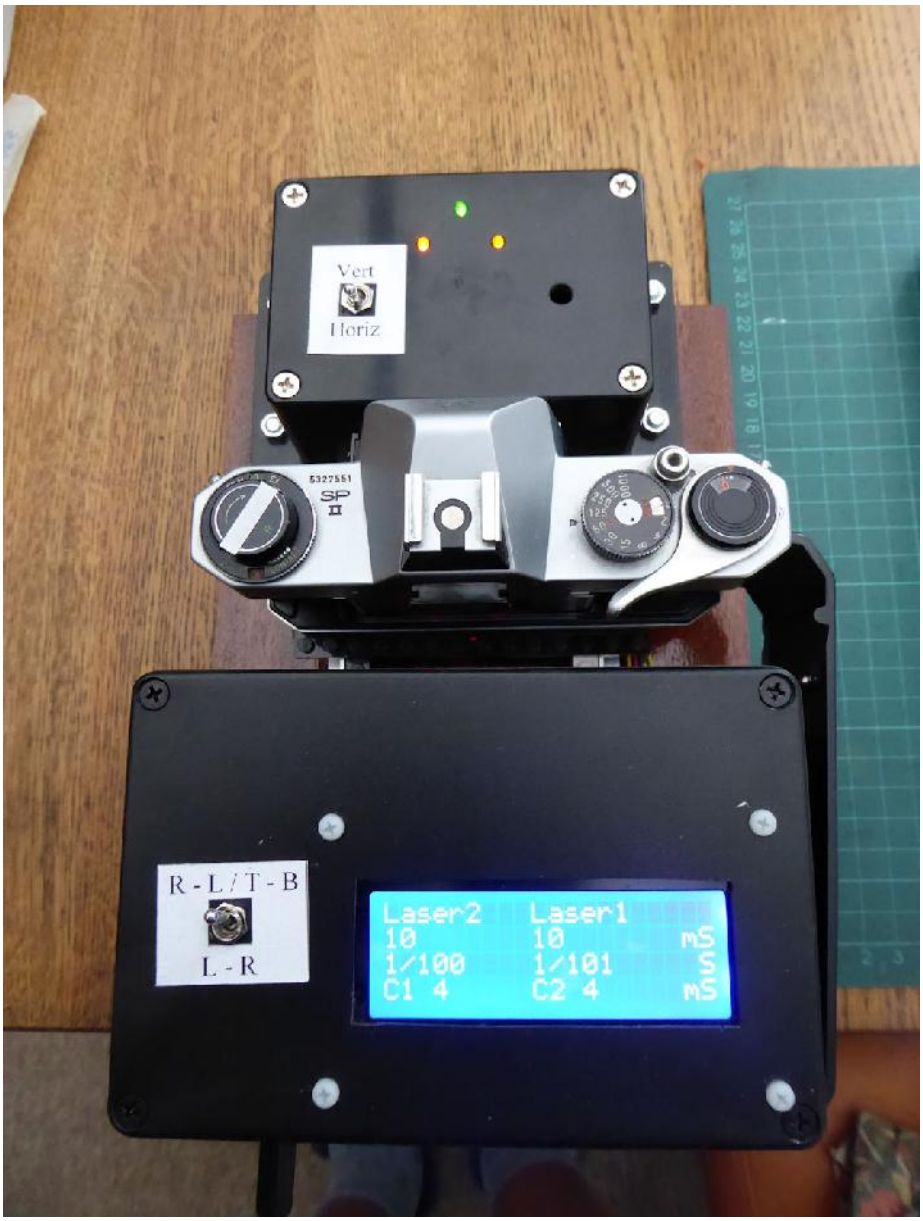
# Build a shutter tester for Focal Plane shutters - Cheap, Easy & it Works

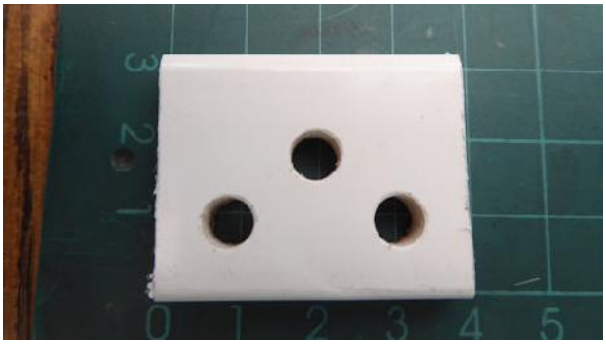
Hi there, and thanks everyone, especially Niglyn for the software and all the info that went towards my interpretation of his design.

