

After running outriggers for the past five years, I decided to try something new for a change of pace. I shopped around for a week or so, but didn't really find anything to my taste. I didn't want a large boat, just something in the 3.5 size maybe. After looking at most everything I decided to try the Dumas Pay-n-Pak scale hydro. But I used it, as an outboard instead of an inboard. It had a length of 30 inches and a beam of 15 inches. The kit used plywood construction, which I liked.

Opening the box, I started going over the plans and instructions very carefully. The instruction sheet was one long page with very small print that you had to read at least twice to make sure you didn't skip anything. The plans had a total of 13 photos and three drawings: one top view, one side view and one view of the radio and engine locations.

After studying the plans very carefully I started to check over the parts. I have built several Dumas hulls in the past, but this one had the best grade of plywood in it, (no ex-

planation on the plywood). As for the construction we dry fitted all the parts (which all fit very nicely) as shown in the photos. The hull was well constructed with eight ribs front to back and four ribs from left to right. The construction was strong with the weight a little on the heavy side. I decided to lighten it some by cutting the centers from the ribs, leaving a space age type frame hull as shown in the photos. This left the hull plenty strong but cut the weight back at the same time. Dumas supplied a 1/8 inch square spruce stick to be glued along the top and bottom of the ribs as a gluing surface for the decking, but as you can see I didn't care much for that, so I used 3/8" x 3/8" triangle balsa strips. This gave me a nice wide glue area and only added one ounce of weight back to the hull. It also added more strength to the outer edges of the decking and the main body of the hull.

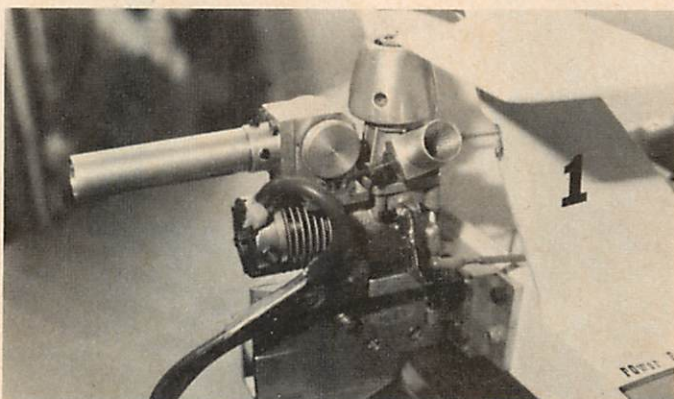
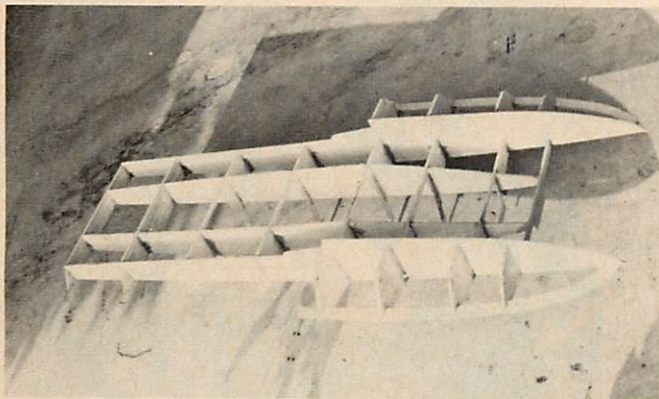
After gluing all the bottom and side planking, I slow dried the entire insides with Hobbypoxy formula 2. This sealed the wood from moisture and made it watertight inside.

Next, I placed the top decking on, to complete the basic hull. The cowl was easy to build and went together with no hitches at all. I moved the radio box from its location at the rear of the hull to the front, as you can see in the photos. The radio box was moved to correct the weight problem and put the hull in proper CG. This also allowed me to put the fuel tank in the rear next to the engine. The only real changes I made were to add an extra 1/4th inch piece of plywood across the transom for the K&B 3.5 Outboard, change the radio box and use a tape down lid style, instead of the screw down style.

