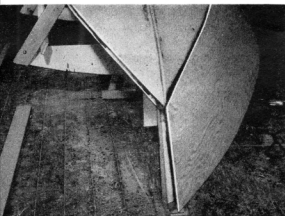




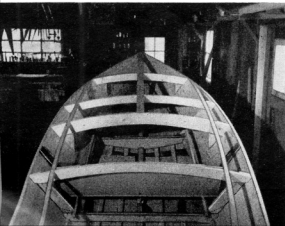


ON THE HOIST, PM-38 displays the planing hull lines which make possible high speeds with small motor



CALKING COMPOUND is used to seal all the lower planking joints at stem, keelson, chines and transom

IF YOU WISH, cut the deck planking first and then install the seat before you begin planking the deck



PM-38

*38-m.p.h. performance
\$38 for materials
38 hours to build*

By Arthur M. Mikesell

(PM Crafts Boating Editor)

EASY ON THE EYES as well as the pocketbook, the PM-38 outperforms boats costing hundreds of dollars more and runs like a racer's dream with just 28 horses clamped to the transom. This streamlined 13-ft., 9-in. runabout can be described in just four words — maximum return, minimum expense.

What's the secret? Since everyone knows that weight is one of the most important performance factors, our designer laid out plans for a fast planing hull and then hacked off weight wherever possible. The result is an agile 200-lb. boat designed for use with a relatively small motor. However, strength and safety were not sacrificed for speed. In addition to the two full frames and transom, two "half frames" were added to provide extra rigidity. Where necessary, joints were reinforced with strong but light gussets.

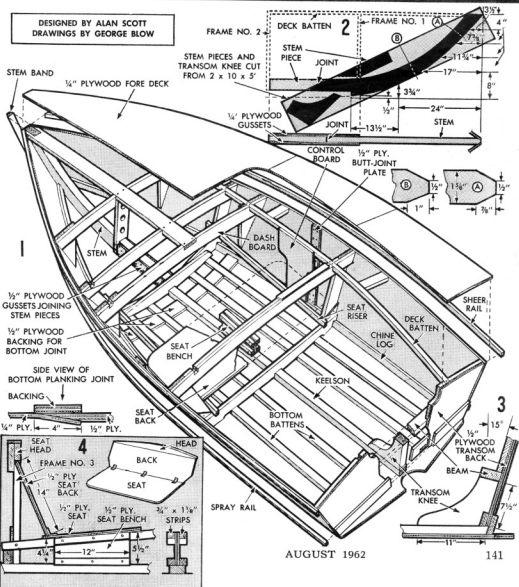
For economy, all parts of the hull fit into cutting diagrams which leave almost no waste. This makes accurate cutting very important, so we suggest that you use full-size paper patterns wherever possible. Incidentally, you can make a perfect tracing wheel for transferring these patterns to the wood by salvaging a gear from a discarded alarm clock and mounting it between the legs of a wooden clothespin with a nail.

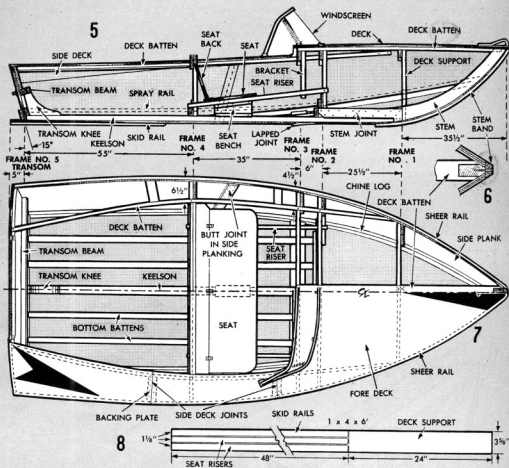
Even the construction is streamlined. You won't need any complex building forms to build the PM-38. Two simple A-frames made from scrap lumber are used to support the framing during construction, Fig. 10. While this means that a certain amount of extra care is necessary to make sure that all parts of the frame remain in proper alignment, it cuts down building time.

Cut the transom back from ½-in. plywood, Figs. 9 and 11, and use this piece as a template to saw the 1 x 4 framing members and the 1 x 8 face plate to fit. Before mounting, notch the bottom framing member for the bottom battens and the face plate for the deck battens. The transom cross beam will be approximately 61 in. long. After cutting this from the 16-ft. length of 2 x 4, saw the remainder length-



DESIGNED BY ALAN SCOTT
DRAWINGS BY GEORGE BLOW





wise to form the keelson and two outer deck battens, Fig. 12.

