

Model Ship World Data Sheet

Subject

Compiled by: Peter Visser

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Building a Display Case

Original post: <http://modelshipworld.com/phpBB2/viewtopic.php?t=15099>

The original posts have been edited to better fit the style of the article. [Ed.]

Introduction

If you're anything like me, you hate to see all your painstaking work covered by a layer of dust. That, and the fact that although everybody knows that these models don't usually have a lot of moving parts, somebody is going to come along and try to trim a sail or basically touch something that wasn't meant to be handled. That is where a display case is invaluable; it protects the model from the elements (dust mostly) and clumsy or inquisitive viewers.

This tutorial allows a reasonably attractive display case to be built without a lot of fancy power tools or advanced carpentry skills.

Design

I realize that there is another tutorial in the side bar written by Bob Wilson and it is excellent. As with anything there are a multitude of methods, this is simply another way to skin the proverbial cat.

This case is roughly 18"x 40" and is 30" in height. I haven't put it on a scale but I would guess it weighs about 60 lbs (about 27kg). The design incorporates two separate components; the base and the case. The glass case is intended to fit into a slot in the base and lifted clear (over the top of the masts) in order to set the model atop the base.



Please note that lifting this type of case is a two person job because of the size and weight.

Tools

Tools necessary for the base:

- a. Circular saw for cutting plywood,
- b. Square and measuring tape for accurate cuts,
- c. Mitre saw or mitre box and handsaw for the 45 degree cuts,
- d. Portable drill for pilot holes,
- e. Wood filler,
- f. Carpenter and CA Glue,
- g. Various grades of sandpaper,
- h. Hammer and finishing nails,
- i. Carpenter glue, and
- j. Your favourite colour of paint or stain.



Figure 1. - Required Tools

Preparation

The first step is to determine the size of your display case. I generally add 8cm to the extreme length and breadth and 4cm to the height of the model. I try to avoid the 'ship in a bottle look' and give the model a bit of space.

Then it's time to go to your local glass shop and get it cut. My preference is to have the front and back cut to the extreme length of the case and have the ends of the side sit inside the sides when they are assembled. The top is then cut to lie on top of the ends and the sides. See Figure 2.

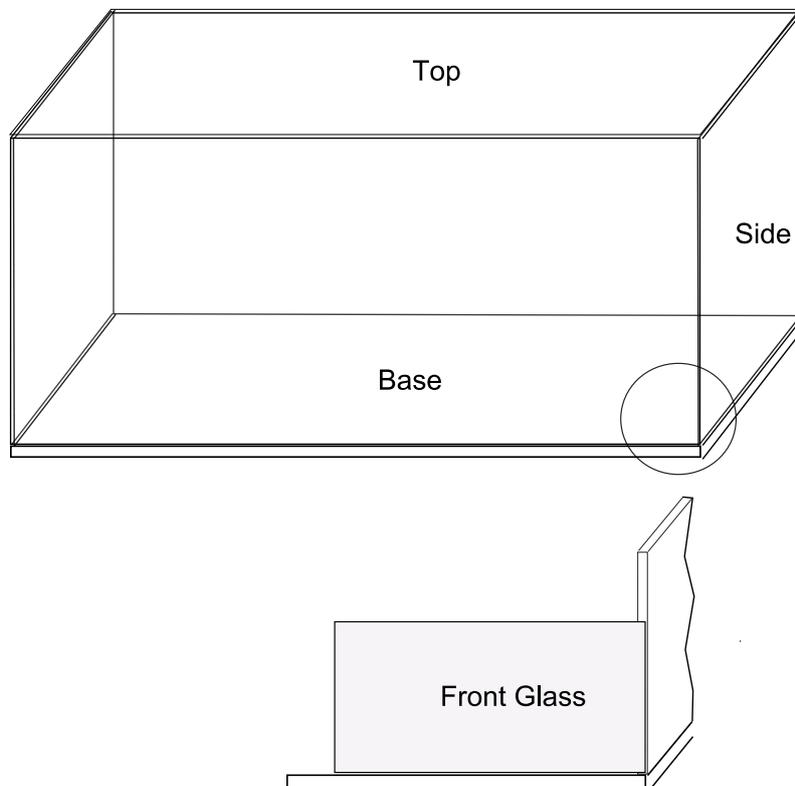


Figure 2. - Placement of glass panels

The glass thickness used in my case is 4 mm. It was recommended by the glass shop owner due to the size of the panels. Smaller cases could probably use 3 mm glass; however, thicker glass will be necessary for larger cases due to the larger panel size and increase in glass flex.

