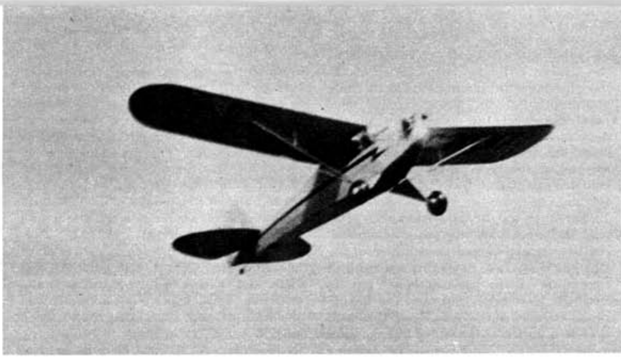
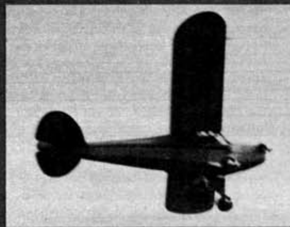
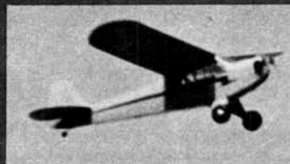






Scale Flying PIPER CUB J-3
Perfect Project for Radio Control

By CHUCK HOLLINGER

With an unparalleled record of 132 successful flights, this R/C model is a fine tribute to designer and radio

■ If you've had success with the usual array of boxy R/C designs you're ready to give the Cub a try. She's not only a cinch to build and fly, but a model that really looks like an airplane. While the only deviations from scale are the increased wing dihedral and stabilizer area, it has more than proven itself as the total number of actual logged flights to date is 132 (approx. 9 hrs. in the air). Best of all she looks nearly as unmarked as when first soloed.

Credit must be split two ways—the inherent stability of the Cub design, coupled with our fool-proof Babcock R/C equipment. Several of the features came about through Dick Schumacher's influence, namely, the fiberglass cowl and demountable, shock-absorbing landing gear. The wing panels with the scale number of ribs are hooked on by means of rubber bands; they've proven their worth on several occasions already. The motor is mounted on its side to carry through the scale lines, in addition to expelling the exhaust downward, resulting in an oil-free ship.

One feature that really astonishes the R/C flyers is the full-scale operating rudder—but believe me it works to perfection, giving excellent control under power and in the glide, without any signs of over-control. In fact, more than a dozen modelers who had never touched a beep button before have flown this Cub without any trouble whatsoever.

Of course, anyone who has put time in the real Cub will attest to its easy

Six-year-old Cheryl Hollinger poses with Daddy's Piper Cub and Babcock BCT-2 transmitter. Power is Fox .19.

handling characteristics—the model inheriting her big sister's stability. Another feature that really makes the Cub so much fun to fly is the motor control. With this you can keep the ship down low, as well as make touch and go landings. After all, this is radio control, so why operate up so high? Except for looping, naturally, which brings to mind the fact that our Cub does its best loops as a seaplane.

As for the construction, it's pretty much standard. The fuselage sides are built right on the plan using 1/4" sq. hard balsa for the longerons, crosspieces and uprights. Use 3/16" x 1/4" stock for most diagonals. Note that there is a slight difference between the construction of the left and right side. Run the top longeron of the right side all the way through same as the left-hand side, and join the two together. Mount the firewall in place and cement securely. Next cover the sides and bottom with 1/8" soft balsa sheet.

Cut out and cement fuselage formers fore and aft. Cut out two pine or ply ribs which will form the cabin, and cement to the 1/8" sheet which makes the rear window. Be sure to cement these together on top of the plan in order that the angle is right on the button, because these determine your wing incidence. Cement these units to sides of F-4. Now add the ply spacer to the cabin. The two 3/16" diameter dowels are cut to approximate length. On one end of these cut a tongue of about 1/16" thick and 3/16" long. Now cut a groove into each longeron where these will make a snug fit, and cement securely with Weldwood glue. It's very important that the two dowels are put in properly because nearly the whole strength of the cabin depends on them, just as in the full-scale Cub.

