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and home theatre technology



Jimi Hendrix
The Essential Discography

REVIEWED

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Metronome Technologie CD4 Player
Krix Apex 4 Loudspeakers
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May/June 2007

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Krix

Apex 4 Loudspeakers



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Krix is somewhat neglected by the hi-fi media, particularly equipment reviewers. And it's all Krix's fault. This is the reason. Before Krix releases a product to the market, its marketing and design teams thoroughly research the market and the drivers that are available, then spend considerable time and expense designing a model that targets that market perfectly. They then make sure that the component parts for the speakers are in plentiful supply (the cabinets and crossovers are all made in Krix's own factory in South Australia, so they need have no worries on that front) before committing to production. This meticulous approach to preparation means that Krix runs its models for much, much longer than most other manufacturers. The problem with this approach is that once the initial flurry of media attention surrounding the release of a new model dies down, the company then gets no press until it releases a new or updated model which, as I've said, doesn't happen all that often.

The new Krix Apex 4 is the direct result of Krix increasing the size of its design team by one. Speaker designer Andrew Bennett's first job at Krix was to review the existing range with a view to making improvements wherever possible. His updates to the long-running Apex design have been considerable...

The Equipment

Perhaps the most substantive improvements in the Apex 4 revolve around the tweeter. First, it's an entirely new 28mm soft dome that Bennett says initially attracted him because of its quick and uniform cumulative spectral decay. However, once he obtained some samples to evaluate, he found this particular tweeter also exhibited very low levels of distortion and a very flat response with a well-controlled roll-off to 20kHz. 'It has quite exceptional performance' he told me.

In the Apex 4 he's partnered it with a 165mm bass driver that has a Theile/Small

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Krix Apex 4

Brand: Krix
Model: 4
Category: Floorstanding Loudspeakers
RRP: \$900-\$1,100 (See Copy)
Warranty: Five Years
Distributor: Krix Loudspeakers Pty Ltd
Address: 14 Chapman Rd
Hackham
SA 5163
T: (08) 8384 3433
F: (08) 8384 3419
E: krix@krix.com.au
W: www.krix.com.au

diameter of 131mm, for an SD (piston area) of 135cm². The cone is formed from plastic-coated paper. There's a plastic dust-cap and a rubber surround suspension. The basket supporting the cone is reinforced moulded polymer and supports a large, unshielded magnet. The cone is driven by a 25mm diameter voice-coil wound on an aluminium former.

The crossover network, which is made in-house at Krix, as mentioned earlier, is to the company's usual very high standard, comprising a pair of bipolar electrolytic capacitors, four metallised polypropylene capacitors, a pair of five-watt wire wound resistors and three inductors. All three are hand-wound. Two are air-cored, the other is ferrite cored and all are cross-mounted to ensure there can be no magnetic interaction between them. Bennett says these components amount to an RC damped second-order low-pass filter on the bass driver and a padded third-order network on the tweeter, with the design arranged so that at the crossover frequency (which is nominally 2kHz) the phase of the bass driver and tweeter overlap. Bennett told me that he'd done this to ensure very stable imaging and so vocals would be clean and defined.

To complement the attention that's been paid electrically to get the bass/midrange integrating properly with the tweeter, Krix has also expended considerable effort mechanically to ensure the acoustic centres are as close together as possible. If you look closely at the photo accompanying this review (or the speaker in the flesh, when you go to audition it) you'll see the bass driver's frame overlaps the tweeter's faceplate by a considerable margin. This not only ensures that the acoustic centres are close together, which impacts on imaging, but also means there's a far superior vertical polar response. Also, it enables the drivers

to be located higher up the baffle, putting both closer to seated ear level and ensuring there is less interaction between the bass/midrange driver and the floor.

Krix has also carefully engineered the space inside the cabinet to minimise the effect of the inevitable standing waves that will occur in a tall (ish, in this case) cabinet, as well as panel flexing and vibration. Inside the cabinet are two angled MDF panel sections that simultaneously brace the walls and baffle and break-up standing waves. Bennett says that he was able to include these braces without increasing the retail price because of Krix's recent substantial investment in a new Morbidelli flat-table CNC machine that allowed him to cut the braces from wood pieces that were so small that they would otherwise have had to be thrown away. 'It means I could add significantly to the value and performance of the product,' he said.

