Subject: If you ...
Posted by Rick Craig on Fri, 31 Aug 2007 23:27:53 GMT
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... want to build an array what kind of budget would you have?

Subject: Re: If you ...
Posted by FredT on Sat, 01 Sep 2007 10:34:25 GMT
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Rick, is this a general question or a response to somebody's information request?

Subject: Re: If you ...
Posted by Rick Craig on Sat, 01 Sep 2007 14:58:12 GMT
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I've proposed a new design on the PE board and someone suggested I also start a thread here. The budget on this can vary quite a bit so I wanted to see if I could get some input.

Subject: Re: If you ...
Posted by Marlboro on Sat, 01 Sep 2007 15:49:03 GMT
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What are you hoping to accomplish with a new design that wasn't already accomplished with the designs you currently sell?I should think that you would need to have specific goals in mind before you get started.I did.

Subject: Re: If you ...
Posted by Rick Craig on Mon, 03 Sep 2007 02:24:48 GMT
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The goal is to produce an array of reasonable size with symmetrical coverage in the horizontal plane that can cross to subwoofers in the 100-150hz range. I already have chosen a group of

drivers that will meet the criteria so it's just a matter of what your budget is and desired system impedance.

Subject: I'm confused.....
Posted by Rex on Mon, 03 Sep 2007 08:06:34 GMT
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How is this different than say your XT8's, with your Citrine sub woofers adjusted slightly? It would seem that by adjusting the crossover you would already have what you are proposing to build.I'm confused.

Subject: Re: I'm confused.....
Posted by Rick Craig on Mon, 03 Sep 2007 13:29:26 GMT
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This is very different from the XT8. The goal here is not to "beat" the other arrays in performance but to offer a less costly alternative that will perform very well. The tradeoffs:1) Lower sensitivity than our other arrays (88-91db target)2) Higher crossover point to the subwoofer (100-150hz)3) Less Sd (surface area) due to the smaller woofersAdvantages:1) Lower cost2) More tweeter choices to meet different budgets3) Symmetrical coverage4) Smaller cabinet footprint with less weight5) Options for system impedance

Subject: More questions?
Posted by Rex on Mon, 03 Sep 2007 15:58:27 GMT
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Do you plan to offer it as a kit like some of the others?What mid ranges have you selected as possible choices to reduce cost?Why does "symmetrical coverage" mean?How many tweeters? And how many mid's do you think you will use?Will it be a passive crossover design or an active design?Do you expect to use separate cabinets for each of the mids or one giant cabinet for all?Rex

Subject: Re: More questions?
Posted by Rick Craig on Mon, 03 Sep 2007 17:20:09 GMT
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Yes, I would offer it as a kit. There are drivers from AuraSound and HiVi that will work very well (maybe some others as well but I'm focusing on these). The symmetrical coverage is allowed with a line of woofers on each side flanking a line of planar or ribbon drivers. McIntosh has some similar designs except they use dome tweeters for the center. The amount of drivers can vary from 16+ woofers per line (64+ for a pair of arrays)and 8+ for the planar/ribbon tweeters (16+ for the array pair). I'll provide a passive design crossover but it could easily be driven active with the right active crossover. One long cabinet about 12" wide and 12" or less deep. And of course the guinea pig gets the best price

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Subject: Re: More questions?
Posted by Rick Craig on Mon, 03 Sep 2007 18:16:50 GMT
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Thanks for your kind comments. I tend to prefer the sealed arrays because it allows for a more compact cabinet and good integratiion with subwoofers. Ported arrays are fine provided you have a woofer that can give you good low end extension with a -3db point in the low to mid 40's. There are very few 5" drivers that will do that without active EQ so that's why I often suggest a 7" for ported arrays. Of course the cabinet size increases quite a bit so you have to keep that in mind.Open baffle arrays present different challenges and in order to cross over to a subwoofer you need to apply a great deal of equalization. You also need a fairly wide baffle and for many wives this isn't possible  There's also the problem of making it stable because all of the weight is at the front of the cabinet. There are also some design issues to overcome in terms of room response.Having worked with the Eton drivers I think you'll find them better suited to a closed box versus open baffle.

