
Subject: New Project

Posted by [Tom R.](#) on Sat, 22 Sep 2007 03:17:15 GMT

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After about 9 months of putting together a line array project, I finally have a quasi array in my living room playing music. Initial impressions are the sonic benefits of a line array, good dynamic range, lots of slam/punch, very good sound stage. They have a few problems but these will be corrected in time, or at least made tolerable. I consider this a long-term project, and this is just a phase. I have started with a quasi line array due to budget constraints, and initially using what equipment I have on hand. I have read Jim Griffin's white paper several times and heard a few line arrays, but I am in no way an expert, only an enthusiast, so technically they have issues, but that's OK. Each mid bass cabinet consists of eight Focal 5-1/4" mid bass drivers, model number 5K013L per side. These drivers are no longer in production. I owned 8, and purchased 8 more used drivers on E-BAY. These are very good mid bass units as long as the crossovers point is low, as they have a nasty top end that is very fatiguing. The tweeter is a single Raven 1 ribbon tweeter per side. I know this is not a good match with the mid bass units, as the Raven 1 needs to be crossed over high. So just for now the mid woofers cross at 2400 Hz. 4th order, and the Raven 1 is crossed at 3000 Hz. 4th order. I figure if I had to have a problem with the response around the crossover I believe a "dip" is better than a "spike". Your ears can hear a rise in frequency response but a dip is more forgiving. The mid bass driver is wired in a power tapering scheme. So far I have not tried any series/Parallel arrangement. Initial listening of the quasi line array with a single tweeter and power tapering to the mid woofers gives the sonic benefits of a line array, but the sound stage is a little more focus like a point source – this is only an observation, I went a little over board with the cabinets, I have not built anything in a while, so my time was the cheapest portion of the project, and building them was an excellent break from the working world. The cabinets are MFD with sections of 6" schedule 40 PVC pipe making up the interior walls of the individual driver boxes. Each box separated by a horizontal piece of 1/2" MFD with holes drilled outside the PVC sections. Once assembled, I left the top off the cabinet and poured a mixture of sand and granular rubber in the top of the cabinet allowing the mixture to flow down to the bottom of the cabinet and fill the cabinet from the bottom up. This created a constrained layer dampening effect between the PVC inner structure and the outside wall of the cabinet. One drawback is the cabinets are now 125 pounds each! The PVC walls are non-parallel, and naturally curved, so they should help break up internal standing waves. The mid bass units are individually sealed and the volume is calculated for a dampening factor of .707 and an f-3 of 106 Hz. I also routed out the area behind each driver so they could breathe. I routed the area by hand, not the best job, but it works. The cabinets were assembled with liquid nails construction adhesive using simple butt joints, and lots of clamps. This project was intended to be used with a sub woofer. I have a stereo pair of very good subs but I do not have them in the system at the moment. I wanted to hear the bass from the new speakers before adding the subs. If you listen to a descent recording that has some bass content the speakers have that punch/slam factor I really like. But if the recording is poor they can sound anemic, but that is to be expected with sealed drivers in the alignment I used. The sound stage is solid with every recording I listened to. But if a CD was well recorded / mastered, the speakers through a very wide sound stage, this I liked very much. Over all I think the initial phase is a success, technically not perfect, but a start. You just cannot beat lots of drivers moving lots of air. The summed cone area of the 8, 5-1/4" mid bass drivers per side is almost the same cone area of a single 12" speaker! I encourage anyone thinking of building a line array to jump in with both feet, the rewards are worth it. Whether you

build your own design or purchase a kit, I am a believer. I have had the chance to hear ART arrays, and for the price they sound very good, for only \$350 worth of parts, plus cabinets! Some construction photos: <http://s212.photobucket.com/albums/cc167/tomr3399/?mediafilter=all>
<http://s212.photobucket.com/albums/cc167/tomr3399/?mediafilter=all>

Subject: Re: New Project
Posted by [Marlboro](#) on Sat, 22 Sep 2007 14:48:34 GMT
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Since its just attached to the side, you might want to consider a high quality dome tweeter that would more effectively match the speakers. it would be an easy switch back and forth. Don't you have some dispersion issues with the single ribbon? marlboro

