
Subject: 4Pi crossover issue

Posted by [Bill Epstein](#) on Fri, 11 Jun 2010 13:33:39 GMT

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Several times over the past 2 years, I've struggled with reduced output in one channel. Using the usual methodology, I eliminated the sources, amplification and cables. There has also always been output from both the woofer and tweeter.

Today, I removed both crossover boards and discovered that the unit with reduced output had a loose connection from the input to the 6.8uF cap.

Since both crossovers were fastened with pressure sensitive adhesive to the cabinets, it's possible that this connection was lost during the removal (I just don't know), and not the cause of the reduced output.

Would the signal be lost entirely with this disconnect (the result of the board removal) or would you expect an approx 6dB reduction in total output and the culprit is revealed?

Subject: Re: 4Pi crossover issue

Posted by [Wayne Parham](#) on Fri, 11 Jun 2010 20:37:27 GMT

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Cold solder joints can do that. Usually, a bad connection causes symptoms just like you're thinking, a make or break deal. But cold solders are different. You can have a junction with resistance, not completely disconnected.

Subject: Re: 4Pi crossover issue

Posted by [Bill Epstein](#) on Tue, 15 Jun 2010 02:24:13 GMT

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I repaired the connection to the solder pad (tell me again why pads are more desirable than thru-hole?) of the 6.8uF cap, put everything back in and the 4Pis are sounding great.

Trying something different today: the speakers are 50" out into the room which makes them a bit less than 96" to my ears. Bass weight is reduced but the image is airy, wide and deep. As I don't have a corner for the right speaker, this may be the best position for this room. Have to get used to electric bass sounding transposed an octave higher!

Subject: Re: 4Pi crossover issue

Posted by [Wayne Parham](#) on Tue, 15 Jun 2010 06:32:55 GMT

I debated on whether to have plate through holes drilled. Everything else I've done had them, but I wanted these boards to be mounted directly to the cabinet wall with just a gasket to prevent vibration. I suppose the component leads could have been cut flush, and there's no real harm in sharp edges from the tips piercing into the gaskets, but that was my concern. My thought was that having no plate through holes would ensure a smooth mounting surface.

Subject: Re: 4Pi crossover issue
Posted by [Bill Epstein](#) on Tue, 15 Jun 2010 18:55:09 GMT
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Quote:My thought was that having no plate through holes would ensure a smooth mounting surface.

You're right, of course. The smooth bottom (and who doesn't love smooth bottoms?) is what enabled me to use the Abzorb-EAR 1002-Abzorb sandwich to attach and isolate the board.

Subject: Re: 4Pi crossover issue
Posted by [Wayne Parham](#) on Tue, 15 Jun 2010 19:27:59 GMT
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Smooth bottoms is what really drove the decision against plate-through holes on the crossover boards. Even if you cut off the sharp edges when removing the leads from soldered components, you'd still have the thickness of the solder joints which would either require stand-offs to raise the board off the mounting surface or the soldering would have to be done on top (as it is now). Stand-offs for mounting weren't attractive to me, because they don't support the board well, heavy crossover parts might allow it to flex and jiggle.

I wanted the board to mount flush with a cabinet interior surface, which really meant soldering on top. If soldered on top, the plate through holes made less sense. So I just chose a simple single-layer board, no plate through holes, no silkscreen, nothing fancy. But that's really all you need for a crossover, I think. Just large traces to carry the current.

I also meant to say something else last time and forgot. One of these times, build yourself some subs. What you lost from lack of boundary reinforcement is more than made up with a couple subs, and you get room mode smoothing in the bargain. I really think the best thing gained from

corner placement is directivity from the lower mids up. It does help the bass some too, but the room plays its part. So my point is, no matter where you put the mains, I think multisubs are a good idea.

Some rooms are better than others, where room modes are concerned. Rooms with framed drywall on concrete slabs are pretty friendly, usually, and modes aren't too bad. Concrete, brick, ceramic tile and stucco walls are more rigid, and that makes room modes stronger. Either way, multisubs make all the difference in the world. They provide extra extension and smooth room modes at the same time.

My home has framed drywall construction, so the modes are very well damped. For a long time, most homes I encountered had similar construction, and I could sort of ignore room mode problems. Large rooms like clubs don't have them 'cause they're large. Smaller rooms with fairly lossy panels (drywall on studs) have what amounts to built-in panel absorbers. That helps a lot. So in my home, I don't need much smoothing, but it certainly doesn't hurt that multisubs makes bass response even more smooth. They're also giving me deeper response than the mains would on their own. It doesn't take much power to drive them, they aren't there for "thump". Just a little bit of extra foundation.

Where the subs really help me notice the modal smoothing property is in the hotel rooms at LSAF. The hotel has concrete walls, floor and ceiling, so the modes are strong. Most systems sound pretty heavy and sometimes flabby. Single driver speakers and open baffles with little bass are boosted by the modes, and it sometimes seems to help them out, It's lumpy bass, but it fills in where there would be a hole. But systems that have adequate bass can sound pretty bloated in rooms like those, because of the prominent room modes.

