

Speaker Placement

Fine tuning the precise placement of your speakers in the listening room can have profound effects on the musical performance of your system as a whole. Shifts as small as half a centimetre/quarter of an inch can be crucial. However, before embarking on the final placement of your speakers (and any acoustic material you wish to use) it is necessary to achieve a good basic position from which to start. Below, we have outlined several different approaches to this problem that we hope will help you reach a good starting point for the speaker optimization process.

Whichever approach proves most useful (and often it is a combination of two or more) then you should start by gathering the necessary tools: masking tape, a marker pen, tape measure, spirit level and any tools specific to the speaker itself, such as a spanner for locking spikes or chocks to help with their installation.

On a carpeted floor:

The easiest way to move the speaker and position it is without the spikes installed. Particularly with wide bandwidth speakers, spike installation will raise the woofer slightly further from the floor, affecting the bass balance, so take this into account when making initial positional judgements.

On a wood floor or similar:

The spikes can be fitted, with spike shoes placed between them and the surface. If you ensure that these shoes have smooth bottoms and deep recesses to accept the spikes, you'll find that they allow you to slide the speaker very precisely across the floor without marking it. DO however, experiment first and make sure that when moving the speaker, it doesn't "walk" off of the shoes or leave one behind on an uneven or rough patch of flooring.

Finally, please note that these techniques are suggestions only. They cannot possibly embrace all products or situations. Also be aware that many speakers are heavy and moving them should be undertaken only with great care and sufficient manpower for the task. Struggling to move a large speaker on your own could result in serious injury or even death if it fell on you! Don't risk damaging your valuable equipment or yourself and treat large, heavy objects with the respect they deserve. An extra pair of hands (and ears) will make adjustments much easier, more precise and safer too.

In the case of really large speaker systems, you should seek professional help from your dealer – who should be responsible for installing them anyway. If you are moving house then be prepared to pay the local dealer for his time.

Method 1

“Audio Arithmetic”

Because of the way that bass is propagated in a room and the effect of the room boundaries on that process, it is possible to define a mathematical relationship between the speaker and those boundaries.

If we take all measurements from the centre of the bass driver (or the mid-point between them if there are two placed close together), we can define the distance to the first boundary – normally the floor, but not always – as X. The distance to the next closest boundary is Y and to the furthest one, Z. These measurements can be related by the following equation:

$$Y^2 = XZ$$

So, if your speaker is a stand-mounted design that has the centre of its bass unit 75cms from the floor, but you can only get it 60cms from the front wall you will have two options as regards spacing from the side-wall:

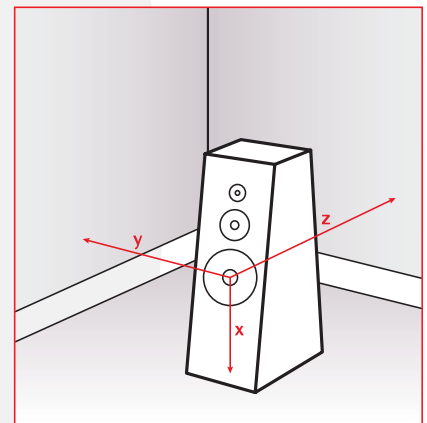
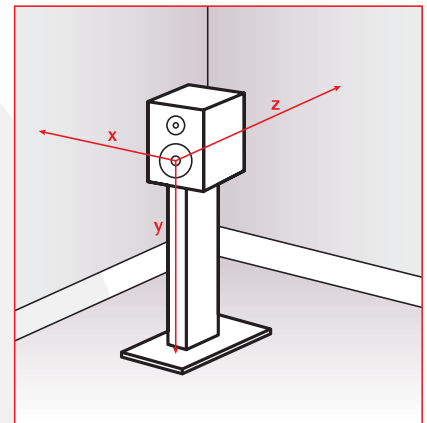
Either $X=60$, $Y=75$ and Z is unknown, or;

X is unknown, $Y=60$ and $Z=75$

The first scenario would give you an equation in which $5625 = 60Z$ or, 93.75cm to the side-wall.

The second would give you $3600 = 75X$ or, 48cm to the side-wall.

Used in conjunction with either of the first two approaches these figures can actually provide a useful guide once you have fixed one of the variables (either sonically or “domestically”).



Method 2

“Voicing The Room”

