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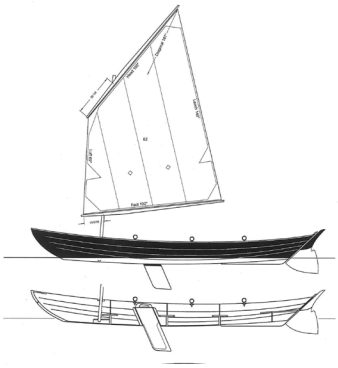
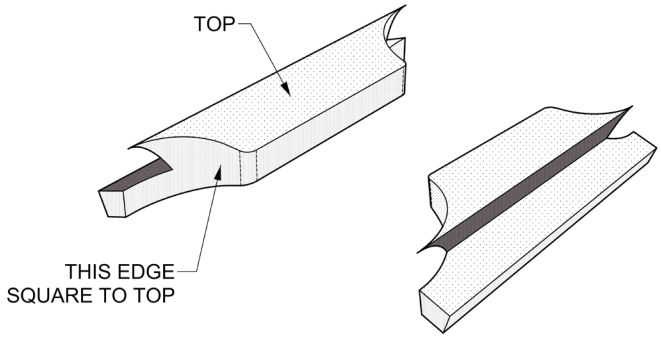
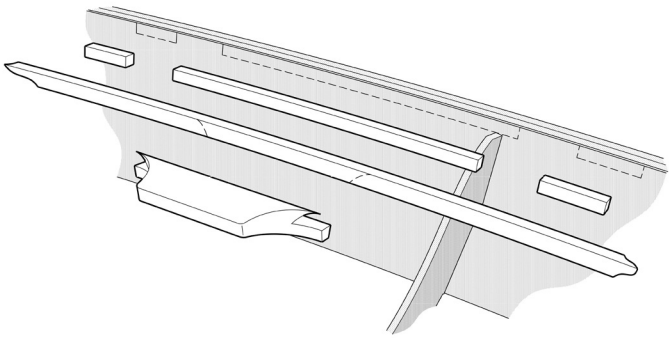
Installing Inwales in a Lug-Rigged Northeaster Dory

ADDENDUM: The "T.L.R.N.D.S.I."







April 2018

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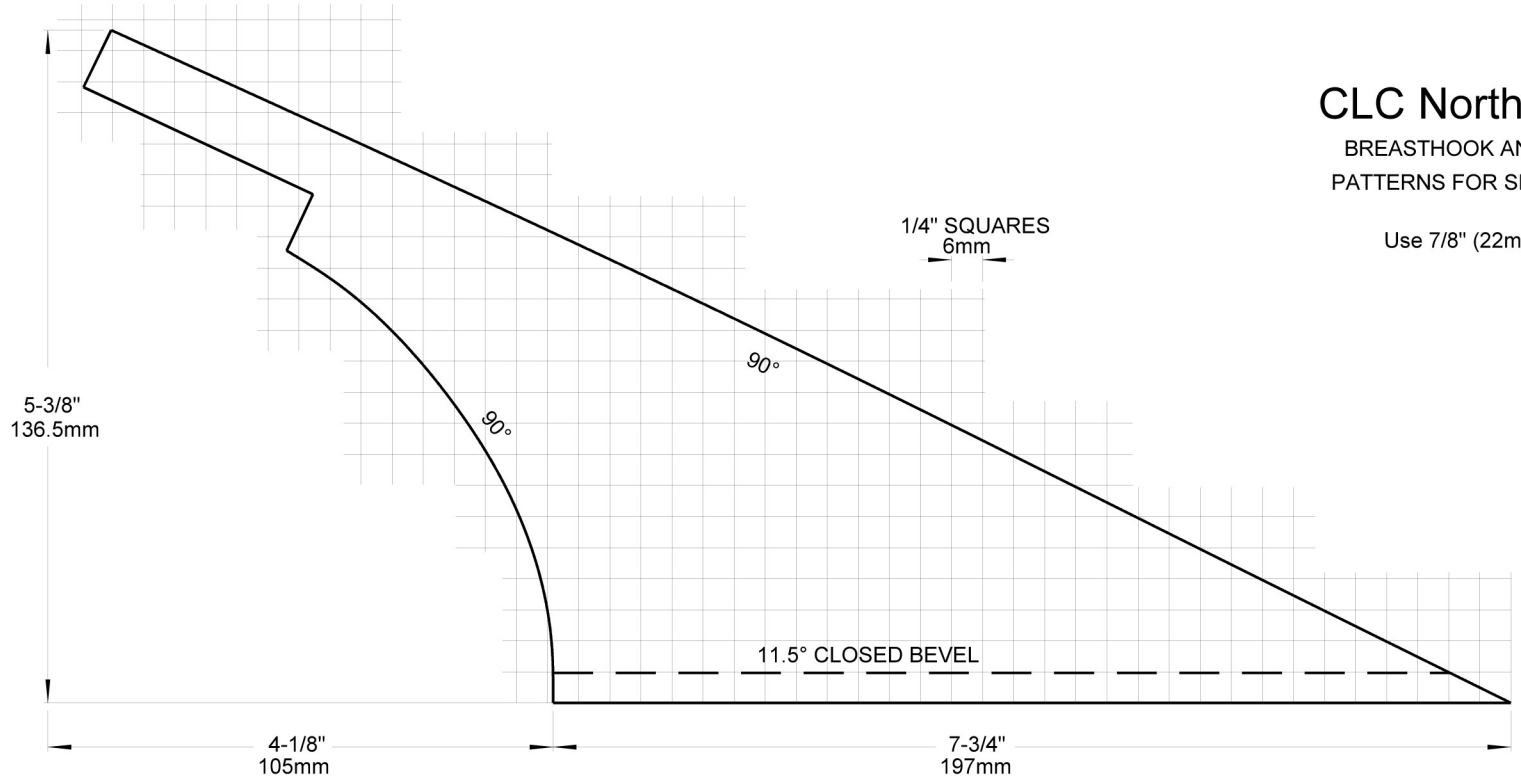
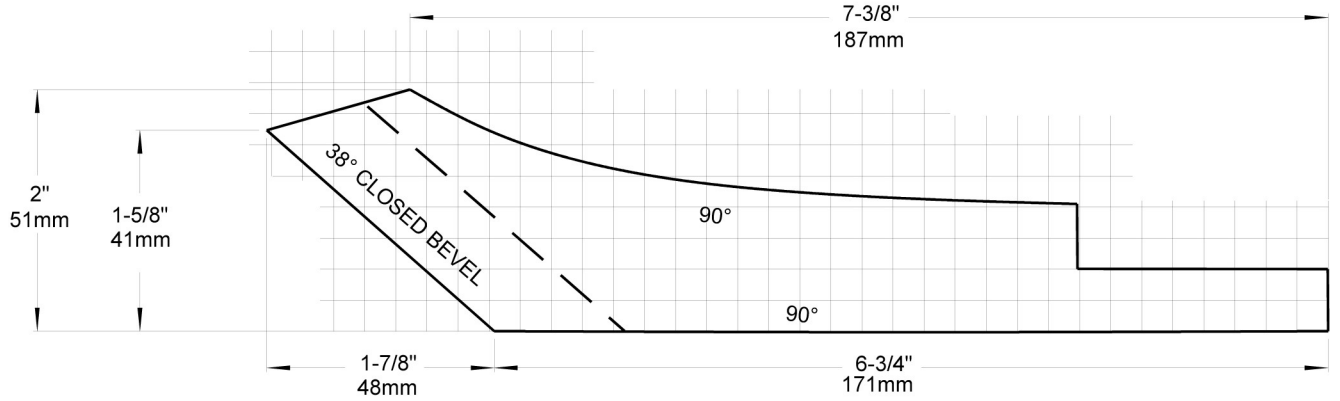
CLC Northeaster Dory

