

Fresh From the Bench

SB Acoustics Rinjani and Ara Speaker Kits

A Gift for Fun

SPEAKER FOCUS

By
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(United States)

Oliver Masciarotte shares his experiences with the surprising SB Acoustics Rinjani and Ara speaker kits, which feature high-end Satori drivers. Masciarotte compares the floorstand Rinjani speakers' performance with the smaller Ara two-way bookshelf version. Both versions share the same design concept and high quality finish, typical of high-end speakers costing multiple times the price.

Unlike many reviewers, I usually only request samples from a company when I'm already aware of a product and admire the manufacturer's work. This review was an exception. The editor of *audioXpress* and I were discussing kit speakers and he suggested I listen to SB Acoustics' new products. The company had e-mailed him to confirm that both the Rinjani and Ara kits were ready for review, and wanted to send both products, as "...they are a close family." They would even be delivered assembled so, no fuss or muss on my part. My only concern was: What if they were not good?

So, one day in late winter a big FedEx truck threaded its way along the back alley that accesses my garage, and a pallet was unloaded with not quite 200 lbs. of speakers and packing. Since a stand is not available from SB Acoustics, I unpacked and set up the Ara pair on my well-used, 21" Sanus Foundations Steel stands. Since they were already broken in, I didn't perform the usual flip-polarity-and-cook ritual. I simply started to listen to them.

A Bit of Background Information

Unless you've been using your back issues of

audioXpress as shims rather than reading material, you might remember the July 2016 issue with a feature on touring the Sinar Baja Electric factory, which is a high volume source for SB Acoustics' components. One particularly salient feature I found in my review units was, as the article notes, the exceptional quality of the drivers. "...for those accustomed to lower standards from Asian suppliers, it's important to reinforce that Sinar Baja's mission statement includes verified ISO/TS quality standards, supported by RoHS standards." The Satori line of drivers possess a linearity seldom heard by any premium transducer family. It may not have anything to do with what's in Surabaya's water, but the design DNA of the Danish engineers certainly contributes to the calibre.

Initial Impressions

On first exposure, the single aspect of both speakers that was obvious to me was their decidedly neutral voicing. I know this is oft repeated, but I did hear elements of my test recordings that I had not previously noticed. Considering how many times I've listened to these files, I found it a bit disconcerting

and quite fun. If I was forced to find any fault, I'd point you to a subjective correction I dialed in for most of my listening. I should explain that this is not something I'd even bring up unless obliged to.

The other aspect of both models that I found most pleasing and atypical, was their distortion or lack thereof. These are sweet systems, not in the sense that they flatter, round off, or velvetize the music. There simply was no sense of harmonic grit that sometimes passes for detail. They also display none of the peaky or resonant aggressiveness that plagues many far more expensive loudspeakers. If you're looking for a close shave, these SB Acoustics kits are not the place to go. What they do deliver is oodles of plausible detail and sound stage, timbrally and temporally. When there was sparkle in the content, it glistened realistically in my living room. If actual reverb was captured in the recording, I could sense the walls in my sweet spot.

Speaking of which, both the Ara and the Rinjani were a bit more difficult to place than I had expected. Rather than the more common 60° equilateral angle between the speaker and the listening position as per ITU-775, in my room I preferred a quite wide 80° placement relative to my head, with the speaker's top edge 24" and the bottom edge 28.5" from the rear wall. Both models have a fair amount of backward lean, the better to lower group delay via time-coincident arrival from each driver. I tried toe-in but found, as recommended by the designer, that only a few degrees from perpendicular to the wall provided the most satisfying imaging. The speakers are not designed for typical toe-in, where the front

baffle is perpendicular to the listener. A maximum of 15° off square is suggested.

