

"ROOM ACOUSTICS - UNDERSTANDING THE BASICS"

- **What is room acoustics?**

The room you are listening in or working in will imprint its own character on the sound in the room. The room can cause echoes, ringing, delay, peaks, dips and many more things that degrade the sound. Room acoustics looks at how this happens and what can be done to minimise it.

- **Why is it important?**

The drop in large screen and computer prices has helped the Home Theatre and Home Studio worlds respectively explode. Time and money is put into finding the best gear that the budget permits. Cinemas and professional studios understand the importance of how the room sounds and treat the rooms appropriately. Home users often plunge into Home Theatre or build a Home Studio without knowing this and are then disappointed when they can't get good sound. Treating a room is usually much less expensive than the equipment used and delivers greater results than incremental improvements in the equipment – so it is excellent value!

- **What are the Problems?**

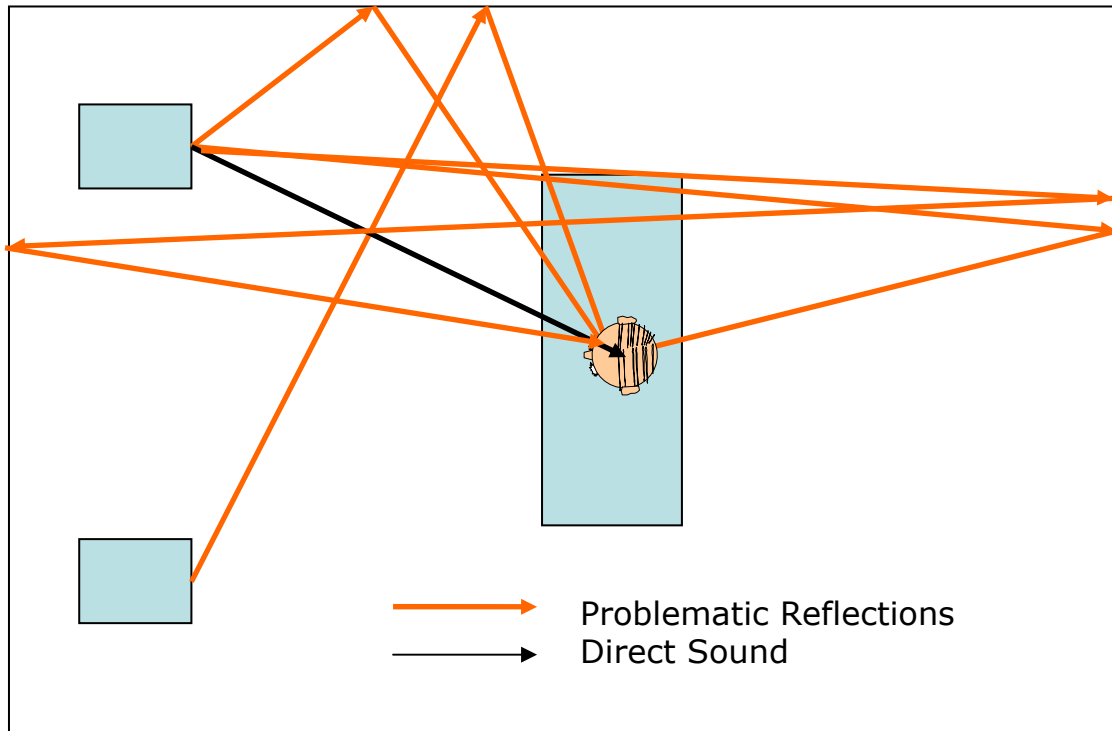
Sound from speakers radiates out until it reaches your ears and you hear it. Unfortunately you don't only get this direct sound. Reflections from walls, the ceiling and the floor interfere with the direct sound to corrupt the frequency response and degrade the image. This is why the dialog is often too quiet and you reach for the remote. It also makes the soundstage blurry and hard to place. Low frequency waves that are of similar length to the room can meet their own reflections and add or subtract from each other. This causes peaky or honking bass in some places and huge bassless holes in others. Try standing in a corner and then in the centre of the room whilst playing a track with good bass. It is why you often can't get great low end even with another sub woofer.

