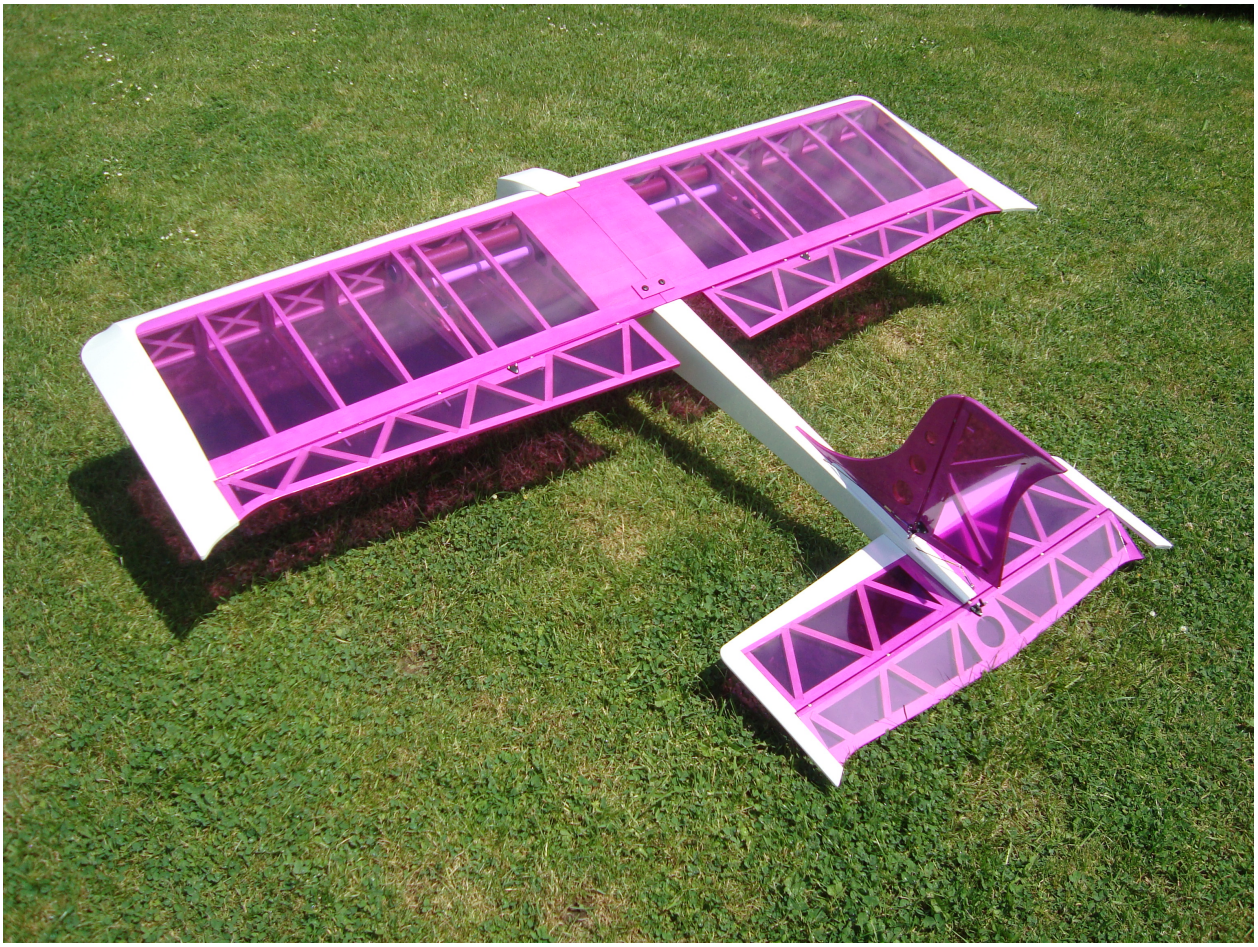


Petrol and Electric Instruction Manual

FEATURES

- Precision Laser Cut Parts
- Lightweight Strong Airframe
- Excellent Low Speed Stability
- Comprehensive Instruction Manual
- High Quality Balsa and Ply parts
- Excellent Precise Handling Characteristics, ideal first large trainer
- High Quality Comprehensive Hardware Pack

Introduction

The Mega Fusion was the natural progression from the Fusion. It can be used for a large model trainer or glider tug (with appropriate alterations) as it provides a stable base which a pilot of any experience will enjoy and feel confidence with. Wind up the rates and put a hot motor in it then like the Fusion it will loop on the spot, roll in the blink of an eye, again, inspiring confidence as it remains rock solid and stable. This model that has been designed to be highly manoeuvrable, but also to be attractive with style and flair.

Building Recommendations (Please read)

Check all parts from the box to ensure that they are present; if not then please contact us at the e-mail address at the back of the instructions. We do from time to time make mistakes!!

Ensure that you use a completely flat base on which to build the model, this should be large enough the build the wing 50" (1270mm) x 18" (450mm) as a minimum.

Read through the instructions before starting to build, understand each step before applying glue.

Any glue detailed in the instructions is for a guide only, this is what we used for the prototypes, it is at the builders discretion which glue is used, but ensure that it is suitable for the intended purpose. **Always** read the application instructions to ensure you achieve a strong joint. **Always** read the safety instructions supplied with the glue.

Take your time building the model, build a straight and strong model, this will ensure the model will fly well!

!!! **Warning**. During the construction you will be asked to sand balsa. Ensure that you are wearing an appropriate mask for sanding balsa and are in a well ventilated area. We recommend sanding in free air (outside).!!!

Enjoy. Building **is** part of aero modelling! By building you will understand how the model works and how to handle it correctly.

This radio controlled model is **not** a toy. It can cause serious injury to the operator, public and property if misused or abused. Ensure that you read all the instructions supplied with this kit and instructions provided with the engine and radio control system or any other components purchased separately carefully. Also make sure that any parts bought separately are suitable for their application.

The kit contains small and potentially sharp parts, keep away from children.

Additional Materials Required	**Recommended Tools**
Uhu Por Cyano Standard Thin or Medium Cyano Aliphatic Wood Glue Epoxy Resin Tinned Copper Wire (For Undercarriage) Solder Heat Shrink Covering Material Power Set or motor Radio Gear	Modelling Knife Razor Plane Set Square Sand Paper Sanding Block Blow Torch Drill Drill Bits Building Board – Completely flat 1270 x 450mm Min Bradawl

Please visit our online shop at www.evolution-models.com if you require any supporting materials. We stock motors and ESCs and all the materials you will require to build your model.