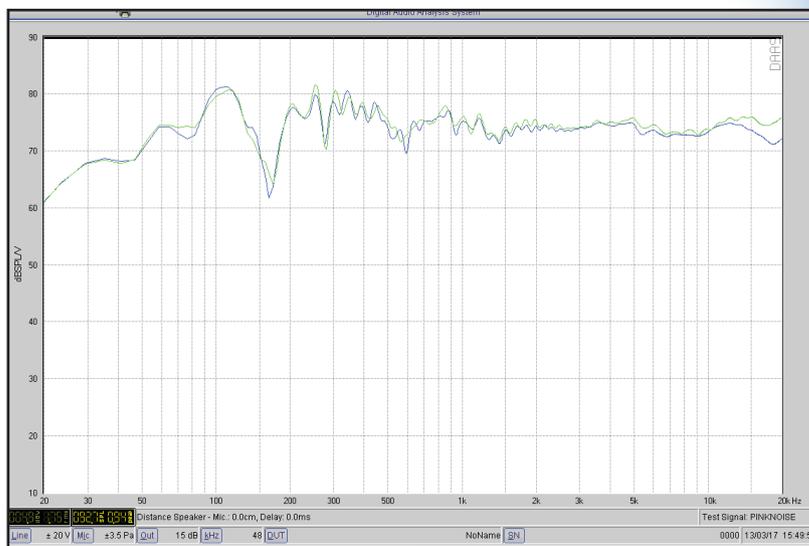
In the golden listening spot, I settled in so my ears were about an inch lower than the tweeter's center. Warkwyn's measurements (see the Measurements text) revealed a rather narrow beaming around 10 kHz, but I didn't notice anything untoward. In a similar vein, I found that the soundstage had a slightly cloudy spot between phantom center and the left speaker, along with a corresponding vagueness between phantom center and the right speaker. When I mentioned this at AXPOA 2017 to Bo Albrechtsen, Sales and Marketing Director at SB Acoustics, he told me he hadn't heard of that deficiency from anyone



Rinjani's sophisticated sound and look makes the entire family happy.



The SB Acoustics Rinjani, Ara, and the new Micro speaker kits were on display at High End Munich 2017.

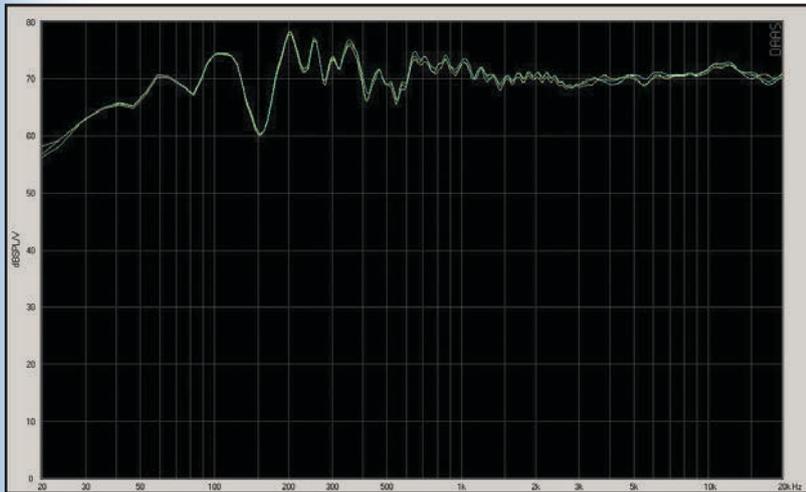


Rinjani's measured frequency response as supplied by Danesian Audio.

else. Warkwyn’s measurements showed wide, even dispersion in the horizontal plane, so I chalked this observation up to room interaction, though I haven’t heard this from other speakers in my room.

While the Rinjani can’t create a plausible version of the opening notes from Richard Strauss’ “Also sprach Zarathustra,” it can dig about as deep as I need. Most folks, and I am one of them, either don’t have the room, space, budget, spouse, or neighbors

that will sanction speakers that are flat to 20 Hz. I also am quite comfortable with my self-image and don’t need to prove anything, so the slim 40” tall Rinjanis fit perfectly into my world view. At Warkwyn, I was surprised to see that Rinjani’s low-frequency response was not as good as I’d subjectively expected, with it starting to roll at about 50 Hz. Still, I found the low end to be fine. Note that the EQ I used did not include any low-order low shelving, which I typically use when I feel low end is lacking. With a 3 dB upper limit of 25 kHz, the tweeter is capable of nicely controlled behavior in the audio passband while delivering, thank you Anthony Burgess, that touch of the old ultrasonic that I enjoy.



