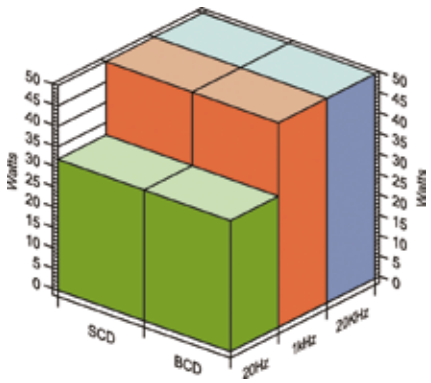
KR Audio Kronzilla SX

Valve Power Amplifier



Power Output: Single and both channels driven into 8Ω non-inductive loads.

When you first set eyes on a Kronzilla SX your eyes will be drawn instantly to the two valves that dominate the skyline of its chassis. And why not? They're huge! Each of these valves rises 320mm above the plinth and has a circumference of 283mm. (Eat your heart out Melanie Safka).

If you're amazed by their size, you'll no doubt be even more amazed to learn these valves are made entirely by hand; a process KR Audio says takes more than 100 hours per valve. I stand to be corrected, but so far as I know, KR Audio is the only manufacturer of audio amplifiers that makes its own valves.

The Equipment

KR Audio Electronics was founded in the Czech Republic in 1995 by Riccardo Kron, but following his death is now run by his widow, Eunice Kron. This is the first time KR Audio's products have been available in Australia, thanks to the enthusiasm of Rex J. Andrews, of Brystock Industries, who is distributing the brand in Australia.

Although the Kronzilla SX is easy to set up, requiring simply that the amplifier be unpacked and placed on a sturdy support and the valves (which come in an entirely separate box) be inserted in their sockets, I'd strongly recommend you have your dealer do all this for you for several reasons. The first of these is that the Kronzilla SX is heavy—very heavy!—even for a valve amplifier, so there's no way one person can safely manoeuvre it even on a flat, level surface, much less lift it! (Indeed when I—with the help of a neighbour—placed the amp on my bathroom scales to weigh it, my significant other gleefully pointed out that she was several kilos lighter than my newest amplifier!)

Second, given the cost of replacement valves ($1,375 each… about which more later), you really don't want to be solely responsible for getting any expensive valve amplifier up and running for the first time.

The Kronzilla SX sits on three feet, rather than the more usual four (this is actually very sensible, as three points

describe a plane, whereas four points describe a wobble), and the only control on the front panel (it's so thin I guess it would be better described as a plinth) is the power on/off button, which has a chameleon red/green LED that switches between 'Standby' and 'On.' (The main 240V power switch is located at the rear of the amplifier.) The valves that are the Kronzilla's heart and soul rise unprotected from a stainless steel 'deck.' Behind them, rough-finished black anodised iron housings contain the various transformers.

I personally loved the industrial design of the Kronzilla SX, which I thought to be a perfect example of the 'brutal' school of engineering, but a mate who visited while I had the Kronzilla on loan thought the rough metal finishing looked… well… rough. I guess it's a personal thing. When I pointed out to him that the black crinkle finish on the Kronzilla was exactly the same as the finish on a brand of famous French cookware, he didn't bat an eye, commenting only that he 'preferred copper-bottomed stainless steel pots and pans.' The only design element I didn't much appreciate on the SX was the way the black edges of the chassis 'lipped' over the stainless steel deck: a four-cornered dust-trap if ever I saw one.

Around the rear of the Kronzilla SX you'll find that mains power switch I mentioned earlier, alongside which is a standard IEC mains socket and a rotary, slot-controlled multi-voltage selector (115/230 volts). In the centre of the panel is the impedance selector (8Ω and 4Ω positions only) which is flanked by the left and right speaker terminals, which are very heavy-duty, gold-plated, multi-way terminals on 30mm centres that appeared to be of WBT origin, though I couldn't find a brand marking. At the far right of the rear panel are two, lone, gold-plated RCA line inputs.

