Designing high quality headphones must be one of the hardest tasks demanded of the hi-fi manufacturer. With just about everything else, the 'target' is clear: a flat frequency response. The whole chain of reproduction depends on an implicit agreement that each piece of equipment does its best to keep the balance even.

Headphones? Not so much. They inject their sound directly into the ears of the listener. There’s almost no intervening air, no shaping of the tone by the listener’s head and ears, no change in angle by which the sound enters the listener’s ears. Headphones with a flat frequency response sound pretty terrible. What we want are headphones that deliver a realistic sound, but into our own private worlds without bothering outsiders too much.

So headphone makers have to tune the sound, but every potential customer is different. With the endless flood of hi-fi headphones and audiophile headphones, these days it’s about finding something that makes the magic happen for you. And that means that while we can give some guidance, you simply must listen yourself before making a final decision.

It’s also worth checking what magic can be heard at higher prices — listen a rung or two above your preferred price bracket, but also to some true exotica, either at a specialist with such stuff permanently on demonstration, or better still at a hi-fi show, where the widest possible range will be available to hear, glowing valve headphone amps and all. ‘Everyone should drive a sports car once’, a wise dealer once said, because if you’ve never driven one, how do you know if you might want one? Even if you don’t, it provides a reference level against which to judge others.

We did put a lid on this test in price terms, but we’ve covered quite the range, from $299 to $1299. We thought we’d end up with a mix of traditional wired and Bluetooth models. In the event, almost all the models are wired (which largely eliminated differences to do with codecs). And the one Bluetooth model is utterly different to any other set of headphones on the market... SD

SOMETHING FOR EVERYONE
Different headphones; different delights — Stephen Dawson goes hunting head-fi.

TESTING TUNES
Since this review is necessarily subjective, I settled on a number of interesting tracks to use on all seven sets. They were:

- Melanie: Lay Down (Candles in the Wind)
  A great 1969/70 song taken from a compilation album of quite indifferent recording quality.

- Bizet/Schedrin, Carmen Suite, Scene (Track 7), I Musici De Montréal & Yuli Turovsky, Chandos
  Beautifully recorded, dynamic and exciting.

- Liszt, Hungarian Rhapsody No. 2, Tzimon Barto, EMI
  Powerfully dynamic piano, but with a tendency to shrillness.

- Primus, Southbound Pachyderm from ‘Tales for the Punchbowl’
  Complex bass and drum rhythms, with surprisingly clear definition.

- Eminem, Stan from ‘The Marshall Mathers LP’
  Quintessential hip-hop rhythms and bass.

- Tchaikovsky, 1812 Overture, Erich Kunzel with the Cincinnati Symphony Orchestra: The famous 1978 recording on Telarc.

- Schubert, String Quintet in C, Alban Berg Quartett with Heinrich Schiff, EMI
  The finest performance I’ve heard apart from Pablo Casals on Philips, for which I’ve yet to find a digital version.

- Laura Marling, Take the Light Off from ‘Once I Was an Eagle’
  A beautiful acoustic work with fine guitar and percussion, and interestingly close-miked vocals.
Coming in at $299, the Dekoni Audio Blue headphones are the least expensive of this collection. Indeed, they’re less than a quarter of the cost of the most expensive.

They do seem to be a little more expensive, however, than the Fostex T50RP Mk III headphones (our review at avhub.com.au/fostex). These I mention because it seems that the Dekoni Audio Blue headphones are a ‘custom variant’ of that model. Indeed, these headphones are labelled ‘Fostex’ on the headband.

Dekoni says that it has made a number of “proprietary changes” to the headphones, including tuning the sound and changing the ear pads. They come fitted with one set of ‘Dekoni Hybrid Ear Pads’ and a second set of “Dekoni Audio Elite Velour Earpads that utilise the Premium Slow rebound, high-density memory foam Dekoni is known for”.

They use planar magnetic drivers. That’s something rarely seen at this price point. The design is neither open nor entirely closed-back. Instead there seems to be substantial venting on the outside of the earcups, but not quite the full flow of air implied by open-backed. Dekoni doesn’t say either way.

They are over-ear headphones, but the inset in the cups for one’s ears are fairly small. Still, mine fitted in, even if a little folded in the process.

The two-metre cable is fairly thick, and detachable. At the headphone end the cable uses a 90-degree 3.5mm plug. This is inset a little and uses a locking collar for security. If the cable fails you should purchase an official one, of course, but at a pinch you should be able to use any 3.5mm...
cable with a body less than 8mm in diameter, although of course it won’t lock.

All but one of the headphones included here come with connections for both 6.35mm and 3.5mm sockets. This is the only one that does it the right way around, I’d argue. The amplifier end of the cable is terminated with a gold-plated 6.35mm plug. A gold-plated 6.35mm-to-3.5mm adaptor is provided. If you do it the other way around (as do most of the others) you do gain the advantage of compactness when using portable gear, whereas the Dekoni arrangement results in a 3.5mm plug some 105mm in length! But if you’re a high-fidelity person concerned with purity first, as are so many of our Sound+Image readers, then you’ll want to reduce the contacts in the signal path. Your high-end gear is most likely to have a 6.35mm socket, so a direct connection to that is preferable.

**Listening**

I started with the Melanie track (the music list for this group test is on the opening page) and three things became immediately apparent. First, these are true high-fidelity headphones, not some kind of cheap implementa-
tion of planar magnetic technology. They do deliver that open, expansive feel of true quality headphones. They are revealing and deliver pretty much everything in the recording.

Secondly, the Dekoni Audio Blue headphones will be extremely pleasing to those who love their bass. The bass line in this track was delivered at a significantly higher level than with any of the other headphones in this collection. It wasn’t florid or booming. The control was excellent. It was just louder. That might make it too loud with some music, but most of the test tracks I used were subjectively improved, or at least not damaged.

