

Speakers for Whole House Audio – Selection and Placement

■ What type of speaker should you use?

What do you and your family members or guests tend to do in each room? Sit and listen intently or move around and socialize? Do you want your speakers to blend seamlessly into your decor? Or are those enormous tower speakers your idea of a fashion statement (in the boys' room, at least)?

In-wall and in-ceiling speakers

In-wall and in-ceiling speakers are the least conspicuous choices. They take up zero floor space, and they virtually disappear when you paint their grilles to match your walls or ceilings.

Today's built-in speakers sound terrific, too. They use the same high-quality ingredients as their bookshelf and floor-standing cousins. The only thing that's missing is the box. Some models feature swiveling tweeters that let you direct the high frequencies toward your ears.

Bracket-mount or "on-wall" speakers

Built-in speakers offer a lot of advantages, but they aren't for everyone. Once you put speakers in your walls, you certainly won't want to move them. If you decide to rearrange the furniture, you may be stuck with awkward speaker placement.

If you own a nice pair of compact speakers, you shouldn't hesitate to use them in your whole house system. If you don't have a shelf in the right place, and you don't care for the look of speaker stands, you can easily hang them on your walls. If you need to move them, you can easily patch and paint the drywall.

Swiveling a speaker in its bracket directs the sound where you want it to go. Many bracket-mount speakers are trapezoid-shaped to tuck into corners, and weather-proof models fit well under the eaves by your patio or deck.

Floor-standing or bookshelf speakers with concealed wiring

In some rooms, brick walls, windows or furnishings make flush-mount speaker installation impractical. Look for opportunities to integrate conventional box speakers into your decor. Small box speakers blend in tastefully on bookshelves.

Even if you choose large floor-standing speakers, you don't have to tolerate the sight of wires running across the floor. Wall jacks installed behind the speakers provide neat connections to the wires concealed inside your walls.



In-wall speakers

They blend well into your decor, but are a permanent fixture in your home.



Ceiling speakers

Perfect for your workshop, kitchen and master bathroom. They are even less conspicuous than in-wall speakers.



On-wall speakers

They are more conspicuous, but you can take them with you when you move. And you can easily aim them toward your listening area.



Freestanding Speakers

Feed your speaker wire to a wall outlet, and you can experience the impact of big tower speakers or the accurate sound of your favorite bookshelf speakers in any space. Your audio components don't have to be in the same room.



How about a subwoofer?

Why not? A powered subwoofer placed discreetly under a table or behind a lounge chair will give you plenty of deep bass to augment the brilliant mids and highs you'll get from small in-wall or on-wall speakers.

As part of a multi-room system, a powered subwoofer should have speaker-level inputs, so you can adjust the volume of the of the speakers and the subwoofer with the same volume control.

Extra Bass

If you want a powered subwoofer in a remote listening room, feed it a speaker-level signal through an 8-post wall plate.



Where should you place your speakers?

For a good stereo effect

If you like to sit in one place and listen critically, you'll want to place the left and right speakers an equal distance from your prime listening seat, at ear level while seated. If the speakers are in a wall that's 10 feet from your chair, place them no more than 10 feet apart from each other and no less than 5 feet apart.

If you place the speakers too far apart, you won't hear the illusion of the singer's voice solidly suspended in space between the speakers. If you place the speakers too close together, you will not perceive any difference in the locations of the instruments, so you'll lose the sense that there are musicians on a stage in front of you.

If the layout of a room makes it impossible to place in-wall, on-wall or floor-standing speakers for critical listening, consider in-ceiling speakers. Ceiling speakers are a great alternative when artwork, windows or furniture get in the way of an ideal in-wall placement. Choose a high-grade set of ceiling speakers with pivoting tweeters.

