

Samsetningar-leiðbeiningar



Magnús Kristinsson tók saman

Samsetningar-leiðbeiningar



Fréttavefs Haukurinn settur saman  
árið 2009

## Specification

Wingspan:	approx. 1000 mm
Overall length:	approx. 1050 mm
Total surface area:	approx. 24 dm <sup>2</sup>
All-up weight:	approx. 164 g
Total surface area loading:	approx. 7 g / dm <sup>2</sup>

Please see the separate sheet for details of essential items not included in the kit.

Refer to the main robbe catalogue for information about tools and aids to building.

## Sequence of assembly

Please study the illustrations and the brief accompanying texts to ensure that you have a clear understanding of the individual stages of construction.

You will need a perfectly flat, true building board for constructing this model. Cover the surface with plastic film to prevent the parts sticking to it.

The top and bottom of the model's components are printed in different colours. Please bear this in mind when gluing the parts together.

We recommend that you check the fit of the parts by slotting the Depron components together "dry" (no glue). Don't glue them together permanently until you are satisfied that everything fits properly.

Certain joints involving carbon rod components are made using pieces of heat-shrink sleeve; this applies to the wing braces and pushrods.

Use the tip of a small soldering iron to heat and shrink the sleeves in place.

If you need to shrink a sleeve that is already installed in or on the model, cover the Depron surfaces to avoid heat-damage.

To save additional weight it is possible to omit the connectors between the motor and the speed controller. The elec-

tronic components can also be attached using thin double-sided foam tape or a drop of epoxy instead of Velcro, but remember that this will make it more difficult to maintain or replace individual components subsequently.

## Adhesives

Depron to Depron:	Uhu por
Depron to carbon fibre:	ropoxi (epoxy)
Small-area joints:	Foam-Speed (foam-safe cyano)

In some instances a different adhesive is recommended; in this case the instructions state which glue to use.

All directions, such as "right-hand", are as seen from the tail of the model, looking forward.

## Radio control system

For this model you will need a radio control system with at least four channels, in conjunction with three servos. An electronic speed controller with BEC function is required to control the brushless motor. We recommend a 2.4 GHz computer system, as it will provide comprehensive adjustment facilities and excellent interference rejection.

Please consider the installation of your receiving system components before you start construction.

If you intend to install a system other than the one we recommend, you can still follow the general installation shown, but you may have to make allowance for minor differences in component sizes.

Set the servos to centre (transmitter sticks and trims central) before installing them in the model. If they are fitted with output discs or levers, remove them at this stage.

When you wish to operate the model, always start by moving the throttle stick to the "motor stopped" position before switching the transmitter on. Only then connect the flight battery to the speed controller.

At the end of a flight always disconnect the flight battery from the speed controller first, and only then switch the transmitter off.

## Flying notes

- The Indoor Hawk is designed for experienced indoor pilots only. You may wish to alter the stated control surface travels and Dual Rates / Expo values in order to fine-tune the model to suit your personal flying style and your requirements of the model.

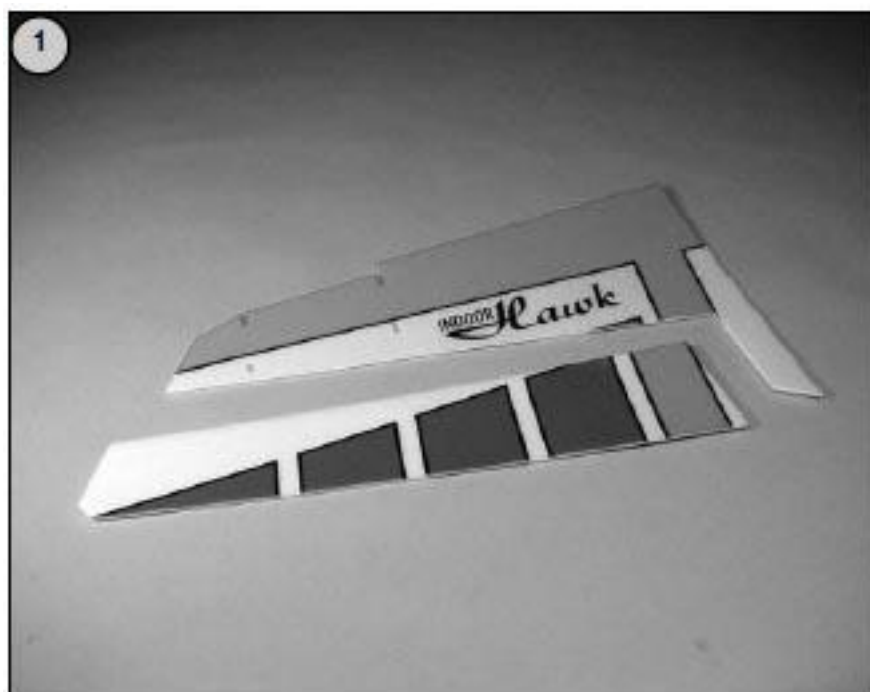


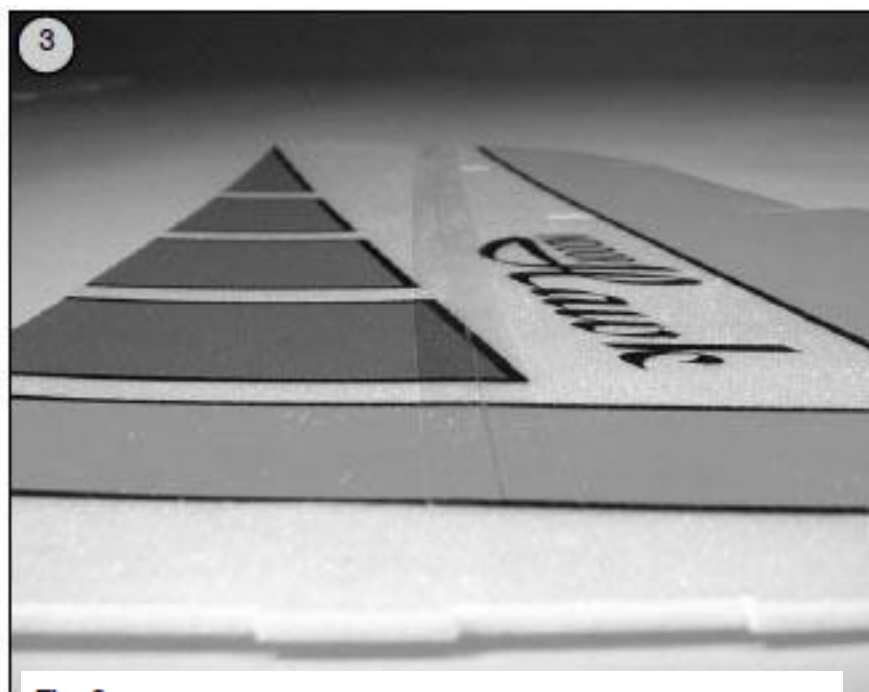
Fig. 1

- Remove the ailerons from the wing panels.



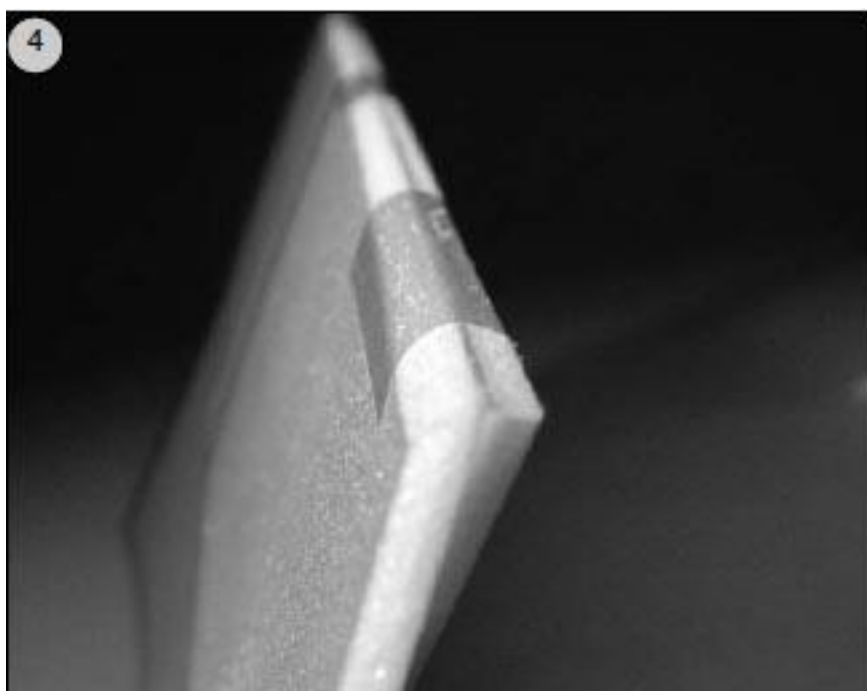
Fig. 2

- Bevel the underside of the trailing edge of the wings as shown.



**Fig. 3**

- Lay the wing panels flat on the building board, and pin or weight them down.
- Offer up the ailerons and attach them to the wings using full-length strips of Tesafilm (clear adhesive tape). Check that the ailerons move freely to the stated deflections.



**Fig. 4**

- Fold the ailerons back onto the wing, and apply short strips of tape in the gap to secure the hinge.



