

## **Homemade Sound Reflection Traps and Bass Traps Tony Treadwell (aka Ballistix) – January 2008**

Having first decided on building a dedicated cinema room in my house in 2002 it took many years for me to “finish” the project. I had always wanted a THX room in the house and spent some time getting cables from the states and as many components for the room over the years. Only lately did I realize that I had missed out one of the most important elements of any room. The inherent sound and acoustic profile of the room, let alone the equipment calibration.

I went into research mode and spent a significant amount of time looking at commercial solutions and the more interesting homebrew solutions that ingenious fellow cinema freaks had invented around the globe.

I ended up making my own...and with tremendous “acoustic” payback. I’ve documented what I did and the process of calibrating before and after they were installed. All of the kit was bought from local stores. I introduced the following reflection traps into my room;-

**2x First reflection points for the fronts on the walls (very close to the speakers)**  
**2x First reflection points for the fronts and subs on the ceiling**  
**2x Second reflection points at the rear ceiling position**  
**2x Bass corner reflection traps in the back corners. These were made with 2x Rockwool panels instead of just one.**

I wanted the traps to be 4x2ft (which is easy for the Rockwool from Wickes because this is the size of each slab). The back two for bass would be double thickness.

### **IMPORTANT POINTS TO REMEMBER!**

- It’s easier to create the frames to fit the Rockwool dimensions. Rather than cut Rockwool!
- Nice to bevel the front edges of the panels because 1) they look much better and 2) they don’t tear your acoustic cloth when you stretch it across the frames.
- Always make sure you fix the Rockwool (I stapled the acoustic cloth right around the frame and into the back to fix the Rockwool in place) so that it has a 1inch gap behind itself i.e. so that the sound can come through bounce off the wall/ceiling behind and then back through the Rockwool.
- Don’t mess with screwing things to ceilings. I used industrial strength Velcro. Get it from Halfords, once on they won’t come off!
- I used simple keyhole brackets for the walled traps and wooden stands made from broom handles for the back two!

## STEP 1

Here's the kit ready for construction



## STEP 2

We started by creating the panels, not being carpenters we just used 90 degree brackets to add strength to the timber joints and this appears to be very strong.



Close up of the brackets...Simply have a friend hold the frame whilst you power-screw the 90 degree brackets in place.



Had to cookie-cutter the others to make the eight traps...



Simple design but actually quite strong using the brackets



**STEP 3**

Used my router (I wanted rounded edges to the front, they look great and will be super easy for when I put the fabric over, no sharp edges. Borrowed router bit from a mate...)



...and here they are all done!



...the edges...



