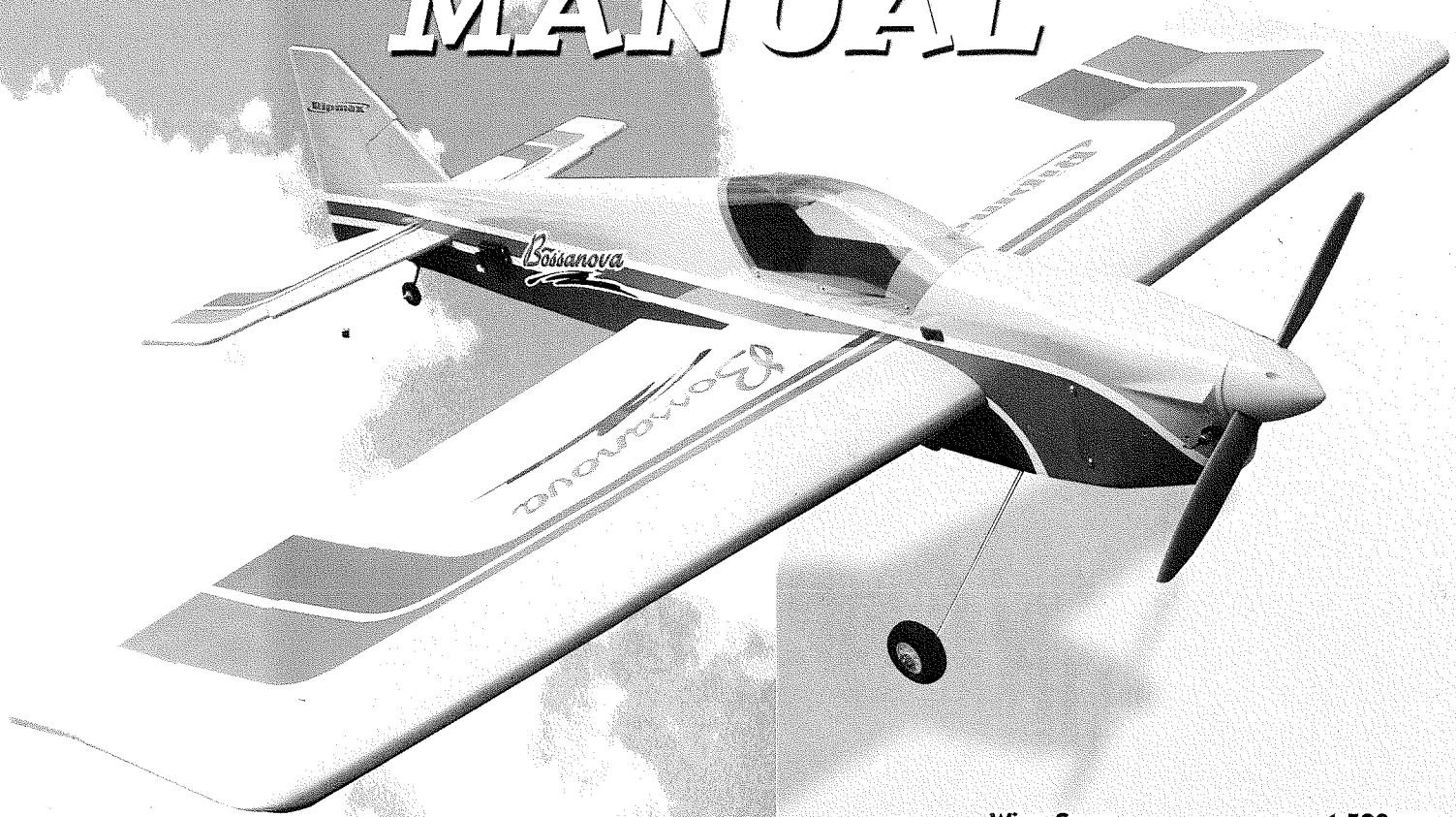
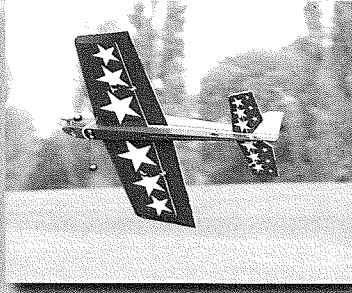
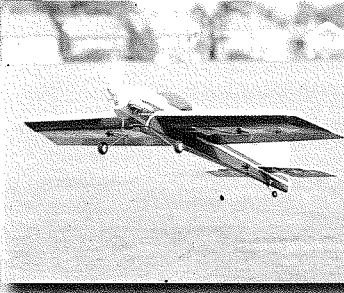
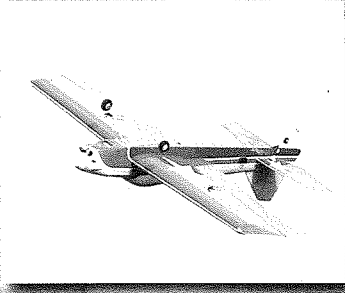
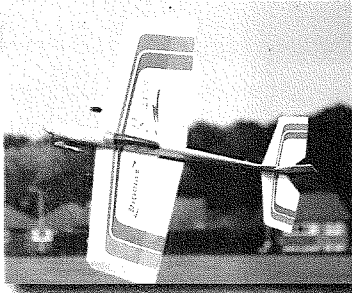


