

CINEPANEL



Solutions for Better Sounding Rooms

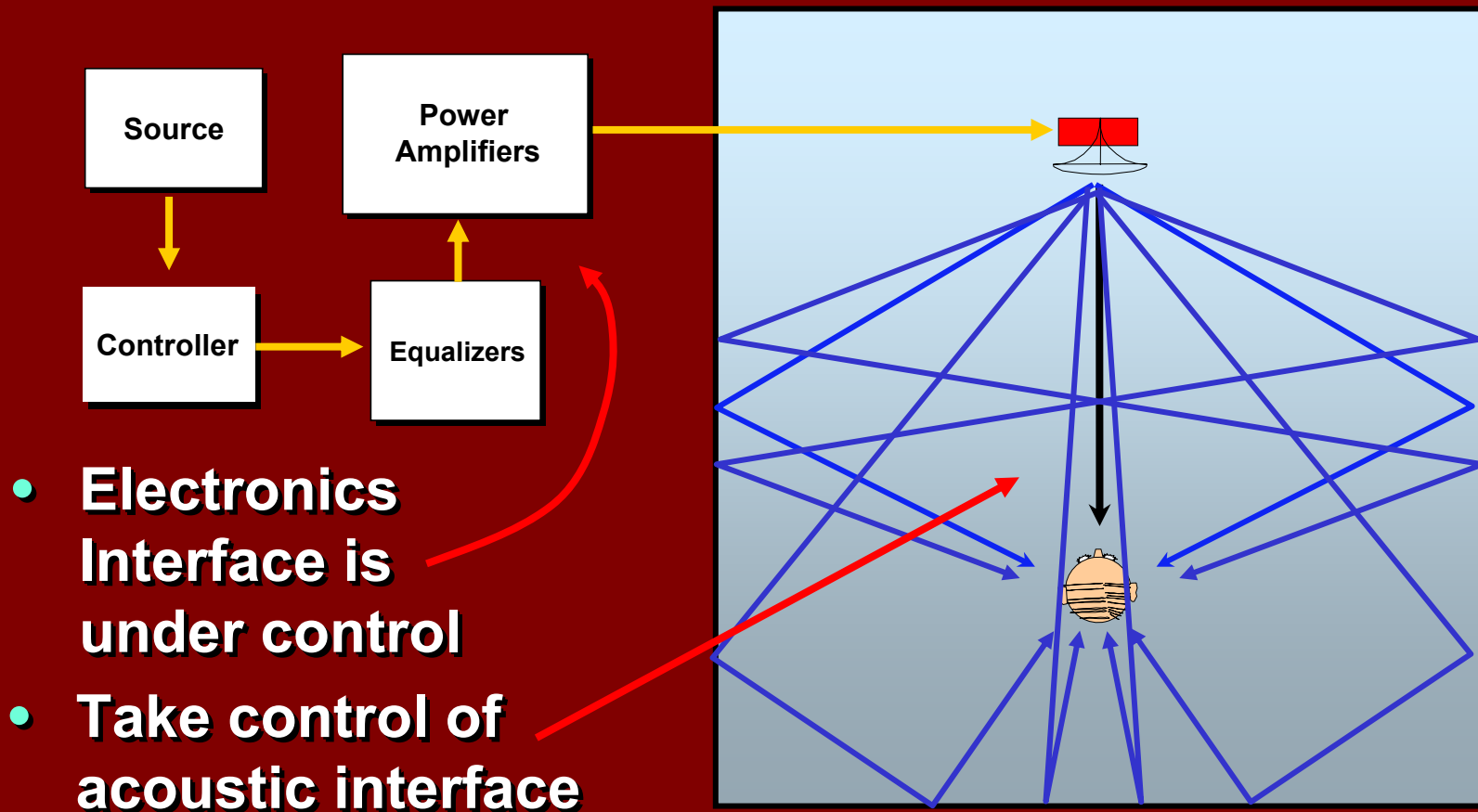


Introduction

- **Why talk about acoustics?**
 - **Acoustics are audible!**
 - **Contribute to over 50% of quality**
 - **Acoustics are fixable**



The Acoustic Interface



What's Acoustics?

- **It's about the speaker/room/listener interface**
- **It's the final frontier!**

Enhancements from Acoustic Treatments

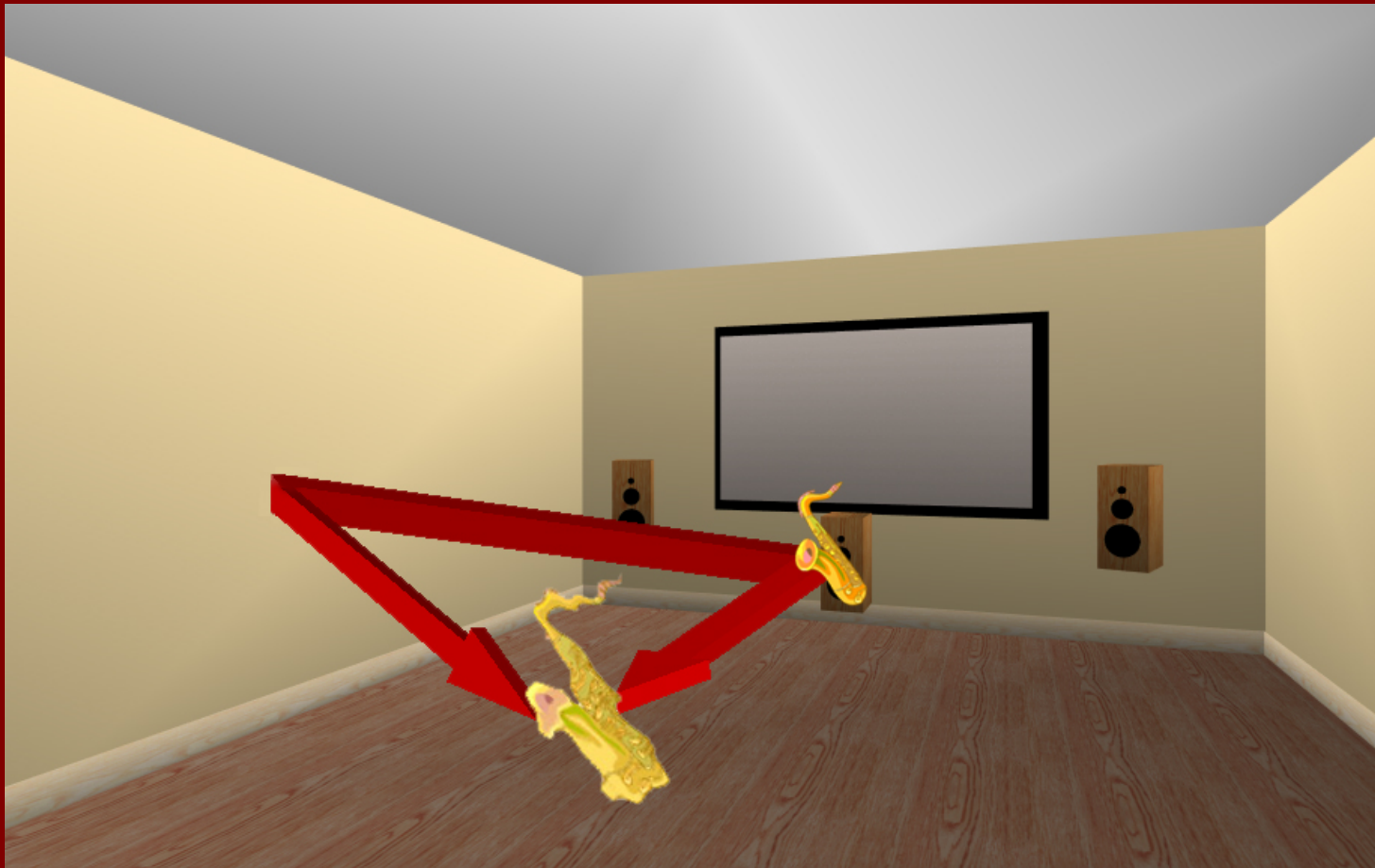
- **Clear dialog**
- **Precise sound localization**
- **Spacious surround**
- **Smooth sound movement**
- **Even tonal balance**
- **Every seat a good seat**



