Subject: Not so "Easy-as-Pie" One-Pi's
Posted by GarMan on Mon, 24 Jul 2006 20:27:30 GMT
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Over the weekend, I took some time to rebuild my One-Pi cabinets. The originals were built almost 3 years ago. They ended up pretty good considering they were my second woodworking project, but there were lots that could have been done better. In addition to cosmetics, I wanted to expand the cabinet from 0.8 cub ft to a full 1 cub ft and retune the port properly. I built the ports in the first cabinet too short and never took the time to lengthen it (I didn't use tube for port, but built with wood pieces).My original intent was to complete the cabinets, ready for finishing in one day. If I was able to bring myself to do what I've already have done, I probably could have completed it in one day. But I have this stupid need to always try something new. Trying something new, coupled with tool failure and thunder storms stretched the project over two days.This is my first cabinet using mitred corner joints. There were several heartwood markings on the sheet of BB ply I was using, so it took a while to work it in the design. Care was also taken to ensure grain continuity around the mitre corners. The heartwood markings runs from front, top and back continuously on both cabinets.Internal panels were lined with foam "live-side, dead-side". On the non-foam side, I decided to cover with acrylic caulking, the thinking being that it would help dampen vibration. Only cost $1.39 for the tube and took 10 minutes to do, so no big risk.After two days, I ended with a pair of cabinets sanded down to 120 grit. Next step is to take it down to 220 grit and then oil.I've been listening to these cabinets for a day now and they sound better than the old, due to better construction, larger volume, tuned port and new tweeter. Port size is currently 3" dia x 5" len. Bass goes deep, but at a attenuated level. I'm thinking a length of 4" to 4.25" is where I'll end up.On the tweeter, I started with 10uF recommended by Wayne, but found the tweeter was really drawing attention to it self. I brought it down to 8.2uF and thought it gave better integration. Still a little too much presence. I expect I'll end up somewhere between 6.5uF to 7uF.I think FredT was to one who stated that he would not be upset if this was the only speaker he could listen to for the rest of his life. I completely agree. Highly recommend this for anyone looking for their first, second, third, forth, etc DIY project. The only problem is that it never ends. Right now, I'm thinking, "How can I turn this into an MTM design?"Gar.
One-PI build photos

Subject: Re: Not so "Easy-as-Pie" One-Pi's
Posted by Shane on Tue, 25 Jul 2006 01:54:41 GMT
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Nice!!!! I feel totally inadequate now

Subject: Re: Not so "Easy-as-Pie" One-Pi's
Posted by Norbert on Tue, 25 Jul 2006 02:39:34 GMT
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Gar,That is one nice piece of woodwork/speaker you got there. Please post the finished look when you get a chance.Norbert

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Subject: Re: Not so "Easy-as-Pie" One-Pi's
Posted by Wayne Parham on Tue, 25 Jul 2006 04:10:17 GMT
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Very nice. Beautiful cabinetry indeed!

Subject: Q on Tweeter XO
Posted by GarMan on Tue, 25 Jul 2006 13:14:47 GMT
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Wayne, I'm having a hard time making adjustments to the tweeter XO. I've tried combinations of reducing cap value and introducing resistor in series with the tweeter, but can't seem to reduce the "sizzle" without numbing the rest of the treble. Specifically, it's the cymbals that are bothering me. It sounds more like loud sizzle than light sparkle.In your original XO, what is the 16 ohm used for? It is to damp the resonance peak at 670Hz?thx,Gar.

Subject: Re: Q on Tweeter XO
Posted by Wayne Parham on Tue, 25 Jul 2006 14:25:20 GMT
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The tweeter is actually about 1dB lower than the midwoofer. But if you need to reduce its output a little more, you can always use a series/parallel resistor combination. Be sure to do some modeling or measurements to set the Q of the circuit, to ensure that its damped enough that a peak doesn't form. That's what the 16 ohm resistor is for - It's a damping resistor. If you add series resistance to reduce tweeter output, you'll need to change the value of damping resistor.The 16 ohm damping resistor is only barely necessary on the stock circuit, because even without it, there is very little peaking. But amplifier output impedance and feedback change the characteristics of the circuit, so the damping resistor ensures that the circuit is well damped even in non-optimal conditions. If you increase series resistance to pad the tweeter, you'll probably find the shunt resistor used for damping should be a smaller value. This will increase damping and will attenuate the tweeter more at the same time.

Subject: Tweeter Brightness
Posted by FredT on Wed, 02 Aug 2006 17:28:19 GMT
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I noticed the same thing. If there is an acceptable range from slightly laid back (like Vandersteens) to a bit bright (like B&W), this speaker seems to fall on the bright end of that continuum. Many people I know prefer this sound and find my favorite speakers too dull, but I prefer a speaker that's a bit laid back. I tried several brands of 10uF caps including the stock Solens, Daytons, Clarity SA's, and Northcreeks, with and without a Clarity SA 0.1uF bypass cap. I hear little difference between all these caps other than the usual placebo effect - the Clarity may be a bit cleaner, but the overall tonal character of the speaker doesn't change. I also tried some lower values, which reduce the mid treble but don't effect the top octave. I prefer the tonal balance with the 10uF. Finally I tried a 2 ohm Mills resistor in series with the 10uF Clarity cap, and I liked the effect it had so I left it in the circuit - still good, clean, well resolved treble, but without that Best Buy / Circuit City "Hey listen to me I'm so bright and forward I must be hi fi" sound.The next tweak will be to the woofer. I have a couple of inductors I plan to try, including a 0.6mH 14ga copper wire air core and a 0.68mH 16ga Alphacore copper foil. The only objective here is to slightly attenuate the low treble peak - the bass is already as good as you could ask for. Nice thing about all these tweaks is that they are easily reversed if I don't like them.

Subject: One Pi Crossover Upgrade
Posted by FredT on Sun, 06 Aug 2006 23:04:58 GMT
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I've found a crossover parts combination that sounds good to my ears. I wish I could say it's a substantial improvement over the stock parts, but it's really more subtle than that, and I can't say which of the parts changes had the greatest effect. I suspect it's the two ohm resistor in series with the tweeter cap, but I believe the cap upgrade itself might also play a small part. The link below is a picture of the new crossover with a summary of the parts included:
Upgraded One Pi Crossover