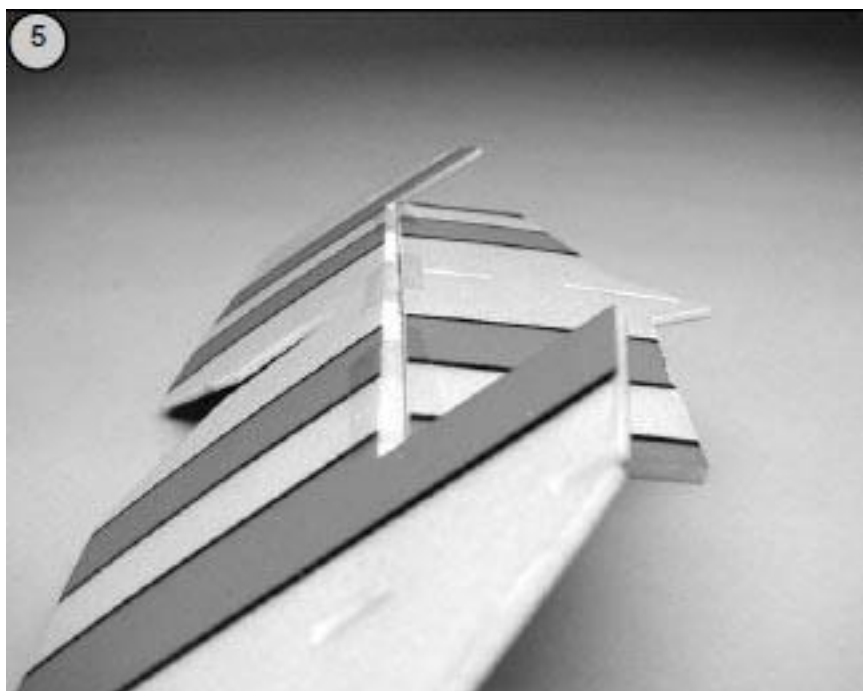


Fig. 5

- Separate the elevator as described for the ailerons, then bevel the trailing edge of the tailplane and attach the elevator using adhesive tape.

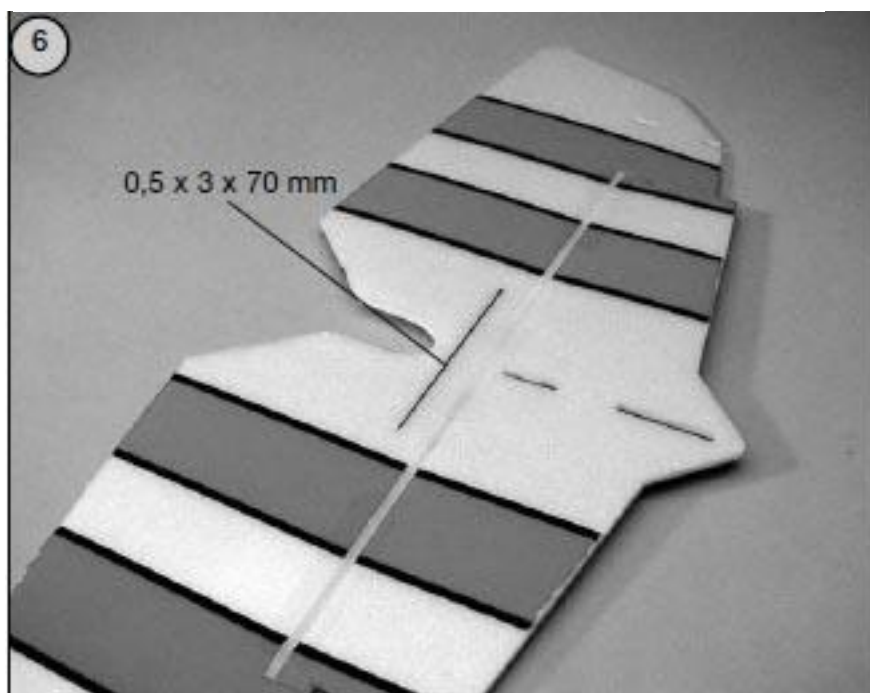


Fig. 6

- Cut the carbon reinforcing strip (0.5 x 3 mm) to a length of 70 mm, and glue it in the slot in the elevator using epoxy.

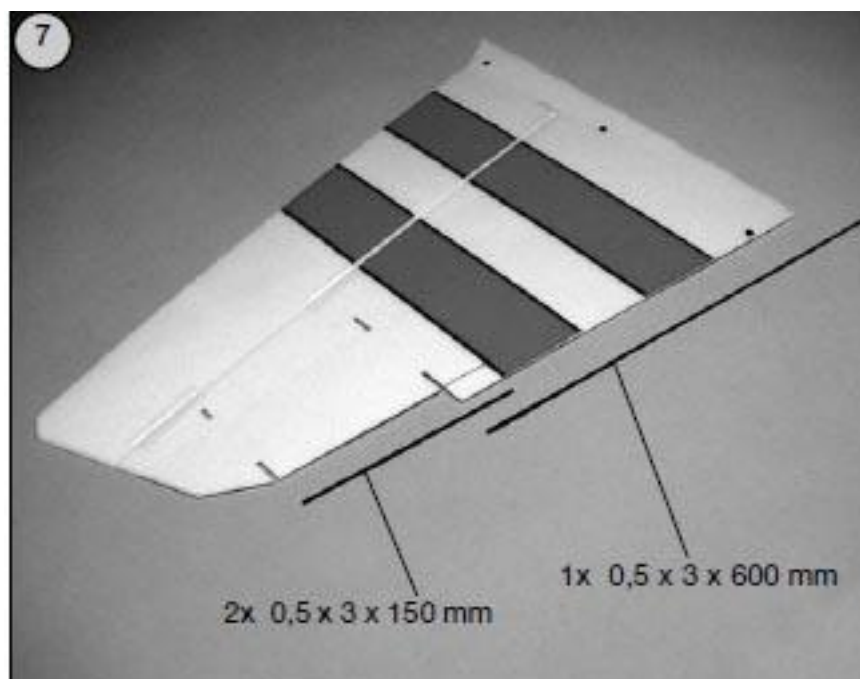


Fig. 7

- Cut the wing leading edge strips (carbon strip, 0.5 x 3 mm) to length and glue them to the wing panels using Uhu por.

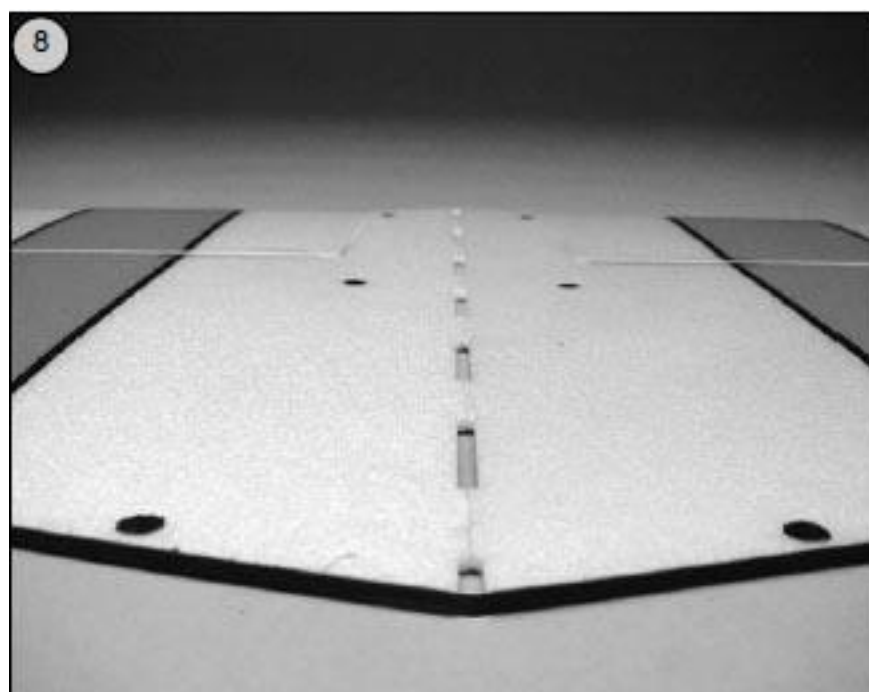


Fig. 8

- Glue the wing panels together as shown, ensuring that the panels are not offset relative to each other. Glue the wing leading edge to the wing panel.

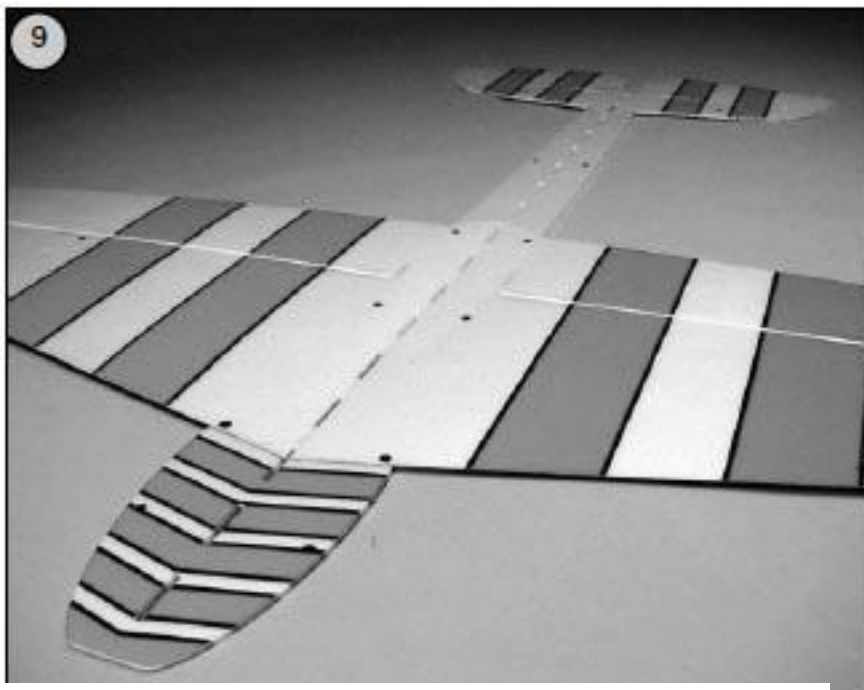


Fig. 9

- Note: the first step in this stage is to complete the under-side of the model by fitting the carbon reinforcing strips.
- Lay the wing, fuselage components and tailplane down flat, with the marker points visible.
- Align the parts using a long steel ruler, and glue them together as shown.

