The Building Jig

by Jack Gregory

The Soling One Meter building jig has gone through several itera tions since it was first developed in 1993. I built the first jig because I didn't think the t-bar suggestion in the original Stowe building notes was going to be a good solution for me. I knew I was going to build several boats, so a jig that could also serve as a shop "dry dock" was developed.

After I finished my first jig, I developed a two-page drawing package. This package, consisting of an assembly drawing with parts list on page one, followed by a full-size set of cutouts on page two, contained some dimensions and enhancements that were never actually part of the prototype. But others built jigs from the drawings, and there were few complaints, so I assumed it was ok.

The drawings were made available on the web, and have been downloaded hundreds of times. I have also answered many questions, and some refinements to the drawing were made. But it always had a few flaws. For one, the "full size" cutout templates did not come out full size, because of a limitation in the software used.

After my first jig was lent out and never returned (the loanee literally skipped town), I decided I needed to build a new jig. This one would be much beefier, as I was never satisfied with the light weight of the original, or even the beefed up thicknesses of the drawing version.

The jig you see on these pages is built entirely of 3/4 Medium Density Fiberboard (MDF), and some 3/4 square poplar stock. MDF is a superior jig material, as it is almost totally uniform in all directions, with no grain. It can be machined easily, though carbide tools are recommended. MDF's only flaw is its incredible weight. But for tooling, weight is not a drawback -- you want the thing to stay put. You can use a high-grade plywood, but the finish and ease of use of MDF is better, and the cost is lower.

You can buy a 2 by 4 foot panel of MDF at home centers. The new jig design can be cut completely from one piece of this, though it takes some planning. You will note on the drawing that the width is "12.00-e". "e" is a small amount, *epsilon*, that you need to compute, based on the width of your saw kerf (K), and the actual measured size of your piece (W x L).

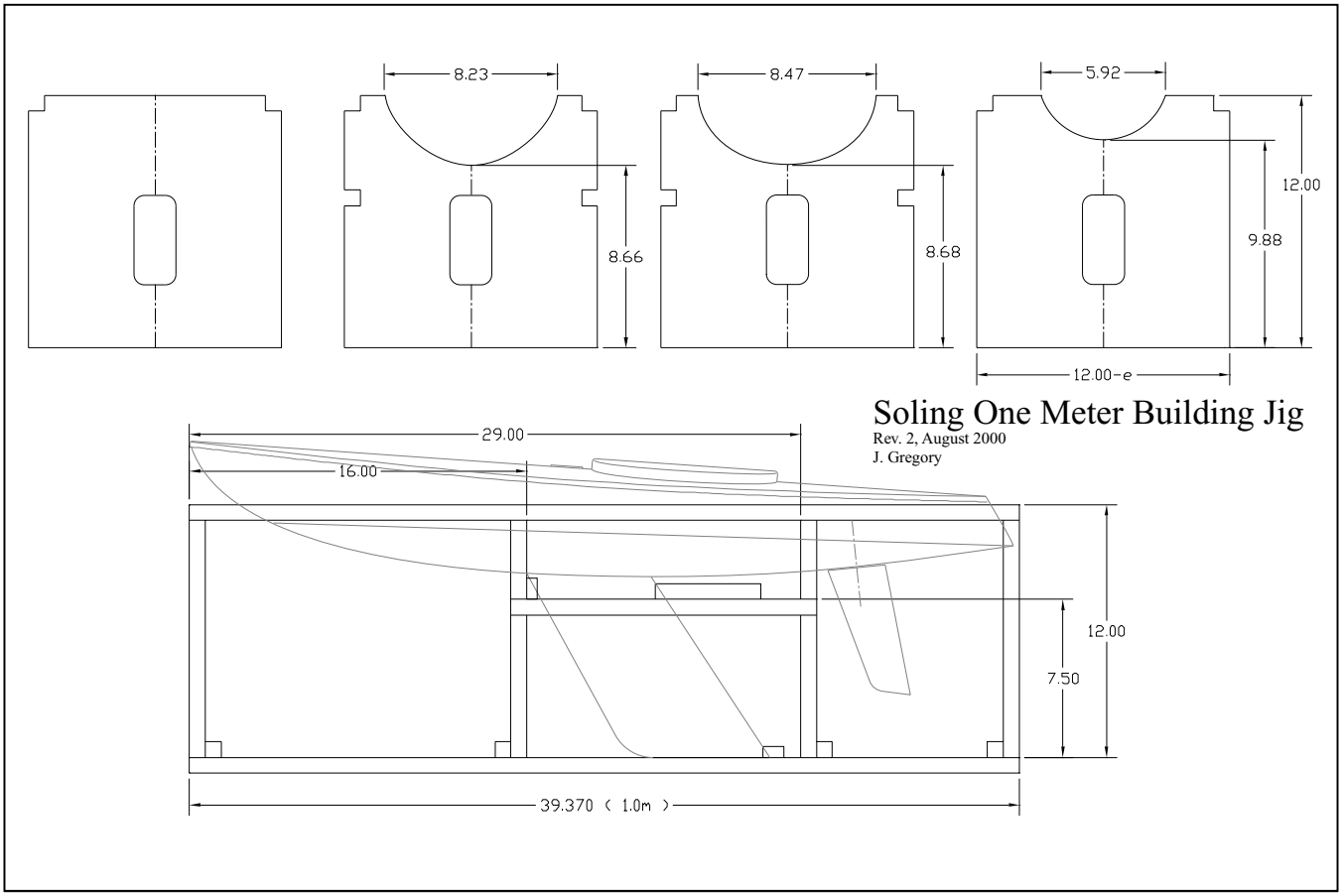
The goal is to have all stations precisely 12 inches high, but a little shy of that in width. You want the base to be exactly this width as well.

