Subject: That line array sound
Posted by lcholke on Tue, 14 Jun 2005 10:58:59 GMT
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I was once listening to a set of fostex fx200 drivers (ob mounted) and was wondering why they did not have the punch of my 16 array. Well punch may not be the right word, but they had horn dynamics without the horn tones. Then I moved about 1 or 2 ft from the fostex driver and they were there (turned down when close). A while back when I had a chance listened to the needles line array it had that line array punch also. Jim Griffin gave a talk at the Dayton DIY meet and noted the two different sound types. Jim was contrasting the nearfield and farfield sound. He did not go into the cause and I did not think of asking him. Has any one else noticed this, better yet have an idea why?-Linc

Subject: Re: That line array sound
Posted by cmanning on Wed, 15 Jun 2005 11:11:54 GMT
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I've got to believe some of it just the radiating area. 16 NSB's=2*2*3.14*16= 200in^2. Fostex 8"=50in^2. Four times greater. I also think that the smaller speakers "launch" faster on dynamics. Cone weight is lighter and the mass of air directly in front of the cone is much lighter. Hence faster? Isn't that punch?

Subject: Re: That line array sound
Posted by lcholke on Wed, 15 Jun 2005 11:38:51 GMT
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The same effect happens with the nsb. Each 1, 4, & 16 stack have a different "sound" at different distances. The 1 needed to be 3', the 4 was good at 4' to 8', and the 16 liked +6. To far away on the 1 & 4 and the sound is mushy again.-Linc

Subject: Re: That line array sound
Posted by Anonymous on Wed, 15 Jun 2005 16:12:11 GMT
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>>Cone weight is lighter and the mass of air directly in front of the>>cone is much lighter. Hence faster? Isn't that punch? There is alot of myth and voodoo in audio. I don't buy into thesmaller drivers have better attack, punch, etc. I don't think theligher cone plays a big role either. I think

Adire had a white paperon this? Based on my listening experience what gives me punch is SPL andamplifier headroom. I think it's that simple. I can drive my 8" midrange rated for 100db sensivity with a 600 watt bridged amp(160v headroom) and I have amazing punch and the crack from thesnare drum is ear shattering on transients. People using hornspeakers say the same thing about punch, well they get alot ofSPL from horns and if you amp has alot of headroom the transientswill have less distortion.I have an NSB array and the speaker cones are treated with 6 coats oflacque and there is just as much punch as without the mod, the onlydifference is a slight loss of sensitivity by doing this mod but thesound is superior to the untreated speaker. The loss of sensivitiydoes get interpreted as not playing as louder unmodded but to offset this I just turn up the amp a few notches.Recently I did an interesting NSB array test to see how much punchI can get form the NSB array. The system is full active with two amplifiers and 'digital' crossover. The NSB's are wired for 2 ohms per channel and a QSC RMX 2450 drives them. The amp is rated forabout 1200w/ch @ 2 ohm. The NSB's are rated for 5 watts rms and I'veclipped the amp on ocassion and there is no burning smell from the speakers so the array is handling that power playing music which hasa much lower duty cycle than playing sine waves in which case I probably would be smoking the NSB's -> {which I have done on my testbench prior to building the array}.The punch is pretty good as the amplifier has 110v rails so the clipping headroom is about 110v.The lastest test I did was to bridge the QSC for 220v of headroomand test one tower. The problem is. The amp is not rated for 2 ohmsin bridged mode but because the NSB's are not going to draw tons ofpower I figured it would work and it did.Having that extra power/headroom was noted, but I felt that it wastoo much for the poor ole NSB to handle as I didn't want to push itto 100% continuously, I did clip the amp to test the sound and itwas pretty intense. I played music at 75% from clipping and I had the perception of more punch just because I increased the power/headroom.I also had an uncanny sense of more depth to the sound but I can'tform final conclusion doing an auditon in mono, I need anotheramp to do the test in stereo. Who knows, I had do it. /lolI may do the long overdue ferrofluid mod to the NSB in which casethe power handling get a huge boost but I don't know the longterm {years} effects of having coolant inside the drivers becauseof the materials used to create the driver. Since these are 49 centspeakers I probably will mod another 32 of them {I have 288 morein stock} with the coolant and get another amp to show peoplewhat a 49 cent driver can do mated with 5kw of power. /evil/fun stuff

