

---

Subject: Re: Amp for 4pi speakers

Posted by [Wayne Parham](#) on Mon, 03 Dec 2018 23:29:54 GMT

[View Forum Message](#) <> [Reply to Message](#)

---

I would describe 100-300Hz as midrange. The fundamentals of human vocals are there; Middle C on the piano is in this range. So it isn't bass at all - It's midrange. And, yes, I think having the speakers on stands will modify the sound in this range. Most people prefer sounds in this range to originate at or near "ear level" because it sounds more natural. But it isn't really caused by a perceived (or even measured) difference in tonal characteristics - It's a position/directional thing.

About the placement of the "helper woofer" - You really need it to be in a separate enclosure for best results. It has to be offset a half-meter to a full meter in all three dimensions; The flanking sub should be placed below, beside and behind the main speaker it is flanking. This is what provides the smoothing of self-interference anomalies from nearest boundaries.

As an aside, I developed the flanking sub approach from three influences, one of which was the 2.5-way configuration. A 2.5-way loudspeaker has a helper woofer in the same cabinet as the main woofer, and it is usually low-passed somewhere close to the baffle-step frequency. The expected benefit of the 2.5-way design is to mitigate the on-axis drop called the "baffle step" when the pattern widens to omnidirectional at low frequencies. At higher frequencies, there is baffle-enforced forward directivity, which increases on-axis SPL. The "helper-woofer" in a 2.5-way increases SPL at frequencies below the baffle step. This benefit is also provided by the flanking sub configuration, because it works essentially the same way except that the "helper woofer" placement is offset in all three dimensions. This gives an added benefit: It smoothes the self-interference anomalies from nearby reflections.

The flanking sub arrangement was also influenced by line arrays and by the multisub configuration. Line arrays mitigate floor and ceiling notches because of differing path-length differences between the listener and each element of the array. A 2.5-way loudspeaker is a truncated array, and it does tend to reduce the size of the floor-bounce provided it is measured in a position that places the notch in the overlap band. From this I reasoned that a helper woofer placed behind the main speaker might mitigate the self-interference notch that results from the reflection from the wall behind the speaker. Placing it a small distance from the mains in all three dimensions reduces self-interference anomalies from any nearby boundary and additionally provides modal smoothing for the higher-frequency room modes.

So the short version of all this is you can put a "helper woofer" in the same cabinet as the main woofer, but then you have a 2.5-way loudspeaker and you will not gain all the benefits provided by the flanking sub configuration.