Ara’s measured frequency response as supplied by Danesian Audio.



This is a bit of high-resolution EQ I dialed in to taste.



The solid quantity terminals are in keeping with the rest of the hardware.

Supporting Gear

For those who keep track, the supporting gear for this review is modest, in keeping with the cost of the speakers themselves. A Mac mini running Audirvana Plus v3 and Amarra v4 players fed my exaSound e22 Mark II DAC via a \$200 top-of-the-line VUE USB cable. Out from the DAC, balanced GEN II Beta 2-22S cabling from Soundstring fed a AMPX Class A stereo amp from Lindell. Finally, AntiCable Level 3 speaker wires animated the elegant white wonders. During their time at my home, I also powered the Rinjani with a 2 x 50 W into 4 Ω Anaview AMS0100-based custom amplifier, but preferred the top end and midrange of the AMPX.

Madisound Speaker Components is the sole distributor of the SB Acoustics kits in the US. Adam Johnson at Madisound told me that the company is going to stock the following kits:

- Rinjani—\$2,500/pair for the kit, including white, high-gloss cabinets, Satori drivers, and assembled crossovers
- Tweeter crossover capacitor upgrades, from ClarityCap and Mundorf will be available.
- Ara—\$1,370/pair for the kit with white, high-gloss cabinets, Satori drivers, and assembled crossovers
- Tweeter crossover cap upgrades will also be available.

While at AXPONA 2017, I got to hear the Micro, a tiny stand-mounted two-way that also sounded great. In white satin, the Micro runs \$450/pair for a kit with cabinets, SB Acoustics drivers, and assembled crossovers.

The Ara and Rinjani occupy a special place in the audiophile ecosystem, being uncommon quality and affordably priced kits. I can think of a handful of factory-built speakers that would sit comfortably alongside either model—Andrew Jones’ Uni-Fi line

Take just a tweeter and mid-woofer, and you'd have an Ara.



The slim but deep mini-tower is dual ported

Resources

Madisound Speaker Components, www.madisoundspeakerstore.com.

J. Martins, "Sinar Baja Electric and SB Acoustics: Too Big to Be Kept a Secret," *audioXpress*, July 2016, www.audioxpress.com/article/factory-tour-sinar-baja-electric-and-sb-acoustics.

"New High-End Drivers and Kits From SB Acoustics to be Unveiled at 2016 High End Show in Munich," *audioXpress* website, April 2016, www.audioxpress.com/article/new-high-end-drivers-and-kits-from-sb-acoustics-to-be-unveiled-at-2016-high-end-show-in-munich.

Sources

Satori TW29R Tweeter

SB Acoustics | www.sbacoustics.com/index.php/products/tweeters/satori/satori-tw29r-b

Satori MW16P-4 Midwoofers (Ara)

SB Acoustics | www.sbacoustics.com/index.php/products/midwoofers/satori/6-satori-mw16p-4

Satori MW16P-8 Midwoofers (Rinjani)

SB Acoustics | www.sbacoustics.com/index.php/products/midwoofers/satori/6-satori-mw16p-8

Rinjani Kit

SB Acoustics | www.sbacoustics.com/index.php/sb-acoustics-kits/sba-satori-rinjani

Ara Kit

SB Acoustics | www.sbacoustics.com/index.php/sb-acoustics-kits/ara-kits

or KEF's LS50. Yes, those are both British designs, and the SB Acoustics offerings can hold their own in terms of tonal neutrality and uniformity across the audio spectrum relative to those competitors. In addition, Rinjani and Ara exhibit much lower distortion than either, while delivering truthful timbre and exceptional good looks.

As with all things audio, your taste is not mine, but I found both speakers, ahem, spoke to me with a compelling and authoritative voice. I haven't had so much fun since a pair of \$5,000 Gauder Akustik ARCONA 40s were in the house. If you need to have reasonable bass without excess clutter, then Rinjani is for you. If you have a difficult room or wish to optimize the low end, I'd highly recommend the Ara, coupled with a mono or, better yet, stereo set of subwoofers. Either way, if you go for truth more than euphonious color, and enjoy a bit of tinkering and DIY, then either kit is highly recommended.

