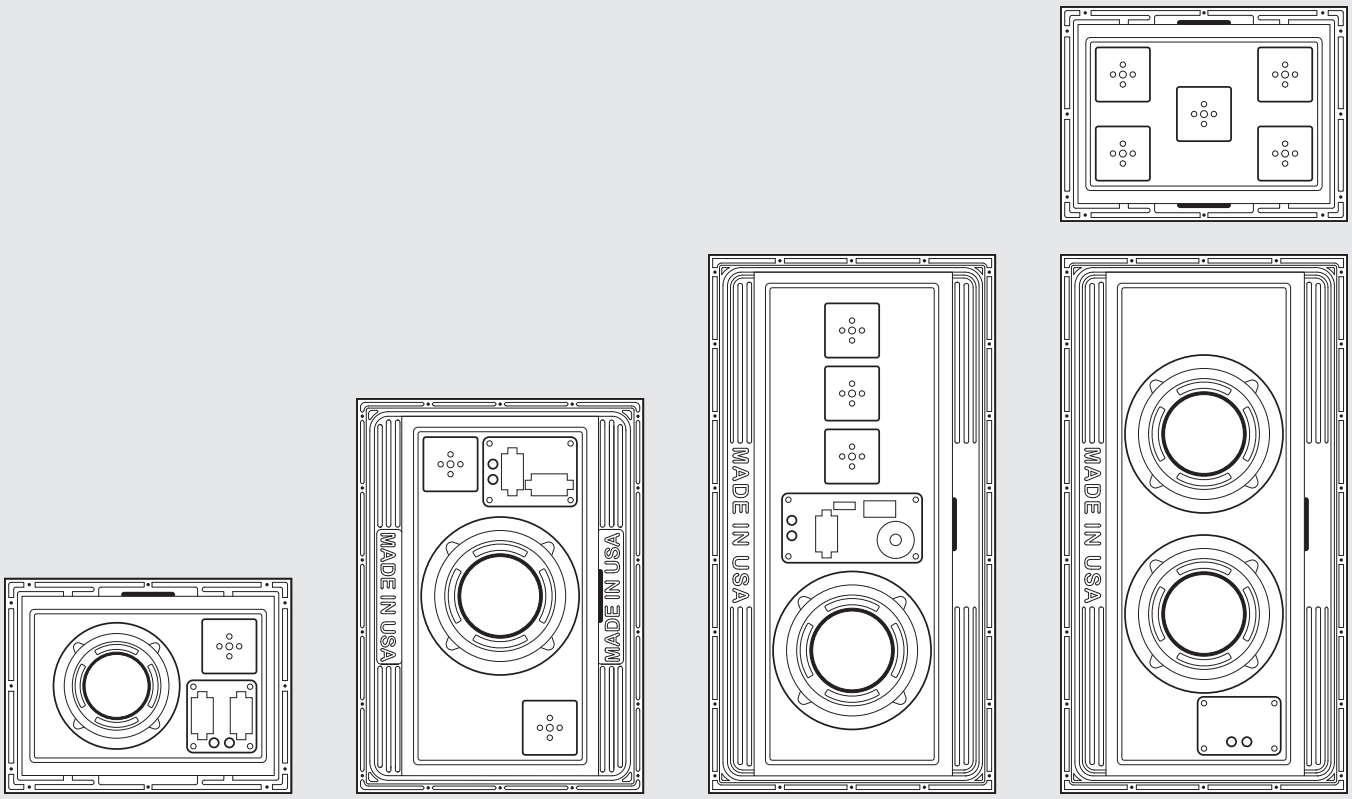
LINEAR RESPONSE

INVISIBLE SPEAKERS & SUBWOOFERS



User Manual & Installation Guide

▸ For New Construction and Retrofit Installations

STEALTH ACOUSTICS

▸ Tips ▸ Troubleshooting
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StealthAcoustics.com/invisible-speakers

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SPEAKER WARRANTY

STANDARD 5-YEAR SPEAKER WARRANTY

Each Stealth speaker panel is covered against defects in manufacturing under manufacturer's warranty for a period of 5 years. The warranty coverage is limited to the repair or replacement of the speaker panel. Removal and installation is not covered. Since the condition of use is beyond our control, the user and/or installer assumes all risk. The installer is responsible for proper use, preparation and placement of materials, and bonding to any substrate. All Stealth electronics are covered against defects in manufacturing under manufacturer's warranty for a period of 2 years.

EXTENDED 15-YEAR SPEAKER WARRANTY

Stealth Acoustic offers a limited 15 year extended warranty covering the removal and re-installation of defective invisible speaker products. Requires project registration and acceptance by Stealth Acoustics. Subject to terms of the Limited 15 Year Warranty Statement. invisible speaker extended warranty form must be submitted with purchase order. Cost and conditions may apply.

LINEARESPONSE INVISIBLE SPEAKERS

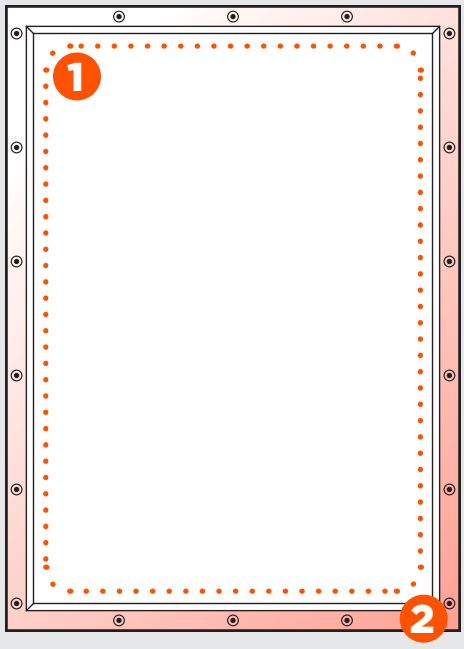
INTRODUCTION

Thank you for purchasing a Stealth Acoustics LineaResponse invisible speaker. This speaker is constructed in the USA with high quality materials. Built in circuit protection (on most models) adds reliability and piece of mind. With proper installation and care it will last a lifetime.

LineaResponse invisible speakers use a combination of two sound generating technologies. The first (and common to all other invisible speaker products currently on the market) is the direct coupling of an exciter/transducer driver to the active surface of the speaker. This works very well for higher frequencies, but direct coupled motors become less efficient as the frequency drops. This why the majority of in-wall invisible speaker have no real bass response. To overcome this, Stealth combines the direct coupled motor technology with an acoustic lever technology driven by a traditional woofer. The acoustic lever energizes the entire FidelityGlass™ active surface of the speaker panel which results in impactful bass. In this case, larger area translates to lower frequency response and is why the 2-panel B30g subwoofer can achieve industry leading frequencies well below 30 Hz.

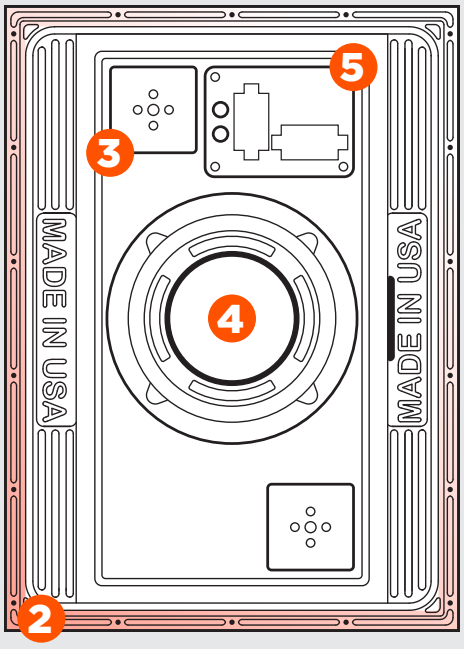
Stealth's invisible speakers are built on solid frames that are designed to mount directly to the structural framing of a room to deliver maximum audio performance while minimizing the aesthetic pollution in your home or business.

The front of each speaker (radiating diaphragm) is made from FidelityGlass™; a flat, durable, proprietary material designed to finish invisibly into the surrounding wallboard. The typical installation process is similar to making a wallboard patch. Simply mount the speaker, tape and mud the wallboard seams, and apply the desired finish. Finishes such as texture and paint, as well as thin fabric, wallpaper and veneer can then be applied resulting in a completely invisible audio experience.



Anatomy of a Stealth Invisible Speaker

1. FidelityGlass™ Radiating Diaphragm
2. Speaker Perimeter Screw Flange
3. Transducer High/Mid Frequency Driver
4. Low Frequency Cone Woofer Driver
5. Circuit with Crossover, Protection and/or Speaker Wire Terminals



INSTALLATION TYPES

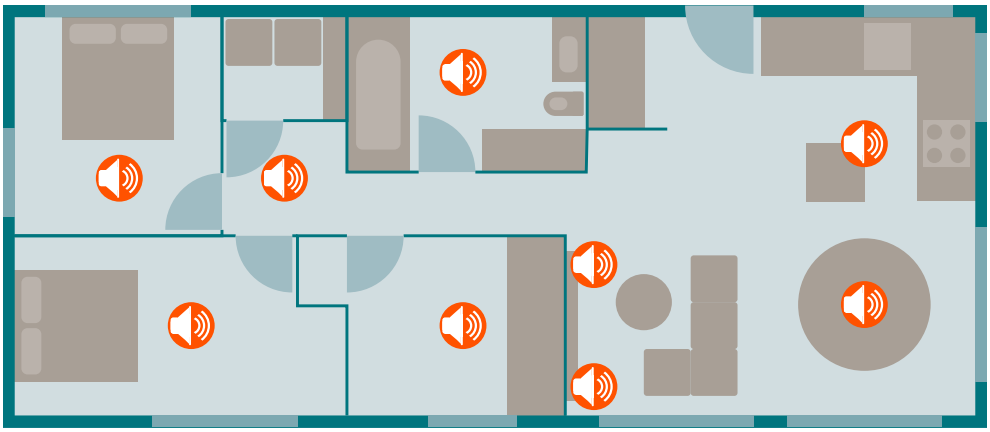
LineaResponse invisible speakers are designed for use in wall and ceiling applications and due to their invisible nature and broad dispersion pattern they are a highly flexible speaker solution. The broad dispersion means there is no need for exact placement to achieve maximum audio results while their invisible nature eliminates the need to visually integrate unsightly speaker grills into the surrounding architecture.

LineaResponse speakers come in a wide range of models making them an ideal choice for all types of audio installations: distributed audio (whole-home and commercial) systems, stereo listening, surround sound and ATMOS home theater.

DISTRIBUTED AUDIO

Stealth's LineaResponse speakers are ideal for residential and commercial distributed audio projects. These speakers don't sacrifice sound quality and won't clutter the space with unsightly speaker grills. The full range sound, wide dispersion pattern, and invisible nature of the speakers means they can be installed almost anywhere in a room and sound great.

Additionally, most speaker models are available with an optional transformer compatible with 70-volt amplifier systems and have tap values of 30/20/10/5 or 60/30/20/10 watts (depending on model).

