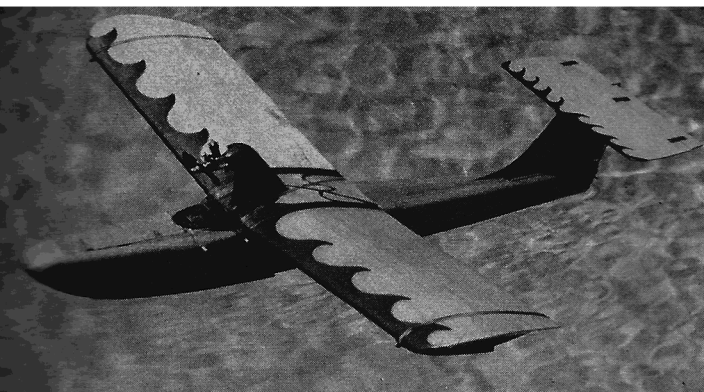




This little seaplane is equally at home on land or water and can provide the best sport or fun flying that you have had in a long time.



Above, slow and easy in the glide, just about ready to set down in the water and will hardly raise a ripple. In photo below, we see plane just about ready to set down and again, hardly a ripple will be raised.



LI'L SWELL

By KEN WILLARD

THIS LITTLE BIRD CAN NEVER LOSE ITS FLYING AREA TO HOUSES, ROADS, ETC. PONDS, LAKE AND STREAMS WILL SUFFICE.

► Did you ever have this happen to you? You finish your latest dream job, wait impatiently for the finish to dry, check out the radio, and hi-tail it out to your favorite testing field—only to find it all laid out with streets and foundations for a housing development! Gone forever is that cushion of tall grass and weeds that forgives your adjustment errors and lets your model live through that first spiral.

Well, there's another medium that is also very forgiving—water. (Ed: I'm not sure that forgiving part is so when we spiral into water!) And most of the lakes, lagoons, and reservoirs are not likely to be converted into built up areas—although I understand it happened in Florida once.

So try a seaplane design for a change. One of the advantages is that after you've checked it and flying right, you can always fly it over grass—either by skidding it in on the hull for a landing, or by adding a strap-on landing gear.

The size which you select for a seaplane design depends on several factors. You have to decide which ones are most important. Big jobs handle rougher water, but they need more room. Little jobs, on the other hand, can't carry the equipment for multi control, so you have to have a boat to retrieve them, since you can't taxi them to shore after landing. But this is not too

much of a drawback; to be safe you have a boat for the big job too. You're going to dump it into the water sooner or later anyway. We all do.

So, for you modelers who have a small lake or reservoir nearby—or for that vacation at your favorite lake (when the car is so full of the family “junk” that you don't have room for a big model) here's the Li'l Swell, an .020 job that will give you some real kicks.

You might be interested to know that four versions were tried before settling on the one in the plans. They all used the same hull, but the difference in flight characteristics and water handling was unusual.

The first version was a pusher. Although it worked, it was too sensitive to balance—especially in the transition from power-on to power-off flight trim. Also, the pusher arrangement tended to make the engine overheat, and the power would sag.

The next version had the engine in back of the wing, but in tractor arrangement. This gave plenty of power, and again was even more sensitive to the thrust adjustment. Although these two designs had the advantage of protecting the engine and propeller from the bow wave spray on takeoff, they were discarded because of the tricky flight adjustment.

Next a conventional tractor, with the engine on a pylon above the wing, was set up. It flew very well, but water takeoffs were marginal at best. The hull needed a longer nose, and the step was too far back.

Rather than make a new hull, since the moment arm was ample between the wing and tail, I relocated the wing aft, re-balanced the model, and tried it again. The difference in water handling was immediately apparent. Takeoffs were excellent, and landings smooth. And although the model is perhaps a little short coupled, it handles unusually well in the air. So that's the final version you see in the plans.

Here are a few construction hints.

WING: Construction is conventional, and the choice is yours. In my prototype I used a Schoolboy wing with a 3½" center section added. It's rugged, light, and quickly built. You can make a regular rib and spar wing if you prefer, or for that matter a single surface wing from 3/32" flat stock and ribs to provide the undercamber. The only caution is that the wing must be sealed so water doesn't get inside the structure. Some designers advocate dopping the structure inside and out, and putting pinholes in the surface at the trailing edge to drain water. I prefer to seal the water out to begin with. It's less work.

Wing floats are carved from lightweight balsa blocks; 1/16" dowels, about 1" long, are inserted front and rear, and the tip float is strapped to wing with rubber bands. If you can't find 1/16" dowel, the wood shaft on “Q-tips” works fine.

Pylon is cut from ¼" hard balsa. Bottom is butt-glued to the top of the center section. If you've carefully tailored the curve to fit the wing, and double glue the joint, it will hold through any normal flight or handling load.

The streamline cheeks behind the engine are shaped from basswood or white pine. Then you can mount the engine by using two small wood screws. Maybe it isn't conventional, but it works.

EMPENNAGE: Vertical fin and rudder are cut from 3/32" stock; hinges are either cloth or nylon. Fin is butt-glued to the top of hull, with ⅛" sq. braces alongside. For neat appearance, outside corner of the braces can be cut away and sanded so the braces fair into hull and fin

Stab, of 1/16" flat stock, is butt-glued to the top of the fin, with ⅛"sq. braces alongside, just as at the fin-hull joint. Elevator is hinged with cloth or nylon and rests on the extensions to the fin braces, which can be shaved away slightly if small elevator droop is desired. If model is nose heavy, however, don't shim the elevator up; that will cause a strong swooping tendency in power flight. Instead, add a little weight to the tail.