About the Author

Oliver A. Masciarotte has spent more 30 years immersed in the tech space, working on facilitation, optimization, marketing, and product development for clients worldwide. As an author and speaker, he enjoys informing folks about technological best practices. More information is available at seneschal.net and othermunday.com.

Tips from Danesian

All the Sinar Baja transducers used in both Ara and Rinjani are designed by former Danish Vifa/Scan-Speak experts and current Danesian Audio ApS co-owners Frank Nielsen and Ulrik Schmidt. I asked Schmidt for specifics on the products. Here are excerpts from our conversation.

OLIVER MASICAROTTE: Are these kits time coherent? If so, how? Baffle angle, crossover, or both?

ULRIK SCHMIDT: The baffle on both speakers is inclined about 7° to 8° to fully compensate for the difference in time delay between the (upper) midwoofer and the tweeter—but it is also a design feature. We provide this data for some combinations of drivers on our website (Time Alignment: www.sbacoustics.com/index.php/technical-notes). It is not strictly necessary to do this, but in this case it made it a lot easier to design the crossover network.

MASICAROTTE: Tell me about the individual drivers, and why did you specify those particular units?

SCHMIDT: For these speakers, we chose our top-of-the-line Satori drivers (that we had) at the time. We didn't have the beryllium tweeter back then and though we did have the neodymium version of the Satori tweeter, we didn't use it here, as we didn't need the higher sensitivity. Also, these are speaker kits that are supposed to be fairly affordable. [For a list of features for the drivers, see Sources.] Both the Rinjani and the Ara use the Satori TW29R tweeter. The Ara uses the Satori MW16P-4 (4 Ω) midwoofer and the Rinjani uses two MW16P-8 (8 Ω) midwoofers.



The measurement setup that the designers, Danesian Audio, used for their measurements. Note the asymmetrical shape of the speaker, which are delivered as mirrored pairs.

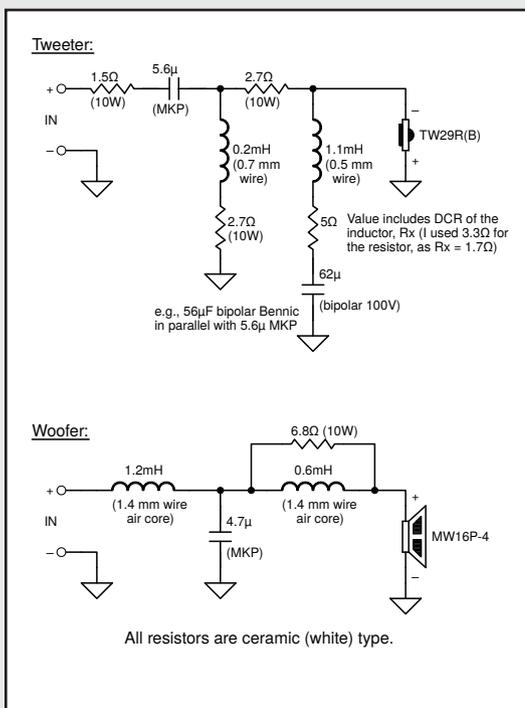
MASICAROTTE: Tell us about the crossovers—topology, materials, and why you chose those?

SCHMIDT: I could write a book about this, but I am not going to. I am not religious when it comes to crossovers. The objective is to make it all work—to make the drivers integrate and work together as a whole. Given the inclined baffle and the very flat impedance, at higher frequencies, of the midwoofers, we are looking at second order filters with some modifications, with the tweeter connected in reverse phase.