Assemble the frame on the plywood back, using waterproof glue (Weldwood, or similar) and 1 1/4-in. ring-groove nails. For additional resistance to corrosion, you might consider substituting serrated bronze nails (Stronghold, Anchorfast, etc.), though they are somewhat more expensive. (This also holds true for all screws used in the boat.) Fasten the 2 x 4 cross beam from the outside with 1 3/4-in. No. 8 flatheaded screws, countersinking them slightly so that they can be masked with wood putty.

Frames 1 and 3 aren't actually complete frames since each consists of just a beam and two brackets, Fig. 9. These will be installed later, once the side planking has been completed. Frames 2 and 4 utilize 1/4-in. plywood gussets between the side and bottom members to gain additional strength. Coat all contacting surfaces at each joint with glue and secure with two 1 3/4-in. No. 8 screws per joint.

Note that the bottom of frame 2 is made in two pieces which are linked by a third. Glue and screw the chine joints first, then fasten the third member between them with six 1 3/4-in. No. 8 screws and glue. After the glue has hardened, notch this third piece to receive the keelson.

Cut the two-piece stem from a 5-ft. length of 2 x 10, Fig. 2. Assemble the two parts temporarily to make sure that you have a tight even joint and trim if necessary, then nail the two pieces together with two 2-in. nails, one through the top and the other through the bottom. To further strengthen this joint, fasten 1/4-in. plywood gussets to each side with glue and 1 1/4-in. nails, Figs. 1, 5 and 10.

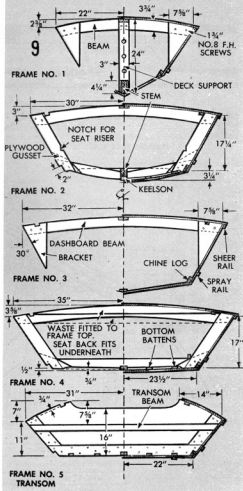
Lay the stem aside until the glue has hardened (about 24 hrs.). The outer edges must be beveled according to sections A and B, Fig. 2. Don't continue the bevel below B, since this will be done later when you attach the keelson, at which time the bevels will be faired into the keelson.

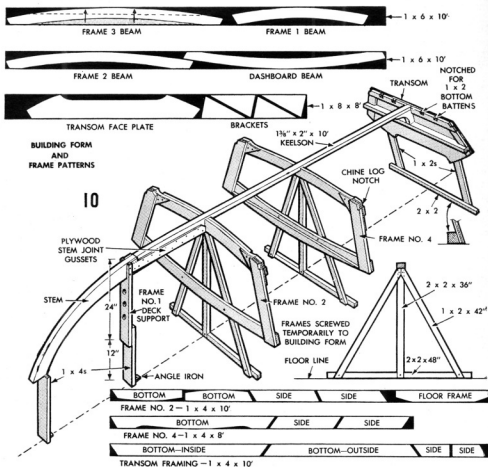
Attach the fore end of the keelson to the notched portion of the stem with three 2½-in. No. 10 screws and glue. Notch the transom to accept the aft end, but before attaching the keelson, cut the transom knee from the 2 x 10 from which you obtained the stem, Fig. 2, 3 and 5. This piece must be notched for the 1 x 4 bottom frame member in order to fit flat against the plywood transom back under the beam.

Temporarily assemble the transom knee, transom and keelson to make sure that all mating surfaces fit tightly together and trim if necessary. Then coat all contacting surfaces of knee, beam and transom back with glue, and fasten the knee in position using two 1¾-in. No. 8 screws through the plywood and one 2½-in. No. 10 screw down through the beam into the knee. Counter-sink exterior fastenings. Finally, fit the keelson into the transom notch and secure it to the transom knee with glue and two 2½-in. No. 10 screws.

