Subject: Under $500 Line Array Choices
Posted by FredT300B on Tue, 13 Jul 2004 17:30:21 GMT
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There's an interesting project description at http://www.lonesaguaro.com/speakers/array/array.htmThis array uses multiple midwoofers with a single tweeter. Certainly this type of array is a compromise, but with the least expensive planar tweeters selling for about $30 (and you need 16 of them for a full two speaker array), a single $55 dome tweeter is about the only way you are going to build an array that sounds good for less than $500. I built a similar array using 10 very similar Vifa/JBL midwoofers and the $22 Peerless #811647 1" horn loaded fabric dome tweeter. You can see it at http://fredt300b.smugmug.com/gallery/132721/1/4830622But the midwoofers in both Lou's array and mine are PE "buyout" drivers that will not be available in the future, and they are designed for use in a small volume ported satellite-type enclosure. Lou's Morel tweeter choice sounds good to me, but I doubt its 93dB sensitivity would be adequate with a high efficiency midwoofer array. My Peerless tweeter choice was a very sensitive 99dB, but its sound is clearly inferior to the Silver Flute planars in my Linus array.So here's the challenge: How can you build an under-$500 multi woofer single tweeter array using drivers that 1)will sound good, 2)will be available in the future, 3)will go down into the mid 50's, and 4)the tweeter will be sensitive enough to match up with a 95-97dB woofer array?I was looking at Madisound's 5.25" 8 ohm Silver Flute midwoofer as a candidate for the midwoofer array. It seems to do what I need, and if I used 8 in a 2-3-3 ported configuration I would get a reasonable friendly 6.8 ohm nominal impedance and an F3 in the mid 50's. Its less-than-$15 price makes it a tempting choice.Finding an inexpensive tweeter that's sensitive enough and that will sound good is a tougher challenge. I don't want to spend much more than $50 for each tweeter in a "budget" array. The only ones I can find are the Morel that Lou used, the Peerless that I used in my first project, and the Vifa MG27TG39-04, at 95dB efficiency, but it's a four ohm speaker and its frequency graph looks like it might be a bit tizzy in the top end (good for a car audio system). The Fountek JP3 would sound much better, and it offers a very friendly six ohm load, but it's a bit on the pricey side for this array at $81.Any comments? Would the Silver Flute midwoofers be a good choice? How about the tweeter choice? Should I bite the bullet and go with the Fountek, or are there some other choices I'm not aware of?

Subject: Re: Under $500 Line Array Choices
Posted by Bill Fitzmaurice on Tue, 13 Jul 2004 18:55:28 GMT
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I'd bag the single tweeter idea. The whole idea of arrays for the DIYer is that you can get killer sound with very inexpensive drivers that individually aren't worth much but in large groups work very well indeed. I built a pair of these arrays for $60 total, and while the closeout drivers I used may not be available now there's always going to be something out there on the cheap that will work just as well. Using high end drivers, which with a single tweeter you're forced into pretty much, instantly robs you of the $ advantage. I can't give details on my array prior to its publication late this year but I will say that for a $500 budget you should be able to come up with a lot more

than you're currently aiming for by using bargain basement drivers.

Subject: Re: Under $500 Line Array Choices
Posted by Jim Griffin on Tue, 13 Jul 2004 20:22:13 GMT
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Fred,The original Linus array, which was developed three years ago as a proof of concept project (full disclosure free plans are available) by Rick Craig and me, runs a little more than your target price. The Linus 1 uses 12 woofers and with 6 planar tweeters per side. The woofers are the MCM Electronics #55-1855 at $281 per set of 24. The planar tweeter is available from three sources: Silver Flute YAG20-1 ($27.50 each from Madisound), Parts Express #275-085 ($24.80 each), or the Stryke Audio RTW2 (contact them for their current price as it is no longer shown on their website). While this array would run above your target price for drivers at regular pricing, the drivers are often sold as discount or deal of the day specials. The total cost at regular pricing is a bargain at well under $600 total driver cost, it likely can be had routinely in the $500-$550 range. The Linus 1 design is a true near field array with few compromises. It features a 3 dB down point at 43 Hz (ported box) so many people will be more than content without a subwoofer. For what it is worth the Linus 2 design that you built (uses an improved woofer and more tweeters than the Linus 1) runs $900 for drivers and crossover parts. One of the criterion for the Linus 1 and Linus 2 designs was to develop designs that featured readily available drivers that would be on the market for future users. Hence, no clearance drivers or parts that would limit future usage. It is a shame that Bill's array is already obsolete (his drivers are discounted factory buyout models which are no longer available) a full six months before his article even goes to print.Jim

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Subject: Obsolete? Only if no one ever makes another 4 incher.
Posted by Bill Fitzmaurice on Wed, 14 Jul 2004 10:36:25 GMT
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The drivers I used have specs that are quite common, and you can easily substitute at least a dozen other models from the pages of the Parts Express catalog. If you are lucky enough to find some at closeout that's frosting on the cake, but even at regular pricing suitable drivers can be found at $5 apiece or less 24/7/365.