The Apex 4 is a bass reflex design. The port is located on the rear panel, down near the floor and is rather larger than I might have expected given the volume of the enclosure (which I estimated at about 50 litres). The port is 60mm long and 75mm in diameter. I measured the Apex 4's cabinet as being 849mm high (though it will stand higher when you 'spike' it), 205mm wide and 320mm deep. This last measurement includes 'protrusions' such as the grille frame and speaker terminals. Speaking of the grille frame, I was surprised to find it was made from plastic, rather than wood. It appears this is the work of Krix's new industrial designer, Jon Scott, who thought this type of grille would add clean curves to 'soften' the appearance of the cabinet without affecting the cabinet itself. Bennett was also happy with the new grille because the plastic frame is much thinner than a wooden frame, so there is considerably less edge diffraction than on any previous Apex design, all of

which used wooden grille frames.

So far as finishes are concerned, Krix supplies the Apex 4 in no fewer than six standard finishes, with the final price reflecting the quality and cost of the chosen finish. Choosing any one of the three standard vinyl wrap finishes (Black, White and Silver) will peg the RRP at \$900 per pair. If you step up to either of the two lowest-priced real wood veneers (Black Ash and Atlantic Jarrah) you'll add \$100 per pair to the price. The top-of-the-line Beech veneer Apex 4 has an RRP of \$1,100.

Listening Sessions

I started the listening sessions with a fairly new discovery for me: Phill Niblock's CD 'Four Full Flutes' (www.indie-cds.com). His work is beyond description, but essentially, he records flutes playing single tones at micro-intervals, then uses multitrack to layer them, which creates beat tones and harmonic overtones when they're played back. The effect seems almost outrageous at first, but if you persevere and continue listening, the sounds become first hypnotic and then incredibly involving. If you're into meditation, it would be perfect. For audiophiles, the other benefit is that the notes sustain for so long that you can get a 'fix' on tonal aspects of different components, and also on the dispersion of speakers. The only disconcerting effect for me is that Niblock works in analogue, which means that because of all the editing and multi-tracking, the end result has more than its fair share of intrusive tape hiss. In the case of the Apex 4s, Niblock's new CD made it immediately evident that the midrange was beautifully flat, with very little audible distortion. I also noticed that the tape hiss that always annoys me was slightly muted, pointing towards the Apex 4s having a rolled-off high-frequency response.

However, when later I switched to female




vocals, in the form of Helen Rivero's 'Yes Captain' (www.helenrivero.com) her voice was as pure and clean as usual, so any h.f. roll-off was obviously happening well above her range. However this CD revealed the Krix 4's fabulous tone through Andrew Purdam's C melody sax, and again the very low distortion of the speakers, thanks to the sound of that rarely-recorded instrument, the Australian saw, played superbly by Judy Turner. Rivero's unusual music is not everyone's fare, of course, so it was on to Janis Ian (also not everyone's fare, but certainly more mainstream) and I was well pleased with what I heard. Her voice was not at all emphasised either, but I fancied that her guitar work sounded a little more detailed than usual with the string sound seeming to standing clear of the body. The vocal sound was delicious: full of emotional richness and totally cohesive. I also listened to Sara K's album *Hobo*, in particular the *Brick House* track, because of the sibilance recorded on it and although the clarity was excellent, the sibilance was... well, still sibilant, hinting at a slight forwardness in the upper mids. On Julia and Angus Stone's latest EP, 'Chocolate & Cigarettes' this slight forwardness was translated into superbly detailed sound, etching the guitar tone wonderfully, and rendering Julia's unusual voice instantly captivating. The recording quality is fabulous, so it too is a great CD for evaluation. Unfortunately, it might be a bit difficult to find. Their website, www.angusandjuliastone.com, will point you in the right direction.

The Apex 4s did not dig deep into the

bass, but there's plenty there to satisfy all but ardent pipe-organ lovers, and more than sufficient detail in the bass to let me hear, for example, the drum machine flaws on Sade's 'Love Deluxe'. Increasing the volume did not diminish the impact of the bass, but there are limits to how far you can move the volume control in a clockwise direction, because this is still, after all, a two-way design with a relatively small bass/midrange driver, so you can't push too hard, particularly in a large room.

Imaging and sound-staging abilities were clearly superior to anything I might have dreamed would be possible in a sub-\$1,000 design, with the Apex 4s producing a finely focused image at the sweet spot, with palpable stage depth and clearly audible image height, and yet also retaining their excellent tonal balance to far further off-axis than anyone would ever seriously contemplate listening from.

