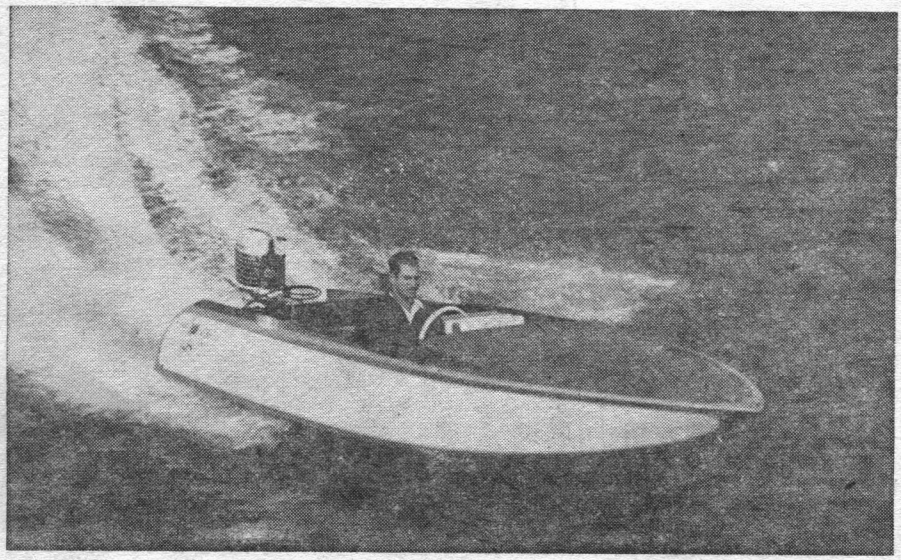
REBEL

Designed by
Glen L. Witt





DIMENSIONS	
Length overall	14'10"
Beam	6'4"
Hull depth forward	25"
Depth at transom	20"
Approx. weight	400#
Power	30-80 hp

Here's a speedy ski boat you can build from a kit or from plans. Construction is relatively simple if you use the supplied frames

☐ The Rebel is a modern outboard runabout of the "ski boat" type. It is designed for high speed use, and its cowl type of forward deck eliminates the need for a windshield. It also has flaring anti-trip chines that provide a safety factor in turning, and also tend to smother much of the spray around the transom area.

Construction, using the frame kit that's available, is relatively simple, but this is not a boat recommended for a beginner's job. A building form is necessary, which must be set up as shown on the plans that come with the kit. It is important that the base member of the form be anchored to the floor so that it will not move around when the various members are assembled on the form.

When the form is completed, mount the frames on it bottom side up. After they are accurately spaced, center them carefully as shown in Photo 1, and anchor them rigidly to the form with temporary screws, or clamps. Be sure to adjust for any minor discrepancies in alignment by wedging the frames slightly.

The position of the transom is obtained after installing the keel, which is allowed to extend aft from frame #4 in a straight line. The transom knee, butted to frame #1, will space the transom properly. Block the transom with braces so it is held on its outer extremities, and is spaced equal distances at the chine points from frame #1.

Install the chine blocking and breasthook to the stem, using 2″ #10 screws after coating mating surfaces with glue. The heel of the stem is butted to the floor timber at frame #5, and is fastened in place with 2″ #10 screws. The entire assembly is then mounted on the building form, taking care to follow the dimensions given in the plans. After the entire structure has been carefully aligned, block and clamp it securely in place.

The keel is made up of a single length of oak, spruce, or mahogany 1″ x 4″ plank, laminated on the inside with ⅜″ or ¼″ plywood to prevent splitting. The plywood lamination need not be full length; use simple butt joints (which must be between frames) if necessary. Glue the plywood lamination to the keel, and nail with 1″ annular ring nails spaced 6″ apart. Use caution in placement of nails, as the points may cause trouble when the keel is beveled to accept the bottom planking.

