Subject: macintosh xrt 29
Posted by mr hayes on Fri, 01 Apr 2005 21:55:40 GMT
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Hrllo: I have been looking around for a project to do. Recently I found the xrt 29 macintosh speaker. Looks like an interesting design. Any one has any idea of the drivers or info on how to clone them.Thanks

Subject: Re: macintosh xrt 29
Posted by cmanning on Sat, 02 Apr 2005 13:15:32 GMT
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I have listened to that speaker and it's all about the "line array experience." I have an intention to build a "similar" speaker, but not a clone. I have built a couple of NSB 16 speaker arrays with either Onkyo or PT-2's. They are running off gainclones ~ very nicely I might add. Friends bring over "favorite" CD's to really listen to the recording. I posted a similar question several months ago and would LOVE TO HEAR JIM GRIFFIN opine on the McIntosh design. His paper is one of the few technical resources on arrays. However, I am unable to fully integrate his information especially regarding a double line of 4" speakers. The new design will use 34 NSB's and 7 PT-2's. I will drive the pair using a 4-channel Aleph and MOX active crossovers. Bases will include my present Tuba 18's running off a plate amp. I am willing to take the Pepsi challenge with an NSB clone against the 29's.Wiring? Balanced or tapered? My original thought is tapered. That's how I came up with the odd number of 34 drivers. Now all I have to do is find that piece of scrap paper! My personal opinion is that I can't hear much differenceThe 29's are using a 4" driver with a long line of 1" tweeters. I don't think the 1" tweeters really give you the sound of the ribbons and they are a pain in the ass to wire. I wouldn't do the 1" line again even if they were free... too much work. As for the M-T-M horizontal arrangement of the Mac's, I think there are real technical advantages (less lobing) to the MM-T arangement. One of the design challenges will be to reinforce the baffle with strong backs if they are built with MDF. This will be especially true with a second line of woofers. The structure of the baffle will be pretty weak without a little something in the back. McIntosh uses an extruded aluminum enclosure (not sure about the baffle???) and that might be a reasonable solution. It would be quite possible to job out the baffles for laser cutting, right down to the mounting holes that could be tapped later. One need only to supply the DXF file and pick up the parts the next day. You would also have the opportunity to form the sides in a nice radius (for some BSC). One would simply need a decent plan for dampening the baffles. Epoxy and cement board? That would be pretty dead. McIntosh is a boxed speaker, my intention is to build an open baffle. Even with a box, the 3" and 4" speaker choices are petering out at 150-200Hz, so you need something low. The Tuba's are VERY tight and the 18's are a decent match for the arrays. The other big question is the baffle step. I don't think that I can sell a 30" baffle to the little Mrs. ~ she's a good earner and I would like to keep her around.Anyway, the boat went in the water yesterday and I must go to the shop and fabricate spinnaker cranes for the mast. Sailing season has started and (other than the mess in the den) DIY audio season is soon in a 6-8 month moratorium.

29's

Subject: Re: macintosh xrt 29
Posted by cmanning on Sat, 02 Apr 2005 13:19:56 GMT
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...and by the way, I'll never go back to point source boxed speakers.

Subject: MacIntosh XRT 29 Comments
Posted by Jim Griffin on Sun, 03 Apr 2005 17:15:15 GMT
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Actually the Mac design isn't too shabby. If you look at the owners manual it gives you details like driver spacings, line lengths, crossover frequency, etc. so you can defer a lot about this array's theoretical performance. The woofer and tweeter line lengths are long enough to enable most any normal listening room to be in the near field. That is a good thing. With the side by side mids the concern is to have them spaced close enough and use a low crossover frequency so that any M to M (side to side now) would be minimal. This would minimize any off-axis nulls in the horizontal dispersion in the frequency range covered by the mids. This spacing is 6.75" (one wavelength for the M to M centers is 2008 Hz and cncellation would occur at twice that frequency) and the crossover is at 1700 Hz. The side by side mid-woofers yield symmetrical horizontal dispersion radiation and minimizes any lobing assocatied with the low order (2nd and 3rd) specificed crossover slopes. The tradeoff that the designer has to consider is the small diameter of the mids (closer M to M spacing) and low crossover frequency that would be dictated by this side by side configuation. The smaller mids would also limit the array's lower frequency extension as it does in this design. The vertical M to M spacing is on 4.5" centers (one WL is 3013 Hz). With the crossover at 1700 Hz you should be free from comb lines even with the second and third order crossover slopes. The T-M spacing is 3.375" (one WL at 3616 Hz) so again with the low crossover you will maintain good dispersion as sound transitions from mid woofer to tweeter lines. I'm troubled by the tweeter to tweeter spacings as anyone who has read my white paper would understand. The center to center spacings for the tweeters is 2.75" (one WL 4931 Hz and two WL 9863 Hz). Hence, you'll have the first cancellation at 9863 Hz and vertical axis comb line effects in the upper octave (10-20,000 Hz). Likely the tweeter line sensitivity in the upper octave will also show a downward slope so that the crossover would have to attenuate the lower part of the tweeter band to flatten out the overall band. Bottom line is that the tweeters are too far apart to cover the upper ocatve without comb lining and associated sensititivy reduction.You know I really like a line of planar or ribbon drivers instead of dome tweeters which would alleviate these tweeter line issues. You can improve this design by spacing the tweeters closer but it would require more drivers and even then you really need to get the center to center spacing within 1.35"--preferably less than one inch. If I were doing a design with dual rows of mid-woofers, I would use ribbon tweeters and crossover low enough to minimize the side by side mids effects as done by Mac.