Conclusion

This latest incarnation of the Krix's Apex design is the best by far, and given the accolades showered on the previous incarnations, you'll have to trust me that this isn't faint praise! Superbly built, with a sound quality that's as involving as it is revealing, they could very well be the best-value floor-standers on the market. You'll get exactly the same sound quality no matter what finish you choose, but I'd recommend springing the extra ton for one of the two lower-priced real wood veneers, because they'll travel better than the vinyl finish and if you end up buying a pair of Apex 4s, I reckon you'll be listening to them for a long, long, time. 

Chris Green

Readers interested in a full technical appraisal of the performance of the Krix Apex 4 Loudspeakers should continue on and read the LABORATORY REPORT published on the following pages. All 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

LAB
REPORT

Test Results

The frequency response of the Krix 4 proved to be quite linear and extended, though it was characterised by an approximately 2.5dB 'lift' in the high frequencies between 2kHz and 10kHz. This slight increase in level ensures the output above 10kHz is slightly higher than it would otherwise have been. *Newport Test Laboratories* measured the overall response of the Krix 4 as extending from 60Hz to 18kHz ± 3 dB. However, even though this is an excellent result, it's perhaps not truly indicative of the Krix 4's linearity across the most musically significant part of the spectrum. Between 100Hz and 2kHz, for example, the Krix 4's frequency response was within ± 1.0 dB. (C7, the second-highest 'C' on a piano, has a frequency of 2,093Hz.)

Graph 1 shows the frequency response of the Krix 4 measured with a pink noise test stimulus. In this graph, *Newport Test Labs* has overlaid the 'raw' unfiltered response with a post-processed response filtered to one-third octave.

The second graph (*Graph 2*) shows the high frequency performance of the Krix 4 when measured using a gated sine test signal, which simulates the environment of an anechoic chamber, and also places less 'stress' on the tweeter than the pink noise signal, which is extremely difficult for a tweeter to reproduce. You can see the response mirrors almost perfectly the pink noise response, though the enhanced detail on this graph allows you to see the Krix 4's frequency response actually starts rising at 1.5kHz then creeps slowly upwards in level with increasing frequency to 7.7kHz where it effectively 'shelves' at this level right out to 12.5kHz before starting a long, slow roll-off to 20kHz. Apart from the broad lift in the response, it's otherwise notable for being remarkably smooth, with few discontinuities at a micro-frequency level.


Low frequency performance was excellent, with the bass/midrange driver's response showing up as being extraordinarily smooth. Look particularly at the section on the graph between 90Hz and 250Hz, where the bass driver's frequency response tracks along the 100dB line. Note also that above 250Hz, as the response rolls off (partly due to the driver, and partly due to limitations in the near-field measurement technique used to obtain the graph) the trace is very smooth, with almost no peaks or dips, so there are no niggling resonances, which points to Krix's work on eliminating standing waves being successful. Below 90Hz the response rolls off quite sharply to null at

50Hz. You can see that the port's output peaks at just below 50Hz, so it would appear that the cabinet design is pretty-much 'text-book.' (Refer *Graph 3*.)

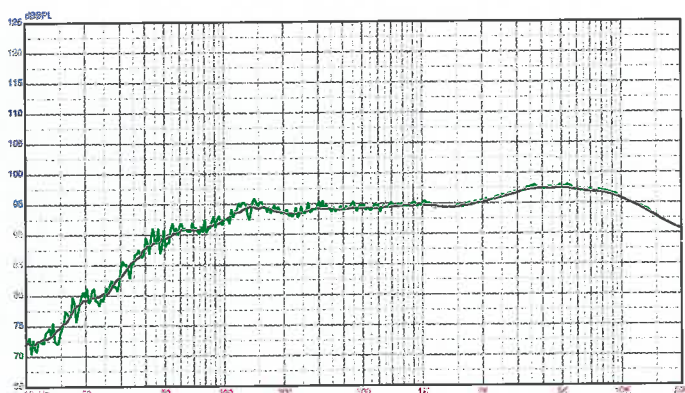
The impedance graph (*Graph 4*) shows that although Krix rates the Apex 4 as 'nominally 8 ohms', its impedance actually dips to close to 5 ohms at 4kHz, which technically makes this a 6 ohm design, though since most musical energy is located in the bass region, where the Apex 4's impedance remains above 8 ohms up to 100Hz, and then above 6 ohms up to 3kHz, I can see why the company hasn't followed the strict dictates of the IEC ruling on this

topic. The graph shows the impedance traces for both left and right speakers, and you can see that Krix's quality control is excellent, with the two tracking each other almost perfectly: there's just the tiniest difference at 35Hz, on the lower resonant peak. The null is exactly at 50Hz: again 'text-book' design. The small glitches in the traces at 100Hz, 1kHz and 10kHz are due to the test equipment's automatic range-switching circuitry, but the small 'wrinkles' at 160Hz and 330Hz would appear to be minor cabinet resonances that are too small to show up on the response trace. System phase angle at 2kHz is shown on the graph