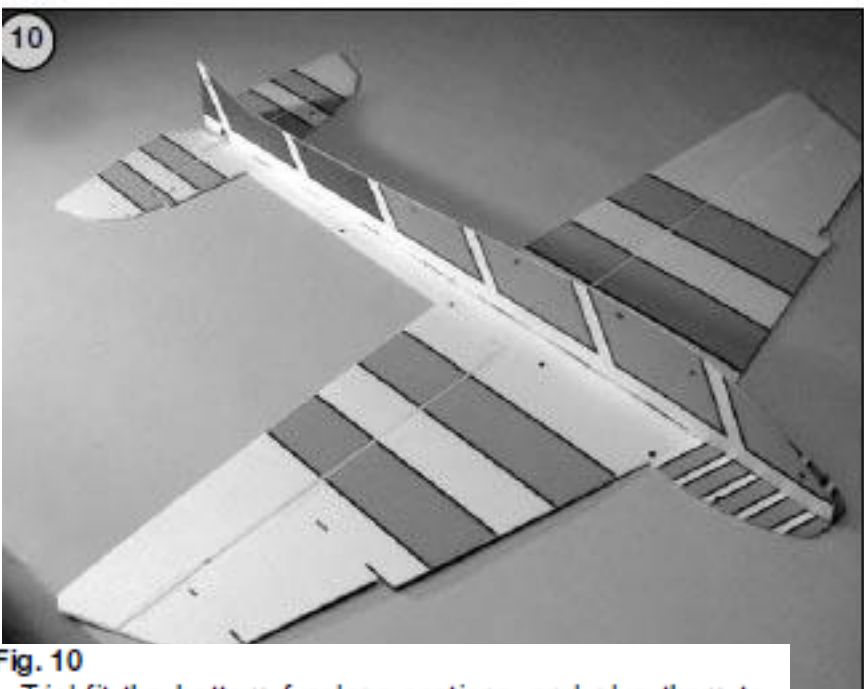


Fig. 10

- Trial-fit the bottom fuselage sections, and glue them to the wing and tailplane, taking care to keep them exactly at right-angles.



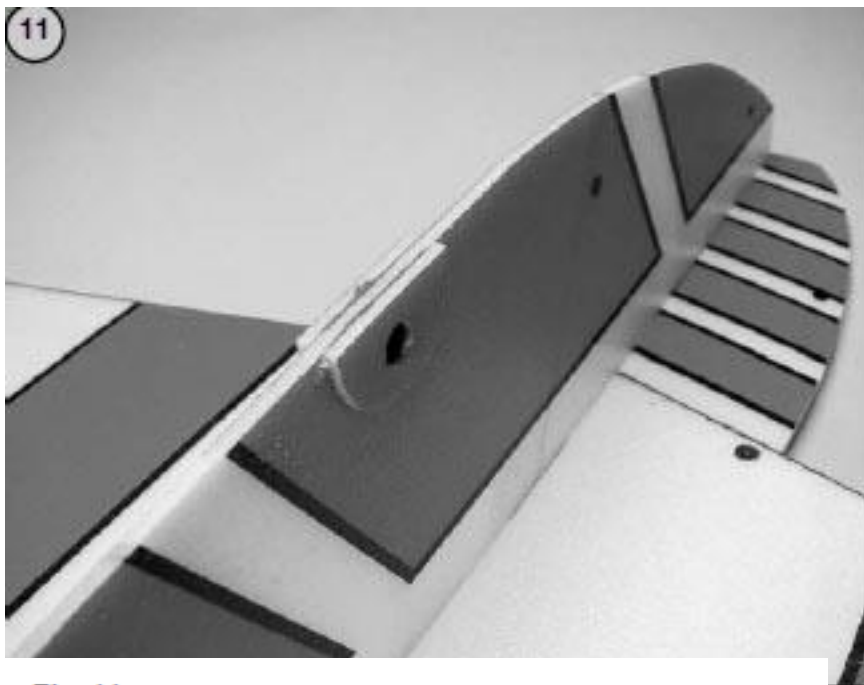


Fig. 11

- Glue the doublers on both sides of the fuselage, taking care to line up the holes accurately.

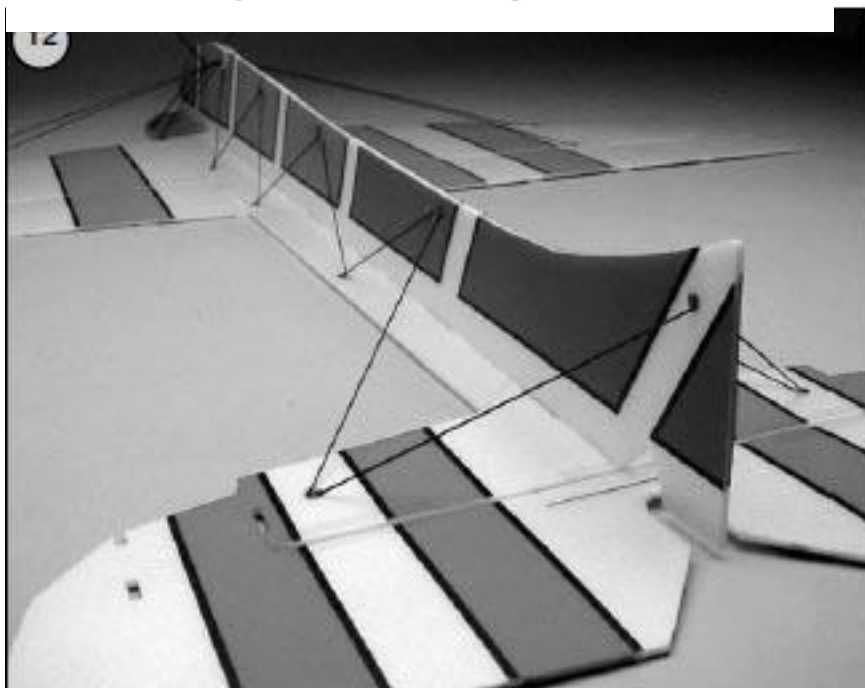
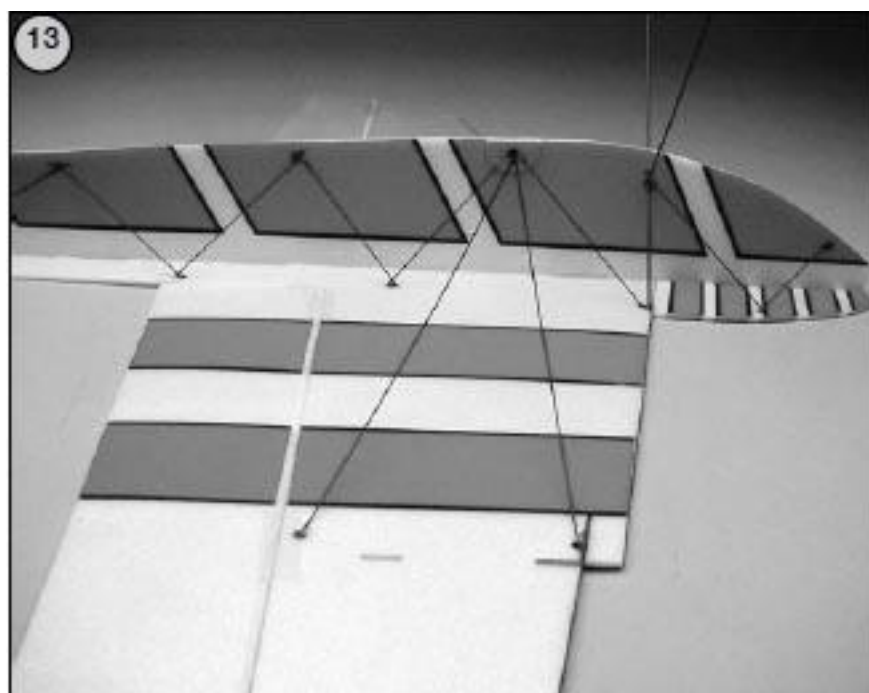


