CHRISTIE

Baffle wall design and installation guidelines for Vive Audio systems

This document provides guidelines for designing and installing a baffle wall for Vive Audio systems. Read these guidelines carefully before starting the design or installation process.

Integrating LA series speakers into a baffle wall

Use the following guidelines when designing and installing a baffle wall and LA series speakers.

Laser alignment

One of the key attributes of line array speakers is a curved single cabinet design, providing even coverage of an entire auditorium when properly installed and aimed.

Align the speakers using the procedures in the *Vive Audio Line Array and Line Source Laser Alignment Procedures Instruction Sheet (020-101406-XX)* when designing and installing the baffle wall.

Positioning the speaker face

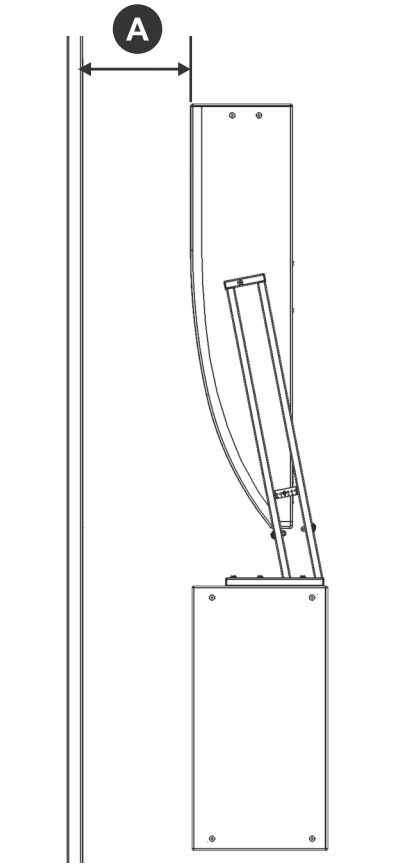
When integrating curved line array speakers with a flat baffle wall, the entire front face of the speaker must be located in front of, or flush with, the front surface of the baffle wall.

This ensures that all acoustic output is free from obstruction and maintains even horizontal and vertical coverage.

Positioning a speaker behind a perforated screen

When installing speakers behind a perforated projection screen, the optimal distance from the top-front of the speaker to rear of projection screen is 150 mm (6 in) (A) once the laser alignment procedure is complete.

This distance provides the best possible speaker performance behind a perforated screen.



If this distance is not practical due to site conditions, maintain a distance of no less than 100 mm (4 in) and no more than 300 mm (12 in) between the top-front of the speaker and rear of the perforated screen, to avoid deterioration of audio performance.

Acoustic treatment

You must apply acoustic treatment on the baffle wall to reduce interference from sound wave reflection.

This treatment acts as a broadband absorber of acoustic energy down to lower ranges of audio system frequency response. With typical acoustic treatment materials, such as acoustically rated mineral wool, the thicker the material the lower the frequencies of acoustic energy it can absorb.

To achieve broadband absorption down to mid-bass frequencies of 125 Hz, Christie recommends using a material that is 100 mm to 200 mm (4 in to 8 in) thick. Common acoustic treatment thicknesses of 25 mm to 50 mm (1 in to 2 in) are only effective in absorbing high frequencies.

Baffle wall and speaker configurations

The following table provides an overview of the three recommended configurations.

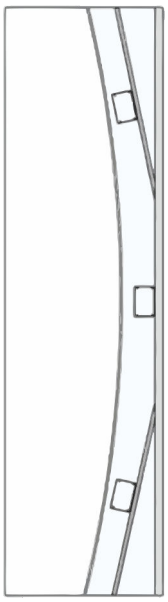
Configuration	Advantages	Disadvantages
Speakers and subwoofers placed directly in front of the baffle wall.	Lowest cost to complexity and best cost to performance ratios of all options.	Moderate low frequency reinforcement due to reduced half space loading (the baffle wall

Configuration	Advantages	Disadvantages
		focusing all of the sound in one direction).
Speakers and subwoofers partially recessed within the baffle wall.	Better low frequency reinforcement due to better half space loading.	Higher cost and complexity, with complex keyhole shaped cutouts in the wall.
Speakers placed directly in front of the baffle wall, subwoofers fully recessed within the baffle wall.	Greatest low frequency reinforcement due to the greatest half space loading.	Higher cost and complexity, but with less complex rectangular cutouts in wall.

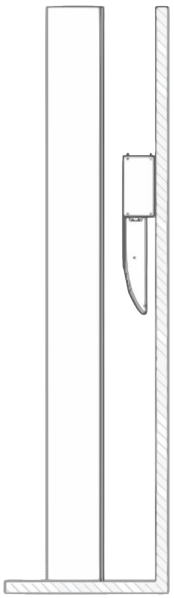
Speakers and subwoofers placed directly in front of baffle wall

In this configuration, speakers and subwoofers are placed in front of the baffle wall, with approximately 25 mm (1 in) of clearance behind them, with acoustic treatment installed on the baffle wall..