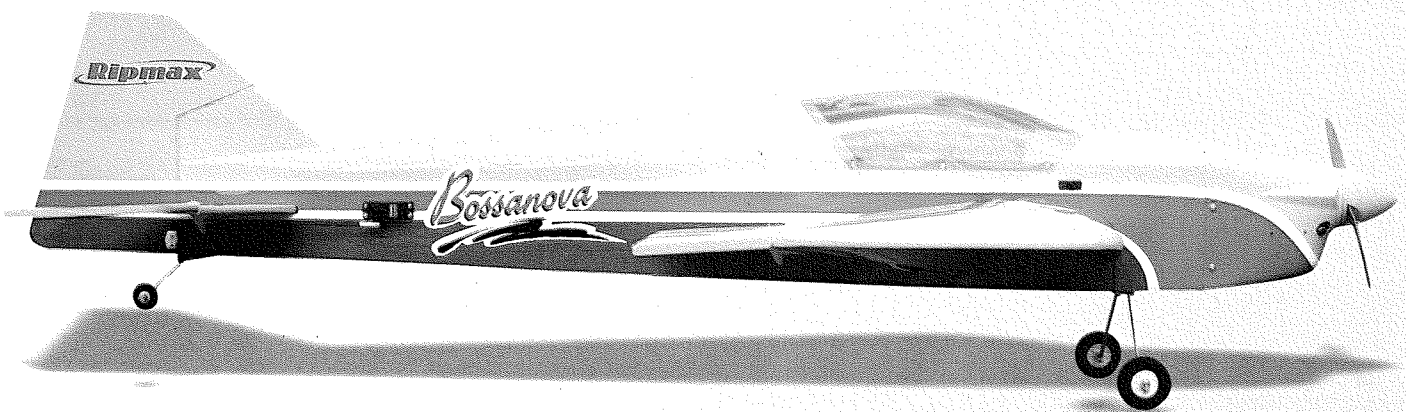
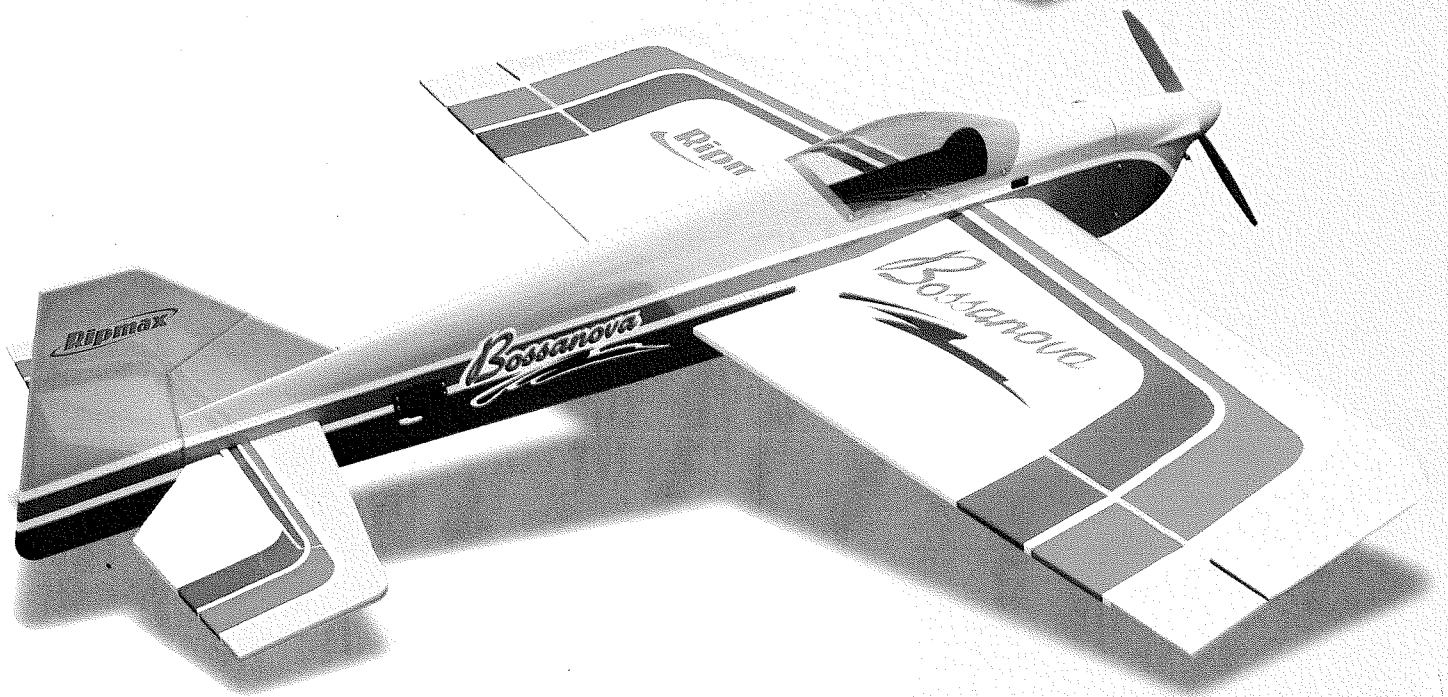
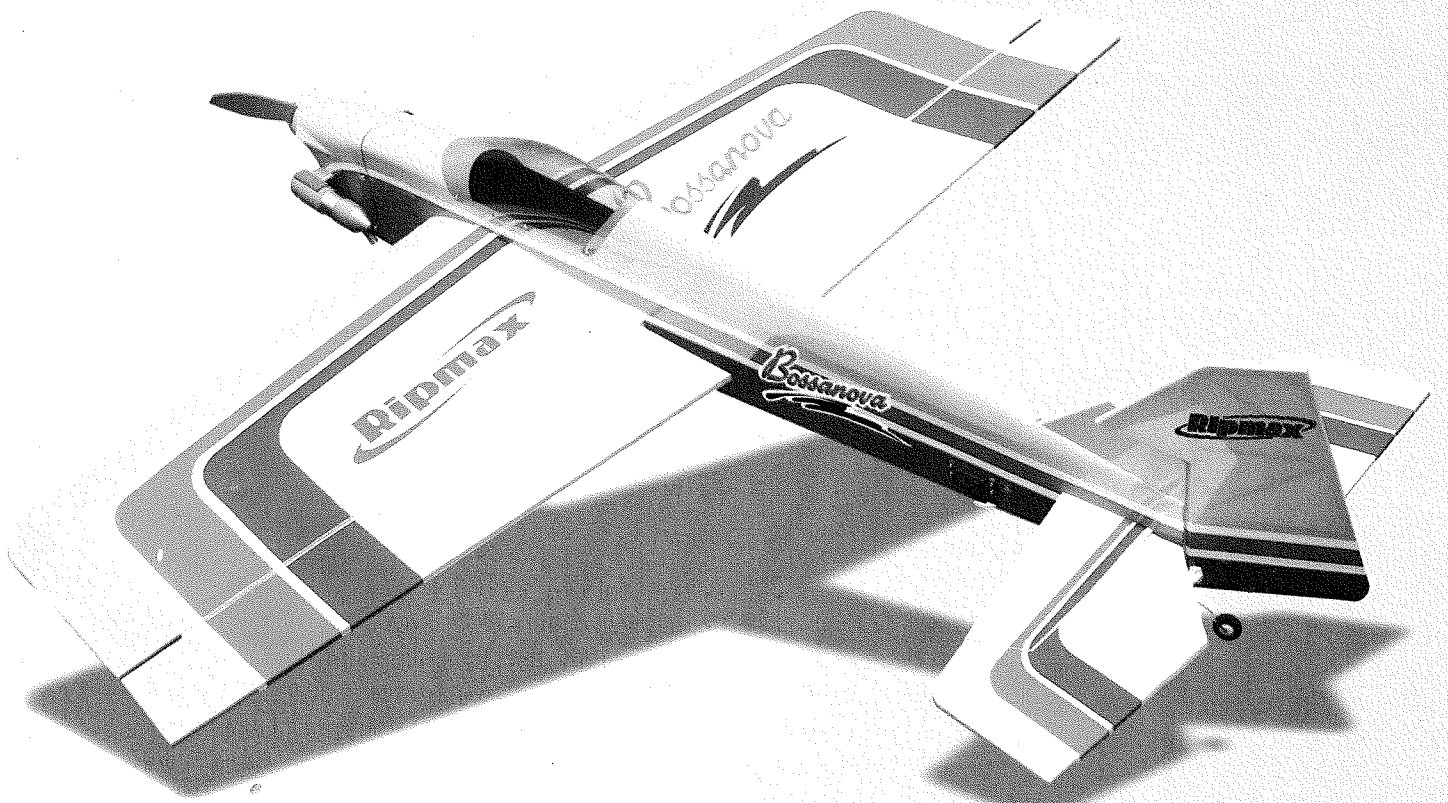
Ripmax Bossanova

INSTRUCTION MANUAL



Wing Span 1,520mm
Engine46-.53
Radio 4 channel with 5 servos

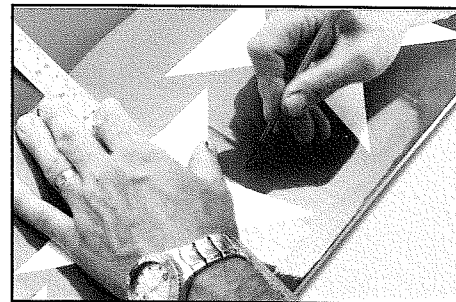




THE WINGS

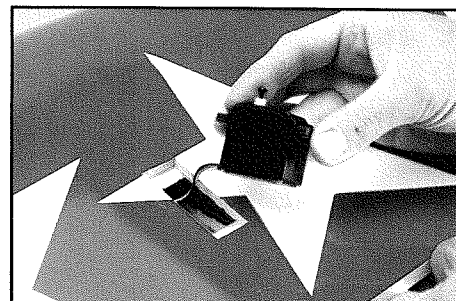
STEP 01

Locate the aileron servo apertures in the underside of the wing and carefully remove the covering using a sharp knife. Finish off the opening by sealing the film edges using a covering iron.