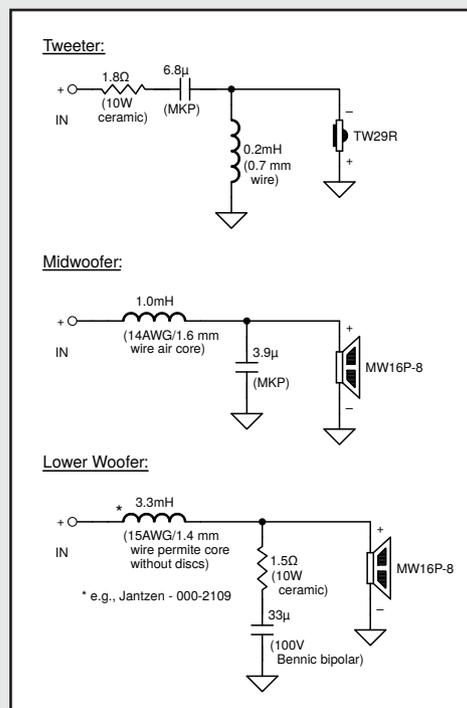
The Ara uses a second-order network with a shelf filter for baffle-step compensation on the midwoofer. This ensures a very neutral tonal balance. The high-pass filter on the tweeter might look a little bit complicated at first, but really it isn't. Basically,

it's a second-order filter with some attenuation. To achieve perfect integration with the midwoofer in the entire crossover region, it was necessary to use a resistor in series with the inductor. This is a really neat trick that often makes the whole difference, (as it) changes the phase and roll-off. This resistor makes it more of a first-order filter at lower frequencies and therefore it is necessary to equalize the impedance peak at the tweeter's resonance frequency, hence the LCR-network in parallel with the tweeter.

The Rinjani is a little bit more straightforward. As a 2.5-way speaker, it doesn't need the shelf filter. The lower woofer adds



Crossover schematic for Ara



Crossover schematic for Rinjani

the extra/missing energy below the baffle frequency, where it is crossed over. Furthermore, the relatively flat upper response of these midwoofers makes them easy to work with. Second-order filters on all drivers, though a low value resistor is used in series with the capacitor on the lower woofer to make it blend in perfectly with the upper midwoofer near the crossover frequency. So, this is not your typical RC network used to equalize the inductive part of the impedance curve on a midwoofer—inductance is already very low, thanks to the copper sleeve on the pole piece.

There are no exotic parts or components. We use good quality, standard components that we like: Jantzen Audio Cross-Cap capacitors, wire wound inductors with sufficiently low resistance in the right places, and ceramic resistors—my preferred type, actually. One inductor for the Rinjani network uses a core, which is a very good quality Permite core as opposed to a laminated iron core. People who build these speakers don't have to buy our cross-over networks, though fully mounted PCBs are available, of course. (The crossover is not bundled with the cabinet, it's purchased separately, as are the drivers.) Anyone is



The cavity in which Rinjani's crossover resides



Looking into the lower portion of the Rinjani prototype cabinet. This photo also reveals internal bracing and the inner wedge-shaped rear wall, behind the midwoofers only, that significantly reduces the reflected sound wave.

welcome to upgrade to more expensive/exotic components.

MASICAROTTE: How about the cabinets? Flexy or stiff, materials, shape, port details, internal details, etc., and why?

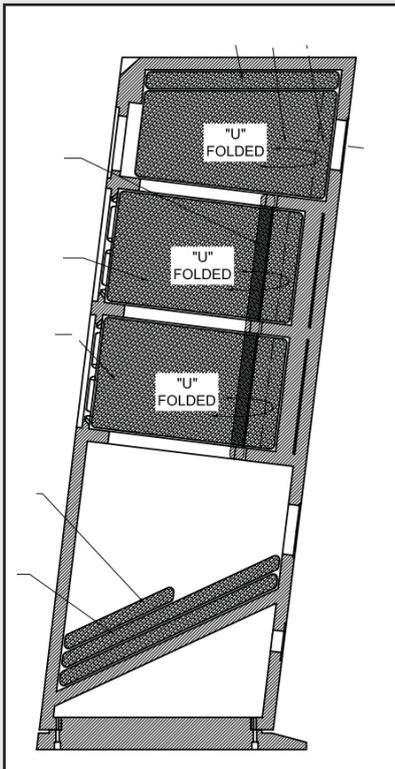
Do the mids and/or woofers have their own enclosures/spaces? If there is damping, what do you use and why?