Those huge valves are T-1610s, which are specified in the literature as 'ultra high-power triodes with an output of 22–55 watts' and are certainly the largest valves you'll see this side of a radio transmitter. (I'm reliably informed they're the largest valves ever used in any audio amplifier, something I found quite easy to believe!) Each T-1610 valve runs a filament voltage of 5V and a current of 3.8 amps. Transconductance is 9.9 mA/V and maximum plate voltage is around 650 volts, for a plate dissipation of 150 watts. The glass envelope and all the internal glass supports (there's lots!) are made from Simax hard glass and, yes, all the glass is hand-blown!

For those up on what's happening in the Czech Republic, I should point out that the SX has a completely different circuit from KR Audio's Kronzilla SD. The SX has automatic biasing and completely different cathode resistor circuitry.

Right about now, you may be wondering about what you'll do when it comes time to replace those two towering, hand-made T-1610s. Well perhaps not so much wondering about the difficulty of replacing them, that's easy: they just plug in and out like any valve, but the cost involved. I mean, don't valves wear out? My personal opinion is that all those people who whine about valve life have in all probability never owned a valve amplifier, and are merely parroting horror stories they heard from their grandparents about the unreliability of the valves in early black-and-white television sets.

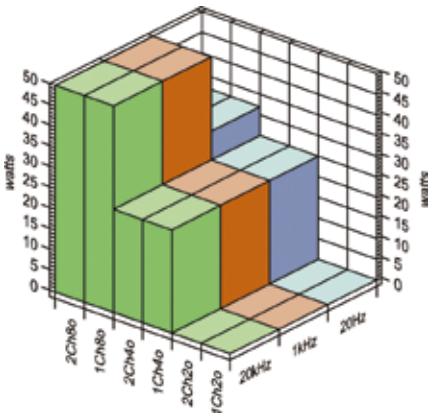
One laughably inaccurate story is the one that would have it that amplifiers that contain valves are delicate and easily damaged. If this were really the case, do you think musicians (hardly highly paid at the best of times) would insist on using valve guitar amps—particularly if you've seen your average 'roadie' in the act of either loading or unloading a rock band's equipment! I figure the average guitar amp is loaded, transported on a truck without springs, and then unloaded in some pub at least three or four nights a week, every week, year in and year out. The valves in a hi-fi amp, by comparison, obviously get to live the life of Riley!

As for the longevity of valves themselves, I'd advise thinking not along the lines of hundreds of hours, or even tens of hundreds of hours, but upwards of tens of thousands of hours. Let me do the math for you: That's two and a half hours a night, every night, for more than ten years… at a minimum. Most valves will last even longer than this.

KR Audio

Brand: Kronzilla
Model: SX
Category: Power Amplifier
RRP: $13,500
Warranty: Two Years
Distributor: Brystock Industries Pty Ltd
Address: PO Box 271
Penrith
NSW 2751
T: (02) 4739 6766
F: (02) 4721 7644
E: valves@vares.com.au
W: www.vares.com.au

'All those people who whine about valve life have in all probability never owned a valve amplifier, and are merely parroting horror stories they heard from their grandparents'



Power Output: Single and both channels driven into both 8Ω and 4Ω loads, in both instances using the 8Ω tap on the Kronzilla's output transformer.
IMPORTANT NOTE: The Kronzilla SX was not tested into 2Ω loads, so you should ignore the sections of the above graph marked 2Ch2o and 1Ch2o that sit on the '0 Watts' line.

The Edison Effect

Most audiophiles know that valves work because when electrical current passes through a coil of wire inside a vacuum, the filament heats up and gives off electrons. Because the electrons so created are negatively charged, they're attracted to the positive plate. This effect was a great source of frustration for Thomas Edison when he was developing the light bulb, because it caused the inside of his bulbs to turn black, which annoyed him intensely. However, such was his genius that he realised something important must be going on inside the globe to cause this, so although he didn't know what was causing it, or how he could make buck out of it, he nevertheless in 1883 patented the blackening process as the 'Edison Effect.' It was more than twenty years before John Ambrose Fleming, Professor of Electrical Engineering at University College, London, found a use for the effect in 1904, when he built what is largely regarded as the first diode, which he immodestly dubbed a 'Fleming Valve'. Two years later, famous US inventor Lee deForest added a grid to control and amplify signals, and called his version an 'Audion' because of its ability to convert r.f. signals into audio. A.B.