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Subject: Re: More questions?
Posted by Rex on Tue, 04 Sep 2007 02:22:58 GMT
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Re:  The symmetrical coverage is allowed with a line of woofers on each side flanking a line of planar or ribbon drivers. McIntosh has some similar designs except they use dome tweeters for the center.What would be the advantage sonically of putting in four lines of woofers?  It would certainly double the cost.

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Subject: Re: More questions?
Posted by Rick Craig on Tue, 04 Sep 2007 02:50:08 GMT
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Do you mean four lines of woofers per speaker?

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Subject: one idea
Posted by lcholke on Tue, 04 Sep 2007 14:02:04 GMT
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Hi Rick,Have you considered a 4 stack box. As the owner got more funding for the project they could add more speakers on top. The x-over would have to be on the outside since adding 4 more drivers would change the sound. -Linc

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Subject: Re: one idea
Posted by Rick Craig on Tue, 04 Sep 2007 19:37:52 GMT
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Adding more drivers changes the crossover and can also change the wiring configuration. With that in mind I wouldn't go that route but if you're running active it certainly would be easy to do. I'm also not sure how much of a negative effect the gaps in the lines would be.

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Subject: Re: More questions?
Posted by Rex on Wed, 05 Sep 2007 02:06:18 GMT
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No....two lines of woofers with a line of tweeters in the center.  Isn't that what you were talking about when you said symetrical?

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Subject: Re: More questions?
Posted by Rick Craig on Wed, 05 Sep 2007 03:36:00 GMT
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The extra line of woofers will provide identical coverage in the horizontal plane to the left or right. With a single line of woofers this isn't possible though you can correct for it with a DSP crossover like the DEQX or TacT. The second woofer line also is of benefit to the smaller drivers by doubling the surface area and increasing output capability.

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Subject: Re: More questions?
Posted by Marlboro on Wed, 05 Sep 2007 10:16:39 GMT
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Re:  "The extra line of woofers will provide identical coverage in the horizontal plane to the left or right. With a single line of woofers this isn't possible though you can correct for it with a DSP crossover like the DEQX or TacT."OK(if I may step in here).... But what is the hearing difference and what is it that you are correcting for that you can hear a change for?  Since I have a line of 16 3.5 inch woofers connected to a line of 3/4 inch dome tweeters with flanges cut to a c-to-c of about .9 inch, what difference would I hear by adding anther line of 3.5 inchers on the other side of the tweeters?  I'd also have to be careful of the distance between the woofers causing potential horizontal comb filter issues.

Subject: Re: More questions?
Posted by Rick Craig on Wed, 05 Sep 2007 11:49:22 GMT
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Adding another row of 3.5" woofers won't help your design; in fact, it will make things worse because of your driver selection.

Subject: Re: More questions?
Posted by Marlboro on Wed, 05 Sep 2007 16:45:59 GMT
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And why would that be?  I hate general blind statements that don't have any facts to support them, as if they are painfully obvious.The Macintosh symetrical design speakers that you alluded to use a design that is similar in the speakers to mine, except that the vertical combing of the tweeters is a nightmare, and the horizontal combing is also a nightmare.Are you saying that your proposed design using symetrical is better than the McIntosh, or are you just into dicing my design again. (I'm hoping that you have reasons and that its not the second, because then you have violated our agreement and freed me from it also.)Marlboro

Subject: Re: More questions?
Posted by Rick Craig on Wed, 05 Sep 2007 17:07:22 GMT
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Why would the vertical or horizontal combing on the McIntosh be any worse than your design?

