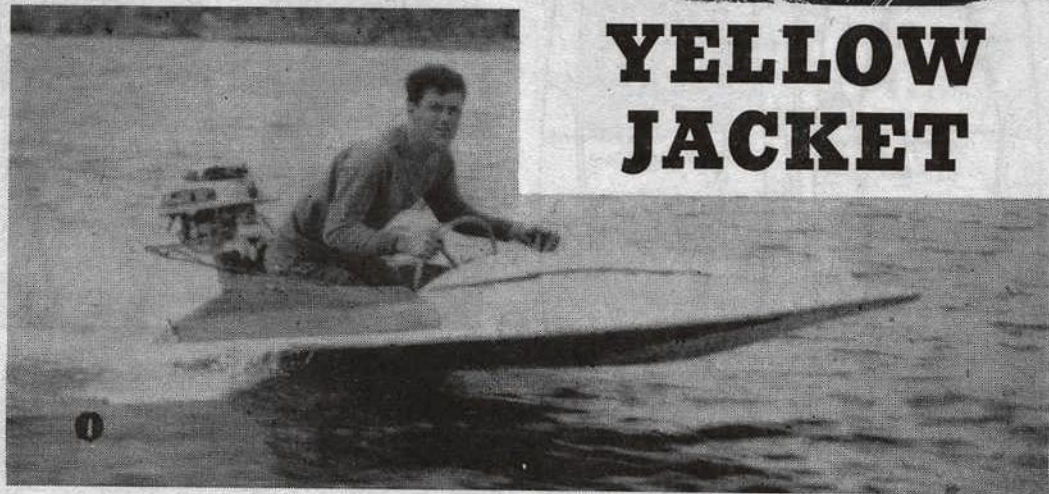


BOATS



YELLOW JACKET



Water speedometer tests show this "hot rod" speedboat will do 39 mph with a Class A motor, 45 mph with a Class B

By WILLIAM D. JACKSON
Naval Architect

"LET'S try one that will really give 'em some speed, Bill, and will also qualify for Class A racing." That was the editor talking and, since I like to be obliging, here's just what he and a lot of you readers requested. *Yellow Jacket* weighs 100 pounds lakeside, not including steering wheel, fin and throttle controls, and this brings it within the Class A racing requirements of a minimum 100 lb. hull weight. Also, to qualify for Class A racing, *Yellow Jacket* must be used with an outboard motor with a piston displacement of over 10 but not over 15 cu. in.

As for performance, we really tested this racing hydroplane with a Truspeed 0-50 mph water speedometer, and she proved to be a mighty hot little number, as the data in Tables A and B show. At wide open speeds, *Yellow Jacket's* wetted or running surface is no larger than an ordinary dinner plate, and the hull darn near rides on the propeller. Note in Tables A and B how the choice of motor, driver's weight, motor angle, propeller and fuel mixture affected

Craft Print Project No. 165

FEATURES: Frankly designed as a light-weight Class A racing record breaker. Can also be used with Class B motors for unofficial racing at speeds approaching 50 mph. Incorporates very low C/G, improved hull bracing and streamlining. Can turn at wide open speeds without tripping.

LENGTH: 8 ft.

BEAM: 47 in. overall.

WEIGHT: 100 lbs. (excluding steering wheel, steering gear, fin, throttle control, handles, and speedometer).

SEATING CAPACITY: One person.

MATERIAL: Exterior plywood and fabric deck.