BREASTHOOK AND QUARTERKNEE
PATTERNS FOR SPACERED INWALES

Use 7/8" (22mm) MAHOGANY





If you're working from plans, here are patterns for the the breasthook and quarter knees you'd use with spacered inwales.

Installing Inwales in a Lug-Rigged Northeaster Dory

Introduction

There are something like 110 different ways to configure a CLC Northeaster Dory kit when you build one yourself.

You can choose from a rowing-only version, or rig the Dory as a sloop or as a lug, for example. To any of these variations you can add *inwales.*

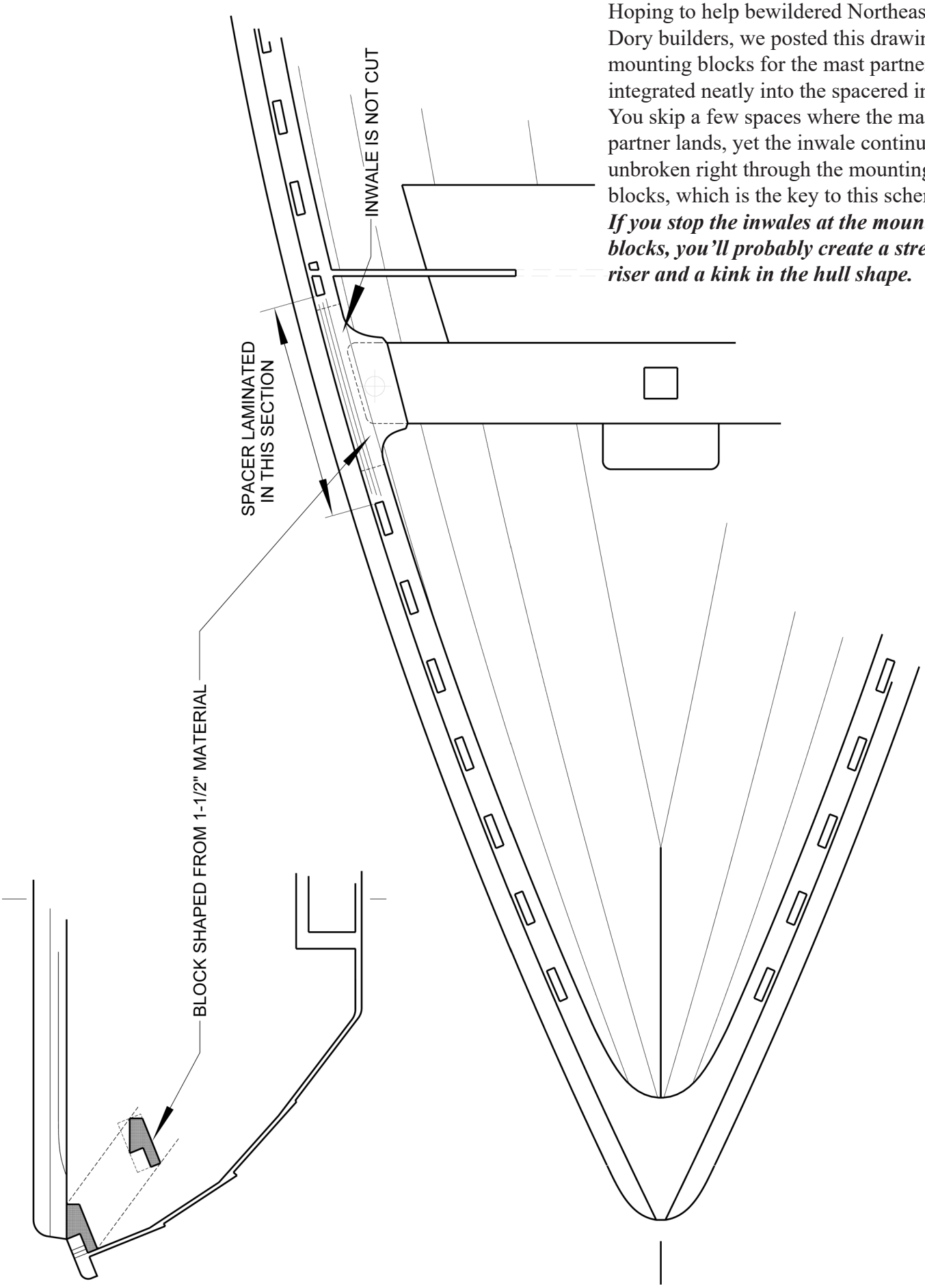
The inwale option we offer with kits are the so-called "spacered" or "scuppered" variety. These are longitudinal rails glued to the inside upper edge of a boat, with a zillion little wooden blocks elevating the rail off the plywood. Spacered inwales are a new invention, mostly unknown until maybe 30 years ago. What the spacer blocks are doing is imitating the tops of the steam-bent frames in traditionally-built boats. Functionally, the spaces create solid tie-off points around the perimeter of the boat, very handy indeed.

