally exhibited a resultant fast and detailed sound. No surprise here then that the Duke 2 provides a sonic signature bearing those very same traits. Fast fingers on steel guitar strings showed what these drivers can do best. There's an ultra-clean handling of transients at the notes' leading edge and a delivery of profound levels of detail that can become addictive. You will find yourself searching through your collection for music with plentiful transient attacks and richness in the minutiae of micro-detail just to hear the Duke 2s deliver them. Those qualities follow through to a satisfying by-product—that of excellent separation.

“

Ultra-clean handling of transients at the notes' leading edge and a delivery of profound levels of detail that can become addictive

Marten—not a Nordic denizen but the Swedish loudspeaker manufacturing company—carries its region's tradition of understated beauty and solid engineering into its products. Here we have the Duke 2—the entry point of the mid-level Heritage range—an elegant mid-sized sharp-angled stand-mount dressed in an oh-so classy gloss veneer. And design aside, these stand-mounts have the promise of high performance; they come from a company that has the engineering gravitas to produce the state-of-the-art half-a-mill-US\$ Supreme 2 statement tour-de-force.

Dense musical passages or complex multi-tracked modern recordings exhibit clean and obvious delineation between strands and this makes it easy to follow various lines of vocal or instrumental musical structures. A minor condensing or congesting which presents itself in the upper mids/lower highs along with a subtle reticence in that area makes for a polite presentation—this is a subtle effect and in some systems, especially those with forward-sounding sources and amplification, it could actually restore a satisfying balance.

The bass register is rich and surprisingly ample. That ceramic bass/mid driver punches solidly with kick drum, in particular, attacking quite powerfully and with bass notes, be they acoustic or electric, having a boogying sense of rhythm and pace. The prowess in the bass is carried up into the midrange, especially in the lower mids, where the Duke 2's rendition of voices and instruments is excellent—all come across with good body and heft. Dynamics are quite good for a speaker of this size and this is seemingly augmented via the Duke 2's superb handling of transients. The speakers' noise floor—no doubt due to the well-designed crossover network—is also very low, as exhibited by the silences between notes and the overall ease in the musical event.


Speaking in general terms, stand-mount speakers tend to image and soundstage extremely well, so I was not surprised that the Martens performed brilliantly in both these areas. The Duke 2s are able to 'disappear'... whilst at the same time produce a vast soundfield that stretches laterally and with good soundstage depth. Of note is the angled baffle's ability to project an image with an appropriate height—singers have realistic stature rather than hovering just off floor level.

Over the years, I have reviewed and auditioned speakers with all manner of high-frequency transducers, ranging from cloth, titanium, beryllium and diamond domes to exotic ribbon and air motion transformer units... but this was the first time I've reviewed a pair of speakers that had ceramic tweeters, and I can report that the outcome was most enjoyable. The Duke 2's tweeters' sound is sweet, reasonably extended and possessed of a beautiful



tonality. There was no trace of harshness or imbalance—traits that, rightly or wrongly depending on the design, have sometimes been associated with this type of driver. Of course, I've already talked about the detail and speed and those are firmly wedded to this high-frequency driver's design, and indeed these attributes are mirrored by the mid/bass unit which, aside from keeping up with the tweeter's qualities, integrates quite seamlessly with it. There have been considerable crossover design and tweaking skills applied here.

CONCLUSION

The Duke 2 is a highly refined transducer with a consistent set of satisfying qualities across important performance criteria, namely, detail, transient speed, soundstage and tonality. Audio performance is high and, given the form factor and the choice of veneers and finishes, it will suit any appropriately-sized environment, be it classic or contemporary.  **Edgar Kramer**

MARTEN DUKE 2 LOUDSPEAKERS

Brand: Marten
Model: Duke 2
Category: Stand-mount Loudspeakers
RRP: \$11,290 (matt finishes)
Warranty: Three Years
Distributor: Absolute Hi End
Address: PO Box 370 Ormond VIC 3204
T: (04) 8877 7999
E: info@absolutehiend.com
W: www.absolutehiend.com.au



Detail, soundstage
Tonality & transient speed
Fit 'n finish



Single set of binding posts
Three-year warranty

LAB REPORT: Turn to page 79
Test results apply to review sample only.

MARTEN DUKE 2 LOUDSPEAKERS

LABORATORY TEST RESULTS

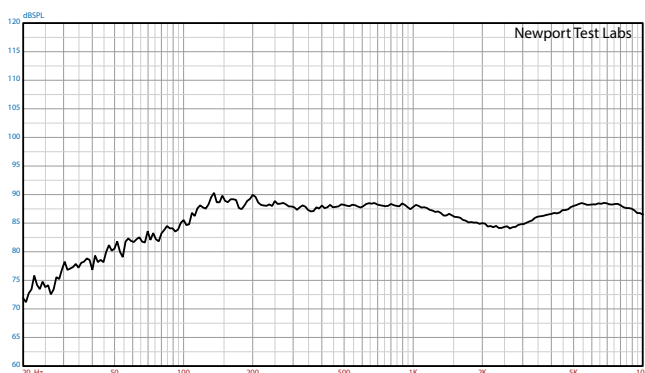
Graph 1 shows the Marten Duke 2's in-room frequency response when tested using a pink noise test stimulus. The graph has been limited to 10kHz in the high frequencies (see Graph 2 to see the high-frequency performance), and you can see that the Duke 2's response extends up to that imposed limit from 83Hz within ± 3 dB. The low-frequency response rolls off below 130Hz but is very flat from 130Hz up to 1kHz, where there's a fairly wide trough

that bottoms at 3kHz followed by a rise to nearly reference level at 5kHz, where it remains until 7.5kHz before starting to roll off with increasing frequency.

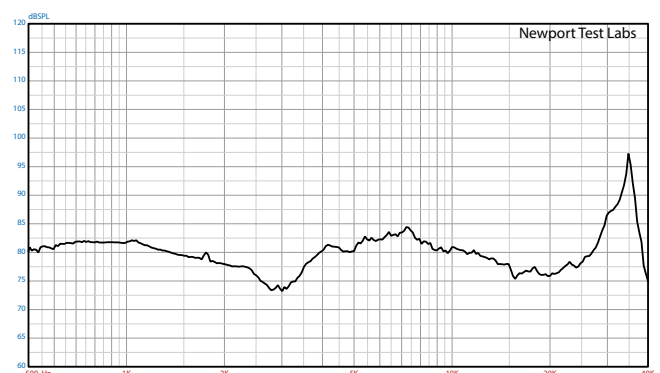
High-frequency performance of the Marten Duke 2 is shown in detail in Graph 2, via a gating technique that simulates the response that would be obtained in an anechoic chamber. This also shows the trough at 3kHz and that the roll-off that starts at 7.5kHz continues its downward progress until it reaches 20kHz, at which point

it starts rising to the tweeter's resonant frequency at 35kHz. Across this graph, the Marten Duke 2's response is around 500Hz (lower measurement limit) to 30kHz ± 3 dB.

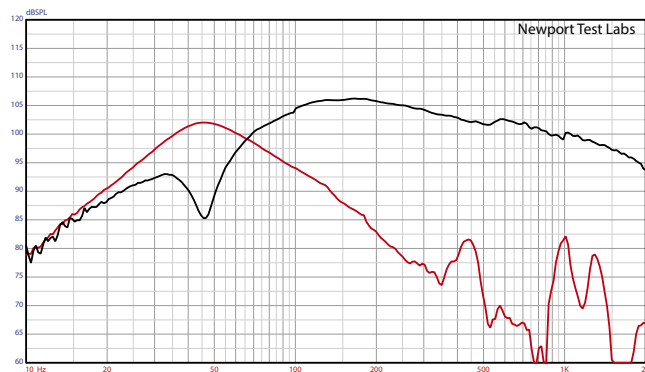
The low-frequency performance of the Marten Duke 2 was measured using the well-accepted near-field microphone technique, slightly compromised in this instance because of the presence of a non-removable metal mesh over the woofer/midrange cone that prevented ideal positioning of the microphone.



Graph 1. Averaged frequency response using pink noise test stimulus with capture unsmoothed. Trace is the averaged result of nine individual frequency sweeps measured at three metres, with the central grid-point on-axis with the tweeter. [Marten Duke 2 Speaker]



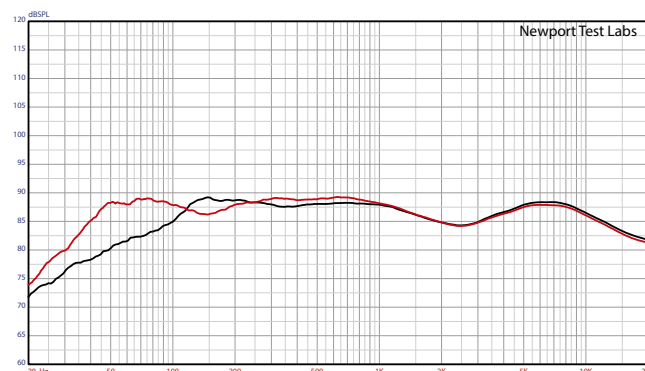
Graph 2. High-frequency response, expanded view. Test stimulus gated sine. Microphone placed at three metres on-axis with dome tweeter. Lower measure limit 500Hz. [Duke 2]



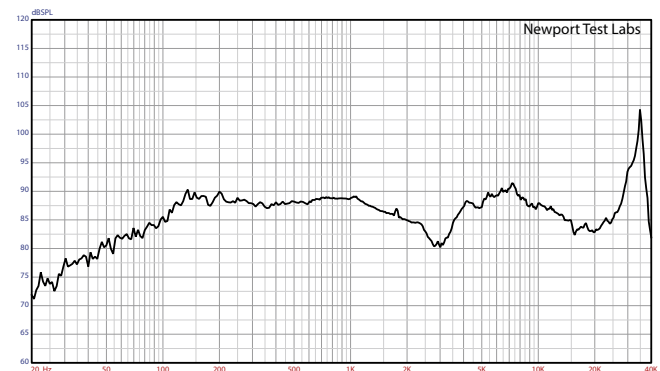
Graph 3. LF response of rear-firing bass reflex port (red trace) and woofer. Nearfield acquisition. Port/woofer levels not compensated for diff radiating areas. [Marten Duke 2]



Graph 4. Impedance modulus of left (red trace) and right (yellow trace) speakers plus phase (blue trace). Black trace under is reference 5-ohm precision calibration resistor.



Graph 5. Low-frequency response showing effect of placing rear of speaker 10cm from a rear wall. Black trace shows in-room low-frequency response with speaker on stand three metres from rear wall. Red trace shows in-room low-frequency response with speaker on stand 10cm from a rear wall. [Marten Duke 2 Loudspeaker]




Graph 6. Frequency response. Trace below 1kHz is the averaged result of nine individual frequency sweeps measured at three metres, with the central grid point on-axis with the tweeter using pink noise test stimulus with capture unsmoothed. This has been manually spliced (at 600Hz) to the gated high-frequency response, an expanded view of which is shown in Graph 2. [Marten Duke 2 Loudspeaker]

Nonetheless we can see that the driver's response is very smooth and controlled, with the low-frequency roll-off commencing at 130Hz, to its minima at 46Hz. The output of the rear-firing bass-reflex port peaks at 46Hz to compensate for this minima, and rolls off smoothly either side, to be 6dB down at 28Hz and 80Hz. This is exactly in line with the driver/cabinet alignment, but a fair way from Marten's specification for the Duke 2 of 39Hz. There's a little high-frequency leakage through the port at 450Hz, 1kHz and 1.3kHz, but it's all at very low levels and therefore unlikely to be audible.

The impedance of the Marten Duke 2 (Graph 4) is very well-controlled and fairly high—mostly maintained above 8Ω, dipping to 5Ω at 180Hz and just below 5Ω between 6kHz and 10kHz. The impedance rises from 10kHz to 40kHz, which is good design technique. The two resonant peaks

expected from the bass reflex cabinet design occur at 24Hz and 72Hz. The pair-matching of the left and right speakers is outstandingly good, with only a very slight disparity evident on the lower of the two resonant peaks. Phase angle is also well-controlled with less than a $\pm 60^\circ$ swing over the graphed range. Although this is a perfectly standard impedance trace, the graphed impedance doesn't seem to align with Marten's specifications for impedance, which puts the Duke 2's nominal impedance at 4Ω and its minimum impedance at 3.7Ω.

As everyone knows, the low-frequency performance of any loudspeaker is affected by where in the room it is placed. This is illustrated for the Marten Duke 2 by Graph 5, which shows a third-octave-smoothed in-room response with the speaker on a stand positioned three metres from a rear wall (black trace) and on the same stand

but positioned so the rear of the speaker was 10cm from a rear wall (red trace). You can see that the proximity of the rear wall lifts and extends the low bass such that it remains useful right down to around 38Hz, with the only penalty being a minor suck-out at around 150Hz. Graph 6 shows the overall response of the Marten Duke 2, as measured by *Newport Test Labs*, obtained by using post-processing to splice the in-room pink noise low-frequency response (from Graph 1) to the gated high-frequency response (from Graph 2). This shows an overall frequency response of 45Hz to 28kHz ± 5 dB. Marten's specifications (38Hz to 40kHz ± 3 dB) would seem to show that in order to obtain its figures, it also positioned the speaker close to a rear wall to maximise bass performance (as outlined in the previous paragraph and shown in Graph 5), and ignored the resonant peak in the tweeter (which it's entitled to do under European measurement ruling IEC 268-5). *Newport Test Labs* measured the sensitivity of the Marten Duke 2—using its standard stringent test methodology—as being 84dB SPL at one metre for a 2.83V_{eq} input, which is quite low—though not unexpectedly so—for a small two-way design. But it is a lot lower than Marten's specification of 88dB SPL. Given this measured result, I would suggest the Marten Duke 2 would benefit greatly from being driven by a powerful amplifier, but due to the relatively high overall average impedance, it's not current-hungry, so any good-quality amplifier would be up to the task and Class-D amplifiers particularly well-suited. 

