

# ANDERSON



## KINGFISHER

**T**he prototype Anderson Kingfisher was designed and built by Earl Anderson (a Boeing 747 Captain). It took him nine years to complete, and he made the first flight in April 1969. Interestingly, standard Piper Cub wings are used; drawings for the full size aircraft are available, and there are probably around fifteen of the aircraft flying at the present time in various parts of the world. Richard Warner, of Warner Aviation (who sell the full size plans) was very helpful, supplying photos and drawings from which the model was built.

My model is built to 1/4 scale, weighs in at around 16 lbs., and is powered by a Super Tigre 90 2-stroke. The layout of the aircraft is unusual, the engine being forward of the wing, with the tractor propeller rotating in front of the windscreen. This not only serves to lower the Centre of Gravity, but brings it forward, reducing the need for the weight in the nose. However, the hull is more heavily built in the nose to further offset the need for the nose weight. Do try to keep the tail end light.

The model flies in a "Cub-like" fashion, as one might expect. If you

feel that you would like to build this unusual and versatile amphibian, I suggest that you start with the wings, then sort of graduate into the hull.

By Dennis Tapsfield



A 1/4 Scale  
reproduction of a  
beautiful amphibian.  
Flies in a "Cub-like"  
fashion.

### CONSTRUCTION

**Note:** Be sure to use a waterproof glue for building this model.

#### Wings:

Perhaps the first things to make should be the laminated wing tips. First decide on what material you intend to use and this will tell you the thickness of the completed tip, so that you can place a series of pins around what will be the **inside** of the tip. Using a waterproof white glue, join the laminations together and, while wet, gently wrap the tip around the pins, inserting pins on the outside as you go, and leave the whole thing to set. Make two. Cut the plywood root ribs and the centre section ribs. These should be drilled in a pack for the 1/2" dia. tubes at the same time as the wing root ribs to ensure the correct alignment. Be sure to allow for the dihedral angle in each of the ply root ribs on both wings, as they will have to be staggered for drilling.

When cutting the rest of the ribs from balsa, it is probably best to use a template cut from 1/16" ply to ensure consistency. The wing can be built over the plan in the usual way, but will have to be removed for sheeting, completing the spar tips, adding the



## ANDERSON KINGFISHER

Designed By:

Dennis Tapsfield

**TYPE AIRCRAFT**

Sport Amphibian (1/4 Scale)

**WINGSPAN**

108 Inches

**WING CHORD**

15 3/4 Inches

**TOTAL WING AREA**

1584 Sq. In.

**WING LOCATION**

High

**AIRFOIL**

Clark "Y"

**WING PLANFORM**

Constant Chord

**DIHEDRAL EACH TIP**

1 1/4 Inches

**OVERALL FUSELAGE LENGTH**

70 Inches

**RADIO COMPARTMENT SIZE**

Very Large

**STABILIZER SPAN**

31 1/2 Inches

**STABILIZER CHORD (incl. elev.)**

8 Inches (Avg.)

**STABILIZER AREA**

240 Sq. In.

**STAB AIRFOIL SECTION**

Flat

**STABILIZER LOCATION**

Mid T-Tail

**VERTICAL FIN HEIGHT**

13 1/4 Inches

**VERTICAL FIN WIDTH (incl. rud.)**

11 1/4 Inches (Avg.)

**REC. ENGINE SIZE**

.90 2-stroke/1.20 4-stroke

**FUEL TANK SIZE**

11 Oz.

**LANDING GEAR**

Plug In/Adjustable

**REC. NO. OF CHANNELS**

4

**CONTROL FUNCTIONS**

Rud., Elev., Throt., Ail.

**BASIC MATERIALS USED IN CONSTRUCTION**

Fuselage ..... Balsa & Ply

Wing ..... Balsa & Ply

Empennage ..... Balsa & Hardwood

**Wt. Ready To Fly** ..... 260 Oz.

(16 1/4 Lbs.)

**Wing Loading** ..... 23-24 Oz./Sq. Ft.

tips proper, and then the spar webbing. Make the strut brackets at this time so that the 1/4" ply fillers between the spars can be drilled together prior to gluing them in place.

Complete the wing to drawing, including servo installation and aileron hinges, but do not separate the aileron yet; just make sure that all is complete first.