You can check or work on your radio and have the lid back on before most guys can get the screws out of the box with the other style. I use Scotch Brand Vinyl Tape, which is 100 percent waterproof. After removing the tape five or six times, it leaves a sticky film on the lid and box. To remove this film I use a little Barrymans B-12 automobile carburetor cleaner and wipe it right off, but you can use any solvent that won't hurt your paint job.

Dumas' Pay-N-Pak

Originally intended for inboard power, our author fitted a K&B 3.5 Outboard and produced a real mover/**Al Berry**

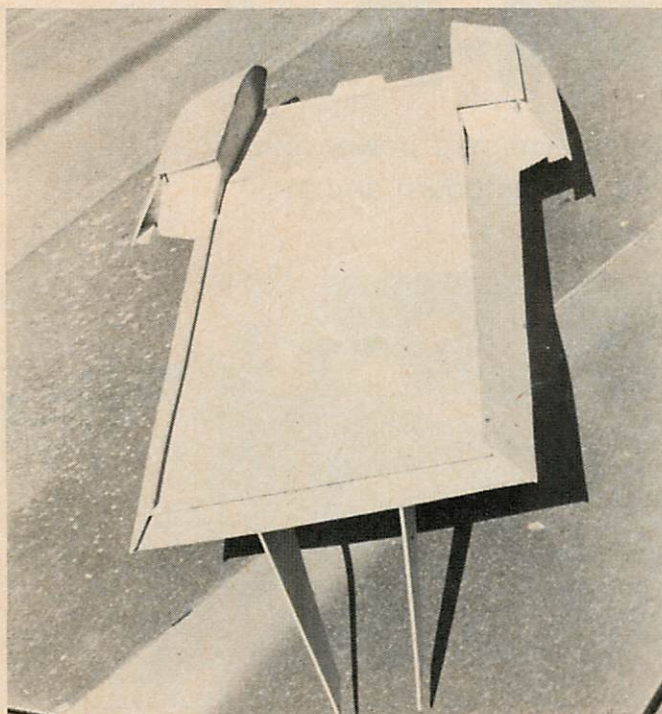
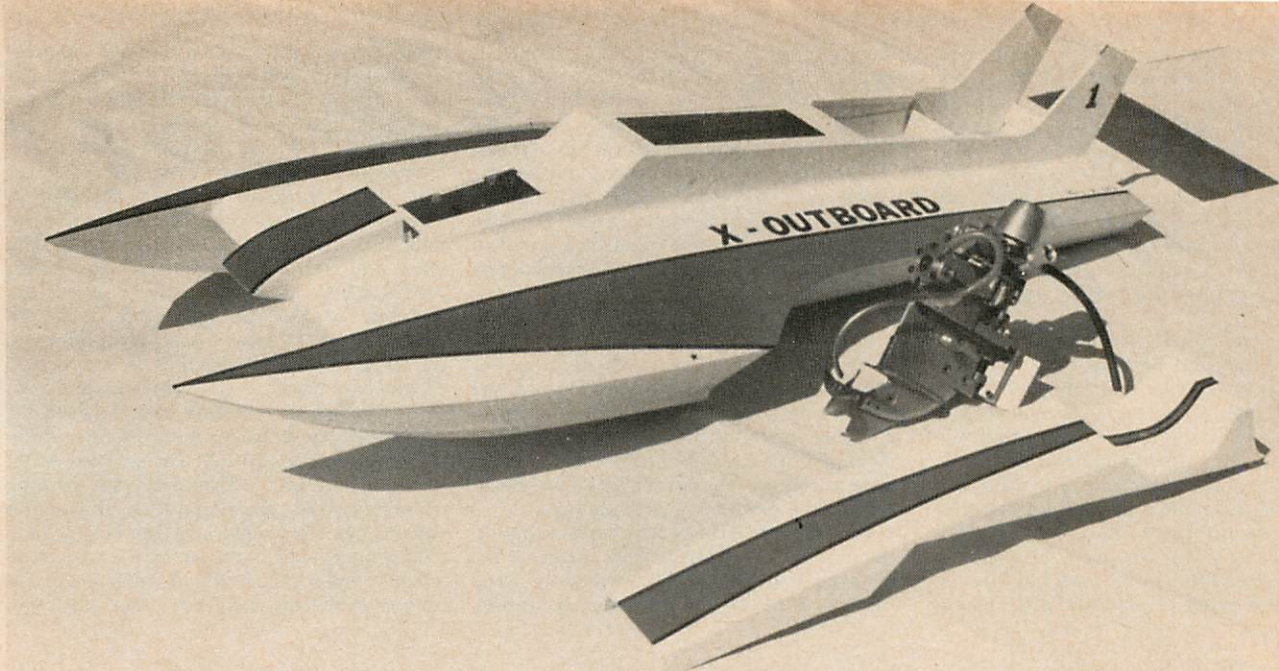