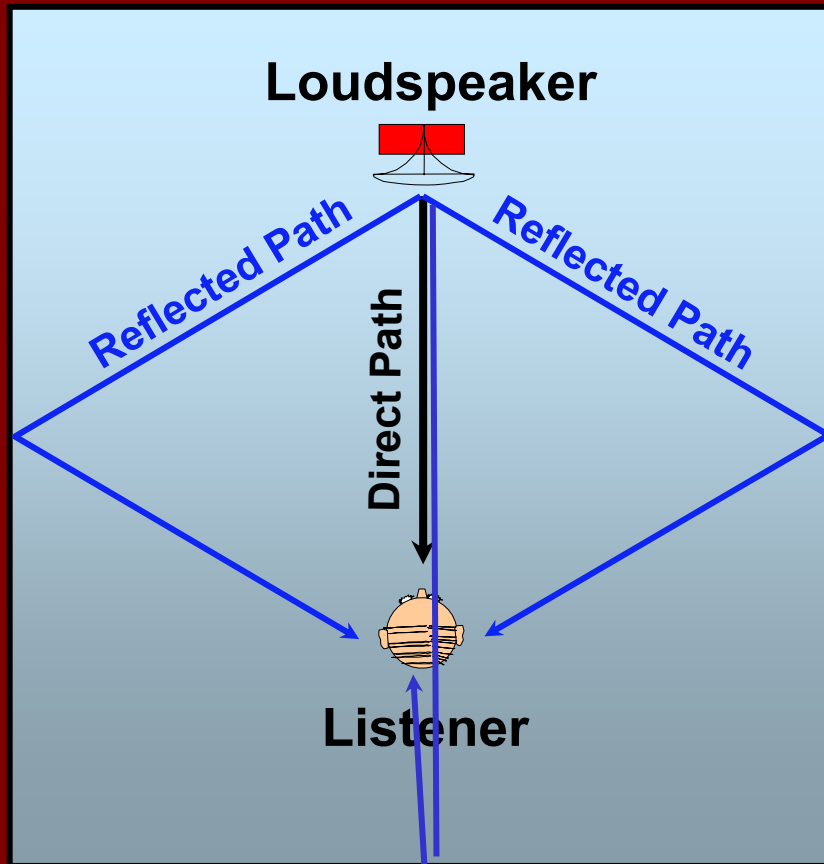


Room Reflections

Reflections = Distortion



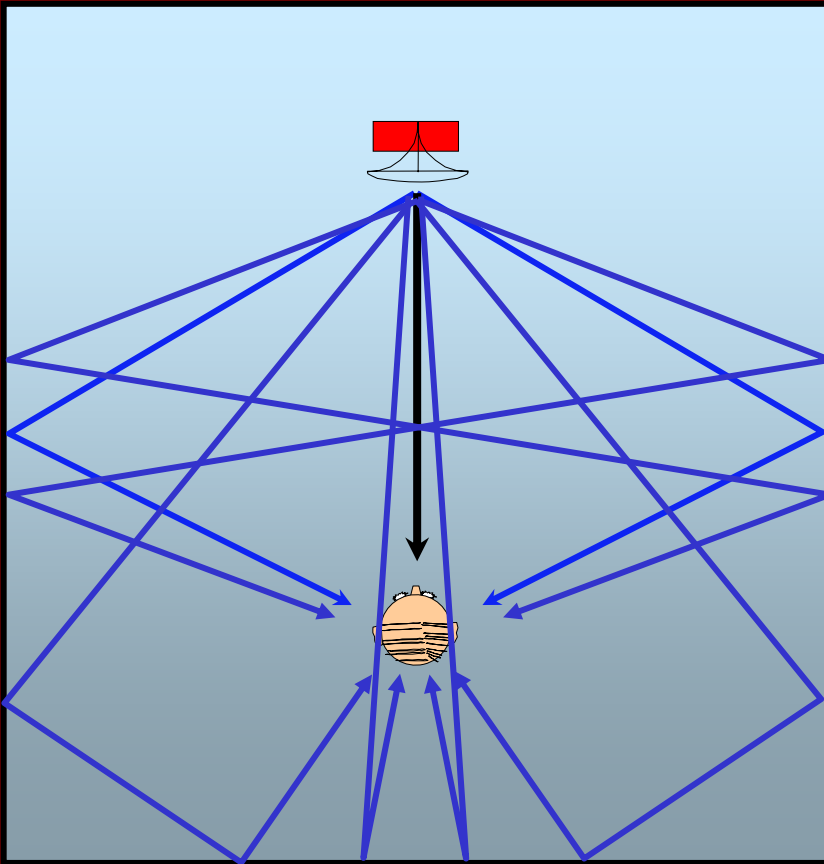
Room Reflections



- **Sound reflections degrade sound quality and sound staging**

Room Reflections

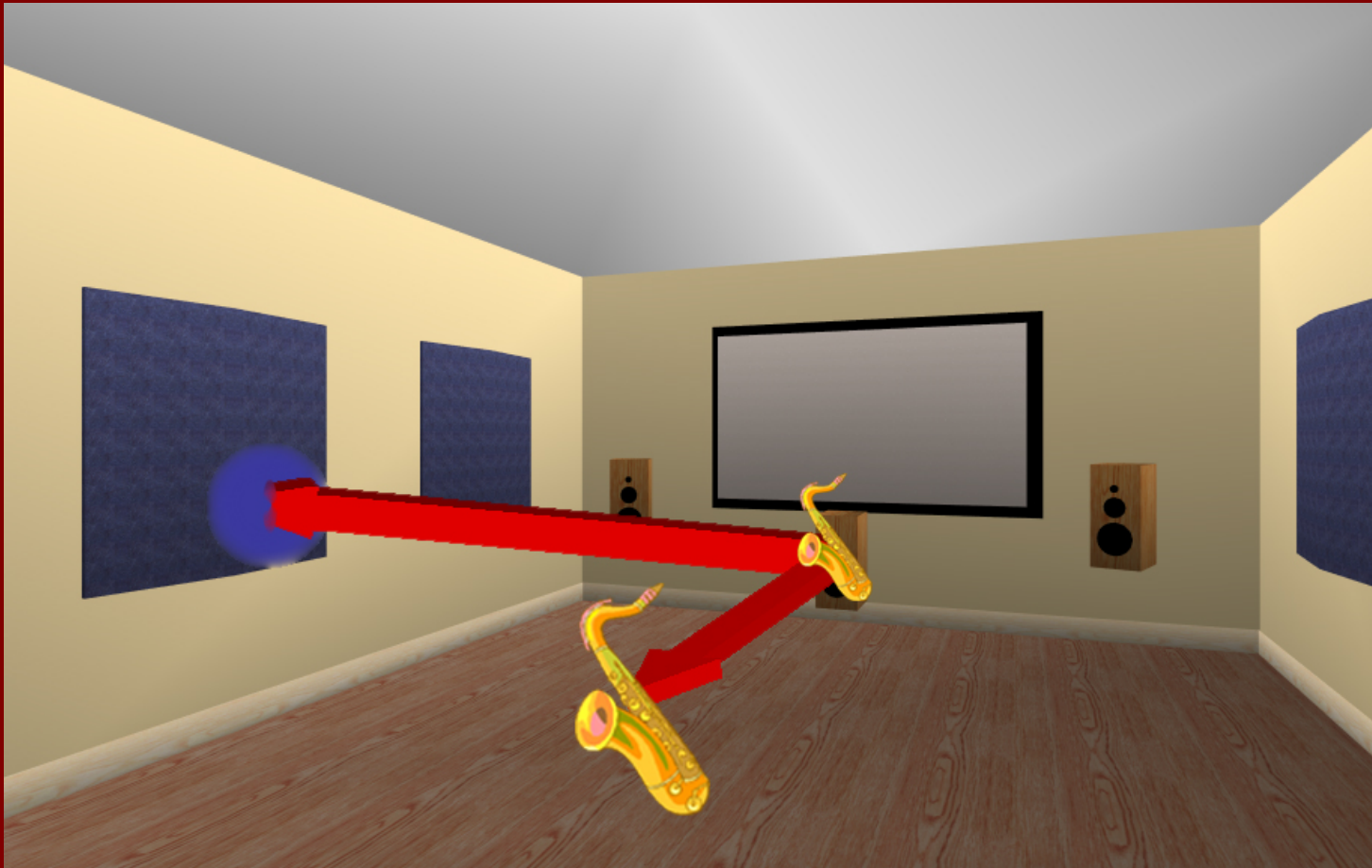
Did you Know?!



