Subject: Here I'm again
Posted by Peppennino2 on Tue, 01 Feb 2011 12:54:21 GMT
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Hi Wayne,
After 5 years of superb music listening with your Theater 4 project, I decided to build a center channel to match with, in order to add a video section to my setup. As I have little space between main channels, I'd like to build a hi-eff smaller speaker with a good tonal matching with my old Theater 4. Are Studio 1 or two a good choice, or it would be better to go with the same Eminence compression driver? Many thanks in advance,
Vincenzo

Subject: Home Theater Setup
Posted by Wayne Parham on Tue, 01 Feb 2011 16:09:44 GMT
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Honestly, I don't like making the center channel speaker different than the left and right speakers. If you can't make them the same, I'd prefer not to even use a center speaker. Use a phantom center instead. You can configure the home theater this way, and it works very well for most plasma and LCD screens, even the large ones. They aren't so large that the phantom center configuration leaves a hole in the middle, especially when the right and left speakers provide uniform directivity and are toed-in, forward axis crossed in front of the listeners. That's how my system is setup.

Have you tried the crossed-axes configuration, pointing the left and right speakers to an imaginary place one or two meters in front of the listeners? If you haven't tried that, you should:
Imaging, placement and orientationIn my opinion, the best reason to run a center speaker is behind very large screens, so large they really need a center. Most screens that size are used with projectors, and are acoustically (semi) transparent, so speakers can be placed behind them. This also allows you to use speakers that are physically large, and not have to settle for a poorly designed center (like one with side-by-side drivers) as are so commonly used.

spectral match when used as surrounds.

While you're upgrading the system and adding speakers, you might also consider adding subs. It will help add extension for home theater sound effects, and believe it or not, it will also help sound quality of music by smoothing room modes, making the lowest bass more uniform throughout the room. The subs aren't blaring or "thumping" - when setup right, you can't even tell they're on because they blend so well. Everything sounds like it's coming from the mains. They're just there to smooth the low end, and to add a little bit of foundation at the very deepest frequencies. See the last few pages of the document below for more information about how this works:
High-Fidelity Uniform-Directivity Loudspeakers

Subject: Re: Here I'm again
Posted by Peppennino2 on Tue, 01 Feb 2011 18:54:28 GMT
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Many thanks for the precious reply, Wayne!
I will try crossed-axes configuration (I actually have a equilateral triangle with speakers in axis with my ears) and phantom mode.

For the sub(s), in order to have a more uniform bass, I suppose it would be necessary to cut actively the front speakers, right? Classical 80Hz cut would be correct?

New plasma screen would be 46 or 50", so I think I'll try for the moment phantom mode with a pair of One Pi as surround (could you send me the plans?) speakers. The room is not large and I'll share Theater 4 between the HT receiver and 300B stereo amp.

Again, many thanks, Wayne!
Vincenzo

Subject: Re: Here I'm again
Posted by Wayne Parham on Tue, 01 Feb 2011 19:38:58 GMT
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I'd be happy to send plans - on their way now - check your mail.

On the subs, no, don't high-pass the mains. This is a different strategy than what is traditionally done.

Prosound installations usually high-pass the mains and low-pass the subs with a traditional crossover. This is done to take some of the load off the mains and to reduce distortion at high power levels. This is done outdoors or in very large rooms where there is no modal problem and

The multisub configuration achieves a very different purpose. Indoors, it isn't possible for

This causes peaks and valleys in the response curve, and they are different at different places in the room. So the goal of the multisub arrangement is to smooth room modes by adding even more sources. Where a null might form from one bass sound source and its reflection, a second sound source in a different position can fill in the hole. By using several sources, the sound field is made more uniform.

Because the multisub configuration works by using several bass sound sources, you want as many as possible. Actually, you don't really need more than four, but still, having the mains generate some of the bass helps because it adds bass node positions. If the mains can't handle the power, then it might make sense to high-pass them and use more subs. But if the mains can handle the power, then it makes sense to use them. Your speakers definitely can handle the

power. Low-pass the subs, but run the mains wide open. Read the last five or six pages of that "High-Fidelity Uniform-Directivity" paper linked above.