Subject: Lets try this again.....
Posted by Marlboro on Wed, 05 Sep 2007 18:48:28 GMT
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Let's try this again.The MciNSTOSH design has dome tweeters that are about center to center distance is 2.75 inches apart.  This causes vertical comb filter distortion to start at roughly 5000hz, which for most people should be clearly audible.  While I use dome tweeters too, mine are not 1 inchers, they are 3/4 inchers, and the flanges are cut so that the vertical comb filter distortion for me doesn't start until roughly 15,000hz.I have only one line of mid ranges so I don't have to worry about getting the close enough to avoid horizontal comb filter distortion.  I can't tell from the McIntosh photo whether this is an issue since I don't know what the crossover to the tweeter is. But it may be an issue with the McIntosh models.My midranges are 3.5 inches but my center to center distance is 5 inches.  This means that I need to cross my mids to the tweeters at  at least 2671hz to avoid audible comb filter distortion.  I cross them at 2400 using a 24 db octave electronic crossover, and I use 30 tweeters  per side, so that each one carried only 3.3% of the total tweeter load.It looks like the McInstosh need to cross at less than 1600hz or so from the c-to-c distance vertically.  If they had used ribbons or planars like you do, this wouldn't be a problem, but they've used some kind of dome, so this is a problem.  I don't know any 1 inch domes that will cross at 1600hz adequately.MY SYSTEM WAS DESIGNED USING JIM GRIFFIN'S RESEARCH AND WITH HIS HELP, AND IS VERY DIFFERENT THAN THE MCINTOSH MODEL.  BUT WE'VE HAD NUMEROUS DISCUSSIONS ABOUT THIS IN THE PAST AND YOU ALREADY KNOW THIS.Marlboro

Subject: Picture differences
Posted by Marlboro on Wed, 05 Sep 2007 21:48:21 GMT
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McIntosh xrt28(http://www.mcintoshlabs.com/mcprod/shopdisplayproducts.asp?hid=1&id=20&cat=Loudspeaker+Systems&prodid=1042&product=XRT28)vsThe Calipsohttp://pub48.bravenet.com/photocenter/album.php?usernum=4095425731&album=48032 Pictures are clearly different.

Subject: Re: Lets try this again.....
Posted by Rick Craig on Thu, 06 Sep 2007 02:28:37 GMT
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The issue with adding a second line of 3.5" drivers to your design is that the tweeter won't cross low enough. Even with a single line of 3.5" drivers a dome that small is not a good idea and it can easily be proven with good measurements. Why do you think Jim Griffin has only used planars or ribbons in his arrays?Not all of the McIntosh arrays use the same spacing and driver sizes;

however, keep in mind that some of the small drivers they use can be crossed lower than what you use because of the way the drivers are designed.

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Subject: Re: Picture differences
Posted by Rick Craig on Thu, 06 Sep 2007 02:32:48 GMT
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See my comments above.

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Subject: Just a restatement of what I said about the McIntosh
Posted by Marlboro on Thu, 06 Sep 2007 11:06:24 GMT
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You've simply stated what I said about the reason why the McIntosh that I referenced probably doesn't work except in certain seated places.I never had any intention of adding another row of mid ranges. But then again I've not heard a description from you as to how the sound is better by doing so over a single line.As to using ribbons planars over domes, one has to cross lower with planars than domes. There is nothing in Jim's work that precludes the use of domes. Using ribbons or planars just gives more choices, and higher quality choices. However when you compare using 8 PT2 planars to using 30 domes, the sound issue quality disappears.Of course if you use enough of them, like more than 60, the %age of covering of the band can be so low that they are hardly stressed at all. But the whole design system is widely different than using ribbons or planars. You have to allow for that if you want the dome tweeter sound. My own experience is that only 3/4 inch domes will work though. ONE inchers are too big to make the c-to-c work. 1/2 inchers might work but nobody makes one that doesn't have a huge flange. If someone were to make one that allows a tight edge of dome to edge of dome contact like can be done with the one Dayton Neo they would be super.Domes can be used in Line arrays; small 3.5 inch mid ranges can be used in line arrays. However this combination requires a narrower choice of speakers, and requires a much tighter management of parameters than does the use of a larger mid range and planar/ribbon speakers. You can't cut any corners at all if you want to make it work, and that includes mandatory electronic crossovers, and separate enclosures for each midrange speaker,plus paying very close attention to the c-to-c distance.And unfortunately for anyone who likes to buy really expensive raw component speakers, one has no options.If you want to argue this point, I have no problems keeping it up as long as you want. I listen to my speaker system every day. And you have never even tried to build using my approach much less listened to anyone who has. Unfortunately, if history is any reference you will start making derogatory comments about my design. This will then negate our agreement. Don't go there. I have nothing to lose.

