Building FIRE FLY

You can really go places in this speedy hydroplane, which is designed for the largest outboard motor available. Try your hand at building her. She's guaranteed fun.

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FIRE FLY is a high speed, stepped, outboard hydroplane. A new but thoroughly proved method of venting the step for top speed, and a new bottom design, make this sporty craft fast, efficient and seaworthy on smooth or rough water. Fire Fly will exact every bit of speed possible from the power utilized. Outboard motors of 15 to 50 horsepower are best adapted to this super speed runabout. With this hull, the Evinrude Big Four (rated conservatively at 50 horsepower), can plane six persons with ease, haul aquaplanes, and attain speeds approaching 60 miles per hour. However, an outboard motor such as the Johnson Twin (developing around 25 horsepower), will give very satisfactory performance.

Fire Fly measures 14 feet long with a beam slightly over 5 feet. The completed weight of this hull is close to 275 pounds. Cost of construction will average about seventy-five dollars. The speed of Fire Fly will range between 15 and 60 miles per hour, depending on which power unit is being used.
This hull should be built in a well lighted, dry building. Use air-seasoned oak for all framework, and 3/4-inch marine plywood for planking bottom and sides, if you plan to give the boat heavy service. For light service (using motors up to 25 horsepower) you'll find that 3/4-inch marine plywood is entirely satisfactory.

Drill lead holes for all fastenings. When inserting screws, soap the threads to prevent breakage. Glue all adjoining surfaces with resin glue, except along the chines on the bottom planking and along the keel, step and transom joints. Here aviation glue and cloth is used for flexible and permanently water-tight joints. Keep tools sharp for close even joints. Use good marine finishes on the completed hull. If you want an attractive deck job, use a combination of woods such as contrasting 1/4-inch birch and walnut plywoods. Finish these with spar varnish. A quantity of "C" Clamps will facilitate construction, and a few straight battens will assist materially in aligning all frame parts.

Before beginning the construction, scan the plans and familiarize yourself with the various details. It may help to lay the lines of this hull down full size upon the floor on large sheets of building paper. Begin by drawing full size patterns of all frames and stem upon large sheets of paper. Laying the frame material upon these pattern outlines, mark the parts and cut them to shape. Return parts to pattern outlines for final assembly. Coat adjoining surfaces of frame with glue and fasten.
Here are some of the first steps in the construction of the boat. They are (2) attaching the chines to the stem; (3) attachment of chines has been completed; (4) and (5) two views showing the completed framework; and (6) attaching the initial planking. Next steps will be to finish planking and deck.

![Image](image_url)

With 1½-inch No. 8 flathead screws.

Transom No. 6 is made of ¾-inch plywood; as indicated edges are secured with a frame, then glued and screwed into place. Frames No. 4 and No. 5 are simply screw-fastened and glued at the joints. Step frame No. 3 consists of an after step frame fastened to forward step frame. A ¾ x 2-inch frame is fastened to fore step frame to serve as a reinforcing doubling piece at this point.

All parts of the step framing including the sides are glued and screw-fastened in place. Frames No. 1 and No. 2 are the same as the after frames except that the center or keel joint is secured with ¾ x 8 x 18-inch floor frames; all parts are glued and screw fastened with 1½-inch No. 8 flathead screws. Saw the stem to shape and notch it for the keel. Then bevel the edges as indicated.

Next saw the form to shape using the dimension drawing for a guide. Notch the form for frames and mount it on legs similar to a saw horse and at a convenient working height. Next assemble all frames on the form in their respective notches and spring a batten around the frames. Mark along each edge the proper bevel each must be planed and trim accordingly.

Now remove the frames from the form and notch for keel, chines, and clamps, following the sweep of the beveled edges. Then return frames to their respective form notches, and prepare to attach the keel. The keel is attached in two lengths or pieces, one from transom frame notch to step, and one from step to stem notch. Notch only the frame of the transom and the doubling piece of the step frame. Fasten fore and after keel in place with two 1½-inch No. 10 flathead screws to each joint. Next attach the chines. These chines are notched all the way through the transom and extend 6 inches beyond the transom. Fasten the chines to each...
LIST OF MATERIALS

<table>
<thead>
<tr>
<th>Item</th>
<th>Wood Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clamps</td>
<td>2 pcs. 3/4&quot; x 1 1/4&quot; x 15&quot;</td>
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<tr>
<td>Chines</td>
<td>2 pcs. 3/4&quot; x 1 1/4&quot; x 15&quot;</td>
</tr>
<tr>
<td>Keel (Inner)</td>
<td>1 pc. 3/4&quot; x 3/4&quot; x 12&quot;</td>
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<tr>
<td>Keel (Outer)</td>
<td>1 pc. 3/4&quot; x 3/4&quot; x 12&quot;</td>
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<td>Mouldings</td>
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<td>Deck beams</td>
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<tr>
<td>Stem</td>
<td>1 pc. 1 1/4&quot; x 10&quot; x 4&quot;</td>
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<tr>
<td>Transom knees</td>
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<tr>
<td>Form</td>
<td>1 pc. 2&quot; x 10&quot; x 12&quot;</td>
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<td>Bilge battens</td>
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<tr>
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<tr>
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<tr>
<td>Floor frames</td>
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<tr>
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<tr>
<td>Decking (plywood)</td>
<td>4 pcs. 3/4&quot; x 2&quot; x 4&quot;</td>
</tr>
<tr>
<td>Flooring (plywood)</td>
<td>1 pc. 1 1/4&quot; x 2 1/4&quot; x 4&quot;</td>
</tr>
</tbody>
</table>

