

## Tip #15 Subwoofer Placement

“Where do I put the subwoofer?” This is probably the most often-asked question when putting together a home theater system. It can be dazzlingly confusing, or strikingly clear, depending on how you approach it. We prefer the ‘strikingly clear’ approach ourselves. We’re sure you will, too.

With traditional box subwoofers, it’s best to experiment with placement, since no two rooms are exactly alike. Keep this in mind: room boundaries—such as floors, walls, and ceilings—act like “acoustic mirrors,” and will reinforce the subwoofer’s output. Therefore, a subwoofer placed 3 feet out from all the sidewalls behind a chair, for example, will sound thinner and weaker than the same sub in the same room placed directly at the floor-wall intersection.

Probably the most important thing to remember is that all rooms have what engineers refer to as “room modes” or “room resonances,” whereby the room’s dimensions will either reinforce or weaken certain bass notes where the bass wavelengths correspond to the room’s dimensions. Asymmetry is your friend! (Huh?)

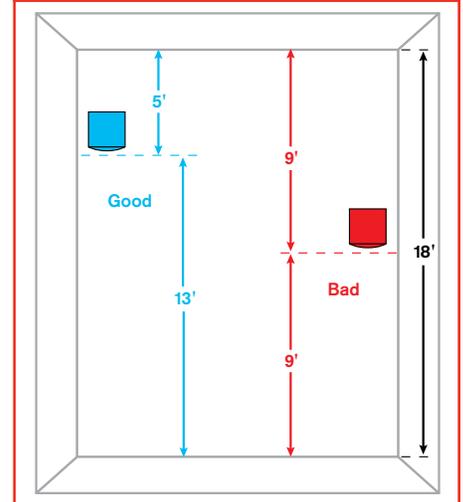
The best way around this (especially if you aren’t using expensive, complicated room diagnostic tools and fancy equalization) is to locate the subwoofer asymmetrically in the room with respect to the room’s dimensions. For instance, if the sub is going to be placed along an 18-foot wall, try locating it, say, five feet out from the corner. Five and thirteen feet are mathematically unrelated, which is good. (Remember your 6th grade arithmetic: 5 and 13 have no common factors, and 13 is not evenly divisible by 5. Got that? Mrs. Gunderson would be so proud of you.)

Therefore, those distances (5 and 13 feet) don’t conspire together to reinforce or cancel harmonically-related frequencies. On the other hand, if you located the sub 6 feet out from the corner, then you’d be left with 12 feet. Not as good, because 12 and 6 are directly related (2:1 or 1:2), and you could get either a buildup of room modes around harmonically-related frequencies (imparting an objectionable, thick drone to the bass) or a destructive cancellation, robbing the bass of its body and weight. 9 feet out (mid-wall) is even worse, because then it’s 9 feet and 9 feet.

If you have the space and budget for two subwoofers, that’s even better. Not only can you achieve higher bass loudness levels in your room with lower distortion, but as you now know from the preceding discussion about room dimensions, you can really randomize the effect of room resonances by placing the two subwoofers asymmetrically in the room. The response will be very smooth, with great impact and definition.

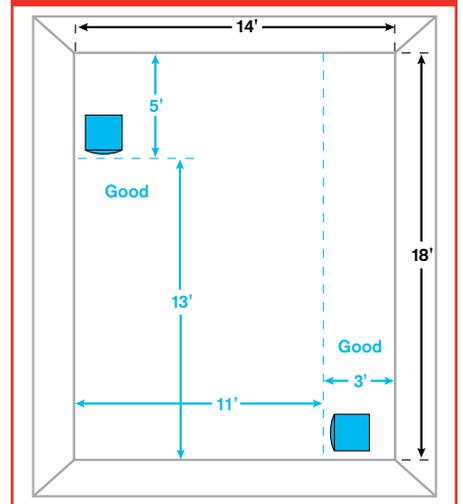
You get the idea. Experiment with placement. Keep the placement asymmetrical (see Fig 1). If you have two subs, locate them in a non-mirror-image manner (see Fig 2).

**Figure 1: Asymmetrical placement**



*Good: Asymmetrical distances--5' and 13'  
Not So Good: Symmetrical distances--9' and 9'*

**Figure 2: Placement for 2 subs**



*Very Good: Two asymmetrical subwoofers.  
One is 5' and 13'. The other is 3' and 11'*

### Other Tech Tips:

- Tip 11: Why Low Resonance Tweeter?
- Tip 12: Why FS Series?
- Tip 13: What is “Boundary Comp”?
- Tip 14: The Sub-8 Team