To save you some serious brain injury and possible traumatic stress from your junior-high school algebra, I have developed a formula you can just plug into. Just find the greater number:

e1 = 24+K-W

e2 = (48+3K-L)/4

So, if your kerf is 1/8 of an inch, and your panel is 24.25 by 48.00, e1 is minus 1/8. e2 is +3/32, so you should use e2, and your building width is 11 and 29/32. Actually, that is pretty painful to deal with, and I would use 11+7/8. In practice, you almost always will want e2, unless you have a board that is more than 3 kerfs longer than 48 inches.



With some planning, you can make one tablesaw setup at that magic number, and make all the cuts that use it: the long rip of the panel, the 3 station cuts from the other side, and the cleats that are also precisely that length.

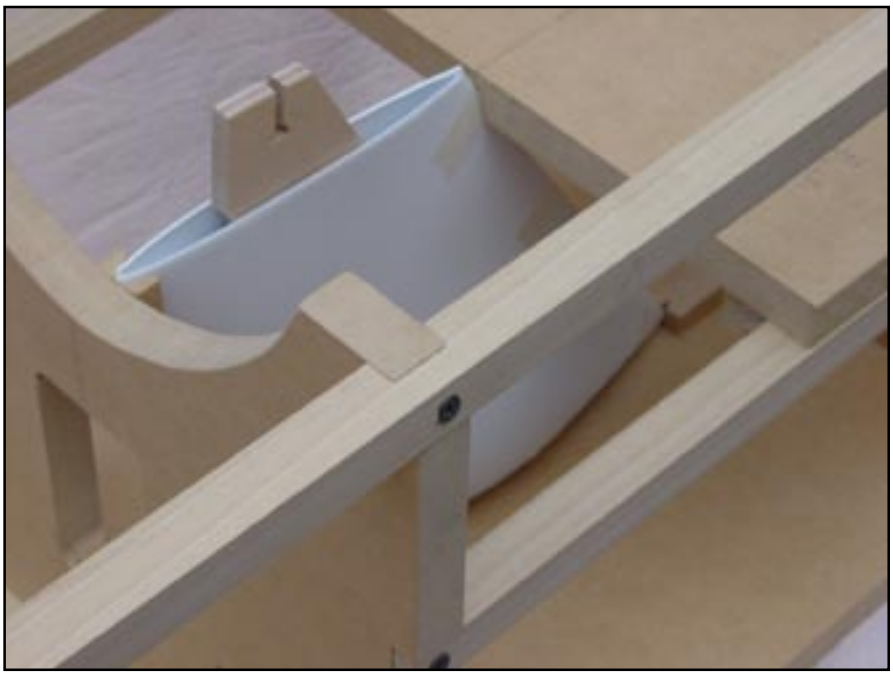
I cut the station cutouts and the windows using a router. I made a template for the windows, but I cut the hull cutouts freehand. Although people seem to worry about the cutouts, they are not critical. The boat isn't even supposed to touch them with the keel attached -- they only support the hull when the keel isn't there. They do not "shape" the hull in any way.