I once inherited a valve amplifier that my father-in-law had built himself in the 50s (yep, it was a Williamson). Thirty years later it was still working fine and still using its original valves.

However, according to Eunice Kron, KR Audio valves will last far, far longer than ordinary valves because unlike ordinary mass-produced valves, KR's valves don't use extruded tungsten filaments (be they thiorated tungsten or otherwise). These filaments are found in all mass-produced valves and mean that the valves also act like light bulbs, in that they give off both light and heat. Eunice Kron says that KR's valves are made with oxide-coated ribbon filaments so that when they're operating all you'll see is *'a tiny sliver of light'* and you'll feel *'very little heat'*. Kron says that it's excess heat and light that stress a valve and lower its duration and reliability. She says her late husband was fond of telling people who asked about the correct way of designing and building valve amplifiers that: *'a tube is not a fireplace'*. Incidentally, I am so accustomed to valves not having any sort of warranty at all, or one that can be counted in days, I was more than a little surprised to learn that KR Audio offers a two year warranty on the T-1610.

KR Audio rates the Kronzilla at 50 watts per channel into 8Ω (THD = 3%) with a frequency response of 20Hz–20kHz –3dB. Input required for rated output is 1 volt RMS. The amplifier measures 385 × 415 × 550 mm and weighs... well, according to my bathroom scales it weighs more than 50kg, but my wife says she'll divorce me if I reveal the exact figure to any living soul. And speaking of exact figures, my guess is that anyone who buys a Kronzilla SX will be in quite exclusive company. The serial number of the amplifier I received for review was 458.

Listening Sessions

In these times of full and frank disclosure on the part of journalists, I feel I need say that at the outset that this review will inevitably be biased, because I am an unashamed diehard fan of valve amplifiers, having continuously owned at least one valve amplifier for my entire life, which has seen my living room contain most of the usual 'glass bottle' suspects including examples from Audio Research, McIntosh, Luxman and even—most famously in my youth—two Lenard guitar amps wired in parallel as a high-power stereo.

However, like many valve amplifier enthusiasts of the 21st Century, I am currently on a single-ended-triode (SET) kick, but am finding the low power output of these otherwise glorious devices can be at times frustrating: at times when it comes to choosing suitable speakers and at times when you want more than the usual amount of volume! So having the editor of *Australian HI-FI* call to ask whether I'd be interested in reviewing a Kronzilla SX was a little like asking a man dying of thirst in the desert whether he'd like a glass of water.

Switch the amplifier on using the front panel switch and the Kronzilla's power LED will switch from displaying red to showing green in just 12 seconds. This may be the minimum time for the Kronzilla to become operational from stand-by, but my ears told me it wasn't *quite* long enough for the amplifier to be properly warmed up. Start listening immediately by all means, but expect the sound to gradually improve for at least another 15 minutes, after which performance will have reached its maximum potential. If you switch the amplifier off completely, at the rear panel, factor in at least another 30 minutes to this warm-up time.

And warm-up the Kronzilla certainly does! Despite the late Riccardo Kron's apposite aphorism, my review Kronzilla SX ran very hot indeed—and not just the valves. Even the metalwork cooked. This was at least partly because I was given the task of reviewing the Kronzilla in an unairconditioned house during one of the hottest summers on record in Australia, during which I'd left the amplifier switched on all the time, to ensure I was hearing it at its best. If this isn't a 'worst-case' scenario, I don't know what is.

