Building a Wooden Double Deluxe Weather Station

This design is simply a guide. It is intended to be made by adults taking sensible safety precautions. The user is responsible for his/her own wellbeing and safety.

This Stevenson Screen design is intended to come as close as possible in its functions to a purchased Stevenson Screen given the limitations of average DIY skills and materials.
The weather station provides for circulation of air whilst stopping most rain and wind. The whole should be painted white to reflect sunlight. The screen should be mounted on the north facing side of a post so that the bottom of the thermometer is 125cm from floor level.

A balance has been struck between the requirements of a good quality screen and the practicality of making one from scratch. Similarly there may be a compromise between expense and a desire to get the best conditions for good quality weather data collection. Naturally all work must be carried out carefully with regard to safety.

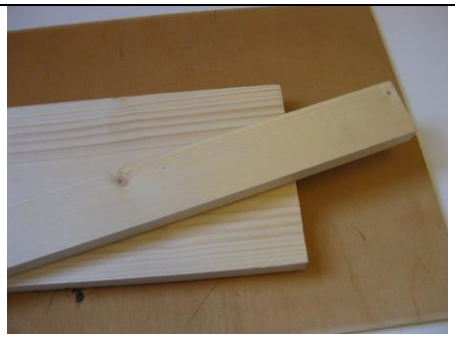
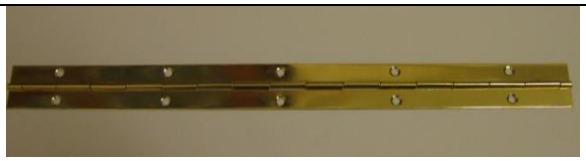
The chart below attempts to summarise these points clearly.

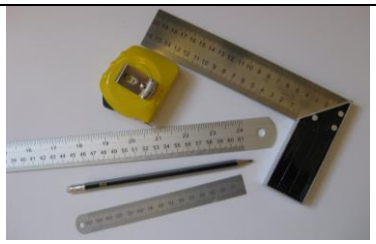
Pros	Cons
It is made from materials which are obtainable in DIY stores.	Some of the materials work out rather expensive, costing before starting is essential.
Only basic tools are required for the construction.	An ability to measure, saw, drill, screw and keep things fairly square is needed.
The double vent holes allow air to circulate but do not let in the rain or wind because they are staggered.	Due to the need to restrict direct wind there cannot be as many holes as one might like. This is so that the holes on the inner and outer layers do not co-incide.
The inner layers have been made so that they can be removed. This example used pegs to secure them, so that they can be removed for cleaning.	It can be hard to clean between the two layers, especially the inner and outer roof.
There is a double roof and a slatted base as required for good weather data collection.	The roof, centre back and base sections are made from larger pieces, and may mean you have to buy more wood that you need. If possible these could be purchase as offcuts from a timber yard.

The instruments are hung centrally to the space. This means that the air can circulate round them.	
It is post mounted which means that there is no heat radiating from walls and the weather station can be set at the correct height. This also makes facing the correct direction more practical.	The fencing post will need to be securely set into the ground.

Materials

These materials can be quite 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.

	**Wood** For sides, door and some of the back – planed timber - 44mm x 18mm x 2100mm For the base and centre back - planed timber - 144mm x 18mm x 2100mm (offcuts of a similar thickness would be better) For the door and baffles - plywood
	Fittings 1 x magnetic catch screw covers
	1 x length brass chain to stop the door from dropping down 2 x eyes to secure chain
	1 x continuous hinge (300mm) (aka piano hinge) These can be cut to length using a junior hacksaw
	Glass paper and sanding block

	Materials for weatherproofing – if this is done carefully the weather box will last longer - Primer Undercoat White gloss Paintbrush Brush cleaner
	Tools and materials for filling screw holes and sticking parts - Wood filler Filling knife Glue gun Glue sticks
	Measuring tools – to measure sizes, and for keeping the construction square - Tape measure Metal ruler(s) Pencil Set square
	OtherTools - Screwdrivers (to match screws) Hammer Panel pins Screws (the size depends on the thickness of the wood etc.)
	Saw NB – The saw you use will depend on your requirements and experience. The wood needs to be cut with minimum damage, so the teeth of the saw should not be too big.
	Drill Bradawl Countersinking tool

Making

Do read the introduction sheet carefully before embarking on this project. This will help you decide if this weather box meets all of your requirements.

These instructions are a specific as they can be, but as the instruments to fit in may differ the measurements have been omitted.

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 box together.

Measure the instruments that you want to fit into the weather box. Calculate the measurements accordingly.

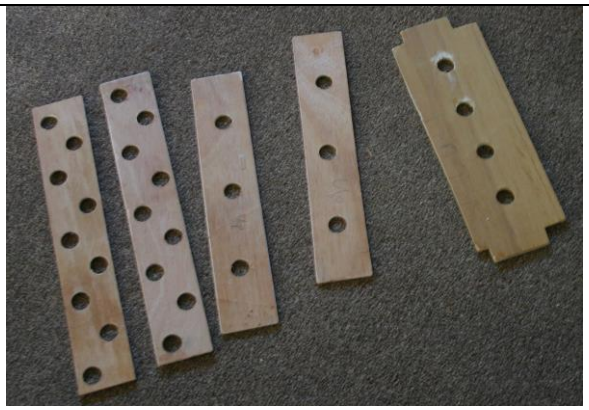
The ventilation holes are 20 mm. in diameter. Those in the back have been positioned to avoid the area which will be against the post that it will be mounted on.

The top section is sloping ready for the outer roof. The slope of this one was later adjusted so as not to be so steep. The cut out section is to take the inner roof.