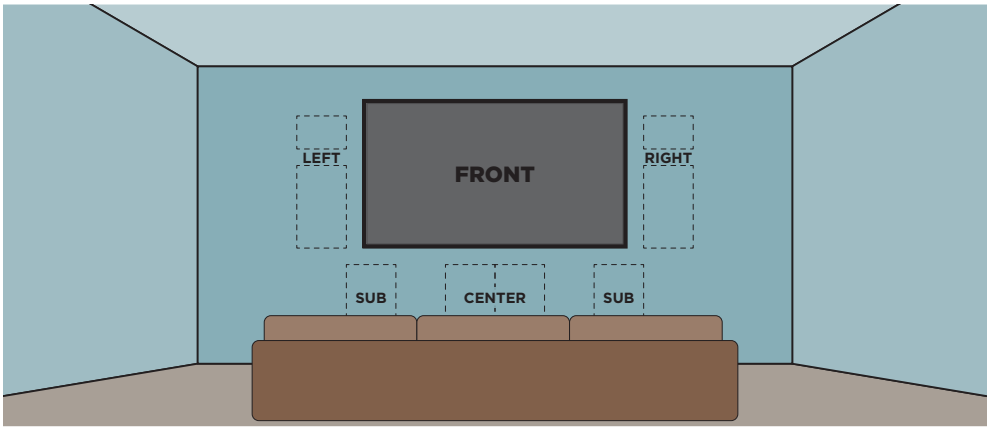


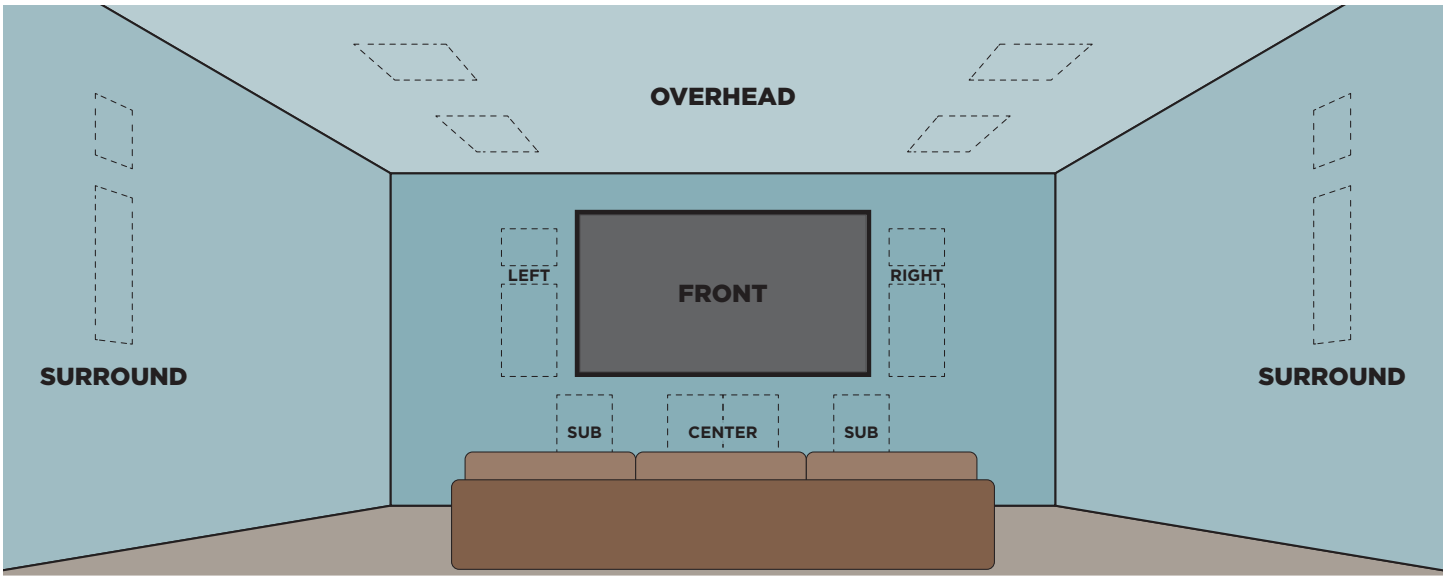
STEREO & 3.1

For demanding audiophiles that seek impeccable audio performance yet desire the aesthetic benefits that only true invisibility can offer, Stealth's LineaResponse invisible speakers offer the solution.

Real cone woofer drivers allow excellent low frequency response, while enhanced driver sets, mechanically tuned diaphragms, and a new FidelityGlass Advanced™ lamination processes make LineaResponse speakers the highest performing, best sounding invisible speakers on the market.

Along with the higher power handling capabilities LineaResponse speakers also offer peace-of-mind. To protect your investment, Stealth speakers employ self resetting protection circuits that prevent excessive amplifier power from damaging the speaker.





SURROUND SOUND AND ATMOS™

As ATMOS surround sound technology has migrated from the movie theater to home theater systems, more speakers are required to add "height" to the soundscape. Additional speaker channels mean that audio is no longer limited to the left/right "X" axis and front/rear "Y" axis but now incorporate the up/down "Z" axis for a true 3D sound experience.

Yet, adding "Z" axis speakers typically means adding more bulky speaker boxes and unsightly grilles which clutter the aesthetic design of a room. This is exactly the *wrong* direction for dealers who want happy architects, interior designers, and home owners who have come to expect A\V technologies to be hidden from view. Stealth has a no-compromise solution to this problem with its award winning LineaResponseX family of completely invisible speakers.

Stealth's invisible speakers are designed with home theater in mind. Utilizing its patented FidelityGlass Advanced™ technology in combination with directly coupled mid/high tweeters, and real cone woofer bass stage, the speakers have a smooth, articulate response - all from a totally invisible speaker solution. In addition, the speakers feature a nearly hemispherical sound field insuring a surround speaker system that sounds spectacular in all directions: X, Y and Z.

LineaResponse speakers simultaneously achieve maximum aesthetic and audio performance. The broad dispersion pattern eliminates typical on-axis "beaming" found in traditional speakers while the completely invisible nature of the speaker eliminates the need to visually align unsightly speaker grills within an architectural space. These features combine to give LineaResponse speakers an unprecedented flexibility for home theater installations.

Home theater surround sound systems benefit from Stealth Acoustics speakers in three ways:

1. **A diffuse sound field with wide coverage angles.** Stealth speakers offer a wide coverage angle which minimizes the "flashlight" effect of traditional speakers, especially when ceiling mounted. Wider coverage means off-axis listeners hear the same full range sound as on-axis listeners resulting in a fully immersive experience from any seat.
2. **Directional information that is cogent throughout the coverage area.** Stealth speakers not only have broader coverage than traditional speakers, but within the coverage area offer a more sonically consistent experience which leads to bigger panoramas and better spatial cues for more seats. Traditional speakers change their sonic qualities quite a bit from different listening angles which can confuse spatial location details and response blend relative to listening angle.
3. **The ability to be set to "large".** Traditionally LFE "low-frequency effects" are sent to the subwoofer channels such as Stealth's completely invisible B30g subwoofer system. And, because the LRX-85 is a more capable surround speaker it can also carry lower program material which means more the surround audio system can be tuned more easly and achieve a more realistic experience. Comparable in-wall surround speakers would require larger device and thus a larger visible speaker grill to achieve the same bass extension. Stealth invisible speakers allow for extended bass without any visual impact.

Stealth has a full family of invisible speakers to create great sounding ATMOS home theater systems, all without impacting the visual environment. Stealth speakers are *perfect for the "Z"*.

TIPS & BEST PRACTICES

THESE INSTRUCTIONS ARE IMPORTANT!

Reviewing and understanding these instructions prior to installation is a simple way to help prevent improper installation which can void the warrantee and lead to a visible installation, poor speaker performance, damage to the speakers, and possible costly repair/refinishing expenses.

INFORM THE CONTRACTOR AND CREW

It is very important that the contractor and wall finishing crew are made aware of the speakers and have reviewed this document and the installation videos available at StealthAcoustics.com prior to arrival on site. Although the materials and skills required are typical for drywall finishing this is not a technique the contractor should be expected to know without first reviewing the installation instructions/videos. Understanding the nuance and limitations of the installation process ahead of time will result in a great sounding, long lasting and completely invisible installation.

BEFORE INSTALLING SPEAKERS

- **Plan ahead.** Before beginning an installation, review this document and the related installation videos at StealthAcoustics.com
- **Consider speaker location.** Because of their wide dispersion pattern and invisible nature, Stealth speakers offer a greater flexibility when placing them within a room. A perfectly symmetrical installation is not required so speakers can be adjusted to accommodate architectural and structural limitations yet still achieve a balanced sound. (See page 7)
- **Consider acoustic isolation**. Each project will have different acoustic isolation requirements. What will be on the opposite side of the wall/ceiling from the desired speaker location? Can the speaker be relocated or a back box utilized to help with sound isolation? (See page 7)
- **Consider wall finish type.** What finish will be used? Stealth speakers can accommodate a variety of finishes and planning ahead for the desired finish will help achieve optimum results. (See page 17)
- **Take your time.** To achieve a completely invisible installation, time and care must be taken. Joint compound must be allowed to fully cure for 24 hours between applications to prevent future seam cracking. Inspection and Sanding between coats of compound will ensure a smooth, seamless finish. (See page 15)

PANEL EXCURSION IN CEILING INSTALLATIONS

When installing the larger 30" format speakers such as the B30g Subwoofer in a ceiling it is important to understand that there will be some deflection of the face panel downward due to the effects of gravity. The natural excursion of the face panel is what allows greater bass response in the LineaResponse speakers, but it can become visible in ceiling installations under some installation and lighting conditions. This deflection is normal and can be mitigated if the joint compound is applied correctly. **Do not float joint compound over the entire speaker face.** Joint compound is unnecessary on the speaker face and adds weight which may further exacerbate any deflection.

Minimum Tools Required for Speaker Installation	Minimum Tools Required for Wall Finishing
• Stud Finder • Pencil • Saw • Wire Strippers • Screwdriver (phillips bit) • Level/Straight Edge • Amplifier with Audio Source (for testing)	• Seam Tape (paper or mesh) • Joint Compound (all purpose) ***Do not use chemically curing joint compound.** • Wallboard Knives • Sander • Paint Roller • Primer • Paint

Box Contents	Speaker Panels	Shim Strips	Drywall Screws	Quick Start	Spec. Sheet
LR6G	1	16	25	1	1
LR8G	1	16	37	1	1
SLR8G	1	16	37	1	1
LR3G	1	16	45	1	1
LRX83	1	16	37	1	1
LRX85	2	16	34	1	1
B22G	2	16	37	1	1
B30G	2	16	45	1	1

PLANNING SPEAKER PLACEMENT

With full range sound, a wide dispersion pattern, and completely invisible installation the LineaResponse speakers can be installed virtually anywhere in a room and sound great. Without the need to symmetrically integrate speaker grills within the architectural space or worry about bright or dead spots in the sound pattern, planning speaker placement becomes much easier.

Start with standard speaker planning techniques for each room, but know that LineaResponse speakers can be relocated around architectural features or hidden utility services such as plumbing or ducting, etc. Each speaker comes with a protective paper overlay that can be used as a planning tool. Arrange and attach the overlays to the wallboard/framing when planning the installation. Once in position, trace the overlay for a cutting template.

Like all speakers, some sound is radiated from the back of the panel. Consider what lies on the opposite side of a wall where a speaker is intended to be installed. The flexibility of the LineaResponse speakers may allow the speaker to be moved to the ceiling or an exterior wall to achieve better isolation from adjoining rooms without effecting the final result. (See "Acoustic Isolation Practices" page 8). For added sound isolation consider adding an optional back box (See page 9).