Steve Holding



High-End Performance without the high-end price tag!



We are proud to introduce the **Rhyme Acoustics** brand to Australia.

Rhyme Acoustics speakers and amplifiers are built to extremely high specifications incorporating the best quality components and materials to satisfy the most discerning enthusiast.

They deliver music and home theatre performance normally reserved for much higher-priced components.

Rhyme Acoustics P-series speaker features include:

- Heavy MDF enclosures, internally braced and insulated with spike feet on floor-standing models
- True ribbon tweeters on all models giving flat response and amazing detail right up to 40kHz
- Lightweight aluminium-cone drivers with cast aluminium frames for phenomenal dynamics
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High End Munich 2015

How does one discern what's to be reported from vast oceans of high-end exotica from all corners of the globe, especially given the encouragement of the surprisingly decent room acoustics at the High End Munich Show? The answer is that one covers as much ground as possible, pen and pad in hand, listens intently, takes notes and hopes that slivers of brilliance will cut across the homogenous shadows.

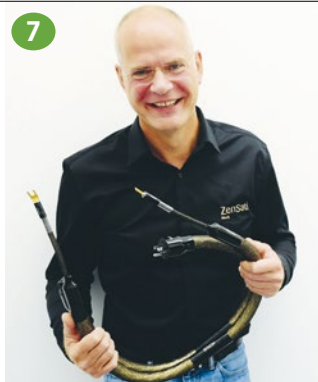
Most systems engaged me in some way or another but I was also impressed by the wise system choices, skilled room set-ups, and selections of demo music. A few exhibits were especially popular with the punters—an educated audience—in terms of bums on seats, which made photography somewhat of a trial. Interestingly, it seemed to me that there was a correlation between ascending system cost and descending illumination levels, which presented a further pictorial challenge. My trek started with the static display/meeting room exhibits, where the affable Fleming Rasmussen and partner in **Gryphon** Valdemar Boersting (1) ran me through its new products while proudly informing me of the company's milestone 30th Anniversary

Report and images by Edgar Kramer

celebration. Founder Rasmussen told me a new integrated will be called the Diablo 300 and it features a new micro-controller system for the very important, in terms of sonic impact, 43-step relay volume control. The new Diablo replaces its 10-year-old predecessor and is a powerful 300-watt (into 8Ω) amplifier and can provide up to 950 watts into 2Ω. 'A large dual mono Holmgren transformer and a storage bank with multiple capacitors forms the massive power supply. The Diablo 300 is a zero negative feedback high Class-A/B bias design with military-grade dual layer circuit boards and many of the short path circuit layout strategies that we applied in the Mephisto and Pandora products,' explained Rasmussen. Optional modules can be added for vinyl playback via an MM/MC phono stage and on-board digital playback can be added via the DAC board which offers five digital inputs (including a high quality USB) of up to 32/384kHz and DSD resolution.

Audio icon **Dan D'Agostino** (2) has expanded his company's range of products with a high-end all-in-one media player and amplifier, the





MLife. The gorgeous unit, styled in the Momentum copper-flanked chassis, features a bright 13cm LCD touch-screen for added functionality. D'Agostino has also developed an app to control such conveniences as volume adjustment, input switching and display colour selection (for matching to other components' colour schemes). A neat feature is the now-almost-iconic Breguet-style central dial's pointer, which moves up or down in concert with manual adjustments on the app's volume control. Nice. The MLife is a streamer with Apple Air Play and Bluetooth connectivity, USB input, UPnP hard drive connectivity and the unit accepts files from USB thumb drives. It has a built-in digital-to-analogue converter with up to 32-bit/192kHz PCM/DSD resolution while streaming services such as vTuner and the new full resolution Tidal are available with more coming soon. The amplification stages are the same as the Momentum integrated amplifier and 'we've included two additional high-quality transformers, aside from the main transformer and we've taken considerable measures to shield the analogue section from any

potential interference from the touch screen, Bluetooth and wireless systems,' said D'Agostino. Available in August 2015 it's slated at US\$48,000. Also on display were a new phono stage (3) and a lower-level amplifier range.

Thrax (4) featured the new Teres hybrid transformer-coupled amplifiers and Lyra speakers, all aluminium enclosed two-ways with interesting cabinet design and as company principal Rumen Artarski told me: 'the speaker features pressurised and damped panel coupling and a baffle machined from a 60mm solid aluminium panel which has been optimised around the tweeter area by way of a proprietary profile flared shallow horn.' Also on debut in this room was the Döhmman Helix 1 turntable (5) from Mark Döhmman. The system sounded tonally accurate and head-spinning-powerful. Döhmman played the track of the show, Mad Season's *Artificial Red*. Just wow!

Wilson Audio (6) once again exhibited with dCS and a full dCS stack of digital goodness mated with VTL monos and Wilson Alexia speakers. The bass was deep and powerful while

the tonal qualities were slightly tipped towards the brilliant side of the spectrum. This made for a fast, detailed and nuanced sound.

The ever-jovial Mark Johansen (7) showed the new cable products from **Silenzio**, sister company to ZenSati, featuring distinctive cable geometries and aesthetics. The new products are a follow-on from ZenSati's top cables and as Johansen put it: 'I wanted to change the fundamental structure and ideas behind the Seraphim and used a Litz construction with silver-plated copper core surrounded by super-thin threads of copper and silver-plated copper. Again, an air dielectric and, via a request from Asia, an improved mechanical damping characteristic to the entire structure.' Silenzio exhibited with Viola Labs Sonata preamp (full app control) and Crescendo amplifier, Ocean Way Sausalito speakers and Artesania racks.

Canadian giant **Paradigm** (8) showed a prototype of a soon-to-be-released flagship speaker for the time being known as the 'Concept 4F'. It sounded big, dynamic and marginally forward while filling the large room with sound—not surprising seeing the enormously-over-engineered internal twin bass drivers.

Marketing Manager Erin Phillips: 'we designed and fabricated all the drivers... even the unique speaker grilles have been customised to control dispersion while the patterned perforations aid phase alignment.'

Mark Levinson (9) showed the new No 536 monobloc power amplifier.



As Todd A. Eichenbaum Director of Engineering explained, *'the amplifier is a high-bias Class-A/B. The power supply is placed directly on top of the output stage for a very short path-way, each output stage has an inverting and a non-inverting section which allows us to draw symmetrically off the filter capacitors... it uses the power stored very efficiently...'* The all-Mark Levinson system ran giant Everest DD66000 speakers (10) in a new gloss white finish.

KEF's (11) was one of the largest exhibits in which the Blade Two was on show in matt blue livery powered by relatively humble Arcam electronics. From my limited exposure to both the Two and the original Blade, the newer sibling displayed a marginally smaller scale but a more satisfying openness, tonal balance and dynamic contrast.

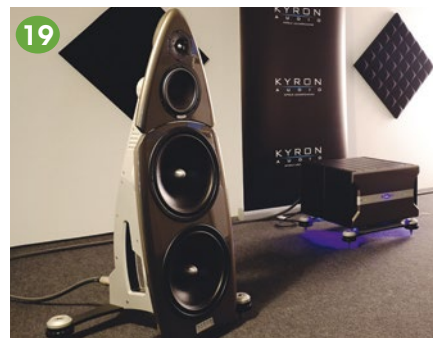
The highly-anticipated 3-way S7 (12) from **Magico**, featuring bespoke Nano-tech drivers, got its airing at Munich. The room was always crowded and rightly so... the sound here was full and nuanced while the speakers' bass frequencies were nothing short of stunning. Ditto the finish!

At a filled-to-the-rafters press conference **Naim** and **Focal** respectively announced the new DR range of amplification and Sopra (13) speaker range to fit below the Utopia line. The new Naim DR (Discrete Regulator) circuit, a trickle-down technology from the Statement flagship that finely tunes the power supply for specific applications, will feature in all new Naim amps. The Focal Sopra range is styled in a simplified form closely reminiscent of the Utopia curved back scheme, at this stage

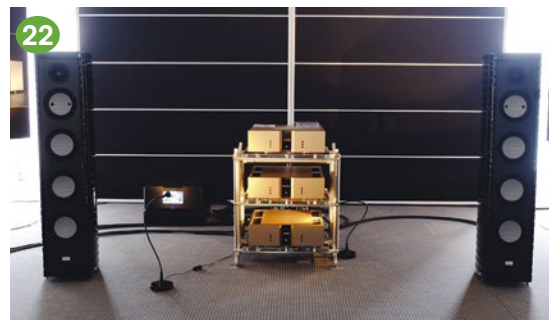
the new speaker range includes a standmount and a mid-sized floorstander. All new models will feature new ultra-low distortion drivers. The tweeter has been mounted on a specially-designed infinite horn-loaded enclosure which allows the interior cabinet volume to be optimised for *'big performance from small speakers'* as Focal's Gerard Chretien and designer Shitaro told me. The new Sopra speakers will be available in a number of colourful finishes at E8000 for the standmount and E12,000 for the floorstander.

Swiss electronics company **Soulution** (14) exhibited with Magico Q7 MkIIs. The sonic quality here was very track-dependent, as I found while staying for three tracks on the first occasion and another two or three on a quick second visit. The performance went from the sublime to the so-so, which I thought perplexing. The sublime end of the scale of course hinted at the extraordinary potential of this system.

Demetris Backlavas (15) from **Ypsilon** showed a full suite of electronics with Perfect8 speakers. The sound had what may have been the deepest soundstage of the show. A subtle congestion was heard through the mid band, however, while the highs were very refined and delicate. One of the funkiest exhibits had to be **Devialet's** Phantom array (16). Showing a multitude of the system-come-speaker wonder-in-a-pod, the tiered arena style seating always held a large crowd that was pounded with booming bass and fizzy highs. The Phantom offers enormous possibilities, and may even be a landmark product, but Munich's showing didn't exploit its potential. **Dali** (17) had a strong exhibit with the



company's expertise in speaker driver design very well presented by a display showing the various mechanical parts used in its high-quality drive units. A small Dali system displayed excellent sound



quality in a side area while the flagship speakers (18) were on static display.

Our own Aussie lads from **Kyron** (19) were exhibiting with the Kronos, spinning an eclectic mix of tracks that impressed with refined detail, transient attack and the Kronos' signature bass excellence. German turntable specialist **Clearaudio** (20) needed a massive stand, demonstrating not only its products but also a stunning motorcycle that Clearaudio modifies with its advanced materials expertise and is available only direct from Clearaudio.

Gauder Akustik's Berliner RC9 (21) speakers in gloss white were shown with AVM electronics. The system, with music sourced from AVM's new Evolution MP 5.2 media player, had a present and palpable midrange, a smooth top-end and deep and tight bass.

The **Cambridge Audio** exhibit featured a swag of the company's electronics including the new CX series components.

Gabi and Edwin van der Kleij showed **Siltech** and **Crystal Cable**. The system comprised of the new Mini Saga integrated in its almost final form (minor cosmetic changes) driving the Crystal Minissimo diamond-tweetered speakers and a yet-to-be-named subwoofer.

The Minissimos punch well above their weight but in conjunction with the subwoofer the sound stepped up to another level of power, involvement and bass shock. Marvellous.

Hans-Ole Vitus showed his outstanding **Vitus** (22) line of electronics using Gauder Akustik Berliner RC7 MKII speakers. This was a full-sounding and tonally correct system featuring upgraded Vitus digital playback.

Klipsch Reference RP-280F and **Jamo** Concert C109 (23) speakers were shown side by side. Upon walking into this room, the C109s were sounding so enormously powerful that it almost gave me shellshock. Others reported the sound of Reference RP-280F as being equally big but with a different overall presentation.

Tune Audio, **Modwright** and **VPI** (24) exhibited together. The massive horn-loaded Anima speakers sounded effortless and un-horn-like, if you catch my drift. No nasal voices or over-projected sound here... just good music with a balanced presentation.

Designed by legendary Bascom King, the new **PS Audio** (25) BHK amplifier was demo'd driving Magneplanar speakers and delivered a big sound with good tonal qualities.

In the **Nagra** room (26), the company's new HD monobloc amplifiers effortlessly drove Wilson's Alexia speakers to perfection, with an ease, top-to-bottom evenness and extension that presented classical to Zep... naturally.

What do you get when you combine top-line Kondo, a massive battery power supply and the full **Living Voice** Vox Olympian horn system (27)? The top sound of the show... a totally effortless presentation with scary dynamics and detail that presented familiar music in a new and fresh way.

Marten, **MSB Technology** and **Jorma Design** banded together to celebrate the new Coltrane 3 (28) with diamond tweeter and Cell drivers. The system sounded full and very detailed while projecting a large soundfield.

TechDas, **CH Precision** and **Vivid Audio** (29) made up the system (with Artesania racks making another appearance) in a room that was dominated by the beauty of the Vivid Giya G2 speakers.

