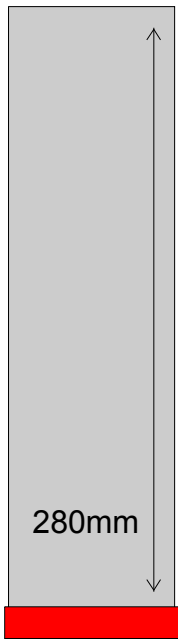


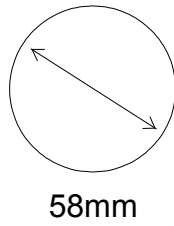


work in progress draft rough copy

sunshine recorder  
by Michael Parry-Thomas

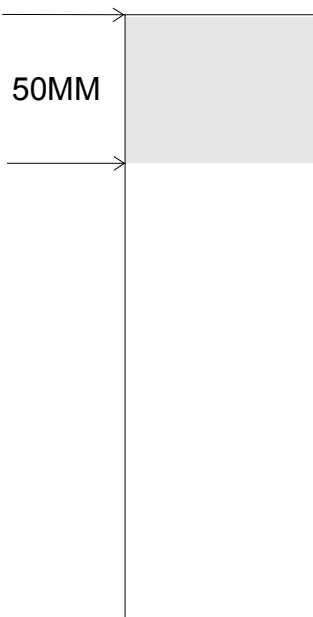


The plastic tube was cut from an old fishing rod tube holder, you also need the bottom cap.



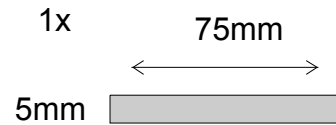
← plastic cap

1 Tube 280mm x 58

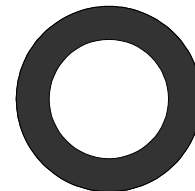


The plastic tube needs to have some aluminium foil around the inside of the plastic tube to act as a reflector, you can purchase this from eBay, you need the aluminium foil which has an adhesive backing.

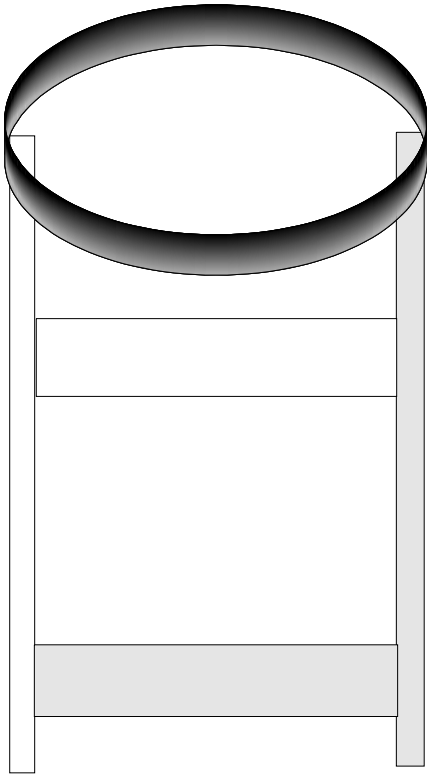
Make a top flange to hold the Glass Ball