Fusion Part List

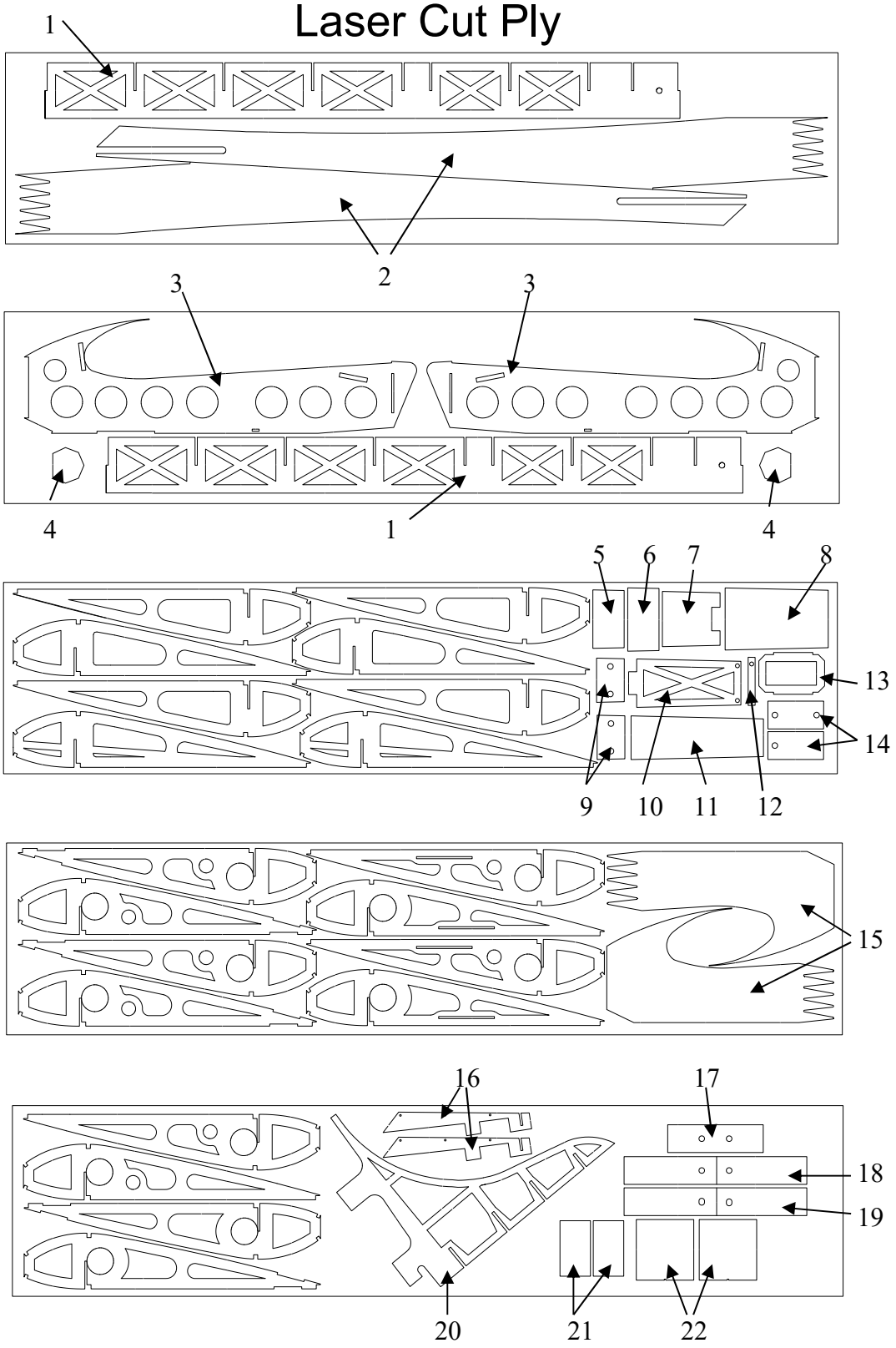
Wood Pack

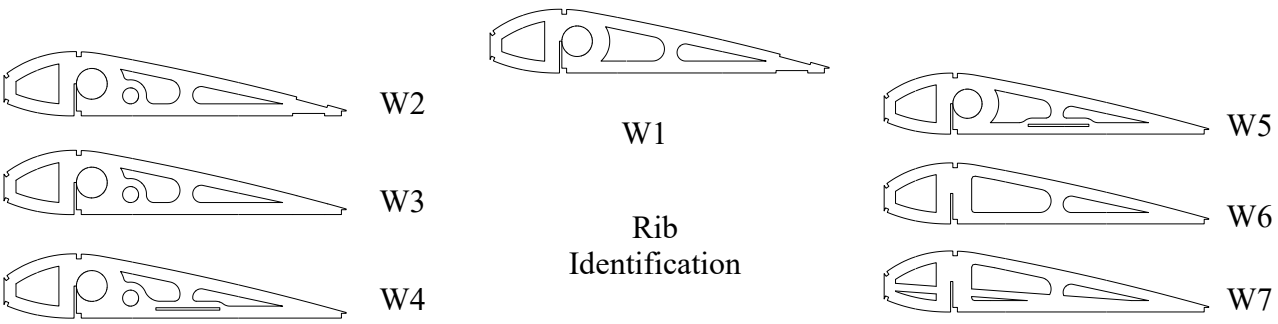
Description	Sheet Size		Quantity
	Metric	Imperial	
Leading Edge Sheet	2 x 100 x 915mm	3/32 x 4 x 36”	4
Leading Edge (**cut into 2 pieces**)	9.5 x 75 x 915mm	3/8 x 3 x 36”	1
Trailing Edge Sheet (**cut into 4 pieces**)	2 x 100 x 915mm	3/32 x 4 x 36”	1
Main Spars and Trailing Edge Spar	6 x 6 x 915mm	1/4 x1/4 x 36”	6
Leading Edge Spar	4.5 x 4.5 x 915mm	3/16 x 3/16 x 36”	4
Wing Centre Section Sheet	2 x 100 x 915mm	3/32 x 4 x 36”	2
Fuselage Bottom and Front Deck Sheet	3 x 150 x 915mm	1/8 x 6 x 36”	1
Rib Capping Strips	2 x 9.5 x 915mm	3/32 x 1/4 x 36”	14
Aileron/Rudder/Elevator/Tail Plane Strip	9.5 x 12 x 915mm	3/8 x1/2 x 36”	5
Fuselage Triangular Fillet	9.5 x 9.5 x 915mm	3/8 x 3/8 x 36”	8
Tail Plane Spar Cover	1.5 x 6 x 915mm	1/16 x 1/4 x 36”	1

Hardware Pack

Description	Quantity
75mm (3”) Wheels	2
Metal Clevis (M3)	8
Metal Extender (M3)	2
Nuts (M3)	8
Aileron Control Rod (M3)	2
Closed Loop Adaptors	4
Closed Loop Crimps	8
Closed Loop Wire	4 m
Control Horns	6
5mm x 450mm Carbon rod	1
Single Saddle Clamp 6 swg and Screws (12)	6
6 Swg Wheel Collet	2
Captive Nuts, bolts and washers	2
Pinned Hinges	19
Servo Mount Spruce 6 x 6 x 25mm (¼ x ¼ x 1”)	2

