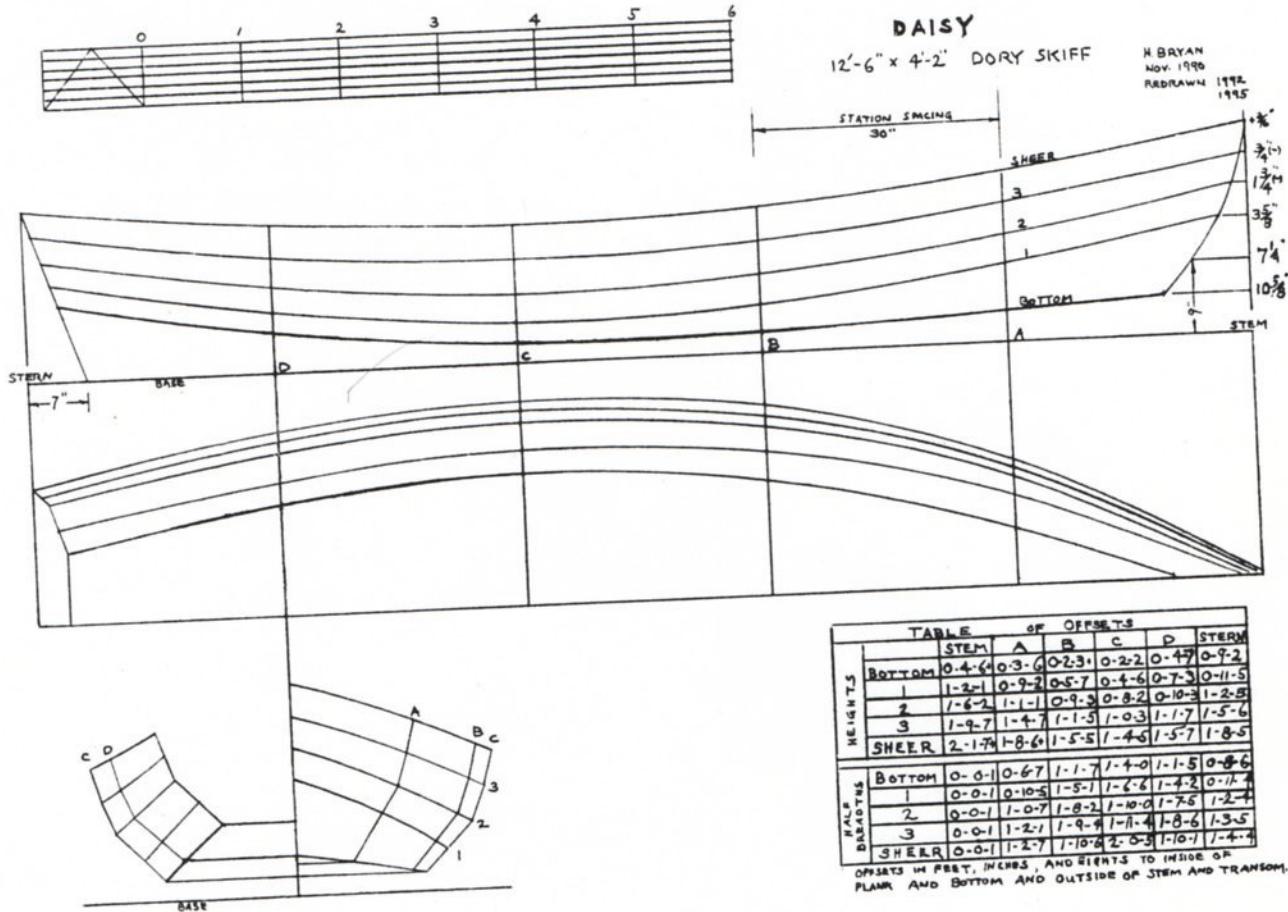


Building Daisy Part 1



One of the fascinating things about boatbuilding is that, even after many thousands of years, there is still so much experimenting going on. It would seem that in something so basic as a skiff, all the possibilities of design and construction would have been explored and their relative merits decided upon. Perhaps almost all the variables have been tried, but at widely spaced intervals of time and in different parts of the world. Also, if small changes were unimportant, then a general consensus as to what was best would probably have been reached long ago. Subtle changes can be very significant, however, both in the performance of the boat and

in her strength and general ability to resist the elements.

Add to this the prejudices we develop toward certain forms, techniques, and materials, and you will see that some of the unexplored territory exists simply because we refuse to address the possibilities.

So, here is yet another boat, a skiff remarkably similar to the Yankee Tender presented in *WoodenBoat* Nos. 30 and 31, and to the Chamberlain skiff and the semi-dories in John Gardner's *Building Classic Small Craft* and *The Dory Book*. Daisy, as I call the design, comes with a cargo of prejudice, such as a sweet, upsweeping sheer, the belief that a boat is more than a seagoing box, and that it is a

good thing to lean heavily on the heroes of the past.