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Subject: Re: Just a restatement of what I said about the McIntosh
Posted by Rick Craig on Thu, 06 Sep 2007 12:46:33 GMT
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With the symmetrical woofers the lobe will be identical to the left and right of the speaker. That means better imaging and the same off-axis response to the left and right of the speaker. The second line also increases the surface area so that we can move more air with less compression and lower distortion. The use of planars or ribbons is better for the following reasons:1) better sensitivity2) lower interference patterns in the vertical plane3) can be operated at a lower crossover point than the small neo dome tweeters

Subject: Re: Just a restatement of what I said about the McIntosh
Posted by Jim Griffin on Fri, 07 Sep 2007 01:21:57 GMT
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Marlboro,The symmetrical arraying of dual mid-range driver lines around a line of tweeters does create several potential advantages as pointed out by Rick. You can think of this design as a stack of MTM elemental speakers. The key to successful utilization of this design (as with any horizontal MTM speaker) is to cross over to the tweeter from the mids at a low enough frequency to mitigate lobing issues which would narrow the horizontal plane coverage for off axis listeners. Crossing low necessitates a very close spacing between the mid range drivers and a small width tweeter to assure a wide horizontal lobe in the horizontal plane. The McIntosh XRT28 symmetrical line array design is an example of a line array design that uses the two mid range driver lines and a line of small domes concept. While the XRT28 does have dome tweeters, the drivers are rather different from common small dome tweeters. For example, the Aura Sound NSW1-205-8A (I suspect that McIntosh uses this driver in their XRT28 as the photos indicate this) is a small 1" diameter full range driver (Fs of 220 Hz) which can be used as tweeter in such a symmetrical array. That small driver enables the mids to create a wide horizontal lobe which tight spacing between drivers. The mid to tweeter crossover can be very low in frequency which assure a broad lobe in the horizontal plane. The NSW1-205-8A is listed by Madisound at: http://www.madisound.com/aurasound.htmlYou can gain additional information on the Aura Sound site as well. Robert Greene tested the XRT28 for the Absolute Sound magazine and adds additional analysis in his on-line site at: http://www.regonaudio.com/McIntosh%20Supplement.htmlGreene points out the advantage of this arrangement as the horizontal lobe somewhat limits side wall reflections within the listening room. Thus you'll experience both minimal ceiling and floor reflections inherent with a line array plus minimal sidewall reflections. The sound that reaches the listener is more direct (vs. a mixture of direct and reverb sound) so any room signature is limited. One final point is that you really need to shoot for a center to center spacing of a wavelength (or less) spacing between the midrange drivers for an optimal near field array. That is the vertical spacing of the drivers. What happens is that the amplitude response of the midrange line tends to droop as you go beyond one WL spacing. In the dual midrange symmetrical array you need to shoot for a center to center spacing between the mids in the two lines of a wavelength as well to create a favorable lobing situation.Jim

Subject: Re: I'm confused.....
Posted by jphaggar on Sat, 08 Sep 2007 07:15:31 GMT
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What about your RS8 an already less expensive ( but still costly)high performance solution ? using a woofer that is around 25 $ aluminum cone with a somewhat analitycal sound , what happens if you still go lower in price do you think the equation of price versus performance and sound can be beaten ? JP

Subject: Re: I'm confused.....
Posted by Rick Craig on Sat, 08 Sep 2007 19:02:12 GMT
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With the PT2C planar drivers a kit with crossovers would be around $1,075. The Fountek ribbon would up the cost to $2,425. There are differences between these and the RS8 in terms of sensitivity, output capability, and crossover point to the subs.

Subject: Re: If you ...
Posted by Danse on Sun, 09 Sep 2007 16:23:24 GMT
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How about an updated budget needle with HiVi 14 B4N and one Fountek Neo CD2?

