

LINEA **R**ESPONSE

INVISIBLE SPEAKERS & SUBWOOFERS

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Installation Challenges

▶ Overcoming Hidden Obstacles

When installing Stealth LineaResponse in-wall speakers into existing construction, there is always a chance of encountering hidden obstacles within the wall/ceiling that conflict with installation plans. The installation site should be carefully inspected for possible electrical, plumbing, HVAC, and structural conflicts. While most electrical conflicts can be dealt with relatively easily, interfering with pipes, ducts, and beams should be avoided. In some cases it may be necessary to choose a new location for a speaker to complete the installation.

Hidden obstacles can be a problem when installing traditional in-wall speakers. Their visible speaker openings/

grilles and narrow sound dispersion patterns mean that relocating a speaker to a new location, even by a small amount could break the symmetrical aesthetics of the installation and adversely effect the soundscape.

Stealth LineaResponse speakers offer more flexibility in this scenario. Because the speaker features a 170 degree sound dispersion pattern and installs invisibly placement need not be limited to exact locations and symmetrical placement within a room.

The key to success when choosing a speaker location in a retrofit project is the flexibility of the LineaResponse speaker.

HIDDEN OBSTACLES

Below is an example of some of the challenges that were encountered during a retrofit installation of a 2-panel subwoofer system into an existing finished wall.

The two panels were originally intended to install side-by-side using two adjacent stud bays, but the preferred location was abandoned after it was discovered that the space behind the wallboard contained the cold air return for the furnace. Using the subwoofers in the same stud cavity as the duct work would propagate low end frequency sound to undesired areas of the house, so an alternative location was needed.

A new installation location was chosen on a very narrow wall that did not have plans for decoration with pictures or artwork that might rattle. It would not allow for the speakers to install in adjoining stud cavities as originally intended but instead stacked in the same cavity.

Because this wall was less than 24" wide and finished with $\frac{5}{8}$ " wallboard, it was assumed that the stud spacing would be greater than 16" and easily accommodate the two speaker panels. When the wall was opened however, a hidden obstacle was discovered. Running directly down the center of the wall was an unexpected stud which created two cavities less than 16" wide. **The use of a stud-finder would have prevented this surprise (See Figure 1).**



FIGURE 1



FIGURE 2



FIGURE 3



FIGURE 4



FIGURE 5



FIGURE 6

Also revealed was an electrical box for the outlet on the opposite side of the wall. **Inspecting the adjoining room beforehand would have been helpful.** Observing the outlet on the opposite wall would have indicated the existence of the troublesome stud and allowed the hole to be cut higher up on the wall to also avoid the electrical box. **When considering locations to install speakers it is important to consider what is on the reverse side of the wall.**

For installation to continue, a section of the stud needed to be removed. First the project was shifted up an additional 8 inches so the electrical junction for the outlet on the opposite of the wall could remain in tact. An additional 8 inches of wallboard was carefully cut from the top of the opening and saved for use as a patch of the lower portion of the wall.

Using a reciprocating saw the stud was cut into three smaller sections. By reversing the blade to get a greater angle of attack on the cut it was possible to make the cuts and avoid disturbing the finish on the opposite wall. The stud pieces were still attached to the adjoining wallboard with screws. Rather than using a hammer to knock the stud pieces free, a medium size pipe wrench was used to grip the stud and slowly twist each piece out of the opening. This worked to gently pull the screws out from the wallboard along with the stud pieces and left no visible disturbance on the other side of the wall (See Figure 2).

The left edge of the opening was cut centered along the framing stud to allow the speaker panel to be securely screwed to it. Stealth Invisible Speakers are ideally installed between 16" on-center stud framing. But because this framing was not standard 16" on-center, the right side of the speaker would need to be attached to the wallboard in another way.

The solution to this was simple: attach 3" wide strips of $\frac{3}{4}$ " plywood along the top, right and bottom of the opening and maintaining a $\frac{3}{4}$ " reveal inside wallboard edges. The strips

were glued and clamped into position then securely attached with wallboard screws. The 8" wallboard patch cut from the top was then attached to the bottom and another plywood strip applied to it for attaching the bottom edge of the speaker. Since LineaResponse speakers do not vibrate at the edges, this support system worked well (See Figure 3).

Next, the area inside the wall cavity was filled with insulation. Insulating this space improved the response of the panel plus helped dampen the bleed through to the room on the backside of the wall. The insulation was packed tight around the electrical box and wiring to help prevent leakage and the speaker wire was routed in the middle of the insulation so it would not come in contact with the backside of the wallboard to avoid rattling (See Figure 4).

Even though it was not needed in this installation, additional isolation techniques for the room on the opposite side of the wall could have been implemented at this time. Adding a thin-membrane vinyl dampening barrier such as "Dynil" behind the speaker panel is recommended in these cases.

When the subwoofer panels were test-fit into the prepared opening, it was discovered that the finished surface of the wallboard was actually thicker than the expected $\frac{5}{8}$ ". Stealth speakers are designed to install directly into $\frac{1}{2}$ " wallboard, and by applying the appropriate number of the included shims around the full perimeter the speakers can easily be brought out to the proper installation depth.

After that it was a simple job to tape the edges of the panel using off-the-shelf, self-adhesive nylon mesh joint tape, fill in the gaps around the panels with joint compound, feather the mud to the existing wall, texture and re-paint. The result is a completely invisible speaker system that sounds great and has that extended low-end "thump"! (See Figures 5 & 6)

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