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Subject: 3 PI build

Posted by [BFP](#) on Thu, 16 Jan 2014 20:58:34 GMT

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Hi folks

I've started a 3PI build. I am using the Eminence 4012HO woofer and a B&C DE250 horn driver. I have the PI H290C horns from Wayne. I am adding 4" to the overall height of the box and will house the crossover in the resulting compartment underneath. The internal dimensions are identical to the PI 3 plans developed by Wayne. I have some flared ports that are about 2 3/4" diameter that are long enough to be cut down to length for the 3.

I had some 3/4" Baltic Birch which will be used for the inner ply of a 2 layer baffle and also for the back panel. I will be using 3/4" MDF for the sides and top/bottom. Bracing will be a mix of the 2 materials as well.

I started by building the crossover board and back plate. I used 1/2" MDF and some scraps of BB for bracing. I put a couple of thin pieces of particle board on the bottom to act as spacers for tie wraps or bolt head clearance.

I am using a mix of parts. Coils are 14G Solen. Resistors are the 25w non inductive Mills heat sinked resistors. I mounted them on pieces of 1/4" Aluminium that I had in my scrap metal pile. For capacitors I had some North Creek Zen and Crescendo caps that add up to 7uf so they are doing duty as the first tweeter cap. The rest are Axon 250volt. Wire is mostly the component leads or 12 gauge OFC Anti Cable enamelled speaker cable wire. For the driver leads I had some 14g OFC wire for the woofers and 16G monster cable for the tweeters. This is mostly bits and pieces I had in stock but should get the job done. Solder was Cardas tri eutectic. Here is one under construction and also a top view of the finished unit. These will slide into the empty space at the bottom rear of the box.

That's all for now. Next instalment will be starting to work on the box itself.

## File Attachments

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Subject: Re: 3 PI build

Posted by [BFP](#) on Fri, 17 Jan 2014 01:08:35 GMT

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Correction: The resistors used in the crossover are rated for 50w not 25w as stated above. There are 2- 25w resistors on the heatsink as well. They are in parallel with a 15ohm 50w to bring it down to the 13.5 ohm value required.

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Subject: Re: 3 PI build

Posted by [BFP](#) on Sun, 19 Jan 2014 22:27:30 GMT

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There are many ways to build a speaker box. A lot depends on what tools you have at hand and what methods you prefer. I will be starting with a laminated baffle. The outside is 3/4" MDF backed up by 3/4" Baltic Birch. The inner baffle is inset so it will form a ledge for the front of the walls and top/bottom. The top/bottom are inset leaving no MDF joints visible on the sides. The back will be inset. I will be adding a cap to the top, making it 2 layers thick. I'm thinking of doing a black lacquer on the top. The rest of the box will probably be flat black covered with satin water based poly urethane. I plan on making a base to bolt to the bottom and a grill to keep dust off the drivers.

Heres some pictures of the inner baffle. I cut the horn through hole before laminating the 2 layers. I used a jig saw. The one I have is a Dewalt which I just got recently. A good jig saw is a great tool to have around. This one is capable of fast, accurate cuts without a lot of noise and vibration.

Laminating the panels. You need lots of glue and clamps. You need to use a glue with a long open time. I'm using Lee Valley GF2002 which I have found to work well. Tite Bond 3 is quite similar.

I also used drywall screws and brads in the centre section.

Do yourself a favour and tape off both ends of one of the horn flares to prevent dust from getting in there. The static charge on the plastic attracts dust like crazy.

Next job was to mark out the position of the port and woofer holes. The port I'm using requires a large hole at the front where the flare is. I decided to reduce the diameter of the hole in the inner baffle so I could seal and support the port with a snug fit in the baffle and some silicone.

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Subject: Re: 3 PI build  
Posted by [Bill Epstein](#) on Sun, 19 Jan 2014 23:31:26 GMT  
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Classy work!

Given any thought to keeping that drawer from rattling?