Massimiliano Marzi and Andrea Nardini from Italian company **Audia Flight** were manning the exhibit which featured the new FLS-1 preamplifier/DAC and FLS-4 stereo power amplifier.

CONTINUED ON PAGE 103



Pro-Ject 1Xpression Carbon Classic

TURNTABLE

Pro-Ject calls this an 'entry-level' turntable, but it's very much above run-of-the-mill units and is also priced over a thousand dollars (two hundred and ninety-nine dollars over it, actually), which hardly makes it 'entry level' even in Pro-Ject's own range (since you can buy the Pro-Ject Elemental for a mere \$379 or a Debut Carbon for \$599). It does, however, come with a fairly up-market phono cartridge: Ortofon's 2M Silver moving-magnet cartridge.

In essence, the Pro-Ject 1 Expression Carbon is the sixth generation of the company's classic Pro-Ject 1, first delivered in 1991, when no right-minded person would have predicted vinyl's resurgence and the likelihood of a new turntable design making it through one, let alone five, design revisions. Pro-Ject has an extensive range of turntables,

many of which are similarly-named, so there are several different models with which it could easily be confused—the 2Xperience Classic, for example, and the 1Xpression Carbon, though this latter appears identical except for the addition of the silver-spoiled 2M Silver cartridge which comes with my Carbon Classic review model, and the additional finishes available on this model. Mine had a gloss white plinth which floated above my equipment rack, but there are also equally gorgeous olive and mahogany plinth options... and, of course, black.

THE EQUIPMENT

If you do consider this an 'entry-level' model, well it's a pretty tricked-up entry-level loaded with hi-fi thinking. The Carbon in the name comes from a new carbon tone-arm fitted with what Pro-Ject calls 'Evo Kardan' rings,

presumably referring to the tube-within-tube design at the counterweight end, where an outer ring is fixed vertically and an inner sheath horizontally, the main arm passing through both to receive the screw-on resonance damping counterweight at the rear.

The belt-drive system works with a decoupled low-noise a.c. motor with a precision d.c.-driven a.c. generator (like the company's Speed Box), while the fairly weighty platter has what Pro-Ject calls a sandwich construction of aluminium alloy and thermo-plastic elastomers (TPE), which is actually an aluminium platter with a deep ridge underneath in which a thick ring of rubber (or TPE, rather) sits. This platter interference-fits over a chrome-plated stainless steel thrust, which runs on Teflon in a bronze-bearing housing. The on/off power switch is under the left lip of the plinth, and sets the platter spinning even without lifting the cover.

(That is, if you've chosen to attach the cover. I did, even though it was sorely tempting to remove it and enjoy the clinical minimalist of the design, especially in the white plinthed sample I reviewed, where the black tonearm, white plinth, silver platter and cork mat (felt, if you prefer) present a punchily modern combination of geometry and texture. However, commonsense prevailed, in the sense that the cover prevents dust falling onto precious LPs while they're playing, which results in fewer 'clicks and pops' and reduces the need for frequent cleaning. In most cases, the cover also prevents the cartridge's performance being affected by air movements in the room... particularly important if you play your music LOUD!)

That main plinth in its various finishes is made from MDF, decoupled from structure-born noise by three absorber feet—two in the front, one bringing up the rear. These are inset a bit from the edge of the plinth and end in inverted black cones, so that against the smoked glass of my support shelf the legs all but disappeared into the darkness and left the Pro-Ject appearing to 'float' above it. I was thinking of taking a picture for *Home Beautiful* magazine, but since I later had to add a blob of Blu-tac under each coned foot, to overcome the sliding of these small contact points and the slight shifting of the turntable whenever I interacted with it, it was probably lucky I didn't. With the feet, the Blu-tac and the further isolation of my equipment rack, the Pro-Ject 1Xpression proved impressively immune to even heavy footfalls nearby, the only audible extraneous noise being the gentle dropping of the lid as I settled back to enjoy m'tunes.

As I mentioned previously, this package comes with an Ortofon 2M Silver cartridge rather than the 2M Red used on the mere Carbon model. This is a significant upgrade—it's hard to know exactly what the 2M Silver is worth, since it only currently appears in these Pro-Ject packages, but I reckon you could around double the \$150-ish standalone price of the 2M Red to go Silver. (The 2M range culminates in the 2M Black, somewhere above \$900, should you one day hanker for a cartridge upgrade.)

PERFORMANCE

While it's compulsory to follow a turntable instruction booklet during unpacking and set-up, perhaps don't read the whole thing before you start, as the details on cartridge and tracking adjustments may alarm you. The 1Xpression comes delivered with the arm pre-installed and the cartridge pre-installed and factory-aligned—extremely accurately

■ Already, as you can see, I was starting to ignore the turntable and cartridge and concentrate on the recordings—and this is what hi-fi should do!

I found—so it'll be entirely up to you what level of tinkering you want to indulge in.

The unavoidable involves removing a couple of transport screws which secure the motor assembly, untwisting the twistie around the arm, levelling your surface carefully, and then running the belt carefully around the motor pulley and hub—a process you'll find will be far easier and more quickly successful than for some rival turntables.

The main counterweight is also well-designed for simple screwing on, centring and then setting of downforce—18mN for the Ortofon cartridge, easily set using the markings on the weight.

The fiddliest part of the job is hanging the tiny anti-skating weight on the second groove of the anti-skating stub—a needle-threading procedure requiring bright lighting and reading glasses for those who need them! No adjustment of the arm pillar proved necessary to get the right vertical tracking angle, nor for azimuth on my review machine.

LISTENING SESSIONS

I started with some 45rpm singles. I have a \$350 Pro-Ject USB turntable in regular use, and the upgrade from this lesser turntable was screamingly obvious from the get-go. The soundstage was thrown open, the dynamic range raised by the significantly lower noise floor and the clarity with which individual instruments were resolved from the overall sound. Rather than any sense of the limitations of turntables and the vinyl format, the 1Xpression Carbon Classic delivered a sound and a frequency range that were limited not by the turntable but only by the quality of the mastering and pressing of each single.

So the 1981 45 of Duran Duran's *Careless Memories* yielded an energetic presentation with all those syn drums nicely sharp-edged as they pan amusingly across the soundstage, and the synth bass solid but not particularly deep. But spinning up a good 1979 United Artists pressing of Dr Feelgood's *Put Him Out of Your Mind* enabled total enjoyment of a full and rich bass guitar sound from this most solid of rhythm sections under Mike Vernon's able production. Already, as you see, I was starting to ignore the turntable and cartridge and concentrate on the recordings—and this is what hi-fi should do!

One negative of this turntable is that speed change is not available by a handy switch—instead you have to remove the platter and move the belt to the larger of the two motor unit grooves. The platter is, as mentioned, quite heavy, and the tight tolerancing all round means that unless you push the centre spindle down firmly as you lift the platter up, you're likely to pull up the plastic hub (around which the belt fits) as well, thereby removing and potentially stretching

PRO-JECT 1XPRESSION CARBON CLASSIC TURNTABLE

Brand: Pro-Ject

Model: 1Xpression Carbon Classic

Category: Turntable

RRP: \$1,299

Warranty: Two Years

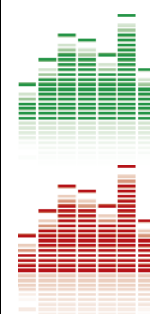
Distributor: Interdyn

Address: Level 1, 116 Cremorne Street
Richmond VIC 3121

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- Great sound
- Pre-aligned
- Cartridge included
- Cover included

- Speed change
- Support feet
- Finger-hook

LAB REPORT

Readers interested in a full technical appraisal of the performance of the Pro-Ject 1Xpression Carbon Classic Turntable and Ortofon 2M Silver cartridge should continue on and read the LABORATORY REPORT published on page 89. Readers should note that the results mentioned in the report, tabulated in performance charts and/or displayed using graphs and/or photographs should be construed as applying only to the specific sample tested.



Lab Report on page 89

the belt, and leaving yourself up for a full reconstruction rather than a quick shift. This inconvenience may discourage regular gear changes enough to make you consider adding Pro-Ject's external speed change unit, which puts an electronic speed change unit in a separate box.

Once you move to Long Players, there is time to enjoy what was rapidly becoming established as this Pro-Ject's greatest trick—to make you forget you're listening to vinyl. That might sound an odd goal... aren't we deliberately trying to enjoy the 'vinyl sound'? Not really, no—as in any hi-fi system, we're trying to hear what they heard in the studio, or what those in the studio wanted us to hear. Time and again, as I settled into the Pro-Ject's presentation of a 20-minute side of vinyl, I was jolted when the stylus slipped into the run-out groove, having completely forgotten it was vinyl playing, rather than some more modern format. This is a huge compliment, meaning that issues of surface noise, and limitations on dynamics and resolution were all transcended—I was simply enjoying the music.

And how I enjoyed it indeed. I began with some testers for piano stability—some Oscar Peterson Trio (The Trio Live from Chicago), Rick Wakeman's extended piano parts in *Awaken* by Yes—to confirm the low levels of wow, quoted at $\pm 0.1\%$. *Awaken* soars to some complex highs, and the Pro-Ject proved its worth in resolving the different strands within the whole without delivering the wall of sound that can emerge from lesser vinyl-spinners.

This was the first turntable on which I played my 'Ultra LP' version of Jack White's latest, *Lazaretto*, complete with its angel holograms, dual-grooved side two and a side one which has a reverse groove that plays from the inside out. The album's balls-out rock'n'roll presented thrillingly on vinyl through this rich pressing, delivering fast and full bass and some giant soundstaging. The opener (so the inside track), *Three Women*, includes separate instrumental breaks for piano, synth and guitar which burst from their stereo positions, each with their own highly realistic acoustic. When Jack pauses the band with repeated moments of room-filling extended sustain through *High Ball Stepper* (the last and so outside track on side one), there's magnificent depth to his zinging cloud of electric guitar, an ear-fizzing three-dimensionality delivered with Mr White's usual acrobatic intensity—and all coming through the medium of vinyl very loud and very clear, no high-resolution digital specs required, thank you very much.

Finding that reversed groove on side one of *Lazaretto* proved to require quite accurate needle dropping, and my perhaps larger-than-



■ All issues of surface noise, and limitations on dynamics and resolution were all transcended—I was simply enjoying the music.


average fingers found the finger-hook on the head-shell too narrow for this to be entirely reliable—you can drop it manually on the outside of a record easily enough, but only with difficulty to a subsequent track, particularly in low light when the hook and cartridge are both black against vinyl. Best to return to the safety of the rear lift lever to ensure no acci-scratchy horrors on the way back to the armrest.

The Pro-Ject's accurate delivery meant that any flaws on dirty and damaged records were delivered equally accurately (and given the volume levels at which I was playing, a 'crack' was quite a crack!), so the best vinyl hygiene is recommended—cleaning records before every play, along with proper attention to stylus cleaning and replacement. Time to commit to vinyl!

Also arriving during this review were the three first remastered Led Zeppelin albums. The intensity of the first album, the acoustic lushness of *Zep III*—for my money the vinyl presentation from the Pro-Ject's 2M Silver

cartridge outgunned the 24/96 download version, perhaps because vinyl is how I first heard these albums, or perhaps because it just sounded so right—solid, of-a-piece, none of your slight edginess, none of your tin, rather keeping it rich and real.

CONCLUSION


I don't know how much of a lift is being given by the Ortofon 2M silver cartridge on this package, but as a whole the Pro-Ject 1Xpression Carbon Classic delivers depth, solidity, speed and range that make for real hi-fi results and no real cause for complaint, other than its slippery feet...though how 'slippery' they'll be in practise will be entirely dependent on the surface on which you're using it. My listening notes were entirely positive, with the only issues coming from LPs which needed cleaning. This turntable also shows that there is a huge rise in quality to be discovered when you pay \$1,299 for a turntable instead of \$350. It's a different class of audio.  Jez Ford

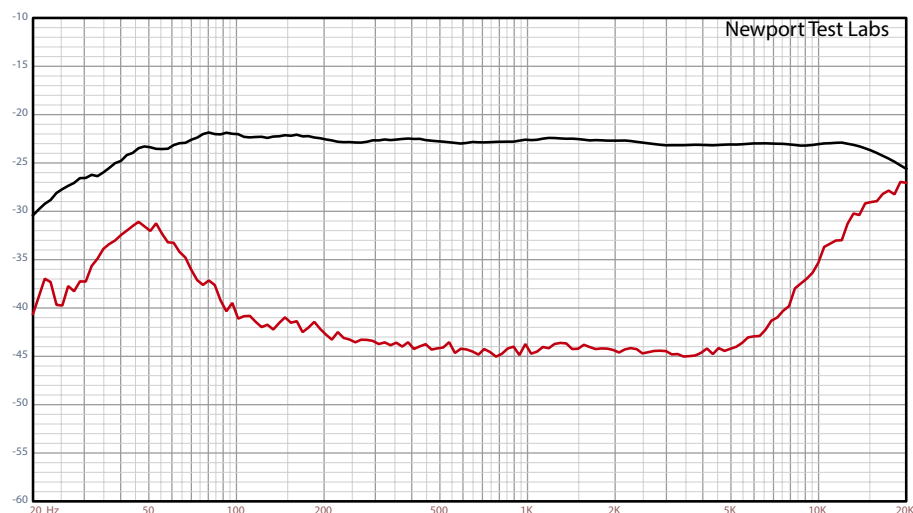


■ **Newport Test Labs measured the frequency response and channel separation of the Ortofon 2M Silver phono cartridge fitted to the Pro-Ject 1Xpression Carbon Classic and found them to be outstanding good.**

LABORATORY TEST RESULTS

Newport Test Labs first tested the accuracy of the Pro-Ject 1Xpression's platter speed at 33.33rpm and found it to be exact—at least within the limitations of the test record—with the 3150Hz test frequency playing back at 3158Hz, or just 0.25% fast. The difference in pitch as a result of this difference would be around one sixteenth of a semitone: completely inaudible even to someone with perfect pitch. Wow at 33.33rpm was measured at a very low 0.06% CCIR unweighted. Flutter was also low at 0.16% unweighted. Overall wow and flutter figures were measured as being 0.15% CCIR-weighted and 0.16% RMS unweighted. Power consumption is low, with the Expression's 'wall-wart' power supply drawing only 4.89 watts from your 240V a.c. mains.

