Krix Phoenix V2.0

LOUDSPEAKERS

If any loudspeaker manufacturer could afford to rest on its laurels, it's Krix. In the 39 years it has been operating as a family business (and it continues to be operated as a family business, with almost all the 'Krixes' being in some way involved with manufacturing their speakers, either hands-on or in customer support roles) the company has not set a foot wrong. The speakers they've designed for home use have perfectly targeted the right market sectors, so they've been commercially successful, and their performance has resulted in many awards. Krix's professional division has, on many accounts, been even more successful, with Krix winning contracts to fully outfit cinemas and multiplexes with multi-channel sound systems in countries all around the world, including the USA. But anyone who knows Scott Krix will know that he is not likely to ever stop designing, and that he always has some new project on the boil. The latest project to come to fruition is the Phoenix V2.0, which, although it re-uses a well-known name, and is suffixed by a 'V2.0' moniker, is actually a brand-new loudspeaker design.

When I say 'brand-new' I mean it. The cabinet isn't even built the same way Krix built its previous models. Thanks to new CNC machinery in Krix's factory (Krix builds its own wooden speaker cabinets, grilles and all crossover networks in-house), the panels in Phoenix V2.0's cabinet are now mitre-jointed to each other, rather than assembled using the 'picture frame' technique previously employed. This technique results in a cabinet that's inherently more rigid, but Krix increases rigidity further still by using its 'X-brace' system, which it says also helps prevent standing waves inside the cabinet (which are always an issue in cabinets that tend towards being tall—though at 950mm high, I'd hesitate to call the Phoenix V2.0 'tall'.)

The tweeter used in the Phoenix is not the same as in the original Phoenix but it's hardly 'new', because it's the same tweeter that's now used in many Krix models, including the flagship Neuphonix. The bass driver, on the other hand, is new, and although it's externally similar to the previous model, the 'innards' have undergone a radical overhaul, with the magnet increased in size by 50 per cent and the size of the voice-coil increased dramatically (from 25mm to 38mm).

THE EQUIPMENT

The Phoenix V2.0 is a two-way bass-reflex design that arrays its drivers (two bass/midrange drivers and a single tweeter) in what's most properly called an 'MTM' (Midrange Tweeter Midrange) configuration, so the tweeter sits midway between the two midrange drivers. (Although this configuration is often called a D'Appolito configuration, because of a configuration popularised by the famous speaker designer Joseph D'Appolito, it's not always the case that it is, because a true D'Appolito configuration involves not only an MTM driver layout, it also requires that very specific driver-to-driver distances be used, along with a particular type of crossover network...

so there are some MTM configurations that are also D'Appolito configurations and some that aren't.) The primary advantage of the MTM configuration is that the path distances from both bass/midrange drivers to the ear are identical (assuming you position the speakers so the tweeter is at seated ear level) and the path differences between the tweeter and each midrange driver are also identical. This leads to better stereo imaging and a more realistic 'presentation' of the image, irrespective of a speakers' other virtues.

The bass/midrange drivers in the Phoenix V2.0 are nominally 165mm in diameter and have laminated polypropylene cones. Their 38mm voice-coils are wound around an aluminium former, and the voice-coil is under-spider ventilated. Distortion is reduced through the use of an aluminium flux stabilisation ring and, as noted in the introduction to the review, the magnet is now 50 per cent larger than previously. When I measured the cone, it turned out the '165mm' referred to the measurement across the 'flat' section, from side to side (as you can see from the photograph accompanying this review, the driver chassis is not symmetrical), whereas if you measure from 'top to bottom', the driver is 180mm in diameter. The important measurement is the Thiele/Small diameter, which I measured at 135mm, giving an effective cone area (Sd) of 141cm². Because two cones are used to deliver bass, the available area is twice this, at 282cm², which means that if Krix had used a single driver, rather than two it is using, that driver would have had to have had a T/S diameter of 189mm, for an 'overall' diameter of around 230mm.

