

Krix Volcanix

SUBWOOFER



It's annoying when a manufacturer releases two new—and very similar—models simultaneously, because then it's difficult to know which one to review... or at least which one to review first. Pick the wrong one and the hifi@next.com.au email inbox will be full to overflowing the minute the magazine hits the stands. Luckily, Krix made it easy for us—and you—with the release of the new Tektonix and Volcanix subwoofers. Easy because the Tektonix is basically just a Seismix 3Mk 5 with a more powerful amplifier. (The one other difference being that that amplifier is a Class-D type, rather than the Class-AB one originally used in the Seismix 3 Mk5.)

The Krix Volcanix, on the other hand, is a different beast entirely (and my use of the word 'beast' is entirely appropriate, as you shall discover), even though it is the replacement for the Seismix 5 Mk2, which has 'been retired', as they say in the business. The Volcanix has a Class-D (ICEpower-cored) power amplifier module that Krix rates at 450-watts continuous, which drives a brand-new long-throw 305mm front-firing woofer, mounted in a bass reflex enclosure.

However, although the Volcanix has upgraded hardware, the most exciting feature is that it's the first Krix sub to feature a software-controlled interface, which you get to drive using just a few front-mounted buttons and an eerie-looking blue screen display fitted to the front baffle. And although the basic Class-D circuitry is licensed from B&O, all the electronic design, board layout, front panel display and software programming has been engineered in-house at Krix.

THE EQUIPMENT

The Volcanix I received for review was an advance sample, fresh off the production

line, but according to Krix, it was a full production version save for some planned software updates (about which more later). My first response was to marvel at the size of the bass reflex port, which is huge! Or, if you want me to define 'huge' more academically, it's 105mm in diameter (and 350 mm long), so nearly big enough to swallow a CD. I'd certainly use the Volcanix with the grille fitted, just to eliminate that yawing hole! The port itself is a tad unusual because although it looks to be made from ABS, it's not all ABS. Although the exit is ABS, and so is the 'entry' inside the subwoofer, the centre section is made from cardboard. I puzzled over the reason for this until the light finally came on and I realised that it means that using just a single plastic extrusion, you can have a port any length you like, merely by cutting the cardboard tube to different lengths and fitting the same extrusion to either end. No wonder everyone is doing it! At least Krix is putting a flared extrusion at each end... some manufacturers put the flared extrusion only where it's visible, while inside only cardboard tubing is used, so the air-flow entering the port isn't as efficient, and can possibly become noisy. Krix refers to this dual flaring system as a 'Symmetrix' vent.

But if the reflex port is huge, then so too is the bass driver. Krix rates it as a 305mm unit, but my tape measure put the overall diameter at 310mm, and the mounting hole diameter at 296mm. However, the important measurement is the Thiele/Small diameter, because it's this that dictates how much air the cone moves, and it's this dimension that loudspeaker designers use when calculating the optimum balance between cabinet volume, port size and low-frequency extension. I measured the T/S diameter at 249mm which means the effective cone area (technically

known as 'Sd') is 487cm². The driver used by Krix has a paper cone and a rubber roll surround. Although paper is hygroscopic, so its performance varies with humidity, it's really the only choice if you want a large cone to move quickly, because it has the lowest mass per square centimetre of any cone material. Using rubber as the roll surround is also a good move on Krix's part because unlike foam surrounds, which deteriorate fairly quickly under Australian climatic conditions (high heat, high humidity and lots of UV radiation), rubber surrounds are far more stable and long-lived. The all-important voice-coil is 50mm in diameter, with four layers of windings.

The Volcanix cabinet is rather large. I measured it as being 400mm wide, 470mm high and 470mm deep. However, it stands on four rubber feet that are themselves 36mm high, so if you're calculating total height, don't forget to take this into account (as it brings the total height to 506mm). I noted that my measurements don't quite tally with Krix's brochure specs, so if size is crucial, measure it yourself!

