building AIRBORNE by Hal Kelly AIRBORNE is basically a class "B" Runabout but can be enlarged to make 11' 6" Class B Runabout with the materials listed she will weigh 130 pounds with all hardware.



1. I'm barely cracking the throttle in this shot

BRONZE, MONEL, or EVERDUR FASTENINGS 1 gross of %" no. 8 flathead wood screws 2 gross of 1¼" no. 8 flathead wood screws 4 dozen of 1½" no. 8 flathead wood screws 3 lbs. of 1" no. 12 Anchorfast nails 350 to lb 2 lbs. of 34" no. 16 Anchorfast nails 950 to lb. 8 carriage bolts \(\frac{1}{4}'' \) x 4" with nuts and washers

The above may be obtained from Whitehead Metal products Co., Inc., 303 West 10th St., New York 14.

N. Y.-C.O.D. PAINT PRODUCTS

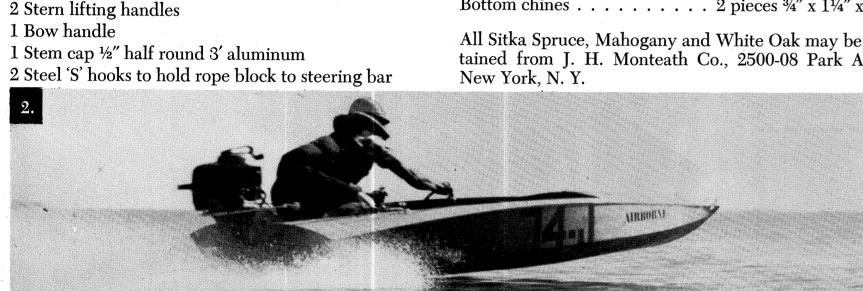
5 lbs. of Weldwood glue 1 lb. of Wood Dough or similar surface filler 1 gal. of Spar varnish for interior, decking, and exterior

HARDWARE

1 Steering wheel 1 Piece of steering rope 26' 1 Safety throttle 1 Bowden throttle cable 5' long

1 Racing fin for class B 4 Rope tiller blocks—with straps 1 Steering rope tightener—heavy spring 2 Tiller or wire rope clamps

1 Bow handle 1 Stem cap ½" half round 3' aluminum



BILL OF MATERIALS

PLYWOOD Decking and sides 2 sheets of 3 ply waterproof plywood 1/8" x 4' x 12'. Bottom, non-trip chines, seat, and flooring 2 sheets of 5 ply waterproof plywood ¼" x 4' x 12'.

SITKA SPRUCE

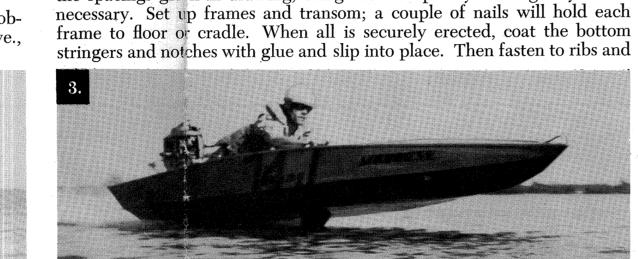
Sheers 2 pieces ¾" x 1" x 12' Chines 2 pieces 3/4" x 11/4" x 12' Side frames 1 piece 3/4" x 13/4" x 12' Bottom frames 1 piece 3/4" x 6" x 8 Bottom frame No. 3 1 piece 34" x 21/2" x 4' Battens 2 pieces ½" x 1\%" x 9' Battens 2 pieces ½" x 1½" x 7' Keel 1 piece ½" x 1½" x 13' Bottom stringers 2 pieces ½" x 2½" x 9' Bottom stringers 2 pieces ½" x 2½" x 7' Middle deck beam $\dots 1$ piece $\frac{3}{4}$ x $\frac{4}{3}$ x $\frac{3}{3}$ Deck batten 1 piece ¾" x 1" x 4' Cockpit coning 2 pieces ½" x 2" x 8'

HONDURAS MAHOGANY Inside of keel at bow 1 piece ½" x 1½" x 7' Transom framing 1 piece ¾" x 4" x 16' Transom 1 piece $\frac{1}{2}$ " x 14" x 5" Dash and dash beam 1 piece ½" x 7" x 7" Sheer guard 2 pieces $\frac{1}{4}$ " x $\frac{1}{2}$ " x $\frac{12}{2}$ "

