Are you working in a different scale?

If you are working in **1:32 scale,** reduce these drawings to 75%.

If you are working in **1:29 scale***, reduce these drawings to 82.7%.

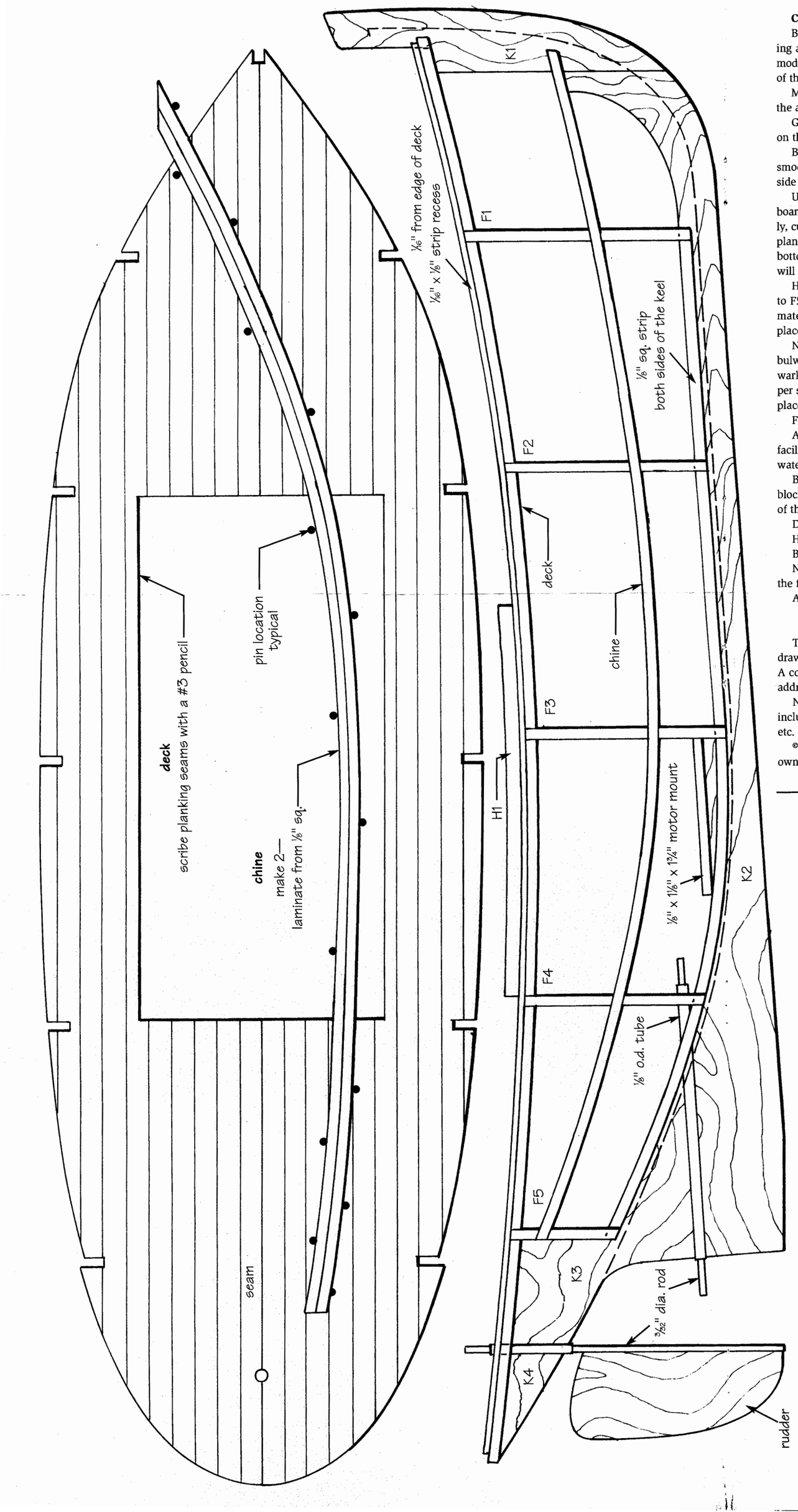
If you are working in **1:22.5 scale***, enlarge these drawings to 106.6%.

If you are working in **1:20.3 scale***, enlarge these drawings to 118.2%.

If you are working in **16mm scale**, enlarge these drawings to 126.3%.

If you are working in **1:13.7 (⅞") scale**, enlarge these drawings to 175.1%.

