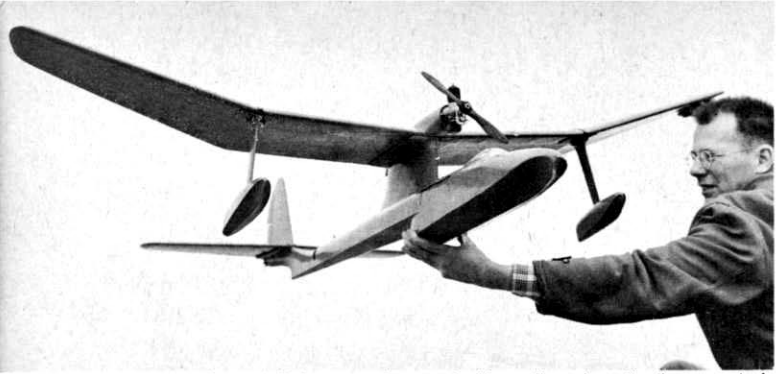

The NACA-type planing hull shows to advantage in this excellent photo. Tip floats are shock mounted; slight polyhedral in wing reduces float strut length. High thrustline makes good power flight.

SEA CAT

by HENRY STRUCK

▼

If you live near water you do not have a flying site problem. This RC or free flight amphib a beautiful flier.

▸ Are you looking for a mile square, level flying site? Well, there are plenty of them around, and no permits are required for their use. Of course, there are a few minor discomforts you must endure, such as spending days out in the warm sun, away from crowds, poison ivy covered trees, rocky fields and housing developments.

All of which is just one way of saying that you haven't really enjoyed model flying until you have tried flying boats.

To participate in this ultimate in sport, we present the Sea Cat, developed through the years. The original configuration of hull and engine in pylon mounted wing was built and flown 'way back in 1941, with its water characteristics revealing the ignorance of its designer.

However, in the air, it promised much. When in 1945 the NACA planing tail hull designs were developed, the basis of a really high performance flying boat became available. These long, narrow, deep draft hulls, besides offering greatly reduced air drag, maintain an almost constant trim angle throughout the take-off run, eliminating the necessity of rocking up on the step. Further, with the long tail of the hull in the water until sufficient air speed for control is reached, the tendency to yaw off course is reduced, and with two point planing, porpoising is eliminated.

With these fine hull designs available, the next real problem was lateral stability on the water. Sponsons projecting from the hull seemed to be the immediate answer, but their small righting moment necessitated extreme large size. An added disadvantage was their rigid attachment to the hull. So we came to the old reliable "tip float," which was not

Years of research and development went into development of a design with excellent ROW characteristics. Model weighs 64 oz., gets off in 50 ft.

practical at the tip because of the large amount of dihedral a free flight flying boat would require.

The compromise arrived at on the Sea Cat is to use very little center dihedral. The rubber shock-mounted method developed makes the float assemblies virtually unbreakable and also permits them to be removed easily for land plane flying.

When a bid came from the sponsors of the Plymouth Model Plane Contests to design a plane to fly from the U.S. to Canada to advertise their annual (*Continued on page 23*)

PLANS CONTINUED ON NEXT PAGE

For land plane use, a sheet metal gear straps in place. Plane lands smoothly on grass without nosing-over. Has great spiral stability.

Sea Cat

(*Continued from page 21*)

meet, one more design change was necessary—to install radio gear! This had to be easily accessible and sealed from the water. Our first attempt wasn't. When the ship failed to take off on its first flight, salt water poured in through the carefully fitted hatch and instantly ruined one RC installation. A foam rubber gasket was put around the hatch and since then no ducking has harmed the RC gear.

On the day of the International flight the wind, of course, swept through from Canada. Late in the day the attempt had to be made. To make certain the engine wouldn't cut out part way across while bucking the wind, we filled the pressure tank to capacity. In about four minutes the ship was across the water, and over the landing spot.

But the engine was still running, the ship climbing, and just barely holding against the strong wind! Ten minutes later, after several spin-downs and consequent loss of headway, the engine stopped, with the model far inland over Canada. After many tense minutes we brought the speck back into plain view and seemed to be coming in for a successful landing in a small cove. It was not to be, however, for we ran out of altitude and smacked into a large tree near the shore. But the first International radio controlled flight was accomplished.

Since then the Sea Cat has been flown many times, both from the water and land, in free flight and under radio control. Landings on grassy fields revealed an unexpected benefit as the ship slides smoothly into a landing without any of the usual nosing-over tendencies. In the air, turns can be made easily with little tendency to spiral dive even with rudder held over for a complete turn, while stall recovery is extremely gentle. These smooth handling characteristics have enabled us to win several places in competition against more conventional contest type radio control craft.

