Subject: Rear Folded Horn Line Array
Posted by Jeffery L on Thu, 27 Dec 2007 16:14:44 GMT
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I made a line array a little over a year ago with 8 cheap 4"x6" car audio speakers and from what I remember, 18 Onkyo 3/4" tweeters. They have a serious lack of low frequency response. I don't have any specs on the 4"x6"s.I would like to build a rear folded horn array with the same speakers. Can any one offer any critiques or possible design ideas? I drew up some rough plans with approximately an 8 foot horn path with a horn mouth about 10" wide by 24" tall.I don't know much about the physics behind horn design. With all the information out there it's all a little confusing. Any help would be greatly appreciated.

Subject: Re: Rear Folded Horn Line Array
Posted by Marlboro on Thu, 27 Dec 2007 17:17:37 GMT
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Where you want to go: the definitive source:http://www.billfitzmaurice.com/AutoTuba.htmlMarlboro

Subject: Re: Rear Folded Horn Line Array
Posted by Jeffery L on Thu, 27 Dec 2007 21:33:45 GMT
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What does the Auto Tuba have to do with it?

Subject: Or.....
Posted by Marlboro on Thu, 27 Dec 2007 23:47:04 GMT
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Pile them on top of each other. Bingo you have a hi tech folded horn array.Or if you don't want to do that, then the only person I know of who could advise on how to do an array of folded horns would have to be Bill.Essentially..... I have an array of sealed mid-ranges. Each one is a sealed separate speaker piled on top of each other. Same for the tweeters. Why would woofers be any different? I would never even consider putting any of the individual speakers in an array in the same enclosure, that's COLORATION LUNACY!Marlboro

Subject: Re: Rear Folded Horn Line Array
Posted by lcholke on Fri, 28 Dec 2007 02:10:27 GMT
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Hi Jeffery,

Horns are tough. They require a lot of theory to design. The horn requires the horn length to be 1/4 the lowest wave length, so many of the designs that I have seen use a non horn for deep bass.

If you run 4 of the 10" x 24" horns, in a corner, the mouth cutoff will be 61 hz. An 8 ft 1/4 wave path has a 35 hz cutoff. (by the std equations)

http://www.dmcbean.bigblog.com.au - will provide hours of design fun

-Linc

http://melhuish.org/audio/

Subject: Re: Or.....
Posted by Jeffery L on Fri, 28 Dec 2007 12:43:03 GMT
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What I was thinking was to use the 8 - 4"x6" speakers as a direct radiating line array and use the back wave of the speakers to feed a rear loaded horn to help with the lower frequency response. I haven't been able to find any information on a combination mid-low frequency line array, rear folded horn.Marlboro, is this what you meant when you said it would be coloration lunacy? I am not looking for a horn woofer array. I am toying with the idea of a dual 8" loaded Bill Fitzmaurice Table Tuba, if I need it.

Subject: OH....
Posted by Marlboro on Fri, 28 Dec 2007 13:49:43 GMT
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Jeffrey,I didn't understand what you were trying to do. That's a pretty interesting concept. I've no idea whether it would work or not. Again, Bill Fitzmaurice would be the person to ask, I should think.What I meant by coloration, is that to put a bunch of speakers in the same box means that their combined radiations will muddy the sound coming back through the front.I used a separate enclosure for every speaker in my 34 speaker midrange part of the array. I used 4 lb cu ft fiberglass in tubes which eliminate most of the radiation coming back out the front. Tube enclosures eliminate muddy odd ordered harmonics by the physics of sound in tubes, so that only even ordered harmonics return through the front of the speaker, and in small quantities lend clarity

not warm muddiness. The result is a line array with exceptional clarity in the midrange. I further augmented this by fixing it so that even electronically there was no chance to muddy up the mid range by having transients from the bass interfere with the waveform, since I tri- amped the system, and the woofers and tweeters have their own completely different amplifiers. Finally, I kept the midrange as sonically pure as possible by not breaking it up in the middle with a crossover. The midrange is covered from 165hz to 2500hz with the 34 mid range speakers.Its was just how I put it together, but no one else has done this that I know of, and so from experience of they synergy of this, no one else knows how significantly all these parts fit together. This is what I meant when I was talking about coloration.Marlboro

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Subject: Re: OH....
Posted by Jeffery L on Fri, 28 Dec 2007 14:40:52 GMT
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From what I can tell it should work. I am having a mental conflict about the horn size and mouth area. How big of a deal are the speaker specs on a rear folded horn? How much midrange is the horn going to put out? How muddy is that sound going to be? Is there an effective way to dampen the midrange out of the horn section to ideally have more bass without the midrange coloration?I am just wondering how big of a sound stage a line array with a front exiting horn section. This makes the boxes a total of 72 inches tall with the bottom of the box being a horn mouth at least 24 inches tall. Line arrays already sound incredible for as cheap as my speakers are. What can a horn reinforced wave front do?