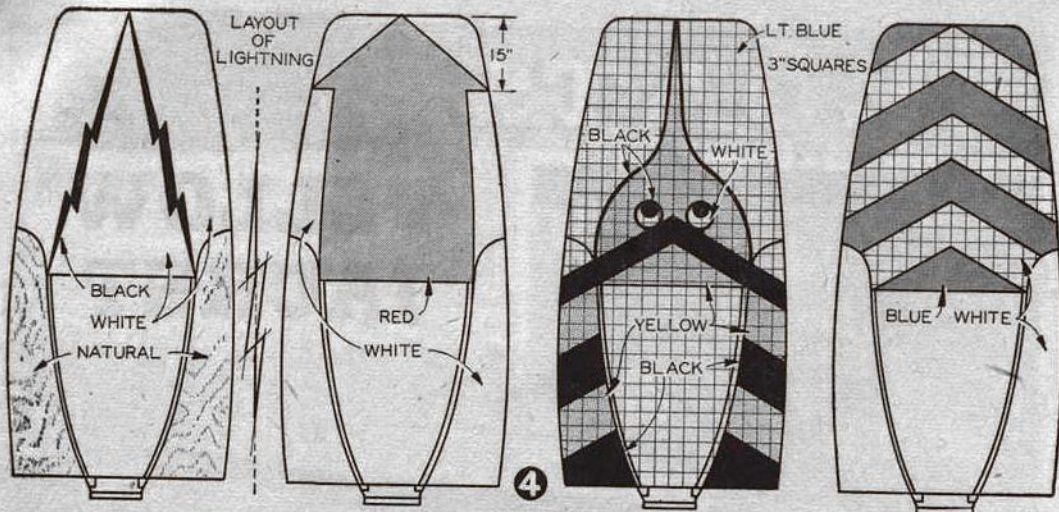
DESIGN: For use with 7½ hp, minimum cu. in. piston displacement motors for sanctioned Class A racing, or Class B motors for sport and speed thrills.



Note outer frame attached to the transom.



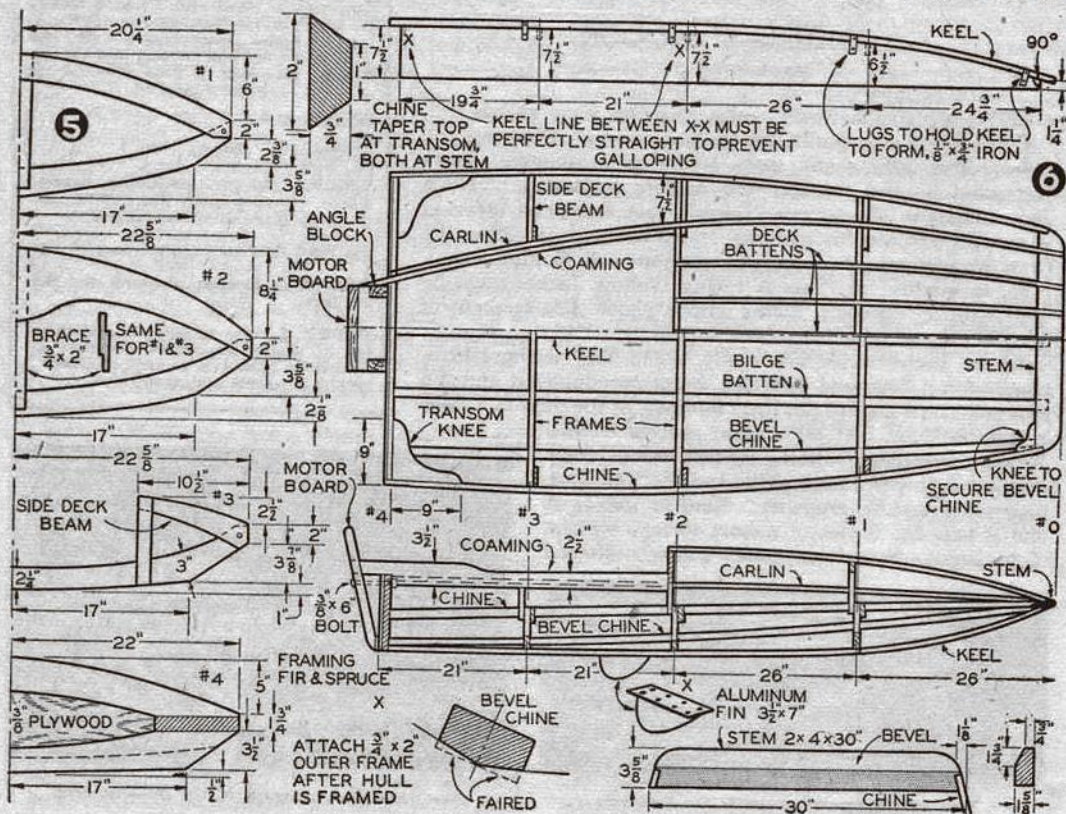
Bow view of framework on the building form.