The one exception, arguably, was the Liszt piano work. Some sections of the music are heavy on the left hand, and these tended to overpower the rest of the keyboard in their louder parts. By contrast, the Eminem track was even better for the bass strength. I guess with hip-hop there’s not really such a thing as too much bass!

It seems that it isn’t just the mid or upper bass, either. Dekoni talks about how its tuning was aimed amongst other things at ‘an extended bass response’. This was borne out by the 1812 performance. With both the bass drums and the cannon, the hard, hard slam was accompanied and followed by plenty of ultra-deep, near-infrasonic tones. Those are the kinds of things you tend not to notice the absence of, but when they do appear you can’t help but marvel in the greater authority they grant the music, and the sense of the performance space that they provide.

The other stated tuning aim of Dekoni in producing these headphones was to make them ‘less fatiguing and smoother all around’. The third thing I immediately noticed on the Melanie was a certain upper midrange/lower treble zing. I wouldn’t call it fatiguing, but neither would I call it ‘smooth’. Her voice even had a touch of sibilance injected into it. This carried through to the Eminem track. Mr Mathers’ voice had an edge that zinged, not altogether realistically. The percussion also had a harsh edge that did make this track a little fatiguing. That was not apparent with the Schubert. Here there was a fine sweetness in the violins, while the cellos benefited from the greater weight leant by the bass forwardness. Likewise for the orchestral work in the 1812. It was clean and clear and entirely pleasing.

Well, almost entirely pleasing. These headphones are not very sensitive. Using a headphone amplifier/DAC, they went plenty loud enough with the Eminem and the Liszt and the Primus and the Laura Marling. But I could not get the first three quarters of the 1812 quite up to a fully pleasing level. I’d say another three decibels would have done the trick. That’s a pity, because when the cannon-laden climax is reached, it was handled with comfort by these headphones, including, as mentioned, a good dose of infrasonic bass.

When used with a Pioneer portable player with EU-hobbled output level (see our separate article on page 82), even inherently loud material such as the Eminem and Primus were short of satisfying.

That said, one thing you don’t have to worry about is the line impedance of the source device. These headphones share the planar magnetic characteristic of a flat impedance curve across the audio spectrum. Even with a ridiculously high-466 ohms in line, the signal delivered varied by only 0.5dB across the audible frequency range.

Or just make sure you use a headphone amplifier with plenty of oomph. These headphones are rated to cope with up to 3000mW of power. I’m not sure I’d want to be wearing them when they were doing that... –

**SPECs**

- **Drivers:** Planar magnetic
- **Quoted frequency response:** 15Hz-35kHz
- **Nominal impedance:** 50 ohms
- **Sensitivity:** 92dB (1mW)
- **Weight:** 320g
- **Contact:** Addicted to Audio
- **Telephone:** 02 9550 4041 (Sydney)
  03 9810 2999 (Melbourne), 08 6478 4816 (Perth)
- **Web:** www.addictedtoaudio.com.au

**Dekoni Audio Blue**

$299
There were many famous US brands established in the post-war period, commonly named after their various founders. Few remain independent. But Grado is still in the hands of the Grado family some two-thirds of a century after it was established in Brooklyn, New York.

And even though the Grado GH3 Heritage Series headphones are priced towards the lower boundary of this collection, they also are hand-built in Brooklyn.

They are by far the lightest in physical weight of any of the headphones in our group test: 156 grams according to my scales. These are also the only on-ear model from this collection. The light weight means that they need not apply much pressure on your head to stay in place, even with a bit of head shaking. That’s important for on-ear models. Too tight a grip on my ears and they begin to get uncomfortable after a while.

The pads are foam rubber, removable and replaceable. The earcups had sufficient travel on the headband to properly align with my ears, and had a little left over. The band has a leather-look cover, which I suspect is a synthetic. I found the headphones comfortable to wear. They are also unique amongst this bunch in that the cups rotate 90 degrees, so you can pack them away without them occupying too much space. But you’ll have to come up with a case or bag, since none is provided.

The cables are fixed. They join to both cups and are combined into one cable a couple of hundred millimetres under one’s chin. It’s terminated with a 3.5mm plug, and a 6.35mm adaptor is provided.
The bodies are made from Norwegian pine, so of course Grado entitles its webpage for this model (and the more expensive GH4) ‘Norwegian Wood’. Note, this isn’t just a stick-on bit or insert. If you peel off the foam pads you’ll see that cases look to have been wood-turned. They are ridged cylinders because the driver units are open-backed. Consequently they give virtually no isolation to ambient noise, and will share music to which you’re listening with others in the room.

The drivers are dynamic. They are rated at 32 ohms nominal impedance. Grado rates their sensitivity at 99.8dB for 1mW of input. A claim of driver sensitivity specified down to tenths of a decibel seems a trifle over precise, but Grado does say that the left and right drivers are matched within 0.05 decibels. The company seems very keen on precision.

Nominal impedance is one thing, actual impedance over the audio band is another. The headphones clearly have a very high impedance peak at 80 hertz. When fed from certain home theatre receivers, this is going to result in an eight decibel boost at that frequency. With good sensitivity and a clear preference for low output impedance amplifiers, these headphones are best suited to being used with modern designs.

Indeed the Pioneer portable music player drove them to highly satisfying levels with Eminem’s Stan, even in its Euro-compliant low output ‘Headphone mode’.

**Listening**

I briefly tried the headphones on a Yamaha home theatre receiver, which has around 100 ohms of output impedance — relatively low for the genre. It clearly hurt the sound, not only boosting the bass noticeably, but adding a level of harshness to music which was best avoided. Going back to the portable player and sticking with Stan and other tracks on ‘The Marshall Mathers LP’, the sound was a pleasure.

The bass was appropriately hip-hop-forward without being overblown. This album can easily sound tiring with car gear that is too strong in the treble. Instead, these headphones kept everything very smooth and listenable.

That impression was maintained when I moved to a DAC/headphone amplifier with a higher output.

