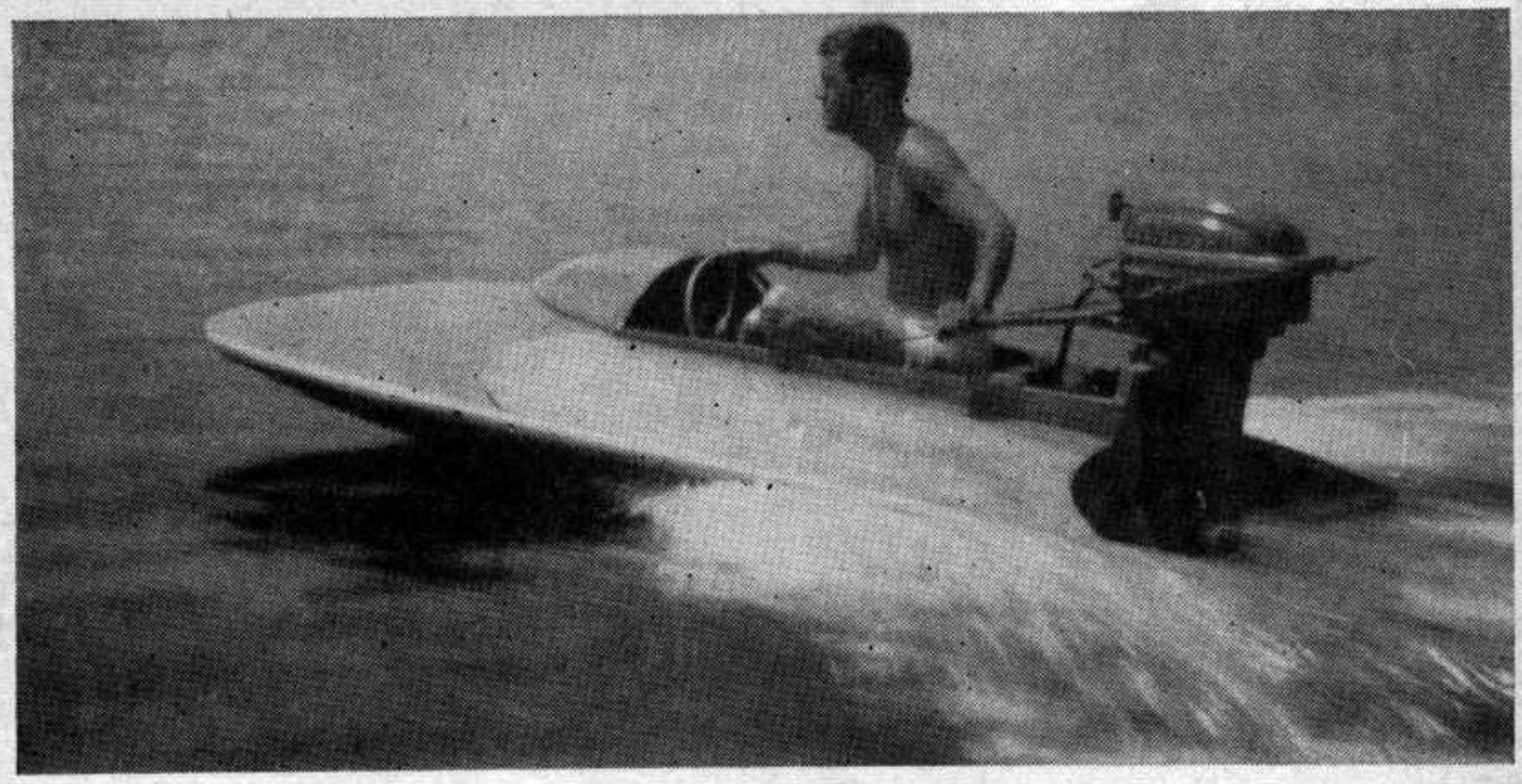


Hasty Hornet

By WILLIAM D. JACKSON, N.A.
Craft Print Project No. 161

FEATURES: Trim, lightweight, high-speed outboard hydroplane racer that is ideal for general sports use or sanctioned racing. With the proper motor and after-plane lines (see text), Hornet will place among the winners in any competition.

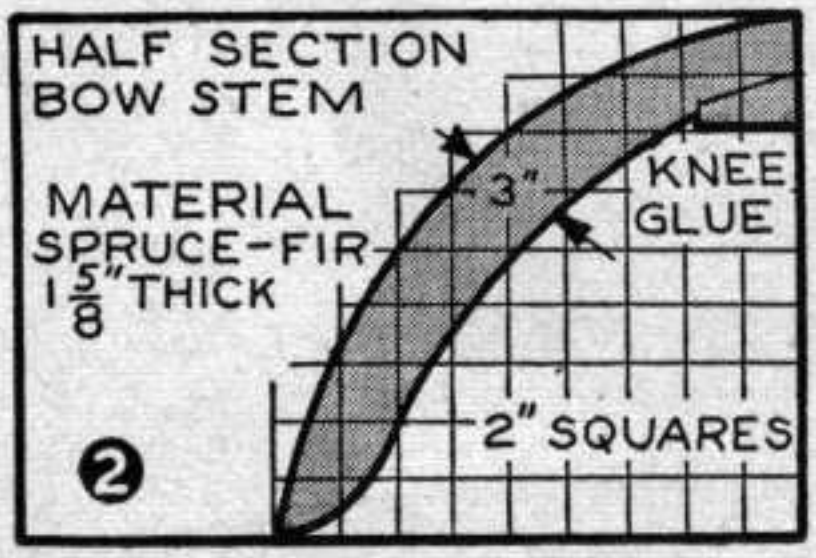
LENGTH: 11 ft.
BEAM: 54-in. (approx.)
DEPTH: 12-in. at amidship center line
WEIGHT: 130 lbs.
SEATING CAPACITY: One person
MATERIAL: Exterior plywood and fabric deck

DESIGN: Adapted to any size motor for speeds up to 38 to 40 mph or, with special after-plane lines shown, for speeds well over 40 mph. Rounded stem fairing into streamlined body presents least wind resistance possible. Wide, non-tripping chines for safety when making turns at high speeds.