The lab also measured the frequency response and channel separation of the Ortofon 2M Silver phono cartridge fitted to the Pro-Ject 1Xpression Carbon Classic and found them to be outstanding good, with the frequency response between 45Hz and 16kHz remaining within ± 1 dB of reference. The overall response was measured as 25Hz to 20kHz ± 3 dB. Channel separation at 1kHz was 23dB and this excellent level of separation was maintained over the frequency range between about 200Hz and 5kHz, diminishing only at the frequency extremes, as would be expected. The two traces are shown in Graph 1.  **Steve Holding**



Graph 1. Frequency response and channel separation. Ortofon 2M Silver Cartridge.



Bose QuietComfort QC25

NOISE-CANCELLING HEADPHONES

Bose is a company that is often a little light on supplying product specifications—apparently instead preferring that its potential customers simply listen and decide for themselves (rather than making often meaningless comparisons between numbers that don't fully represent performance). And I have no problem with that.

What the company does deliver in spades is stories—one might even call them 'legends'. One of these concerns its late founder Dr Amar Bose when he was on a SwissAir flight back in 1978. This was when acoustic ear-tubes (don't ask!) were being replaced by electronic headphones for passengers, and the good doctor was so disappointed by the difficulty of hearing anything against the

background noise of the plane that he not only conceived noise-cancelling headphones on the spot but had a notepad of equations to achieve it by the time he touched down on home soil back in the USA.

The idea, with hindsight, seems simple enough—use a microphone to record the external noise, then invert it and feed it back into the headphones. Presto—sweet silence. Yet noise cancellation is a fiendishly difficult thing to actually achieve in practise. In order to cancel out noise in real time, you have to invert it and add it back pretty much instantaneously. And you have to do it all in a portable device that people will be happy wearing on their heads. So it took 22 years of development before the company's first consumer noise-cancelling headphones made

it to market—and some in the company thought it would never happen (see panel).

Since then, however, Bose has not looked back, and while there are more competitors now than then—and Bose wasn't actually the first to bring a pair of noise-cancelling headphones to the consumer market—the company still rules the consumer marketplace with its executive-friendly models, and absolutely owns the professional noise-cancelling headphone market, with the overwhelming majority of commercial and private airplane and helicopter pilots using Bose A20 Aviation Headsets.

THE EQUIPMENT

Last year I was absolutely blown away by the company's QC20 and QC20i noise-

■ The Bose QC25s are the best-sounding noise cancelling headphones I have ever heard, and cancel noise better than any other noise cancelling headphones I have ever used...

cancelling earphones, an in-ear model of marvellous comfort and remarkable noise-cancelling abilities given the difficulties of doing so from an in-ear position. They took out a 2014 award from Sound+Image Magazine last year, and if it's in-ear 'phones you're after, I still recommend them highly. But this year's noise-cancelling wonder is the new Bose QC25, an over-ear model that has already won the 2015 award from Sound+Image magazine in the noise-cancelling headphone category. The QC25s are smaller, lighter and feel less luxurious than the company's QC3 and earlier models, but they have a number of significant advantages over those models.

First, they use just a single AAA battery, and these are easy to find or replace (or recharge) at any time, but most especially when travelling—you just push the right headshell forward in its mount and pop open the plastic tray to remove or insert the battery, which goes in point (positive terminal) first. But second, and even more importantly, the QC25s will work (passively) without any battery power at all... whereas some earlier Bose models simply didn't.

IN USE AND PERFORMANCE

The light weight (195 grams) of the Bose QC25s is an immediate boon for comfort, and it doesn't detract from the quality of the noise cancellation at all—when you flick the switch the world recedes into the muffled distance with just the slightest feeling of sucked-in eyeballs, after which you can then either simply enjoy the quiet, or enjoy the in-flight movie over a background of near-silence.

The top attraction here, though, is that Bose has delivered a great-sounding pair of headphones for music. That is, they sound great whether you use the noise-cancelling or not. The bass is rich, lively and solidly supported, but not bloomy, and they make as handy a pair of cans for the daily bus

commute as they do for distancing yourself from the horrors of a long-haul flight. As is often the case with noise-cancellers, the sound is slightly different when you kick in the active circuits required to do the cancellation. The mids and treble are immediately lifted with an extra dose of presence, and there's just fractionally less bass, but since the bass also benefits from a fresh tightness and impact from the presence lift, I preferred the active balance to the slightly softer passive one. You settle into either sound balance very quickly, and both represent top-notch performance for noise-cancellers at this price.

Battery life proved extremely impressive—I used the QC25 both ways on transatlantic flights without reaching for the spare battery I'd packed in my hand luggage just in case. Bose says you'll get 35 hours from an alkaline battery (and 28 hours from a rechargeable) when using active noise-cancelling (depending on playback volume, obviously) after which the battery light will start flashing, but even when it does you'll find you have a good few hours of battery life left. And of course, it's not like some previous Bose models which fall silent (in the wrong way) when power is exhausted; the passive mode here means you can carry on listening, just without that silent background that brings the music or in-flight movie into such clear relief. The silence of noise-cancellation is also something of a hearing protector, since



BOSE QUIETCOMFORT QC25 NOISE-CANCELLING HEADPHONES

Brand: Bose
Model: QC25
Category: Noise-cancelling headphones

RRP: \$399

Warranty: One Year

Distributor: Bose Pty Ltd

Address: 3/2 Holker Street
Newington NSW 2127

1800 023 367

(02) 8737 9999

info@bose.com.au

www.bose.com.au



- Excellent sound, active or passive
- Light and comfortable
- Bose's best cancellation yet
- Needs cable removed to fit in case


you don't need to crank levels so high when you're listening over silence.

The Bose QC25s have an inline remote control and microphone on the cable, and they come with the usual hard case and airline adaptor (though not the cards Bose used to include with its noise-cancellers to hand out to interested fellow passengers, which I always thought was a marvellous bit of marketing!).

The headphones need to be folded twice in order to fit into the supplied case—first inwards, then upwards, and they fit quite tightly, the case being 21cm long and the headphones less than 2cm shorter. It would be a little tricky to find the right position to fit them into the case had Bose not most helpfully included a little picture of the correct folded position, carved in relief into the inner velour of the carry case. The only minor inconvenience for daily users is that to fit them into the case safely you'll find it's best to first remove the headphone cable and fully retract the headband. But if that's my sole criticism of the QC25s (and it is), I reckon that's nothing short of a rave.

CONCLUSION

The Bose QC25s are the best-sounding noise cancelling headphones I have ever heard, and cancel noise better than any other noise cancelling headphones I have ever used.

So when you consider that Bose has also improved ease of use, plus added a special version especially for use with Samsung Galaxy phones, yet still kept the price below \$400, you can see why I am so happy to rave about them.  **Jez Ford**



Storytelling

Bose recently celebrated its 50th anniversary, and at a special celebration in New York the company's president, Bob Maresca, expanded on the development of noise-cancellation technology with the interesting revelation that had the bean-counters had their way, the whole idea might have been dropped. Here he speaks exclusively to Jez Ford.

Bob Maresca: So in 1997, Dr Bose came to me and he said, 'You know we're having a real hard time with this noise-cancellation technology and I need you to run the division. And I said, 'I'm a researcher! Surely you have somebody qualified to run this business?' And he says 'No we don't, so you're doing it!' [Laughs.]

And then he says 'The company needs you.' and that was always the

hook, you know? I owed so much to him that I couldn't let him down.

So I took the job, and pretty soon I got a call from the CFO. They come to me and say 'Bob, we've been running this business for 19 years and we've lost 50 million dollars! How are we going to convince the chairman how to shut down this business?' And I said, 'Jeez, he only just asked me to run it this last week, but let me go talk to him.'


And when I went up there, I said, 'You know, not all your executives are as enthusiastic about this business as you are. He said 'I know, they all want to shut it down!' I said 'Do you know how much money we've spent? \$50 million dollars!'

And I'll never forget his response, because the professor in him, he wanted to teach me a lesson, and he said, 'Fifty million dollars? If this was a publicly traded company I would have been

fired years ago!' At which point I just looked at him, and I'm scared to death, the blood's draining from my head, and I'm saying: 'So you're sure you want to continue this?'

And he looked at me and said, 'Bob I know we've been at this a long time and we've spent a lot of money. But when I see somebody put that headset on in a noisy environment and I see the look on their faces, I know we have a technology that has real benefits for people. There must be a way we can make a successful business out of it.'

And I said 'Well I have no idea how.' And he said 'Neither do I, but we're going to keep trying!'

So the ironic thing about that is that if we were publicly held, you know, with the pressure from the stockholders to give them that money in dividends—there'd be no noise-cancellation technology today. 



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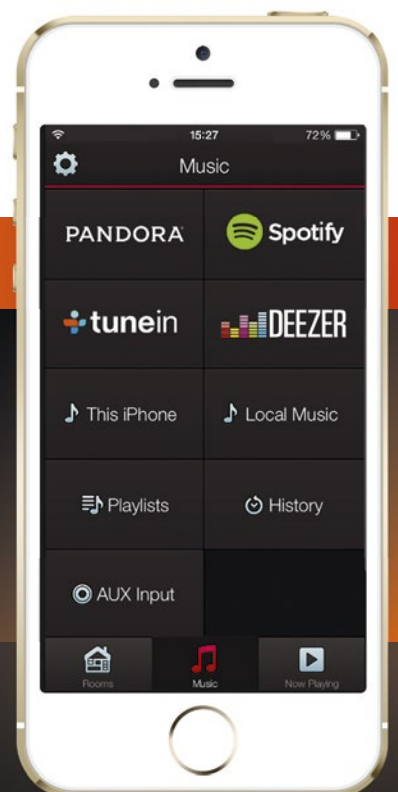
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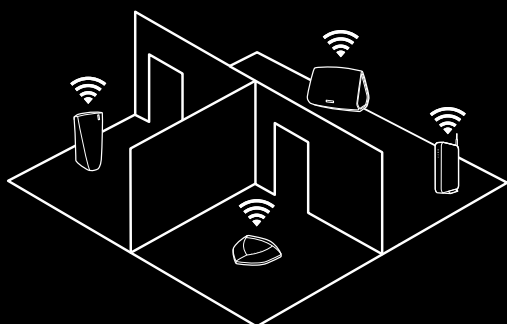
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Interview

Udo Besser, AVM

Udo Besser is the sole owner and managing director of German high-end audio manufacturer AVM. He's credited with turning the company around and building it into one of Germany's most successful enterprises, in the process revitalising the company's product line and extending its sales network around the world. Australian Hi-Fi Magazine's editor, Greg Borrowman, caught up with Udo during his brief visit to Sydney...

AHF: *How did you get into the hi-fi business in the first place?*

Udo Besser: I filled in the wrong form! (Laughs). Hi-fi and audio had always been a hobby for me, but I didn't really get into it professionally until I was studying electronics at university and got a part-time job repairing stuff for a hi-fi store in Munich. While I was still at uni the owner of the store wanted to open more stores, so I gave him a hand with that. He still owns them and he's still one of my best friends. After finishing in university in Germany I went to America and obtained my MBA, after which I came back and worked at Burmester for about 15 years, during which time I became a partner in the company, as well as its Managing Director.

AHF: *So how did you end up owning AVM?*

UB: I already knew of AVM, of course, because it was a very well-known and reputable brand in Germany, Austria and Switzerland, but the company had never sold its products internationally. In 2010 a friend of mine rang to tell me the company was in trouble and asked if I could help. I looked into the company and discovered they had a super team running under the supervision of one of the founders of the company, Gunter Mania, and I thought to myself: "I can do this: I can turn AVM into a real global company." So I left Burmester, and sold all my shares in Burmester so I could buy AVM. I bought the entire company!

AHF: *What did you have to change in order that you could turn around the company's fortunes?*

UB: AVM's core business was building hi-fi amplifiers, which is how it had started in 1986, and although it had added CD players and converters over the years, nothing much else had changed. I decided we needed to concentrate on becoming a manufacturer of complete systems with a particular focus on streaming and that we needed to have distribution throughout the world... and most particularly in China. Four years later, I have achieved that, but I could not have done it without Gunter and the great team he'd put together. Making a global company isn't something you can do by yourself.

