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Subject: Theater room LCR

Posted by [LoveJBL](#) on Sun, 09 Mar 2014 01:49:24 GMT

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Hello all,

about a year ago my oldest son moved out and left me with a room downstairs in my house 24' x 11'. It didn't take me long to convince my wife that I could save about \$200 a month if I built a theater room. of course she had no idea how much it would cost.

In any case I quickly started compiling a list of like to haves and must haves. Didn't take me long to realize that retail sound was not going to do it for me. So I started looking at what actual cinemas use for sound and I decided to go pro.

Here is my list of current equipment.

1 Each Integra DTC 9.8

4 Each Crown DSI 1000 Amps

1 Each Crown DSI 2000 Amp

2 Each JBL 4645C Sub Woofers

1 Each EV18B set up for mid Bass

3 Each JBL 3677 used for LCR behind a AT Screen

4 Each JBL 8330 used for L and R surround and Rear Surround

various source devices BD rom, Dish, Apple TV and a Media Center

OK so needless to say that I have the capacity to tear the paint off the walls and unhinge the ceiling joists. I do like to listen to movies loud.

My JBL 3677 speakers great as they are fatigue my ears after about a half hour of an action movie. I have tried many different things to tame them but just can't seem to get them in line.

A friend of mine suggested that I check out Pi speakers, he mentioned that he had read someones post on this forum about changing the CD in the 3677 to something that was much more pleasing to the ear. I looked at the forum and could only find a post where someone tested a few different drivers but did not come to a resolution inside the JBL cabinet.

So the real question is do anyone know if a direct replacement for the CD in the 3677 that just works? I know there is much more to it than that but I have to ask.

If the answer comes back no then of course I need to start cutting wood for My Pi 4 speakers and my question will be will the woofers in my 3677's work for a Pi4 build or would it be better to get the 2226's.

Where do I start? are there plans for the speaker box cuts or sizes available.

does it make a huge difference in sound quality if you buy the crossovers with the more expensive caps and resistors for the Pi 4?

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Subject: Re: Theater room LCR  
Posted by [Nick77](#) on Sun, 09 Mar 2014 12:30:22 GMT  
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Sorry the commercial stuff isn't working out, i dont think you could ever match the quality of the Pi4 commercially. The fatigue factor plagues a lot of commercial designs.

I cant answer all of your questions but i can highly recommend building the Pi4 with the 2226. I personally think there is a huge difference between the crossovers but I use my Pi4 mostly for music. If strictly for HT use maybe the upgrade isnt cost effective, personal decision. Good luck and welcome.....

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Subject: Re: Theater room LCR  
Posted by [Bill Epstein](#) on Sun, 09 Mar 2014 13:02:31 GMT  
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Has it been 12 years since the JBL Tent Sale?

Seems a lot of us posting here and Audio Karma and Asylum, etc. bought a pair of 3677s and at least one 4648A for it's set of two 2226Js (still have'm and still in my 4Pis). I vaguely recall thinking the 3677 came with a very good 2205(?) that turned out to be a far lesser woofer; the 2226Js went into the 3677 cabinets.

Those had the good 2370 horn (have you seen what they retail for?) and again, a down-market comp driver. I think I used Altec 902s in mine. It was thought the shallow depth of the box was a factor and they sounded very good.

End of story, the 2226 is unmatched as a mid-woofer and after 8 or 10 years of farting around with lot's of different cabinet builds, putting them in Wayne's 4Pi configuration was a revelation.

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#### File Attachments

1) [site1212.jpg](#), downloaded 5084 times

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Subject: Re: Theater room LCR  
Posted by [Wayne Parham](#) on Sun, 09 Mar 2014 17:02:13 GMT  
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I'll send plans to your E-Mail account, so you can get started on the cabinets.

As others have said, the JBL 2226H is a best-of-class midwoofer. In my opinion, there are no better woofers than the JBL 22xx series devices, and in saying that, I am including the GPA and AE product offerings. Everybody is trying to catch the JBLs, but in my opinion, none are able to.

The CD we use is the B&C DE250. It also is a world-class driver, and most consider it to be the "one to beat." You can't do better for anything less than a grand. Next step up would be the TAD drivers, and the improvement you get is a tiny sliver of extension above about 18kHz. Not sure I'm willing to pay a grand for that.

You can buy kits from me, or you can source your own parts. Look around on eBay and you may find some good deals on refurbished JBL woofers. But make sure they have genuine JBL cone kits.

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Subject: Re: Theater room LCR  
Posted by [LoveJBL](#) on Mon, 17 Mar 2014 23:16:25 GMT  
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Wayne,

A buddy of mine and I were talking today about my plans to build the 4pi speakers for my theater room. He prides himself on being an audio buff of sorts. He is a huge fan of MagnaPan speakers and tube amplifiers. I get where his head is at, everyone has different tastes. He is an electronic engineer by trade so I am always picking his brain about electronics.