#### STEP 4

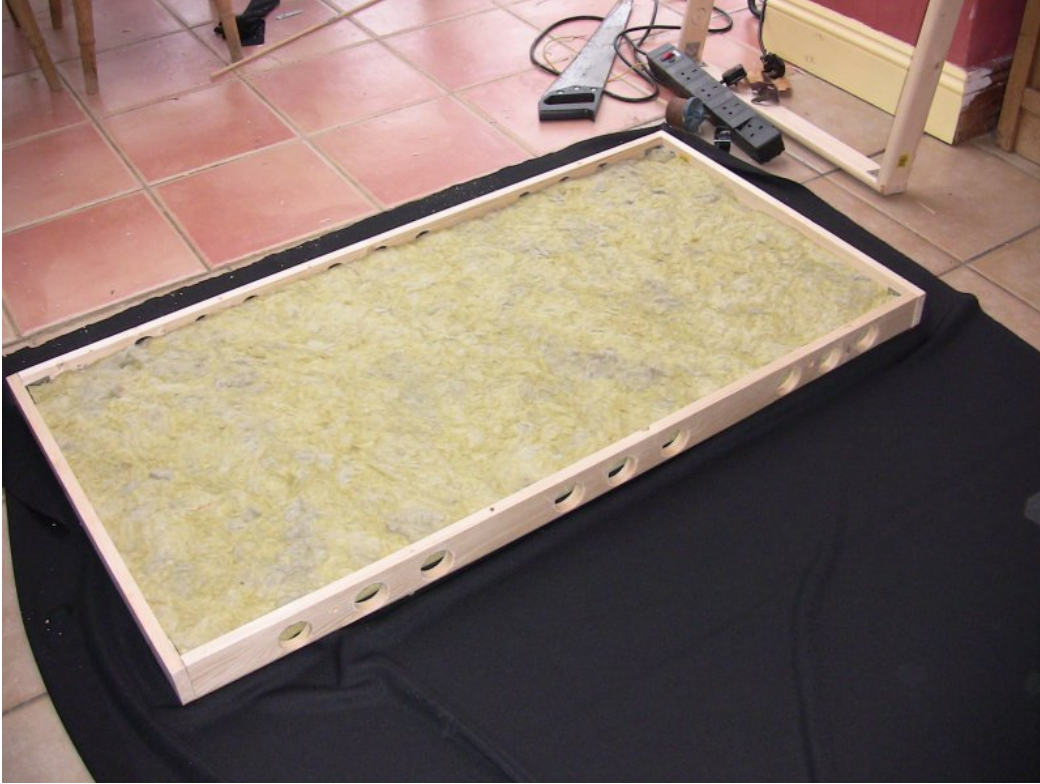
I wanted to make sure that the reflection panels did as much good as they could so I decided to make sure the sides were as "porous" by putting holes all the way along them.

Use a circular sawing drill bit. These are cheap and easy to find at any local hardware store.



### STEP 5

Once this had been done across all panels it was time to start putting that Rockwool in. Remember, if you use Wickes Rockwool it is exactly 4x2ft in dimension, just drop them in!



## STEP 6

Covering with the acoustically transparent cloth...I also decided to put some thin dowel down the back of the panel. This would ensure that a 1inch gap remained behind the panel (good idea to do this because it allows the panel to use the back wall to reflect sound back through, double goodness). In the end I didn't do this for all traps. You can achieve the desired effect (pushing the Rockwool panel to the front of the panel, leaving the 1inch gap behind. **THIS IS VERY IMPORTANT!!**



Once I had done this for all eight panels (The covering is the most time consuming bit but aesthetically most pleasing) they were put into the room ready for installation. I used a staple gun to put the cover on, I also made sure that the 1 inch gap was secure at the back of each panel. The front was support purely by the fabric which worked very well. The panels looked great and the routed tapered edge made a difference to the professional look!

For the two rear panels I used 2 slabs of Rockwool. This made them 4 inches thick (much better for base). These would stand on legs at the back of the room.



With all of the panels done it was time to put them up. To do this one has to find the first reflection points for each speaker you are addressing (For me it was the fronts and the subs).

## **STEP 7**

Use a mirror to find the reflection points. Do this by having someone sit in the central listening position and the second person holding the mirror. Mark on the wall when the sitting person can see the speaker from edge to edge, this is the first reflection point for the speaker. We did this for both the side and ceiling reflection panels.

For the second back ceiling panels we used the mirror against to make sure we could see the front speakers...then simply place the panel with it's centre at the centre point for the speaker.

The wall panels were secured using normal key-hole frame holders and the ceiling traps were fixed using a strong Velcro!



First reflection point for the right hand front speaker. Because my speakers are close to the walls my reflection points were quite forward positioned. Remember to use the mirror trick to find the perfect placement for you!



### **STEP 8**

With all of the panels in place it was time to start recording and calibrating the room acoustics. All I can say is that this needs a post on its own. The difference was astonishing. Punchy base, much less resonance in the room and it just sounded tighter all round. The difference that the panels made to the 500Hz-4K range was nothing short of revolutionary for me.

### **CONCLUSION**

In summary, I've built the panels for around £200 for eight. That's less than you will pay for one commercially built foam based panel.

The finished room!

### **Rear bass trap**



Rear bass trap side shot..



Ceiling trap





**Finished!**