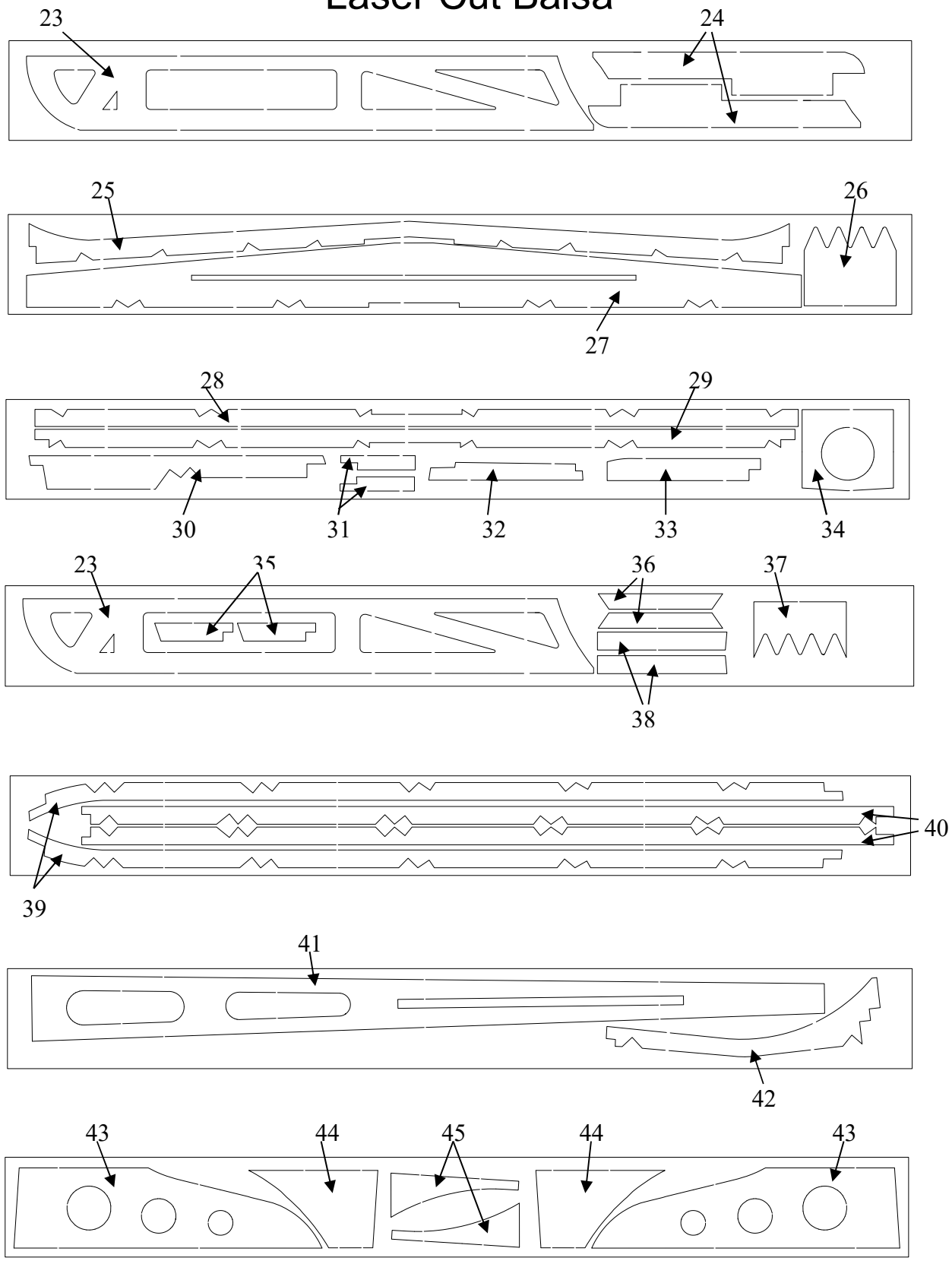
Laser Cut Ply





Rib Identification

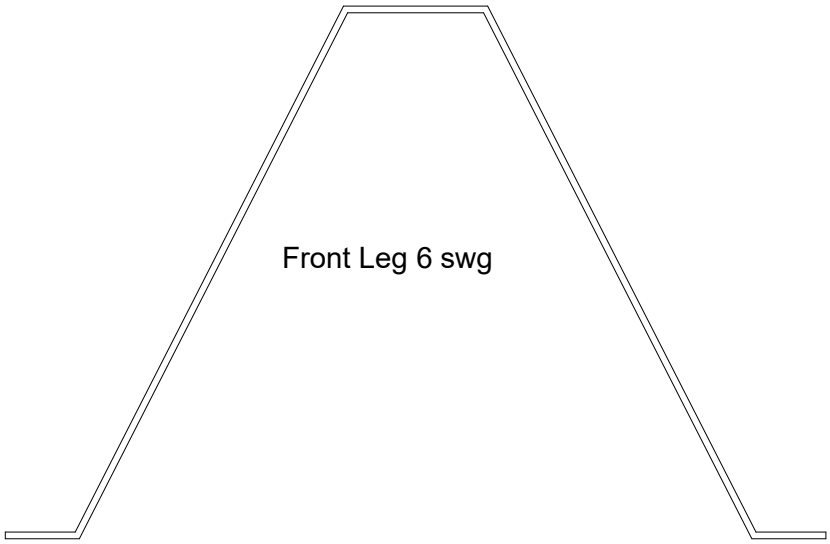
Laser Cut Balsa



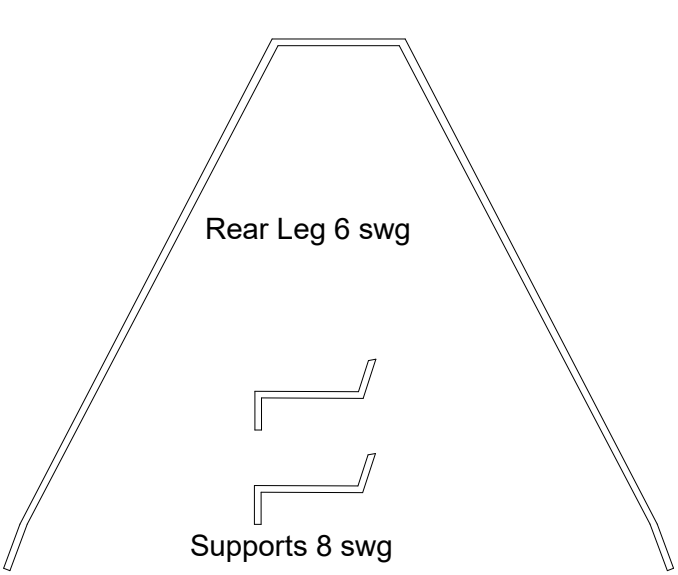
Part No.	Description	Sheet Material
1	Main Wing Spar (2)	3mm (1/8”) Ply
2	Left and Right Fuselage sides Rear Section (2)	3mm (1/8”) Ply
3	Fuselage Doubler (2)	3mm (1/8”) Ply
4	Wing Tube End Plates (2)	3mm (1/8”) Ply
5	Inner Front Undercarriage Mount	3mm (1/8”) Ply
6	Outer Front Undercarriage Mount	3mm (1/8”) Ply
7	Inner Rear Undercarriage Mount	3mm (1/8”) Ply
8	Outer Rear Undercarriage Mount	3mm (1/8”) Ply
9	Wing Bolt Plate (2)	3mm (1/8”) Ply
10	Hatch Plate	3mm (1/8”) Ply
11	Servo Mounting Plate	3mm (1/8”) Ply
12	Hatch Latch Plate	3mm (1/8”) Ply
13	F2	3mm (1/8”) Ply
14	Wing Dowel Plates	3mm (1/8”) Ply
15	Left and Right Fuselage sides Front section (2)	3mm (1/8”) Ply
16	Tail Skid plates (2)	3mm (1/8”) Ply
17	Outer Wing Bolt Plate	3mm (1/8”) Ply
18	Upper Wing Bolt Plate	3mm (1/8”) Ply
19	Lower Wing Bolt Plate	3mm (1/8”) Ply
20	Fin Core	3mm (1/8”) Ply
21	Aileron Servo Mounting Plates	3mm (1/8”) Ply
22	F1 (2)	3mm (1/8”) Ply
23	Wing Tip (2)	9.5mm (3/8”) Balsa
24	Tail Plane Tips (2)	9.5mm (3/8”) Balsa
25	Elevator Trailing Edge	9.5mm (3/8”) Balsa
26	Tail Plane Centre Section	9.5mm (3/8”) Balsa
27	Tail Plane Leading Edge	9.5mm (3/8”) Balsa
28	Tail Plane Trailing Edge	9.5mm (3/8”) Balsa
29	Elevator Leading Edge	9.5mm (3/8”) Balsa
30	Rudder Leading Edge	9.5mm (3/8”) Balsa
31	Elevator Tips (2)	9.5mm (3/8”) Balsa
32	Rudder Bottom	9.5mm (3/8”) Balsa
33	Rudder Top	9.5mm (3/8”) Balsa
34	Elevator Centre Section	9.5mm (3/8”) Balsa
35	Aileron Outer Tips (2)	9.5mm (3/8”) Balsa
36	Aileron Horn Plates (2)	9.5mm (3/8”) Balsa
37	Tail Plane Centre Section	9.5mm (3/8”) Balsa
38	Aileron Inner Tips (2)	9.5mm (3/8”) Balsa
39	Aileron Trailing Edge (2)	9.5mm (3/8”) Balsa
40	Aileron Leading Edge (2)	9.5mm (3/8”) Balsa
41	Fuselage Backbone	9.5mm (3/8”) Balsa
42	Rudder Trailing Edge	9.5mm (3/8”) Balsa
43	Rudder Outer Cladding (Rear) (2)	3mm (1/8”) Balsa
44	Rudder Outer Cladding (Middle) (2)	3mm (1/8”) Balsa
45	Rudder Outer Cladding (Front) (2)	3mm (1/8”) Balsa