ENVIRONMENTAL CONDITIONS

LIGHTING

An important consideration when selecting speaker installation locations is the lighting. The drywall finisher must understand the Stealth product and be very skilled at the craft. An installation might look very good with the light coming from one direction and then become unacceptable when the light moves and comes from a different direction. A skilled finisher will know this and check his work from many angles with a portable artificial light source.

EXTREME TEMPERATURE

Through the use of Stealth's proprietary fiberglass infused ABS plastic known as FidelityGlass™ in the construction of the speaker frame and active radiating panel, the invisible speakers have a very stable expansion/contraction coefficient throughout a broad temperature range from 0°F (-17°C) to 150°F (65°C).

CONTROLLED AIRFLOW

LineaResponse speakers are perfect for “clean room” installations because there is no exchange of air between the framing cavity and the room. The speakers can be used for paging systems, background music, or for sound masking applications in locations such as electronics manufacturing facilities or medical operating rooms where dust or contaminate build up on a speaker grille may pose a risk and controlling airflow is critical.

METALLIC DUST

In a construction environment or if the installation location might be subject to metallic dust particles in the air metallic particles may be attracted to the powerful speaker driver magnets and buildup of these particles can look unsightly and in extreme cases may cause performance issues. Carefully clean the area over and around the speaker.

HIGH HUMIDITY

LineaResponse invisible speakers are well suited for use in environments such as bathrooms, saunas and spas where high humidity and moisture are a problem for traditional in-wall/ceiling speakers. Porous grills allow moisture inside of the sensitive speaker components causing rust/failure and even into the wall/ceiling cavity which could cause damage.

Due to their unique construction, the LineaResponse speakers have a completely sealed FidelityGlass™ face and are moisture resistant once the edges have been sealed to the surrounding wallboard. The speaker face has no exposed components to collect moisture or rust, and moisture can not enter the wall cavity.

OUTDOOR INSTALLATIONS

LineaResponse Speakers are designed for indoor use, but the sealed FidelityGlass™ radiating diaphragm is water resistant. Once the edges of the speaker are properly sealed with the surrounding wall material the speaker can resist high humidity and moisture from the front (see the "Environmental Conditions" section above). Stealth Acoustics offers the ***StingRay*** Soffit Kit speaker which is specifically designed for completely invisible outdoor under-eave installation.

The complete StingRay product line was designed to meet the industry's need for high-quality, outdoor invisible speakers. The StingRay line of award winning outdoor speakers are based on the LineaResponse speaker technology and enclosed in an IP68 rated shell for a completely waterproof speaker. These speakers can further be camouflaged with custom paint or graphics. An outdoor StingRay subwoofer is also available.

For more information visit: StealthAcoustics.com/StingRay/

ACOUSTIC ISOLATION PRACTICES

SUBWOOFERS

It is important that the location for Stealth invisible subwoofers be chosen carefully. The backside low frequency output of these panels is roughly equivalent to the front side output and as such, sound can penetrate through the rear wall behind the speaker into the adjacent space. **Ideally, subwoofers should be mounted on exterior walls, or on interior walls connected to less used spaces (like laundry rooms, closets, etc) to avoid low frequency bleed-through to an adjacent room**.

- **It takes mass to attenuate sound energy and the lower the frequency, the more mass required.** Additional sound dampening can be achieved by adding additional mass like gypsum wallboard to wall and ceiling structures around the subwoofer. Varying layers of different dampening materials in and around the back box can improve sound isolation dramatically.

CHOOSING AN INSTALLATION LOCATION

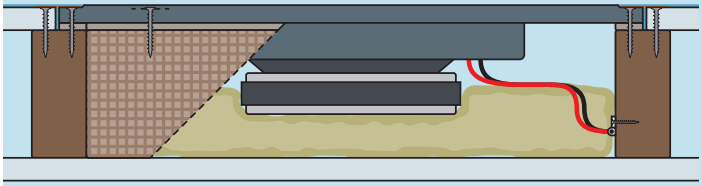
All in-wall/ceiling speakers are subject to unwanted sound transmission. Choosing the optimum installation location for each speaker is an important step in the design process. Acoustical isolation solutions for loudspeakers are specific to each installation, as the acceptable level of isolation varies by project. While Stealth Acoustics cannot indemnify specific isolation results for a given installation, here are some guidelines to follow:

- **Know the expectations of the job.** a single family home might be different from a “zero-interference" metric of a luxury condominium.
- **Sound isolation is a combination of mechanical and acoustical properties.** Stealth speakers have little mechanical vibration at the attachment points, so the primary isolation issues with Stealth speakers are acoustical.
- **Whenever possible, place speakers on outside walls, non-party walls, or adjacent to interstitial spaces** (attics, closets, laundry rooms, etc.) This is especially true for subwoofers where the backside low frequency output is roughly equivalent to the front side output and as such, sound can penetrate through the rear wall behind the speaker into adjacent spaces.
- **Walls and ceilings near Stealth speakers need to be firmly constructed and free of structural items that could rattle** (such as wiring and plumbing), or transmit sound to other parts of the home (ie. duct work).
- **Air-gaps greatly reduce sound isolation.** Avoid air-gaps by sealing stud, header, and bottom plate penetrations with caulk or expanding foam, and caulking should be used where the wallboard attaches to studs.
- **Stealth recommends the use of a Back Box sealed enclosure with each speaker** (See page 9)**.** Sealed enclosures loosely filled with insulation can also be custom built for the specific installation. The insulation absorbs some high-frequencies while the enclosure not only isolates sound it also "loads" the speaker resulting in increased sound quality. Unwanted sound transmission can still occur when using a Back Box.
- **Test the system before seam finishing to ensure sound isolation objectives are achieved.** Involve an Acoustical Consultant to confirm your solution if the job requirements are critical.

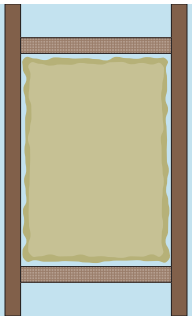
BACK BOXES

You must use a back box behind each Stealth speaker to obtain the specified bass response. Stealth offers accessory back boxes (BX, MBX, MBA and MBC models) which provide proper enclosure volume and “loading". Back boxes also offer added sound isolation and MBX and MBA models are plenum rated.

BASIC INSTALLATION



A basic back box can easily be achieved by adding on center framing above and below the speaker opening in the stud bay and then filling the area with insulation before installing the speaker.



BX BACK BOX

Wooden BX boxes are ideal for both new construction and when retrofitting Stealth speakers into existing walls or ceilings where there are no plenum requirements.

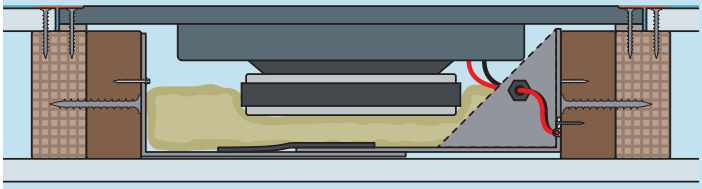
The BX enclosure helps with sound isolation and speaker performance.

MBX BACK BOX

Metal MBX back boxes should be used when a UL rated enclosure is required behind speakers and also to reduce sound transfer to adjacent spaces.

MBX back boxes can be used with metal studs and hat channel, as well as standard wooden framing.

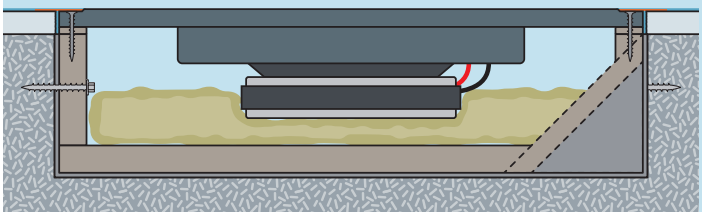
MBA BACK BOX



The versatile, UL listed MBA metal back boxes offer the same features as MBX back boxes but can be adjusted to accommodate narrow framing.

MBA back boxes can be used with metal studs and hat channel, as well as standard wooden framing.

MBC BACK BOX

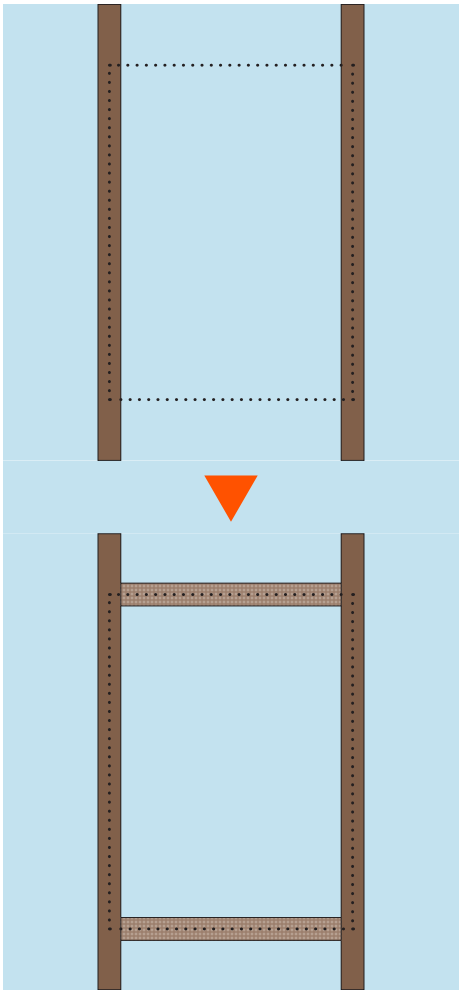


MBC back boxes are designed primarily for use in masonry or hat channel installations where no suitable framing is available to support the speaker perimeter. The metal shell protects the speaker while the wooden interior provides a secure perimeter anchor.

PREPARING WALL FRAMING

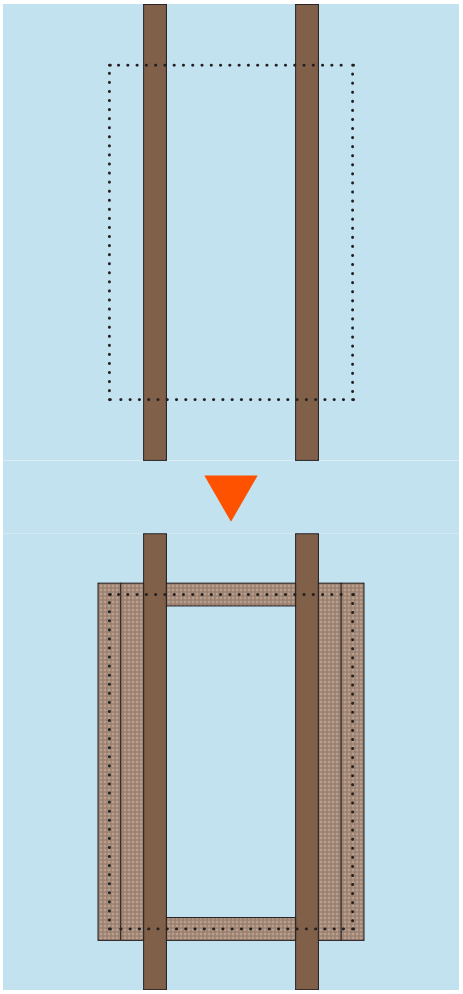
Stealth Acoustics invisible speakers can be installed in new construction or as a retrofit into an existing wall. Typically the speakers are installed in walls or ceilings that will be finished with ½" (13mm) or ⅝" (16mm) wallboard but can easily be adapted for other construction types.