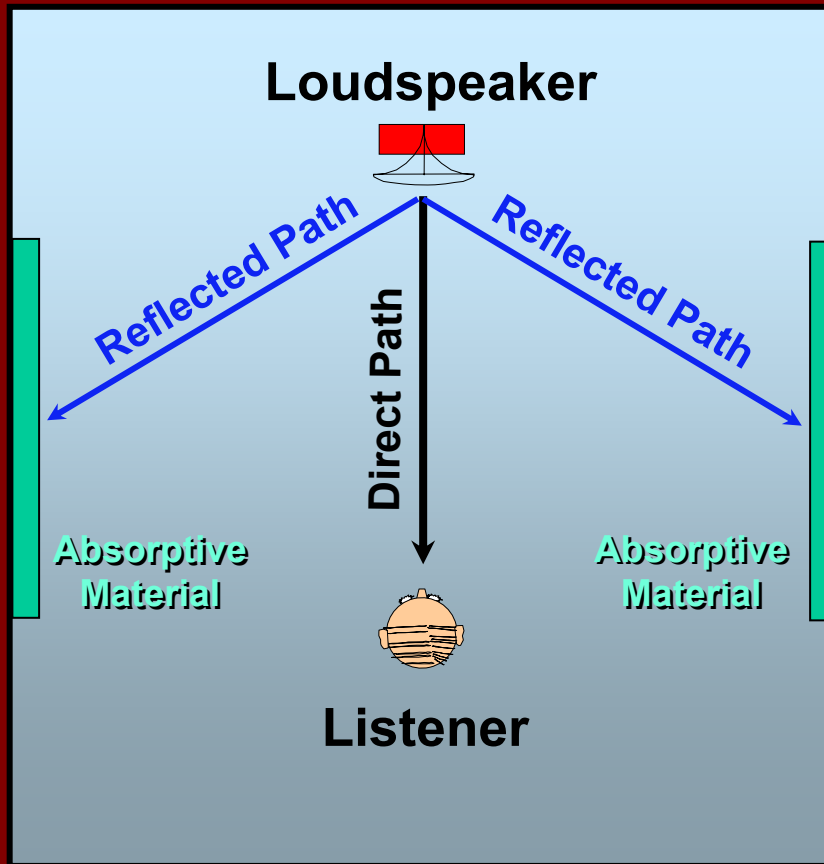
- **At main seat you listen to more reflected sound than direct!**
- **The room plays an important part in the sound you hear**
- **Acoustic treatments take control of reflected sounds**