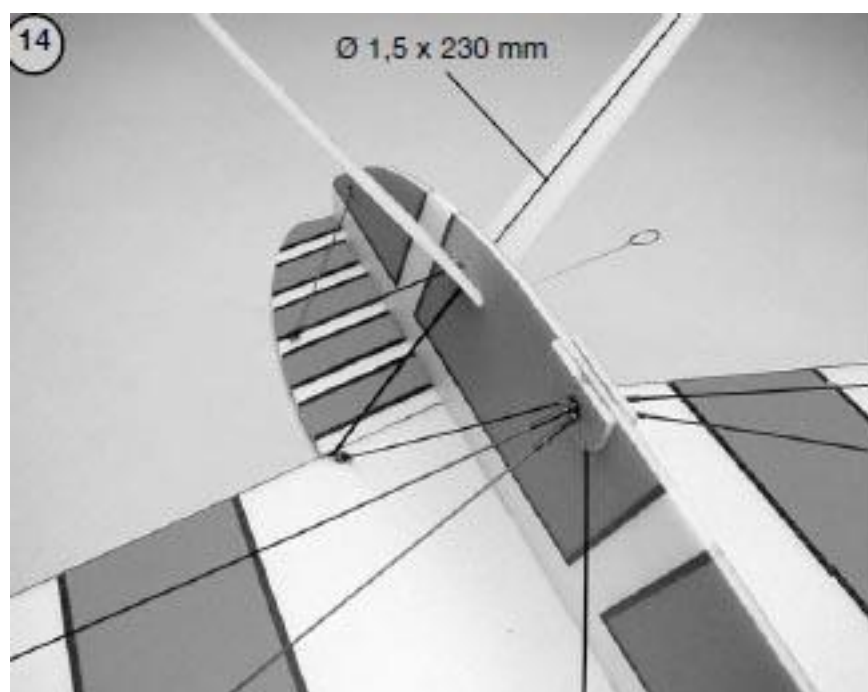
Fig. 12

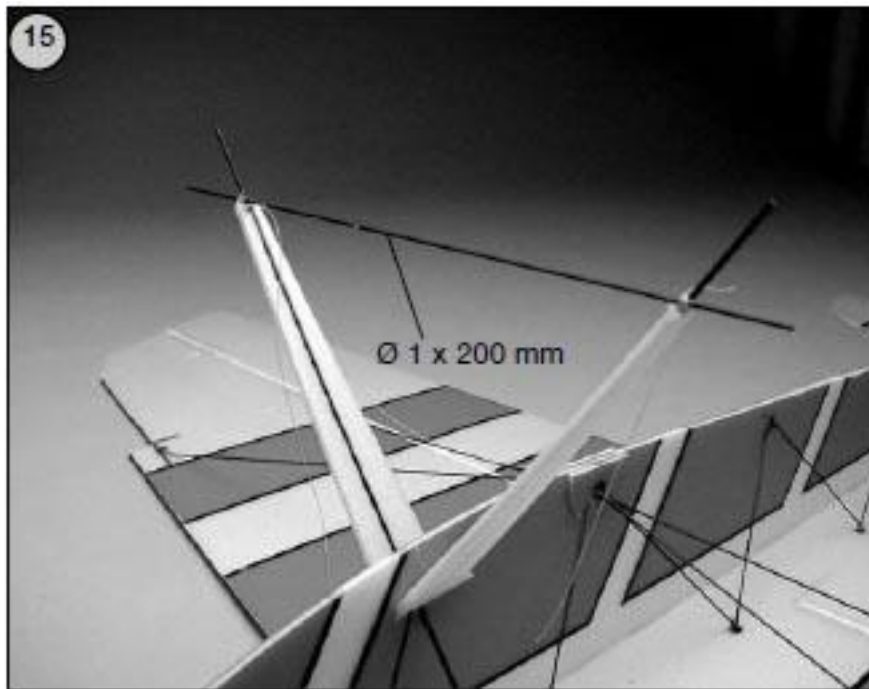
- The marked points indicate the position of the 1 mm  $\varnothing$  carbon rods. Cut the rods to length and glue them in place, starting at the tail and alternating from right to left.
- Check constantly that the fuselage components are straight and perpendicular to each other.
- The carbon rods must not be under tension when fitted. Fix them in place with small drops of epoxy.



**Figs. 13 and 14**

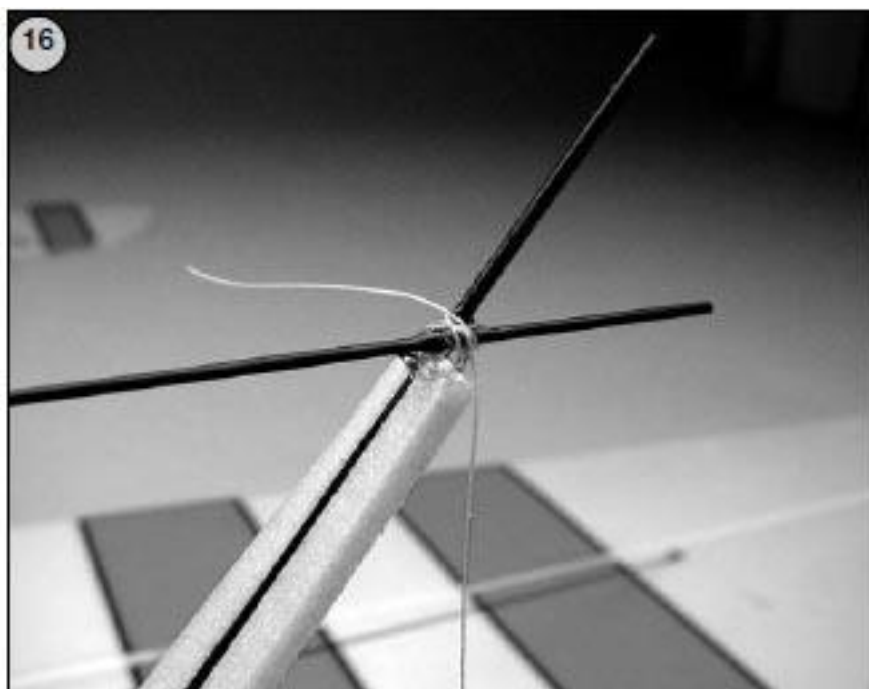
- Cut the 1 mm Ø wing braces to length and join the pairs of braces in the middle using pieces of heat-shrink sleeve. Fit the braces through the fuselage and glue them in place.
- Install the main undercarriage legs (1.5 Ø x 230), taking care to position the parts symmetrically. Glue the parts in place.
- Cut a lengthwise channel in the undercarriage leg fairings and glue them to the undercarriage legs as shown.





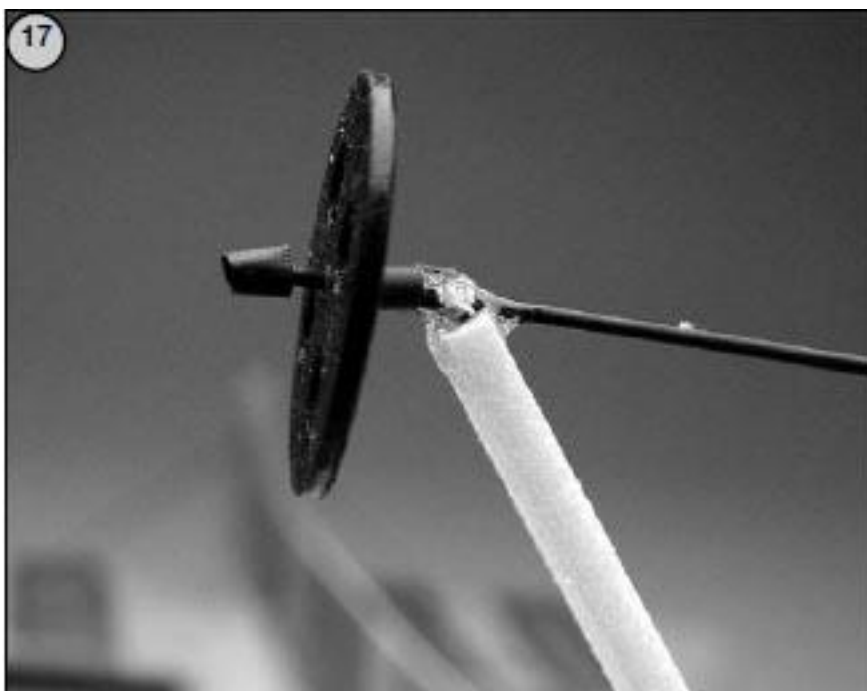
**Fig. 15**

- Cut the 1 mm Ø wheel axle to a length of 200 mm, position it as shown, and align it carefully. Note that the axle must lie parallel to the wing when viewed from the front.



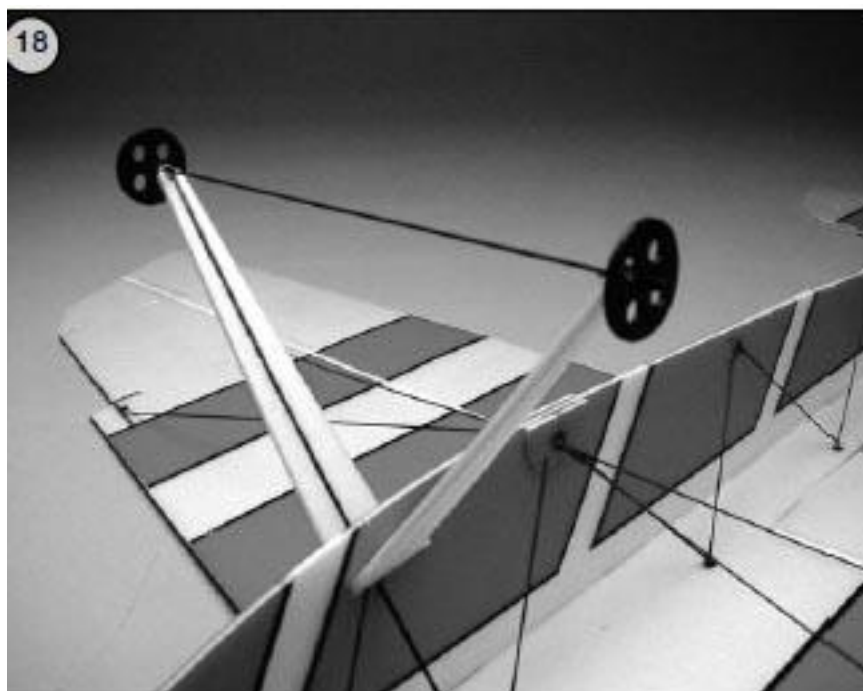
**Fig. 16**

- Tie nylon thread round the undercarriage legs as shown, and apply glue (foam cyano) to the joints.