The reason you could be calculating total height carefully is, of course, that you could be planning on building the Volcanix into a wall or cupboard because since the port and the driver are both front-firing, this is entirely possible. Indeed this is one of the very reasons Krix decided to build a subwoofer with the controls on the front panel as well. With the driver, port *and* controls all on the front, you'll never need to go around the back of the subwoofer (at least you won't after you've made the all-essential wired connections, which are all on the rear). However, even if you weren't planning on mounting the Volcanix in a hole cut into a wall (architects and builders refer to such a special-purpose

'hole' as a 'soffit'), the front-panel-mounted controls mean you can make adjustments to subwoofer volume, phase, crossover frequency etc, very easily.

When I was clarifying some of the finer points of the Volcanix's operation (about which more later) with Peter Lawson, who is Director of International Sales and Marketing at Krix, he told me that they'd developed the front controls specifically for 'standard' installations, because Krix's feedback from its customers was that most of them pushed their subwoofers back against a rear wall which made rear-mounted controls difficult to reach, and sometimes put them under tables or other objects as well, which made the controls even more difficult to reach. *'By putting the operating controls on the front panel, it means no more worrying about pulling your subwoofer out of joinery and risking scratching it or pulling out a lead while pulling the sub out from the wall to make changes whilst holding a torch in one hand and trying to read the labels that are upside down,'* he told me. *'All the adjustments [on the Volcanix] can be done quickly and effectively by removing the front grille and scrolling through the menu options and pushing the buttons to make your selections.'*

The front panel controls that make this all possible are mounted on a panel that's 120mm long and 80mm high. Inset into this panel is a two-line blue-coloured LCD display panel, with each of the lines having room for 16 characters per line, for a total of 32 characters. There are three buttons on this panel. One is marked 'Menu', the other is marked '+' and the last is marked '-'. The menu button is a rocker-type, but the other two are standard push-buttons.

You press one side or the other of the Menu rocker control to cycle through the control options available. These are Volume (00dBMAX to -50dBMIN), Low Pass (50Hz to 195Hz plus 'LFE'), Phase (0° and 180° only), Power-On Mode (Autosensing or 12V trigger), Auto Sensitivity (00-10), Display Contrast (00-10, where 10 is the 'darkest' setting for the display), Restore Defaults, and Menu Lock (which is also used to unlock the menu, though you have to guess this, because when the menu is locked, the display doesn't change to read Menu Unlock). These are all fairly straightforward and self-explanatory except for the 'Sensitivity' mode, which simply alters the sensitivity of the Volcanix's line inputs (or LFE input) to incoming music signals. For example, if you set it too low, the subwoofer may fail to switch on when you start playing music on your system. The 'Menu Lock' locks the Menu, so users can access it, but more importantly, it prevents other people from adjusting your preset setting—including Volume level.

You'll note from the previous paragraph that one thing I have not mentioned is the 'High Pass' window on the menu, which

allows you to adjust the Q of the Volcanix's built-in 22Hz high-pass filter between 0.5 and 0.9 values. Although this menu screen will be on the production versions available in stores, it was not fitted as a menu item on my review sample. Instead I had to access this particular feature via a 'hidden' menu editing option. Suffice it to say that production versions will allow you to adjust Q from the main menu! The reason Krix uses a high-pass filter is to limit driver excursion at infra-sonic frequencies. Most powered subwoofers have such filters, but very few manufacturers tell you they exist, and only some allow you to fiddle with that filter's Q!

The blue backlighting for the menu turns off automatically after 45-seconds, after which you can turn it back on by pressing either side of the 'Menu' rocker switch, or the '+' or '-' switch. The problem I had with this is that if you want to see, for example, what volume level you've set, pressing the '+' or '-' button to turn the display on not only turns on the display, but adjusts the volume up or down by one step. If you press the 'Menu' rocker to avoid this, the volume display disappears, because the Menu always resets to showing 'Volume' after 44-seconds (that is, one second before the display switches off), so if you press the right side of the rocker, the display changes to show the 'Low Pass' setting and if you press the left side of the rocker, it reverts to the 'Menu Lock' screen. And if you've locked the Menu, you can't see the Volume setting at all, because pressing any of the three buttons results in the display turning on and simply showing the words 'Menu Lock.' However, if you then wait 44-seconds, the volume level WILL be displayed for just one single second prior to the display switching itself off.