FRAMING: 16″ ON-CENTER



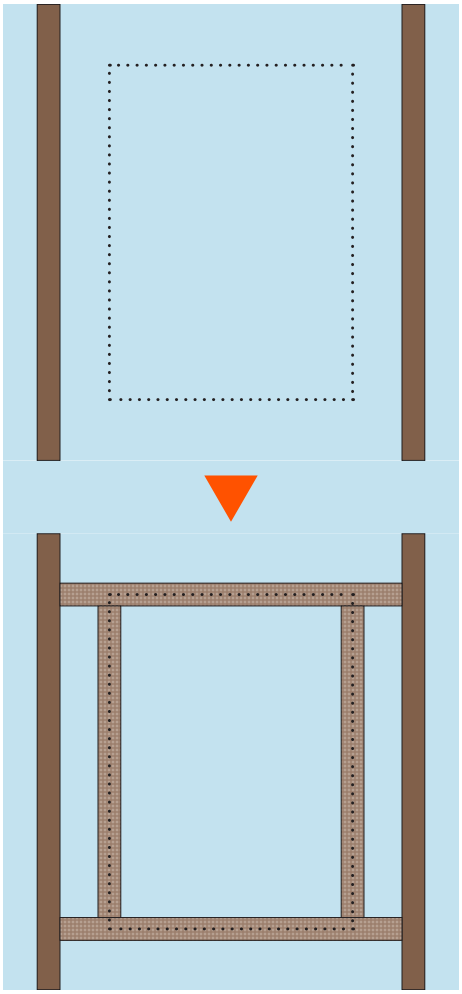
For standard 16" (406mm) on-center framing, add cross member framing above and below on-center for the speaker height.

FRAMING: NARROW



For narrow framing add cross member framing above and below on-center for the speaker height as well as outside blocking to achieve a 16" (406mm) on-center width. (See "Specifications" page 20)

FRAMING: WIDE



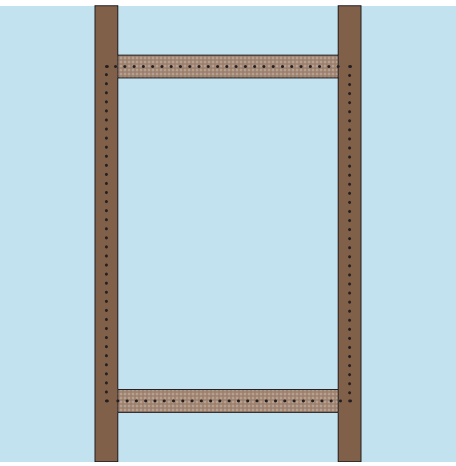
For framing wider than 16" (406mm), construct support framing to achieve an opening with a 16" (406mm) on-center width and on-center framing above and below for the speaker height.

- The speakers measure 16" (406mm) wide and feature models in 12" (305mm), 22" (559mm) and 30" (762mm) heights designed for installation into 16" (406mm) on-center wooden stud framing, but with additional support can accommodate wider or narrower framing.
- **Stealth Speakers require a stable mounting structure for proper support.** Speakers should only be attached to non-moveable elements of a building such as a structural ceiling or structural wall and must allow for screw attachment of all four sides of the speaker and the adjoining wallboard. *Well-cured and dry* structural pine 2" × 4" studs (35 × 70 mm) can be used for such framing if the existing construction does not provide the required stable mounting structure.
- If the stable mounting structure is in a lowered ceiling, then you must use ceiling hangers to directly secure the mounting structure to the building structural ceiling.

PREPARING FOR NEW CONSTRUCTION

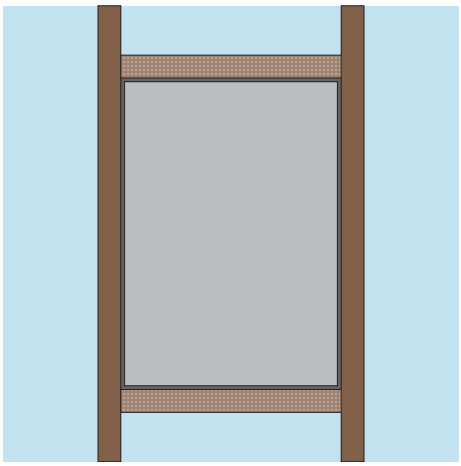
Installing a Stealth Acoustics invisible speaker into new construction is compatible with standard speaker installation (without a back box), as well as installations with the recommended BX, MBX and MBA back boxes.

1: ADD FRAMING



Cross member framing should be added above and below the speaker opening whenever possible so that the speaker and surrounding wallboard may be securely attached on all four sides. (See page 10)

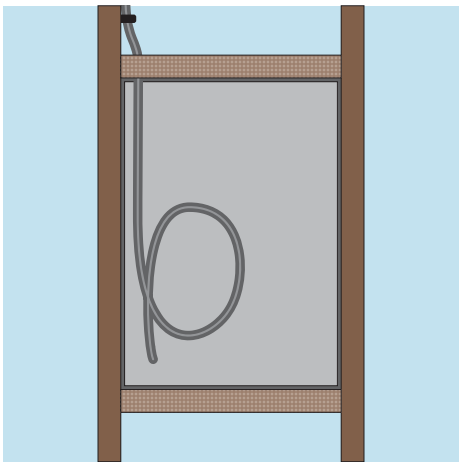
2: BACK BOX



Back boxes are recommended for every installation. (See page 9) BX model back boxes are installed along with the speaker while MBA and MBX back boxes are installed flush with the framing at this time.

See the instructions included with each back box for proper installation.

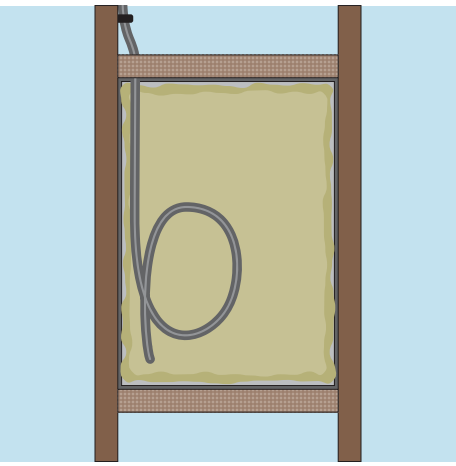
3: PREPARE WIRING



Run the speaker wiring and attach it securely to the studs at each speaker location.

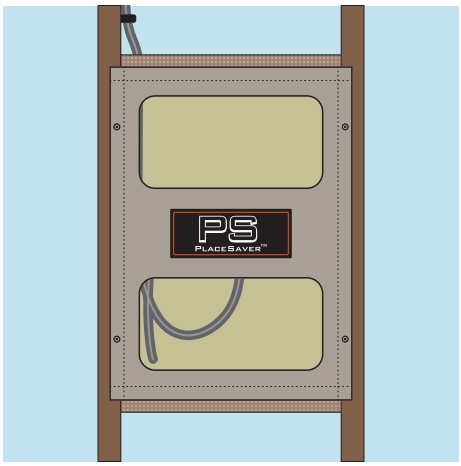
- For runs of 50 feet (15m) or less, use 16 gauge wire.
- For runs longer than 50 feet (15m), use 14 gauge wire.

4: ADD INSULATION



Each of the back box models comes with insulation. For installations without a back box, it is recommended to add insulation behind the speaker for added isolation and performance.

5: PLACESAVER™

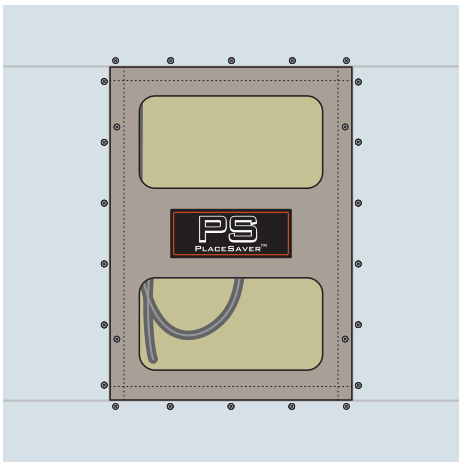


Install the optional PlaceSaver as a placeholder for the speaker during the wallboard installation process.

Adding PlaceSavers will also reveal where additional support framing may be necessary.

Center the temporary PlaceSaver on the framing and attach with provided hardware.

6: WALLBOARD



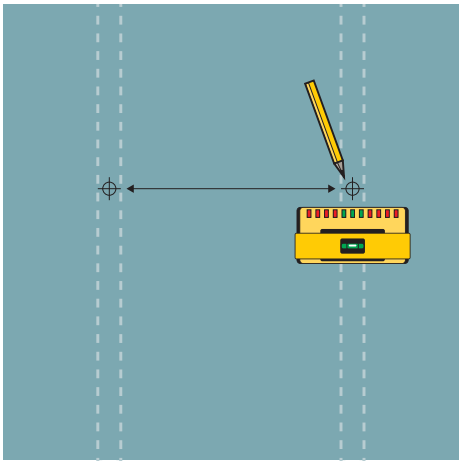
The PlaceSaver reserves the exact size space for the speaker during the wallboard installation preventing the speaker panel itself from exposure to harsh construction environment.

After wallboard installation, proceed to "Test Fit & Shims." (See page 13)

PREPARING FOR RETROFIT

Installing a Stealth Acoustics invisible speaker into an existing finished wall is similar to making a wallboard patch. Retrofit installation is compatible with standard speaker installation (without a back box), as well as installations with BX, MBX and MBA back boxes.

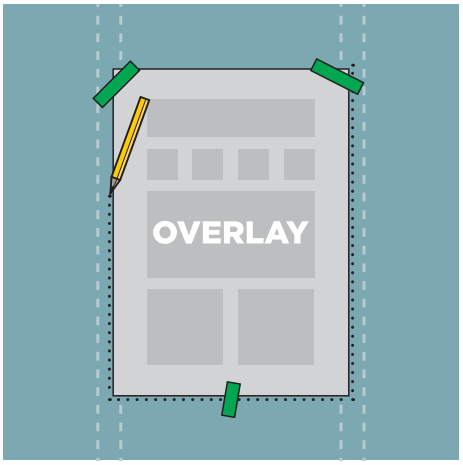
1: LOCATE FRAMING



Once the approximate speaker location has been selected, use a stud finder to detect the wall or ceiling framing.

Drill small test holes to verify stud locations before cutting the wallboard.

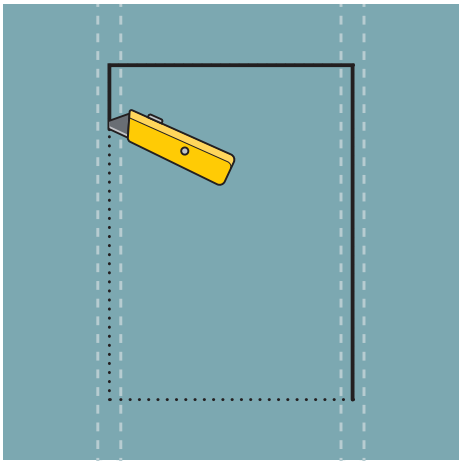
2: MARK POSITION



Remove the overlay sheet that comes attached to the front of each speaker and temporarily attach it to the wall or ceiling to assist in planning speaker placement.