I have called Daisy a dory skiff. From the dory she gets her lapstrake planking, her sawn frames, and her two-piece, non-rabbeted stem. Her skiff genes give her increased bottom and transom width. The curve of her sides softens her appearance, allows for a bit narrower bottom to help reduce wetted surface for rowing, yet adds beam quickly when heeled to hold up her sailing rig. She is a stable boat, able to support four adults while rowing, with room for three under sail.

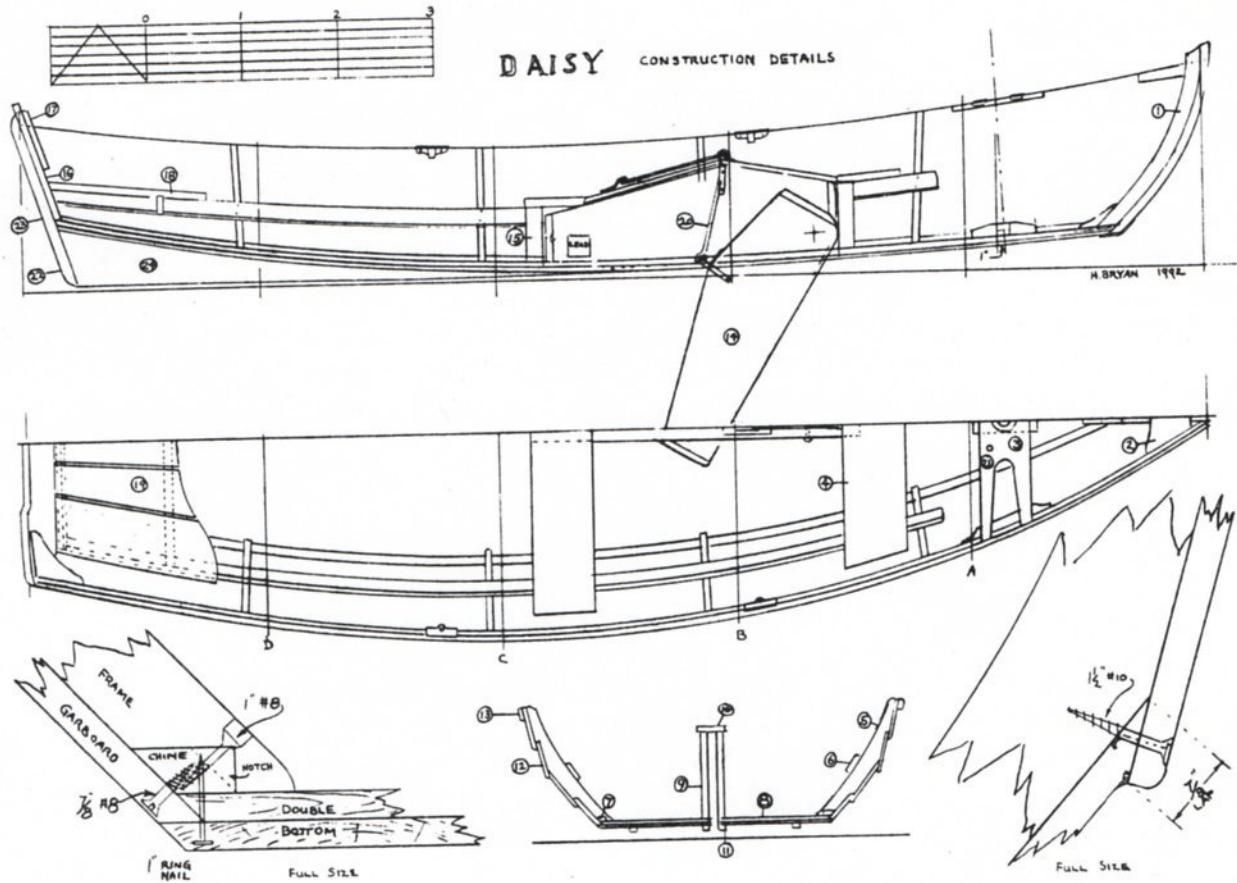
Weighing just over 140 lbs, she can be cartopped but will need a good quality rack to take the weight.