I found the action of the display a little annoying because when reviewing a subwoofer I am constantly changing parameters to see which settings work best in different situations, such as with different subwoofer placements in a room, and when teamed with different loudspeakers. However, in a real-world situation, once you've positioned your subwoofer and aligned it, you'll probably never touch the controls again, so this little 'quirk' of the menuing system will not affect you in the least. That said, when I mentioned my frustrations to Peter Lawson, he reminded me that Krix itself had written all the code for the menu, and that adding a line of code to have the display switch do nothing on the first touch of a control other than switch on would be a simple matter so, by the time you read this review, the menu may work slightly differently... but even if it doesn't it's really no biggie.

Around the back of the Krix Volcanix is something amazing: there's no external heat sinking at all, just a smooth, concavish plastic extrusion

on which are mounted RCA terminals for left and right line-level inputs (with the left-channel one acting as the LFE input if you connect to an LFE output on an AV receiver) and multi-way speaker binding posts for high-level inputs. There's also a 12V trigger input using the usual 3.5mm phone socket and a fused 240V IEC mains input socket, so you can fit any length mains cord you like (the one provided by Krix is three metres long, which should be ample for most situations, but you never know). And when I say there's no external heat sinking, there's very little internal heat sinking either, as you can see from the photo. The Class-D 'KDSA' (Krix Digital Switching Amplifier) module used by Krix is so efficient that there's no need to dissipate much heat, despite the prodigious power output (450-watts continuous into 4Ω).

Just in case you were wondering—though you could always check it out on Krix's excellent website—despite the 'addition' of

KRIX Volcanix

BRAND: Krix

MODEL: Volcanix

CATEGORY: Powered Subwoofer

RRP: \$2,195*

WARRANTY: Five Years

DISTRIBUTOR: Krix Loudspeakers Pty Ltd

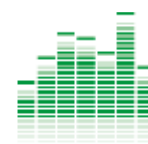
ADDRESS: 14 Chapman Road
Hackham, SA 5163

☎ (08) 8384 3433 📠 (08) 8384 3419

✉ info@krix.com.au

🌐 www.krix.com.au

(* Depends on finish—see copy)



- Deep, tuneful bass
- Excellent controls
- Powerful yet runs cool



- Controls under grille

LAB REPORT

Readers interested in a full technical appraisal of the performance of the Krix Volcanix Powered Subwoofer should continue on and read the LABORATORY REPORT published on page 91. 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 91

two new subwoofers to Krix's range, there are still only four models available: the Seismix 1Mk3, which has a 150-watt Class AB amplifier and a 203mm down-firing driver, the Seismix 3Mk5 (which has a 225-watt Class AB amplifier and a 280mm front-firing driver), the Tektonix (with a 450-watt KDSA module and 280mm front-firing driver) and, of course the Volcanix. Regarding the price of the Volcanix, that varies depending on the type of cabinet finish you order. The price quoted in the pull-out box in this review (\$2,195) is for a cabinet finished in vinyl woodgrain. Available vinyl finishes are Black Woodgrain, Atlantic Jarrah and American Cherry. A real timber veneer cabinet finish will set you back another \$200. If you choose the timber veneer, your finish options are Black Ash, Atlantic Jarrah and American Cherry. If you're a bit over timber veneers, irrespective of whether they're real or vinyl look-a-likes, \$2,995 buys you a Volcanix finished in a high-gloss (piano) black or white finish. As always, Krix continues its consumer-friendly policy of offering custom finishes to special order and because Krix manufactures all its wooden cabinets in its own factory facility in South Australia, turn-around times are very quick.