The driver Krix is using has a very unusual manner of construction involving the way the cone is attached to the voice-coil, and it's not too dissimilar to a system developed in the UK by GP Acoustics. In this driver the cone is not attached to the voice-coil former in the usual manner using a small collar, but there is instead an intermediate funnel-shaped 'header' fitting where the small part of the header attaches to the voice-coil former and the wider section is attached to the speaker cone. This gives a far superior joint for both the voice-coil/header interface and the header/cone interface and means the cone is not being driven at its centre, but at a point about half-way across the cone surface. The only penalty would appear to be some increased mass and some added cost for the header. The remainder of the driver is fairly conventional—although high-tech—design, where the chassis is a very high-quality alloy casting which features 'under-spider' venting for improved heat dissipation, and there's additional ventilation above the spider as a result of holes punched in the voice coil former.

The tweeter is a 26mm dual-concentric diaphragm type with a wave-guide centre plug for controlled directivity. The design is usually referred to as being a 'ring radiator', and in this case is a Vifa XT25TG30-04. Two chambers at the rear of the diaphragm prevent reflections interfering with the direct sound and also result in a fairly low resonant frequency, so it's more ideally suited to two-way designs, as in this Phoenix V2.0. It has a copper shorting ring fitted to reduce harmonic and other distortions. As I noted in the introduction, this is the same tweeter used in Krix's top-line model, the Neuphonix.

Krix's crossover network is very easily accessible, since it's located on the rear of the rear terminal plate, which itself is quite large because it's set up for bi-wiring/bi-amping if desired, so there are two pairs of gold-plated multi-way speaker terminals. The crossover is built on a printed circuit board but Krix is using so many components (10 in all, and this is for a two-way speaker design!) that it's had to stack some of these components four-high on the PCB, which has in turn necessitated a fair deal of point-to-point wiring as well. In all, there are two inductors (one air-cored, one iron-cored) which are properly cross-mounted so they can't interact magnetically, six capacitors (five of which are Krix-branded metallised polypropylene film types and one of which is a bipolar electrolytic) and two Cermet high-power resistors.)

As I said previously, the Phoenix is a bass reflex design, and its bass reflex port is located on the rear of the speaker, below the speaker terminal plate. The port tube is made of plastic and is flared at both ends to reduce turbulence. It's 74mm in diameter (internal) and 77mm long.

As with most loudspeakers these days, the Phoenix V2.0 is available in a variety of finishes, with your choice of finish determining the final cost. A pair in Krix's standard 'Black Vinyl' finish costs $1,795 per pair, but paying a little extra ($2,095) will get you a pair in a real wood veneer, rather than vinyl, in your choice of Atlantic Jarrah, American Cherry or Black Ash. Krix also offers the option of choosing a custom 'one off' finish, but cost would depend on what you want.

The cabinets stand just under a metre high (950mm) and are 195mm wide and 295mm deep, for an internal volume of around 37 litres. Each cabinet weighs 18kg. (If you can afford it, I'd always recommend choosing a real wood veneer over a vinyl finish, no matter how good the vinyl finish.)

IN USE AND LISTENING SESSIONS

When setting up the Phoenix V2.0 speakers I found that rather than providing threaded captive nuts and spikes for mounting, Krix has instead fitted rubber feet which are screwed into the wooden base and which it says give improved acoustic isolation on both hard and soft floor surfaces. However, I found that the combination of the rubber feet and the small 'footprint' of the base (195×295mm) combined with the speakers' height and the fact that all three drivers (including the two bass/midrange drivers with their heavier magnets) are located at the top of the cabinet, meant that the centre of gravity of the combination was very high, so

KRIX PHOENIX V2.0
LOUDSPEAKERS

Brand: Krix
Model: Phoenix V2.0
Category: Floorstanding Loudspeaker
RRP: $1,795
Warranty: Five Years
Distributor: Krix Loudspeakers Pty Ltd
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☎ (08) 8384 3433
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- Incredibly accurate
- Big sound
- Smallish enclosures

- High centre of gravity
- Lowish impedance

LAB REPORT

Readers interested in a full technical appraisal of the performance of the Krix Phoenix V2.0 Loudspeakers should continue on and read the LABORATORY REPORT published on page 36. 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 36

that the cabinets overbalanced relatively easily, given a strong-enough shove from almost any direction, but most particularly from the sides. The original Phoenix design had a plinth at its base which I recalled as meaning it was more stable than this V2.0 design, but when I queried Gary Krix about this, he assured me this wasn't the case and that this V2.0 version is actually more stable than the original Phoenix.