So far, so good! But there's ONE increasingly popular permutation of the Northeaster Dory that's causing builders to scratch their heads, and that is the combination of the **lug rig option** with **spacered inwales**.

This photo shows a stock-standard Northeaster Dory, with the mast "partner" (or thwart) fitted for the lug rig's freestanding mast. Sturdy, carefully-shaped blocks of timber are glued to the sides of the hull, and the removable mast partner is bolted to these blocks.

Doing a clean job of combining spacered inwales with those attachment blocks is a little tricky, so we are going to show you how to do it.

Hoping to help bewildered Northeaster Dory builders, we posted this drawing. The mounting blocks for the mast partner are integrated neatly into the spacered inwales. You skip a few spaces where the mast partner lands, yet the inwale continues unbroken right through the mounting blocks, which is the key to this scheme. ***If you stop the inwales at the mounting blocks, you'll probably create a stress riser and a kink in the hull shape.***



We retrofitted Northeaster Dory Hull #1 with spacered inwales, in part because it was old and in need of cosseting, but also to capture photography of how this odd business of lug rigs and spacered inwales fit together.

Since this is a RETROFIT, we had to cut out the old mast partner mounts.

Likewise, the old plywood breasthook is cut out and this solid timber breasthook substituted.

Glue the two halves together on the bench...

...then glue the breasthook into the hull.

If you've opted for the spacered inwales before you start construction, you'll install this breasthook INSTEAD of the stock plywood one, early in the assembly sequence.

Quarter knees are fitted at the transom and epoxied in place.

(Southwester Dory)

The Northeaster Dory's three frames extend right to the top of the hull. They will need to be notched or cut down to make room for the inwales.

The inwales and inwale spacer blocks are 1/2" x 7/8" (12x22mm).

Thus, make a mark for a 1" x 7/8" (24x22mm) notch.

Cut the notches with a cabinetry saw. The brave and the steady can use a router with an end-mill bit if desired.

The notches in the three frames have been opened and checked.

Time to figure out the spacing for your spacered inwales!

For our Northeaster Dory, we settled on a nominal layout of 3” (76mm) spaces with 3” spacer blocks.

By the time you take into account the three frames, the longer spacers where each of the three oarlock stations go, and of course the extra-long spacer where the mast partner is sited, it’s going to be impossible to make the spacing work out in neat multiples of three inches.

Have a few smaller blocks cut to length so you can cheat the spacing as needed. Ultimately, you want the spacer blocks evenly divided around the perimeter of the boat, and identical on both sides.

Use spring clamps to hold your test blocks in place while you work out a spacing scheme and mark the rails with a pencil.

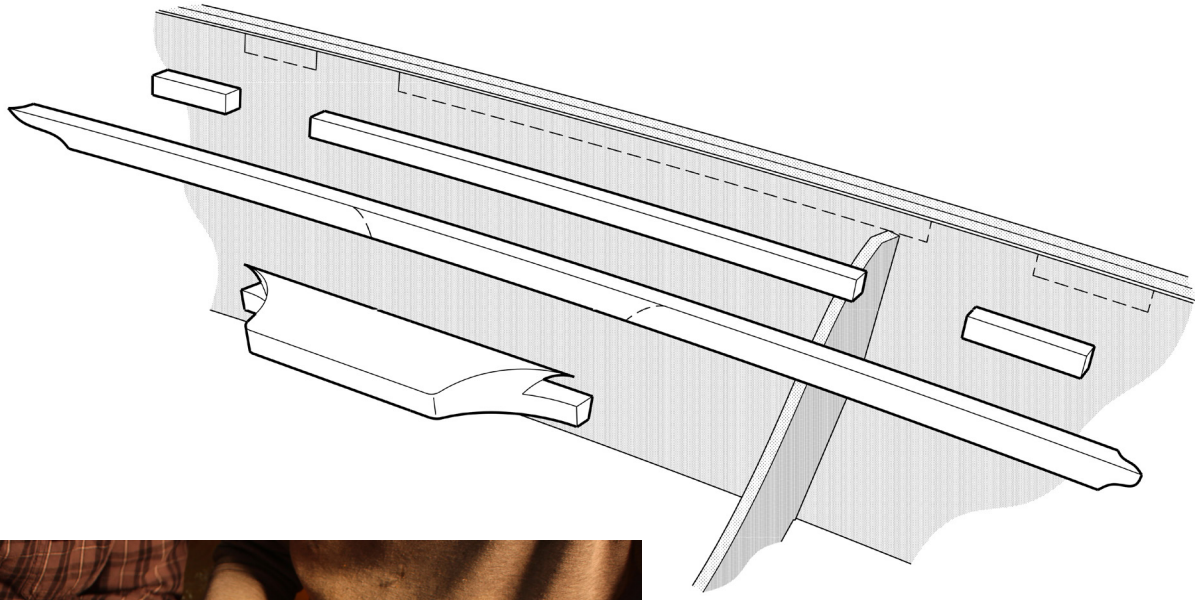
Spacer blocks are located and marked along the length of the hull.