* See the note in the first paragraph of the text regarding scale



Arnold S.— A 1:24-scale yard tug

Plan set #61-A

Part 1: The hull

by Ted Stinson | Wiscasset, Maine

Arnold S. is a small, yard tug. The boat is a composite of features found on several yard tugs here in Maine. The plans are drawn to ½" scale (1:24), which will also work well in 1:22.5 scale. However, if you are working in 1:20.3, I suggest that you increase the height and width of the pilot-house door to 3¼" x 1". If you are working in 1:29 scale, decrease the height of the pilot-house door to 2½". That way, you won't be altering the design so much that it becomes difficult to build. Moreover, the boat will still be consistent with the range of sizes that can be found in small yard tugs.

The model is built of balsa and plywood. When sealed inside and out, it can be operated in water with an electric motor and radio control. This is a two-part construction article. This first part is concerned with building the hull. The second part will deal with the deck house, motor, and R/C installation.

Construction

Begin by cutting out the deck halves and frames from ⅛"-thick balsa. Cut the keel parts from the same wood. If you are building a working model, you will need ⅛"-OD brass tubing (supplied in Power Package #113). Build the keel over the plan. If the model is for display only, replace the ⅛" tube with ⅛"-diameter dowel. Complete the keel by gluing ⅛"-square strips along both sides of the keel, from F1 to F5.

Make two chines from ⅛"-square strip, laminated together. Protect the plan with waxed paper and use pins to hold the strips to the appropriate curve.

Glue the deck halves together. If you want to simulate a planked wood deck, scribe the deck halves with a #3 pencil as shown on the plan.

Begin assembling the parts of the hull by spot gluing the frames to the keel. Fit the deck in place, making sure that it follows a smooth curve similar to that shown in the plan. When things look right, reinforce all the glue joints. Now add the chines to each side of the hull.

Using a sanding block and #220 sandpaper, fair the edges of the hull framework in preparation for planking the sides. Use poster board to make patterns for the side planks, which should run from the bow aft to F5. When satisfied that the plank will fit fairly closely, cut two side planks from 1/32"-thick aircraft plywood. As cut, the planks should be slightly oversize to allow for fitting. Test fit the planks, then start gluing at the bow and move aft. Do one side, then the other. Trim excess material from the top of the deck and bottom of the chine. If you are making a working model, this is a good time to dry-fit the motor and propeller shaft. The open hull will allow you to check to see that these items will line up.

Having completed the sides, plank the bottom in the same way you did the sides. **Note:** The bottom planking will run from F1 to F5. Fit these planks carefully. When satisfied with the fit, begin gluing at the front and move aft. When done, remove excess material and sand smooth. Fill the hull at both the bow and stern with balsa blocks, cut and sanded to shape *before* gluing in place. When finished, sand the hull smooth, filling irregularities with spackle. Use #220 sandpaper for the final sanding.

Now fit and glue a 1/16" x ⅛" strip to the deck. This should go around the whole deck and be recessed 1/16" from the edge. Cut the bulwarks from 1/16" balsa. Fit and glue the bulwarks into this recess. At the stern, use 1/16" x ½" balsa strip (grain vertical) for the bulwarks. Add the ⅛ frameheads to the inside of the bulwarks. Cut the openings for the scuppers where shown on the plan (three per side). Cut the rail caps (R1, R2, and R3) from 1/16" balsa. Sand the top of the bulwark flat and smooth and glue the rail caps in place. Sand the rail caps smooth. Add the 1/16" x ⅛" buffalo rail at the stern.

Fit and glue the two layers of 1/16" x ⅛" stripwood around the outside of the hull to form a ⅛" rub rail.

At this point, the hull is ready for finishing. All details added after this should be sealed and painted before gluing in place. To facilitate painting the model, make a simple cradle to hold the hull level and firm. Using this cradle, you will be able to mark the waterline on the hull.

Begin the finishing by applying three coats of clear lacquer to both the interior and exterior of the hull. Be certain that the balsa blocks are completely sealed. Fill any grain with spackle and sand out thoroughly. Apply one coat of sandable primer to the outside of the hull. Sand this out in preparation for the color coats. The colors are as follows:

Deck inside of bulwarks: Natural
Hull above waterline: Black
Bottom: Oxide red

Now make the bitts. These should be finished and painted black before gluing them in place. The rail bitts are fitted next to the frameheads. This will require you to cut a ⅛"-square recess in the rail cap for each rail bitt.

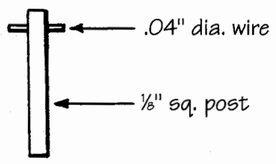
At this point, the hull is done and ready for the addition of the deck house and working options. These will be covered in part 2.