A viable alternative for safety (shatterproof) and weight factors is plexiglass or acrylic sheet. However, as Mark Taylor points out on-line some that acrylics have differing properties – please investigate before using any materials mentioned here. For instance Mark states that Lexan may have less flex than Plexiglas but when it shatters, it goes into tiny shards. Plexiglas has a lot of 'give' before it breaks and usually breaks into rather large pieces. From my experience with Plexiglas, you may want to think about the so-called double-strength (double the standard thickness) for a case of any size. Note, Lexan is the stuff they make race car windshields and aircraft cockpits out of.

Mark also points out that with glass, there is no need to use tempered, but for a case of any size, get at least double-strength, maybe even triple. The weight definitely goes up but the safety factor is worth it. Especially if you have young children or grandchildren, consider going with some of the thicker materials. If in doubt, talk to the glazier.

As bizibilder has also pointed out on-line, in the UK at least, there are rules about the kinds of glass that are "allowed" for display in public (e.g. at exhibitions). I'm no lawyer but if you are spending out on components it would be wise to get glass of the approved quality?

I prefer glass because it is more resistant to scratching which is important when you wipe the glass to clean it. I am also afraid of the plexi fading over time. On the downside, it is heavier.

Construction of the Base

Once the glass is cut, you can start work on the base. I use good one-side plywood. It's cheap and relatively inexpensive. The baseboard bottom shown in Figure 3 is $\frac{3}{4}$ " and the top layer is $\frac{1}{2}$ ". Cut the base bottom layer to the extreme dimensions of the glass sides and ends. The top layer is then measured and cut to the same dimensions minus the thickness of the glass sides and ends. Fasten the two sheets together using wood screws and you should end up with a baseboard that looks similar to Figures 4 and 5.

As Keith (Jack Nastyface) has stated on-line, the base can be 'dressed up' before the base is completed. I like to use green felt as I find it provides a nice sharp contrast to the model itself. It is my thrifty solution in giving it the finishing touch.

However, there are lots of other options. A good quality wood veneer or a sheet of fine grained wood would also be suitable material to dress the base. This can be stained, lacquered or painted. Similarly, matching the base veneer (if used) with hardwood mouldings in oak, mahogany, cherry etc. is another option.



Figure 3. - Plywood pieces glued and screwed together



Figure 4. - The baseboard in side-view



Figure 5. - The baseboard in profile

The next step involves the cutting (Figure 6) and attachment (Figure 7) of your preferred wood moulding to the baseboard. Keep in mind that the moulding should have the same 'height' as the two thicknesses of plywood together.

This is where a good mitre saw comes in. Once all four lengths are cut, attach them to the base using wood glue and finishing nails as shown at Figure 8.



Figure 6. - A good mitre saw is essential for a clean cut



Figure 7. - Applying wood glue (note that plywood is absorbent)



Figure 8.- The moulding glued and nailed in place

Now that all the mouldings are attached, you will be left with a nice neat groove, the thickness of the glass or acrylic sheet, into which the glass will fit.

It's time to get out the handyman's other secret weapon, wood filler! If you're like me, there will be nasty gaps at the corners, and nail heads showing. Countersink the nail heads and fill the divots and corner gaps with wood filler (Figure 9) and then sand (Figure 10).



Figure 9. - The moulding 'puttied' up with filler



Figure 10. - Moulding sanded to a smooth finish

After a good sanding - Viola! - a base reveals itself (Figure 11).



Figure 11. - The base ready for a lick of paint or stain

Constructing the Case

It's now time to prepare the glass panels and mouldings for assembly.

What I did next was to glue ½" corner trim to the inside edges of the glass. This adds to the surface area to which the glass will be joined along the corners.

The plastic 'L' shape trim is the stuff used to protect wall corners that I picked up from one of the big hardware stores. The type I bought was clear, but I have seen it in white and brown also. Again, it is cheap and easy to procure.

Ideally a solid colour moulding should be used. This will hide the adhesive used to bond the trim to the glass. It is a good idea to score the glass surface where the trim will be glued to get a stronger bond.