Next cover the cabin top with 1/16" sheet. Make the remaining window frame from pine or hard balsa. The stringers may now be added. Note that the center stringer down the back of the fuselage is laminated. Drill hole and insert 1/8" dia. dowel landing gear pegs. Construct the upper part of the door of 1/8" sq. pine or balsa. Make the lower one from 3/16" sheet balsa. Sheet aft end of fuselage using 1/8" stock and cement soft balsa facing block to this section.

Construct the fin and rudder by cutting the pieces for the outline, cementing them together and then fitting in the ribs and diagonals. Sand this structure to streamline shape and mount fin to fuselage. Now carve and sand the fairing block to match the fin. Bend the wire that is a part of the rudder linkage, and mount it to the rudder by first inserting it through a piece of 1/16" ply. Cement in the balsa diagonal.

To construct the stabilizer, first cut the balsa spar and pin to drawings. Next cut the stab outline from medium 1/4" sheet and cement them together. Now cut the 3/32" x 1/4" ribs to length and cement in place. The 3/32" sq. cap strips are glued across the top of each rib. Now cover the center section and turn the stabilizer over and repeat procedure. Cement the 1/8" ply spar brace and sand the complete stabilizer, noting the outline as shown on the drawings.

The main landing gear wire is 1/8" diameter while the rear brace is formed from 3/32 wire. A rather sharp bend is required of the rear one where it joins to be wrapped and soldered. Fill in the landing gear with 1/8" hard sheet and sand. While on the subject of the landing gear, it was found that the Trexler wheels were just right for the scale appearance and for flying from normal fields; however, they don't seem to hold up for landings on concrete runways. Wheel collars are now used in order to easily change over to R/C wheels whenever we head for a day's flying off concrete.

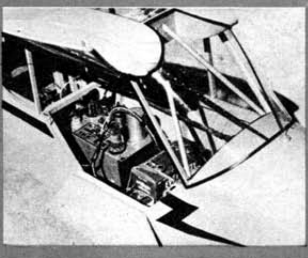
In order to make the fiberglass cowl it is first necessary to carve a block of balsa to the required shape. Do the final shaping with the block lightly cemented to the fuselage. When it is the correct shape remove and cement a sheet of 1/4" balsa which has been cut to the outline of the firewall. This is necessary in order for the fiberglass to extend 1/4" over the forward part of the fuselage when finished. Two layers of cloth with an extra coat of resin were used, and this gave a thickness of 1/32" after smoothing with a rasp, and 320 wet or dry sandpaper. Now gouge out the balsa form and you've got an almost indestructible cowl. Mount it temporarily to the firewall and cover the nose section with 1/32" sheet in order to bring it up to the thickness of the fiberglass and to simulate the full-scale metal cowl.

Begin construction of the wing by cutting out all the wing ribs including the two 1/8" pine or ply inboard ones. Slip these ribs onto the two spars, being sure to leave at least 1/4" extension, but do not cement. Shape the trailing edge or use a standard piece of tapered stock and pin to plan. Cement the ribs to the trailing edge and spars. Note that the two inboard ribs must be glued on at a 3 degree angle as this coupled with the 2 degree slant-in of the cabin results in the correct amount of dihedral. Cement the leading edge tips and the nose ribs in place. While the diagonals are a little extra work, they really make a wing warp resistant. Sheet the leading edge and when dry shape the leading edge and tips.

Now add the four plywood blocks to which the wing struts will connect. Bend the wire U hooks and bind and cement to the spars. Repeat this construction procedure for the right wing except remember to make a right panel and not a second left one.