* * *

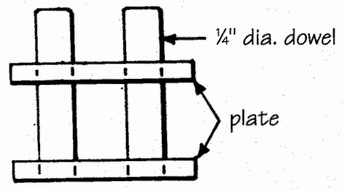
This sheet is a supplement to the August 2003 issue of *Garden Railways* magazine. While supplies last, extra copies of these drawings can be had by sending $1.50 per set ($2.00 foreign) to: Sidestreet Bannerworks, PO Box 460222, Denver CO 80246 USA. A complete list of available plans can be found at *www.sidestreet.info*, or send a stamped, self-addressed envelope to the above address.

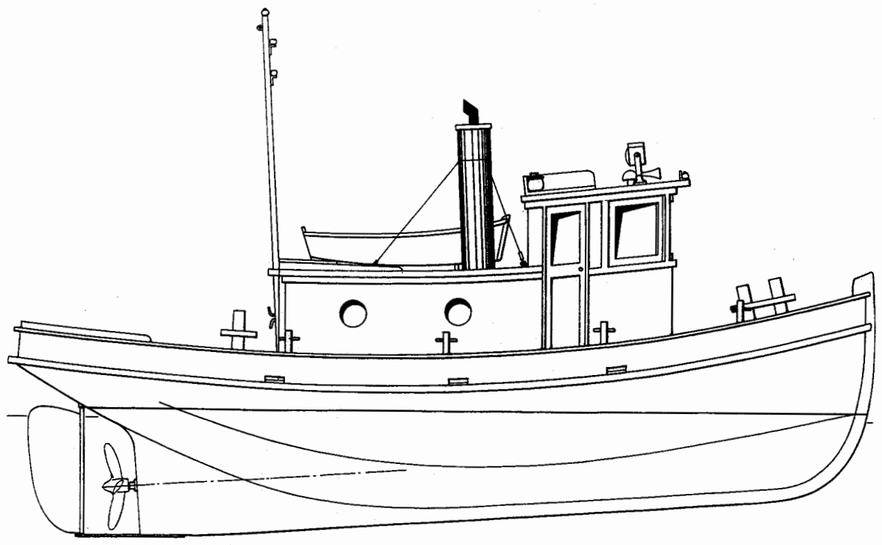
Northeast Narrow Gauge offers a kit for this tugboat (#FS113) for $70 + $7 s&h. Also available is a Power Package (#PP113), which includes motor, belt drive, and running hardware for $35. The company can also supply R/C, speed controls, additional servos, etc. Order from Northeast Narrow Gauge, PO Box 191, Wiscasset ME 04578. Web site: *www.nemodel.com*

