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Tools You Can Make

For Building Your HomeGrown Surfboard Kit

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Appendix C Tools

This section has drawings and descriptions of tools you can make yourself, as well as some tips for caring for tools.

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MAKING TOOLS

Some of the tools described here are those we have made for use in the Grain shop. In this appendix, we have included versions that are less complicated and time-consuming to build. You can find some more suggestions for versions of these tools on www.GrainSurfboards.com in the Kits Section.

We use recycled or re-purposed materials when making shop tools and furniture whenever possible. Many of our shaping stands use material copped from dumpsters or otherwise salvaged.

These tools are listed in the order that someone building a Grain Surfboard would require them.

The rocker table is a base for a lot of the glue-up that will happen during the construction process - in particular, gluing the frame to the bottom plank panel, and gluing the top plank panel to the rest of the board. It is comprised of a form - adjustable if more than one type of board is planned - that matches the rocker of the board, and eliminates stress on the frame while the glue sets up under pressure. Its design accommodates the use of many clamps that hold the board together while it is setting - these can be pipe clamps, straps, or makeshift struts (called “toms”) that hold the parts being glued down by wedging against the ceiling. We have seen many creative methods developed.

TOOL 1: LAMINATING & ROCKER TABLE

The laminating table is used for plank layout and gluing the planks together into panels.

The rocker table is essentially a form that matches the rocker of the board. This allows you to clamp the whole setup to the table, eliminating stress on the frame while the glue sets up. You could construct two separate tables for these purposes - in fact, we have special-built versions of these in the shop - but a single structure that serves both purposes saves space.

All of these versions are designed to rest on sawhorses. It is convenient to be able to walk all the way around the tables.

Tool-Tech 1.1: Simple Ladder-Style Laminating Table

What: This table is made from straight lumber that is stiff enough to span across a couple of sawhorses and not deflect with the weight of all the clamps that you will use on it. For short-board tables, you may be able to use 2x4, for longboards, more like 2x6. But really, anything that is straight will do as long as it does not sag or is supported along its length. You can dismantle this and use the lumber for other purposes when you are done with it.



How: It's as easy as it looks. The "rungs" should be about twenty-four inches (24") wide. Use two screws each side to hold them down (at least two on each end) and space them so that they land directly under the notches in the keel - that way they'll line up with the frames when they are being clamped. When you are spacing them, remember that you will need some support under the nose and tail as well. It is good to have at least six inches (6") of room in forward of and behind the keel. If that's a problem, you can always prop up from the floor to get the last bend into the bottom planks at the ends.

Make it square so that the rungs and two-bys can help clue you in when you are eyeballing something straight. When it's together, put wide cellophane packing tape lengthwise over the tops of each rung to prevent glue drips from sticking.

You will also need an equal number of strong-backs for clamping which are usually about the same width as the rungs, so you might as well cut them at the same time you are making the rungs. Tape one side of them too.

Using It: In this form, it is used for laminating planks. The rungs keep the planks straight, and allow glue to drip through, while the tape keeps glue from sticking to the rungs. With the planks squeezed together with pipe clamps or bar clamps, spring clamps can hold strong-backs down to the ladder rungs to keep the panel from buckling.

