Subject: Looking for some Pi advice for theater ...
Posted by AlphaG on Mon, 14 Jan 2013 15:11:40 GMT
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So I did spend a fair bit of money on a theater layout and am very happy with it. The speakers are specified to be behind a screen wall. I would like to use some of my DIY skills to make the LCR speakers and to that end I have done a lot of reading, multiple forums.

I have come to the conclusion that I cannot design a speaker from the ground up myself, but fortunately the Pi's are available as established plans.

So I did some more reading, including Wayne's white paper. Seems like the optimal solution is to use cornerhorns for left and right, but I would like some opinions on whether this is possible in the space. I don't mind putting the LR speakers out in front of the screen wall if they are in the corner. To that end, I can eliminate the front pillars in the room to make a smoother wall-waveguide. In this instance, I can build a 4Pi for center channel use.

The other option is building 3 x 4pi's. Baffle mounting them could prove problematic because of the limited space behind the screen wall, and would be more complicated. And if I used them with "flanking" subs, I would have to build more subs. I already have a plan to build a large front subwoofer (and have some of the equipment for this) and have two Peerless XLS subwoofers that I planned to use in back surround pillars as "distributed" subs. If I eliminate the front pillars, I would eliminate the back pillars and perhaps mount these reinforcing distributed subs in the floor.

Finally, I do feel somewhat hesitant to deviate too much from the specified plan. Hopefully I can find an optimal setup that I'm comfortable with, and one that let's me DIY it with success.

I'm glad I found this resource. Thanks for the help!

Subject: Re: Looking for some Pi advice for theater ...
Posted by Wayne Parham on Mon, 14 Jan 2013 18:21:40 GMT
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Looking at your floor plan, I think constant directivity cornerhorns would work fine. The things you need most are unobstructed wall space from the apex of the corner and distance between corners that allows the axes to cross in front of the listening position. Your room is close to that ideal, with the front seats being just ahead of the crossed-axes and the rear seats being just behind. That's acceptable.

What we don't want are speakers so far apart that the axes cross well behind the listeners. When they're too far apart, you lose stereo imaging and the channels sound disconnected from one another. We also need the wall expansion from the apex of the corner to be unobstructed. By this, I mean we can't have door openings or open windows within the first six feet. You can have features like bookshelves or closed windows, but we can't have openings because that breaks the

expansion.

On the other hand, a pair of DI-matched two-way speakers would be fine too. But they would need flanking subs to mitigate anomalies from reflections off the nearest boundaries. You could soffit mount the speakers to prevent the reflection off the wall behind the speakers, which is usually the worst offender. But this would still leave the side walls, and you'll get a notch off them.

systems will sound great.

Subject: Re: Looking for some Pi advice for theater ...
Posted by AlphaG on Mon, 14 Jan 2013 20:26:39 GMT
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Great to hear that the cornerhorns would be feasible in the space. If you look at the plan carefully you will see a corner molding trim in the front of the proscenium/stage where I was planning on placing the cornerhorns. Hopefully that is where you thought I would be placing them. While the side walls of the room are relatively unobstructed, I am unsure as to how the acoustics would be affected by the opening for the screen. There is a short wall just behind that area where the cornerhorn would be, but towards the middle of the room, it opens up where the screen is. Will this be a problem?

I can likely soffit mount a 4pi in the middle of the speaker wall for the center channel.

I will then use a big summed mono sub up front and two summed mono reinforcement subs in the back to help with lower bass modal dips.

Subject: Re: Looking for some Pi advice for theater ...
Posted by Wayne Parham on Mon, 14 Jan 2013 20:52:02 GMT
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I was thinking the wall behind the screen was solid, and that the cornerhorns would be placed there. Are you saying you were planning to bring them forward to where the screen is?

If so, if what you are saying is they would sit near the trim which spans from sidewall to screen, what is the trim made out of and how large is it? How many feet from the apex of the corner?

The screen is probably acoustically transparent, so it won't act like a boundary. So I am thinking your "stubs" of trim won't be enough to support the cornerhorns.

You could do one of two things:

1. Push the cornerhorns back into the corner and use an acoustically transparent material to span the gap between screen and sidewall.

2. If the trim is made from a panel that is wide enough to hold a loudspeaker, create a soffit to hold four Pi speakers. But in this case, I think the soffit might be small enough you may want flanking subs. Have to measure it and see.
