

**OUTBOARDS**

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# *BOAT SPORT*

JUNE 1954  
25c  
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**COMPETITION TUNING  
THE CLASS D MERCURY**

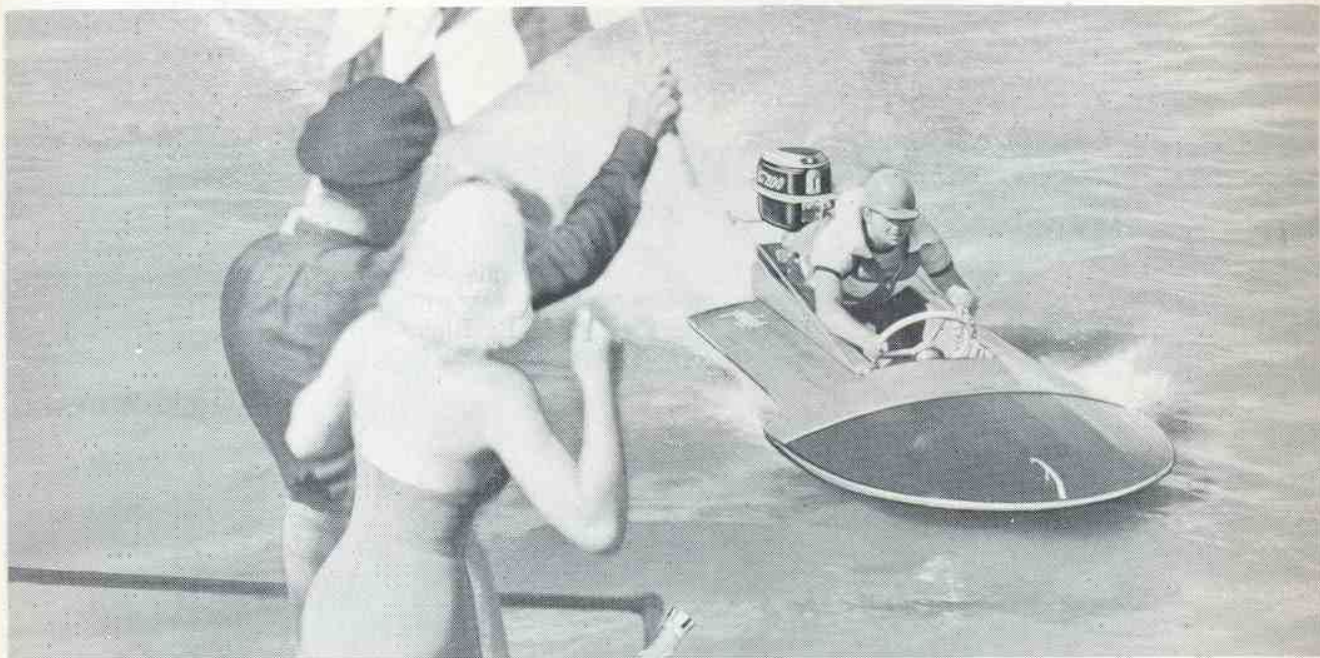
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**Man A MARTIN... "best outboards ever built!"**

# AROUND THE BUOYS

BILL TENNEY, Dayton, Ohio, perennial record breaker, did it again at Lakeland, Fla., on January 30th when he averaged 5.012 mph with a Class B hydro in competition over the five mile circuit to break his own former B record of 53.635 mph set at the same location a year ago.



Old but popular one-designed outboard used in Eastern Outboard Racing Club events, in a ballast-controlled take-off at Acquebog, L. I., N. Y.

Jerry Moshier, Phoenix, N. Y., and his father are constantly experimenting with boats and motors to keep Jerry's rig out in front. For a time last season Jerry (who holds the 1953 National A.P.B.A. Class B stock runabout title) rode his Speed Liner BU on straightaways in the manner pictured here in order to coax a few more mph from the rig. Then with a 3/4" thick piece of mahogany 5-ply, Jerry widened his hull a few inches and V'ed it forward. Despite an added 26 pounds, the alteration picked up 2 1/2 mph in straightaway speed. Experimentation of this sort and a willingness to test thoroughly and constantly is nearly invariably the answer to keeping out in front.



Jerry Moshier, 1953 Class B stock runabout champion and holder of 5th place in professional points for his class (A.P.B.A.), displays a unique, straightaway riding style. He's from Phoenix, N. Y. Boat is Speed Liner.

Boat manufacturers don't rest on their laurels either and General Marine Co., designers of Speed Liners, have come out with a new BU runabout design that should really go places in 1954.

With surface props and close to true prop-riding hulls the answer for new straightaway speeds, the problem of getting the hull on plane is becoming more acute all the time. Recently one record breaker had to be towed to get his rig up on top of the water. Veteran racing driver of stock outboards, Larry Teel of Lambertville, N. J., has a system to overcome this problem. Teel loosens his motor clamps on the transom to full open, holds the motor down with one hand until the hull planes and then tightens up on the thumb clamps. This trick permits the motor to kick under

(Continued on Page 26)

# BOAT SPORT

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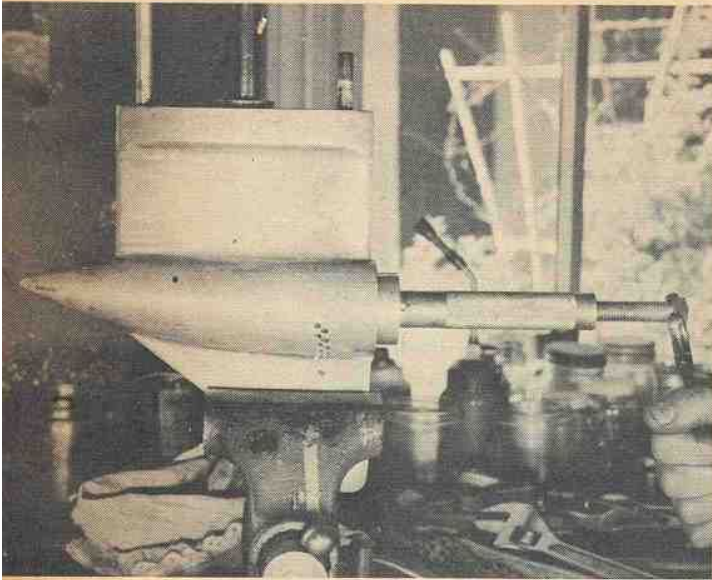
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COVER PHOTOS: MERCURY MOTORS (TOP) AND FEATHER CRAFT (BOTTOM)  
FLEXICHROME BY HAROLD KELLY

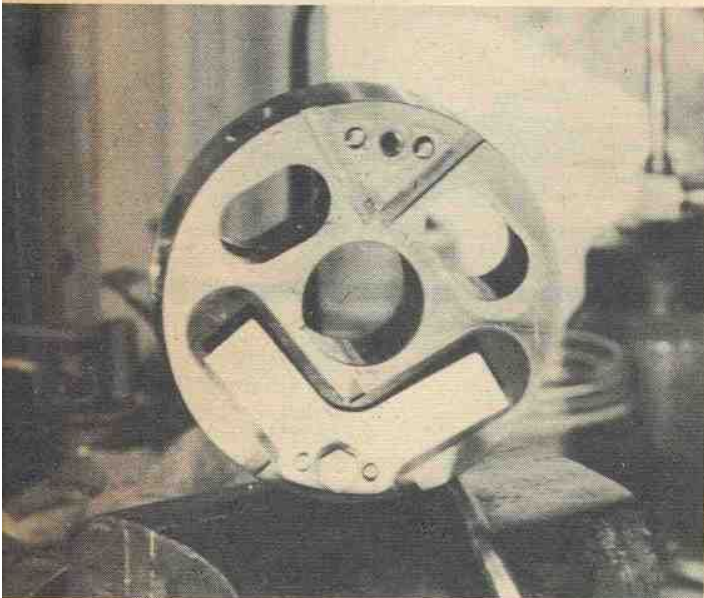
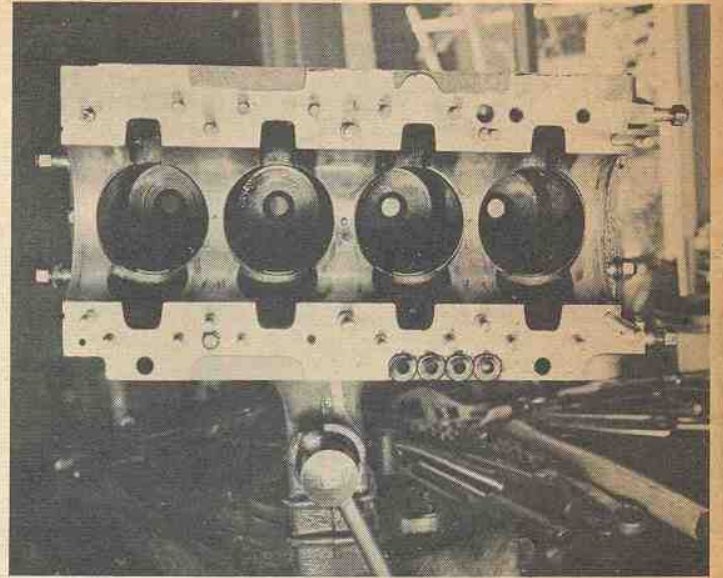
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(Below) Another tool which should be in every racer's kit is the water pump cartridge puller, M-60-5154. Puller screws may break; cost 2c each.



(Below) The 4-cylinder KG9 block is cast as a unit—one half of the crankcase is shown here. (All these photos are by Hank Wieand Bowman).



(Above) The Merc Ds include two complete reed valve assemblies. Reed valve with one set of reeds and stops removed shows how reed can wear brass surface. Worn cages can be lapped smooth with valve compound.



(Above) Maximum clearance between top surface of reeds to reed stops is 5/32". To check this, use 5/32" drill as a "no-go" gauge. Using one drill size smaller as "go" gauge, permits full valve limits in rules.



(Left) To remove the water pump cover of Quicksilver units, a special tool is required. The tool held here carries the Kiekhaefer number M-60-5146 and its cost is \$7.02.

## COMPETITION TUNING THE CLASS D MERCURY

By Hank Wieand Bowman

SETTING up the Class D Mercury for competition is no different than tuning any outboard motor for high speed performance. The final result is dependent on painstaking attention to details. Since the bulk of the competitors today are using the KG9H, with a far lesser number using the new Mark 40s, we have used the KG9H for our illustrations. Basically the two models are the same, with the greatest variance being found in the less complicated and better designed fuel system of the later Mark 40s.

The only major difference between the KG9 and the KG9H is in the lower unit. The KG9 was equipped with a Quicksilver unit while the KG9H has a Quicksilver Hydro unit, the latter being 3" shorter in driveshaft housing design to simplify set-up on hydroplanes whose drivers like to run their units as near the water's surface as possible. The gear ratio in both units is the same. The later style units, however, include

a needle loaded bearing rather than a bronze bushing at the water pump end of the propeller shaft.

For the racer who has purchased a used Merc D, the entire motor should be torn down piece by piece and a complete inspection of all parts should be conducted. The same should apply to a motor owner who wants his outfit to give the peak performance for which it was designed.

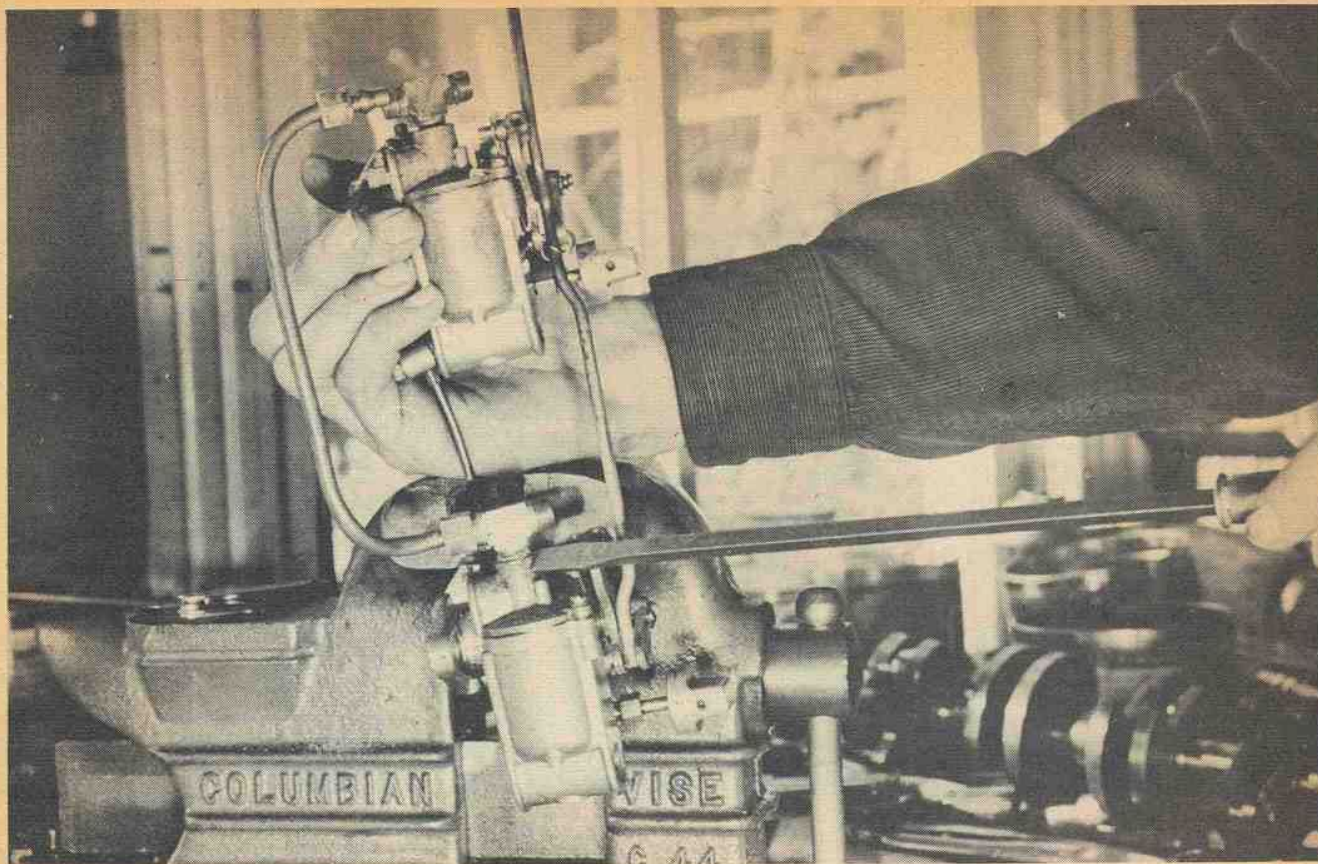
Starting our check at the lower unit, first inspection should be made of the condition of the needle bearing on the propeller shaft. Mercury Factory tool M-60-5146 is a necessary part of your equipment to remove the water pump cover to expose this bearing. Remember, when removing this piece that the threads are left handed. Since the needle bearing is not lubricated automatically when the gear case housing is filled, you must pull the water pump cover periodically so that you can get at the bearing to wash it with gasoline and then smear

it generously with lower unit grease before replacement. Failures of this bearing are rare and most prone to occur after extensive salt water use.

Special Mercury tool number M-60-5154 is used to pull the water pump. Be certain that the neoprene impellor blades are free and not worn, for if you have raced in shallow water or pitted off the beach, it is likely that grit and sand may have seeped into the unit and damaged the blades. Improperly functioning or conditioned water impellor blades may lead to overheating and a stuck motor.

With the water pump removed, the propeller shaft gear can be inspected for worn or fractured teeth, as may be the pinion gear. If either or both gears are badly worn or chipped, they should be replaced. A free running unit will add many additional rpms to your outfit.

Most drivers who run up in the winning brackets consistently also see that the prop shaft bearings (See Over)



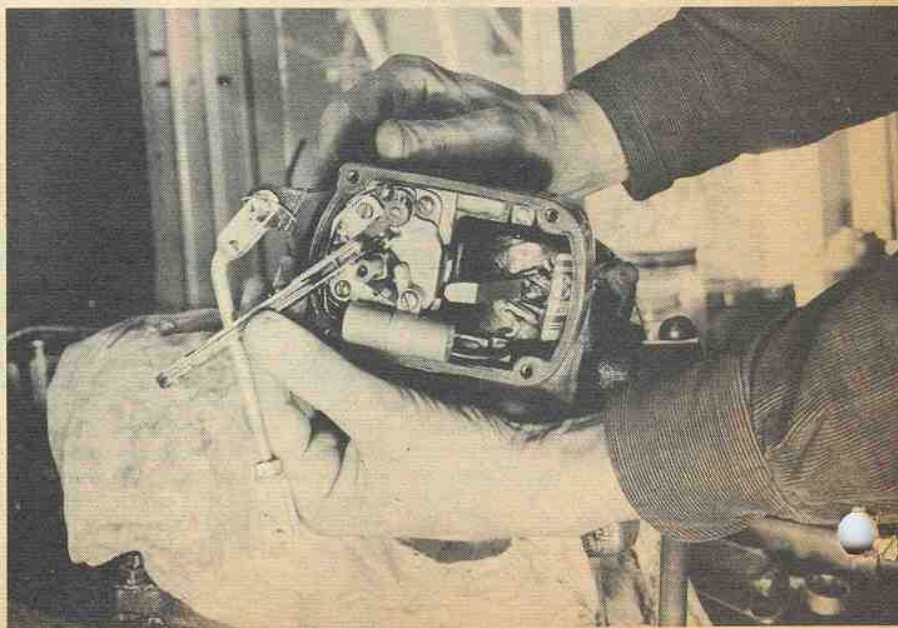
Carburetors should be checked over before competition. In particular, the screen located under T-joint, as indicated above by the screwdriver.

## COMPETITION TUNING THE CLASS D MERCURY

(Below) Every racer's kit should include a set of feeler gauges. All the magnetic breaker points when they are open must be carefully checked to see they are set at .015 inches.

*(Continued from Preceding Page)*  
are in good condition. These should be replaced annually or even more frequently if the engine is used in competition regularly.

