

# SHARK FLYING BOAT

*Below, the distinctive lines of the Shark are sure to attract attention on the water circuit.*

*Bottom, Sharks unmistakable power pod.*



*If you fancy joining your water based counterparts, the Shark could be an ideal first model. Built for .20-.25 engines. Designer Stephen Lough show you the way.*

**T**his flying boat was built after my first visit to Keilder Water where I was flying sports models fitted with floats. Whilst looking around the models present, I realised there were very few flying boats and those that were there were not particularly successful.





# SHARK FLYING BOAT

On returning home, I got pencil and paper and started reading about hull design. Eventually this resulted in a quarter scale sketch of the model presented here.

First attempts at R.O.W. with tip floats made from block balsa were unsuccessful since they were too small. On that occasion, I removed the tip floats and had the machine hand launched by a friend. It did fly but at the expense of full up trim! Back home I increased the engine up thrust from two degrees to five degrees and made larger tip floats from foam as shown on the plan. The next flight was a very different story. Taxiing was no problem — even cross wind — and she was planing on the step within a couple of feet.

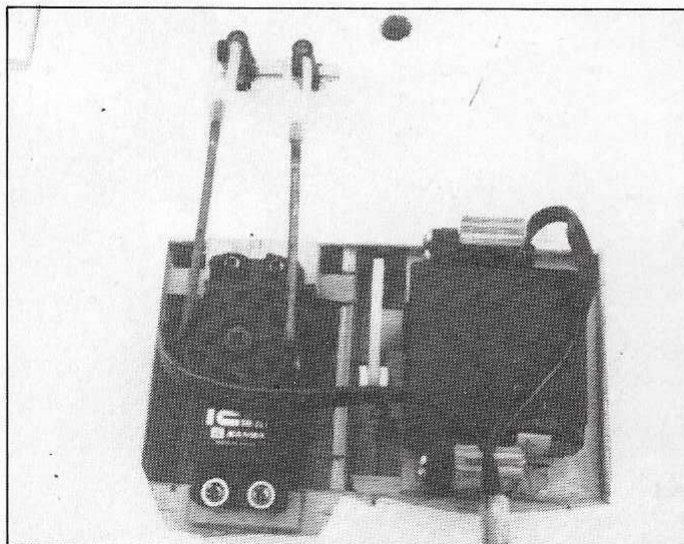
I have taken off in every conceivable direction in relation to the wind including a down wind take off at Keilder Water in a 10-15 mph wind. Although the run was a bit long-winded(!) she came unstuck with no problem.

## Construction

Use waterproof or water resistant glue throughout!

**Fuselage, fin and tailplane.** This is a simple balsa box construction using medium  $\frac{1}{8}$  inch balsa sides cut as shown. All formers, including the  $\frac{1}{8}$  inch ply ones should be cut as shown. Join the fuselage sides together using F4 and F5 (these being of equal width) using epoxy. The back end can now be pulled together and glued. F2 and F3 are pinned in place without glue and F1 is then epoxied in. It might be necessary to dampen the wood to get it to bend with equal curvature on both sides. Add all other formers when dry. Next add the bottom  $\frac{1}{16}$  inch hard sheet (cross grained). glue the  $\frac{1}{4}$  inch sheet keel formers on the centre line after the formers for the 'V' bottom have been added (F1a, F5a and F5b, F7a and F7b). The  $\frac{1}{16}$  inch hard balsa sheet can now be glued in place — use medium hard behind the step. Now epoxy the  $\frac{1}{32}$  inch ply hull bottom on top of this. Glue the front  $\frac{1}{2}$  inch triangular balsa in place followed by the top  $\frac{3}{8}$  inch sheet front. Shape the windscreen but do not glue in place yet.

Glue the rear  $\frac{3}{32}$  inch sheet windscreen in place and the  $\frac{3}{32}$  inch tail plane seating. Make the tailplane, fin and rudder from light  $\frac{1}{4}$  inch sheet balsa. These units have to be made and covered before fixing to the fuselage (unless you have a very small iron!). Glue the  $\frac{1}{8}$  inch balsa wing seating doublers between F4 and F6 and add a small scrap piece on the fuselage above F4. File grooves either side of fin leading edge and epoxy the snake outers. Complete the top  $\frac{3}{32}$  sheeting, add



the noseblock and sand all corners smooth. Glue in the  $\frac{1}{4}$  inch ply wing bolt plate noting the cut out for the aileron torque rods in the port side. Use cyano to glue the  $\frac{1}{4}$  inch triangular spray rails, bending gently as you go!