A 12½' dory skiff

By Harry Bryan

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Specifications (Numbers correspond to construction drawing, above)

1. Stem from $1\frac{1}{4} \times 1\frac{1}{4}$ " oak; false stem from $\frac{7}{8} \times 1\frac{5}{16}$ " oak.
2. Breasthook from $1\frac{3}{8}$ " oak; grain athwartships.
3. Mast partner from $\frac{3}{4}$ " oak; riveted to $1 \times 1\frac{1}{2}$ " fore-and-aft cleats against the sides; cleats screwed and riveted to the guardrails.
4. Thwarts from 1" cedar, spruce, or pine, $\frac{1}{2} \times 1\frac{1}{2}$ "; chamfer edges.
5. Frames from $\frac{5}{8}$ "-thick oak or well-bedded ash; molded 1" at sheer, 2" at knuckle No. 2, $1\frac{1}{4}$ " at chine.
6. Seat risers from $\frac{5}{8} \times 2\frac{1}{4}$ " spruce or cedar, beaded at inboard corners if desired.
7. Chines from $\frac{5}{8} \times 1\frac{3}{8}$ " oak split on bandsaw and re-glued in place.
8. Bottom from two thicknesses of $\frac{3}{8}$ " cedar, inside layer athwartships, outside layer fore-and-aft, fastened together with clenched copper tacks and epoxy.
9. Centerboard trunk sides from $\frac{3}{8}$ " cedar or pine.
10. Centerboard trunk cap from $\frac{5}{8}$ " oak.
11. Keel from $1\frac{1}{16} \times 3$ " oak; forward end tapers from 2' back to stem.
12. Planking from $\frac{7}{16}$ " cedar, beveled and lapped.
13. Guardrails from $1\frac{1}{16} \times 1\frac{5}{16}$ " oak.
14. Centerboard from $\frac{7}{8}$ " oak, ballasted with lead.
15. Centerboard trunk end posts from $1\frac{1}{16} \times 2$ " cedar or pine; grain fore-and-aft.
16. Transom from $\frac{7}{8}$ " cedar or $\frac{3}{4}$ " oak.
17. Outboard motor pad from $7 \times 8 \times \frac{3}{4}$ "; port side only.
18. Stern sheets (if used) from $\frac{5}{8}$ " cedar, spruce, or pine with oak supports; bed well against transom.
19. Stern sheet supports from $\frac{7}{8} \times 1\frac{3}{4}$ " oak.
20. Centerboard control rod from $\frac{5}{16}$ " bronze, attached to centerboard with $\frac{3}{4} \times \frac{1}{8}$ " brass straps.
21. $\frac{5}{8}$ " hole in partner for halyard belaying pin.
22. 1" oak end caps.
23. Sternpost from oak; $\frac{7}{8} \times 1$ " at top tapering to $1\frac{1}{2}$ " at bottom.
24. Skeg from oak; $1\frac{1}{16} \times 6\frac{1}{2}$ " wide at the after edge.

SAILING RIG

Mast: Spruce; 11'8" long; 1 $\frac{1}{2}$ " diameter top; 2 $\frac{1}{2}$ " diameter 4' down; 3" diameter at partner; 1 $\frac{1}{2}$ " step; 7" raking (place step 1" forward of plumb).

Boom: Spruce; 9'10" long; 1 $\frac{1}{4}$ " tack; 1 $\frac{1}{2}$ " at mid-length; 1 $\frac{3}{16}$ " at clew.

Rudder: $\frac{3}{4}$ "-thick oak or, if soft-wood, ballasted with lead.

Tiller: Oak or ash; $\frac{3}{4} \times 1\frac{3}{4}$ " x

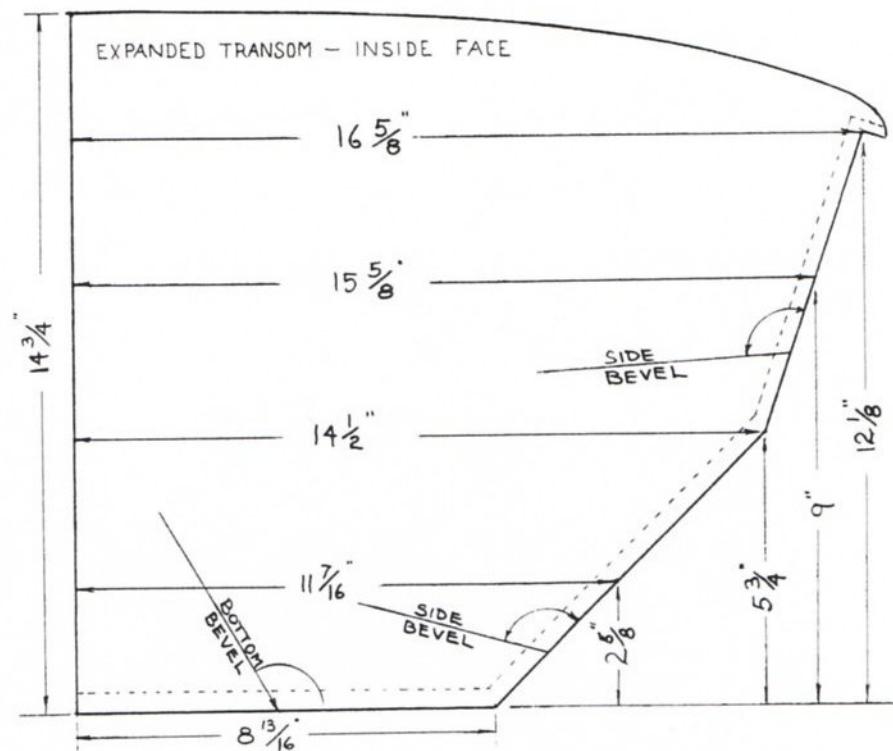
Her construction differs only slightly from the boats mentioned above, but these variations are (as I've said) what the whole game is about. They include: a two-piece chine, installed on the flat; a two-layer bottom, the grain of the first layer running at a right angle to the grain of the second layer; a centerboard trunk in which all pieces have the grain running in the same direction; and a method of beveling and sealing the laps which makes this operation almost foolproof.

