

# Making Display Cases

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As Presented by Ray Peacock at the **October 2018** meeting of the **Model Shipwrights of Niagara**

## **BASES**

Bases are constructed in various forms of which sometimes consist of a mounting board, a base platform, a moulding frame and mounting feet/pads.

The mounting board must be flat and might be solid wood, or MDF or plywood finished on one side (the side facing upwards onto which the model is secured). It is cut square, and sized for a slip fit of the acrylic cover that sits over it.

A groove is required around the base into which the acrylic cover fits. This can be done with a router, but a degree of skill is required with this tool to make a groove to fit the cover exactly. Ray's method forms the groove in a simpler way.

A platform is screwed directly to the underside of the mounting board. It is cut larger than the mounting board to provide a rest for the acrylic cover and a support for a moulding piece which forms the outer edge of the groove. It can be a full sheet or simple mitred framing pieces.

The moulding frame may be a quarter round or some other framing shape that fastens to the base platform but outside of the acrylic cover to give it a finished look.

The base may be finished with rubber feet or felt pads to protect the cabinet shelf or furniture the case will be placed to display the model.

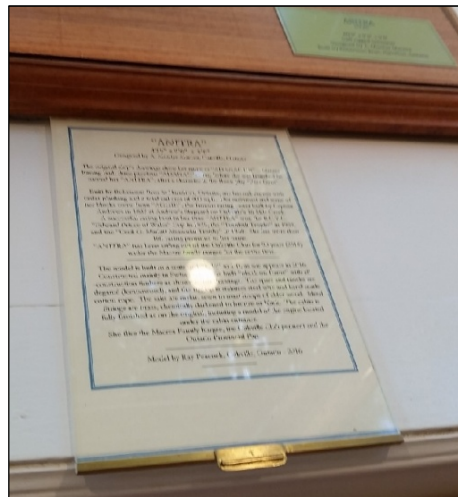


*The images above depict three different base constructions.*

The base is sized so that the acrylic cover extends 1.5" to 2" (3.8 to 5 cm) beyond the bow and stern of the model (3 to 4 " or 7.6 to 10 cm longer than your model), and 1" (2.5 cm) beyond the widest point of your model (2" to 5cm wider than your model) as measured across the hull or the yards.

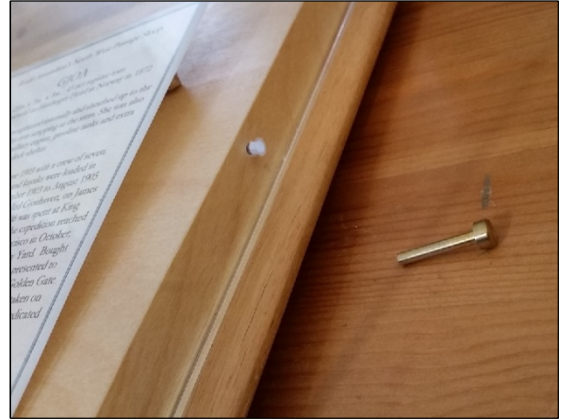
Nameplates are normally added to the mounting board to identify the model and the modeller. These can be anything from engraved metal such as brass, engraved plastic, or even simply paper. In the last photo above the nameplate is paper mounted to the underside of an acrylic sheet. In this example the acrylic was cut 1/8" wider than the sheet all around (1/4" overall) to allow some tolerance in lining up the paper label. A clear drying adhesive (3M Super 77) is sprayed onto the acrylic sheet and the paper is carefully rolled onto the tacky side of the sheet. Alternately the text side of the paper may be sprayed and the paper rolled onto the acrylic sheet. The edges of the acrylic were then sanded to touch the edges of the paper. The sanding technique is explained later in this document.

Ray sometimes likes to add a hidden slide-out drawer that provides more detail or a story about the ship or boat the model represents. Once again he types out the information onto a sheet and spray cements it to the underside of an acrylic sheet.



In the first photo above Ray has used brass channel edging with a small brass strip soldered to it to facilitate pulling the slide out. In the second he used a piece of the same molding as the base, with a small brass knob (Lee Valley).

Security of the cover can sometimes be a concern as people sometimes try to lift the display by the acrylic cover. They are startled when the cover separates from the base and this can result in the model being damaged. Ray`s solution to this problem is to drill and pin the cover to the base with a friction-fitted brass pin through each edge of the base.



## **COVERS**

Covers can be made of glass plate or clear acrylic sheets. The glass plate will need to be thicker and will be heavier and require a carefully made wooden frame. Acrylic sheets would be 3mm thick for small models or 5mm thick for large models. Ray`s demonstration was with his preference... acrylic.