Make up a heap of spacer blocks, preferably more than you need. Since some will be longer than others, keep them segregated by size, and their locations noted in pencil.

The spacer blocks may be clamped in place while the epoxy cures. However, we elected to use screws to install the spacer blocks.

Holes for the screws must be carefully drilled and countersunk.

The spacer that takes the loads of the mast partner on each side should be 16-1/2” (419mm) long,



Here’s how everything looks at the mast partner location.

Caution: Avoid really stiff wood species for this longer spacer block. You could create an ugly flat spot in the hull if the spacer can’t bend to the hull shape. (Laminating this longer spacer block from two layers of thinner material is another option.)

Spread thickened epoxy on the spacer blocks...

And screw (or clamp) them in place.

Clean up the squeezed-out epoxy! Sanding around these things is wretched work.

The spacer blocks are installed and the epoxy has cured.

If you used screws, you should remove any of them that impinge on oarlock installation.

Fitting the inwales themselves is a nice three-dimensional woodworking problem.

A “dry-fit” of both rails comes first.

Seat the inwale in the quarter-knee at the transom, and clamp it in place.

Work your way forward, adding clamps.

Since this boat already had outwales in place, we needed clamps with a lot of throat depth.

Clamp the inwale at every spacer block, and let it ride up on the breasthook as shown.

Mark very carefully before you cut the inwale to length!

Measure eight or ten times and cut once. If you end up short, there'll be no way to hide the error other than replacing the entire rail.

We used a Japanese pull-saw to cut the inwale to length.

We made it just a hair too long, and a couple of swipes with a sanding block resulted in a tight fit.

Find a helper for this step, then spread thickened epoxy on the spacer blocks.

Start once again at the stern...

...and work your way forward, making sure the inwale is flush with the top of the hull.

Given the quantity of clamps required, we were obliged to glue one side at a time even after the CLC production shop was stripped of bar clamps.

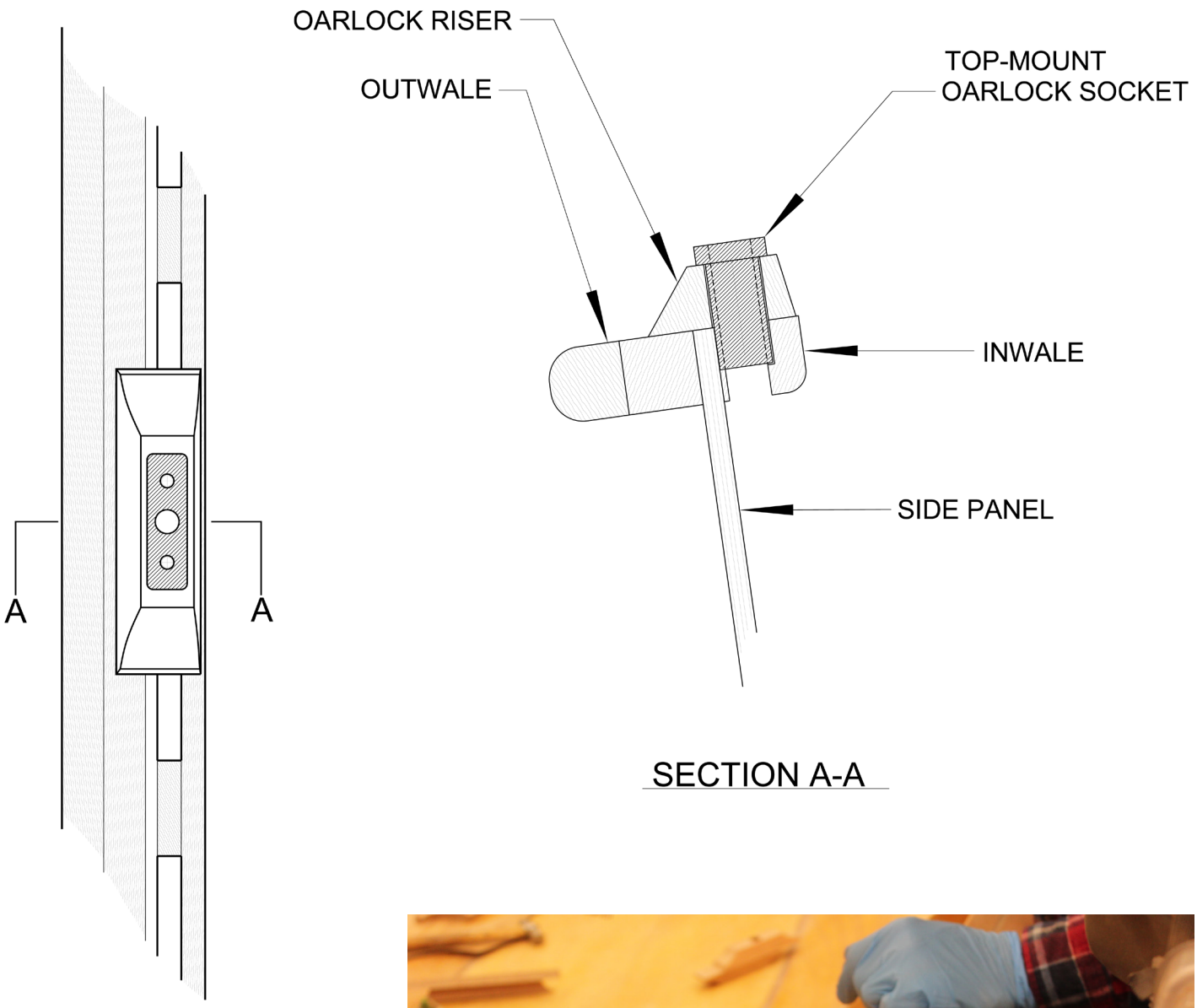
Before the epoxy cures, clean up any excess fastidiously. Use a stick, a rag, a brush, and anything else you can find to clean up the inwales.