Setting Up

Many of today's plans are sold using the statement, "No lofting required." Let's change tacks a bit and say, "No full-sized lines need be bought. All offsets needed to create the design are included!" Seriously, only the fun part is left to be done. You will need some heavy building paper to lay out the shape of the four molds, the stem, and the transom. [Although all the information required to build *Daisy* is included in this series, four 11×16 " sheets are available from the author. Ordering information is included at the end of the article.]

The body plan (to the left of the table of offsets on the lines drawing on page 82) is all you need be concerned with to create the four molds. You will be reproducing that part of the drawing full size on building paper, and you will need to draw both sides of each station. Draw a baseline, a building baseline 36" above the base and parallel with it, and a centerline perpendicular to and connecting both baselines. Using the vertical columns under A, B, C, and D in the table of offsets, measure up from the baseline the indicated heights and out from the centerline the amount of the half-breadth on each side to create the intersections of the plank lines at the molds. These points are called the knuckles in this style of boat, although in *Daisy* only plank line No. 2 has much of a knuckle shape to it. Connect these points with straight lines to create the shape of the boat at each station. The actual mold must overlap the building baseline an inch or more, so continue each line from knuckle No. 3 past the sheer to a little beyond the building base.

To build the molds, slide a $\frac{3}{4} \times 8$ " board under the paper and prick through the bottom points, each



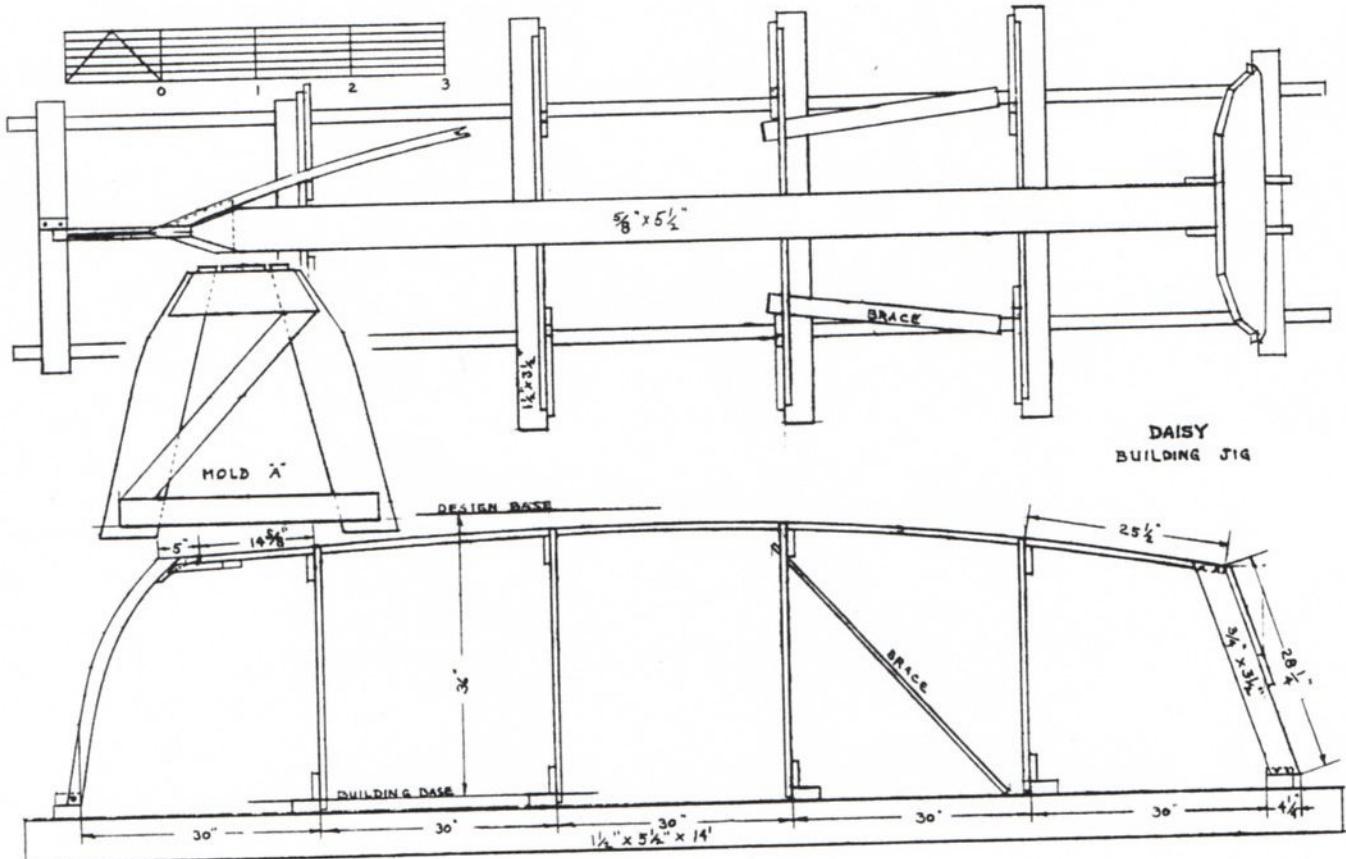
knuckle, the sheer, and the points that represent the building baseline. Remove the board, connect the dots, tack a second board under the first, and saw out both mold sides together. Complete the mold by laying the side pieces in their correct positions on top of the full-sized drawing and connecting them with crosspieces and a diagonal brace as shown on the Building Jig drawing, page 86. Note that the longer of the two crosspieces holding the mold halves together is fastened so that one edge is on the