### Tail:

We can now proceed to the fin and rudder, stabilizer and elevator. The tail unit is quite straightforward, and you should have no trouble here, except to say that the elevator horn must be silver soldered onto the brass tubular joiner prior to joining the elevators together. The tips are made in the same way as the wing tips. Note: Be sure to use very hard balsa for the spars as indicated, and don't forget to fit the hardwood blocks in the stabilizer for the strut screws. You can now cover the wings and the tail. I covered the wings, stabilizer, elevators, and rudder with Solarspan/Black Baron film on my model.

### Hull:

You will need to splice the hard 1/4" x 1/4" balsa longerons since even 48" will not be long enough. Pin the longerons down on the drawing. Note that the 1/4" x 1/4" is spruce under the centre section. Build the two sides complete, but leave out everything between the longerons forward of the front former. Make the forward box of 3/16" sheet balsa. Cut the 1/4" ply uprights for both formers, joining them with the 1/4" sheet cross pieces (make sure they are correctly positioned as they support the box). These are now used to join the two halves together, and the box is now glued in place perfectly central, in the correct fore and aft position. Allow everything to set at this stage.

Cut some 1/4" sheet 9/16" wide and, measuring from the drawing, mark the top of the box for the positions of

spaces 1 to 7. Measure the lengths from the plan view of the nose, and glue the spacers in place on top of the box. Do not forget to notch the top corners for the top longerons. It is also necessary to carefully slit the top and bottom longerons vertically with a balsa knife, back to spacer 4, to allow them to bend, and fill the slit with glue when gluing in place. Do a similar thing for the bottom spacers, except that each one is a different depth from the bottom of the box. Once again, measure the size from the drawing, and notch the bottom corners.

Once you have done this, and pulled the rear of the hull together with the ply former, the worst is over and you can now go on to complete the hull to the drawing. **Do not cover it yet!** Make the brackets for the centre wing section anchor nuts as shown, and fit in place. The centre section should now be made, and since you should already have the ribs cut and drilled, it's a simple procedure to build the base with front, back, and ribs glued and pinned in place. Do be sure that it sits nicely between front and rear formers in the hull, and that the wing joiners all line up correctly. The tricky bit is accurately drilling the holes for the four retaining bolts so that they all line up with the anchor nuts in the brackets.

The remainder is fairly straightforward with the engine thrust line being taken care of by the shape of the 1/4" side pieces. Don't forget the blocks for the bolts and the wing retaining pins, and temporarily fit the throttle servo with its cable, because it's easier to complete everything, and re-fit it last of all. The cowl is quite simple, just 1/32" ply wrapped around two formers, with the balsa front made by laminated 1/2" sheet. The fuel tank nestles inside the cowl, wrapped in foam, and rubber banded to the motor mount (I used an 11 oz. std. Kraft tank). Now, back to covering the hull. Use the balsa and ply as indicated, but leave the front deck and the top rear open to facilitate painting the inside to make it water resistant. (I used Clear Coat tinted with a little green so that I could see where I had been!) Also, install the Gold'N-Rod controls for the rudder and elevator, and the nylon tube for the radio antenna. The fin should be installed at this time to enable the control rods to be correctly positioned as they must both enter the fin and exit at the right place.

This is probably a good time to make the landing gear. Epoxy the square tube into the hull, and drill the solid aluminum blocks to suit the wire as drawn. Burr the ends of the vertical slots to retain the wire, then bend to the shape and lengths shown. Of

course, the landing gear on the full size aircraft is retractable, but as a concession to simplicity, the ones on this model are fixed in either the up or down position; the angles are arranged so that if the left wheel becomes the right, and vice versa for water operation, the gear moves effectively through about 100 degrees of rotation to clear the water, as on the full size aircraft.