Subject: Re: OH....
Posted by sunnyduce on Fri, 28 Dec 2007 21:04:37 GMT
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hi MalboroTime to chip in I guess.yep,I have done what you have,but one better.Gone fourway.{four}TL subs,tuned to 14Hz xover to a 12" sealed box at 63Hz.From there to the{16} sealed mids loaded in PVC pipe stuffed with wool at 330Hz then to the planars at 2800Hz.All this Controlled by 3DCX2496,3DEQX2496 and two FBD2496.Each driver has its own home brew amp.These stacks flank a 130" wide screen in my HT in my basement.When you hear this then you know the meaning of dynamics.Oh and did I mention that proper line array's do away with the center channel?When I find out how to post pics,I will send them.CheersSunny

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Subject: Re: OH....
Posted by Marlboro on Sat, 29 Dec 2007 02:35:03 GMT
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The size of my room is too small for that much bass!Yeah.... no center channels wanted or needed.Thanks for sharing.Marlboro

Subject: Re: OH....
Posted by sunnyduce on Sat, 29 Dec 2007 17:38:09 GMT
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Hi Malboro The four subs are not the for high SPl, but for improved in room responce.Four subs iddling sound far better then one vented box leaving its gap and farting away.Allways been partial to the sound of TL's.Are you into experimenting? If so PM me and I send you some tweets to play with.I too started out with domes,but found them lacking in top-end when used in line arrays.Have planars now but think found somthing better yet.Not ready for the world yet but I would love to get another opinion.Sunny

Subject: Re: OH....
Posted by Marlboro on Sat, 29 Dec 2007 18:32:23 GMT
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Sunny,I'm into buying music and listening now. It took me 18 months to learn everything I needed to build them, and another 18 months to actually built them. I'm not into squeezing another 3% better out of them, that I might or might not hear at my age.The synergy of the speakers required domes. I prefer the dome sound to other kinds of tweeters. 60 of them provide an unbelievable treble footprint that has to be heard to be experienced. 16 planars or ribbons simply don't match up.Marlboro
Calipso Line Arrays

Subject: Re: OH....
Posted by sunnyduce on Sun, 30 Dec 2007 01:01:36 GMT
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Hi malboroYeah I hear you.Taken 40 years of building speakers to get where i am now.This is my fourth set of line array's.Previous set had 84 dome tweets per side.I offered these to you just to get a opinion from someone who has experience with line's.They are neither dome's nor ribbon's.Not trying to sell you anything.I give them to you and will pay shipping to where ever you live.Sunny.

Subject: my arrays
Posted by Marlboro on Mon, 31 Dec 2007 15:31:35 GMT
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Sunny,Most people who build line arrays seem to want to do anything they can to keep the work down to 2-way. I don't understand this preference for building two way line array systems. A 2-way is a bad compromise in a point source, and I down see it as much better in a line array.When people build two way line arrays they always have to compromise the tweeters because they have to now go what I consider TOO LOW. And they have to compromise the mid-range because they have to take it too low. To do this they end up with a too small quantity of 7 inch woofers, and a too small quantity of of planar tweeters. The line of reasoning then says that the mid range is not all that important if you have a quality treble and a quality bass. This has never been my experience. Most of the music content is in the 200hz to 2400hz area, at least most of the music content I listen to, which is jazz and classical and voice.So for me, my 34 3.5 inch 3.3mm xmax midranges, and my 60 dome tweeters crossing at 165 and 2400 work just great for what I listen to. I connect them to a set of 15mm DVC xmax poly prop woofers which go down to about 30 hz, and power them with a separate 350 w/ch amp. They have more bass than I can use in my smallish 12 x 16 foot room.Marlboro