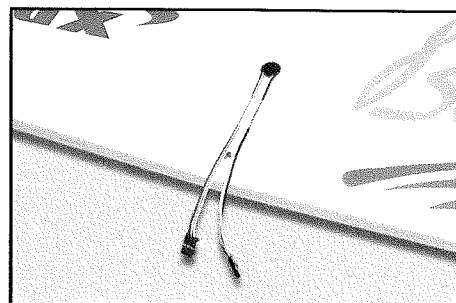
STEP 02

Check that your choice of servo fits the aperture. Adjust the size of the mounting holes with a sharp knife if required. Carefully pass each aileron lead through to the centre of the wing using the length of cotton already in the wing. You may need to extend the length of your aileron servo leads using a pair of extension leads.



STEP 03

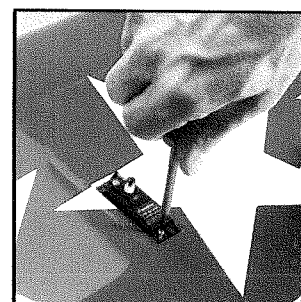
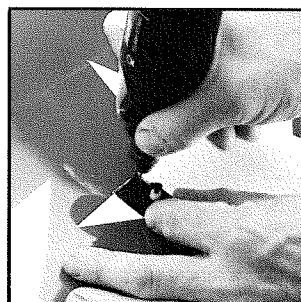
Once each lead has been pulled through the wing and out of the exit hole pre-cut in the top surface of the wing, hold them in place with a couple of strips of tape.



STEP 04

Fit the rubber servo mounting grommets and brass ferrules supplied with your radio equipment in accordance with the radio manufacturer's instructions. Install the two aileron servos in their mounts and pilot drill four holes for the mounting screws supplied with your servo.

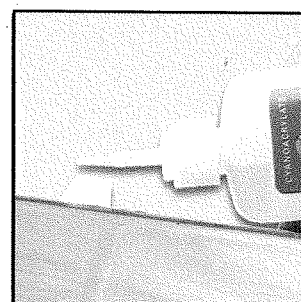
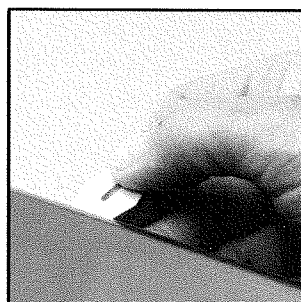
Screw each servo into position taking note of the orientation shown right (output shaft faces to the front of the wing).



STEP 05

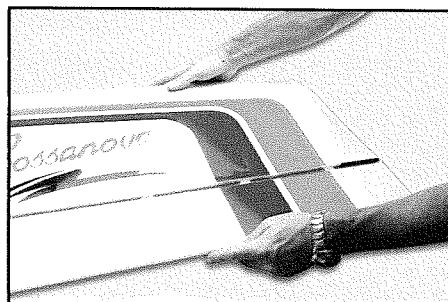
Locate the hinges and insert four mid-way into the each wing half's trailing edge (eight hinges in total). Each of the slots has been pre-cut for the hinges but may need gentle opening up with a sharp knife.

Using thin cyano, pour a couple of drops onto each hinge - above and below - ensuring the glue soaks into the hinge and the surrounding wood.



STEP 06

Carefully slide each aileron into position, ensuring a gap-free hinge line. Make sure that each aileron lines up with the wing tips and that they are free to move through their entire travel.



THE WINGS

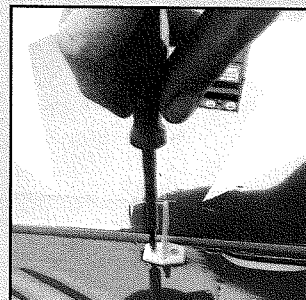
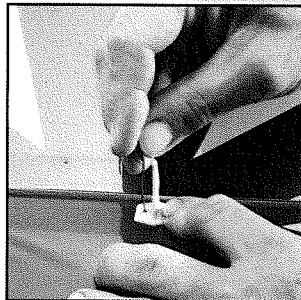
STEP 07

Minimise any hinge gap, then carefully add a couple of drops of thin cyano to the top and bottom of each hinge ensuring that the glue does not run through the hinge line onto the bottom of the wing. Turn the wing over and drop more cyano onto each hinge from the other side.



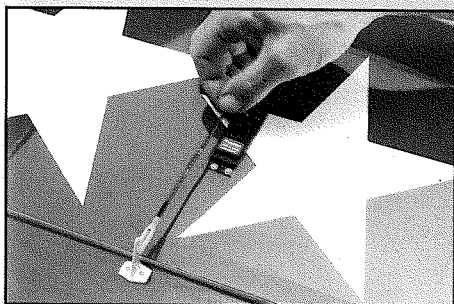
STEP 08

The horns are mounted on the underside of each aileron, in line with the servo output arm and the hinge line. Use a small drill to mark the horn's position on the the aileron then drill clearance holes. Mount the two aileron control horns using the screws provided. Do not overtighten the screws into the mounting plates.



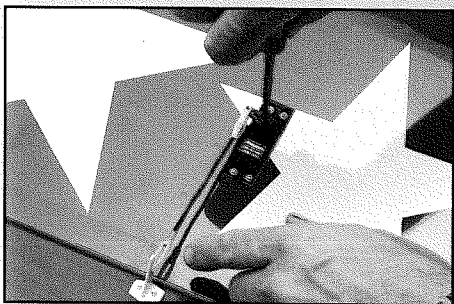
STEP 09

Locate the threaded wire aileron control rod and attach a nylon clevis to the end. Temporarily connect it to the aileron horn and with the aileron and the aileron servo centred, mark the position the control rod passes over the servo's output arm. Repeat for the other aileron control rod.



STEP 10

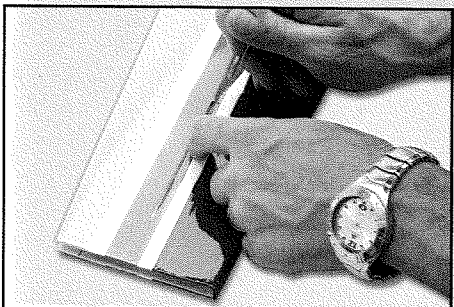
Bend each control rod at 90° at the points marked and cut off the excess wire, leaving approximately 6mm of control rod after the bend. Fit the control rod to the aileron servo using a nylon swing-in keeper. Repeat for the other aileron, then test both ailerons move freely across their entire throw.



FITTING THE TAIL

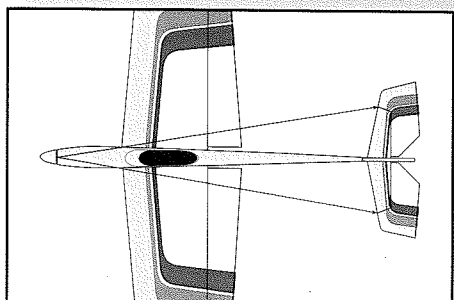
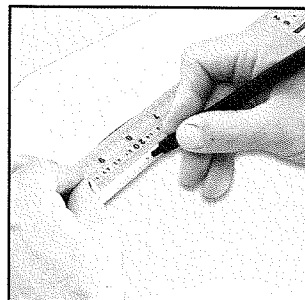
STEP 11

Locate the pre-cut slots for the tailplane and remove the covering film on both sides of the fuselage using a sharp knife. Check the fit of the tailplane in the slot.