Subject: Two Interesting Responses
Posted by FredT300B on Wed, 14 Jul 2004 15:08:24 GMT
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Different in many regards, but they agree about the fact that I don't have to settle for a single

tweeter.Bill, I can't argue with your thinking. You can build an array for a lot less than $500 that will give you much listening enjoyment. I built an array using Vifa/JBL buyout midbasses but with one tweeter for $275 total counting everything, even the mdf. But as much as I like it, it's not in the same league as my Linus 2 arrays.Jim, I hadn't thought of the Linus I. You are so right about not spending $500 for a single tweeter array when for about $100 more you can have a full woofer/tweeter array with drivers that are currently in production. I heard some very similar MCM woofers (#55-1870 I believe) in a Bottlehead Straight 8 I built a few years ago, and they are not bad at all. I read somewhere the original Linus I plans are available, but I have not seen them. Are they on a webpage somewhere?But what if someone were operating on a real-world, kids-to-clothe, bills-to-be-paid budget and $500 would be their absolute top spending limit for everything? Would an array using the $14.25 Silver Flute woofers and a single good quality tweeter be a worthwhile project? What tweeter would be a good candidate?

Subject: Bill: Re: Your Line Array Design Paper for AudioExpress? Only if no one ever makes another 4 incher
Posted by Jim Griffin on Wed, 14 Jul 2004 20:03:54 GMT
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Bill,The facts are that if you buy another 4" driver (from among the various ones you suggest), it is very likely that you would need to redo the crossover network and perhaps more of your line array design . You acknowledge yourself that the drivers you used are no longer available--hence, your design is clearly obsolete even now. That to me, suggests a new design would have to be developed by the readers of your article who wish to pursue a line array design. Others would have to have enough knowledge to select drivers that would meet the target performance of your design or have the ability to derive an iterative design. Hence, your article would only be useful as to how to generally approach a line array design. But, no one could duplicate your design without reworking it. That does not serve the person who lacks the test equipment and the expertise to develop a new crossover design. Line arrays are difficult enough to measure and implement a crossover for knowledgeable designers much less someone who wants to achieve good results without having a lot of speaker design expertise. Furthermore, I would suggest that your line array design as you have presented in the photo and replies on other forums has significant shortcomings in my opinion. First, the woofer line is too short to function as a near field line array which has significant advantages over a line array that functions mainly in the far field (I'm sure that you have read my near field line array white paper to understand my viewpoint why near field operation is better for a home application). Second, the spacing between the drivers will cause comb lining effects from both the woofer and tweeter lines in your design (again see my white paper for suggested spacings and crossover frequency limitations). Third, the sound quality of the drivers you are suggesting (that is if someone else could purchase/duplicate equivalent performance) is certainly not going to yield a speaker that exhibits even mid-fi or better performance to the listener. Sure it would be nice to have another technical paper to add to your resume. To me your line array paper would be just entertaining reading but not a template for others to follow. I dropped my subscription to AudioExpress a couple of years ago because this publication ceased to be useful to me (and others) as you can attain more current and more useful information from the internet for the price of logging-on.Jim
Near Field Line Array White Paper

Subject: Re: Two Interesting Responses
Posted by Jim Griffin on Wed, 14 Jul 2004 20:15:24 GMT
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Fred,See my reply below to Bill's comments on using other drivers than the ones he used in his design. The Linus 1 plans available from me for the price of an e-mail to those interested. Rick Craig also would likely fulfill requests as well. I would say that the Silver Flute 5" driver would make a good driver for a line array design but again this would be a new design. As I suggested earlier, John Janowitz at Stryke Audio likely will sell his planar tweeters for much less than Madisound or Parts Express which would help meet your boogie price. The Linus 1 would still be my preferred approach as it would be a proven design that can be duplicated without the builder redoing anything. To me that is would be worth the extra $50-75 versus coming up with a new or iterated design. Jim

Subject: Re: Bill: Re: Your Line Array Design Paper for AudioExpress? Only if no one ever makes another 4 in
Posted by Bill Fitzmaurice on Wed, 14 Jul 2004 20:19:55 GMT
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Jim, you remind me of the wags who pissed and moaned about how sacreligious Mel Gibson's movie about the crucifixion of Christ was two months before anyone had even seen the movie. Of course the whining stopped as soon as it set box office records the first day out of the gate, mostly thanks to the free publicity courtesy of the bible thumpers.Feel free to criticise my design to your heart's content after you've read the article. Oh, no you can't, you cancelled your subscription. I'm sure that Joe D'Appolito, Gerry Koonce, George Augsperger and all the rest at AX will be crushed.I've read your paper and it has some good points but I've gone way past what it has to offer me.

Subject: Re: Bill: Re: Your Line Array Design Paper for AudioExpress
Posted by Jim Griffin on Wed, 14 Jul 2004 20:48:30 GMT
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Bill,I'll be impressed to read how your design performs when your paper shows up. I do hope you suggest how others can iterate your design to their own successful DIY project. Jim