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HULL: Construction is simple in concept, but the sloping sides and V-bottom require some care in setting up the alignment. You probably have your own method of setting up a “jig and fixture” arrangement, so all I'll describe is the way I did it on the prototype. I call it the “eyeball” alignment.

Cut out hull sides, bulkheads and keel. Next cut, from ¼" flat stock, the top “longerons.” Actually, they are not needed for strength, and if you're not interested in having the rounded contour you can leave them out in building the hull. (If you do, don't make cutouts in bulkheads to match them). Note that you have to cut the ¼" stock at an angle approximately equal to the slope of the hull sides. You can sand it to fit accurately later, if necessary. Also since longerons are mainly there to provide a base for rounding the corners and improving the appearance, they can be cut from medium soft balsa.

Glue the longerons in place, then glue the bulkheads at the leading and trailing edge locations to one hull side which is laid flat on your working table. When dry, glue the other side of the hull to the bulkheads—and here's where you have to “eyeball” the sides to be sure they are parallel from nose to tail. One way to do it is to pin and glue the side to the bulkheads, line the two sides up, then turn the hull upside down so the tops of the two sides rest on your table. Since the tops are straight lines, they should both rest on the table from nose to tail. Let the structure dry thoroughly in this position.

Next, glue the keel in the slots. Then, when you pinch the nose together to glue in the noseblock, and similarly the tail, you can sight along the keel, keep it straight, and be assured that the curvature of the sides is equal.

That's the tough part. The rest of the hull construction goes together easily—but be sure to follow the standard method of installing the escapement and torque rods before closing up the hull top and bottom.

Since the hull is comparatively wide, there's ample room for conventional escapements, although some cutting and fitting is required if you want to use a Bonner with kickup. I've shown the Babcock escapement mounting which I used. The blocks, glued to the sides, with slots cut out to receive the backplate of the escapement, are cut from medium hard balsa. Similar mounting arrangements are easily devised for other standard escapements.

After escapement and torque rods are

installed, and the wing dowels glued in, the top and bottom sheeting can be glued in place, and the corners at the top of the hull sides rounded. Don't round them under the wing, between the mounting dowels. Fair the curve in from there.

Wait until you've finished and doped the hull before cutting out the access hatch. This will prevent it from curling. The 1/16" flat balsa mounting pads for the hatch can be glued in place after the dope job is done and the hatch cut out. This will help assure a snug fit.

RADIO INSTALLATION: I merely solder the two E-91 cells together in series, bind them together with masking tape, rubber band the receiver to the batteries with a ⅛" layer of foam plastic between, wrap the whole bit in Saran Wrap to keep water out, and pack it in the compartment. Packing can be varied by adding foam plastic ahead of or behind the receiver to move it forward or backward as required for balance.

For a switch, I cut the positive lead from the batteries to the receiver, run the cut ends through holes in the hatch, then use a small plug and socket connection, cannibalized from an old Winchester connector. Wires are glued into the holes in the hatch to make it waterproof. Same with the antenna.

FINISHING: Standard finishing—either dope or Hobbypoxy according to taste—is all that is required. But—and this is important—every joint must be completely sealed to keep water from seeping inside the structure. And wherever there are openings, such as at the tail where torque rods come out, the fit should be as close as possible without binding. Then if you apply a little cooking fat, like Spry or Crisco, around the hole, it helps to shed water. To some extent it also serves as a lubricant.

Plug for escapement rubber hook at the back should “wedge fit” the hole to be as watertight as possible. You'd be surprised how water can find its way through the smallest opening.

Before flying from the water, all systems should be carefully checked out, batteries up, receiver tuned, then the hatch can be taped in place with waterproof tape. I find that Scotch tape will hold very well for a full day's flying. Be sure the surfaces of the hatch and hull are clean and dry, with no fuel or oil from the engine spattered on them, or the tape will refuse to stick.

Now your hull is all closed up and you're ready for some water flying.

FLYING: Li'l Swell is small enough to use the usual methods of glide tests and adjustments that we've always used for free flight sport models, but my recommendation to you is simple; just fly it! But before you do, make sure of three things:

1. You've sealed the hatch and made all necessary openings water resistant, but controls move freely.
2. You've checked the alignment and there are no warps.
3. CG is properly located.

Once these are checked out, go out on the water in your boat, so that if the model swerves on takeoff it doesn't just turn and run into the shore before you have it under control.

Fire up the engine, turn on receiver, set model on the water, and let go. Torque may cause left wing to dip, and the tip float drag will make the model turn. Apply right rudder, and as model gathers speed rudder action will break the tip float free. Let up on the rudder right away or the right wing will drop. By now the model

will be on the step, ready to take-off—and all you have to do is let it.

Of course, all this assumes everything is in good adjustment. What if that isn't true? Well, so many things could happen that it would be impossible to discuss them all. But the beauty of it all is that if the model doesn't take off, it'll either capsize or run out of fuel (unless it runs into the shore or the boat), and if it does take off, but swoops out of control, it'll dunk. And the only thing that gets hurt is your pride!

I'll assume that you've flown enough that, if the model takes off all right, and then swoops or turns badly, you know how to correct the flight trim with rudder, engine offset, elevator trim, or rebalancing. That's all been written up many times before.

If, however, you can't get the model to take off water, then hand-launch it over the water, trim it with a couple of flights until you've got good flight characteristics. Then try another water take-off. You'll find that when the model flies correctly, it'll take-off correctly, unaided except for that first torque correction.

For all around flying fun, you'll find it hard to beat the Li'l Swell, a quiet lake, and a calm evening at your vacation spot.