PHOTOGRAPHY: AL BERRY

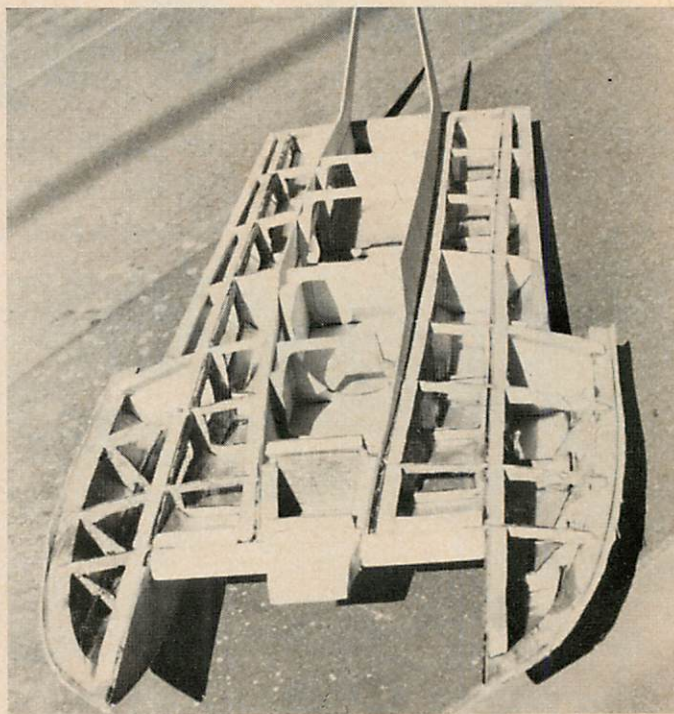
A dry assembly of the parts was done to insure proper fits prior to gluing (above). The Pay-N-Pak in it's intended inboard form (below). Note the wing.

The author decided to build his Pay-N-Pak to accept a K&B 3.5 cc Outboard (above). Note the clearance in the wing to allow access for the starter.





The completed boat ready for the installation of radio and running gear (top). A view of the bottom with all of the planking glued on (above).



The author cut lightening holes in the bulkheads (above). The frame is still extremely strong. The Pay-N-Pak in it's natural setting (bottom).

An eight ounce tank with a brass tubing pick (instead of the clunk type supplied with the tank) is then elevated to match the engine height for a better fuel draw.

I started the finishing. First I sanded the hull and checked to see if I had forgotten anything. Then I made sure all the glue joints were up to par. The hull was ready for the first coat of K&B primer and sealer. I let it dry, sanded it, and applied the second coat. The next coat used was K&B Epoxy Paint (white). After it dried I sanded it with 600A grit sandpaper, then shot the final coat of white paint.

Once the base color was finished, I started the trim painting. I trimmed the hull out with red, orange, and yellow with black lettering. A final coat of clear was then applied



over the entire boat to seal everything.