THIS sleek hydroplane is several notches above more standardized models in terms of speed. You'll find she also requires a bit more skill in building. But that never stopped a dyed-in-the-wool craftsman, so here she is. The secret of *Hornet's* speed lies in 2 things—the kind of bottom lines you give her and the motor angle. Take the bottom shown in Fig. 6; it's designed to give you top performance with speeds up to 38 *mph*. On the other hand, Fig. 6 also shows an after-plane designed for high speed motors which will produce speeds well over 40 *mph*, where the hull does most of its riding on the spray under the after-plane, if your motor and its angle are right.

Some high speed thoroughbreds tend to be skittish, particularly on the turns. But Hornet won't be if you build her with careful attention to details, power her according to the type of after-plane lines you select, and test out your motor angle thoroughly before you try to race her with a wide-open throttle.

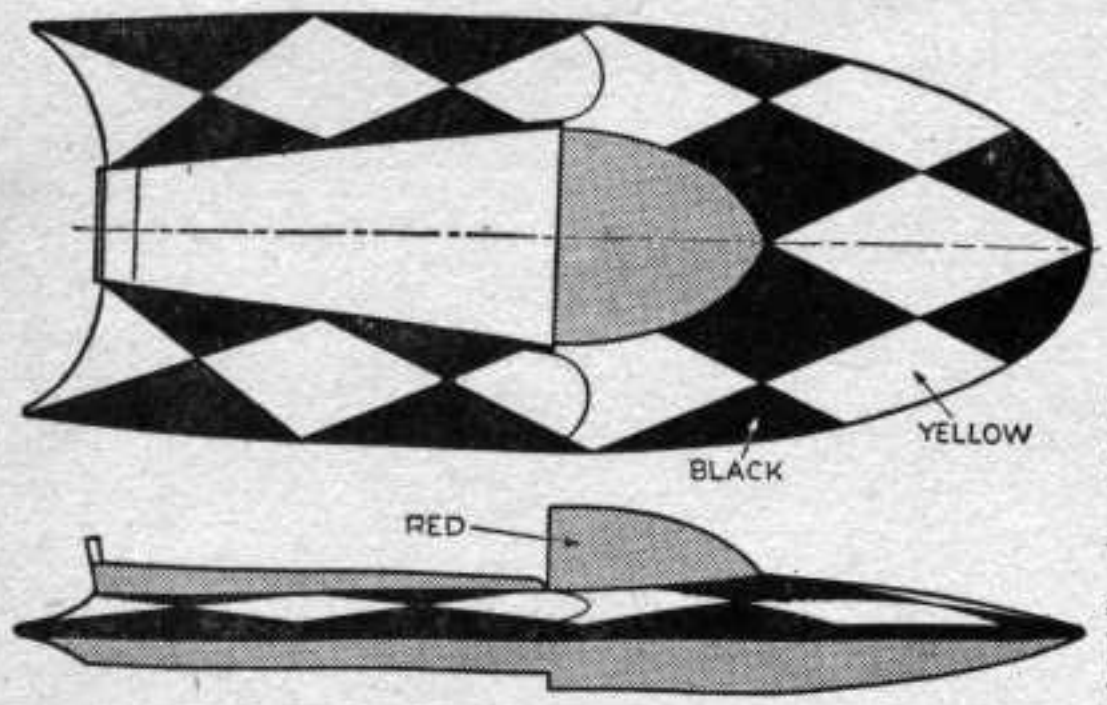
Weight is important, particularly if you plan to enter Hornet in sanctioned races. Class B races require a hull weight not in excess of 100-lb. For Class C, the weight may be 150-lb., which permits more durable construction. But your best bet in either case is to use a strong but lightweight wood such as spruce or possibly Douglas fir or hemlock for the framework, and ¼ in. fir plywood for the bottom and side deck planking, as indicated.