Moving to Tzimon Barto’s ‘Liszt Recital’ on EMI, this usually over-bright, sometimes slightly thin, recording is granted good body and weight by these headphones. In the quieter parts the complex sounds of the hammer blows on the strings were faithfully conveyed. Only the climax at the end of the Second Hungarian Rhapsody ended up a little muddied, as though the drivers retained a little unexpended energy even after the signal relaxed. But this is a monstrously difficult passage.

The restrained — dare I say ‘mellow’ — delivery usefully made such tracks as Lay Down by Melanie nicely listenable. Often with high quality gear the notable deficiencies due to the recording of massed vocals at the tail end of the 1960s are emphasised, making the track sound barely tolerable. Overall, despite the open-backed design, I wouldn’t describe the sound as very ‘airy’. It’s up close, personal and right in your ears. That makes it involving, and certainly seems very accurate... indeed, precise.

Importantly, I was able to achieve satisfying levels with the orchestral sections, thanks to the good sensitivity of these headphones. Yet when the cannon let loose at the end, the headphones coped well.

Likewise when the massed percussion strikes in the Scheridin arrangement of Bizet’s ‘Carmen’ — if there was any dynamic compression, it was far from obvious.

There was good detail in the violins of the Schubert string quintet, without any sense of grating. The reverberation of the kick drum in the Primus’ Southbound Pachyderm came through the mix very nicely, proving that the delivery was clean.

Finally, not once was there any mechanical noise from the headphone. No creaking, no sound of the cable chafing on nearby objects. All I could hear was music — plus room noise, thanks to the open-back design.

These headphones are not really suitable for use with things like AV receivers, since those high output impedances will mess up their tonal balance. But high quality portable audio players — even those hobbled by Euro rules — are ideal, as is any high quality home headphone amplifier.

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**SPECS**

**Grado GH3**  
Price: $475

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<tbody>
<tr>
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<tr>
<td><strong>Nominal impedance:</strong> 32 ohms</td>
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<tr>
<td><strong>Sensitivity:</strong> 99.8dB (1mW)</td>
</tr>
<tr>
<td><strong>Weight:</strong> 156g</td>
</tr>
</tbody>
</table>

**Contact:** Addicted to Audio  
**Telephone:** 02 9550 4041 (Sydney), 03 9810 2999 (Melbourne), 08 6478 4816 (Perth)  
The Nuraphone G2 headphones are radically different. They are almost purely wireless. The analogue cable is an optional extra. For Bluetooth it uses the next best thing after wire: aptX HD. (A Google Pixel 3 phone confirmed it was using this codec.) It should also be compatible with regular aptX. But with no mention of AAC, iPhones would fall back on the regular base-level Bluetooth stereo codec of SBC.

A full charge of the battery is good for 20 hours of use. There’s no on/off switch — they switch themselves on and off according to whether or not they’re on your head. When placed on, they greet you by name and announce their level of charge.

These are over-ear headphones. And they’re in-ear headphones. Yes, both. There are two drivers in each earcup. One is for bass and it works inside the earcup. But also, there are also soft eartips, loosely held by a rubbery diaphragm. They in a position so that when you don the headphones, they are held placed against the openings of your ears. Inside them are full-range earphone drivers.

That bass driver has a separate level control in the app, called ‘Immersion’. This is kind of like having a subwoofer to support bookshelf speakers.

Furthermore the headphones process the sound to match each user’s hearing profile. They set the profiles up automatically using a property of the ears, called ‘otoacoustic emissions’. When the working parts of one’s ears are stimulated by sound, they respond with their own vibrations. These can tell experts a lot about the

**SUMMARY**

**Nuraphone G2**

Price: $499

- Bluetooth connectivity with aptX HD support
- Good sound quality for this market segment
- Active noise reduction
- No analogue cable included
- Weird impedance characteristic with optional analogue cable

**Radically different headphones, personalised to your hearing via an auditory check, and also being both over-ear and in-ear at the same time.**
functioning of the ears and are used to test the hearing of newborns.

The app on your connected phone — iOS or Android — runs you through set-up. The app makes a gentle noise through them for a minute or so and measures the results. It then creates the profile. You can have three named profiles in the app, and the voice in the headphones refers to you by the name.

The ‘G2’ here doesn’t indicate a second model; so far there has been only one Nuraphone. That G2 marks the firmware, which added active noise cancellation.

You can use these headphones with an optional analogue cable (not included). If you do, they will use the currently chosen profile along with the level of ‘Immersion’ last used. You’ll have to pull the cable and reconnect via Bluetooth to your smart phone to change it.

Everything is controlled by the app, though there are four physical controls. A touch-sensitive ‘button’ on each cup can be single or double tapped, and you can assign all the usual functions to those. You can switch noise cancellation on or off in the app (but can’t assign it to one of the buttons). And you can switch on sound pass-through, which uses the microphones, provided for the hands-free phone functions, to pass through outside sounds so you can hear what’s going on around you.

Listening

Because they are so unusual, I’ve spent a big chunk of this review just describing these headphones. So the question is: how do they sound? And the fact is, I can’t tell you!

Once you’ve set up a profile (which is pleasurably displayed as a pink-purple splodge, mine shown above), you can listen using that profile, or you can switch to the ‘Neutral’ mode. I can comment on the sound of the ‘Neutral’ mode because it’s the same for everyone. It sounds pretty poor. It’s kind of flat, a bit midrangey, closed in, limiting. It’s kind of what you’d expect from a pair of indifferent headphones. Cheap ones, even.

So by comparison, switching to my ‘Personalised’ mode sounded simply wonderful. The sound opened up. The bass and treble lifted to provide a much better tonal balance. That ‘veil’ metaphorically used by some many hi-fi reviewers had been especially thick, more like a hessian sack. And it was lifted to reveal something still in the realm of ‘adequate’, but which sounded wonderful by comparison.

Cynical individual that I am, I wanted to check that it wasn’t just changing settings from a preset ‘poor’ to a preset ‘good’. We set my wife up with a profile. She enjoyed the sound delivered by that profile. I detested the sound delivered by her profile. So the whole set-up is certainly doing something individual for each of us.

