MusicReason RESOURCE

Monitoring Placement, Alignment, and Listening Position

https://musicreason.com/resources/monitoring-placement-alignment-and-listening-position/ · Last updated 2026-09-06

Geometry can make a monitoring setup's assumptions explicit: where the speakers sit, where the listener sits, and how far sound travels to reach each ear. It cannot replace measuring a real room or a real playback system, and every calculator in this family says so plainly.

The equilateral triangle is a starting geometry, not a rule

Placing two speakers and the listener at the corners of an equilateral triangle gives both speakers equal distance and equal angle to the listener, a symmetric, neutral baseline.Speaker Placement Explorer and Listening Position Calculator use this as a stated starting comparison, not a claim that it is optimal for every room.

Path-length difference converts directly to a timing offset

A 0.343 meter path-length difference is about 1.0 ms of delay, since sound travels roughly 0.343 meters per millisecond at room temperature.
This falls directly out of the speed of sound, about 343 meters per second at room temperature.
Delay Alignment Calculator uses exactly this conversion to turn a measured or estimated path-length difference into a timing-alignment value.

Inverse-square falloff is an approximation, not a room measurement

Sound Pressure Distance Calculator models only the direct, free-field sound-pressure falloff with distance from a point source. A real room's reflections and reverberation change the level you actually hear, which is exactly why this is stated as an approximation.

Phase alignment is frequency-dependent, timing alignment is not

A fixed time delay translates into a different phase shift at every frequency, which Phase Delay Calculator makes explicit. Aligning two signals in time does not automatically mean they are phase-aligned at every frequency simultaneously.

Placement and room modes are related, separate questions

Where you place a listener also interacts with the room's own low-frequency standing-wave structure, covered separately in Room Modes and Low-Frequency Behavior. Neither calculation substitutes for the other.

Frequently asked questions

Why does an equilateral triangle come up so often in speaker placement?

Placing two speakers and the listener at the corners of an equilateral triangle is a widely used starting geometry that gives both speakers equal distance and angle to the listener, a symmetric, neutral baseline rather than a guaranteed optimum for every room.

Where does the "1 millisecond per foot" (or 0.343m per ms) rule come from?

It falls directly out of the speed of sound, about 343 meters per second at room temperature, so sound covers roughly 0.343 meters, or about 1.13 feet, in one millisecond. Delay Alignment Calculator uses this to convert a physical path-length difference directly into a timing offset.

Does the inverse-square approximation account for room reflections?

No. It models only the direct, free-field sound-pressure falloff with distance from a point source; a real room's reflections and reverberation change the actual level you hear, which is exactly why this is stated as an approximation, not a room measurement.

Where this shows up

ACOUSTICS
Speaker Placement Explorer

ACOUSTICS
Listening Position Calculator

ACOUSTICS
Delay Alignment Calculator

ACOUSTICS
Sound Pressure Distance Calculator

ACOUSTICS
Room Mode Calculator

PRODUCTION AND AUDIO MATH
Phase Delay Calculator