

Optimising Home Cinema Audio







## CINEMA ACOUSTIC TREATMENT SYSTEM – CATS COMPLETE

**CATS** is a unique acoustical treatment system designed to offer the maximum performance with the minimum loss of space across all frequencies.

**CATS** has evolved from the manufacturer's long experience in the design and development of some of the most prestigious home cinema systems in the world. Whilst many solutions already existed on the market none of them successfully combined the required levels of performance with the need to minimise the loss of valuable wall space.

**CATS** has been designed to specifically address the "three Rs of acoustics" - Resonance, Reverberation and Reflection.

Each component in the system is targeted at one of these three acoustical problems resulting in a comprehensive and repeatable solution that remains easy to install and integrate in to the room. All of this is achieved within a depth of just 50mm.

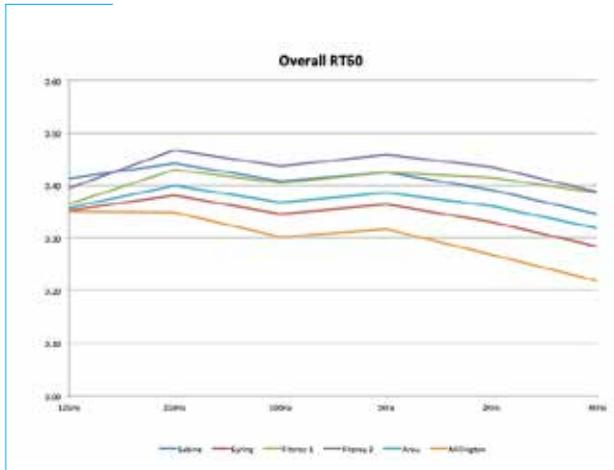
**CATS** is already the critical component of many of the highest performing home cinema systems.

We are delighted that you are considering **CATS** for your own home cinema where it will maximise the performance of your chosen audio solution for years to come.

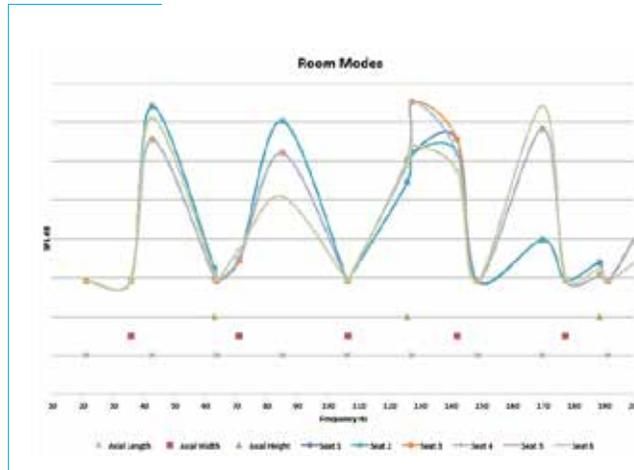




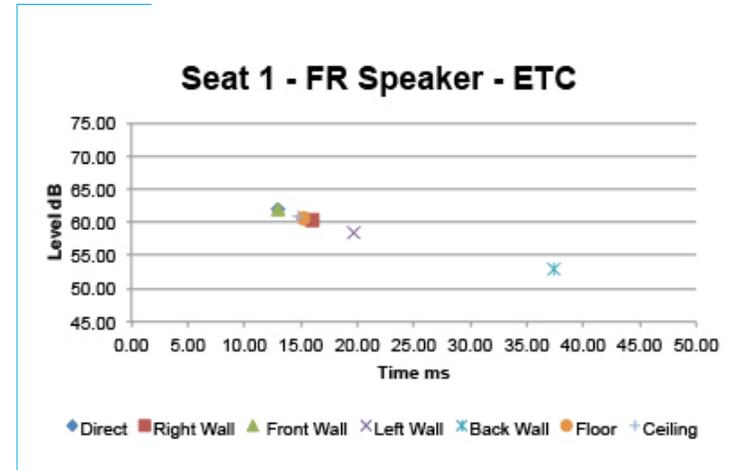
### Resonance



### Reverberation



### Reflections



## THE THREE R'S OF ACOUSTICS

### **Resonance**

Low frequency sounds have a very long wave length, up to 20m in home cinema. As these waves are so long, they are bounced back on themselves by the room boundaries resulting in many of the most noticeable acoustic artefacts. The effect of sound waves bouncing repeatedly between the room boundaries is called resonance.