Turn the stem-keelson-transom unit upside down on the floor and measure off the locations for frames 2 and 4, Fig. 5. After marking these locations on the keelson, assemble the A-frames which provide rigid support for the hull during the remainder of construction. The bottom of frame 4 must be notched to accept the keelson. Erect the hull framing, using the A-frames and temporary supports at the stem and transom. The 1 x 4 deck support, Fig. 8, should be notched, drilled (to lighten it) and installed at this time. The keelson must be perfectly flat. As the work of framing and planking progresses, check periodi-

TRAILERING the PM-38 is a breeze. The light 200-lb. hull is exceptionally easy to launch and retrieve





cally to make sure that it remains flat, especially from the transom forward to frame 4, since this will effect the operation of the boat. Attach frames 2 and 4 to the keelson with one 2 1/2-in. No. 10 screw each.

Cut the two chine logs from one 1 x 4, sawing at a 35-deg. angle, Fig. 12. Then saw off a 1-in. cross section and use this to outline chine notches in the frames, Figs. 9 and 10. Saw out these notches squarely, and after temporarily clamping the chine logs in position along the hull framing, run a hand saw between the logs and frames to seat them snugly in the notches. Trim the fore ends to fit flush to the stem. Use glue and one 1 3/4-in. No. 8 screw at each joint.

While fastening the chine logs to the frame, check frequently with a carpenter's square to make sure that frames and transom remain square to the keelson. Also, check the keelson for flatness, and if you discover any curve, no matter how slight,

correct it with shims or by securing the A-frames more rigidly to the floor.

The four bottom battens are obtained by sawing two 8-ft. lengths of 1 x 4 in half lengthwise. Place two on each side of the keelson, spacing them evenly between it and the chine logs. These fit into the notches in the inside bottom frame member of the transom and against the plywood back, but simply lay across frames 2 and 4. Use glue and one 1 3/4-in. No. 8 screw per joint to fasten them in place.

Once you have installed the bottom battens, complete the stem beveling and fair the rest of the frame. Plane or sand down any irregularities so that the plywood planking will fit flat against the frame at all points. Before you begin planking the bottom, cover the exposed ends of the chine logs and keelson with the 1 x 4 outside bottom frame piece, first coating contacting surfaces with calking compound. Fasten

MATERIALS LIST

NOTE—Since materials costs vary in different areas of the country (and even within the same state), we can't guarantee that the PM-38 won't cost you more than \$38 to build. For instance, a spot check of urban lumber dealers showed that prices ran as much as 50% higher than those in the small town where the pilot model was built, since delivery charges were automatically included.

LUMBER (All fir except stem band)

- 1 pc.—1 x 4 x 14'—Chines
- 2 pcs.—1 x 4 x 8'—Bottom battens
- 1 pc.—1 x 4 x 14'—Sheer and spray rails
- 1 pc.—1 x 4 x 6'—Center deck batten
- 1 pc.—1 x 4 x 10'—Transom framing
- 1 pc.—1 x 4 x 10'—Frame No. 2
- 1 pc.—1 x 4 x 8'—Frame No. 4
- 1 pc.—1 x 4 x 6'—Skid rails, seat risers and Frame No. 1 deck support
- 2 pcs.—1 x 6 x 10'—Deck beams
- 1 pc.—1 x 8 x 8'—Transom face plate and brackets
- 1 pc.—2 x 4 x 16'—Keelson, transom beam and outer deck battens
- 1 pc.—2 x 10 x 5'—Stem and transom knee
- 1 pc.— $\frac{1}{2}$ " x $1\frac{1}{4}$ " x 4'—Stem band (oak or other hard wood)

PLYWOOD (Fir, exterior grade AC)

- 1 pc.— $\frac{1}{2}$ " x 48" x 62"—Transom, seat and seat back
- 1 pc.— $\frac{3}{8}$ " x 4' x 8'—Bottom planking
- 3 pcs.— $\frac{3}{4}$ " x 4' x 8'—Planking for sides, deck and bottom

FASTENERS AND MISC.