The tonal balance with my profile in place was pretty good. But remember that the ‘Immersion’ level — the ‘subwoofer’ level — is set manually. I set it to provide the deep tones underpinning the bass drum and cannon on the Telarc 1812. But that proved to leave it a touch too high for Laura Marling. In the end I settled on a setting with the slider at about 15%.

The performance highlight was with the Liszt piano. The headphones delivered very realistic sound. There was no unusual sibilance or other treble anomalies on the other material.

Levels were adequate even on the 1812, but the volume control was very coarsely grained. Perhaps it was the phone, but I found that the volume seemed to jump by something like six decibels on each of the two highest positions.

Two final notes. First, that outer driver or subwoofer has some oomph. If you turn it up more than about halfway you’ll be finding the whole bodies of the headphones vibrating from time to time. Push it harder on something like the Eminem, and you’re in another world, not quite like any other acoustic experience I’ve had.

Second... ‘Neutral’? I’ve just been through very close listening to six other pair of headphones, none of which does anything at all to the signal, other than reproduce it. Their drivers have all ranged from quite good to extremely good. And all of them sounded to my ears on a scale from enjoyable to superb.

So, why does ‘Neutral’ sound so lousy on the Nuraphone headphones? Is ‘Neutral’ programmed to make it seem poor? Or is it a clean signal, and the basic drivers are themselves rather ho-hum?

I can’t answer that. I’d just suggest that the highest quality sound — even at $499 — might be found elsewhere.

However, if you’re after Bluetooth, active noise reduction and don’t mind fairly bulky headphones, then these are worth checking out. I found that I preferred their sound more than that from a certain famous brand of noise-reducing headphones that I use routinely while travelling.

One thing with analogue use: the Nuraphone headphones have the weirdest impedance curve. Use only with low impedance devices or you’ll get no treble.

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**SPECS**

<table>
<thead>
<tr>
<th>Nuraphone G2</th>
<th>$499</th>
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<tr>
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<td>Web:</td>
<td><a href="http://www.nuraphone.com">www.nuraphone.com</a></td>
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Don’t worry too much about the ‘Home’ part of Beyerdynamic’s Amiron Home. It’s there to distinguish these headphones from the Beyerdynamic Amiron Wireless, which is a powered and closed design which is, as the name suggests, Bluetooth connected. Whereas these are passive, wired — and open, likely why they have the ‘Home’ tag.

They use a dynamic driver with what Beyerdynamic calls ‘optimised tesla technology’. Apparently that means “a much stronger magnetic field than standard headphones”. Apart from anything else, that should result in greater control of the driver cone.

However that works, the headphones are rated at 250-ohms impedance, which is rather higher than the norm these days. That suggests best operation with a headphone amplifier that has plenty of voltage available on tap. But it also offers greater immunity to issues with high impedance headphone outputs. In my test, the headphones had an impedance peak at around 100 hertz. With receivers that have very high impedance outputs (466 ohms) that resulted in an input signal peak of only two decibels.

Perhaps a little unusually, in these days of globalisation, these headphones are ‘handmade in Germany’. They are beautifully constructed, with elegant, simple styling, an open design with large ear cups that provide a generous cavity to accommodate the listener’s ears.

The cable is removable and connects via 3.5mm plugs, with one to each ear, joining about 300mm below your chin (so if you ever need a replacement cable, it’ll have to be the real thing). The cable is also generous: over three metres.
in length. It’s terminated in a 3.5mm plug. A 6.35mm adaptor is included, and this screws onto the 3.5mm plug for added security.

**Listening**

I opened with the Laura Marling track. This number is heavily acoustic, with a super close-miked, slightly overloaded vocal. When well reproduced there’s a superb immediacy, near-intimacy, with her voice. And, yes, these headphones reproduced it very well indeed.

There was a remarkably openness to the sound, a broader sound space than is typical with headphones. Her voice was close, but the piano, guitar and percussion occupied a much larger space. Her voice and microphone threaten sibilance on occasion, but these headphones held that to just the right side. It’s hinted at, but not actually produced. Meanwhile, each of the instruments was described with precision, and complete clarity.

That clarity made these headphones rather unforgiving at times, as with the Melanie test track. There’s little detail worth extracting from it, given the transfer quality, and since these headphones don’t seem interested inpapering over recording flaws, Melanie was a trifle harsh, and was presented in the in-your-face manner of the times.

Very different was the Scherchen/Bizet ‘Carmen’, which is gorgeously, lusciously recorded. This uses a good chunk of the full dynamic range available on CD, and being percussion heavy, the dynamic highlights are powerful and sudden. And with these headphones, these were not held back at all.

But after I’d been playing this track for a while, I went back and restarted it. The reason: I realised I’d had the volume too low for full enjoyment. At that point I realised that the best playback level was with the DAC/headphone amp unit set to -3dB. It maxes out at 0dB, of course, which is equivalent to almost exactly two volts into relatively high impedance loads, such as these headphones. That was a lot higher volume setting than when using, say, the Grado GH3. And that’s even though the sensitivity rating of the Grado GH3 headphones is a couple of decibels less for 1mW than for these.

That’s the impact that a high impedance has. One milliwatt into the Grado’s 32 ohms requires 179 millivolts. Whereas one milliwatt into the Beyerdynamic’s 250 ohms required 500 millivolts. That wasn’t a problem with the DAC I was using: it’s okay for a full two volts. But a portable player that complies with European rules has to be overridden to go over a few tens of millivolts, and isn’t supposed to be able to produce more than 100 millivolts.

Which is my long-winded way of saying: if you settle on these headphones, do test them out with your portable player and some of your music collection. (Again, so long as your device has a portable player that complies with European rules has to be overridden to let it rip.

The rendition of this track was a touch brighter than the norm to which I am accustomed. That did no damage, serving to add a little clarity to Les Claypool’s voice, and bring the cymbals a little more forward.