Solutions to Room Reflections

Absorption



Solutions to Room Reflections Absorption

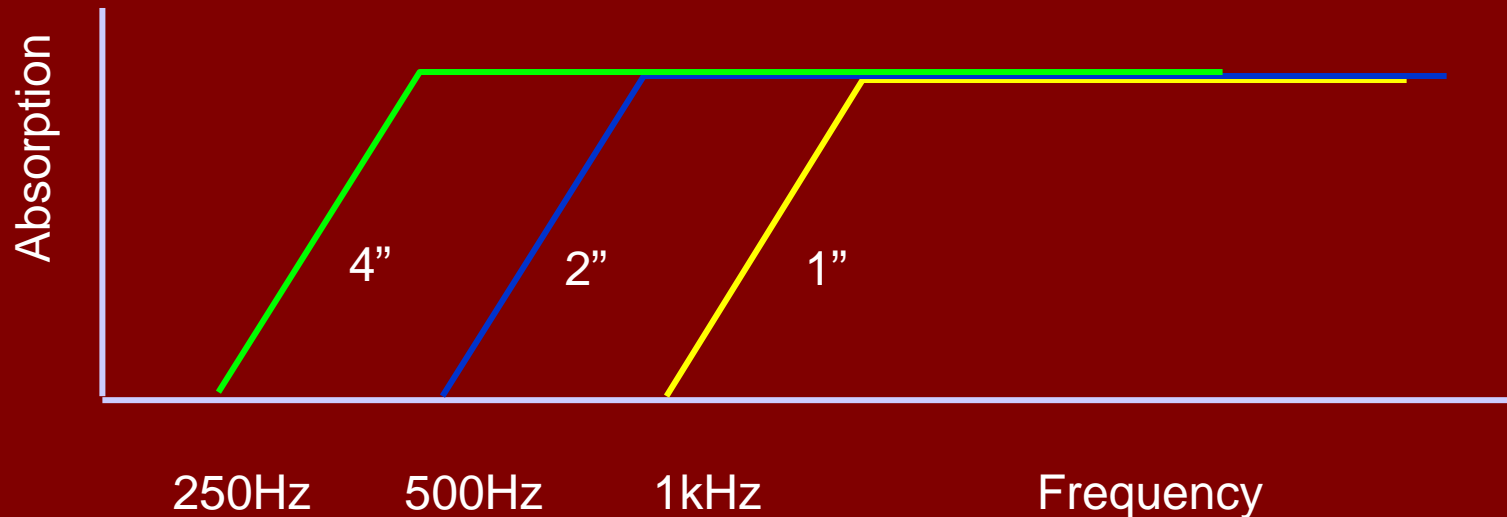


- **Absorptive materials**
 - **CinePanel Absorber**

Acoustical Treatments

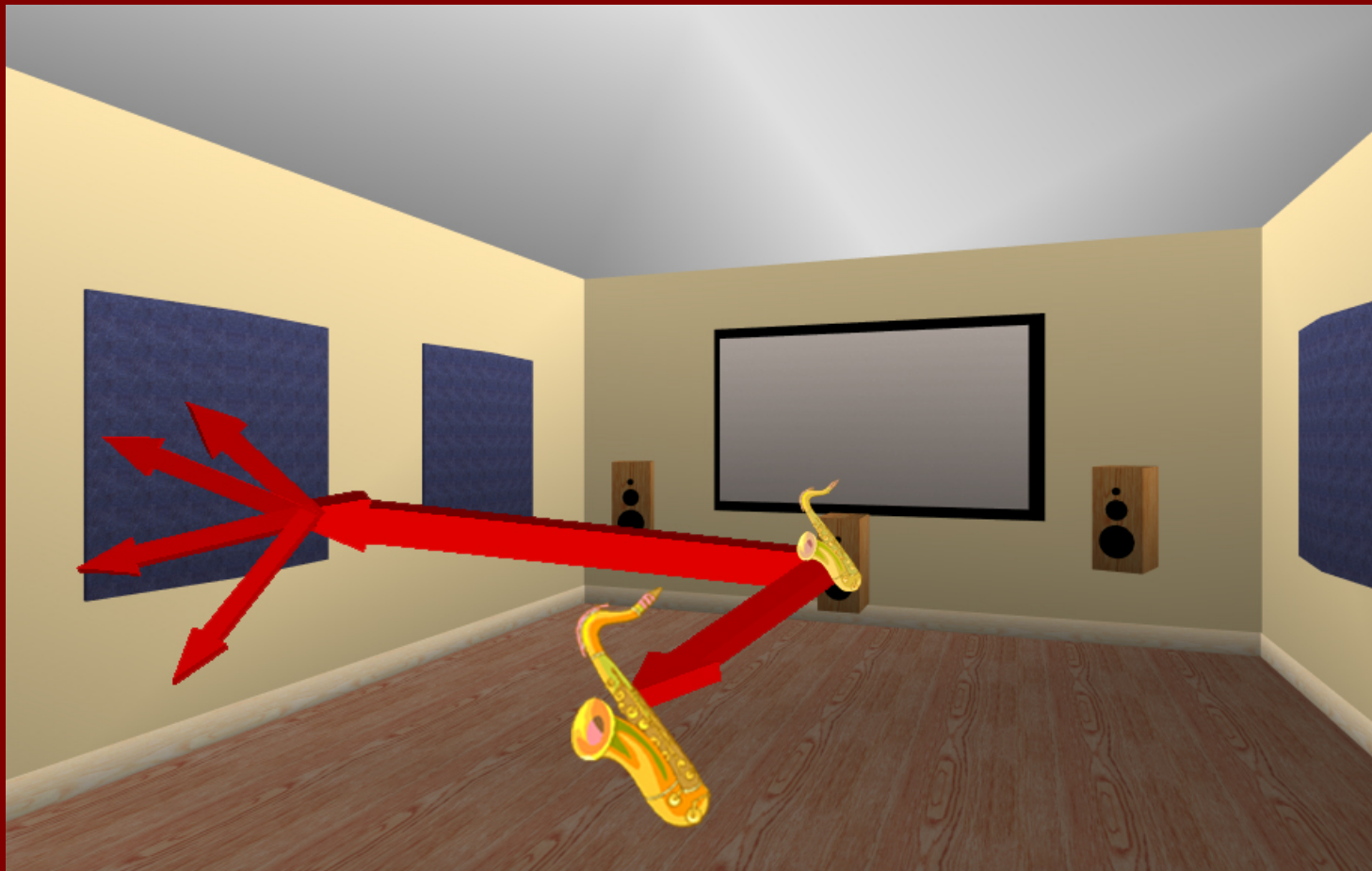
Absorption Thickness

- **1" Panels work down to 1kHz**
- **2" Panels work down to 500Hz (better)**
- **4" CinePanel works down to 250Hz (best)**

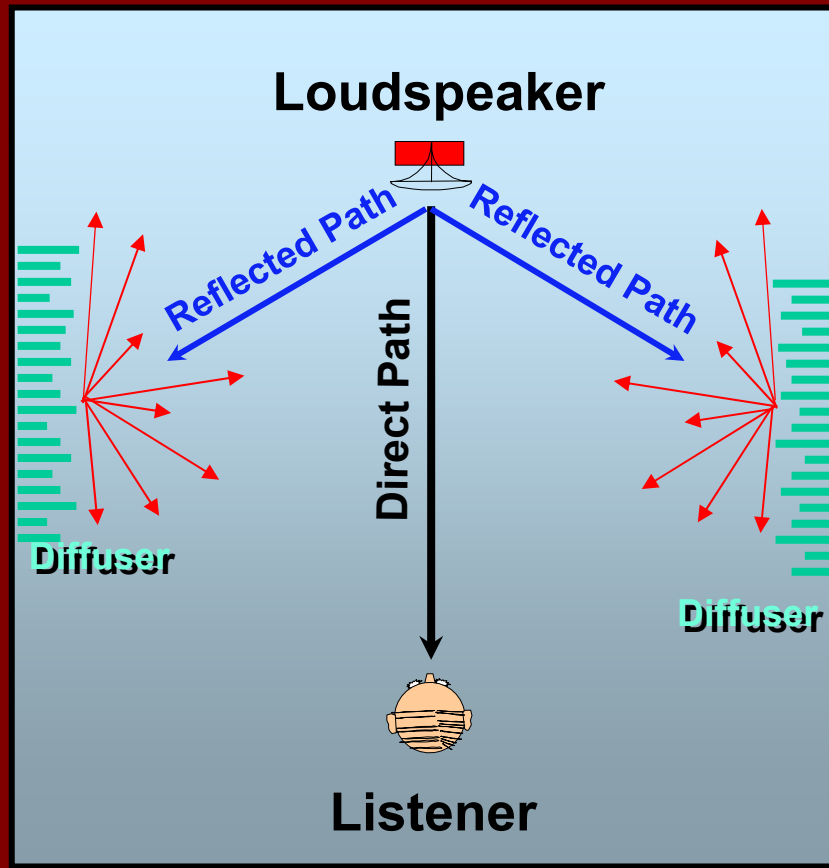


Solutions to Room Reflections

Diffusion



Solutions to Room Reflections Diffusion



- **Diffusive materials**
 - **CinePanel** diffusers

Acoustical Treatments

Diffusion

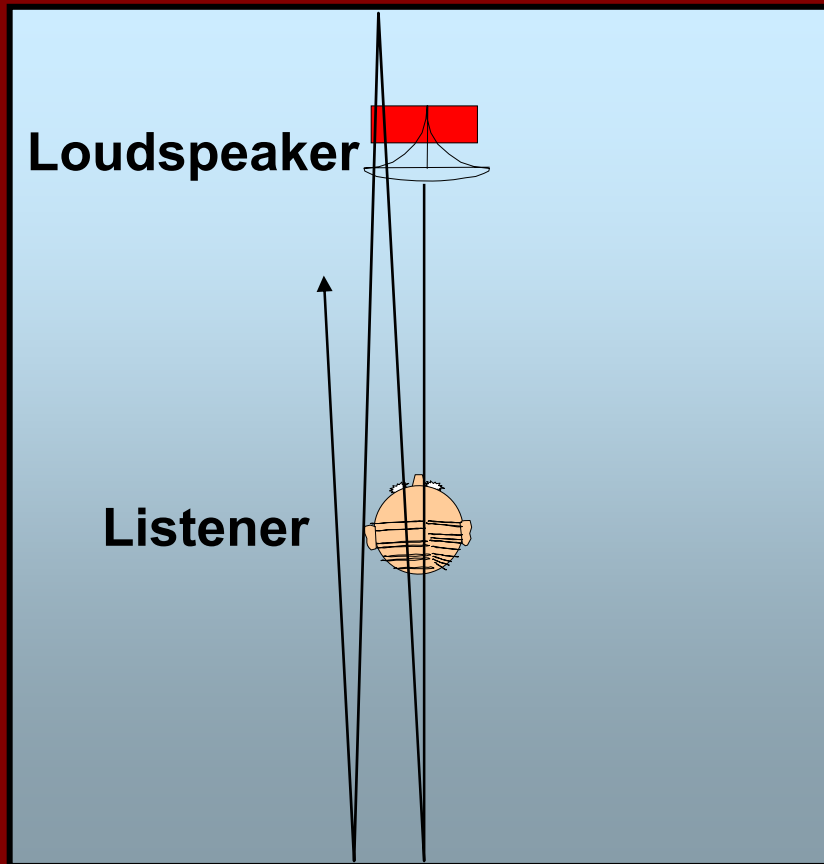
- **Balance diffusion and absorption**
- **Keep some liveness to the room**
- **Need enough diffusion surface to “smooth out” the soundfield**





