Krix Seismix 1 Mk3

Subwoofer

This latest iteration of one of Krix's most successful models is going to be more popular than its predecessor, and this time around, it won't simply be because it's small!

The Equipment

The new Seismix 1 Mk3 is not just the smallest model in Krix's current range; it's the smallest subwoofer Krix has ever built. It measures just 375×395×320mm (HWD). Krix has been able to get it even smaller than the Mk2 for several reasons. The first of these is that the driver now fires downwards, which shaves off around a centimetre because there's now no need for a grille to protect the woofer. This lack of a grille also means Krix was able to save a little on production costs, both as regards the raw materials required to build the grille, and on labour. (The labour-savings are not just in terms of manufacturing the grille itself, there's also now no need to drill holes in the cabinet to accommodate the grille fastening, or indeed, the need for any grille fastenings at all.)

The second reason is that Krix has used a new, slightly smaller and more modern driver in the Mk3, which has enabled it to reduce the volume of the enclosure slightly, though this has also necessitated a re-tuning of the bass reflex port, which is now also down-firing, rather than front-firing, as it was previously. The new port is around 210mm long with a diameter of 75mm. It's made of plastic and is rounded at either end, rather than having a full flare.

When it comes to producing bass, cone area is king, but cone excursion is also a factor, so although the piston area (Sd) of the Seismix 1 driver has dropped from around 350cm² in the Mk 1 and Mk2 versions to just 222cm² in this latest version, Krix says cone excursion, driver sensitivity and power handling handling have all increased, enabling it to maintain or improve the performance of all significant performance parameters. The driver's low mass is enabled by the use of a doped paper-pulp cone with a dust-cap made from the same material. The cone is bonded to a highly flexible and durable rubber roll surround, which means it will outlast all those drivers whose (mostly foreign) manufacturers misguidedly use foam surrounds without realising that they're not suitable for Australian conditions. (Foam surrounds don't last long down under: they develop a condition known as 'foam rot' which eventually causes the entire surround suspension to crumble away into nothingness.)

The profile of the roll surround is new for Krix, having been specially formed to allow for increased excursion and also maximum piston area for the cone diameter. The profile is more of a 'ski slope' shape than the usual half-roll.

There is much argument amongst subwoofer designers as to the relative merits of forward-firing drivers vs. down-firing woofers, with one camp arguing that the cone motion of a down-firing cone is inherently non-linear because gravity assists cone motion when the cone is moving downwards but impedes it when the cone is moving upwards, and also that the weight of the coil and cone assembly will eventually cause the coil to drop so that it's no longer in the magnetic 'centre' of the gap, which will also affect performance. The other camp's counter-argument is that a large vertically mounted cone will also 'sag' upon which it, too, will mis-centre the coil in the gap, but with potentially more serious consequences, such as scraping, which requires that ideally the driver should be removed and rotated every year, to ensure the suspension 'sags' equally. Luckily, when it comes to the Krix Seismix 1 Mk3, the bass driver is so small and the voice-coil/cone mass so low that such coil mis-centring is unlikely to be an issue. And while cone motion will still be inherently non-linear due to gravity, the mass is again so low that gravity has a lesser effect on performance than it would with a larger, heavier driver.

As I hope you can see from our photograph, the four feet are quite unusually shaped. They're shaped in this way (rather like an aerofoil) so that minimal turbulence is created as the high-energy sound waves travel past. I have absolutely no doubt that this will result in less turbulence than if Krix had used the more normal circular feet, but I also certainly couldn't imagine it having any audible effect on performance. That said, I have to say that if I had the choice between two down-firing subwoofers that were identical in every way except for the shape of the feet, I'd most assuredly choose the sub with the aerofoil feet!

Krix has paid particular attention to the feet because in a down-firing subwoofer, the feet serve a very important purpose in lifting the driver away from the floor so there is a precisely defined 'slot' around the base through which the sound waves can exit. In the Seismix 1 Mk3, the feet raise the cabinet

exactly 35mm from the floor, but because the driver's pressed steel frame and the roll surround protrude slightly beyond the bottom of the cabinet proper, there's actually only 24mm of clearance. You'll note from the photograph that Krix has not forgotten those who have thick carpet in their listening rooms. For such users, who would otherwise experience less-than-ideal sound as a result of the bottom of the subwoofer being too close to the carpet, Krix has put a splined tubular recess into each of the feet, so you can add spikes to maintain the required elevation above the carpet.