STEP 12

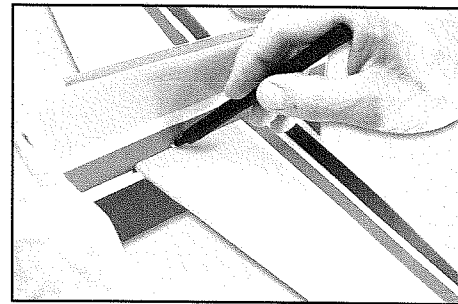
Use a ruler to measure and mark the centre of the tailplane using a water-based felt tip pen. Insert the tailplane in its slot in the fuselage. Temporarily fit the wing to ensure the tail is level. Ensure the tailplane is accurately centred in the fuselage using the line marked in the previous step and a long ruler or string as shown in the diagram on the right.



FITTING THE TAIL

STEP 13

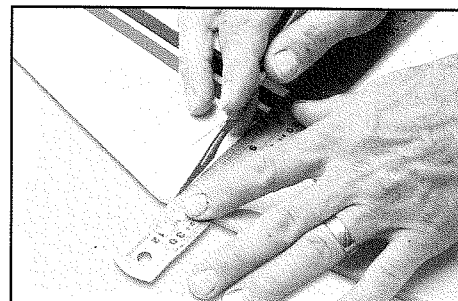
Carefully mark the tailplane on the top and bottom where it enters the fuselage using a soft, water-soluble pen. Now remove the tailplane.



STEP 14

Cut away the covering from just inside the marked lines to give a film-free surface for the glue to bond.

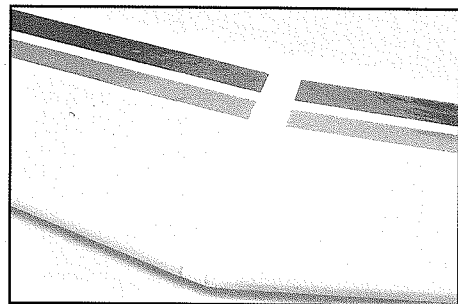
IMPORTANT NOTE: Ensure that only the film is cut - not the tailplane - as this will seriously weaken the structure.



STEP 15

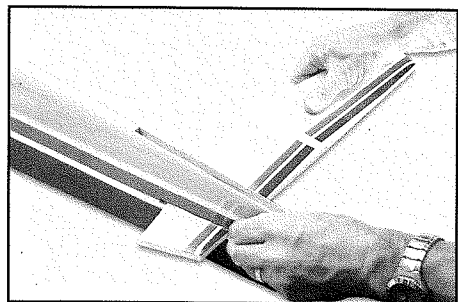
This is how the prepared tailplane should look. You may wish to seal the edges of the film with a covering iron at the centre of the tail before the next stage.

VERY IMPORTANT: Locate the bent wire elevator joiner and place it in the rear of the tailplane slot in the fuselage now. It will be almost impossible to fit it after the tailplane has been glued in position in the next step.



STEP 16

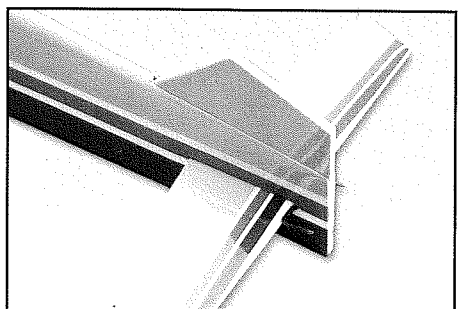
Using 1 hour epoxy, glue the tailplane in its slot. Check that it is correctly aligned and square to the fuselage and wing seat using the same method as in Step 16. You may wish to use masking tape to protect the covering whilst you do this (removing it as soon as you are satisfied with the alignment and before the epoxy cures). Any excess epoxy can be wiped from the model before it cures using methylated spirit or methanol.



STEP 17

The fin can now be glued in position using 1 hour epoxy. Check that it is pushed down into its slot in the top of the fuselage and ensure that it is square to the tailplane and wing while the glue dries. Wipe any excess epoxy from the model before it cures.

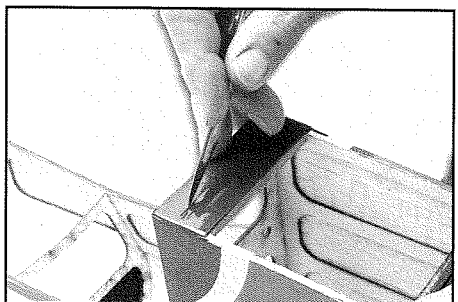
IMPORTANT NOTE: For extreme flying, or when using powerful engines, it is recommended that the tailplane be braced to the fuselage/fin using your preferred method - use aluminium tube or closed loop wire (not supplied).



FITTING THE UNDERCARRIAGE

STEP 18

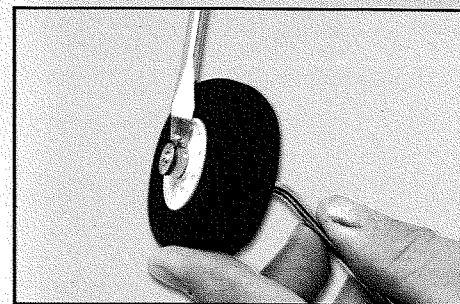
Locate the pre-formed slot in the undercarriage mounting block. Carefully remove the film covering from the slot using a sharp knife. You may wish to seal the edges of the film with a covering iron.



FITTING THE UNDERCARRIAGE

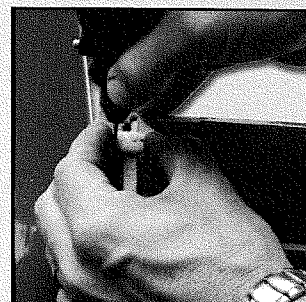
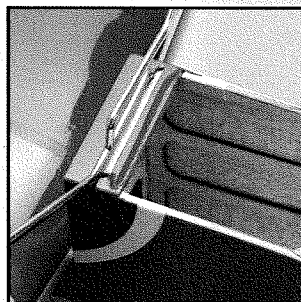
STEP 19

Locate and attach the two wheels onto the pre-bent undercarriage legs using the collets supplied. It is a good idea to add a drop of threadlock to the collet retaining screws during assembly.



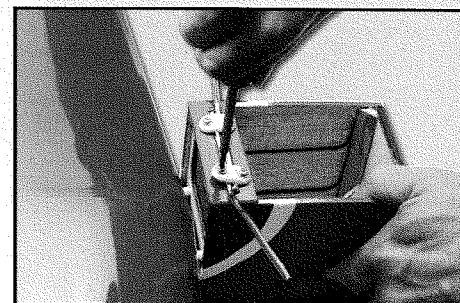
STEP 20

Now insert the two undercarriage legs into their pre-formed slot. Ensure that both legs are completely seated. Locate the nylon undercarriage clamps and holding them in position, pilot drill their mounting holes as shown.



STEP 21

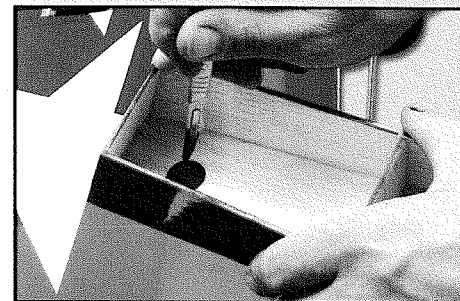
Using the mounting screws supplied, fit the undercarriage clamps taking care not to overtighten.