On the plus side, even though the amplifier ran very hot, it never skipped a beat! Perhaps if KR Audio had made the amplifier a little bigger, to allow more airflow between the various 'towers', it might have run a little cooler, but then it would have been even larger and heavier than it already is... However, I would certainly not recommend putting the amplifier on a carpeted floor, which seems to be a popular location for heavy,

high-end amplifiers, because the carpet will impede air-flow under the chassis, particularly if it's thick. If you simply must have the amplifier on the floor, put a solid base underneath. An appropriately sized 25mm-thick slab of marble or granite would be perfect.

The sound. Ah, the sound. It was everything I could want of a valve amplifier. I particularly loved the fact that it wasn't even pretending to give solid-state accuracy. Instead, it delivers a big, fat, full and rich sound that will fire your musical imagination and really give your speakers something substantial to chew on, so they're able to effortlessly fill your room with glorious valve sound.

I fired up a recording I'd made myself of a local cellist performing several of Bach's cello suites and was absolutely blown away by the richness and depth that was revealed using the Kronzilla SX. Listening to the *Prelude* to *Suite No 2 in D Minor,* it had got me by just the first three divine notes, after which I was completely captivated. I listened over and again to the complete Suite, progressively winding the volume up further and further only to find it just got better and better... and I know it was all the amplifier, because my recording is nothing too special, though it's clean and quiet. (What it definitely isn't is over-engineered!) Later in the same piece, where there's more double-stopping—such as in the *Menuet*—the overtones that result are delivered with heart-wrenching tone. I figured that at least part of this was because the T-1610s are demonstrably highly microphonic: put your ear close to the valves when the amplifier is working hard and you can hear the music from the valves themselves, so the same must be happening in reverse, with the sound from the speakers affecting the performance of the valves. Perhaps this means notes are sustained for slightly longer than they would normally be, or imbued with a richer-than-normal tonal quality... or even perhaps enhanced by some added tonal complexity, but even if all of this was happening, there was no blurring at all of any note runs and all the music I played during my auditions was reproduced with perfect rhythmic accuracy, no matter how complex the interaction between the musicians and their instruments.

This tonal richness also improved vocals, but without affecting the character of the singers' voices. Once again I played one of my own home recordings of a friend whose voice I know better than my own (a trick: no-one knows what their own voice really sounds like!) to find that while recognising her voice instantly, it was still somehow more real than real, if you know what I mean. I certainly know she would have enjoyed hearing herself via the Kronzilla SX.

Intriguingly, the Kronzilla SX seemed to be able to separate the different nuances of instruments playing together, so that when Allan Lee and Jo Abbot share a melody (on vibraharp and piano, respectively) on *Baden-Baden* [Move MD 3303], the sound of both instruments is enriched, but there's no resultant blending of the two different sounds: it's almost as if each were being reproduced by a separate Kronzilla SX. On this same disc, you'll find the sound of the higher notes on the vibraharp as reproduced by the Kronzilla SX is sensational... but then again, so is the music on this CD. The contrapuntal arrangement of Brian Brown's *Diggers Rest* is a real jaw-dropper. Curiously, there's even a Czech connection with this CD (The Music of John Lewis: The Alan Lee/Jo Abbott Jazz Quartet) because Lewis's wife, Mirjana, was born in the Czech Republic.

Conclusion

Would I buy this amplifier? If I had the readies, I'd be in like Flynn—which, considering the dimensions of the T-1610, is probably not a wholly inappropriate remark! In some ways, I wish the valves were smaller than they are, because they tend to distract one's attention from the main game, which is the sound, and it's here that the Kronzilla SX waves its magic wand, adding heart and soul to whatever you're listening to. Beautiful music from an undeniably strange—but strangely wonderful—amplifier.

Andy Brown

LAB REPORT

Readers interested in a full technical appraisal of the performance of the Kronzilla SX 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 sample tested.

