Subject: Possibly... but heres another thought
Posted by Adrian Mack on Fri, 12 Sep 2003 15:28:21 GMT
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Hey Mollecon (and others),> Is it that complicated?Possibly ;). This is an area where I have actually quite a large interest. I know I asked a hell of a lot, but thats what has been running around my mind lately! I think that delay is a pretty interesting and enjoying topic... sadly one that is misunderstood so much, which I guess is part why I am so determined to get it right. > As far as I know, ANY reflexbox will have a phase shift at 180 at -> 3dB point - & ANY closed box a phase shift at 90 at -3dB...Hmmm. That sounds like something I've heard before, I think, but the box modelling programs dont seem to show this :(I guess one of the main things in my discussion was PiAlign, and how it reduces resonant overring. Wayne has stated that it is better than a sealed system having the same -3db point (and its usually Qtc=0.707 or very near it) in that it has less resonant overring by making the -3db point of the system something like a half octave above Fs, and also using a smaller box size and port damping. I guess I want to know how this actually works... I too love vented boxes, and in almost all cases I just dont like the sealed box, mostly because of its limited output, limited bass extension, and high excursion (and therefore increased distortion). The Acoustic Suspension vs Bass Reflex post was very interesting indeed, but either it doesn't tell me exactly why "port damping" makes it better, or I didn't understand it completely.> A closed box with a Q close to 1 will have a ringing of a cycle or > so at resonance, & a -3dB point

resonance, which > is also the -3dB point. A closed box with a Q at 0.5 will show > very little ringing - & you pay for that having the bass down -6dB > at resonanse.Sounds good. One thing I'm a bit wary of, in that acoustic suspension vs bass reflex post, it says "A sealed box can only assist the motor by dampening it - in effect, decreasing compliance". Decreasing compliance is basically decreasing box volume... but isn't it, for a sealed box, the larger the enclosure (not smaller), that means the less overring it produces? The other part of my post was about the phase shifts through the passband, ignoring the resonance overring part. They introduce group delay. Can it be said that, these phase shifts are only minor? Because the rest of the group delay curve is very low, below 10ms or 5ms in most cases. People talk about group delay usually where it peaks, which is near resonance. And then they throw about all these numbers etc and say "higher group delay sucks" etc. But the real thing is resonance overring. The thing that has been troubling me... the signal has to be applied at the resonance frequency or very near it for it to be excited into ringing. If its not, then it doesn't ring (?). And of course, if Fb is like way down... like in a PiAligned cabinet, then any ringing at all is greatly attenuated. Lets say we had a box that wasn't though and it was flat to Fb, and Fb was 20Hz. A lot of music etc has no 20Hz information.. so on music like this, its fair to say that it wont ring? And therefore its going to be just as good in this sense as any other cabinet, like a sealed or PiAligned cab? (ignoring distortion in maximally tuned vented cabs which allow the system to be used near driver resonance where distortion is much higher. Of course if the music has no content here then it doesn't matter, and for this example I'm saying if the music had not content in this area). This is why I gave the example of a song having only above 30Hz information. Does 360 degrees correspond to one cycle? Or do we actually calculate how long the cycle is? On the True Audio Group Delay paper it says that 0.25 cycles is 4.5ms, so 4*0.25*4.5 = 18ms. So is one cycle 18ms? What happens when we have a vented system with a very large peak in group delay near resonance, but then goes down on either side? (this is common of very large boxes, regardless of tuning. EBS has this too). Maybe this is just an indicator that the box has high resonant overring. Finally, Adire Audio state that we should aim for 25ms or less at 20Hz in their Subwoofer Group Delay Comparison tech paper. They say "Lower

group delay numbers are indicative of a "tighter" sound of the subwoofer" which is why I wanted to know about group delay in the passband too, and not just resonant overring. True Audio state that a phase shift of one cycle in the bass region is non-detectable by us (I assume the bass region covers from 0Hz to 100Hz or so). Therefore, between vented and sealed systems - none of these are making multi-cycle shifts. Therefore it means nothing??? As long as resonant overring is kept minimum, then both should sound as good as each other (providing both have flat response). Is this correct? Thanks!Adrian