If you are planning to replace bearings, you can also improve your gears by lapping them in so that they mate together perfectly. This is done by smearing both the propeller shaft gear and the pinion gear with valve grinding compound. Then with the unit locked in a vise and with the propeller shaft fastened to the chuck of a  $\frac{1}{2}$ " drill, the gears are run in with electric drill power until they mesh perfectly. After such lapping, you must replace the bearings, for unquestionably the valve grinding compound will also have gotten into the bearings and caused excessive wear. So plan your lapping at the same time as a bearing change. While you have the lower unit disassembled be sure to insert a new seal at the top of the gear housing unit. This prevents grease and water from being pumped from the unit up the driveshaft with possible resul-



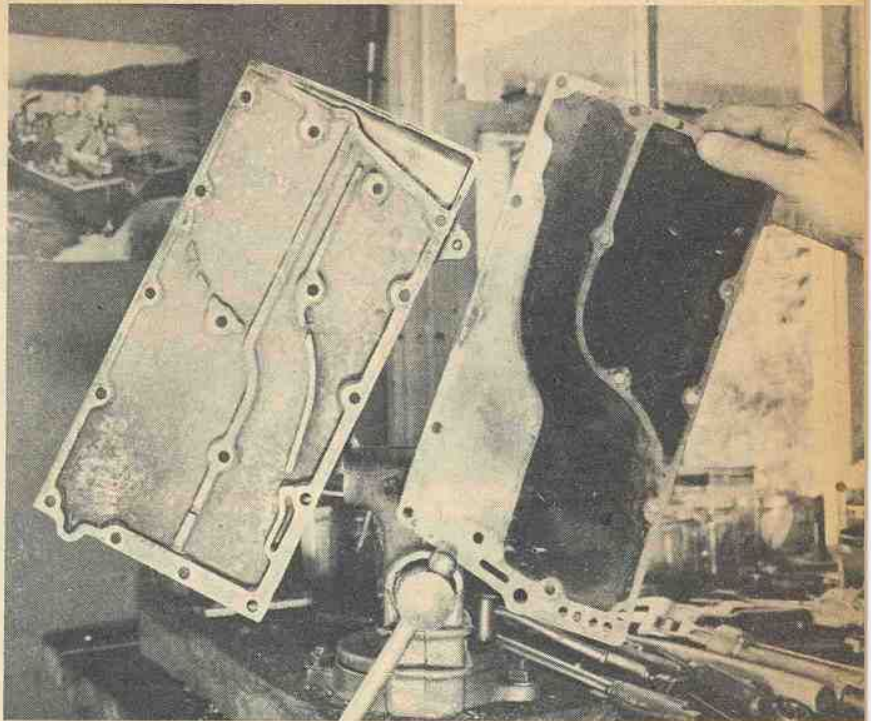
tant damage to the case seal. A leaking lower unit driveshaft seal may result in grease and water being pumped up into the crankcase and eventually into the lower cylinders.

When re-installing the water seal in the gear box housing of the lower unit, be certain to use a sufficient amount of shimming, either under the roller bearings or under the water seal unit itself to prevent any freedom of movement. Otherwise, the seal will be ineffective, water will pump into the unit, displace the grease up into the driveshaft housing, for without lubrication gear and bearing damage is almost certain to result.

When the lower unit is re-assembled, be sure to finally tighten down the water pump cover with a torque wrench to 80 pounds torque and refill the unit with grease.

When you have the crankcase disassembled and have removed pistons from the block, check each bore for scores. And here's for some good news for you D drivers. The Kiekhaefer Factory Service Repair Department is now offering a new service and will re-sleeve scored blocks for \$25 a sleeve. This includes not only the replacing of the sleeves but honing them to standard size. Minor scores and scratches can be lapped to a smooth finish with an electric hand drill used to power a lapping tool. For a lap, use a worn but "in-round" piston and valve grinding compound cut with light machine oil. (Continued on Page 28)

(Below) The baffle plate which separates the exhaust passage of the cylinders from the water jacket shown at left, sometimes will warp badly after extensive use and should be replaced. The baffle held at right, if damaged or badly deteriorated, may permit the jacket to get in the cylinders. (See text for details about tuning Merc.)



(Below) Three sections of the Mercury KG9 magneto are shown here. At left, distributor contact points are shown. When they are worn or weak faulty wiring may result and then these should be replaced.



(Below) The gear train of a KG9 with the main drive gear mounted on top of crankshaft at left. In center is an idler gear which operates fuel pump. Third from left is ignition timing gear. At right is the gear operating the tachometer power take-off. When re-assembling be sure to line up the dots on the main drive gear and the timing gear.





(Above, top) In the Spring a young man's fancy turns to thoughts of outboarding, as well as those of love. Here the two are combined in a No. 5 Deluxe Wolverine molded plywood model (Wagemaker Co., Grand Rapids, Mich.). The 10 h.p. Martin "100" has remote-control steering.

(Above) 1954 will be boating's biggest year, with the credit for the tremendous increase of interest going to outboard boating. Shown is a 14' Thompson Super Deluxe Runabout (Thompson Bros. Boat Mfg. Co., Peshtigo, Wisc.). Motor, a 15 h.p. "Jubilee" Champion, weighs 54 lbs.

"THE FOUR MILLION" is the title of one of O'Henry's books of short stories, that being the population of New York City when he wrote about it; but a few more people have moved in since so it's a little out of date. We've always thought that something ought to be done about a good title like that, instead of letting it go to waste.

Well, now the time has come. We have just read some figures. Reliable sources estimate that at least four million outboard motors were in operation at the end of 1953. So without further delay, we lay claim to O'Henry's title in the name of outboarding. Here's our book:

**THE FOUR MILLION**

How Outboarding Has Grown  
or

Fun Afloat Your Family Can Afford

Of course, every year or so we'll have to change the number in the title: five million; six million, etc. At the rate it's growing, it won't be long before some politician starts using the slogan "A chicken in every pot and two outboards on every boat." (Which, incidentally, is not a bad idea on some boats. See "Twin Motor Installation" elsewhere in this issue.)

There is no question at all that interest in boating is at an all-time high. Boat Shows all over the country have been drawing record crowds and setting new marks for sales and prospects. By the time this issue is published Boat Show Season will be drawing near its close. Cleveland, Des Moines and Milwaukee will be ringing down the curtain on their successful runs on April

11th. Three major shows will remain: Los Angeles (Apr. 15-25); Minneapolis (Apr. 16-25); and Dallas (Apr. 23-May 2).

Just before the opening of the Chicago National Boat Show, W. J. Webb, general manager of Evinrude Motors, said: "This will be the biggest sales year in the history of the marine industry. Representatives from every corner of the country who attended the New York boat show recently were of the same opinion. The outboard motor can take a major share of credit for this boom. More and more people who have never before owned an outboard are getting into boating, and the rising interest of entire families in such water sports as fishing, water-skiing and outboard cruising is responsible for this





(Left) New 14' Sportster (Bowman, Inc., Little Rock, Ark.) has folding back on stern seat, was designed for runabout and water sports use to list for \$300. Motor is 25 h.p. Evinrude Big Twin, which has optional electric starter with remote controls on the new 1954 models.

## OUTDOORS WITH THE OUTBOARDS

HERE'S THE OUTBOARD SLOGAN FOR BOATING'S BIGGEST YEAR: "FUN AFLOAT YOUR FAMILY CAN AFFORD"

By RICHARD VAN BENSCHOTEN



(Above) Here's family fun afloat! And all hands answer promptly to the call "Chow down!" This new 21' Aristo Craft outboard cruiser (Atlanta Boat Works, Atlanta, Ga.) is powered by a 40 h.p. Mercury Mark 50 motor, which has an optional electric starter and generator.



(Above) New 1954 Deluxe Holiday (Pabst Boats Div., Blackhawk Corp., Rockford, Ill.) is a 14' runabout model. This firm also has two new racing runabout models and new A-B hydro in its 1954 line.

heaviest of all off-season business in marine industry history."

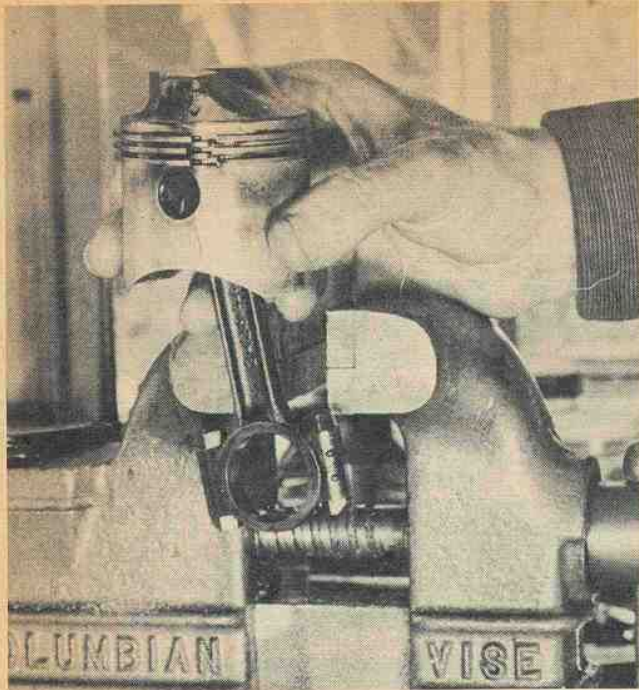
Survey figures released by Outboard Boating Club of America estimate that 500,000 outboard motors were sold last year, of which approximately 250,000 were sold to persons who were buying a motor for the first time. A breakdown of the purposes for which outboards were bought is as follows: fishing, 74%; hunting, 11%; cruising, 8%; others, 7%. (Note: of those who bought motors primarily for fishing, approximately 50% also said they planned to use them for cruising.)

### IT'S YOUR SAFETY

Of course, all this tremendous growth in boating brings about a need for more care (Continued on Page 33)



(Above) It has been estimated that four million outboards will be in operation this season. Perhaps this group represents one of the quarter-million families who bought their first outboard in '53. Boat is a 13' runabout (Lyman Boat Works, Inc., Sandusky, O.); note locker under forward deck. Motor is 10 h.p. Johnson Sea-Horse 10.



A cheap production method to pin rings is accomplished by drilling a hole from the side of the piston baffle downward through the ring lands and then inserting a single pin to present a bridge across grooves as shown here. A staggered pinning set-up is far from desirable.



Recommended method of pinning rings is illustrated here. Each ring groove is drilled and an individual tapered retaining pin tapped into place. Note that top and bottom rings are pinned in one location—center ring, to offset blow by, is pinned on piston's opposite ends.

## DO YOUR OWN RING JOB

By Blake Gilpin

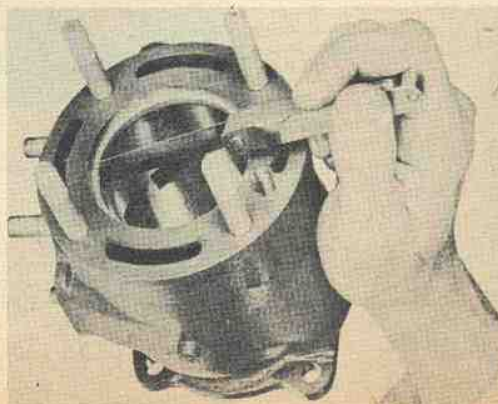
Pictures By Courtesy Of Johnson Motors  
Photos By Hank Wiesand Bowman

THE PISTON and piston ring assembly of your outboard engine combine to seal the fuel vapor in the cylinder and compress this fuel vapor as the piston moves toward the cylinder head. The greatest single cause for drop off in power of an outboard motor and for hard to start engines is loss of compression through the inability of the rings to form a proper seal. Naturally, if your pistons are out of round, scored or the cylinder walls are scored, even a perfect ring job won't provide a seal, for the gasses under pressure will escape by by-passing through the scores. But for the many outboarders who want to keep their engines up to snuff, frequent ring jobs are the answer and you can do the job

yourself without any great difficulty—and with considerable saving of money—by following the procedure outlined here.

If the edges of your ring lands are worn, as in "A" of Drawing No. 2, a ring job won't suffice and new pistons are recommended. However, if your piston grooves are in good condition, a ring job will give your motor a much needed shot in the arm. Telltale signs of blow-by will be dark carbon discolorations across the surface of the piston ring lands or around the piston area just below the bottom groove.

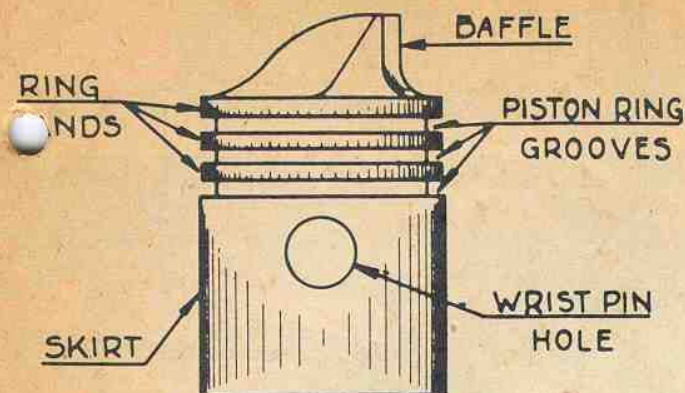
When you are removing worn rings, don't attempt to expand them and lift them over the top of the ring lands, for you will be likely inadvertently to score the piston surface



For proper fit of ringed piston and ring-end clearance, insert ring into bore and check gap with feeler gauge.



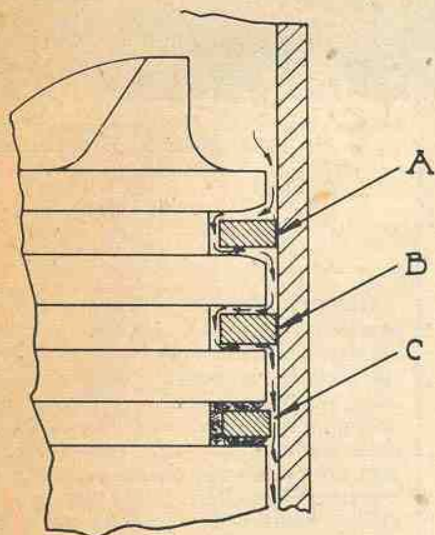
A ring expansion tool eases the job of slipping rings into the piston grooves.



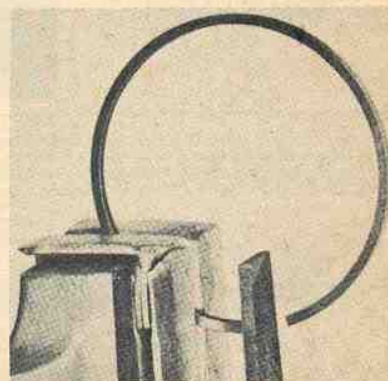
Terminology of various parts of typical two-cycle outboard piston.



Worn file is good tool for removing ring groove carbon.



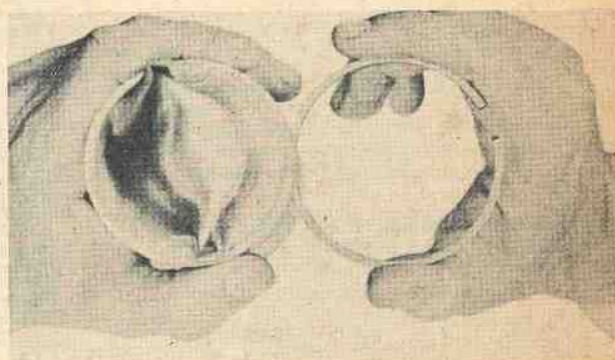
(Left) Sectional view of a piston (broad cross hatch indicates cylinder wall; narrow cross hatch, the piston ring). A: — shows compression loss through worn ring grooves and lands. B: — shows power loss through faulty ring seat due to insufficient gap between ring ends. C: — shows inactive ring caused by excess carbon deposit in ring grooves.



Dressing down ends of piston rings to arrive at desired ring gap should be done carefully. To guard against marring ring in vice, insert lead of copper shims between the vice jaws.

at the lands and damage the piston. With your thumb nails, or two tools that can fit into the groove, pull the ends of the ring apart and break the ring. Carbon accumulation is the most consistent cause of blow-by. After removing the rings, file the end of one broken ring level and using it as a scraper, draw it around the ring groove to scrape away the hard carbon residue.

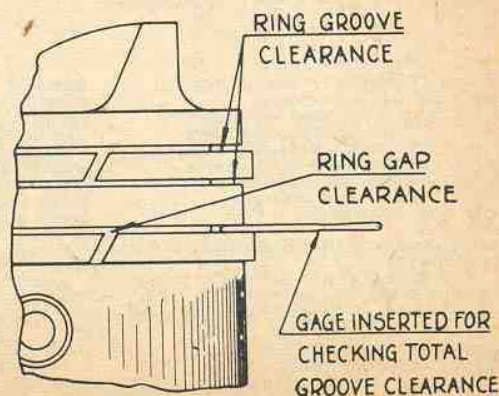
Dependent upon your motor, rings to be installed may be of four types of end design. The cut ends of the rings may have a straight cut, a miter (45° angle) cut, a stepped cut which creates a nearly gas proof joint, or a straight cut with pin notches cut either into (Continued on Page 30)



To check ring groove for tight spots, rotate ring groove as shown here.



After rings have been properly fitted, make a solution of light machine oil and a cleansing powder and apply it liberally to the ring grooves. Then, holding the rings, rotate the pistons to assure good, free lapped surfaces. Flush away abrasive material before piston assembly.



Proper ring gap clearance depends on ring width. (See table in text).

# THE BOAT SPORT-McCRAE SPECIAL

By E. G. McCrae

Naval Architect

A High Performance Class A-B

Three-Point Hydro Styled For

The Amateur Boat Builder . . .



McCrae Design No. 509 (foreground) and Design No. 5113. (Photo by E. G. McCrae).

Materials needed for building the boat sport Special (McCrae Design No. 541)  
 Note: The parts listed to the right are to come from the pieces of material listed to the left. Material other than plywood should be order Dressed or Sized 4 sides to the sizes given. Specify Marine Grade Plywoods (Phenol Bonded) and Air Dried Whole Lumber. Do not use Kiln Dried.

Number Pieces Req'd	Length x Width x Thickness	Material	Use for Making:—
1 piece	4' x 2' x 1/2"	Mahogany Plywood	Transom Trans. Filler Trans. Cleat Bottom Doubler
1 sheet	8' x 4' x 3/8"	Mahogany Plywood	Frames 1 to 7 Stiffener frames Dash Floor
2 sheets	8' x 4' x 1/4"	Mahogany Plywood 1st sheet:	2 girders 2 fwd Non-trips 2 aft Non-trips 2 sponson planks 2 aft sides 2 fwd sides (half) Trans. web knees
		2nd sheet:	(Tunnel plank (in single piece) 2 coamings (Decking (Entire)
1 sheet	10' x 4' x 1/8"	Mahogany Plywood or substitute:	(Decking (aft deck only) (Decking (foredeck)
1 sheet PLUS	5' x 4' x 1/8"	Mahogany Plywood	(2 No. 8 frames 4 knees (Steering post (Trans. Cornerposts
1 piece	5' x 1 yard wide	Aircraft fabric	Breasthook Stem
1 piece	5' x 8' x 5/8"	Mahogany	Trans. frames No. 4/5 frames Steer. post knee
1 piece	30' x 1 1/4" x 1 1/4"	Sitka Spruce	2 3/4" strips for girder posts 2 3/4" strips for Bot. stringers 2 3/4" strips—4-4' stringers 2 3/4" strips—2 carlings 1-2" strip—keel
1 piece	10' x 8' x 3/4"	Sitka Spruce	1-3 1/2" strip for aft sides 1-2" strip for forward sides 1-2" x 4' for centerstrip remainder for non-trip chines
1 piece	8' x 9" x 3/4"	Sitka Spruce	
1 piece	11' x 9" x 5/8"	Sitka Spruce	

Fastenings: (Use only bronze, galvanized or otherwise non-corrosive)

- 11 gross 3/4" x 7 flat head wood screws
- 1 gross 1" x 7 flat head wood screws
- 1 gross 1 1/2" x 7 flat head wood screws
- 24 only 7/8" x 8 flat head wood screws
- 48 only 1 1/4" x 10 flat head wood screws
- 40 only 3/16" x 2" carriage bolts
- 40 only 3/16" flat washers

Miscellaneous:

- 5 lbs. Phenolic Waterproof Glue—U.S.P. 'Resorcinol'
- 1 gal. Old English Oil or other filler primer
- 1 gal. High grade marine varnish

Tools required for building the BOAT SPORT Special:

- Square—Steel 2' size for lofting
- Level—24" level and plumb
- Straight edge—4 to 6', self-made from 1/2" ply
- Chalk Line, Carpenter's Chisel Pencil
- Bending Batten—Approx 1/4 to 5/16" square for lofting and fairing

Hammer

- Hand Saw
- Spiral Ratchet Screwdriver—14" size
- Chisel—3/4 to 1" size
- Countersink & Bit Brace
- Rule or Steel Tape
- Bevel Square or T-Bevel
- Hand Plane—9 to 15"
- Block plane—handy for final fitting
- Sanding Block—self-made, about 4" x 9"
- Sandpaper—Various grits, No. 0 to No. 1
- Hand Drill—Selection of drill bits, 5/64" & 3/32" for pilot-drilling  
5/32" & 3/16" for shank-drilling

Power Tools—Only 1/4" size portable electric drill and either table or band saw are needed. Most of the necessary drilling can be done by hand though it would be much less tedious to have a power drill. Most of the cutting that can't be done by hand can be marked out and toted to a neighborhood shop for cutting on a power saw.