Once framing has been identified, center the edges of the overlay sheet on the framing and trace the speaker outline.

3: CUT OPENING



Cut the wallboard to the size of the speaker using the outline from the overlay sheet.

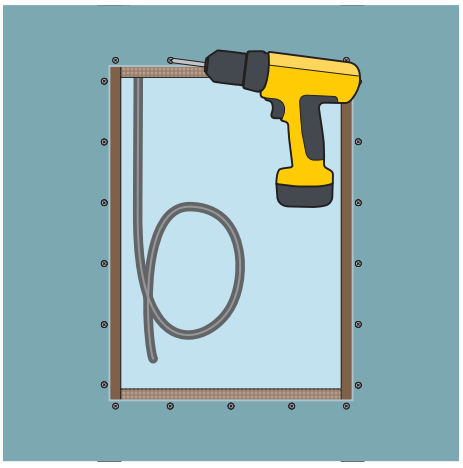
The finished opening should be 16” wide centered on the framing studs and the height of the desired speaker model.

4: PREPARE WIRING

Run the speaker wiring and attach it securely to the studs at each speaker location.

- For runs of 50 feet (15m) or less, use 16 gauge wire.
- For runs longer than 50 feet (15m), use 14 gauge wire.

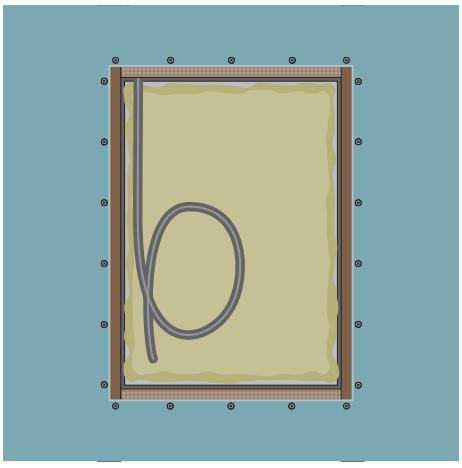
5: SUPPORT FRAMING



Cross member framing should be added above and below the speaker opening whenever possible so that the speaker and surrounding wallboard may be securely attached on all four sides.

For wider or narrower framing types: (See page 10)

6: PREPARE FOR SPEAKER



For installations without a back box it is recommended to add insulation behind the speaker for added isolation and performance.

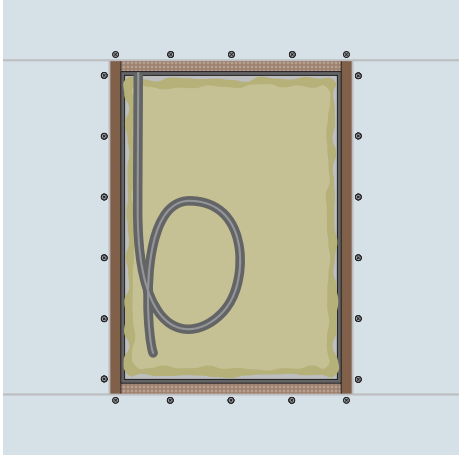
For MBX and MBA installation, install the metal back box at this time.

For Speakers with BX back box, proceed to "Test Fit & Shims." (See page 13)

TEST FIT & SHIMS

Proper registration is a critical step to achieve an invisible installation and to ensure maximum speaker performance.

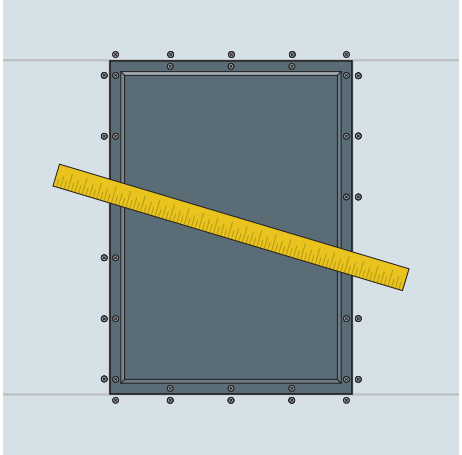
1: REMOVE PLACESAVER™



After the wallboard has been installed, remove the PlaceSaver™.

If a BX model back box is to be used it should be installed onto the speaker at this time.

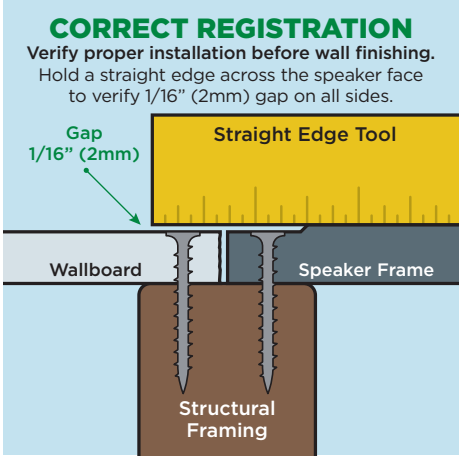
2: TEST FIT



Before speaker installation occurs, it is critical to test fit each speaker to check its registration with the surrounding wallboard.

Stealth speakers are designed for use with wallboard of ½" (13 mm) minimum or ⅝" (16mm) with included shims. Thicker wallboard can be accommodated with additional layers of shims or other appropriate shim materials.

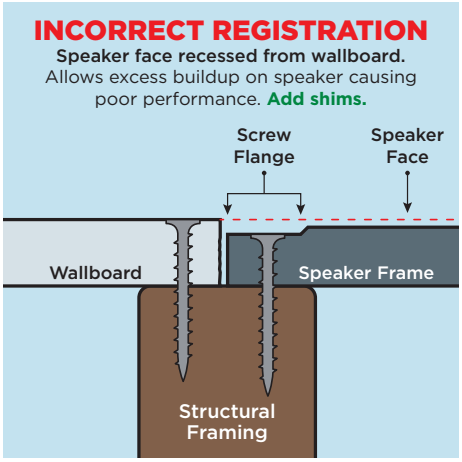
3A: CHECK REGISTRATION



Correct registration is achieved when the perimeter screw flange of the speaker is flush with the adjoining wallboard allowing the face of the speaker to protrude approximately 1/16" (2mm) beyond the wallboard. (See page 18)

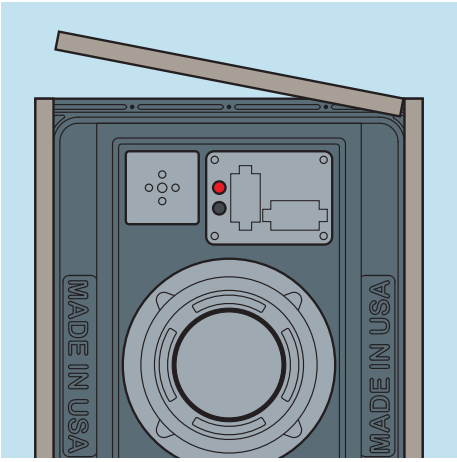
This creates a recess for the seam tape which prevents sanding back into the tape during the finishing process.

3B: CHECK REGISTRATION



If the speaker is recessed in relation to the wallboard, excessive material build-up on the surface of the speaker can occur during the finishing process which will lead to poor sound quality and possible premature failure. (See page 18)

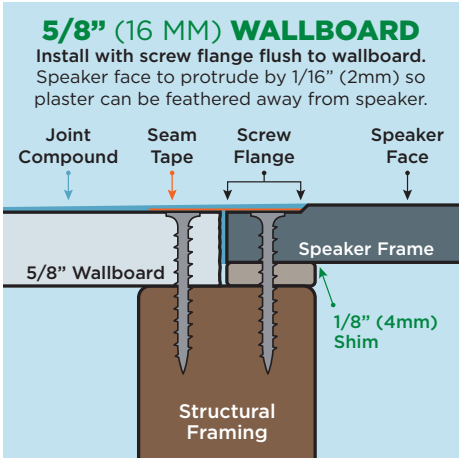
4: ADD SHIMS



If necessary, shim the screw flange out flush with the wallboard by layering the provided self-adhesive shims around the perimeter of the rear of the speaker (shims should cover the screw holes).

- **Do not allow the speaker face to be inset from the adjoining wallboard.**

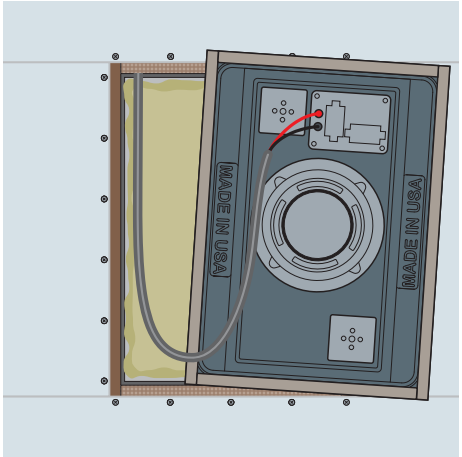
5: REVIEW



A proper installation will allow for seam tape to be covered and joint compound to be feathered away from the speaker face creating a smooth, invisible transition to the surrounding wall surface. (See page 18)

INSTALLATION & SOUND TEST

1: CONNECT WIRES

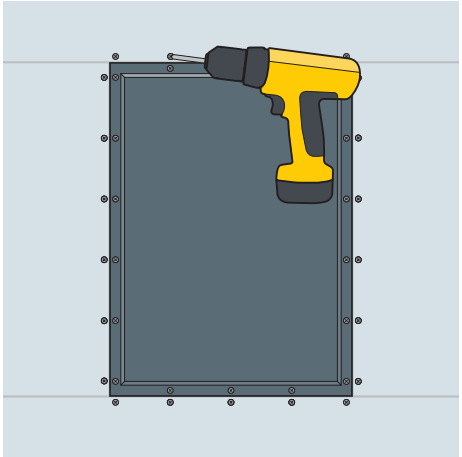


Insert the speaker wires into the binding posts on the speaker crossover (or BX back box) noting proper polarity.

For smaller gauge wires, bend the exposed wire back upon itself prior to insertion to make better contact with the binding posts.

Make sure to securely connect the speaker wires to the speaker binding posts; jiggle the wires and re-tighten.

2: SPEAKER MOUNTING



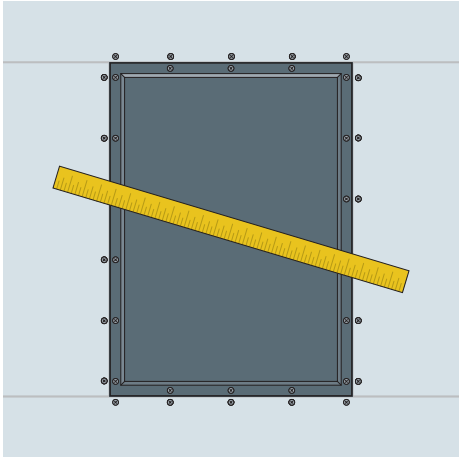
Attach the speaker panel screw flanges directly to the structural framing using the provided wallboard screws in the pre-drilled holes.

Be sure that all of the screws are installed and that they hold securely to the framing.

It is important to add screws to secure the wallboard surrounding the speaker as well.

