Subject: plans for single frequency electronic crossover?
Posted by Marlboro on Mon, 19 Oct 2009 13:18:48 GMT
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Does anyone make plans for building a single frequency electronic crossover?

Marlboro

Subject: Re: plans for single frequency electronic crossover?
Posted by Wayne Parham on Mon, 19 Oct 2009 14:11:19 GMT
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What do you mean, exactly? Are you looking for a "brick wall" filter with high slopes?

Subject: Re: plans for single frequency electronic crossover?
Posted by Marlboro on Mon, 19 Oct 2009 14:33:31 GMT
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I was "looking", in my retirement to build speaker systems. And since I do not like any of the 'benefits' of passive crossovers, and would like to design the speakers with a specific frequency electronic crossover after my own testing, or with the passive selection, rather than with the adjustable one like my Rane Ac23, I would like to be able to include such a device with a small power supply with the potential speaker. I would also be interested in a specific frequency equalization. Basically everything that is done passively, to be done electronically.

And so the question.....

Subject: Re: plans for single frequency electronic crossover?
Posted by Wayne Parham on Mon, 19 Oct 2009 15:34:08 GMT
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Oh, I see now. This is near and dear to my heart too.

I like bi-amplification for its obvious benefits, but I regularly have a sort of problem in that most commercial active crossovers offer pretty generic crossover points and slopes. To get a transfer function specific to an implementation takes circuit design or DSP programming. This is usually beyond the ability of most DIYers. So this makes a problem, in that the "right" crossover is passive and an active one with the right transfer function is outside the reach of most people.

Of course, you can always build an active crossover with the right parts to give the required

transfer functions. That's a solution. But again, it's not trivial. I would like to see a device similar to Smith & Larson's ICD, but designed to provide a configurable active crossover. It would use Spice as the programming language and would do the DSP to provide the appropriate transfer function. That would allow a speaker with a given passive crossover to be duplicated in an active unit, so bi-amplification would be possible.

Subject: Re: plans for single frequency electronic crossover?
Posted by Marlboro on Mon, 19 Oct 2009 23:14:17 GMT
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About 6 years ago there was some dude on PE who was offering to design electronic equipment for people that they could build from his schematics. But he seems to have disappeared.

Subject: Re: plans for single frequency electronic crossover?
Posted by Wayne Parham on Mon, 19 Oct 2009 23:49:11 GMT
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The circuit design isn't what concerns me, nor is it the PCB layout. I guess that's an issue too, since not everyone is familiar with that but if it were just a matter of building a circuit from schematic, you could do a DIY thing. Lots of people build their own amps form kits and even from scratch.

The problem is this is really an acoustics issue. The total system response is a combination of electrical transfer functions and acoustic summing. To further complicate it, the electrical transfer function of a passive crossover is influenced by the impedance of the drivers in the cabinet, They actually become a part of the filters. So to find the electrical transfer functions you have to know not only the passive component values in the crossover but also the impedance of the drivers in the cabinet.

Subject: Re: plans for single frequency electronic crossover?
Posted by Marlboro on Tue, 20 Oct 2009 03:17:21 GMT
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Assuming that most speaker manufacturers(and this may be an inaccurate assumption) design their crossovers using either a very large warehouse, or the great outdoors, or an anechoic chamber, to get their passive crosses as accurate as possible in that flat stable environment.....

I've always had a problem with doing that. You buy a speaker and then you put it in a room. Whatever characteristics that speaker had acoustically in the great outdoors on a quiet day, or in

an anechoic chamber are completely long gone.

Of course, except for the most expensive speakers in the world, no one is come out to your house when you buy the set and with an equalizer in hand, measuring the room that you are putting them in and giving you a custom modification.

But it would be nice to be able to do that, and incorporating the electronic crossover, and a specific equalizer..... well.

Problem is that you've indicated that its probably way more than that to do it right. And it would take a pretty savvy electrical engineer to do that.... Most certainly something that is really way out of my league.