THE DESIGN which I have prepared specially for BOAT SPORT's amateur builders has been worked out with considerable thought given to construction ease, but the project has not been simplified to the extent that high performance characteristics inherent to this design are in any way sacrificed. The construction is developed around two simple girders which form the backbone of the hull. Once you have carefully cut out and assembled these with the girder posts and you have carefully laid out each frame, you will find that setting up will move along very smoothly with little chance of error or misalignment.

It is important that you study the complete plan, instructions and material list until you have thoroughly understood the general procedure you will be expected to follow. The main thing to realize in tackling the BOAT SPORT Special is to allow ample time to do the job properly. Study each step in advance. Don't rush blindly ahead.

You will find that it will be helpful if you loft (draw the plans on heavy paper) the lines full size just as they are shown on the lines plan in Plan and Profile as well as in Section or Body. With an accurate base line and then station lines erected at the proper intervals perpendicular to the base line, you will find that you can reproduce the lines of the hull full size using the Table of Offsets. When you do the Section Plan in laying out the frames be sure to deduct the thickness of the planking all around and also deduct the thickness of the double sides—that is, the side stringer plus the side cap. These deductions will have to be made after the frame section is developed from the Table of Offsets and the measurement for deduction will have to be made square with the respective

planking plans. It will not work to simply alter the Offsets to allow for the deductions. Note also additions which will be necessary to allow for bevelling of the transom.

And now for step-by-step instructions.

Step 1: Lay out the girder following the detailed drawing given on Sheet 2—Lines Plan. Remember to allow a bit extra beyond the No. 1 frame position for fitting to the Breasthook. Fit posts carefully to proper positions in relation to the station lines. Do this first without glue and do your drilling at this time. Then spread glue, insert a screw to tie

the lower end of the girder and outer post forward of No. 5 and do final bolting with 3/16" carriage bolts.

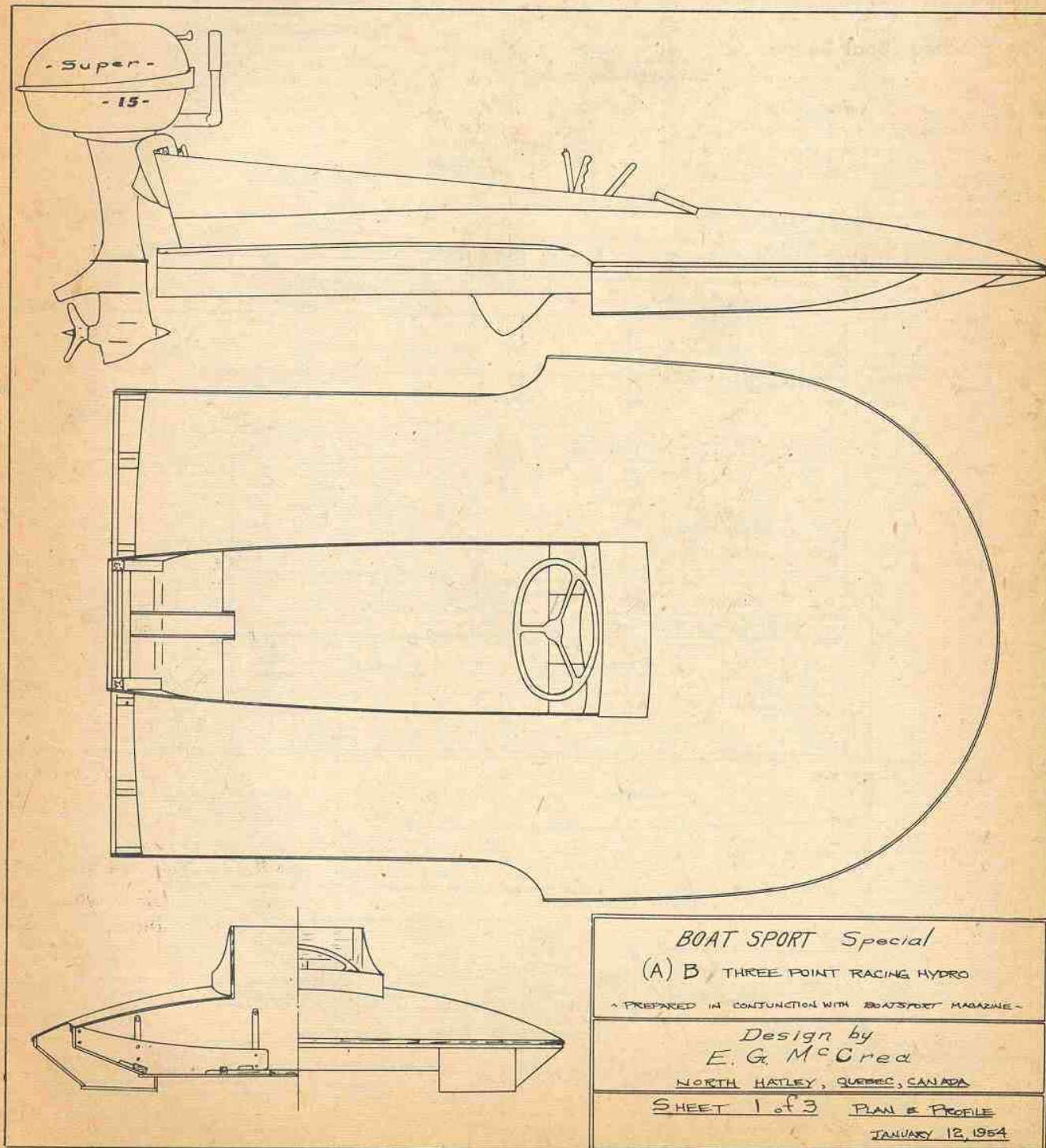
Step 2: Make heavy full-scale paper patterns from Section Plan of frames and transom. Carefully mark girder notches and cut them out. Holes are for lightening and plans show minimum amount of web to be left. Assemble the frames or lands to the transom and the No. 4/5 frame using specified fastenings and phenolic glue. Be sure batten or stringer notches are cut clean and square.

Step 3: Lay out the Stem and the

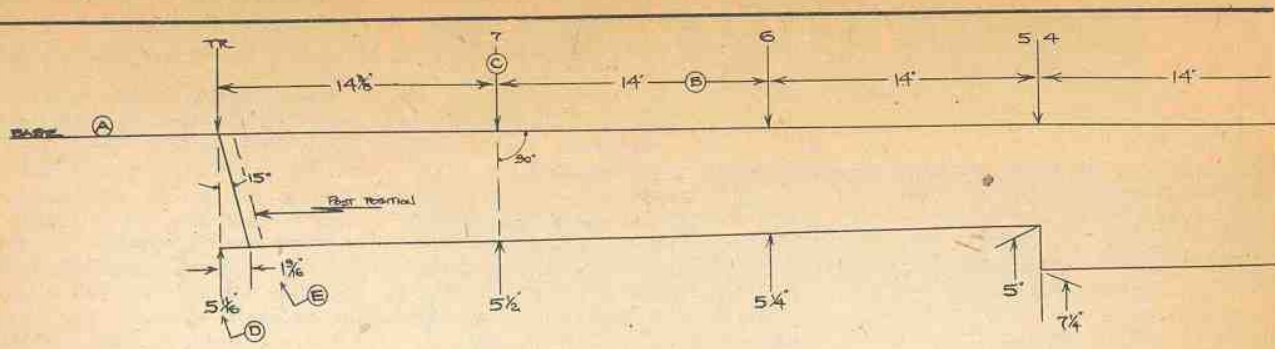
Breasthook, notching each as detailed. Assemble together with glue, then fasten the assembly to No. 1 frame.

Step 4: Build set-up trestles as shown, secure them to the floor and brace them to each other. Clamp the girders in place, then level and square them in relation to each other. They must be level and the respective posts must be directly opposite one another. You may insert a frame to assist in squaring the assembly and also clamp the girders in place.

(Text continued on Page 27—Detailed plans on next four pages.)



BOAT SPORT Special  
 (A) B THREE POINT RACING HYDRO  
 \* PREPARED IN CONJUNCTION WITH BOATSPORT MAGAZINE -  
 Design by  
 E. G. McCred  
 NORTH HATLEY, QUEBEC, CANADA  
 SHEET 1 of 3 PLAN & PROFILE  
 JANUARY 12, 1954

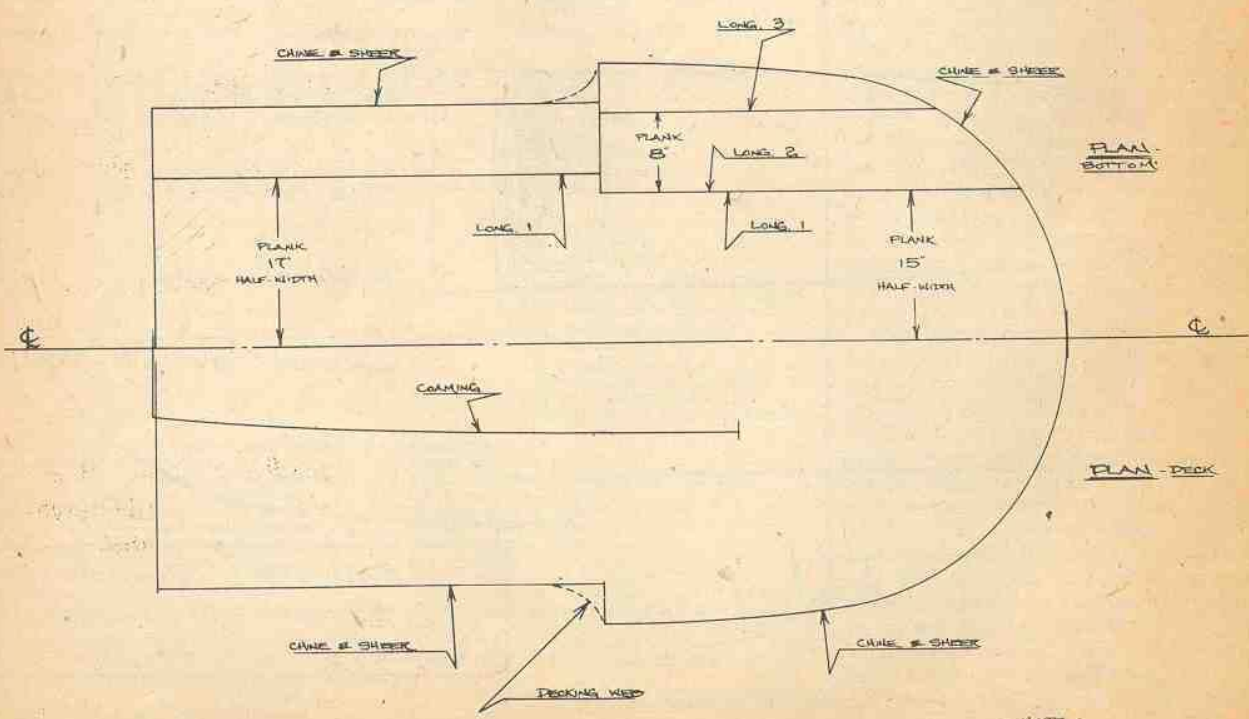
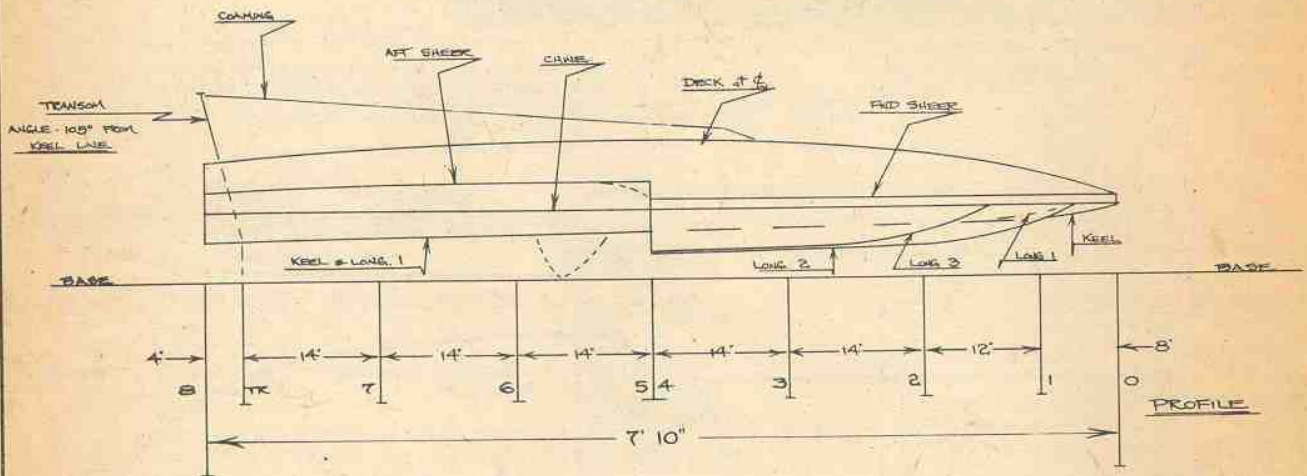


NOTE - 15 TO TR MAY BE CONNECTED BY STRAIGHT LINE ELIMINATING NEED FOR DIMENSIONS AT G & T.

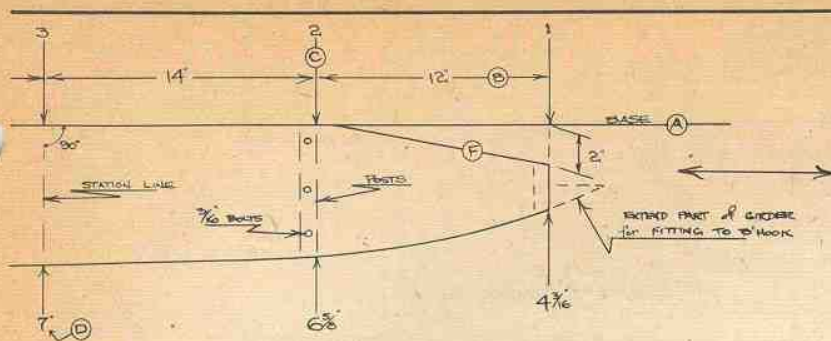
GIRDER LAY-OUT DETAIL

2 REQUIRED - OPPOSITE PAIRS

NOTE - LOCATE END APPROX. 30' FROM NO. 8 TO FORE & AFT & OF END



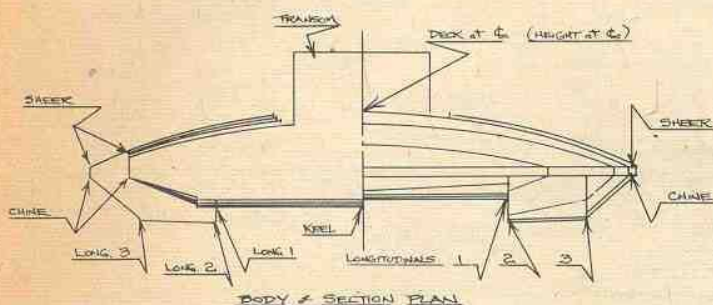
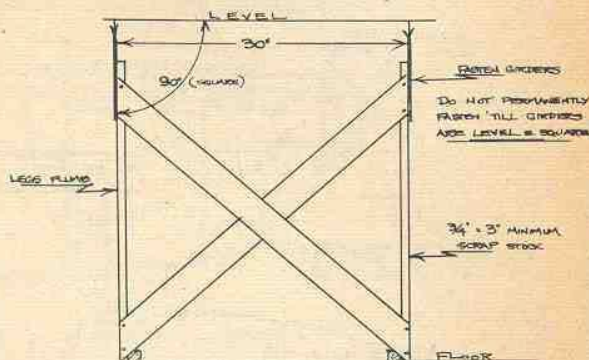
NOTE - PLANKING EDGES NOT SHOWN IN PROFILE OR SECTION - POSITION OF OUTSIDE PLANK EDGE ONLY IS SHOWN.



- STEP - INSTRUCTIONS**
- (A) ESTABLISH CHALK LINE BASE - BASE WILL BECOME GIBBER TOP EDGE.
  - (B) ALONG BASE MEASURE OFF PROPER STATION SPACING AS SPECIFIED NUMBER STATIONS.
  - (C) ERECT PERPENDICULARS AT STN. POINTS
  - (D) MEASURE ALONG PERPENDICULAR STATION LINES DETERMINING WIDTH OF GIBBER BY DIMENSIONS GIVEN (D)
  - (E) DETERMINE TRANSOM ANGLE USING PROTRACTOR OR BY MEASUREMENT
  - (F) CUT TOP EDGE DOWN 2" AT No. 1 AS SHOWN.
- AFTER CUTTING, TRANSFER STATION LINES TO BOTH SIDES OF GIBBER FOR LOCATING POSTS

**NOTE**

- ① GIBBER DIMENSIONS ARE TO INSIDE PLANKING, THIS WILL NOT AGREE WITH TABLE & OFFSETS GIVEN TO OUTSIDE PLANKING.
- ② AT CUTTING, LEAVE BOTH EDGES OF GIBBER PULL TO ALLOW FINAL FAIRING.



**SET UP TRESTLES**

2. REQUIRED EXACTLY 30' WIDTH TO OUTSIDE. LEGS MUST BE PLUMB OR SQUARE WITH LEVEL PLANE HEIGHT OF TRESTLES SHOULD BE APPROX 30' OR CONVENIENT WORKING HEIGHT

LOCATE 3" ASPECT (FIT BETWEEN STNS 2-3 & 6-7) & SECURE SOLIDLY TO FLOOR; BRACE DIAGONALLY TO EACH OTHER.

APPLY GIBBER, LEVEL & SQUARE, FASTEN USING SCREWS OR CLAMPS. FEAMES ARE THEN FITTED TO PROTR. SECTION BY NOTCHES & GIBBER POSTS.