I was discussing with him the crossovers that you designed for the pi4 speakers, more specific I was asking him what he thought about the more expensive capacitors and resistors and how they effect the overall sound quality. He absolutely agreed that the higher quality parts would yield a higher quality sound in many different ways. What came out of this conversation was a question that he posed. He asked why would I use crossovers instead of just bi-amping the speakers as I have enough amplifier channels to do so and the 3 amplifiers that I would use have built in DSP's.

So what do you think about eliminating the crossovers and bi-amping the pi4 speakers?

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Subject: Re: Theater room LCR  
Posted by [Wayne Parham](#) on Tue, 18 Mar 2014 03:15:31 GMT  
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I think if you're capable of configuring an active crossover so that its transfer function is exactly the same as the passive crossover we provide, you'll gain benefits from doing so. But there's the rub: I tend to warn people that they'll need to do some work to setup an active crossover, and not to think that they will enjoy improvements just by simply having one. It requires a crossover/processor that can be programmed to provide any transfer function, not just one that allows the user to select a set crossover frequency and slope. And it takes a little bit of time with an acoustic measurement system, to optimize the system at all off-axis angles. The process is shown in my "Crossover Optimization" thread. The basic process is described, and there is a link to a video that shows you how to find the vertical nulls, which mark the edges of the forward lobe.

The low-pass filter for the woofer is pretty straightforward, but the tweeter circuit is a little more complex. And of course, proper on-axis and off-axis summing through the crossover region requires careful selection of both high-pass and low-pass sections, both in terms of frequency and phase. This is usually set by slope and filter type, and sometimes standard types aren't even used.

The damping of the waveguide's high-pass filter circuit must be adjustable as well as the slope and frequency, because we set the lower "shelf" by setting filter Q. In most cases, it is slightly underdamped because (properly sized) conical horns and waveguides tend to rolloff a little down low. On the other hand, truncated conical horns and waveguides tend to have a peak down low, and in this case, the tweeter circuit can be overdamped to partially compensate. This is a very

above crossover and to tailor it for any waveguide. You will need to provide this in an active crossover as well.

Most people tend to think an active crossover can be easily configured using "CD compensation" but I find this is rarely the case because of the lack of filter Q adjustability. The 6dB/octave compensation for mass-rolloff is the easy part, it's just a single pole RC or RL filter. That's what "CD equalization" in most active crossovers provides. But the result is a transfer function that's a diagonal line, and that doesn't work well in most cases.

Mass rolloff doesn't start to occur until around 4kHz, so we usually want flat response up to that point, followed by 6dB/octave rising response. And as I said above, each individual waveguide has its own unique characteristics in the ~1kHz octave too, some needing a little more damping, some a little less. So for the active crossover to be useful, it needs to be capable of adjusting the transfer function of the tweeter circuit accordingly, usually something like this:

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Subject: Re: Theater room LCR  
Posted by [LoveJBL](#) on Wed, 19 Mar 2014 20:41:22 GMT  
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Wow thank you for your detailed response.

I think I might give it a shot. Are you familiar with the DSP's in the Crown amplifiers? They certainly have a lot of functionality but I'll have to check to see if they can accomplish all of the adjustment types you speak of.

I'll let you know how it goes.

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Subject: Re: Theater room LCR  
Posted by [LoveJBL](#) on Wed, 19 Mar 2014 20:58:12 GMT  
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Well I sold my JBL 3677 speakers, shipped them today, whew that was much more effort than I wanted to take on.

I threw an old pair of Cerwin Vega D9's into my theater for left and right and a CV XLS-6C for the center channel for now. I bought the D9's in 1986 took me a whole summer to save for them. I have had the woofers in them re-coned twice. They still rock the house but they never really had nice imaging. They will have to do until I get the Four pi's built.

picking up the wood this weekend.

surfing Ebay for JBL 2226H's and trying to make up my mind about the CD's B&C or Eminence. I really have already made up my mind

Until next time thanks again for your help Wayne.

Has anyone used the four pi in a theater can you tell me how they sounded?

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Subject: Re: Theater room LCR  
Posted by [Wayne Parham](#) on Wed, 19 Mar 2014 22:48:38 GMT  
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What you might do is to build the passive crossover I've designed as a baseline. That's one you know is optimized, and you'll leverage all my R&D investment by using it. Then, you can also dial in your active crossover, and see what you can get that to do.

Be sure to measure off-axis as well as on-axis, and make sure the response is good in every direction. If you can get it to work as well, then you're set. If not, you can always use the one I made. Again, there is a significant investment in that crossover design, so it is one you can count on.

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