Fusion Parts List

Piano Wire U/C

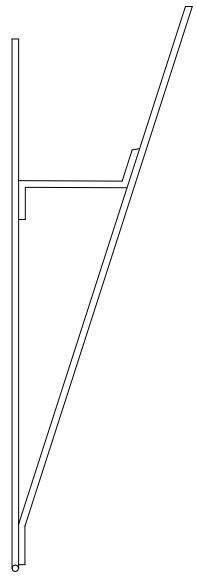


Front Leg 6 swg



Rear Leg 6 swg

Supports 8 swg





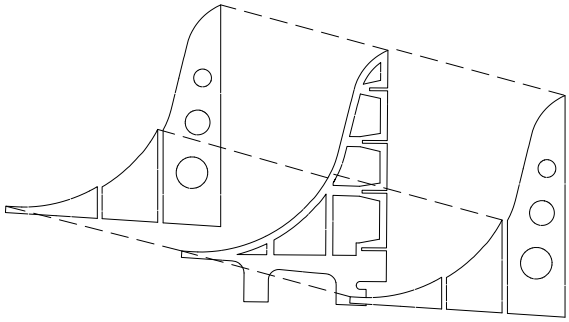
Tail Skid 10 swg

Description	Quantity
Undercarriage Front Leg	1
Undercarriage Rear Leg	1
Undercarriage Support	2
Tail Skid	1
Suspension Parts Set (2 large and 2 Small)	1

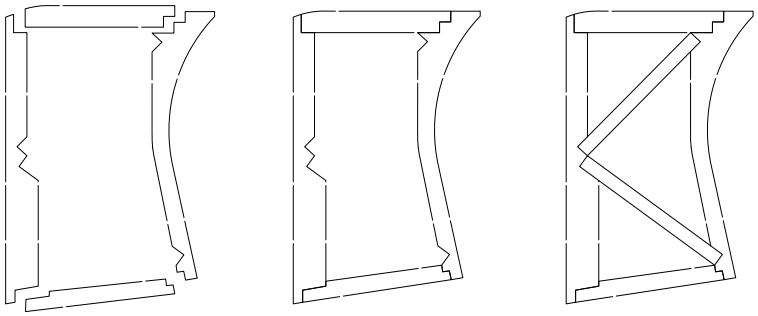
Building Instructions

Fin and Rudder

Take the 7 parts that form the Fin (Parts 43(2), 44(2), 45(2) and 20), sandwich the ply part between the sheets of 1/8th balsa



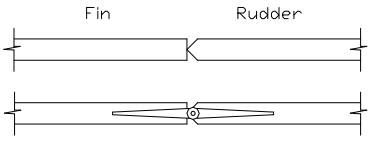
Take the four parts that form the rudder (Parts 30, 32, 33 and 42) and assemble as shown below using the 12.5 x 9.5mm (1/2” x 3/8”) strip wood to create the riblets.



With a pencil mark the centre line of the leading edge of the rudder and chamfer to a 45° angle with a Razor Plane ready to receive the hinges. The hinged part of the pinned hinges sits in the chamfer as shown below. With a file remove a section of the chamfered face to accept the centre of the hinge, then **Carefully** drill the balsa to accept the hinge. The fin has already been cut to accept the four hinges, make adjustments if necessary.







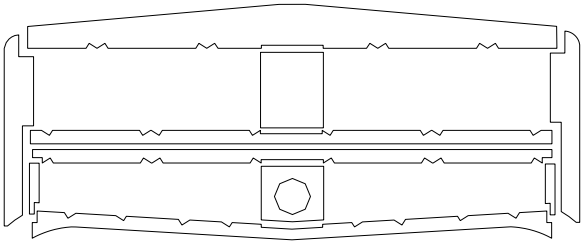
Sand all parts to a smooth Finish and round off the leading edge of the Fin ready for covering.

Tail Plane and Elevator

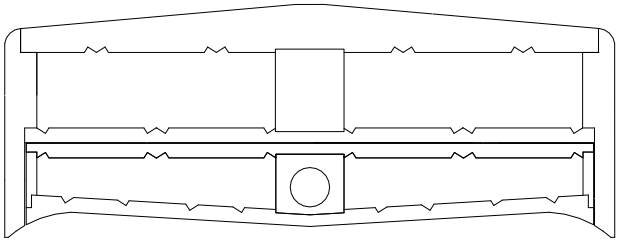
Take the pre-cut parts which form the Tail Plane (Parts 24(2), 26, 27, 28 and 37), trial fit, ensure the tips are at 90° to the leading and trailing edge before gluing. With the supplied strip of 12.5 x 9.5mm (1/2” x 3/8”) cut to length to form the eight ribbing pieces, glue in place.

Using the elevator parts (Parts 25, 29, 31(2), and 34), and 12.5 x 9.5mm (1/2” x 3/8”) strip wood, make up the elevator in the same way as the Tail Plane

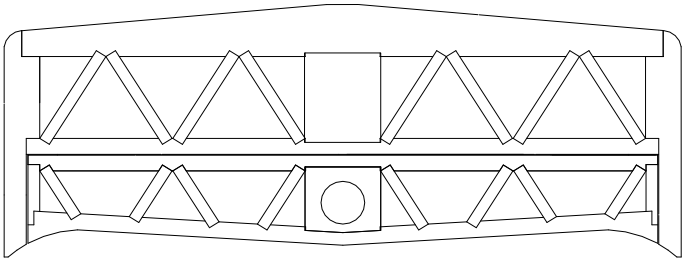
The Tail Plane and Elevator are separate parts do not glue together.



Tail Plane parts laid out



Tail Plane assembled



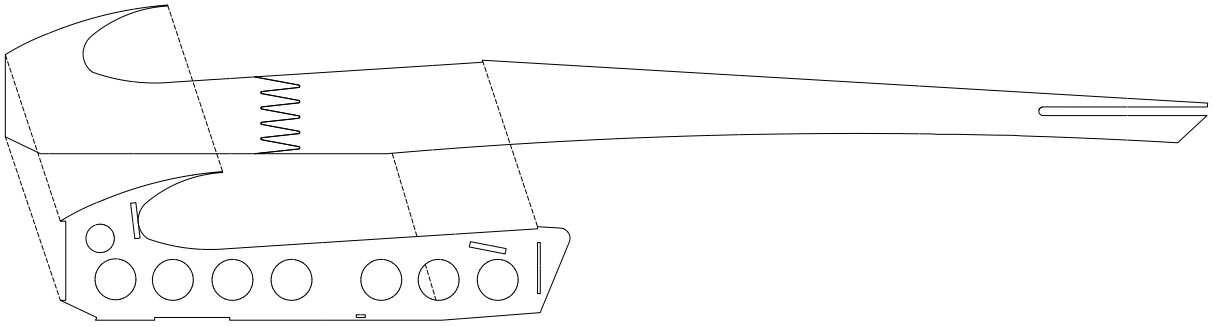
Riblet pieces inserted

Use the 1.5 x 6 x 915mm (1/16 x 1/4 x36”) balsa strip and glue it in the pre-cut spar slot flush with the surface, insert the 5 x 450mm (18”) carbon spar and glue in place with epoxy before capping with the remaining strip.