AHF: *Did you keep production in Germany?*

UB: All AVM products are manufactured in our factory in Germany, which is right on the border of France, and that's also where we do research and development. Marketing, IT and accounts are located in our office in Berlin. Almost all the parts we use in our products are sourced from companies that are located within 10 minutes of our factory, with some exceptions. Our valves are made in the Czech Republic by a daughter company of JJ. Our slot-loading CD transports use a pure CD drive with a monofocal lens that were a special model made by Teac that outputs SPDIF directly. They were so good we bought their entire production. We use a different drive in the upper levels of components.

AHF: When we reviewed your AVM 2.2 we noted in the review that the exterior aluminium casing was absolutely gorgeous. How do you do it?

UB: Those cases are handmade in Germany by real craftsmen, using fresh aluminium that's smelted in Germany. We had to do this to ensure the aluminium's purity. It results in an unbelievably smooth surface that you just can't get using recycled aluminium. If you run your fingers over it, it feels soft... like silk, even on the corners. Using no screws also gives you a chic, reduced design. My aim was to reduce lines, edges and writing until I got to a level where everyone would look at it and say: "I could have done the same thing" ... at which point I'd know it was good.

AHF: You have two case options for the CS2.2: black or silver, but also the option of adding a chrome front panel. Which is the most popular?

UB: About 70 per cent of the models we sell are aluminium and the remainder are black. As for the chromed front panel: it's very rare we sell one, but it looks great... especially on black.

AHF: I can imagine it would look incredible, so why are there so few sales?

UB: It's the cost. Our chrome panels are actually made from brass, which means we have to use completely different tooling to make them. Then they have to be hand-polished, then copper-plated, then palladium-plated and finally chromed. It's quite a procedure: one that's so complicated that we only get two useable panels out of every three we make. We can't repair them, so it means there's a lot of waste.

AHF: And that's on top of a product that's already expensive.

UB: Yes, people often ask me why our products are so expensive, but you're paying for the quality of all the components inside, as well as the exterior plus the amount of computing power inside... which you'll be very glad of when you find we can upgrade your firmware via EPROM.

AHF: The fact that you rate the power output of the 2.2 at 110-watts per channel and that the enclosure is totally sealed told me immediately that there were Class-D amplifiers inside it. Which ones do you use and why?

UB: I really loved the sound of AVM's amplifiers which all used Class-A or Class-AB output stages... in fact they still do, and I wanted the new models to have the same warmth and body, and also enough power to drive any loudspeaker in the world, but I also wanted small and attractive enclosures that would remain cool even at very high volume levels... enclosures that people would be proud to own, so that meant using Class-D. We went to Peter at Hypex to help us achieve what we wanted, and he's been incredibly supportive, so you will hear the same sound quality from our models that use Class-D amplifiers as you will from our models that use Class-A and Class-AB.

AHF: The 2.2 seems to have everything on-board except a DAB tuner. I thought DAB radio was big in Europe?

UB: Internet radio has meant the end of the line for DAB. It wasn't particularly popular in Europe to start with and now many of the countries that had installed DAB broadcasting equipment are taking it out. Why would you listen to DAB when you can get the same quality from Internet radio and also have 105,000 stations to choose from?

AHF: You say you wanted AVM to become a complete system company, yet you don't make speakers... at least not any that I know of. This seems particularly strange to me, especially considering your background at Burmester, which is well-known for its range of loudspeakers as well as for its electronics.

UB: We did actually start making loudspeakers... some small two-ways, but we realised it wasn't what our customers wanted so we withdrew from the market to focus on streaming. Streaming is so complex... and we wanted to do it perfectly.

AHF: The 2.2 isn't what I would call an 'audio-ophile' product. What was your target market when you were designing it?



UB: With the CS models we were aiming at selling to music lovers who wanted a perfect hi-fi system, without wires, in a compact size, and with the ability to not be limited in any way, either by the sources they could connect, or the speakers they could use with them. That's why we use such powerful amplifiers: they'll drive any speakers out there: Martin Logans, B&W 803s... whatever.

We don't even limit where in your home you can use our remote control, which is why it's r.f.—so you can use it even if you're in a completely different room. Its radio frequency signal will go through your walls.

AHF: Oh, I see... the reason the CS2.2 has a phono stage is so that your customers are not limited in their choice of sources...

UB: Exactly! Not only did we find that people who buy our products have big vinyl collections, but also vinyl is coming back big-time. It's becoming very popular in Europe to buy a Rega or a Thorens turntable. We worked very hard on the phono input of the CS2.2. It has a load of 47kΩ and 10pF so you can use it with moving-magnet or high-output moving-coil cartridges, and the RIAA tolerance is closer than 0.05 per cent, which is hard to do, but it really matters.

AHF: Other than power output, what are the differences between the CS2.2 and the CS5.2?

UB: The two are functionally identical, but the 5.2 has two times the power output. Even the software is identical. We actually use the same software across all our models: it's clever enough to work out what product it's in, and therefore which circuits it has access to and which it doesn't. This may sound easy to do, but developing the software was very difficult and... I admit... it was hideously expensive!


It offers lots of comfort options, such as being able to configure the line inputs as home theatre throughputs if you want, or hiding unused inputs. Comfort is another reason we supply a real remote control. Apps are all very good, but if your phone rings, how are you going to answer your phone and operate your system at the same time?

AHF: And yet you can also use your phone to operate the CS2.2...

UB: Yes, plus you can use either an Android or iOS phone. We've actually had Android working in the factory for a long time, but we didn't want to release

it until Apple had finished testing our iOS app, which took them longer than we thought. We didn't release Android first because we'd decided we'd only release our apps simultaneously.

AHF: What is your best-selling product?

UB: We have three that are almost equally popular but the one whose popularity I find most surprising is our CD 5.2 CD player, which comes with a tube stage. Actually, I call it a CD player, but actually it's more like a DAC with a CD drive, because it has seven digital inputs along with upsampling. Anyway, in the 5.2 the tubes don't drive the output directly, there's another Class-A stage after the tube, so we get the charming tube sound from the tubes and the Class-A power to drive the cable. The CD 5.2 was the first tube unit AVM has ever done. It's functionally identical to the 3.2 with the same remote, the same digital input board, the same DAC... but the tube stage means more and bigger power supplies, so it's physically bigger. Anyway, the result sounded absolutely beautiful but Gunter was convinced that even though we'd all own one personally we'd never actually sell one, and that it would be a huge commercial flop. Well, the CD 5.2 really took off, and now we have won all the awards there are with it, and it is one of our best-selling products. 

How to Set Subwoofer Controls

This article details a simple, low-cost and effective method of setting the volume, crossover frequency and phase controls on your subwoofer to ensure the best integration of the subwoofer's low-frequency output with that of your loudspeakers.

A subwoofer is a very important weapon in an audiophile's armoury in the pursuit of perfect sound. Despite what their specifications might say, and their manufacturers might claim, very few hi-fi loudspeakers—even the largest floor-standing models—can reproduce the deepest musical frequencies at appropriate volume levels.

To do this requires a properly-tuned subwoofer: one whose volume, crossover frequency and phase controls have been set in such a way that the subwoofer's output integrates perfectly with that of the main stereo or front/main loudspeakers...wherein lies the problem. Very few people—even experts—are capable of doing this by ear and, until recently, the measuring equipment required to correctly tune a subwoofer was prohibitively expensive. Now, thanks to the processing power found inside any Smartphone, it is possible to accurately calibrate a subwoofer with a Smartphone running a \$10 app and a low-cost CD with appropriate test tones.

But before you start your calibration, you should first position the subwoofer correctly in your room. This is not a complicated



process, but it is lengthy to explain, so the details of how to do it can be found here: www.tinyurl.com/subwooferplacement

You should always position your subwoofer in the spot in your room in which it works best acoustically but, if you have already decided for other reasons to place your subwoofer elsewhere (such as where it looks the best), the following calibration procedure will still ensure its output integrates correctly with that of your main speakers.

However, before you start the calibration process, you will first need to acquire a

suitable test CD, such as Stereophile Test CD2 (See *Break-out Box* on page 98), an iOS or Android smartphone and a suitable Real Time Analyser app (See *Breakout Box*). Once you have these, and you have loaded the app onto your phone, you're ready to go. Whatever you do, DO NOT purchase one of the many free SPL meter apps that are available, or one of the (less readily available) free Real Time Analyser apps. All the free apps I tried had intrusive advertising and some will run up big data charges (or worse!) on your account even when they're not being used. Bite the bullet and pay the \$10!



Photo 1: This illustration shows the Android version of the Audio Tool RTA app [<http://tinyurl.com/audiotool-app>] running in its SPL mode on a Samsung GT-S7562 Smartphone, measuring a 100Hz warble tone (from Stereophile Test CD2, Track 16, Index 4) at 70dB SPL. (The end result of Step 3 of the calibration process.) You can see from the blue 'soft' keys that the averaging is set to 'Off', the mode is 'SPL', Meter Response is set to 'Medium' and that weighting is set to 'Flat'. The two small tabs visible between the tabs that show 'SPL' and 'Medium' are for Peak Hold (On/Off) and Valley (On/Off). For this measurement, either button can be in either mode, as they don't affect the measurement.

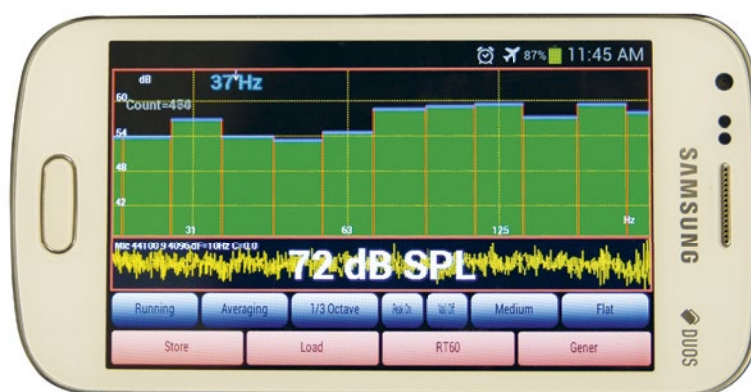


Photo 2: This illustration shows the frequency response of the subwoofer/satellite speaker combination after calibration using the method described. The resultant frequency response extends from 25Hz to 200Hz ± 3 dB, which you can see because all the third-octave bars are between the 54dB SPL and 60dB SPL calibrations (scale is at left of screen). The response is slightly 'high' for the three third-octave bands above 63Hz (the actual centre-frequencies are 80Hz, 100Hz, and 125Hz). Some extra tweaking could have reduced the level here by a dB or so, but I preferred the sound of the slight forwardness in this region, and also wanted to show that you don't need to achieve absolute flatness. Getting all the third-octave bars within ± 3 dB in a normal acoustically untreated room is a good outcome.

Alignment Procedure

1) Position your phone at the listening position, at the point where your head would be. The location of the microphone isn't really important—so long as it's not blocked—so you should position the phone where you can easily see the screen and make adjustments to the measurement parameters (using the on-screen 'soft' keys). Once positioned, leave the phone in this same position for the duration of the calibration process.

2) Set the RTA app on your phone to its SPL mode, then set the 'Meter Response' to 'Medium'; and the 'Weighting' to either 'Flat' or 'No Weighting'. (If the RTA app you're using offers neither of these options, instead select 'C-weighting'.)

3) Disconnect the subwoofer from your amplifier or receiver and play the test CD through the main speakers using the 100Hz warble tone on Stereophile Test CD2 (Track 16, Index 4). While playing the warble tone, gradually increase the volume level on your amplifier/receiver until the SPL meter shows a figure of somewhere between 70dB SPL and 80dB SPL (**See: Calibration Level.**) The actual level is not important, but you do need to make a note of it. Leave your amplifier/receiver's volume control at the position that gave this level and DO NOT touch it again.

4) Now turn the main speakers off using the 'Speakers On/Off' or Speakers A/B

button or, if this is not possible, disconnect the speaker wires, and then **reconnect the subwoofer**, with the subwoofer's volume knob set to zero, its phase control set to 0 degrees, and the subwoofer's crossover control set at its highest possible frequency. Now play the 100Hz warble tone again, slowly increasing the level of the subwoofer's volume control knob until the sound pressure level reading on your phone is the same as it was in Step 3. Leave the subwoofer's volume control knob in this position.

5) Now change the function of your smartphone app from 'SPL' to 'RTA', and apply the following settings: Display Spectrum: 1/3rd Octave; Averaging: Off; Peak Response: Off; Speed: Medium; Weighting: Flat or None; Frequency Range: 20Hz to 200Hz.


(You'll find you can alter the displayed frequency range on the screen by 'pinching' your fingers horizontally across the screen.)

6) **Reconnect the main speakers!** then play Track 15 (Pink Noise at -20 dBFS) on Stereophile Test CD2 and, while it's playing, adjust the vertical resolution of the screen (by pinching or spreading your fingers) until each horizontal calibration is 6dB and all the vertical bars are on-screen. The overall indicated SPL level will not be the same as the one you noted in Step 3, but this is normal and does not matter. DO NOT adjust any volume controls to try to get the same SPL reading.

7) Now, look at the third octave analyser spectrum on your phone to see whether all the vertical bars are relatively flat and smooth across the screen. (As in Photo 2 above.)

Calibration Level

The sound pressure level (SPL) you use during calibration will depend on the level of background noise in your room, because you do not want environmental noise contaminating the measurements you make during the calibration procedure. To establish the correct dB SPL level you should use, shut all windows and doors to the room in which you will be making the measurements, and turn off any air-conditioning.