Install the keel to the frames with 2″ #10 screws, after countersinking ¼″ for the screw heads. Be sure mating surfaces are coated with glue. Bolt the keel to the stem and transom knee with two 5/16″ carriage bolts. Again, countersink the heads to allow for fairing.

Chine logs are made up full length of 1″ x 2″ oak, mahogany, or spruce. Bevel the chine notch at each frame so the chine log will lie flat against it. At the stem, hold the chine log against the chine block, and trim off the end, using the stem itself as a guide to ensure a proper fit.

Fasten each chine log at the stem block with a single 2″ #10 screw driven at an angle that will allow it to make contact with the stem itself. Spring the chine log around the hull framework, fastening it to each frame with a single 2″ #10 screw.

Note: there may be considerable tension

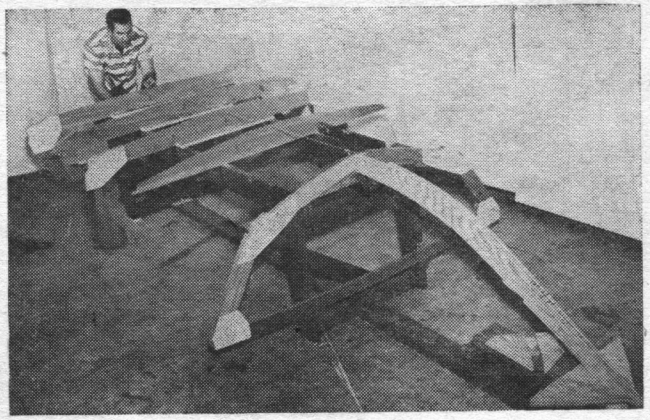


Photo 1. Frames are spaced on building form and checked for alignment. Note the stem assembly bolted to frame #5, and notch in stem that takes notched chine block shown resting on form below stem.

at frame #5, so the screw at this frame may be eliminated until *after* the planking has been applied. Then the screw can be driven through the planking and chine into the frame. This will often prevent cracking of the chine log at this stress point.

Also, install both chines at the same time. Fasten both at the stem, then frame #4 on both sides, and at each successive frame on both sides. If a chine log is installed completely along one side before the other is started, the framework may be warped out of alignment.

Use oak or mahogany 1″ x 2″ stock for the anti-trip chines, and install them. They extend from the transom to a point just forward of frame #4, and they must be tapered to match the chines along the forward edges. Fasten with a 2″ #10 screw at each frame, after coating mating surfaces with glue.

Sheer clamps are made up of two laminations of ⅝″ x 1¼″ mahogany or spruce. These are installed vertically from amidships forward; aft of amidships they take a twist to allow material for fastening both side planking and decking. They cannot be similarly twisted forward. Bevel all frame notches so the sheer clamps will lie flush in them.

In assembly, angle the first lamination to match with the stem-breasthook junction, and screw into place with several 2″ #10 screws after coating mating surfaces with glue. Spring into place around the rest of the frames, fastening at each with annular ring nails. As with the chine logs, install the clamps on each side at the same time to avoid twisting the framework.

Next apply the outer sheer clamp laminations. Coat mating surfaces liberally with glue, and fasten with 2″ #10 screws through both laminations into the frames. Clamp the laminations together in the intervals between frames until the glue has set.

Install the 1″ x 3″ bottom battens. These rest on top of the frames and transom. They need not extend all the way forward to meet the chines, but should be run as far forward as possible. It may be necessary to vary the spacing between battens slightly from frame #3 forward in order to allow them to take a natural curve, and it is advisable to kerf the battens, particularly those closest to the keel, back to a point just forward of #3 frame. (See Fig. 1.)