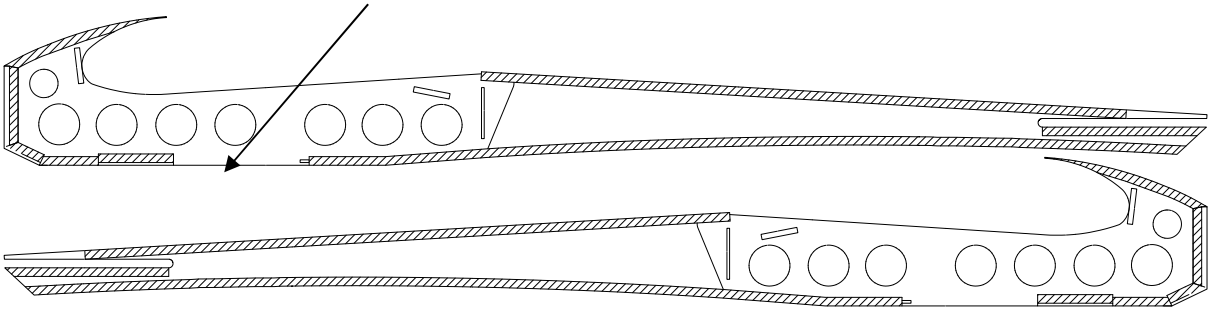
With a pencil mark the centre line of the leading edge of the Elevator. Chamfer to a 45° angle with a razor Plane ready to receive the hinges. Use 5 hinges attach the elevator to the tail plane as describe above for the rudder.

Fuselage

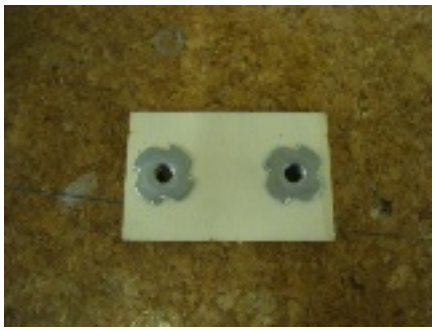
Lay the two Fuselage sides (Parts 2(2) and 15(2)) on the work bench ensuring that you have a left and right hand side. Glue the front and rear sections together before attaching the Fuselage Doubler (Part 3 (2))



Using the 9.5mm (3/8”) triangular fillet, glue to the outer edge of the Fuselage as shown hatched below. Make cuts in the fillet to allow it to follow the bottom curve of the Fuselage If Building the **petrol version** also fill the section at the bottom of the fuselage.

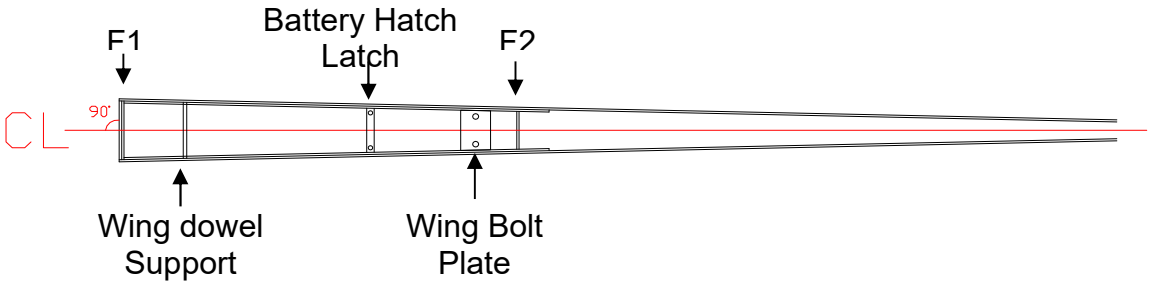


Glue the two F1's (Part 22(2)), two Wing Bolt Plates (Part 9(2)) and two Wing Dowel Supports (Part 14(2)) together to form 6mm (1/4") thick parts. Insert the two captive nuts by using a hammer on a flat surface. If you are building the Petrol Version your kit will have a 6mm (¼") Birch Ply F1 to replace the two 3mm Poplar ply pieces.

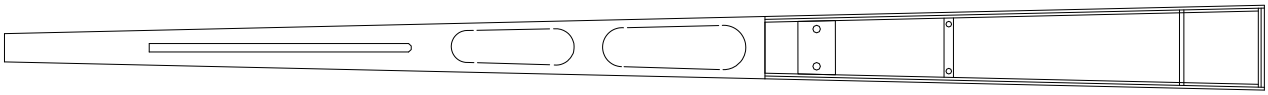


Draw a centre line on your bench as long as the fuselage to create a centre line to work from.

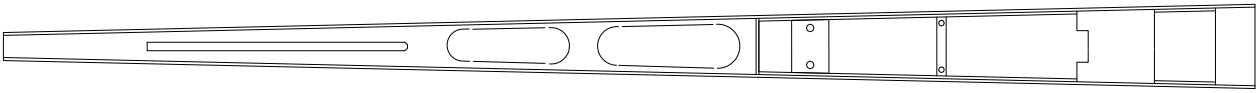
Using F1, F2, the Wing Dowel Support, Tank Hatch Latch (Part12) and Wing Bolt Plate begin to form the fuselage. Insert F2 (Part 13), the Wing Dowel Support, Battery Hatch Latch and Wing Bolt Plate (so the captive part of the nut is on the underside) into the corresponding slots in the Fuselage Doubler and glue in position. Offer up the second side, before gluing turn the whole assembly over so that the fuselage sides are vertical. Place the centre of F2 on the centre line marked on your bench and insert F1 (so that the cut is at the bottom), again on the centre line. When satisfied that the fuselage sides taper evenly either side of the centre line and F1 is at 90° glue the whole assembly together. F1 should be glued into position using epoxy.



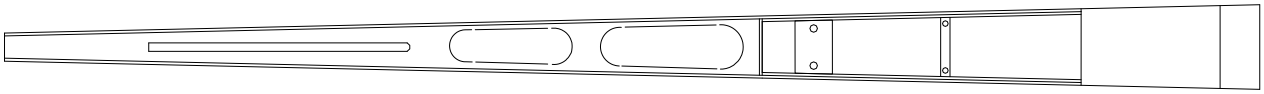
Once the epoxy has set, glue the top decking (Part 41) to the Fuselage, ensuring the rear Fuselage remains square and the cut out for the fin remains along the Fuselage centre line.



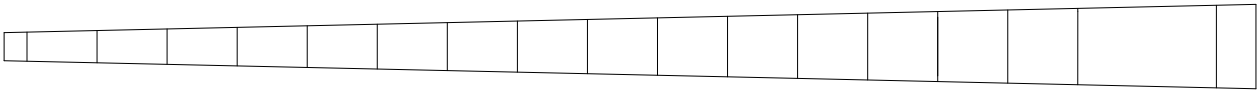
With epoxy glue the front (Part 5) and rear (Part 7) undercarriage plates into position. (Fuselage shown upside down). The plates fit within the recess created by the ply doublers.



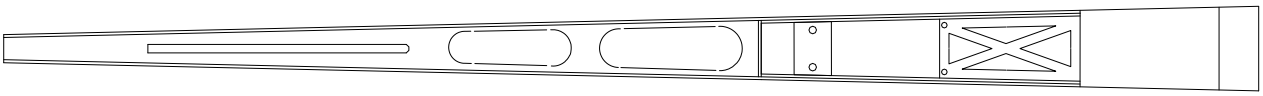
Epoxy the outer undercarriage plates (Part 6 and 8) into position, these sit on top and fit flush with the outer sides.



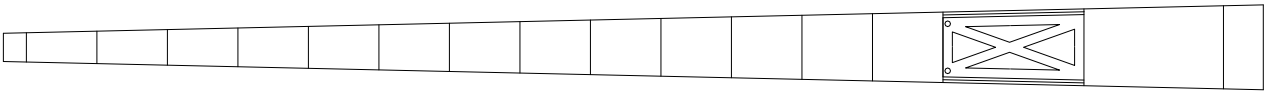
Go to the next step for the electric version. With the supplied the sheet of 3mm (1/8") balsa plank the front top deck of the Fuselage. If you are building the **petrol version** continue to plank the whole of the bottom. The planking grain should run from side to side to provide maximum strength.



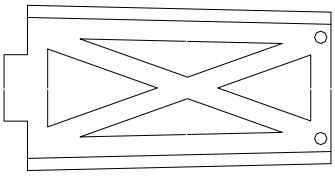
If you are building the **electric version** take the battery hatch floor (Part 10) and place the tab in its slot. Do not glue it into position.