Using the SPL meter function, measure the background level of noise in your room. If it is less than 60dB SPL, use a calibration level of 70dB SPL. If the background level is more than 60dB SPL, you should increase the calibration level by 1dB for every dB above 60dB SPL, so if the background noise level is 63dB SPL, use a calibration level of 73dB SPL. If the background level is 68dB SPL, use a calibration level of 78dB SPL, and so on. 

Don't be concerned that all the vertical bars are dancing up and down a little. This is normal, and you should ignore it. Although the meter will be doing some averaging, you will also have to use your eyes to 'average' the vertical movements. If the vertical bars at 31.5Hz and above are all fairly uniform in level (within $\pm 3\text{dB}$), you're done: the maximum setting of the crossover control is the best setting for your subwoofer to cross over to your main speakers. If the response is not within $\pm 3\text{dB}$, go to Step 8. [Disregard the level of the left-most (25Hz) vertical bar, because this can't be adjusted.]

8) While watching the RTA spectrum display, slowly move the subwoofer's crossover control counter-clockwise from its maximum position until you get the flattest response possible. If the response is relatively flat, you're done: this setting of the crossover control is the best setting for your subwoofer to cross over to your main speakers. If you can't achieve a relatively flat response, go to Step 9.

9) Adjust the subwoofer's crossover control to where the response was the most flat, and then slowly adjust the phase control while looking at the RTA spectrum. As you adjust the phase control you should see the levels of the various vertical bars change. After you've tried ALL settings of the phase control, move it back to the position that gave you the flattest response and leave it there: you're done. You have correctly set your subwoofer's volume and phase controls to positions that allow your subwoofer's output to

Sourcing Stereophile Test CD2

Stereophile's Test CD2 is available for US\$12.99 (plus postage) from Music Direct (<http://www.musicdirect.com/p-8311-stereophile-test-cd-2.aspx?source=igodigital&>). If you don't live in the USA, postage will be a disproportionate part of the cost, so consider buying a few extra music CDs to amortize the cost. Alternatively, you can buy Test CD2 direct from Stereophile itself for US\$9.99 (plus postage) or you can buy a set of all three Stereophile test discs (Test CD1, Test CD2 and Test CD3) as a bundle for US\$24. To purchase direct from Stereophile, details are here: <http://store-badz031c.mybigcommerce.com/test-cds/>




best-integrate with the output of your front left and right loudspeakers.

10) If you are unhappy with the flatness of the response after you have completed Step 9, return the phase control to its 0° position, then adjust the subwoofer's crossover control

to the position that gave the *second-flattest* response, and do Step 9 all over again. If you're still unhappy, adjust the subwoofer's crossover control to the position that gave the *third-flattest* response, and do Step 9 all over again. If you're still unhappy, continue this iteration procedure until you are happy. However, whatever you do, DO NOT alter the position of either your subwoofer's volume control or the volume of your amplifier/receiver to try to 'fix' the response. You will only end up wrecking all the work you've done. You must ONLY adjust the crossover and phase controls on the subwoofer.

11) Now that you've finished, play a track with deep bass (Track 1 of Pink Floyd's *Dark Side of the Moon* should do) to hear the balance of the subwoofer with your speakers. DO NOT attempt to adjust the level of the subwoofer to increase the level of deep bass. Most music contains deep bass only at very low levels, so it should be reproduced at those same very low levels. Movie sound effects contain more deep bass than most music tracks, but you should still resist the temptation to increase the level of bass issuing from your subwoofer: The rule-of-thumb is that if the deep sounds obvious, the sub's volume level has been set too high.

WARNING: If you are going to buy only one CD, you MUST buy Stereophile Test CD2, because the Stereophile's most recent test CD (Stereophile Test CD3) DOES NOT have the pink noise test track you will need to complete the calibration successfully.


There are some other test CDs available that have both a 100Hz low-frequency warble tone and a pink noise track, but Stereophile's Test CD2 has the triple virtues of being (a) the most comprehensive (b) the easiest to obtain and (c) slightly cheaper! 

greg borrowman

Sourcing a Real Time Analyser App

Once, a Real Time Analyser would have set you back thousands of dollars, making its purchase completely impractical for the purpose of a single home subwoofer calibration. These days, thanks to the computing power inside a smartphone, you can buy an app that will turn your phone (or tablet) into a Real Time Analyser. The best RTA app for iOS devices (iPhone, iPad) comes from Studio Six Digital [www.studiosixdigital.com] and is available in Apple's App store for \$9.99. For Android, the best RTA app available is part of AudioTool (\$7.49) available on Google Store, here: <http://tinyurl.com/audiotool-app>

The only problem with using these apps is that because they use your phone's inbuilt microphone there is no guarantee that the microphone's frequency response will be flat, so the measurements you make *could* be incorrect. However, the frequency responses of the microphones on the smartphones I experimented with when preparing this article were flat enough to allow accurate calibration. If you are particularly fussy, and want to use a calibrated microphone, both these apps allow you to use an external microphone. However, to be successful you'd need to use a good, calibrated, external microphone, for which purpose I'd recommend the Dayton imm-6, from Dayton Audio [www.daytonaudio.com/index.php/imm-6-idevice-calibrated-measurement-microphone.html]. In Australia, this microphone will cost you around \$50 plus \$10 shipping [from www.theloudspeakerkit.com].

Anyone who is regularly installing and calibrating subwoofers should use a professional-standard portable RTA, such as NTI's XL2 fitted with the M4260 microphone—www.nti-audio.com/en/products/xl2-sound-level-meter.aspx. In Australia, NTI equipment is available from Amber Technology Pty Ltd on 1800 251 367 or www.ambertech.com.au 

Blur | The Magic Whip

After the slightly sombre *Fool's Day* single in 2010, it seemed that new material from a Blur reformed to include guitarist Coxon might be so weighed down by their combined maturity that Blur as a collective might no longer bounce. Various live dates discouraged this diagnosis, and it is dismissed entirely by the elasticity of this new album, which also welcomes back the quirky sonic production of Stephen Street. Collective inter-Blur experiences manifest in the depth and detail of the songs—the minor rather than major tilt

of *Ice Cream Man*, the powerful dignity of *There are Too Many of Us*, Coxon's layering of parts over *New World Towers* (which Albarn alone might have decluttered) and rising guitar figures between the verses of the arm-waving anthem *Ong Ong*. With all this and the top-notch whistles and hooks of opener *Lonesome Street*, the more you listen, the deeper it goes.



Mark Seymour & The Undertow | Mayday

Hard to imagine opening lines any more Aussie than here on Seymour's latest work—'Shark attack on Tuesday, they shut the beaches down', the first couplet of a brief four-line first verse preceding his instant lighter-waving classic chorus for *Home Free*. This whole album is Seymour singing about his Australian home through political but personal protest songs—simply but stylishly structured tales of fly-in-fly-out mine workers on *HFO*, of the downsides of Diggerdom on *Thirsty Old Men*, of 'shock jocks screaming' and 'billionaires moaning'

on the delightful acoustic coda of *Red Flags*. Style-wise it's guitar-led rock with lighter country-folk edges, his Undertow band tight from touring, supportive in tone, delivering Fleetwood Mac-quality harmonies on *Asylum*, and some solid solos from producer-guitarist Cameron McKenzie (ex-Horsehead). They're coming soon to a venue near you.



Glen Hansard | It Was Triumph We Once Proposed... Songs of Jason Molina | EP

A generous and successful tribute: Hansard was a fan first then a collaborator with Jason Molina, who died in 2013 but will surely gain posthumous patronage from Hansard's delivery of the five cherries on this 26-minute EP. The material suits Hansard to a T, some songs intensified (*Being in Love*), others opened out, like *Farewell Transmission*, where the drums are held in reserve for the first four minutes. Molina's songs and a band of other associates propel Hansard into new territory, even happy places in which Glen himself is

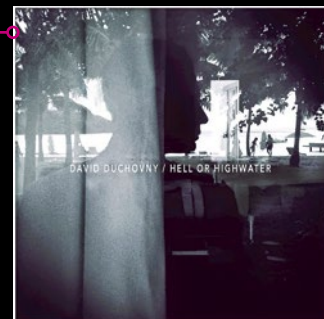
a rare sojourner, and he returns the compliment by committing completely, his *Hold On Magnolia* more delicate and deliberate than Molina's own two studio versions, yet surely sending many listeners scurrying off to secure (or stream) some of the many original albums of Molina and his bands: Songs: Ohia and the Magnolia Electric Co.



David Duchovny | Hell or High Water

Well here's a surprise—a well-produced, sultrily-sung and self-penned album from the man currently acting his way through the all-new 'X Files', not to mention celebrating the recent release of his first novel. Duchovny learned guitar only a few years ago, he claims, and lyric writing too, but a calm and casual confidence carries the simple lyrics and song structures, a rookie overuse of chord changes perhaps, but successfully musical and emotional, so that there's not the sense of celebrity over-reach that accompany the musical

offerings of, say, Hugh Laurie or Scarlett Johansson. His voice is rich and animated, a little like late Paul Kelly on the title track, elsewhere like Tom Petty, but definitely his own man, not, presumably, seeking fame, nor physical media production either it seems—Amazon US lists the CD as 'manufactured on demand using CD-R recordable media.'



Brian Wilson | No Pier Pressure


A Gershwin collection in 2010 was followed by a silly album of Disney songs suspiciously weighted towards recent films—was Brian really a fan of 'Toy Story 3' and 'The Little Mermaid'? Family influence may provide an answer there and here, with producer Joe Thomas's comment that 'we wanted our kids to think we were cool' illuminating this collection's unlikely 10 collaborations with the likes of, err, Sebu Simonian, Kasey Musgraves, Fun's Nate Ruess... With few exceptions these seem less the successful creative crossovers and more an

alienation of all fan bases, the visiting talent either dispensable or downright destructive. But there are moments—Mark Isham's trumpet on *Half Moon Bay*, Peter Hollens' Beach Boys' a capella work on *Our Special Love*, the cool jazz and sultry vocal of She & Him's Zoëy Deschanel for *On The Island*. And some songs are simply Brian being beautiful. So sample with care.



Leonard Cohen | Can't Forget: A Souvenir of the Grand Tour

Four live collections since 2009 (five counting the archive Isle of Wight release) might seem a milking, but there is no duplication, and indeed only four of these ten are in front of an audience. The rest are from Cohen's notoriously long sound checks, including several entirely new songs along with interesting variations such as the funk-up take of *Tower of Song* hidden behind a monologue from his Sydney show, here entitled *Stages*. His vocal throughout is better treated than the extreme aridity imposed on last year's 'Live in Dublin' release,

where Leonard lacked his ululating lows, while audience mikes and hall ambience were dialled down to zero—a bizarre call for a live album, and one that starved the whole recording of air. Here on the live-in-Mönchengladbach *Night Comes On* he is fabulously full, and if the mike handling is occasionally casual, that's entirely in keeping with the captured moments.  Jez Ford





Simon Barker | Descalzo | kimnara.com.au

Simon Barker may well be the only musician in the land who could have attempted this engrossing solo album. It consists of five pieces for drums, percussion and the desperately forlorn sound of Barker's shakuhachi (end-blown flute), all drawing on his mastery of Korean traditional music to open up improvising options. The point is that it probably wouldn't matter were he only playing a pair of bongos: Barker's artistry has

now reached such a pitch as to transcend the actual instruments and arrive at that rare state of pure music-making. It helps that he has such a keen instinct for using dynamics and density to mould dramatic contours, and thereby absorb the listener in musical narratives that are like miniature and exquisitely poetic short stories. The album has also been sumptuously recorded.

MIKE NOCK OCTET SUITE SIMA

Mike Nock Octet | Suite SIMA | FWM004

Some music grips you instantly, the lines and mood heralding something momentous. Peripherals, the third movement of Mike Nock's Suite SIMA is like that. The solo piano introduction and ensemble statement lead inexorably to the twisting beauty and lacerating energy of Peter Farrar's alto saxophone, and then a thrillingly inventive James Greening trombone feature. Nock's new suite pays tribute to the Sydney Improvised Music Association, the band

containing his current trio (with Brett Hirst and James Waples) and two musicians whose careers have been plaited with SIMA in Greening and trumpeter Phil Slater (who achieves startling lift-off on *Holding Patterns*). Then, ensuring the suite as an eye to the future as well as the rear-view mirror, he has three exceptional younger players: Farrar, tenor saxophonist Karl Laskowski and guitarist Carl Morgan.



Alister Spence/Myra Melford | Everything Here Is Possible | ASM002

In late 2012 the US jazz pianist Myra Melford was touring Australia, and while in Sydney took time out to record this album with local pianist Alister Spence. Nothing has been edited or changed from exactly what unfolded, and it is astonishing how quickly the two players seem to become one. Within seconds of the opening you hear the music enfold them, so they cease to be two strangers sitting at large

keyboard-operated machines, and become a single four-handed entity following where the previous sound leads. This synergy is most obvious at the transition points, where one could easily have held back with an 'after you' politeness, but both change direction with miraculous synchronicity. It helps that they share a spirit of adventure, a similar aesthetic sense and a certain whimsy.