I interlock all parts using very tight dado and rabbet joints. The first jig I built (for an EC-12) actually dadoed the stations into the base, but I now think that affects the flatness of the base.

Little notched blocks hold the keel top front and lower back corners. The top rear corner is held by a sliding table that sits on the mid-rails. This sliding table has more 3/4 square stock mounted underneath, so that it can't move from side to side.

Before assembling, draw the centerlines on all the parts. ALL faces. You will use these centerlines for the next 20 years, so take some time and make them right. When assembling, use the lines, not the edges of the pieces.

I use drywall screws for assembly. Counter-sink the heads that go up through the base, as MDF does not compress well, and the heads would scratch everything. Once assembled, the jig should be finished, or moisture will change its shape. Use a clear finish like polyurethane to enable you to see all the centerlines.



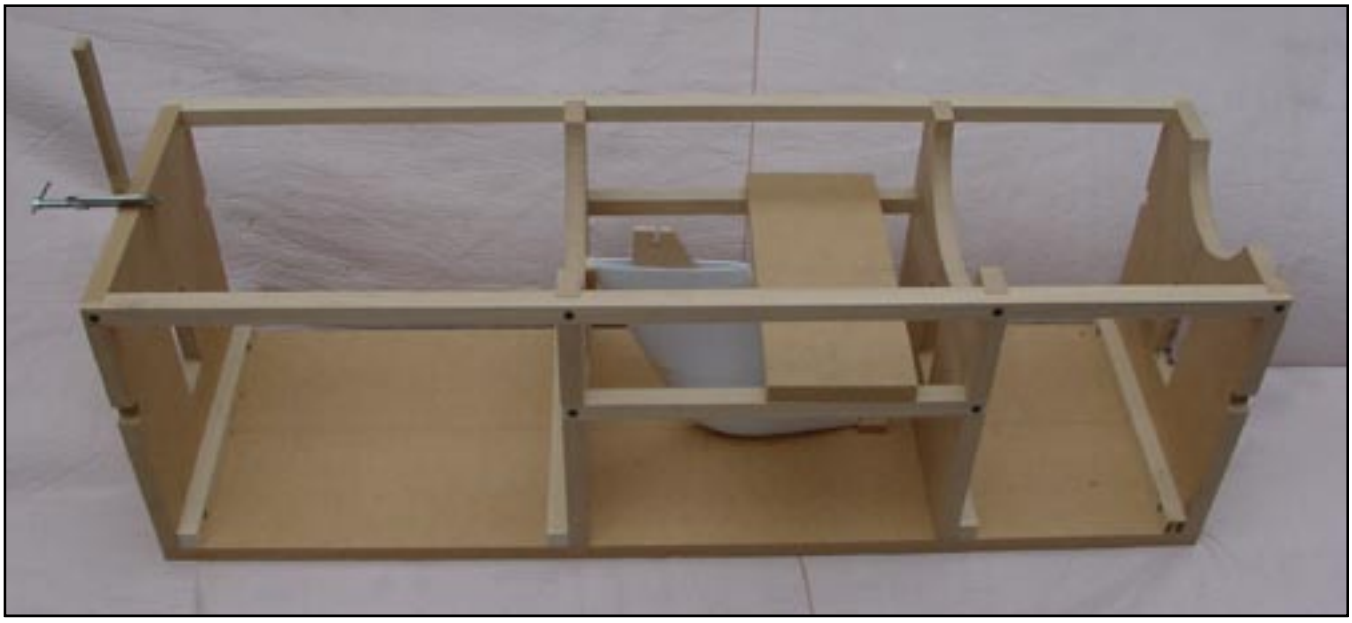
Close-up showing the slider in contact with the trailing edge top of the keel. Scrap MDF blocks are used for the front and base fixed capture points. All three points are notched on the centerline. Note how the front just touches station 16.