Figs. 17 and 18

- Cut off the excess length of the undercarriage legs. Fit the wheels on the axle and secure them with short pieces of heat-shrink sleeve. Make sure the wheels are free to rotate.
- Shrink the heat-shrink sleeves and apply a drop of cyano to secure them.



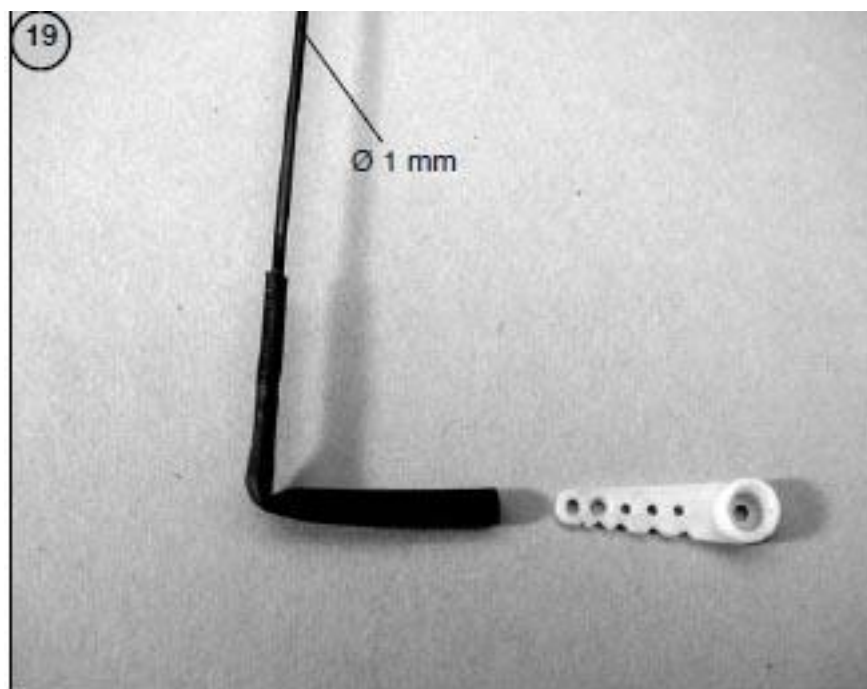


Fig. 19

- Remove the output levers from the rudder and elevator servos.
- File notches in the elevator servo output lever as shown, to prevent the heat-shrink sleeve slipping off.
- Cut the 1 mm Ø elevator pushrod overlength and attach it to the servo output arm using a piece of heat-shrink sleeve as shown in the photo.

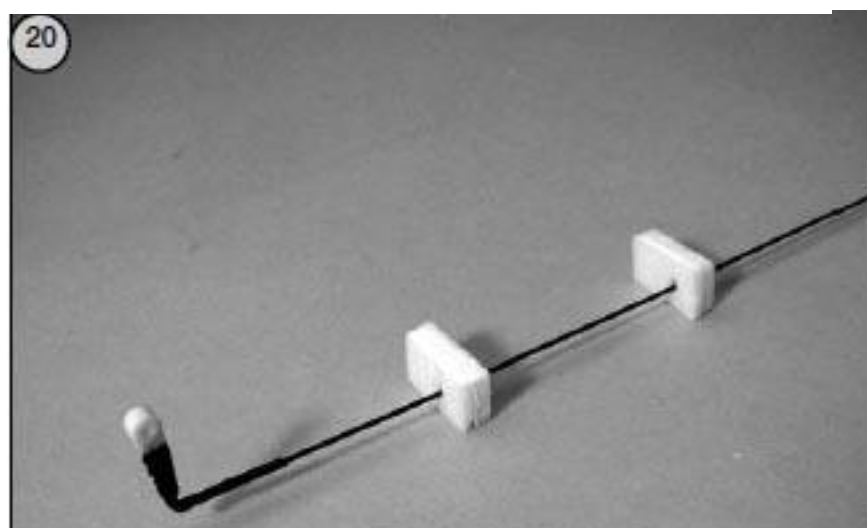


Fig. 20

- Glue the pushrod guides together in pairs as shown, and slip them onto the elevator pushrod. We recommend that you install the pushrod before permanently gluing the guides in place, so that they automatically take up their correct positions.



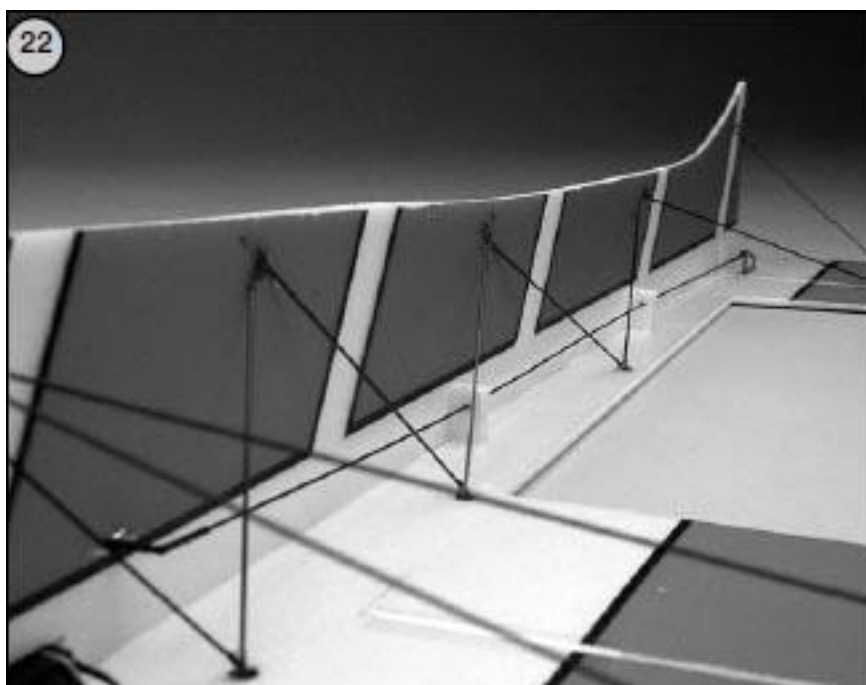


Fig. 21

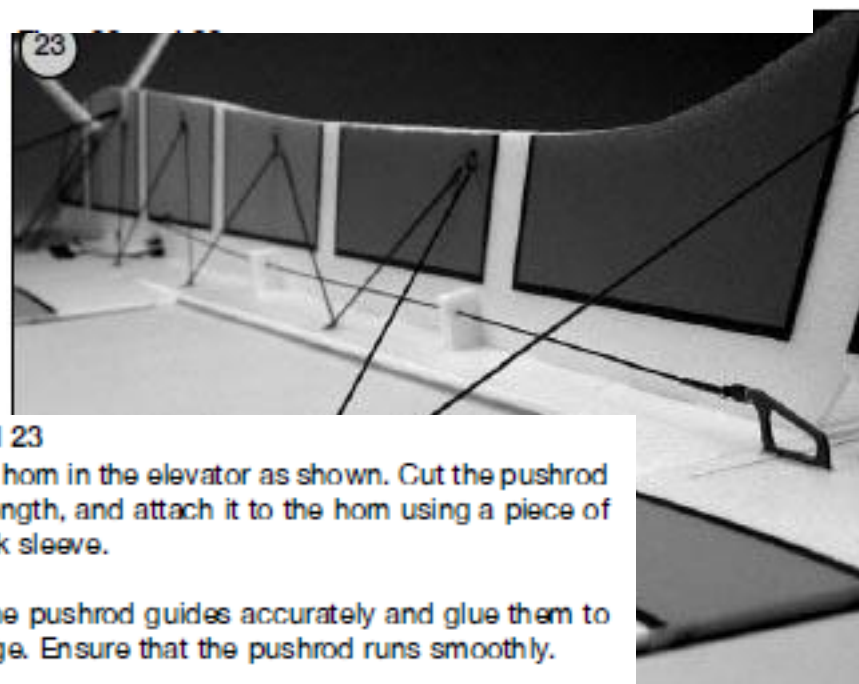
- The illustration shows the three servos and associated pushrods installed.

"H" = Elevator servo

"Q" = Aileron servo

"S" = Rudder servo

- The servos are installed in turn, together with the pushrods, and fixed in place with a drop of epoxy.
- First position the elevator servo and the prepared elevator pushrod.



Figs. 22 and 23

- Epoxy the horn in the elevator as shown. Cut the pushrod to exact length, and attach it to the horn using a piece of heat-shrink sleeve.
- Position the pushrod guides accurately and glue them to the fuselage. Ensure that the pushrod runs smoothly.