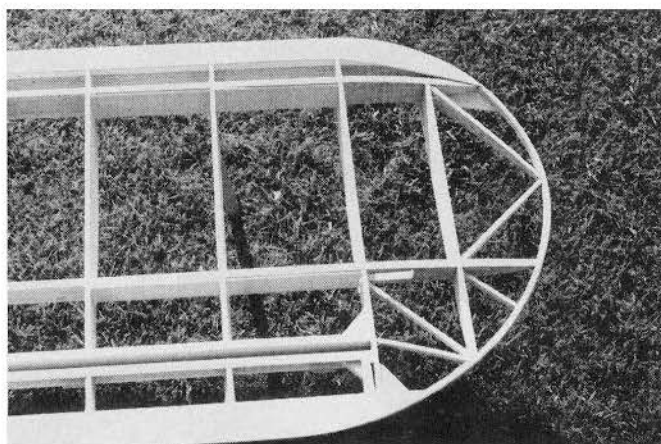
Make the tailwheel bracket from a piece of aluminum. This is a cut, file, and drill job which is not too difficult. Or, if you prefer, you can fabricate it from brass sheet and silver solder. Just remember, alloy is much lighter! Make sure that your four screws enter the ply former and not the ends of the longerons!

#### Tip Floats:

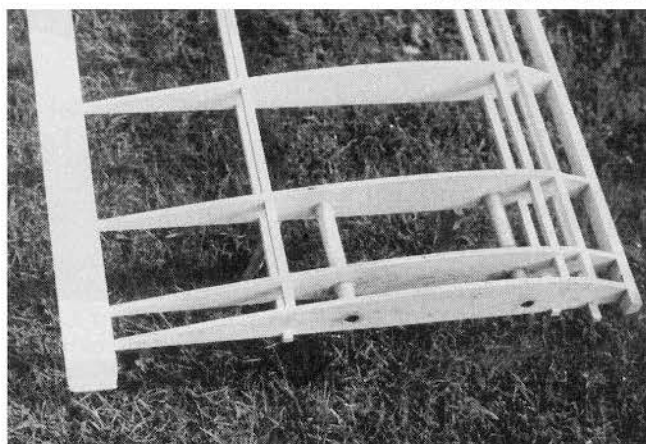
These are made from foam, using the hot wire method. First, cut out all



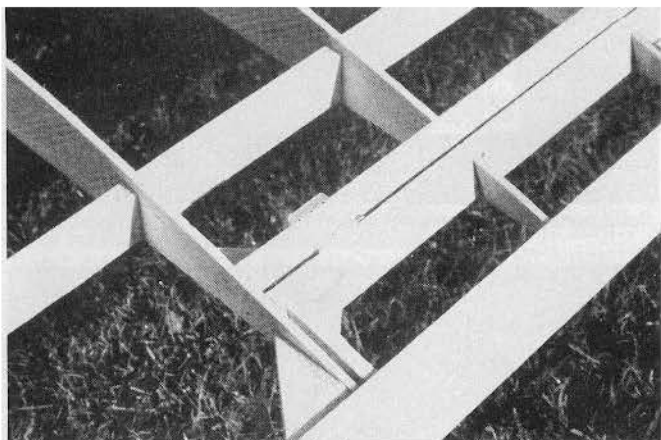
Photo by Barrie Burton.



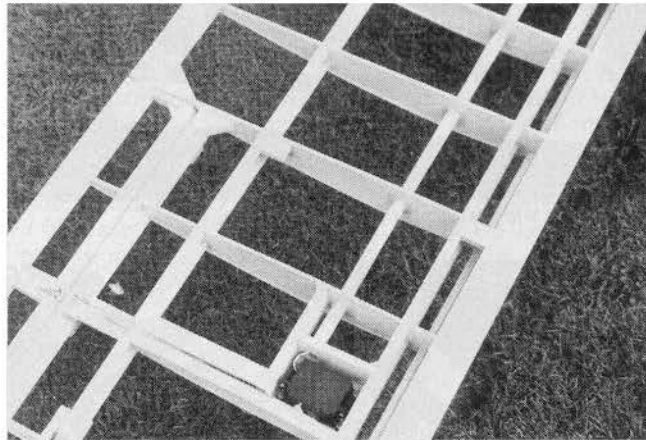
Well braced laminated wing tip.



Spars, ribs, leading and trailing edge pieces in place.



Aileron hinges are let flush, then covered by 1/16" sheet to produce hinge slot.