One of the albums I couldn't wait to hear played through the Phoenix V2.0 was Cloud Control's latest, 'Dream Cave'. Although I think that Cloud Control has had more misses than hits, the hits are worth wading through the misses, because this band isn't like any other you've ever heard: they're the genuine deal, and real experimenters with sound and music. 'Dream Cave' (the band's second album... the first was 'Bliss Release', and one of the 'hits' on that one was *Water We Can't Fight*, which in 2010 made it into the top twenty on Triple-J's 'Hottest 100' list) has quite a few 'hits' that had me programming my player to repeat them over and over, including *The Smoke*, *The Feeling*, *Scar*, *Happy Birthday* (not a cover!), *Moonrabbit*, and *Island Living*. For me, the misses on this album are *Tombstone*, *Scream Rave*, and *Dojo Rising*). The recording quality is variable too, with the one constant being that the drums are clearly and cleanly captured, if rather distantly for the most part. The Krix Phoenix delivered not only the sound of the drums exactly as they were recorded, but also the 'psychedelic' sound effects on this album, and not forgetting the just-plain-weird sound effects (such as the water dripping that so suddenly interrupts *Tombstone*) to wonderful effect. The soundfield the Phoenix's delivered during the intro to *Island Living* was just amazing!

However, I'd the be the first to admit that Cloud Controls' sonic effects are not ideal for critical auditioning purposes, where it's always better to stick to cleanly recorded CDs of acoustic instruments and vocals. One such is Move's wonderful recording of Virginia Taylor (flute) and Timothy Kain (guitar) on 'Character Interludes'. The high frequencies and overtones of Taylor's flute were delivered to perfection throughout by the Phoenixes, but I was particularly entranced by the sound during Máximo Diego Pujul's *Suite Buenos Aires*, and especially in the second movement, *Palermo*. (Co-incidentally-enough, Pujul originally wrote this for Australian guitar/flute duo Julian Byzantine and Gerhard Mallon, who premiered it on their CD 'Music from the New Worlds' on the Walsingham Classics label.) The purity of sound and the extension of the Phoenix's tweeter was just breathtaking to hear, and the fact that the volume was perfectly balanced against the lower strings of Kain's guitar was

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indicative not only of the quality of Move's recording, but also of the fact that Krix has correctly 'balanced' the sound of the Phoenix to be completely linear right across the audio spectrum.

To double-check the accuracy of this frequency balance I played back a recording of a chromatic scale being played on a grand piano, with frequencies running from 27.5Hz right up to 3.951kHz. Other than the very lowest notes being very slightly diminished in volume, the Phoenix delivered all the other notes at exactly the same volume level—and with the correct tonal balance—so I was left in no doubt that the frequency response of the Krix Phoenix was perfectly flat right across this range, which is essentially all music's fundamental notes. I followed up with a number of 'spoken word' recordings (of various poems and Dylan Thomas' radio play *Under Milkwood*) and found that the clarity of the Phoenix when reproducing male or female voice was outstanding, with excellent articulation.

After I further upped the auditioning ante with a long listening list of recordings of solo piano, piano and voice, guitar and voice(s), and various jazz ensembles, my admiration for what Krix has achieved with this Phoenix design only became greater. Not only is the frequency response superbly flat and uniform, so you hear exactly what has been recorded, but also the stereo imaging and sound-staging are equally outstanding. Yes, there is a 'sweet spot' but it's pretty wide and, if you're listening in it, the imaging is truly holographic, so that when listening to live recordings made in small environments, for example, it's really as if you're present at the venue itself... the sound really surrounds you, so it's as if you're hearing the performance not only from the front, but also the echoes and acoustic from behind you as well... a completely immersive aural experience.

