Subject: Re: Multiple Subwoofers
Posted by Duke on Tue, 16 Feb 2010 20:34:00 GMT
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For the record, I'm another advocate of multiple subs. While intuitively it seems like overkill especially in a small room, the reason to go with multiple subs is bass quality, not quantity.

The smaller the room, the farther apart the room-induced peaks and dips in the bass region. And the farther apart they are, the more likely they are to be audible (the ear will average out peaks and dips that are close together). With multiple subs positioned far apart and asymmetrically, in effect you are overlaying multiple dissimilar peak-and-dip patterns so the net result is not only smoother but the peaks and dips are closer to one another because there are more of them, so the audible improvement is fairly significant.

One advantage is that you can turn the subs up louder. Usually the limiting factor on how loud you can crank the subs is the loudest in-room peak. Let's say with a single sub that loudest peak is 8 dB higher than the average, so now in order to keep that peak from overpowering the room you have to turn the bass down. If the peak is livable at +4 dB, your average bass level will be set at -4 dB.

But using distributed multisubs, the worst peak is maybe something like +4 dB. So now you can turn the bass up more before that worst peak becomes the limiting factor.

Equalization of a single sub can smooth the bass at one listening position, but the problem is this: The peak-and-dip pattern will be very different elsewhere in the room, so that 50 Hz peak that you notched out is actually a valley somewhere else... only now it's a canyon. Even for a single listening position, I've had people who've tried both report that unequalized multisubs sounds better than a single equalized ubersub.

Some things to keep in mind if you're going to try distributed multisubs:

1. You can use small subs because you will have several of them.

2. They do not all have to be the same.

3. Any subs that will be positioned well away from the main speakers should have a steep-slope lowpass filter so they don't betray their presence by passing audible lower midrange energy.

4. No more than one in a corner.

5. The ideal is to distribute them in all three dimensions. In practice this means one should be closer to the ceiling than to the floor, which has a fairly low WAF, but if we're talking about your mancave...

6. The subs will sum in semi-random phase in the modal region, and effectively in-phase below the modal region. So in addition to normal room gain, you'll get roughly another 3 dB of low bass boost (assuming all of your subs extend down below the modal region). If you're DIYing, take this (as well as normal room gain) into account.

7.  EQ is quite effective with multiple subs because the low frequency sound field will be considerably more uniform throughout the room.

Duke

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