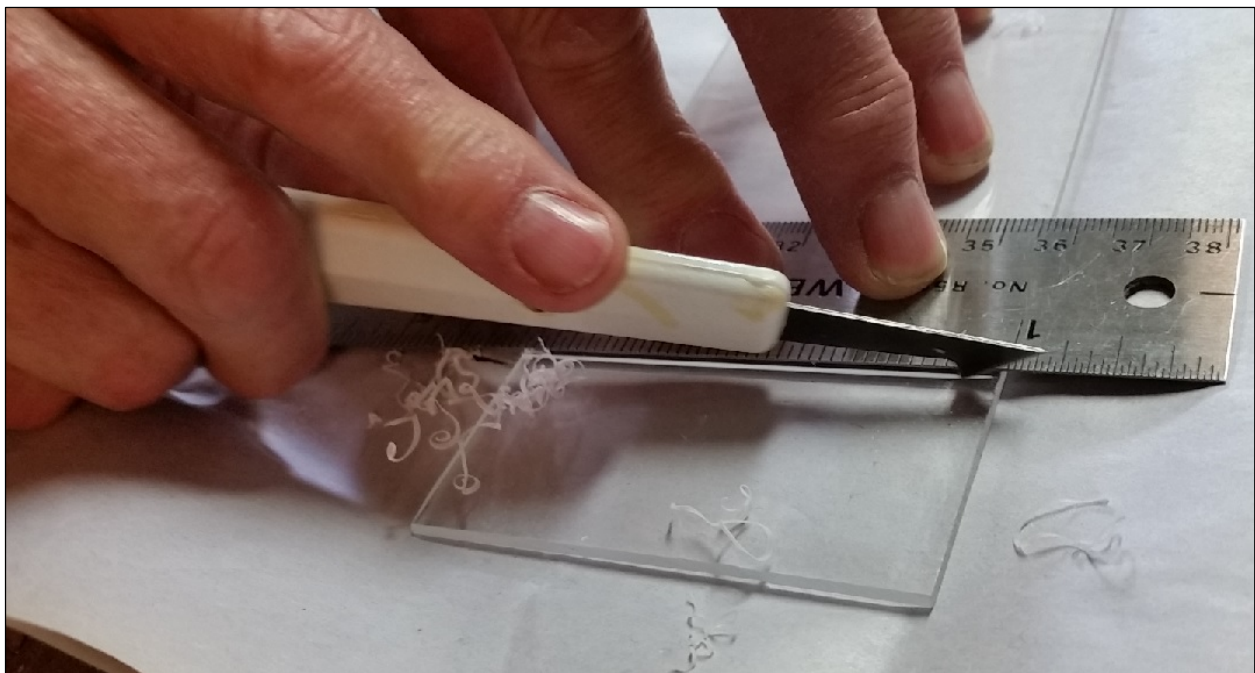
The tools necessary are the acrylic sheet, cork backed steel ruler (or some sort of straight edge), cutter, sanding paper (#150 and #100 grit) and pad, glue brush and/or syringe, acrylic solvent glue.



The acrylic sheet is supplied with a plastic film covering to protect it from any scratches. Do not remove the film while working the acrylic. In Ray's demonstration the protective cover was removed.

*NOTE: When all is done minor scratches can be removed by polishing them out BRASSO or toothpaste.*

All cuts must be at 90°. Mark the paper cover at both edges to locate the cut. With the sheet on a flat surface and straight edge guide on it at the correct location drag the cutter over the sheet multiple times to score the sheet almost completely through. Rotate the sheet 180° and again, with multiple passes, score the tiny end that remains after the original passes. Place the sheet so the score mark is just over the edge of your table and snap the sheet at the scored line.



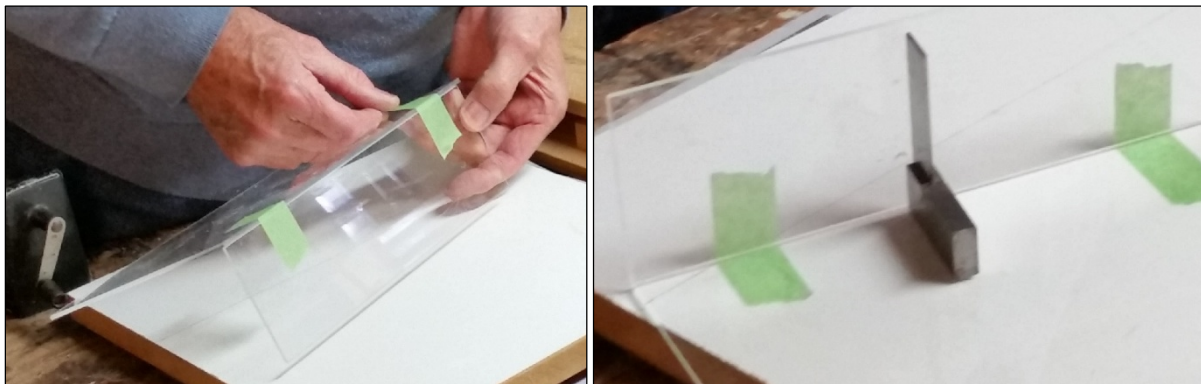
The above photos show the special acrylic cutter and the first passes starting before the top edge, necessitating the sheet needing to be rotated 180° to score the tiny untouched bit near the top edge.

