Subject: Re: One Cubic Foot Subs
Posted by Wayne Parham on Mon, 19 Dec 2011 21:02:08 GMT
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You're so right. Hoffman's "Iron Law" (the one that says you can have two of three: deep bass, small size or efficiency) actually was a precursor to Thiele and Small's work. It's not just a seat of the pants thing, it's actually a quantifiable metric: The efficiency of a woofer system is directly proportional to its cabinet volume and the cube of its cutoff frequency.
Hoffman's Iron LawKeep us posted on your Tang Band 8" build please. Perhaps document it on the ART "Speakers" forum, if you feel so inclined. I know I'd love to see it there.

A group of small subs like that is perfect for use in a multisub configuration. It's small enough that you can place four of them in the room without taking over the room. My smallest sub is larger, at 20"x20"x20", and yours will be something like 13"x13"x13". None of my speakers are small, so I don't get too bent out of shape about size, but I do realize that a smaller sub might be attractive for some people, especially when using several in a multisub setup.

I might offer one small bit of advice. Don't push it for a max-flat alignment, like what you sometimes see when you let a simulator auto-align. Set the Helmholtz frequency a smidge below that, say maybe 10%, so there is a bit of rolloff down low. For example, if the max-flat alignment is at 25Hz, then set the actual box frequency to 22Hz. The reason for this is Thiele/Small figures are measured at very low power levels, like 1mW, and the parameters shift at higher power levels. Even at moderate levels, like just a few watts, there is a clearly measureable shift and it tends to push the system towards underdamping, which can make a tubby or even boomy sound. So back it off a bit by selecting a Helmholtz frequency that provides gradual rolloff.