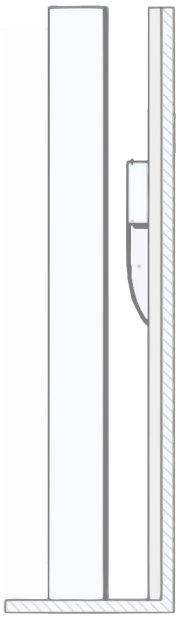
The following diagram shows a three segment baffle wall, with the center segment constructed on top of the existing front wall of the room and two new wing wall segments constructed on either side of the center segment.



Plan view (without acoustic treatment)



Section view (without acoustic treatment)



Section view (with acoustic treatment)

In the diagram, the speakers and subwoofers are connected using an L bracket, in a flown configuration. Alternatively, this configuration can be implemented with speakers and subwoofers connected using a tilt bracket and placed on a platform in front of the baffle wall.

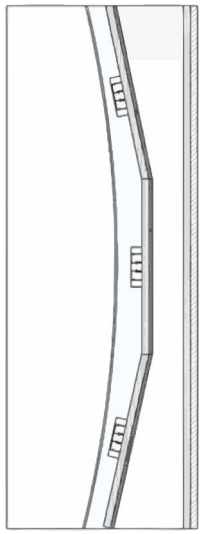
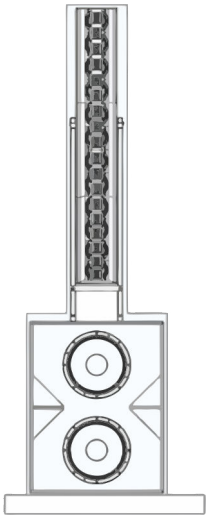
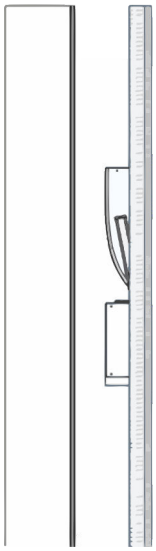
For systems with five screen channels, this design can be modified as a five segment baffle wall, with four new wing wall segments constructed on either side of the existing center segment.

Speakers and subwoofers partially recessed within baffle wall

In this configuration, a baffle wall is constructed in front of an existing wall. Keyhole shaped holes are cut to fit the speakers and subwoofers. Acoustic treatment is applied on both the front of the baffle wall and on the existing wall.

The speakers are mounted on the subwoofers using a tilt bracket. The assembly is placed on a shelf that extends through the front of the baffle wall, allowing the bottom of the line array speaker to be flush with the front of the acoustic treatment. This ensures the entire front of the line array is clear of any obstructions.

The following diagram shows a three segment baffle wall constructed in front of an existing wall, with space between the baffle wall and the existing wall for service access.

		
Plan view (with acoustic treatment)	Elevation view (without acoustic treatment)	Section view (with acoustic treatment)

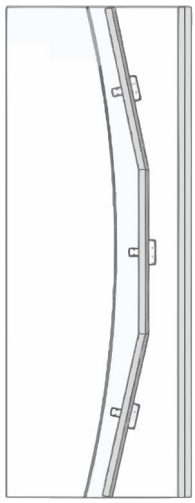
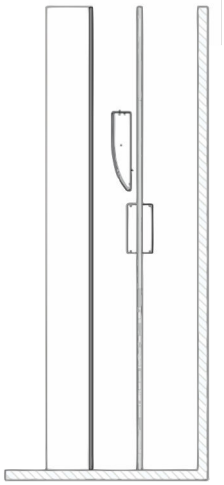
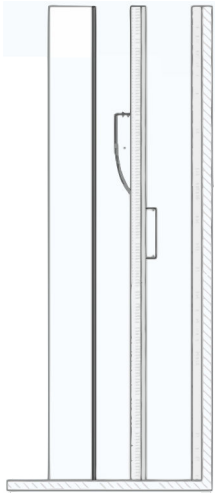
For systems with five screen channels, this design can be modified to include a five segment baffle wall with two wing wall segments constructed on each side of the center segment.

Speakers placed in front and subwoofers fully recessed in baffle wall

In this configuration, line array speakers are placed directly in front of the baffle wall, either flown using cables, or mounted in front of the wall using wall brackets. The subwoofers are fully recessed within the wall.

Ensure that the entire front of the line array is clear of obstructions.

The following diagram shows a three segment baffle wall constructed in front of an existing wall, with space between the baffle wall and the existing wall for service access.