the test speeds. Actually, with an experienced 75-100 lb. kid driver (instead of the 175 lb. man who ran these tests), and a bit more souping, I'll lay you a bet that this boat can equal the world's record for sanctioned Class A racers. As a Class A racer, Yellow Jacket will ordinarily be used with such $7\frac{1}{2}$ hp motors as Mercury, Martin, Champion Evinrude or Johnson and with these small motors, with their minimum of cu. in. piston displacement, a lightweight driver will com-

pete best. In fact, under the 1951 rules set forth by the American Power Boat Association, 700 Canton Ave., Detroit 7, Mich., the maximum driver-plus-hull weight for stock hydroplane Class A racing, is 250 lb.

In case you've noticed a similarity in outward appearance between Yellow Jacket and the *Skeeter* speedboat we described in the August issue, we'll have to admit that *Skeeter* has been improved upon. *Yellow Jacket's* design is a far



MATERIALS LIST—YELLOW JACKET

Exterior Plywood Required: AB or AA Grade

Item	No. Req'd	Size
Bottom, bevel chines and floor-board	2 pcs.	1/4" x 4' x 8'
Side decking (makes two pieces)	1 pc.	1/8" x 26' x 50"
Transom and 2 coamings	1 pc.	3/8" x 36' x 48"

Framework Lumber Required

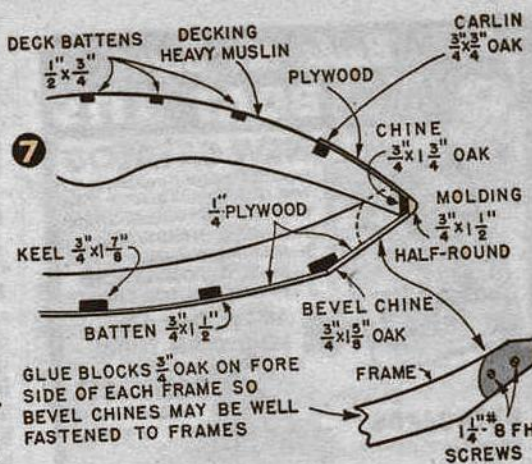
Bottom frames and transom	1 pc.	3/4" x 7 1/2" x 8'
Deck beams and side deck beam	{ 1 pc.	3/4" x 11 1/2" x 4'
	{ 1 pc.	3/4" x 9 1/2" x 8'
Chines	2 pcs.	3/4" x 2' x 8'
Bilge battens	2 pcs.	3/4" x 1 1/2" x 8'
Bevel battens	2 pcs.	3/4" x 1 3/8" x 8'
Deck battens	5 pcs.	1/2" x 3 3/4" x 5'
Carlins	2 pcs.	3/4" x 3/4" x 8'
Keel	1 pc.	3/4" x 1 7/8" x 8'
Moldings	{ 2 pcs.	3/4" x 1 1/2" x 8'
	{ 1 pc.	1 5/8" x 11 1/2" x 17"
Motorboard	1 pc.	1 5/8" x 3 3/8" x 12"
Angle pieces	1 pc.	(makes 2 pcs.)
Stem	{ 1 pc.	1 5/8" x 3 3/8" x 30"
	{ 1 pc.	3/4" x 10' x 18"
Stern knees and stem knees	1 pc.	2' x 8' x 8'
Building form	1 pc.	