Flutter Echoes

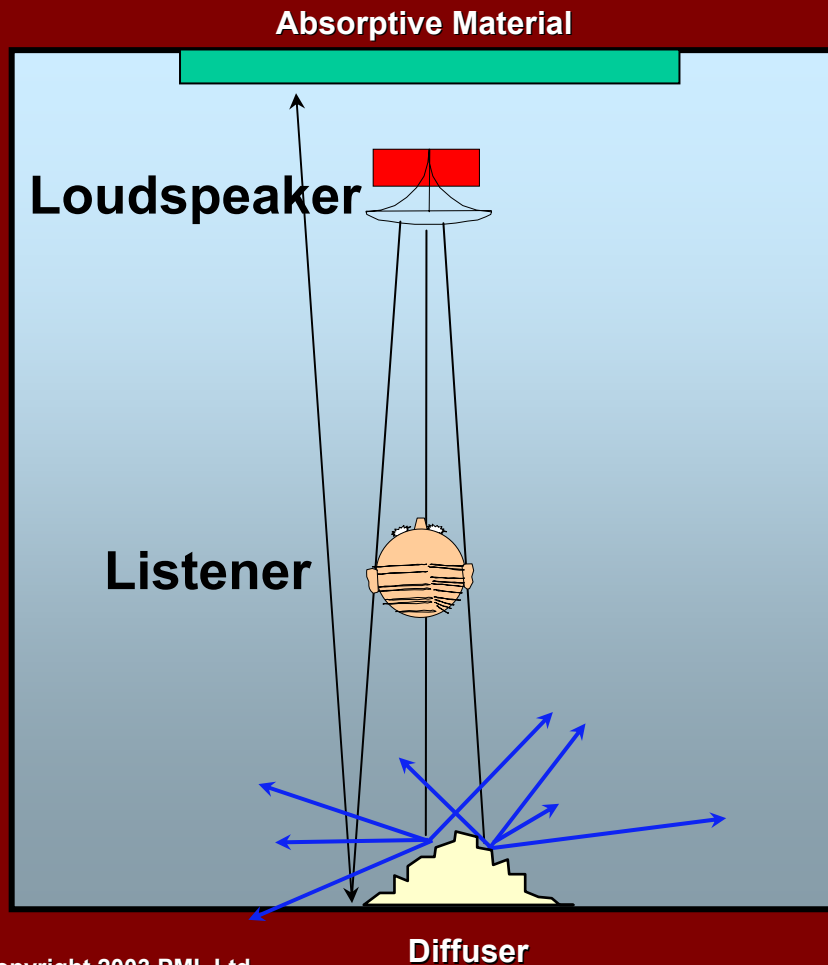
Flutter Echoes



- **Echoes are**
 - Repeated reflections between two parallel surfaces
- **Slap echoes cause**
 - Degradation of soundtrack clarity and soundstaging
 - Bright, “zingy” sound

Solutions to Echoes

Materials



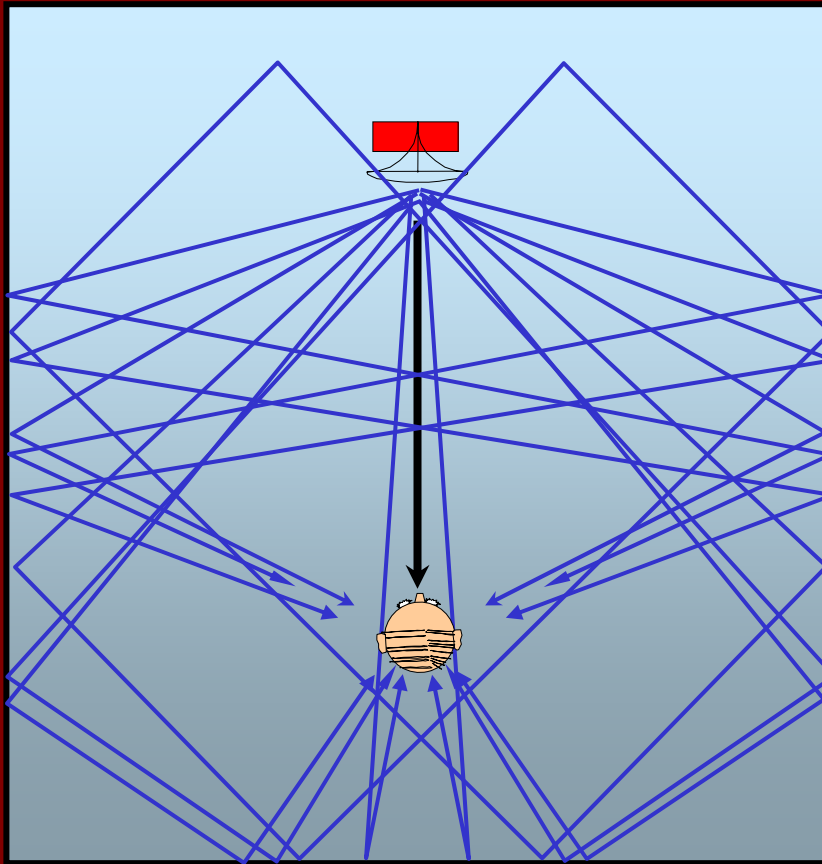
- **Absorptive**
 - CinePanel Absorbers
- **Diffusive**
 - CinePanel Diffusers



Reverberation

"Early Decay"

Reverberation



- **Reverberation is the result of multiple reflections**
- **Reverb level and time length have to be just right**

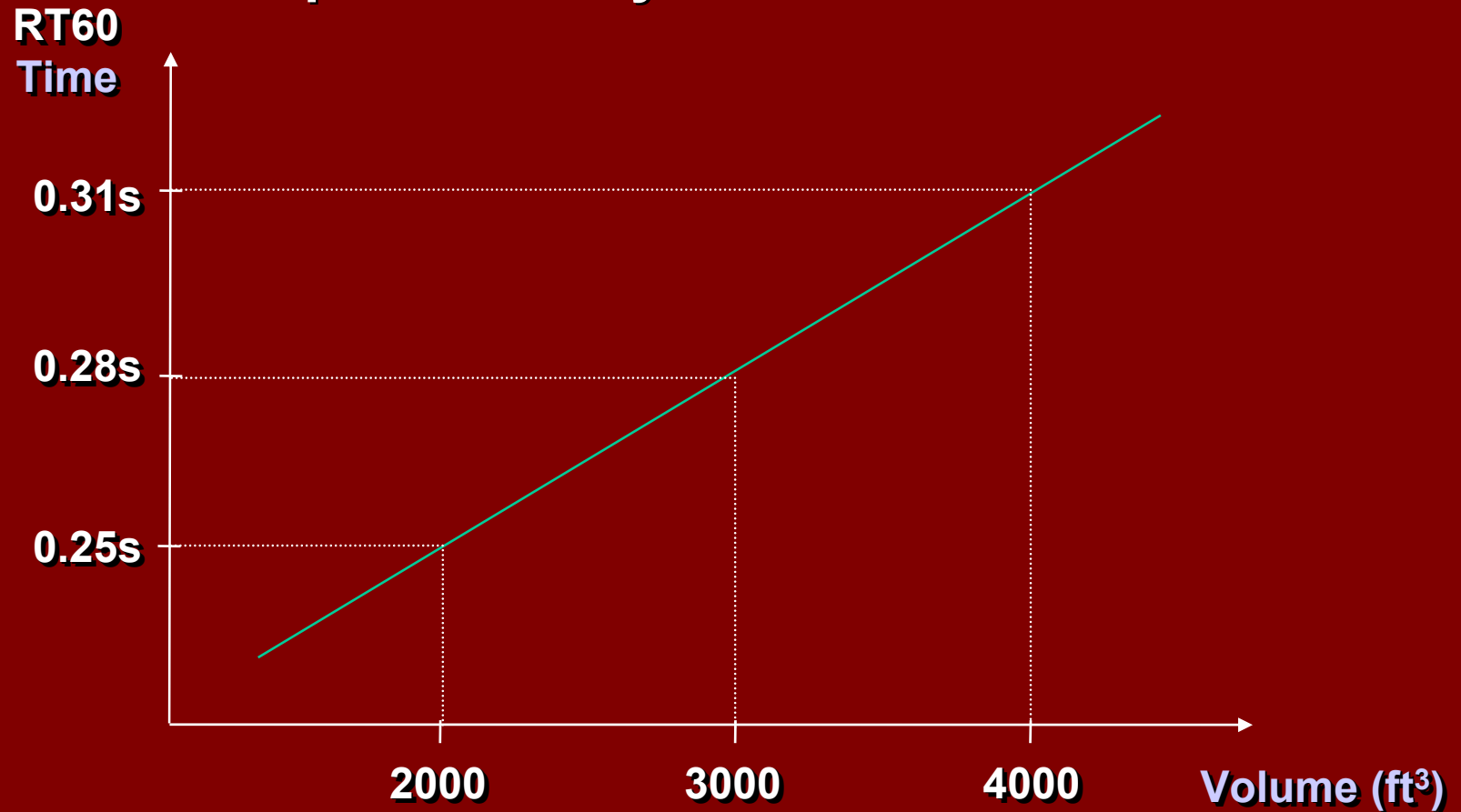
Reverberation Guidelines

- **Research shows that most people like the same range of reverb time**
- **Decay time should be .2 to .4 seconds**
- **$T_m = 0.3 (V/3532)^{1/3} \pm 15\%$ where V=room volume in ft³**