building baseline. The shorter cross-piece running from chine to chine can be held down $\frac{5}{8}$ " to accommodate the chines and strongback, as shown, or it can be placed at the level of the bottom and notched out for these members.

The transom cannot be drawn from the offset table because it stands at an angle to the body plan. Pick up its dimensions from the transom expansion drawing. Two or three pieces of oak, edge-glued together, will be needed to get sufficient width



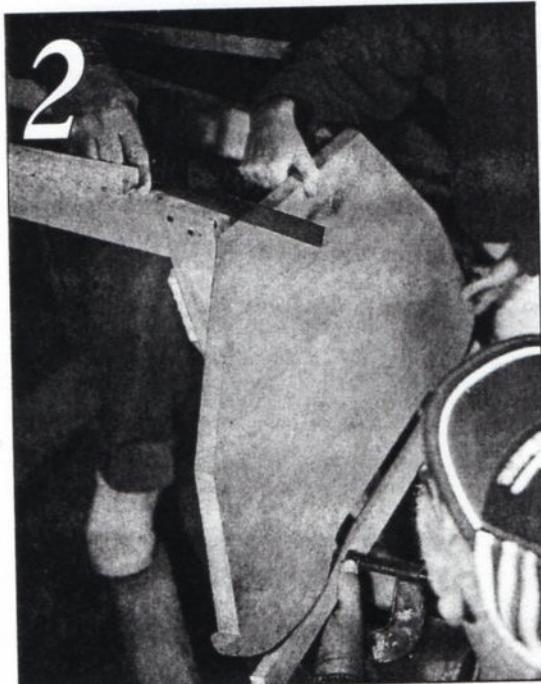
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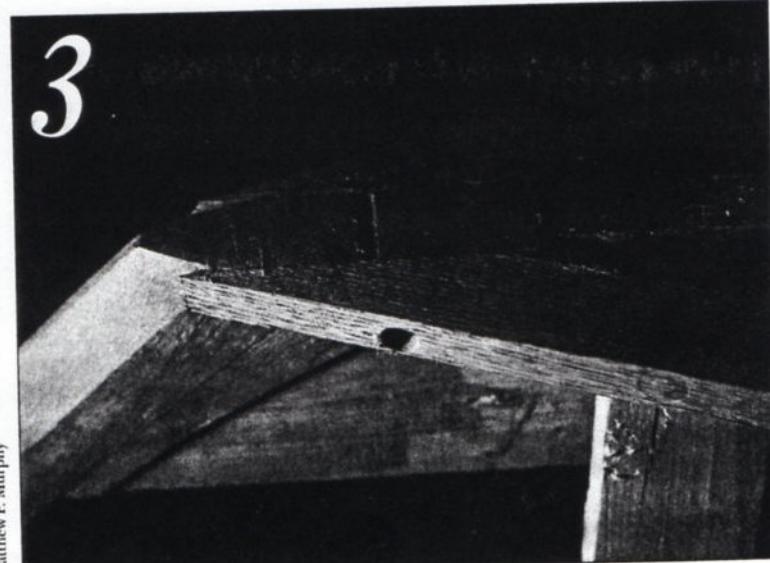
for the transom. The edges where the bottom and side planking bear will need to be beveled. Get out your magnifying glass and lift these bevels from the expanded transom drawing. Do the heavy beveling at the bench, but leave a little wood for fine-tuning after setting up.

