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Subject: Active vs. Passive Crossovers

Posted by [FloydV](#) on Wed, 21 Dec 2011 04:19:11 GMT

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At AVS forum DIY speakers, several people have made statements that they no longer use passive crossover networks. Instead they use active (electronic) crossovers.

First, can someone give me a short course for dummies in Active Crossovers?

Are they really replacing passive crossovers in many applications?

Active brings to my mind something like graphic equalizers. As I remember, they were faulted for inducing unwanted distortion. Maybe times have changed.

Floyd

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Subject: Re: Active vs. Passive Crossovers

Posted by [Wayne Parham](#) on Wed, 21 Dec 2011 05:29:45 GMT

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Active crossovers are great, and offer several advantages. However, the problem is, just going active doesn't assure the DIYer of success. The crossover still has to be designed for the acoustic solution, which is not trivial. I see far too many DIYers assume that they can roll their own easily, by "dialing it in" without doing any real homework. This won't give a good result.

I have designed several loudspeakers with passive crossovers. These crossovers can be implemented actively (and in fact are during development), but the crossover I provide to the customer is passive. The truth is that 90% of my customers want a passive crossover, so that must be done, and it must be done right. That is what I provide.

For the occasional DIYer that wants to go active, I am obliged to warn them that they can't just put any old active crossover with the same crossover points in the system and expect it to work as well. It won't. The transfer function has to be matched, and that is something most general purpose active crossovers won't do. They tend to provide textbook filters only, and this just won't do.

So the long story short is, sure, active is great but only if you do the homework. It isn't a sure deal.

Here is a write-up on what things must be considered when designing a crossover. It's just one loudspeaker configuration - the matched directivity speaker aka waveguide. But it will give you an idea what things must be done for a fully-optimized loudspeaker:

Notes for the DIYer

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Subject: Re: Active vs. Passive Crossovers

Posted by [Bill Wassilak](#) on Fri, 23 Dec 2011 02:07:38 GMT

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I agree with Wayne, any old active crossover will not cut it, that's why every thing's shifting to DSP x-overs rather than analog active x-overs. But using a properly designed passive x-over is a lot less expensive than going DSP and the cost of an extra amp on top of it all.

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Subject: Re: Active vs. Passive Crossovers

Posted by [FloydV](#) on Fri, 23 Dec 2011 03:22:34 GMT

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Bill, please explain analog vs. DSP xovers. I like to keep up with new tech.

Floyd

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Subject: Re: Active vs. Passive Crossovers

Posted by [AudioFred](#) on Fri, 23 Dec 2011 13:13:05 GMT

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FloydV wrote on Thu, 22 December 2011 21:22Bill, please explain analog vs. DSP xovers. I like to keep up with new tech.

Floyd

You'll have to read through and around the marketing hype, but here's a summary of the functions an active DSP crossover performs. You'll need to read the intro section first, then click on the each sub heading (loudspeaker correction, room correction, etc). for the full explanation:

<http://www.deqx.com/technology.php>

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Subject: Re: Active vs. Passive Crossovers

Posted by [Wayne Parham](#) on Fri, 23 Dec 2011 16:21:16 GMT

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I would NOT suggest using a crossover that relies on a single microphone measurement to "auto-correct". What sounds good in one spot will not necessarily sound good in another spot. A good crossover, in my opinion, is one that makes the speaker sound good over a wide coverage area. This requires the speaker to be designed for this approach too, of course, but the point remains that the design goal should include optimizing the whole listening area, which then requires several microphone measurement locations. They can be measured all at once with a microphone array, or by taking several measurements and moving the microphone each time. But no single measurement using a single microphone position is adequate, not even with the most powerful processor. There just isn't enough data.

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This is where I see the biggest disconnect. Some DIYers think the ultimate solution is to throw money at the problem and get an expensive active crossover or processor. This is the wrong approach. If you want the best, it takes some homework. I don't care if it's passive or active, analog or digital. There are some really great tools out there, and the digital filters make it easier to construct complex filters and change them quickly and easily. But that's what you have to do. You have to use the tools and optimize the crossover with them. Marketing hype notwithstanding, nothing out there will do a good job auto-aligning and optimizing itself using a single microphone.

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