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PLACEMENT OF SPEAKERS

The placement and the listening environment can completely compromise the performance of any speaker. No matter how much it costs or how flat its response can be, speaker performance can be very different than what we expect if it is in the wrong place..

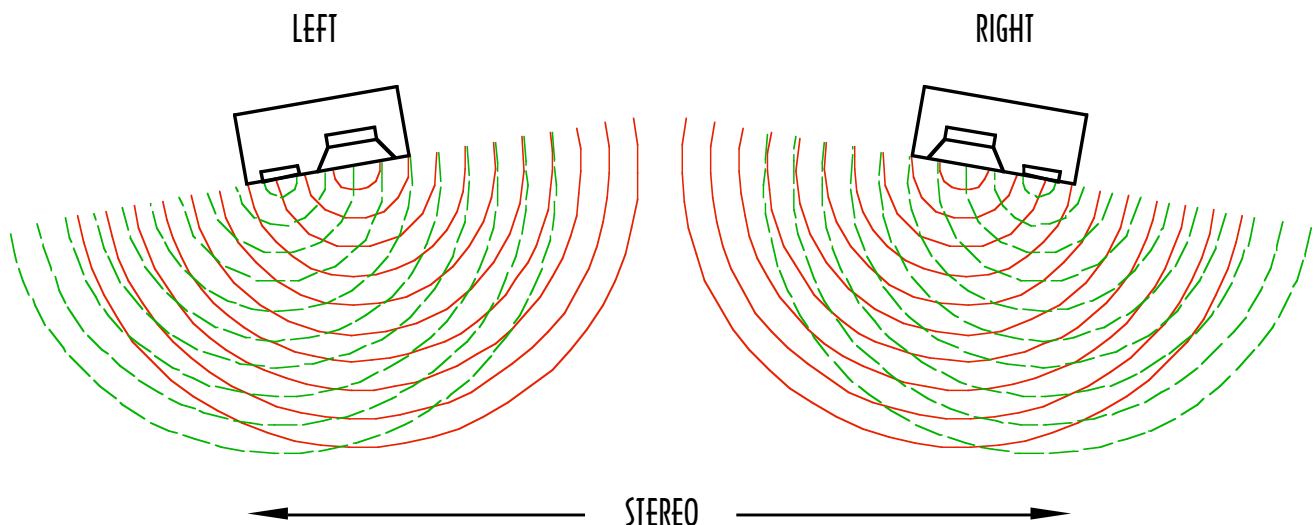
It is important to understand near-field speakers limitations and listening environment interaction to get the most out of a monitoring system.

VERTICAL VS HORIZONTAL

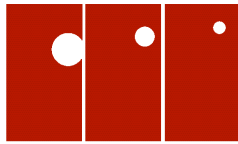
Two way systems use separate woofer and tweeter units mounted in a vertical line on the baffle. As there is a fixed vertical distance between the physical centers of the two devices, there is a fixed distance between the acoustical centers of each device.

At crossover point, both high and low frequency drivers reproduce the same audio information. As consequence of this physical distance, there is a time difference between the drivers producing changes in the character of the sound at crossover point.

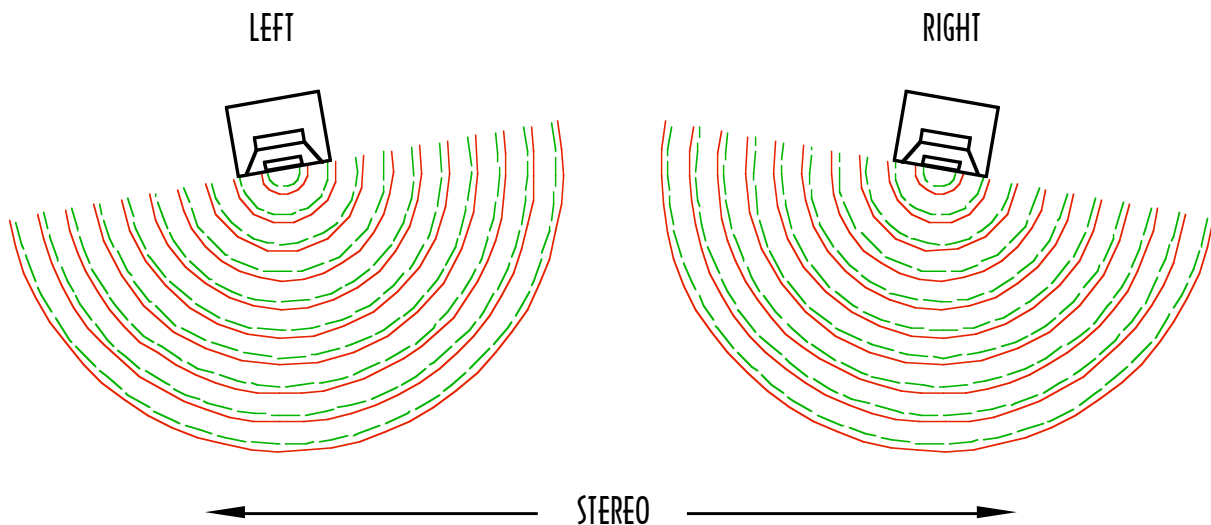
The figures below are a representation of a stereo speaker system operating at crossover point. The red lobes represent the sound energy emitted by the woofer and the green dotted lobes represent the sound energy emitted by the tweeter.



With speakers laying horizontally, when you move along the stereo image, you will cross the largest number of variations caused by the physical/time offsets between the drivers.



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With speakers laying vertically you will notice the least variations as you move from left to right along the stereo image.

Stereo occurs from left to right. That's the plane in which we want to minimize the changes in physical/time offset between the woofers and the tweeters. By stacking them in the same vertical line, we are providing the widest range of movement to the listener in the horizontal plane reducing the problems caused by these physical offsets.

Near-field listening condition magnifies the effect of drivers offset. The closer to the speaker you are, the more noticeable the effect is.

All two way systems have to live with some listening position dependent compromises at crossover points. The crossover frequency of small two ways speaker systems falls into the center of the mid-band (2kHz to 3kHz), where the ear is most capable of recognize frequency/phase response deviations.