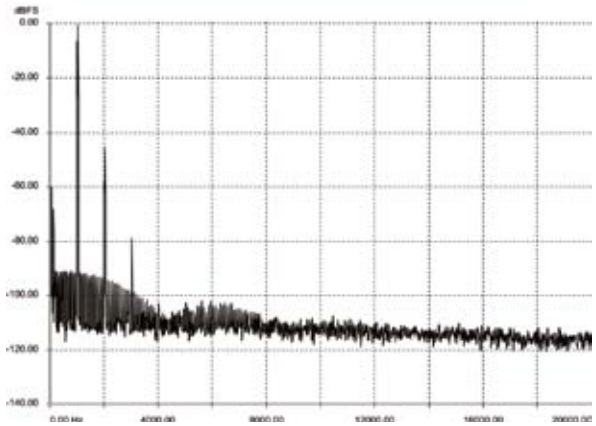
Test Results

Power output was measured at just on 50 watts (16.9dBw) per channel into 8Ω at 1kHz and above, with no difference depending on whether one or two channels were driven, right on KR Audio's specification. I noted however, that the mains voltage during the measurement session was at best fractionally low (238 volts) and on occasion, dipped as low as 228 volts, so in practise, with a more stable power grid, one could expect slightly more power, but only a watt or two. Power output at 20Hz into 8Ω was just 32 watts (15dBw) per channel, so under US FTC or IHF rules, the Kronzilla would have to be rated at 32-watts per channel.

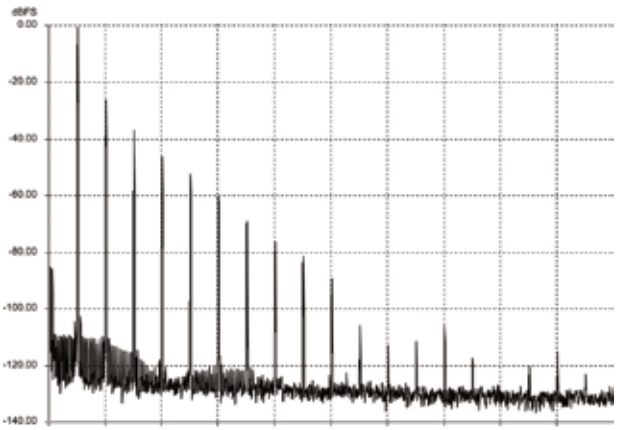
Australian HI-FI Test Laboratories also tested the performance of the Kronzilla SX with an impedance mismatch, by using the 8Ω transformer tap to drive a 4Ω load. As you can see from both the bar graphs and the tabulated results, this resulted in a maximum power output of 25 watts per channel, at any frequency, irrespective of whether one or both channels were driven. This shows that the Kronzilla SX will not suffer a load mismatch kindly, so you should be careful with your choice of speakers. My personal recommendation is that for best performance you should select a pair of speakers with a nominal impedance of 8Ω whose minimum impedance doesn't drop below 6Ω.

Regular readers will be aware of the difficulty of measuring the maximum power output of valve amplifiers, because they don't readily go into hard clipping, so the lab technician has to make a personal decision based on overall waveform linearity and/or a simultaneous measurement of THD+N. In the case of the Kronzilla SX the THD+N at rated output (50-watts) was 5.9%. At an output of just one watt, THD+N came in at 0.49%. High though this latter figure is, it would be inaudible, as many listening tests over the years have proved. The reason for the overall high distortion figures is that the Kronzilla SX does not use any negative feedback.

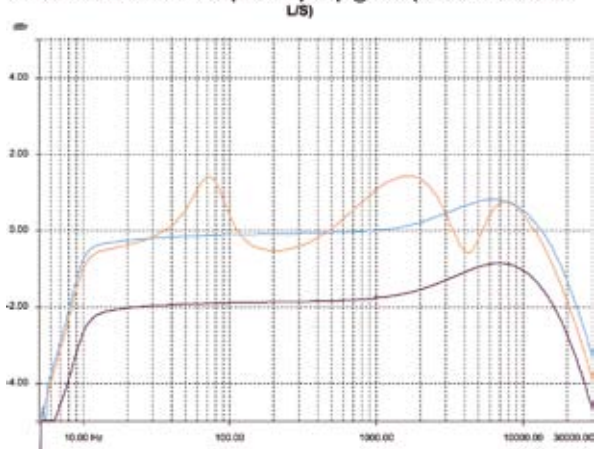
KR Audio Kronzilla SX Power Amplifier THD @ 1kHz @ 1 watt (8 ohms)



