Subject: LC tuning instead of ports
Posted by Bill F on Thu, 06 May 2004 13:57:53 GMT
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Hello all, I read about a guy using a coil and a cap instead of porting to increase bass like BR does...My question is, what do you think are the benefits of this, if any? If it is a good idea, why aren't any speaker companies doing it?It kinda makes sense, kinda not...Your thoughts?

Subject: Re: LC tuning instead of ports
Posted by AstroSonic on Thu, 06 May 2004 14:30:29 GMT
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Bill,The use of an electrical resonant circuit between the amp and speaker allows greater bass extension from overdamped alignments, closed or vented. However, for vented designs, this does not offer the benefits of cone motion damping/reduction near Fb: increased power handling and reduction in excursion related distortion. I wonder if there may not also be a potential problem with amplifier stability due to the reactive loading produced by the resonant circuit. Best,Bob

Subject: Re: LC tuning instead of ports
Posted by Wayne Parham on Thu, 06 May 2004 18:06:16 GMT
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If what you mean is a speaker output level resonator circuit, I think it's an interesting idea. One potential benefit is the ability to modify resonator frequency and Q. Frequency could be changed with core sliders that increased or decreased the amount of iron in the inductor core and Q could be changed with varying amounts of resistance in the resonator circuit.On the other hand, changing the resonant frequency is of limited value once the appropriate range is known. It's not like you really need to or want to change the resonant frequency of a vented loudspeaker because it should be set fairly specifically, usually within about 10% of some target value. So to me, the ability to change resonator frequency and Q is interesting and potentially useful, but I'm not sure it is worth the cost of implementation.Cost might actually be the most significant issue here. The components required to implement this are large, both in reactive value and power handling ability. It is likely that a speaker output level resonator circuit would be more expensive than the woofer it is used with. A port does the same thing and is much less expensive.There is another way to do it that might be more attractive, and that's to put the resonator at the preamp level. If you do this, you'll make a sealed system have the same characteristics of a vented system and the electrical components won't have to be as large. Essentially, to do this is to provide equalization for a sealed system that gives it the same response as a vented system. I think it's a good way to do what you are describing.

Subject: Re: LC tuning instead of ports
Posted by Bill Wassilak on Thu, 06 May 2004 19:05:31 GMT
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Also as you near Fb in a vented enclosure, or if your resonance circuits tuned a little above or below Fb, you can go over the execursion limits of the speaker. Especially when your using hi powered amps. That's one of the draw backs to it.Wayne I don't know if you've heard of the ELF integrators that Bag End came out with several years ago, but it uses an integrator type circuit at the line level. It operates the speaker below Fb because the lower in freq. you go the higher the output, but they recommend that you use it in a sealed enclosure because with the system operating that far below Fb they use the air thats trapped in the enclosure. It acts a back spring for the speaker, so you don't send the cones flying across the room. You can use them with vented cabinets but they recommend you block the ports when using them.Bill W.

Subject: Re: LC tuning instead of ports
Posted by Wayne Parham on Thu, 06 May 2004 21:44:36 GMT
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I'm familiar with the Bag End subs that are run under-resonance. The idea of using a corresponding filter to match slope is pretty cool.About vented systems, woofer excursion rises below fb, and it should be limited to use above fl in high-output situations. Use of EQ to increase output below fl wouldn't be cool in a vented system if output was high, and really not that beneficial even at moderate outputs.I suggested the EQ scenario for sealed systems, and my point was that if a sealed system is equalized to mimick the frequency response of a vented system, then all the other characteristics like damping and group delay will match too.

Subject: Re: LC tuning instead of ports
Posted by Bill Fitzmaurice on Thu, 06 May 2004 23:01:16 GMT
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This LC thing has been discussed over at AA and what has not been thoroughly explained by its proponents is that it's a power hungry mod, as is any that uses EQ either before or after amplification to increase bass response. It works, but it's not an efficient way of doing things, nor cost-effective, as you can get a high quality EQ for the price of the large inductors and caps required of an LC filter. Plus EQ is adjustable over 31 1/3 octave bands- LC filters aren't. Much the same is true of ELF. Technically that system uses a 12dB/octave filter to compensate for the 12dB rolloff below the Fb of a sealed box woofer. The system does work, limited only by the XMax of the driver and the amount of power available to push it. That power can amount to a whole lot of juice. With an Fb at 60 Hz and 200 watt input at 60 Hz you'll need some 3000 watts or so to maintain equal output at 30 Hz. The advantage to the system is high output from relatively small boxes, and pro-sound contractors are more concerned with cartage than they are the cost of

multi-kilowatt amps. The system won't work with a ported box since ported boxes aren't loaded below Fb, and the resulting 24dB/octave rolloff cannot be compensated for within XMax limitations, not to mention the astronomical power requirements even if you could find a driver with the requisite six inches or so of excursion capability.

Subject: Re: LC tuning instead of ports
Posted by Adrian Mack on Fri, 07 May 2004 23:14:57 GMT
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I believe the Bag End approach is to not have a 'real' crossover and the group delay associated with it, and operating it below resonance as Bag End have done avoids the group delay completely. It is essentially two 6db/oct lowpass filters set around 8Hz-20Hz. Linkwitz did a similar approach on his site by raising the crossover frequency and lowering the slope to only 2nd order, because he had group delay problems with the sound.