Fasten the battens with a single 2″ #10 screw at each frame, but omit those at the forward frame until *after* bottom planking is applied. This will enable the kerfed area

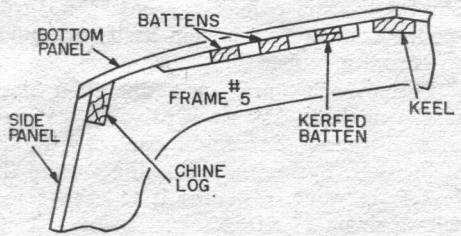
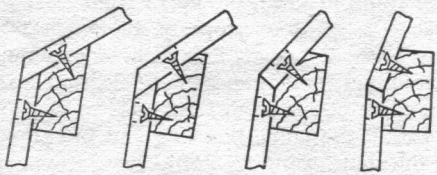


FIG.1



CHINE LOG BETWEEN FRAME #5 AND STEM

FIG.2

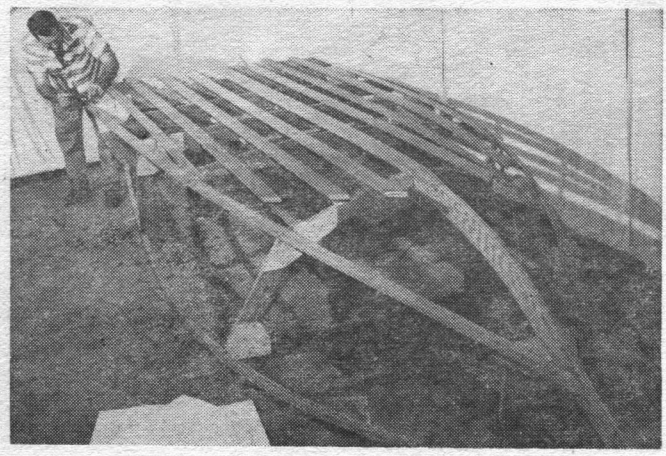


Photo 2. Completed framing is faired to take side and bottom planking. Horizontal cuts (kerfing) through the stringers nearest keel can be seen. Kerfing allows the stringers to bend more naturally when bottom planking is applied.

to take a more natural bend.

The transom capping member is the final part of the framework to be assembled. It is applied flush to the bottom of the battens. It caps the gaps between battens and the transom and also provides a solid bearing for the bottom planking. The bottom surface must be beveled 12 degrees to accommodate the bottom planking. Fasten the capping member to the transom with 1½" #8 screws.

Now all the framework must be faired so that planking will lie flush against all members. Use a wood rasp on chine logs and sheer clamps where they pass through frame notches to fair these members with the frames at these points. Then use a plane to fair the chine logs and sheer clamps in the areas between frames, see Photo 2. Use a small piece of plywood, or a thin batten, to check your work. Keel and stem are faired in a similar manner, again using a flexible batten or small piece of plywood.

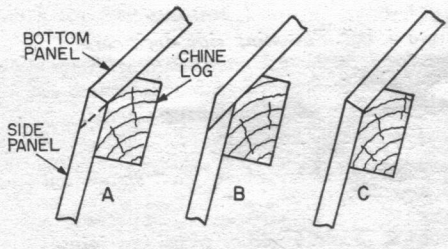
Use a long straight edge, and draw a line along the side of each chine log from the point at frame #5 where side and bottom panels meet, to the mid-point of the chine log at the point where it meets the stem. Fair the chine log as shown in Fig. 2 to accept both side and bottom panels.

A single length of ¼" marine or exterior grade plywood is desirable for each side panel, but shorter lengths can be used if the sections are butted along a backing block at a point between frames. Clamp the plywood to one side, or sink several screws to hold it in position, and mark it roughly around the sheer clamp, transom, chine log, and stem. Remove the panel and cut it roughly to shape.

Re-apply the panel, and re-mark and re-cut it as necessary to make it fit. Particular care must be taken with the fit along the chine between frame #5 and the stem; at other points the panel can be planed fair after final installation.