And then there was the Schubert. This is being played so very delightfully through these headphones as I type. The dynamics are superb. The lead violin has never been sweeter. Every subtlety of the recording is being conveyed with assurance. I think that I’m falling a little in love with these headphones from this track alone.

And then there was the Tchaikovsky. Satisfying playback levels demanded the headphone amplifier be put to maximum volume. I could do that safely because there’s no way it would clip into a load this large. That allowed the orchestral levels to be engagingly high. When the cannon arrived, the headphones handled them magnificently. They delivered the slam, but added what seemed to be an octave of deeper bass rarely heard on any gear, let along headphones.

It was the same on the bass drum earlier in the piece. The slam was there with the best of them, but there was more going on in the near-infrasonic regions. I was impressed.

But still, I always like to have a little headroom to spare. I’d recommend the use of a dedicated headphone amplifier capable of delivering well over two volts of output into highish impedance headphones.

One final pleasing discovery — I had the idea that these were thousand-dollar plus headphones when I was writing this review. And then I checked the price, to find they are $799. These are the bargain buy from this collection. (Again, so long as your device has plenty of voltage available. Two volts is the bare minimum.)

### SPECS

**beyerdynamic Amiron Home**

| Drivers: Dynamic with ‘tesla’ magnets |
| Quoted frequency response: 5Hz-40kHz |
| Nominal impedance: 250 ohms |
| Sensitivity: 102dB (1mW/500Hz) |
| Weight: 340g |

**Contact:** Synchronised Technology  
**Telephone:** 1300 467 968  
**Web:** www.syntec.com.au
Over the last few years HIFIMAN has developed quite the reputation for high quality headphones at relatively low prices, with the company winning back-to-back Sound+Image awards for the original Edition X and then the version 2, which dropped in price. The HIFIMAN HE5se is a nod to another of the models pivotal in developing that reputation, the HE5. There’s certainly a cosmetic resemblance, but it seems there are also some very significant differences.

One clear difference is the use of a planar magnetic driver. This uses a flat diaphragm, with a coil applied to its surface, in a strong magnetic field. This arrangement tends to allow a lighter driver than the more common dynamic driver design. The remarkably literate 24-page user manual even lays out the formula relating maximum frequency to driver mass. Incidentally, the box in which the headphones come is lined in a classy black satin. There’s a real sense of luxury and care with these headphones.

These drivers are built into an open-back design. The headphones look to be very nicely finished. The cushions are large, with the round insets for the ears offering ample space for one’s ears. The cushions have soft leather-look sides and cloth faces. The main headband has a softer, wide strap suspended underneath to rest gently on one’s head. Left and right are clearly marked. There is no creaking or other mechanical noise from the body, nor where the earcups swivel on their connections to the headband.

The cable is removable and connects via 3.5mm plugs, though there are two of them so you’re not going to be able to replace them easily. The cable is 1.55 metres long.

**HIFIMAN HE5se**

**Summary**

<table>
<thead>
<tr>
<th>HIFIMAN HE5se</th>
<th>Price: $1099</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Extraordinary detail</td>
<td>+ First class bass</td>
</tr>
<tr>
<td>+ Luxuriously delivered</td>
<td>– Slight treble forwardness</td>
</tr>
<tr>
<td>– A touch insensitive</td>
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Detailed but never clinical, these headphones revealed details of music we’d never previously noticed, yet they’re not short of the deep stuff.
In my office, that’s bit of a stretch to my headphone amplifier/DAC, and I can imagine that also being the case in many living rooms. A 3.5mm-to-3.5mm extension cable would be the solution.

HIFIMAN rates the frequency response of these headphones relatively modestly (compared to some) at 20Hz to 35,000Hz. My listening suggested rather more bass extension than that.

Their nominal impedance is 40 ohms, and as is a common characteristic of planar magnetic headphone designs, the impedance varies very little across the audible band of frequencies. Even in line with a high (466 ohms) impedance, the resulting input signal varied by less than half a decibel across the audible spectrum. However, the claimed sensitivity is quite low: 92dB, which I presume to be for 1mW of input. That could lead to inadequate levels with some musical content and some equipment, particularly portable players.

**Listening**

These headphones were one of the brighter models of this collection. That came out in a couple of different ways. Laura Marling’s occasional incipient sibilance on some words, for example, was no longer incipient. On the Melanie track, the crunchiness of the recording was brought forward a little, but also coming forward were such things as the handclaps halfway through, of which I’d previously been unaware.

You see, with that brightness comes a marked attention to detail. I should add that it was a pleasing brightness for the most part, often adding some sweetness where required. And it was amply balanced by a powerful bass. Again with Melanie, the bass guitar line was clearer, better articulated than most. That evened the score with the treble.

The opening bars of Eminem’s ‘Stan’ are a processed version of Dido’s ‘Thank You.’ I admit it — I sometimes don’t get things until I have my nose rubbed in the them. These headphones did just that, and for the first time I realised that the processing is meant to make it sound like it was coming from a car radio. That’s clarity and detail for you. You come to new realisations.

After a few bars, the bass line kicks in with tremendous power and clarity in these headphones. What sounds to be electronic drums (my apologies to Mr Mathers if they aren’t) are again a little brighter than I’d preferred, but not excessively so. This just brings out the inherent tinniness of the sampled drum sounds.

But with real drums and cymbals there is no such tinniness. The percussion on Primus’ ‘Southbound Pachyderm’ is first-class in precision when delivered by these headphones. Some of the subtle cymbal work operating underneath the main layer of percussion is brought more to one’s attention by these headphones. Yet again, the bass drum is full of power, perhaps a decibel or two above a purely neutral level.

The Schubert Quintet was delivered with a great sense of excitement, and it contained a few surprises. The rustle of clothing, the drawing of breath, these were things I had not heard before, but were evident with the HIFIMAN headphones. ‘Revealing’ is, I think, the word we’re supposed to use here. Revealing these headphones are. Nothing can remain hidden.