FITTING THE UNDERWING FAIRING

STEP 22

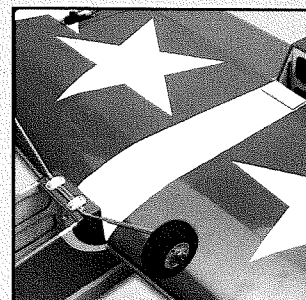
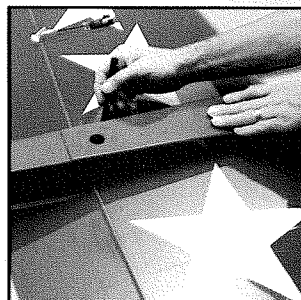
Trim the covering away from the pre-drilled wing mounting bolt access hole. You may wish to seal the edges of the film with a covering iron. With the wing bolted in position, test the fit of the fairing.



STEP 23

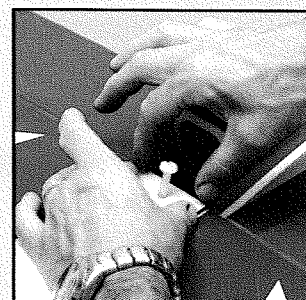
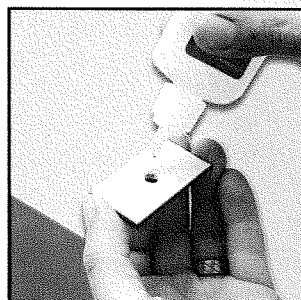
Holding the fairing in place, mark its position on the wing with a water-soluble pen. Remove the fairing and trim the covering from the wing centre section inside the marked lines.

VERY IMPORTANT: Ensure that only the film is cut - not the wing - as this will seriously weaken the structure.



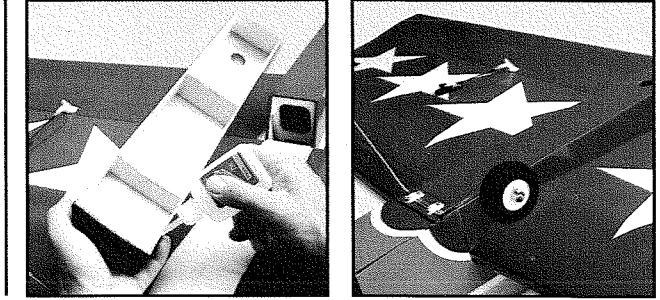
STEP 24

Locate the ply wing bolt reinforcing plate. Using thick cyano or epoxy, carefully glue it in position on the underside of the wing. Use the wing bolt to align the plate ensuring that the glue does not come into contact with the bolt.



STEP 25

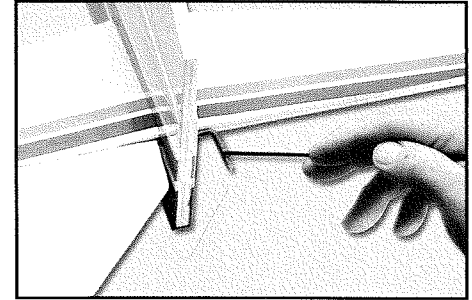
Now glue the wing fairing in position using 5 minute epoxy or thick cyano as shown here. Ensure that the fairing aligns correctly to the fuselage and that the glue does not come into contact with the fuselage.



COMPLETING THE TAIL AND FIN

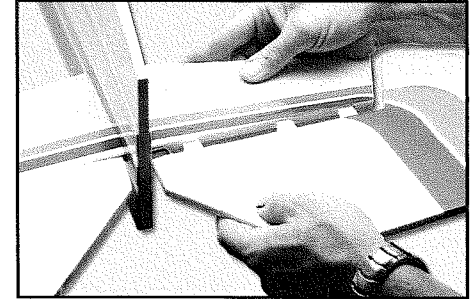
STEP 26

Prepare each elevator half by gluing 3 hinges into each as shown previously for the ailerons in Step 5. Now mix and apply a small quantity of 5 minute epoxy to the elevator joiner as shown right.



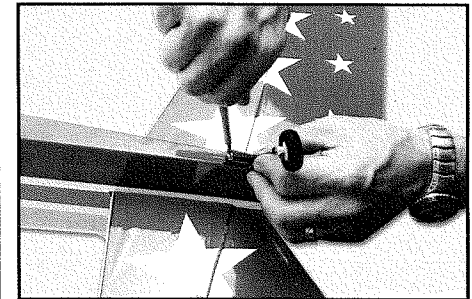
STEP 27

Now slide the elevator onto the wire joiner and ensure that all 3 hinges enter the pre-cut slots in the tailplane. Ensuring a gap-free hinge line, add a couple of drops of thin cyano to the top and bottom of each hinge ensuring that the glue does not run through the hinge line onto the bottom of the tail. Turn the model over and drop more cyano onto each hinge from the other side. Repeat for the second elevator half.



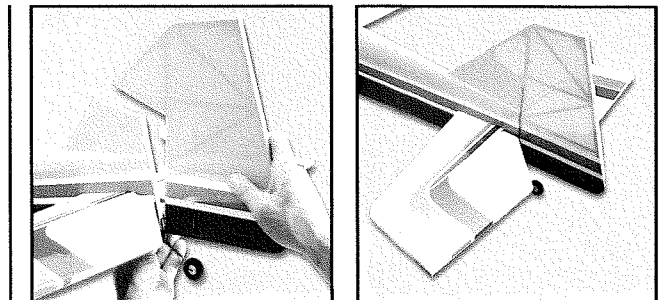
STEP 28

Locate the tailwheel assembly and mounting screws. Aligning the tailwheel wire with the rear of the fuselage, pilot drill the underside of the fuselage and screw the tailwheel in position. Avoid over-tightening the mounting screws.



STEP 29

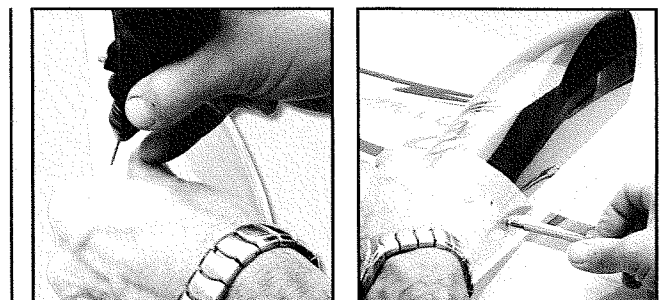
Glue 3 hinges into the rudder. Carefully drill a hole in the bottom of the rudder to accept the bent end of the tailwheel wire and then apply a small quantity of epoxy onto the wire. Slide the rudder into position, ensuring free movement left and right and a gap-free hinge line. Now apply a couple of drops of thin cyano to each side of each hinge taking care not to allow the adhesive to run through the gap onto the other side of the model.



FITTING THE CANOPY

STEP 30

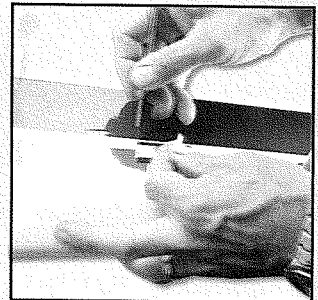
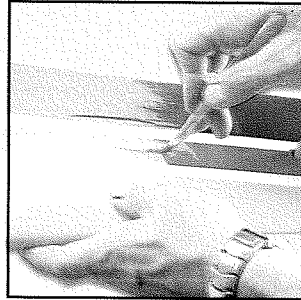
The canopy is simply fitted using 6 small screws. Check the fit of the canopy and trim if necessary. Holding the canopy in place, drill pilot holes for the mounting screws then carefully screw each in place, taking care not to over-tighten.