### **Reverberation**

Sound waves can be long and travel at surprisingly low speed. As the sound waves bounce off the room boundaries they lose some energy but do not disappear completely. We can hear these repeated sounds for some amount of time after the original sound is over. The effect of sound waves taking some time to decay to silence is called reverberation.

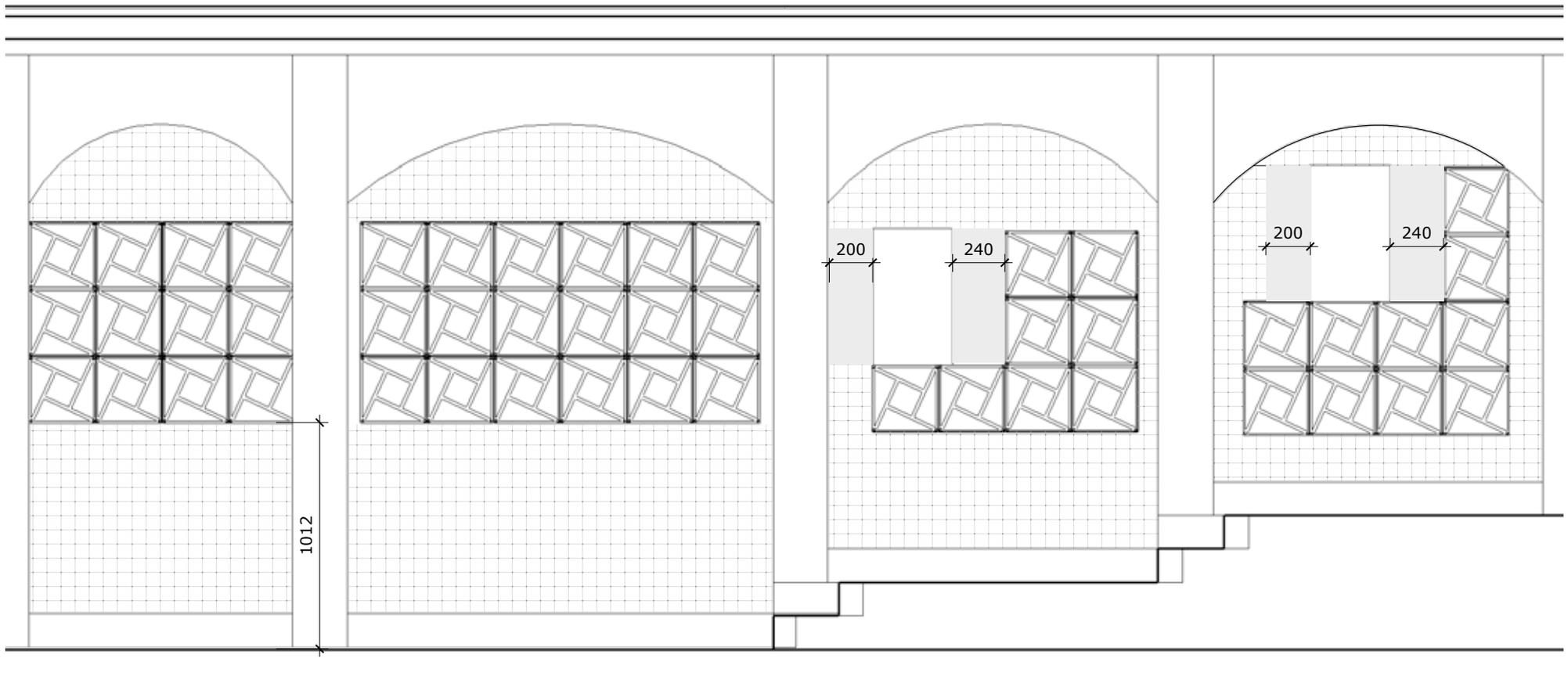
### **Reflection**

Sound waves travel in straight lines and when they hit a boundary they are bounced back in a very specific direction. This is very much like the behaviour of a pool ball bouncing off the cushion. Our auditory system uses these spatial cues to work out where sounds are coming from so they are very important to our experience. The effect of sound waves bouncing off a boundary is called reflection.