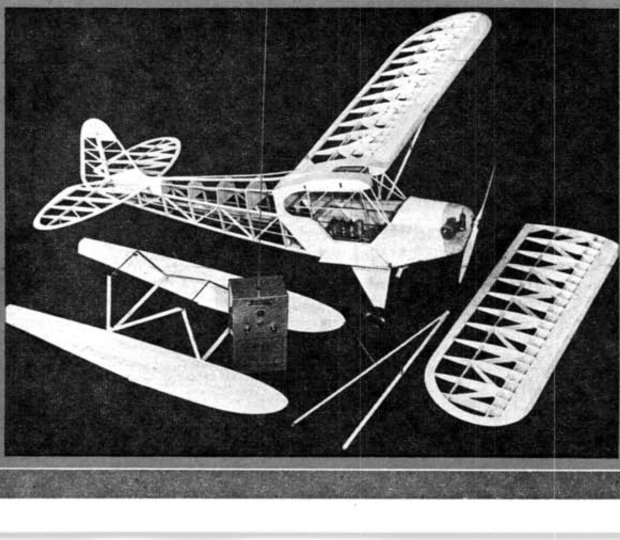
Our Cub used pine originally for wing struts, but after the first fifty or so flights they were replaced with maple.

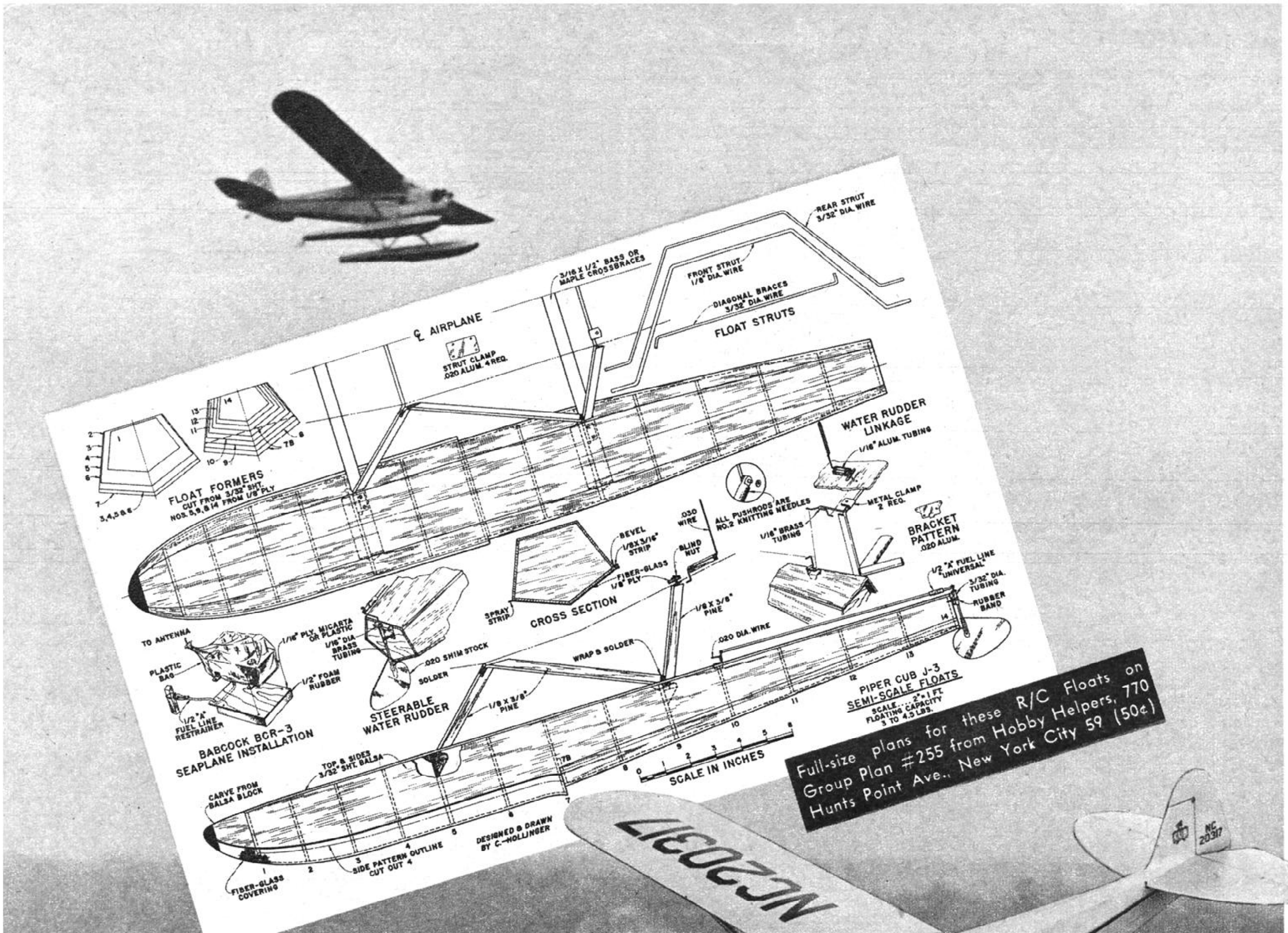
Additional building details are available on the full-size plans.