And that includes deep, deep bass. The 1978 Erich Kunzel, Cincinnati Symphony ‘1812’ had both the bass drums and cannon delivered with a satisfyingly deep bass extension underpinning the slam. There was a real sense of atmospheric rumble.

However, it also disclosed a limitation with these headphones. They are relatively insensitive. For satisfying playback I turned up the volume to the maximum. In fact, I wouldn’t have minded going a touch louder still. This is with a two-volt unit. You’d be very limited with material recorded at a low level of encoding if you were using a device capable of one volt of output. And even more so with some portable devices that are subject to European output level restrictions. So choose your player carefully.

But that low a level in a recording is quite unusual. For just about everything recorded in a modern genre, there was plenty of headroom with the two-volt output DAC.

If you particularly like hearing everything — absolutely everything — in your recordings; if you like to analyse the sound and performance of what you hear, then the HIFIMAN HD5se headphones are going to deliver for you. There’s nothing hidden. Yet they couldn’t properly be called ‘clinical’ either, because they also deliver a sense of excitement and a slightly forward bass line to which I couldn’t help but tap my foot. —

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**SPECS**

**HIFIMAN HE5se**

$1099

Drivers: Planar magnetic

Quoted frequency response: 20Hz-35kHz

Nominal impedance: 40 ohms

Sensitivity: 92dB

Weight: 387g

Contact: Addicted to Audio

Telephone: 02 9550 4041 (Sydney) 03 9810 2999 (Melbourne), 08 6478 4816 (Perth)

Web: www.addictedtoaudio.com.au
C
an there be a headphone brand more famous than Stax, and yet one that is more rarely experienced? I must shamefacedly admit that I’ve never before donned Stax headphones. [Our Editor chokes into his coffee at this revelation.]

So now’s my chance. Their fame, of course, in part rests on their electrostatic designs. And electrostatic designs do come with certain idiosyncrasies.

First, they cannot be driven by conventional headphone amplifiers. Rather than dynamic drivers (which use a coil and cone, somewhat like miniature loudspeakers) or planar magnetic drivers (which are a variation on the same theme), electrostatic drivers don’t use magnets at all. They rely on the attraction and repulsion of objects carrying electrical charges. As with magnets, opposites attract, while likes repulse.

So the driver consists of a very thin membrane (called the diaphragm) suspended between two grids (called stators). The signal is turned into high voltage charges on the stators. A high voltage is applied to the diaphragm and it moves accordingly.

In these headphones (or ‘earspeakers’, as it is Stax’s way to call them), the ‘bias’ voltage is 580 volts. This SRS-3100 system is designed for those new to Stax, so it includes both the SR-L300 ‘earspeakers’ and the SRM-252S ‘driver unit’.

Stax is a Japanese company. Founded in 1938, it produced its first electrostatic headphones way back in 1960. The manuals for the two devices are bilingual — Japanese and English. The latter evoked a sense of nostalgia in me, the slightly awkward wording (‘How to use a driver

**Stax SRS-3100 electrostatic Earspeaker system**

Electrostatic earspeakers and dedicated driver unit together form the headphone system here, from one of the great longstanding brands, Stax.

**SUMMARY**

**Stax SRS-3100 system**

Price: $1199

+ Superbly well defined sound
+ Whatever level the listener wants
+ Very comfortable wear
- Requires mains power

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72
headphones
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**Stax SRS-3100 system**

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+ Superbly well defined sound
+ Whatever level the listener wants
+ Very comfortable wear
- Requires mains power
Normal headphones are low (or lowish) impedance units, driven by low voltage, high current devices. The Stax earspeakers present an extremely high impedance to the driver unit: 145kohms says the manual. They are high voltage, low current devices. The driver unit acts as the conceptual equivalent of a headphone amplifier. It has two RCA inputs on the back for the two channels, plus a pass-through so that the signal can go on to other equipment. If you have a choice between connecting it to a headphone output or line output, you should generally choose the latter.

On the front of the driver unit is a level control and the headphone connection. Should you upgrade in the future — these headphones are pretty much the entry level into the Stax world — you can still use the driver. It is smallish, measuring 130mm wide and 40mm tall. The level control turns off the unit when rotated fully counter-clockwise. The whole thing is a solid-state analogue device.

The connection is a 5-pin affair (see left), the cable a flat ribbon type with six conductors, around 28mm across and nearly two metres long. The cable splits into two 38cm short of the headphones.

The headphone construction is strictly utilitarian, and seems to be primarily plastic. The back and sides of each cup are mostly grates — these headphones are clearly open backed. You can see the diaphragms through the grates. They’re large and oval, and measure 90mm by 45mm, a lot of surface to push air, because excursion is limited by the stators.

The headphones are very comfortable to wear. The rectangular cups give ample space for ears. And despite the plastic construction, there is no creaking or other mechanical noise from the hinges, and the only noise from the cable is if you drop it so that it tugs abruptly on the headphones.

Listening

The first thing to note is that with the driver unit, this headphone system is pretty much independent of gain in the source devices. Even European rules can’t get in the way! So there are no problems using it with a portable device, except of course that the driver unit is mains powered. So you can’t use these headphones portably (unless you invest in Stax’s recent portable driver).

The second is that their input impedance — that is, the input impedance of the driver unit — is quite high. I measured it at around 12.7kohms. Furthermore, the impedance seems to be even across the frequency spectrum. That means that you can use it with devices with high output impedances without worrying that the source will offer unbalanced levels at different frequencies.

I started with my classical selections with these headphones. It seemed more appropriate, somehow. The Schubert String Quintet, played by the Alan Berg Quartet with Heinrich Schiff on the extra cello, was a delight. It was so very sweet and smooth, yet the dynamic range seemed completely unrestrained. There was plenty of dynamic range to encompass the Telarc 1812 Overture, ripped from CD. This has the closing cannon mixed in at a higher level than it was in the original ‘unplayable’ LPs, and given the hard 0dB limits of digital audio, the orchestral lead-up is recorded at a significantly lower level. So, on a lot of equipment the bulk of the music cannot be played at a satisfying level without risking damage upon the arrival of the climax. There were no such problems here. Again, the strings were sweet, and even in complex sections such as the appearance of the orchestral bells, all the elements of the sound were clear. When the cannon did arrive, they delivered their enormous crack, but not the feared crack of the diaphragm bottoming out against the stators. The near-infrasonic boom wasn’t quite as apparent as with some other headphones.

