Home Theater Treatment Plan

Michael,

Your room is currently too reverberant relative to the Dolby specification for theater room acoustics with a measured RT60 value of 0.54 ms at 500Hz as shown in Figure I.

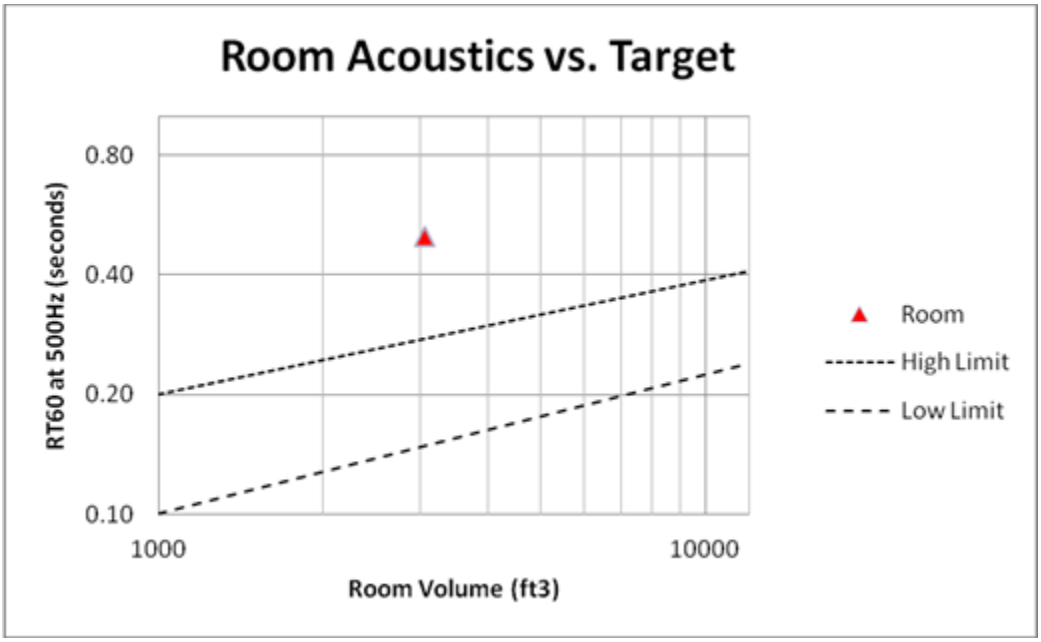

Figure I - Measured Room Reverb

The chart below shows the reverberation across the frequency spectrum. The measurements show that the sound absorption is a little too heavy at 63 Hz as shown in Figure II relative to the Dolby specification for theater acoustics.

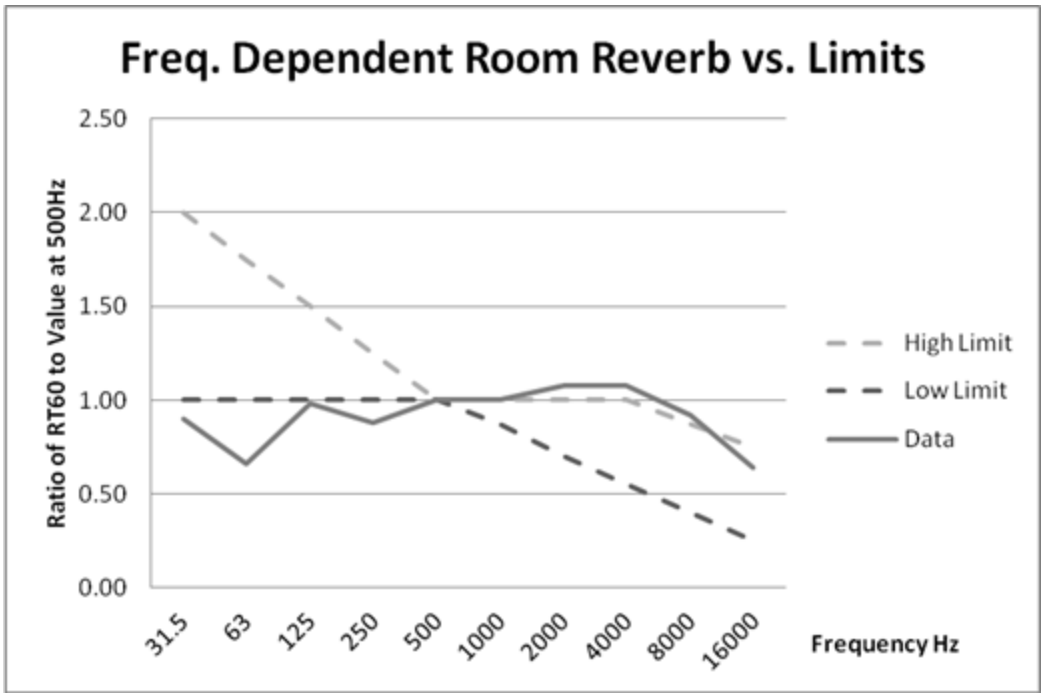

Figure II - Room Acoustics Balance

The fact you have too much absorption at the lower frequencies versus the higher frequencies is caused by the excessive use of bass traps, too little higher frequency absorption and the open nature of your room. This results in the obvious acoustical ringing in the room from too little absorption above 125 Hz. The fact that your room is not carpeted and has many sidewall openings creates a significant challenge to obtaining room acoustics that will render quality sound reproduction.