Receiver installation is neat; Bonner compound escapement used with Babcock BCR-3 receiver. Chuck ran antenna through one wing panel, but thinks fin connection best.

Full-size plans for the Piper Cub are a part of Group Plan #155 available from Hobby Helpers, 770 Hunts Point Avenue, New York 59, N. Y. (50¢)





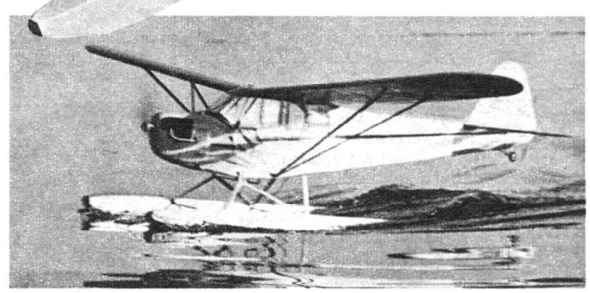
Semi-Scale Floats
FOR R/C MODELS

By CHUCK HOLLINGER

■ What say we go for a short hop in the Cub before discussing seaplanes? Here, you take the transmitter and I'll have the motor going in a jiffy. There she starts! Give three beeps and it will drop to idling speed. Now I'll set the Cub in the water and you taxi her out to that clear spot—see how nicely she controls with that water rudder operating? Check the wind. All clear? Okay, give three beeps and there she goes! Look at the wake . . . there, now, it's much smoother because it's on the step . . . another fifty feet and she's off! How about a 180 deg. turn now and cut the motor back to low speed for a power-on landing. Here she comes taxiing up to the beach—now three more beeps, hold, and there the motor has stopped.

This is only a sample of the fun that is in store for you with an R/C seaplane. Looked easy, didn't it? Well, a lot of work and a good many dunkings preceded this flight.

Here, for instance, is a short, sweet history of some of the things tried. First off, two stationary rudders were mounted for scale appearance. Result—no control over direction on the water as the air rudder wasn't effective enough. No take-offs. Next we tried to make one water rudder steerable using pulleys and Nylon thread. This didn't work because the Nylon had too much stretch, so a pushrod (*Continued on page* 66)



For plans of Chuck's J-3 Cub see the previous issue. Floats can also be used for free flight; can be scaled 40% of any wingspan.

Semi-Scale Floats

(*Continued from page 64*)

system was devised using aluminum tubing. This functioned perfectly on the bench, but with the motor running it created so much static that the receiver was unreliable.

The solution to that was to substitute plastic knitting needles as pushrods. Now the steering both at low speed and high was licked, but try as we might she still liked the water too well and wouldn't get off. In the process, however, we soon learned that water can really chew up the tips of a prop so now we fiberglass them, resulting in a practically indestructible propeller and one that has more fly wheel action, which means increased reliability on low speed.

A hook (slight droop) was added to the step of the floats. This resulted in quite an improvement, but still no take-offs. The only thing to do then was to move the steps forward one inch from their present location. But in the rush we didn't bother to build up the hooks as we were *sure* it would make it now! Well, it didn't. Another thing learned, however, was that water was getting into the cabin, so as a protection for the receiver we enclosed it in a small plastic bag and applied rubber cement around the plug to make the radio unit absolutely waterproof.

While it didn't quite take off on those last tries we noticed that it apparently had enough flying speed but there was just too much suction. Back to the shop and the "hooks" were added again. This time she made it after a run of about 150 feet! Since then we have experimented with the angle of floats relative to the fuselage, and with about a 2 deg. angle she now consistently takes off in about 100 feet. This could be shortened even further if we wished to sacrifice its landing characteristics by putting them at 0 deg. angle. This would be okay for an R/C job with elevator control to level her off on the approach. One inch has been added to the aft end of the floats for increased buoyancy.