I've noticed some manufacturers choose to rent the larger conference rooms, because they're large enough to avoid the room mode problem. It's night and day the difference between a room that size and one of the smaller sleeper rooms. It's easy to get smooth bass in the large room, because it's almost the same as being outdoors. What's hard is getting smooth bass in the smaller rooms. So that's what shows off the effectiveness of the multisub concept to me better than anything else.

Subject: Re: 4Pi crossover issue
Posted by [Bill Epstein](#) on Tue, 15 Jun 2010 23:20:13 GMT
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I have the 2 subs I used in the cottage last year but stored them away because of their size and now having neighbors in my current townhouse.

As you can see, it's a tough room, just 12x15

No corner on the right but at least the bicycle helps with diffraction

I'm thinking about spending for some lower end 10" Dayton subs and building 1.5 cu ft boxes, then running them just above the edge of audibility. That worked well with the big subs in the cottage

I just have to resist the temptation to TURN IT UP for the Organ Symphony

File Attachments

1) [IMG_0680_1.JPG](#), downloaded 4998 times

Subject: Subs and crossovers

Posted by [Wayne Parham](#) on Wed, 16 Jun 2010 00:37:35 GMT

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I remembered that you had subs over the years, seems like you had Tent Sale 2245's didn't you? Then again, even if you did, those are huge. I also seem to recall you had a Titanic sub or two. Any of those would work just fine. Or maybe build smaller boxes with good quality 10" or 12" woofers, the kind usually marketed as car subs.

You could probably build some pretty small subwoofer cabinets that sounded great, sacrificing some efficiency in trade for the small size. Just push 'em with an inexpensive T-Amp, or maybe a garage sale find. Plenty of decent amps and receivers out there that would work great for subs.

If you had one sub in the corner, back behind and to the left of your left main speaker and another behind the right speaker, pushed back to the wall between the curtains and the door, they'd probably work great. That's kind of similar to how I had my room setup at LSAF last month:

You would run the mains all the way down, and then just low-pass the subs around 100Hz with a relatively gentle slope. That's basically the same setup I use, and I have a funny little crossover that just works great:

Active Sub Crossover

Subject: Re: Subs and crossovers

Posted by [Bill Epstein](#) on Wed, 16 Jun 2010 01:22:01 GMT

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Upon further review, just as with the big ugly black subs, a sealed cabinet and the 15" Dayton DCS-380s I have on hand give me a nice plot in 3Pi-sized boxes 20" on a side.

Should be a good'n easy summer project. I also have a pair of plate amps so won't have to fool around with those lovely, but teeny-tiny parts crossovers you mentioned.

File Attachments

1) [DCS-380 Sub.bmp](#), downloaded 4835 times

Subject: Re: Subs and crossovers

Posted by [Wayne Parham](#) on Wed, 16 Jun 2010 02:53:38 GMT

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Well, there you go, perfect! That's the exact same size of the subs I'm using, shown in the photo above, 20" cubes.

Subject: Info for Bill

Posted by [spkrman57](#) on Thu, 17 Jun 2010 15:46:24 GMT

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Get the speakers off the floor 4" - 6" and you will be surprised at the better sound quality.

You don't need floor bounce messing up the sound waves.

Ron

Subject: Re: Info for Bill

Posted by [Bill Epstein](#) on Fri, 18 Jun 2010 02:01:54 GMT

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Quote: Get the speakers off the floor 4" - 6"

Yes sir! Right away sir! We appreciate your SOBER analysis!

File Attachments

1) [DONE 004.jpg](#), downloaded 304 times

2) [DONE 004a.jpg](#), downloaded 2813 times

Subject: Digging up old pics!
Posted by [spkrman57](#) on Fri, 18 Jun 2010 16:00:59 GMT
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Bill,

I can't believe you have these old pics.

I was looking at the pic and seen something not found in my home anymore, ashtrays! 14 months smoke free!

Ron

Subject: Re: Digging up old pics!
Posted by [candoon](#) on Fri, 18 Jun 2010 23:23:41 GMT
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Grats to another ex smoker! I have been smoke free almost 5 months now for the first full time in my life. Its awesome to be able to breathe again.

Subject: Re: 4Pi crossover issue
Posted by [Bill Epstein](#) on Sat, 19 Jun 2010 23:12:16 GMT
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18 months for me! Aaaaaaaahhh!

Subject: Re: 4Pi crossover issue
Posted by [Wayne Parham](#) on Sun, 20 Jun 2010 13:59:46 GMT
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I'm an ex-smoker too! I always hated the ways smokers get treated these days, with workplace smoke areas turning into outdoor porches and then into not allowed at all. Restrictive laws are even worse. But I'm definitely glad that's not my problem anymore. And geez, six bucks a pack!