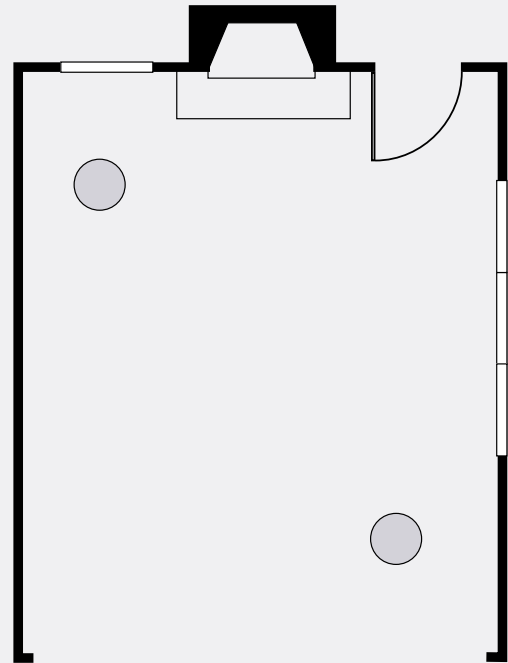
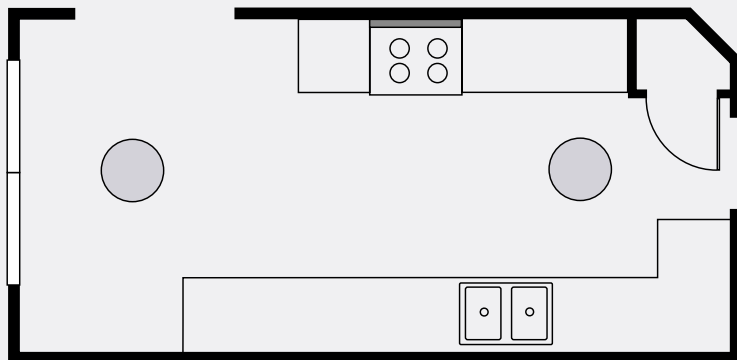
Optimizing Bass Response

When a speaker is placed in a corner, its bass output is reinforced by your room acoustics. You hear more bass, but not necessarily good, tight bass. This so-called "boundary effect" can make the bass sound "loose" or "boomy." So for critical listening, keep your speakers at least one foot away from a corner or a wall/ceiling boundary.

Ceiling Speaker Placement

RIGHT: Diagonal placement, gives good coverage in a typical rectangular room of 300 square feet or less. In rooms larger than 300 square feet, you will get better results if you install two pairs.

BELOW: In a narrow room, place the speakers in the middle at either end. In this example, stereo-input speakers would be a good choice.





A stereo-input speaker

LEFT: This ceiling speaker has two sets of inputs (for the left and right audio channels) that feed two tweeters and one dual-voice-coil woofer.

BELOW: The tweeters are angled to spread the stereo sound.



You don't sit down for "serious listening" in the dining room. Place your speakers so they'll sound good anywhere in the room.

Speaker Placement for Everyday Living and Entertaining

In rooms you move around in or frequently entertain in, speaker placement designed for critical stereo listening won't work. The music will be too loud in one area and too soft in another. This flaw will be most obvious when the volume is low.

Ceiling speakers are a great choice for entertainment listening, because in-wall speakers create more "hot spots" (areas where the sound is much louder) than ceiling speakers do. If in-wall speakers offer an easier installation or a better match with your décor, place the speakers at least 6 feet off the floor. Place speakers at least 2 feet away from corners for good sound at high volume.

When a room is long and narrow, L-shaped, or larger than 300 square feet, you may need more than one pair of speakers. Consider using three or more stereo-input speakers.

When your décor or budget will not allow more than two speakers in a large or irregular room, try to place left and right stereo speakers near the corners of the room or at the far ends of narrow rectangular room to enclose the listeners with sound, no matter which way they face or where they move in the room.

The dining room

Dining rooms are for dinner, which means low-volume music only. Place your speakers so that they surround your guests with relaxing music at just the right volume and your dinner parties will be big hits.

Place dining room speakers low in the walls (at AC outlet height) in opposite corners. This creates a very pleasant and pervasive sound field at low volume. Turned up loud, this kind of placement would sound muddy, but for dining room conversation enhancement, it's unbeatable. Ceiling speakers are an option, but sound reflected off the dining table can interfere with conversation.

The master bath

The master bath is one room you know you'll spend time in every day. Why not make the most of it? Relax to music while you're soaking in the tub, or check the news while you brush your teeth.

The master bath calls for a different speaker placement strategy. If you install conventional stereo speakers, you will hear the left channel in the shower stall and the right channel at the sink. The solution is to place special stereo-input speakers in both locations.



A little soothing music with your bath helps you soak your stress away.



You spend a lot of time in the kitchen. Music makes it high-quality time.

