

## Building the freetarget Pt 3 putting it all together and over view

I built the original target just to get it working and to see if it would work without needing witness paper or a target card to create the noise to pick up by the microphones. Although it was picking up noise and registering a shot the results were vague (as I can call my shots) and I surmised it may be picking up the sound of the pellet hitting the pellet catcher. I then decided to go the whole hog and put in the LED lighting option and a paper drive. When I built the first version I did build to allow me add the LED's and drive later and because of this the wooden blocks that hold the sensors were the correct height to mount a witness paper guide and would place the witness paper 8mm above the edge of the microphones. These witness paper guides would also double up as shields for the sensors and are made from 1mm mild steel. This was because I had made the laser cut hole in the 2mm steel plate the same size as a target card, this meant my microphones were 5mm outside of it's protective shielding.

I made the witness paper drive so it pulled the paper below the 8mm I had planned it to go this allowed me to put in a wooden paper runner at a height of exactly 8mm and the paper would be pulled tightly over it. At the other end where the witness paper get pulled into the target I removed wood in the top of the frame to allow it to enter at 8mm above the microphones.

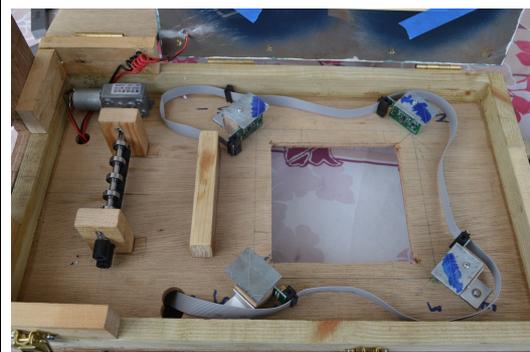
The LED strip I used was the type for indoor use only so is not coated with a silicone so bends and conforms well and so far it has stayed were I stuck it in the LED lighting shield and gives superb light.

Do check you have not made your sensor mounting blocks too large otherwise the ribbon cable will not reach around the sensors and plug in, but I made up a longer cable and it also was made longer to allow me to mount the circuit board somewhere else and allowed me to mount it in a box on the back of the target out of the way. The next target box will just be made longer and the circuit will it in its own compartment with a door facing forward as it is very useful to see the led lights flashing registering a shot or not, and also witness the start up sequence and know it is on. This system is brand new and still in the development phase and as such things do happen but Allan soon sorted it out but it did mean I had to download an interface to the Arduino called puTTY and do some simple inputting of code to sort it out with Allan holding my hand. Problems were the board just did not go through a check and no LED's came on, this is a know buglett and is being dealt with but was easily cured using puTTY. My commands for the motor time and LED brightness would not write to the Arduino from the software and again simply sorted from puTTY but again it is being looked at but that problem may have been my own making by updating the firmware and software without allowing it so save settings, but it is working fine now.

The trip point on my system is 0.73v and it works very well and does not get it's knickers in a twist for other shots at the range at my club, my feed rate with a 100rpm motor is 500m/s (half a second) is fine but I may shorten it a bit as it will use less paper. The lighting LED's stutter when the motor drives so I'm uprating the 12v power supply to 2A up from 1A.

The \$64,000 question? How accurate is it – that will be the subject of a new page to this journey, but all I can say is that from what I've experienced through holes in paper and calling shots this system is superb but to fully analyse it I need a range to myself and that will have to wait for the new house. It is silly trying to do it at my club as we have target wizzers and everyone would have to keep stopping to allow me to keep going down range to retrieve cards. I'm happy with it's accuracy and it is retuning results well within my average of 91-92 depending how I'm feeling so no strange scores.

Below are some pictures that may or may not help you in your build as there are so many ways this target could be built.



Showing here are my sensor protectors that double up as mounts for the witness paper support card,



Sensor shield scribed up to align witness paper support card.



Witness paper support in place



Edge of frame cut away to allow witness paper to enter box 8mm above microphones on sensor boards.



Feed for lighting LED's tided by winding wire around screwdriver creating spring coil.