I have been critical of the control layouts of several of the amplifiers Krix has used on its subwoofers in the past, so I am pleased to be able to report that the one that is fitted to the Seismix 1 Mk3 (Model No: KD-12A) has a control layout—and lettering—that are models of clarity. The rotary low-pass filter control is now sensibly printed with frequency designations (one earlier model used dots!) and it is wired so that minimum bandwidth is achieved when the control at its most anti-clockwise setting, and maximum bandwidth when it's rotated fully clock-wise (an earlier model had this working *vice versa*!). My only niggle is that although the calibration notations start at 50Hz and finish at 200Hz, it is possible to wind the rotary control past these two points, which might lead one to assume that it's possible to dial in a low-pass turnover point lower than 50Hz at one end of the dial and higher than 200Hz at the other. It's not. The range is 50Hz to 200Hz, as stated in the specifications: it's the position of the notations on the plate that are a little awry.

Only a two-position phase control is provided. For most ordinary users this will be one position too many, though in an ideal world, it would be better for a subwoofer's phase angle to be continuously variable. However, since many low-priced subwoofers don't provide any type of phase adjustment at all, it's good that Krix has been able to fit one at all. Just below the two-position phase switch is a three-position power switch, with settings for 'standby', 'auto', and 'on', with the 'standby' mode rather giving away the fact that there's another mains power switch fitted to the plate as well. Rather than follow the Australian convention for power switching, the switch on the Seismix 1 Mk3 follows the American convention for switching electronic devices, such that 'Up' is 'On' and 'Down' is 'Off.' However, in order not to confuse anyone, the switch is clearly marked as to which position is which.

The Seismix 1 Mk3 has only two line-level RCA inputs (the left input being the one you use for a 'mono' LFE connection). There are no line-level outputs, and no speaker-level inputs or outputs. In my view this is a sensible economy on Krix's part, considering that more than 90 per cent of subwoofers which offer both LFE and speaker level inputs will only ever be connected using their LFE input. Krix rates the output of the KD-12A amplifier module fitted to the Seismix 1 Mk3 with an output of 150-watts, but you should note that this is into a 4Ω load, not the 'standard' 8Ω load into which hi-fi amplifiers are rated. It's a source of some frustration to me that there is still no Australian (or US, or European…) standard for measuring the output of subwoofer amplifiers, with the result that it's impossible to make meaningful comparisons of power output based on specifications. At least Krix states that its power output figure is based on a continuous measurement, and also states the load impedance. The 150-watt figure certainly seems to me to be more than realistic: You can bet that if you see any subwoofer manufacturer claiming a high three-figure power output—or a four-figure one—that there's more than a little 'gilding of the lily' going on.

Still on the subject of subwoofer amplifier power ratings, most subwoofer buyers also completely overlook that fact that almost all subwoofers have only a single bass driver, and that this driver obviously has its own maximum *input* power rating. So there is absolutely no point in fitting a subwoofer with a power amplifier that has a higher power rating than the driver itself! (Except to make your specification sheet look more impressive.)

The price of the Seismix 1Mk3 varies quite dramatically depending on what finish you're after. If you're happy with a vinyl finish the RRP comes in at only $895. For an extra $100 you can have a true wood veneer. Both the vinyl and the veneers come in Black Ash, Atlantic Jarrah and American Cherry.

> "a god-send for those living in apartments and small flats, who'd like some bigger, deeper bass"

In-Use and Listening Sessions

The small size of the Krix Seismix 1 Mk3 automatically gives it a very high wife acceptance factor (WAF). Indeed this sub is so small and so inconspicuous that my better half didn't even twig—at least not until the weekend came around—that I'd snuck a second subwoofer into the home theatre room, because I'd been able to position it below her usual line of sight. This size advantage will no doubt be a god-send for those living in apartments and small flats, who'd like some bigger, deeper bass without sacrificing too much valuable floor space.