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Subject: Re: 3 PI build  
Posted by [BFP](#) on Mon, 20 Jan 2014 16:07:41 GMT  
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Bill Epstein wrote on Sun, 19 January 2014 17:31Classy work!

Given any thought to keeping that drawer from rattling?

Thanks Bill

The rear of the crossover will be secured with 4 - 1/4" bolts and T nuts. I need to secure the front but haven't come up with a solution yet. I need to do that soon. I'm not sure how much it could rattle but if it can move at all there is a chance it will cause problems.

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Subject: Re: 3 PI build  
Posted by [BFP](#) on Tue, 21 Jan 2014 16:43:54 GMT  
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Just a few general notes/comments on building speaker boxes.

Safety is important. I use a cartridge respirator when cutting MDF and Birch. Even though I have dust collection there is still enough dust to be very irritating. I also wear ear protection and safety glasses. Having all your equipment in good working order and keeping the work area clean are good practice as well. Try not to rush and quit working when you are tired.

I usually start by making a cut list of all the parts. I then have a look at my tools, making sure what I have what is needed and that the blades and router bits etc. are in good shape and clean. This helps avoid problems as you work through the project.

After establishing the size of all the parts, I determine how they will be cut. Set the saw once and cut all the parts that size, then move on. For instance, in these boxes the tops, bottoms, inner baffle, back panel and braces are all the same width. Having them identical in size is very important. Doing one set up and cutting them all minimizes any differences. Precision is more important than accuracy in this case. If the width is off by a small amount it's not a problem as long as all the pieces are the same width.

Another issue can be the thickness of the MDF or Birch. I knew the BB was 18mm not 3/4" but did not realize that the 2 different lots of MDF I used were not the same thickness. I didn't check this and have some minor issues to deal with because of it.

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Subject: Re: 3 PI build  
Posted by [BFP](#) on Wed, 22 Jan 2014 20:37:54 GMT  
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The next job was to cut the woofer holes and make the recess for flush mounting the horn.

The woofers were pretty easy. I used a Jasper Jig mounted on a plunge router to make the recess then the through hole. For a 4012 HO woofer I went with the 11 1/16in. size for the through hole and for the recess I went 12 7/16 in. The recess is about 9/16" deep. The woofer is listed as 12.38" diameter so you may get it to fit with 12 3/8 but I went with the larger hole to be sure. Since I am going with a black baffle any small gap will not be noticeable.

To do the recess for the horn I made a pattern and used a bushing on the router to cut the recess from the pattern.

It's a 3 step process. First you rout around the outside of the horn flare. In the post above you can see the horn flare face down, bolted to a piece of 1/4" MDF which became the first pattern. This creates an over sized pattern. You then rout around the inside of that pattern to create a second smaller pattern. That pattern is oversized by the diameter of the bit used to create the patterns. You then use the smaller pattern to rout out the recess around the horn opening in

the baffle. You need to use a bushing to compensate for the size. So if you are again using a 1/4" bit you use a 3/4" bushing which gives you the correct offset and a perfectly sized recess for the horn. It's a lot of work and may not be worth it for many people.

Here you can see the large pattern clamped down and the just routed 2nd pattern in the centre.

The recess and a gasket. Don't forget to add depth to the recess for a gasket.

With the horn in place.

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Subject: Re: 3 PI build

Posted by [BFP](#) on Wed, 22 Jan 2014 20:50:46 GMT

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OK, It's time to stick the drivers/port in a baffle and see what they look like. Pretty nice! These woofers are a really nice looking driver. They look very well made and the magnet/voice coil and venting are all huge.