TABLE OF OFFSETS

I HEIGHTS ABOVE BASE IN INCHES & FRACTIONS - MEASURE ALONG PERPENDICULAR OR LINES TO SPOT POSITIONS & LONGITUDINAL LINES IN PLAN										
STATION	B	REQUIRED TRANSOM	7	6	5	4	3	2	1	0
KEEL	4	4 1/8	4 1/4	4 1/2	4 3/4		5	5 1/4	5 1/2	7
LONGITUDINAL 1	4	4 1/8	4 1/4	4 1/2	4 3/4		5	5 1/4	6 1/4	
LONG 2						2 1/2	2 3/4	3 1/8	5 1/2	
LONG 3						2 3/4	3	4 1/8		
CHINE	7	7	7	7	7	7	7	7	7	7
SHEEK	9	9 1/8	9 1/4	9 1/2	9 3/4	8	8	8	8	8
DECK AT 1/2	12	12 1/8	13 1/4	13 1/2	13 3/4		13 1/8	12 1/2	10 1/4	8
II HALF-BREADTHS FROM 1/2 IN INCHES & FRACTIONS - MEASURE ALONG STN LINES TO SPOT POSITIONS & LONG LINES AS IN PLAN										
CHINE & SHEEK	24	24	24	24	24	28	27 1/2	26	19 1/8	
LONG 3						23	23	23	23	23
LONG 2						15	15	15	15	15
LONG 1	17	17	17	17	17	15	15	15	15	15
COAKING		7	8 1/4	8 3/4	9		9			
STATION	B	REQUIRED TRANSOM	7	6	5	4	3	2	1	0

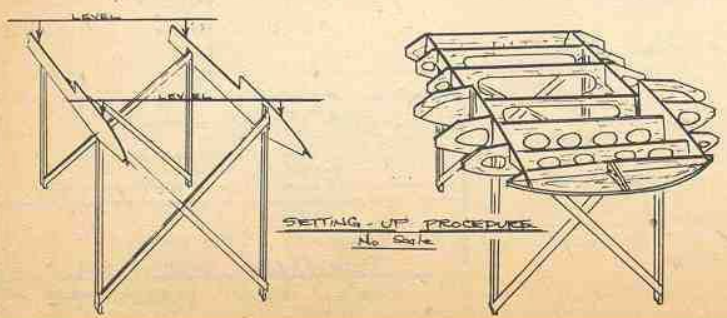
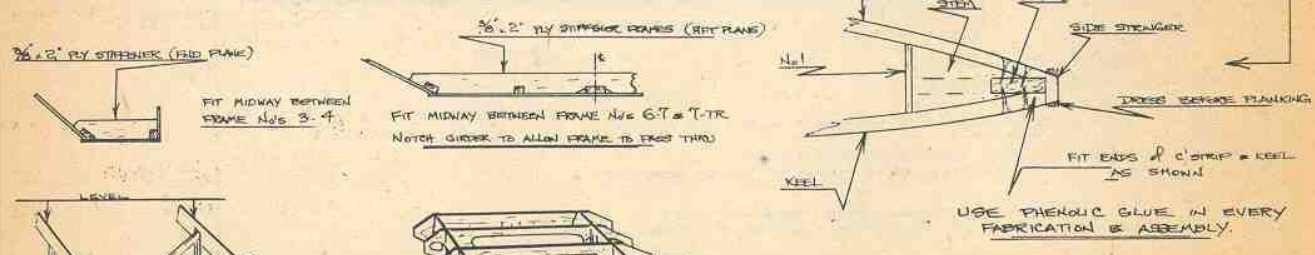
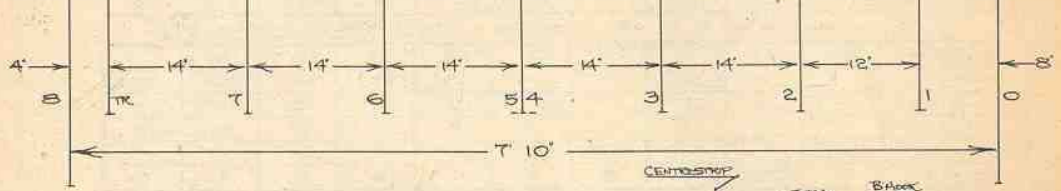
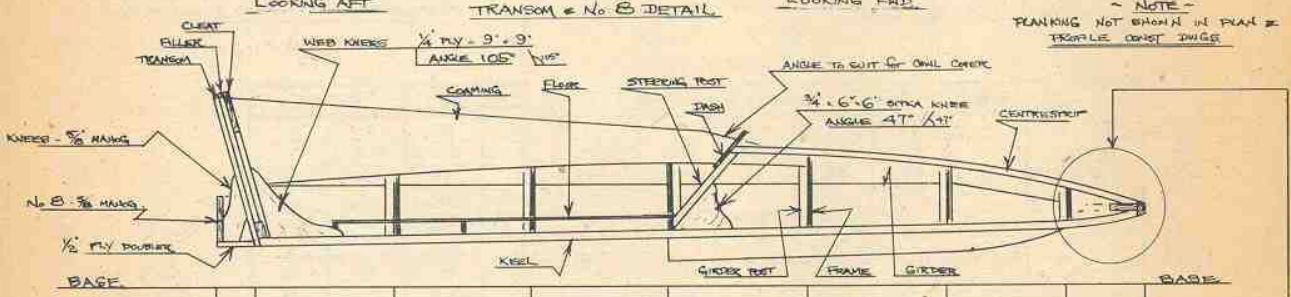
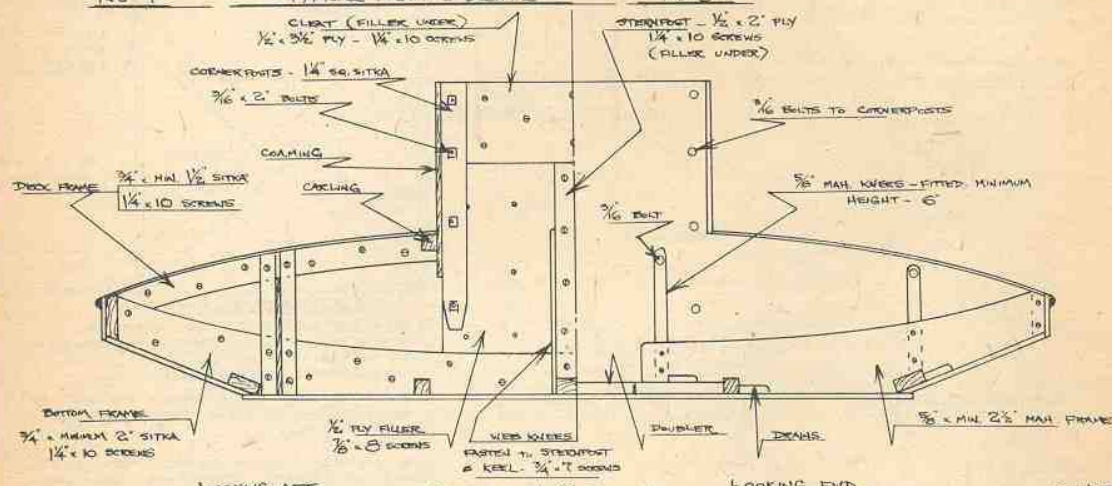
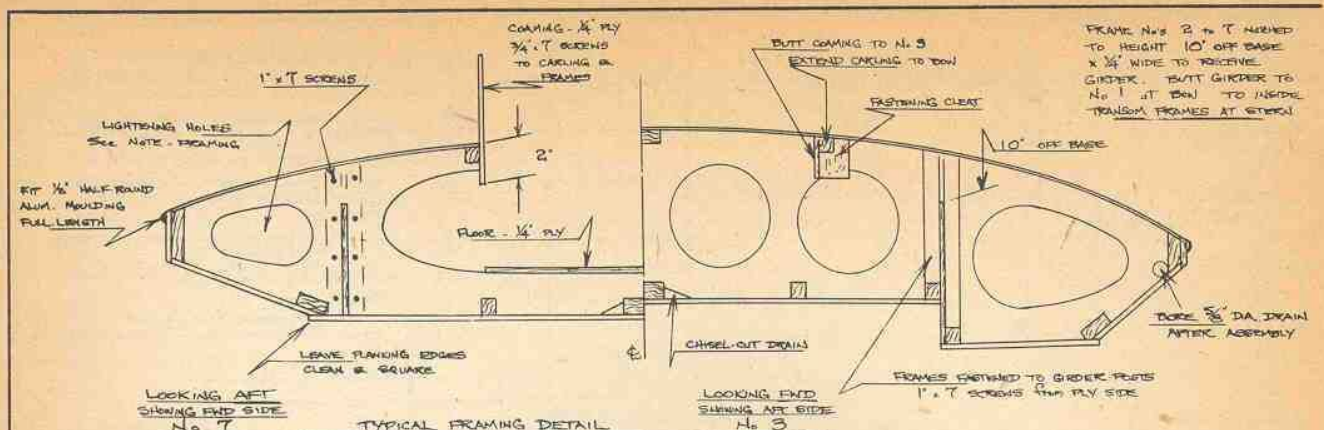
GENERAL NOTES -

1. OFFSETS GIVEN TO OUTSIDE PLANKING.
2. FOR PROFILE LINES - KEEL DEVELOPED FROM STRAIGHT LINE + 1" OFF BASE AT No. 8 ; 5 1/8" AT No. 0. LONG 1, 2, 3 & KEEL PARALLEL. CHINE STRAIGHT THRU 0 to B + SHEEK STRAIGHT 0 to 4 ONLY. USE 0 to B OFFSETS FOR LOTTING & EXP. TR. OFFSETS OF TRANSOM SECTION PLAN.
3. FOR PLAN LINES - LONG 1, 2, 3 PARALLEL TO 1/2 + CHINE & SHEEK PARALLEL 5 to B. DECK DEVELOPED FROM 26 1/8 RAD. TRUE ARC (OUTSIDE PLANKING).
4. TRANSOM SECTION PLAN - TOP TO BE 10 1/8" OFF BASE FOR 15" MOULD HEIGHT. TO ALLOW BEVELLING - ADD 1/8" TO BOTTOM EDGE OF TRANSOM. ADD 1/8" TO BOTTOM EDGE OF TR. FRAME. EXTEND FRAME 1/8" BEYOND PLY TRANS. AFTER DEDUCTING PLANKING THICKNESS. ADD 1/8" TO COAKING LAND; EXTEND CORNERPOSTS 1/8" BEYOND PLY EDGE. AFTER DEDUCTING PLANKING THICKNESS. DECK BEVEL IS FORWARD; NO. ADDITION NECESSARY.
5. ALL FRAMES TO BE FORWARD OF STATION. ALL GIBBER POSTS AFT OF STATION; - Nos 4/5 & TR. EXCEPTED. No. 4-5 POSTS END OF FRAME - 3/8" END OF STATION. TRANSOM POSTS FLESH WITH END OF GIBBER.

**BOAT SPORT Special**  
 (A) B THREE POINT RACING HYDRO MOTORS TO 80 C.I. MAX.  
 - PREPARED IN CONJUNCTION WITH BOATSPORT MAGAZINE -

Design by  
**E. G. McGrea**  
 NORTH HATLEY, QUEBEC, CANADA

SHEET 2 of 3 LINES & OFFSETS  
 JANUARY 4, 1954



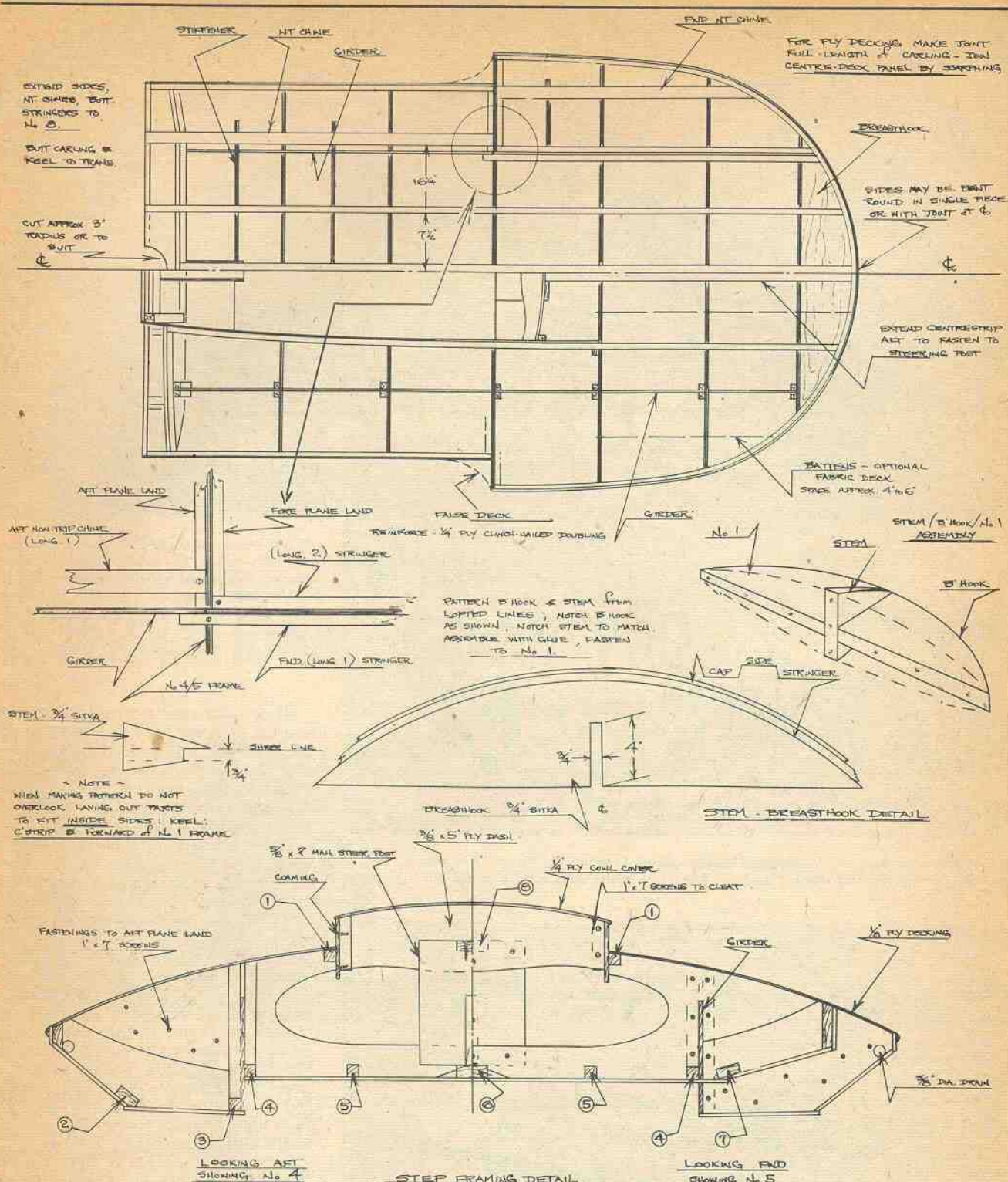
**BOAT SPORT Special**

(A) B' THREE POINT RADIAL HYDRO MOTORS TO 20 C.T. MAX.  
 - PROVIDED IN CONSTRUCTION WITH BOATSPORT MAGAZINE -

Design by  
**E. G. McCrea**  
 NORTH HATLEY, QUEBEC, CANADA

**SHEET 3 of 3 CONSTRUCTION**  
 JANUARY 4, 1954





**STRINGER SPECIFICATION** Indicated by Numbers — No. 4/5 Detail Drawing

Name	No.	Specification	Fastening
Carling	1	3/4" x 3/4" Sitka Spruce	1-1 1/2" x 7 Screw per Frame
Fwd HT Chine	2	3/8" x 1 1/2" Sitka Spruce	1-1 1/2" x 7
Fwd Stringer	3	3/4" x 3/4" Sitka	1-1 1/2" x 7
Fwd Stringer	4	3/4" x 3/4" Sitka	1-1 1/2" x 7
Full-Length Stringer	5	3/4" x 3/4" Sitka	1-1 1/2" x 7 per Frame
Keel	6	3/4" x 2" Sitka	1-1 1/2" x 7
Aft Non-Trip Chine	7	3/8" x 1 1/2" Sitka	1-1 1/2" x 7
Centerstrip	8	3/8" x 2" Sitka	1-1 1/2" x 7
Side Stringers	—	1/2" Thick Sitka	Aft—2-1 1/2" x 7 Fwd—1-1 1/2" x 7
Side Caps	—	1/4" thick Mahog. or Ply	3/4" x 7 Staggered, Spaced 2 1/2"

Use phenolic glue in addition to screws for fastening stringers. All notches should be precisely cut for snug fits.

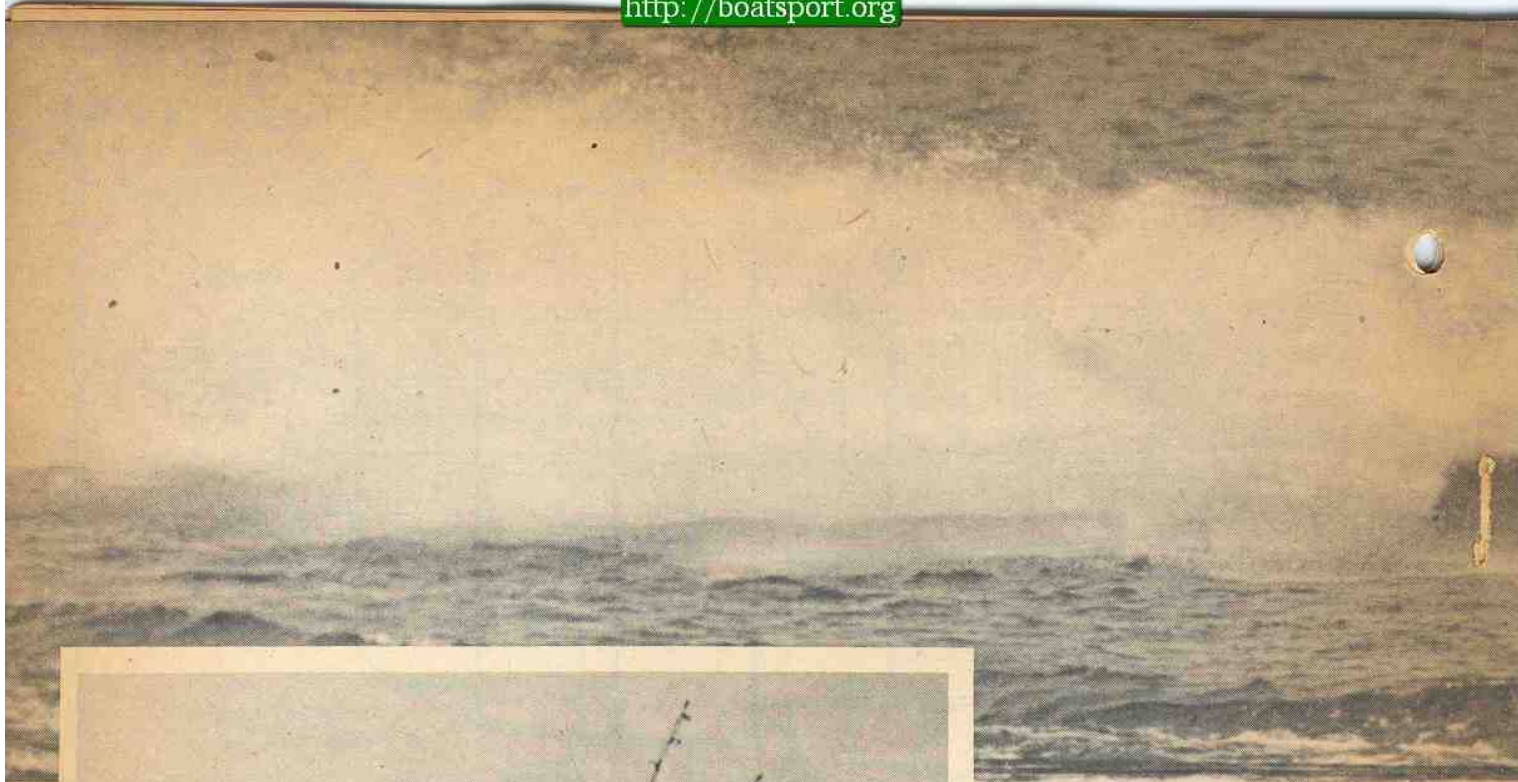
**FRAMING SPECIFICATION**

All frames to be from 3/8" plywood fore and aft plane lands fitted to Nos. 4/5 to be from 3/4" Sitka. Minimum width 2 1/2". Lightening holes to be cut to suit. Minimum web to be—2" width on bottom. 2" width at sides. 1 1/2" width at girder and on deck.  
Transom—trans. filler—cleat and bottom extension doubler to be from 1 1/2" ply. Assembled with glue as well as specified fastenings. All girder posts to be 3/4" x 3/4" Sitka—glued and thru-bolted—3/16" carriage bolts.

