
Subject: Pi Sevens up and running!

Posted by [Tim Barnes](#) on Tue, 07 Aug 2007 17:46:55 GMT

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At the weekend I finally was able to install my new Pi Sevens in my living room. Here's a first set of impressions. My system is as follows: * Townshend Rock III turntable with Grado MM cardtridge. * EAR 834P phono stage* Naim CDP8i CD player* First Sound passive "preamp"* Music Reference RM9 tube amplifier* Mixed cables - DIY solid silver, Cardas speaker cables. The speakers replace my Thiel CS3.6 floor-standers, in roughly the same locations (corners). The room is sub-optimal in that the speakers are in corners that also house bookcases, and there's a baby grand piano between the speakers along the same wall. However, there's no sign yet of any piano-contributed vibration. I've been listening to lots of stuff: Beatles, Tom Paxton, King's Singers, Lieder (Brahms, Schubert), Wagner, Gilbert & Sullivan, Dave Brubeck, and a mix of CDs and records. The first impression is of a very delicate and accurate mid-range. The King's Singers have never sounded better. The mid-horns seem solid and unfussy. The treble is clear, but I think a bit recessed, and definitely less audible than with the Thiels. The bass I'm not quite sure about yet. Clearly the power of the woofer is exciting a couple of room modes, and I will need to build some tube traps or something, and possibly alter the room layout a bit (I'm sitting against the back wall, which is probably not ideal). The most obvious effect is on plucked bass lines, and also some coloration on male voices. But except for the notes that are too loud, the bass seems clear and unobtrusive. I don't know if I'm really getting all the extension I was expecting - this may be because of the bookcases, or (and I hope not) it's possible the cabinets leak. I have been unable to detect much port action so far. The other major change is the increased level of dynamics. I find I have to adjust the volume for every recording separately - I never needed to do that before. Popular recordings with lots of compression need to be turned well down. Classical recordings with wide dynamic range can be turned up and I still get good pianissimo, with exciting climaxes. The bass excitation limits my ability to listen loud - especially with bass or baritone voices. I should mention my long-suffering wife's responses - she has three (presented in unvarnished form): 1. "They are bigger than you led me to believe" 2. "They are uglier than I thought" 3. "They sound much better than the old speakers." ...so I guess I get to keep them, but I will need to finish the veneering and clean up the wiring etc. So once again, Wayne - thanks for all your support through the process, and thanks for the design. The project was worthwhile, and has given my music collection a new lease of life. I look forward to more projects - office and garage speakers, and perhaps some room acoustics modifications. Regards, tim
Pictures

Subject: Re: Pi Sevens up and running!

Posted by [Wayne Parham](#) on Wed, 08 Aug 2007 14:33:10 GMT

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That's awesome, Tim! Thanks for posting. Check room wall and bookshelf panels for sympathetic vibrations. This is one of the most troublesome issues I find. Shelves sometimes buzz, and cabinets with closing doors sometimes vibrate door against stop. Do something to preload the panels that make your shelves back walls and see if you can find ones that are making noise.

Chances are, you'll find a lot of things in your home that buzz when vibrated. The different woofers and setup may energize them differently and make it more noticeable.

Subject: Re: Pi Sevens up and running!

Posted by [Tim Barnes](#) on Wed, 08 Aug 2007 16:47:42 GMT

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Thanks for your thoughts. The bookshelves are built-in and pretty solid, but I'll have a close look at them. Last night I "installed" four bags of R19 insulation under the piano and in corners. The bass boom is gone, but the treble is now definitely too light, so I've overdone it a bit. I'll keep on experimenting and I plan to take some measurements over the weekend. The most obvious problem I can detect at present is that the front of the bass cab vibrates a bit, despite two glued-on braces and two cross-braces (above and below the woofer). Would it be a good idea to put in some kind of compressible bracing between the back of the woofer and the front of the cab? Or should I just add more glued-on pieces to the inside of the front?

Subject: Re: Pi Sevens up and running!

Posted by [Wayne Parham](#) on Wed, 08 Aug 2007 17:26:42 GMT

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I would suggest running braces along the front. Glue 1x2 wood along the panel with the taller dimension (2") standing up. That way it will resist panel flex. If you find room modes are troublesome, you may want to add a couple subwoofers. This may seem counterintuitive, especially if you feel that the bass is strong. But what will happen is bass will be made more smooth as a result. Use CARA and figure out where to place the subs. I have found many cases where the four opposing corners are best, and others where they're not. Of course, your decor will determine what you have to work with too. I usually suggest the additional woofers be the same as the ones in your sevens. They don't have to be cornerhorns, but they surely can be. If not cornerhorns (with mids and tweeters), then low-pass them very low, below 100Hz. This prevents localization and improves integration, by keeping sound sources acoustically close. Or you can go with a different approach, using woofers like the LAB12 that are tuned for a very deep range. This lets you hit even deeper bass notes while providing smoothing of the overlapping range. You may be able to install subs in cabinets that fit under existing furniture. You can usually find a configuration that models well in CARA and that also fits in nicely with your room decor.