Subject: Re: Here I'm again
Posted by Peppennino2 on Tue, 01 Feb 2011 20:44:02 GMT
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Many thanks for the answer & plans!
Adding two other bass sources in the room, how could I obtain a good tonal balance? maybe a parameter digital EQ would be necessary... or not? As main speakers are fullrange, it maybe would be too complicated to adjust and make "flat" the bass level.

In which position have the subs to be placed in order to have a unifom sound field together with main speakers?

Tks a lot!
v

Subject: Multisubs
Posted by Wayne Parham on Tue, 01 Feb 2011 22:47:26 GMT
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I like to use CARA to model the room and speaker positions. It gives a pretty good indication where in the room the sound field is most uniform. Put the subs where the sound field looks best, especially in the listening area.

As for the use of parametric EQ, consider this to be optional. You want to do most of the work with speaker position. You can then equalize the averaged sound field if you want but I don't think you'll find it necessary. What I do is to use a low-pass frequency that's low enough you can't localize the subs. I also don't use much drive signal to the subs. Just enough to get them moving, but not enough to tell they're on. Subtle is the key.

Subject: Re: Multisubs
Posted by justphil on Wed, 02 Feb 2011 03:37:25 GMT
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Not to hijak but Wayne when you say run the mains wide open what exactly does that mean? On my AVR I have my current mains cut off at 60hz even though Audessy set them at 40hz because I was told on another forum or read somewhere that 60 hz and lower is better left to the subs and

thus gives your amp some head room if I am not mistaken.

Does this not necessarily pertain to me as I use an AVR or is there something I could try changing in my settings? This post has me even more excited about finally getting my 3 2 pis done for my mains and center as I really had no idea that your mains could aid as bass sources.
I was pointed in your direction on a forum as I was told speakers such as what you have designed will make my HT more dynamic.

Subject: Re: Multisubs
Posted by Wayne Parham on Wed, 02 Feb 2011 17:01:11 GMT
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What I mean when I say "leave the mains wide open" is to not high-pass them, let them run all the way down.

As you've said, conventional wisdom is to high-pass the mains at the same frequency you low-pass the subs. This is a traditional crossover setup. And there are very good reasons to do it that way. It reduces the strain on the mains since they don't need to handle bass. Excursion is reduced, bandwidth is limited, so IMD is reduced. These are good things to do, important when the mains are pushed very hard like in a prosound environment or when the mains are little-bitty mini-monitors designed to be used with subs.

If the speakers were used outdoors or in a very large room where there were no modes in the passband, this would be the end of the story. You would want point source bass, and crossover to limit excursion on the mains would probably make the most sense.

But indoors, we have a competing priority, which is room modes. We can smooth them using multiple sound sources below about 100Hz. Now then, if you have deep pockets and can afford four subs, if your room layout allows that many speakers placed around, then you can have your cake and eat it too. High-pass the mains at say 80Hz and run the lower frequencies to the subs. Might want to have the two closest subs run to 80Hz, and the more distant ones low-passed at 50Hz to prevent localization. But the point is, with four subs, you can high-pass the mains and still have multiple bass sound sources.

Another option that works with powerful mains it to just let them run all the way down, providing two more bass sound sources. This makes it possible to take advantage of the multisub configuration with just two subs. I wouldn't suggest this if the mains are mini-monitors because the extra excursion will make them sound terrible. But an efficient speaker with a large woofer designed to handle a lot of power isn't going to gain much by high-passing to reduce excursion at normal home listening levels.

These speakers are loafing along even when it's so loud stuff is rattling off the walls. So you can gain two bass sound sources simply by letting the mains run all the way down and blending them with the subs. The subs are still low-passed at 50Hz to 100Hz, but the mains are run full range. With the right setup, you only need two subs this way and still get the modal smoothing benefits of the multisub configuration.

Subject: Re: Multisubs
Posted by Peppennino2 on Wed, 02 Feb 2011 17:31:50 GMT
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Very interersting informations! Thanks a lot, Wayne!!

Subject: Re: Multisubs
Posted by justphil on Thu, 03 Feb 2011 00:10:32 GMT
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Wayne I really appreciate your time and explanation. =)