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Subject: Re: That line array sound
Posted by Jim Griffin on Thu, 16 Jun 2005 02:09:52 GMT
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Linc,Two observations I would make that impress me about line arrays are their dynamic response capabilities, how near field arrays sound, and their integration distance. 1. Dynamic range. The lack of compression and the higher SPL capabilities are very much horn like in sound when you have a line array as it typically would have 10 dB or even more higher SPL output than an individual driver. The ease that a line array can produce sound is like have an amplifier on steroids. 2. Near field response. As you clearly suspect the near field response does sound different than far field performance. In the near field you'll have more uniform volume in the room--both front to back and even side to side. Often listeners who are accustom to hearing point source speakers will notice the wider image spot from a near field array. Some may like the wider imaging but you have to hear it to sense the difference.3. Integration distance. With a line array if

you listen a few inches away from them you can likely hear a different sound than if you are several feet from them. I recommend that you listen a least a distance equal to the length of the line away from them. Hence, for a 6 feet tall line try listening 6 feet or more away from them. Now if you get too far from the source, you'll be in the far field so that may not sound the same as the near field sound. Jim

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Subject: Re: That line array sound
Posted by Earl Geddes on Tue, 21 Jun 2005 17:58:56 GMT
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This topic came up on another list having to do with the perception differences when one moves closer to a speaker or farther away.There are a lot of posts talking about the "near" field when in fact I think that they mean the direct field. The direct field is when one is close enough to the source that the reverberant field is negligable. This is different than the near field. The near field is when you are so close to the source that the sound does not drop with distance as it does in the direct field. In fact the near field can be very complex with nulls and peaks at different points and at different frequencies. Generally the near field is to be avoided. The near field is hard to define without mathematics so thats why its definition seems nebulus. With math its quite precise.When one is in the direct field the imaging is precise because the early reflections of the room are surpressed - more initial, direct, sound. Array have high directivity so the direct field extends further out than it does for a small source - where the direct field is very small. Thus the array will almost always have a higher direct to reverberant ratio. BUT, one can move close enough to any source to get this same ratio.I think that this is what you were perceiving.

Subject: Re: That line array sound
Posted by lcholke on Fri, 24 Jun 2005 14:30:17 GMT
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Hi Earl,Thanks for the comments. They are right our of your book. On page 68 , fig: 3-15 , it looks like you do not assume a plane wave front in the nearfield. The figure shows cancelation due to ray length differences. On page 59 you say the line source is assumed to have uniform velocity. Could you comment on why the plane wave is calculated(3.7.69) as a series of point sources. Or, have I missed something.-Thanks Linc

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Subject: Re: That line array sound
Posted by Earl Geddes on Fri, 24 Jun 2005 22:43:26 GMT
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Linc wrote: They are right our of your book. On page 68 , fig: 3-15 , it looks like you do not assume a plane wave front in the nearfield.One cannot assume a plane wave in the near field. The correct analysis comes from taking the sound radiation from each infinitessimal element and integrating over the entire source. This is exactly what EQ. 3.7.68 does. The radiation from the infinitessimal element is the Green's Function for the proper coordinate system. In the cylindrical case it is the Hankel Function which then becomes EQ 3.7.69.All sound radiation problems come down to solving EQ. 3.7.68 or something very much like it. So where deos EQ 3.7.68 come from? This comes from a solution of the scalar wave equation by using Green's Theorem to find this solution as an integral over the boundary of some enclosed volume. One bounding surface is let go to infinity, where the solution must go to zero, and hence the integral goes to zero on this surface, leaving a solution as an integral over the source only. Complex math, but it is the classical approach. BEM is a direct solution of this bounding integral done on elements numerically. Thus it can be used for any source shape - however this approach has its problems too.