Transom and knee braces 1 piece ¾" x 3" x 6'

WHITE OAK Bottom chines 2 pieces ¾" x 1¼" x 12'

All Sitka Spruce, Mahogany and White Oak may be obtained from J. H. Monteath Co., 2500-08 Park Ave.,



BUILDING AIRBORNE

a fine "D" Runabout and will qualify under the A.P.B.A. rules. Built

To avoid confusion, let me explain that there are two AIRBORNES:

AIRBORNE will take any motor from 7 hp to 25 hp with safety and

the one I ran last season and this one. They are almost identical but this

one has tumblehome forward of amidship on the sides. She rides beauti-

fully when going into a headwind, won't wander all over the course, and

hold four people with comfort. If you are building AIRBORNE for a reg-

ular pleasure metor the transom should be about 15" high. She also makes

a fine boat for water skiing. Plywood in 12' lengths would be ideal, but if

not you will have to glue up two 8' lengths. A typical plywood joint is

clearly illustrated on this page. A two-inch bevel is best done with a good

mistake Philippine mahogany for mahogany. That stuff is best suited for

the making of cigar boxes; it is too brittle for boats. Let's face it—this is not

meant to be a one-season boat; given reasonable care it will last for many

years. It cost me about \$125 and 75 hours work. You'll spend a few hours

ready to start on the ribs. Due to space limitations only half of the ribs are

shown, but since the ribs are the same on both sides this will offer no prob-

lem. Cut out all of your rib components and place them on the full-size rib

drawings using Anchorfast nails and screws as indicated on the drawing. A

for size and shape. The sides of the frames are 1¾" wide and straight-sided;

the large gussets form the non-trip chines. Place the frame components on

the layout and hold them in place with temporary fastenings. Place two

plywood gussets over frames (one on each side) and fasten with glue and 1"

Anchorfast fastenings. You'll have to drill undersize pilot holes. There

should be at least three Anchorfast fastenings in each frame piece. When

both sides are in ished, carefully turn the frame over and fasten the gussets

on the other side. Before lifting the frame from the drawing, carefully

solid mahogany and transom framing from 34" mahogany. First assemble

the transom frame and carefully notch for battens, keel, chines, and sheer

Coat the mating surfaces of the joints and aft surfaces of framing with

Weldwood glue and clamp the transom and framing together. Bore for

fastenings and screw the frame to the transom with 14" No. 8 flathead

wood screws. Allow one day for the glue to fully set before taking off the

with a piece of mahogany ½" x 1½" both are glued together after the

the notches for the sheer and chines. Note that only in frame No. 2 do the

cradle laid on a concrete floor in a space about the size of a one-car garage.

Lay out the center line and frame lines on the floor or cradle according to

the spacings given in drawing, using such temporary bracing as you feel

proper shape has been obtained, and, steaming is not necessary.

Forward of Rib One the keel (which is ½" x 1½" spruce) is backed

After the glue in the frames is hardened, remove the clamps and cut

The boat should be built on a level wooden floor, or on a wooden

before assembling transom framing. All lapped joints should fit snugly.

Assemble the transom and the transom frame. Cut transom from ½"

The bottom of each frame is continuous from chine to chine; check art

piece of thin tracing or wax paper will keep the glue off your plans.

After accumulating the stock listed in the bill of materials, you are

When building AIRBORNE, please stick to the materials listed. Don't

size hand plane with the plywood clamped to a flat surface.

runs straight as an arrow.

alone getting a hice slick bottom.

inscribe the center line on one face.

clamps. The keel and stem are one piece.

bottom stringers go through.

transom with small blocks, glue and 34" No. 16 Anchorfast nails. Next slip the keel into place with glue and 14" No. 8 flathead wood screws, using two screws to secure keel to transom and one about every 10" to the bottom stringer. After all the battens are in place, screw them to the bottom stringers, as was done with the keel. Next secure the chines and sheers, using glue and 1½" No. 8 flathead wood screws. Where they butted against the stem and transom, bevel them to obtain a good landing, one screw at each frame, transom and stem. The bottom chine, which is white oak, is cut thinner from the bow to Rib No. 1, where it gradually takes on its original thickness. The front part of the lower chine is ½" x 1½" in size; this will allow it to bend better and lighten the nose. Don't forget fin bracing from frame No. 2 to frame No. 3.