RADIO INSTALLATION

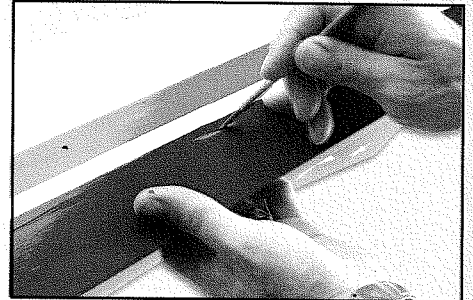
STEP 31

Both the rudder and elevator servos are mounted in the rear of the fuselage - one on each side. Locate the pre-cut mounting hole for each servo (the elevator servo mount is shown here) and remove the covering film with a sharp knife.



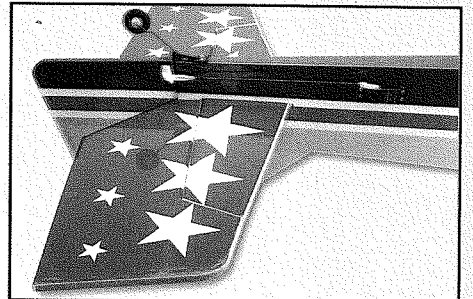
STEP 32

Repeat on the other side of the fuselage for the rudder servo. Test fit the servos in their mounting holes trimming as necessary with a sharp knife. Fit the rubber servo mounting grommets and brass ferrules supplied with your radio equipment. Pilot drill four holes for the mounting screws supplied with your servo. Installing extension leads as necessary, screw each servo into position with the output shafts facing to the rear.



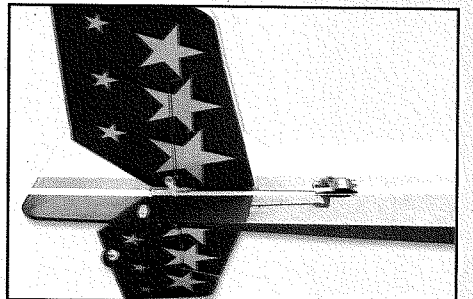
STEP 33

Mount the rudder control horn using the screws provided. Do not overtighten the screws into the mounting plates. Centre the servo and rudder, then make up the pushrod with a clevis at one end and a 90° bend and nylon keeper at the other - just as you did for the ailerons in Step 9 and 10.



STEP 34

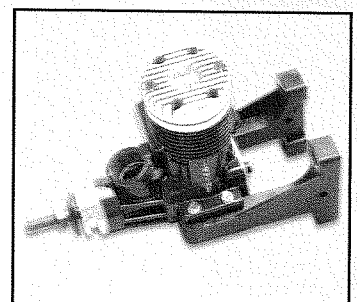
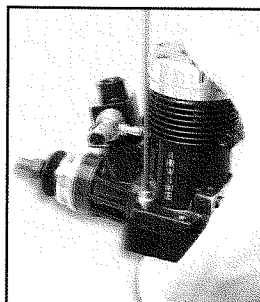
Now mount the elevator control horn on the underside of the elevator as shown using the screws provided. Do not overtighten the screws into the mounting plates. Centre the servo and elevator, then make up the pushrod with a clevis at one end and a 90° bend and nylon keeper at the other as you did for the rudder pushrod above.



ENGINE INSTALLATION

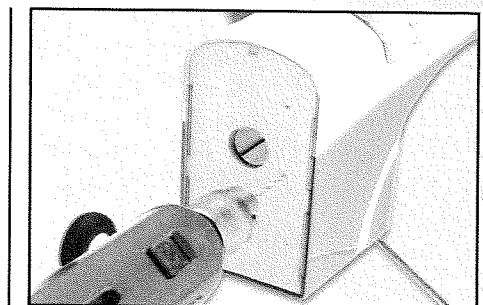
STEP 35

Locate the two halves of the glass filled nylon engine mount. The distance from the rear of the mount to the front of the prop driver should be 130mm. Mark the position of the engine mounting holes on each leg of the mount, pilot drill and attach the engine using the mounting screws supplied.



STEP 36

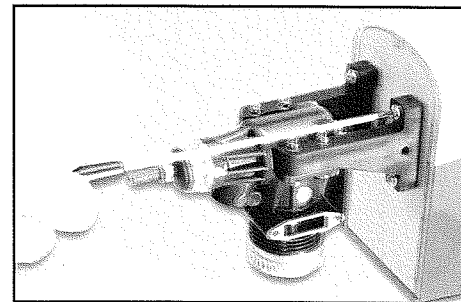
Using the centre lines marked on the bulkhead, mark the positions of the mounting holes for the engine mount and drill clearance holes for the mounting screws and captive nuts supplied. Note that the engine is mounted inverted in the Bossanova.



ENGINE INSTALLATION

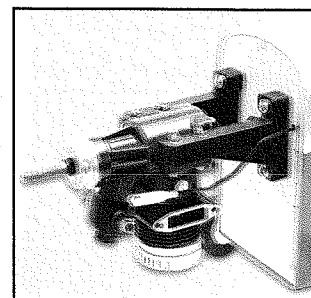
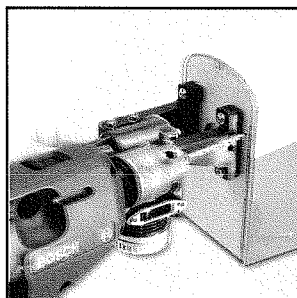
STEP 37

Screw the engine mount to the bulkhead using the the four screws and captive nuts supplied. Ensure that the mount is centred left and right on the bulkhead so that cowl alignment is maintained.



STEP 38

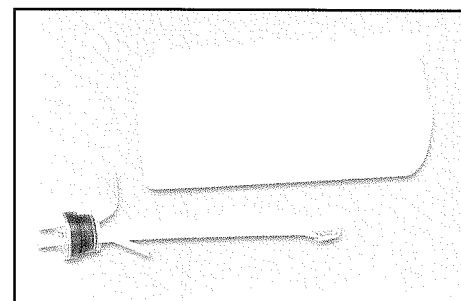
Drill a clearance hole for the throttle pushrod as shown. Screw a nylon clevis onto the pushrod and bend it as shown far right. The linkage can be completed once the tank is fitted and the throttle servo has been installed.



FITTING THE TANK

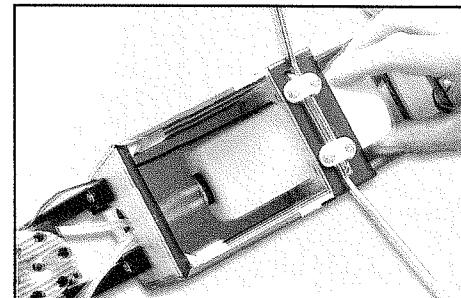
STEP 39

Locate the tank and prepare the bung assembly by bending the fuel and vent tubes as shown. Connect the clunk to the fuel tubing supplied and fit the bung assembly ensuring the clunk is free to move inside the tank without touching the rear. Tighten the retaining screw in the bung.



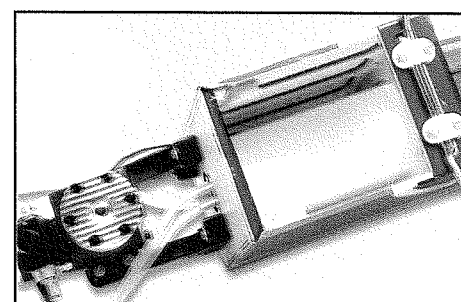
STEP 40

Attach three lengths of fuel tubing to the tank (not supplied) then insert the tank into the front of the fuselage, feeding the fuel pipes out through the bulkhead.