IN USE AND LISTENING SESSIONS

I don't know what rubber formulation Krix is using in its weirdly-shaped feet (they're shaped weirdly to minimise turbulence when Krix uses them on its down-firing subwoofers, such as the Seismix 1Mk3) but they'd better watch out for industrial espionage, because it's fantastic! Despite the not-inconsiderable weight of the Volcanix (23kg, which seems light, but don't forget that due to the Class-D amp and switch mode power supply, there's no heavy power transformer, no big smoothing capacitors and no weighty heat sinking) the feet support the Volcanix in such a way that when you push it, it almost wobbles like jelly on a plate. The reason, of course, is to prevent any vibrations from being transmitted into the floor—presumably so as not to upset the neighbours.

However, when I turned the volume on the Volcanix up to 'Stun' (actually, 00dB-MAX), the level of bass that burst forth was so incredibly high that teensy little vibrations being transmitted through the floor would be the least of your neighbours' worries! Luckily for my neighbours, after a few seconds of this level of sonic abuse, (OK, it was 'way too loud...') the Krix's internal soft-clipping protection kicked in to protect them. Well, actually, it wasn't protecting the neighbours so much as the bass driver, but I'm sure Miguel was pleased nonetheless! Soft-clipping isn't the end of the Krix's built-in protection circuitry either. The Volcanix also protects

itself from low mains voltages, excessive voice-coil currents and over-heating. Generally, the protection resets itself, but in cases where it doesn't, switching the subwoofer off, then back on again, will usually get you back in action.

When I got around to operating the Volcanix rather more sedately, it proved none the worse for wear for its excursion to the 'dark side' and in fact revealed itself to be an immensely 'musical' subwoofer, in that its low-frequency sound was nicely balanced across its entire operating range, no matter whether I set the crossover frequency to 50Hz or to 195Hz or, indeed, at any position in between. What happens with many subwoofers (and, I regret to say, particularly with subwoofers that have stiff, small-diameter drivers in small cabinets) is that their bass response is very 'peaky' so that although they produce bass



Krix KDSA 450-watt amplifier module.

over their entire claimed operating range, one frequency band is reproduced at a higher level than all the others, which bestows a very 'one-note' character to everything you play through them, with the 'character' of the sound varying depending on the particular frequency band that's being emphasised.

The sound produced by the Volcanix was not only very true-to-life, faithfully reproducing the tonal character of the sound of the instrument being reproduced, whether it be a drum, bass guitar, cello, double bass, or whatever... but also completely consistent, so you could tell immediately that it was the same double bass being played, irrespective of whether it was playing a low 'E' or the 'E' two octaves above. Playing back a recording of a chromatic scale played on a piano, using just the subwoofer itself and no main speakers, and using the LFE setting of the low-pass filter, I found the response of the Volcanix

not only to be audibly flat, but also the sound quality was completely authentic, with the Krix managing to deliver the underlying percussive nature of a piano's sound despite the (obviously missing!) lack of high-frequency musical information above 200Hz.

The fact that the Krix works so well—and sounds so musical—with its low-pass filter crossover set so high (195Hz or even LFE) meant that it worked beautifully with small to medium-sized stand-mount and bookshelf models, easily taking over the low-frequency duties where they left off, managing to stay 'sonically invisible', so there was almost no change in tonal character as sounds transited down from the main speakers to the subwoofer. The same was true when I used larger, floor-standing speakers, though in this case, to deliver the same seamlessness required abbreviating its bandwidth by winding the low-pass crossover frequency back towards 50Hz. The advantage of using larger front-main speakers and a lower crossover frequency is that it's possible to squeeze higher sound pressure levels from the Krix to better-match the higher power-handling capabilities of the large floor-standing main speakers.

Due to other demands on the review sample I was using, I had only a few weeks of living with the Volcanix, and in all that time I mostly listened to music, though that music was across almost all formats, including two-channel (mostly CD and SACD), and multi-channel (DVD and Blu-ray), and at all times, with everything I played, I was so pleased by the performance of the Krix Volcanix that I felt so confident it would easily do justice to sound effects on movie soundtracks that it was only at the very end of my tenure with it that I actually put this to the test. I was not mistaken in my confidence: the Krix Volcanix blitzed it, from dinosaur footsteps, to the earth splitting open, to tidal waves, to missiles exploding... right through to thermonuclear explosions, in fact pretty much every sound effect I had time to throw at it. Ironically, I didn't have a copy of the 1997 movie 'Volcano' to try out... probably because I read the reviews of that movie and didn't bother wasting my money!

