



Digital Radiation Screen - Introduction

This Digital Radiation Screen design is intended to be used to screen a digital sensor from direct sunlight and wind.

The digital thermometer used in this case is wired. This means that the cable will need to be threaded indoors by some means. Make sure that the sensor is weatherproof, as it may be exposed to considerable humidity outside. (A wireless thermometer would still have a transmitter unit, which could not be incorporated into this design.)

Naturally all work must be carried out carefully with regard to safety. All necessary permissions need to be sought regarding siting of the unit.

The chart below attempts to summarise these points clearly.






Pros	Cons
It is made from materials which are obtainable in DIY stores.	Some of the materials work out rather expensive, costing before starting is essential.
Only basic tools are required for the construction.	An ability to measure, saw, drill, screw is needed.
The louvred effect shades the sensor from the sun but allows the air to circulate.	There is only room for the sensor in the screen. This means that the cable will need to be threaded indoors to the control unit.
The bead spacers are easy to obtain and are just the right size.	The beads need to create a gap big enough to allow air circulation. However it should mean that the curve of the saucers still overlap each other, so that you cannot see through to the centre.
This example is post mounted which means that there is no heat radiating from walls and the weather station can be set at the correct height. It can however be wall mounted, especially if it needs to be near somewhere for threading the cable indoors.	The fencing post will need to be securely set into the ground. A hole will be needed in all in all instances for getting the cable indoors to the control unit.



