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Subject: 12" 15" or 18" ?

Posted by [threeeyedowl](#) on Mon, 28 Apr 2008 23:44:11 GMT

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I know there seems to be a consensus of opinion especially among us rappers, hiphoppers, and regaetoners, that the bigger the speaker and the louder the low end, the better and more exciting the sound. But I want to appeal to the technically correct rather than to the excitement of my guts being blended. Here's the question: If I have two JBL Control 29 AV-1 speakers(one 8" woofer and one horn equipped 1" titanium driver each)and I want to array them horizontally or vertically (doesn't matter) and add a sub. What size speaker should I use for a sub and still keep my SPL and post speaker dynamics healthy? a 12" a 15" or an 18"?

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Subject: Hoffman's Iron Law

Posted by [Wayne Parham](#) on Tue, 29 Apr 2008 19:28:29 GMT

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Hoffman's Iron Law states that the efficiency of a woofer system is directly proportional to its cabinet volume and the cube of its cutoff frequency. What this means is the most powerful subwoofer systems are necessarily large. You can probably match your tops with a small sub, like a direct radiating LAB12 in a 4ft3 box. It will go pretty deep, the tradeoff is efficiency for size. But if you want deep bass and high efficiency, you have to use a larger bass bin than that.  
Hoffman's Iron Law

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Subject: Re: Hoffman's Iron Law

Posted by [threeeyedowl](#) on Tue, 29 Apr 2008 23:18:19 GMT

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Thank You very much for your response Wayne. Please clarify this statement a little for me since it's critical to our choices. "If you want high efficiency from a small package, you have to sacrifice deep bass and live with a higher cutoff point." Is this "cutoff point" the lowpass filter end on the top or the frequency rolloff end on the bottom?

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Subject: Re: Hoffman's Iron Law

Posted by [Wayne Parham](#) on Wed, 30 Apr 2008 19:43:48 GMT

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It's the rolloff on the bottom that is sacrificed when you make a small sub with high efficiency. You

lose deep bass extension.

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Subject: Upper bass harmonics of BIG cones could affect sound

Posted by [Scooter](#) on Sat, 24 May 2008 05:55:59 GMT

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Hi threeeyedowl, Many designers both listen to, and review the CSD(stored energy)plots of bass speakers several octaves above the crossover frequency to see if harmonics, cone break-up, or just distortion will affect the midbass sound. The best designers want all bass "nasties" -60db down, and claim that it is easy to hear even -40db down cone break-up. Very large diameter woofers might require very steep crossover slopes to approach the -60db goal....steeper than LR4 can "ring" and have audible phase shifts. I have found 15" woofers to have the best balance of bass SPL, bandwidth, and low midbass distortion. The 15" also seems to be the most popular pro-audio size, and hence offers the most options and best engineering.

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Subject: Thank You

Posted by [threeeyedowl](#) on Sat, 24 May 2008 16:29:55 GMT

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Thank You both, Wayne and Scooter. You have helped me in a three-week journey of successful research. I hope I can be as useful to you in the future.

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