Reverberation Time

Optimal Decay Time vs. Room Volume



Reverberation Time

Getting it right

- **Use the right amount of absorption**
- **Calculate the amount with the Arau-Puchades equations**
 - **Know the absorption coefficient of materials**
 - **Be prepared to do lots of math**

Reverberation Time

Getting it right – Do the Math

- **The Arau- Puchades equation: Best and latest**

$$RT60 = \left[\frac{0.161V}{-S \ln(1-\bar{\alpha}_x)} \right]^{x/s} \times \left[\frac{0.161V}{-S \ln(1-\bar{\alpha}_y)} \right]^{y/s} \times \left[\frac{0.161V}{-S \ln(1-\bar{\alpha}_z)} \right]^{z/s}$$

V is volume

S is total room surface area

α is area-weighted averaged absorption coefficient for each wall

x is area of Left + Right walls

y is area of Front + Rear walls

z is area of Floor + Ceiling

Reverberation Time

Getting it right

- ... or simply use the CinePanel room size guidelines
 - We've already done the work for you!

CinePanel Kit Selections

Optimized decay time for each room size

Room Size	Kit	Absorbers	Diffusers
180 ft ²	CP55	5	5
200 ft ²	CP66	6	6
300 ft ²	CP77	7	7
400 ft ²	CP88	8	8
500 ft ²	CP99	9	9
600 ft ²	CP1010	10	10