**PLANKING SPECIFICATION**

**BOTTOM** — 3/4" mahogany, birch or 'Macoba' red cherry. Do not use fir plywood.  
**DECKING** — 1/8" mahogany or fir; aircraft fabric may optionally be used fwd of No. 3. In this case insert 1/2" x 1/2" Sitka stringers as indicated by broken lines (deck plan).  
**FASTENINGS** — To be 3/4" x 7 screws (anchor-fast nails may be used) spacing—2" centers on all edges and water joints. May be increased to 4" centres in frames and intermediate stringers.

Use extreme care in fastening to frames, pilot-drill in every case. Use phenolic glue in every fabrication and assembly. Specify marine-grade phenol bonded plywood.



(Above) Winner of the \$7,500 Grand Prix trophy was Mario Verga, 43-year-old Italian silk manufacturer, who scored a fourth and two firsts in his Alfa Romeo powered "Laura 11" (Publifoto).



Start of the third heat of the Orange Bowl Regatta's International Grand Prix events. Left to right: Ray Gassner, St. Petersburg, Fla.; D. C. Kiesacker, Miami; Ezio Selva and Mario Verga, Italy.



Fastest of three Italian entries was "Arno XI," piloted by Achille Castoldi, 49-year-old stocking manufacturer. He won first heat at 77.187 mph, but later damaged left sponson and hatch cover.

MIAMI AND FORT LAUDERDALE had the best set of races for a long time due to the spark set by the Italian "invasion" of American territory. There were also a half dozen Canadians down here, too—among them being Art Hatch, who drives a fast 266 c.i. and drives it hard.

Three Italians, plus their retinue of mechanics, were on hand. The three drivers were Achille Castoldi of Milan, driving "Arno XI" powered with a Ferrari 274.5 c.i. engine—tandem four cylinders; Ezio Selva in "Moschettiere" with a four-cylinder BPM of 195.2 c.i. (Selva worked right in the BPM shop and practically built this engine himself); and Mario Verga with a new boat, "Laura II," which had the same engine set-up that I saw him run in Milan last May, a 91 c.i. Alfa Romeo with two-stage supercharger. This boat earlier had attained a straightaway record of 140.7 mph. Verga's "Laura II" and Castoldi's hull were built by Timossi.

The Italians arrived in New York on December 17th and were met by Charlie Kittel of Miami, representing the Orange Bowl Committee. The Italian Naval Attache and Italian Consul were among others welcoming the drivers. Upon arrival in Miami, they were put up at the Venetian Hotel on the Venetian Causeway—to create a home atmosphere—and the boats were taken out to Louis Nuta's boatyard. "Luigi," as they called Louis, had to resurrect all the Italian he used to know and had almost forgotten. He squired the Italians around during their entire stay here with his Greyhound bus which he uses as a boat tender for his son, Louis, Jr., who races



# INTERNATIONAL GRAND PRIX-

# FLORIDA, 1954

By Rad Welles



With a one-three-four defense in the Grand Prix, the Italian pilots prepare to fly home from New York International Airport. Left to right: Justin Cork of the Toronto, Canada, Hydroplane Club; Mario Verga; Erminie Sawyer; Ezio Selva; Harold Hersey, Editor of BOAT SPORT; Paul Sawyer, famous racer and Achille Castoldi. (Exclusive photo by Enell, Inc.).

"Little Stinker" in the E racing runabouts. Sometimes he loaned them his Cadillac convertible so they could go off on tours themselves. On those expeditions Castoldi, who speaks the most English, did the chauffeuring.

After quite a discussion on the fuel being furnished (which they had arranged for before leaving Italy) and concern over the late arrival of their spare parts boxes from New York, they got in the water Christmas Day at Pelican Harbor Yacht Club. They had almost a race audience and did they show that audience something! First one and then the other until you couldn't tell which was the faster. At any rate they *all* looked fast. Some of the on-looking Americans boat drivers who had been making big bets hedged a little after this exhibition.

On Sunday, December 27th, came the big race, the International Grand Prix

for the Baker Paladium Trophy, valued at \$7,500. This race was to be run under U.I.M. (Union International Motonautica) rules for the 800 kg. (1,763 pounds) class. However, we had a problem in the timing. Under these rules a driver can cross the line early, up to five seconds, and get a time penalty: twenty seconds for each second over early, and then the race is won on elapsed time. The man who comes in first might not be the winner. Knowing this would not appeal to an American audience and facing the complex timing difficulties—we had seven boats in the race—we asked the Italians at the drivers' meeting if they'd use our type start and they graciously agreed. So Canadians, Italians and Americans all agreed—at least for once.

First heat: all boats roared over the line well bunched with Castoldi a bit ahead and on the inside. Selva was well

up along with Art Hatch of Canada. Then came Verga acting as file closer and watching his two teammates carefully. Along with him came Ray Gassner, of St. Petersburg, Florida, in "Sunshine Baby" and D. C. Kiesacker, Miami, driving Bob Ikerd's "Smoke." Joe Wolfe of Reading, Pennsylvania, in "Sagana" (the defending boat belonging to Frank Foulke) wasn't doing his usual best.

Castoldi stayed in the lead, roaring down the straightaway and not losing much on the corners. Art Hatch piled after him. "Sagana" wasn't doing so well. "Sunshine Baby" and "Smoke," however, were right in there fighting. Result, first heat, in order, Castoldi, Hatch, Selva, Verga and Gassner.

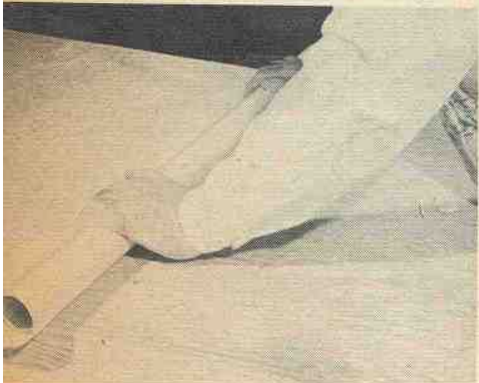
Second heat: Castoldi pressed and was over the line before the gun and so was disqualified. Verga in team fashion stepped out in front and came in first. Hatch went (Continued on Page 25)

# "GLASS BOTTOM BOATS"

PHOTOS REPRODUCED BY COURTESY OF GLASS PLASTIC SUPPLY CO.



Be sure to fill all seams, holes and gouges with the non-oily seam filler. There's no need to fill hair-cracks.



Cut the glass cloth to lengths for the surfaces to be covered and roll on mailing tubes, or on old broomsticks.

AN OLD PROVERB tells us that people who live in glass houses shouldn't throw stones—but people who ride in "glass bottom" boats can forget such warnings. They also can forget the yearly chores of caulking, painting and soaking-up before launching.

The glass on the bottoms of the boats we are talking about is laminated fiber glass cloth, the "new skin" that has grown on thousands of wooden hulls in the past few years, resulting in a tough, shock-resisting, waterproof and non-rotting protective covering.

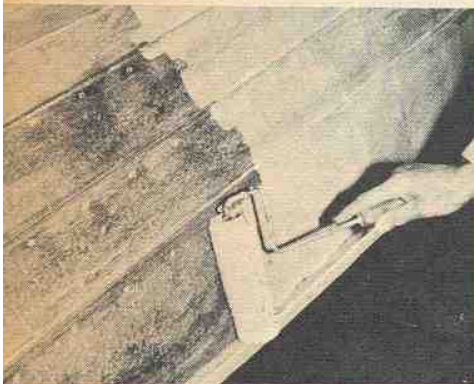
Fiber glass cloth is a fabric woven from glass yarn. It looks like canvas in some weaves, in others it has more of a tight mesh-like appearance. Introduced only a few years ago as a protective hull cover, the new material met with skepticism at first; but last year the demand for this type of plastic hull-skin reached an all-time high, which is already being challenged by 1954 figures.

The same material is used by manufacturers to mold glass-plastic boats on the production line, and it is a simplified

version of their process that you use when you refinish your hull at home. The fact that you can do it yourself in a few hours is one big reason for the present popularity of these "glass bottom" boats.

There are various reasons for giving your boat a glass-plastic skin. You may want to waterproof it because of minor leaks, or you may just want to make maintenance easier by eliminating the need for yearly caulking, painting and soaking up. In such cases, a one-ply lamination will be sufficient for your needs. On the other hand, your boat may be old and leaking badly, with some apparent weakening of its structural members. Here, two laminations of fiber glass cloth should be applied, for this material can add greatly to structural strength and stiffness. In extreme cases, a three-ply application may be required; but when you finish you will have what amounts to an almost completely new hull surrounding the old one.

Prices differ slightly for the glass cloth, resin and other incidentals necessary to refinish (Continued on Page 32)



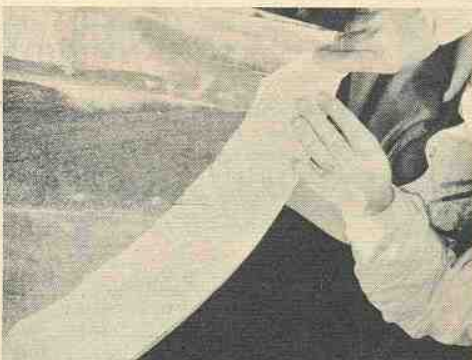
(Below) Forming cloth overlap at stem. For maximum strength, such overlaps should never be less than two inches.

Two coats of resin must be applied before the glass cloth can be laid, as wood absorbs most of the prime coat.



Immediately after the second, or "wet" coat of resin has been applied, a narrow length of cloth is neatly rolled on.

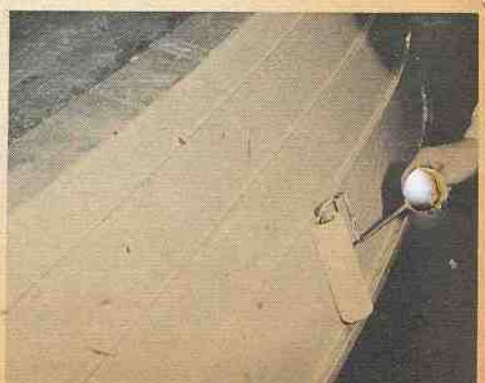
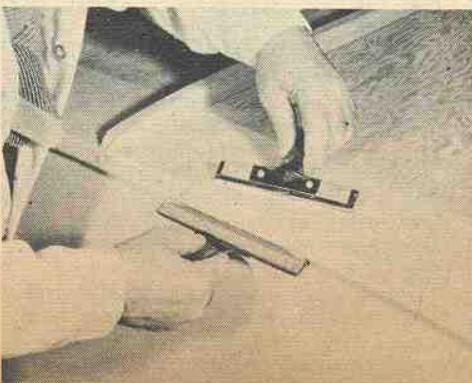
(Below) Rolling cloth onto wet coat of Super Resin on transom. Resin is sufficiently adhesive to "grip" the cloth.



(Below) Ordinary dime-store squeegees are handy fiber glass application tools.

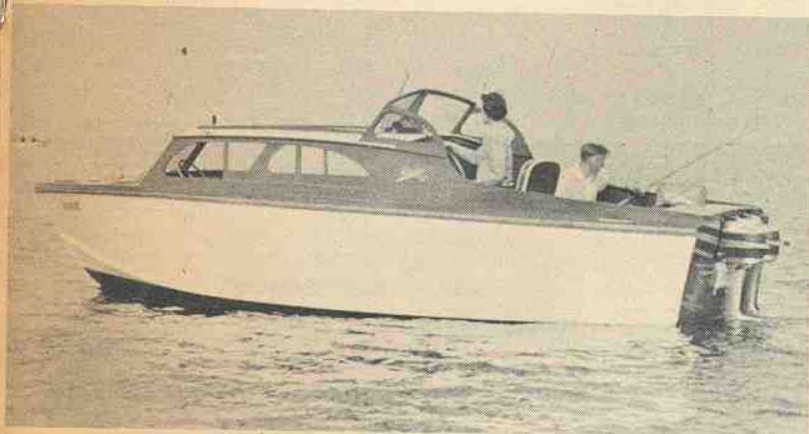


(Below) After cloth has been smoothed on it's time to roll on another coat of resin.

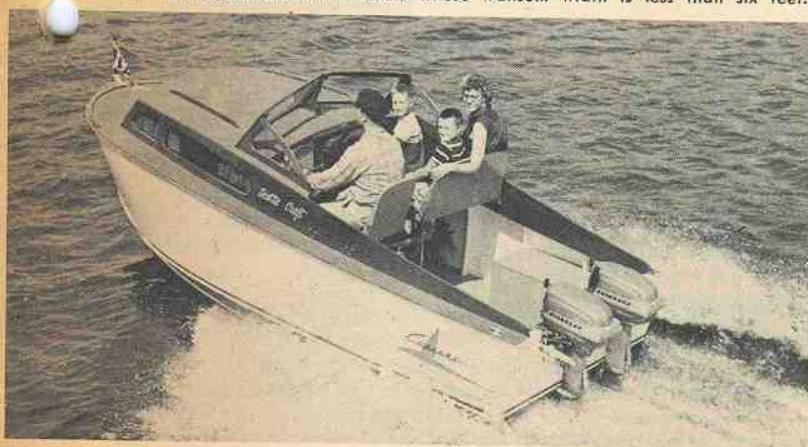




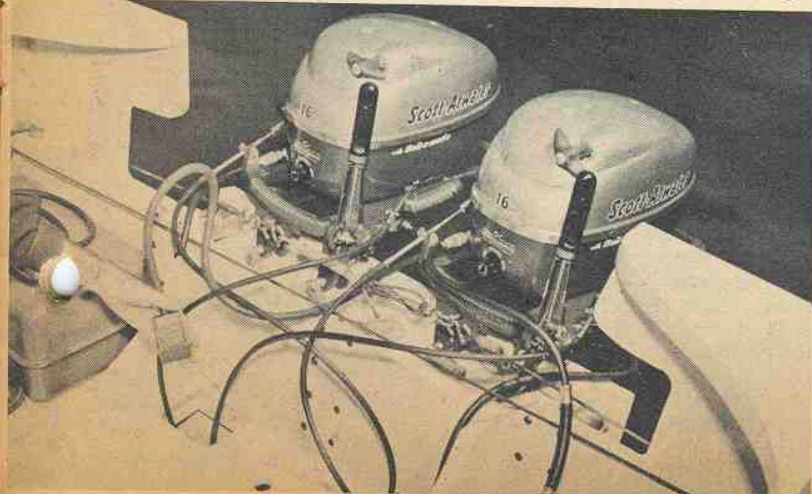
A 16' Nova Scotia 500 convertible (Sportsman's Supply & Service, Miami) with twin Johnson Sea-Horse 25's—electric starters optional. Designed by Richard Cole, boat is molded plywood, has "walkthrough" forward seat.



This 21' Inlander outboard cruiser (Bob Jacobsen, Seattle, Wash.) has a pair of Mercury Mark 20's for total of 32 h.p. Twin motor installation is not recommended for boats whose transom width is less than six feet.



(Above) Family cruises in 18' Scottie Craft (International Shipbuilding Corp., Miami) with a dual 15 h.p. Evinrude Super Fastwin installation. (Below) Twin 16 h.p. Scott-Atwater "Bail-A-Matic" set-up. Note remote controls and automatic bailer strainers which can be dropped in bilge.



# TWIN MOTOR INSTALLATION

THERE ARE MANY points to take into consideration on the question of hanging two motors on your transom, not the least of which is price. For instance, a 25 h.p. outboard will list just over \$400 (without electric starter), while two 15 h.p. motors, giving a total of only 5 h.p. extra, will list more than \$650, which seems quite a bit to pay for the additional power.

On the other hand, two motors offer more security in case trouble arises when you are far out from shore. You always have one motor to get back on. Also, the two motors may be used on different boats, and here is probably where a great deal of the twin appeal lies. Many people who have cruisers (on which most such installations appear) also have runabouts or utilities for fishing, which may not take a full 25 job. With two 10's, 15's or 16's, they can have their cruising cake and eat their fish, too.

Sometimes an outboard cruiser is jointly owned—many kit cruisers are put together by neighbors—and the partners usually each have a smaller boat of their own plus a motor. When the cruiser is taken out and full power is wanted, both motors are mounted and away they go.

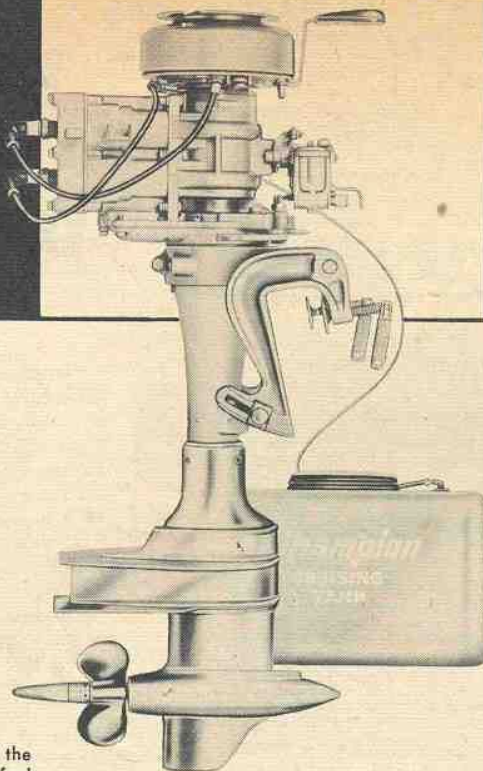
In the case of twin 25 h.p. motors, of course, there can be no similar comparison, as there is no 50 h.p.-or-over unit now being made, the nearest being the new 40 h.p. outboard introduced at the Boat Shows. But, again, when you figure about \$850 for two 25's (without electric starter) you might almost be talking about an inboard.