- **Do not use nails.**

3: CHECK REGISTRATION

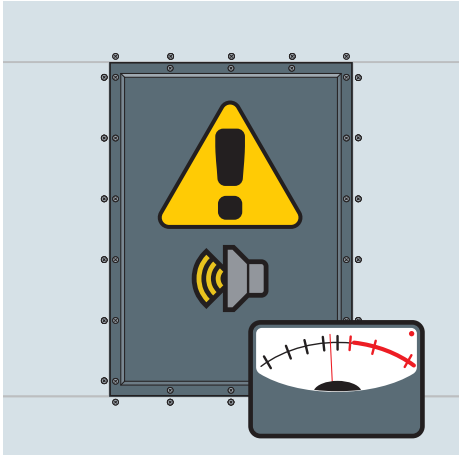


Once the speaker is secured, recheck that the outer flange of the speaker is flush with the surrounding wallboard. (See page 18)

Place a 4-foot straight edge across middle of the speaker to verify that the speaker face protrudes approximately 1/16" (2mm) beyond the wallboard in each direction.

- **Check that the speaker is not warped from strain caused by uneven framing. A warped speaker frame will cause the speaker face to bulge.**

4: TESTING



Test each speaker with music or pink noise from an amplified sound source at listening volume. Check high/mid/low frequency drivers of each speaker and listen for any rattling or vibration.

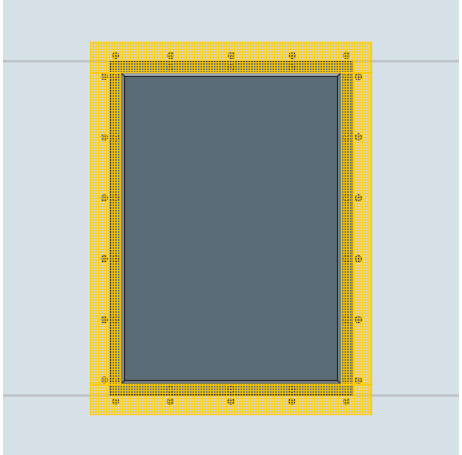
- **Now is the time to correct any potential issues.**

WALL FINISHING

Wall finishing is a key step for a proper installation and should not be taken lightly. Applying joint compound in a hurry or in one continuous pass across the entire face of the speaker can easily lead to an excess of compound to build up.

The central active area of the speaker begins 1¾" in from the perimeter of the speaker frame. **This area must be free of excessive joint compound in order to move to create sound.**

1: SEAM TAPE



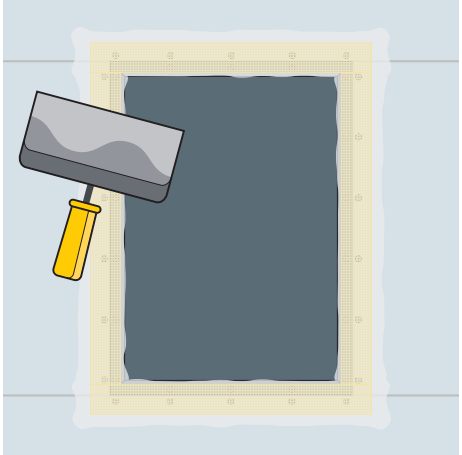
After the registration and sound check, seam finishing can proceed.

The speaker panel should be finished in-place, similar to any other piece of wallboard.

Self-adhesive nylon mesh tape is recommended due to its ease of use, however paper tape is also acceptable.

Finish seams completely using best practices and wallboard finishing techniques.

2: SEAM FINISH STAGES 1-2-3



For best results, we recommend at least three light applications of joint compound be applied. Each coat should dry for 24 hours then lightly sanded.

The joint compound should be spread beginning 2"-3" (50-75mm) in from the speaker edge and then feathering outward 16"-20" (400-500mm) away from the speaker by the third application.

It is important that enough joint compound be gradually applied around the speaker perimeter to make a very smooth transition from face of the speaker panel to the wallboard.

- **Do not allow build up of more than 1/16" (2 mm) of joint compound over the face of the speaker panel.**

3: SAND STAGES 1-2-3

Because the speaker panel is a flexible surface, a sanding pad will have less effect in the center of the speaker than it will around the parameter.

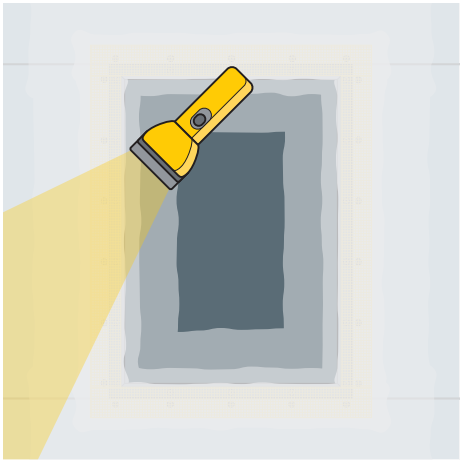
If joint compound is allowed to build up in the center of the speaker it will be difficult to sand off.

When sanding, imperfections in the application of the joint compound may appear. If so, additional joint compound and sanding may be needed to create a seamless transition.

- **Sanding is the last important step before the painting begins. This can make or break the quality of the installation.**

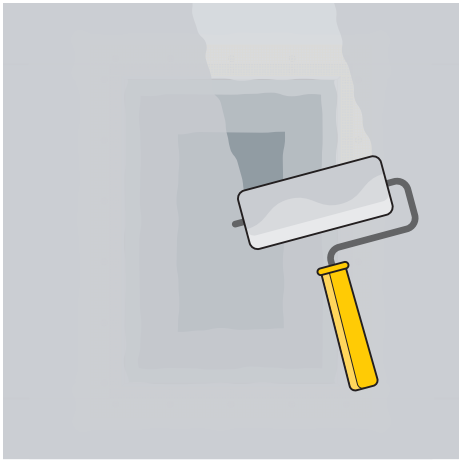
- **Use only pre-mixed light or normal weight, air-dry, joint compound.**
- **Do not use any catalyzed, chemically curing, or rapid drying joint compound.** Use of this compound may result in cracking around the perimeter of the speaker. These types of compounds are usually dry-packaged and noted on the packaging as having a drying time of under 3 hours.
- **Allow 24 hours between each application of joint compound for complete drying. Failure to allow the joint compound to completely dry between applications may result in fine hairline cracking around the speaker.** If this occurs, repair the crack using standard wall finishing techniques. (See page 19)
- Heavy knock down or trowel finishes are not recommended. LineaResponse speakers are engineered for optimum audio performance with no more than 1/16" (2mm) of any material applied to the surface of the speaker. To exceed the 1/16" (2mm) limitation will cause degradation of audio quality. (See page 17)

4: CHECK FINISH



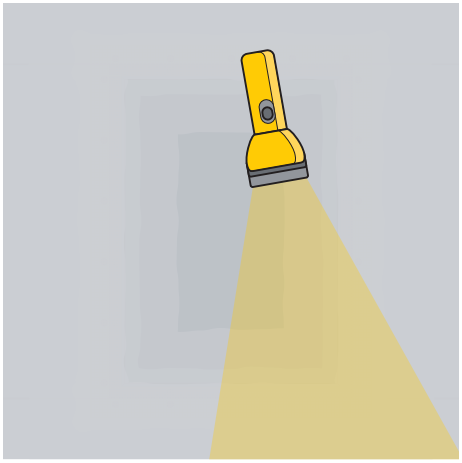
Best practice may include the use of a flashlight to shine sheer light down the wall or ceiling in order to identify high or low spots in the finish work.

5: TEXTURE & PRIME



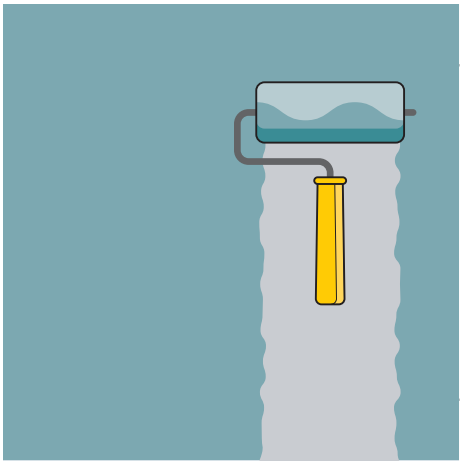
Once sanding is complete the wall is ready for primer. It is recommended that all unfinished wallboard and speakers be first primed with an adhesive type latex based primer-sealer.

6: CHECK FINISH



After the primer has dried, use a flashlight to shine sheer light down the wall or ceiling in order to identify and address any blemishes before applying the final coat of paint.

7: PAINT/TEXTURE



Apply paint as usual.

Light “orange peel” texture, light knock-down texture, wallpaper, veneer, or level 5 finish may be applied if desired. (See page 17)

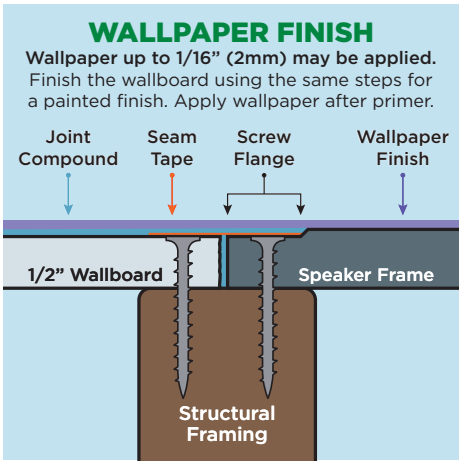
Heavy knock down or trowel finishes are not recommended.

WALL FINISH OPTIONS

STANDARD TEXTURE & PAINT FINISHES

Most invisible LineaResponse speakers are finished with a light texture with latex paint well under the 1⁄16” (2mm) material coverage limitation. If installed according to the instructions in this document the speaker will become completely invisible after the texture and paint finish. More advanced finish techniques (noted below) are possible and require a close attention to detail but can result in a quality finish and quality speaker output.

WALLPAPER FINISHES



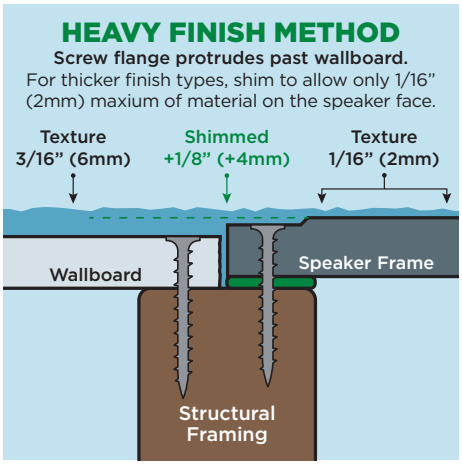
When finishing LineaResponse speakers with wallpaper, it is important to use care when selecting the type of wallpaper being applied. For best results use traditional or vinyl wallpaper up to 1⁄16" (2 mm) in thickness. **Some types of wallpaper (extra thick, foam, or spongy) can hinder the high frequencies being emitted. This creates a muffled sound from the speaker.**

To prep a speaker installation for a wallpaper finish, the wallboard and speakers should be taped, mudded, and sanded according to the instructions for a smooth wall finish (See page 15). Once the sanding is complete and the wall is free of blemishes; apply a coat of latex primer followed by the wallpaper.

As with any wall finish over Stealth Acoustics speakers, it is imperative to never exceed the 1/16" (2 mm) of material over the face of the speaker. This can result in poor sound quality and is not covered by the manufacturer’s defect warranty.

Please contact Stealth Acoustics customer service if you have any further questions regarding wallpaper or other special finishes.