Now for the construction. Let's start by cutting out of 3/32" sheet the formers for both floats and mark their centers with a light pencil. Formers number 5, 9, and 14 are to be cut from 1/8" ply. Cut out tops of floats from 3/32" sheet and mark a light line down the center. Cement formers in their respective places. Cut out sides to the outline shape as shown on the drawing, bevel the top edges and cement them in place. It is recommended that Weldwood glue be used for attaching the sides and bottom. Cover the bottom of the floats from former No. 3 forward, with the grain of the sheet running crosswise. Cut nose blocks to shape and cement to the No. 1 former. Carve and sand to final shape.

The two cross struts that connect the floats together should be made from maple or basswood (not pine). Cut slots in sides of floats and slip through these struts, cementing with Weldwood glue. Note: allow 5/32" clearance for metal brackets which are to be added later. Add triangular hard balsa or pine reinforcements. Cover the remaining bottoms with 3/32" sheet balsa, running the grain lengthwise of the floats. Cover the top, sides, and bottom with Silkspan. It isn't necessary to cover the bottom from the step forward.

Cement soft balsa strips 1/8" x 3/16" along the sides from step forward to act as form for the fiberglass spray strip. Now fiberglass the bottoms of both floats from the step forward to the nose. Bend the wire float struts to exact size as this determines their angle relative to the fuselage. Cut out metal brackets and bend them around the wire. Cut small holes in tops of floats, screw on brackets, and slip wire in place. Replace cutouts. Bend diagonal braces to shape, wrap and solder to struts. Cut and sand the strut fairings to shape and cement to wire. Give the floats two coats of clear and four of aluminum fuel-proof dope, sanding lightly between coats.

Drawings show how to construct the mechanism for operating the water rudder. This linkage set-up is designed to operate from a Bonner compound escapement, so if you are using a different escapement it may be necessary to revise slightly. Mount the floats to the fuselage using rubber bands to connect the front struts and two 4-40 machine screws to attach the rear ones. Be sure to ground your radio circuit to one of the blind nuts that anchor the rear struts. Check the unit for smoothness of operation and then again with the motor running.

Incidentally, you will need a block of wood approximately an inch thick to which mount two sponge-rubber pads spaced the width of the floats apart. This serves as a stand which sets under the aft end of the floats to protect the water rudder while you are running the motor on the ground.

Now you are ready for the taxi tests. With the motor running at low speed set the model in the water and check to see if it taxies in a straight line with the rudder neutral. If not bring it back and adjust the rudder. A 10 deg. deflection left and right of center seems to be a reasonable compromise for the Cub as any more than this makes it too tricky at high speed, and any less means inadequate control at low speed.

We recommend that you use a propeller of nine-inch diameter and four-inch pitch under rough water conditions, and a 10/4 prop for smooth water.

The floats as drawn are easily adaptable to any R/C designs with wingspans of 4½ to 7 ft. and flying weight between 3 and 4½ lbs. They could support even more, say 5 lbs. total weight if your model had elevator control, which means that the floats could be shifted aft one inch. This change will require that the model be "flown" off the water by rocking onto the step and then a touch of up elevator as per full scale.