Acoustic Panel Key:

-  Absorber (soft side out)
-  Reflector (Hard side out)
-  Diffuser (300mm x 300mm ABS panel)



**CATS is a complete treatment solution for four walls with the ceiling a recommended option**

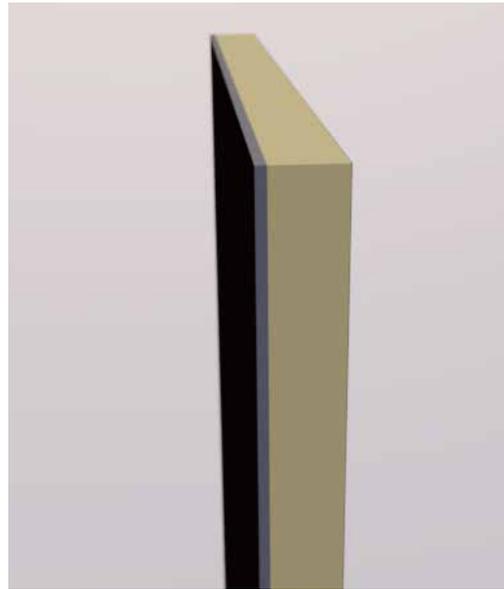
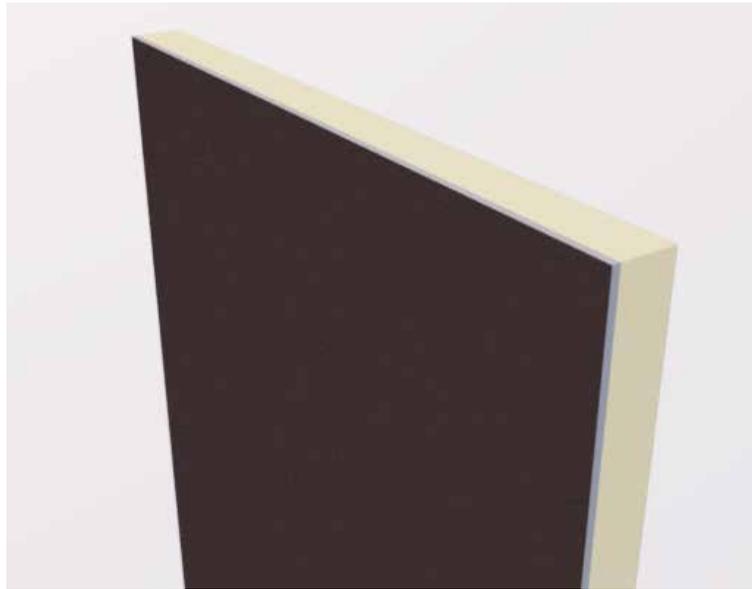
**Step 1** - Using a propriety computer model calculate the quantity of each panel required to meet our strict reverberation target.

**Step 2** - Position low frequency effects speakers and **CATS** multipanels to optimise the resonance response of the room.

**Step 3** - Position the scattering panels and remaining multipanels to optimise the reflection response of the room.

The output of the design process is a report on the critical performance parameters and a series of drawings showing exactly the placement of speakers and **CATS** panels required for best results.





**CATS Multipanels are used to provide absorption to control both resonance and reverberation in the room.**

**CATS Multipanel – Hard Side**

This is a diaphragmatic absorber which is used to control resonance in the low frequency range

Sound waves have their highest pressure at the room boundaries. This pressure causes the multipanel to compress converting the sound energy in to motion.

Reducing the energy of the sound wave at the boundary greatly reduces the strength of the wave being bounced back in to the room