Repeat on the opposite side.

With both inwales in place, sand the tops of the rails flush. Make sure you don't over-sand and turn the boat's sheer into a wavy line.

A router with a round-over bit is one way to ease the edges of the inwales and outwales. If the router bit is dull, or if you try to cut too much in one pass, there's real danger of picking up a "running splinter" that breaks a rail in two. Proceed with caution, and use a sander to create the round-over.

Finish up by hand-sanding.



The addition of spacered inwales complicates the installation of oarlock sockets. Quite a lot!

You will switch from the “angled mount” type standard in the North-easter Dory kit to the “top mount” oarlock sockets.

Because you’ll need to drill a great big hole in the inwales to take the bushing of the oarlock socket, so you will need to add “oarlock risers” at each of the oarlock locations as reinforcement.

Spread epoxy on the oarlock risers and clamp them atop the rails.

Note the slightly longer spacer block where the oarlock riser is mounted.

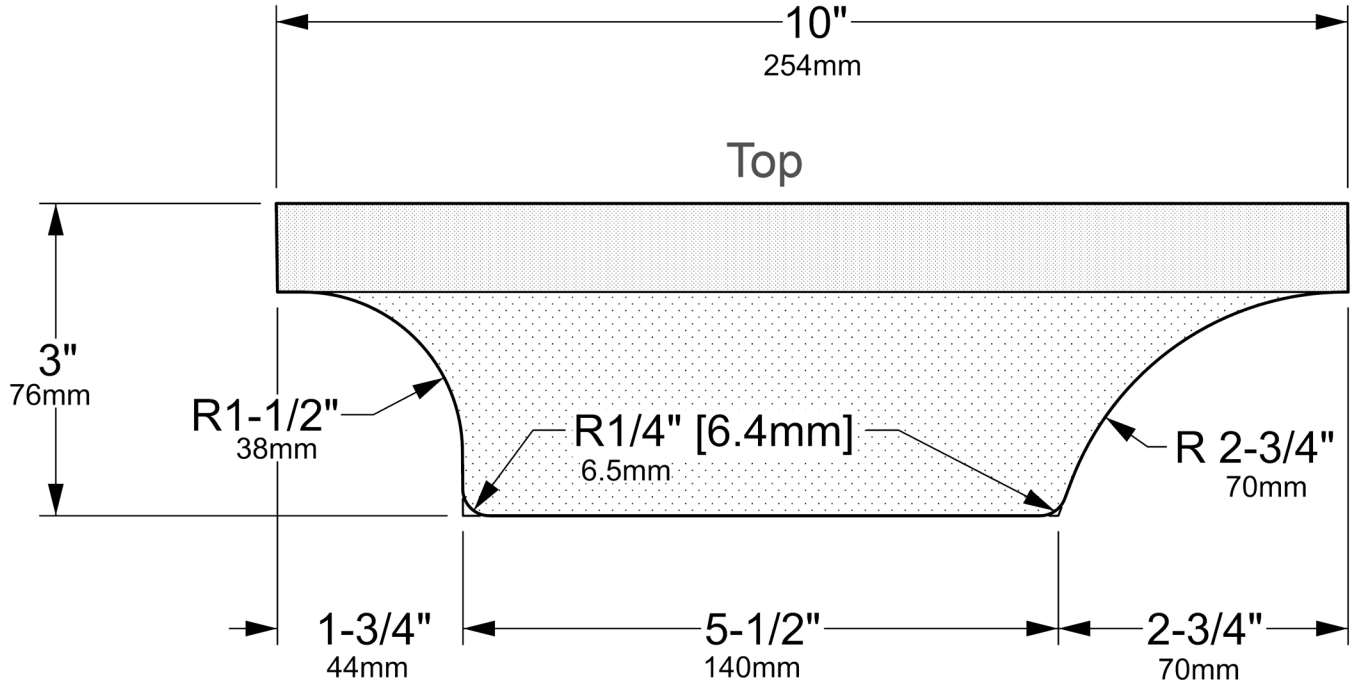
Oarlock riser glued, placed, clamped, and cleaned up.

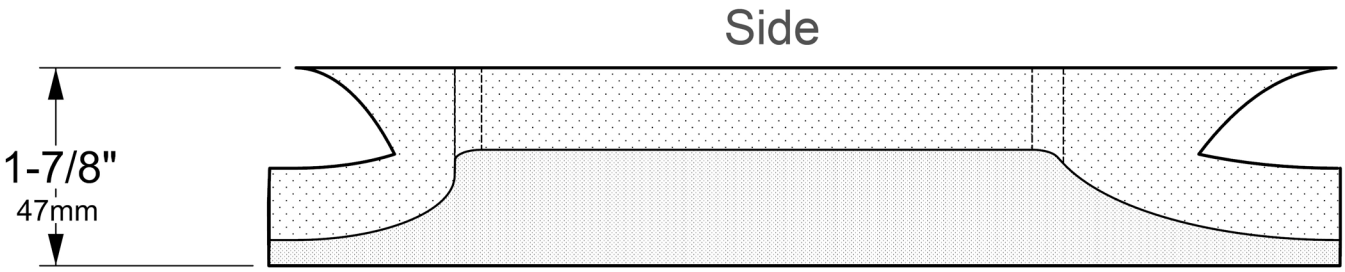
So that the top mount oarlock sockets will seat properly, you'll need to drill out the inwale assembly to match the hole in the oarlock riser.