- 1 gross—1" No. 8 flatheaded screws, cadmium plated
- 1 lb.— $\frac{1}{4}$ " ring-groove nails (Sears)
- 1 doz.—2 $\frac{1}{2}$ " No. 10 flatheaded screws, cadmium plated
- 9 doz.— $1\frac{3}{8}$ " No. 8 flatheaded screws, cadmium plated
- 3 pcs.— $1\frac{1}{2}$ " x $1\frac{1}{2}$ " angle irons
- 1 lb.—Waterproof glue (Weldwood or similar)
- 1 pt.—Calking compound
- $\frac{1}{2}$ pt.—Wood putty
- 1 gal.—Exterior semigloss paint

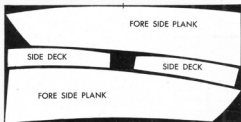
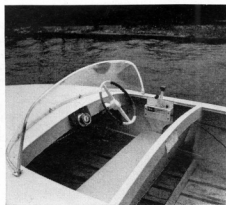
MOTOR AND PROPS

On test runs, the PM-38 hit approximately 35 m.p.h. when powered by a 28-hp. Johnson (standard three-blade wheel) and carrying one 155-lb. person. To reach 38 m.p.h., the standard wheel was replaced with a two-blade racing prop (Miehlman Wheel AJC462 10 x 14). This is a bronze wheel and should be used only in fresh water. For salt water operation, use the AJC461 10 x 11 two-blade aluminum wheel. According to OBC ratings, the maximum size motor to be used on the PM-38 is 45-hp.

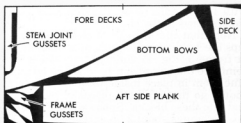
LARGE-SIZE PLANS AVAILABLE

If you prefer to work from larger drawings than those included here, a set of plans on 22" x 30" sheets is available. For the plans, plus a booklet containing the text and photos, send \$3.00 to Popular Mechanics Blueprint Dept., 200 E. Ontario St., Chicago 11, Ill.

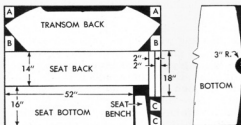
REMOTE CONTROLS should be mounted on a piece of $\frac{1}{4}$ -in. plywood that is attached to batten and chine log



ONE 4' x 8' SHEET— $\frac{1}{4}$ " FIR PLYWOOD, EXT. AC



TWO 4' x 8' SHEETS— $\frac{1}{4}$ " FIR PLYWOOD, EXT. AC



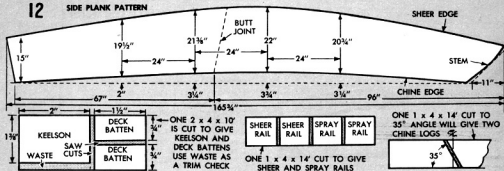
ONE 48" x 62" SHEET— $\frac{1}{2}$ " FIR PLYWOOD, EXT. AC

ONE 4' x 8' SHEET— $\frac{3}{8}$ " FIR PLYWOOD, EXT. AC

in place with twelve $1\frac{3}{4}$ -in. No. 8 screws.

Clamp the $\frac{3}{8}$ -in. plywood panel on the frame so it projects 3 in. beyond the 1 x 4 outside bottom framing of the transom. After marking the chine outline on the panel, remove it and cut to shape, sawing along the outside of the line to allow for final fitting after securing it to the frame. Also, saw a center slit 30 in. long in the fore end of the panel to accommodate the curve of the hull at this point. After sawing the panel, clamp it over the framing again to check the fit, then crawl under the frame and mark the location of chines, keelson, battens, etc. Remove the panel and drill lead holes at 12-in. intervals along the centerline of the outline of each member. Then turn the panel over and countersink each hole slightly. Be sure to replace the panel in exactly the same location so that screws and nails will be positioned in the center of each frame member.

(Text continues)



Before attaching the bottom planking, coat both the bottom of the transom and the mating surface of the plywood planking with calking compound. Then apply glue to the bottom surfaces of the frame members and the matching areas of the plywood planking. Finally, fasten the planking in place, using a double row of $1\frac{1}{4}$ -in. nails spaced 2 in. apart at the transom and 1-in. No. 8 screws spaced 4 in. apart along the battens, chines and keelson. Use a double row of screws along the slit in the fore part of the planking.

The rest of the bottom planking is $\frac{1}{4}$ -in. plywood and will require steaming or soaking to bend to the hull curves. To facilitate bending, place a wet towel on the exterior surface and run a hot iron over it. Coat contacting surfaces with glue and fasten

with $1\frac{1}{4}$ -in. nails along the stem and 1-in. No. 8 screws at the chines.

Note that the $\frac{1}{8}$ -in. rear planking overlaps at frame 3, Fig. 1. Cut backing blocks to reinforce this joint from $\frac{1}{2}$ -in. plywood and glue them in place inside the hull. Screws should go through both pieces of planking and into these blocks. Space all fore planking fastenings about 2 in. apart.