Before fitting the planking bevel the frames, chines, sheers and keel, using a plane and a good wood file; carefully trim and fair so the plywood planking will lay on all structural members. Check the fair from time to time as you progress by springing battens around the structure. Remember that from Rib Two to the transom the bottom must be perfectly flat, and the plywood bottom cannot be flat unless the structural members are faired flat. The non-trip chines are fitted first. Cut the panels a bit oversize, clamp in place and mark outline of the boat on panels. Remove them and accurately saw to shape. Remember that the bottom goes over the edge of the chine except up toward the front where they butt each other at a slight angle. Put glue on the frame, clamp the panels back in place and start bor-

ing and fastening. You will have to fair the non-trip chines again after the glue is dry. The bottom goes on much the same way and is all one piece with a V cut in front to allow the bottom to come to a V up in front. Up toward the front it will take a little careful fitting to make the bottom butt into the non-trip

Glue is applied to all the structural members that the bottom will touch, and Anchorfast nails are put along the keel transom and chines, set about 1½" apart; Anchorfast nails are also used at 8" intervals to secure the bottom to all the battens from the transom to the point just in front of frame No. 2. After the bottom is dry, plane the edge at the same angle as the chine except towards the back where it is allowed to remain square. This gives you a little lip to help grip the water on turns. The side panel and all the decking are \%"-thick plywood. The side overlaps the edge of the chine after the chine is beveled and the procedure is the same as for the chine; ³4" No. 16 Anchorfast nails are used to hold the sides in place. Remove the temporary bracing and turn the boat over on a couple of padded saw horses at a workable height to put on the decking, transom bracing and floor. Fashion deck beams, sawing them to the crowns shown on drawings and fasten them to the frame and sheer using 14" No. 8 screws. Fit transom knees in place, using bolts and screws as indicated in drawings and photos. Next glue and screw deck and hood frame in place. Using 34" No. 16 Anchorhead nails and glue, fasten all decking in place. Glue 4" plywood on bottom stringers for flooring with Anchorfast nails. This forms a structural part of the bottom and will prevent it from warping or cupping. The front seat offers no problem and if you prefer a back seat instead of kneeling, just screw a 34"-thick mahogany board to the top stringers of

the non-trip chines. Sand the entire boat down carefully, and varnish Don't forget to varnish under the floor boards first. The bottom up to the top of the non-trip chines, is Fiberglass. See the copy included on Fiberglass. Now screw the fin in place. The back of the fin should be about 32" from the transom. Finally comes the installation of the hardware and gear. Secure the bow handle with long screws driven into the deck batten and stem. Bolt the lifting handles in place on the transom to suit. Bolt steering wheel, pulleys, etc., in place. Locate the throttle control to suit your reach.



and crash helmet. Push the nose away from the dock, start the motor, and idle out into clear water. Crack the throttle and away you go! I'm sure you'll be pleased with her performance. Motor angle and height are very important for racing and a motor 1/8"

too high or low has lost many a race. A marine speedometer is handy to have while making these adjustments. To get your racing number, send \$10 to the American Power Boat Association, 700 Canton Avenue, Detroit, Michigan. Enclose in the letter a description of your boat and motor; the A.P.B.A. will want to know the make, model and serial number of the latter. Besides luck, you need three things to win races: a good boat, a good

motor and prop, and a knowledge of driving and motor setup. With AIR-BORNE you have the best boat. As for motors, the Mark 20-H's all run within a mile of each other. You will find that AIRBORNE will ride right into a head wind without floating all over the course or becoming airborne, and will turn beautifully. It will outhandle any boat in rough water. I find that the stainless steel Kaminc prop is the best at this time. On very good water I get my top speed with a one inch rev stick on my transom, and on very rough water right on the transom. These are two extremes.