SCHMIDT: The cabinets are very much alike, as the Ara cabinet is quite simply the top of a Rinjani with a bottom plate. The way I made the Ara prototype cabinet was to cut off the top section of a Rinjani prototype cabinet with a plunge saw and mount a new bottom plate.

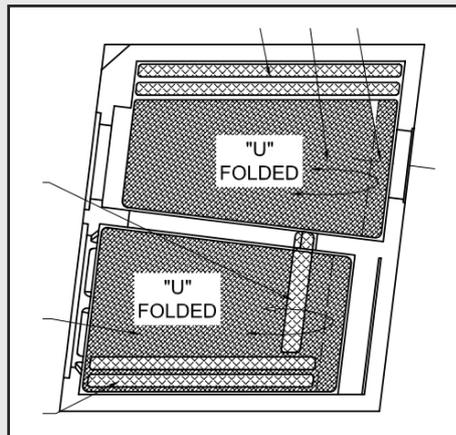
The cabinets are made with 19 mm (0.75") MDF. The facets in the top area reduce edge diffraction at higher frequencies, though this is also a design feature to give the speakers a unique appearance. The Ara uses one 50 mm diameter port, (with) both ends flared, and the Rinjani uses two of these ports (with) only the outer end flared. In the Rinjani, the two midwoofers share a common enclosure. I have always preferred to do it this way with 2.5-way speakers, but you could certainly use separate cavities as well. Potentially, a common enclosure can cause problems with vertical standing waves, depending on how the drivers and port(s) are positioned in this internal "transmission line." The internal slanted bottom plate, in combination with the damping material, effectively deals with that. This is absolutely nothing to worry about in the Rinjani.

We use a synthetic porous damping material, Dacron, with a sheet thickness of 25 mm (1") and an area density of 300 g/m² (1 oz./ft²). Notice, there is an additional layer on the back wall in the midwoofer sections.

We use Dacron because it works well and it is available everywhere. Where to put the damping and how much is determined by experiments and listening tests, (plus) a lot comes with experience. We spend a lot of time listening, fine tuning the crossover, ports and damping.



Damping material for Rinjani



Damping material for Ara

The Measurements

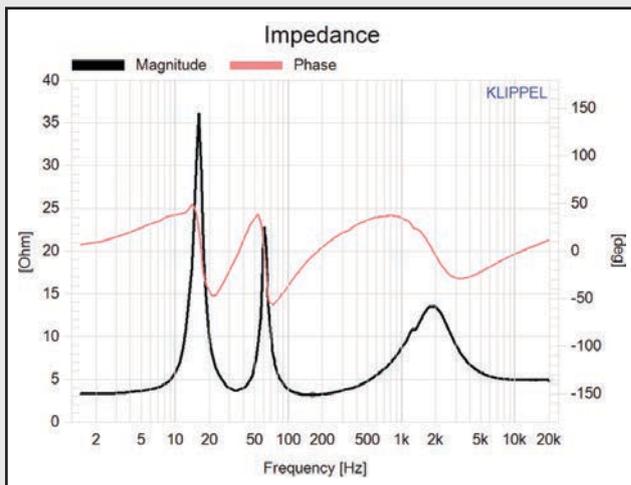
The SB Acoustics V1r2 “Rinjani” was measured at Warkwyn’s facility using the Klippel Near Field Scanning (NFS) system. The NFS is an autonomous speaker measurement system that utilizes robotics to move the microphone around the device under test (DUT), thus leaving the DUT in a stationary and stable condition while measurement occurs. In this way, the loudspeaker has consistent interaction with the room. In addition, stationary loudspeakers are easier to support with minimal gear—a big advantage for anyone measuring large heavier loudspeakers—the Rinjani a notable inclusion.

Since the speaker is stationary its interactions with the room are consistent and valid measurements are obtainable in non-anechoic conditions with the NFS. By scanning around the DUT in two cylindrical layers of measurement points the system is able to remove the effects of the room using a combination of acoustical holography and field separation. An acoustic model is then created and SPL measurements can be generated from any point in 3D space. For more information, visit www.klippel.de/our-products/rd-system/modules/nfs-near-field-scanner.html.