The kitchen

Ceiling speakers are a good bet in the kitchen, where you will be constantly moving about. Or, you might try placing a set of bookshelf speakers out of sight on top of your kitchen cabinets, pointed at the ceiling. The sound reflects off the ceiling, and down into the kitchen, providing good music coverage throughout the room.

Speaker Placement for Background Listening

Typically, the most effective way to bring background music to small rooms is to utilize stereo-input speakers. In a powder room, laundry room or dressing room, a single stereo-input speaker can provide good background sound inexpensively and effectively from the center of the room.

Overcoming the Obstacles to Great Sound Outdoors



Outdoor music really makes the meal.

The great outdoors presents a different listening environment than your typical room. Inside, there are walls to reinforce low frequencies and reflect and contain sound. Outside, of course, it's wide open, and there's usu-

ally much more background noise — wind, traffic, barking dogs, and even crickets!



If you'd like to mount your speakers in a totally exposed location, make sure they're waterproof, not just weather-resistant.

It's also important to consider the durability of a pair of outdoor speakers. All outdoor speakers are weather resistant, but some are genuinely waterproof. Weather resistant speakers should be mounted in a protected location, such as under a porch roof or an eave.

Here are a few placement tips that should increase the performance of any outdoor speaker you buy:

- The higher you mount your speakers, the greater the sound projection, and the farther away you will get good sound.
- Placing your speakers near a wall or other solid surface improves bass output.
- When mounting the speakers, tilt the speakers so the cones face slightly down for drainage.
- Experiment with placement before permanently mounting the speakers. Place the speakers in a likely location, and walk around to determine how well the sound travels throughout the listening area. Once you are satisfied, it's time to mount the speakers.



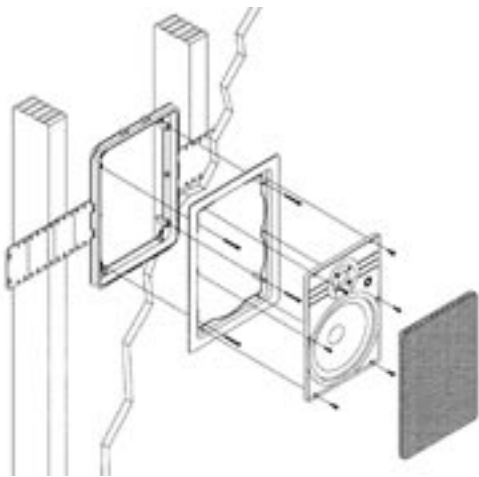
Rather not have speakers hanging from your eaves or sitting on your deck railing? Choose "rock speakers," for placement in your garden, or a stereo-input model that also serves as a flower pot.

Installing Speakers for Whole House Audio

■ In-wall and ceiling speakers

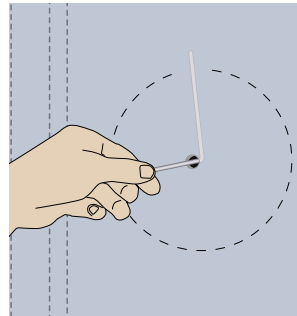
The idea behind all in-wall and in-ceiling speakers is that the speaker is held in place by sandwiching the drywall. A frame around the speaker presses against the front of the wall. Behind the wall, the speaker has a set of flip-out “dogs” or a bracket that screws to the frame. Here are some tips:

- Put some insulation in the wall cavity before you install the speaker. The insulation will improve the sound. Put the same amount of insulation in each speaker cavity. Don’t pack it tightly in one and loosely in another.
- Check for any tone controls on the speaker. If the speaker is within a foot of a corner, set the bass controls to the “minus” or “cut” position. If the room is very “live,” without rugs or a lot of upholstered furniture to absorb sound, set the treble control to the “minus” or “cut” position.
- Don’t over-tighten the screws. If you over-tighten the screws, the speaker frame will bend, which makes grille installation difficult.
- If the speaker has tone controls or a pivoting tweeter, leave the grille off until you listen to the speaker. After you adjust the speaker, install the grilles.
- Be careful handling the grilles. If they get bent, it is very difficult to use them. Grilles pressure-fit into the speakers. Do not push on them too hard. If the grille does not slip in, try loosening the mounting screws. Work a little in at a time, starting at one corner and gradually moving around the speaker.