A mistake many new drivers make is that in testing and adjusting their motor too early the day of the race—setting their motor for the best speed at that time. A few hours later their race comes up, and perhaps by now, a strong wind has roughened the water so that in the middle of the race they find they are much too high or kicked out too much. It's always nice to test out on good water; it's nice riding and you go

much faster. But I make it a point to do at least half of my testing on rough water. Try setting up some buoys and practice turns. I know a few fellows who set up their own course and practice out on it as if they were running a race; they even have a starting clock to practice on. I'll admit that there's nothing like an actual race for experience, but testing will be a big help. Motor setup is not easy to learn. It's hard to know whether to kick it in (for rough water) or out (for calm water) or how high to run. You can look around and see how the better drivers are running their boats, but frankly this is of little help because boats and driving styles differ. I have seen two good drivers at a race both running the same make hydro, motor, and prop: one ran on the fourth motor notch, the other on the third. Both took a first and a second, and were tied on time. I'm sure this would confuse any beginner. When you practice for a race, don't just run around. Try all kind of setups.

Pick-up means a lot in short-course racing and I often sacrifice a few miles of top speed for acceleration. As an example, before one race a friend of mine was passing me on a long stretch down the river. He was running faster than anyone else. With a beautiful start he hit the first buoy first in a three-buoy turn, but coming out of the turn five fellows passed him and I think he finally finished a sad sixth. I managed to steal a second in that

The main thing you can do to a stock motor and remain legal is to carefully set up your reed cage and points. Run the exact amount of oil in your motor that the manufacturer recommends—no more no less. In breaking a new motor don't run a rich oil mixture, but set your high speed jet a little richer for the first hour, with the spark on two-thirds. Run the motor at half-throttle for 15 minutes. Then give the motor a five-minute break and run again for 15 minutes. Do this for about one hour running time. Now take her out and boot it wide open for a stretch, but for the next two hours running time refrain from any continuous high speed runs.

I always run my motor with a full butterfly. In case of a flip it's much safer for you and the other drivers, and will save you from a blown motor. All in all it's a great sport and I never met a finer group of people than those within the sport. We cover about 8,000 miles each year just going to the races. When I go, the whole family goes: wife, two kids and the dog. Win, lose, or draw, we all have a picnic. See you at the races. •

2. Coming out of a turn at full throttle, no bobbing or bouncing, smooth as glass. 3. Low angle shot coming right at you full bore. Note the angle of the sides at the stern, no digging in on one buoy turns with this boat.

4. This is the first pilot model of AIRBORNE leading the

Tweedle, one of the many fine pictures he takes of the

Photo by T. B.

pack at Millville, N. J.

boys at the races.

AIRBORNE AS A "D" RUNABOUT

AIRBORNE has performed so well as a B runabout that I'm including a set of scales to enlarge her. As a "D" she will be about 141/2% larger. The ribs on the back of this page are not the same size for a "D."

There is a Scale for "D" Runabout Ribs next to the rib patterns. With dividers pick off a distance you want from the rib patterns, place the dividers on the Rib Scale and note the measurement. Now use a standard rule to transfer this measurement to the new rib patterns that you will have to draw to build the "D" Runabout. A Scale for "D" Runabout is also included for taking measurements of the scale drawings on this page. Building procedure is the same as for AIR

BORNE only the bill of materials is changed. All fastenings remain the same but order about 20% more. Plywood: the bottom is %" thick, sides and non-trip chines are ¼" thick and the deck remains the same, \%" thick. You will not be able to get plywood in 14' lengths. 16' is the next larger size and that will probably be hard to get. You will have to glue up your lengths. Don't have your glue joints of the sides, non-trip chines, etc., in the same spot on the circumference of the boat. Have some in the back and some up front. The bottom glue joint should be up front. The deck and glue blocks will be the only things

held together with ¾" No. 16 Anchorfast nails so you need not order more of them, but of the 1' No. 12 Anchorfast nails you will need about 6 lbs. All the framing remains the same size, only longer, and is replaced with white oak in every case, except the transom which is 3/4" thick Honduras Mahogany. The transom height must re-

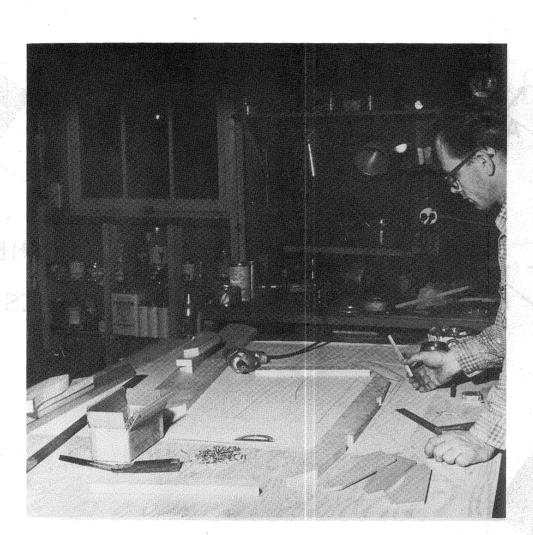
main 13½" high for the Mercury "D" Quicksilver.

