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Subject: 4 Pi Cabinet  
Posted by [Norbert](#) on Wed, 12 Jul 2006 17:59:37 GMT  
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I am in the middle of building the cabinets for my 4 Pi (most likely it will end up as Premium series) and is thinking of locating the tweeter horn outside the cabinet. I assume that by locating the tweeter horn to the outside cabinet it should not affect the performance of the speaker overall (with all other dimensions as per Wayne's plans). Question: Can the vent port be placed anywhere of the front baffle? Thanks, Norbert

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Subject: Re: 4 Pi Cabinet  
Posted by [Wayne Parham](#) on Wed, 12 Jul 2006 18:04:50 GMT  
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Yes, that is fine.

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Subject: Re: 4 Pi Cabinet  
Posted by [GarMan](#) on Wed, 12 Jul 2006 19:06:32 GMT  
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Hey Norbert, I think I still owe you an email reply. Sorry, but I've been busy at home. If you're relocating the horn outside of the main cabinet, move the woofer up on the baffle so the distance between woofer and horn remains (mostly) the same. The attached pix is George's Premium-4, with Martinelli horns. Personally, I think the woofer can be placed even higher. By the way, what material did you decide on? If BB-ply, careful cutting cross grain because it tears out easily. Use a zero-clearance insert or sled if you can, and keep the good-side up. A hint for woofer mounting: use 1/4 x 20 t-nuts instead of #10 or #12. Because it's easy to get black cap screws in the 1/4 size. You can find them at Home Depot or Lee Valley. These are the screws that have the little heads that fits right into the driver frame and gasket and looks great. Are you going to flush-mount the woofer? Gar.

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Subject: Re: 4 Pi Cabinet  
Posted by [Wayne Parham](#) on Wed, 12 Jul 2006 19:43:13 GMT  
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Great point, Gar, nice catch. I was focused on the question about port placement, but you've

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brought up what's more important in this situation, which is the positions of the drivers in relation to each other. They should stay the same, as you've said. Baffle spacing, phase angles and time alignment, revisited

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Subject: Re: 4 Pi Cabinet  
Posted by [Norbert](#) on Wed, 12 Jul 2006 20:29:12 GMT  
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Hi Gar, Don't worry about not getting back to me sooner... all is well. You brought up a good point in that the relationship between center of the HF driver and the woofer needs to stay constant (and Wayne confirmed that with all that mathematical calculation -thanks Wayne). What this means is that I need to be careful when building the enclosure to house the horn. So goodbye to fancy horns such as this ones: <http://www.acoustichorn.com/> I ended up using BB-ply from Commonwealth lumber. Getting the 5x5 wood home was quite a challenge... I ended up putting the wood on the roof rack of the van. To install the T-nuts, do I just drill the hole the size of the cylindrical barrel and let the pressure of the screw drive the prongs into the wood? Thanks, Norbert

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Subject: Re: 4 Pi Cabinet  
Posted by [GarMan](#) on Wed, 12 Jul 2006 21:35:43 GMT  
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Didn't I warn you about having to bring your own saw to Commonwealth? I drive a compact car, so that's why I go all the way up to Century Mill where they will cut it for you. Don't discount future horns yet. The best you can do at this point is to place the woofer as close to the top as possible for future flexibility. For the t-nuts, drill a 1/4" hole right through the baffle for the bolt. Then from the back, drill a wider opening for the t-nut, but only as deep as it needs to be. Use a drill-stop to control depth. Masking tape on the drill bit works too. Then like you said, use a power driver and bolt to pull the t-nut in. I've never heard of Acoustic Horn, but for the price they charge, I would consider a pair of Martinelli horns. Gorgeous and sounds great. Let me know if you plan on flush mounting the woofer. I have a couple of lessons learned from first hand mistakes I want to share with you. Gar.

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Subject: Re: 4 Pi Cabinet  
Posted by [Norbert](#) on Wed, 12 Jul 2006 22:05:40 GMT  
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I haven't decided about flush mounting the woofer as of yet, but if you care to share your "secret" I am all ears :-). I plan to use a rotozip to cut the hole and am concerned that to have a flush mount my hole must be perfect....Norbert

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Subject: Re: 4 Pi Cabinet

Posted by [Matts](#) on Wed, 12 Jul 2006 23:53:05 GMT

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might be fancier, but I've never drilled a countersunk hole from the back for t-bolts. I just mark the holes from the driver with a pencil (circle around and an X marks the spot), move the driver so you don't hurt it or buzz the metal with the side of the bit and have flying shrapnel, drill a hole just slightly smaller than the barrel of the t-nut. then, I use a large o.d. metal washer with a small hole on the front to do the first tighten of the t-bolt and pull the nut into the back by tightening it. You can also tap them with a hammer from the back once they're lined up correctly if you want. They'll pull into the wood very snug with the force.

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Subject: Re: 4 Pi Cabinet

Posted by [GarMan](#) on Fri, 14 Jul 2006 13:59:40 GMT

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Hi Norbert, Even with a Rotozip, you can still cut a perfect circle. I'm not familiar with what the base of the Rotozip looks like, but I'm sure with a bit of creativity, you can attach a homemade circle jig to it. The jig can be nothing for than a 12"x3" piece of 1/4" scrap wood. Once attached to the Rotozip, you can nail down the other end to your baffle and swing it around like a compass. It'll also let you take multiple passes of shallow cuts instead of trying to cut through 3/4" of material at once, resulting in a cleaner cut. (I use a big heavy duty router with high quality spiral bits and even though I can cut 3/4" of material at once, I still choose to take multiple passes.) The typical way to flushmount a woofer is to cut a clean "perfect" circle and then run a rabbeting bit on a router around the edge to cut the recess. This works well with most woofers because the lip of most woofers (the difference between cutout and total radius) is 1/2" or less. The difference between cutout and total radius on your 15" pro driver is almost 5/8" (overall dia = 15.21", cutout dia = 14"). Once you cut the 14" baffle hole out, you will not find a rabbeting bit wide enough to cut the 5/8" rabbet needed to flushmount the woofer. Two ways around this. 1) Forget about the 14" and cut the baffle hole exactly 1" less in diameter than total diameter. Then use an 1/2" rabbeting bit to cut the recess. You do lose some support behind the driver and some of the flanges of the t-nuts may hang out. 2) Cut the recess for flushmount first using total dia, then cut the baffle hole using cutout dia. This is what I did for my JBL 15" (see pix 25 of link below). The outer ring is a 3/8" deep recess for flushmount, and the inner ring is the cutout. You're left with a thin ring of material that you can easily peel off. Another thing to consider if you flushmount is baffle thickness. Once you cut the 3/8" to 1/2" recess, you're not left with much material. Most guys double up their front baffle, but at the very least, double up the area behind the woofer. (see pix 33). If final note: If you chose not to flushmount, you don't need a perfect circle. Use a jigsaw instead of the Rotozip to cut the hole. It requires a lot less effort. When using a jigsaw: GOOD SIDE DOWN, BAD SIDE UP. Gar.

Mounting 15"

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