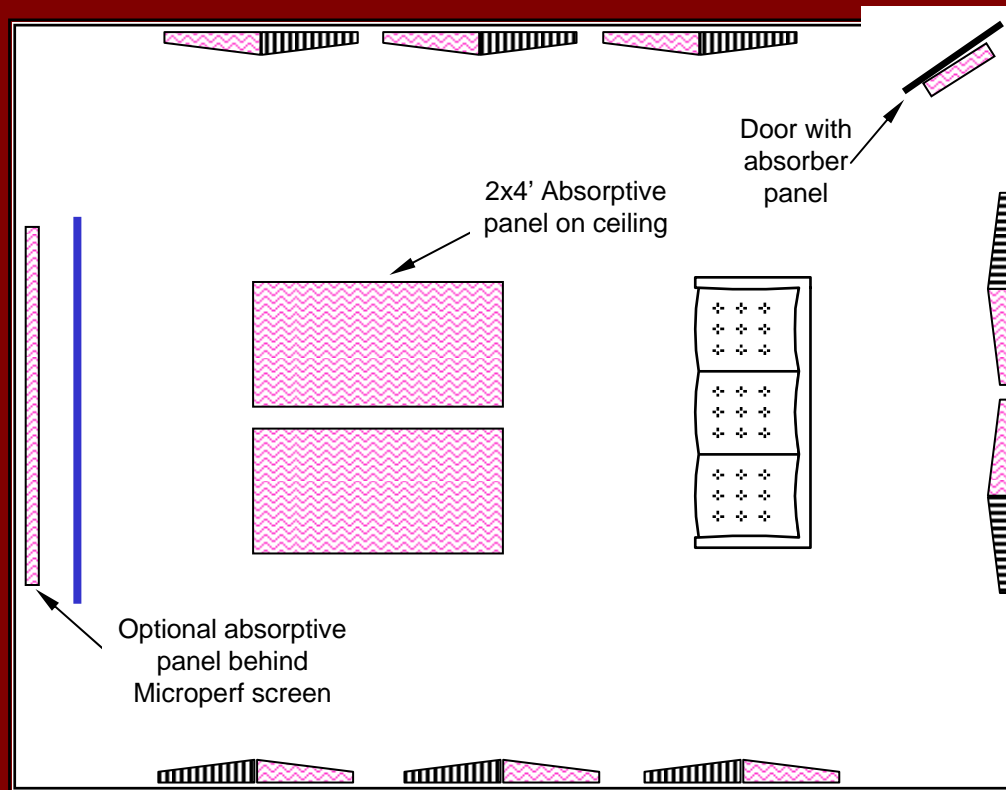




Example Layout

Example Treatment Layout

CinePanel CP88P in 400 ft² room



CinePanel Diffuser



CinePanel Absorber

**Asymmetrical
placements
prevent Flutter
Echoes between
diffusers**

CINEPANEL

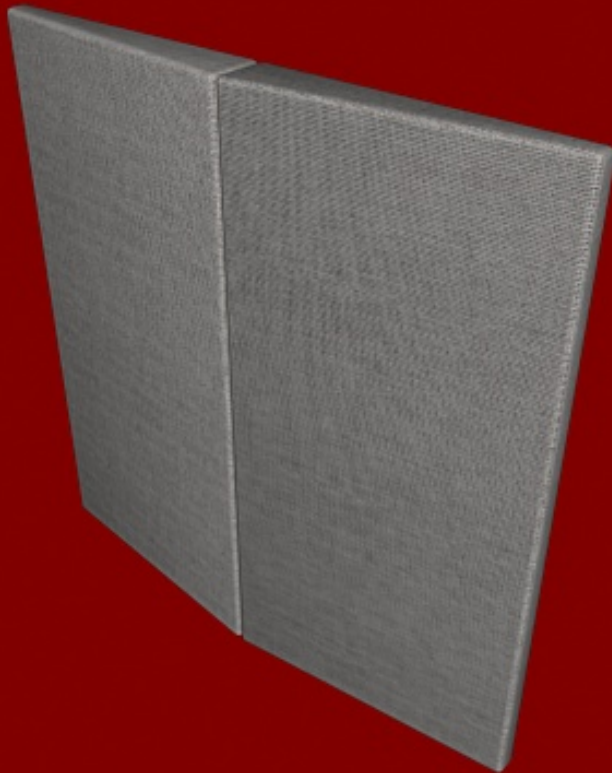


CinePanel®

The Product Line

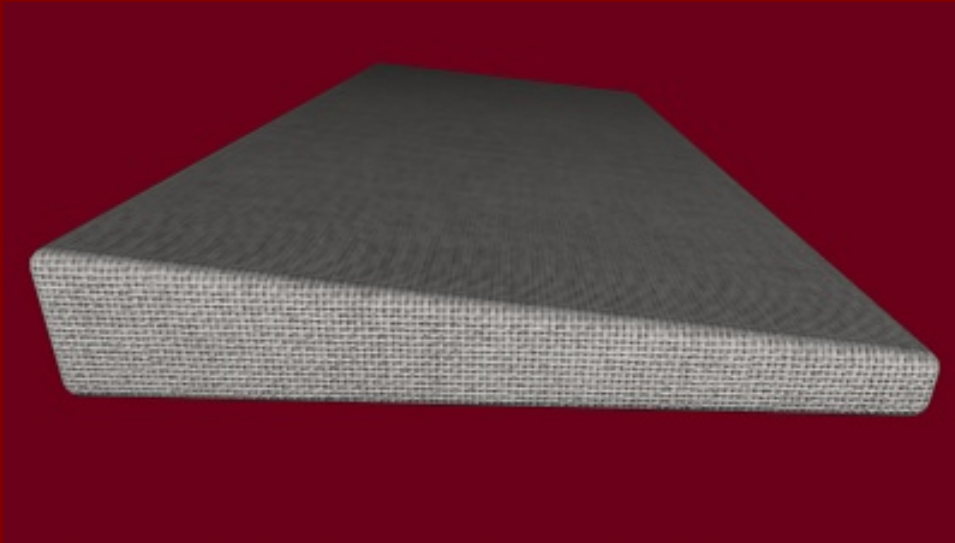


The CinePanel Building Block



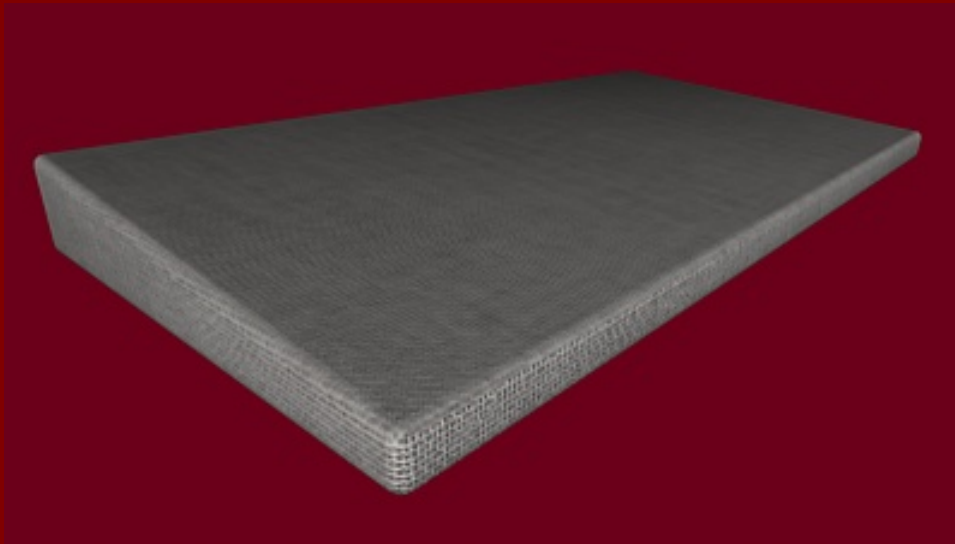
- **Absorber-Diffuser panel pair**
- **Each panel is 2'x4'**

The CinePanel Building Block



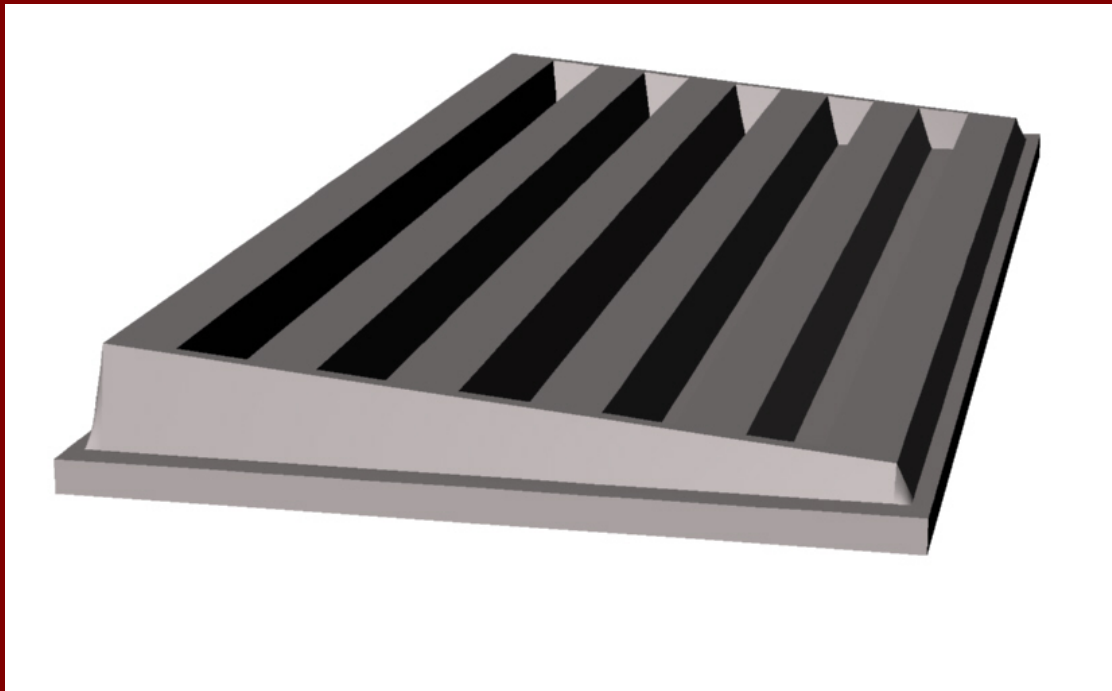
- **Wedge-shaped panels**
- **Taper from 2" to 4½ "**
- **Benefit: wider response without the visual bulk**

The CinePanel Building Block



- **Absorber and diffuser Panels look identical**
- **Cores are different**
- **Absorber is dense mineral wool in fiberglass sheath**

The CinePanel Diffuser



- **Linear wells**
- **Different depths for broader frequency range**
- **Low resonance Polyethylene**

Fabric Color Choices



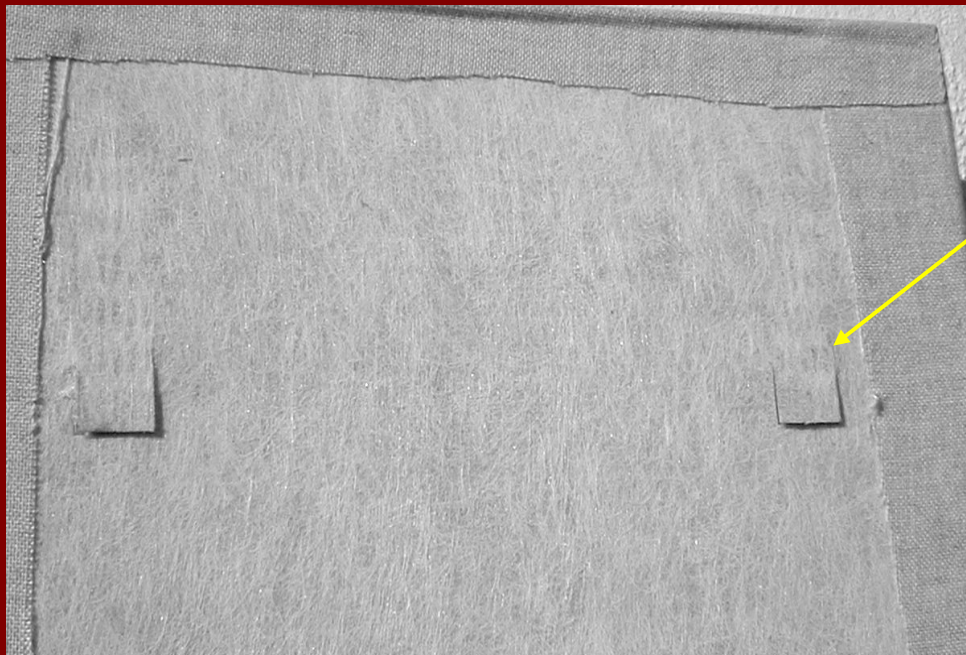
- **Guilford FR701 Fabric**
- **48 Color choices**