The fact that the Seismix 1 Mk3 is now down-firing makes it even easier to position, since you can push it right into a corner. And when I mean 'right into a corner' you'll find that the bottom edge is now high enough to fit over many architraves, so you're not even limited by the width of the architrave. (Though if your architrave allows you to do this, I'd recommend not pressing the side of the sub hard up against the wall, but instead leaving a gap of a few millimetres, and if you want the control panel out of sight, you'll need to leave a much larger gap on this side.) Corner-positioning in this way will also give the low bass frequencies a lift, due to the improved coupling. Remember that although corner mounting is suitable for most full-range loudspeakers (there are some exceptions, such as Klipschorns, which are designed for corner-mounting) the same is not true for subwoofers, because you're able to use the volume and crossover controls to compensate for frequency response variations caused by boundary effects. By using a bound-

- Small and compact
- Very attractive
- Power and features

- Stiff switches
- Non-detachable power cord
- Spikes not supplied

Krix Seismix 1 Mk3 Subwoofer

Brand: Krix
Model: Seismix 1 Mk3
Category: Subwoofer
RRP: $895–$995 (See Copy)
Warranty: Five Years (One Year Electronics)
Distributor: Krix Loudspeakers Pty Ltd
Address: 14 Chapman Road, Hackham SA 5613
T: (08) 8384 3433
F: (08) 8384 3419
E: info@krix.com.au
W: www.krix.com.au

ary effect, you can sometimes get superior performance from a small subwoofer mounted in a corner than from a much larger subwoofer that's been placed well clear of any walls.

Setting up the Krix is easy, but I found the action of the small toggle switches rather stiff. Normally I'd say they'd free up with use, but since their operation is essentially 'set once, and then forget', it doesn't apply in this case. The operation of the automatic power switching is excellent, with the Seismix 1 Mk3 springing out of its 'sleep' mode the instant it detects an audio signal at the LFE input and then waiting 20 minutes after last detecting a signal before going back to sleep (during which mode it draws only a miserly 2.8 watts). This means that the subwoofer won't 'cycle' unnecessarily when you're watching a movie where the LFE channel is switched on and off through the movie. Rather unusually the mains power cord is fixed to the subwoofer (rather than being detachable), but it's able to reach a power point up to 1.45 metres away, so this is unlikely to be an issue.

One of the first discs I span up was a recent copy of the Stereophile Test CD2 simply because I'd finally got around to replacing a copy which I had inadvertently left in a CD player long since returned to the distributor (an occupational hazard—I have lost hundreds of dollars' worth of CDs in this way). I like this CD for any number of reasons, not the least of which is not listening to former Stereophile writer Cory Greenberg's absolutely frightful-sounding track (*Eden*). Greenberg said of this piece: 'the project was to come up with a recording that evoked a mood' so in one sense, he's certainly succeeded! I was, however, able to give the Seismix a workout with the adagio from Bach's lovely Trio Sonata, as played by James Johnson. As the liner notes point out, the Flentrop organ on which it's played has a very appealing 'chiff or chirp' at the onset of each note. For subwoofer testing, the track is ideal because the pedal line is very simple and very clear, with easy progressions, so you know what the next note will be, and can therefore easily hear any unwanted doubling, or excessive distortion. The overall volume of this track is also low and quite uniform, so you can afford to wind the wick up without fear of a sudden onslaught of sound. (Note, however, that whenever you are using a CD that contains non-musical test tracks, as this one does, you should NEVER play any of these tracks at a high volume level! And if, when playing a test CD at a previously established low volume level you can't hear a sound, tone or signal that is supposed to be there, do not—ever—turn the volume up to try to hear it. Doing so will certainly damage your speakers.)

The next disc up was Jimi Hendrix' *Purple Haze*. The star of this is the amazingly powerful kick drum, whose impact was delivered unhesitatingly by the Seismix 1 Mk3, which I found rather an eye-opener (or should that be ear-opener?) as I really hadn't imagined that a subwoofer this small would be able to deliver the kind of performance it actually does. The sound is blindingly fast, and appropriately deep without any overhang at all, and the accuracy of the levels it delivers are excellent. I found I was able to reach the Seismix 1 Mk3's limits at this frequency if I cranked the volume 'way up, but by the time I did, the overall volume was overwhelming… and this was in a fairly large room, when the Seismix 1 Mk3 is obviously designed for much smaller rooms.