HEAVY PLASTER OR LEVEL 5 FINISHES



When installing LineaResponse speakers into walls or ceilings specified for finish with a heavy application or skim coat of plaster (or other plaster-like material) over the wallboard, proper registration of the speaker face relative to the surface of the unfinished wallboard is critical. The speakers may be skim-coated with almost any plaster type material so long as the maximum material coverage of 1⁄16" (2 mm) is not exceeded.

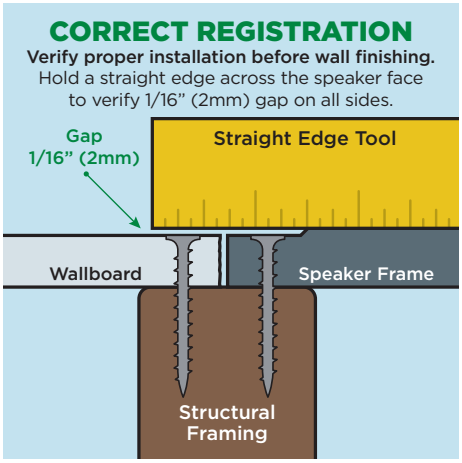
As with any wall finish over Stealth Acoustics speakers, it is imperative to never exceed the 1/16" (2 mm) of material over the face of the speaker. This can result in poor sound quality and is not covered by the manufacturer’s defect warranty.

To install LineaResponse speakers into a wall or ceiling where the specified heavy-plaster coat will exceed 1⁄16" (2 mm) on the wallboard, the installer must use the additional provided shims to move the speaker forward in relation to the wallboard. The distance forward will be determined by the specified depth of the plaster coat. For example, if the plaster coat is to be 3⁄16" (5 mm) thick, then the speaker must be shimmed forward in relation to the wallboard by an additional 1⁄8" (3 mm) – so that while the wall or ceiling will be covered with the specified 3⁄16" (5 mm) plaster coat, the amount over the speaker itself remains at 1⁄16" (2 mm) or less. In this example the speaker would be protruding beyond the wallboard by approximately 1⁄8" (3 mm).

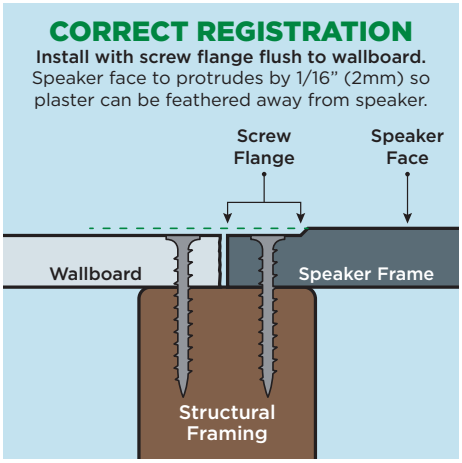
- A set of shims is included with each speaker. For projects requiring additional shimming a Shim Kit accessory package may be purchased. Additionally, any appropriate construction materials may also be used for shimming.
- If the plaster being applied to the wall or ceiling contains the final color of the finish, we recommend that the speaker be primed with a latex primer using the same color as the finishing plaster before the plaster is applied. This will allow a thinner coat of plaster to be applied over the speaker and obtain the proper finish color to avoid “ghosting."
- If paint is to be applied over the heavy plaster Stealth recommends that no more than 4 or 5 total coats of paint be applied for optimum speaker performance. **The total thickness of plaster and paint should not exceed the exceed the 1/16" (2 mm) limitation.**

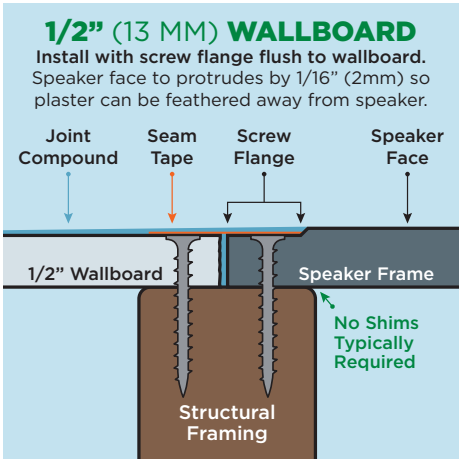
DEPTH REGISTRATION

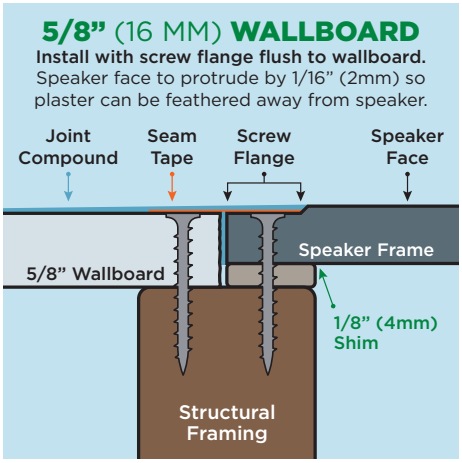
The most important step in achieving a completely invisible speaker installation is creating the smooth, gradual transition between the speaker and surrounding wallboard. It is critical to attach the speaker at the correct depth in relation to the wallboard so the joint compound can be applied properly. **Refer to the illustrations below for correct depth registration.**

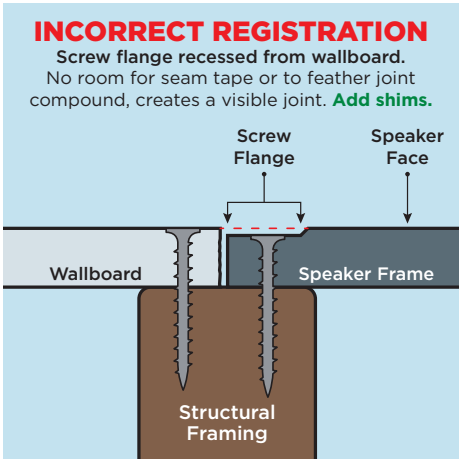


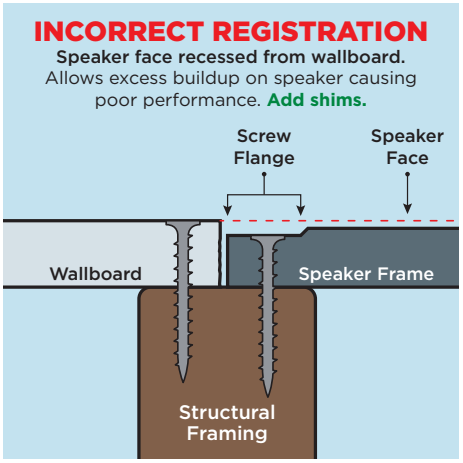
- Examine the framing surface to ensure the entire perimeter is on the same plane. Once the speaker is screwed down any bumps, dips, or misalignment in the framing will appear as a bulges or dips on the front panel. If this happens, the speaker must be removed and additional shim material used to create a flat mounting surface. *There is some art to this process; be patient and observant because completing this step successfully is critical to the end result.*
- **Do not proceed to wall finishing on speakers that are stressed and warped.** Wall finishing may visibly conceal a warped speaker, but the problem is not gone. Any physical distortion to the front panel will result in limiting the excursion available to the speaker and the additional mud masking the warp further exacerbates the problem. Larger speakers are more sensitive to stresses from screws and uneven mounting surfaces. The speaker may sound normal at low levels but will begin to rattle when volume is increased because the front panel has limited room to move. **Always test each speaker with music or pink noise from an amplified sound source at listening volume to ensure full speaker functionality before proceeding to wall finishing.**
- Use a straight edge to re-check the flatness of the front panel throughout installation. First, install the corner screws and check the front panel for flatness. Proceed to the screws toward the center on the long sides and check again. Then install the central screws on the short sides and check. If the front panel of the speaker has remained flat install any remaining screws and do a final check.

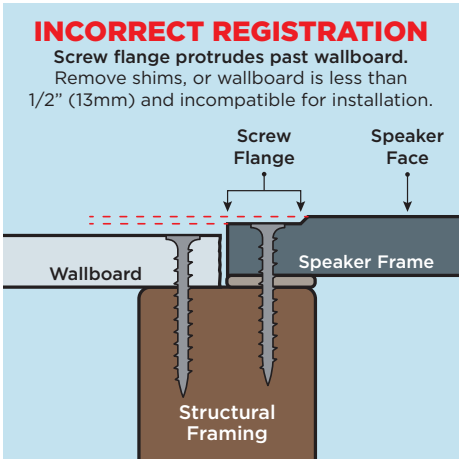












REPAIR, REMOVAL & REPLACEMENT

HAIRLINE CRACKING CAUSES AND REPAIR

If hairline cracking occurs it can be easily addressed and a completely invisible installation can be achieved. LineaResponse speakers are designed specifically to prevent the wallboard finish around the perimeter from cracking during normal use. However, every installation is unique and installation conditions may arise that can result in cracking.

If fine hairline perimeter cracking does occur soon after installation, it is most commonly associated with insufficient drying time of the base coat of joint compound. **It is critical that each coat of joint compound is completely dry before the next layer is applied.** Any moisture retained in the base layer will continue to slowly dry and shrink slightly under the subsequent layers of joint compound. This type of cracking does not typically appear at the seam between the wallboard and speaker, rather at the chamfered edge of the speaker diaphragm about ¾" (19 mm) inward from the edge of the speaker frame. Cracking may not be visible right away as it may take days or weeks for the base coat to completely dry.

The best way to prevent this type of cracking is to allow additional 24 hours of drying time for each layer of joint compound, especially in areas where the construction environment is cold or damp. THE USE OF HOT MUD OR CHEMICALLY CURING JOINT COMPOUNDS IS NOT ADVISED AND MAY ALSO LEAD TO CRACKING.

Repairing this type of hairline cracking should be done with standard wall-finishing techniques:

- For smooth wall/ceiling finishes, use a sharp tool such as the corner of a chisel or utility knife to widen the crack to 1⁄16" - ⅛" (2-3 mm)then fill/skim the affected area with lightweight joint compound or spackle. **Use air-dry type compounds only.** Once completely dry, sand the area smooth and re-paint.
- For textured or more forgiving finishes it is possible to repair the cracks with a water-based paintable caulk. Use a putty knife or fingertip to push the caulk into the crack and wipe away the excess with a damp cloth. Allow to dry and then paint.

REMOVING AN INVISIBLE SPEAKER

LineaResponse invisible speakers are designed for a lifetime of maintenance free use. Once a speaker has been installed and finished, it will most likely never need to be removed.

Because of their invisible nature, if a speaker does need to be removed, the first job is to locate it. Slide a paperclip or small metal object around on the wall in the vicinity of the speaker until it is attracted to the magnetic field of the high frequency driver. Mark this area and use it as a reference for locating the parameter screws. Next use a small magnet or screw finding tool to locate and mark the parameter screws along all four edges. Pay attention to the pattern that develops.

Begin loosening the screws and the perimeter edge may begin to be visible about ¼" to ⅜" out from the screws. Use a utility knife to find the edge of the speaker panel and cut around all four sides. Finish removing the screws and carefully remove the panel.

REPLACING AN INVISIBLE SPEAKER

When installing a new speaker into the opening of a previously installed speaker keep in mind that the seam finishing process for the original speaker has already been done. This included build-up and feathering of joint compound to level the speaker face with the surrounding wallboard. In order to allow for new seam tape and prevent adding another layer of build-up which could be difficult to feather and become an eyesore a different installation method must be used.