The keys are the low crossover frequency and the close spacing between the mids. The ribbons would be able to alleviate the dome tweeter issues assocaited with this design. Jim
Near Field Line Array White Paper

Subject: Re: MacIntosh XRT 29 Comments
Posted by cmanning on Sun, 03 Apr 2005 19:55:18 GMT
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Thank you Jim for your analysis as this will be my next project. Do you reckon you can cross the PT-2's at ~3000Hz (2nd order) safely, as this is their lower limit per specification?What do you think about baffle & wings in aluminum sheet?

Subject: Re: MacIntosh XRT 29 Comments
Posted by Jim Griffin on Sun, 03 Apr 2005 23:06:24 GMT
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Well, if you read what I said about the Mac design you should realize that 3000 Hz is too high to cross with this design unless you use smaller than 4" diameter drivers spaced really close together. You need to be shooting for a crossover in the low 2000's Hz(possible) or sub 2000 which the PT2 can not do. I have used the PT2 type planar as low as 2300 Hz (third order). Unless you have skill in metal work or access to such technology, I would be thinking of what you can do with wood working skills. You can build a rectangular box similar to the outside dimensions of the Mac box and brace it to strengthen the baffle. I have used multiple full shelf internal braces in similar wide face boxes. I don't understand what wings would for you unless you are thinking of an open baffle application. If you go open baffle, you need to equalize a lot to cover the lower freq ranges plus add stereo woofers to cover the bass area. The NSBs are too small and inefficient (bass wise) to do much for you down low without a lot of dipole EQ. Maybe 34 NSBs per side will help but EQ will be needed to make the open baffle work. By the way, you mentioned rounding the baffle edge for BSC. Rounding of the front baffle does nothing for BSC but does help baffle edge dispersion higher in frequency. With your active crossover the BSC you will have to be EQed (that is if you are using a vented or closed box). Of course no BSC for open baffle but dipole compensation will have to be done for good results.

Subject: Re: MacIntosh XRT 29 Comments
Posted by cmanning on Sun, 03 Apr 2005 23:43:47 GMT
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...3000 Hz is too highOK. More thought will be required here....skill in metal work or access to

such technology.Both. Possibility exists to go directly from .dwg to CNC laser cutting. Buy some metal and call in a favor....open baffle applicationI just can't go back to boxes. I'm running NSB/PT-2 arrays now and filling in the bottom with Tuba 18's. I like it. The arrangement would be similar for the planned 34 driver baffles....no BSC for open baffle but dipole compensation.Understand.

Subject: Re: MacIntosh XRT 29 Comments
Posted by jdybnis on Mon, 04 Apr 2005 00:54:05 GMT
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Jim said:You need to be shooting for a crossover in the low 2000's Hz(possible) or sub 2000 which the PT2 can not do. I have used the PT2 type planar as low as 2300 Hz (third order).cmanning,The higher the order of the filter is the lower you'll be able to cross. If Jim used a 3rd order at 2300Hz. You could certainly drop it to 2000Hz with a 4th order slope. Probably even lower if you wanted too.

Subject: Re: MacIntosh XRT 29 Comments
Posted by cmanning on Mon, 04 Apr 2005 02:03:34 GMT
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PE's specs are 3000 on a second order and 2500 on a third order. So that's pretty close.

Subject: Re: macintosh xrt 29
Posted by Anonymous on Mon, 04 Apr 2005 17:49:48 GMT
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>>The new design will use 34 NSB's and 7 PT-2's.Is that a single column of 34 or dual 17's ... per tower.

Subject: Re: macintosh xrt 29
Posted by cmanning on Tue, 05 Apr 2005 00:09:57 GMT
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Dual