Construction is quite simple considering the advanced design of the model. Cut out the hull former halves of 1/8 sheet and cement at center line, reinforcing with 1/4 sq. stiffeners. Note the 1/2 dia. holes in formers 5 to 10 to accommodate paper tube escapement rubber guide. Cut fuselage sides from 1/8 sheet and mark position of formers. Attach bottom planks, moistening outside of forward planks to form sheets into concave section at bow. Bevel edges of top and side planks and add 1/4 corner plank. Reinforce side of tail boom with sheet applied with grain diagonal.

Cut upper and lower tail boom sections from 9/16 thick balsa. Join sections with 3/16 x 1/4 strips to form passageway for control rod. Fit tail boom assembly in hull. Cement balsa blocks to nose and shape to blend with contours of hull. In sanding down the hull keep corners of bottom sharp to induce water to break from surfaces while ship is planing.

Shape the hatches of soft balsa, 1/2 thick. Fit hatches carefully, beveling edges to provide a good seat on gaskets.

The wing and tail are of rugged construction. Assemble the wing panels on the plan. Join the tip panels to the inboard panels. Note that filler blocks are fitted between the spars at dihedral break to keep wing watertight after drilling for tip float attachment rubber. Join the wing halves at center with gussets, blocking up tips to the correct dihedral while drying.

Cut firewall from 3/16 plywood and drill for engine mounting bolts. Insert bolts from rear of firewall and anchor with bent pins soldered into heads of screws. Shape nacelle from medium balsa block and fit between (*Continued on page 41*)

(*Continued from page 23*)

center ribs. Cement firewall to front of nacelle and reinforce with fabric strip doped in place. Fill in bottom of wing with sheet balsa at outboard dihedral break to support tip float assembly. Drill 1/4 hole through spar for float attachment rubberbands. Drill hole in leading edge and install 1/8 dowel to receive bands after they have been pulled through holes in spar. The stabilizer is similar in construction to the wing. Assemble fin and hinge trim tab with soft wire. Hinge the rudder control tab and check for free operation. Cement fin assembly to stabilizer.

Assemble the tip floats, joining sides with formers as in the construction of the hull. Add bottom and top planks, soft balsa blocks to each end, and shape to finished contours. Cut through top and insert struts of hard balsa. Fit platforms to upper ends of struts to match dihedral angle reinforcing joint with corner blocks. Apply several coats of cement and fit fillets of 1/16 sheet balsa. Experience proved this rugged attachment to be necessary, with extremely high loads imposed on the strut root in spite of rubber shock mounting.

Sand the entire framework to remove all bumps that may show through the covering. Apply a coat of dope to the entire structure to prime the surfaces. Cover with silk, applied wet, to all surfaces, including those of sheet balsa. Brush on at least three coats of butyrate dope, to be sure the surfaces are completely sealed.

Hardwood spray strips may be cemented to the corners of the hull to provide the sharp chines essential to break the water cleanly from the bottom. These also protect the hull and can be easily replaced if damaged.

Install the forward control rod bearing in former in escapement compartment. Form forward end of control rod and spring through passageway in tail boom. Add rear bearing and form crank in end of shaft. Mount escapement on 1/8 plywood, reinforcing with corner blocks. Assemble receiver chassis and mount components. Lash hatches in place with rubberbands and test for leaks by submerging hull, increasing tension of bands if any water should find its way into the hull. Drop the escapement rubber through the tube in the hull and install receiver chassis in the radio compartment. Attach the stabilizer with rubberbands pulled through hole in boom and hooked at rear on dowel. Make a wire hook to facilitate pulling rubberbands through holes in nacelle and tail boom.

In flying the Sea Cat a few simple rules of procedure should be observed. Although the ship can be flown from the shore, a small power boat is desirable, since then the wind need not be "on shore" for take-offs and, should trouble develop in the equipment, the model can be quickly recovered. For take-off, the ship should be launched directly into the wind, with the transmitter handy to give a quick beep if the ship should veer from a straight course in windy weather. The weight of the model necessitates about a 50-ft. run to become airborne, affording a most realistic sight. The ship has taken off many times as a free flight, unassisted by radio control. Should the model seem reluctant to leave the water, slip a shim under the trailing edge of the stabilizer to increase the negative incidence.

The original ship, finished with colored butyrate dope, weighed 64 oz. For contest work, from hard-surfaced runways, a sheet aluminum landing gear strapped to the hull affords beautiful take-offs. For the experimentally inclined modeler, we feel the basic configuration of the Sea Cat, high thrustline, low center of resistance and moderate polyhedral, can be developed into exceptionally performing free flight as well as radio control designs operating from land or water.

END