One unusual aspect of these headphones’ delivery of this music was earlier in the piece when the bass drum sounds. This usually stands out alone, above the music, thanks to Telarc’s practice of not limiting bass instruments (any instruments, really) in any way. Yet with these headphones the drum did not stand out and apart. Instead it seemed fully integrated into the sound. Was the bass perhaps a little less intense? Arguably, but the impact was at least as powerful as with any other equipment, and more than most.

The troublesome Melanie track came through as well, a little troublesome. The transparency of these headphones ensured that the defects weren’t papered over. Nonetheless I found it enjoyable, because neither were the defects enhanced.

The Primus and Eminem were beautifully delivered, with the former even being disclosed with a generous helping of air (as was much of the classical material). The Eminem seemed to have the bass clear and strong, but down perhaps a couple of decibels (as was much of the classical material). The transparency of these headphones ensured that the defects weren’t papered over. Nonetheless I found it enjoyable, because neither were the defects enhanced.

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Blue hails from the United States, and is perhaps best known for its microphones. (Heard of the Blue Yeti?) But it also does a bunch of headphones. We have the wireless NC Blue Satellite model currently under review for next issue, but here we spent time with the cabled Blue Ella, the top of Blue’s range.

They are unusual in a number of ways. First, they have dual modes available: active and passive. They have a 250mW amplifier built in (it’s unclear whether that’s total, or per channel) and a lithium-ion battery to store power. But they are not Bluetooth headphones; they are purely wired. Furthermore, they’re primarily intended for plugging into headphone outputs, even when you’re using active mode. They have no volume control. The only control is a three-position switch: Off, On and On+. The last position is supposed to “restore the low-end character to vinyl-era music”. Hrrmpphh! Think of it as a bass boost.

They have a rated run time of 12 hours in active mode, and they charge via a Micro-B USB socket on the side, switching off automatically when the earpieces are allowed to rest against each other without an intervening head.

The switch is a collar around the 3.5mm input socket. The writing on it is tiny and very hard to read.

Inside, the driver is a 50mm square magnetic planar unit. The headphones are large and heavy — the heaviest of any of this group test by quite a margin. Nonetheless I found them comfortable to wear.

While the cable is detachable and uses a 3.5mm plug at the headphone end, this is on the end of a long, thin plastic extension to the cable, so you won’t be able to use

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**SUMMARY**

**Blue Ella**

**Price:** $129.95

+ Excellent all-round sound quality
+ Built-in amps give relative independence from vagaries of sources
+ Good isolation from ambient noise
– Not quite the ‘air’ of open-backed designs

---

**Our first encounter with Blue headphones proves a great success, with the range-topping Ellas delivering two modes of fine sound.**
third-party cable replacements. But it comes with two — one is a straight three-metre cable for use with your home hi-fi system, the other a 1.2-metre cable with an inline control pod that’s compatible with iOS devices. The play/pause and volume buttons work even through the Lightning audio adaptor required for newer iPhones. (The play/pause button works with Android phones too.)

**Listening**

So, here’s the big question with these headphones. Passive or active? (I’m going to say straight out that no one would want to use the bass boost mode, even though I did note that this mode is fairly subtle... nonetheless I wish it weren’t there because it would make switching on and off more intuitive.)

The first thing to note about the two modes is that there isn’t a whole lot of difference between them in the character of the sound. That says to me that Blue Designs hasn’t used the powered mode to apply a stack of EQ or other processing. Mind you it’s impossible to do a valid A/B test because the powered mode is significantly louder than the passive mode. A quick and dirty measurement with pink noise suggests that it’s around 7dB louder.

And that’s a good thing, because it overcomes the limited output levels available from many players, particularly European ones (see the article on p82).

Nonetheless I did do a fair bit of listening in passive mode. Blue doesn’t give the sensitivity for the headphones in passive mode, but it was clearly considerably higher than the 92dB (1mW input) of the Dekoni Audio Blue headphones. The 2V-output headphone amplifier and DAC was quite capable of getting these headphones to very satisfying levels with the orchestral section of the Telarc 1812 overture.

And with the internal amplifier on, they could well and truly overdo even this low-level recording. With regular modern music they could achieve good levels in passive mode even from a Euro-hobbled portable music player.

I did most of my listening, though, with the built-in amplifier switched on. Heck, it’s there, and it gives relative independence from the source. Indeed, even if the claimed 250mW of output power is total, the 125mW into 50 ohms is delivering considerably more than just about all portable devices, and most desktop devices.

As it happens, I’ve been using these headphones for a couple of months as my main set, even before I was asked to do this group test, and I have been very satisfied with them. I set them aside to use all the other headphones, but I returned them up first. After experiencing the superb quality of some of those others in the group, I was starting to think that perhaps the Blue Ella headphones weren’t quite at the top level. And then I returned to them to do the formal listening and found that I’d been wrong. Their virtues had faded in my memory. In every way but one they matched the performance of the best of them. That one way is inherent in their design. It’s nearly impossible for closed-back headphones to produce that same sense of airiness available from open-backed designs. It’s just the way things work. But it is better than the open-backed designs in a different way: sound isolation. If your circumstances involve you doing your music listening in the same room as someone else is watching the TV, these are the headphones to go for.

As for specifics, the tonal balance was subjectively even. Bass, while strong, was not overblown. The main bass line in the Eminem was solid and powerful, but everything else remained clear. It was extended. The cannon and bass drum in the Telarc 1812 had that solid, rumbling underpinning that completed the sound, made it real. That despite very high listening levels (I’d brought up the very quiet part to the level at which I’d normally listen to orchestral music). The bass accompaniment to the Melanie track was at a good level: clear and easily followed, without being overblown.