I reinstalled the radio, engine, fuel tank and went to the lake. At the lake I drove the boat around until the engine had some time on it and got down to business. I started with the stock prop, then went to a F-20, then a G-20, then a F and G-22. They all ran well but the H-25 gave the best all round speed and performance. As you know no two boats will run the same prop very often and the props I used might be only a good starting place for your boat. After trimming the boat and engine a little I had a very fast and a very competitive outboard. With speed, good looks, and great handling characteristics what else could a boater ask for in one boat. Take a friend boating with you and show them how much fun it is.

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Cooling of inboard engines has usually been performed by two basic types of water pick-ups. One is the typical, vertical tube mounted aft of the prop. Pressure of the water from the rooster tail forces water up through the tube and forward to the engine. With a poorly mounted tube, water pressure can be erratic and produce excess drag due to the spray hitting the supports.

The other type of pick-up is a tube sawn off at 45° and mounted either on sponsons, transom, or extended below the rear of the rudder. Simple flow tests using a garden hose against a rudder show that drag is quite large. (with and without a rear bottom pick up).

At the 1980 IMPBA Internats in Bartow, Florida, I came upon another type of pick-up which Don Pinckert (of "Gator" fame) informs me has been in popular use for the last three or four years in model boats. Many boaters, from all over the country, have adopted the scheme which is also used on full-scale hydros, and is quite evident at the Internats.

Shown in the drawing is the internal rudder pick-up in which are literally drilled into the sealed rear tube through the sides of the rudder. Some boaters only put a hole on the starboard side for oval racing (turns to the right). Assuming the holes are properly sized, it appears the drag is about the same with two holes as with one.

Obviously, no additional form drag is present with this method as the rudder frontal area doesn't increase. Some slight drag is observed in tests, by Pinckert, over the undrilled rudder, and is probably due to the water leakage into the holes, and some early separation due to turbulence. At high speeds the holes appear to be almost solid, except for the leakage into the cooling pipe. Advantages of this type of rudder are the low drag and a steady cooling flow (assuming that you put the holes close enough to the rudder bottom).

Conversations with a number of successful boaters have indicated that this type of pick-up should be used primarily on .40 and .60 hulls in which wider (thicker) rudder blades are used. On .20 hulls the super thin rudder blades won't support the holes. Water pick-up in the prop spray is a better alternative.

Construction of the integral rudder water pick-up is relatively simple. There is no need to use expensive machining techniques, although if you have the machinery, feel free to do so. A simple 1/8" brass tube is epoxied (a metal bonding epoxy or even 5 minute will work) to the rear of a wedge rudder. Marine Specialties rudders are fine, for example. The drawing shows the construction details.

Construction steps:

1. Take the metal rudder and drill holes (about 50/1000"). Drill from center rear and angle slightly away from leading edge as in Figure. Holes should be 1/4 inch above each other, and centered no more than 1" above the rudder bottom. Higher holes, and too far toward trailing edge, may not pick up water due to rudder ventilation.
2. File rudder trailing edge flat and then clean with alcohol (keep your fingers with their oil off the trailing edge).
3. Epoxy 1/8" P.D. brass tube to the rear of rudder with enough tube sticking above rudder for attaching water hose. Don't seal off tube. If any bending of tube is


required, do it before epoxying. Let the epoxy cure.

4. Carefully drill holes from front rudder edge back into the copper tube for water flow.
5. Clean out the metal chips from holes and inside brass tube.
6. Seal-off the bottom of the brass tube with epoxy to avoid closing off holes.
7. Add a wire support at top to keep the tube from breaking away and cover with epoxy.

8. File epoxied rear of rudder to give a wedged, trailing edge. If necessary, use five minute epoxy, and micro-balloons as filler, to obtain the proper shape.