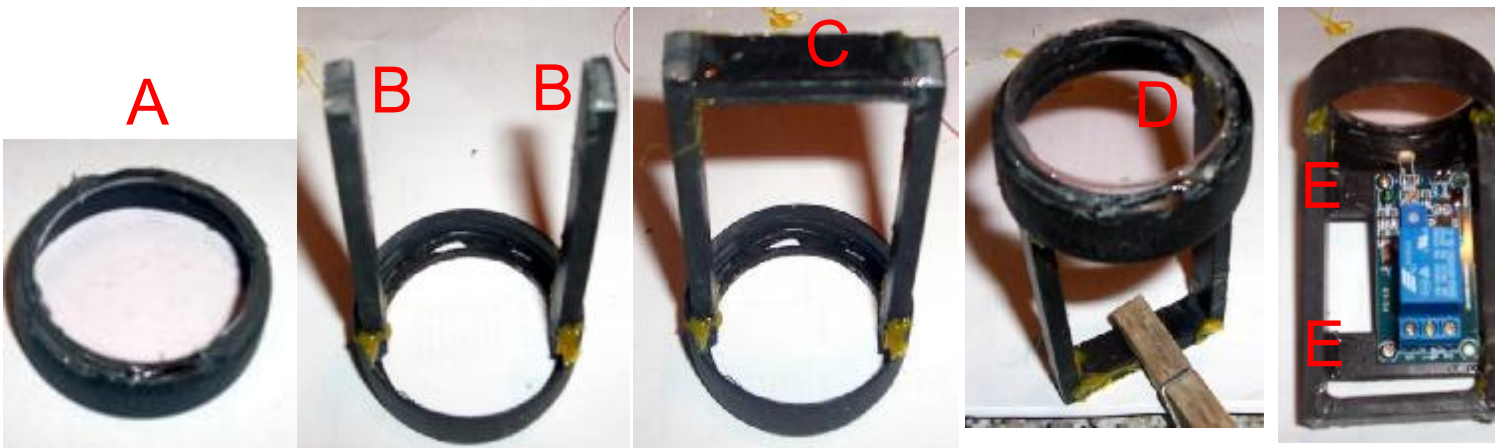
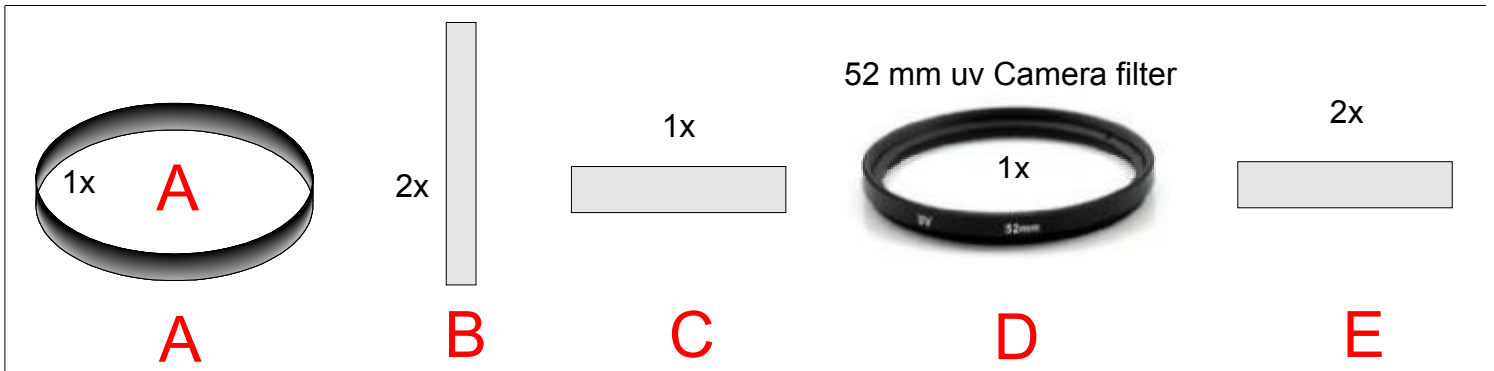
Top flange

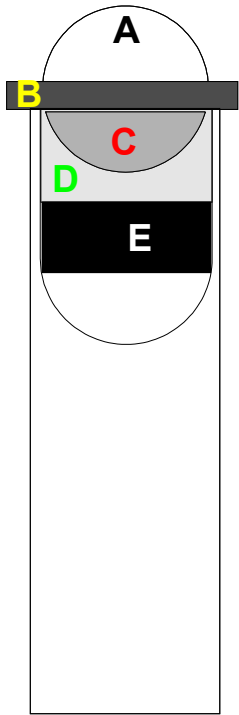


I made the flange out of some old plastic Flomax this is a plastic which is used in signmaking and it's very easy to cut.

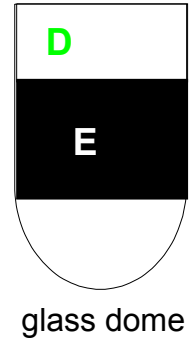
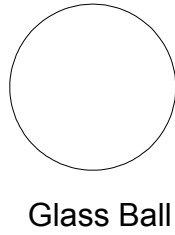


To make the circuit board holder UV filter glass protection you need a plastic tube which will fit inside the large housing. Tube is to be approximately 10mm in-depth, this is to hold the UV glass filter in place and the circuit board housing, this will need to be able to slide up and down in side the tube holder, it must be a good fit so it will not slip down on its own. The UV glass filter protects the components on the circuit board.