CONCLUSION

Krix's new Volcanix is a superb subwoofer that will work perfectly across a wide range of applications, from being the 0.1 in a purist stereo-only system to being the 0.1 in a 5-channel or 7-channel high-end home theatre system. My biggest single worry is that Krix seems to have priced the Volcanix so realistically that some people hunting for a subwoofer might be put off by the low price tag and fail to give it even the courtesy of a proper audition. Hopefully, if you're reading this, you won't be one of them!

greg borrowman

SEE REVIEW ON PAGE 32

TEST RESULTS

Figure 1 shows the frequency response of the Krix Volcanix, measured using a pink noise test stimulus, at a distance of 2 metres. The black trace shows the response with the low-pass filter set to 195Hz, while the red trace shows the response with the low-pass filter set to 50Hz. You can see that with the filter at the upper setting, the frequency response extends from 34Hz to 270Hz±3dB. When filter is set to 50Hz, the response extends from 23Hz to 120Hz±3dB. Both responses are excellent, and even more so when you look at the response variation across the most linear parts of the responses, such that over the region 46Hz to 128Hz on the upper trace, where it varies no more than ±1dB, and on the lower trace where it's 26Hz to 85Hz ±1dB. On both traces you can see the roll-off below 26Hz that evidences the Krix's built-in high-pass filter.

Figure 2 shows the nearfield frequency responses of the bass driver alone (that is, without the contribution of the bass reflex port, as shown in Figure 1.) You can see that with the low-pass filter set at 150Hz, the driver itself is extraordinarily linear, with the unassisted response extending from around 37Hz to 220Hz±3dB and within just ±1dB across the region 47Hz to 155Hz. When the low-pass filter is set to 50Hz, the equivalent responses are 36Hz to 81Hz±3dB and 39Hz to 73Hz±1dB.

In Figure 3, Newport Test Labs has shown the nearfield response of the bass driver using the LFE (Bypass) setting of the low-pass filter (black trace) and also the nearfield response of the bass reflex port. Note, as stated in the graph caption, that the data for the port has

not been scaled to compensate for differences in radiating area, so the port's output would actually be further 'down' the graph than shown, due to the radiating area of the driver being 487cm² compared to that of the port at only 87cm². The port rolls off smoothly from its tuned frequency of 33Hz right to the end of the subwoofer's pass band. There is some unwanted output from the port visible on the trace at around 350Hz, but it's a long way down compared to the main output from the bass driver.

Newport Test Labs plotted the levels of second, third, fourth and fifth harmonic distortion components individually against frequency, measured when the Volcanix

the Krix Volcanix is a very powerful subwoofer that has a flat frequency response within its pass band, low driver distortion, low mains power consumption...

was delivering 100dB SPL, and the result is graphed in Figure 4. You can see that all components are mostly below 1.0% over most of the Volcanix's operating band, and between about 50Hz and 200Hz, the levels of HDL3, HDL4 and HDL5 drop below 0.1%. For a subwoofer, these are all excellent results. The level of HDL2 is higher across this range—but only significantly higher between 50Hz and

100Hz—but since HDL2 is largely a benign distortion (being the good-sounding octave of the fundamental) it's not significant. The levels of 2nd and 3rd harmonic distortion are higher below 30Hz, but you have to consider that the Volcanix was delivering 100dB SPL at the time, which is around 10dB louder than I would expect that it would operate in a domestic environment even at high volume, so even at 90dB SPL, distortion levels below 30Hz would likely drop below 1.0%. [Steve requested a re-test at this lower level, but regrettably, it could not be fitted into the lab's schedule before deadline. In future, we will run an additional test at 90dB SPL for all subwoofers. Editor]