The bottom of AIRBORNE is fiberglassed, up to the top of the non-trip chine at the expense of 10 extra lbs. Costs ran me a little less than 40 cents a foot. I used a medium weight glasscloth, 50" wide, which left no seam on the bottom at all. A thin application of the plastic was applied to the bare wood with a brush. After it had hardened (the next day), I laid the cloth over the bottom and trimmed to fit. You need not cut out a V for the front as it drapes over the bow very well. A generous coat of plastic was applied to the bottom, the cloth laid over the bottom and smoothed out, and more plastic was applied with a squeegee to smooth. The cloth becomes almost invisible if applied correctly. The next day with a grinder I carefully ground down the surface so that it was smooth, flat, and even, and one more coat was applied with a brush, and carefully smoothed with a lot of elbow grease and wet sandpaper. Then a lacquer compound was used to give a plate glass finish. Fiberglass is composed of a plastic and a hardener plus the glass cloth or mats. You have to work rather fast. It's a two man job as the "pot life" is short or long depending on how much hardener you use. By short "pot life" I mean that the mixture hardens in the pot before it hardens on the boat. One minute it is liquid, but then it starts turn into a jelly and proceeds to get very hard in a matter of seconds. I would say that for the beginner it is a dog job. But the results are very rewarding. It is literally as tough as glass and just as smooth. This is not intended to be a full discussion by any means, but just a few words to let you know what you are in for if you would like to fiberglass the bottom of AIRBORNE.

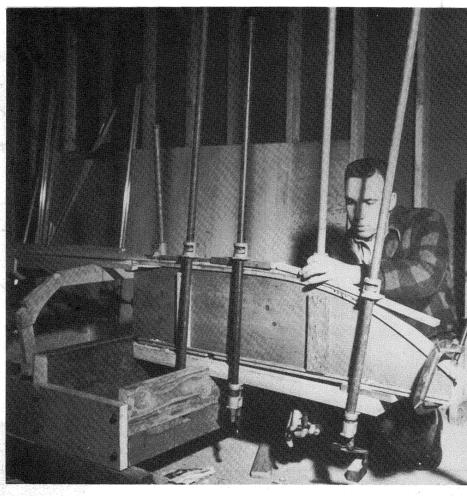


5. AIRBORNE all set up, ready to race. Note cut down

Mercury tank that fits between the stringers of the boat.



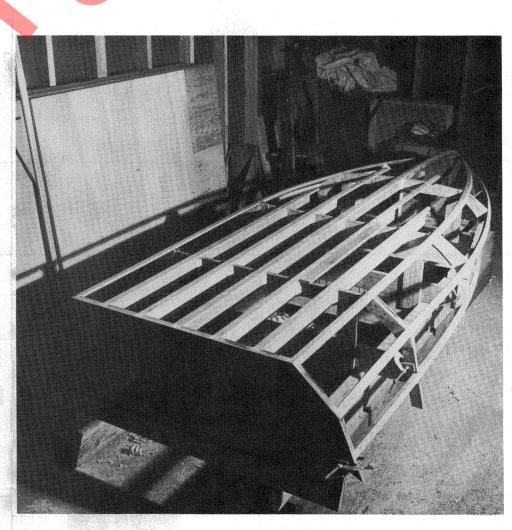
6. Here the ribs are being assembled from full size rib patterns. All rib parts and gussets are cut and then



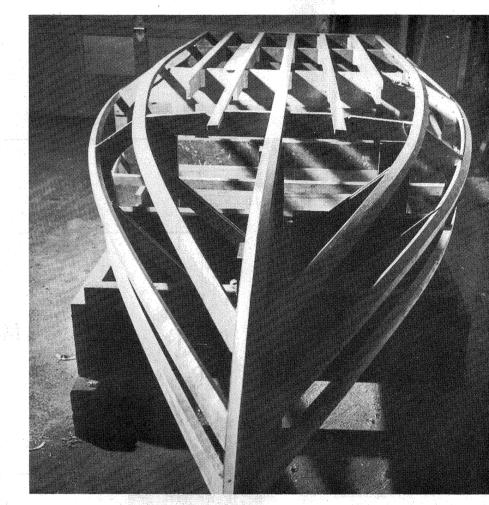
7. Here the ribs are set up on a rather extensive jig. The keel is backed up with a piece of mahogany ½" x 1½" forward of rib one.