My son is a bit of a camera enthusiast and has a number of old film cameras that he has purchased on-line and managed to get working, but was unable to check the shutter speeds of the focal plane cameras: he mentioned this to me and as I used to be an electronics engineer but retired for some 20 years, I rashly volunteered to build him one, and found this one during a on-line search.

What I eventually came up with was this:-

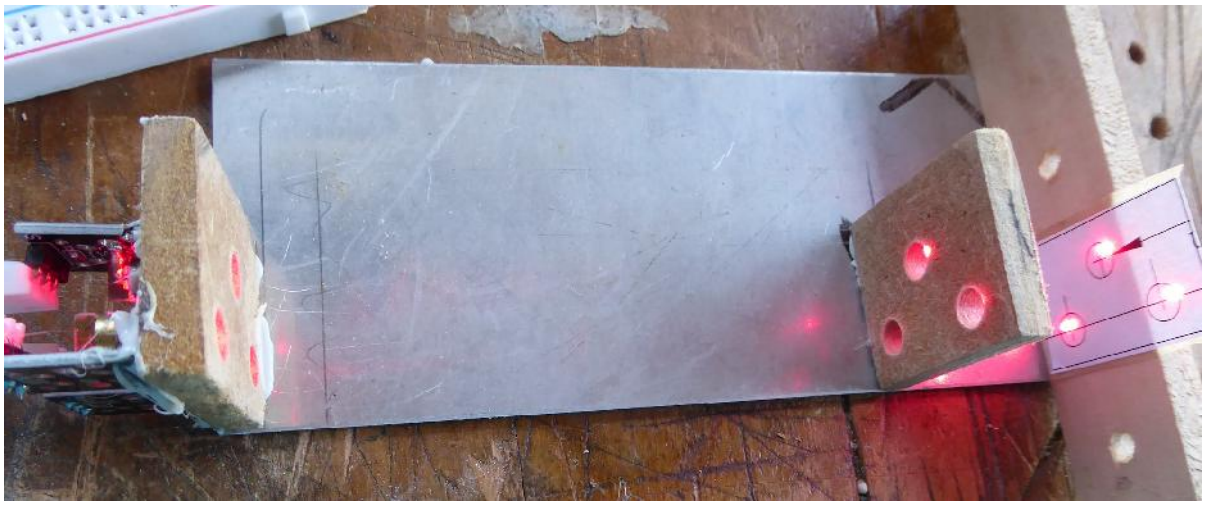


The process of getting there was a little fraught, but the results were worth it.
I thought that a system that could check vertical as well as horizontal shutters would be useful so the design then incorporated a third laser in the middle of the other horizontal lasers but 10mm higher to that end I made this jig as I knew that the spacing would need to be repeated a number of times. The holes are 6mm in diameter, which was the same as the brass barrels of the lasers



Using the jig above, I made two more very similar objects from some 6mm MDF, one was glued with hot glue (darned useful at times ) to one end of a piece of aluminium and the other square to it some 100mm away.

With a paper target, with the same dimensions printed on it at about 120mm.



Then the fun began!

Fortunately the MDF was relatively soft which allowed me to push the lasers with an interference fit into the MDF. It was then just a case of adjusting the lasers to shine through the holes of the second jig and onto the paper target and again securing into position with hot glue. (steady hands needed) When the glue had fully hardened it was not difficult to to remove the lasers from the ali backing, ready to be fitted to the display box.