Subject: Re: plans for single frequency electronic crossover?
Posted by Marlboro on Tue, 20 Oct 2009 03:25:00 GMT
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Re: "....To further complicate it, the electrical transfer function of a passive crossover is influenced by the impedance of the drivers in the cabinet, They actually become a part of the filters. So to find the electrical transfer functions you have to know not only the passive component values in the crossover but also the impedance of the drivers in the cabinet."

So... I understand what you are saying.....but!

But you have an implication here that doesn't jive with my ears: Those of us who have built line arrays from scratch ourselves and then used a standard electronic crossover like the Rane AC-23 with its 24db/octave cross, have decided on the crossover frequencies, and simply done it.

This would suggest that my system should sound like crap unless I was just plain lucky with my selection of speakers for it.

Or something else is involved....

And without doing anything other than setting the crossovers and then listening to different variations around the frequencies I've chosen, my ears tell me they sound just great.

What am I missing here?? Are my ears just too old? Just barely not as old as Fred, but from your pictures, way older than you.

Marlboro

Subject: Re: plans for single frequency electronic crossover?
Posted by Wayne Parham on Tue, 20 Oct 2009 14:16:09 GMT

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Well, without getting into anything subjective I'd say that it's rare when I've seen textbook filters be the best solution. That's why I'd love to see a product like the S&L ICD designed for use as a stand-alone active crossover. You could set the filter however you like. It's infinitely configurable. Find a product like that and you're golden!

Subject: Re: plans for single frequency electronic crossover?
Posted by Marlboro on Tue, 20 Oct 2009 19:52:56 GMT
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S&L's ICD is a software program.

You are asking for a hardware device that allows you to do this. Doesn't the Beringer active digital crossover and equlaizer essentially do that? It costs about $300, but you can choose a slope anywhere from 6 db octave to 96 db/octave, and a frequency crossover virtually anywhere that you want, as well as giving you a parametric equalizer for the whole spectrum. Yes I could buy one of those, but then I would need some kind of kit that allowed me to select the components necessary and the design schematic to duplicate the Beringer sets in individual electronic components combined with a small pre-amp size power supply.

Does this make sense?

Marlboro

Subject: Re: plans for single frequency electronic crossover?
Posted by Wayne Parham on Tue, 20 Oct 2009 21:02:55 GMT
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That may very well do the trick. Being a digital device, it must have the ability at least internally, since a filter is implemented as an algorithm. Whether or not you have access to the programming language to tailor the filters is the question, I guess.

As for the S&L system, it's both software and hardware. What I'm suggesting is essentially a Spice engine that allowed you to build an active crossover by emulating passive components, using the Spice circuit description language. That's what the S&L system does, but it is used specifically for making measurements, for emulating a passive crossover. I think it would be nice to have a similar device, but designed to be used as an active crossover with high quality digital and analog chips so you could use it in the signal path and expect good quality sound.

Subject: Re: plans for single frequency electronic crossover?
Posted by Marlboro on Wed, 21 Oct 2009 03:14:06 GMT
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Sounds like the kind of "put together" projects that were available in the Allied Radio Catalog back in the 1950's. I can still remember the smell of the paper. My uncle was a professor of electrical engineering at UMASS. He left some job where he was making $20000 a year in 1954 for GE in Philly, to take the assistant professorship at about $1900, in Amherst. He had all these catalogs to drool over, and later I used to drool over Heathkit.

Also sounds like the stuff my nuclear physicist son used to put together, though way more simple, of course.

Subject: Re: plans for single frequency electronic crossover?
Posted by AudioFred on Sat, 19 Dec 2009 16:09:12 GMT
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Marlboro wrote on Mon, 19 October 2009 22:25
...Are my ears just too old? Just barely not as old as Fred, but from your pictures, way older than you.

Marlboro

Hey, I'm not old, I'm seasoned:) Have you considered the Marchand XM1 kit?
http://www.marchandelec.com/xm1.html