Next the T nuts get installed in the baffle. I used 1/4" t nuts for the woofer. The woofer mounting holes will take 1/4". However, it's a close fit without much room for error. I set the woofer in the baffle, shimmed it tight, marked it's position and used a 1/4" forstner bit in a portable drill to make centre marks for each hole. I then used a drill press to drill the through holes. This ensures a hole perpendicular to the baffles. The tolerance is too close to hand drill these IME. If I did not have the drill press I would use the smaller #10 T nuts which leave room for error. The holes all lined up fine in the end. I also cutout the crossover access hole in the back panel and added the 1/4"

Tnuts for the crossover cover.

I wanted to add T nuts to the bottom so I could add spikes/feet or a base/stand. I used 3/8" T nuts and installed 8 of them to make sure I could securely bolt up a stand if needed.

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Subject: Re: 3 PI build

Posted by [BFP](#) on Thu, 23 Jan 2014 23:26:22 GMT

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Now it's time to build the box and brace it. I started by gluing the top and sides to the baffle then added the bottom. Clamps were left on for a few hours and the boxes left for 24hrs before being handled.

Next up, bracing. I'm a fan of using a lot of bracing inside cabinets, especially large ones. I decided on 2 window braces, one below the horn and one between the port and the woofer. I also added a brace at the mid point of the woofer and stick braces on all the panels. Cutting or routing braces can be a lot of work. I cut this down by gang drilling the corners of the 4 window braces and cutting as much as possible on the mitre saw. I only had to do the short sides with the jig saw.

4 brace blanks stacked and clamped in place for drilling with a forstner bit.

One of the braces being installed

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Subject: Re: 3 PI build  
Posted by [tom-m](#) on Fri, 24 Jan 2014 01:20:50 GMT  
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Very nice, you got it going on. I am enjoying following along.  
Tom

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Subject: Re: 3 PI build  
Posted by [BFP](#) on Fri, 24 Jan 2014 11:15:35 GMT  
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Thanks Tom. Stay tuned!

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Subject: Re: 3 PI build  
Posted by [BFP](#) on Tue, 28 Jan 2014 23:08:01 GMT  
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Got all the braces and the bottom of the speaker volume installed. Putting the bracing in really stiffens the panels. You can hear the difference when you do a knuckle rap test on the sides. The

resonance of the panels is much higher in frequency after they are braced.

In addition to the shelf braces I also glued in stick bracing vertically on the sides as well as across the top and bottom.

A few posts back Bill asked how I was going to hold the crossover board from vibrating. The rear is securely fastened to the cabinet back. I could put T nuts in the front of the board and bolt it down from the underneath. This would be awkward for removing the board. I decided to hold it down in the front using some spring steel clips I had in my junk box. They fit under a cleat attached to the back side of the baffle and hold the board down onto the bottom of the box. This should do the trick. If not I can always bolt them down.

Heres the clips mounted on the front side of one of the boards.

Here is the board up against the cleat before seating it . The cleat has a 30degree slope on the bottom to help ease seating the board.

And here it is seated. The amount of force needed to seat the board is not that great but definitely holds it securely to the bottom of the box.

Next up will be putting he backs on the boxes.

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Subject: Re: 3 PI build  
Posted by [petew](#) on Wed, 29 Jan 2014 00:18:34 GMT  
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What would we do without the junk box (pile, room, garage, yard)

Thanks for sharing your build. Nice work!

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Subject: Re: 3 PI build



Posted by [Matts](#) on Wed, 29 Jan 2014 01:27:19 GMT

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Great looking work! I like to see how the "other half" builds... Mine get slapped together, screwed and glued, but still, fortunately, sound great...

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Subject: Re: 3 PI build

Posted by [BFP](#) on Wed, 29 Jan 2014 01:36:56 GMT

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I've only built a few pairs of speakers over the years. Newform 645 cabinets, GR Research OB7's, a pair of subs and now these Pi 3s. I'm a bit out of practice as I haven't been doing much wood working in the past 2 or 3 years. The hardest part is yet to come. I always find finishing a set of speakers to be the hardest part. I'm going to paint these. I've done veneer in the past but with the size of these boxes it would be a lot of \$ and time to veneer them.