The original jig would again be used to drill the holes in the front of the display box, in the centre and towards the bottom. Quite a lot of time was expended, determining the height of

the shutter window of a series of different cameras, but varied in my case between 20 and 25mm above the LEGO sled that was below, which turned out not to be necessary.

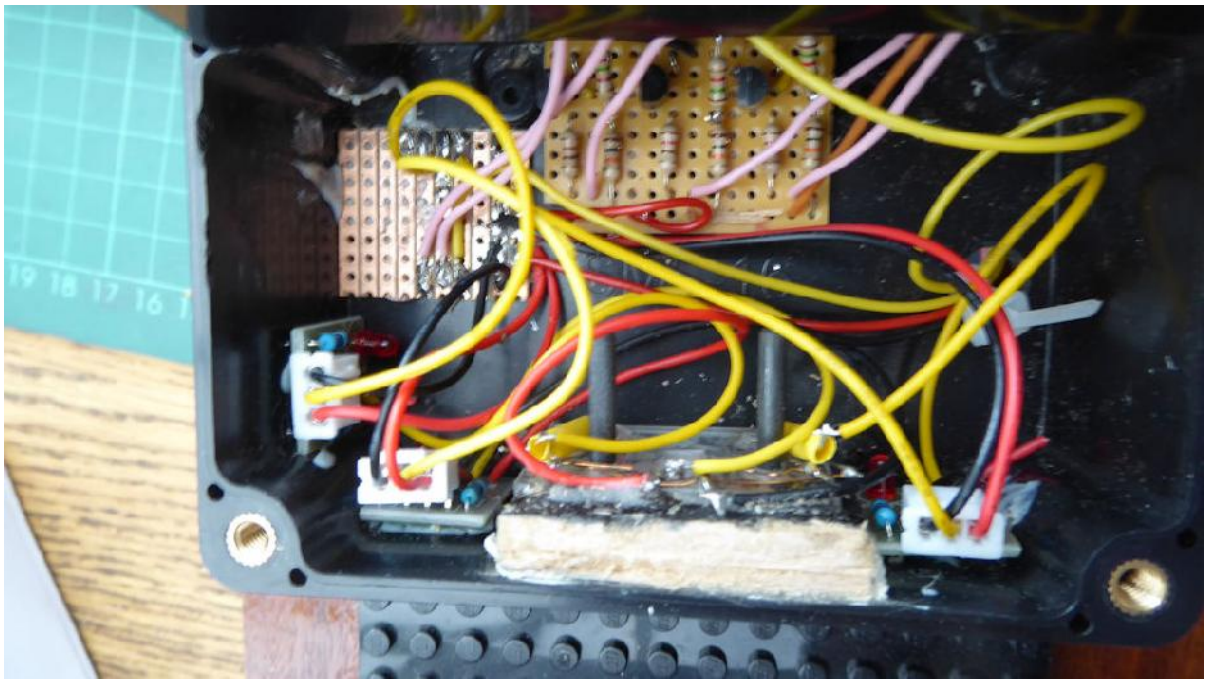
Once all these dimensions had been checked, checked again, and just for good measure a third time it was time to drill some holes.

The position of both the display, NANO, power input plug, and a large hole for access to the NANO when all was assembled, had been checked out. The holes for all of them were drilled and cut out as were the holes for the bolts used to raise the box to the correct height and for the wires to and from the laser receivers.

Assembly was quite straight forward, the laser cluster was glued into place using epoxy and the NANO with just 2 spacers and 4 screws.

As a junction board I glued a small piece of stripboard to the bottom of the box. The display window was cut and the hole for the switch determining direction of a shutter was drilled.