Subject: Re: New Project
Posted by [Tom R.](#) on Sat, 22 Sep 2007 20:43:41 GMT
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I do not think so, but what do you think I should look for? I do have an older pair of Focal 3/4" inverted titanium dome, and a pair of Accuton C2-11, 3/4" inverted ceramic tweeters that I planed on trying in the near future. both tweeters are in the 88 to 89 dB sensitivity, so I will have to pad down the mid woofers to match the tweeter levels. When I get a chance I will give the different tweeters a try and report back on what I hear. Actually I am thinking of selling the Ravens, Accutons and Focal tweeters and purchase a pair of high quality ribbons that can be crossed very low say 1500 Hz. Or purchase some of the cheaper plainers to form a true line array

Subject: Good job
Posted by [jack](#) on Sun, 23 Sep 2007 03:08:47 GMT
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I like it! Looks like a lot of work but I believe it paid off!

Subject: Re: New Project
Posted by [Marlboro](#) on Sun, 23 Sep 2007 11:15:56 GMT
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Ribbons seem to have a fairly narrow vertical dispersion, which is why they are used in GROUPS in line arrays. As Rick Craig says, they have "lower interference patterns in the vertical plane." So if you have them facing exactly at ear level they should be great, but if you are shorter or taller of seated stature or if you stand up, the tweeter sound should go away. Do you hear anything like that? Alternatively, you could run a line of neo domes 30 strong down the side. You'd have to cut the flanges to .9 c-to-c but this is easily done with a jig saw. The sensitivity of this is 106 db, so electronic crossovers and bi-amplification is a better way to go than padding the tweeters. Marlboro

<http://pub48.bravenet.com/photocenter/album.php?usernum=4095425731&album=48032>

Subject: Re: Good job

Posted by [Tom R.](#) on Sun, 23 Sep 2007 19:20:39 GMT

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Thanks - One thing I wish I would have done, is performe a test with the cabinets empty and one with the sand granular rubber. Just to see if the mass loading made any difference in the sound. But I got too anxious, put the mixture in.

Subject: Re: New Project

Posted by [Tom R.](#) on Sun, 23 Sep 2007 19:29:07 GMT

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Initial listing with the ribbons 10 inched below ear level sounds good. I have sat on the floor at ear level and I don't hear any difference. I have some additional woodwork to complete, I will be adding a footer platform with heavy-duty castors so I can move them into the room for listing, which will raise the ribbon close to ear level

Subject: Re: New Project

Posted by [Marlboro](#) on Mon, 24 Sep 2007 18:35:17 GMT

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So far so good. You won't know for sure until you have both operating in your listening environment. But you have plenty of options should it not sound quite as you wish. Marlboro

Subject: Re: New Project

Posted by [FredT](#) on Wed, 26 Sep 2007 11:52:08 GMT

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Nice looking speakers, Tom. Probably the best line arrays in Cajun country. Ribbons that can be crossed over at 1.5K will be expensive. Have you considered the Fountek NeoCD2? It can be crossed at 2kHz? Its limited vertical dispersion will make this a speaker that requires the listener to be seated, but you could later add additional ribbons to make a full tweeter array. Both Jim Griffin and Rick Craig have used this single ribbon tweeter configuration in a midwoofer array using either the 5" Fountek or Aurum Cantus, and both were well recieved by listeners who heard them. Regardless of which tweeters you use the crossover is critical for achieving their full potential. When I'm building a cheap line array I don't hesitate to "wing it" with my inadequate crossover design software, but if I were spending significant \$\$\$ I would pay a bit more and have one of the line array gurus design a crossover that optimizes the sound.

Subject: Re: New Project

Posted by [Tom R.](#) on Fri, 28 Sep 2007 01:13:22 GMT

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Thanks for the advise Fred, After listening to your array systems, I took the plunge, and really like the results. This a great long term learning project for me, that already sound better than most commercial speakers I have heard Yes, I have considered the NeoCD2, but I will play around with tweeters that I have on hand for a while and see how they interact with the mid-woofer array. Cash is short at the moment, so I have some time to figure out what to do next. Maybe some time in the future, I will pack the line arrays and the subs and come to Houston one Saturday!