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Subject: Re: 3 PI build

Posted by [Bill Epstein](#) on Wed, 29 Jan 2014 02:48:06 GMT

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BFP wrote on Tue, 28 January 2014 20:36 I've done veneer in the past but with the size of these boxes it would be a lot of \$ and time to veneer them.

Awww, go for it...but make it easy on yourself, 4x8 sheets of NBS veneer from Tape Ease and contact cement. One sheet does it if you paint the backs.

I've done PPR, hide glue (lots), yellow heat bond(sucks!) and even 3M spray-on (disaster) on backed and raw veneer; contact has worked and held up best for me.

Don't do this:

Do this

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Subject: Re: 3 PI build

Posted by [BFP](#) on Thu, 30 Jan 2014 11:05:03 GMT

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Those boxes look great in veneer Bill. I am still staying with the black paint. I've done this before on an equipment stand and it has held up remarkably well over 15years of use. A top coat or 2 of water based polyurethane has proven to be a tough finish that is easy to apply. These speakers will be in my dedicated listening room and don't need to have a furniture grade finish. My thought was that the black will look nice with the black horn and woofer. We'll see.

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Subject: Re: 3 PI build  
Posted by [BFP](#) on Fri, 31 Jan 2014 23:16:08 GMT  
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Back panels glued on. I used a couple of screws in the centre at the Baltic Birch window braces to make sure the back was pulled in tight.

Next I added some temporary feet so i could move the boxes around easier for painting etc.

I installed the 4 magnet washers into the front panel just below the surface. Sorry for the blurry photo. The magnets will be in the grills. I got these at Lee valley. They have sets of 4 magnets, cups and washers in various sizes. These are 1/2". The weight of the grill will be sitting on a plinth attached to the lower front of the speaker so the magnets only need to hold the grill in against the baffle.

Here is a box with a plinth installed.

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- 3) [DSCF9618.jpg](#), downloaded 5153 times
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Subject: Re: 3 PI build  
Posted by [lucasmateo](#) on Sun, 02 Feb 2014 18:21:13 GMT  
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Amazing! You are very skilled with the carpentry!  
Great looking speakers!

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Subject: Re: 3 PI build  
Posted by [BFP](#) on Wed, 05 Feb 2014 16:01:00 GMT  
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Thanks. It's been a while since I tackled a major project. DIY speakers are a bit of a gamble and an experiment. We'll see how this one works out.

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Subject: Re: 3 PI build  
Posted by [BFP](#) on Wed, 05 Feb 2014 16:18:02 GMT  
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OK, next up. Finishing the boxes. I started with a coat of Zinzers oil based "Cover Stain" primer.

I had planned to paint the plinth at the bottom of the baffle and the tops with a Black Lacquer. After experimenting with this on the tops I abandoned it for now. It did not go well and the odour was strong and persistent. I still may lacquer the tops. I painted them with the same finish as the rest of the box. I screwed them on without gluing them so I can change them out if I decide on a different finish. Perhaps in the summer when I can work outside i will try again.

I then applied 2 coats of Rustoleum Painters Touch flat black latex. I used a foam roller. Next I applied 2 coats of Varathane Diamond Coat satin with a good quality bristle brush. If you try to roll this stuff you get runs and air bubbles.

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Subject: Re: 3 PI build  
Posted by [BFP](#) on Wed, 05 Feb 2014 16:43:15 GMT  
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I next ran the wiring from the crossover up through a hole in the base. I sealed the hole with electricians putty on the bottom and silicone on the top. I used batt insulation on the backs, bottom and side nearest the port. I also placed a batt on the window brace between the horn and woofer. I covered the batts in the woofer section with a layer of quilt batting to prevent any fibres from getting out of the box. I remember demoing some speakers one time and the salesman decided to show off and play a track of some thunder at an extreme level. A big chunk of fibreglass blew out the port. Needless to say I didn't buy anything from them and have always wondered if any fibres are being pushed from a fibreglass insulated box in routine operation. Note! The camera somehow got switched to image stabilization mode which resulted in low quality pictures here.