If you have a wooden floor in your shop just nail to same. In this case the floor was concrete. This simple jig worked out quite nicely.

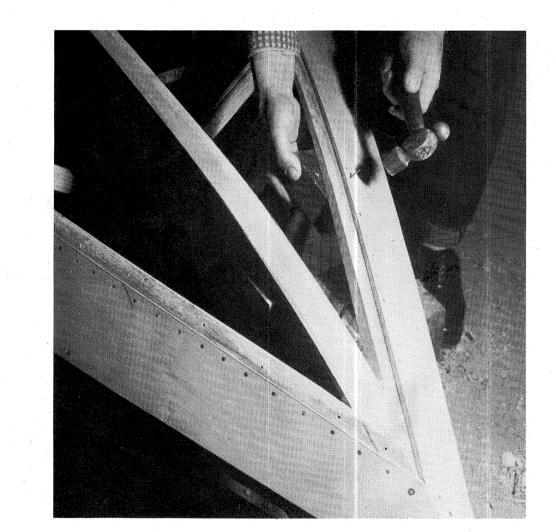


9. This type of jig is rather involved, but since I am building three AIRBORNES on order it justified the extra work and saved time in the long run.



10. Here the frame is all faired ready to receive the plywood, this takes more patience than skill. Fin brace is next to

Batten No. 2.



11. The non-trip chines are glued and ¾" No. 16 Anchorfast nails are used up front. The bottom will butt against the non-trip chines for about the first 3 ft. up front.

BOTTOM CHINE

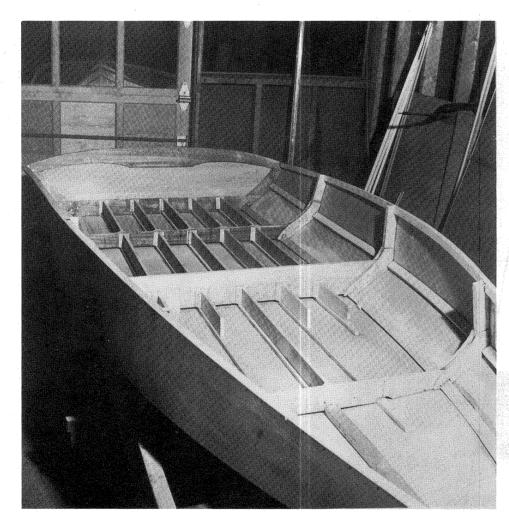
I" NO.12 ANCHORFAST NAILS

I" NO. 12 ANCHORFAST .NAILS

BOTTOM CHINE

3/4"X 1-1/4"

3/4" X I-1/4"



12. Boat right side up to receive decking, seats, etc. She weighed 82 lbs. at this point. At this stage I varnish where the floor boards go, giving it 4 coats of spar varnish.



13. Detail of the inside of the stem. Mahogany was used under the stem piece forward of rib No. 1, thus the stem

TRANSOM

1/2" MAH OGANY

TRANSOM FRAMING 3/4" MAHOGANY

COAMING

1/2" X 2-1/2" STRINGERS BUTT ON

FORARD AND AFTER SIDES OF FRAME NO.3

at this point is 1" x 1½" thick.



14. Bow complete ready for decking, under deck I have already given 4 coats of varnish, a lot easier than when

BATTENS 1/2"X 1-1/4"

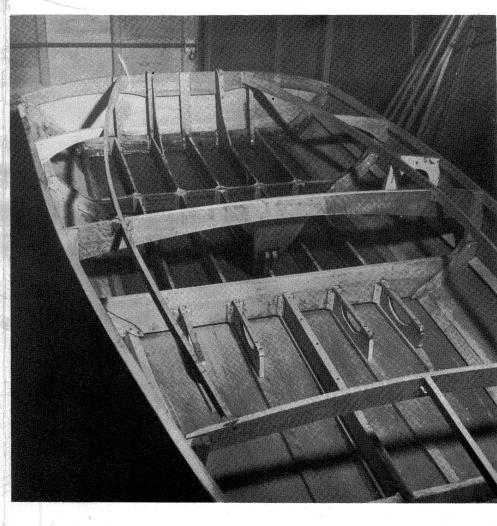
3/4"X I-1/2

BOTTOM CHINE

the deck is on.