Look on the lines drawing for the information needed to reproduce the stem's profile. On your building paper, draw a baseline about 2' long and a parallel building baseline 36" above. Erect a perpendicular connecting the midpoint of these lines to represent the forward perpendicular on the lines

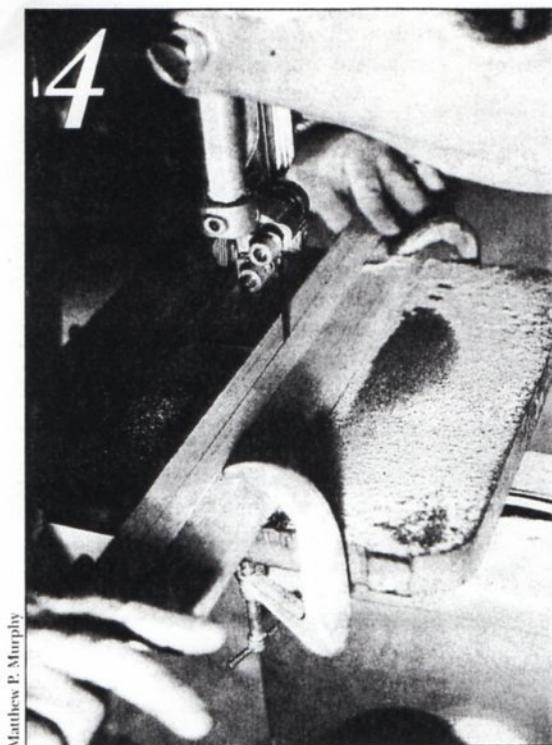
drawing. To get the bottom point of the stem, measure up the perpendicular from the base a heavy $4\frac{3}{4}$ ". (This is the height of the bottom of the stem taken from the table of offsets.) Now measure back from this point $10\frac{5}{8}$ " as shown on the lines drawing. Use the same method to get the intersections of knuckle lines 1, 2, and 3 and the sheer with the stem. Connect the dots and extend this profile line until it reaches the building base.



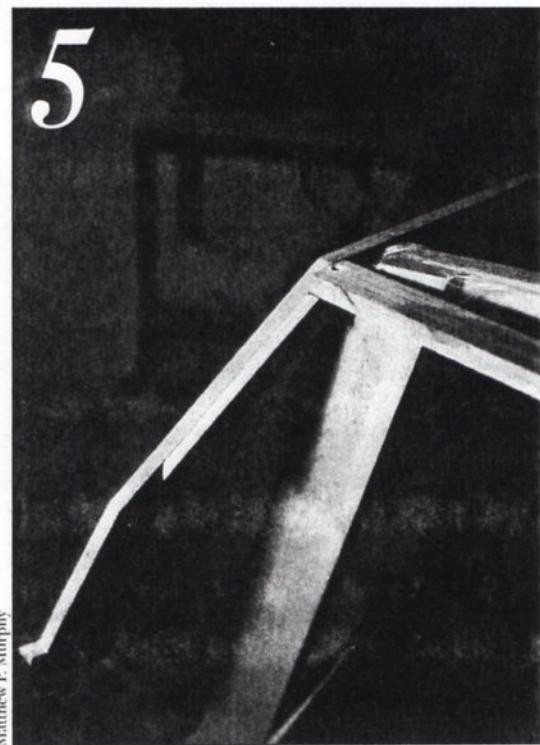
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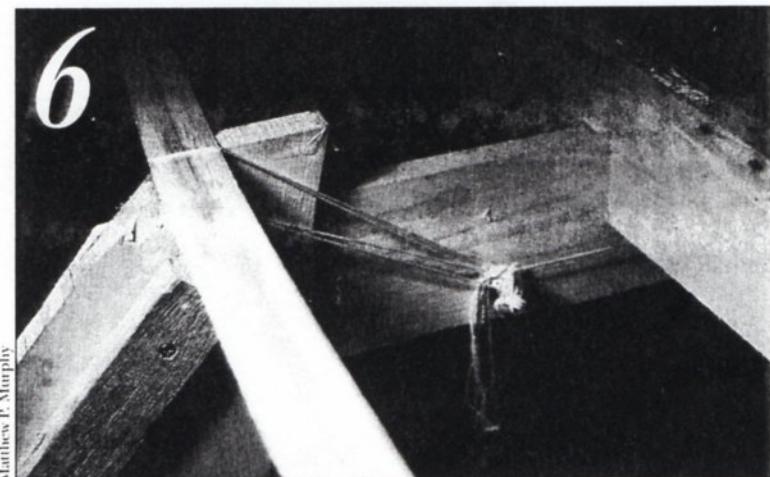
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The siding and molding (athwartships and fore-and-aft dimensions) of the stem are found in the list of specifications on page 84. Bevel the stem from its heel to the sheer, leaving a $\frac{1}{4}$ " face width. To get the correct bevel, set an adjustable bevel gauge to measure the angle between the sheer and the centerline on the half-breadth view of the lines drawing. Hold the gauge against the stem at approximately the same angle that the sheer intersects the stem in the profile drawing (not perpendicular, or normal, to the stem), then cut away, as in photo 1, with drawknife, spoke-shave, and plane until the gauge fits. Bevel the rest of the stem by setting the gauge, in turn, to each of the knuckle lines and the bottom, and planing away until the gauge fits each location. Repeat for the opposite side of the stem.