Batts in place. I cut away some of the insulation for the horn/driver to fit.

Quilt batting added.

I also installed some "affordable" spikes. Carriage bolts, nuts and washers. In this case the size is 3/8". If you are doing something like this make sure you allow clearance for bolts to extend up into the enclosure. I set up the enclosures for a upward tilt of about 3/4" from back to front. This should get the sound up high enough to not need any stands.

So now we are ready to add the drivers.

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Subject: Re: 3 PI build  
Posted by [BFP](#) on Wed, 05 Feb 2014 17:10:58 GMT  
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For ports I am using some that I had around. They are flared at the front and tapered slightly in diameter. I had 4 of them. 2 used and 2 new. In order to get the correct box tuning I decided to experiment with the used set of ports. I used an average diameter for the port. This figure was about 10% larger than the stock 2.5". Since the port length formula has radius squared as a variable I squared 1.1 and came up with a figure of 1.2 x the stock length of 2.5" or 3". I cut the used ports to 3" and installed them as a starting point. I can then measure the tuning frequency and work from that figure to find a port length for the permanent installation.

Driver install was pretty straight forward. The BandC 250 came with hardware to install them on the horn. It didn't take long to get things finished.

I decided to try the corners as a location for these. The room is 19' x 12.5'. I put them in the corners of the long wall angled at 45 degrees which seemed incredibly far apart. I am not using the subs at this point.

So... how do they sound. Different from what I was used to. It's early to make any judgements but one thing is obvious. Dynamics are stellar. I played Jonny Lang - I Am from the album Wonder This World. This track is very dynamic and I turned it up and was surprised to hear it play much cleaner than I'd heard it in the past. The vocals stayed clean where previously they would get nasty when even approaching these levels. The overall tonality is good with no obvious problems. Bass is tight and a bit thin down low, but the woofer is just breaking in and I am used to 2 subs being in the mix. I'll post more later on sound. It's very promising at his point.

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Subject: Re: 3 PI build

Posted by [HPower](#) on Thu, 06 Feb 2014 16:59:50 GMT

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Hey Brian,

Great job on your 3PIs, looking good!!!

I like your use of the odds and sods with the mounting of your Xover boards and carriage bolt feet,

but any Canadian worth his salt should have some Duck Tape in the mix.

Can you say Red Green.

I still have not gotten to my 4PI build, our kitchen reno has decided to take up all my hobby time. Hopefully in a month or so I can get to it.

Again, congrats on a nice job,  
Tom

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Subject: Re: 3 PI build  
Posted by [BFP](#) on Fri, 07 Feb 2014 11:28:40 GMT  
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It's good to hear from you Tom. I've been wondering how your 4 build was coming along. I'm pretty happy with the sound of these but I don't know about the corner positioning. It works quite well for some music. However, for anything where an instrument is recorded hard to one side, such as in older jazz recordings, it puts those instruments way out there in the corners of the room. It's a bit odd and not what I'm used to. After logging a few hours on them I am most impressed with the dynamic range and the purity of the treble produced by the DE250/H290C combination. I have never had such clean HF reproduction. Never harsh or "bright" sounding.

P.S. I put the duct tape on the inside for better WAF!

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Subject: Re: 3 PI build  
Posted by [HPower](#) on Fri, 07 Feb 2014 13:49:39 GMT  
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" P.S. I put the duct tape on the inside for better WAF! "

Good call!!!

I have my Cornscalas in a 20' x 15' room, speakers on long way about 3' from side wall and 2' into room which puts the front-center of the speaker about 12' a part and main seating position 11' from each speaker.

This gives me a nice wide sound stage with no noticeable hole in the middle.