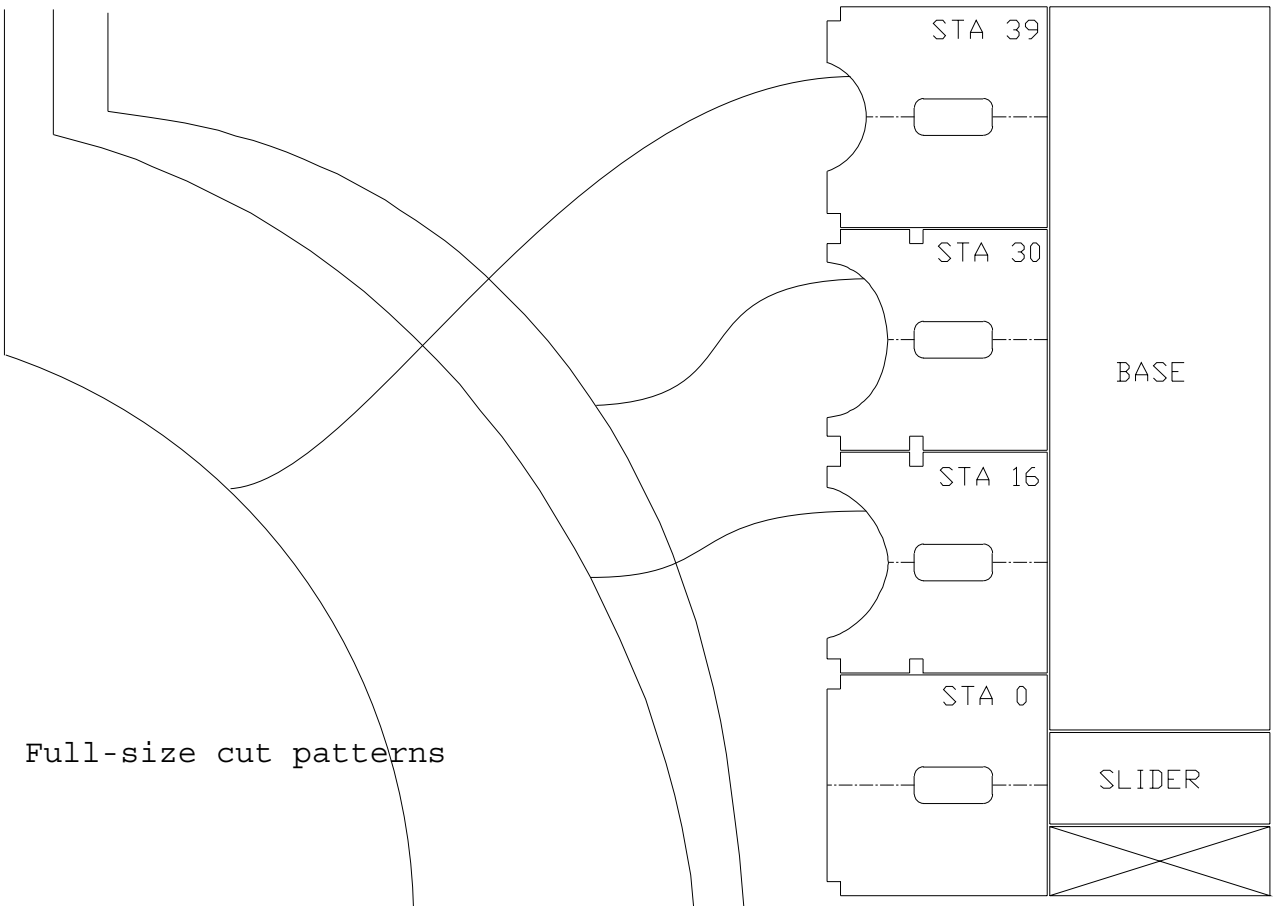
The windows allow you to look from the front to see the keel, and to look from the back to see the keel and rudder. A long rod through the rudder tube, which goes all the way to the base centerline, is how the rudder tube is aligned.

I clamp a piece of the 3/4 square stock to act as a bow stop when I need to. The old jig had this stop built into station 0, but it isn't worth it. You can play with fore-aft position of the keel by adjusting the hull position, so the same jig can be used to build boats at different ends of the permitted tolerances.

It is quite interesting to put other, non-jig-built boats into the jig. Some boats are so twisted they won't even fit. Other than this problem, the jig can be used as a measuring station. Just make sure the deck dimensions are taken along the deck, not parallel to the base.

The jig from the port side. The dado cuts in the end stations are an accident -- only the center stations need them. Sometimes, with the saw humming, it is hard to stop making sawdust! Both photos this page by Art Jacobsen.





Full-size cut patterns

Cut plan above for 2’ by

The aft face of STA 16 sho
16.00 inches from the fro
base and STA 0.
The aft face of STA 30 sho
29.75 from the front of S
The aft face of STA 39 sho
39.37 from the front of S
and flush with the aft fa
base.
See text to compute width
stations and base.

Cut Plan

Soling One Meter Building

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