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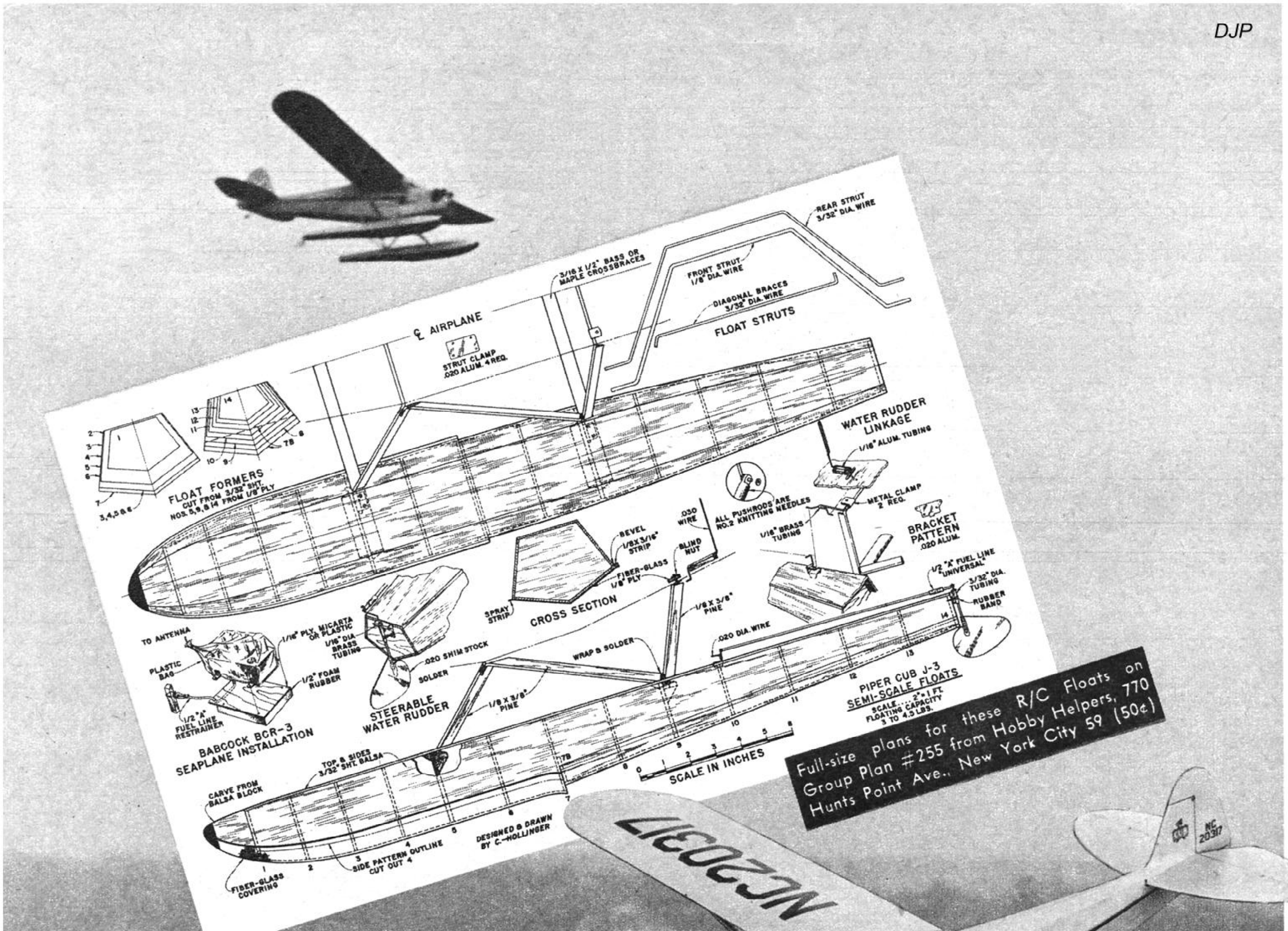
While all the discussion has pertained to R/C, these floats could easily be used for free flight as well. Since their wing loading is generally much less, and coupled with a higher power loading, a F/F will take-off much more quickly. Locate the step in the same manner, however, and use two stationary water rudders.

DJP



Full-size plans for these R/C Floats on Group Plan #255 from Hobby Helpers, 770 Hunts Point Ave., New York City 59 (50¢)

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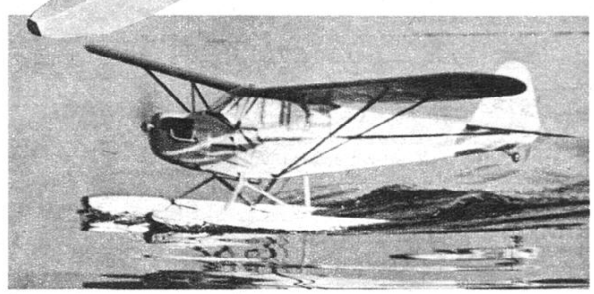

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