CONCLUSION

They may be fairly small floor-standing speakers, but these Krix Phoenix V2.0 speakers deliver a really big sound, and one that's amazingly lucid and also incredibly accurate. Although they will sound superb in any size room, they are most ideally suited for use in home units and apartment buildings where they are also sufficiently small enough to be completely inconspicuous... that is until you start playing music! ***greg borrowman***

CONTINUED ON PAGE 36

CONTINUED FROM PAGE 34

LABORATORY TEST RESULTS

The Krix Phoenix's response, as tested by *Newport Test Labs*, was smooth, extended, linear and balanced: everything you want to see in a loudspeaker response. Figure 1 shows performance in a real room, averaged across nine different measurement points and you can see that it fits within a 2.5dB window from 48Hz up to 10kHz (the upper limit of this graph—the Phoenix's response extends beyond 40kHz, as shown in Graph 2). That puts the response over this bandwidth at just ±1.25dB, self-evidently excellent. Note, too, that the response is not 'skewed' to favour either bass or treble... or even the midrange.

The Phoenix's response, as tested by Newport Test Labs, was smooth, extended, linear and balanced: everything you want to see in a loudspeaker response.

The response is 0.5dB 'high' around 100Hz, then again just 0.5dB 'high' around 600Hz and again 0.5dB 'high' around 6kHz. I've put the word high in inverted commas because we're only talking half a dB! Consider that if this speaker had not been 0.5dB high at these points, I could have been comparing its response to that of an amplifier.

Graph 2 shows not only the high-frequency response of the Krix Phoenix V2.0 in ultra-sharp detail, but also the different test stimulus (gated sine) removes the inevitable 'averaging' of the pink noise test signal used for Graph 1, plus these traces are the result of a single sweep, rather than nine averaged sweeps. Even so, you can see that the Krix Phoenix V2.0's frequency response is still beautifully flat, particularly when the grille is not fitted (black trace). When the grille in place (red trace), the response is not quite as flat, but the differences are only minor and I doubt that they would be audible, even in a direct A–B comparison. Remember that the two traces track up to 3kHz, which is around the highest note that can be played on any instrument, so the slight differences at higher frequencies would affect only harmonics, not fundamentals. This graph shows the response to be within ±2.5dB from the lower graphing limit up to the upper graphing limit of 40kHz. (Under IEC guidelines the small dip between 22kHz and 26kHz can be ignored because of its small bandwidth and the frequency at which it occurs.)

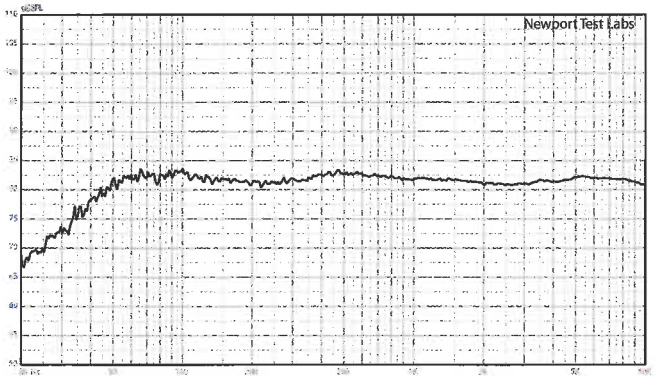
Low-frequency performance is shown in Graph 3. You can see the bass/midrange drivers start rolling off slowly below 100Hz, with the port coming in to compensate at 45Hz, perfectly chiming in with the bass/midrange drivers' minimum output at the same frequency. The port's Q is fairly high, so it is 6dB down at 29Hz and 80Hz. Importantly, there is no unwanted leakage of high-frequencies through the port: the trace rolls off smoothly to around 150Hz, then dives down so that above 200Hz, there's almost no appreciable acoustic output. Excellent design on Krix's part.