Here are a couple of photos of this stage (Figures 12 and 13). The level was used simply because it provided a straight edge to butt the trim up against so that it was even with the edge of the glass.

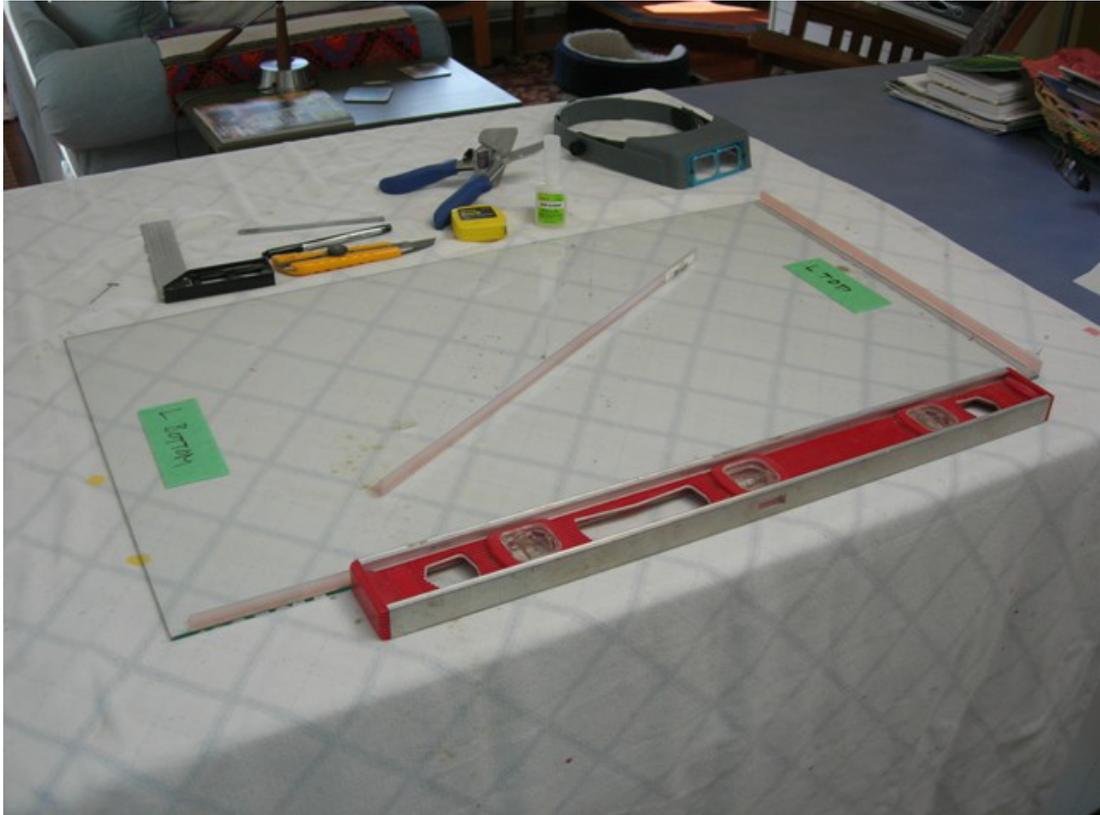


Figure 12. - Gluing the corner strips to the glass panels

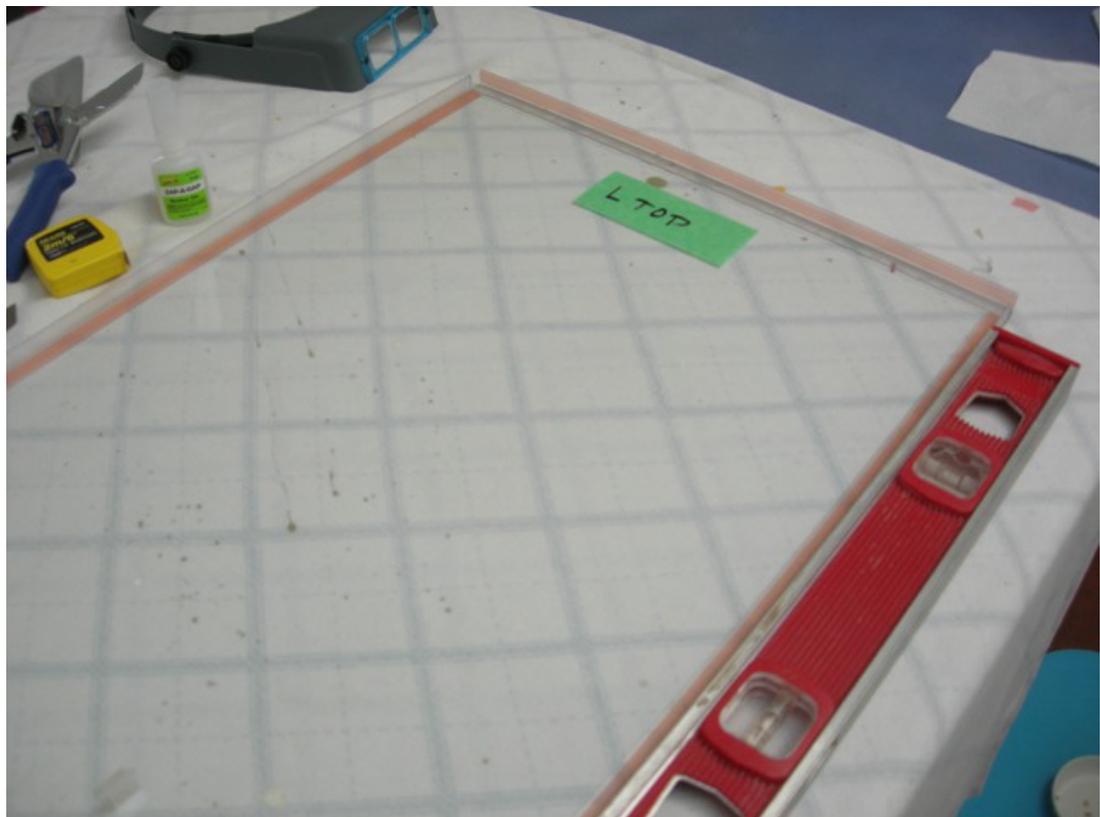


Figure 13. - The 'completed' glass panel ready to be joined

The next step involves gluing the glass sides to each other. It is a bit of a nail biter when you're working by yourself, let me tell you. Visions of toppling glass crashing to the ground were running through my head.

I have used CA glue and it is necessary to score the glass to ensure a stronger bond. The CA glue was used for its quick bond properties, but contact cement might be considered as well. I 'dot' the CA glue onto the plastic trim and then attach it to the glass.

Epoxy glue might also be used, but you will need to work quickly to prevent it curing before applying it to all of the glass, especially for larger panels. There are also specialised glues available to ensure a good bond for acrylic panels that ensures no discolouration (clouding) of the acrylic at the weld which you may get with CA type glues.

Once three of the sides have been glued, start installing the outside corner trim. Due to the size of the case I opted for the larger outside corner mouldings which have a $1\frac{1}{8}$ " outside dimension and $\frac{3}{4}$ " inside dimension.

I decided to paint the mouldings prior to their installation so there would be less masking when it came time to apply the paint. It also allows you to paint the inside corners. To bond the corner mouldings to the glass, I used clear silicon.

When all four sides have been glued to each other and the corner mouldings siliconed to the glass, I used a number of lines (see Figure 16) to hold/clamp them in place until the silicon cured. I realize that F-clamps might have worked better, but this is what I had at hand.