Interestingly, the Volcanix was tested at the time Newport Test Labs had just added two additional tests that will in future be standard when investigating the performance of all powered subwoofers. I say 'interesting' because co-incidentally they both relate directly to strong points in favour of Class-D amplifiers—and of course this is the amplifier class used by Krix in the Volcanix. The first of these new tests is for mains power consumption, which has always been a standard test for all other components tested by Newport Test Labs, so it's really been an oversight so far as powered subwoofers are concerned. The measurement showed that under a no-signal condition, the Krix Volcanix draws only 7.78-watts from the mains. This is very low, and 'way under what I'd consider 'normal' power consumption for a conventional Class-AB subwoofer amplifier module, which would be around 30–40-watts. The other new test is to measure the temperature of the external heat sink. In this case, because the Volcanix doesn't have an external heat sink, Newport Test Labs instead measured the temperature of the plastic extrusion that backs onto the amplifier. This measured 29°C (ambient 15°C), which means that the Volcanix runs very cool indeed!

Overall, Newport Test Labs measurements showed that the Krix Volcanix is a very powerful subwoofer that has a flat frequency response within its pass band, low driver distortion, low mains power consumption, high electrical efficiency and high thermal efficiency. So, as they say, it's all good...

Steve Holding

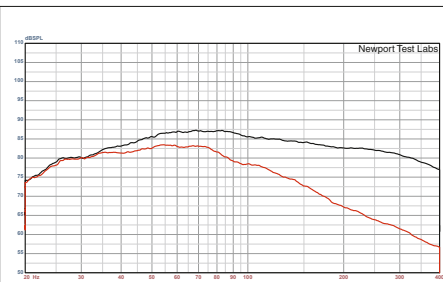


Figure 1: Pink noise frequency responses (smoothed to one-quarter octave via post-processing) at 2.0 metres. Black trace shows response with crossover control at maximum (195Hz) and red trace shows response with crossover control at minimum (50Hz). [Krix Volcanix Subwoofer]

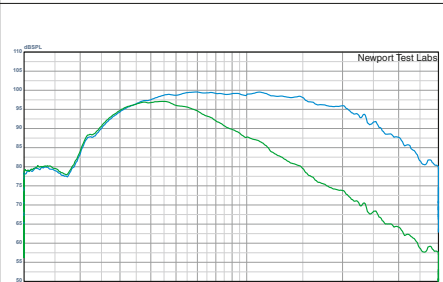


Figure 2: Nearfield swept sine frequency responses. Blue trace shows response with crossover control at maximum (195Hz); green trace shows response with crossover control at 50Hz. [Krix]

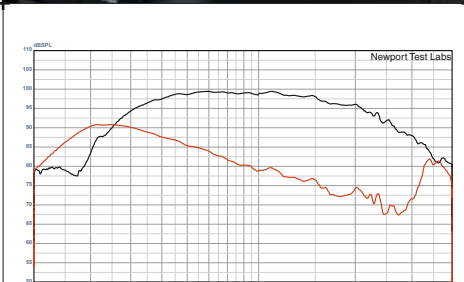


Figure 3: Nearfield sine frequency response of bass driver (black trace) and reflex port (red trace) with crossover control set to LFE. (Note that data for port has not been re-scaled to compensate for differences in radiating area. [Krix Volcanix Subwoofer])

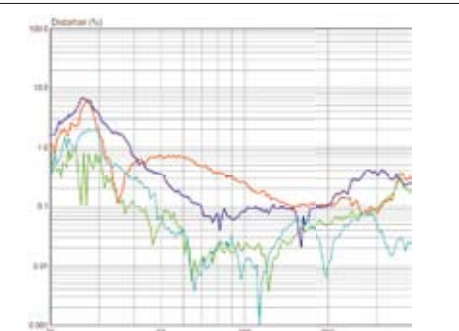


Figure 4: Harmonic distortion vs Frequency at 100dB SPL. Red Trace: HDL2. Dark Blue Trace: HDL3. Green Trace: HDL4. Light Blue Trace: HDL5.