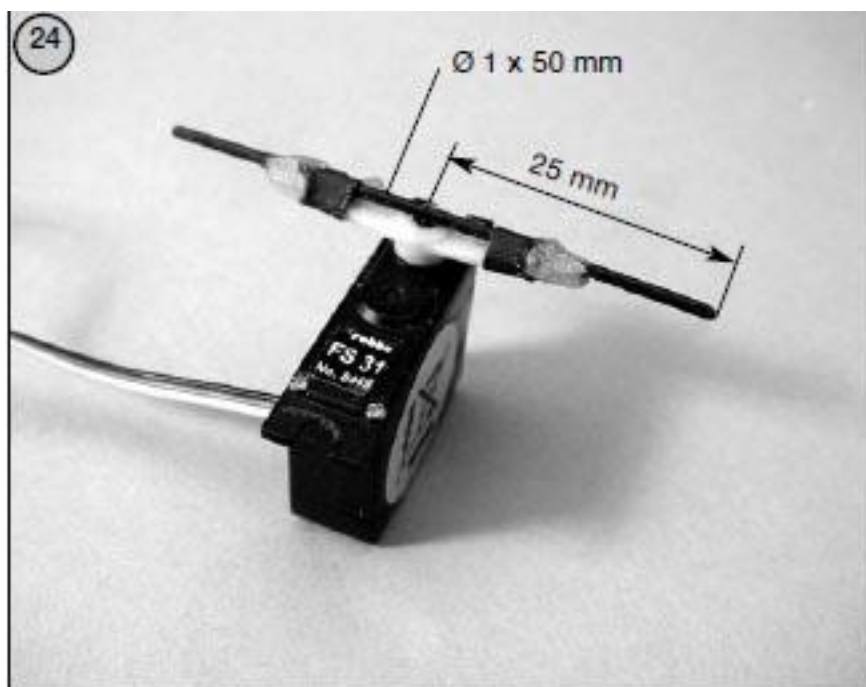


Fig. 24

- The aileron servo must be at neutral; check this from the transmitter.
- Extend the servo output lever using a 50 mm length of 1 mm Ø carbon rod, and attach it centrally to the lever using pieces of heat-shrink sleeve, as shown in the photo.
- For additional security these parts should be glued together using cyano + filler powder.



Fig. 25

- Epoxy the horns in the ailerons as shown.

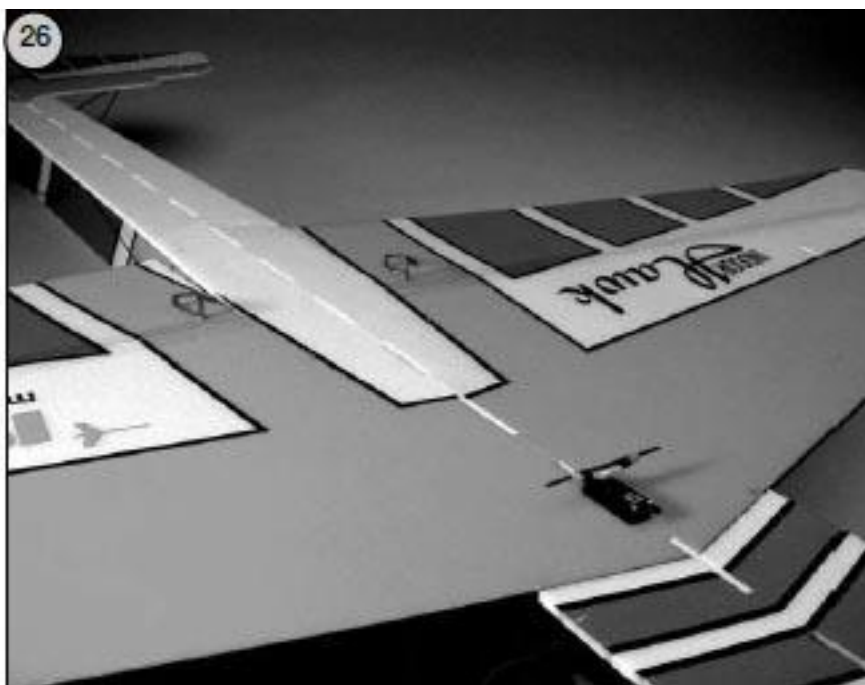
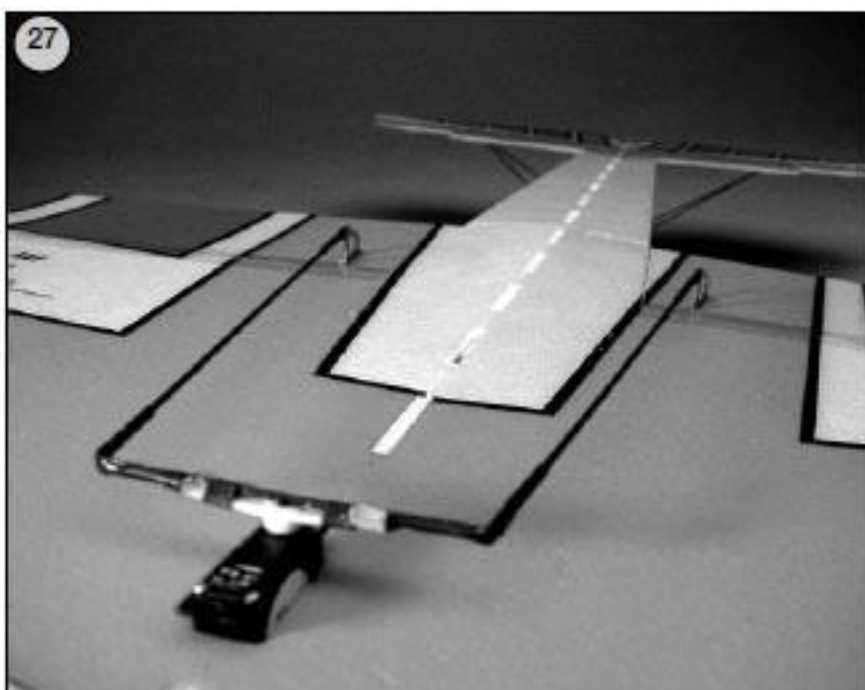


Fig. 26

- Place the aileron servo in the appropriate opening, and glue it in place.

Fig. 27

- Set the ailerons to centre (neutral). Connect the servo to the aileron horns using 1 mm Ø carbon pushrods and pieces of heat-shrink sleeve.



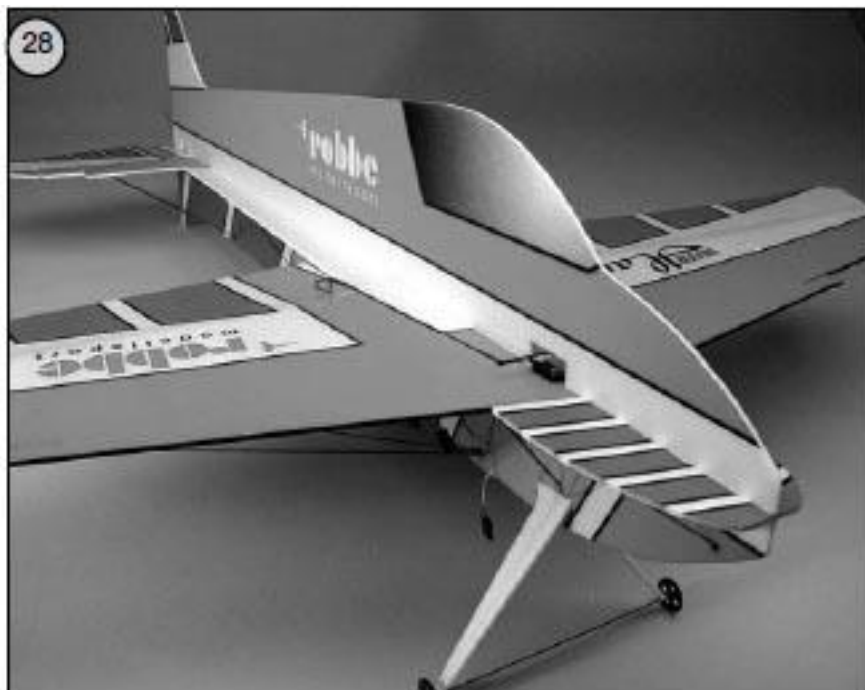


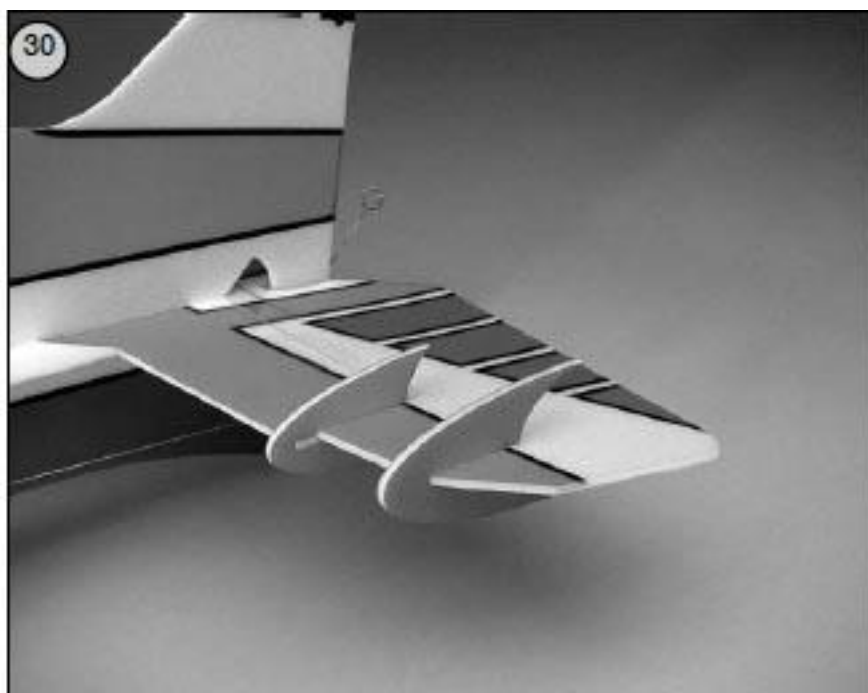
Fig. 28

- Trim the fuselage top section to fit, align it carefully and glue it in place.