Plank with the 3mm (1/8”) balsa sheet from the rear of the battery hatch floor to the back of the Fuselage.



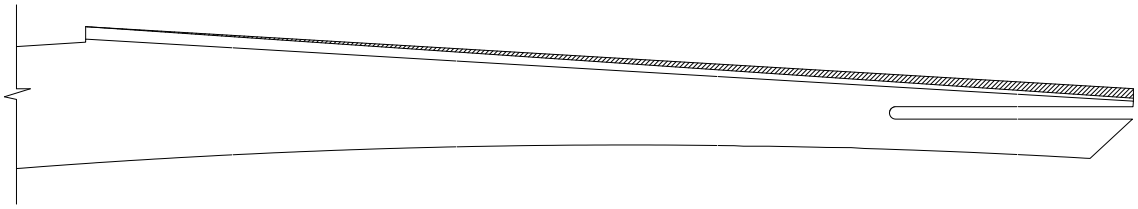
Plank the bottom of the hatch floor with 3mm (1/8”) balsa except for the tab that fits under the U/C mount. The balsa should be wider that the hatch floor by approximately 6mm either side to the edge of the fuselage. Make over size and sand down with the planking to the same size as the fuselage.



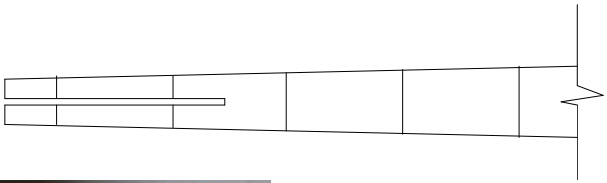
Insert the magnets into the holes, both in the hatch and the latch plate inside the fuselage; make sure the magnets are correctly orientated so they do not repel before gluing in place. Scraps of ply can be glued over the magnets in the fuselage to prevent them pulling out.

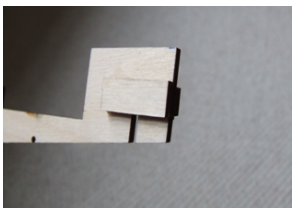
Sheet the front curved section of the upper Fuselage **once** you have fitted the wing (see page 15) with the remaining 3mm (1/8”) balsa.

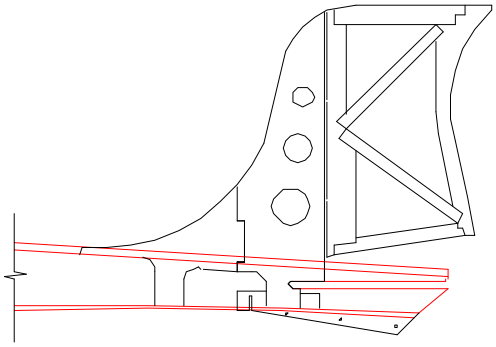
The rear deck should reduced to a point as shown below, remove the hatched area so that the rear edge is only 2mm thick. Sand the Fuselage to shape rounding off the top and bottom decking and sand the front top deck at the front down to 1mm (1/16”) where it meets the wing.



Glue the two tail skid (Part 16(2)) together and place on the bottom of the Fuselage. Mark the distance from the rear and cut a slot 6mm (1/4”) wide to accept the skid along the centre line of the Fuselage. Slot the Fin in from the top and ensure that the parts mate within the Fuselage. Glue scrap pieces of ply either side of the Tail skid slot to prevent the Tail skid wire rotating as in the picture below. Ensure that they are not too large to slide into the Fuselage.

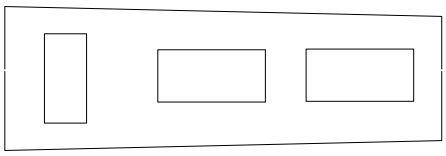






Adjust to suit before gluing in the skid with epoxy. **Do not** glue the Fin in at this stage. Ensure that the Tail Plane can fit into the Fuselage slot and the Fin slot without fouling.

Cut slots in the Servo Mounting Plate (Part 11) to accept your chosen servos. The rudder and elevator servo sit at the rear of the plate, if building the petrol version then mount a smaller servo at the front of the plate for the throttle. Ensure that the rear servo can still be accessed under the wing bolt plate. If your building the electric version then the plate can be cut down to provide the maximum room in the battery bay. The plate can be mounted later; when it is, ensure that it is securely mounted using some of the scrap triangular balsa epoxied into position.

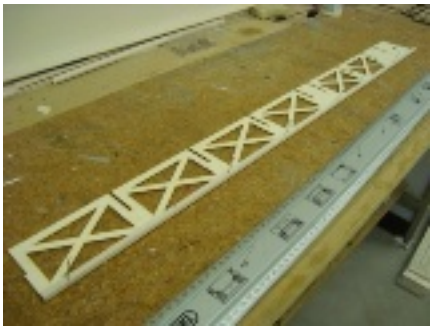


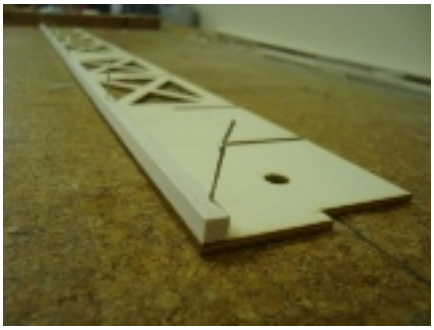
Wing and Aileron

We recommend building the entire wing with Aliphatic Wood Glue. It is generally fast setting and can be sanded at the same rate as balsa**.**

The wing panel shown in the pictures below makes up the left hand panel (when viewing the model from behind). Ensure that you also make a right hand panel.

Take the main spar (Part 1) and glue a strip of 6 x 6 x 915mm (1/4 x1/4 x36") balsa strip flush with the bottom. A left and right hand main spar is required, the balsa strip should be glued to the back.