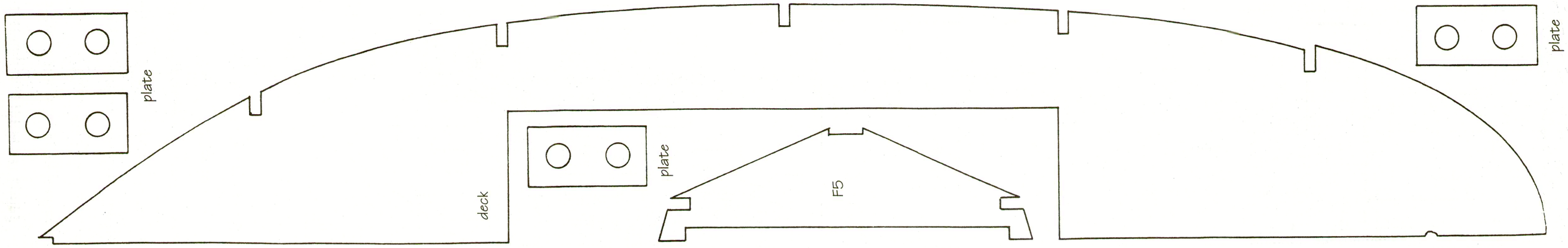
rail bitt
make 8

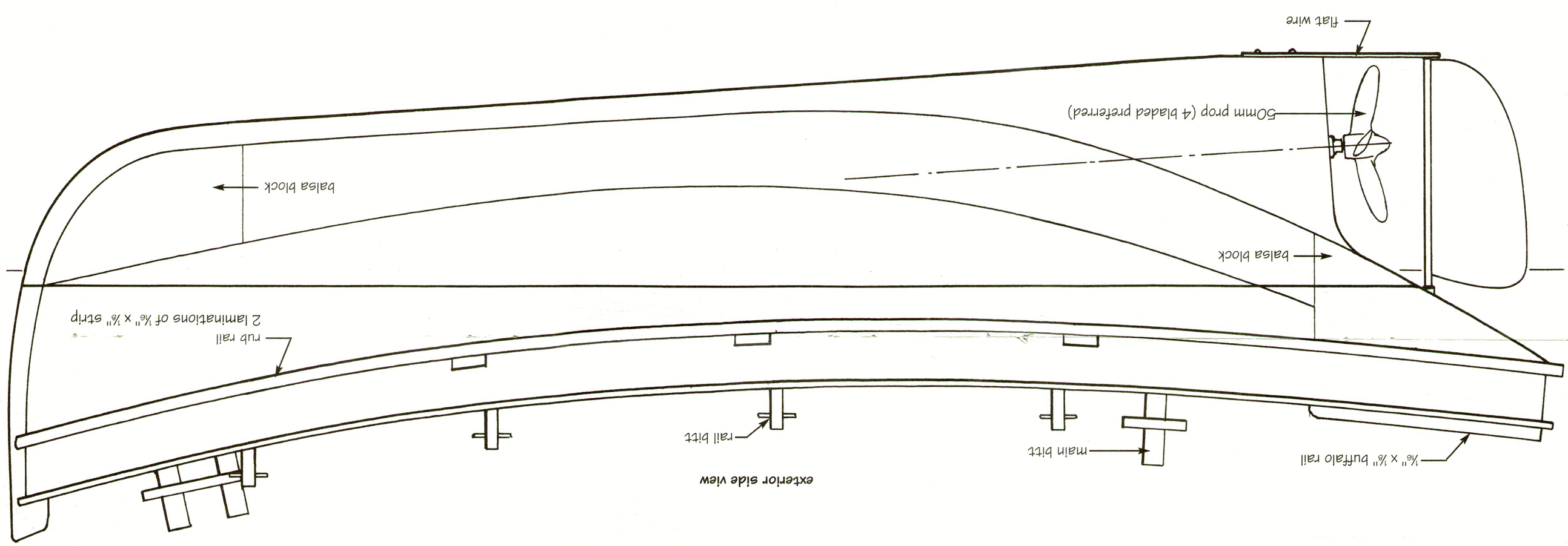


main bitt
make 2

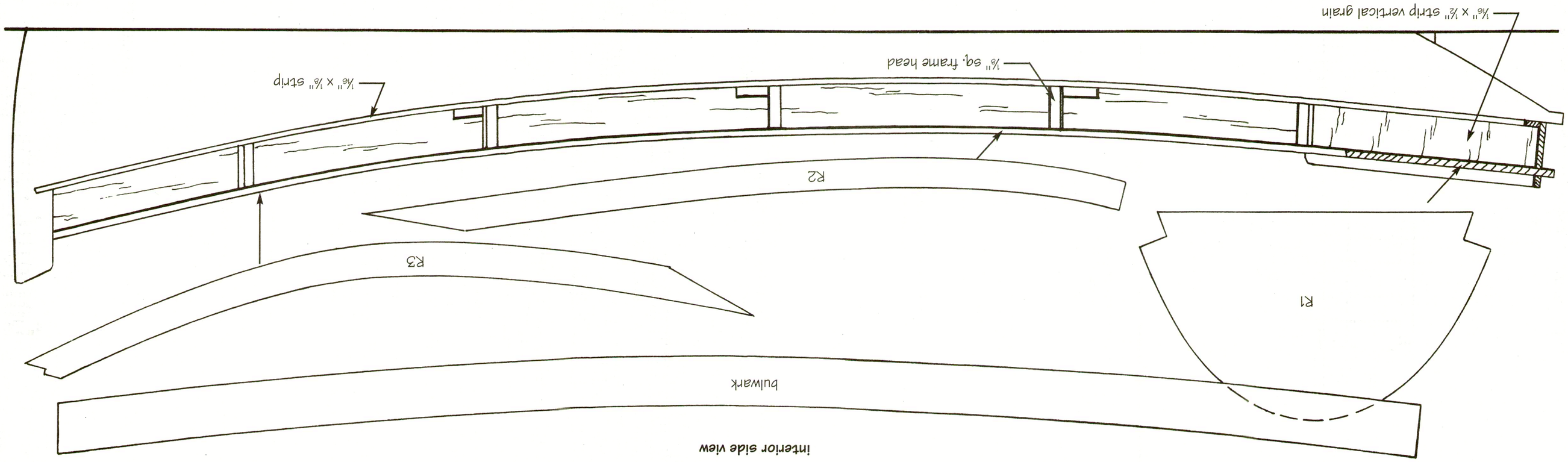








exterior side view



interior side view