Large sheets of acrylic can be cut on a table saw with the proper saw blade. Ray uses a 6" diameter 200 tooth x 1.57 mm wide saw blade on his table saw. The sheet must be moved at a steady speed so as to minimise melting of the acrylic.

The cut edge must be sanded smooth, keeping it square, with first #100 grit paper and finishing with #150 grit paper. Ray does this at the edge of his table, steadying his sanding by dragging his fingers along the table edge below the sheet.



Cut sheets are fitted by hand, taped and made square prior to tacking together with the solvent.



Once the sheets are properly assembled the joint is tacked in place with a dab of solvent applied on the inside of the joint by brush or syringe at several spots, but away from the location of the holding tapes. This is to prevent the solvent wicking at the tape locations and spreading onto the acrylic surface. The solvent wicks into the seam and melts (welds) the acrylic pieces together. Ray has two types of solvent in his shop: IPS Weld-On 4 by Johnson Plastics, and Plastic Weld by Plastruct. Water-thin CA adhesive can also be used, but while excess solvent cement just evaporates the excess application of CA remains on the surface. In either case he says you cannot leave the container open too long as the contents will evaporate very quickly.



Weld-On 4 and Plastic Weld need only about 15 to 20 seconds to bond. After holding for a short time until the solvent bonds the tapes are carefully removed and more solvent is then applied along the full length of the joint. Ray did suggest it might be prudent to tack two sides and one end, as the end would help to keep the fit at a 90 degree angle. This procedure is followed to complete the four sides and top of the cover.

If a perfect 90 degree edge has been sanded onto the acrylic sheet the resulting butt joint will appear to be solid and clear after the cement is cured. It is advisable to practice achieving this edge on scrap pieces of acrylic before making the case.

The edges of acrylic cases may be covered using self-adhesive ¼" wide copper tape of the sort used by workers in stained glass. This gives the appearance of a decorative narrow "frame".

### COVER ASSEMBLING JIG

As Ray has made a number of model display cases he developed a jig to assist in a one-man assembly, particularly of large covers.

The completed assembly consists of five (5) pieces: the base, vertical supports (A and B), and acrylic support table plates.



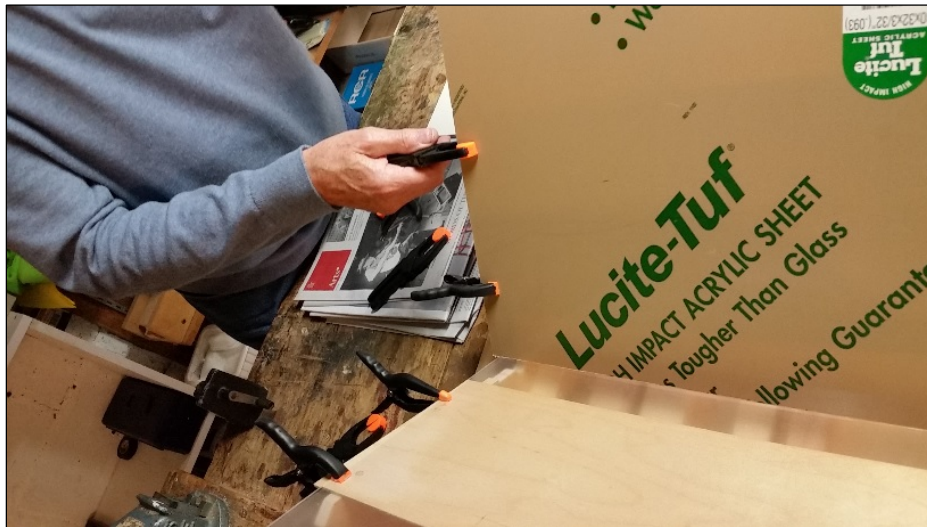
The jig stores in a flattened collapsed state to save space. Assembly begins by fitting the fixed vertical support (A) in position at one end of the base. These vertical end pieces have a 90 degree cut in them with a relief hole at the apex. They also have a peg dowel near the top and a stopper block near the bottom of the 90° wedge on both sides.



Next the moveable vertical support (B) is located in position to suit the size acrylic sheets being assembled. Ray has a number of support table plates to suit the span between A and B.

The support table plates have two peg holes near the top that perfectly match the peg dowels in the vertical supports. When the support table plate is assembled to the peg dowels the bottom edge rests against the stop blocks.

The jig holds the two sheets of acrylic butted at a perfect 90° angle, freeing both hands to work with and apply the solvent safely to the joint. Ray uses soft spring clamps over the acrylic sheet and support table plate to hold the sheets firmly together. The reliefs at the apexes ensure that the solvent is therefore restricted to the butt joint, and not to any holding tape used for cases made without the jig.



### **MINOR SCRATCHES**

Ray demonstrated how to remove minor surface scratches with household abrasives like toothpaste or BRASSO. You simply apply the toothpaste or BRASSO to a cloth and polish the scratch out. The fine abrasives in the toothpaste or BRASSO will do the work but it takes some time and elbow grease to get the job done properly.

**END**