Subject: Re: my arrays
Posted by sunnyduce on Mon, 31 Dec 2007 19:45:51 GMT
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Hi MarlboroI could not agree more.I started my array venture with fullrange drivers,that peaked my interest.Then two way passive,5 1/4 with domes.On too active three way,life is good now.Better still too come.Four way active.Heaven is here.People might not believe it,but I am with you.We live in a midrange world.Now I am in seventh heaven with each driver having its own amp.Cheaper than one good big amp. Got the little amp modules from Hong Kong,no bigger than a pack of cigaretts.5 bucks each7 watt output.It is a whole new level of performance.I believe that wiring so many voice coils in series and parallel doessomething funny to the sound,no mather how good your drivers are.WhatI have now confirms this.Sunny

Subject: MORE ON MIDRANGE IMPORTANCE
Posted by Marlboro on Mon, 31 Dec 2007 22:56:34 GMT
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Sunny,Along with the midrange discussion I had above, I also found it very important to give each midrange speaker its own completely separate enclosure. And when I say separate, I mean separate---not just a space in a part of a bigger box, but a completely "1/2 inch air space separated from its peers" enclosure. This completely eliminates any coloration caused by the other midrange speakers. Additionally each enclosure is a 23.5 inch pvc tube stuffed with dense

4 lb/cu foot fiberglass, wrapped in fiberfill battens. The tube forces the back wave through the tube and completely through 47 inches of fiberglass before it has to get back to the front of the speaker. The harmonics in the tube peak at add odd fundamentals. There is no even ordered harmonics in a tube. Why this is good is this: when tube amplifiers overload they tend to produce lots of less objectionable but soft mushy sounding even ordered harmonic distortion. Odd ordered harmonics and distortion are the part of the sound which is clarifying, but in large quantities it sounds screeching. Since my midranges have to have their back sound go through 47 inches of fiberglass, and each one only has to handle 6.25% of the total sound volume, not much comes back through. But the part that does tends to give the speaker a more DEFINED CLARIFIED SOUND. This is essential with the mid range. And since the distortion levels are low because of the percentage of the total bandwidth, and low because no woofer sounds or tweeters sounds are dragging it into clipping distortion, my midrange is very exceptionally super.My opinion of course, but if one has not heard a midrange in this way,on has no idea how important the midrange can be to the music, particularly those who have designed systems around ways which by their nature tend to compromise the whole midrange of the music---where all the fundamental tones of everything "I" listen to exist. Others who listen to lots of home theater with gun shots and explosions may not notice.Marlboro

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Subject: Re: MORE ON MIDRANGE IMPORTANCE
Posted by sunnyduce on Tue, 01 Jan 2008 21:40:11 GMT
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Hi marlboroSorry I could not interest you in some experiment.Others have contacted me.hopefully they will share with us there findings.Good chatting with you.Any thoughts on the series/parallel issue? Keep on listening.Cheers.Sunny.

Subject: experiments
Posted by Marlboro on Tue, 01 Jan 2008 23:41:29 GMT
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Got no way to do the experiment without tearing everything apart. I'l have to move everything back from the wall. The tweeter connections are not readily accessible.Don't know about the series/parallel issues. Do you have some etiology for how that might come about?Marlboro

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Subject: Re: experiments
Posted by sunnyduce on Wed, 02 Jan 2008 01:47:57 GMT
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Hi MarlboroI started to notice this first when I rewired a MTM from parallel to series using the same drivers in the same boxes.trying to save money on the xover designs I was playing with.The parallel just sounded better and i believe that is of better control the amp has over the drive units wired this way.I took this further with four 16 Ohm drivers.Adjusted for the same SPL level the four parallel just where somehow cleaner.Cant technically explain it but there is nothing wrong with my ears.Cheers Sunny

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Subject: Re: my arrays
Posted by Tom R. on Wed, 02 Jan 2008 02:13:44 GMT
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Seperate amps for each driver is an interesting concept. Do the tweeter array uses seperate amps for each unit?Tom R.

Subject: Re: my arrays
Posted by sunnyduce on Wed, 02 Jan 2008 06:05:48 GMT
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Hi Tomyes they dosunny

Subject: Re: OH....
Posted by Steven Homrighausen on Thu, 03 Jan 2008 21:04:08 GMT
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I'm in the process of building my second array - I've used planar and ribbon tweeters to this point. If you're willing to ship to me, I'd LOVE a chance to hear dome tweeters in an array. Let me know if you are interested.

Subject: Re: OH....
Posted by sunnyduce on Sat, 05 Jan 2008 18:02:10 GMT
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Hi Stevesomeone else beat you to this.Cheers