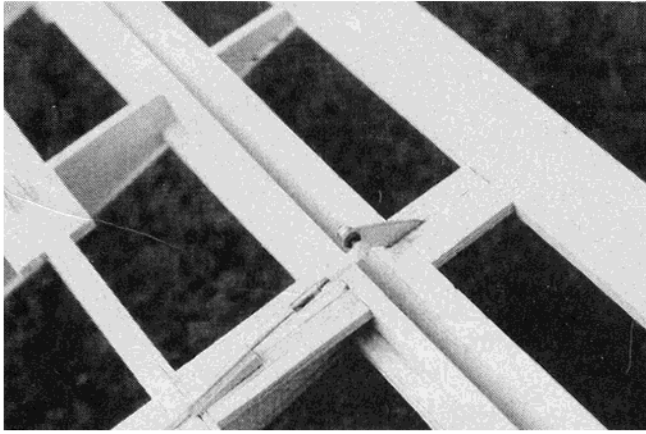
The aileron servos use standard mounting brackets to retain them in their boxes.

six templates from 1/16" ply as shown on the drawing, making sure that all the profiles are smooth so that the hot wire will move over them without snagging. Drill two or three holes in the templates to take wire nails or brads; about 1"-1½" long by approx. 14 swg. These nails will be pushed through the templates into the foam

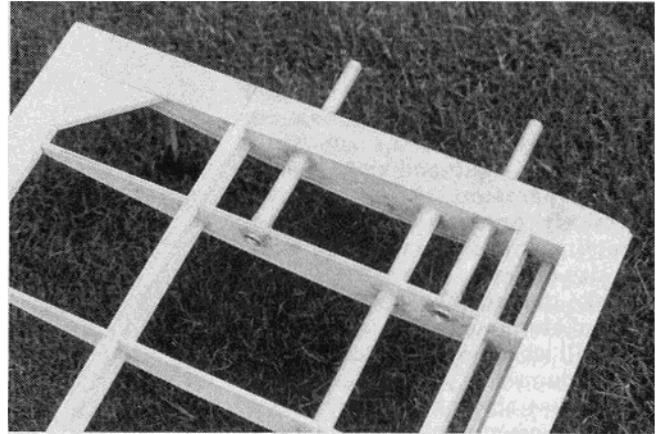
holding them in place. Cut two blocks of foam, each piece should be 12" long x 3½" wide x 3¾" deep (one for each float). Draw a centreline around the blocks in the middle of the 3½" width. Next, using the nails, position the top template flush with the front of the block, then the bottom template on the underside, also flush with the front of

the block and hot wire the float out.

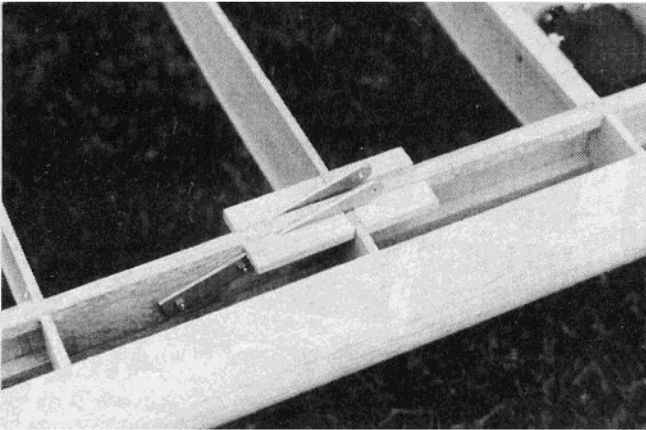
**Do not discard the offcuts**, they must be taped or tack glued back in place **now** before continuing. Next cut the top profile and tape it back in place for the next operation. Take the side templates and, using the nails, attach "A" to one side of the block keeping the straightedge flush with the top of the



