



Home Theater Treatment Plan

Keith,

I recommend adding a total of 15 (4ft x 2ft x 2in) sound absorption panels to your room to achieve high quality sound reproduction. I would place four panels on the back wall, four panels on each of the side walls and three panels on the front wall. This is based on a target reverberation time RT60 of 0.36 seconds at 1 kHz. This target was chosen to balance well with the current RT60 at 200 Hz of about 0.36 seconds and to keep the number of panels to a reasonable number. You can use different sized panels if you wish. It is the total surface area (120 ft²) and thickness that is important to maintain. (Estimated material cost \$1500)

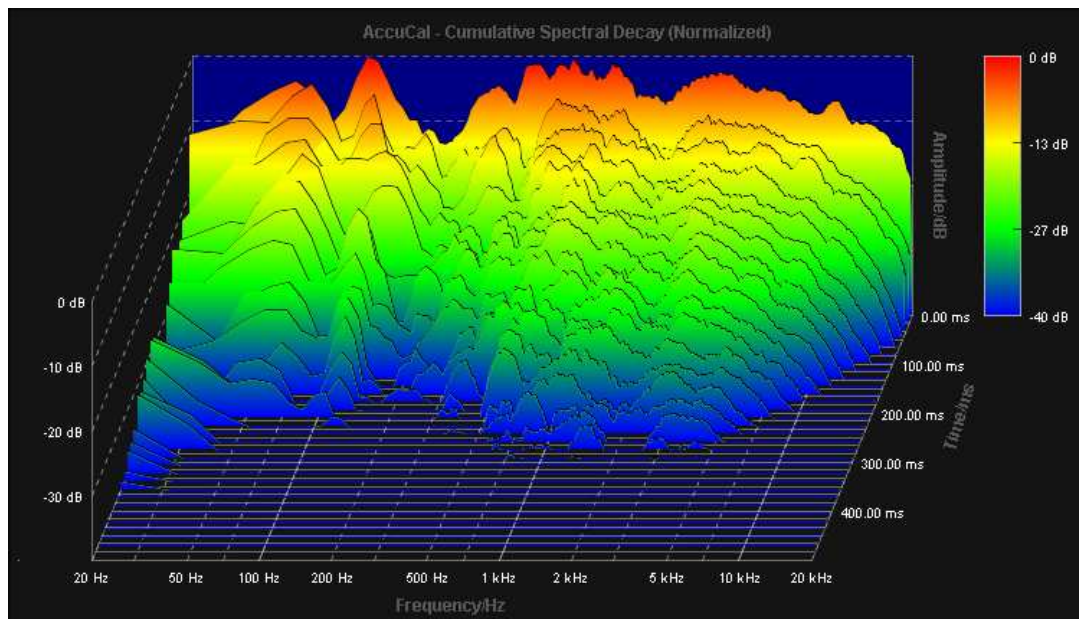


Figure 1 - Room Waterfall Chart

Additional Treatment #1 – Add (24 ft²) 3 additional sound absorption panels to the ceiling to further reduce reverberation and reflections and make the rear panels 4 inches thick instead of just 2 inches. (Estimated material cost \$300)

Additional Treatment #2 – Adding an equal area (120 ft²) of diffusers to absorption panels on the side and rear walls would achieve an even higher level of sound performance. Diffusers should be staggered with absorbers. Quality diffusers are

irregular and have significant depth like the source shown below. (Estimated material cost \$1500)

The panels on the side walls should be positioned as shown in Figure 2. The point of sound reflection is best found by moving a mirror around on the wall while watching for the speaker from the seating position. The side panels closest to the screen should be positioned where you can see the closest speaker to that seating position in the mirror. The panels on the rear walls are best placed in line with the listening positions relative to the front speakers. The panels on the front wall should be mounted behind the front and center channel speakers and in line with the front seating position to reduce reverberation and reflections.

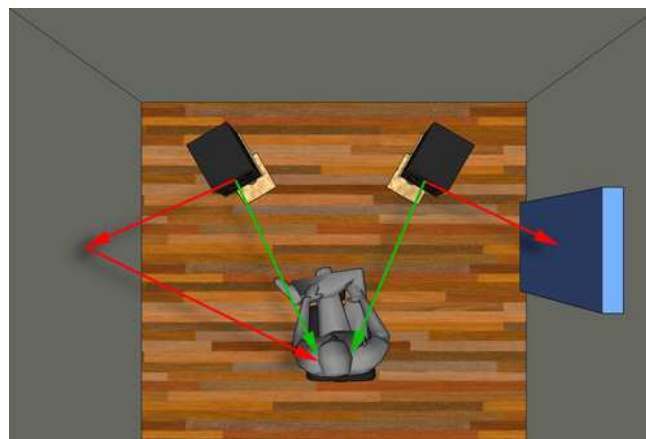


Figure 2 - Absorber Positioning

Example sources for acoustic absorption panels:

<http://www.readyacoustics.com/index.php?go=products.proddetails&prod=RT422>

<http://www.truesoundcontrol.com/products/C24PANEL.html>

Example source for diffuser:

<http://www.truesoundcontrol.com/products/TFUSOR.html>

Calculation Basis:

Room Volume - 2973 ft³

Measured RT60 Times (estimated from Figure 1)

5 kHz 0.50 seconds

1 kHz 0.50 seconds

500 Hz 0.50 seconds
200 Hz 0.36 seconds

Sound absorption factor 1.0/ft² at 1 kHz for 2" thick panel.