- **What to do about it?**

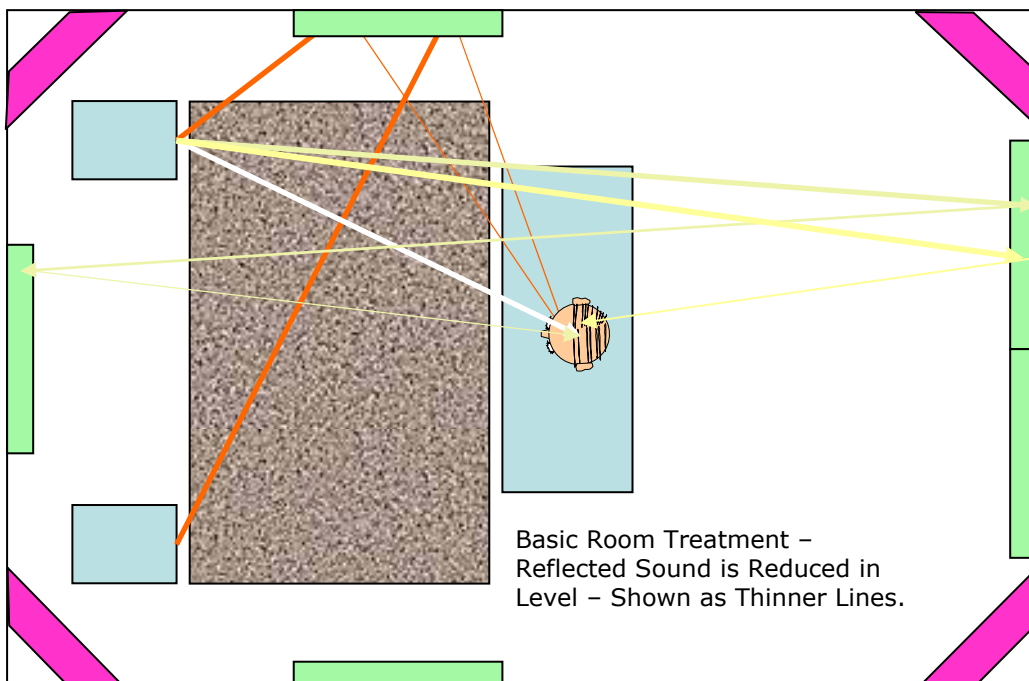
The good news is that the mid and high frequency reflections can be largely removed by careful placement of absorptive elements. Low frequencies that cause problems have maximum pressure build up in the corners, so placement of specialised bass controllers in the wall to wall and wall to ceiling corners work well.

- **Installing Acoustic Treatment**

Acoustic room treatments are designed to work together in treating the broad spectrum of acoustic problems.



Acoustic Treatment Bass Controllers can be placed in wall to wall and wall to ceiling corners to reduce bass peaks and dips. Acoustic Treatment wall tiles can be placed at reflection points to absorb interfering reflections. A rug or carpet on the floor helps as well.



Basic Room Treatment -
Reflected Sound is Reduced in
Level - Shown as Thinner Lines.

- **Finally - Listening and testing**

Listening is what this is all about and ultimately represents the best test. It is a good idea to improve one aspect of the room at a time rather than trying to do it all at once. For example, put Acoustic Treatment tiles at the reflection points on the side walls and ceiling (these can be found if you sit in the listening position and get a friend to move a mirror around until you can see the speaker). Have some favourite music well remembered before you start and see the difference when you are done. The sound stage should be centred well, at the correct height and a nice realistic width. The same goes for Bass Controllers, listen to some music with good low end. Try it in the corners of the room and at the listening position. Place the Acoustic Treatment Bass Controllers in the wall to wall and wall to ceiling corners and listen for the difference. For those who wish to use a sound level meter and Test Tones on CD, follow a similar process. Don't expect placing one Acoustic Treatment Panel or one Acoustic Treatment Bass Controller to have an easily audible effect. You need to cover a reasonable percentage of the surface area of the room. You don't have to completely cover it though. Strategically placed absorption works very well. A carpeted floor is a good start. With Acoustic Treatment Tiles and Bass Controllers, expect to cover 30 to 40% of the remaining surface area.