Fastenings:

- 4 gross 7/8" No. 6 fh screws (planking to framework)
- 3 dozen 1" No. 8 fh screws (transom plywood to frame)
- 6 doz. 1" No. 5 fh screws (for side decking)
- 1 doz. 2" No. 10 fh screws (chines to framing)
- 4 2 1/2" No. 13 fh screws (for motor board)
- 3 doz. 1 3/4" No. 8 fh screws (for battens and keel)
- 2 3/8" x 8" carriage bolts and washers (for motor board)
- 4 oz. 3/16" tacks (for cloth decking)

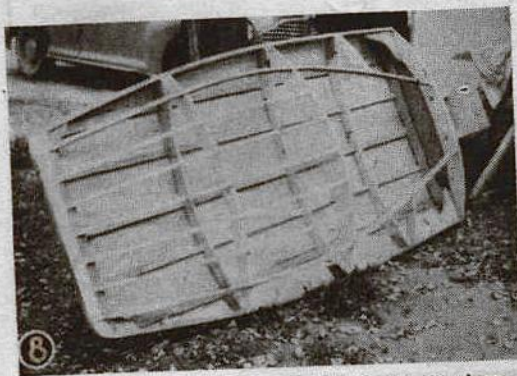
Miscellaneous

- 2 yds. heaviest weight muslin for cloth decking 48" wide;
- 1 lb. Weldwood resin glue; 1 gal. Firzite (natural or white) varnish and paint; 1/2 gal. aeroplane wing dope;
- 1 qt. Kuhl's Elastic Bedding Composition; Duotrol throttle control (Fox River Sales, Oshkosh, Wisc.); Stannus 2-blade 7 1/2 x 9 1/2 propeller (Stannus Propeller Co., 356 E. Jefferson, Detroit, Mich.); No. 703 2x9" fin (Karinor Co., 761 W. Lexington, Chicago, Ill.); No. 737 steering wheel (Perkins Marine Lamp and Hardware, 1934 Pitkin Av., Brooklyn, N.Y.); Trusped No. 202 water speedometer (Michigan Wheel Co., Grand Rapids, Mich.); and Martin, Mercury or Champion 7 1/2 hp motor.



fastenings despite any amount of pounding and the difference in weight is negligible). First saw the form from any rough lumber to the dimensions shown (Fig. 6), and mount it atop sawhorse legs at a good working height. Then draw full-size paper patterns of the frames from #1 to #4. Since only half a frame is shown you'll need to draw both sides, instead of sketching a frame half-size on paper and folding paper over to make two halves; the folded paper isn't accurate enough. Small differences in this boat will ruin performance, so be careful.

When the full-size frame patterns are drawn, lay them atop the framing material, prick the outline through, mark legibly and then saw the parts to shape. Also saw out the deck beams, side deck beams, bottom frames and transom and recheck their shapes by laying them on top the paper pattern outlines. If they are correct, start assembling the transom and frame. The 3/4 in. inner frame is screwed to the outer part of the 3/8 in. fir plywood transom (coat contact surfaces of these two parts with Cascophen or Weldwood glue and screw-fasten transom plywood to framing with 1 in. #8 fh screws spaced about 3 in. apart). Next, shape the stem as shown in Fig. 6 from a spruce or fir 2x4 and round and notch the ends for the chines. Fit bottom frames #1, 2 and 3 with a small oak block on each side and then glue and screw-fasten these frames in place. You'll need these blocks for fastening the chines to the frames at this point. Notch out the form for the frames and notch frames and transom for the keel and bevel chines. Then assemble stem, bottom frames #1, 2 and 3, and the transom to the form. With the frames in place on the form, secure the keel to the frame notches with two 1 3/4 in. #8 fh screws to each joint. Use either clamps, screws or small iron lugs screw-fastened to form and keel on each side; when the boat is finally planked, you can unscrew lugs to lift the boat clear. When the keel is in place, square the frames with the keel and maintain this alignment by lightly nailing temporary 3/4 x 3/4 in. battens to reach from transom to stem; use one batten on each side of the keel, midway between



Showing bottom finished and deck framing in place.

better one, with a lower center of gravity, better streamlining and hull bracing, and the ability to turn at wide open speeds without tripping. She's not the most comfortable craft in the world—the driver must kneel and hang onto steering wheel for support—but you can't beat her for speed.