Subject: Re: And what does wifey think of the R-19?

Posted by [IRS](#) on Wed, 08 Aug 2007 23:29:03 GMT

Or adding 2 or 3 more sub-woofers. LOL.I've got 3 stacks (John Risch cheap 'n dirty bass traps) of R-13 fiberglass that comes in rolls in corners.That tamed the bass boom in my room: poorly suspended wood floor.I cut plywood circles for the tops of the stacks and stapled colored burlap to the edges which skirt the rolls down to the floor. Kat likes to sit on the one by the window. After she bakes you a pie you might let the little woman choose the fabric herself.The thicker the insulation the lower the frequencies absorbed so your R-13 shouldn't be lightening the treble. Just the opposite. There should be more clarity. I think you're hearing the lesser extension of a horn tweeter compared to your Thiels. Might want to consider a JBL 2405 or other super-tweeter.Just my buck and a quarter.

Subject: Easy to add Post-assembly Bracing
Posted by [Skip Pack](#) on Thu, 09 Aug 2007 16:04:44 GMT
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I've used 1" 'dowels' several times -- available from HomeDepot. Cut them to length, see if you can straighten them into position, if not sand the ends slightly and try again.Once you have a fit, take them out, smear glue on both sides and put them back. Once you see/feel what's vibrating, you get a pretty good idea about where to put them.Skip

Subject: Room treatments
Posted by [Wayne Parham](#) on Thu, 09 Aug 2007 18:24:16 GMT
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Raised hardwood floors are almost always problematic. Their acoustic contribution is usually even worse than room modes, because they tend to form a resonant chamber, like a large bass drum. You really have two sets of room modes to deal with when setting up a sound system in a room having a suspended wood floor. You have the modes of the crawlspace, which are generally severe, and you also have the modes of the listening room. The room itself may be reasonably well damped, but the crawlspace usually isn't. The ground and supporting side walls are rigid, but the floor vibrates. This makes a perfect resonator with very little damping - an acoustics nightmare. Rooms without raised hardwood floors are usually better. However, if the walls are rigid, then modes aren't well damped. Rooms with rock, concrete or brick walls usually have more modal problems than those with framed drywall construction. Rooms like these can benefit from bass trap panels. Sometimes, things in the room act as resonators, and that causes problems too. Built-in cabinets sometimes resonate or buzz. Large free-standing furniture sometimes resonates. So there are lots of things to look out for.

Subject: Re: Hardwood floor
Posted by [Tim Barnes](#) on Thu, 09 Aug 2007 23:09:40 GMT
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My floor may be marginally better than some - it's an engineered hardwood floor (basically plywood planks) laid on a few mm of foam, over a particle board floor on joists (I used to have carpet). I also have a big rug in the middle of the room and quite a lot of soft furniture. But in any case, I'll see what it sounds like under the floor. I imagine that if I use Cara to work out room modes, and then when I measure I find something different, it may be because of the sub-floor space? I have some other things to do as well - explore moving the piano to another part of the room to let the horns do their thing with fewer obstructions; put some kind of absorbent pad under the piano (a Jon Risch-style trap lying on the floor?); and then we'll see where I am. The room needs to get back to the clean and minimalist look it had before I put all the stuff in there - it is meant to be a peaceful place, not just a listening room...

Subject: Re: Super-tweeter
Posted by [Tim Barnes](#) on Thu, 09 Aug 2007 23:13:28 GMT
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I would like to experiment with a supertweeter, but I would rather not spend too much until I have proved the concept. Any suggestions in the sub-\$100 range?

Subject: Re: Easy to add Post-assembly Bracing
Posted by [Tim Barnes](#) on Thu, 09 Aug 2007 23:15:14 GMT
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That will work well for face-to-face braces. Is it a good idea to brace against the back of the woofer?

Subject: Re: Hardwood floor
Posted by [j.luis](#) on Fri, 10 Aug 2007 00:28:05 GMT
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Hy ..Tim . What woofer do you have in the 7 Pi bass bin ..Thanks

Subject: Re: Hardwood floor
Posted by [Tim Barnes](#) on Fri, 10 Aug 2007 00:46:08 GMT
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Absolutely standard build to Wayne's specifications - the woofer is the JBL 2226H.tim

Subject: Re: Pi Sevens up and running!
Posted by [Tim Barnes](#) on Fri, 10 Aug 2007 05:29:14 GMT
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I ran a frequency test in my living room tonight with my Radio Shack meter and the test tones from realtraps.com - the results are as follows:* Audible response below 20Hz if I turn up the wick a bit.* Real response seems to start at about 25Hz - small peak at 26Hz.* Up another 10dB by 35Hz.* Up to "average" levels by 46Hz - 15dB above the 35Hz figure.* Small peaks at 67Hz, 100Hz, 160Hz and 290Hz.* Response drops at 85-95Hz, 110-150Hz, 230-270Hz.* Narrow suckouts (down 8-10dB) at 110Hz and 270Hz.This is with three bags of R-19 - two under the piano and another hiding under a coffee table.I'm a bit surprised there's not more bass in the 25-45Hz range - is this the result of inadequate corners, perhaps? I can also hear a certain amount of vibration - not sure of every cause, but I could identify a shelf and a table and some CDs as a start. Also the floor vibrates, and I wonder if I should isolate the speakers from the floor?
Realtraps test cd link