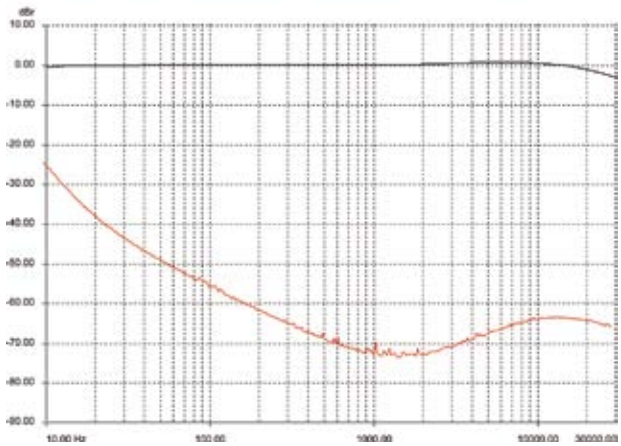
KR Audio Kronzilla SX Power Amplifier THD @ 1kHz @ 50 watts (8 ohms)



KR Audio Kronzilla SX Power Amplifier Freq. Resp. @ 1 watt (8 & 4 ohms & Simulated L/S)



KR Audio Kronzilla SX Power Amplifier Channel Separation @ 1 watt



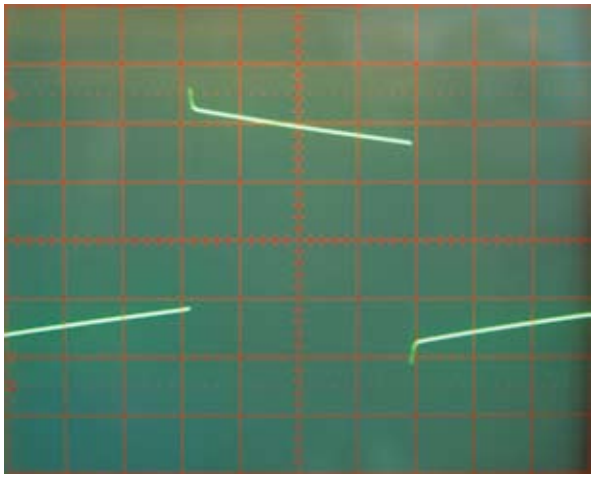
The lack of negative feedback is evidenced by the spectrograms showing the Kronzilla SX's output. As you can see, at one watt into 8Ω the second harmonic distortion component is sitting at –45dB (0.56%) and the third is at –78dB (0.01%). You can see a hum component at the extreme left at –70dB, but otherwise all those spurious power-supply related components are below –90dB (0.003%). Importantly, there are no high-order distortion components at all.

The graph showing output at rated output shows a second harmonic at –28dB (3.98%), a third at –37dB (1.4%), a fourth at –44dB (0.63%) and a fifth at –55dB (0.1%). The sixth and all higher-order harmonically-related distortion products are all more than 60dB (0.1%) down.

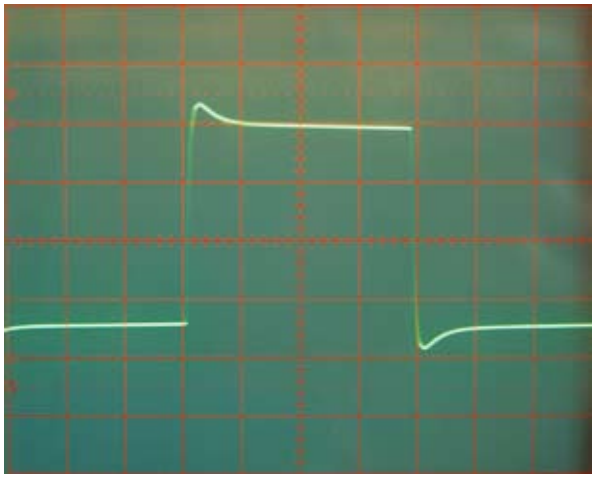
Intermodulation distortion was also relatively high, though the high-frequency sidebands of the 19kHz/20kHz test signal were quite low, at around –73dB (0.02%). The main point of interest here is the regenerated 1kHz component at –43dB (0.7%) which is the difference signal the amplifier creates from the two high-frequency test signals.