Attention now turned to the laser sensors:

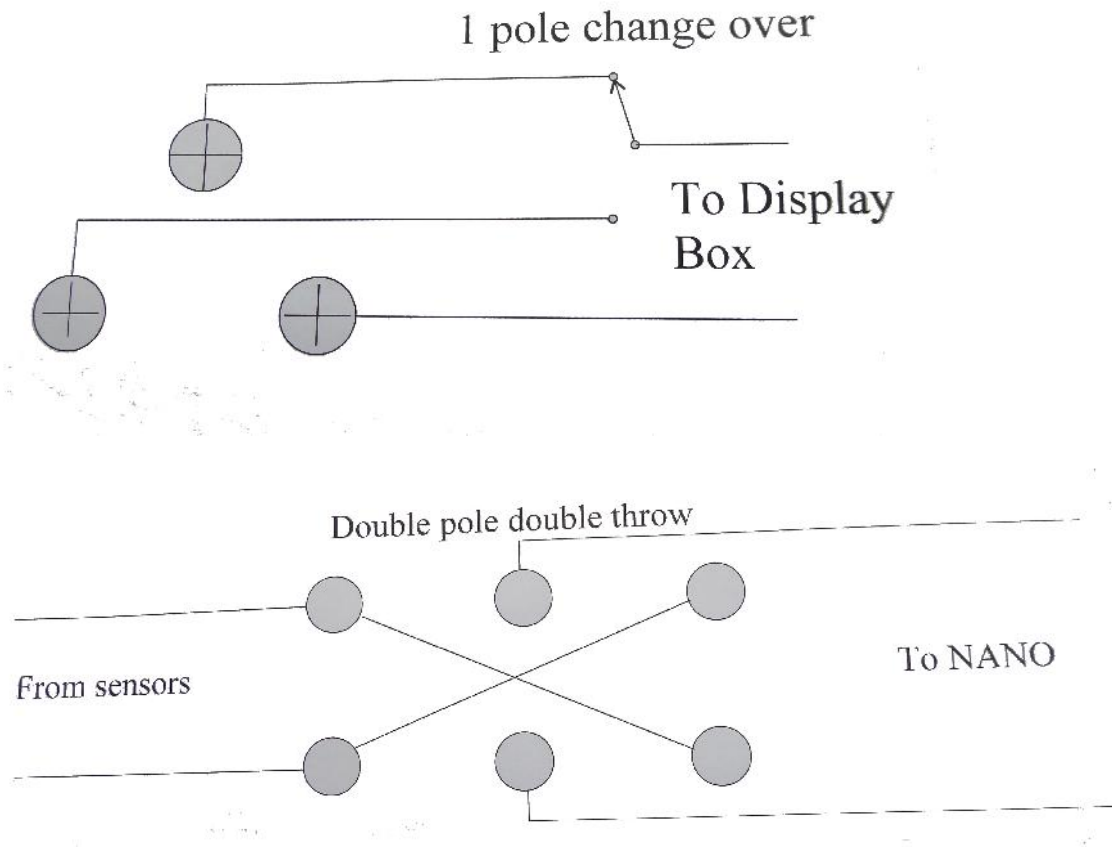


Part of the original alignment jig was used to determine the hole placement and then glued to the inside of the receiver box to make a shallow tunnel to shield the receivers from the ambient light, which I had found could be a bit of a problem. Using the original jig (Fig 1) holes were drilled into a piece of perspex about 2mm thick and the receivers were epoxied into place within the 6mm holes. They are a tight fit. When the epoxy was cured I wired all the positive leads together using fine wire and the same with the grounds. This reduces the wiring count by 4 which as you can see from this image, helps. The perspex was then epoxied into place.

The cover for the receivers was then drilled for the LED’s and the switch and fully assembled.

Time for testing: the triangle of LED’s on the cover of the sensor box, were initially

going to indicate alignment of the camera when the shutter was on ‘Bulb’. The transistors visible at the back of the box were there to help drive the LED’s but unfortunately the laser sensors could not drive then sufficiently, and as their circuit board was again glued down, it was too late to modify the circuitry, so the LED’s are now just an aiming point.
and two of the three signals from the sensors transferred to the NANO via the two switches.




Testing involved:- Contax 139
Pentax Spotmatic
Pentax SF7

The Contax, having been recently serviced was spot on with the exception of the 1/1000th which was about ½ stop out.

Both the Pentax’s were good up to 1/500 with the two fastest more than a stop out.

Yes IT WORKS!