Of course, the first thing you should find out before even thinking about twin motors is whether your boat is suitable to such a power plant. Is it rated to handle the horsepower of the motors? Is the transom wide enough for installation? A six-foot transom width on a cruiser is considered by many authorities to be the practical minimum for such a set-up. Is the cut-away in the transom designed for two motors (or is the bracket mounting wide enough) to allow the correct clearance for operation? After all, you may have twin motors but you don't want them to be Siamese twins. Twenty inches between the center of each motor is said

(Turn to Page 32)

# CHAMPION

## TO CHALLENGE STOCK RACING FIELD



The Champion Motor, Model 4M-HR, like all of the Champion Hot Rod models, has a separate fuel tank. All three Champion models have the same lower unit dimensions with 14:19 gear ratio.

FOR 1954, the Champion Motors Company of Minneapolis, Minnesota, offers a three-motor line of stock racing outboards. From their design the larger two motors may be well adapted to conversion to alcohol burning jobs for competition against the strictly-designed-for-outboard-racing equipment as well as for strictly stock competition. Champion's 9.66 c.i. Class JU Hot Rod is already well known on the N.O.A. circuits. A.P.B.A. restricts competition in Class JU to motors of 7.5 c.i., thus putting the Champion Model 4M Hot Rod 2.16 c.i. over the maximum limits for JU.

Champion JU owners who have had to restrict their competition heretofore to N.O.A. competition or enter AU A.P.B.A. events at a tremendous handicap, are indeed happy to know that at the option of regatta sponsors Class AU may now, at the option of the local regatta committee, be subdivided into two classes: AU-1 for motors of 7.5 to 12.5 c.i. and AU-2 for eggbeaters of the 12.5 to 15 c.i. displacement category. This means that present owners and future owners of Champion 9.66 c.i. Model Hot Rods should find competition under both major sanctioning groups. In A.P.B.A. AU-1 events the Champions will tangle with the Martin "60" (an 11 c.i. job) which will put the 4M-HR racers into action at a 1.34 c.i. disadvantage. However, in tests on hydroplanes the 4M-HR has run in the neighborhood of 37 to 38 mph on gasoline and oil, which is a better than fair performance.

At first glance the Champion JU, AU and BU Hot Rods all look good.

Although the new Hot Rods are at this writing untried in competition, we feel that BOAT SPORT readers would particularly like a description of Champion's new 19.94 c.i. Class BU Hot Rod which carries the Champion model number 6M-HR.

The most striking report of the new BU Champion is that under dynamometer tests, its horsepower curve was still on the increase at 7000 rpm, whereas some motors have already levelled off at this point—in fact some have started to show a horsepower drop-off long before the 7000 rpm mark is reached.

Some of the design features that caught our eye in going over the motor were the following: First, we noted with interest that the completely pressure cooled cylinder and cylinder head was designed in two separate units, making the problem of modification for competition against strictly racing equipment in this respect on a par with the Johnson Class B SR models.

This feature makes the reduction in combustion chamber ccs and the resultant increase in compression ratio a simple job. It also simplifies grinding, rebor-ing or honing of cylinder walls.

All three of the Champions are extremely lightweight, ranging from 36 pounds for the JU, through 44 pounds for the AU and 46 pounds for the BU. The AU and BU include heavy ball bearings both top and bottom of the

crankcase with the center of the crankshaft mounted in needles. The JU (AU-1) unfortunately has bronze bushed mains while the Martin "60" AU-1 has ball and needle mains. The case setup of the Champion AU and BU, however, certainly could not be improved upon. Both the wrist pin and crank throw ends of the light weight forged steel rods are set up with Torrington needle bearings.

The very cleanly contoured lower unit gear housing which has a minimum breadth at its widest point of 2-1/16" is set up on two ball bearings. The pinion gear shaft, however, is supported by bronze bearings top and bottom and in modified or strictly racing competition, it is probable that new owners will replace the bronze bearings with balls or rollers. The lower unit which is fitted with a 14:19 gear ratio (one tooth higher geared than the Johnson SRs) and a left hand rotating propeller should offer good turning characteristics and excellent acceleration out of the corners as well as more power in the corners where a motor tends to lug.

Positive fuel distribution is made possible by the dual internal rotary valves integral with the crankshaft. This eliminates springs, cams or reeds which are used in the other stock utility motors.

The Tillotson carburetor is a type MD with a 13/16" venturi. This should be quite adequate for stock racing with gasoline fuels. If the motors are modified for alcohol burning, it is our feeling the carburetor venturi and the rotor ports are all too small to handle a large enough charge of alcohol fuel to make the Hot Rod run up with the fast SR drivers.

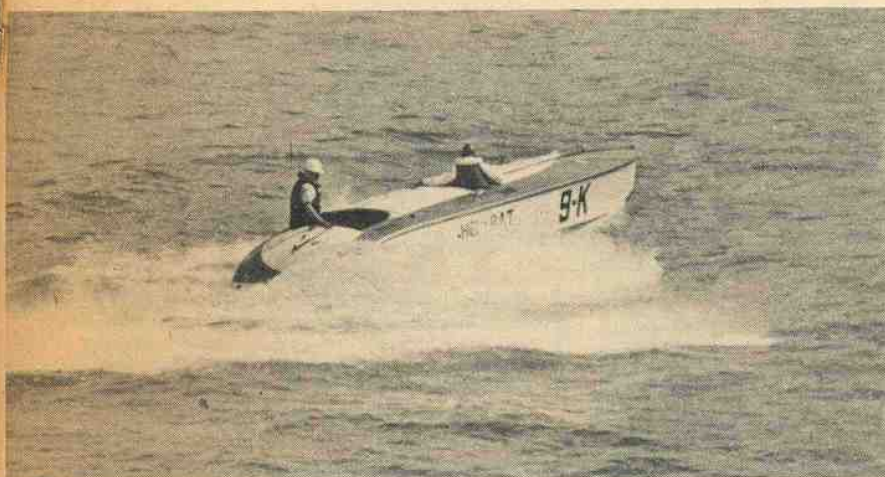
For alcohol burning competition, however, the crank ports can readily be enlarged and a larger throated carburetor substituted to pack in a greater charge of fuel.

Outboard racing drivers over a long period of experience have learned that the intake ports on the two cycle racing jobs should be approximately one-quarter of the length of the full stroke. With a 2-1/32" stroke and 9/16" intake ports, the Champion would seem to fit this requirement well. Another feature discovered from long experimentation was that the exhaust ports should open a minimum of 3/16" earlier than the intake port is uncovered on an approximately 2" stroke engine to give the required pressure drop. The Champion offers a 1/4" pressure drop which with effective 9/16" exhaust ports (5/8" but inserts are opened to 9/16" only) should provide excellent scavenging.

In general we would consider the entire line of three Champion Hot Rods to be very well engineered and for the newcomer to the sport planning to enter any of these three classes, the Champion will give a far better than even chance for successful competition.

The list price of the BU is \$397.50 f.o.b. factory. The 14.99 c.i. Class AU sells for \$395 and the 9.66 c.i. Hot Rod lists at \$295. (End)

(Right) Lou Eppel shown testing his Class A outboard before the 1935 Inter-collegiate. (Photo by F. Victor Williams). (Below) Lou and Roy Foyle in their unlimited inboard runabout 'Hel Pat' during Around Manhattan race in 1952. They won 2nd place with 600 h.p. Packard engine in Ventnor hull. (Photo by Morris Rosenfeld).



# TORQUE TALK

By Lou Eppel

*It is a pleasure to welcome Lou Eppel to the pages of BOAT SPORT. He started racing in 1928 with a Baby Whale hull and an Evinrude Class C motor. He has competed in all classes of racing outboards. From 1934 to 1936 he was a member of Rutgers University Intercollegiate Outboard team. In 1940 he switched to inboards, racing 135s. After the War he went back to outboards for two years and then switched back to inboards with a 91 hydro in 1946. Raced this class in U.S. and Canada, topping it off with a win in the 135-91 combined class in the Harwood Trophy race around Manhattan. Worked two years with Mel Crook building a Gold Cupper which proved to be not so hot. He took over the driving of Joe Van Blerck's 7-litre job in 1950 when Joe retired because of illness. He owned the unlimited inboard runabout "Hel-Pat" which finished second in the 1952 Around Manhattan race. Lou has been a member of the A.P.B.A. Council since 1943; has served as Chairman of the Outboard Racing Commission and as Chairman of the Inboard Racing Commission. He is now a member of the A.P.B.A. Stock Outboard Racing Commission and Inboard Racing Commission, and for the last three years has been President of the American Inboard Association.*

EVER SINCE Torque Talk made its last appearance 'way back in October 1947, we have been thinking about the need for a publication which would cater to those of us who find our relaxation in the pursuit of speed on the water. With the birth of *Boat Sport* the boat racing enthusiasts have at long last gotten what they sought. From time to time, we have discussed various ideas for a column with Harold Hersey, the editor. However, it wasn't until we suggested taking Torque Talk out of retirement that he gave us the green light. It is our hope that we shall be able to bring to you as much of the inside "goings-on" in the sport as possible, covering the activities of all categories from the mighty fleet of the Stock Outboards to

the capricious antics of the Unlimited and Gold Cup hydros.

Checking back in the files, we find that during the summer of 1947 there was tremendous interest in having a purely international race, with our Italian friends anxious and willing to come to these shores to show us how to win boat races. It took almost seven years to get them over here for the Miami Orange Bowl Regatta and the Grand Prix race . . . and what happened? . . . Achille Castoldi, Ezio Selva and Mario Verga with 800 kilogram class boats took on the best of our 266s and came out with a first, third and fourth. What on first glance looks to be a sound trouncing of the American outfits by the three Italian invaders becomes, at the

end of some careful scrutiny, a less impressive win . . . all of the powerplants in the Italian hulls put out at least 75% more horsepower than any of our limited boats and not qualifying in any way under the A.P.B.A. rules . . . the similarity between the American craft and the Italian jobs ended when it was discovered that both country's entries were racing boats . . . but certainly not of the same class.

That a lot was learned from our Italian friends cannot be denied, for there is much talk of developing for our own classes the gearboxes or transmissions which gave the 800 kilo boys such an edge in cornering and acceleration . . . though Ray Gassner in his 266, "Sunshine Baby" (Continued on Page 26)



## SPILLS AND THRILLS

(Above) Hubert Entrop's only trouble was his skidding into a hole on the turn. Though he is assuming downward position here, he is actually on his way up and out. He swam back to his boat, started his motor and came in third. He is from Seattle. The flip occurred at Moses Lake, Wash.

PHOTOS BY CARVER AND SWANSON



(Above) If the B Stock hydros resort to jostling in the turns, someone is apt to come back down side up, as Bob Wall of Longview, Washington, can testify. This mishap occurred at Twin Lakes, Wenatchee, Washington.

(Below) A typical B Stock runabout mixup. This time it's Ray McKeen gulping water at the Devil's Lake Regionals, Delake, Oregon. Note that it doesn't take much of a wake to make a pretty big splash sometimes.





# INTERNATIONAL GRAND PRIX

(Continued from Page 19)

out. "Sunshine Baby" was second, Selva and Kiesacker following.

Third heat: Verga first again. Selva in there but Castoldi out because he'd lost his after cowling and was having difficulty. Net race result: Verga, first; Gassner, second; with the Baker Trophy going to Italy and the Boat Club MILA of Como.

A big dinner and reception Sunday evening was given at the Rod and Reel Club, Miami Beach. Trophies were given out; the Orange Bowl Queen and all her court princesses were there as well as several hundred other drivers, wives and mechanics.

At Fort Lauderdale, on January 3, the second scheduled event, Verga had circulating water trouble. First, he couldn't get suction and then when he did, it came in on a hot engine. Selva was having trouble but ran the first heat for several laps before dropping out. Kiesacker, again driving Bob Ikerd's "Smoke" (Bob was badly burned in a cruiser explosion two months ago) got over the line first with Castoldi right near by. Kiesacker got around the turn first with "Arno" not far behind. Then Castoldi poured on the coal and almost caught him before the turn . . . but not quite, and then up the stretch again with Castoldi breathing down Kiesacker's neck. This went on for eight laps and they finished up just about where they started with a difference on time of *two seconds* in ten miles and an average speed of over 74 miles an hour.

The second heat was disheartening for the Italians and Canadians as well. Verga and Selva were out. Art Hatch's co-driver had flipped his fast 266 on the south turn and only two boats came out for the final heat. Kiesacker and Castoldi (the latter is certainly a princely sportsman) came up for the starting line right together. They were a little ahead of time and Kiesacker slowed down in order not to beat the gun . . . both were trying hard to save a split second. Then Castoldi slowed, too much, and his engine died and these Italian boats can't re-start themselves. So Kiesacker went over the line alone and made the eight laps within one mile an hour as fast as the first eight laps. Kiesacker also took two first in the 266 class and Louis Nuta, Jr., after getting third in the International Race, took a pair of heats in the E Racing Runabouts.

Louis Nuta, Jr., took the Italian sportsmen from Lauderdale back to Miami in his Greyhound bus and they were rather morose. But I saw Louis a few days later at the Annual Dinner of Pelican Harbor Yacht Club and he had just bade the group goodbye and reported everything is lovely. Their American trip was wonderful and we must come over there and they are coming back here again—Verga perhaps with a Gold Cup boat. (End).



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## AROUND THE BUOYS (Continued from Page 3)

about two inches to give an added angle of attack and it works, but if you try it, be sure to get those clamps down tight again.

Dick O'Dea, of Paterson, N. J., spotted by BOAT SPORT in its December, 1952 issue, as being a promising newcomer with a real future, has made good this prophecy by taking the nation's 1953 high point stock outboard competition title with a grand total of 17,961 points and the right to carry U. S. 502 as his professional boat number on his hydro during 1954. Point tabulations for all sanctioned regattas from January 1st to

December 31st show that O'Dea racked up 8,398 points in Stock runabouts and 9,563 points in Stock hydros for a grand total of 17,961 points which netted him the coveted E. C. Kiekhaefer Trophy, awarded each year to the Stock driver who accumulates the most points in both runabout and hydros.

Closest to O'Dea in total points were Gerald Moshier, of Phoenix, N. Y. with 12,136 points and Ronald Zuback, of Morgan, N. J. with 11,876. O'Dea cancelled any chance of being out-pointed by Moshier and Zuback when he travelled to the Orange Bowl Regatta to place first and second in two Stock hydro events.

The Los Angeles Speedboat Association has reason to be proud of a membership that includes some of the fastest running alky burning equipment in the country. Orlando Torigiani of Bakersfield, Calif., is the pride of Tommy Ingalls, A racing hydro chairman for the group, for Torigiani copped the N.O.A. national championship in straight heats and then went on to repeat his performance by driving his *Cotton Kid* to the A.P.B.A. Class A crown as well.

Just to prove that no areas are without some form of outboard activity these days, Terry Murray of Ketchikan, Alaska, reports a red hot interest in outboard racing in his locale. Water conditions are pretty rugged and hydros are definitely out. Two classes are run—above and below 35 c.i., and events are held rain or shine, calm or blow. The Ketchikan Bay water can really whip up a chop. Murray who drives a 12-foot fibreglass Wizard hull, powered by a B Merc, says the driftwood problem is also very bothersome. In a 20-mile marathon on Labor Day last year, he picked up a kitchen chair in his lower unit and the rescue boat had to call on a carpenter to get Terry free.

The Maumee River Racing Association of Toledo, Ohio is an up and coming new group. At their first sponsorship of the Swan Boat Club races near Monroe, Michigan, they had a turnout of 91 boats for the stock events. 32 of the entrants were Maumee Boat Club members. When the spray had subsided, of 23 trophies awarded, M.B.C. drivers had garnered 12. Not a bad average.

Elmo Belluomini of Buttonwillow, Calif., was laughed at by some of the West Coast skeptics when he flipped trying for the Class B hydro mark. Elmo has the last laugh now for he gave it another try and now is the new A.P.B.A. SR hydro holder. He also topped the Los Angeles Speedboat Ass'n. in Class B high points for 1953 although Arnie Adams gave him a plenty close battle. (End).

## TORQUE TALK

(Continued from Page 23)

did give a terrific account of himself and equipment against great horsepower odds. . . . From all indications it looks as if Frank Foulke and Merlyn Culver intend to turn their talents toward setting up, American style, a pair of 800 kilo jobs to take over to Europe next summer to race on more or less even terms against the Italian trio; this should make for interesting doings.

Since the return from extended Naval duty of Ev Morris of the "New York Herald-Tribune," the possible return of Intercollegiate and Interscholastic outboard racing seems much brighter. . . . In pre-World War II days, the "Intercollegiates" were, without doubt, the greatest amateur races staged, with such still shining stars as Paul Sawyer, Sammy Crooks, Bobby Rowland, and many others getting their early fame in these classics. . . . Now that the Stock Outboards have such a following and at a cost which makes it possible for many more students in both college and prep school circles to own outfits, it seems a natural to put this type of competition back on the racing calendar. . . . I'll have more information to pass along as organizational plans progress.

Despite the complete stranglehold Stan Sayres and his Seattle based fleet of "Slo-mo-shuns" seem to have on the Gold Cup, Detroit sportsmen are again readying an invasion fleet to try to get the chalice back to the Eastern half of the U. S. . . . At least three new jobs are reported a-building with several of last year's unsuccessful challengers getting their bugs worked out. . . . Lee Schoenith's twin-prop job and a new Arena-designed-and-built twin Allison twin-screw creation should be most interesting to see. . . . And just to make Detroit's bid for the Gold Cup just a bit more difficult, there is news of a California craft which is being readied in the Sayres' style, with exhaustive testing and trials before being turned loose, under the guidance of some of the top racing hands on the West Coast . . . perchance the Seattle lease on the Cup is running out.

Seems to us that the Stock Outboard boys are really more conscious of the need for safety in racing than all of their older inboard and alcohol burning outboard brothers. . . . Restricting their field to twelve entries per heat except in Divisional and National Championship events makes sense (and a lot more work for the officials in setting up eliminations). . . . Such sound practices plus the "keep the stock" approach will guarantee their dominance in numbers in the sport.