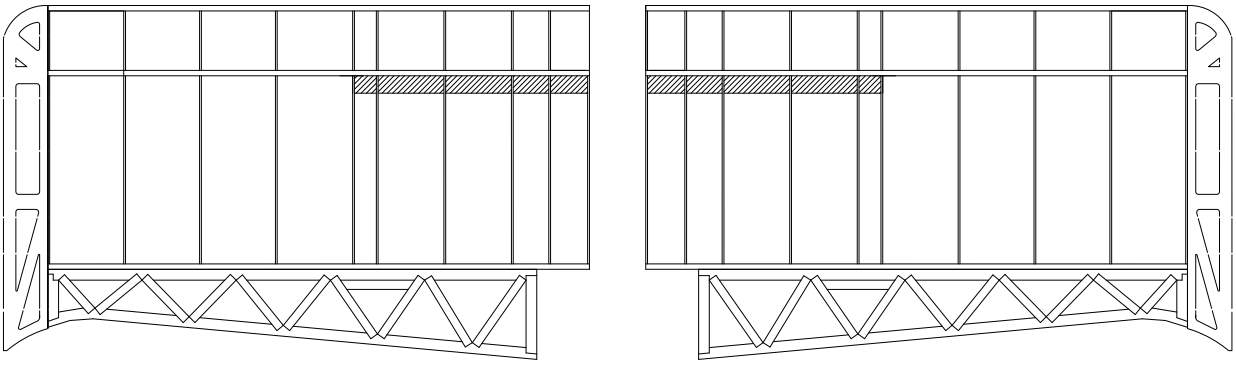




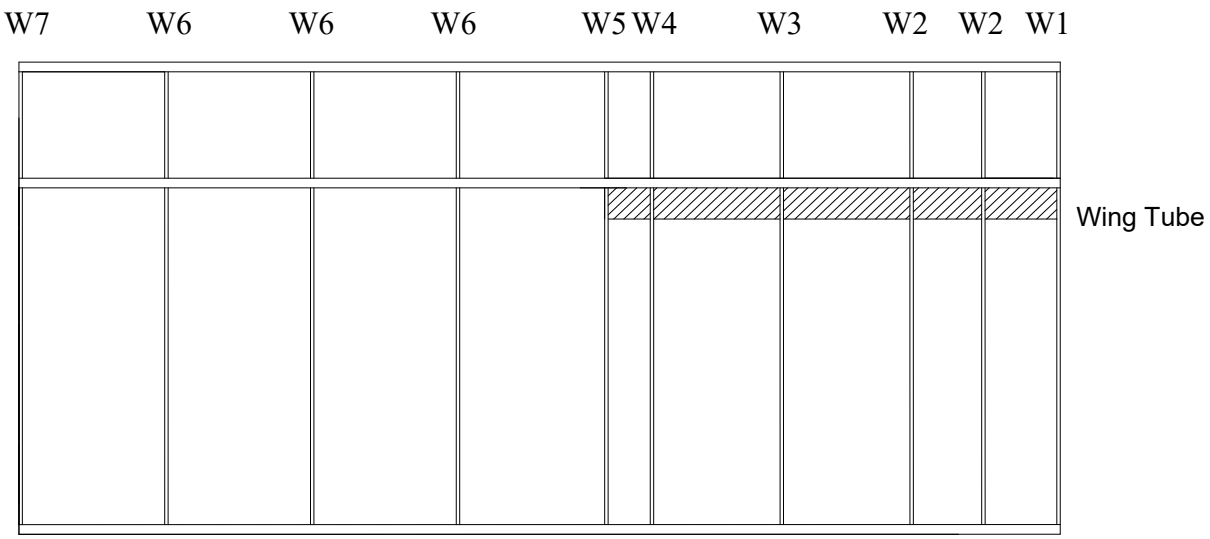
Pin the spar vertically on the board; use a straight edge to ensure the spar is straight.







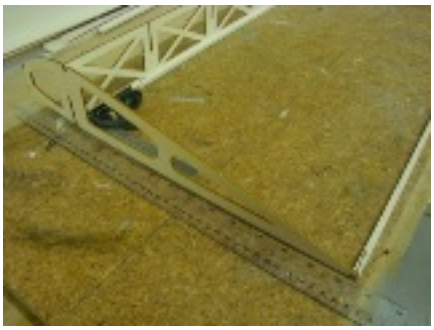
Wing Layout



Wing Layout (Left Hand Section, mirror for Right hand section)

Begin placing the ribs in the slot in the order shown above. Using a set square ensure that the ribs are at 90° to the spar, and use a ruler to ensure the rib is straight without any deviation. The centre and end rib must be absolutely vertical and straight. Pin the trailing edge spar to the board parallel to the main spar.





Continue until all the ribs have been inserted.





Insert the upper 6 x 6 x 915mm (1/4 x1/4 x36") spar, glue in place and allow to dry before attempting the next stage. Cut the Phelonic (outer only) wing tube to 405mm and insert through the pre-cut hole in the wing. The tube should slide through to W5 easily if required gently run sandpaper around the edge of the holes to ensure it does. Check, check and triple check that the end rib is vertical and straight before gluing the tube into position. Insert the aluminium joining tube into the outer and check this is also at 90°. If you haven't guessed this is critical so that when the two wings are joined the centre ribs are absolutely parallel to one another. Glue the wing tube caps (Part 4(2)) on to the end of the wing tube at W5.



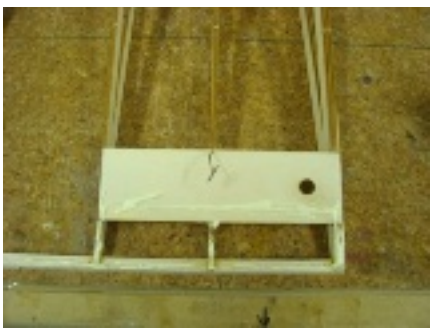

Insert the 4.5 x 4.5 x 915mm (3/16 x 3/16 x 36”) spars into the leading edge slots, check the end ribs before gluing. Once dry gently sand so that it is flush with the vertical leading edge.




Take the sheet of 9.5 x 75 x 915mm (3/8 x 3 x 36”) balsa and cut in half along its length to form the two leading edges. Glue it in position against the ribs and leading edge spar. Using the 2 x 100 x 915mm (3/32 x 4 x 36”) slightly chamfer the front edge so a good bond is achieved where it meets the leading edge and leading edge spar. Before gluing in place check the whole wing is completely square and the end ribs are straight and vertical. Once satisfied apply glue to the ribs and top spar and roll the sheet into position and pin until dry.




Glue one of the upper wing bolt plate (Part 18(2)) in the pre cut slots across the first three ribs at the trailing edge. Using one sheet of the 2 x 100 x 915mm (3/32 x 4 x 36”) cut it into four 25mm (1”) sheet to form the trailing edges. Glue one in position as shown below.




Using the 2 x 4 x 915mm (3/32 x 4 x 36”) balsa sheet plank from the trailing edge sheet to the leading edge sheet across the first three ribs. Drill and file out the hole for the wing bolt.



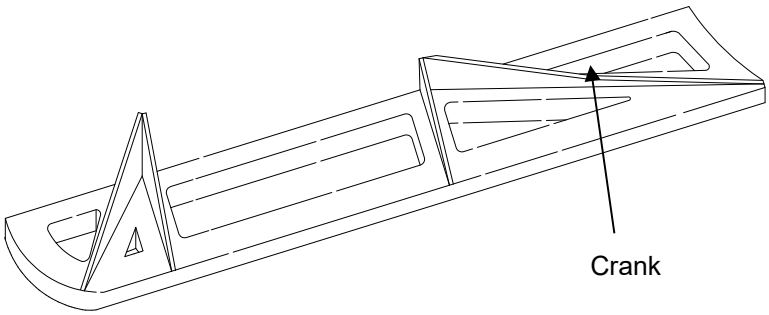
Centrally to the top of each exposed rib glue the 2 x 9.5 x 915mm (3/32 x 3/8 x 36”) capping strips from the trailing edge sheet to the leading edge sheet. The end cap strip will be glued flush with the wing tip end rib.

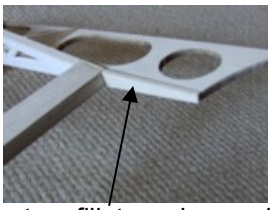
Un-pin the wing, be careful as it will still be quite flexible, turn over and re-pin the trailing edge and main spar back onto the board. Check that the wing is square, adjust if necessary. Glue the lower wing bolt plate (Part 19) with the elongated hole. Insert scrap balsa between the wing bolt plates so that when the bolts are tightened it prevents the wing from compressing.



Repeat the sheeting process for the bottom of the wing ensuring the wing is square and twist free.

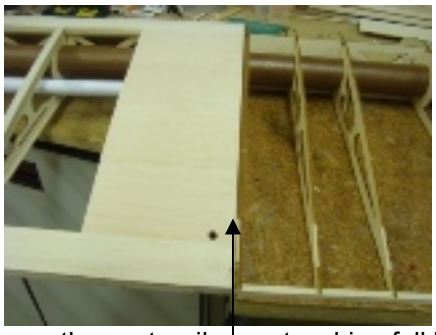
Take one of the wing tip (Part 23(2)) and glue onto the tips of the wing. The tip should be lined up with the centre of the leading edge and the centre of the trailing edge. With some scrap 3mm (1/8”) sheeting make triangular fillet pieces to support the wing tip on both sides. Position the fillets as set out below. The rear fillet will have to be ‘cranked’ in line with the wing trailing edge to allow the covering to follow the wing contour neatly.




Create a fillet as shown above

Sand the wing and shape the leading edge ready for covering. Carefully sand the sheeting flush with the end rib ensuing that it remains vertical.