3

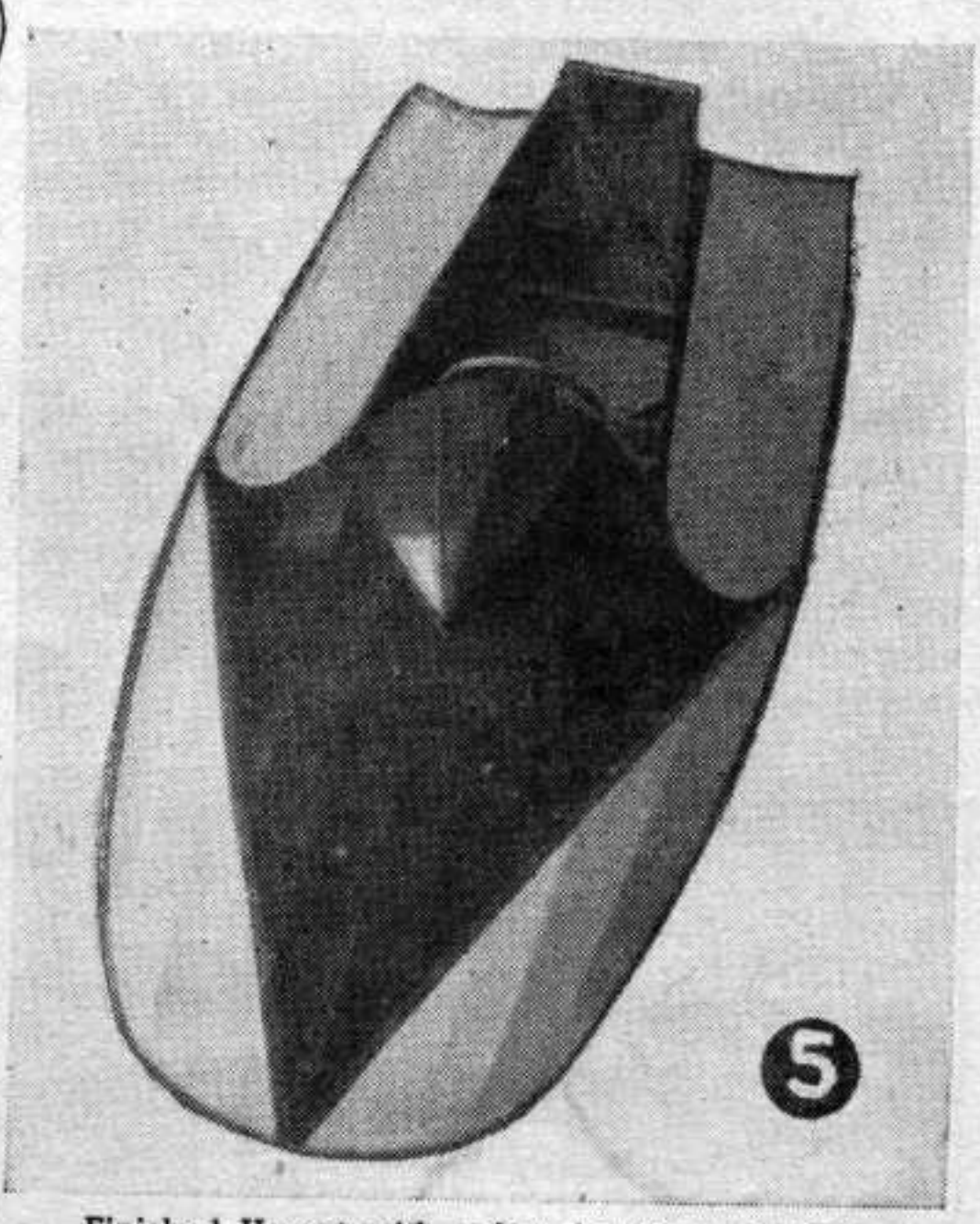
Framework on form ready for planking.