Figs. 29 and 30

- Glue the side force generators to the wings and tailplane.



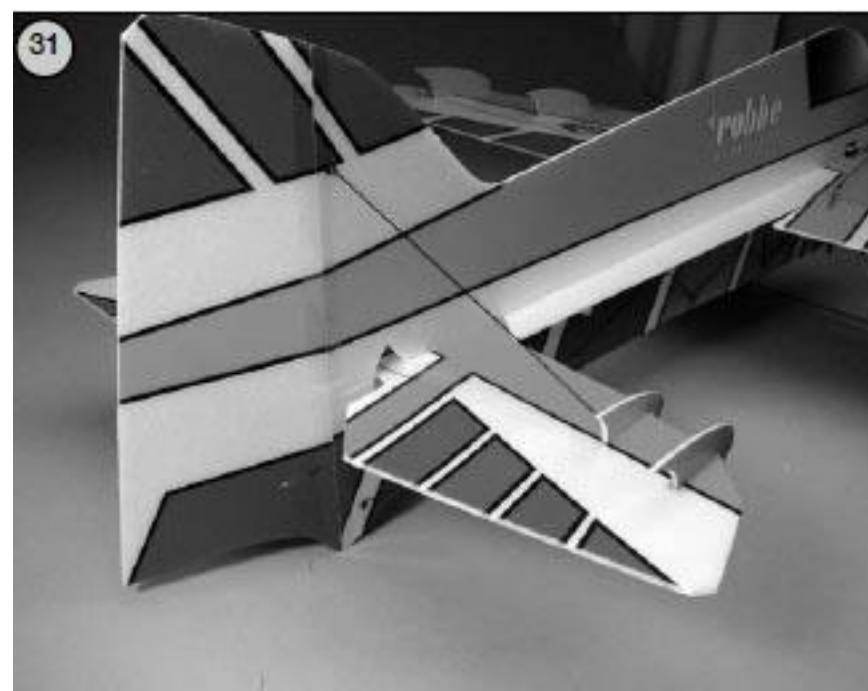


Figs. 29 and 30

- Glue the side force generators to the wings and tailplane.

Fig. 31

- Bevel one side of the rudder leading edge and attach it to the fin using strips of adhesive tape, as described for the ailerons.
- Attach the upper braces (1 mm Ø carbon rod) to both sides of the tailplane and the fin.





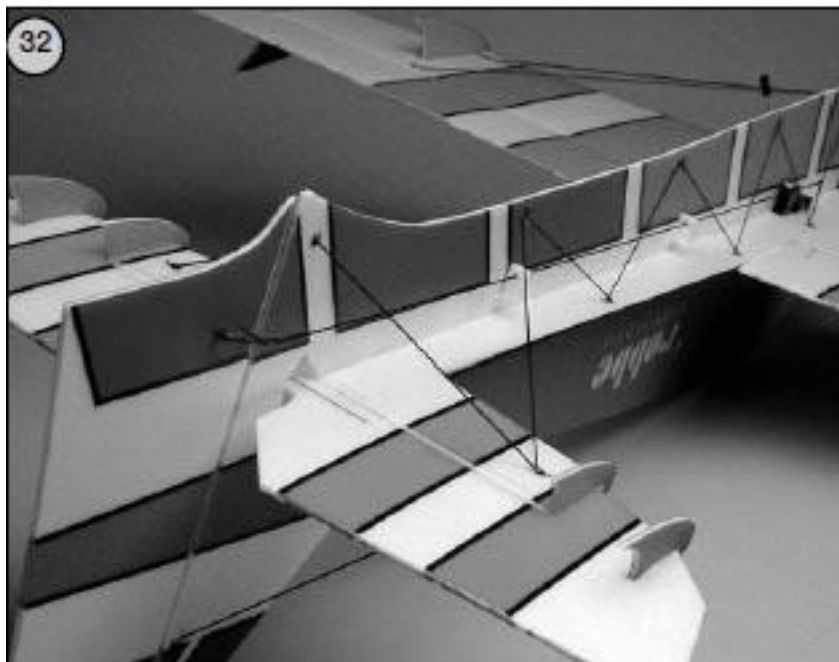


Fig. 32

- Install the rudder servo.
- Prepare the rudder pushrod using the method described for the elevator pushrod, and connect it to the rudder.

Fig. 33

- Before carrying out the following steps please read the instructions supplied with the motor and speed controller. Solder the appropriate connectors to the wires attached to the motor, speed controller and battery, and insulate each individual joint with a piece of heat-shrink sleeve.

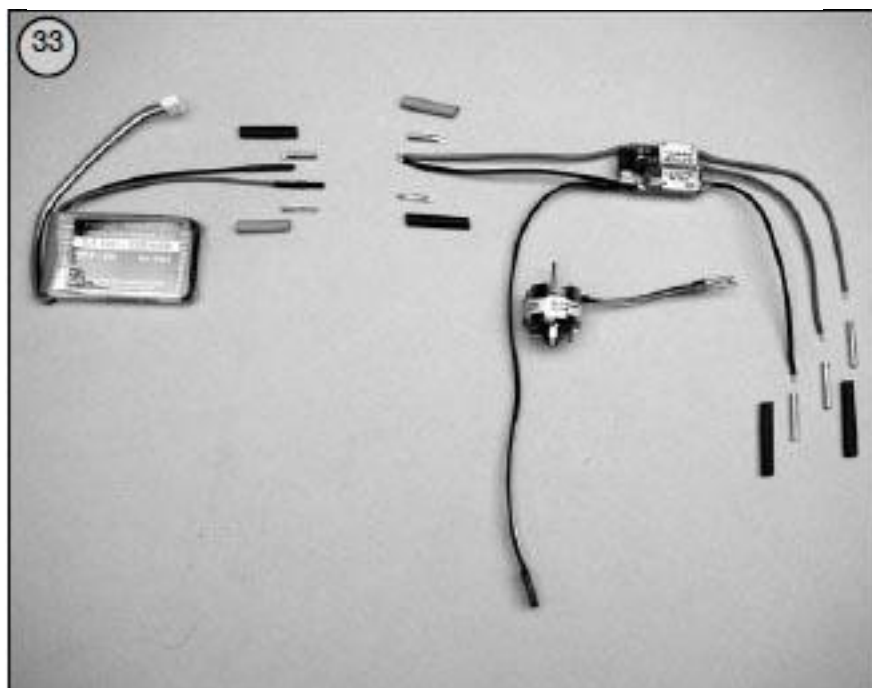




Fig. 34

- Fix the motor mount to the motor using two M2 x 4 mm machine screws.

Fig. 35

- Offer up the motor assembly to the fuselage nose, and check that the rear end of the output shaft does not foul the fuselage. Remove a little fuselage material if necessary to provide adequate clearance.
- Epoxy the motor bulkhead to the fuselage nose. Be sparing with the glue: don't let it run into the motor.
- Apply strips of adhesive tape to the four arms of the motor mount for additional security.



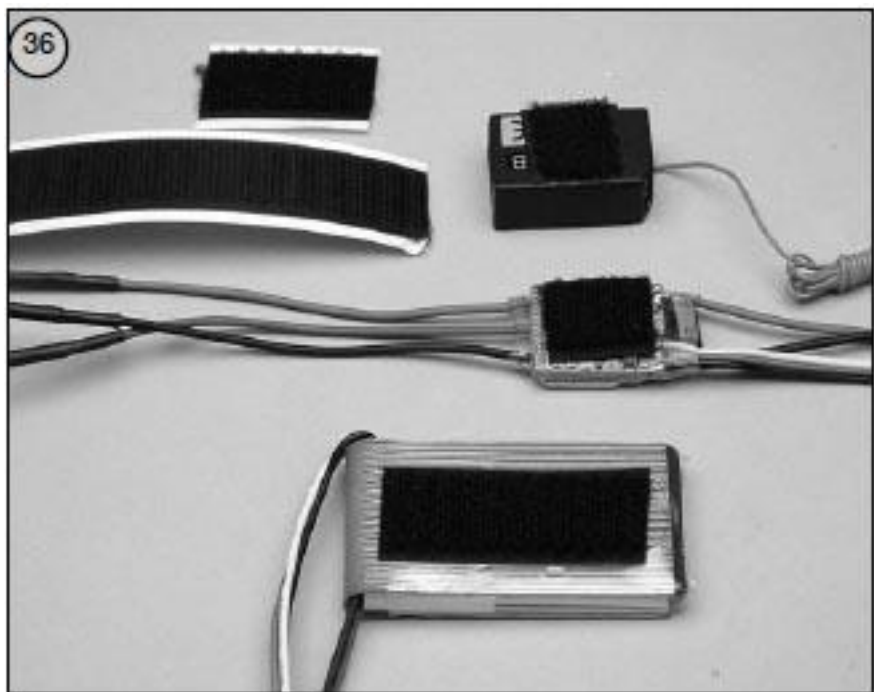
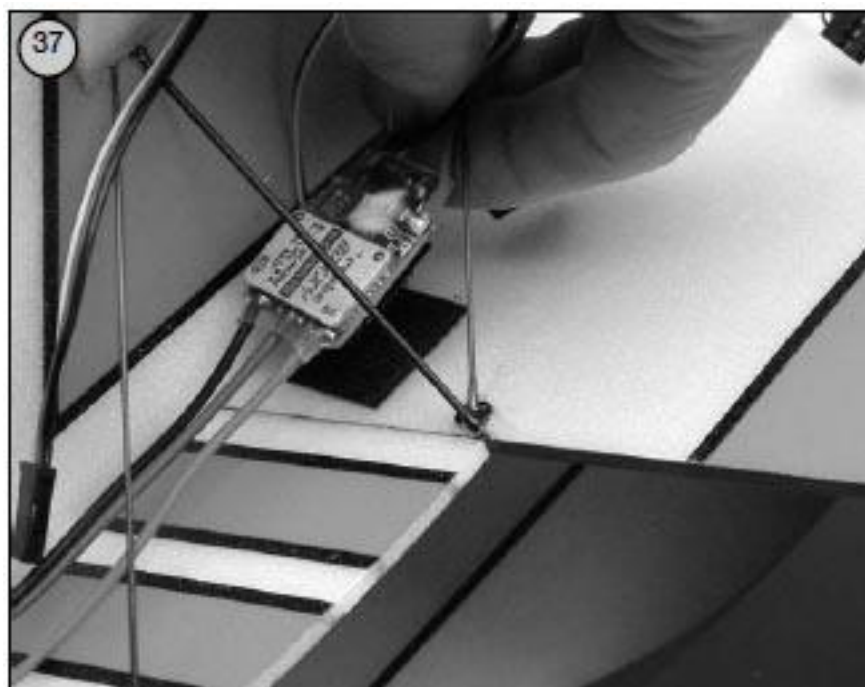


Fig. 36

- Stick pieces of Velcro tape to the receiver, battery and speed controller.