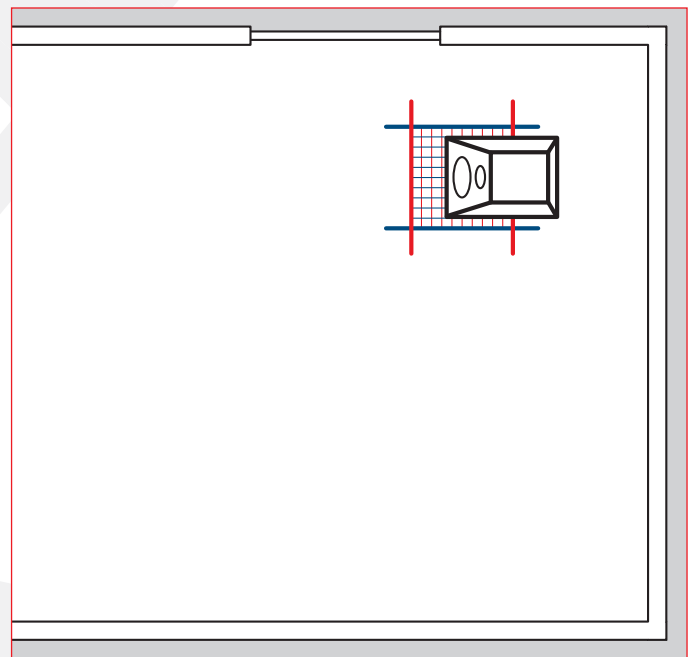
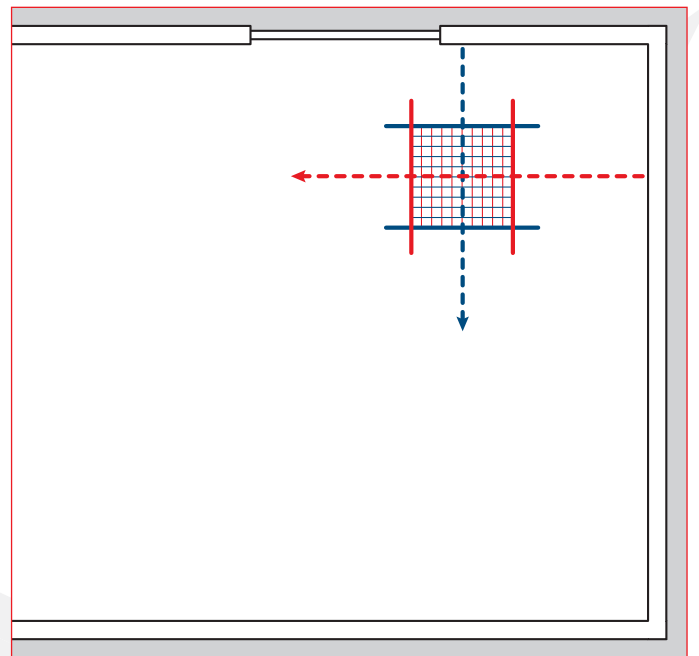
This is loosely based on a technique first developed and popularized by Wilson Audio. You will need to start by clearing the space where the speakers will stand. Then, starting with your back against the front wall (the wall that will be behind the speakers) and roughly one fifth of the way across it, move slowly down the room, speaking in a loud but even voice as you do so. At first your voice will sound chesty and thick, but as you advance into the room it will become more natural in balance. Once it sounds correct, mark the floor with a strip of masking tape parallel to the front wall. Now continue your advance until it starts to sound hollow and diffuse. Again, mark the boundary where your voice starts to lose its natural balance. You will probably now have two strips of tape, between 15 and 45cms apart.

Next, starting on the side-wall, between the two pieces of tape you've already laid, move across the room, again speaking until your voice achieves its most natural balance, marking this point and the subsequent point where it loses it again. This should leave you with a rectangular space marked out on the floor.

Repeat the process for the other side of the room where the second speaker will stand. Now place the speakers centrally, a third of the way back into the rectangles you've defined. Along the inner edge of each speaker run a long strip of masking tape and mark it off in \pm half-inch increments from the front baffle. Then, using a piece of appropriate music (I often use the Analogue Productions disc of This One's For Blanton, with its extended acoustic bass passages) adjust the speaker forwards and back until you achieve the best bass balance. Of course, you can also use the low frequency tones on the Nordost System Tuning and Set-Up Disc, but remember, this is about bass energy and timing as well as linearity. You need the low frequencies to be musically communicative.

Once you have a good position, mark it and then continue. The taped increments mean that you can always return to a better place. Once you have the fore and aft positioning for both speakers, place a strip of tape across the front of the speaker, mark it up and repeat the process laterally, the two tape axes allowing you to move the speakers on a predictable and repeatable “grid”. Above all, don't be afraid to move on to another position; you can always go back.

Once you have the best, most musically integrated and communicative placement, you are ready to start looking at toe-in using the LEDR tests.



Method 3

“Changing Places”

A surprisingly effective way of achieving an initial placement for speakers involves quite literally changing places with them. Put the speakers side by side at the listening position and play some music. Then, on your knees so that your ear approximates the height of your listening position,

move around the area where each speaker will be placed, until you find the point that delivers the best musical results. Mark that point and once again, follow the grid procedure laid out above – obviously moving the speakers into their correct places and restoring yourself to the more comfortable perch of your listening seat.