In planning construction, remember that the minimum weight for this class hull is 100 lbs. While lightweight spruce can be used for the frames, don't use it for chines, keel and bottom battens; substitute oak or fir (oak will hold the

the keel and the chine. After chines are attached remove these battens and your frame work will be squarely aligned. Remember to first bevel the chines as in Fig. 6 and secure them to the frames with one 2 in. #10 fh screw to each joint. Insert the screw through into the frame block you previously fastened to ends of frames. Then fasten chines to stem notches.

Now clamp or temporarily fasten standards from the floor up to the frames and align the framework so that it is level and without a twist anywhere. Next position the bevel chine battens over the joints, marking each side of frame along the batten and notching each batten flush into the frames. Fasten battens in place with one 1 3/4 in. #8 fh screw to each joint. Then position bilge battens exactly between keel and notch the bevel chines, transom, frames and stem so each bilge batten fits flush. Fasten bilge battens in place with one 1 3/4 in. #8 fh screw to each joint.

Fair the entire bottom framework down with a

MOTOR BOARD FOR HIGHEST SPEED HAVE BOARD AS HIGH AS POSSIBLE & STILL PREVENT CAVITATION IN ROUGH WATER

9

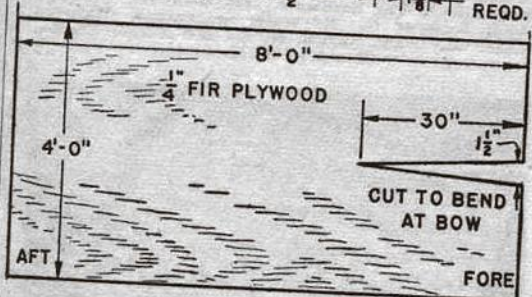
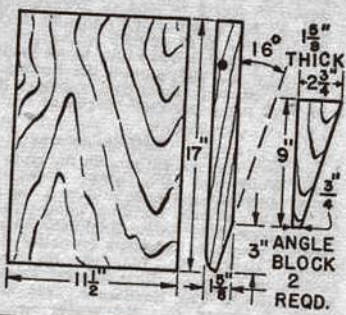


TABLE A. CLASS A PERFORMANCE TESTS OF THE RACING HYDROPLANE—YELLOW JACKET

SPEEDOMETER RECORDINGS: 33-37 mph.
MOTOR USED: Martin 7 1/2 hp. Hi-Speed "60" (for Class A racing).
PISTON DISPLACEMENT: 11 cu. in.
MOTOR WEIGHT: 43 1/2 lbs.
PROPELLER USED: Stannus 2-blade 7 1/2 x 9 1/2".
SPARK PLUGS: Champion J-2.
TRANSOM HEIGHT: Gained 1 1/2 mph by raising from 17 in. to 17 1/2 limit for this motor.
DRIVER WEIGHT: 175 lbs. for initial tests (other tests indicate a 75-100 lb. driver will increase speed 2 mph).
MOTOR ANGLE: Adjust so hull gallops slightly at 2 1/2 wide open, flattens out completely when wide open. Best results with this boat were produced with a motor angle of about 12°.
FUEL MIX: With 1 1/2 pts. of No. 40 oil to 1 gal. gasoline, made 33 mph. With pre-mixed alcohol-plus-lubricant Ace-O-Speed Fuel (Midwest Oil Co., Minneapolis, Minn.), made 39 mph, did not smoke and ran cooler.