Remove the panel and check it for fit on the opposite side of the boat. It can then be used as a pattern for marking the second side panel. Re-install the first panel, screwing it permanently in place with 1" #8 screws spaced about 2" apart along chines, transom, sheer clamp, and stem. Screws are not needed along the frames, although these points, as all other mating surfaces, are coated with glue. Fair the panel to the chine log; be sure to note that at the stem the second side panel will lap the first. Install the second panel in the same manner as the first.

Before bottom panels are installed, fair



A-SECTION AT LAP/BUTT JOINT TRANSITION POINT
B-LAP JOINT AFT OF TRANSITION POINT
C-BUTT JOINT FORWARD OF TRANSITION POINT

FIG. 3

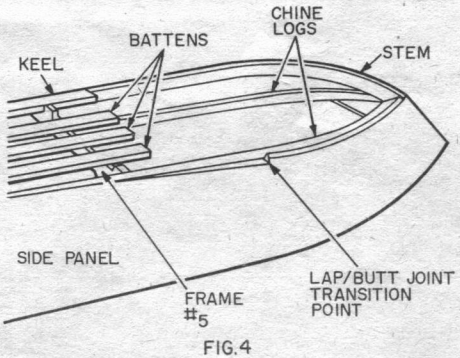


FIG. 4

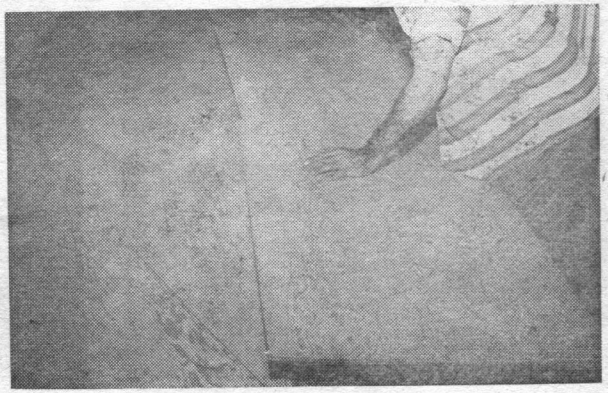


Photo 3. Second bottom panel is fitted in place before trimming to fit along its side panel. Transition joints in this and in bottom to side panel seam at left can be clearly seen.

the side panels forward of frame #5 for a lap joint to a point about 15″ ahead of the frame. From this point forward, side and bottom panels will meet in a butt joint, as shown in Fig. 3 and Fig. 4.

Use ⅜″ marine or exterior grade plywood for bottom panels; single lengths are best but shorter lengths can be used with butt block joints between frames. In this case the butt blocks must be inserted between the battens.

Installation is in the same manner as for the sides. Clamp one panel in place, and mark for the rough cut. Be sure to align a long straight edge of the panel along the centerline of the keel, and use a few screws to keep it from shifting. In the final fitting of the forward area, it's a good idea to soak a couple of burlap bags in boiling water, then spread them over the plywood to make it easier to bend. Ahead of the point where the transition is made from lap to butt joint, trim the panel carefully, a little at a time, and fasten the panel with temporary screws through 2″ square plywood blocks as you work your way forward. These blocks will help spread the stress, and will bring the bottom panel down flush with the side panel. Finally, add the permanent fastenings of 1″ #8 screws spaced 2″ apart after all temporary fastenings have been removed, and all mating surfaces coated with glue.

Apply the second bottom panel in the same manner. Note that a transition is made from a butt joint along the keel to a lap joint along the stem. See Photo 3.

Next install the anti-trip planking. This is butted to the bottom planking on each side of the hull, and laps over the side planking. Of course it is planed flush with the sides after it is fastened in place. Fill all screw head holes in all panels with wood putty, and sand flush with the plywood after the putty has hardened.

If the hull is to be fiberglassed, this is the time to do it. It is recommended that fiberglassing be done if fir plywood is used for bottom and side panels, as this prevents the checking that often occurs with this type of plywood. Carefully follow the instructions provided by the manufacturer of the resins and catalysts used.