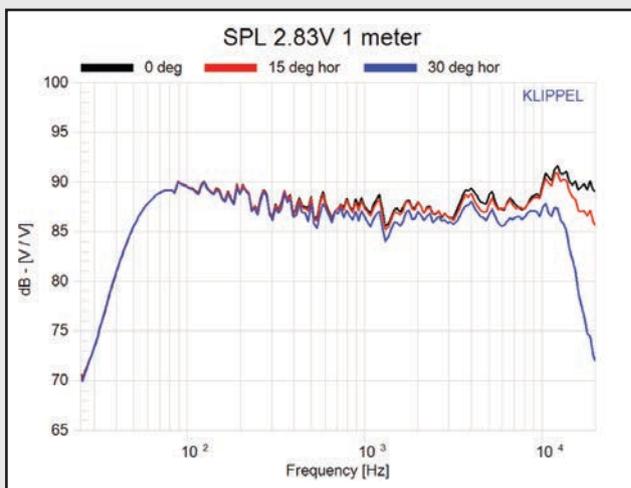
To measure the Rinjani, we used the typical 2.83 V/1 m with



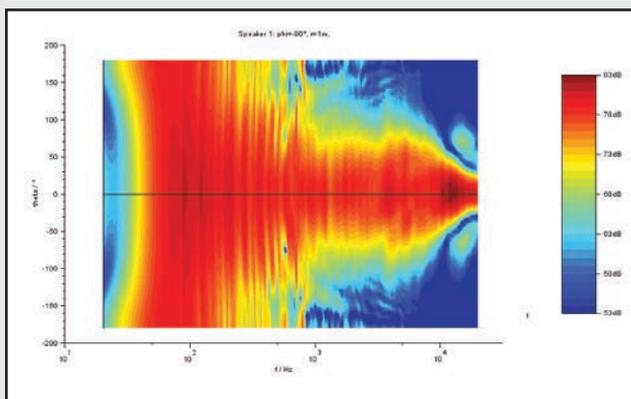
The Rinjani is pictured on Warkwyn’s Near Field Scanner.



The Rinjani’s minimum impedance resides at 155 Hz and at 3.14 Ω , which is consistent with the specification of 4 Ω .



The Rinjani’s horizontal sensitivity was taken on axis, at 15°, and 30°.



An unwrapped 360° pressure/frequency contour map provides a complete view of the horizontal radiation of the speaker and through its rated frequency response.

a calibrated ACO Pacific (7052E capsule) free-field microphone with the 4048 preamp. All the data shown is referenced to on-axis with the tweeter.

Measurements points around the speaker totaled 2,597 and were processed with a resolution of 0.73 Hz from 20 Hz to 20 kHz. The length of the stimulus was 1.4 s.

Unfortunately Warkwyn had little time to perform subjective listening tests, however, measurement data provided some notable results.

A look at the Rinjani's impedance shows a relatively well behaved crossover, staying within $\pm 50^\circ$. The minimum impedance resides at 155 Hz and at 3.14Ω , which is consistent with the specification of 4Ω .

On- and off-axis measurements show that the speaker has relatively good low-frequency response with a rolloff below 60 Hz. This response was a bit surprising and a greater slope than anticipated. This can be attributed to the measurement environment being 4π and the listening position being 2π . It is certainly Warkwyn's impression that the low frequency response in a 2π condition would indeed emphasize the low-frequency enough to call it noticeable and not necessarily lacking.

Though relatively smooth from 100 Hz to 1 kHz, there is a noticeable dip at 1.3 kHz, a presence rise at 1.8 kHz and then a 4 dB rise immediately after the crossover point. Subjectively, this could create some "hollowness" in lower speech fundamentals with sharper sibilance. In an anechoic or critical listening environment the peaks at 4 kHz and 5 kHz may present themselves as a bit harsh but in a typical listening environment with carpet, couches, and cats this will most likely increase presence in the upper vocal regions to a satisfactory result while reducing some 1 kHz nasal-ness.