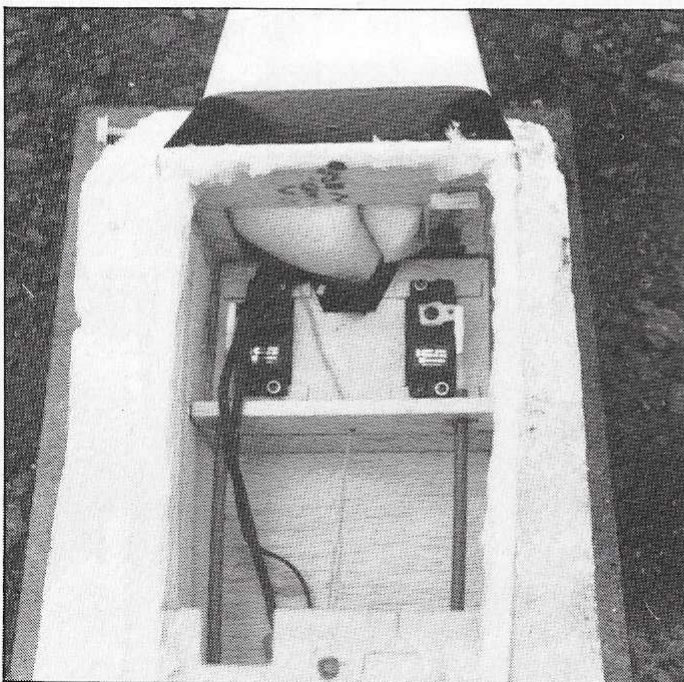
## Wing

the wing is built with a flat bottom from the bottom spar for ease of building but ends up as a semi-symmetrical section when fully assembled. All ribs are  $\frac{1}{16}$  balsa. The main

*Top: The smooth, sleek lines of the shark show her to be as happy in the water as her 'real-life' namesake.*

*Above: The Aileron and throttle servos mounted side-by-side in the wing.*

*Below: Radio installation in the hull — Note switch position.*



difference on this wing is the hardwood blocks for the engine pod location. Note how the point where the pod fixes is parallel to the pod base. Pod supports are made from 2mm Dural secured with  $\frac{1}{2}$  inch self tapping screws. The pod is a simple ply and balsa box (note five degrees upthrust built in).

Back to the wing now and the bottom  $\frac{1}{4}$  inch x  $\frac{5}{8}$  inch trailing edge. All ribs except the centre ones are glued in followed by the top spars and leading edge. The wings are now joined using the braces as shown. Add the  $\frac{1}{8}$  inch x  $\frac{1}{2}$  inch spruce rear block support, centre ribs and all hardwood blocks. When dry, sand the l.e. to the section shown. Pin one panel on the board supporting the raised one. Glue all webbing, top sheeting and capping strips and repeat for the other side. When completely dry, remove from the board and add bottom sheet and capping strips. (Note no washout). Make the aileron torque rods, recess the trailing edge and glue on as shown. Make the ailerons, glue on wing tips and sand to shape. Using two pieces of  $\frac{1}{16}$  inch ply sandwiched together, epoxy in place on the l.e. centre using the fuselage with polythene between the wing and F4 to make sure it sits flat to F4. When set, drill through F4 into the wing and on to the  $\frac{1}{8}$  inch ply brace for  $\frac{1}{4}$  inch wing dowel. Epoxy the wing dowel and also the  $\frac{1}{16}$  inch ply wing bolt plate on the wing to prevent the bolt crushing the balsa.