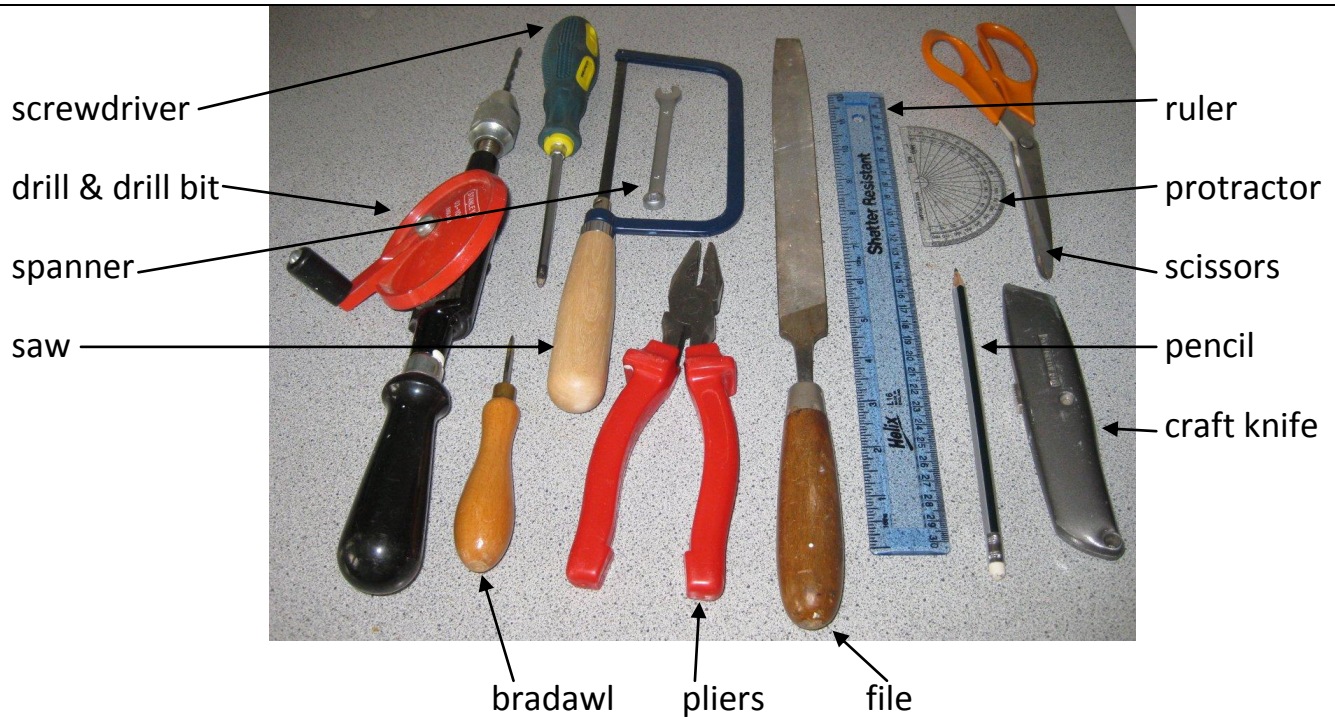
Materials

These materials can be a little expensive. Use this page as a shopping list to go and check availability and to try to estimate the final cost. It may also help to check the tools (and therefore skills) which are needed. Tools and materials should be used with full regard for safety.

	Materials
	<p>3 x 4mm diameter threaded rods</p> <p>Bracket (to hang the radiation screen with)</p> <p>Nut, bolt and washer (to secure the first saucer to the bracket)</p> <p>Matching 4mm washers and nuts (check to see that they fit the threaded rods)</p> <p>Beads to act as spacers (these examples are 6mm deep)</p> <p>Screws (to affix the bracket to a post or wall)</p> <p>Thick wire (or cannibalised giant paperclip)</p>
	<p>10 x 16cm diameter plastic plant pot saucers</p>
	<p>An alternative to the beads is to use plastic tubing, which can then be cut into spacer beads. It is not easy to do this accurately, but it could be used as a last resort.</p>



Tools



Making

Do read the introduction sheet carefully before embarking on this project. This will help you decide if this design meets all of your requirements. Naturally all work must be carried out carefully with regard to safety.

These instructions are as specific as they can be, but you may find that you need to make adjustments to suit your needs.

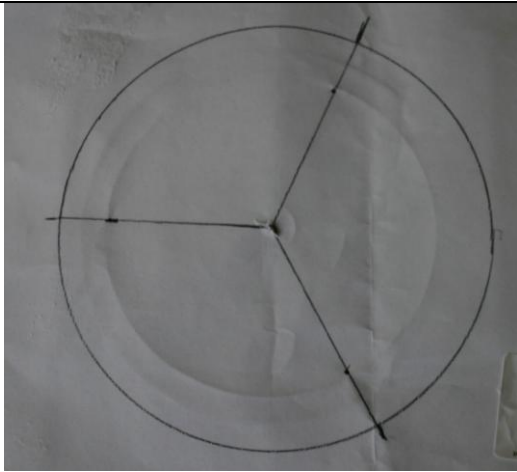
Zoom in to look more closely at the photographs, and look at more than one photograph. Read ahead so that you understand the sequence for putting the screen.



Select white plant saucers which are about 16cm in diameter. Earlier tests with smaller ones showed that the temperature sensor was not being shaded enough and the readings were not correct.

The colour must be white to reflect the heat from the sunlight. You may need to shop around to locate these, but they are available.





Make a template to help drill three holes accurately.

- Draw the circle to the correct size by drawing round one of the saucers.
- Mark the centre point.
- Use a protractor to put radii at equal intervals of 120 degrees.
- Put a mark on each one ready for drilling; just inside the flat section of the saucer.



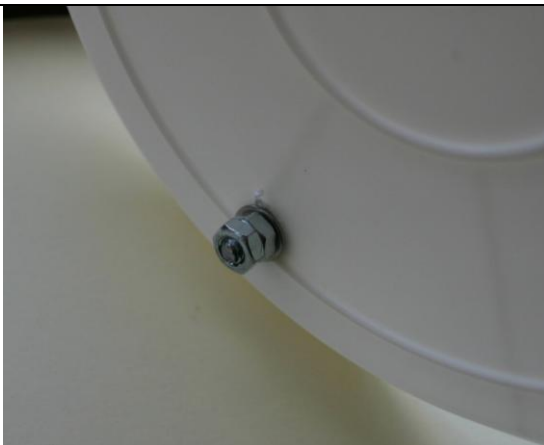
Drill holes using the template. All of the saucers will need these holes.

Cut a circle out of the middle of all except the top and the bottom saucers. This may be best done with a craft knife.



Cut the threaded rods to length. (In this instance it was about 16cm). Use the file to make sure that no rough bits stop the nuts going onto the thread.