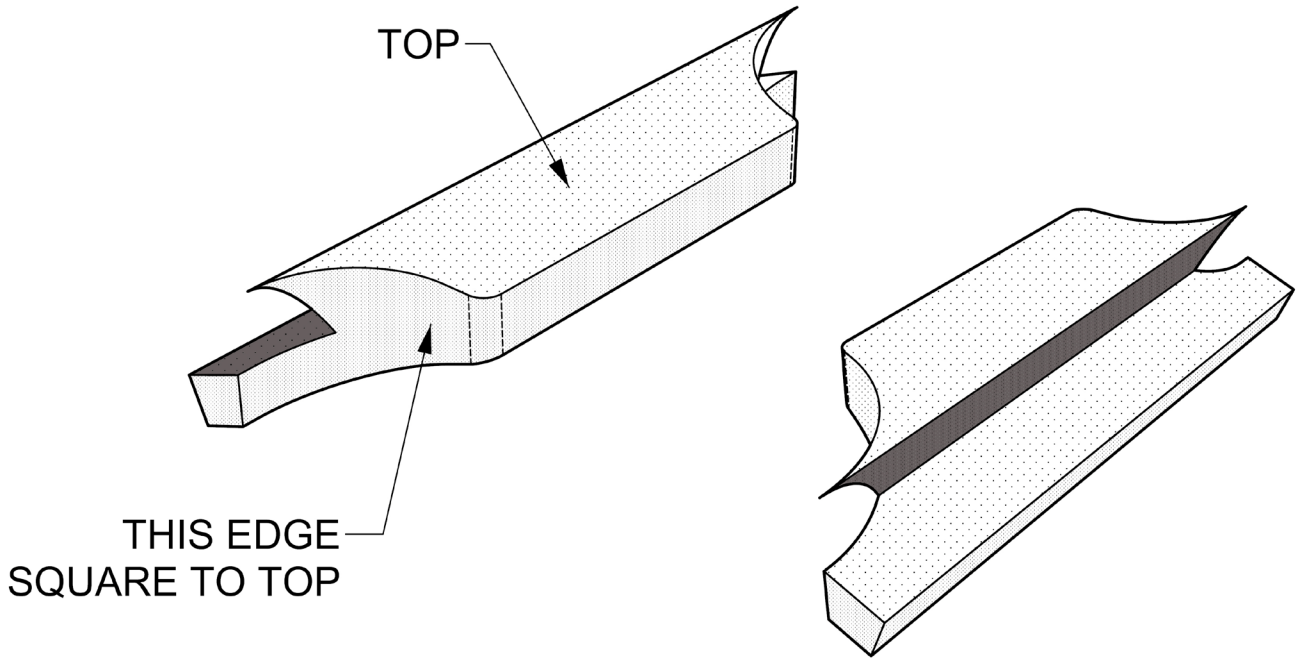
Note the scrap of wood clamped to the underside of the inwales to prevent "tear-out" of the drill bit when it emerges on the underside of the inwales.

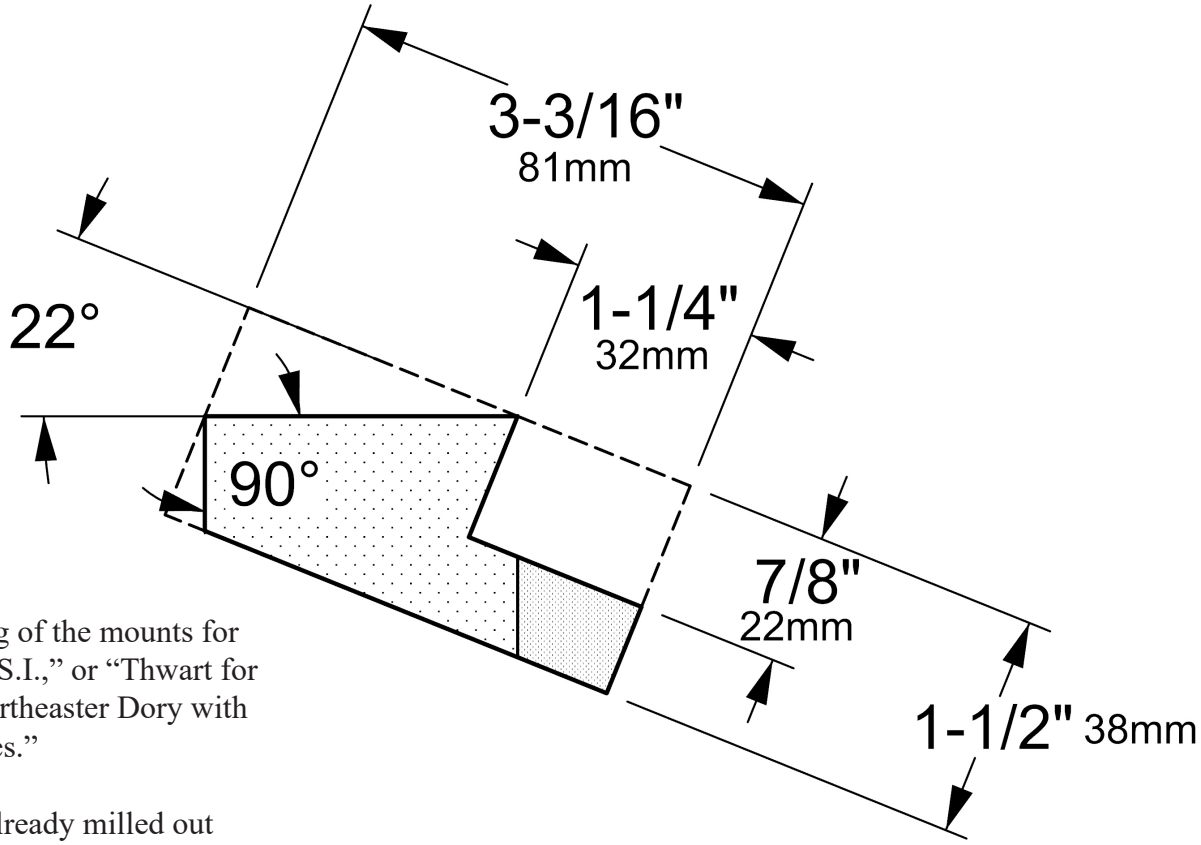
Now the carpentry gets REALLY interesting!