TABLE B. TESTING THE CLASS A YELLOW JACKET FOR MAXIMUM SPEED WITH A CLASS B MOTOR*

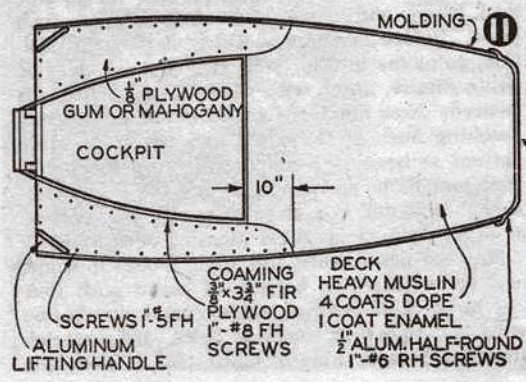
SPEEDOMETER RECORDINGS: 42-45 mph.
MOTOR USED: 1949 Mercury Lightning KE 7 (for Class B racing).
SPARK PLUGS: Champion 6
MOTOR WEIGHT: 60 lbs.
PROPELLER USED: Johnson 8x9".
TRANSOM HEIGHT: 17 in. (with special "quicksilver" lower unit can be raised to 17 1/2" to improve speed by 7-8 mph).
DRIVER WEIGHT: 175 lbs.
MOTOR ANGLE: About 12° for best results.
FUEL MIX: Used 1 1/2 pts. of No. 40 oil to 1 gallon gasoline. (Carburetor changes required in order to use a special alcohol-lubricant fuel mix)

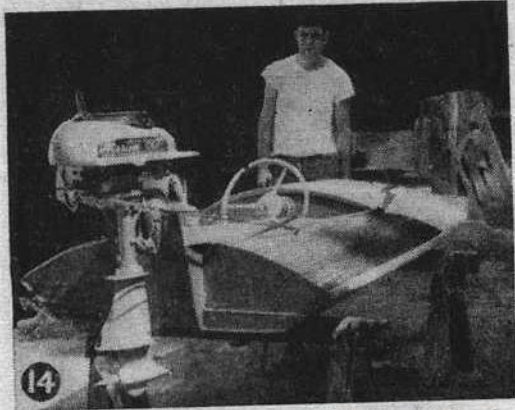
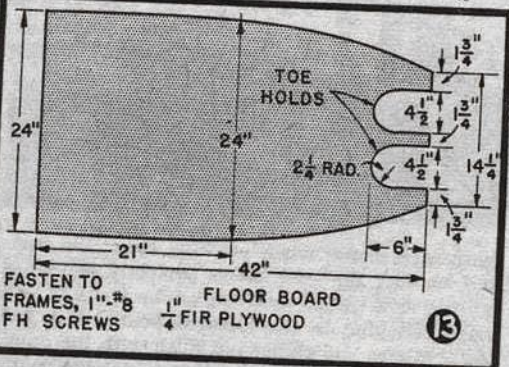
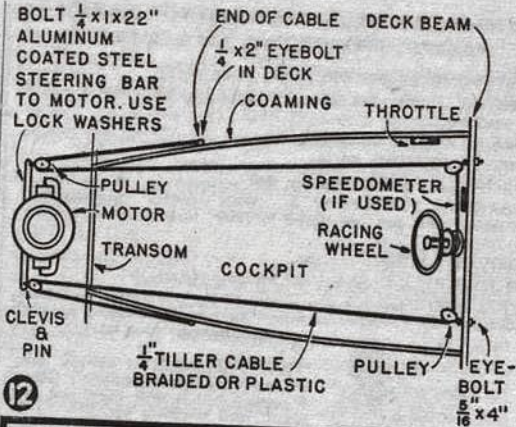
*This combination of course cannot be used for sanctioned Class A racing but it will give you top speed and exciting sport.



sharp jack plane; when working along the transom, be sure the keel line is perfectly flat, since as little as a 1/16 in. variation at the transom will cause galloping in the finished boat. With the keel, battens, and chines cut flush with the outer face of transom, coat joints or notches with Kuhl's Bedding Compound and fasten an outer frame in place with 1 3/4 in. #8 fh screws spaced about 4 in. apart. Then trim the bottom evenly.