Based on these measurements and the aesthetic requirements for your room I would add 15 to 20 2" x 2' x 4' panels to your room suspended from the ceiling. Suspending these panels off the ceiling by 8 inches or more will increase their effectiveness if you use ones that are open in the back like Dual Acoustics products. Replacing the bass traps behind your seating with 2" x 2' x 4' panels will bring the low frequency reverberation in-line with the higher frequencies. This will offset the reverberant nature of your hardwood flooring and bring the room within the Dolby specification.

Adding this absorption will also improve the clarity of sound reproduction in your room. Currently the D50 values 500 Hz and above are mostly below 90 indicating that over 10 percent of the sound heard in the first 50 ms in the range of dialog intelligibility is not from the speakers. I find values above 95 percent in this frequency range are found in rooms with good clarity. The level of treatment I am recommending will bring you much closer to this, but the fact that you are sitting in very back of the room from the speakers make this a challenging specification to meet with treatment alone while maintaining the appearance of your room.

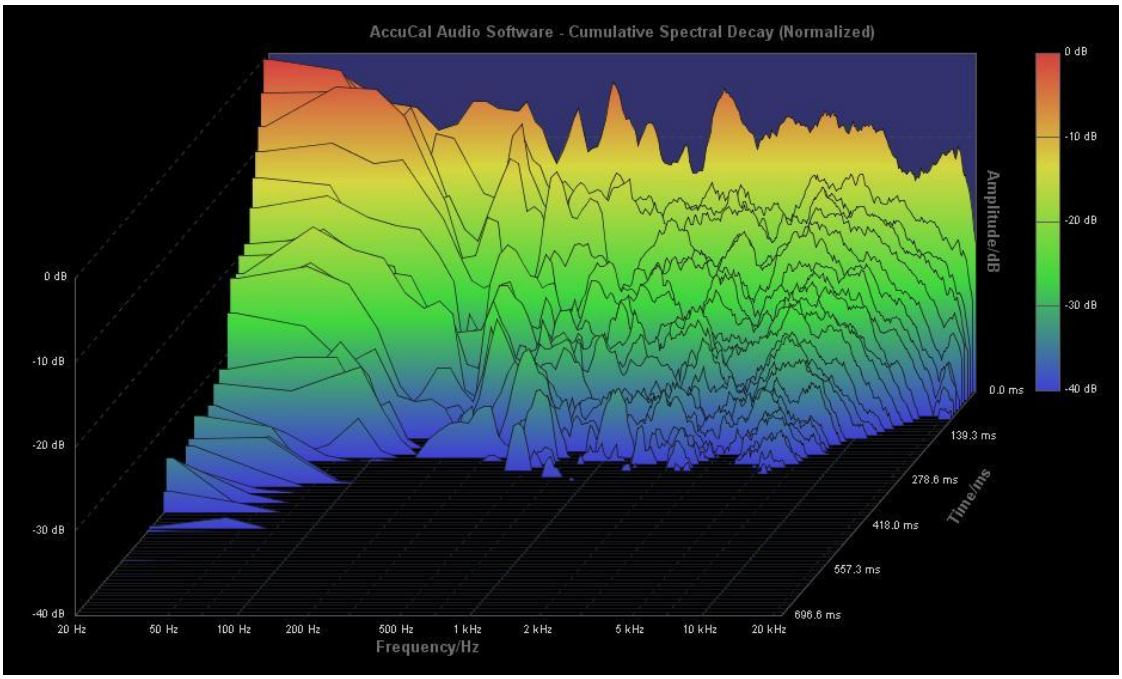

Figure III - Room Waterfall Chart

Calculation Basis:

Room Volume - 3200 ft3

Measured RT60 values based on T10:

Frequency Hz	31.5	63	125	250	500	1000	2000	4000	8000	16000
RT 60 (sec)	0.42	0.33	0.49	0.46	0.52	0.54	0.57	0.56	0.49	0.33

Measured D50 values:

Frequency Hz	31.5	63	125	250	500	1000	2000	4000	8000	16000
D50 %	9.54	29.78	90.87	90.30	84.98	86.34	85.20	85.29	89.23	94.13