The Kronzilla's frequency response was not overly extended, with –1dB down-points at 9Hz and 18kHz, and –3dB points at 6Hz and 29kHz. You can see this on the accompanying graph, which shows the SX's frequency response

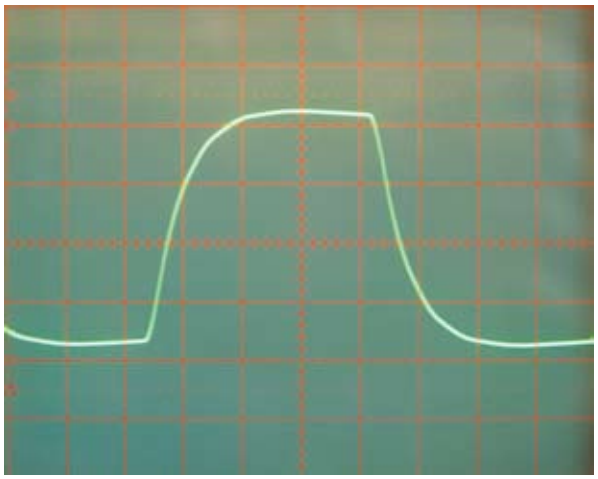
The Kronzilla's frequency response was not overly extended, with –1dB down-points at 9Hz and 18kHz, and –3dB points at 6Hz and 29kHz.



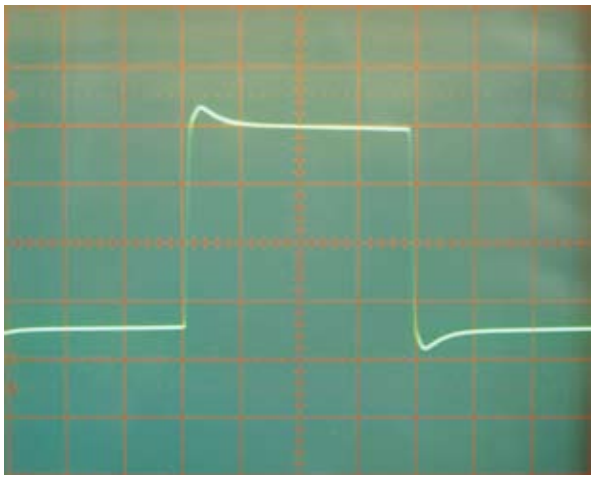
100Hz Square Wave (8Ω resistive load)



1kHz Square Wave (8Ω resistive load)



10kHz Square Wave (8ohm resistive load)



1kHz Square Wave (8Ω//2uF capacitive load)

into 8Ω (blue), 4Ω, (black) and into a simulated loudspeaker load (red). The response into 8Ω is 0.5dB below reference at 20Hz, rises slowly to 0dB at 1kHz, then rises to just shy of +1dB at 6kHz where it shelves to 7kHz, then rolls off to be –1.2dB at 20kHz. Because of this, if you shift the reference, the overall response could still be stated as 20Hz to 20kHz ±1dB, which is considerably better than KR Audio's specification. The response into 4Ω is identical, the shift of the trace downwards merely reflecting the transformer tap/load mismatch. As you can see, the frequency response is more erratic into a real loudspeaker load, because of the high output impedance of the Kronzilla SX (2.45Ω) interacts with the speaker impedance, which results in a +1.5dB peak around 70Hz that would definitely have an effect on the sound, and another +1.5dB peak at 1.8kHz (which would be in the crossover region of many two-way loudspeakers). The dips in response centred at 200Hz and 4kHz are minor, as is the smaller peak at 6–7kHz. Into the simulated loudspeaker load, the Kronzilla SX's overall frequency response measures 20Hz to 20kHz +/1.5dB—again, far better than specification.