Jon Armstrong Jazz Orchestra | Farewell | Orenda 0008

It's as though they were commandments delivered from heaven on a stone tablet, and all big-band leaders nodded meekly and set about rehashing the sound of other big bands. Creativity be damned. This presumably comes as a shock to some, but any supposed rules were made for breaking. Jon Armstrong understands this. The gifted Los Angeles tenor saxophonist may have assembled a 23-piece band of fairly traditional instrumentation,

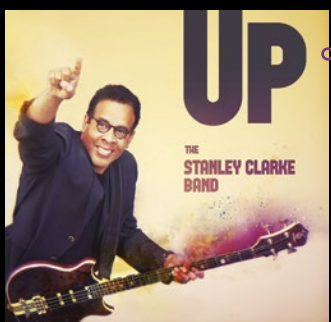
but he is a composer/arranger who dares to imagine, the more pedestrian title track apart. Seldom resorting to the full blast of massed horns, he prefers to draw out shifting patterns of colours, textures and dynamics, using structures that sometimes dare to reach beyond the head-solos-head format. Improvising (including by the scything trumpeter Daniel Rosenboom) becomes a conceptual part of the pieces.



Steve Hunter | Cosmos | Green Square GSM001

Bassist Steve Hunter is a consistently imaginative composer. This live album dips into the back catalogue, the chosen pieces considerably freed-up with help from pianist Matt McMahon, saxophonist Matt Keegan and drummer Andrew Gander. Despite its propulsive groove the opening *The Kingston Grin* never quite catches fire, *Love & Logic* being much more successful, having a certain in-built portentousness amplified by Keegan's yearning tenor lines. The

flamenco-infused *Cazador* is among Hunter's most dramatic compositions, and here it becomes a feature for his streaming ideas and luxuriant sound on the bass. *Habitat* may lack crispness, but it certainly bristles with energy, suiting Gander's busy, insistent drumming, and, after McMahon has unleashed torrents of sound, *Let's Look* eventually unwinds into some of the album's most fascinating and finely-wrought improvising.



The Stanley Clarke Band | Up | Mack Avenue/Planet MAC1083

Stanley Clarke's propensity for faster-louder gaucheness has been frustrating, because, as he reminds us here, he is also capable of making real music. Each piece is a fresh adventure, from a funky blues to using choirs and string quartets, and even a version of *School Days* with original drummer Gerry Hemmingway and a searing Jimmy Herring guitar solo. Other guests include Police drummer Stewart Copeland (a typically effervescent, top-of-the-beat

performance on *Up*, with guitar by Joe Walsh) and Chick Corea, whose piano is one half of a gorgeous duet with Clarke's double bass. Clarke mainly plays predictably fast, funky electric bass, but his most interesting and beautiful electric work comes on some little interludes called *Bass Folk Songs*, including one dedicated to Charles Mingus.

John Shand

[www.johnshand.com.au]

Perfect Strangers | Heiner Goebbels/Frank Zappa | LAWO Classics MC SACD 1063 [NewArts Intl]

This new SACD is a wild and worthwhile ride featuring two contemporary maverick composers in a spectacular multichannel recording. Suite for Sampler and Orchestra by Goebbels is dissonant and energetic, drawing inspiration from baroque music, Jewish prayer chants, and industrial noise. It has deep bass, sparking highs and very aggressive positioning of instruments and voices. We also get works by the late, great Frank Zappa.

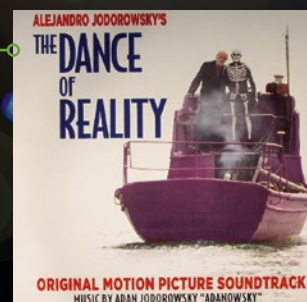
Zappa was not taken seriously by some, but he was a skilled composer. Hearing his music played by The Norwegian Radio Orchestra in multichannel sound is a treat and the sound is simply superb. It's one of the best recordings I've heard, and it fully engages the LFE and surround channels. This is a demo-quality disc that's not going to be everyone's cup of tea musically, but one that I'd highly recommend.



Alexandro Jodorowsky | The Dance of Reality (2014) | abkco records/ RGM-0302 (Vinyl)

Partly due to the success of the amazing documentary 'Jodorowsky's Dune', Chilean filmmaker Alejandro Jodorowsky has gained much attention. Following up on the vinyl release of the soundtrack music to his original big hit El Topo, abkco has here mastered the original soundtrack to The Dance of Reality, whose soundtrack music was written by his son Adan. This music appealed to me because

much of it sounds like a sort of raw version of Nino Rota's wonderful scores for Fellini. The 16 tracks on vinyl have a connection and flow that is not found on the Holy Mountain score. It's been described by Jodorowsky as 'alternately lush and comical, brooding and wistful.' The fidelity of the vinyl was up to the usual audiophile vinyl standards.



Arvo Paart | Piano Music | Jeroen van Veen, piano | Brilliant Classics 90000 (2 LPs)

These piano works by Paart (some with added instruments) cover 50 years and three distinct periods of his career. First his Neoclassical phase, then one in which he used techniques associated with the Soviet *avant-garde*—serialism and atonality. In the third, after he took a break to study plainchant and ancient vocal music, he emerged with a pared-down style that combined spiritualism with minimalism and both ancient and modern techniques. All Paart's works preserve their special

mood no matter the instrumental forces used, similar to the works of Bach. *Für Alina* is in his tintinnabuli style, and can evoke anything in the listener from unutterable sadness to serenity. *Fratres*, which has been performed in many different versions, is here, along with another Paart classic, *Spiegel im Spiegel*. The two-piano version of *Hymn to a Great City* here can also be seen and heard on YouTube.



Ludovico Einaudi | Piano Music | Jeroen van Veen, piano | Brilliant Classics 90002 (2 LPs)

The idea of Minimalism seems to be that more can be said with less, as less seems somehow necessary in today's increasingly noisy and chaotic world. Ludovico Einaudi has had an important role in taking his peaceful and beautiful compositions into the mainstream of classical music and asking us to just sit back and enjoy his unique works. His lyrical, timeless, Zen-like melodies have had a

universal appeal and have reached non-classical listeners all over the world. Don't worry too much about the titles of each track: they don't make much difference to the music, which always remains faithful to the path of the great classics, the melodies always descending, and is ambient, calm, meditative and often introspective.



Fernando Sor | Guitar Sonatas | Ricardo Gallen, guitar | Eudora MC SACD EUD-SACD 1401


This is a lovely performance and recording of the guitar music of Fernando Sor, who died in 1839 and was both a well-known classical guitarist and a well-known composer. His works are here performed by Ricardo Gallen, and although they're passionate and well-played, some would consider them to be music for background listening, due to the guitar sound being presented in a large acoustic space and only a hint of ambience in the surround channels.

I listened to the disc's CD layer and found the high end just a bit subdued. I also listened to the DSD mix direct, and it sounded identical to the PCM version. This disc is the inaugural release on the new Eudora Records label and it's a worthwhile listen. Sor's music is always a delight and Gallen is a fine performer who honours the music with this fine high-resolution addition to the catalogue.



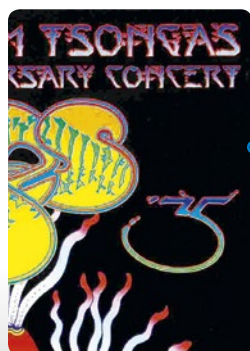
Blues Masters | Various Artists | AudioQuest Music/MasterMusic xrcd24 NT015 [Dist: Combak]

Masters is a *bona fide* collection of modern blues classics. The opening track is a slow-burning Sam McClain/Kevin Barry original composition *I'm So Lonely*. A second McClain number, *Too Proud*, has Bruce Katz delivering a resonating performance on Hammond B-3. Doug Macleod resurrects down and dirty acoustic blues on Willie Dixon's *Bring It On Home* helped by the incomparable Charlie Musselwhite. Terry Evans is transformative on J. B.

Lenoir's *Down In Mississippi* with an all-star band that includes Ry Cooder and Jim Keltner. Robert Lucas contributes two numbers: Muddy Waters' classic *Feel Like Going Home* and *Moonshine 2*. The xrcd sound is fabulous: guitars are crisp and smooth; the B-3 warm. Quiet moments have precision, but still possess complexity and strength and the aural potency is superb. 

Audiophile Audition [www.audaud.com]





Songs from Tsongas YES 35th Anniversary Concert 2004

Starring: John Anderson, Steve Howe,
Chris Squire, Rick Wakeman, Alan White.

It is with some trepidation that I approach reunions of old rockers. Do they still have it after all these years? Yes! 'Songs from Tsongas' proves, in 244 minutes of glorious live concert material, that in 2004 the band remained near the height of its powers, some thirty-five years after its formation.

The band consists of what might be called the classic line-up: that which applied from 1972 to 1974 and from 1976 to 1980, with Jon Anderson on vocals, Rick Wakeman on keyboards, Alan White on drums, Steve Howe on lead guitar and Chris Squire on bass. None of them quite pulls off the youthful look of their earlier decades of course. Rick Wakeman maintains the distinctive long blonde—almost white—hair I remember from his classic 'Journey to the Centre of the Earth' live recording, but he now has a rather more portly shape.

But all have maintained their skill and musicianship, and the camera gives a nice sampling of their musical mastery at work. Particularly impressive is Anderson's voice. He has no apparent difficulty in maintaining the range he once had (although he isn't as stretched as he might have been, because *Heart of the Sunrise* from 'Fragile' is not included in this performance).

The 'Tsongas' of the title is the arena in Massachusetts where the concert was performed in May 2004 as part of the band's 35th Anniversary tour.

The band performs a selection of songs from throughout its career. The later stuff, with which I was unfamiliar, was just about as good as the classic progressive material. I particularly recommend the concept piece *Mind Drive (Parts 1, 2 and 3)*. Much of the second half has the band lined-up across the stage with acoustic instruments, yet somehow it manages to be as driving and powerful as the band with full instruments.

The song *Ritual* from the same concert is delivered as an extra. The other extra is a 70 minute concert performed the same year in Lugarno (with SD picture and stereo audio).

The sound is delivered in 5.1 DTS-HD Master Audio or stereo LPCM (the default), both at 16-bits and 48kHz sampling. The modulation level is fairly low, so my home theatre receiver was running at a higher volume level setting than usual. There was plenty of dynamism. Things were a little clearer on the multichannel mix, thanks to the use of three channels to carry the bulk of the sound (there was just crowd noise and little bleed in the surround). The only real anomaly was where on a couple of occasions, particularly in *South Side of the Sky*, the upper register of the bass guitar resonated somewhat overpoweringly.

FEATURES

Running time: 145 minutes

Picture: 1.78:1, 1080i60, MPEG4 AVC @ 20.66Mbps

Sound: English: DTS-HD Master Audio 16/48 3/2.1 @ 2432kbps (core: DTS 16/48 3/2.1 @ 1509kbps); English: LPCM 16/48 2/0.0 @ 1536kbps

Subtitles: Nil

Extras: Bonus Track (1080i60, DTS-HD MA 16/48 5.1 @ 2418kbps - 29 mins); Live in Lugarno 2004 (480i60, LPCM 16/48 2.0 - 70 mins); Interview with Roger Dean (480i60 - 8 mins)

Restrictions: Rated G, Region Free

Movie: A | Picture: A | Sound: A- | Extras: A

Elton John The Million Dollar Piano 2013



Director: Chris Gero

Starring: Elton John, Davey Johnstone,
Bob Birch, Kim Bullard, John Mahon,
Nigel Olsson, Rose Stone, Táta Vega,
Jean Witherspoon, Lisa Stone, Luka Sulic
Stjepan Hauser, Ray Cooper.

It's hard to think of a better place for a showman such as Elton John to appear than in Las Vegas, at The Colosseum, Caesars Palace. This show—The Million Dollar Piano—began in September 2011. John's reference in the concert to being almost 65 years old suggests it was recorded in early 2012.

Despite his age, Elton remained in good voice, if a little coarser than in his youth, belting out a dozen and a half hits tunelessly and clearly. The piano for which the show is named was specially made (it took four years according to the booklet included with the disc) by Yamaha. Its main distinguishing feature is the inclusion of 68 LED video screens, so says the booklet. These run around the edges of what looks like a nine foot grand piano. This is necessarily faced with flat diagonally placed panels instead of sporting the usual curved edges.


Why? Well, just about every flat part of the stage and set facing the audience consisted of video displays (perhaps rear projected, in part, although it isn't clear). So apart from a few fixed elements—such as giant swirls at the edges of the stage—the whole thing is active and can display whatever the show designers want.

What they want is florid, rich and varied. Apparently there was a Sun King theme. The colour scheme switched from blues to reds to golden bronzes. It's largely a delight to the eyes. Because so much of the screen is bitmapped at a not particularly high resolution there tends to be a bit of interference with the 1080i60 photography, the interlacing resulting sometimes in unintended twinkles as a display tries to reconstruct fine details from two parts photographed at slightly different times. Likewise microphone stands and such sometimes appear rather ragged.

Included in the band are long-time Elton John Band members Davey Johnstone (guitar) and Nigel Olsson (drums). There are newer members, too, including YouTube sensations 2Cellos Luka Sulic and Stjepan Hauser, whose strains I could occasionally pick out from the mix.

The sound defaults to LPCM stereo, 24-bits at 48kHz, with DTS-HD Master Audio in 5.1 channels at the same resolution as an option. The latter mainly uses the surrounds for applause.

The piano itself has a rather bright, honky-tonk sound, otherwise the sound has a fine balance, with good grinding bass guitar and drums that stand out in the mix.