The impedance modulus (Graph 4) shows the Phoenix V2.0's minimum impedance

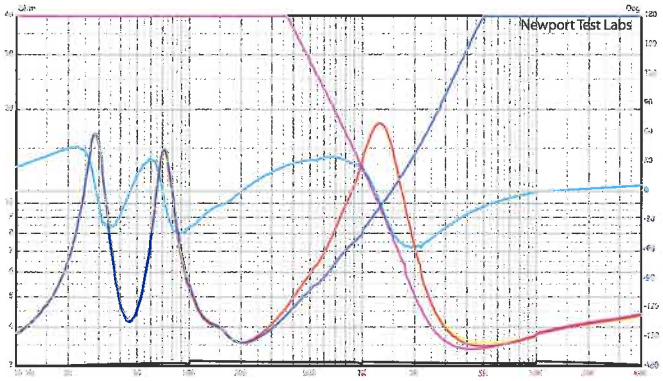
occurs at 200Hz and 5kHz, where in each case it's around 3.5Ω, exactly as claimed by Krix, meaning that it just scrapes in as being 'nominally 4Ω' under IEC regulations, so Krix should actually rate this design at '4Ω' rather than 6Ω. You can see that at high frequencies (from 3kHz to around 16kHz) the impedance is below 4Ω, however it's the low frequency impedance that's more important and you can see that this is mainly below 5Ω except at the resonant peaks (which occur at 29Hz and 61Hz). This means that I'd recommend you use a well-designed amplifier in conjunction with the Phoenix V2.0s: one that has been proved to deliver good performance into 4Ω loads. There appear to be two minor cabinet resonances at 150Hz and 500Hz but they're tiny and would not have any effect on sound quality. The electrical crossover takes place at 1.3kHz, a little below what Krix says is the acoustic crossover at 1.9kHz. Note that the impedance rises at high frequencies (good speaker design practise) and the phase angle is quite controlled, particularly at low frequencies. Again, good design practise.

Graph 5 marries the in-room response shown in Graph 1 with the gated sine (simulated anechoic) response shown in Graph 2 to give a better picture of the overall performance of the Krix Phoenix V2.0 from 20Hz right up to 40kHz. You can see that overall, *Newport Test Labs'* measurements show the frequency response of the Phoenix as extending from 40Hz to 40kHz ±3dB. Excellent indeed. The final graph (Graph 6) simply shows all the responses that were measured on the same graph, enabling technically-minded readers to correlate the various measurement techniques.

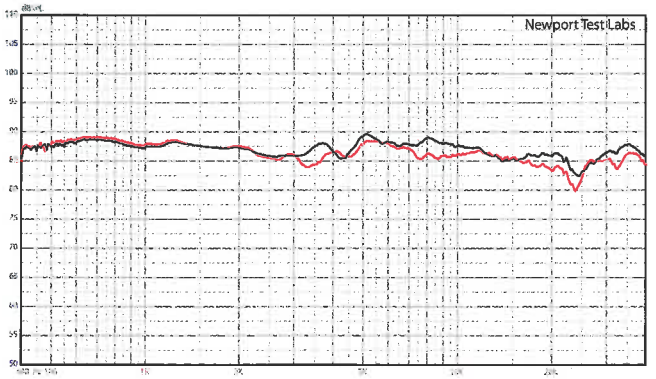
Using its standard, very stringent, test procedure, *Newport Test Labs* reported the sensitivity of the Phoenix at 89dBSPL at a distance of 1M for a 2.83Veq input, somewhat lower than Krix's claim of 91dBSPL, but an excellent result nonetheless, one that is both well above average and high enough to mean that you won't need an overly powerful amplifier to get the Phoenix V2.0s sounding their best. Overall, an outstanding set of results from this new Krix design. ***Steve Holding***