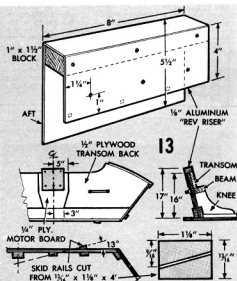
Use the same procedure when planking the sides as you did when installing the bottom planking. Calk the joints between side planking, chine and transom, but coat all other mating surfaces with glue. Attach the planking with $1\frac{1}{4}$ -in. nails spaced 2 in. apart. Use glue and $1\frac{1}{4}$ -in. nails to secure the $\frac{1}{2}$ -in. plywood backing plate for the butt joint. Drive these nails from the outside through the planking and backing plate. Since they are slightly long for this joint, you'll have to clinch the ends which protrude through the backing plate.

Before turning the hull right side up, cut and install the skid rails, Figs. 8 and 13. Taper and round the fore end of each rail to reduce drag. Use calking compound when mounting the rails, and secure them to the hull with 1-in. No. 8 screws through the planking and into the outer bottom battens. Countersink these screws slightly and fill the holes with wood putty.

To complete the bottom, plane the stem planking joint flat and install the stem band, Figs. 5 and 6, using calking compound and 1-in. No. 8 screws spaced 6 in. apart. Soaking the stem band in hot water for a short time will make bending easier.

Now turn the hull over and rest it on padded saw horses. Cut the two sheer rails and spray rails from a 1 x 4, Fig. 12. The sheer rails should be mounted first, starting at the bow. Coat all contacting surfaces with glue and fasten the rails from inside the hull with 1-in. No. 8 screws at 8-in. intervals. Following the same procedure, secure the spray rails 3 in. above chines.

(Continued to page 198)



PM-38

(Continued from page 146)

Next, install the beams and brackets which make up frames 1 and 3. Secure brackets to beams with glue and two 1 $\frac{3}{4}$ -in. No. 8 screws per joint. To mount the half frames, drive two 1-in. No. 8 screws through the side planking into each bracket, countersinking each slightly.

Notch the deck beams of frames 1, 2 and 3 for the 1 x 4 center deck batten. The fore end of this batten will have to be notched also to fit around the stem. Use two 1 $\frac{3}{4}$ -in. No. 8 screws and glue to attach this batten at each joint. To complete the deck framing, install the two outer deck battens, fitting them into notches cut in frames 2, 3, 4 and the transom. Bevel the fore end of each to fit against the side planking. Secure with glue and one 1 $\frac{3}{4}$ -in. No. 8 screw per joint. Before planking the deck, plane the edges of sheer rails and plywood side planking to conform to the curvature of the deck beams and transom.

Plank the deck as you did the sides, using glue and 1 $\frac{3}{4}$ -in. nails spaced 2 in. apart, Fig. 7. Utilize scrap $\frac{3}{8}$ -in. plywood from the bottom planking panel as backing plates for the butt joints, Fig. 12.

Mount the seat risers first, Figs. 5 and 8, attaching them with glue and one 1 $\frac{3}{4}$ -in.

No. 8 screw per joint. Since the seat bench is made from scraps cut from the same panel as the seat itself, saw out the seat before making up the bench. If necessary, you can adjust the dimensions of the bench, Fig. 4. Use glue and nails to assemble the bench and mount it on the keelson. Fasten the seat to the risers and bench with 1-in. No. 8 screws and glue, then secure the seat back to the seat bottom with three inside corner plates and 1-in. No. 8 screws. Finally, trim the seat head to fit, attach it to the top of frame 4 and cover the joint with a trim strip obtained from the waste of the keelson 2 x 4.

Either make up the motor board from scraps of $\frac{1}{4}$ -in. plywood left over from the deck planking panel, or (preferably) from a 10 in. x 16-in. scrap from another project. To elevate the motor to the proper height, glue and screw a 1 in. x 1 $\frac{1}{2}$ -in. block to the top of the transom. If possible, reinforce this with a cap made by bending a piece of scrap aluminum, Fig. 13.

While we normally recommend fiberglassing seams before painting, this isn't absolutely necessary and it will make the boat more costly. After painting, all that remains is to install the windshield, controls and motor before loading the boat on your trailer and heading for the nearest water. ★ ★ ★

