Subject: Some basic questions about Pi web site and speakers:
Posted by Greggo on Thu, 10 Aug 2006 21:41:24 GMT
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1) Are the prices per pair or per speaker, couldn't find any reference on the web pages?2) Is there a way to convert box volumes for an aperiodic or sealed alignment that would only affect the lower end roll off of the woofer but not disturb the midrange and transition to tweeter that your crossover is designed for?3) Do your speaker plans, such as the Pro 3, include crossover designs and if so, do you sell any of the components or recommend a source for such?Thanks, and I promise not post any more questions for at least 48 hours.GreggoAsheville, NC

Subject: Re: Some basic questions about Pi web site and speakers:
Posted by Wayne Parham on Fri, 11 Aug 2006 03:40:05 GMT
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Prices are for one speaker. We list them that way because some people buy an odd number, like when a center channel is used for home theater. The plans include the crossover schematic. Kits include the completed crossover, ready to install. Box tuning is critical for bottom octave performance and really doesn't affect the midrange, except for bandwidth issues such as intermodulation distortion. In that sense, whatever you do to increase bass extension also increases IMD and, all things being equal, group delay as well.

Subject: Re: Some basic questions about Pi web site and speakers:
Posted by Leland Crooks on Fri, 11 Aug 2006 10:27:19 GMT
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"whatever you do to increase bass extension also increases IMD"Clarify please. I don't think I've ever heard that.

Subject: Re: Some basic questions about Pi web site and speakers:
Posted by Bill Wassilak on Fri, 11 Aug 2006 16:21:06 GMT
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Let's see if I can explain this right. Lets say you have a long excursion 15" woofer operating in a range of 50 to 1Khz with flat response. Then you drop the frequency down to say 25hz well the IMD will go up in the frequency range of 500-1Khz because the lower frequency will start modulating the upper octaves of that operating range. Hence higher intermodulation distortion

from 500-1k.Simple explanation, it's like when you yell into a fan it modulates your voice.Bill W.

Subject: Re: Some basic questions about Pi web site and speakers:
Posted by Leland Crooks on Fri, 11 Aug 2006 17:41:31 GMT
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Thanks Bill. I was familiar with IMD per se, but not as to how it related to changing the response of a driver in a box. I remember when I played with this stuff a lot in the stereo store the IMD would make you think the phone was ringing.

Subject: Intermodulation, phase and Doppler distortion
Posted by Wayne Parham on Fri, 11 Aug 2006 21:59:23 GMT
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Intermodulation distortion is actually caused by two things, each being somewhat related and both involving excursion. One is Doppler distortion, where the cone is moving back and forth from a low frequency tone so a higher frequency cone movement must ride upon this shift, which causes a phase shift. The other is a non-linearity caused when the driver is pushed nearing or exceeding Xmax, where the voice coil has less drive force because it partially moves out of the gap. This causes it to become non-linear at high drive levels.One way to reduce IMD is to reduce bandwidth, so if you crossover the woofer to mid at a lower frequency, you'll reduce IMD. I don't really notice it unless excursion is high, so if you're not pushing a midwoofer too hard, it isn't generally a problem. But if you are pushing a subsystem far enough that IMD becomes noticeable, the best way to solve it is by reducing bandwidth. Either crossover the lower point higher or the higher point lower, or both.Doppler distortion in loudspeakersPhase, Time and Distortion in LoudspeakersPhase Correction - Myth or Magic

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Subject: Re: Intermodulation, phase and Doppler distortion, and then some
Posted by Bill Wassilak on Sat, 12 Aug 2006 06:02:01 GMT
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Wayne,I don't agree with the phase shift theory's because you can't hear phase shift unless there's significant time delay's involved,so I don't agree with this: ::a low frequency tone so a higher frequency cone movement must ride upon this shift, which causes a phase shift.At a certain point the higher frequencies depending what they are, are ethier going to add,subtract or cancel(within the harmonics of the lows, at certain frequencies and x-over points) causing peaks or notches in the overall operating band width of the response.Isn't this modulating (the highs am style, aka IMD) In a limited bandwith the response with respect to the lows??This statement I

some what agree with:::The other is a non-linearity caused when the driver is pushed nearing or (not really) exceeding Xmax,:: where the voice coil has less drive force because it partially "moves out of the gap.(bad news unless your hitting the bottom plate and/or sliding V.C.back into the front of the gap)This causes it to become non-linear at high drive levels.(TRUE).Dont, worry because power compression will set in long before hand which will reduce your output 3-7 db because of voice-coil heating. Even though your amps are at full power and not clipping, so don'tboost your lows if you think there lacking.Time to get off of here,Mr.Seagrams is calling(so I maybe full of s__t)Not sure though.

Subject: Re: Intermodulation, phase and Doppler distortion, and then some
Posted by Wayne Parham on Sat, 12 Aug 2006 21:01:30 GMT
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I agree with you on what you're saying about phase. I didn't go into the matter in much detail, but did provide some links that did. Phase in and of itself isn't audible, but the summing of two signals having a particular phase relationship is potentially audible. When a phase inversion causes a reduction in amplitude, that's audible. So it isn't actually the absolute phase that's audible, it's the frequency anomalies that can result from interaction of two signals that cancel. Of course, when phase moves so far as to become an echo, that's audible too but it's a different issue.Crossovers and phase shiftsBaffle spacing, crossovers and phase anglesPhase, delays and offset baffle spacingBaffle spacing, phase angles and time alignment, revisitedAudibility of PhaseHolism and Reductionism - Fourier SeriesCrossover nullsHorn PhaseTransient Perfect Crossovers"Can't reproduce a square wave"A few more useful documents

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Subject: Crosspost (from diyaudio.com) you may find interesting...
Posted by Greggo on Sun, 13 Aug 2006 16:59:36 GMT
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Regarding the sub design, have any of you guys looked at these commercial designs and attempted to think through if there is something of merit here or not. The first one is Zu Cable's Definition, which seems to follow the "keep cone resonance above pass band" philosophy for there integrated subwoofer, though the use a small sealed chamber for all 4 of those Eminence drivers...http://www.6moons.com/audioreviews/zu2/definition.htmlThe second one that I find even more interesting is the Escalante, which uses compound loading and staggered crossover points, low passing the rear (internal to the cabinet) driver around 80hz and then letting the front driver run well up into the midrange... and claiming that this creates an environment for the front driver to have a controlled resonance of sorts and thus lower distortion and dramatically improve the rise time of the drivers response:http://www.positive-feedback.com/Is...nte_fremont.htmI normally don't pay much attention to the HiFi press or commercial markets as I am slowly moving towards a mostly DIY system, but these two systems really got my curiousity up and the reviews are both a fun read.So the last one got me thinking, instead of taking on the whole mid dome instead of whizzer engineering for super extended range from the woofer, is it possible to take the

framework of Scott's design, and compound load a second B&C 12TBX100 in front of it and run it all the way up to 90hz or even up to 3-600Hz depending on your overall system design goals and the other drivers involved. Thinking about Scotts take on the frequency ranges that constitute hall valume, slam, punch, etc... wouldn't it be nice to have a stereo pair of bass towers that cover it all before handing off to an upper-bass/lower-mid driver in another cabinet that starts the final stage of the journey to a full range system. Of course, that's if there is something to Tierry's patents worth cloning (for our own, non-commercial use of course).Anyways, these two products and their accompaning reviews/descriptions/patents go into territory I have not seen discussed on the various diy forums before, most of the time these things are a big yawn for me and I much prefer the forums, these two struck as worth looking at as closely as possible.Regards,Greg JensenAsheville, NC