Fastenings Required

1" No. 6 flat head screws
1 1/4" No. 10 flat head screws
1 1/4" No. 8 flat head screws
1 1/4" No. 6 flat head screws
1 1/4" shingle nails

Glues and Finishes Required

1 pound resin glue
1 pint aviation glue
Point, Enamel, Varnish

side simultaneously, using one 1 1/4-inch No. 10 flathead screw at each joint. Fasten chine ends in the same manner after beveling them to fit stem. Clamps are next attached to notches with one 1 1/4-inch No. 8 flathead screw to each joint; ends are beveled to fit stem and fastened similarly.

Measure an equal distance between keel and chines on each side of the keel on both fore and after planes, and notch flush into frames the two bilge battens. Fasten in place using one 1 1/2-inch No. 8 flathead screw to each joint. The entire framework is now trimmed and fairied by planing so that the plywood to be applied lies evenly at all points. Next preparations are made to plank the bottom. Outer keel is first fastened in place to inner keel with 1 1/2-inch No. 8 flathead screws spaced about 8 inches apart. Allow this outer keel to extend over stem notches a bevel of one foot for trimming later.

The after plane is planked first, the plywood being applied in two pieces—one on each side of the keel. Lay a sheet of plywood in position allowing it to extend about 8 inches over the transom. Then mark and cut to shape, the shaped piece serving as a pattern for the opposite side. Coat all adjoining surfaces with resin glue and screw fasten planking to frames, keel and chines with 1-inch No. 8 flathead screws spaced about 2 inches apart. After placing a cloth on the transom edges, insert a double row of screws along the transom.

The forward plane is next planked with the plywood overlapping upon the step as indicated in the drawings. This forward plane is fastened in similar fashion to the after plane except that the forward plane or fore end of plywood on each side is tapered as shown and fore edges of plywood are partially rabbeted into the keel and chine. Glue and screw fasten as was done with the after plane. Fasten the planking at all points including bilge battens with 1-inch No. 8 flathead screws spaced about 2 inches apart. The extreme fore end of planking covering the stem is best marked to shape with the aid of a paper pattern. Make a paper pat-
Two views of boat interior showing the hull completely planked and ready for work on deck beams.

Turn the hull over and bend an outside bow stem $\frac{1}{2} \times 2 \times 3$ inches around the exposed edges of stem. Fair lower end of outer stem into outer keel and screw fasten at all points.

When the hull has been turned right side up, the various deck beams are cut to shape and each is trimmed to fit its position. Where a deck beam does not land upon a frame, provide a $\frac{3}{4} \times 1\frac{1}{4}$ inch support to extend from chine to clamp. The beams are then attached to support and all beams are fastened with $1\frac{1}{4}$ inch No. 10 flathead screws, two to each joint. The deck battens and carlings are now notched flush into the beams and screw fastened with $1\frac{1}{2}$ inch flathead screws.
Beginning the work of attaching the deck beams.

No. 8 flathead screw to each joint.

Different combinations of 1/4 inch plywood make a beautiful combination on this deck, if they are naturally finished with spar varnish. The outside portions of plywood landing upon clamps and carlings is sawed to shape and attached, first fastening each side in place with 1 inch No. 6 flathead screws, spaced about 3 inches apart. For the shape of the center portions of plywood, use paper patterns, fitting paper in place and transferring shape to plywood, and then fastening similarly to deck. Finish cockpit edges by covering beam sides with scrap pieces of plywood and sides of cockpit with a 3/4 x 3 inch coaming. All coverings are screw fastened in place with 1 inch No. 6 flathead screws.

Moldings are screw fastened in place as shown with 1 1/4 inch No. 10 flathead screws, spaced about 8 inches apart. Seats are made as shown in illustrations screw fastened in place with angle irons and supports. The flooring is of 1/4 inch plywood, cut to fit position and screw fastened in place to keel and bilge battens with 1 inch No. 6 flathead screws. A paint strip is attached to each side of hull as indicated with 1 inch No. 6 flathead screws. The bottom paint color comes up to this strip and the top sides paint comes down and ends at the paint strip. Prime coat the entire hull inside and out and then apply at least three coats of marine enamel. The moldings and deck should be given three coats of varnish, allow ample drying time between coats.

Fittings such as a windshield, bow light, stern flag staff and steering wheel will dress up the hull most effectively, enhancing its value.

When fitting a motor to this hull try it in various positions to gain the most efficient planing angles. Try shifting the motor in or out to obtain best running trim. Also try raising the motor to obtain the most efficient stern height. The Big Four Evinrude utilizes a separate motor board supplied by the manufacturer and this should be set at the height indicated by the manufacturer's directions for best results.

The boat is now finished. If you try your hand at making it, a line to us with a photo of your finished boat will be more than appreciated.

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Fig. 12 shows boat with deck beams installed. Fig. 13 shows the builder attaching the decking.

Drawing and photo showing stern knees and completed boat, with knees attached.