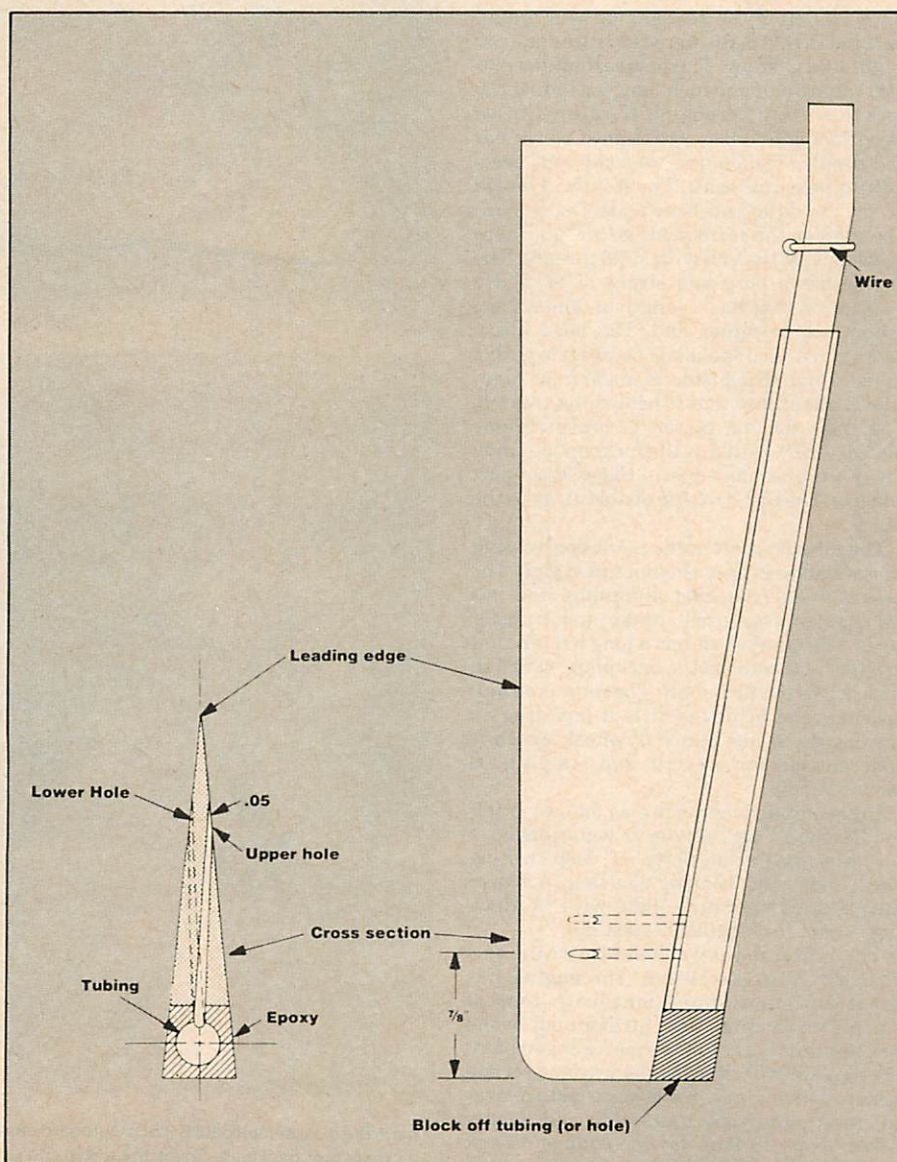
9. Sharpen rudder leading edge and wet sand the assembly with 400 and 600 paper.

10. For looks, paint the epoxied portion with silver dope (and wet sand any paint ridges).

Good luck with your modified rudder. And if you're like I am, make a spare. 

An RCMB How to:

A rudder Water Pick-up/Ed German



The K&B outboard has been out for some time now and most boaters are quite familiar with them. K&B has had a lot of success with the outboard, but is still striving to make improvements on it all the time. K&B is a company that wants to provide the boater with the best product they can and at the lowest price they can. They now have available a third generation of K&B 3.5 outboards, with many improvements. These improvements are the result of hours of grueling competition-running in races throughout the nation.