The announced retirement from racing of Ben Jankowski of Glen Head, N. Y. is a tough blow to the pro-outboard ranks. . . . With their fading numbers the "glamor boys" of outboard racing can ill afford to lose such drivers. . . . Unfortunately there seems to be no real new blood entering the pro ranks



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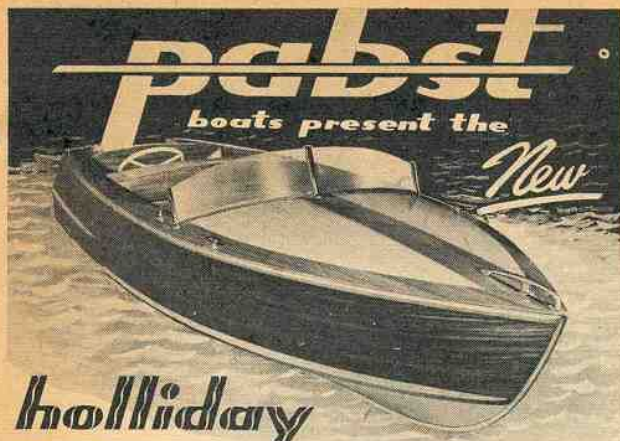
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to take the places of the Paul Wearlys, and others who retire. . . . After the Creechs, Tenneys, Wigets and Maypoles and the limited few who are the backbone of KR's, SR's, PR's and 4-60's, hang up their helmets, what happens? . . . Right now, with improved and approved replacement parts readily available, as well as complete powerplants, the interest, which was so great in the lean days immediately after the end of the War when there were no motors or parts available, seems to be petering out. . . . We hope that this does not indicate the beginning of the end of a wonderful era of outboard racing. (End).

## THE BOAT SPORT—McCRAE SPECIAL

(Continued from Page 13)

Step 5: Fit the frames making certain that their notches bed properly on the girder. Fasten with phenolic glue and No. 7-1" screws. Fasten first frame No. 7 and then move to No. 2. Next fit the No. 1 stem assembly and then the transom. Fasten the transom through the posts to the transom frames with No. 7 1½" screws. Be sure that the girder butts inside the transom frame but does not butt against the plywood transom.

Step 6: Stiffener frames for the after frame are inserted next. Then fit the keel, side stringers and the remaining

BOAT SPORT

bottom stringers, fastening them to the stiffeners and also the main frames. Fasten the steering post support knee through the keel as shown in the drawings.

Step 7: Fit the No. 8 frames and the support knees plus the ½" ply doubler. Now it is important to be sure that the straightline run of the bottom lines is continued beyond the transom; thus be sure to fit the entire assembly carefully so that it is sturdy but do it without forcing the stringers out of shape. Fairing (producing a smooth contouring) calls for painstaking care and frequent checking with an accurate straight edge. On any curved surfaces, be sure that the radii are smooth so that the planking will seat on all bearings evenly.

Step 8: Make patterns of the planking panels from heavy paper full scale. First plank the fore and aft non trips, leaving the inner edge free of fasteners. Clamp it temporarily with a full length clamping block. When the next planking lap is laid over it, you will fasten through both planks. Tunnel or sponson planes may be planked next. In fitting the tunnel panel, leave a slight extra width forward for final fitting due to the slight V forward of No. 2 frame. Fasten about every 4", drill pilot holes and counter sink in all cases and fill with plastic wood.

Step 9: Mahogany ply should be used for the bottom although you may use mahogany faced fir ply. Old English Oil



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cut with turpentine will serve as a good primer. After sanding, prime again with uncut primer, then varnish, re-sand, varnish until you have a minimum of at least five coats of full varnish.

Step 10: Remove the hull from the trestles, place it upright on level supports. Once the hull is again levelled and secured so it won't go out of shape, fit coamings and carlings, center strip and fore deck battens for a fabric deck. Extend the center strip aft to the steering post which is fitted next. Fasten the steering post to the No. 4 frame, and to the knee which you have already placed. Next fit the dash, fastening it to the small cleats at each coaming and to the center post, making its top edge flush with the coaming at each side and giving it the same curve as the No. 3 (See Over)

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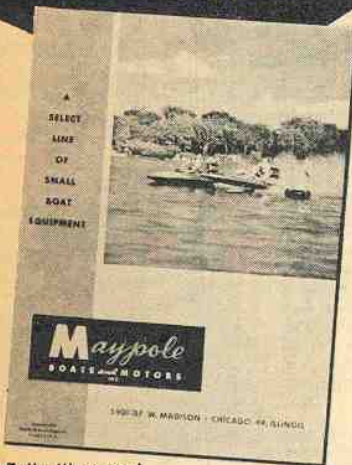
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(Continued from Preceding Page)

deck frame. Coaming may be designed to carry the cowl cover to any angle you prefer. Fit small  $\frac{3}{4}$ " square cleats along the cowl cover angle on the coamings to give ample support for the cowl fastenings.

Step 11: Fair the decking framework carefully as you did the bottom and lay decking. If you are using plywood throughout, it is preferable to make the joint along the full length of the carling, leaving the carling joint forward of No. 4 frame free of fastenings. When the glue is dry, scarf this edge to allow the center deck panel to lay over. This is difficult but it can be done by using phenolic glue and a clamping block over the completed joint until the glue is hard. If you use a fabric deck, which will be lighter, the ply afterdeck may be ended at either No. 4 or No. 3 stations.

Step 12: Locate the fin approximately 36" from the No. 8 station.

From here on it's up to you. You must realize that it will take extensive testing with any boat to determine the proper motor height, motor angle, propeller choice and even fin location before peak speed and handling performance is attained. No one can tell you these things because are dependent upon your weight, riding style, etc. They may only be determined through methodical testing, keeping a record of each test run. And remember, in order to tell what results you obtained from your changes, make only *one* alteration in your set of testing characteristics at a time.

(Editor's Note: BOAT SPORT made arrangements with E. G. McCrae, Naval Architect, to design this competition three-point hydroplane, which we consider incorporates not only high speed characteristics and good riding qualities, but also is designed with an eye to ease of construction.)

## IT'S NEWS

Tomahawk Boat Mfg. Corp., Tomahawk, Wisc., offers Glass Covering Kits for 12' and 14' wooden-hulled boats which include all materials necessary for applying plastic glass cloth to bottom, sides and transom. The firm also has Tomahawk Glass Cloth, Plastic Set and Glass-Plastic available in any amounts for special orders, plus the other accessory items for completing the covering job. Kit prices are: 12' boat, \$38; 14', \$43 (both are delivered prices and are subject to change).

The Tomahawk method of application differs from some others in that the glass cloth is laid over the sanded hull before it has been coated with resin. Cloth is tacked in place instead of being pressed against a "wet" coat of resin, which is claimed to allow more time for careful fitting since the whole boat may be covered in one operation. After fitting and tacking, the liquid Glass-Plastic is poured along the keel and spread evenly; later, a finishing coat is brushed on to complete the job of waterproofing, protecting and strengthening the hull.

## COMPETITION TUNING

(Continued from Page 7)

Fit the piston with a discarded connecting rod cut off just above the crank throw end. On a grinding wheel or with a file, grind the cut end of the rod down to fit in your power drill chuck. Then with the cut down end of the rod secured in the drill, put the ringless piston in the cylinder hole after first coating it generously with the lapping paste which you have mixed with oil to the consistency of light cream. Then with the drill turned on, gently move the lapping tool toward the head end of the cylinder and back toward the base of the cylinder in a gentle in and out rhythmic motion. The drill, of course, is meanwhile imparting a rotary motion and the wrist pin and top of the connecting rod will compensate for any failure on your part to perfectly center the drill during the operation. A light lapping of this type from time to time will keep compression up to snuff and add mph to your rig.

If your blocks are free of scores, mike them to check for wear. A.P.B.A. rules permit up to .020" oversize. The factory can also supply .015" oversize pistons and for \$20 will rebore and hone worn blocks to take these oversized pistons.

To save additional labor cost when you send any blocks to the factory, be sure to strip them of all studs, screws and covers.

Generally speaking, you can't expect good compression in any outboard motor even with blocks and pistons in perfect condition unless your rings are up to snuff. Drivers who take their sport seriously put in a new set of rings for each marathon event and replace their rings after every few race meets. Since any type or make piston rings may be used, when you replace them you can try a bit of experimenting. One ring manufacturer has designed a ring on which the lower surface which seats in the bottom of the ring groove has been chamfered on one side. Theoretically this is supposed to prevent rings from sticking when carbon builds up in the grooves.

Another type ring has a softer metal leading edge which presumably wears down to perfect seat to match any slight imperfections of your particular engine's cylinder walls. Good reports have followed use of this type. However, any good standard piston ring should do the trick, the important thing being unworn rings properly seated and properly fitted for your cylinders so that you do not experience undue compression loss. (See elsewhere in this issue for more detailed information on how to do your own ring job.)

Perfect balance of reciprocating parts, or revolving parts, will result in longer engine life. One school of racing philosophy claims that this balance of parts will also add speed. This is subject to argument and I know of at least one top driver who claims that the fastest engine he ever had was his most poorly balanced engine. It would be hard to prove today because that mill did eventually blow.

Within the rules you may remove metal from connecting rods and pistons just so you do not bring them below minimum weight specifications. Before assembly, using a balance scale, your approach to creating perfect weight balance is to weigh each component set of piston, rod, wrist pin, wrist pin retaining clips and bearings and compare the figures with other counterparts. If any one of the four sets of components proves to be considerably out of weight balance with the others, compensations may be made by filing or grinding away aluminum from the inside of the piston skirt (the bottom, open end of the piston). Naturally, you will remove the metal from the heavier components to balance them with the lighter.

When you have your motor completely disassembled, great care should be taken not to knock the matching face surfaces of the two case halves with tools or in any way mar the level surfaces. These two halves do not have a gasket in stock condition. Some drivers merely coat the surfaces with heavy oil. I prefer to use an Aviation grade gasket cement. If you are racing in modified circles and find that either of the surfaces has been damaged, you may lap the surface until the damage has been eliminated, or have it faced off at a machine shop and then make a gasket to compensate for the metal removed. In modified stock circles and also where the D is used in strictly alcohol burning racing in Class F, some drivers have provided themselves with a near perfect seal by machining a .020" groove down each face of the crankcase shell. Then a new and perfectly conditioned soft copper wire is laid down this groove in which gasket cement has been laid to form a seal when the two parts are bolted together.

While the top and bottom main bearings—balls at the top and needle race at the bottom—seldom go bad given proper lubrication and cooling, it is well to check them and at the same time check the bearing surface on the drive-shaft for galls and pitting. For best results, of course, both the shaft and the bearings must be in perfect condition. A badly galled crankshaft must be replaced and as a precaution have your crankshaft and rods magnafluxed periodically. This precaution may save you a blown engine as well as a boat race.

Both the bottom and top seal should be replaced and also the neoprene seals around the exterior of the main bearings.

Of interest only to those who are running non-stock is a simple means of obtaining a power boost devised by Randolph Hubbell. Hubbell manufactures and installs compression blocks at \$12.50 per hole. These blocks bring the c.c.s of the hole at top dead center to 18 and increase the compression ratio from stock to about 10:1. Since heat is used in installing these compression blocks, the holes must be rebored to assure perfect roundness and this can be done for \$4 a hole.

Increases in speed up to 7 mph have

been claimed for these aluminum insert compression blocks.

Next check the reed valve assembly. After removing the reed valve stops and the reed valves, check the face of the assembly. After considerable use the reeds from constant fluttering will cut a pattern of their size into the metal of the valve assembly. When replacing with new reeds, this contouring will in all probability not perfectly fit the new reeds so that a perfect seat will not be obtained and some case compression loss through the intake manifold may result. To prevent this, gently tap the four securing pins on the face downward until the face is completely level with no obstruction. Then with a lapping compound paste prepared as before, place the assembly on a flat surface such as a heavy gauge discarded mirror and working with a gentle pressure, using a figure 8 pattern, lap until the surface is completely flush. Reed valves for the KG9 are sold in balanced sets. They should be installed with no preload, that is, the reed should be so secured that there is no tension against the valve seat. But when installed the no preload condition should not exceed .007".

It is always possible that a faulty reed might be supplied so under no conditions attempt to bend reeds to obtain the proper tension. If the reed does not seat properly and has a greater than .007" no preload opening, it is safer to discard the reed. The practice of replacing a complete set of reeds when only one may be damaged, or appear not to have the proper tension, is to assure equal fuel distribution at all speeds which will only be obtained when each reed functions identically with the others in the set. Use gradually breaks down the tension so that replacement of only one or several is certain to throw off properly balanced operation.

If you are planning to compete under stock rules at sanctioned events, the clearance between the reed and the reed valve stop as shown in the picture may not exceed 5/32". In modified competition some drivers have found it advantageous to increase the reed stop gap as much as an added 1/16". Beyond this point, testing has indicated that flutter of the valves will become unpredictable and any advantage of a wider reed opening will be lost in failure of that valve to retain a proper seal when closed.

When you start to re-assemble, be certain that the crankshaft drive gear is completely seated into the pin provided for it on the crankshaft. And on the subject of gears, remember that you should not only keep after the lower unit but also be certain that the gear train is topped off with grease. You will note that there is both a filler plug and an inspection plug. Open both plugs, fill through the filling plug until the lubricant comes out the inspection vent.

On the KG9H be sure to check the breaker gap points of the magneto before replacing the steering handle, gas line connections and the pressure pump.

(See Over)

## HOW TO SELECT HOW TO OPERATE HOW TO REPAIR OUTBOARD MOTORS and other 2-cycle engines



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repairs. Complete overhaul of engine and accessories, including step-by-step instructions for disassembly, analysis, repair and assembly. Preparing stored engine for service. Motors that have been submerged. **Trouble Shooting:** hard starting, engine skips or misses, overheats, low compression, excessive vibration or noise, lack of power, spark plugs burn or foil, engine races. **Boats:** selection, loading, safety first, riding out rough weather, navigating in strange waters, docking, mooring, winter storage, painting, Federal and State regulations.



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**COMPETITION TUNING**

(Continued from Preceding Page)

Otherwise, it is impossible to get at the points.

If you have torn down your engine after a flip, be certain to inspect the gear train. I have known of several drivers who followed all of the customary checkover precautions after a flip, even to thoroughly flushing the magneto with carbon tetrachloride and drying it with compressed air, only to find that their engines were experienc- ing ignition missing and on inspection the magneto would prove to be wet. What had happened was that the gear train housing was not fully loaded with grease and water got into the gear train. The engine, ostensibly completely dry, after it ran a few minutes would start working water down the timing gear shaft into the magneto.

In checking over the mag, be sure that the coil spring lead makes good contact with the contact point of the distributor cap. It is also well to check the rotor of your motor if you have picked it up second hand. Some rotors are equipped with a copper spring which takes up any free motion. Rotors not so equipped may tear up the contact points in the distributor cap or cause overly rapid wear to the contacts.

When you replace your high tension leads, you will note that each lead is marked on the distributor cap with a number from 1 to 4. However, you can still fall into error in reconnecting these lines which may lead to backfiring and damage to the reed valves. The wire from the No. 1 distributor lead goes to the top cylinder of the motor. No. 3, wire goes to the second from the top cylinder. No. 4 goes to the third from the top cylinder and the No. 2 wire is the high tension lead for the bottom cylinder. This isn't as crazy as it sounds for the firing order is one, three, four, two from top to bottom. Since wires may become mixed during plug changes, some

drivers tape numbers to the wires and scratch corresponding numbers beside the plug holes, to prevent pit stoooges from making mistakes.

For general racing conditions, you will find that J-6-J Champion plug on the hot side of the range will be fine. For long distance racing where your motor will be running wide open with- out shut off for an extended period of time, a J3-2 plug or a K3 colder type are recommended. While the plug gap settings will probably be about .030", a gap setting reduced to .022" to .024" is preferable. One somewhat baffling source of inefficient performance can be traced to your fuel lines. It is quite possible for the lines not to leak fuel and still leak air, which leads to faulty car- buretion. I strongly recommend that you use Form-a-Gasket aviation grade Per- matex on all fuel line joints.

Some drivers in noting the four holes drilled in the magneto end cap on their KG9s have taken upon themselves to offset the possibility of spray entering the magneto and have sealed these holes with a waterproofing compound. This is a very poor practice for it leads to con- densation on the interior of the magneto and faulty ignition will result.

Here's a tip that may also save you some headaches. After any race, if you plan to carry your racing motor on the floor of your car or in the trunk, be certain that all of the water has been permitted to drain out of the driveshaft housing. Otherwise, with your motor lying down flat in the car, the motion of the car moving around turns and bouncing over the road may cause water remaining in the driveshaft housing to run through the exhaust ports and into the powerhead.

As is the case with any racing motor, time spent in the shop is going to save you wasted time stalled on the course or wallowing around in the rear of the pack. Do your shop work at home and don't expect to be able to do it in the pits. (End).

**DO YOUR OWN RING JOB**

(Continued from Page 11)

the side or notched on the inner surface.

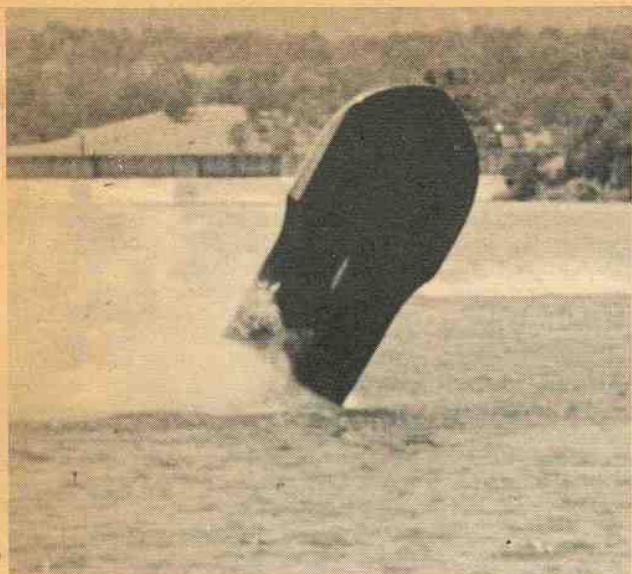
Full floating rings are strictly for the birds. By this is meant unpinned rings which permit the rings to move freely around the ring grooves—and allows them to end up as often as not catch- ing in the intake or exhaust ports. Broken or quickly worn rings result from lack of pins in the ring grooves and these will score pistons or cylinder walls or at least cause a rapid break- down of compression.

Rings—even pinned—must be pinned properly and in the correct location to do the sealing job right. They must have their gaps staggered for greatest effi- ciency. Since the wrist pin boss and hole location is always designed to pass over a port free section of the cylinder, the ring pins should be placed in line with the wrist pin holes to assure against catching in the ports.

If your rings do not have a pinning method already installed, it is a simple matter to drill a small hole with a di- ameter about one-third the width of the ring groove and press fit into the hole a tapered pin that will be below the sur- face of the ring land. The width of the ring to be used will be dependent upon the groove width. The ring naturally, in order to have freedom of movement, must have a width slightly less than that of the groove. The following table gives the most commonly encountered groove diameters and recommended side clearance between surface of the ring and the groove.

Ring Width	Side Clearance
3/32"	.001 to .003"
1/8"	.002 to .004"
5/32"	.003 to .005"
3/16"	.003 to .005"

Should your ring width not be one of these, adjust the side clearance in



A dilly of a flip! Date of the race was May 10, 1953—the place, Stoney Gorge Dam, 20 miles west of Willows, Cal. An A.P.B.A. sponsored event. The driver was Bill Berry of the Western Speedboat Ass'n., Medford, Ore. Boat is Class A-B 3-point Neal Hydro; motor a Super 10, Mercury Hurricane (Stock). At time of the race water was very rough with 20-mile wind blowing. This particular event was B Stock hydro race. Because of number of B hydros entered, officials had to run an elimination race. It was in fourth lap when Bill Berry flipped. Just prior to this he had "blown off" the water and went down the lake about fifty feet on the transom before he managed to settle boat back on the water again.