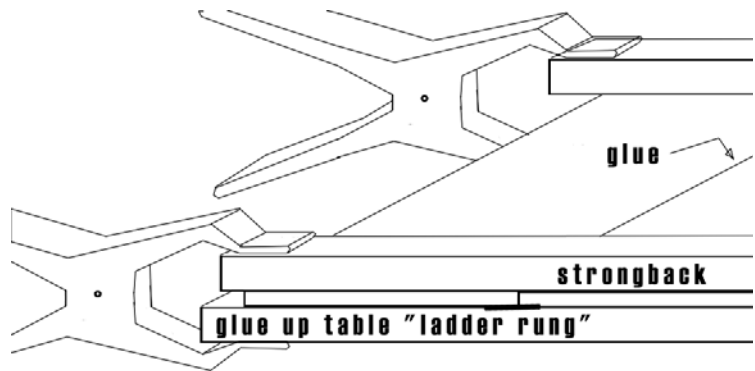
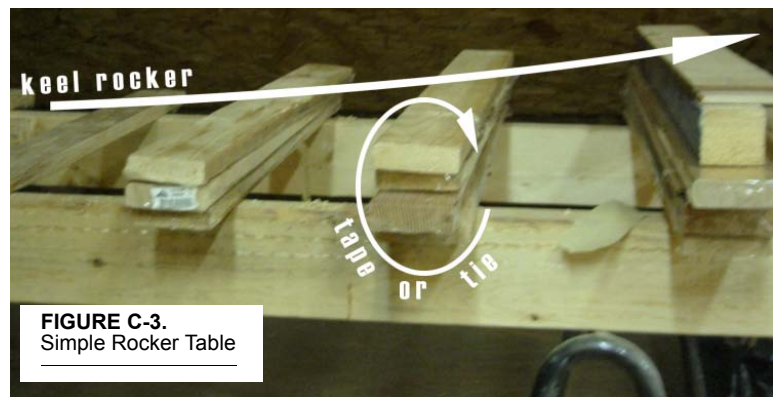


FIGURE C-2. See *Task 4: Making the Panels in Chapter 3* for details on using this tool.

Tool-Tech 1.2: Ladder-Style Rocker Table

What: This is a tool to support the keel and frame during gluing operations in “Task 5: Join Frame to Bottom” (page 15) and “Task 11: Install Top Planks” (page 68).

How: We’re going to use the simple laminating table we made in Tool-Tech 1.1 as a rocker table. Using the keel (assembled if it is in two pieces), shim under each notch with more strong-backs, plywood, scraps, old clapboards or shingles - anything that won’t compress appreciably - until you have the keel fully supported at each “station”. The tops don’t have to be bevelled - they just need to support the frames. The “keel blocks” (as they are called in shipbuilding) will be directly on top of each of the ladder rungs (or “stations”) and can be taped, tied or screwed to them any way that is convenient.



While you are sizing the keel blocks, you should not have any frames inserted in the keel, as the tight fit of the frames can increase the rocker of the board noticeably. Hang a couple of spring clamps from the lower edge of the keel down between ladder rungs somewhere near the middle of the keel to keep it upright while you are affixing the keel blocks.

Using It: The components that you are clamping in are held down in pretty much the same way that you would do for holding down the panels when you glue them. Use the strongbacks as before, but you will be clamping something with more height, so spring clamps do not have the reach to do all the work. Instead, use pipe, bar or strap clamps to flex strongbacks down across the keel and frames to attach the frame to the bottom or the top to the rest of the board.

FIGURE C-4. (right)
Keel blocks support the frame.



TOOL 2: SMALL TOOLS

Tool-Tech 2.1: PVC Clamps

What: Clamping rail strips and other parts require many, many clamps. It is a great idea to have a supply of at least a dozen spring clamps (two-inch opening), but you will need far more clamps than that.

Small spring clamps are actually not suitable for most of the rail-strip clamping that you will need to do - they don't have enough opening, can't be applied at the right angles, and will over-stress the wood at some point.

An inexpensive alternative is the PVC clamp. If you can locate a plumbing supply or plumber who regularly has off-cuts, then you don't have to create demand for the production of more of this terrifically toxic material, but if not, you can buy it anywhere (unfortunately).

How: We need to slice the pipe - usually four-inch (4") diameter - into one-inch slices (approximately). Thinner slices make clamps that have less strength, so a complement of those can be handy as well. The slices will be split open, and the result is a clamp with very sharp edges that can slip off of the pieces being clamped. To prevent slipping, we will drill the pipe first to "divits" in the business ends.

The first step is to mark a line down the length of the pipe with a sharpie marker. Then use a tape measure to mark a series of points on that line which are the same distance apart as the width of the clamps you want to make (e.g. one-inch, 3/4" etc). Use a drill and a 1/2" bit to drill a hole at every mark. Neatness doesn't really count - just knock 'em out.