STEP 41

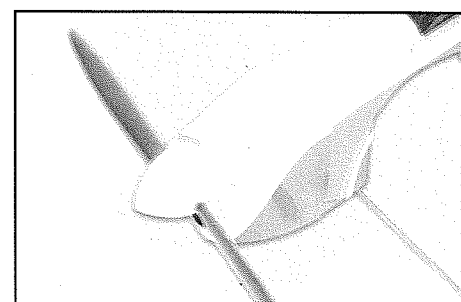
Push the tank forward until its neck passes through the bulkhead. This ensures that the fuel and vent pipes cannot be pinched or trapped. Use a couple of pieces of foam to locate the tank and a scrap of balsa or ply glued to the rear former to retain it in position.



FITTING THE COWL

STEP 42

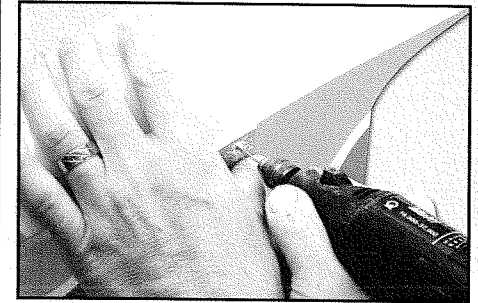
Temporarily fit the cowl, propeller and spinner. Use card to give sufficient clearance between the back of the spinner and the front of the cowl and use strips of tape to hold it in place.



FITTING THE COWL

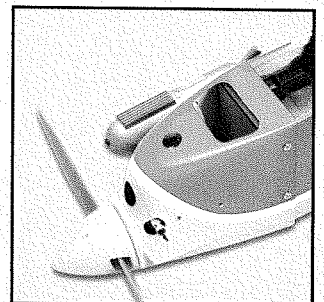
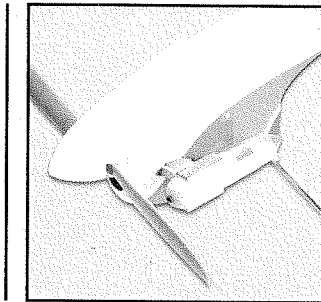
STEP 43

Pilot drill the cowl in four places for the cowl retaining screws. Ensure that you drill the mounting holes so that the screws pass through the cowl and into the ply bulkhead.



STEP 44

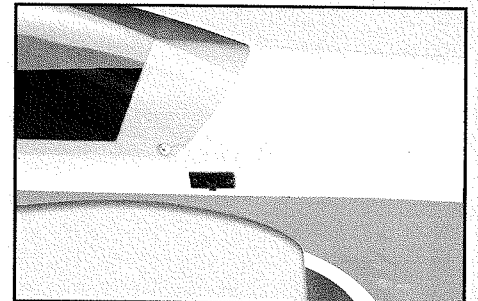
Once the cowl is fitted, trim it for clearance on the silencer, the carburettor and access for the glowplug. Add a cooling hole at the front and an exit underneath as shown.



FINAL INSTALLATION

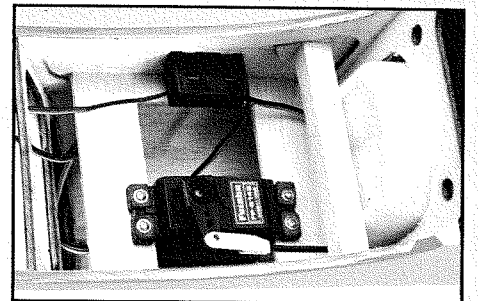
STEP 45

Mount the switch through the side of the fuselage ensuring that it is on the opposite side to the silencer.



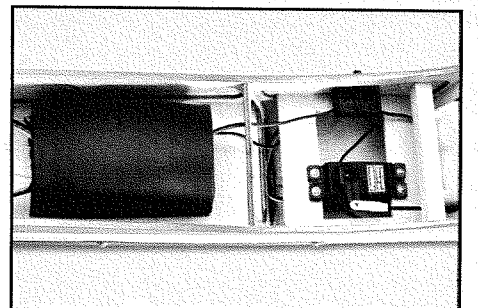
STEP 46

Glue the throttle servo tray in position immediately behind the tank using 5 minute epoxy or cyano. The throttle servo can now be fitted using the rubber grommets, brass ferrules and mounting screws supplied with your radio system. Complete the throttle linkage using a 90° bend and a keeper. Check that the throttle opens and closes fully with no binding.



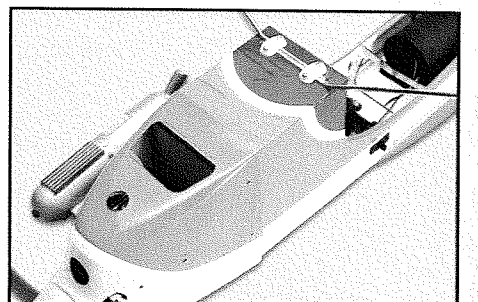
STEP 47

Wrap the receiver in foam rubber as shown and attach it to the floor of the cockpit behind the throttle servo using hook and loop tape or elastic bands. Route the receiver aerial down the inside of the fuselage in a spare length of tube, or drill an exit hole through the fuselage and run it along the outside.



STEP 48

Wrap the receiver battery in foam rubber and place it under the tank. Use scraps of foam to retain it. The final cover can now be glued in position over the lower fuselage opening. This completes the assembly of the model.



CONTROL THROWS

For initial flights, we recommend the following:-

Elevator:	25mm up
	25mm down
Rudder:	50mm left
	50mm right
Ailerons:	20mm up
	20mm down

Once comfortable with the Bossanova the control throws can be increased. For 3D flying, these movements can be significantly increased. The Bossanova is not intended for beginners, but with reduced control throws and a .40 size engine, it is perfectly suitable as an aerobatic trainer or a second low-wing model.

BALANCING THE MODEL

The Centre of Gravity position should be 135mm back from the leading edge measured at the root of the wing. Support the completed model at this point and add weight as necessary to achieve a slightly nose down attitude. A model that is not correctly balanced will not perform as it should and, at worst, be unstable or unflyable, leading to damage to the model or injury to yourself or others. Do not miss out this step in completing your Bossanova!