- **Do not use this method for brand new installation** unless there is insufficient space to properly feather a panel into the wall. (See page 12)
- First, create a recess for the seam tape by making a shallow cut 1" (25 mm) around the perimeter of the opening and peel back the first layer of wallboard paper. (See photo at right.)
- Next, test-fit the speaker panel and use a straightedge to check that the face of the speaker panel is flush with the existing wall. If the speaker face is recessed, apply the necessary amount of provided shims to the perimeter of the speaker to make it flush. **If the speaker is proud of the finished wall it may be necessary to modify the underlying framing to achieve a flush fit.**
- Follow the guidelines (See page 14) for screwing the speaker into position making sure to avoiding warping or putting strain on the speaker face.
- Apply seam tape and joint compound into the groove (See page 15) except in this case the joint compound will not feather beyond the outside edge of the groove created for the tape. Sand and finish per standard wallboard patch techniques. (See page 16)

On a finished wall, create a space for the nylon mesh tape and mud by stripping back about 1" of the wallboard paper.

SPECIFICATIONS

Model:	LR6G	LR8G	SLR8G	LR3G
Type:	2-Way Full Range	2-Way Full Range	2-Way Full Range (single panel stereo)	3-Way Full Range
High Frequency (HF) Driver:	1⅛" (30mm) neodymium transducer	1⅛" (30mm) neodymium transducer	Two 1⅛" (30mm) neodymium transducers	1" (25mm) neodymium transducer
Mid Frequency (MF) Driver:	N/A	N/A	N/A	Two 1⅛" (30mm) neodymium transducers
Low Frequency (LF) Cone Woofer Driver:	1" (25 mm) voice coil, 6.5" (165 mm) cone, 15 oz. (425 gr) ceramic magnet	1.5" (38 mm) voice coil, 8" (203 mm) cone, 20 oz. (622 gr) ceramic magnet	1.5" (38 mm) voice coil, 8" (203 mm) cone, 20 oz. (622 gr) ceramic magnet	1.5" (38 mm) voice coil, 8" (203 mm) cone, 20 oz. (622 gr) ceramic magnet
Input Power:	50 watt minimum 100 watt RMS	60 watt minimum 120 watt RMS	60 watt minimum 120 watt RMS (each channel)	75 watt minimum 200 watt RMS
Impedance:	8 Ohm	8 Ohm	8 Ohm (each channel)	8 Ohm
Sensitivity:	83 dB (1 watt / 1 meter)	83 dB (1 watt / 1 meter)	82 dB (1 watt / 1 meter)	83 dB (1 watt / 1 meter)
Frequency Response:	45Hz to 20kHz	45Hz to 20kHz	45Hz to 20kHz	40Hz to 20kHz
Polar Dispersion:	170 degrees horizontal & vertical	170 degrees horizontal & vertical	170 degrees horizontal & vertical	170 degrees horizontal & vertical
Protection:	Two independent self- resetting devices (HF and LF)	Two independent self- resetting devices (HF and LF)	Four independent self- resetting devices ((2) HF and (2) LF)	Three independent self- resetting devices (HF, MF and LF)
Panel Dimensions:	H 11⅞" W 15⅞" D 2¾" / H 302mm W 403mm D 70mm	H 22" W 15⅞" D 3" / H 559mm W 403mm D 76mm	H 22" W 15⅞" D 3" / H 559mm W 403mm D 76mm	H 30" W 15⅞" D 3" / H 762mm W 403mm D 76mm
Minimum Opening (without back box):	8½" / 216mm	9½" / 241mm	9½" / 241mm	9½" / 241mm
Mounting Depth: (without back box):	2¼" / 57mm	2½" / 64mm	2½" / 64mm	2½" / 64mm
Cut-out Dimensions:	H 12" W 16" / H 305mm W 406	H 22⅛" W 16" / H 562mm W 406mm	H 22⅛" W 16" / H 562mm W 406mm	H 30⅛" W 16" / H 765mm W 406mm
Weight (per panel):	8.5 lbs. (3.8 kg)	13.5 lbs. (6.2 kg)	15 lbs. (6.8 kg)	18.5 lbs. (8.4 kg)
PlaceSaver:	PS-12	PS-22	PS-22	PS-30
Back Box Compatibility (optional):	BX-12, *MBA-22*, MBX 12, MBC-12	BX-22, MBA-22, MBX-22, MBC-22	BX-22SLR, MBA-22, MBX-22, MBC-22	BX-30, MBA-30, MBX-30, MBC-30
Accessories (optional):	SK-1 Shim Kit CVXMR30 Transformer	SK-1 Shim Kit CVXMR30 Transformer	SK-1 Shim Kit	SK-1 Shim Kit

SPECIFICATIONS

Model:	LRX83	LRX85	B22G	B30G
Type:	3-Way Full Range	3-Way Full Range (2-panels)	Subwoofer System (2-panels)	Subwoofer System (2-panels)
High Frequency (HF) Driver:	1" (25mm) neodymium transducer	1" (25mm) neodymium transducer	N/A	N/A
Mid Frequency (MF) Driver:	1⅛" (30mm) neodymium transducer	Four 1⅛" (30mm) neodymium transducers	N/A	N/A
Low Frequency (LF) Woofer Driver:	1.5" (38 mm) voice coil, 8" (203 mm) cone, 20 oz. (622 gr) ceramic magnet	Two: 1.5" (38 mm) voice coil, 8" (203 mm) cone, 20 oz. (622 gr) ceramic magnet	One per panel: 1.5" (38 mm) voice coil, 8" (203 mm) cone, 20 oz. (622 gr) ceramic magnet	Two per panel: 1.5" (38 mm) voice coil, 8" (203 mm) cone, 20 oz. (622 gr) ceramic magnet
Input Power:	80 watt minimum 160 watt RMS	120 watt minimum 300 watt RMS	100 watt minimum 160 watt RMS (per pair)	120 watt minimum 200 watt RMS (per pair)
Impedance:	8 Ohm	8 Ohm	8 Ohm	Selectable 4 Ohm or 16 Ohm (each panel)
Sensitivity:	84 dB (1 watt/1 meter)	84 dB (1 watt / 1 meter)	86 dB (1 watt / 1 meter)	86 dB (1 watt / 1 meter)
Frequency Response:	40Hz to 20kHz	35Hz to 20kHz	30Hz to 150Hz	20Hz to 160Hz
Polar Dispersion:	170 degrees horizontal & vertical	170 degrees horizontal & vertical	170 degrees horizontal & vertical	170 degrees horizontal & vertical
Protection:	Three independent self- resetting devices (HF, MF and LF)	Three independent self- resetting devices (HF, MF and LF)	N/A (requires amplifier with limiter)	N/A (requires amplifier with limiter)
Panel Dimensions:	H 22" W 15⅞" D 3" / H 559mm W 403mm D 76mm	**HF/MF:** H 12" W 15⅞" D 3¼" / H 305mm W 403mm D 83mm **LF:** H 30" W 15⅞" D 3" / H 762mm W 403mm D 76mm	H 22" W 15⅞" D 3" / H 559mm W 403mm D 76mm	H 30" W 15⅞" D 3" / H 762mm W 403mm D 76mm
Minimum Opening (without back box):	9½" / 241mm	**HF:** 9" **LF:** 9½" / **HF:** 226mm **LF:** 241mm	9½" / 241mm	9½" / 241mm
Mounting Depth:	2½" / 64mm	**HF:** 2¾" **LF**: 2½" / **HF:** 70mm **LF:** 64mm	2½" / 64mm	2½" / 64mm
Cut-out Dimensions:	H 22⅛" W 16" / H 562mm W 406mm	**HF/MF:** H 12⅛" W 16" **LF:** H 30⅛" W 16" / **HF/MF:** H 308mm W 406mm **LF:** H 765mm W 406mm	H 22⅛" W 16" / H 562mm W 406mm	H 30⅛" W 16" / H 765mm W 406mm
Weight (per panel):	14 lbs. (6.3 kg)	HF: 10 lbs (4.5 kg) LF 19.5 lbs (8.8 kg)	12 lbs. (5.4 kg) each panel	19.5 lbs (8.8 kg) each panel
PlaceSaver:	PS-22	PS-12, PS-30	(2) PS-22	(2) PS-30
Back Box Compatibility (optional):	BX-22, MBA-22, MBX-22, MBC-22	BX-12-85, BX-30 MBA-22, MBA-30 MBC12, MBC-30	(2) BX-22, (2) MBA-22, (2) MBX-22, (2) MBC-22	(2) BX-30, (2) MBA-30, (2) MBX-30, (2) MBC-30
Accessories (optional):	SK-1 Shim Kit CVXMR60 Transformer	SK-1 Shim Kit	SK-1 Shim Kit	SK-1 Shim Kit

TROUBLESHOOTING

SOUND CUTS OUT OR IS DISTORTED

- Most models of LineaResponse invisible speakers contain self-resetting limit switches for protection against excessive amplifier output. These switches respond to the heat generated from the excessive volume output and will be triggered before output reaches levels that could damage the speaker. Sound quality may be greatly reduced as the limit is approached but the speaker and amplifier will not be damaged. Once fully triggered, audio output will cease until the excessive volume has been corrected and the limit switch returns to it's normal operational state (approximately 5-10 minutes).
- Some speakers may contain up to three independent switches: high-frequency, low frequency, and mid-range frequency. Depending on the frequencies in the audio being played one or more limit switch may be triggered while the remaining frequency ranges may continue to output normally. In any case, pause the audio or reduce the volume level until the limit switches have returned to their operational state.

SOUND IS MUFFLED

- Muffled sound from an LineaResponse speaker is almost always a sign that too much material was applied to the face of the speaker. **Do not allow build up of more than 1/16" (2 mm) of any materials over the face of the speaker panel.**
- If the sound was clear after installation but become muffled during playback the self protection limit switch may have engaged. (See " Sound Cuts Out or is Distorted" above).

DISCOLORED DOTS

- This condition is caused by metallic dust particles. (See "Metallic Dust" page 7)

CRACKING FINISH

- (See "Hairline Cracking Causes and Repair" page 19)

I CAN SEE THE SPEAKER

- By following the instructions in this document it is possible to achieve a completely invisible installation of the LineaResponse speaker. Experience with wall finishing techniques and skills are helpful, but with patience and a keen eye for detail a handy homeowner can achieve satisfactory results. If a speaker is installed in a hurry or without care it will be visible even after texture and paint have been applied. Applying additional wall finishing compound or other materials to cover an improper installation may correct the visibility of the speaker but will likely impact sound quality. Contact your Stealth dealer or Stealth Acoustics directly if an installation repair is necessary.
- On the larger sized models of LineaResponse speakers installations in ceilings (or sometimes walls) can be adversely affected by improperly skimming mud over the entire speaker face. Although the transition may appear smooth, the extra weight of the material in the center of the speaker can cause it to deflect and a "pillowing" effect may be visible. Excess material should be sanded away carefully. (See "Wall Finishing" page 15)
- In rare cases lighting conditions may generate sheer lighting down/across the installation location at a very low angle. This can cause even very small irregularities in the finish to cast a shadow and appear to be larger than they are. Care in planning speaker locations can help prevent this situation, as well as using a flashlight to generate sheer light during the installation process to check and correct any problems as they might arise. (See "Wall Finishing" page 15)