COLOR SCHEMES FOR HORNET

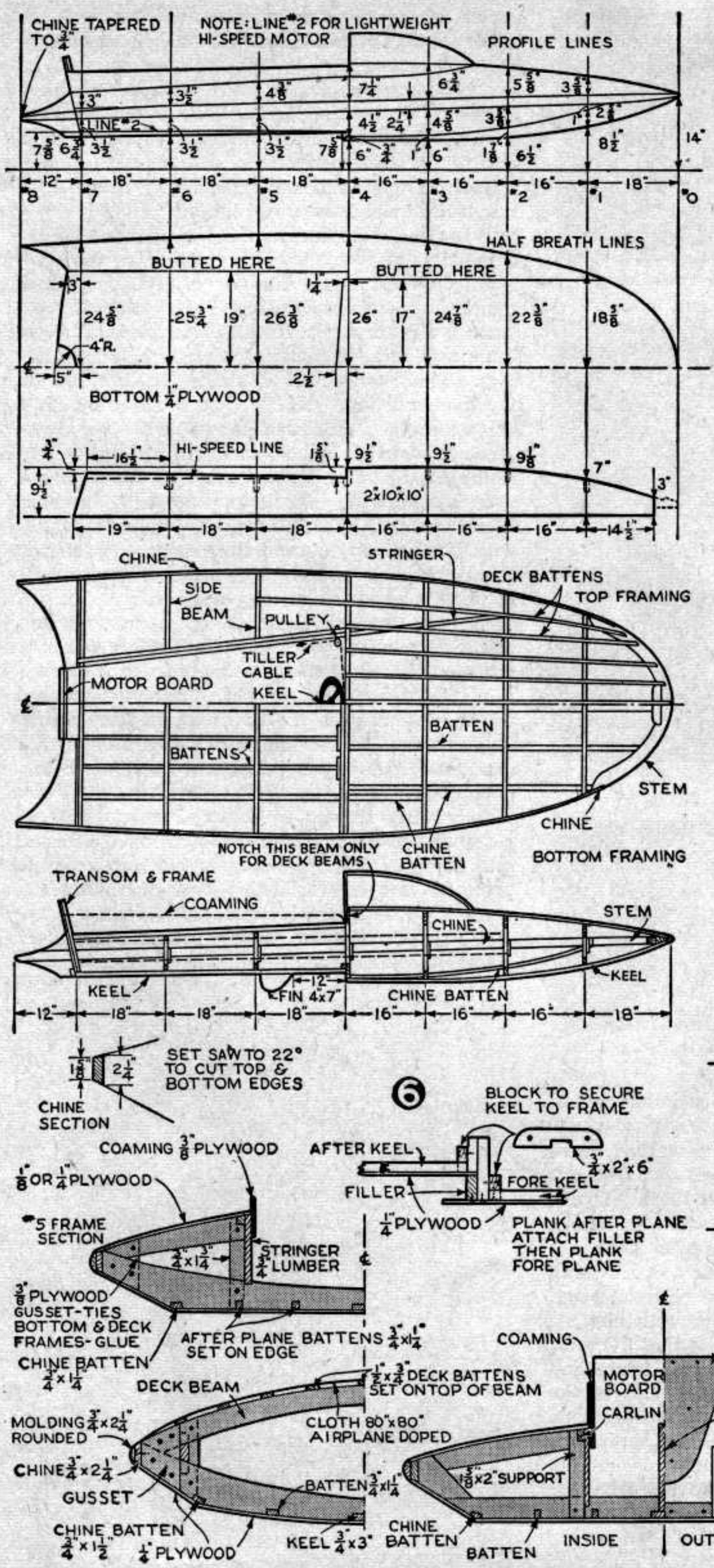


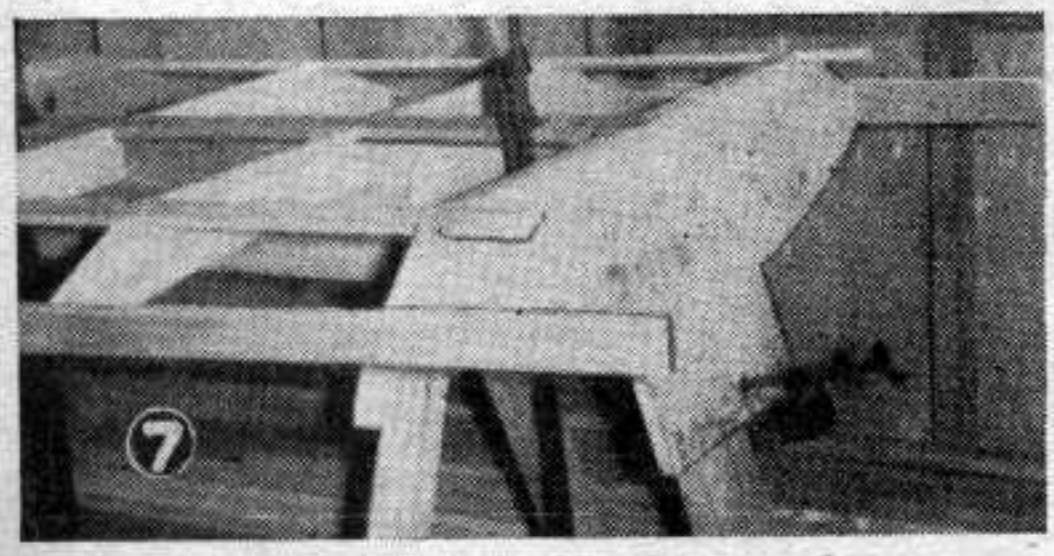
If you cut the framing from 1x8 boards (¾x 7½ in.), you can make the bottom frames and the deck beams, and use the waste for the side deck beams. Simply lay out frame and beam shapes directly on the boards, and then saw them to shape. Saw transom No. 7 from ½ in. thick plywood, cut transom frame as shown and secure this frame to the transom with Weldwood glue and ⅞ in. #7 *fh* screws. Next, saw the stem to shape in 2 halves, joining the center joint together with a knee (Fig. 2) and fastening it with Weldwood glue (if this piece is held by clamps while glue sets no further fastenings are necessary). Then saw the form on which the hull is built to shape, using a piece of 2x10 in. x10 ft. lumber mounted on sawhorse legs at a convenient working height. Notch out the form for the frames. The chines, which in this case actually form the sides of the boat, may be easily cut on any circular saw by setting the saw to cut a 22° angle on both top and bottom sides. The next step is to notch the frames for the keel. To assemble the framework, place all frames (including transom and frame) in their respective form notches, clamp the transom in place, and support the stern with wood strips clamped in place temporarily. Now place the 2 keel parts (one for the after-plane and one for the fore-plane) in the keel notches, and fasten keel in frame notches using two 1¾ in. #8 *fh* screws to each joint. The keel is notched all the way through the transom and fore part of step frame and is screw-fastened in these notches and to the stem. You'll need to bevel the stem slightly but do this after the chines are placed in position.

Make sure all frames, stem and transom are squarely aligned with keel, hold them temporari-

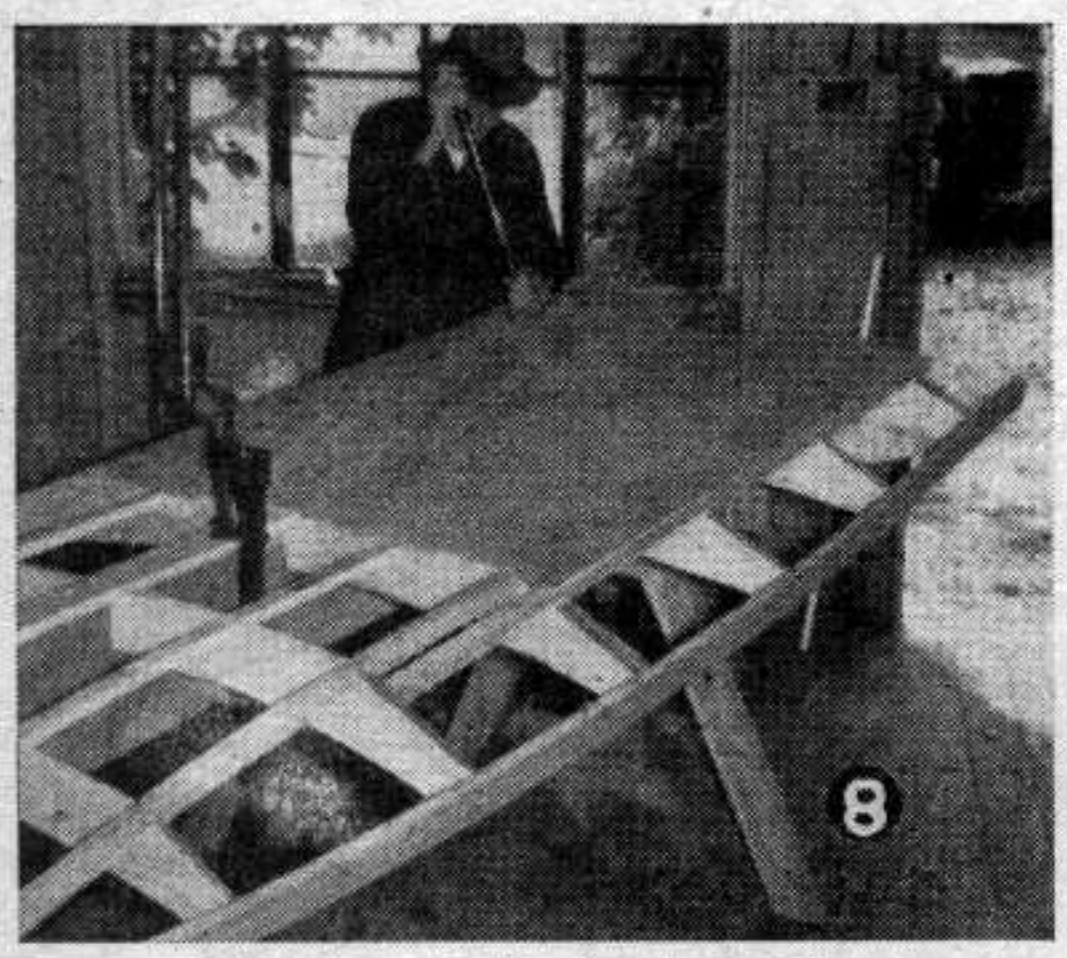


Finished Hornet with red and white paint job.