Subject: Re: Easy to add Post-assembly Bracing
Posted by [Skip Pack](#) on Fri, 10 Aug 2007 13:27:40 GMT
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I imagine it would be a good thing if you could use some closed cell foam or something like that put the brace/rod under a reasonable amount of compression. Perhaps you could take a square of mdf, drill a hole in the center, and glue it to the inside of the back panel centered on the woofer cutout. you could then put a thin amount of the foam in the hole then tighten the woofer mounting screws against rod/dowel going from the hole to the back of the driver. You could judge the force adjusting the thickness of the foam to make it snug without putting too much stress on the woofer frame or the mounting screws. As I said I haven't done this, but I do put four of the dowels around the woofer cutout to localize the panel reaction to the woofer acceleration. Skip

Subject: Re: Pi Sevens up and running!
Posted by [Wayne Parham](#) on Fri, 10 Aug 2007 14:32:59 GMT
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subwoofer use, and doesn't reach the 20Hz-30Hz range. As you've noticed, there's usable output from 30Hz up but bass starts to rolloff about 40Hz. The system is tuned to have a slightly overdamped alignment for corner loading. Corner loading brings up the bottom end and the overdamped alignment prevents a midbass peak.

Subject: Re: Super-tweeter
Posted by [dB](#) on Mon, 13 Aug 2007 15:16:57 GMT
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I am going to post a good site on ribbons very educative, watch for the main thread. In the mean time you can ask if Wayne plans in using them in the future and what he thinks if he has anything in view. Also watch for beautiful Fostex's not far way in price (\$50's/\$100's), FT17H/FT96H that is if you can handle. Regards
Tweeter : Horn Tweeters

Subject: Re: Pi Sevens - almost finished!
Posted by [Tim Barnes](#) on Tue, 14 Aug 2007 06:13:08 GMT
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I've turned them around against a different wall and finished the veneering (although they still need finishing). This seems to work better as they have more room to breathe. The treble seems improved, which is a surprise, and the overall balance is better too. As you can see from the picture, they are sitting on my hardwood floor, which is less than ideal. They don't have any feet or isolation of any kind - any ideas as to what I should do there? The crossover is still loose, and needs a box, and I plan to remove the shelves and build something more effective for CD storage so the speakers are truly in the corner. I'm constantly amazed at how much more I'm hearing from all my records. It's hard to stop listening - which is the point, I guess

Subject: Hey Tim.
Posted by [j.luis](#) on Thu, 16 Aug 2007 16:11:03 GMT
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Hy..Tim .How compare your new speakers against the older ones ..thanks

Subject: Re: Hey Tim.

Posted by [Tim Barnes](#) on Thu, 16 Aug 2007 20:47:08 GMT

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Some information in my previous post (referenced below). The increased efficiency is the first and most obvious difference. The second is the increased sense of ease and detail in the mid-range. I am hearing a lot of new information. The difference between CDs and LPs is even greater than before - with LPs clearly preferable. The corner positioning and perhaps the use of horns seems to lead to a couple of changes - more air movement and sense of being involved in the sound which is a good thing. The precise imaging I was used to is not really present any more. I feel there's a bit of a hole in the soundstage towards the center. But there's a benefit too - the sweet spot is much bigger. I can sit in many places in the room and still enjoy a balanced sound. There seems to be a shortage of low bass with the Pi Sevens, but very good and clear and unfussy mid-bass. The Thiels use a passive bass radiator which gave quite a lot of bass - especially if the speakers are anywhere near a corner. The Thiel cabinets are much more rigid than the Pi Seven bass cab - double or triple thickness baffle, lots of internal bracing, smaller panels. I never felt any vibration of the Thiel cabinet, but I can detect vibration on the front of the Pi. I plan to take the drivers out and beef up the internal bracing. The treble is clearly less than with the Thiels, but it's clean and sweet. I might investigate a super-tweeter, but we'll see. The integration between the treble and mid-range seems to be perfectly seamless from anything more than a couple of feet away. One reason the Pis work well for me is that my amp is a Music Reference RM9 tube amp that is not really at its best into very low impedances. The Thiels go below 2 ohms at certain frequencies, which in addition to their low efficiency makes them tough to drive. A transistorized amp was better at the bass, but worse at the mid-range. With the Pis I can get a good overall performance with my tube amp. Let me know if you have any more specific questions - I'm still learning about the speakers and I'm sure my views will continue to evolve. My net conclusion is that they were well worth the trouble to build, and a very satisfactory improvement on the Thiels. I wish they were smaller. Regards, tim
Some first impressions...