### DO YOUR OWN RING JOB

(Continued from Opposite Page)

relationship to the variance in ring width.

Since piston rings will expand due to heat when the motor is running, the two ends of the rings cannot be butted snugly when tested in the cylinder bore, but rather a gap clearance must be provided to compensate for the expected expansion. This over-all expansion will vary depending upon the type of ring used and also depending upon width and diameter of the ring. For motors to be used for strictly pleasure use, a gap clearance of .004" to .006" is ample. For engines to be used for racing purposes, with cylinder bore diameters of from 2" to about 2.125", a clearance of .005" to .006" is recommended. For engines to be used for high speed work with bores of from 2.125" and up, allow a gap clearance of .008" to .010".

If you are planning to race your motor, it's well to remember that the sides of your new piston rings may not be completely flat and this will lead to a compression loss through ring twist and flutter—not too noticeable for general utility purposes but apparent in loss of rpms in high speed work. The racer should always lap in his piston to be certain of flat sided rings. A mirror or any piece of plate glass about 12" square provides a perfect lapping surface. The lapping block consists of a piece of flat hard wood large enough to cover the entire circumference of the ring. A door knob or a boat carry-

ing handle fastened to the top of the lapping block will make it easier for you to work. A piece of rubber inner tubing or felt is then glued to the bottom surface of the lapping block. Make a creamy paste of fine valve grinding compound or an abrasive cleaning powder, such as Bon Ami or Ajax, and flood the surface of the lapping glass. Place the ring on the glass and then put the lapping block on top of the ring. Maintain an even downward pressure, rotate the lapping block (and with it the ring) over the glass in a figure 8 movement and then follow this with the lapping-in method illustrated in Photograph No. 5, which will lap the rings into the ring grooves.

For the racer a lapping glass is a constant necessity and may be used to advantage to lap head and cylinder faces, case faces and other parts which require precision smooth surfaces.

Remember that your engine is only as good as its cylinders and even perfect cylinders are poor performing with bad rings. (End).

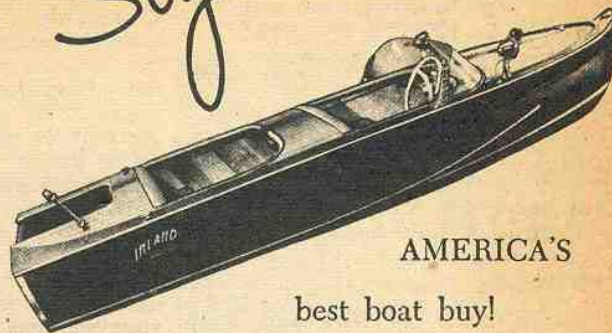
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## TWIN MOTOR INSTALLATION (Continued from Page 21)

to be the closest they should be mounted together if you plan to use remote controls. Twenty-two inches is much better and gives plenty of space for adjustments and control connections.

As to the speed you can expect, this depends to a large degree upon the size and design of your boat, the number of passengers, and the amount of extra equipment and supplies you have aboard. Most outboard cruisers are designed with planing hulls, which have to get up out of the water before they operate efficiently. If a motor does not have sufficient power to do this, the hull acts as a normal displacement hull would do; but since it is not designed to function in this way it becomes extremely inefficient. If this happens with your boat, you definitely need to do one of these things: jettison some of the cargo or crew; get a bigger motor; or change to twin installation.

But weighing these various factors, a rough rule of thumb for maximum speed expectancy would be something like this: 18-20' cruiser with 25 h.p. or twin 15's or 16's anywhere from 16 to 22 mph; same boat with twin 25's, anywhere from 26 to possibly 30 mph.

Twin outboard motors can be operated independently (one forward, one reverse) to help in docking or moving

about in tight places, but this should only be attempted while running at slow speeds. Any marked difference in motor speeds while running ahead under nearly full throttle will result in the slower motor tilting up due to the pressure of the water against it.

It's nice to be able to go along at a fairly good rate of speed in an outboard cruiser, but there is no need to try and break records. The fun of cruising is being on the water and being able to stay on it while you eat and sleep. And on a cruise, one part of the waterway is almost as interesting as another. Don't be in a hurry to get to your turning point and back again. Go away from home port until you've used up half your time, then turn around and head back.

That's what cruising is. The name itself implies a leisurely, relaxing way of getting around on the water. Even crossing the Atlantic on the *Queen Elizabeth* isn't called a cruise, much less hopping across it overnight in a plane.

So have fun; have the power you need to run your boat as it's meant to be run and to take care of the extra power needed in emergencies; but don't try and make a hot rod dragster out of your cruiser. If you want speed, get a hydro. (End)

## GLASS BOTTOM BOATS

(Continued from Page 20)

a boat with a one-ply glass-plastic covering, but for rough estimating purposes the following approximate figures are fair averages: 8' pram, \$25; 12' outboard, \$40; 14' outboard, \$50; 16' outboard, \$60; 18' outboard cruiser, \$100. For comparative purposes, a two-ply hull application, with one-ply deck job, for a 16' outboard runabout will cost you around \$95.

What about the added weight of the cloth and resin? Your boat will weigh anywhere from 4 to 6 ozs. more per square foot of surface covered by fiber glass, but it will actually weigh less when it is in the water. This is because the glass-plastic surface does not absorb water, whereas a painted wooden hull picks up enough water to more than make up the difference in original weights.

Fiber glass is available in varying widths and may be ordered by the running foot in amounts sufficient to cover the surface area of your boat. Resin usually can be ordered in various colors, which will be the color of the finished job. However, it is difficult to get a sharp dividing line between two colors and so for two-tone jobs at the water-line colored resin is not recommended.

Kits for fiber glassing are also available, containing all materials necessary for the job. You merely specify the size and style of your boat and what color you prefer. Some kits are furnished for certain models of various makes of boats, with the cloth measured to fit with a minimum of waste.

The application of fiber glass is a simple process, as shown in the photographs which accompany this article. These pictures show some of the steps in covering a lapstrake outboard with Boat Armor, a product of Glass Plastic Supply Co., Linden, N.J. Incidentally, such an operation on a lapstrake or clinker-built boat was considered impractical a few years ago due to the difficulty of getting the cloth to adhere to the narrow plank edges without the bother of tacking. But improved resins, such as Glass Plastic's Super Resin, have adhesive qualities which now make such jobs routine. Also, with the use of the newer resins, keel mouldings and spray rails need no longer be removed before application of the cloth, although some suppliers still recommend it.

A brief outline of the steps in applying a one-ply lamination of fiber glass follows: 1) remove all paint with coarse sandpaper; 2) fill all seams, cracks and holes with non-oily seam filler; 3) cut cloth to fit areas to be covered — clean cuts can be made by pulling a thread in any direction and cutting along the exposed break in the fabric; 4) apply two coats of resin, as prime coat will be absorbed by the wood; first coat can be applied all over, but second or "wet" coat should only be put on area that is to be covered immediately; 5) apply length of cloth to "wet" area, pressing with hands and using window-washing squeegee to get all air bubbles out; 6) apply another coat of resin over the cloth in place; 7) trim edges of



cloth, leaving at least 2" for any laps—trimming can be done with pocket-knife, scissors or razor blade in a holder; 8) after all areas are covered, sand all over lightly and bring ends down to a feather edge; 9) apply finishing coats of resin. The following concerns are some of the suppliers of fiber glass cloth either as ordered or in kits for various boats. Write them for information on prices, literature, etc. Some accept direct orders, others will be glad to refer you to dealers in your region.

The Castolite Co., Marine Division, Woodstock, Ill. "Castoglas." Coast Manufacturing & Supply Co., Box 71, Livermore, Calif. "Trevano Glass Boat Fabrics."

Custom Craft Industries, Buffalo 7, N. Y. "Armor-Glass."

Glass Plastic Supply Co., 333 W. Elizabeth Ave., Linden, N. J. "Boat Armor."

Herter's, Inc., Waseca, Minn.

Kristal-Kraft, Inc., 420 10th Ave., Palmetto, Fla. "Fibreglas."

Norman Parke Co., Chicopee, Mass.

Plastic Sales & Manufacturing Co., 3023 McGee Trafficway, Dept. BS, Kansas City, Mo. "Glass-Kote Kits."

U-Mak-It Products, 701 Whittier St., Bronx, New York 59, N. Y. "Ever Glasting Boat Armor."

## OUTDOORS WITH THE OUTBOARDS

(Continued from Page 9)

and caution on the water. As greater numbers of people find their recreation afloat, the more chances there are for accidents to happen.

Recognizing these facts, members of the boating industry got together in New York, during Boat Show time, and organized the American Boat and Yacht Council, with the main purpose of promoting small boat safety. Admiral Halbert C. Shephard of the Coast Guard addressed the group and intimated that unless boaters took safety seriously and did something about it themselves government regulations might become necessary.

During the Kissimmee Boat-A-Cade, last fall in Florida, 250 of the boats taking part in the event (mostly outboards) were given Coast Guard Auxiliary Courtesy Motorboat Examinations, and 137 craft received the coveted decals. Lack of one thing or another on the CME list of requirements kept the others from getting an O.K. But you can be sure all skippers were safety conscious after these inspections and the talks which were given, plus the fact that life jackets were credited with saving the lives of occupants of two boats which capsized and sank on the trip. (See Over)

## BOAT PLANS AND PATTERNS FOR AMATEUR BUILDERS FROM DESIGNS BY E. G. McCREA



PLANS—PATTERNS—INSTRUCTIONS specially prepared and detailed for amateurs, available for all outboard racing classes and for hi-speed sport boats. New illustrated booklet now available. OUTBOARDS ONLY—Inboards ready by early fall.

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## IT'S NEWS

### NEW RACING SPARK PLUG

Of particular interest to the alcohol-burner outboard racing clan is the announcement of the Champion Spark Plug Company of an improved outboard racing spark plug able to withstand high heat at full throttle and still show no fouling tendencies when speed is cut for the turns. Field testing of the new plug in actual racing has been highly satisfactory. Bill Tenney used the plug when he set his new Class A world's record at Seattle, Washington, last fall at 53.746 mph. Bob Dingleline, Secretary of the St. Marys Boat Club of Ohio, in reporting on use of the new plugs stated, "... There was absolutely no splutter prevalent... no fouling of plugs and top speed was increased..." The new plugs are model R-2-S, replacing the older R-2S.

### YOUR OUTBOARD

The Socony-Vacuum Oil Co. announces that the 1954 edition of its 44-page popular booklet, "Your Outboard" is now available. It is crammed with valuable hints on the care and operation of the outboard engine. The 1954 edition has been completely revised and rewritten and contains sections on the electric starting outboard engines. Recommendation charts are included, covering all popular makes of outboard engines through 1945 to 1954. Copies are available, gratis, to those who write to Socony-Vacuum Oil Co., Inc., Marine Sales Dept., 26 Broadway, New York 4, N. Y.



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## SID-CRAFT Smashes World's BU 5-Mile Record



Jim Coulbourn of Burlington, N. J., driving a stock model SID-CRAFT drove his BU outboard to new, sizzling records in Florida of 49.793 m.p.h. for the mile straightaway and 46.512 m.p.h. for the five-mile competition at Lakeland, Fla. Join the record breakers by ordering your SID-CRAFT now.

SID-CRAFT Wins High Honors With Stock Utilities at the Syracuse Nationals, August 30, 31st. Richard O'Dea of Paterson, N. J., took two heats in AU—Ronald Zuback of Morgan, N. J., placed third in AU—DU was taken by Gerald Waldman of Milwaukee.

SID-CRAFT BOATS

MAIL ADDRESS: ROUTE 43, PLAYER AVE., U.S. 1, NIXON, N. J.  
SHOP ADDRESS: U.S. 1, NEW BRUNSWICK, N. J.

## OUTDOORS WITH THE OUTBOARDS

(Continued from Preceding Page)

Remember the old song that goes "The bulldog on the bank and the bullfrog in the pool"? We think a good safety slogan could be taken from its lyrics. The next line is "The bulldog called the bullfrog a green old water fool." How about: DON'T BE A GREEN OLD (or YOUNG) WATER FOOL.

Incidentally, the 3rd Annual Midwest Safety Afloat Conference, usually held during the Chicago Boat Show and sponsored by Outboard Boating Club of America and other organizations, including American Red Cross, has been postponed until sometime in April. More about this later, along with news of the new Model Boating Code that the industry and OBC are working out, as well as information on the Red Cross program of teaching outboard handling and boat safety.

### MOTOR NOTES

Evinrude Motors announces that its motors no longer need to be flushed after salt-water operation. The company has known for some time that all of its motors were resistant to internal corrosion from salt-water but delayed the public announcement until after completion of two years of testing. Washing the motor externally is still recommended, if the owner wishes to keep his motor attractive in appearance. A simple fresh-water spray over all exposed areas and a good wipe-down will do the job.

Johnson Motors' new 5½ h.p. Sea-Horse will be equipped with connections for optional remote control operation, making it interchangeable with larger motors on boats which have throttle-and-shift levers and steering wheel at the driver's seat, a feature suggested by runabout and cruiser owners who want a smaller motor as auxiliary equipment. Conversion kits will be available to owners of the earlier models.

Mercury's new Mark 50, a 40 h.p. outboard—4 cylinders in line, can be equipped with optional electrical system, including key-type starter, electric choke, distributor and generator.

Chris-Craft, who discontinued the manufacture of outboard motors last year, has built up a substantial stock of service parts as a protection to owners of its motors. Any one desiring to buy parts or discuss service problems should write to Chris-Craft Corp., Outboard Motor Division, Holland, Mich.

### BOAT NOTES

(Prices quoted are subject to change) Van Pelt Boat Co., Spring Lake, Mich., is in production of the new 17' Funster, which has seating capacity for six people, full width rear and middle seats with storage spaces underneath, two full length bunks and room for head installation in short forward cabin space. Designed for combination pleasure, fishing, water sport and week-

end cruising uses, it comes with choice of bracket or transom mounting to take up to two 25 h.p. motors. List price: \$985.

Another new entry in the outboard field, Glass-Craft Co., Fort Dodge, Iowa, is now in production of 12, 14 and 16' utilities with molded one-piece fiber glass hulls with color molded in: red, green, blue or white. Boats contain Navy Foam for bouyancy and have undergone extensive testing in fresh and salt water at high and low temperatures. The 14' model lists at \$349 f.o.b.

Chris-Craft Corp., Algonac, Mich., has a new boat kit, the 14' Hornet, which can be equipped with windshield and plush upholstery in the adjoining twin cockpits. Grooved mahogany decking is provided for fore and aft decks so that owner can use white seam compound to give effect of solid mahogany. Designed for up to 25 h.p. motor, it has tested at 40 mph. Price of kit is \$230 f.o.b.

### IT'S NEWS

#### NEW MARTIN MOTOR MOVIES

A new series of 15-minute color motion pictures dealing with various types of fresh and salt water fishing, and entitled "Fishing USA," is to be made available this season to sportsmen's groups by Martin Outboard Motors of Eau Claire, Wis. The films, made at such fishing hot spots as Basswood Lake, Ely, Minn., on the Minnesota-Ontario border; Teal Lake, in the Chippewa Flowage, Wis.; Neah Bay, Washington; Catalina Island, Calif., and others, show plenty of fishing action. In addition, they are different from most other fishing movies in that they are actually stories, with a wide general appeal for every member of the family. Some of the stars of the film are Buzz Fiorini, famous Pacific Northwest guide; Gloria Pete, one of the two accredited girl guides in the Minnesota-Ontario border country; and Sam and Bea Welch, famous musky hunters of Northern Wisconsin. The films may be ordered for showing through Martin Outboard Motor dealers and also by writing the factory at Eau Claire, Wis.

#### NEW OUTBOARD MOTOR LOCKING DEVICE

C. & C. Manufacturing Company, 4865 Exposition Boulevard, Los Angeles, 16, California, is marketing a unique device to prevent outboard motors from being lost overboard and also to prevent theft from boats. Called Moto-Lock, the device, made of cast aluminum, consists of three sections: a safety "lipped" plate and a two-piece locking unit, designed to take any standard sized padlock. Moto-Lock is available in three sizes, ranging in price from \$5.50 to \$6.95. Mail orders should include the make and horsepower of the outboard motor for which the Moto-Lock is to be used.



In response to many reader requests the sleek, prize-winning BU Outboard, "Dry Run," featured on the December cover of BOAT SPORT, may now be built from professional plans, designer and operator Hal Kelly announces. Large detailed drawings, a complete bill of materials, full building instructions and 8 pictures of her in construction are offered for \$3.00 postpaid. For further information write direct to: Hal Kelly, 98 Anderson, Bergenfield, New Jersey.

## Classified Advertising

Use this directory for prompt response. Rate 20c per word (\$3.00 minimum). CASH WITH ORDER. 5% discount for three or more insertions to direct advertiser. Copy should be on one side of the sheet and typewritten, if possible. Schedule of closing dates for classified advertising as follows:

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Make remittance payable to BOAT SPORT, Classified Advertising Dept., 215 Fourth Ave., New York 3, N. Y.

### FOR SALE

**FOR SALE**—Used and rebuilt marine motors, 2 to 550 H.P. gasoline and diesel. Complete stock list of popular models. Write for FREE Catalog 180 covering conversion equipment, propellers, reverse gears, fittings, and supplies of all kinds. STOKES MARINE SUPPLY, Dept. BS, Coldwater, Mich.

**CONVERSIONS** for all model Ford, Mercury, Lincoln and Jeep Engines. Free Catalog. Lehman Manufacturing Company, Dept. K, 972 Broad Street, Newark 2, N. J.

**JACOBY HYDROS**, Racing Accessories, Helmets, Fins, Steerers, Life Jackets. Fred Jacoby Boats, North Bergen, N. J.

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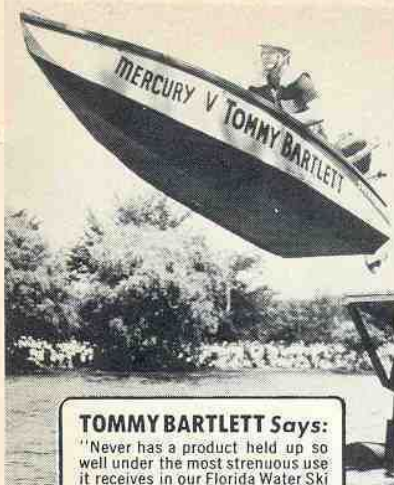
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**FOR SALE**—Brand New KG7Q Mercury (in factory carton) \$299.50. SPORTS CRAFT, 2228 E. Douglas, Wichita, Kansas.

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A sea of boating enthusiasts flooded the mammoth Kingsbridge Army in New York City for the January nine-day run of the Golden Jubilee Motor Boat Show. This anniversary exhibition was one of the most successful in the fifty-year history of the National Association of Engine

and Boat Manufacturers, sponsor of the show. More than \$12,000,000 worth of boats, marine engines, outboard motors and accessories were sold from the floor to consumers and dealers, indicating that 1954 season would be the biggest ever. (Photo by Morris Rosenfeld-H. A. Bruno).



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