		
Plan view (with acoustic treatment)	Section view (without acoustic treatment)	Section view (with acoustic treatment)

Acoustic treatment is required on both the front of the baffle wall and on the existing wall. Ensure that the front face of the subwoofers are flush with the front face of the acoustic treatment applied to the baffle wall.

For systems with five screen channels, this design can be modified to include a five segment baffle wall with two wing wall segments constructed on each side of the center segment.

Integrating LA series speakers without a baffle wall

If you cannot construct a baffle wall, another option is to install acoustic treatment on the front wall of the room, directly behind the line array speakers and subwoofers.

Doing this reduces low frequency reinforcement and half space loading effects but also reduces the installation cost.

Apply acoustic treatment following the *recommended guidelines* (on page 2).

Integrating LS series speakers into a baffle wall

The LS series line source speakers can be flown or placed on a raised platform, depending on the site requirements.

The LS1 and LS2 speakers are full range speakers (both speaker and subwoofer) in a single enclosure, and are also rectangular and flat faced, so they do not require complex shapes cut into the wall.

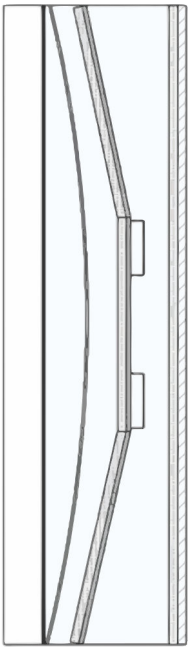
These speakers can be placed directly in front of the baffle wall, partially recessed into the baffle wall, or fully recessed into the baffle wall, as described previously.

Integrating low frequency effects speakers into a baffle wall

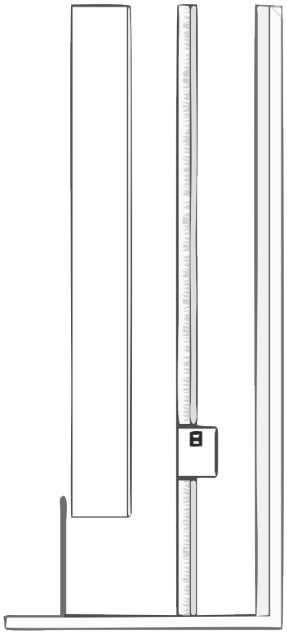
In this configuration, the low frequency effects (LFE) subwoofers are placed on either side of the center channel, behind a perforated screen, above the floor on a platform.

The front face of the subwoofers must be flush with the front face of the acoustic treatment on the front of the baffle wall. Ensure that they are fully recessed within the baffle wall.

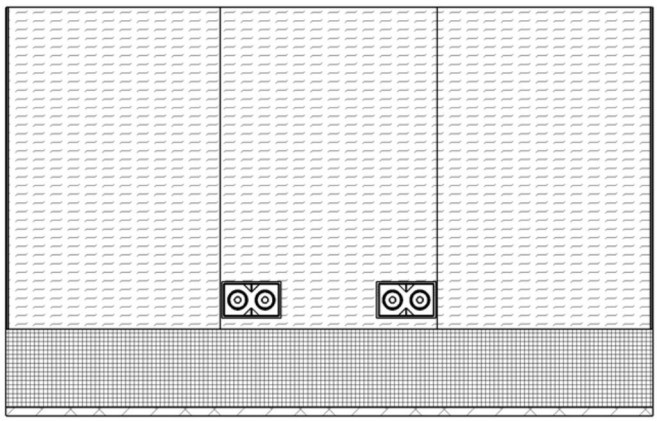
The following diagram shows a three segment baffle wall constructed in front of an existing front wall of an auditorium.



Plan view (with acoustic treatment)



Section view (with acoustic treatment)



Elevation view (with acoustic treatment)

Christie recommends this configuration for the most even sound pressure level (SPL) throughout the entire auditorium. It reduces the number of detrimental room modes and corresponding peaks and dips, and minimizes interaction between the subwoofers and non-acoustically transparent materials below the screen. This configuration also provides greatest low frequency reinforcement due to half space loading effects created when LFE subwoofers are fully recessed within the acoustic treatment.

Avoid placing the subwoofers behind any non-acoustically transparent materials such as screen framing, masking, and heavy curtains, as this can obstruct output.

If you require a higher LFE subwoofer sensitivity, group the subwoofers together on either side of the center channel. You can also place them on the floor, but this reduces how even the SPL is throughout the auditorium.

Technical support

Technical support for Christie products is available at:

- North and South America: +1-800-221-8025 or Support.Americas@christiedigital.com
- Europe, Middle East, and Africa: +44 (0) 1189 778111 or Support.EMEA@christiedigital.com
- Asia Pacific: +65 6877-8737 or Support.APAC@christiedigital.com