Even when I had my previous KHorns in the 20' corners I was getting a similar good soundstage. I would suggest moving your 3PIs closer together, yes you will probably lose some bass response with them out of the corner, but you should improve your side to side imaging. I know PWK suggested using a center channel in mono to help imaging with wide corner placements but I never have tried that technique.

This shot shows how my CSs are place in relationship to my 20' corners... about the same for the left speaker that is not completely in pic. Hopefully trying some different positioning will get you where you want to be.

Yes, horn speaker do excel in the dynamics. I love the way hons sound, a real "live sound"!

I am sure your 3PIs and my 4PIs (once I get them built) will be equally enjoyable in this regard.

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### File Attachments

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**Subject:** Re: 3 PI build  
**Posted by** [BFP](#) on Fri, 07 Feb 2014 14:17:17 GMT  
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Tom, your system and room look great! I see you have some interesting items damping the tops of your Cornscalas! I've never experienced horn loaded tweeters in my system. They are not harsh or strident at all, just the opposite in fact. I had the subs on last night and have got them dialed in pretty close by ear. I'm going to get out my DEQ2496 and measurement mic and see what's up in the bass. I want to give the woofers a little more break in time. I re tightened the mounting bolts last night and they had loosened off a bit. Gasket compression I guess. I need to measure the port tuning frequency so I can determine the proper port length for the permanent install. I hope to get the grill frames done on Saturday.

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**Subject:** Re: 3 PI build  
**Posted by** [BFP](#) on Wed, 12 Feb 2014 11:21:46 GMT  
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**Update:**  
I've been experimenting with placement on the long wall. I can't seem to get the sound I want in that configuration. This is nothing new. I've never been happy with any setup with the speakers along that wall. I'll try putting them in the corners of the short wall.

The grill frames are built, painted and the magnets installed. The fabric is going on tonight if I have time.

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Subject: Re: 3 PI build

Posted by [BFP](#) on Sun, 16 Feb 2014 21:03:17 GMT

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Got the grills done and have continued to experiment with placement. The grills are simply a frame of 1/2" MDF 2" wide on the top and sides and 3" wide on the bottom. They are simply butt joint glued together and painted flat black. The fabric and magnets/ friction discs were added and they do the job just fine.

I have abandoned trying to get decent sound on the long wall. Even with the speakers moved in to 11ft. apart I still could not get a decent centre image unless I sat right in the middle. Moving a foot to the side would pull the sound to the speaker. I also had my chair against the wall which never seems to work well IME.

I put them in the corners firing up the long dimension of the room where I could sit further back. This seemed to create the stable image that they are supposed to produce. I placed my subs in the opposite corners behind the listening seat. This provides excellent deep bass and integration with the PI 3.

I got a chance to check the port tuning and it was lower than spec at 26.5 hz. I cut the ports down to just under 2" and got a tuning of 29.8hz which is right where it should be. I do wonder if I have too much insulation in the boxes. I used rock wool batts that are 3" thick and are designed for acoustic duty. At 2.5lb/cu.ft. they are slightly denser than regular fibreglass or rock wool which I believe are around 2lb.

I may have to talk to Wayne about measuring the impedance values to determine if I have too much insulation in the box.

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Subject: Re: 3 PI build

Posted by [Wayne Parham](#) on Mon, 17 Feb 2014 22:52:19 GMT

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There is a write-up about measuring T/S parameters in the link below:

T/S Measurements Of course, now days, with some of the automated measurement devices, you can literally get these specs with just a few clicks of the mouse and a test box or some weights (like coins taped on the cone). But the process and the formula that show what's going on "under the hood" are in that post, which may prove interesting.

Here's another post with useful T/S formula:

Measurement equipment and software And two posts that show formula for Helmholtz (bass-reflex box) resonance, and how it is manifested in the impedance curve:

Frequencies of Interest

Measure impedance

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Subject: Re: 3 PI build

Posted by [BFP](#) on Tue, 18 Feb 2014 16:22:56 GMT

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Hi Wayne

To determine box tuning I simply measured the impedance minimum frequency by putting a resistor in series with the amp and measuring the frequency where the current was maximum. Perhaps this is not good enough.

