
Subject: musical peaks / SPL / power distribution

Posted by [Steven Homrighausen](#) on Tue, 03 Apr 2007 00:31:00 GMT

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Sorry for the lengthy post. Thanks in advance to all who reply. In a tweeter array of nine ribbons (wired 3x3), say 98dB each - rated at 20w RMS / 50w max each. The array is 98dB, and can support 180w RMS / 450w max. Theoretical 'constant' SPL of 120.5dB with SPL 'peaks' of 124.5dB (so really 124.5dB musical peaks). In a mid-bass array of nine drivers (wired 3x3), say 89dB each - rated at 100w RMS / 200 max each. The array is 98.5dB, and can support 900w RMS / 1800w max. Theoretical 'constant' SPL of 128dB with 'peaks' of 131dB (so really 131dB musical peaks). 1. Please correct the above statements if they are incorrect. 2. A stereo pair - can you assume 3dB more than the above listed numbers? What about 'in-room' vs. 'anechoic' levels? 3. If - you power each of these arrays with the RMS power listed above (180w & 900w)- at a crossover point of 2000Hz with electronic crossover set to LR4 (or LR8 for that matter)- with a good mix of music (classical, jazz, rock, R&B, fusion, etc, etc.) will the tweeters see a similar amount of that 180w that the woofers will see of the 900w? Stated another way, what's the general power breakdown with a crossover point of 2k (20% tweeter, 80% mid-bass)? 4. I've heard that ribbon tweeters DON'T like to be overdriven, and will just 'give up'. Is this true and is this something to worry about more than 'under-driving' them with an amp that's too small for the transients? 5. What are people generally using for the bottom octave (or two)? With the levels presented above, it seems that an IB sub would be a logical choice. (94dB with 4 drivers + 1000w = 124dB potentially.) In the grand scheme of things, I'd rather hear \$600 worth of woofers pop a bit, than hear \$2000 worth of tweeters give up. I know that these are EXTREMELY high levels, I'm just trying to understand each of these concepts.

Subject: Re: musical peaks / SPL / power distribution

Posted by [Marlboro](#) on Tue, 03 Apr 2007 02:00:25 GMT

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Have you read Jim Griffin's line array paper? How loud it can play really doesn't make any difference. By the numbers, my dual 12 inch woofer, 34 3.5 inch midranges, 60 dome tweeters running tri amped with 1300 watts can pump out 141 db. But the key is not how loud, but its how incredibly detailed and almost intimate astounding the experience can be. With small groups its the closest thing to having these people actually in your listening room playing just for you.... Most of the time I play it and can talk while listening. I know this isn't the answer you wanted...Marlboro

Subject: Re: musical peaks / SPL / power distribution

Posted by [Steven Homrighausen](#) on Tue, 03 Apr 2007 13:07:32 GMT

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Thanks for your reply, and comments. I'm not really concerned with total output. I just wanted to verify my understanding of a few things and get some opinions. Overall, I want a highly detailed system that is 'balanced' - to me, it doesn't make much sense to have a line array that is capable of high dynamics if your bottom octave doesn't share the dynamics. I believe that too often, the answer is that line arrays are amazing, dynamic, etc. I understand that. I've read Dr. Griffin's paper and understand most of the theory. One area that I may have missed is total power handling of a ribbon array. When someone builds a speaker (any speaker), there are limits in ultimate output and therefore dynamics. My father owns a pair of Klipschorns and based on their 105dB sensitivity, and their 400w peak power handling, they can produce 131dB (though their site states maximum acoustic output of 121dB). I find the Klipschorn to be a fatiguing sound, and overly bright (though my father loves them). Most of my listening levels are quiet enough that I can carry on a conversation in the same room without being annoyed by the music. There are times, that greater levels are required. I want to understand the limits of a line array.

Subject: Re: musical peaks / SPL / power distribution
Posted by [Anonymous](#) on Tue, 03 Apr 2007 14:28:08 GMT
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Line array power handling is pretty high, probably more power handling than most people drive. I drive 16 4" midwoofers in an array with a bridged QSC PLX3402 amp, rated for 3400w. Another PLX to drive 10 PT2 planars. Same for the other channel. The midwoofers are rated for 5w rms each. I run the system to clipping and I've been torturing this array for 2 years now, no drivers have ever smoked. Point is, I have four amps, total power rating 13.6kw driving the budget array using low cost drivers and it's loving it. The sound is amazing, not amazing because the array consumes 13.6kw, but rather the clipping headroom is very high and that is the real reward on why you want high powered amps. Bridged mode is 2x more clipping headroom, that's why I do it this way. Clean transients, clean sound.. Don't fear high power.