Installation Clips for Diffusers



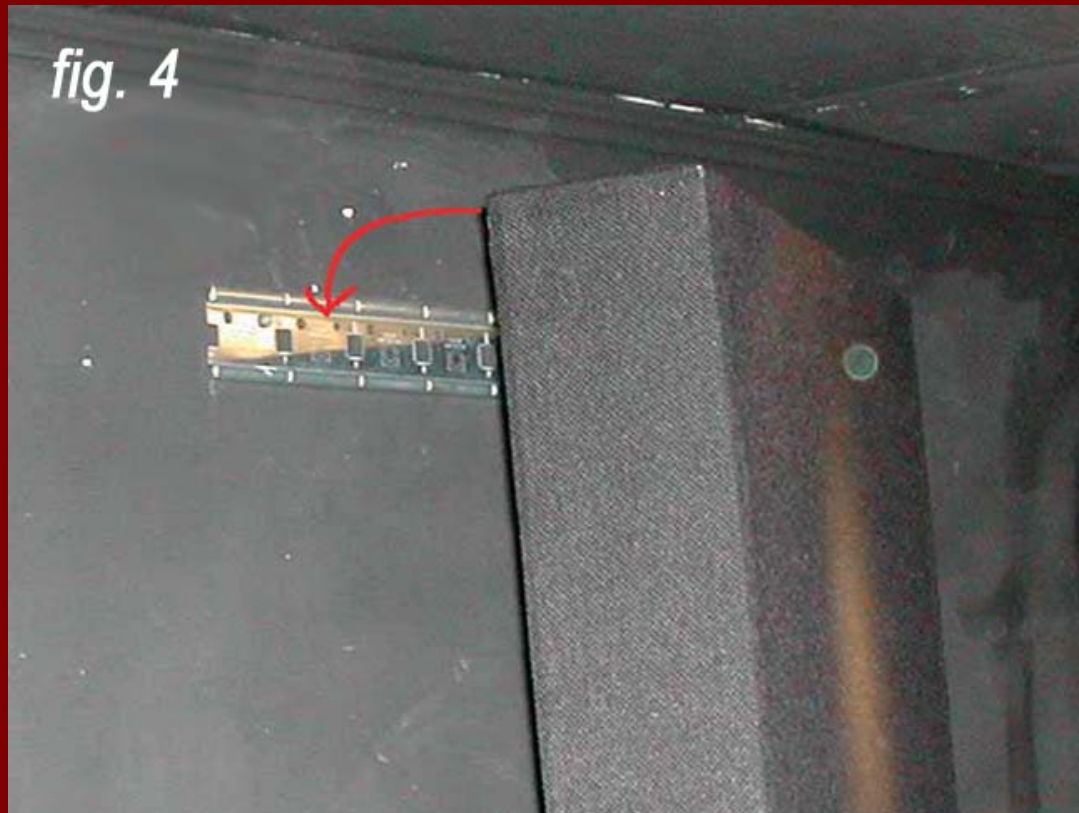
- Clips
- V-Bar
affixed to
wall

Installation Clips for Absorbers



- **Z-Clips**
- **V-Bar**
affixed to
wall

Installation



- **Panel hangs from clip bar**
- **Easy to install and remove**

Installation

Hanging the Panels



- **Place absorbers and diffusers 2 ft up from floor**

Lighting Option

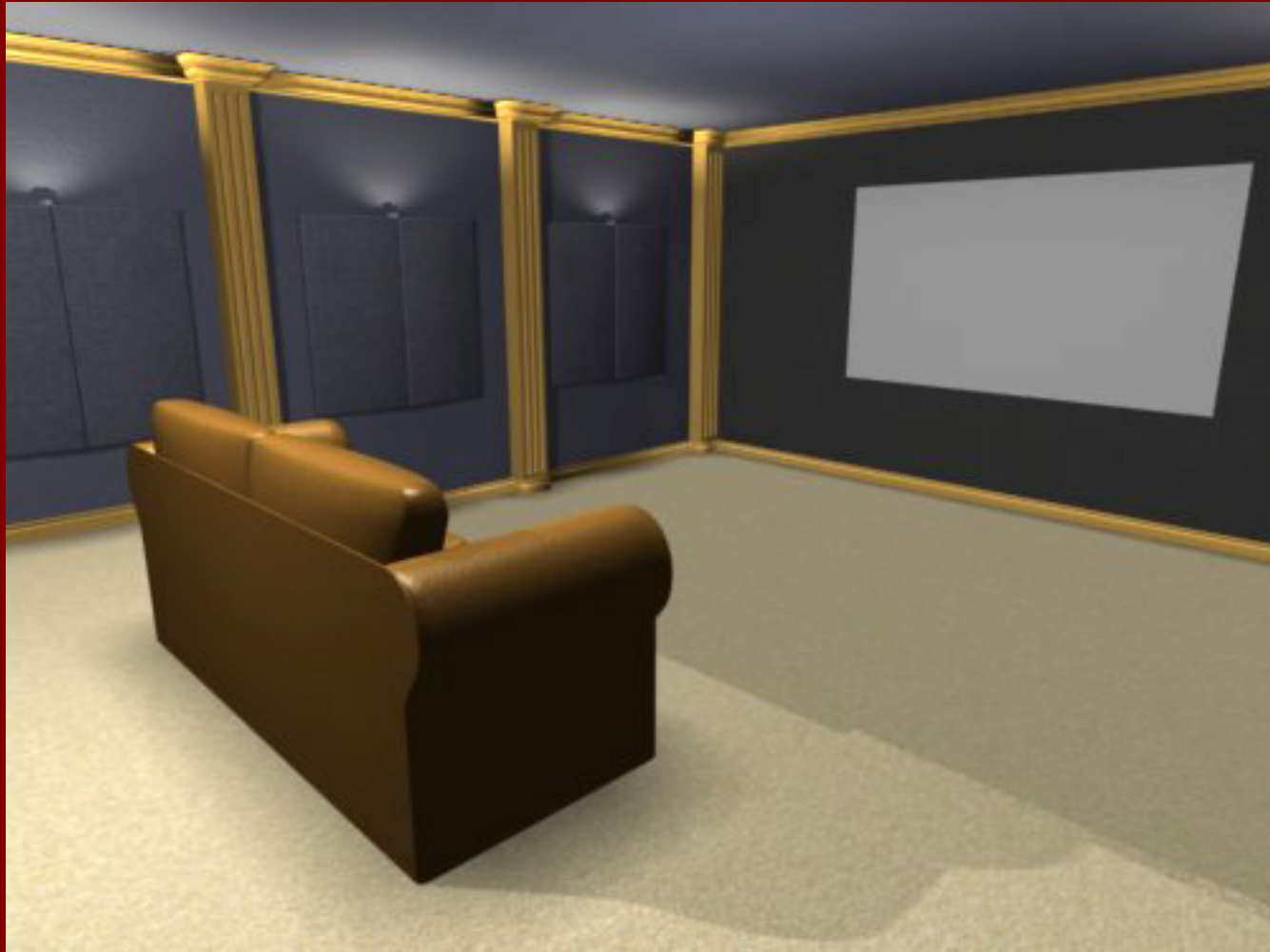


- **Place low voltage halogens on top of panel pair**
- **Increases architectural function**

CinePanel Room in Gray



CinePanel Room in Blue



CinePanel Room in Red



CinePanel Kit Prices

Room Size	Kit	Retail
<180 ft ²	CP22	\$1300
180 ft ²	CP55	\$3,200
200 ft ²	CP66	\$3,700
300 ft ²	CP77	\$4,300
400 ft ²	CP88	\$4,800
500 ft ²	CP99	\$5,500
600 ft ²	CP1010	\$6,100



CinePanel "Plus" Kit Prices

Room Size	Kit		Retail
<180 ft ²	CP22P		\$1,600
180 ft ²	CP55P		\$3,500
200 ft ²	CP66P		\$4,100
300 ft ²	CP77P		\$4,600
400 ft ²	CP88P		\$5,500
500 ft ²	CP99P		\$6,200
600 ft ²	CP1010P		\$6,800



CinePanel Press Coverage

- **Phenomenal !**
- **Home Theater Nov 2002**
- **Home Theater May 2003**
- **Sound and Vision May 2003, page 26**
- **Widescreen Review Issue 70, Page 25**
- **Cinema Chez Soi (France) November 2002**
- **Inside Track, Aug 28, 2003**



Summary

- **Room acoustics affect any audio system**
- **With basic science and care you can tame room acoustics**
- **CinePanel is the simple answer!**

