
Subject: Re: Placing speakers against the wall
Posted by [Wayne Parham](#) on Tue, 09 May 2017 17:58:19 GMT
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Just to be clear for those that don't study the material in the links:

Placing a speaker against the wall that is not designed for it has disadvantages. But a speaker can be designed to be placed against a wall, turning potential problems into strengths.

It is all about acoustic scale and distance with respect to wavelength.

Two things happen at boundaries: 1. Boundaries limit the space a sound source radiates into, and 2. Boundaries reflect sound.

As to the first point, limiting the space a sound source radiates into: That increases sound pressure level for sound sources that are acoustically close, i.e. less than $1/4$ wavelength away. It's easier to place a loudspeaker acoustically close to a boundary at bass frequencies because the wavelengths are longer. In fact, most loudspeaker placements transition from being acoustically close to a boundary at bass frequencies to acoustically distant at midrange frequencies. This makes bass seem louder as a result.

The baffle forms a sort of small truncated boundary too. It constrains the radiation angle to the forward direction at midrange frequencies upward. So while it has no impact on bass, it tends to raise the midrange frequencies. This has an effect of making the midrange seem louder as a result, often referred to as a "baffle step."

You may see how a design can take advantage of these two competing properties, with boundary loading increasing bass to offset the baffle increasing the midrange.

Ideally, all sound sources would be on an infinite baffle so there would be no transition. This is what soffit mounting does because it puts all sound sources on a single wall. Even better to have a constant directivity cornerhorn, because it puts all sound sources at the trihedral junction of a room's corner.

And this brings me to the second point, which is that all boundaries cause reflections. If the source is acoustically close, then the direct sound is in-phase with the reflection, making the boundary a launch point rather than a reflector. It acts like a baffle and nothing more. If the sound source is acoustically very distant, then the reflections are late enough they don't adversely affect response and simply contribute to the reverberent field. The really troublesome reflections are early reflections, which interact with the direct sound to create anomalies in response.

Here again, the ideal would be to have all sound sources on an infinite baffle so there would be no early reflections. This is what soffit mounting does because it puts all sound sources on a single wall. And again, it's even better to have a constant directivity cornerhorn, because it puts all sound sources at the trihedral junction of a room's corner. That prevents an adjacent wall from causing early reflections.