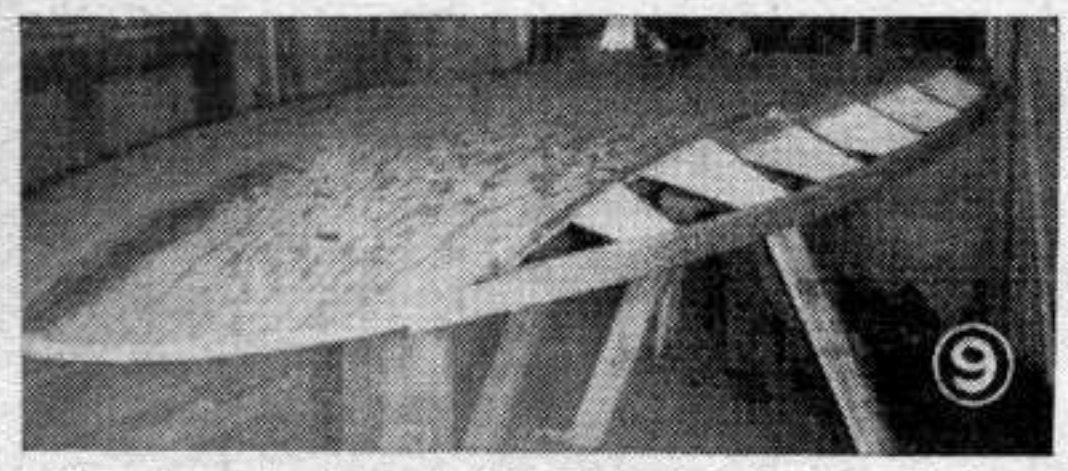

CHINE TAPERED TO 3/4"
NOTE: LINE #2 FOR LIGHTWEIGHT HI-SPEED MOTOR
PROFILE LINES
LINE #2
HALF BREATH LINES
BUTTED HERE
BUTTED HERE
4"R.
BOTTOM 1/4" PLYWOOD
HI-SPEED LINE
2"x10"x10"
CHINE
STRINGER
SIDE BEAM
PULLEY
DECK BATTENS
TOP FRAMING
TILLER CABLE
MOTOR BOARD
KEEL
BATTEN
BATTENS
STEM
CHINE
NOTCH THIS BEAM ONLY FOR DECK BEAMS
CHINE BATTEN
BOTTOM FRAMING
TRANSOM & FRAME
COAMING
STEM
CHINE
KEEL
FIN 4"x7"
CHINE BATTEN
KEEL
SET SAW TO 22° TO CUT TOP & BOTTOM EDGES
CHINE SECTION
#1
#2
#3
#4 STEP FRAME
#5
#6
APPROX.
#7
BEAMS & BOTTOM FRAMES ARC OF CIRCLE
6
BLOCK TO SECURE KEEL TO FRAME
AFTER KEEL
FORE KEEL
FILLER
1/4" PLYWOOD
PLANK AFTER PLANE ATTACH FILLER THEN PLANK FORE PLANE
COAMING 3/8" PLYWOOD
1/8" OR 1/4" PLYWOOD
#5 FRAME SECTION
STRINGER 3/4" LUMBER
3/8" PLYWOOD GUSSET-TIES BOTTOM & DECK FRAMES-GLUE
CHINE BATTEN 3/4"x1 1/4"
AFTER PLANE BATTENS 3/4"x1 1/4" SET ON EDGE
DECK BEAM
1/2"x3/4" DECK BATTENS SET ONTOP OF BEAM
CLOTH 80"x80" AIRPLANE DOPED
MOLDING 3/4"x2 1/4" ROUNDED
CHINE 3/4"x2 1/4"
GUSSET
CHINE BATTEN 3/4"x1 1/2"
1/4" PLYWOOD
KEEL 3/4"x3"
BATTEN 3/4"x1 1/4"
COAMING
MOTOR BOARD
CARLIN
1 5/8"x2" SUPPORT
CHINE BATTEN
BATTEN
INSIDE
OUTSIDE
OUTSIDE MOTOR PLATE 1/4" PLYWOOD
TRANSOM KNEE 1 1/4" THICK
TRANSOM KNEE SHAPE TO FIT



View of transom showing chine overhang.