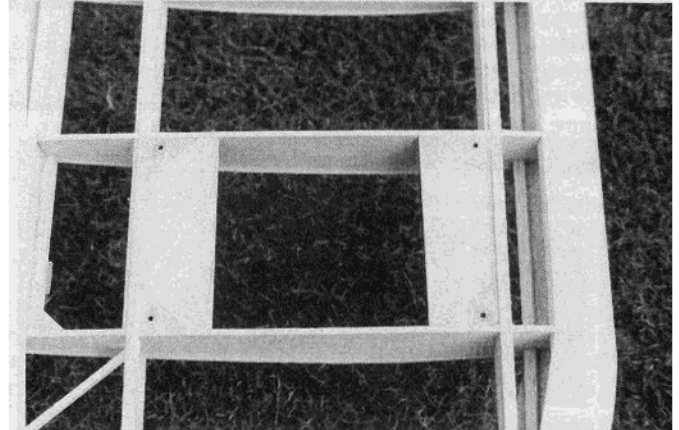
*Ball links are fine for all linkages.*



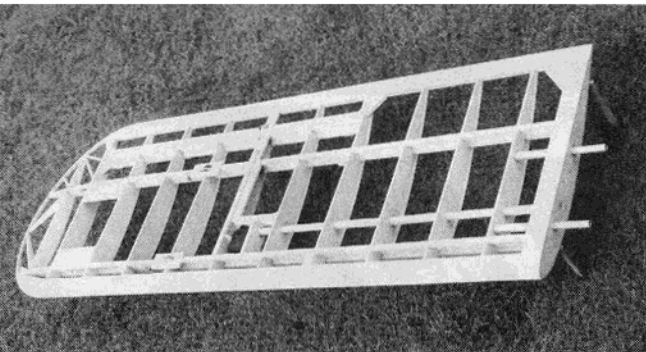
*Root fixing tubes must be firmly epoxied in place, after roughing the tubes.*



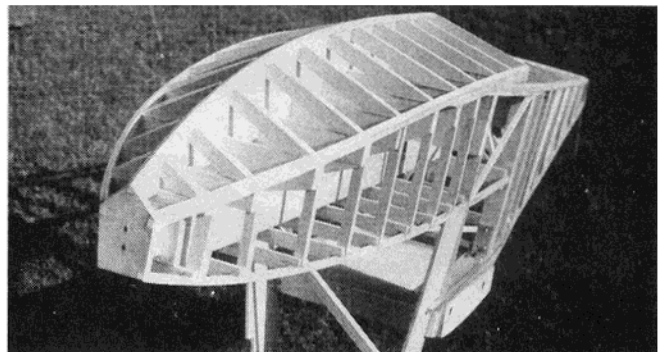
*Left hand front main strut mounting.*



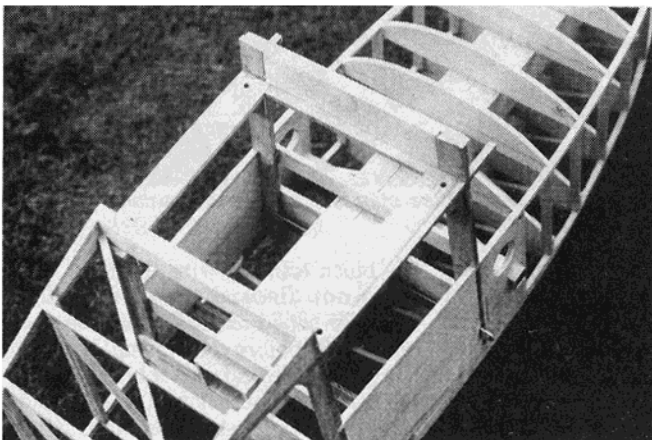
*Tip float mounting plates.*



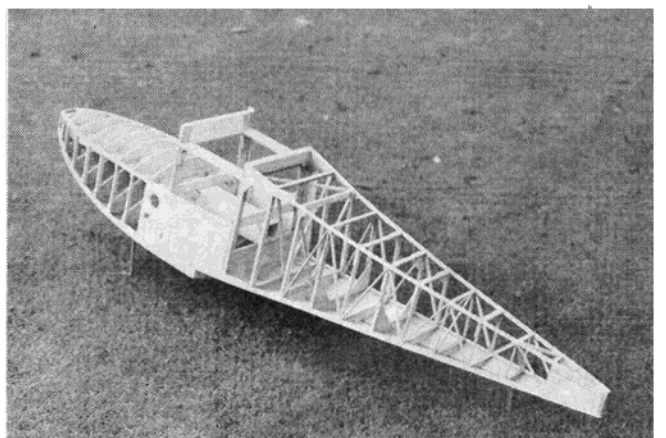
*Completed wing with root mounting tubes.*



*Solid construction here for those rough water operations.*



*Structural box at front end, doubles as battery and ballast weight box.*



*Structure looks complicated, but goes together conventionally.*