

Helios

Introducing the Helios.

In early 2018, [Bo Albrechtsen](#) of SB Acoustics asked me to design two speakers for them to be shown at AXPONA using their new ceramic drivers that were about to be released. We discussed the possibilities and I arrived at a tower speaker using two SB23CAC's, an SB15CAC, and an SB26CDC tweeter. Bo also wanted me to design a small stand mounted mini-monitor using a Satori MW13P midwoofer, their newest Beryllium tweeter, and a new small format racetrack style passive radiator.

Due to a combination of my health situation and time constraints, I knew I was going to need some help. [Mark Sayer](#) from Meniscus agreed to make the mini-monitor enclosure for me to my dimensions, and I reached out to Javad Shadzi to make the tower cabinets. He was very enthusiastic about it, so off went a big box of drivers to California. The small speakers became the Revolution series with an additional speaker added using the SB15CAC midwoofer, and the towers became the Ceramicos you are familiar with.

The collaboration with [Javad Shadzi](#) was a great experience, and this year when Bo asked us about doing another couple of speakers for AXPONA, we jumped at it. Javad and I decided to do this year's differently: We would each come up with our own design concept, and order the drivers through Bo, Javad would build the cabinets for both, and I would do the crossovers for both. Apparently, Javad has approved of putting my crossovers in his cabinets, so this is working well.

Javad's concept was all his, and mine was all mine, so we each would end up with a speaker that reflected ourselves as designers (in a sense, since his input would be in both cabinets and mine in both crossovers). You have already his speaker unfolding on these pages as the Jintani, a three-way all Satori design. Now, it is time to introduce you to my speaker for this year's AXPONA.

Last Fall Bo and I were talking and kicking around different ideas. Each of us had several designs we thought about trying out; I mean, the possibilities are endless. During the discussion I said, "Let's do something different, like a large two-way with a larger woofer. you just don't see that very often anymore". Bo said, "Hey, I like that idea. We're working on a new waveguide for the Beryllium Satori and we could use it", and I said, "OK, let's do it". That brings us to the Helios.

The Helios is a larger stand-mounted two way that implements the Satori WO24P-4 9.5" woofer, paired with what may be the finest tweeter in the world - the Satori TW29BN - neo motor, Beryllium tweeter in a waveguide designed by SB Acoustics for this tweeter. The speaker also employs a side-mounted SB29NRX passive radiator being used in a slightly unconventional way (which will be explained later).

I have posted a few preliminary pictures below, but I won't go into too much detail here, because Javad will post a complete multi-post build thread that will cover all details of the cabinet construction and together we will post on the crossover design too (which I will begin this week). My goal with this speaker is to design a no holds barred state of the art two-way. Let's see how it turns out!







Helios Speaker Part 2 - Interlocking Strip Translamination Enclosure Construction

Time to get into the Helios project! Up to now I haven't posted about this as my priority has been to actually finish both the Jintani and Helios by mid March, and I'm happy to say that [Jeff](#) and I are right on schedule. Axpona is coming up April 12th, with a week shipping lead time it will be nice to spend a week or two with both these projects finished to be sure they are both 110%.

For Helios I decided to use the interlocking strip translamination technique I used on the Rivalries. Though this technique is a little more work, it results in essentially zero scrap or waste compared to typical translam construction. And when your material is solid maple Appleply at \$200/sheet, minimizing waste is key.

For a rectangular shape like this the technique is quite easy to do, more challenging how I did the Rivalries but not too difficult by any means.

I made a spreadsheet that calculates how many strips are needed for each layer and each enclosure, this is key as it gets confusing real fast. In fact I tape up an illustration of each layer style and label all pieces A,B, etc to ensure each layer is built perfectly so there are no screwups, for example putting two of the same layers together in a row that don't interlock. If you want access to the spreadsheet let me know I'll be happy to send it to you.

The first layer is most important as it's the "keystone" that all other layers will be built off of.