Building the "T.L.R.N.D.S.I." Mounts









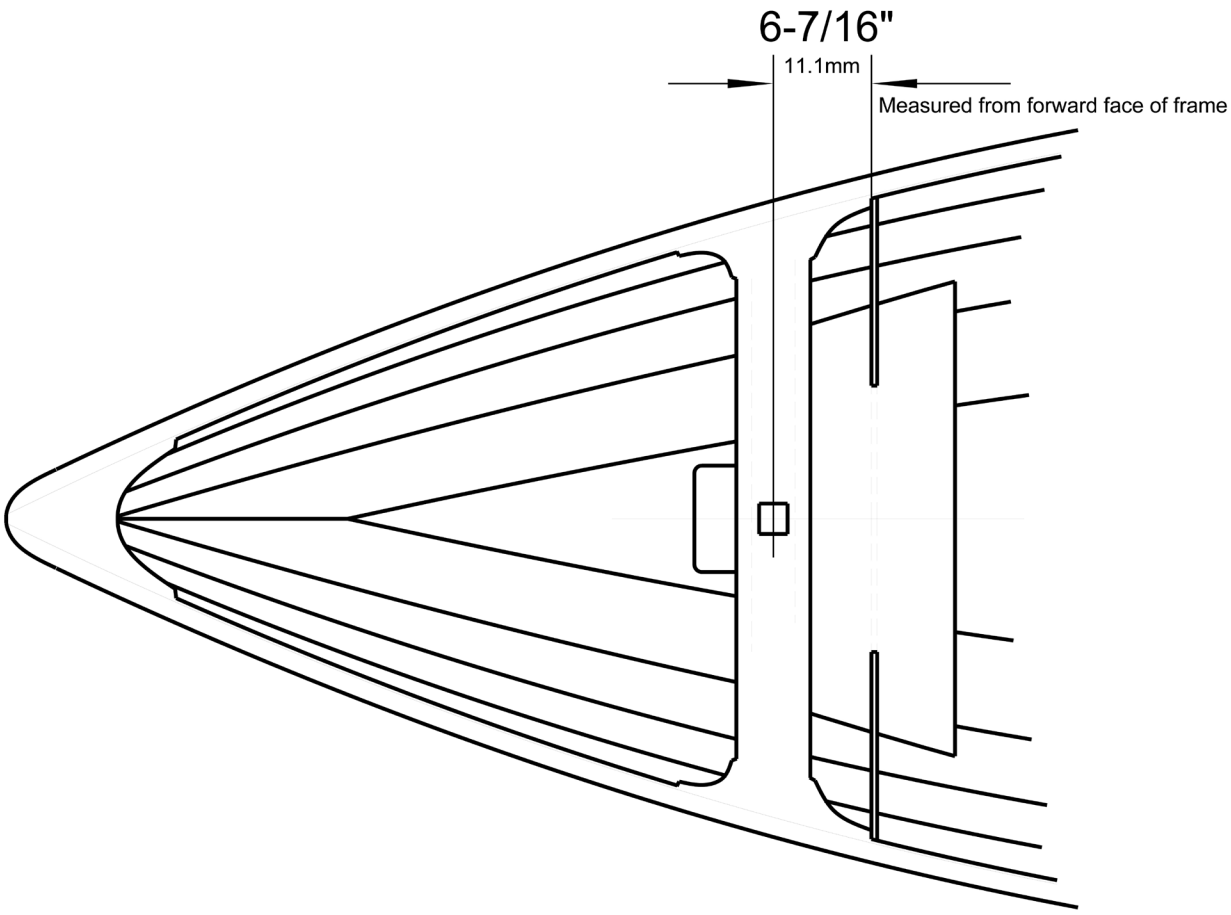
Here's a drawing of the mounts for the "T.L.R.N.D.S.I.," or "Thwart for Lug Rig in a Northeaster Dory with Spacered Inwales."

You buy these already milled out from us. If you're working from scratch, you'll need a good tablesaw with a sharp blade for this work. Also, familiarity with a tablesaw and the good sense to know when and how to use a "push-stick," if you want to keep all ten fingers.

It's basically five rips on the tablesaw. You'd make a "blank" about 24" (610mm) long with the rabbet and the two bevels machined into it with the tablesaw. This blank will yield two mounts.

The finished profiles are cut with a bandsaw. Be sure that when you cut out the second one, it's a MIRROR image of the first. You need to end up with LEFT and RIGHT mounts.

Make a practice run with scrap lumber. We use mahogany for the finished parts in kits.