Accompanying the main program are four songs from a concert in Kiev seemingly made around the same time. This demonstrates how different live recordings can sound, with this one having stacks more reverb and a wonky kick drum microphone that sounds like it's suffering with every kick of the pedal.  **Stephen Dawson** [www.hifi-writer.com]

FEATURES

Running time: 111 minutes

Picture: 1.78:1, 1080i60, MPEG4 AVC @ 30.00Mbps

Sound: English: DTS-HD Master Audio 24/48 @ 4771kbps; (core: DTS 24/48 3/2.1 @ 1509kbps); English: LPCM 24/48 2/0.0 @ 2304kbps

Subtitles: Nil

Features: Live in Kiev (1080i60, LPCM 24/48 2.0, 21 mins); Featurette (1080i60 - 23 minutes); 8 page booklet

Restrictions: Rated PG, Region Free

Movie: A | Picture: A- | Sound: A | Extras: B

CONTINUED FROM PAGE 85

As is usual with Audia Flight, the build quality and assembly were first rate.

If one system stood out because of its sheer physical beauty it was the all-**Kharma** one (30). The Kharma electronics (dCS source) drove the Exquisite Midi Grand speakers (US\$175k) to produce a natural and effortless sound with the usual Kharma speakers' disappearing act, even if the room may have constricted the grandeur of these transducers. Company founder Charles van Oostarum told me of some special driver technologies now appearing in the top models, and soon to be adopted more widely, which will provide further control over design and ensure the flow-on of increased performance.

Chord Electronics (31) launched the company's new Dave FPGA-based DAC and headphone amplifier. Another team effort between company principal John Franks and long-time designer Robert Watts, the Dave DAC is the culmination of 22 years of digital development. There was also a hint of a no-holds-barred DAC that promises to really stir the high-end digital space.

Luke Manley (32) walked me through the new **VTL TL6.5 Signature Series II** Hybrid preamplifier (US\$15K) with new 'FET' output stage, 'we had somewhat of a resistance from customers regarding our MOS-FET preamp designs so I explored alternatives and found a power-FET that sounded superb, even better than valves, and had other qualities I was looking for.' It must be said that the build quality and internal circuit design (through the clear acrylic top) looked state-of-the-art.

German company **Kaiser** (33) had its absolutely stunning 'Brilliant Edition' Kawero! speakers with massive Dueland-filled external crossovers sounding majestic and involving. The level of engineering and fit and finish of these superb speakers is extraordinary.

Wilson Benesch debuted the R1 Reference rack with a system of CH-Precision electronics, the Air Force Two turntable from highly-acclaimed TechDAS and WB's own beautiful Endeavour reference monitor, and Taurus subwoofers. The sound was solid yet smooth, refined, and tonally beautiful.

Manfred Diestertich ran me through some of the technologies in the superb **Audio Physic** speakers (34). 'The ceramic pads we use for cabinet damping feature different densities and sizes of 'bubbles' which provide varying dampening characteristics while also having the effect of 'enlarging' the enclosure size.'



Elac, now has the services of the talented Andrew Jones, following his departure from TAD, and in a system with Primare electronics the Elac FS-507 VX-JET (35) sounded über-detailed and dynamic. The brilliance of the JET tweeter was evident and made for a fast, transient rich presentation.

MBL whose cavernous and near-pitch-black room (photographic woes...) used the Xtreme speakers and, of course, MBL electronics to project a massive soundfield that brought orchestras into the room. CEO Christian Hermeling explained, 'the advantages of our speakers are that they radiate in 360 degrees and also up and down, and this takes the room into account whether it's a natural-sounding or a live room, so the sound is very natural.' I'd have to agree: the sound was enormous and displayed an astounding level of ambient information.

This was my first visit to what has become the biggest high-end audio show in the world and it was a revelation. It was well organised—this is Germany!—and the MOC is a superb venue. No small, dark hotel rooms here, but



spacious and (mostly!) well-lit rooms, whose exhibitors spun varied, interesting and sometimes even captivating music—not a single sighting of Rebecca Pidgeon—and the Who's Who of the audio world was there under the one, massive, roof. It was, as the Germans say: super cool! **Edgar Kramer**

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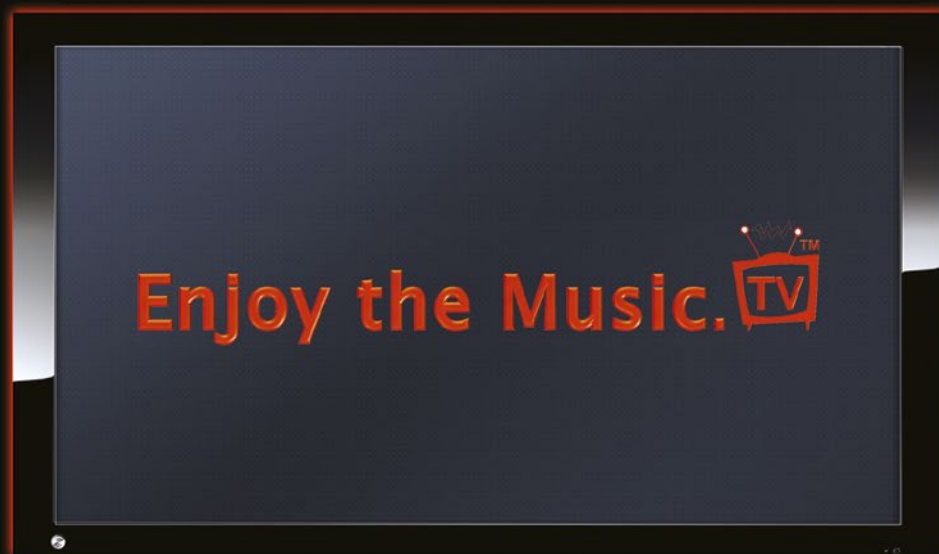


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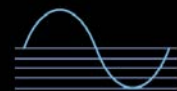
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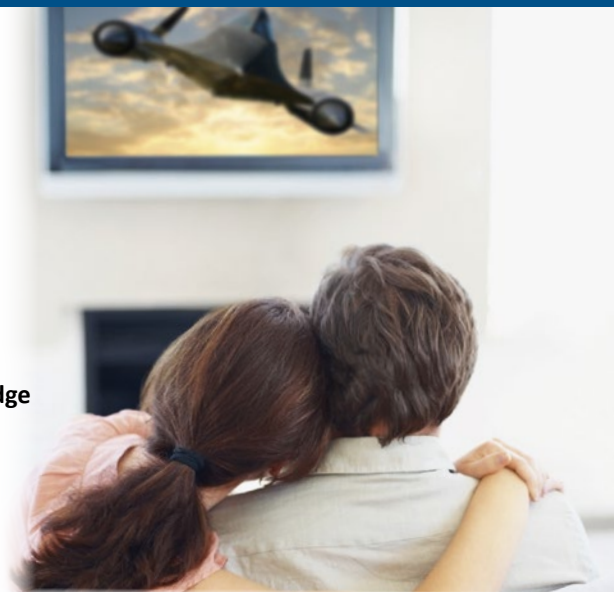
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CONTINUED FROM PAGE 34

LABORATORY TEST RESULTS

You don't need to go past Figure 1 to see that Sunfire's automatic equaliser works a treat! In fact Figure 1 shows that it's very smart indeed. The top (black) trace shows the in-room frequency response of the XTEQ 12 after the auto-equalisation and you can see the response is almost ruler-flat between 30Hz and 70Hz, and only 6dB down at 18Hz and 150Hz, which means, normalised, *Newport Test Labs* measured the Sunfire XTEQ 12's frequency response as 18Hz to 150Hz ± 3 dB. That's impressive. As for the equalisation circuit being smart, that's demonstrated by the lower (red) trace which shows the response with the crossover set to 30Hz. In this case, the Sunfire XTEQ's frequency response is very flat from around 18Hz up to 35Hz, after which it rolls off at around 8dB per octave.

Figure 2 shows the near-field unequalised sine responses for the bass driver for four settings of the crossover control. It would appear that there's no difference between the 100Hz and Bypass settings.

The slight 'squiggle' on the 30Hz trace is where some mains hum has crept into the test set-up and should be ignored. You can see the output of the driver peaks at around 66Hz when the crossover is at the 100Hz setting and at 55Hz when it's at the 65Hz setting. The driver's minimum output is down at around 27Hz, but this is where the output of

the auxiliary bass radiator (ABR) kicks in, as you can see in Figure 3, where the frequency response of the ABR is shown as the trace with the dashed lines. It appears that Sunfire has tuned the ABR a little lower in frequency than the textbook suggests, in order to gain some additional 'free' bass extension.

The two traces in Figure 4 are in-room pink noise frequency responses, smoothed to one-third octave, with the top-most one showing the raw unequalised response of the Sunfire XTEQ 12, and the bottom one showing the equalised response (as is also shown in Figure 1). You can see that below 30Hz and above 100Hz the traces are almost identical, so the auto-equalisation circuit has simply pulled down the gain in each of the four bands to flatten the response.

The Sunfire XTEQ 12 performed exactly as claimed by its manufacturer and provides an extremely flat frequency response across its passband for all settings of the crossover control.

Steve Holding

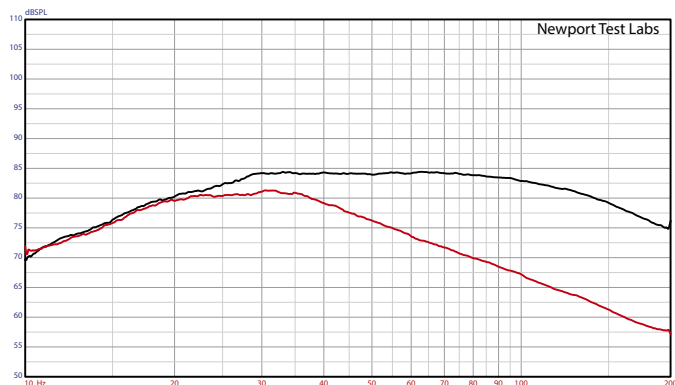


Figure 1: Pink noise frequency responses (smoothed) at 2.0 metres with crossover control at minimum (30Hz) and maximum (100Hz) after auto-equalisation. [Sunfire XTEQ 12]

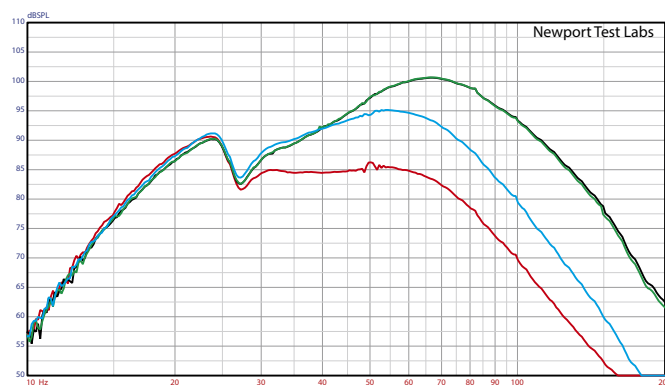


Figure 2: Nearfield sine frequency response of bass driver with crossover control set to 30Hz (red trace), 65Hz 'Normal' (light blue trace), 100Hz (green trace) and Bypass (black trace), with auto-equalisation circuitry disabled. [Sunfire XTEQ 12 Subwoofer]

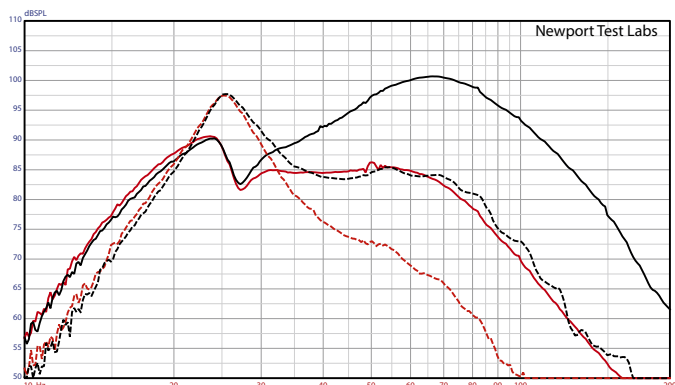


Figure 3: Nearfield sine frequency response of bass driver and port with crossover control set to 30Hz and 100Hz, with auto-equalisation disabled. [Sunfire XTEQ 12 Subwoofer]

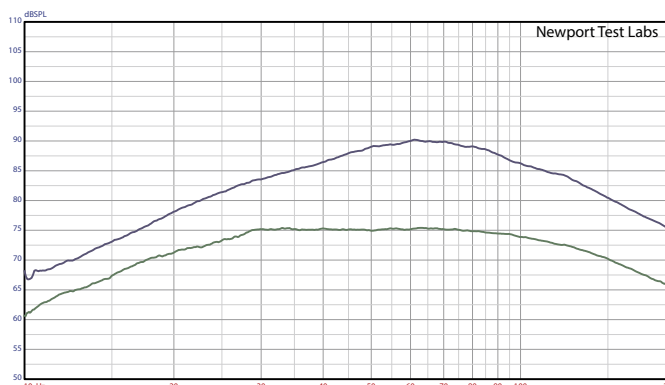


Figure 4: Pink noise frequency responses (smoothed) at 2.0 metres with crossover control at 100Hz, showing response with equalisation (black trace) and with auto-equalisation circuit disabled (green trace). [Sunfire XTEQ 12 Subwoofer]



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