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Subject: Subwoofer Crossover

Posted by [NWCgrad](#) on Wed, 25 Jan 2012 03:21:05 GMT

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I am getting ready to upgrade my electronics (the 4 Pi speakers and modified Pi 3 flanking subs I built and documented here were the first step). To that end, I am supplementing my Onkyo TX-SR805 THX Ultra2 7.1 A/V Receiver by adding an Odyssey Audio Khartago Extreme amp (2009 TAS Amplifier of the Year) and Tempest preamp (w/ HT bypass so I can still use my receiver for movies).

By going two channel I lose my bass management from the receiver. So after much consternation I have decided to install a Behringer active stereo 2/3 way crossover (CX2310).

This device should allow me to run my 3 subs (flanking subs on the two low outputs - variable crossover points starting at 40 Hz, Linkwitz-Riley filters with 24 dB/octave) and my third sub from the dedicated mono subwoofer output.

I believe when I switch in the HT receiver I will have to set it to no subwoofer and large main. Although Behringer doesn't have the best reputation, I "think" since only the subs will run through the device I should be okay.

Thoughts, comments or better solutions (as long as they don't cost a lot, the Behringer is about \$80 and my wife is starting to get miffed by upgraditis) encouraged.

Thanks for reading!

#### File Attachments

1) [CX2310\\_P0132\\_Front\\_XXL.jpg](#), downloaded 5806 times

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Subject: Re: Subwoofer Crossover

Posted by [Wayne Parham](#) on Wed, 25 Jan 2012 13:58:11 GMT

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I really prefer second-order slopes for flanking subs.

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Subject: Re: Subwoofer Crossover

Posted by [NWCgrad](#) on Thu, 26 Jan 2012 00:32:46 GMT

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Any suggestions? I know you used to use a modified Pyle crossover, but I do not have the

electronics skill required to do so.

I have looked at a miniDSP unit, cost is about \$135 (more than I wanted to spend). However, if I go with a MiniDSP 2x4 (2 input, 4 output) and associated 2 way Advanced 2.1 plugin I should be able to set low and high pass filters for Left, right and mono subwoofer outputs (w/ Butterworth up to 8th order (6 to 48dB/oct); Linkwitz-Riley up to 8th order (12 to 48dB/oct); and Bessel - 2nd order). In addition, the unit has 6 parametric EQ bands per output, 6 EQ bands per input, Frequency, Gain, Q configurable, and Peak of Shelf (low/high). It is powered from the USB input used to program the box. Should be sufficient for my needs.

Does anyone here have experience with the unit? I know it is popular on AVSForum and other DIY websites.

### File Attachments

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- 1) [MiniDSP Schematic.png](#), downloaded 5525 times
  - 2) [MiniDSP 2 x 4 Unit.png](#), downloaded 5677 times
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Subject: Re: Subwoofer Crossover

Posted by [Wayne Parham](#) on Thu, 26 Jan 2012 01:15:22 GMT

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The MiniDSP would work nicely, because you can use it to set whatever low-pass frequency and slope you want. I'd probably lean towards that since it gives you such flexibility. Sub crossovers are easier to dial-in than the crossovers inside the mains. Measurements help, of course, but you can set the subwoofer low-pass pretty well by ear.

Remember - we don't high-pass the mains when running flanking subs. We only low-pass the subs. Actually, you can rolloff out-of-band signals by high-passing the mains at 40Hz, but don't go higher than that. We want the mains and the flanking subs to blend in the room's modal region. Room modes, multisubs and flanking subsAs an aside - speaking of that cheap Pyle crossover - I've found a lot of companies are branding and selling the same unit. I wouldn't suggest it without the upgrades though:

Pyramid CR66

Legacy LXR1

Boss BX15

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Subject: Re: Subwoofer Crossover

Posted by [NWCgrad](#) on Thu, 26 Jan 2012 01:59:59 GMT

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Thanks Wayne!

I will buy the miniDSP, especially since I can use REW and auto program the device for in room equalization. I will be running the speakers full range.

I have elevated the speakers about 9" using some cheesy wicker stands I paid \$9 for, I do have 3" x 3" x 9" extruded aluminum (from 8020) taped to the legs to eliminate any possibility of structural failure. They could really nice elevated with the flanking subs.

My wife is not a fan of you and your speakers! Since the purchase I have started to listen to 1 to 2 recordings every night, prior to the purchase I had grown discontented with my system and rarely fired it up. I cannot think of better evidence for the quality of your product.

I think when I retire from the Navy in 6 yrs and buy a house I will look to get rid of the 4 Pi's and upgrade to the 7 Pi's so I can recycle the JBL and B&C drivers. In the appropriate room, how significant is the difference?

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Subject: Re: Subwoofer Crossover

Posted by [gofar99](#) on Thu, 26 Jan 2012 02:14:26 GMT

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Hi, That mini dsp is a cool device. I may have to get one. Right now the sub chore is done by a Marchand 24 db/oct set for 50 HZ. The ability to change slopes and frequencies easily is a real plus.

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Subject: Re: Subwoofer Crossover

Posted by [Wayne Parham](#) on Thu, 26 Jan 2012 14:06:03 GMT

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NWCgrad wrote on Wed, 25 January 2012 19:59 I will buy the miniDSP, especially since I can use REW and auto program the device for in room equalization.

I wouldn't set it for auto-equalization unless you connect an array of microphones that sample several points in the room. But you could surely use more than one microphone, and then I think it would work pretty well.

You just don't want it to EQ based on one microphone because it will equalize for that single position, which may be right in a node. It would be terrible for the system to increase output at frequency where room modes sucked out the SPL at the microphone position.

NWCgrad wrote on Wed, 25 January 2012 19:59 I think when I retire from the Navy in 6 yrs and buy a house I will look to get rid of the 4 Pi's and upgrade to the 7 Pi's so I can recycle the JBL and B&C drivers. In the appropriate room, how significant is the difference?

The bass is the same, and the treble is the same. Midrange is where the difference is. A constant directivity cornerhorn projects the sound smoothly through the entire audio band, with the launch point being the apex of the corner. So there is no self-interference from the nearest

boundaries. This makes the midrange incredibly smooth and realistic sounding, and it also makes imaging spooky good.

Sometimes you can get a set of traditional mains and flanking subs to sound almost as good. It depends on the room and the speaker setup. But you can never get any other kind of speaker to be better than constant directivity cornerhorns - not direct radiators, not horns, not planers or dipoles. Constant directivity cornerhorns remove the dependency on flanking subs to smooth the lower midrange - The problem of self-interference off the nearest boundaries simply doesn't exist in constant directivity cornerhorns. So it really is the best approach possible, in rooms that have the right corners.

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Subject: Re: Subwoofer Crossover  
Posted by [NWCgrad](#) on Thu, 26 Jan 2012 14:25:54 GMT  
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I will use my microphone to take multiple measurements, then set the parametric eq by had (if required). I do not want to try to boost a big null.

Thanks,