Figs. 37 and 38

- Connect the speed controller to the motor.
- Connect the servos and the speed controller to the receiver.
- Fix the electronic components to the fuselage using the mating pieces of Velcro tape.



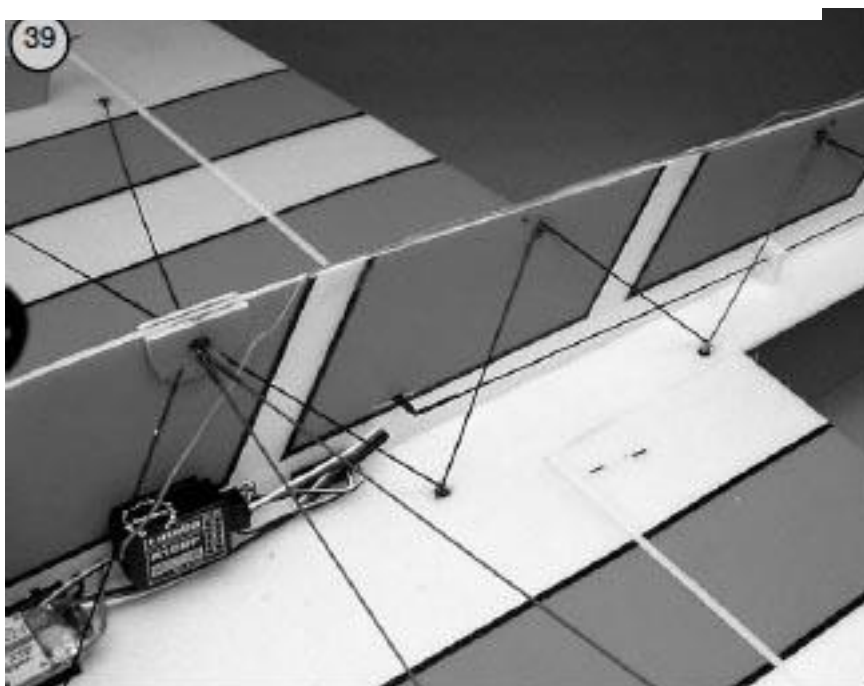


Figs. 37 and 38

- Connect the speed controller to the motor.
- Connect the servos and the speed controller to the receiver.
- Fix the electronic components to the fuselage using the mating pieces of Velcro tape.

Fig. 39

- Unwind the flexible wire aerial attached to the receiver, and deploy it along the underside of the fuselage towards the tail, keeping it as far away as possible from the carbon fibre pushrods. Tape the aerial in place.





**Fig. 40**

- Switch the transmitter on, and move the throttle stick to the "Motor stopped" position.
- Check the direction of rotation of the motor: when viewed from the front, the motor shaft should rotate anti-clockwise, as indicated by the arrow. If this is not the case, e.g. if you are using components other than those recommended, you can reverse the motor by swapping over any two connections between the motor and the speed controller.



Querruder, aileron, aileron



Seitenruder, rudder, direction



Höhenruder, elevator, profondeur



Fig. 41

- Move the transmitter sticks and trims to the centre position.
- The control surfaces should now be at centre.
- Check that the control surfaces deflect in the correct "sense" (direction relative to stick movement).
- The optimum control surface travels vary greatly according to the pilot's preferences and flying style. If you want maximum possible aerobatic capability, set the maximum travels, and use Dual Rates and / or Expo to "tame" the controls.
- If any of the functions works the wrong way round, reverse that channel at the transmitter using the servo reverse facility.

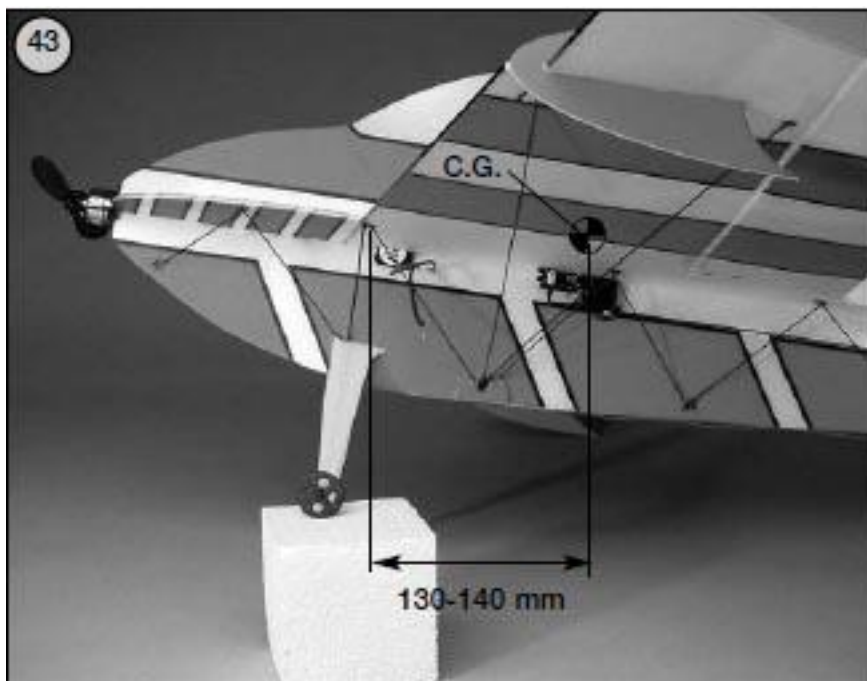
Fig. 42

- Place the propeller on the motor and secure it using the O-ring as shown. An alternative method is to use small rubber bands.



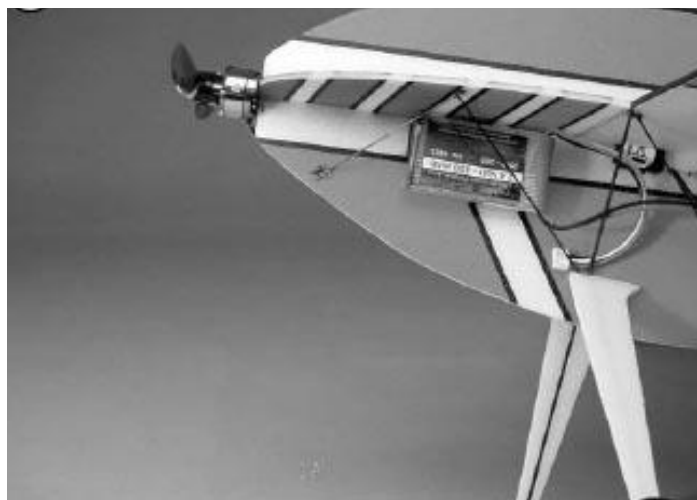
Fig. 42

- Place the propeller on the motor and secure it using the O-ring as shown. An alternative method is to use small rubber bands.



Figs. 43 and 44

- Mark the Centre of Gravity (marked "C.G." in the photo) on both sides of the fuselage at a point 130 to 140 mm aft of the wing root leading edge.
- Support the model on your index fingers at the marked points, close to the fuselage, and allow it to hang freely. The model is correctly balanced when the fuselage hangs level, with the nose inclined slightly down.
- Once you have found the correct position of the flight battery, fix it in place with Velcro tape.
- Mark the position of the battery on the fuselage, so that you can be confident of replacing it in the same position if you have to remove it.



### Test-flying, flying notes

- Note: keep your fingers well clear of the rotational plane of the propeller whenever you are working on the model (assembly, adjustment, maintenance) - injury hazard. Ensure that nobody stands in front of the model when the motor is running.
- Please read the sections entitled "Routine pre-flight checks" and "Flying the model" in the Safety Notes before attempting to fly the aeroplane for the first time.
- The model can be test-flown in any reasonably large hall. The Indoor Hawk can also be flown outdoors, but only in totally flat-calm conditions.
- Repeat the check of all the working systems.
- The model is designed to take-off from the ground. Briskly advance the throttle to full power, and apply gentle up-elevator to lift off as soon as flying speed is reached.
- Check the model's response to control commands. You may need to enlarge or reduce the travels after the model has landed.

### Maintenance

- The O-ring or rubber band holding the propeller to the motor is subject to wear and damage; check it at regular intervals and replace it when necessary.