Subject: Active Crossover - 4Pi Tower?
Posted by jshoc on Sat, 24 Jun 2006 20:24:15 GMT
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Anyone using active crossovers with their Pi Speakers?I was thinking about giving them a try with my 4Pi Towers (6.5 cu.ft, JBL 2446-16ohm, Eminence Delta Pro 15in) using a 24dB slope. Naturally, I will have to purchase another amp in addition to the active crossover.Any comments/suggestions would be appreciated.Hakn

Subject: Re: Active Crossover - 4Pi Tower?
Posted by Paul C. on Sat, 24 Jun 2006 22:00:09 GMT
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I had thought about this myself... but the Pi crossovers do more than just crossover from woofer to tweeter. They flatten the response of the tweeter in a way that you can't duplicate in an active crossover. The PSD2002 horn driver used in many of the Pi speakers is remarkable in that it comes all the way down to 1600 hz (or lower!), allowing many of the Pi's to be only two way designs with large woofers ("We don' need no stinkin' subwoofers!"). But this one horn driver covers the entire upper end of the audio range. Still, it tends to fall off in the top octave.The Pi crossover fixes that with a neat solution. It takes advantage of the fact that HF horn drivers generally have much higher SPL than most woofers. The horn driver must be padded (resistors added) to match the woofer. There is a bypass capacitor around the padding resistors that lifts that top end and flattens the response. There is very little power requirement in that top octave, so this really does not put much addtional load on the HF driver even at high volume levels.You can't do that with a active crossover.

Subject: Re: Active Crossover - 4Pi Tower?
Posted by Russellc on Sat, 24 Jun 2006 23:28:20 GMT
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You would have to ask Wayne for sure, but you may be able to just use the compensation circuit on the tweeter, and then crossover electronically at the desired point. You can do the whole bit electronically, but you had better know a whole lot about electronic crossover design! Basically, there is a rise in most compression driversin the mid highs followed by a drop after about 15khz. The compensation circuit, (which is a seperate circuit from the rest of the crossover), pushes down this rise down and the energy is then used to extend the high end, flattening the response overall. It is used a lot with altec A5 systems, which use the larger format drivers which tend to have a more prominent mid high rise, followed by even more dramatic drop off on the high end. If you search around, there is a nice article from an old issue of sound practices that illustrates this nicely, by a guy named Jean Hiraga, for the A5. Most all compression drivers suffer from this to

some extent, and a proper compensation circuit undoes the mid High peak, and boosts the high end droop ay the same time. You can do this electronically, just not with any basic off the shelf crossover, as the compensation would have to be designed and added in. Compensation is added to electronic crossovers for certain subwoofers, a bass boost is added which compensates for the bass drop off, resulting (hopefully) in flat response to a lower point than the driver/crossover alone will allow. Wayne, will the compensation circuit alone (passive, like in the standard crossover you sell) perform its function mated to an electronic crossover of the same slope as your passive units?Russellc

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Subject: Re: Active Crossover - 4Pi Tower?
Posted by Wayne Parham on Sun, 25 Jun 2006 03:19:54 GMT
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Lots of good input here already, that's for sure. Paul's exactly right that the passive tweeter circuit does more than just crossover and attenuate. The reactive components in the passive circuit all interact to produce the desired response curve. And Cody is right too, inferring that compensation might be performed by the active unit itself, provided it has CD compensation as a configuration option. Some active units have this feature, but since there is no real "standard" CD curve, the implementation is different from unit to unit, of those that even have the option.

A long time ago, here on the forum, I provided a schematic for an op-amp based active crossover circuit. I also made a tube circuit, and included a schematic and PSpice file for it. Links to both of those posts are shown below. Eric Mainardi has offered to provide an active crossover kit, so you might post over on the Selectronic forum. His solution provides the exact right curve. This is the EQ curve we want sent to the tweeter:

You could add the compensation cable assembly to the tweeter, after the amp. It will act as an attenuator and do some level setting. But that sort of defeats the purpose of biamping, and while it provides some EQ, the shelved portion of the curve is provided by the interaction of the passive crossover and the driver and tweeter cable assembly. Resistors R1 and R2 set the Q of the crossover circuit, causing it to make the response curve shown above. But if the passive crossover isn't used, this response doesn't result.<p>More information can be found in the following posts:
Active highpass filter (op-amp)
Reverse attenuation and HF comp. networks, active X-over
6DJ8 Tube Crossover
Compensation circuits
Triphon Crossover
Active crossover
"Crossover Electronics 101"

Subject: Re: Active Crossover - 4Pi Tower?
Posted by dB on Sun, 25 Jun 2006 12:47:54 GMT
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Hi. It should be possible to use an Equalizer before the Amps. But I don't know about the curve it generates. Is it perfect or close to Wayne's?
It might be a little tricky to adjust at the right level (freq./SPL) for a given driver, for the first time.
Regards
(Bose 901) A Loudspeaker in Need of Corrective Equalization

Subject: Re: Active Crossover - 4Pi Tower?
Posted by Wayne Parham on Mon, 26 Jun 2006 13:19:14 GMT
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a bit different too. Same general idea though.

Subject: Re: Active Crossover - 4Pi Tower?
Posted by dB on Tue, 27 Jun 2006 06:31:07 GMT
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Hi,
My actual question was a bit different, sorry if I didn't make it clear. It was this, if an equalizer like this

http://www.realproaudio.com/product_info.php?products_id=1512

or

http://www.realproaudio.com/product_info.php?cPath=24_74_79_595&products_id=61

can give the "same" curve you need for the compression driver passive compensation network.
The document that I find of great value (and the speakers as a classic by the way) came just as an add-on.
Thanks Wayne.
Regards

Subject: Re: Active Crossover - 4Pi Tower?
Posted by Wayne Parham on Tue, 27 Jun 2006 13:10:58 GMT
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There are some active solutions, as you've indicated. In fact, some active crossovers have a specific CD EQ function built-in.