Another favourite deep bass test disc of mine is Enya's famous *Watermark* album, though I actually also like it for its music. On the *The Longships*, I found the ultra-deep bass on this track was slightly down in level, perhaps more than I'd have expected considering the incredible performance above 30Hz. It turned out this roll-off was the result of a deliberate strategy on Krix's part, as the company has fitted a high-pass filter with a 26Hz turnover in order to limit driver excursion. On balance, I think this is a sensible decision, particularly since the small driver is not going to be efficient at such low frequencies anyway, and that so few CDs (or DVDs) have any musical energy below 30Hz. (I don't have any firm figures on the actual percentages, but my estimate would be that only around one disc in every thousand produced would contain bass below 30Hz.)

Famous Blue Raincoat is a disc that has quite a lot of low bass (down as low as 34Hz on the *Joan of Arc* track), which is the reason it's still popular at hi-fi shows around the world, despite its age. As anything Leonard Cohen ever wrote is fine by me, no matter who is singing it, it happens to still be on my regular high-rotation play list just for the music, and not for the bass. I thought the Seismix 1 Mk3 kept the bass lines moving along beautifully, and exceedingly rhythmically—I never once had a sense of the Krix lagging or falling behind on the pace.

LAB REPORT

Readers interested in a full technical appraisal of the performance of the Krix Seismix 1 Mk3 should continue on and read the LABORATORY REPORT published on the following pages. 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

Conclusion

If you're in the market for a subwoofer—any subwoofer—I'd recommend you audition the Seismix 1 Mk 3 just to hear how far subwoofer technology has advanced in recent years (driver development as well as amplifier development) and so you can see its superior build quality, which I find amazing in a model that has a recommended retail of less than $900. That way, even if you then decide to buy a larger, more expensive model, in order to get more bass, you'll at least have a baseline in the quality/performance stakes. However, if size will be an important part of your decision when buying, you should make a special point of checking out Krix's latest and smallest model, because once you've seen and heard it, you likely won't look any further.

greg borrowman

Laboratory Test Results

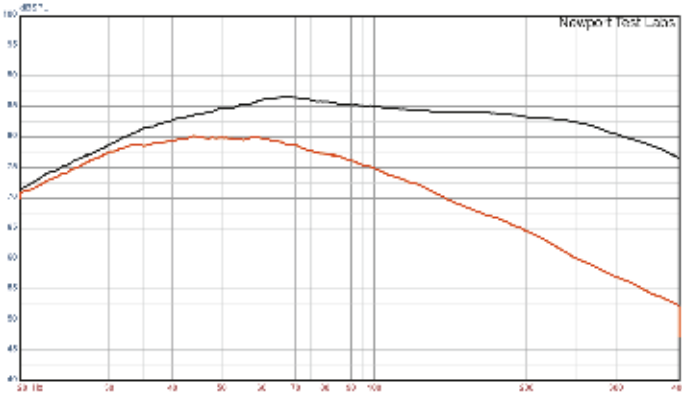
The Krix Seismix 1 Mk3's frequency response is very flat and extended, as you can see from *Graph 1*. As explained in the caption underneath the graph, this response was acquired using a pink noise test signal, and the result has been smoothed by a third-octave filter before being graphed. The top trace shows the response with the rotary high-pass filter set to its maximum clockwise position (200Hz) and you can see that the frequency response extends from 35Hz to 270Hz ±3dB. This is very close to Krix's specification of 27Hz–200Hz –6dB, which is also obtained using an in-room response, however, *Newport Test Labs'* results were obtained with the subwoofer placed in the middle of the room, whereas Krix's were likely obtained with the subwoofer at the optimum position in the room. Had the lab moved the subwoofer closer to a wall and/or corner it would have extended the bass response somewhat, but the low figure would always be limited by the inbuilt 26Hz high-pass filter. In musical terms, the difference between the 35Hz measured by *Newport Test Labs* and the 27Hz quoted in the specification is just four semitones: the difference between A (27.5Hz) and the C# above (34.6Hz). And, of course, you can see that the low-frequency roll-off is quite gradual, so there's still considerable output at 27Hz, but it falls just outside the ±3dB envelope.