KEEL STRINGER 1/2" X 2-1/2"

STRINGERS 1/2"X2-1/2



15. This picture should answer a lot of questions. The bottom s glued, and nailed with Anchorfast nails to all battens.

About 8" on center.

DECK FRAMING

SCALE FOR B'RUNABOUT

SCALE FOR 'D' RUNABOUT

SHEER I'X 3/4

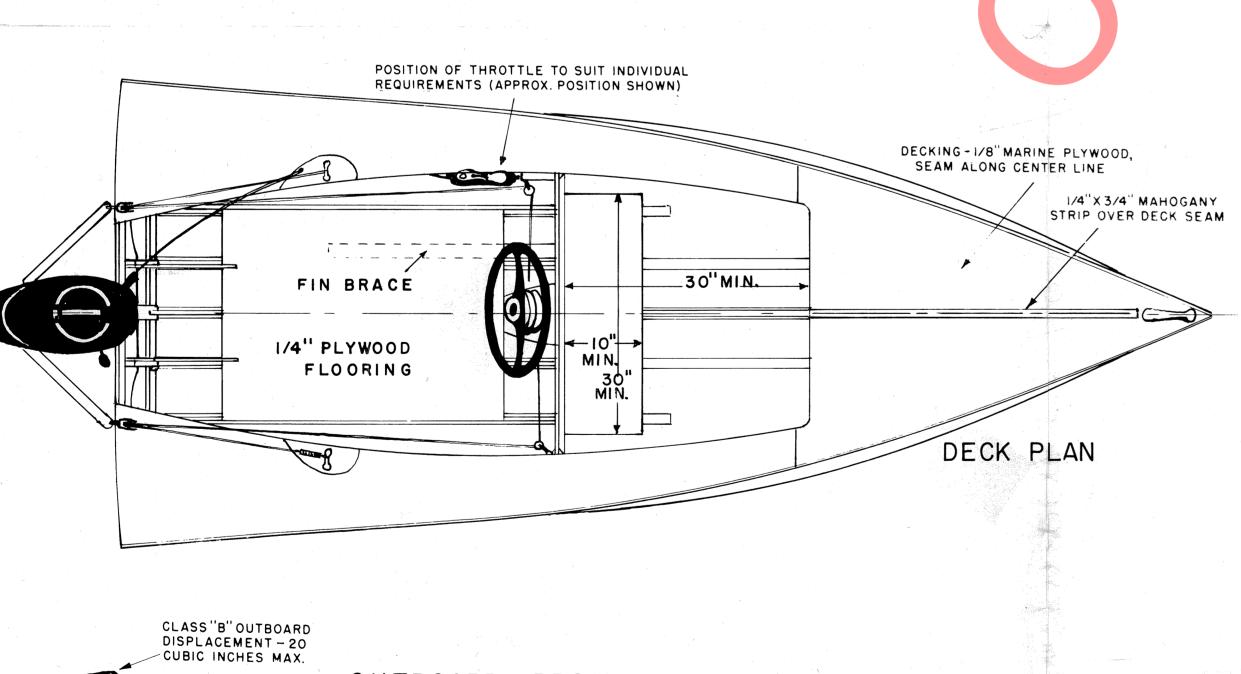


16. Transom knees of 1/4" plywood extend for about 10" below the floor board, they not only hold the transom fast but

help keep hooks out of the bottom.