The bottom of the sides is angled to allow any water to drain out quickly.

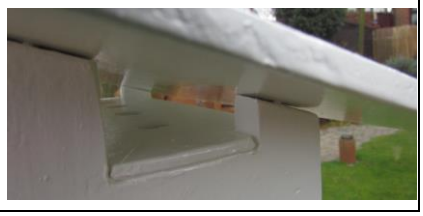
The sides are joined to the back by drilling and countersinking holes and then screwing the sides to the back. The block at the back is ready for the cross pieces that will hold the instruments.

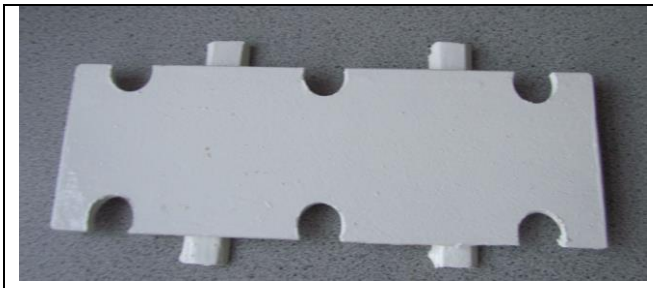
Two pieces of wood to form the door frame are fixed between the sides. The outer floor pieces are fixed to the sloping ends of the sides. These do not meet, in order to provide ventilation. The gap in the bottom sections is shown more clearly here in the image on the right.



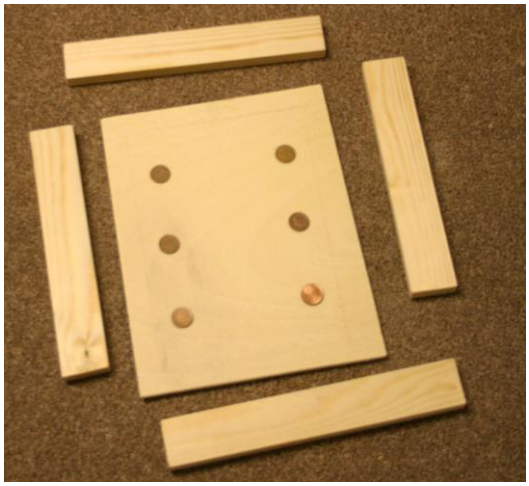
Prepare the baffles to stop direct draughts from causing wind chill inside the weather box. The holes are drilled so that they do not coincide with this on the other skin of the box. Left to right they are two side panels, two back panels and the second layer of the roof.

The ends of the roof one are cut so that is can rest on the cut out section at the top of the sides. This can be seen in this picture of the finished box.



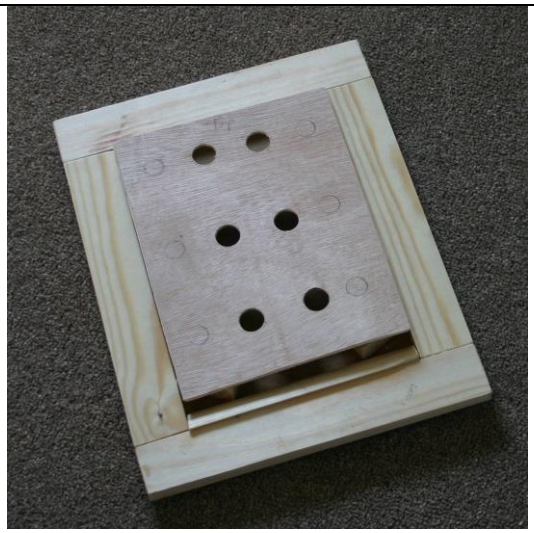


This was found to be the best method of making the inner skin of the bottom of the weather box. It simply rests in place. This means that it can be removed for cleaning. The two strips of wood lift the plate to create a ventilation slot.



Build the door using lengths of wood and an oblong of plywood. Cut a series of ventilation holes in the plywood. Remember that another piece of plywood will make the inner skin for the door. This will have holes in different places to prevent a direct draught. This means there cannot be too many holes. Use glue and tacks to secure the plywood to the frame created by the lengths of wood.

A piece of quarter dowel is used to prevent any water ingress from staying inside the door. Small blocks of wood are used to mount the inner skin onto. The lower ones are placed at an angle to encourage drainage.



The inner skin is stuck onto the blocks of wood. The circles drawn onto this one show where the outer ventilation holes are. The photograph below shows the gap between the inner and outer layers.

In order to make the side baffles removable for cleaning they were affixed using pegs and holes. A plastic peg set into a small block of wood (see right.) The strategy used here was to place the pegged blocks in place, then to stick the baffle to them and weight them down as they stuck. This made it possible to get the positions correct.

All parts were thoroughly painted. This included primer, undercoat and top coat. A drying rack was constructed to speed up this process.

This is inside the finished weather box. Two cross pieces have been put on the back for hanging the thermometers on.

The long piano hinge can be seen at the bottom of the door.

This shows how the thermometers are hung. The lower cross piece helps to keep the thermometers stable. This is especially useful when a button needs to be depressed to reset the thermometer.
The magnetic catch helps to secure the door. The brass fastening is for a padlock to prevent the thermometers being reset before readings are taken. This is useful in an open site.
The chain has been cut to length so that the door lowers down to a horizontal position. Two eyes have been used to secure the chain to the door and to the frame.

		The Stevenson Screen is fastened to a post. To see the correct height, and useful facts about where to position a Stevenson Screen visit ; http://www.weatherforschools.me.uk/html/settingup.html and http://www.weatherforschools.me.uk/html/moresettingup.html