Method 4

“Di-Poles and The Rule Of Thirds”

Di-pole speakers such as the majority of electrostatics and planar-magnetics drive the room very differently from more conventional, box loudspeakers. This is due to their unimpeded rear output, which can cause severe comb-filtering cancellation with the forward low-frequency output once it is reflected from the wall behind the speakers. As a result they generally benefit from more room behind them than box speakers do. One popular approach suggests a simple formula where both the speakers and listening seat are placed at the one-third intervals down the room. The speakers can then be adjusted laterally and with toe-in for soundstage width, depth and focus. Undoubtedly effective in sonic terms, the domestic impact of such placing in a shared space often rules it out, but in a dedicated listening room it is an ideal starting point with most panel speakers – and not a few boxes.

If the Rule Of Thirds proves impractical (and it often does) then a more reasonable alternative can often be arrived at using the following formulae:

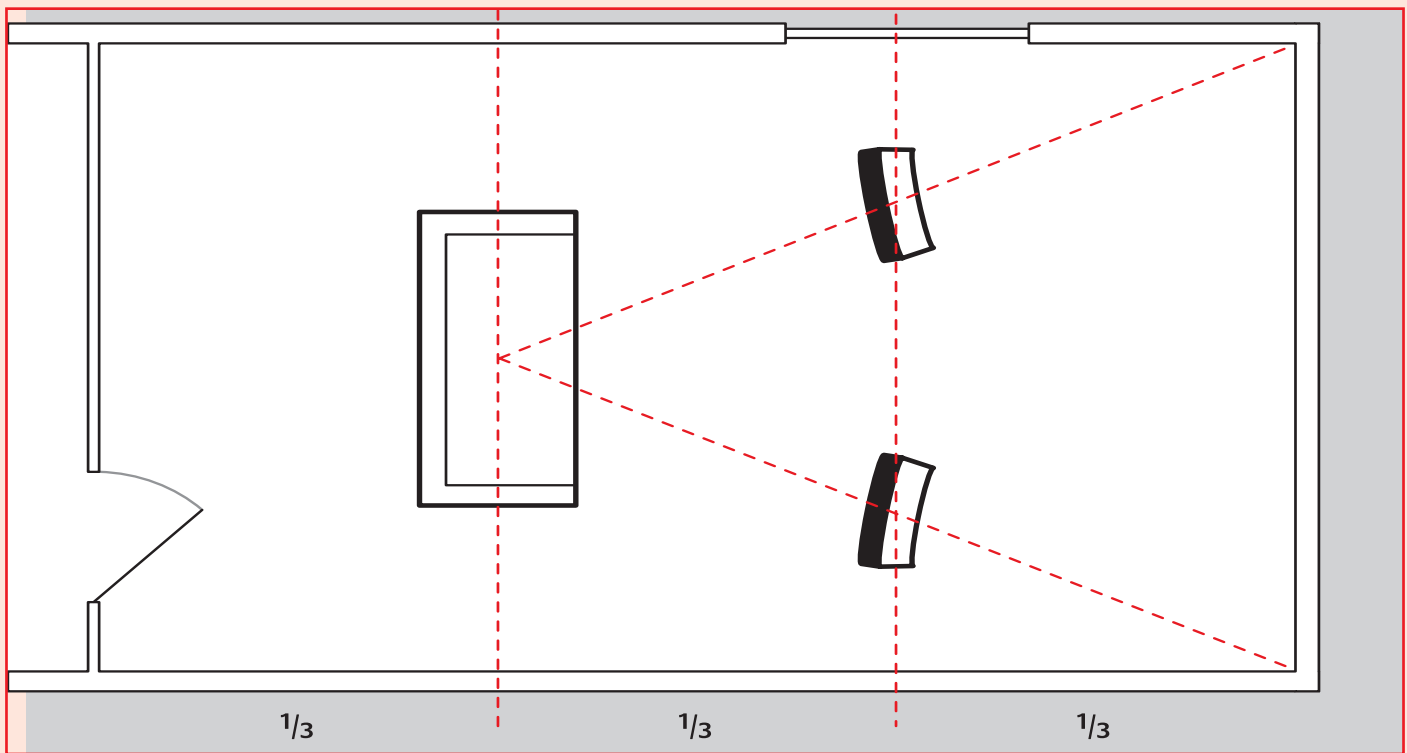
Distance from front baffle to rear wall = height of ceiling x 0.618

Distance from tweeter or centre of panel = width of room divided by 18. Multiply the result by 5

So, in a room with an 8' ceiling and 13' width:

$96" \times 0.618 = 59.3"$ to the rear wall

$156" / 18 = 8.666 \times 5 = 43.3"$ to the side wall



Finally, once you've achieved initial placement of your speakers, level them precisely. Yes, small movements will disturb their level and you'll need to repeat the operation again, but having them level to start with will make the effects of each shift in position much easier to hear.

Speaker placement is all about precision and repeatability – so be precise in what you do, and be prepared to repeat the steps as often as necessary.



Whilst the information contained here can be used in its own right, it is primarily intended to achieve an initial position that can then be refined by using the tracks contained on the Nordost System Tuning and Set-Up Disc. This carefully considered set of “audio tools” will enable you to optimize your speaker set-up and system condition and should be part of every audiophile’s armory. If you don’t already own a copy, you can obtain one from any Nordost dealer or by contacting Nordost direct.

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