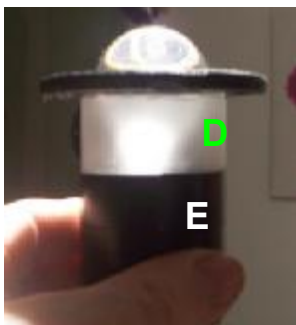


You need to prepare the glass ball before using it in this project, please do not skip this process

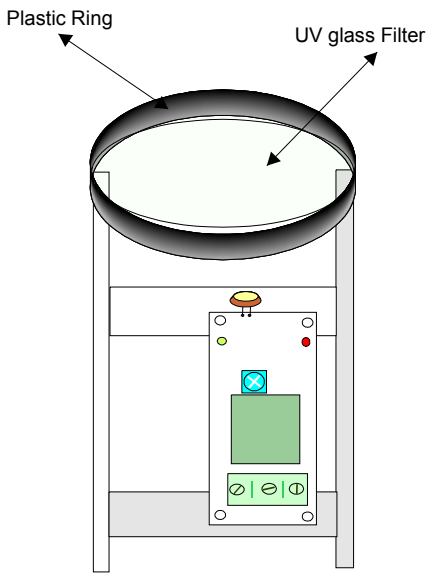


**It is very important to make the optic diffuser correctly, please do not skip any of these processes**

.Half of the glass ball needs to be etched, I used a piece of sandpaper and carefully sanded half of the glass ball until it was completely semitransparent you need this so it will defuse the sunlight, you do not want any focused sunlight going into the plastic tube. The second part is a glass dome, I purchased this from a pound shop. It was part of a glass ornament I simply removed all the inside items and I was left with the glass dome, this also needs to be etched from the open end approximately 30MM in-depth, I use sandpaper to achieve a transparent frosting effect. This acts as part of a diffuser,



When the sun is out, you'll see it's reflection in the clear glass ball top, this is then diffused by the bottom part which has been frosted, a combination with the outer frosted glass dome makes the unit glow with defused sunlight, as this is mounted inside a black tube. You get a big contrast between daylight and sunlight, this is detected by a small circuit board, which has a sensor and operates a relay which can be used to connect to a counter, analog clock, datalogger, and also can be connected to a computer using a USB port



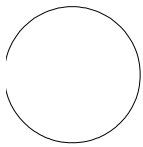
Circuit boards were purchased from eBay, the company offers two types, one with a single sensor, and another with two sensor, I am currently using the one sensor.

You will need to experiment with the different types of boards to get the optimum results for your area. (option one)

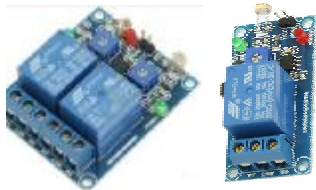
I connected a quartz analog clock to the output on the relay this records how much time of sunshine during the day

(option two)

you can connect a digital counter on the normally closed contact and a data logger on the normally open contact, both circuit boards can be powered by a 4.5v battery, I'm using three AA 1.5 in a battery plastic holder, the data logger and counter are self powered,



2PCS CLEAR GLASS QUARTZ CRYSTAL SPHERE BALL 40mm £5.01 purchased from eBay



Sensor board

0A 250VAC/ 30VDC Relay Photo Resistor Sensor Module 1 Channe £3.79

**you can either use one channel or the two channel board**

0A 250VAC/ 30VDC Relay Photo Resistor Sensor Module 2 Channe £5.72

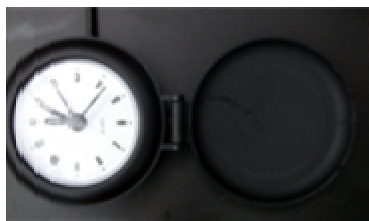


1 x Battery Holder Case 3x AAA 4.5V with 6" Leads Box £1.37



power lead

CONNECTOR SOCKET WITH 2-WIRE LEAD PCB CONNECTION £3.37



Analogue clock £1 .8 0

## (Option two)



£5.22 from eBay

The advantages of using a digital counter is you can simply reset it with a small button on the front of the module and the module is very small

17ET-BM-s 0 - 99h59m59s Counting Range No-voltage Required Time Timer Counter



Datalogger EL-USB-5  
Counter, Event and State USB Data Logger  
<http://www.lascarelectronics.com/>

the datalogger will record the duration between the periods when the sun was shining, it will also timestamp each event after you've recorded your data. You can view the information on your computer you can do it in graph form and exported to Microsoft excel for further processing

## (option three)

you can connecting output from the relay to a RS 232 connector and have the device record the data in weather display software (not yet implemented or tested)  
More information to follow

how to make the connectors for the analog clock