When I tried to calculate the minimum impedance I got a high figure of 11ohms. I may have made a mistake in the measurements but I haven't had a chance to repeat them.

I placed a batt of insulation on the brace between the horn and woofer. This makes a tight seal sitting on the window brace. Could this be causing an over damping of the alignment and suppressing mid bass? There aren't any issues with transient response. The dynamics these will produce are eye opening. The horn and B&C driver pair are so clean and detailed that even at high levels there is no listening fatigue. These will eat most HI Fi speakers for lunch and not even belch when it comes to dynamics.

The sound is quite good with them in the corners. I am getting bass impact with the subs that will rattle your teeth. I have listened to a lot of different styles of music and am very happy with many aspects of the sound. They are very different than what I had which were dipole in the mids and had wide horizontal dispersion in the highs. I'm still getting used to them but one thing is for certain. They sure are a lot of fun. Being able to play loud and clean without listening fatigue or worrying about damaging a 20W rated tweeter is bringing some new pleasure back to listening again.

Thank you for the PI designs and your support for us DIYers.

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Subject: Re: 3 PI build

Posted by [Wayne Parham](#) on Tue, 18 Feb 2014 22:08:33 GMT

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That's awesome. Thanks for the feedback!

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Subject: Re: 3 PI build

Posted by [BFP](#) on Sun, 23 Feb 2014 22:08:42 GMT

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I had a friend visit yesterday to hear the Pi 3 setup. He brought his laptop and music he is familiar with. My system consists of a Mac Mini, sending USB music via Pure Music to a DBLabs Tranquility DAC into a 250w/ch W4S STI500 integrated. The Pre outs are feeding a crossover /EQ to a faithful Hafler DH220 driving a pair of sealed 15" Dayton series 2 subs. The Pi 3s, running full range, are in the corners firing up the long wall and angled in at about 40 degrees. Subs are in the opposite corners behind the listening position.

My friend has had a lot of great sounding equipment over the years and he likes his music loud. He brought his torture test tracks with him.

We only had about 90 minutes but he was able to thoroughly test the system in that time. The 3's passed every test without missing a beat. He played a lot of new music and blues that I am not familiar with. Some of the bass tracks were extremely loud and deep. The system handled them without problem. Even at extreme volumes the sound remained easy to listen to without harshness or any sense of compression or distortion.

Other than the fantastic dynamics, we both thought that they were very transparent and revealing without being "bright" sounding. Wayne has done a great job at voicing these speakers. All the familiar vocals sounded natural and uncolored. This was one thing I was worried about. I can highly recommend the Eminence 4012HO woofer. It can pump out some serious volume and does not muck up the midrange. I also recommend that you brace the cabinets really well. I cannot hear any problems related to cabinet resonances. The BandC250/290C horn is also capable of excellent resolution, delicacy and an overall clean and clear presentation.

Unlike many audio products out there these speakers live up to their promise and perform at a very high level in a real room.

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Subject: Re: 3 PI build

Posted by [BFP](#) on Tue, 11 Mar 2014 19:35:14 GMT

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I needed to add the PI logo to the speakers but the black decals that Wayne sent me wouldn't work on my basic black color scheme. I stuck them to a piece of 1/8" mdf and used a scroll saw to cut out wooden versions. I painted them gold and then added a couple of coats of clear. Here are some pictures.

These speakers continue to impress me. They sound great with everything I play on them and have the dynamics and grain free highs that make listening fun and fatigue free. The corner placement and constant directivity design really have solved some problems in my room that other speakers could not.