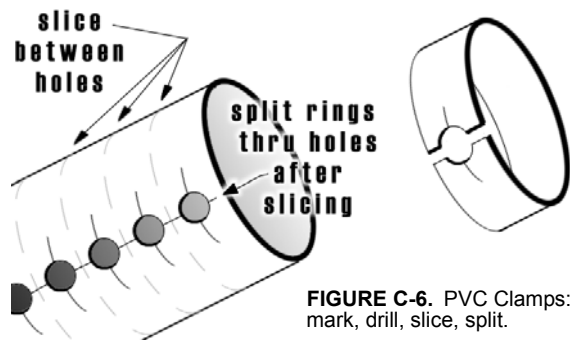


FIGURE C-6. PVC Clamps: mark, drill, slice, split.

Finally, devise a means to slice the pipe. You may have a chop saw that is big enough, but you can certainly hand-saw them as well. Cut exactly between the holes you drilled - leaving a hole directly in the middle of each slice's width.

Now, with a jigsaw, bandsaw, or handsaw, open each clamp with a cut exactly through the holes you drilled.

Using It: The holes create little divits that will seat around the edge of the bottom planks and over the railstrip beads. Use care with these - they can actually burst apart if you pull on them too hard, so wear safety glasses when you are applying them under stress. The little divits are fairly sharp-edged, which can dig into the soft wood, so apply them gently, and don't snap them down into place. If you get dents in the wood from the clamps, just wet the dents and the fibers will usually swell back out in a matter of seconds. You can also apply a little steam to get the fibers to rise.

It is also possible to double up these clamps to get more force.



FIGURE C-5. Clamp applied to railstrip. This clamp should have a drilled hole making a half-moon divit in each of the edges right where they bear on the bottom planks and the railstrip bead.

Tool-Tech 2.2: Fairing Board

What: A flexible sanding pad that is stiff enough to ride over high spots, but flexible enough to sand curved surfaces.

How: All you need are some flexible panels - masonite (flexy) or 1/4" plywood (stiffer) that you can attach sandpaper to. Handles on the back help alot.

A quick but effective fairing board is shown in the diagram below.

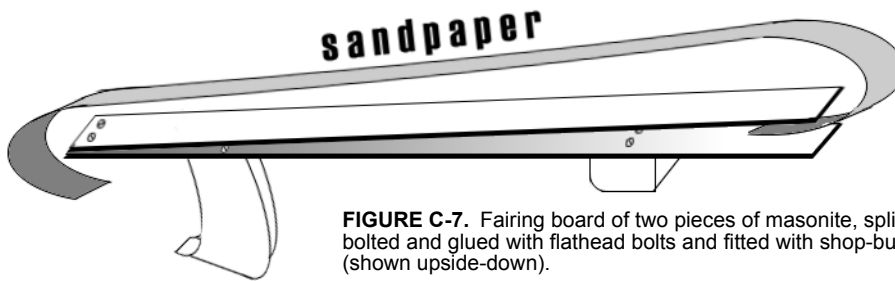


FIGURE C-7. Fairing board of two pieces of masonite, split for flexibility, bolted and glued with flathead bolts and fitted with shop-built handles. (shown upside-down).

Using It: Use adhesive backed rolls of sandpaper, or create a smaller one that can use strips of standard sandpaper attached with spray adhesive. Attach the forward end of the paper between the two slabs of masonite, and the of the paper over the ends of both pieces.

You won't be able to bend a fairing board around the rails, but these work great parallel to the centerline and at an angle to the rail. These are especially great to have for Step 8.1: Fairing the Rails (page 52) as a fairing board helps guarantee that the rail is fair and true before you start cutting the lands - an absolute requirement.

TOOL 3: SHAPING STANDS

Shaping stands can be complex or quite simple to make. The goal is to have something that the board can lay on top of, and slot into without risking damage to the board. They are always padded.

One important quality - especially when building wood boards - is that they be sturdy, and shake-free. Using something heavy at the bottom can help to make them more stable.

Tool-Tech 3.1: Shaping Stand

What: Some larger lumber from the lumber-yard, 3” screws, padding.

How: Use wide lumber (like 2”x12”s) to provide stability and a work shelf under the board as well as stable uprights. 2”x4”s act as legs for side-to-side stability.

Using It: This stand gets well padded. It is fairly sturdy, but can benefit from having additional weight added low-down.



FIGURE C-8. Shaping stand of 1x12