Subject: Re: If you ...
Posted by Rick Craig on Sun, 09 Sep 2007 17:25:36 GMT
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I would place the ribbon to the side so you have the option of adding more ribbons when your budget allows.

Subject: Re: If you ...
Posted by Danse on Sun, 09 Sep 2007 18:20:44 GMT
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What would the other benifits be of adding more ribbons outside of having you locked in the sitting position?In your opinion would be better 1 center Fountek Cd2, or 8 Dayton PT2C?From what I understood you were looking for possible lower cost opions. Needles also have a smaller footprint, that may be appealing to some.Your thoughts?

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Subject: Re: If you ...
Posted by Rick Craig on Mon, 10 Sep 2007 00:40:49 GMT
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If it were me I would prefer eight PT2C's over a single Fountek because it would be a true array. It also gives you better vertical coverage in addition to the smoother power response.

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Subject: ART Arrays
Posted by Wayne Parham on Tue, 18 Sep 2007 13:43:41 GMT
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Have you seen Fred Thompson's ART Array design?  A pair of them costs $350.00 to build.ART Array KitsART Array Test ResultsBuilders of ART Arrays: Impressions

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Subject: Re: ART Arrays
Posted by Rick Craig on Tue, 18 Sep 2007 14:22:58 GMT
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Yes I've seen Fred's design. I've designed "quasi-arrays" with a single ribbon tweeter but prefer to have a line of planar or ribbon drivers.

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Subject: Re: ART Arrays
Posted by Wayne Parham on Tue, 18 Sep 2007 14:49:10 GMT
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I can understand that.  But to me, the biggest advantage of arrays for home hifi is the reduction of floor bounce, which is accomplished with the midwoofer array.  Using a single tweeter is a cost saver.  I think Fred would say that more expensive arrays can be made with definite advantages,

but I think he feels his ART Array design is a good one for the money.  It clearly measured well.

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Subject: Re: ART Arrays
Posted by Rick Craig on Tue, 18 Sep 2007 15:47:00 GMT
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It's really about tradeoffs and unfortunately the extra drivers can make for an expensive project.

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Subject: Ribbons vs domes
Posted by Marlboro on Sat, 22 Sep 2007 10:44:35 GMT
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"The use of planars or ribbons is better for the following reasons:1) better sensitivity2) lower interference patterns in the vertical plane3) can be operated at a lower crossover point than the small neo dome tweeters"1.  30 dome tweeters have a sensitivity of 106 db.  That's pretty high.  8 planar Daytons will come in at 105.  So that's a wash.2.  Theoretically this is certainly true.  Sonically, I'm not entirely sure that its audible.  I've not been able to find any research suggesting that its a viable concern.  Certainly neither the Pipe Dreams people nor the McIntosh people have been concerned about this enough to switch to ribbons.3.  Operating at a lower crossover point is an important consideration: IF YOU ARE USING 6-7 INCH MID RANGE SPEAKERS.  For off axis performance,and for the ability to adequately handle the frequencies between 1200 and 3000, having a lower crossover is very important.  However if your mid range units are 3 inchers, then off axis performance is less of an issue(especially in you average living rooms anyhow) and coverage in the upper midrange is already assured.------A three way line array using (per side) 30 c-to-c .9 inch dome tweeters, 17 - 23 three inch cone mid ranges, and one 12 inch woofer is a viable way to get high sensitivity, and quality sound without using ribbon or planar speakers.  It all twists on the mid ranges.  If you use 6-7 inch mid ranges then you have to use ribbon/planars.Marlboro

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Subject: Re: Just a restatement of what I said about the McIntosh
Posted by JPH on Wed, 28 Nov 2007 17:31:39 GMT
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JimI'm thinking of building a pair of arrays like the XTR 28 .When you look closely at the XTR 28 you find out that the tweeters are spaced by at least one inch wich makes the c to c about 2 inches wich is a source of combing problem ? could you explain?What would be a good candidate midrange to the aurasound 1" tweeter in a price range that would match the tweeter in quality ?As for the woofers I already own 4 12" peerless that I would use from 120 Hz down .JP

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