These headphones also revealed the crunchiness of that track, particularly on the massed vocals, but without undue emphasis. The Schubert matched the best of the others for sweet strings and a sense of vitality. The sound was limitless detailed. So it’s a tradeoff — a slightly greater openness for some of the others, versus reduced environmental noise with these ones. This one also eliminates the problem of low amplifier outputs, and likewise amplifier outputs with high in-line resistance. Indeed, if you’re using one of the latter, make sure you turn down the volume on the amp before switching from passive to active mode! The different impedances between passive and active mode change the received signal level radically with some AV receivers, from around 10% of the nominal output voltage to 90%, in addition to the 7dB gain increase... —

**SPECS**

**Blue Ella**

<table>
<thead>
<tr>
<th>Drivers: Planar magnetic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quoted frequency response: 20Hz-20kHz</td>
</tr>
<tr>
<td>Nominal impedance: 50 ohms</td>
</tr>
<tr>
<td>Sensitivity: not stated</td>
</tr>
<tr>
<td>Weight: 481g</td>
</tr>
<tr>
<td>Contact: Pacificomm Group</td>
</tr>
<tr>
<td>Telephone: 1300 856 823</td>
</tr>
<tr>
<td>Web: <a href="http://www.pacificomm.com.au">www.pacificomm.com.au</a></td>
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$1299.95
### Headphones Group Test

<table>
<thead>
<tr>
<th>Brand</th>
<th>Dekoni Audio</th>
<th>Grado</th>
<th>Nuraphone</th>
<th>beyerdynamic</th>
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<td>G2</td>
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<td>$299</td>
<td>$475</td>
<td>$499</td>
<td>$799</td>
<td>$1099</td>
</tr>
</tbody>
</table>
| Description            | • Good, open high fidelity sound  
• A bass-lover’s delight  
• Very affordable | • Smooth, enjoyable sound  
• Excellent value  
• Fold flat for transportation | • Bluetooth connectivity with aptX HD support  
• Good sound quality for this market segment  
• Active noise reduction | • Superbly well-defined sound  
• Excellent bass reach  
• Excellent value for money | • Extraordinary detail  
• First-class bass  
• Luxuriously delivered |
| Drivers                | Planar magnetic | Dynamic | Dynamic, 2 way | Dynamic with 'tesla' high magnetic field magnets | Planar magnetic |
| Frequency response     | 15-35,000 hertz | 18-24,000 hertz | Not stated | 5-40,000 hertz | 20-35,000 hertz |
| Earmcup design         | Vented       | On-ear, open back | Over-ear/in-ear, closed back | Over-ear, open back | On-ear, open back |
| Sensitivity            | 92dB (1mW)   | 99.8dB (1mW) | Not stated | 102dB (1mW/500Hz) | 92dB |
| Nominal impedance      | 50 ohms      | 32 ohms | Not stated | 250 ohms | 40 ohms |
| Power handling         | 3000mW       | Not stated | Not stated | Not stated | Not stated |
| Built-in amp power     | N/A          | N/A    | Not stated | N/A | N/A |
| Bluetooth codecs       | N/A          | N/A    | N/A | N/A | N/A |
| Active noise cancellation | No         | No     | Yes | No | No |
| Handsfree phone operation | No        | No     | iOS/Android | No | No |
| App                    | N/A          | N/A    | N/A | N/A | N/A |
| Battery life           | N/A          | N/A    | 20 hours | N/A | N/A |
| Charge time            | N/A          | N/A    | 3 hours | N/A | N/A |
| Included cables        | Removable analogue, 2.0 metres | Fixed analogue, 1.8 metres | Charge cable | Removable analogue, 3.1 metres | Removable analogue, 1.55 metres |
| Analogue plug          | 6.35mm w/ 3.5mm adapter | 3.5mm w/ 6.35mm adapter | Nil (analogue cable is optional extra) | 3.5mm w/ 6.35mm adapter | 3.5mm w/ 6.35mm adapter |
| EQ                     | No           | No     | No | No | No |
| Carry case             | No           | No     | No | No | No |
| Fold flat              | No           | Yes    | No | No | No |
| Weight                 | 320 grams    | Not stated | 329 grams | 340 grams | 387 grams |
| Contacts               | Addicted to Audio | Addicted to Audio | Nura Operations | Synchronised Technology | Addicted to Audio |
| Telephone              | 02 9550 4041 (Sydney), 03 9810 2999 (Melbourne), 08 6478 4816 (Perth) | 02 9550 4041 (Sydney), 03 9810 2999 (Melbourne), 08 6478 4816 (Perth) | None, web live chat only | 1300 467 968 | 02 9550 4041 (Sydney), 03 9810 2999 (Melbourne), 08 6478 4816 (Perth) |

### Conclusions:
I found these reviews most heartening. I’ve been listening to a lot of Bluetooth earphones and earbuds in recent months, and most of them have been good enough... for podcasts. I would only listen to music through them as a very last resort. I was starting to wonder if perhaps my own judgement had somehow gone off trend. But these headphones reassured me that high quality sound from headgear is available, and in some cases at surprisingly affordable prices. And that my sense of right and wrong in headphone sound is neither unreasonable nor uncatered for.

From among these, the clear winner for Bluetooth is of course the only Bluetooth model amongst them! The Nuraphone headphones are indeed fascinating, also, in what they’re doing. The result is sound quality at least as good as other Bluetooth headphones of a comparable price. Indeed, a bit better than most.

Price will partly govern choice, of course, but the Blue Ella headphones deliver...
extremely good sound quality pretty much regardless of the amplifier or source that you’re using. They win out here for quality that doesn’t depend on the source. But if I could choose a suitable source to go with them, I’d make the Beyerdynamic Amiron Home headphones my own. – Stephen Dawson