Helios Speaker Part 3 - Bracing, Enclosure Construction Continued

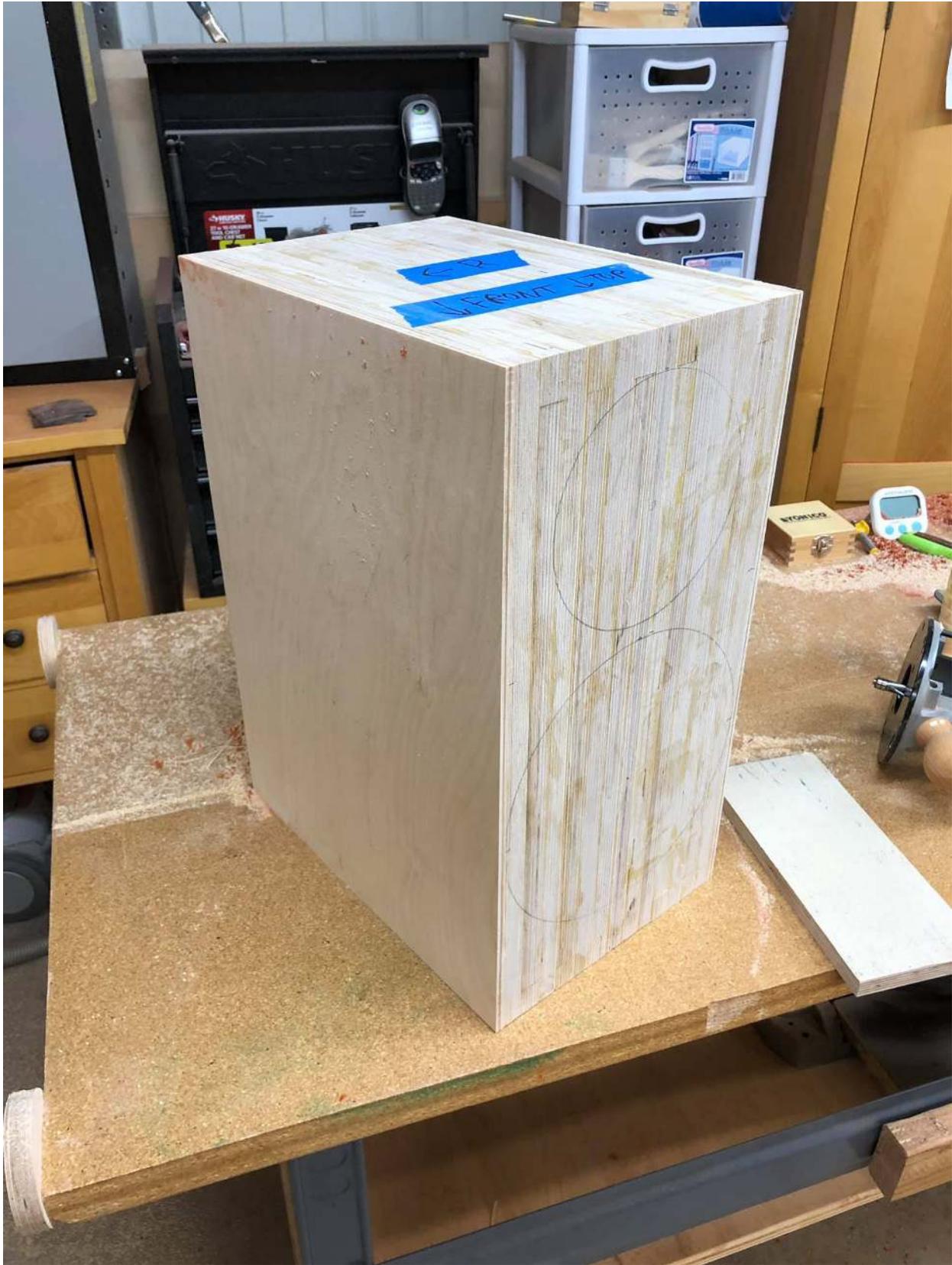
With all the layers glued up, it was now time to start on the braces. Braces for this enclosure are a little challenging due to the side mounted PR, tolerances are pretty tight due to the close proximity of the 9.5" Satori and the 11" PR. In fact it's so tight that the braces snake through the frame opening of the PR, and in order to install the PR it must be installed in one specific orientation, but alas it all works perfectly as intended.

Once braces were cut and fit, I glued on a 1/4" or 5mm layer of Baltic Birch on one side. The reason for this is that the base 13 layer enclosure I made is the exact frame width of the WO24 woofer, in order to make the enclosure wider I would have had to add two more layers of 3/4" maple Appleply and that was a lot more width than I wanted. Two layers would be required to keep the staggered alternating joints consistent from side to side. One layer of 5mm not only made the face just wider to nicely accommodate the woofer, but also added panel thickness for the PR and have a nice base to laminate the solid hardwood sides onto.

Once I had the 5mm on one side, I glued in the braces, checked my work a bunch and glued on the second 5mm birch on the other side.

Finally I cut a slightly oversized hole for the 12" PR.





Helios Speaker Part 4 - Solid Padauk sides

At the lumber store when I visit, I've been eyeing this amazing orange wood called Padauk, I've always wanted to work with it, and I felt like it would create a striking contrast to the solid maple plywood the rest of the enclosure was made from.

Being a tropical wood, it can have some caveats to work with, some people are really allergic to it or worse, but fortunately for me it didn't bother me. As with any wood I use good breathing protection, but man this red orange sawdust did cover my entire shop and even got into the pores of my skin.

To be safe I did wipe glue joints down with acetone and let it evaporate thoroughly, I'm not completely sure this is necessary but it can't hurt to remove some of the oils on woods like this. The oil does make it a little difficult on tooling and sandpaper, sandpaper clogs almost instantly and tooling bits and cutting surfaces are covered in it as well, but it's nothing that can't be cleaned.

This wood is really nice to work with, cuts and machines beautifully, in fact a quick rip on the tablesaw create such a sharp square edge that I could easily cut skin if you're not careful.