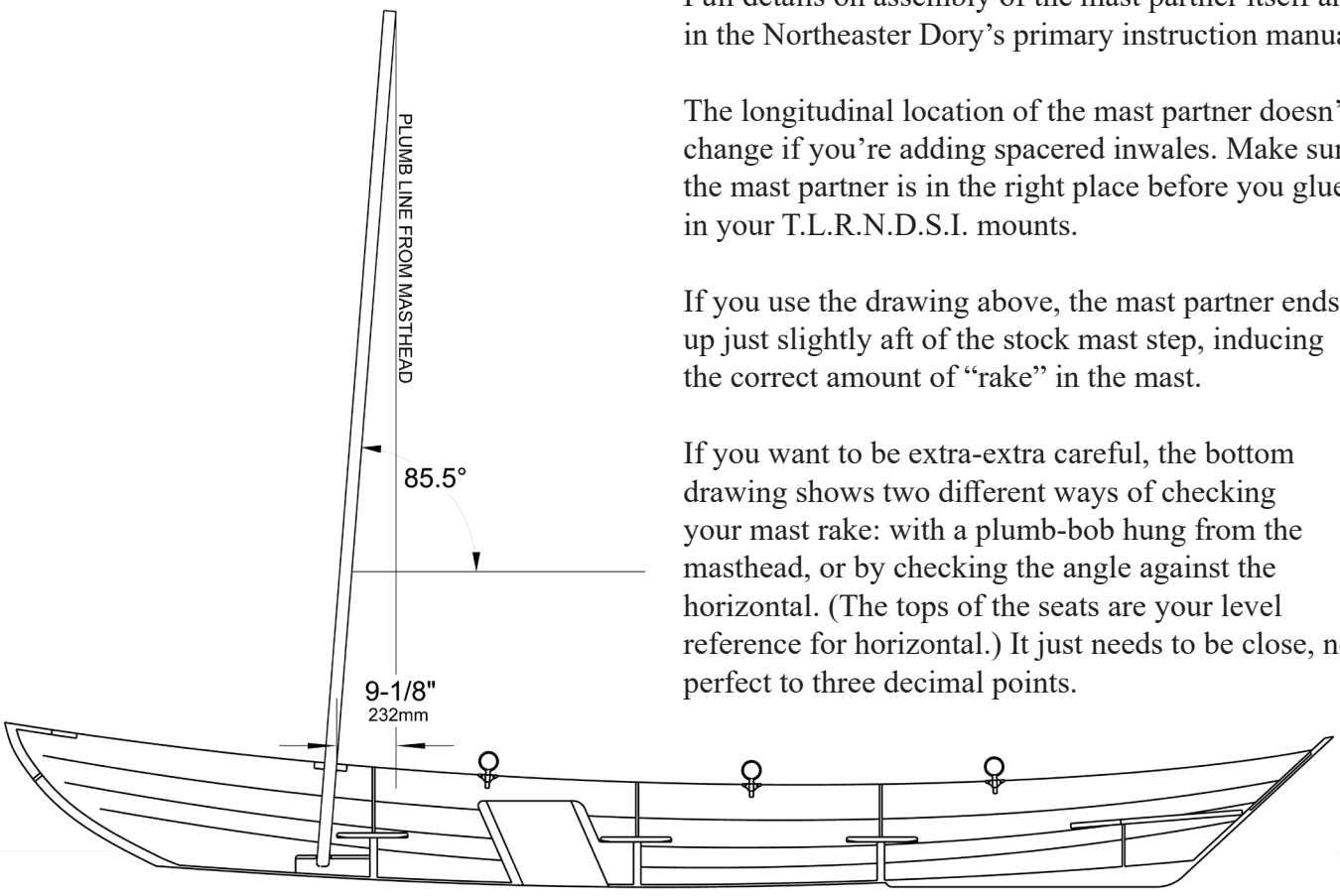


Full details on assembly of the mast partner itself are in the Northeaster Dory's primary instruction manual.

The longitudinal location of the mast partner doesn't change if you're adding spacered inwales. Make sure the mast partner is in the right place before you glue in your T.L.R.N.D.S.I. mounts.

If you use the drawing above, the mast partner ends up just slightly aft of the stock mast step, inducing the correct amount of "rake" in the mast.

If you want to be extra-extra careful, the bottom drawing shows two different ways of checking your mast rake: with a plumb-bob hung from the masthead, or by checking the angle against the horizontal. (The tops of the seats are your level reference for horizontal.) It just needs to be close, not perfect to three decimal points.



Satisfied with your location, epoxy and clamp the T.L.R.N.D.S.I. mounts to the rails.

Clean up the excess epoxy!

Sand the tops smooth. A straight-edge spanning the hull should rest flat atop the mounts.

Relieve the edges with a round-over bit...

...and/or sandpaper.

Knowing the abuse our demo model Northeaster Dory will endure, we elected to add an epoxy fillet for extra strength where the mount rests against the hull.

The epoxy fillet is smoothed with a radiused filleting tool.

Bolts hold the mast partner to the mounts, allowing you to remove the partner easily.

Clamp the assembled partner atop the mounts and drill a 1/2” (12mm) hole.

NOTE: The Northeaster Dory’s lug rig mast partner is going to be several inches SHORTER than the standard version because of the inwales.

Seal the bottom of the hole with masking tape, then fill the hole with epoxy.

Allow the epoxy to cure...

....then drill again with a 3/8” (9mm) bit for the bolt. The epoxy protects and strengthens the holes in the T.L.R.N.D.S.I. mounts.

The inwales should be sealed with several coats of epoxy, just as you did with the rest of the boat.

Note the masking tape protecting against drips and runs.

Add 3-5 coats of varnish and go sailing!

The neatly proportioned mounts for the mast partner blend in with the whole assembly, and look lovely.

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