FURTHER ENHANCEMENTS

We can cover the back wall with any leftover treatment pads. We should be aiming to cover at least 20% of the surfaces of our room.

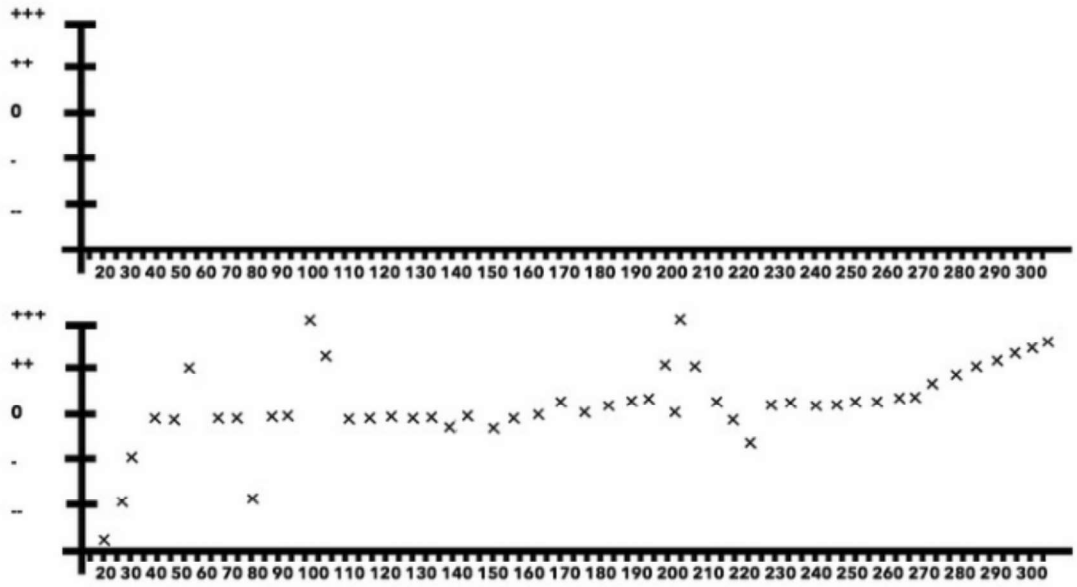
Make sure there is nothing in our room that is likely to cause vibrations from bass frequencies. For example: paperclips in a metal container on the desk, or any metal or glass items that are touching each other.

If there are any vibrations occurring, rubber is the perfect material for absorbing some of the vibrations and decoupling the sound from the material. Finally, we can double check our speakers are isolated from their stands, as well as ensuring that stands are also isolated from the floor. If we have a window in our room, try to make use of a long set of curtains to prevent waves bouncing off the glass windows and producing secondary reflections. (This is why recording studios control room glass is usually angled)

Different Types of acoustic isolators & de-couplers

TESTING ROOM ACOUSTICS – TEST TONE GRAPH PLOTTING

Now that we have our room treated, we are going to test how it sounds and plot a low-frequency response chart. We will need to draw a graph that looks like this:



Firstly play a sine wave, starting right down at 20Hz. Turn this sine wave up just enough so that the volume is as low as possible, whilst still being able to hear it clearly. The reason we do this is because it will be easier for our ears to detect changes in volume at these lower levels.

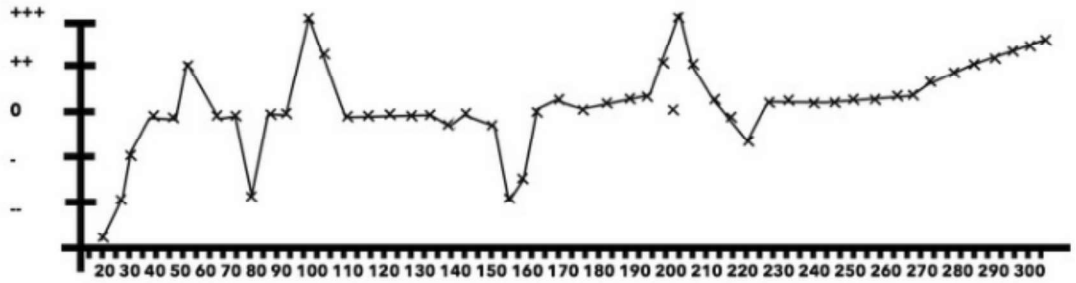
Notice that on the graph we have only plotted frequencies from 20Hz to 300Hz. This is because these low-end frequencies are going to be the most disruptive to the acoustics of our room.

Now we can increase the frequency of our 20Hz sine wave, whilst keeping our head directly in between our speakers. (In the natural position that we will be mixing in.) This is important, because moving our head to any other point in the room, even by a few inches will drastically affect the frequency response curve.

As we increase the frequency, we are going to mark on the graph whether the tone gets louder, quieter, stays the same, or if we cant hear it at all.

This will allow us to map out the resonant frequencies and the troughs in our audio. This can highlight to us where we may have standing waves that are cancelling and doubling at certain frequencies.

We can now join up the dots that we have marked on the graph to give us an approximate idea of our room modes. This coupled with our knowledge of standing waves, room dimensions and treatment should allows us to bring our listening environment up to more of an acceptable standard.



From this graph we can see that we have a room mode at approximately 50Hz, which is also causing problems at its harmonics of 100Hz and 200H. We also have a cancellation of frequencies at around 80Hz and 160Hz. This response graph can change from even the slightest head movement in the room.

ACOUSTIC TREATMENT SUMMARY & KEY POINTS

- Standing waves affect the whole frequency spectrum
- Standing waves are most problematic below 300Hz
- Echo, reverb and side reflections can cause phase issues and comb filtering
- Set your studio up so that sound is projected down its longest length
- Too much insulation can cause a room to sound very dead, use diffusers as well as acoustic treatment panels
- Bass traps can help reduce standing waves and bass build-up in the corners of the room
- Low frequency standing waves are usually caused by structural problems such as the room dimensions and can't easily be fixed with thin acoustic foam
- At least 20% of the surfaces in our room should be acoustically treated
- The floor & ceiling of a room can also be acoustically treated
- We can plot a basic frequency response graph using a test tone and our ears or a DB SPL meter