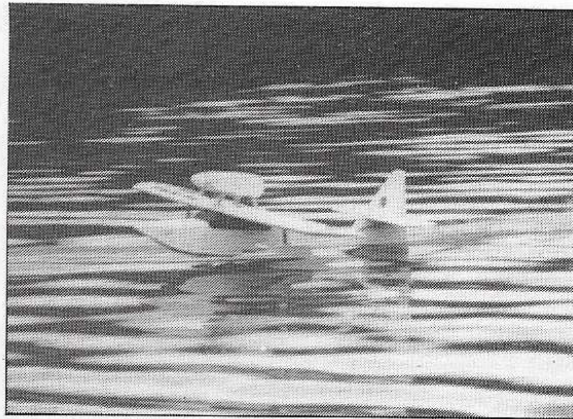
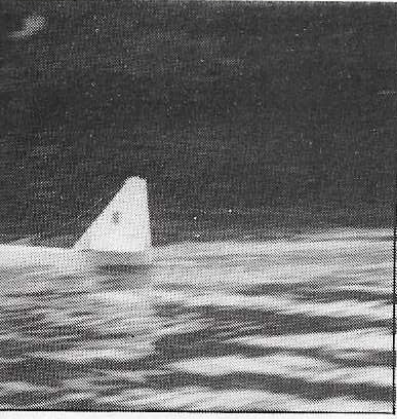
Drill through the wing into the  $\frac{1}{4}$  inch ply plate and insert a blind nut. Now glue the windscreen to the fuselage. Tip floats are sanded from polystyrene foam and sheeted top and bottom with  $\frac{1}{16}$  inch balsa with  $\frac{1}{2}$  inch square l.e. and are  $2\frac{3}{4}$  inches wide. A  $\frac{1}{4}$  inch x  $1\frac{1}{4}$  inch ply insert is let into the top of the floats. 2mm Dural is again used to attach them to the wing. Cover the floats with solarfilm and seal the edges with clear Solarlac.

## Engine Pod

Cut out the pod sides from  $\frac{1}{4}$  inch balsa, the base from  $\frac{1}{8}$  inch ply and the firewall from  $\frac{1}{4}$  inch ply. Epoxy



# SHARK FLYING BOAT



the pod sides together on the base and drill the firewall for the engine mount of your choice, throttle linkage and fuel tubing. Epoxy this in place and add a hollowed balsa rear block or use 1/4 inch sheet balsa. Mount the engine and build up the front of the pod with sheet and triangular balsa. Add the nosering, tack glue a 1/4 inch hatch and remove the engine before sanding to shape. Fit the pod onto the Dural supports so that it sits flat in relation to the wing. Mark and drill the blocks for 1/2 inch self tappers. Drill an access hole for the throttle snake. It is handy to mark the supports so that they are always replaced in the same way since they have to be removed while the pod is covered and fuel proofed. When the pod and the wing have been covered, refit the pod and install the throttle snake. A small amount of silicon sea-

ler is placed around the snake where it enters the wing and glued at the firewall end. Make sure the linkage moves freely.

## Radio

Make up a servo tray from 1/16 inch ply and fit where shown. The switch plate is also of 1/16 inch ply. Cut all snakes to length and glue to 1/4 inch balsa cross piece. The battery and receiver are fitted in balloons with the leads exiting through the neck which is sealed with rubber bands. Both battery and Rx are located under the windscreen. Should the model be tail heavy, move the batteries forward of F3. The aileron servo is mounted to the starboard side of the centre rib in the usual way and the throttle servo is mounted on a 1/8 inch ply plate with 1/4 inch ply blocks epoxied on. Throttle linkage is via Bowden

cable or loose fitting inner and outer snake. Aerial exits through a tube behind the wing.

## Covering

I used white Solarfilm all over and sealed the edges with clear Solarlac on the first model and this is still going strong after more than two years use. On the second model, I used the same method except I added a coat of SP113 epoxy resin on the front of the hull for durability on wet grass landings.

## Waterproofing

There is only the wing seating to protect and this is achieved with silicon bath sealant. Spread all around the wing seating and 'push/pull' switch wire, place polythene between wing and fuselage and leave overnight to dry.

## Engine Notes

An OS25 FSR and 9x6 prop was used on the prototypes and provided more than enough power. In both cases the engine was mounted on its side and fitted with an OS helicopter silencer as the pod mounts would have been in the way of a standard silencer. You could mount the engine upright but this would alter the throttle linkage and would not look as neat.

I think the Shark would also fly on a powerful .20c.i. engine on a 10x4 prop if your take off and landing paths are not too restricted. a .40c.i. engine could be fitted, I suppose, although I have never tried it.

The Shark will fly on rudder/elevator only but I like the ailerons as they enable the wings to be held level on take off and also make her more aerobatic.