CENTER LINE

DRAIN HOLES ON ALL BACK STRINGERS





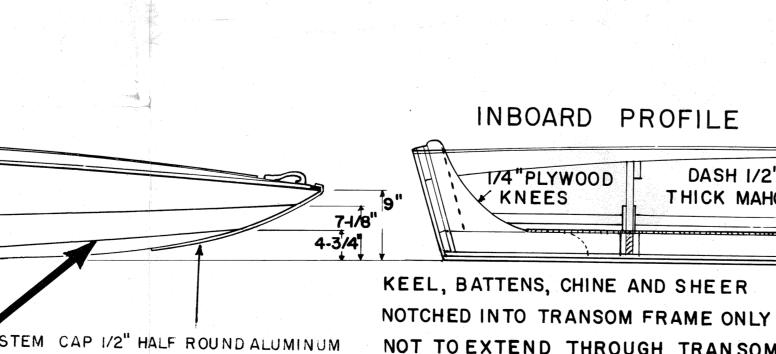
BOTTOM CHINE

1/2"X 1-1/4"

RACING NUMBER, ASSIGNED BY THE AMERICAN POWER BOAT ASSOCIATION, TO BE PAINTED ON

SIDES IN COLOR CONTRASTING TO THAT OF SIDES

3/4" NO. 16 ANCHORFAST NAILS



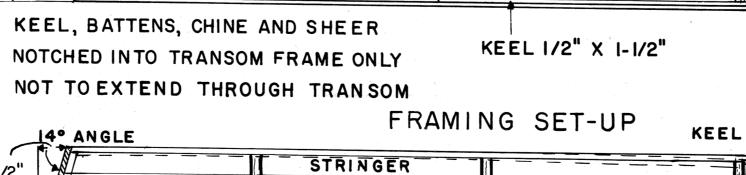
14° ANGLE

TRANSOM

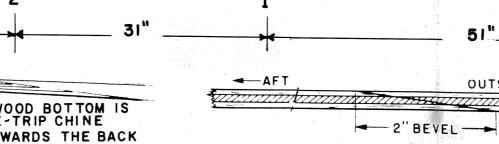
3-1/2"

3/4" NO.16 ANCHORFAST NAILS

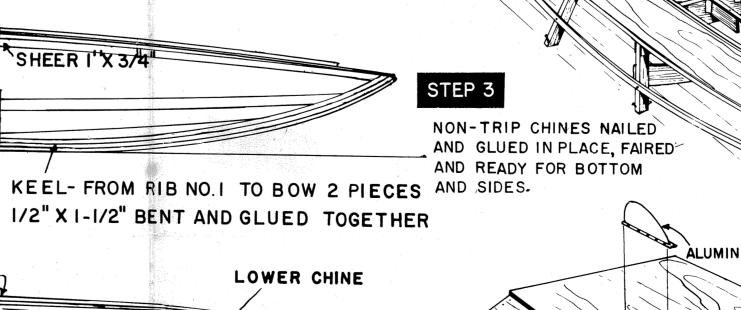
INBOARD PROFILE SIDE FRAME3/4"XI-3/4" DASH 1/2" THICK MAHOGAN UPPER CHINE I'XI/4"



UPPER CHINE



SHEER



RIBS NAILED TO

SET UP FRAMES AND PUT

STRINGERS IN PLACE WITH

GLUE BLOCKS USING 3/4" NO.16 ANCHORFAST NAILS

FRAMING ASSEMBLED AND

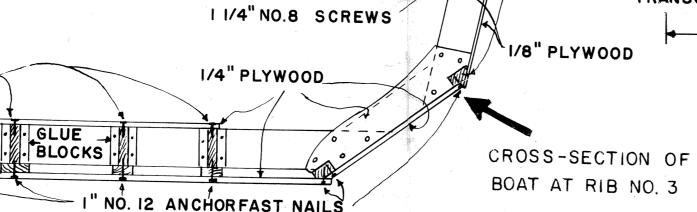
FAIRED READY FOR PLYWOOD.

WOODEN FLOOR

ALUMINUM FIN BOTTOM BUTTS AT THIS POINT OVERLAPS ON THE REST OF THE NON-TRIP CHINE PLYWOOD JOINTS IF YOU BUILD WITH 8' LENGTHS

STEM CAP 1/2" - HALF ROUND ALUMINUM STRIP TO COVER BOTTOM SEAM.





DETAIL OF HOW PLYWOOD BOTTOM IS PLANED ALONG NONE-TRIP CHINE LEAVING A LIP TOWARDS THE BACK

2" BEVEL --

TYPICAL PLYWOOD JOINT

FLOOR LINE

BOTTOM AND SIDES NAILED AND GLUED IN PLACE.