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### File Attachments

- 1) [DSCF9711.jpg](#), downloaded 4241 times
  - 2) [DSCF9714.jpg](#), downloaded 4137 times
  - 3) [DSCF9712.jpg](#), downloaded 4238 times
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Subject: Re: 3 PI build  
Posted by [Wayne Parham](#) on Tue, 11 Mar 2014 20:08:18 GMT  
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Those speakers look seriously good. Thanks for reporting back, and for the eye-candy.

And congratulations on your build!

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Subject: Re: 3 PI build  
Posted by [Michaelzh](#) on Wed, 12 Mar 2014 12:30:53 GMT  
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The gold PI logo just tells what I feel about Wayne's design: gold nugget. I especially agree with your saying "Wayne did a great job voicing the speakers even though I do not have the 3 Pi. I can confirm with what he did with 7 Pi speakers.

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Subject: Re: 3 PI build  
Posted by [BFP](#) on Wed, 12 Mar 2014 20:12:57 GMT  
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I am enjoying music again after years of being unhappy with the sound in my room. That is the bottom line on these. If I had the space I would have built the corner horns. The sad part is that I looked at the PI speakers years ago and decided to try something else. I have tried a few different things to get good sound in this room, including Newform 645s which had a wide

horizontal dispersion 45" ribbon tweeter and GR research OB7's which are dipole in the midrange. I finally came back to look at the PI site and dug into all the technical information on the designs. It made sense and the end result has performed exactly as I'd hoped.

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Subject: Re: 3 PI build

Posted by [BFP](#) on Wed, 12 Mar 2014 20:21:40 GMT

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Wayne Parham wrote on Tue, 11 March 2014 15:08

Those speakers look seriously good. Thanks for reporting back, and for the eye-candy.

And congratulations on your build!

Thanks Wayne. I made a few decisions during the build that made it harder for me, but the end results weren't too bad. I still plan to build new tops for them and paint the horn flanges to improve the appearance a bit. Maybe this summer when it's warm enough to paint out in the garage. I'll probably invest in some nicer feet or spikes as well. Right now I am still going through my music collection and enjoying it very much!

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Subject: Re: 3 PI build

Posted by [Michaelzh](#) on Thu, 13 Mar 2014 00:14:18 GMT

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BFP wrote on Wed, 12 March 2014 15:12 I am enjoying music again after years of being unhappy with the sound in my room. That is the bottom line on these. If I had the space I would have built the corner horns. The sad part is that I looked at the PI speakers years ago and decided to try something else. I have tried a few different things to get good sound in this room, including Newform 645s which had a wide horizontal dispersion 45" ribbon tweeter and GR research OB7's which are dipole in the midrange. I finally came back to look at the PI site and dug into all the technical information on the designs. It made sense and the end result has performed exactly as I'd hoped.

Me too. I knew about Wayne's corner horns a long time ago. But only recently I started by reading about Geddes horns, and then Seos horns, and finally Pi horns. Wayne did a great job answering diyers' questions and made the most sense to me such as that he pays a great deal of attention to the room environment in his design of the H290C horn.

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Subject: Re: 3 PI build  
Posted by [Nick77](#) on Thu, 13 Mar 2014 11:33:26 GMT  
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Hi im just curious, will an over sized resistor sound the same as the spec'ed Mills 12 watt? Just wonder if it might introduce extra noise?

I tried the OB/7's also, while they sounded great just couldn't make them work in my room.

Those look awesome by the way!

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Subject: Re: 3 PI build  
Posted by [BFP](#) on Fri, 14 Mar 2014 15:25:30 GMT  
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Nick77 wrote on Thu, 13 March 2014 06:33Hi im just curious, will an over sized resistor sound the same as the spec'ed Mills 12 watt? Just wonder if it might introduce extra noise?

I tried the OB/7's also, while they sounded great just couldn't make them work in my room.

Those look awesome by the way!

Thanks

Resistor noise would be at a low level at these low resistances. It is dependant on the resistor value and also what the resistance element is made of, metal film, carbon composition, wire wound etc. Since the larger wattage resistor is the same value and composition I can't see there being any difference in noise.

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