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Subject: Re: 4 pi, oh my!

Posted by [Wayne Parham](#) on Wed, 23 Feb 2011 20:25:53 GMT

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I agree with Bill, the quality difference in the 150Hz to 1.5kHz range is noticeable with the upgraded midwoofer. That's the reason for the upgrade, and the reason why I think the woofer is the most important part to upgrade. Tweeter is second, because while it is smoother, I think the improvement is a little less "important" than the midwoofer upgrade. Both woofer and tweeter upgrades are worthwhile though.

the stock build, but the upgraded midwoofers are higher quality "best of class" parts. The difference is largely due to shorting rings being used in the upgraded parts, which makes the motors more linear and decreases distortion. The material and shape of the cones in the upgraded midwoofers also helps reduce breakup, with the end result being smoother midrange with less distortion.

If you're just casually listening for a few minutes at a time, the differences are subtle. You can hear a difference, but it definitely isn't night and day. It's when you really sit down and listen that you notice the quality improvements from the upgraded parts the most. I guess that's subjective, but my point is you shouldn't take this to mean the stock parts suck and the upgraded parts are the only things worth having. That's not the case. The stock speakers sound great. It's just the upgraded versions make the speaker go from a "great speaker" to what I consider to be a "best of class speaker". It's a good-better-best deal with the stock builds being "better than most" and the upgraded builds being the "best".

There is one last thing worth mentioning. There is a difference in the electro-mechanical parameters of any loudspeaker driven at one watt than there is when driven at ten watts, and it shifts even more at a hundred watts. At high power levels, voice coil resistance increases and this tends to shift the speaker towards an underdamped electrical alignment. Voice coil heating tends to lift the low bass, sometimes causing excessive peaking. At low power levels, the voice coil is cool so there is more electrical damping but the suspension of prosound speakers (designed for several hundred watts) is often stiffer. This change of compliance tends to reduce low bass output. All my designs are made so that they won't get peaky at high power levels, providing good response from flea power to full tilt, but some shift a little more, some a little less. Most shift from moderately overdamped to slightly overdamped, some from slightly overdamped to slightly underdamped.

One thing I've noticed about the 2226 is that it is stiffer than you expect at low power levels. Even though T/S parameters are technically small signal values, JBL rated the 2226 with values that are more representative of how the speakers acts at about 10% power, i.e. ~60 watts. If you take a JBL 2226 and connect it to your handy-dandy T/S woofer tester, you'll find compliance is a lot smaller than the published figure. That's because the woofer tester is sending it about a tenth of a watt for an input signal, and the electro-mechanical properties are much different than it will be at higher power levels. Personally, I think it was a good idea to publish T/S specs for this woofer that are representative of how it acts at moderate power levels, because this is how the driver is going to be used most of the time. But most manufacturers publish specs that are more in line

with what you'll actually measure with less than a watt drive signal.

using the Omega 15 produces more output below 100Hz at low power levels than the version with the 2226. As power levels increase, the alignment shifts and brings up the bottom end but at very low power levels, there is less bass output from the 2226. So if you're running low power tube amps, this might be something to consider. If you're using subs, it really doesn't matter. The improvement in midrange quality makes it worthwhile to upgrade, in my opinion, even with the slightly reduced bass output. But I did think it worth mentioning.

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