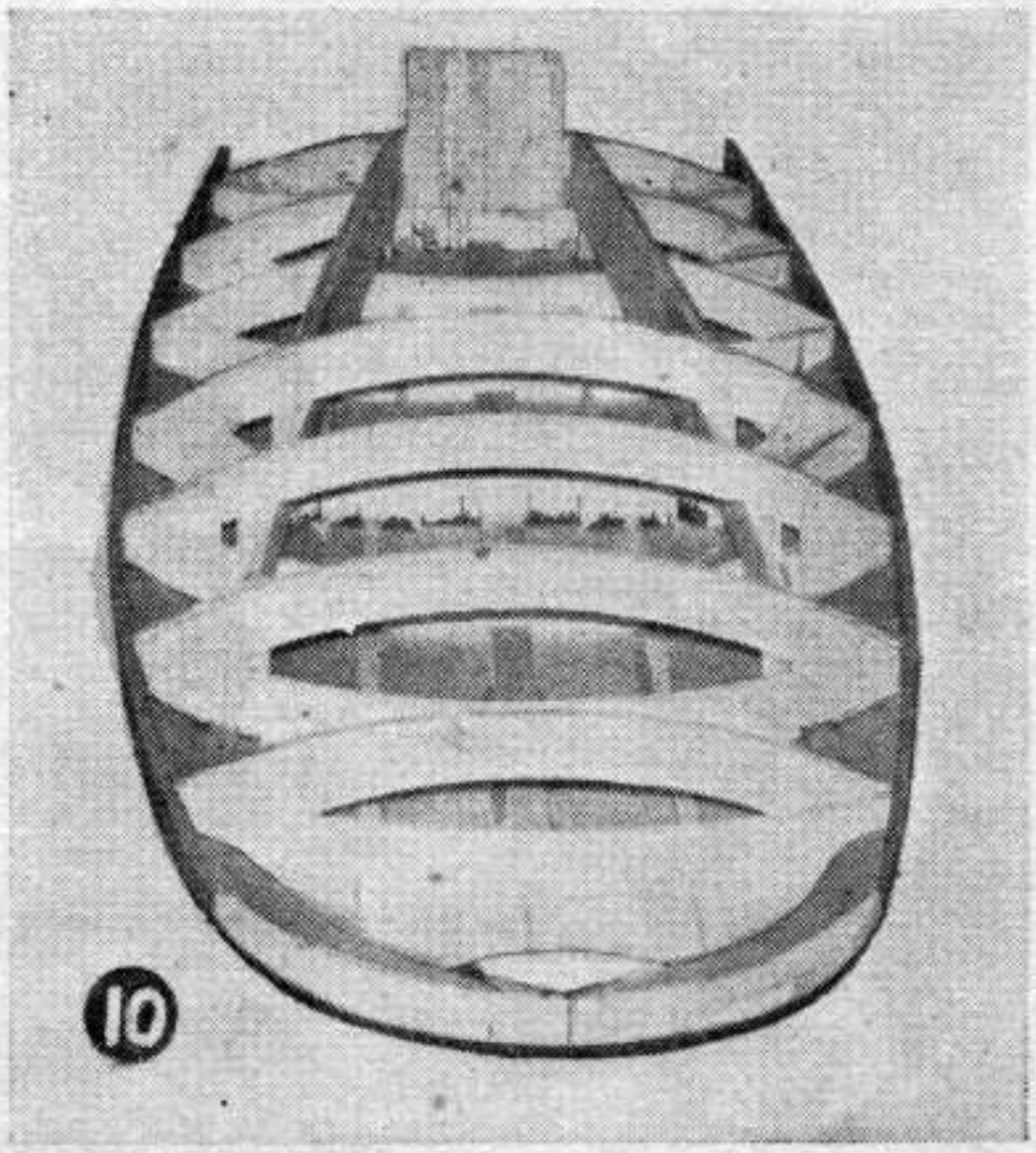
After-plane planking is attached first.



Hornet ready for attaching beveled bottom planks.

ly with wood strips nailed lightly in place and secure the chines to the frames using two 2 in. #8 *fh* screws to each joint. Countersink screw heads well. You'll have to notch the stem for the chines, and to find the proper depth for this notch, spring chines in against the stem and mark and saw notch accordingly. Next place the chine battens in position, mark them for correct depth and angle, and notch the frames both fore and aft. Screw chine battens in place with one 1¾ in. #8 *fh* screw to each joint. Note that the after chine batten extends through the step frame and lands against #3 frame. The step end of the fore-place chine batten, however, is not notched and butts against the step frame in a screw-fastened joint (Fig. 6). Bevel the stem so planking to be applied lies evenly and then place bottom battens in position. On the after-plane use 4 battens set on edge and 2 battens set flat on the forward plane. Notch all these battens flush and fasten them in place with one 1¾ in. #8 *fh* screw to each joint. Screw-fasten in batten supports to secure the battens at the step, so you won't have to notch the step frame excessively. Locate all battens equi-distant between keel and chines. Then fair in the hull, using a sharp jack plane or a heavy rasp.

Hornet is planked, starting with the after-plane. Lay the plywood sheet in position, fitting it carefully against step frame and letting about 6 in. extend aft of the transom. Now mark the plywood on both sides of each chine batten, then remove plywood and, using a straight batten or wood strip, draw a line equi-distant between inner and outer edges of each chine batten markings. Then, when cut to shape, outer edges of plywood will land exactly in the center of each chine batten. Before fastening this shaped after-plane plywood in place, secure a ¾x2 in. outer frame to the after bottom edge of the transom with 1¾ in. #8 *fh* screws, and trim transom edges evenly. Then coat all adjoining surfaces with Weldwood glue and the transom edge with Kuhl's bedding compo, place after plane plywood in place and fasten at all points with ⅞ in. #7 *fh* screws spaced about 2 in. apart. Before planking the fore-plane provide a filler piece at the step, bedding it down in bedding composition, screw-fastening it securely and trimming edges of step evenly. To hold the keel firmly in place to the form while planking, screw little cast steel lugs to the form and keel; after this portion is planed, the hull may be removed by withdrawing screws in lugs. Plank the fore-plane as you did the after-plane, using Weldwood glue for all framing coming in contact with the plywood but coating step edges with bedding composition. Position and screw-fasten fore-plane as you did the after-plane and then trim edges along the stem evenly. You'll need to



Planked hull with beams and stringers in place.