The building jig for this boat is a standard ladder frame constructed of two 2×6 " planks on edge with 2×4 " crosspieces on the flat and located on station lines as shown in the drawing on page 86. Level this assembly carefully. Put a centerline down the crosspieces, and set mold "C" over the line. Stand it plumb, and brace it. Set the rest of the molds, none of which need bracing since they will be held plumb by the $5\frac{1}{2}$ " strongback when it is installed as shown in the plans. The building jig drawing



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gives measurements which allow the stem and transom (photo 2) to be set up properly.

The little knee screwed and glued to the heel of the stem is for attaching the chines (photo 3). The combined length of the bottom of the stem and knee should be 5".

Installing the Chines

The chines are usually difficult pieces to install. In most boats, they are installed with their wider dimension running up the side of the boat. Their tops must then be beveled so as not to trap water; and to get them to lie in their notches in the molds, they must be bent in two directions and usually twisted as well. All this strain falls on the ends where the chines

connect to the stem and transom. In Daisy, however, we have put the chines on the flat. So, their top edges don't need to be planed, and they will bend easily to the moderate bottom rocker curve. The edgewise bend that the chines must make to follow the athwartships curve of the bottom is made possible by ripping on the bandsaw (leaving the last 3" solid at the stern) as in photo 4. After spreading thickened epoxy in the saw kerf, fasten the chines to the transom (oak cleats, as seen in photo 5, are to be fastened to the transom for just this purpose).

Now, spring the chines around the molds, temporarily tying them in place as in photo 6. Cross their ends over each other at the bow, and hold them in this position with a clamp

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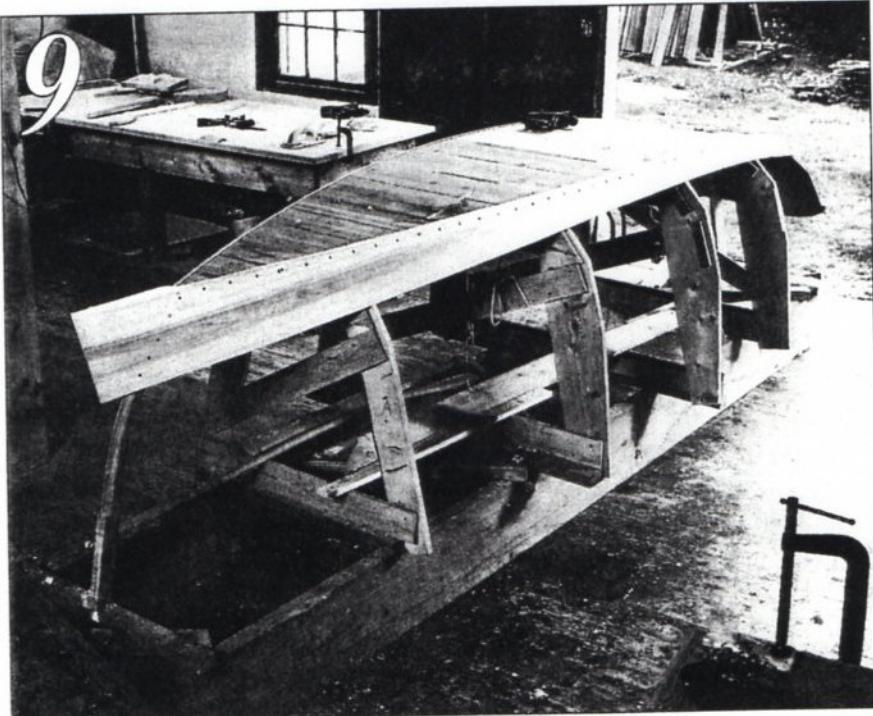
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(separate them with a piece of plastic so they will not be glued to each other). Then go back and lightly clamp along the whole length of each chine. When the epoxy cures, the chines will be locked in their correct curve, allowing for a relaxed and careful fitting at the stem. The outside edges of the chines should now be planed to match the flare of the sides. The top of this bevel may be marked with a marking gauge, as shown in photo 7.