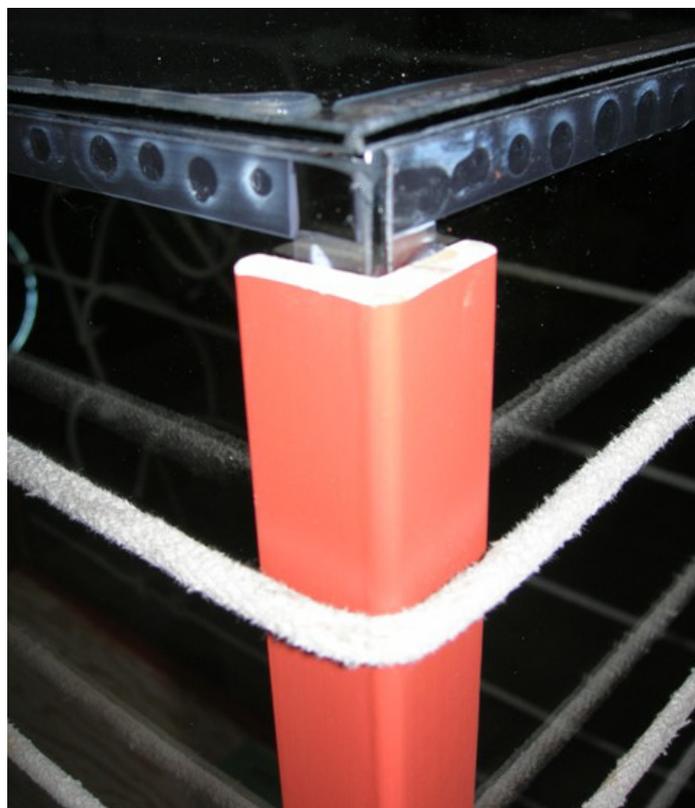


Figure 14. - Fitting the mouldings

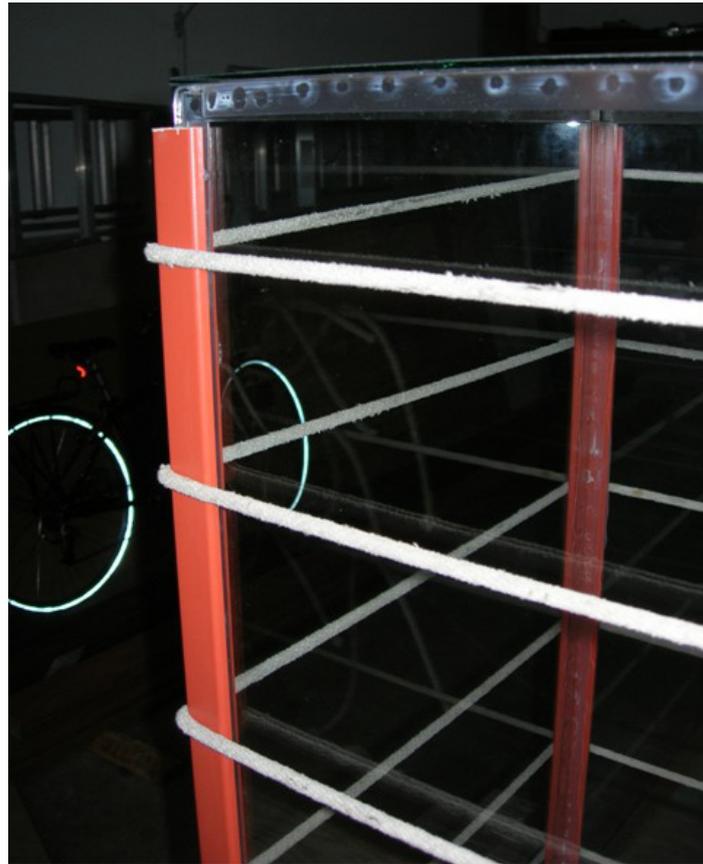


Figure 15. - 'Clamping' the moulding



Figure 16. - The case set aside for drying

I left the corner mouldings overnight cinched down with the limes and then tackled the top mouldings when they had dried. This is where the mitre saw really came into its own. I was able to make neat accurate cuts for each length.



Figure 17. - Prepared moulding ready for fitting



Figure 18. - The moulding in place

The next step is to fill some unsightly gaps at the corners with wood filler, give them a sanding and touch them up with paint.

After the proper silicon had set, it was time to give the corners some attention with wood filler. I filled and sanded twice to get them as smooth as possible. Figure 19 shows the prepared case prior to painting.



Figure 19. - Touching up the moulding

Once that was complete, the trim was ready for a couple of coats of paint. That is what I did today, and I am reasonably happy with the results. As I mentioned earlier, it would have been better had I used a solid colour trim for the inside corners. Live and learn goes the adage.

Another little touch I added were some felt pads (Figure 20) that I glued to the bottom of the base. Alternatively, you may consider rubber feet that you can purchase from the hardware store or even some supermarkets. These will prevent scratches on any table or polished surface on which the case rests.



Figure 20. - Felt pads for under the base

So here is the unveiling of the display case (Figures 21 and 22).



Figure 21. - The 'finished' display case



Figure 22. - The 'finished' display case with my model

The above photo (Figure 22) shows my incomplete model in front of the display case. I will update the photo when the model is completed and placed in her permanent home.