Channel separation was excellent, better than 70dB at mid-frequencies and still a very good –35dB at 20Hz. It was particularly good at high frequencies, with a reading of 58dB at 20kHz, which is superior to most solid-state amplifier designs. Channel balance was 0.35dB, more than acceptable and actually very good for a valve amplifier. Interchannel phase error was 4.1 degrees at 20Hz, improving to 0.3 degrees at 1kHz, before swinging to 1.9 degrees at 20kHz.

The signal-to-noise ratios were good, with the unweighted result of –71dB referenced to 1-watt reflecting the presence of the mains hum I commented on previously. With standard A-weighting, this figure improves to –80dB. Referenced to rated output, the figures improve again, to –81dB and –93dB, this last result being particularly good for a valve amplifier rated at 50 watts.

Input sensitivity was relatively high, so you'll be able to drive the Kronzilla SX directly from any source component with a line-level output and be assured of developing maximum power output. The amplifier requires just 135mV to develop one watt, and just 950mV for rated output.

The square wave images are what I'd expect to see from a valve amplifier, exhibiting the effects on the waveform of limited low- and high-frequency response. The most important point to note here is that there's absolutely no difference in the amplifier's response into 8Ω at 1kHz when 2µF of capacitance is added, which in the past has correlated well with amplifiers that are highly regarded by audiophiles for their 'good sound.'

Power consumption is very high. The Kronzilla draws only 1.76 watts on standby, but the minute you switch it on it will draw more than 440 watts from your mains power supply, a drain that remains quite constant no matter what the volume level (indicating, by the way, that the Kronzilla SX is, indeed, a *true* Class-A design, which can be said of very few amplifiers that claim to be Class-A). Given this power consumption, even at idling, I am not surprised that Andy Brown noted the amplifier ran hot: there's an excellent reason for it!

Steve Holding

KR Audio Kronzilla SX Valve Power Amplifier - Power Output

Channel	Load (Ω)	20Hz (watts)	20Hz (dBW)	1kHz (watts)	1kHz (dBW)	20kHz (watts)	20kHz (dBW)
1	8Ω	32	15.0	50	16.9	50	16.9
2	8Ω	32	15.0	50	16.9	50	16.9
1	4Ω	25	13.9	25	13.9	25	13.9
2	4Ω	25	13.9	25	13.9	25	13.9

Note: Figures in the dBW column represent the output level, in decibels, referred to one watt output.

KR Audio Kronzilla SX Valve Power Amplifier.		**Serial Number: 458**
Test	Measured Result	Units/Comment
Frequency Response @ 1 watt	9.0Hz–18kHz	–1dB
Frequency Response @ 1 watt	6.0Hz–29kHz	–3dB
Channel Separation	35.0dB/70.0dB/58.0dB	(20Hz/1kHz/20kHz)
Channel Balance	0.35dB	@ 1kHz
Interchannel Phase	4.10/0.30/1.90	deg (20Hz/1k/20k)
THD+N	0.49% / 5.90%	1 watt/rated o/p
S/N Ratio (unweighted/weighted)	71.0dB/80.0dB	dB re 1 watt output
S/N Ratio (unweighted/weighted)	81.0dB/93.0dB	dB re rated output
Input Sensitivity (CD input)	135mV/950mV	(1 watt/rated o/p)
Output Impedance	2.45Ω	OC = 2.85V
Damping Factor	3.26	@ 1kHz
Power Consumption	1.76 watts/444 watts	Standby/On
Power Consumption	445 watts /447 watts	1-watt/Rated op
Mains Voltage Variation	228–238 volts	Min–Max