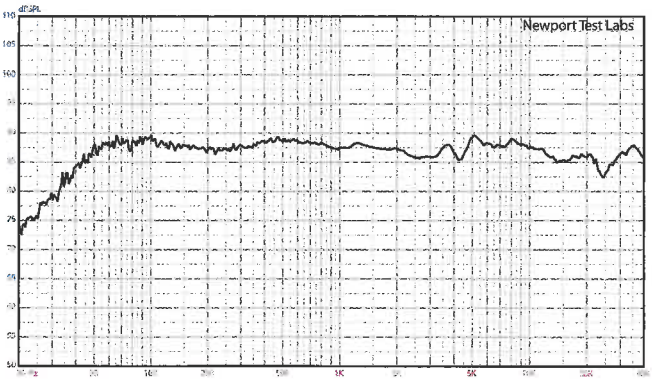
Graph 1. Averaged frequency response using pink noise test stimulus with capture unsmoothed (red trace) The trace is the averaged results of nine individual frequency sweeps measured at three metres, with the central grid point on-axis with the tweeter. [Krix Phoenix Loudspeaker]



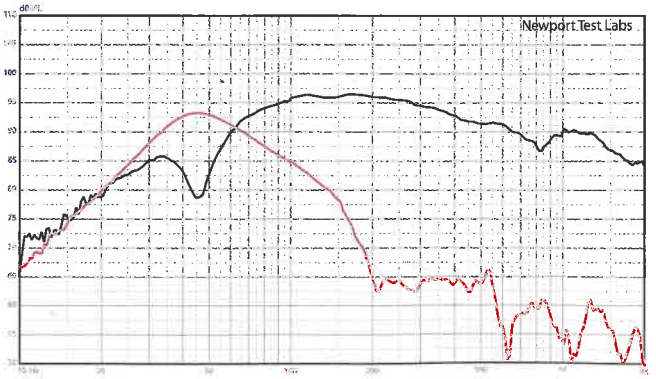
Graph 4. Impedance modulus of left (red trace) and right (yellow trace) speakers plus phase (blue trace); high-pass section (purple trace); low-pass section (dark blue trace). Black trace under is reference 3-ohm precision calibration resistor. [Krix Phoenix Loudspeaker]



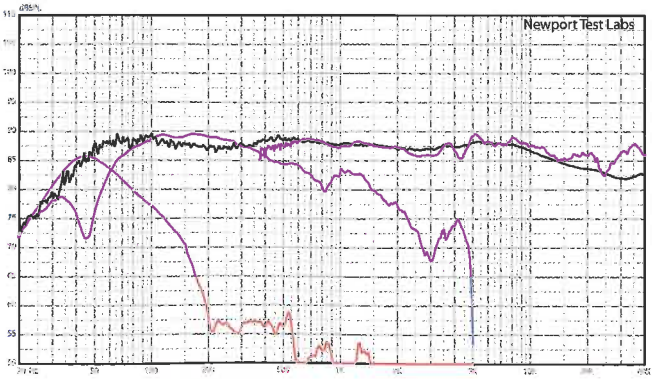
Graph 2. High-frequency response, expanded view. Test stimulus gated sine. Microphone placed at one metre on-axis with dome tweeter. Black trace with grille off; red trace with grille on. Lower measurement limit 400Hz. [Krix Phoenix Loudspeaker]



Graph 5. Frequency response. Trace below 1kHz is the averaged result of nine individual frequency sweeps measured at three metres, with the central grid point on-axis with the tweeter using pink noise test stimulus with capture unsmoothed. This has been manually spliced (at 800Hz) to the gated high-frequency response, an expanded view of which is shown in Graph 2.



Graph 3. Low frequency response of front-firing bass reflex port (red trace) and woofer. Nearfield acquisition. Port/woofer levels not compensated for differences in radiating areas. [Krix Phoenix]



Graph 6. Composite response plot. Red trace is output of bass reflex port. Dark blue trace is anechoic response of bass driver. Pink trace is gated (simulated anechoic) response above 400Hz. Black trace is averaged in-room pink noise response (from Graph 1). [Krix Phoenix]