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Subject: Re: 1pi or 2pi for surrounds?

Posted by [Wayne Parham](#) on Thu, 15 Sep 2011 03:10:30 GMT

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flat up top, with gradually reduced bass below a couple hundred Hertz. By 65Hz or so, they're really pretty much done, although in your case, a room mode boosts the output around 40Hz - 50Hz. The point is, the room is what really sets the response below 200Hz.

This illustrates pretty well why I don't use baffle step filters in my crossovers.

The reduced output below 150Hz - 200Hz is caused by the omnidirectional radiation at low frequencies contrasted with the half-space (forward-only) radiation above around 200Hz or so. At higher frequencies, the baffle sets the pattern, directing it forward. Since lower frequencies are omnidirectional, the same amount of power is distributed over a larger area, and the net result is on-axis response drops. The higher frequencies are "focused" into a forward-only direction, concentrating the energy in a smaller area.

This is why some people use baffle step compensation. The idea is to equalize the speaker with a gentle low-pass filter, lowering output above 200Hz to match the on-axis output below 200Hz. Baffle Step  
The problem I have with baffle-step compensation on speakers the size of mine is that the directivity shift happens in the room's modal region. The thing is, directivity ceases to be a function of the loudspeaker below the Schroeder frequency, around 200Hz in most homes. So what we have is a situation where the room's influence makes electrical equalization impossible. You don't get a steady 6dB drop like you would outdoors. Instead, you get a series of peaks and valleys. If you push that range up using a baffle step circuit, then the peaks and valleys become really pronounced. Essentially, you're throwing more energy into the modes, making them worse.

Whether used as main speakers or as surrounds, I prefer to use multisubs to provide the foundation of deep bass. It has the added benefit of smoothing the room modes too. What we really want is to add more sound sources at low frequency. This gives extension and smoothing, mitigating room modes at the same time.

Room modes, multisubs and flanking subs

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