Above 10 kHz, the speaker is well behaved to 15° and as would be expected, drops significantly at 30° and above 12 kHz.

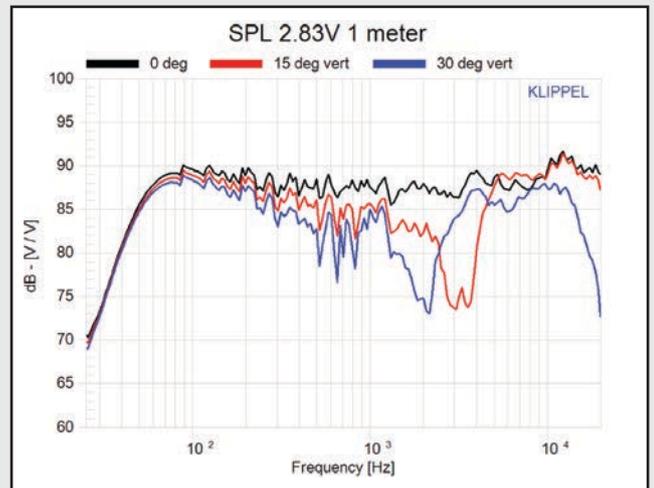
An unwrapped 360° pressure/frequency contour map provides a complete view of the horizontal radiation of the speaker and through its rated frequency response. The horizontal contour mapping affirms the single on/off axis measurements with a few interesting details. For example, the extreme attenuation above 10 kHz and at 30° to 50° makes a 10 dB rebound at approximately 70° and at 12 kHz—presumably this could be explained due to diffraction and the addition of another reflective source at the corner of the cabinet. (As you examine the contour, the "cut" or "sloped" right corner of the top of the cabinet is to the top of the center line, this illustrates slightly less pressure level.)

Vertical on/off axis measurements tell a slightly more complicated story. The Rinjani cabinets are very beamy with respects to a vertical radiation in the mid-band and the SPL measurements bear this out. At 15° (above) the cabinet there is a considerable dip in response at 3 kHz and 4 kHz. Oddly this makes a slight recovery at 30° but shifts the problem lower to 2 kHz, right in the middle of the speech range.

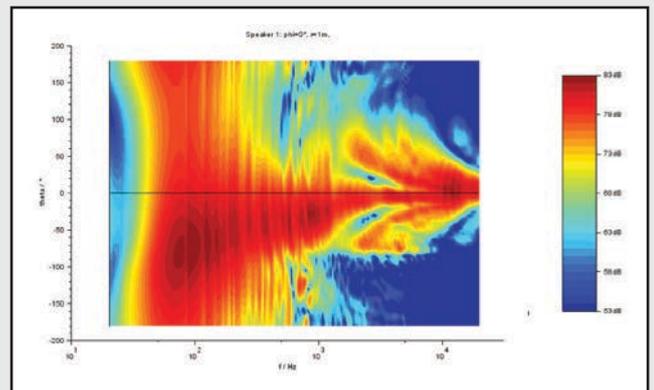
Examining the unwrapped vertical contour balloon, it is clear that there are some off-axis holes 30° off axis beginning at 1,200 Hz and narrowing as frequency increases to 5 kHz. This make a recovery >10 dB, 50° above and below the tweeter.

Of course, this is with a stimulus under measurement conditions. Again, in a typical room with positive reflective surfaces and moderate absorption, these holes would not be exceptionally apparent. However, in a trade show environment (i.e., a large room, space to move close to and then farther away from the speaker while standing), it might be noticeable given a consistent pink noise stimulus—assuming any trade show floor would be quiet enough to concentrate on your own thoughts, let alone a speaker's response and radiation.

If we were making positioning recommendations, it would be at ear level with the tweeter, with small toe-in of the cabinets. All in all, we found the Rinjani attractive, solid, and well behaved within certain angular guidelines.



The vertical on/off axis measurements tell a slightly more complicated story.



Examining the unwrapped vertical contour balloon, it is clear that there are some off-axis holes 30° off axis beginning at 1,200 Hz and narrowing as frequency increases to 5 kHz.