Planking the Inner Bottom

Daisy's bottom is made of two layers of $\frac{3}{8}$ " cedar. The inner bottom runs athwartships, from chine to chine (photo 8). The outer bottom (installed after the garboards are on) runs fore-and-aft. Cedar is such a soft and forgiving wood that we can get away with gluing these relatively thick pieces at right angles to each other. The result is a bottom that will not open up between uses or during a trip on the

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Ken Wissink

trailer. This construction also allows us to use up cedar that has good width but insufficient length for fore-and-aft planking. (Either $\frac{1}{2}$ " plywood or double cross planking—as in "Building a Flat Bottom Skiff," WB No. 30, page 74—will make an excellent bottom as well.)

Before proceeding with the glued-up version of the bottom, staple plastic to the strongback to prevent bonding the boat to the jig.

The first layer of bottom planking to be installed is made of random-width boards running athwartships from chine to chine. Joint their edges for a reasonable fit, then put a bead of polyurethane sealant (like 3M 5200) on the chine and epoxy on the edge of each board. Hold this bottom in place temporarily with 1" wire brads driven partway into the chines and strongback. As each piece is fastened, mark the projection of the chine bevel onto the board's upper surface using a marking gauge like that in photo 7. When the glue and sealant have cured, remove the brads, connect the chine points with a batten, then trim and plane the ends of the bottom boards flush with the outside edges of the chines.

Planking the Sides

The side planking is $\frac{7}{16}$ " cedar; pine is a good substitute. The shape of the garboard can be found by taking the board selected for that piece and simply wrapping it around the boat. Trace the bottom curve, and the outside of the stem and transom. Also mark each station and the position of knuckle No. 1 on that station. Remove the board, connect the No. 1 knuckle marks, and saw to the lines. You have the luxury on the garboard of leaving $\frac{1}{4}$ " or so of extra wood on the bottom edge, as this is easy to remove after fastening.

Other methods are quite acceptable (and often easier) for getting the shapes of the planks. A Masonite spiling batten that is 1' wide and nearly 16' long may be used in a manner similar to that described above; to obtain the required length, join two pieces of Masonite together, end-to-end, with a glued-on butt block or, better, a piece of 3"-wide fiberglass tape set in epoxy on each side of the butt. Mark on the batten as above, lay it on the plank stock, and transfer the shape by chucking a brad in your

drill and poking it through at the appropriate spots.

Apply polyurethane sealant at the stem, transom, and chines, then fasten the garboards in place, as in photo 9.

Planking the Outer Bottom

Plane the garboard flush with the bottom, and give the whole bottom a going-over with a smoothing plane to prepare for the outer layer. Select sound but not necessarily knot-free boards, joint their edges, and dry-fit the planks. Make reference marks across the seams of the outer bottom planking for re-alignment, and trace around the edge of the bottom's first layer so excess can be trimmed off. Mark on the inner bottom where the seams of the outer bottom fall so you can glue on one plank at a time. You will want a helper to get each piece fastened securely before the glue begins to set.

Begin fastening by spreading slightly thickened epoxy on the appropriate area of the inner bottom (photo 10) and on the first outer bottom plank. Place the plank in position and tack it down with $\frac{7}{8}$ " common copper tacks driven through against a bucking iron. Space the tacks every 6", in pairs. Apply temporary clamping pressure to the perimeter and to the center along the strongback by nailing through small pads of wood, then on through the bottom, as shown in the photo.

When the outer bottom is complete and the glue has cured, trim the edges flush with the garboards and fasten both layers to the chine and transom with 1" ring nails spaced every 3".

In the next issue, Harry will complete the planking of the dory skiff, fit her out, and give some tips for finishing.

Harry Bryan builds and repairs boats in New Brunswick, Canada. His shop relies on a small gas engine and solar panels for power, emphasizing a strong commitment to human-powered and hand tools. He teaches a course on building Daisy here at WoodenBoat School.

Although Daisy can be built from all the information supplied in this article, the drawings printed here are available reproduced at 11 x 16". Order from Bryan Boatbuilding, RR 4, St. George, NB E06 2YO, Canada; 506-755-2486. The price of the set is \$30.00.

