Subject: new subwoofer
Posted by Manualblock on Mon, 08 Nov 2004 16:25:20 GMT
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So Pi people; this new model 12 sub is designed for pro use; right? No one is building them for the home? Thanks J.R.

Subject: Re: new subwoofer
Posted by Wayne Parham on Mon, 08 Nov 2004 19:59:58 GMT
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I can't imagine anyone using them for home hifi use, and in fact would encourage them to use multiple direct radiating subs instead. The multi-sub arrangement is more home-friendly than a massive hornsub and it has the advantage of smoothing room modes. But if you wouldn't mind a

and lowest possible distortion.

Subject: Re: new subwoofer
Posted by Manualblock on Tue, 09 Nov 2004 00:00:32 GMT
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Thanks Wayne; The hornsub thing, couple questions;Do the room dimensions affect the performance of the sub and if so are there limitations that would preclude the use of a sub.Will you be offering a xover design specifically tailored for the 12Pi to integrate with the 4Pi's.Here is the clincher; other than home theater explosions and such is there enough musical energy down there to be apparent to listeners.Thanks Ahead, J.R.

Subject: Re: new subwoofer
Posted by Wayne Parham on Tue, 09 Nov 2004 04:27:42 GMT
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boundary loading. Of course, boundary loading will have an influence but the horn was designed to not need constrained space to work properly. It's not really intended to be used indoors, at least not in small rooms. It's made to be used in very large areas. It is overkill for a medium size theater or club and definitely larger than what I think most people would want in their homes.What prompted my work on this was the fact that most folded basshorns work best from midband up,

but are somewhat at a disadvantage at the low end of their response curves. Many have what I would consider excessive ripple and all have distrortion that rises rapidly at lower cutoff and below. At the lowest frequencies, all basshorns become direct radiators in a fancy box. So my focus was on doing things that improved the performance of the system at low frequencies near cutoff. That's where I thought improvements were most needed.One way to improve distortion performance of the driver is to employ a shorting ring large enough to reduce distortion at low frequencies. Another is to use the push-pull configuration to cancel harmonics.There are several

So there are already top-quality statement products available for home use. I believe there is something for just about every price point.I had considered building a push-pull version of the

are hidden and fire into a constrained space. Cancellation would be good because the corner loading would couple the two drivers well, like slot loading does. And the woofers are hidden from view, so it would be attractive too.But I have access to very nice woofers with flux stabilization which does the same thing. It came down to a cost factor - Two good woofers without flux stabilization were more expensive than one with. So I realized that it might be better to use a single woofer with a shorting ring than two without. It was really a cost thing. I still think a

some work to determine the best venting and the best folding pattern. I can go with the "W" fold, a "Z" fold or a spiral. Each has its own sets of benefits and each also has some things I'll have to work around.I also want to do a few tests to see how audible venting noise is, and the best ways to vent cooling air in and out of this thing. I don't want air trapped in a small rear chamber, but I don't want it to be an air slug moving back and forth in a long hose either. The voice coil gap connects the cooling vent with the rear face of the speaker, so whatever configuration chosen will act like a tiny, resistive "stir straw" sized port connecting the two. I have to do some testing to know the consequences of this. It can be analyzed with a computer model, but it's probably easier to build a physical model. So I think that's the way I'll handle it; Sounds like a good winter

before its done.The two things I am sure of are that the push-pull plenum will reduce 2HD significantly and that getting cool air to the vents will improve power handling at high output. Now it's a matter of investating to find the ways to exploit each of these improvements to get the most from them.

Subject: Re: new subwoofer
Posted by Manualblock on Tue, 09 Nov 2004 11:30:30 GMT
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Thanks Bud, that clears it up. J.R.

Subject: Re: new subwoofer
Posted by GrantMarshall on Tue, 09 Nov 2004 11:43:10 GMT

Wayne says:>> I also want to do a few tests to see how audible venting noise is, and the best ways to vent cooling air in and out of this thing. I don't want air trapped in a small rear chamber, but I don't want it to be an air slug moving back and forth in a long hose either----------Hi Wayne.I've been doing some thinking about air movement. In the summer when it cools down at night opening one window doesn't do much. You open 2 and get a cross breeze. You can put it in "car terms" too. You wouldn't dream of running your car with only an intake, or only an exhaust. In a similar way I think you would actually need 2 hoses to really cool your motor, one in, one out. You could rely on a passive system but that would be limited in how much air moved. A small, quiet pump would gaurentee air movement. You wouldn't want it too noisy. You wouldn't want high cost. An example of a pump that might do the job can be found athttp://www.fish-supplies.com/buy-699098.aspx . (Note: I'm not sure this is the quietest pump you could find. It's just an example.) This pump can be combined with an inexpensive control valve (usually found at the same "type" of store and a single pump could handle 2 motors. There are battery powered versions at the same site if you didn't want to do power lines at concerts. One important thing is that the exhaust should be much larger than the intake so it never restricts the motor. If you get a quiet pump you don't worry about controlling when it's on. You just leave it on all the time. Grant.

Subject: Re: new subwoofer
Posted by Wayne Parham on Tue, 09 Nov 2004 15:16:22 GMT

I agree with you on the pump analogy, and the intake and exhaust idea. The speaker itself is a pump, but it's like a two-stroke that has no valves. Thomas (ToFo) proposes a pair of ducts plumbed into the vent with AR orifices that make one (exhaust) flow easier out and one (intake) flow easier in. The ideas is that when the vent has pressure, hot air will flow out the exhaust and when the vent has vacuum, cool air will flow in. That will prevent a single hot air "slug" from moving back and forth along the duct. I think it's a good idea. The only other alternatives are to make the duct itself conduct heat from the air or to do something else that encourages turbulence and mixture of new cool air with expelled hot air.My main focus was always on the distortion aspect, and the push-pull configuration addresses that. But this cooling vent has turned from a secondary issue into what's on the forefront of many people's minds. There's a lot of interest into ways to dissipate heat and increase thermal capacity.
