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Subject: Re: 3 Pi build

Posted by [Wayne Parham](#) on Tue, 07 Jan 2025 17:20:37 GMT

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You could use 15mm panels, but that doesn't help you reach the goal of a 63.5mm port. We don't want a 60mm port - that's just a little too short. But you could perhaps do that and add a thin sheet of something to bring it up. Whatever you need to do to get it up to 63mm.

And to be honest, I don't think you'll want to double the thickness of the whole front baffle. It won't offer much but will make the cabinet very heavy. What I like doing is to double up just the area around the drivers and the waveguide.

Cut a circle that's a little larger than the woofer and a rectangle that's a little larger than the waveguide. Something like 5cm larger overall, for example. Glue and clamp them to the baffle side facing inward and cut the woofer and waveguide holes through them. It doubles the thickness of the panel in the area around the drivers so you can route a groove for flush mounting without making the routed "lip" on the baffle too thin.

As for my preference to MDF, it's not so much avoidance of voids as it is that MDF is a "different animal" entirely. In my opinion, it is the best single sheet panel, e.g. non-CSD, to build loudspeakers with. It's made using a variety of wood types, all shredded and combined with resins to form a pulp. That is heated and pressed to form a dense panel.

When working with plywood - as you've said - I do worry about voids. But the way I avoid the voids is to use Baltic Birch. The plies in Baltic Birch are so thin that any voids are completely filled with the adhesive that holds them together. So this greatly reduces any chance of having a panel with a void.

But even void-free Baltic Birch isn't as dense as MDF. I don't really have a problem with panel resonance with either one, because panel resonance is outside the woofer chamber's passband. But I do prefer MDF if the cabinet won't be moved a lot or exposed to moisture.

To be honest, the biggest potential problems are caused by unwanted cavity resonances, which is what I think attracts open baffle enthusiasts - they avoid cavity resonance. But open baffles have their own sets of problems, and so I prefer to deal with the cavity resonances a different way. That's done by careful positioning of the midwoofer and the port and by using damping material inside that's placed in such a way that it is most effective at damping cavity resonance.

Which brings me to your question about bracing, since it serves double-duty as a positioning device for a very important piece of damping material - the one that spans the cross-section. The brace must be placed between the woofer and the waveguide, and a sheet of insulation must rest upon it, spanning the entire width of the cabinet front-to-back and side-to-side. Having the insulation placed some distance from top and bottom cabinet panels helps improve its damping ability in the lower midrange. This is the one I know must be there, because it has been designed by modeling and confirmed by testing.

You can also place a similar brace just below the woofer, between it and the port. If you do so, it

wouldn't hurt to place another sheet of insulation there, again, spanning the cross-section. This will separate the woofer and the port. Bass will pass right through though, so it will not adversely affect bass performance at all. It will only have an effect at midrange frequencies and higher.

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