

**SH**Acoustics

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## Acoustic Principles of Home Theater Design

The Significance of Acoustics in RAYVA Private Theaters

### The Importance of Acoustics

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- Beyond a certain distance from a home theater's screen, one hears more sound from room reflections than directly from the main speakers. So, failing to acoustically treat the interior surfaces of a theater in the proper manner can have a highly adverse effect on what listeners experience.
- The implementation of acoustic design is ultimately meant to optimize the audience experience by:
  - Providing an appropriately quiet environment
  - Maximizing the tonal quality of what one hears from movies and music.
  - Proactively mitigating sonic issues that cannot be easily fixed when the theater construction is complete
  - Considering the end user's needs
- Acoustics act as a bridge between many disciplines, including: audio/visual, architectural, mechanical, interior design, and others.
- Elements of these other project disciplines often overlap with different aspects of acoustic design – all of which must be addressed and coordinated among the design team.

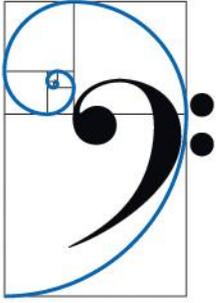
### Client Considerations

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The acoustic design of a theater is largely based on the fundamental goals and needs of the client, including:

- The desired aesthetic theme
- Number of rows and seats per row
- Expectation for audio quality
- Audio configuration (5.1, 7.1, Atmos or other 3D, etc.)

RAYVA considers each of these items and coordinates them with our acoustic design package.



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## Room Acoustic Considerations

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RAYVA believes that the quality and control of sound are extremely important to the cinematic experience. Below are key aspects of acoustic design that are included in our theater acoustic treatment package.

### *Room Acoustic Quality*

- The room acoustic environment will be balanced and controlled for the presentation of movies, TV, music, sports, video games, etc.
- The acoustic material types and quantities will be precisely specified to ensure that the space is not overdamped for movies and music, and also remains comfortable for social conversation.
- With our theaters being multi-use spaces, the acoustic design will promote:
  - Appropriate liveness / dryness
  - Seat-to-seat consistency of sound in both level and frequency
  - An immersive and enveloping environment
  - Proper imaging in the front soundstage as well as the surround field
  - The reproduction of the aural goals of the original content creators
- The acoustic design typically revolves around a dedicated sweet spot where conditions will be most optimal, but also ensures that the whole audience will have a high-level entertainment experience.

RAYVA also strongly believes that having a quiet environment – whether from internal noise sources, such as HVAC or projectors, or adjacent noises generated in the rest of the house or from the exterior - is necessary to create a successful private theater. While we do not directly provide construction materials to achieve this, our design package does include basic details and/or guidelines to address the following issues.

### *A Quiet Environment*

- The highest theater experience occurs in a quiet environment, which allows the audience to:
  - Fully immerse themselves in the entertainment experience



## Acoustic Principles of Home Theater Design

- Hear the slightest sonic details and the full dynamic range of the content as the creators intended
- Remain comfortable throughout their time in the space
- In developing a quiet environment, the acoustic design primarily considers HVAC noise and external noise intrusion which are particularly undesirable during quiet passages in movies or music.
- It is also important to ensure that the impactful sound of the Theater does not disturb the adjacent spaces. Nor should other loud activities in the home intrude upon the ambient sound levels in the Theater.
- Rayva's basic details provide a moderate upgrade to the sound isolation performance of our Theater and should be implemented by the project's general contractor. For a higher level of isolation performance, Rayva suggests engaging one of our approved acoustic partners to custom design the boundary construction.

### **Creating the RAYVA Acoustic Performance**

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RAYVA's standard acoustic package is intended to provide a fundamental level of quality and balance for the sound in our theaters, incorporating all principles described in the previous section.

Unlike the claims of other prefabricated theater companies, Rayva's acoustic performance will satisfy most customers, but will not be the same as what one can achieve at a higher level with an experienced acoustician.

For those who want the very best aural experience, RAYVA can work with our approved acoustic partners to achieve such results.

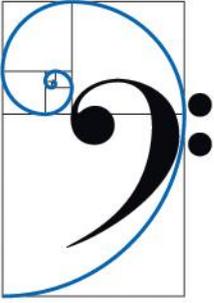
### **The Final Touch – Audio Calibration**

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- To maximize the sonic performance of all of our theaters, Rayva engages one of our acoustic/audio experts to perform a thorough audio tuning and calibration of the completed theater system. This calibration is intended to:
  - Maximize the performance of the audio system at all seats, with concentrated effort placed on the preferred seating position(s)
  - Compensate for any room-specific colorations
  - Adjust processor settings to optimize the overall tonal quality

## Acoustic Principles of Home Theater Design

- Balance subwoofers for even bass energy and tonal quality
- Ensure that the intended aural experience of the content creator is accurately reproduced



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