The results of these improvements are quite pleasing. To start with, K&B replaced the old slide valve exhaust throttle with a brand new sleek black aluminum carburetor, and to aid the fuel supply, they added a pressure tap in the lower-end-unit for guys who need to pressurize their boat's fuel tank. Along with all this, they replaced the old shaft bushings in the lower end with new shaft bushings that require nothing but water as a lubricant. In other words, they *do not* require any oil. (This doesn't mean they won't wear out, but they will last longer than the old material they were using.) K&B cautions you not to run the engine out of water for more than 30 to 45 seconds for maximum shaft bushing life.

Since the K&B 3.5 outboard is the most powerful (out of the box) engine ever manufactured in this class, here is a little data you might like to know. The new carburetor is $\frac{3}{8}$ inch square and one inch long, excluding the neck that fits in the engine. It features an air bleed idle hole; all new designed spray bar and needle. The engine uses two ball bearings on the crankshaft. The front is a sealed $\frac{5}{8}$ " x $\frac{1}{4}$ ", and the rear bearing is $\frac{15}{16}$ " x $\frac{15}{32}$ ". The shaft on the crankshaft is $\frac{15}{32}$ " and steps down to $\frac{1}{4}$ " at the end with $\frac{1}{4}$ -28 threads. The engine has a bore and stroke of $\frac{5}{8}$ " and a bushed rod that has a length of 30mm from center end to center end. The head has a depth of $\frac{3}{32}$ " and is a dome hemi-style with a squish band. The piston is made from high-silicon aluminum that is heat sink treated. The liner for the piston is brass chrome plated (ABC) with a wall thickness of 1mm. The K&B also has a bar in the exhaust port window. The bar is to stop piston tilting in the liner.

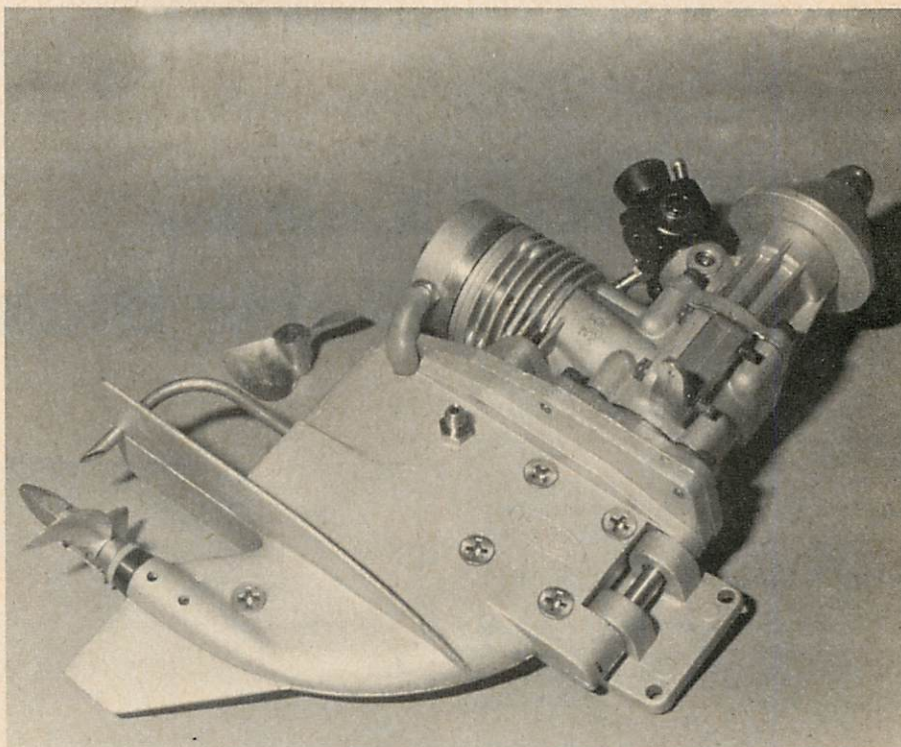
The exhaust port timing is 155 degrees and works well with or without a tuned pipe. The case is made from cast aluminum and has very generously sized intake and transfer ports. The crankshaft has a long rod pin that drives a rear rotor in the backplate, which in turn drives the flex-shaft. The rotor is on ball bearings and achieves little if any drag on the engine. A one ounce flywheel, which is cone shaped for electric cup starting, is mounted atop.