Each rod will need to have two nuts threaded on to one end. Having two means that one will lock the other. Add a washer to each.



Thread a prepared rod through each of the three holes in the top saucer.





Drill a hole in the centre of the top saucer and use a nut and bolt to attach it to the hanging bracket. This has to be done at this point, as it will not be possible after the rest of the saucers are added. In this example a simple shelf bracket is used.



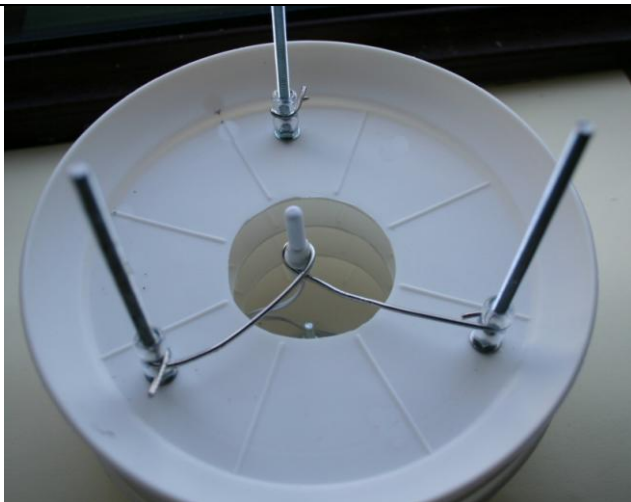
This shows the prepared top saucer. A washer and a nut have been added to secure each rod. Add two spacer beads onto each rod before adding the next saucer.



As you add the second saucer, thread the temperature sensor between it and the top saucer. Thread it down the centre hole.

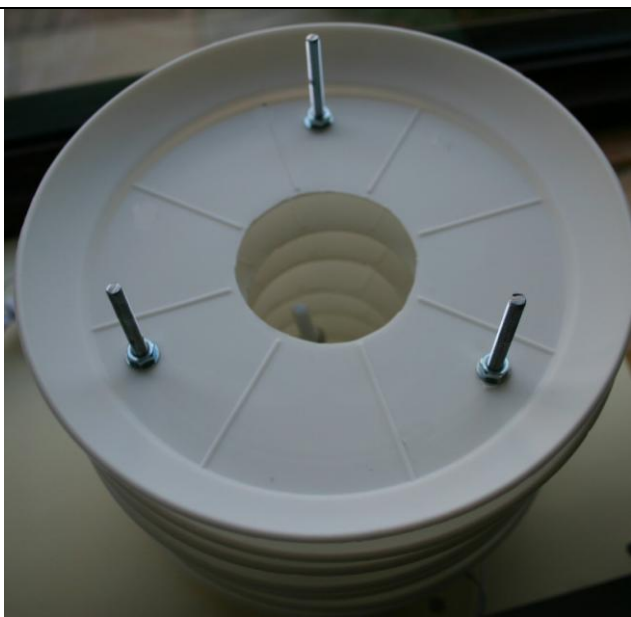
On each level add washer, nut and two bead spacers before the next saucer. In this picture the third saucer has already been added.





When three saucers have been added to the top one in the same fashion, use thick wire to secure the temperature sensor in a central position.

(This wire was taken from a very large paper clip. This meant it was easy to bend, but quite strong.)



Continue to add the rest of the saucers, using washer, nut and spacer beads each time.



Make sure that the temperature sensor remains central.





Add the final saucer, which has no central hole cut into it. Secure with washers and two nuts (to lock them).



The radiation screen can then be attached to the post. It will need to have somewhere weatherproof for the unit which has the controls. Perhaps the cable could be threaded through a window frame so that the control unit can be indoors.

The Digital Radiation Screen is fastened to a post. To see the correct height, and useful facts about where to position a weather station visit ;

<http://www.weatherforschools.me.uk/html/settingup.html>

and

<http://www.weatherforschools.me.uk/html/moresettingup.html>

The cable has been secured to stop it moving.

All necessary permissions need to be sought regarding siting of the unit.



The control unit can be placed in a sensible location. Here the wire has been threaded through the window surround so that the unit can be placed on a nearby window sill.