To plank the hull, first place a 1/4 in. x 4 x 8 ft. piece of plywood in position on the bottom, mark plywood on each side of the bevel chine and cut out a wedge-shaped piece as in Fig. 9, so plywood can bend easily at the bow. Now remove plywood and, using a straight edge, mark the plywood exactly in the center of the two bevel chine markings and saw it to shape; marking the plywood this way assures the plywood outer edges adjacent to the bevel chine will land exactly in the center of the bevel chine. Before fastening plywood, coat edges of transom and bevel chines liberally with Kuhl's Bedding Com-





Completed boat with motor clamped to motor board.

edges with $\frac{5}{16}$ in. tacks spaced about 1 in. apart, and then coat decking with 3 or 4 coats of aeroplane wing dope. Shape the $\frac{1}{8}$ in. mahogany or gum plywood side decks (Fig. 11). Then coat transom and chine edges with bedding compound and fasten side decking in place with 1 in. #5 fh screws spaced about 2 in. apart. Trim the side decking evenly along the carlins and install coamings on each side as in Fig. 6, notching for transom and fastening in place with 1 in. #8 fh screws spaced about 3 in. apart.

Before placing the moldings in position, putty and smooth off all screw heads and indentations

and coat edges of keel, battens, frames and stem with Weldwood resin glue. Then clamp shaped plywood in position and screw-fasten at all points with $\frac{7}{8}$ in. #6 fh screws, 2 in. apart.

Fit the planking along the bevel chines in place, mark it to shape, saw out and, after coating bevel chine and other chines with Bedding Compound, fasten these parts in place, again using $\frac{7}{8}$ in. #6 fh screws spaced about 2 in. apart. Then trim planking evenly along chines, stem and transom and lift hull free from the form and turn it right side up. Attach transom knees in place on each side with six 2 in. #10 fh screws to each knee. Now fasten the deck beams and side cockpit beams in place with one $1\frac{3}{4}$ in. #8 fh screw to each joint. Fasten center deck supports to #1 and #2 beams and also to #3 side deck beams with one $1\frac{3}{4}$ in. #8 fh screw to each joint. Before fastening decking battens in position, paint the interior with two coats of clear or white Firzite, tinted with paint if a color finish is desired. Now notch the deck battens in position, notching flush at beam #2 and the stem while battens at beam #1 simply rest atop the beam. Nail battens in position with one $1\frac{3}{4}$ in. galvanized shingle nail to each joint, positioning battens at equal distance apart for pleasing deck lines.

Saw the motorboard and angle blocks to shape and screw-fasten at bottom of board with four $2\frac{1}{2}$ in. #12 fh screws; upper parts are bolted with two $\frac{3}{8}$ x 6 in. carriage bolts. Now stretch the cloth fore decking in place, tack it along the

and paint the hull with two coats of white Firzite tinted yellow, followed by one or two coats of yellow enamel and one coat of thinned yellow enamel for the doped decking. Apply two or three coats of clear Firzite to the side decking, followed by one coat of spar varnish. Allow ample drying time between coats. The moldings are varnished and fitted in place and rounded off smoothly. Attach them to the boat with $1\frac{1}{4}$ in. #8 fh screws spaced about 8 in. apart. Cover the exposed edges of cloth at the fore end of the boat with a screw-fastened aluminum molding.

You'll need a special floorboard with toe holes cut in this board as in Fig. 13, so the driver can insert his toes and hang on in rough going. Cut the floor to shape shown, paint or varnish both sides and fasten in place to frames with about one dozen 1 in. #8 fh screws. Since the driver will be kneeling, it's wise to provide a sponge rubber pad for the knees. Locate the fin so that its foremost edge is 31 in. from the aft edge of the transom (Fig. 6), and exactly along centerline of boat (this is important to prevent "snaking" action). Fasten $3\frac{1}{2}$ x 7 in. aluminum fin to bottom with 1 in. #8 fh screws. Install the lifting handles, throttle control (with self-releasing handle) and steering gear as shown in Fig. 12.

• Craft Prints in enlarged size for building outboard runabouts are available at 50c a set (no C. O. D.'s). Address Craft Print Dept., SCIENCE AND MECHANICS, 450 E. Ohio Street, Chicago 11, Ill.

YELLOW JACKET