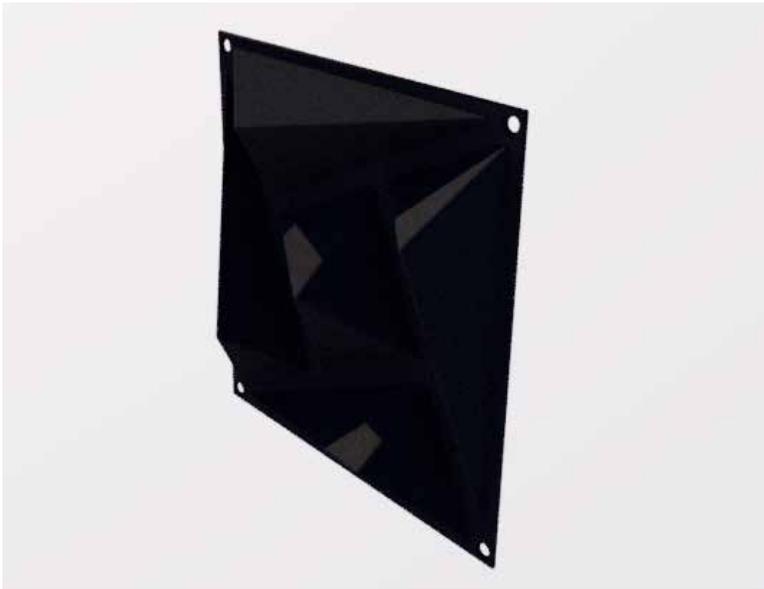
The Hard Side of the Multipanel is only effective against the lowest frequency waves. A large area of these panels is the key to efficiency of CATS at low frequencies.

**CATS Multipanel – Soft Side**

This is a porous absorber which is used to control reverberation in the mid to high frequency range. Sound waves cause movement of air particles which are obstructed by the fibres in the multipanel converting the sound energy in to tiny amounts of heat.

The Soft Side of the Multipanel becomes more efficient as frequency increases. It must be used sparingly to help meet CATS reverberation targets.





## CATS COMPLETE SCATTERING PANEL

### **CATS Scattering Panel is used to provide control of reflections and to meet CATS reverberation targets.**

This panel has been designed specifically for the **CATS** system and provides effective scattering to around 500Hz.

The panel is injection moulded from a very strong 3mm ABS plastic to provide the best possible performance and stability.

The numerous irregular shaped faces cause the sound waves to be scattered rather than directly reflected back in to the room.

These scattered waves are reduced in energy and broadly dispersed which greatly improves the sense of spaciousness in the room and reduces

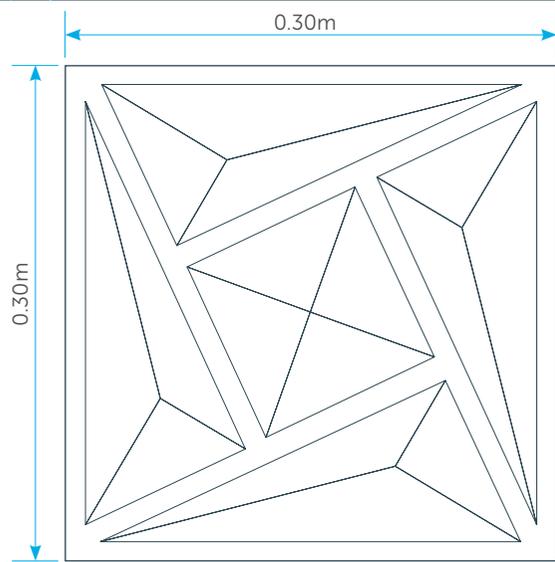
the problem of reverberation.

By scattering rather than absorbing much of the sound **CATS** results in a very high efficiency sound transfer which can be clearly heard in the improved dynamics and clarity of the overall audio system.





# CINEMA ACOUSTIC TREATMENT SYSTEM





**CATS** is designed to be extremely straight forward to install. It should be mounted directly to the wall with appropriate screws. Most acoustically isolated walls are constructed such that no special wall fixings are required to secure the panels.

**Scattering Panels – 30cm x 30cm**

Panels are supplied with countersunk screw fixing points as part of the mould. 4 screws per panel.

**Multipanel – Soft Side – 120cm x 60cm**

Fixing must be made directly through the soft material so that the hard side of the panel is securely held against the wall. 10 screws per panel.

**Multipanel – Hard Side – 120cm x 60cm**

A countersunk bit should be used to prepare the hard side of the panel for receiving the screw. Chosen screw must have at least 15mm of unthreaded

shank below the screw head. The screw should be tightened such that the panel can move away from the screw head when pushed but fits neatly against it when released.

Free movement of the panel is critical for maximum efficiency. 10 screws per panel.





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