After fiberglassing, the hull can be turned right side up and blocked level. Now trim the edges of the side panels flush with the sheer clamps. Install the intermediate deck beam; this should be cut from 1″ mahogany or spruce, although ¾″ plywood can be used. Screw the blocking to the sheer clamps on

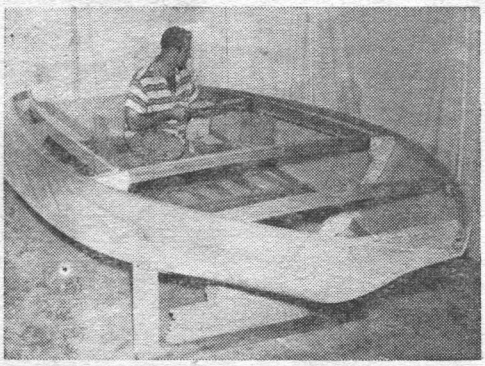
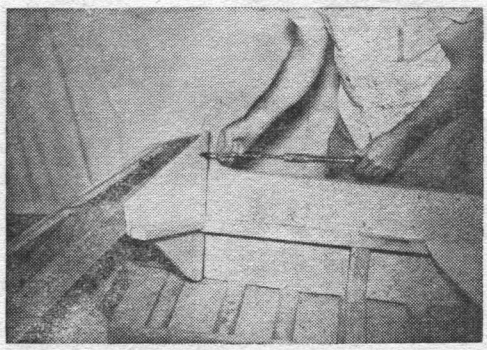
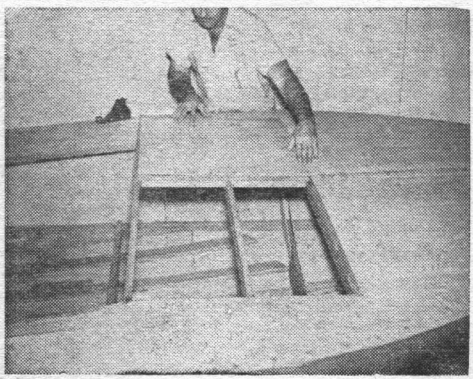


Photo 4, left. Fastening side deck carlings in place. Note how the intermediate deck beam is fastened to blocks, which in turn are screwed to the sheer clamps.

Photo 5, below left. Sides of self-bailing motor well are made from scraps left over from hull planking.

Photo 6, below. View of transition joint from lap to butt aft of frame #1. Use a medium wood rasp, followed by sandpaper, to fair deck into the tumblehome of the sides along the butt joint.





each side of the hull, and screw the beam to the blocking with 1½" #8 screws.

Next the carlings, the longitudinal members that form the sides of the cockpit, are sprung into position as shown in Photo 4. They are screw fastened at the transom, each of the frames, and at the frame #5 deck beam. Now fair the carlings, sheer clamps, and side panels so the side decks, when installed, will lie flush against all members. Be sure to eliminate any bumps or hollows.

Bevel the athwartships 2" x 4" member to mate to the transom, and fasten it in place over the transom knee. Then form the motor well tray with side members that extend from the top of the carlings back and down to the transom motor board, plus a motor well tray that is screwed to side blocks and the athwartships member. See Photo 5.

To complete the topside framing, install the battens and strongback that go under the foredeck. These are notched into the deck beams and the strongback into the breasthook as well. The strongback must have a clean, even sweep that ends at the tip of the stem.

Plywood is used for the decking, and it is installed in the same manner as side and bottom panels. Clamp it in place, mark for cutting, and cut to rough size. Re-install and mark for any additional cutting needed, and trim to fit. At the junction of the forward decking and aft decking, a butt block is used —under the decking, of course. Note that a transition joint is needed near the transom; this comes at frame #1. See Photo 6. Carefully trim all deck overhangs along the sides. Fasten decking with 1" annular ring nails.

Coamings are fitted to the lower edge of each carling. These extend from the motor well forward to the frame #5 deck beam. Cut the forward beam for the cowl to the same crown as the frame #5 deck beam, and install it flush with the top of the deck beam. Be sure to notch it first for the cowl strongback.