MATERIALS LIST—HORNET

Exterior Plywood Required:

Bottom, bevel chines, side decking and flooring
2 pcs. 1/4"x4'x6' (Can use two 1/4-in. gussets instead of one 3/8-in.)
1 pc. 1/4"x4'x8'
Transom 1 pc. 1/2x18x50"
Coamings 1 pc. 3/8x12"x5' (makes 2 coamings)

Framework Lumber Required:

Chines 2 pcs. 3/4x2 1/4"x10'
Chine battens 4 pcs. 3/4x1 1/2"x6'
Keel 1 pc. 3/4x3"x10' makes fore and after keel
Transom frame, motor board, frames, stringers, side deck beams and supports 7 pcs. 1x8"x12' (3/4x7 1/2"x12')
Stem 1 pc. 2x8x4' (1 5/8x7 1/2"x4')
Bilge battens 6 pcs. 3/4x1 1/4"x6'
Carlins 2 pcs. 3/4x1 1/4"x5'
Moldings 2 pcs. 3/4x1 5/8"x10'
Deck battens 9 pcs. 1/2x3/4"x6'
Form 1 pc. 2x10"x10' (1 5/8x9 1/2"x10')

Fastenings:

5 gross 7/8" #7 *fh* screws
1 gross 1 3/4" #8 *fh* screws
3 doz. 1 1/4" #8 *fh* screws
2 doz. 2" #10 *fh* screws

Miscellaneous

Tacks for cloth; cloth for deck; 1 gal. airplane wing dope (Alan Clarke Co., New York, N. Y.); 1 lb. Weldwood glue; 1 steering wheel, tiller cable, pulleys; 1 fin (4x7-in.); 1 throttle control; paint and varnish as desired

split the center of the plywood on the fore edge about 3-ft. back from the stem so that it will bend downward readily.

Plank the beveled part of the bottom next. Place each beveled side plank in position so that it extends from the transom to the #1 frame and about 12 in. of the beveled side plank extends aft of the transom to make the stream-lined tails. If you don't want these tails, trim the beveled side planks even with bottom planking on the after-plane. Coat all contact surfaces of framing except beveled chines with resin glue and coat beveled chines and transom with bedding compo, then clamp shaped plywood in place and screw-fasten it at all points with 7/8 in. #7 *fh* screws spaced about 2 in. apart. Trim plywood evenly along the chines, remove hull from the form and turn right side up upon saw horses.

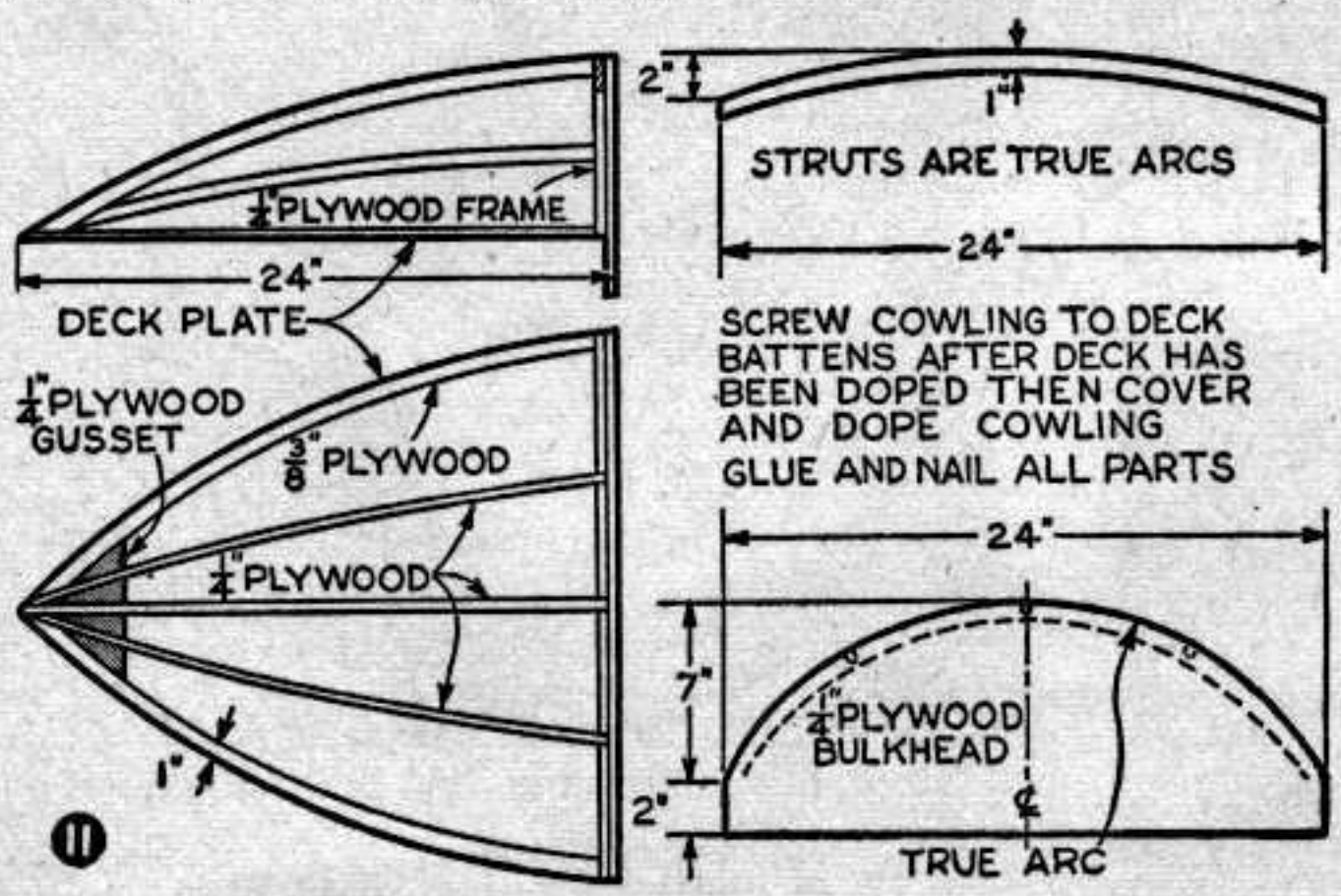
With the deck beams (which are arcs of a circle) cut to shape (Fig. 6), screw them in place to the #1 to #4 frames and secure these and the cockpit beams to the frames with 3/8 in. plywood gussets. Glue coat the contact surfaces and screw gussets in place with 7/8 in. #7 *fh* screws. Make the stringers from 3/4 in. plywood or 3 thicknesses of 1/4 in. glued together. (For the lower power motors and speeds not over 40 *mph*, you can use 1x8's cut to fit in position.) These stringers, which outline the cockpit, are fitted in place first, their position is marked on the frames, and the stringers are then removed and side cockpit beams and side beam supports are glued and screw-fastened as in Fig. 10. Now notch a carlin piece into the side deck beams as in Fig. 6 and screw-fasten it with 1 3/4 in. #8 *fh* screws to each joint. Glue and screw a stringer transom support to the transom and then glue and screw the stringers in place with 1 3/4 in. #8 *fh* screws.