Hole-saving brackets: They don’t save holes, but they do save you from having to cut holes! Install them before your walls go up. Your drywall hanger will cut the holes for your in-wall and ceiling speakers.

Steps for installation in an existing home



Before cutting a large hole: use a stud sensor to locate studs. Drill a pilot hole between the studs. Bend a coat hanger into an “L” shape. Insert the coat hanger into the pilot hole and twist it around to probe for obstructions.



A. Level the template.



B. Trace the template.



C. Cut the drywall out in one piece.



D. Attach outer frame to bracket placed behind the wall.



E. Connect the wires and screw the speaker into the frame.



G. Gently place the grille into the frame.

■ How to install bracket-mount speakers

Determine what type of hardware you need to securely hold the bracket and speaker to your wall or ceiling. Screw directly into a stud, if possible, using 1 $\frac{3}{4}$ " wood screws. If you are placing the speaker between studs, use



Most brackets let you aim the speaker at your listening area.

the correct type of wall anchor for your wall material. Do not hang speakers on nails or wires.

Be careful when mounting a bracket close to a corner. If you cut it too close, the speaker won't fit onto the bracket.

The installation process is straightforward:

1. Hold speaker bracket in place. Use a level to align it. Mark the locations of the screw holes.
2. Install wall anchors or drill pilot holes to embed wood screws in studs.
3. Thread the speaker wire through the bracket, if necessary, and screw the bracket into place.
4. Attach the speaker wire to the speaker.
5. Loosely attach the speaker to the bracket with the supplied hardware and aim the speaker.
7. Tighten the speaker to the bracket.

Outdoor speakers

Mount your speakers to a solid wood or masonry surface. Do not attach your speakers directly to aluminum or cedar siding; they may not be strong enough to support the weight of your speakers.

Speaker wire should be run through your walls and not sent out through a door or window jamb, as it is possible to crimp the cable and cause a short. Determine the cable's path, especially wall entry and exit points, and measure the path as precisely as you can. Add three to five feet to your total measurement to give you some play when you install the cables.

Bring speaker cables through exterior walls close to each speaker location. Seal the holes with silicone. If you have installed a wall box, weatherproof the wall plate with a blob of silicone around each of the terminals then a continuous bead of silicone around the wall box.

■ Wall plates for free-standing speakers

Follow these steps to installing wall plates:

1. Check that the excess wire can be fed back into the wall. If it cannot, move or replace your labels and trim the wire back.

2. Strip only enough conductors to make the connection. Typically, $\frac{1}{8}$ " of exposed wire is enough.
3. Attach wires to terminals on the back of the plate.
4. For any plate with more than one set of speaker terminals, use a label maker to label the wall plate.
5. For standard-style plates, simply screw the plate to the bracket or box. For Decora plates, screw the module to the box then screw the cover plate in place. For multiple gang Decora locations it is important to leave the screws a little loose. This will allow you to reposition the modules when you fit the multiple gang cover plate into place.



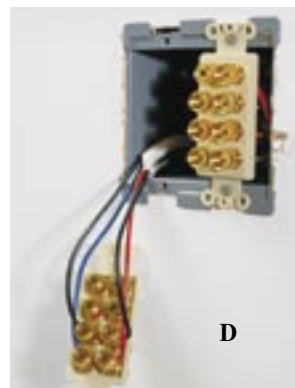
A



B



C



D

Installing wall plates for speakers: A. Insert the wires into the J-box

B. Insert the J-box into the cutout

C. Turn the screws to secure the J-box to the wall

D. Attach the wires to the backs of the terminals, and cover with a 2-gang Decora plate (not shown)

■ Speaker painting tips

In-wall, in-ceiling and many outdoor speakers are easy to paint. Just follow these steps to prepare the speaker:

1. Remove the grilles. They must be painted separately with paint that has been thinned.
2. Clean surfaces with a damp cloth before masking.
3. Mask the woofer and tweeter before painting. If you are painting box speakers, mask the wire terminals, too. Some speakers come with plastic paint masks. If not, use paper and masking tape to create your own mask. Don't use tape on the drivers.
4. A primer such as Krylon Spray Primer #1318 will ensure the best paint adhesion for box speakers.
5. It is best to spray the paint on in several light coats. When you paint the grilles, use thinner paint and take care not to clog the holes of the grille.
6. Wait until paint dries before removing the masking.