Next install the dash beam and cowl beam to the coaming with side blocks in the same manner as the intermediate deck beam. Notch each for the cowl strongback, and screw this into place with 2" #10 screws. The cowl covering panels then butt to the foredeck, and fit into rabbets provided along the coaming and dash beam. See Photo 7.

Floorboards are an optional feature, but can be made up of ⅜" plywood installed over the bottom battens. Any type of seating arrangement suitable to a hull of this size can be installed.

After giving the finished boat the paint and varnish job of your choice, you are ready to fit engine and controls, and to enjoy many hours of happy boating. ■

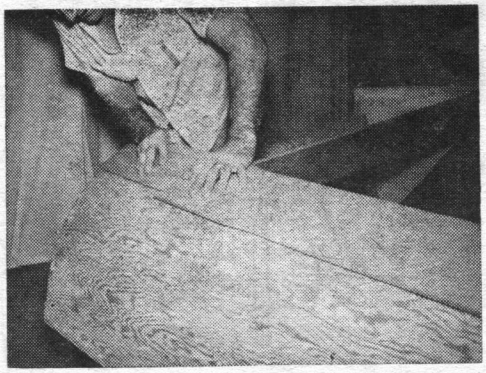


Photo 7. Cowl panels butt against after edge of the foredeck. This cowl eliminates the need for a windshield, although such a unit could be added if desired. Screw holes along deck edges are filled with wood putty, then sanded flush before varnish is applied.

Frame kit for building Rebel with complete plans is available from Glen L. Marine Designs, 9152 E. Rosecrans, Bellflower, Calif. 90706 for $95. Complete plan sets, and plan sets with full-size patterns for stem, chine blocking, breasthook, transom knee, and frames, are also available at $9 and $18 respectively.

BILL OF MATERIALS

Quan.	Size and Description	Use
	40 bd. ft. Random widths & lengths, oak mahogany or spruce	Frames, four quarter material*
1	¼" x 3' x 6' plywood	Frame gussets, keel laminations*
1	¾" x 4' x 8' plywood	Stem, transom, breasthook, chine block, transom knee*
2	¼" x 3' x 16' plywood	Side planking
2	⅜" x 4' x 16' plywood	Bottom planking, anti-trip planking
1	1" x 4" x 11' oak, mahogany or spruce	Keel
2	1" x 2" x 16', oak mahogany or spruce	Chine logs
4	⅝" x 1¼" x 16' oak, mahogany or spruce	Sheer clamps
6	1" x 3" x 11' oak mahogany or spruce	Bottom battens
2	1" x 2" x 8' oak, mahogany or spruce	Anti-trip chines
2	1" x 2" x 6' oak, mahogany or spruce	Deck battens
1	1" x 3" x 7' oak, mahogany or spruce	Strongback
2	1" x 4" x 10' oak, mahogany or spruce	Carlings
3	1" x 4" x 6' oak, mahogany or spruce	Intermediate deck beam, cowl beams
1	1" x 8" x 5' mahogany	Dash beam
1	1" x 7" x 9' mahogany	Coamings
2	¼" x 4' x 8' Douglas fir or mahogany plywood	Decks
1	2" x 4" x 4' Douglas fir	Athwartships brace
1	1" x 3" x 4" mahogany	Motor well beam
	Scrap plywood from planking	Motor well bottom and sides
6	5/16" x 5" carriage bolts	
2 gross	¾" #8 flat head wood screws	
4 gross	1" #8 flat head wood screws	
1 gross	1¼" #8 flat head wood screws	
1 gross	1½" #8 flat head wood screws	
1 gross	2" #10 flat head wood screws	
8 only	3" #14 flat head wood screws	
3 lbs.	1" #12 bronze or monel annular thread nails	

Resorcinol or urea type glue
*Members furnished in frame kit


THE REBEL