That the high frequencies are quite extended did not come as a surprise: I'd expect this given the smallish driver fitted to the Seismix 1 Mk3. It means you will be able to get the Krix to integrate very easily and very seamlessly with even the smallest bookshelf speakers, and these are the most likely models to be paired with it. If you choose to use larger front-main speakers, you'll need to wind back the low-pass filter, and you can see just how far you can do this by viewing the lower trace shown on *Graph 1*. With the control pinned at its maximum counter clockwise position (nominally 50Hz) you can see the high-frequency response starts rolling off at 60Hz. With the control set to this position, the overall frequency response is 25Hz to 110Hz ±3dB. You can see from the shape of the curve that this would make the Seismix 1 Mk 3 an ideal match for larger bookshelf speakers (or smaller floor-standers) whose response starts rolling off at around 90–100Hz. Again, the integration will be seamless, with the only limitation being that the small cone size of the Seismix 1 Mk3 will limit the maximum SPLs that can be generated. However, in a smaller room, I would anticipate you would not reach this limit.

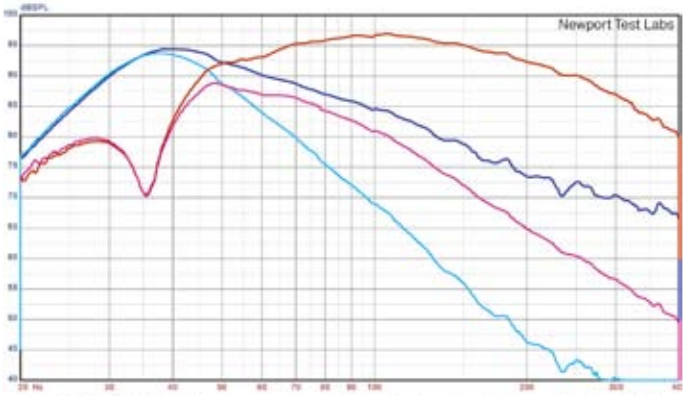
Graph 2 shows the performance of the Seismix 1 Mk3 measured using a near-field microphone technique that allows us to isolate the separate contributions of the bass driver and port, and also to predict the 'anechoic' response of the subwoofer. You can see from this graph that the bass driver's output peaks at 110Hz and holds up well all the way down to around 50Hz, after which it rolls off very sharply, as the design would predict, to null at 35Hz. The bass reflex port's output peaks at 40Hz and is 6dB down at 27Hz, dove-tailing neatly with Krix's own low-frequency specification. You can see that the peak output of the port varies a little depending on the setting of the low-pass filter control, but the differences are tiny.

Graph 3 shows the nearfield response of the bass driver when the low-pass filter is set to its maximum clockwise position (red trace), its minimum position (blue trace), and at 60Hz (green trace) and 100Hz (black trace). What's most interesting about this graph is the enormous difference between the 60Hz and 100Hz traces, which indicates that the rotary control's action is not linear. This in turn means that when you are adjusting the control to get the best match between the Seismix 1Mk3 and your front-main speakers, you should move the control only in very small increments between these two positions, because even tiny variations in the position of the control will have a considerable affect on performance.

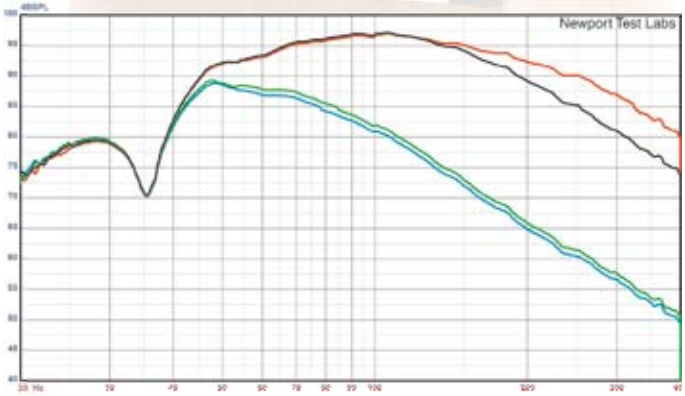
Steve Holding



Graph 1. Averaged frequency response using pink noise test stimulus with capture smoothed to one-third octave. Top trace is response with low-pass control set fully clockwise. Lower trace is response with low-pass control set fully counter-clockwise. (Krix Seismix 1 Mk 3 Subwoofer)



Graph 2: Nearfield sine frequency responses of bass driver (red and pink trace) and port (dark blue and light blue) with low-pass filter control set to 50Hz and 200Hz. (Note that data for port has not been re-scaled to compensate for differences in radiating area.)



Graph 3: Nearfield sine frequency response of bass driver crossover control set to max (red trace), 100Hz (black trace), 60Hz (green trace) and minimum (blue trace). (Krix Seismix1Mk3)