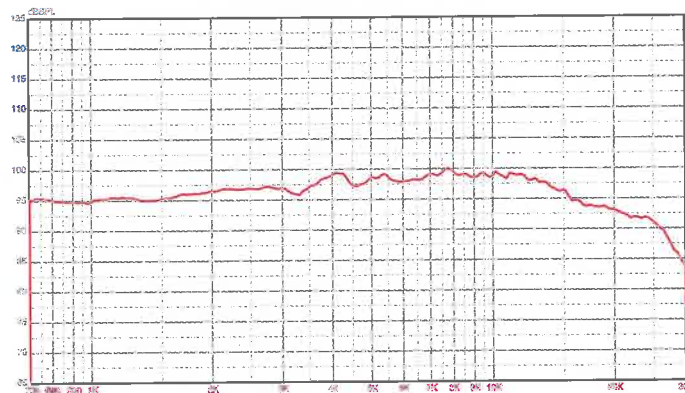
at -60° but it would appear that the actual crossover point on the review sample was closer to 1.5kHz, where the system phase angle is just -15° .

Sensitivity was measured at 87.5dB SPL at one metre, for a 2.83 volt equivalent input, which pushes the Krix 4's result to just above 'average'. This above-average sensitivity, combined with the easy impedance and phase angles, means the design will be very easy to drive, and will place few—if any—demands on the amplifier that's driving them. Overall, I found the Krix 4 to be a very well-executed loudspeaker design. 

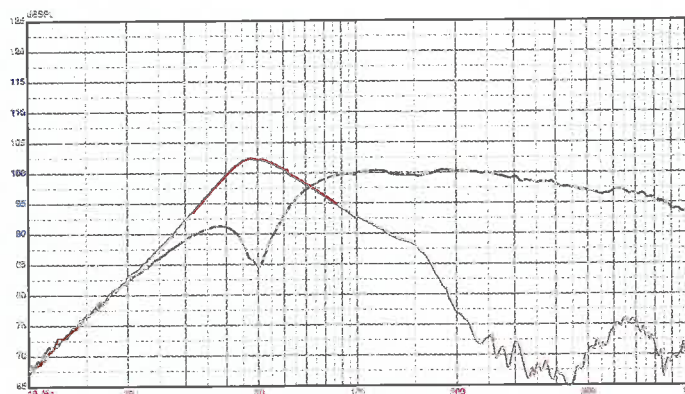
Steve Holding



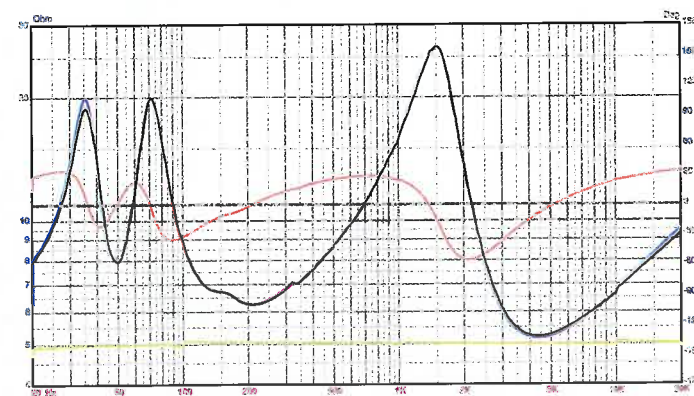
Graph 1: Pink noise frequency responses (smoothed and unsmoothed) measured at 1.0 metre.



Graph 2: Gated sine frequency response (unsmoothed) measured at 1.0 metre.



Graph 3: Nearfield frequency response of both bass/midrange driver and reflex port. (Note data for port has not been re-scaled to compensate for differences in radiating area.)



Graph 4: Impedance vs frequency, plus phase, with both left (blue trace) and right (black trace) speakers graphed (see copy). Yellow trace under is that of a reference 5Ω precision resistor, measured concurrently for calibration purposes. Use scale at right of graph to evaluate phase angle (red trace).