Now you are ready to secure the deck battens to the deck beams as in Fig. 12. Use 9 battens—one in the center and 4 on each side, and space battens equally between center deck batten and chine. Notch only the #4 deck beam for the battens (Fig. 6); on all other beams and the stem, the battens rest on the surface and are nailed or screw-fastened in place. Trim battens by beveling to fit on the stem. For extra strength make the center batten and the 2 outside battens 1/2x1 1/2 in. instead of 1/2x3/4 in. and let the outside battens extend back to the #5 frame. Now is the time—before decking is applied—to paint or varnish the interior with 2 or 3 coats.

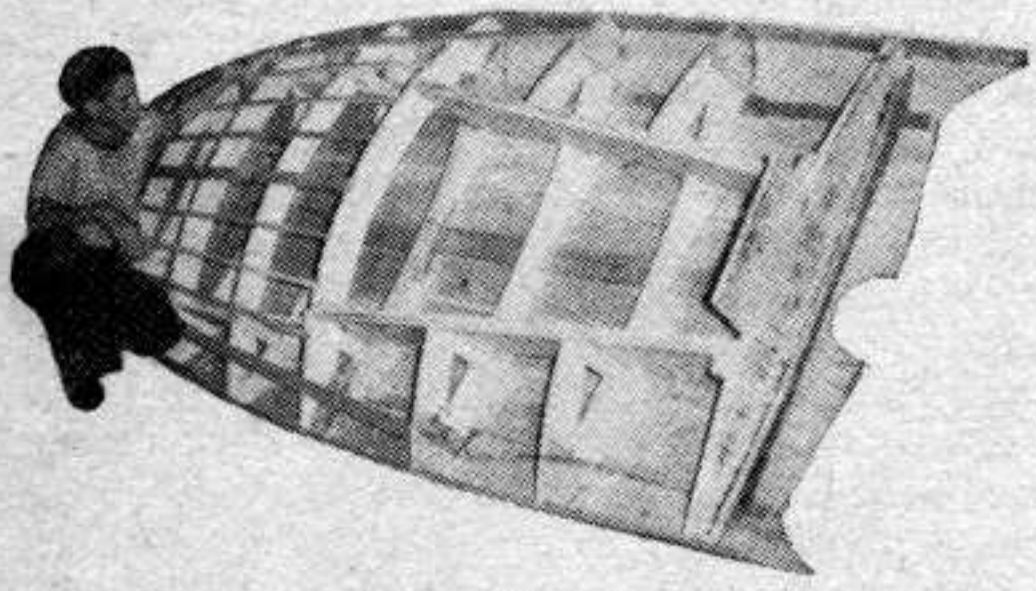
Cover the fore deck with airplane cloth or a heavy weight muslin (80x80 thread count). Stretch this in place firmly but not too tightly and tack it along the sides, stem and #4 deck beam. Apply 4 or 6 coats of airplane wing dope to the cloth.

The streamlined cowling is built atop the deck and covered with cloth and dope. Make the aft side decking of either 1/8 in. or 1/4 in. plywood (for Class B racing use 1/8 in. to keep the weight down, but for greater strength and durability, use 1/4 in. plywood). Place this plywood in position, letting 12 in. extend aft of the transom and rounding it at the #4 beam. Mark plywood to shape, then remove and saw to size. Fasten decking in place with 7/8 in. #7 *fh* screws spaced 3-in. apart. Next, shape and fasten a 3/8 in. coaming in place with 1 1/4 in. #8 *fh* screws. Shape 1/2-round moldings for the chine edges, fastening them in place with 1 1/4 in. #8 *fh* screws spaced about 8 in. apart. Soften a 3/8 in. x3/4 in. hardwood nose piece in hot water and bend it and screw-fasten it to conceal the fastenings at that point. Now fasten 3/4 in. thick knees in place to support the transom extension aft, and one 1 1/4 in. thick knee inside to stiffen the transom at the keel.

Paint the hull or doped cloth any color desired, varnishing side decking and molding for contrast.



Or use one of the color patterns shown in Fig. 4, if you want a really sporty design. Sand the bottom smoothly, and then apply 2 flat coats of paint followed by 2 coats of top grade enamel. Be sure you have puttied all screw holes, and sand each coat of paint when dry to make a smooth, frictionless finish. Screw a floor of ¼ or ⅜ in. plywood inside the cockpit and cut holes in the flooring towards the transom so operator may hook his toes into these holes when the going is rough.



Deck battens in place ready for the canvas fore deck and plywood side decks.

With the addition of steering wheel, throttle control and fin you are ready to go. Mount pulleys for steering cable using ¼ in. eyebolts mounted through stringers in line with wheel drum. Remember to take it easy when trying out this boat the first time. If the boat seems to ride excessively on the fore-plane and slow down, simply tilt the motor at different positions until the boat rides almost entirely on the after-plane. And how she rides!