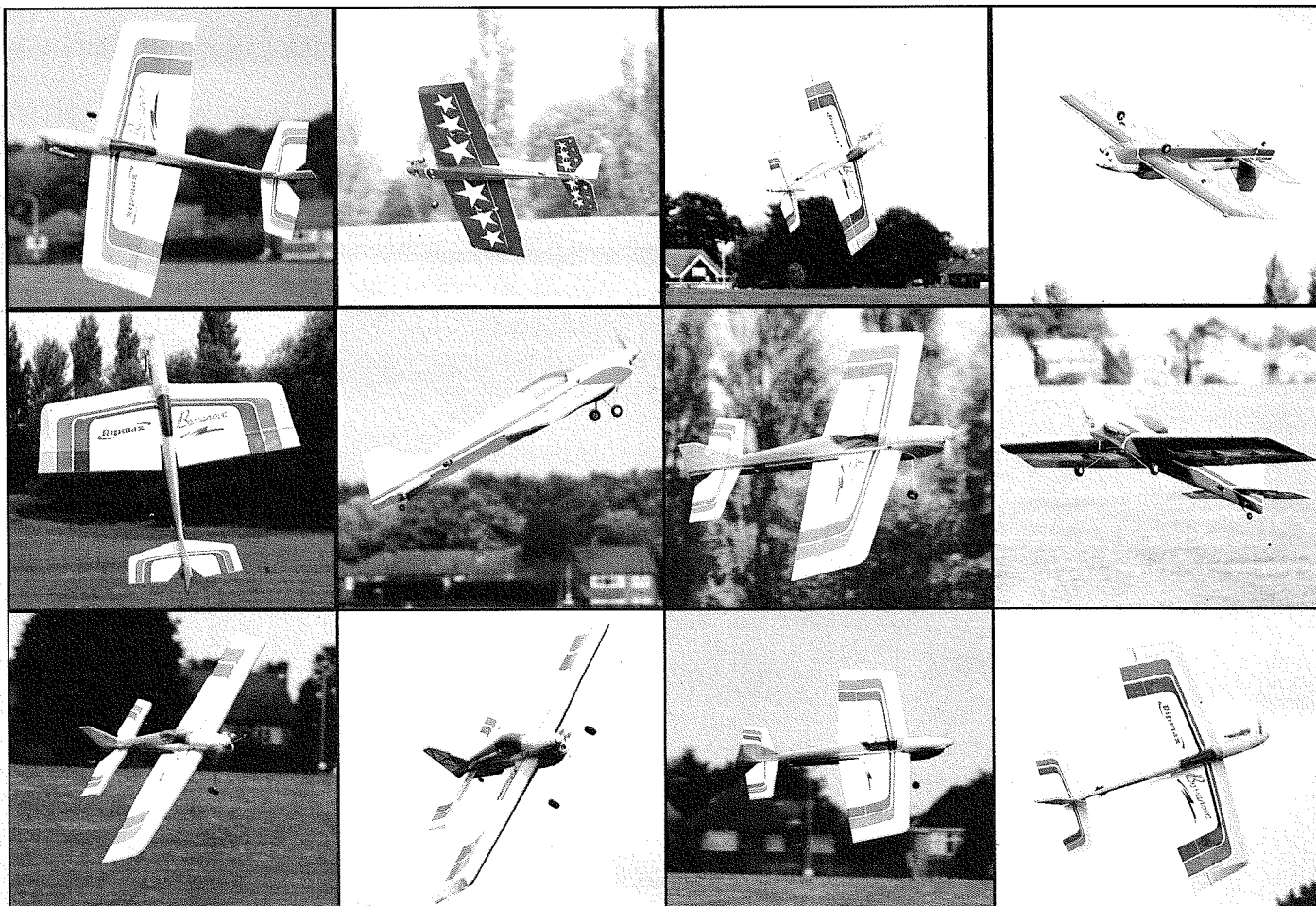
PRE-FLIGHT CHECKS

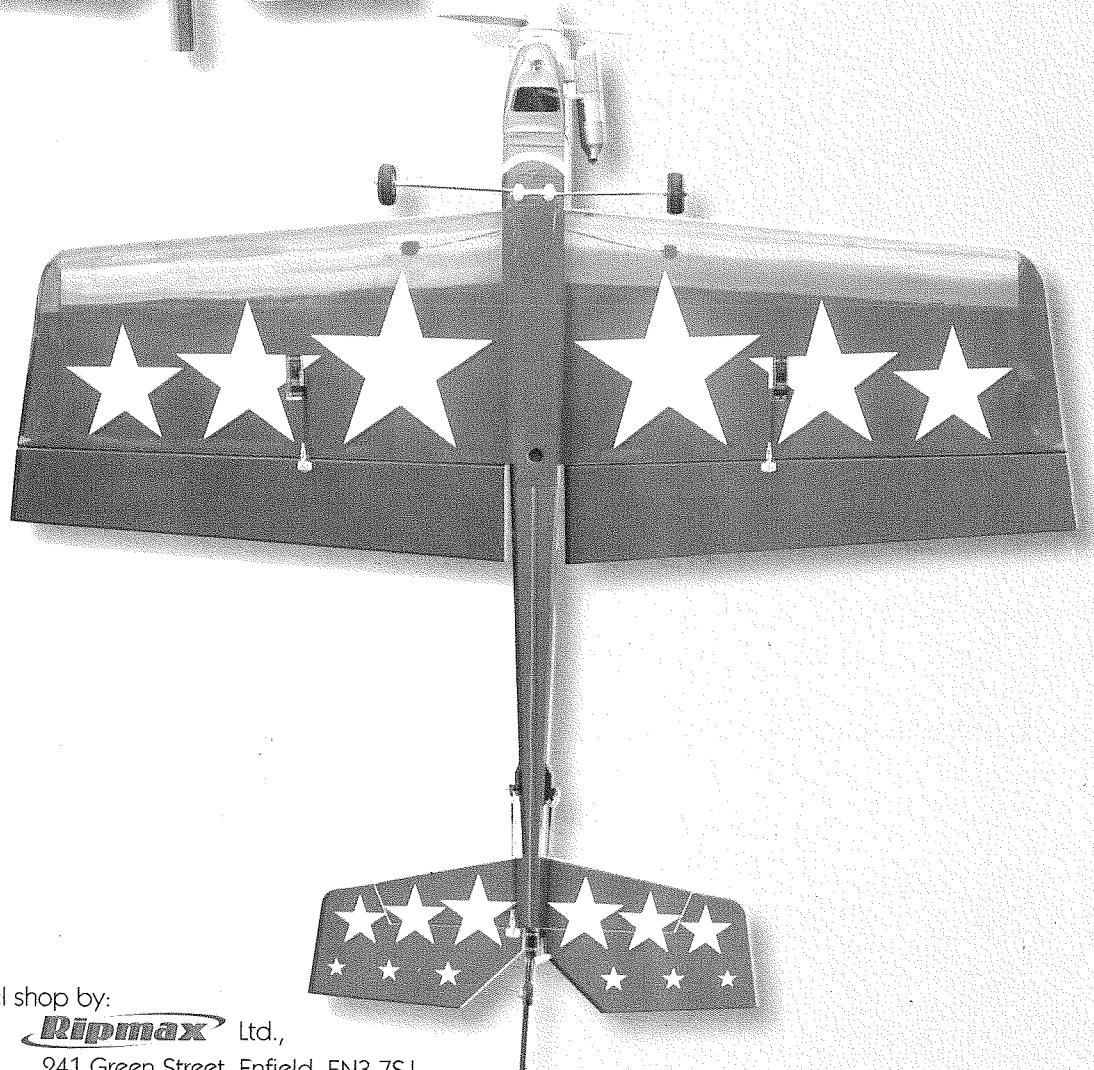
- Completely charge your transmitter and receiver batteries before flying.
- Carefully check your model over to ensure that all screws are tight and everything is well bonded.
- Double-check the Bossanova's Centre of Gravity.
- Check the control surfaces for both the correct throw and direction. Ensure that each surface moves freely, without any binding.
- Check the receiver aerial is fully extended.
- Ensure the wing bolts are tight - use with the metal washers supplied.

IMPORTANT

The Bossanova is a highly aerobatic model capable of extreme 3D manoeuvres. When fitted with a .53 class engine, it offers unlimited performance. However, it is not a pattern aerobatic model and is not designed to be flown fast, but with the correct choice of 3D 'paddle' prop having broad blades and very low pitch. Also, ensure that your choice of servo can handle the huge control surfaces and consider the enormous strain that will be placed on all components of the airborne radio equipment.

Always fly responsibly and safely.





Distributed to your local model shop by:

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