Other improvements are as follows: a teflon flexshaft liner, $\frac{1}{8}$ th brass waterpickup, a $1\frac{1}{2}$ " wide cavitation plate, $\frac{3}{4}$ " deep turning skeg under the bearing housing, a heavy duty bushed mounting plate with $\frac{1}{4}$ " thick lugs and a $\frac{3}{16}$ " stainless steel pin.

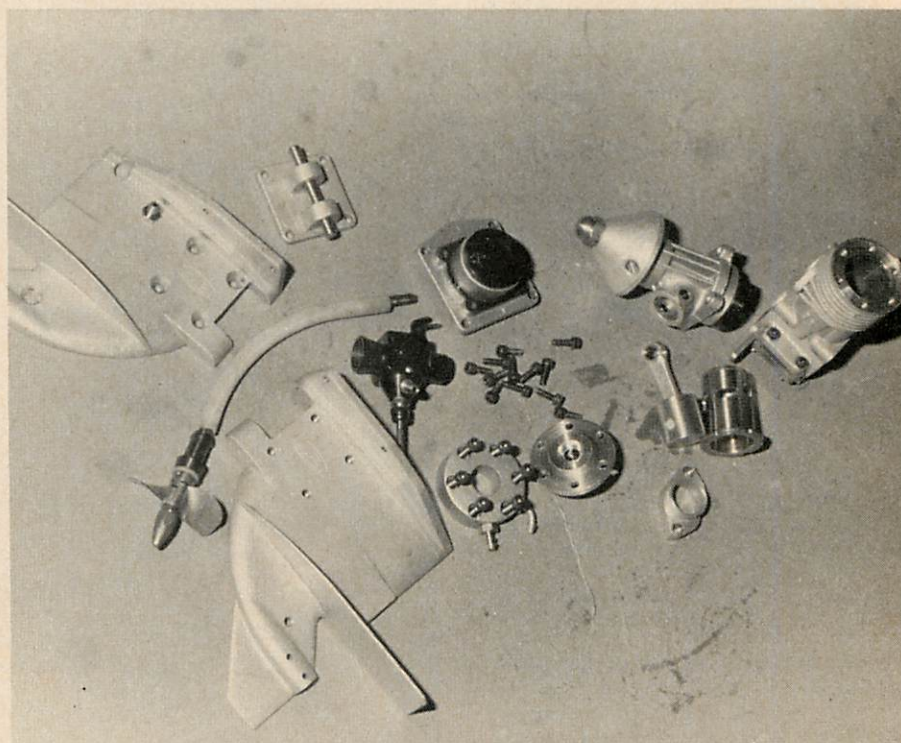
The outboard was well built before the new changes. Now it's better. The engine has great low-end-torque along with tons of r.p.m.'s on the high end. Straight out of the box this unit is a top performer. For you boaters that are still running the first and second generation engines, K&B has a change over kit to up date your units with and it only takes about 30 min. for the change. Check one out at your local hobby shop.—AL BERRY

An RCMB Engine Review:

K & B 3.5 Outboard/Al Berry



PHOTOGRAPHY: AL BERRY



This is the disassembled K&B 3.5cc Outboard (above). Note the pressure tap on the right lower case half. The rear-rotor backplate drives the lower end unit. The 3.5 as it comes stock (top).