The second wing is built in exactly the same way; ensure you build a left and right hand panel, and again ensure the end ribs are completely vertical and straight. The only change to the construction process is at the sheeting stage; insert the tube into each wing panel so the centre ribs are touching one another. Sheet the second wing so that the joint between the panels wing is as tight as possible.



Make sure the centre ribs are touching full length

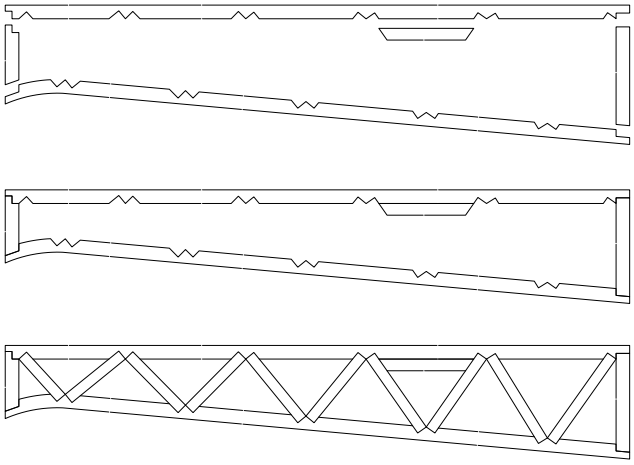
Once both panels are complete join the wing using the aluminium tube and test the fitment to the fuselage, make adjustments where required to the fuselage cut out or the profile of the wing. Ensure that the wing is central on the fuselage, push one of the dowels through the holes to leave a mark on the leading edge, remove the wing and drill an 8mm hole where the dowel marked. Insert the dowel through the hole into the hole in the main spar. Test fit to the fuselage and make adjustments as necessary. Sheet the top deck of the fuselage as described on page 10.



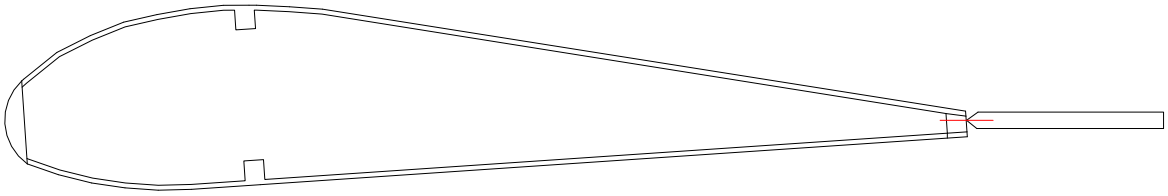


Ailerons

Take the five pre-cut parts (Parts 35(2), 36(2), 38(2), 39(2) and 40(2)) which form the ailerons, trial fit, ensure the tips are at 90° to the leading edge, fit the trailing edge, when satisfied glue with Cyano or white wood glue. With a supplied strip of 12mm x 9.5mm x 915mm (1/2 x 3/8 x 36”) cut to length to form the ten ribbing pieces, glue in place.



With a pencil mark the centre line of the leading edge and chamfer to a 45° angle with a razor Plane. Insert the hinges as described earlier for the rudder, use 5 hinges per aileron. The hinges at either end should be place 25mm (1”) in from the edge, then the others equally spaced.



Repeat the above stages for the second aileron.

Ensure that you get at least 45° free movement either way. **Do not** glue the hinges in at this stage! Cover both parts with your chosen covering first.

Sand to provide a smooth, blemish free surface ready for covering.

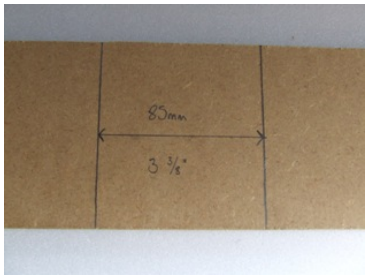
Covering

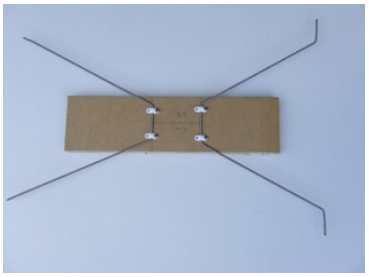
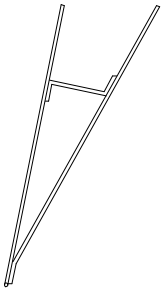
Before undertaking the covering seat the wing, tail plane and fin and make sure that all fit. Make any alterations as necessary with fine sandpaper and a block. Finally sand and fill all parts to provide a smooth, blemish free surface ready for covering.

This is your chance to express yourself; unlike the ARTF models on the market you can now choose your own colour scheme. The prototype model was covered in Profilm, but the choice is yours. Just make sure that you follow the manufactures recommendations when applying the film. We would recommend applying a surface sealant to the area around F1 so that the film adheres better in areas where it is likely to be exposed to fuel (petrol version). We also recommend that you apply a glow fuel sealant to the radio compartment of the Fuselage. Follow the manufactures recommendations when applying. Ensure when you cover the model you do not introduce any warps, cover each section and evenly tighten the covering on both sides. Ensure when you have finished covering all parts they are straight and true.

Tail Skid and Undercarriage

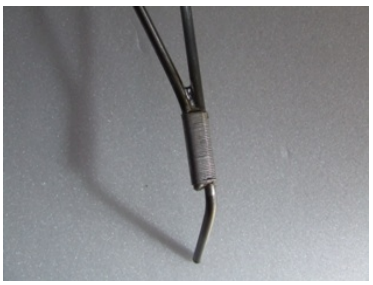
Draw two lines on a piece of scrap ply 125mm (6”) apart. Place the front leg and rear leg on each of the lines and screw down using the supplied 6 swg saddle clamps and screws. Make adjustments with pliers to make sure that the legs are parallel where they are to be bound.



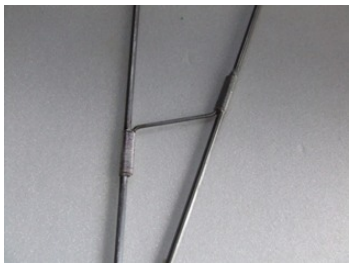
Clean the tops of the legs with sandpaper or wire wool to remove any dirt or lubricants ready to solder. Pull the legs together so that they join as shown in the photograph. The U/C should also rake forward as shown in the diagram above adjacent to the front leg. Bind together using tinned copper wire. The 12 swg wire suspension parts should be bound at the same time in the positions shown below in the first photograph below.





We advise wearing heat-proof gauntlets at this point. Heat the wire using a blowtorch and feed solder into the joint, ensuring that you flood the joint to make it strong. Clean off the excess with a damp cloth; **do not** touch the leg as it will be extremely hot. Repeat for both sides. Once cool remove from the scrap ply. Save the clamps and screws.

With the two support pieces, offer these up to the main U/C legs and Find the point at which they best fit, make minor adjustments as before, install the smaller 12 swg supports. Bind and solder as before. Repeat for the second side, ensuring that the supports are positioned symmetrically.



Once the Fuselage has been covered, line the undercarriage up with the centre of the two mounting plates. Ensure that it is placed square to the Fuselage. Place three saddle clamps over the wire and screw onto the centre of the front undercarriage plate, repeat for the rear leg. Make sure the axles are at 90° to the centreline of the Fuselage. Minor adjustments can be made with pliers or mole grips, just ensure that you hold the undercarriage legs when doing this to prevent damaging the Fuselage.

Place on the supplied 3" (75mm) wheel followed by collet. Ensure that the wheel rotates freely and tighten the second grub screw. Cut off any excess piano wire. String two wing type bands diagonally between the suspension parts as shown below. Alternatively suitably sized springs could be used.





Take the pre-bent 3mm (10 swg) wire and attach to the Tail skid using cotton, looping through each of the pre-drilled holes several times before securing with Cyano. Ensure the Cyano penetrates through the cotton.



Final Assembly

If you have any queries about the final assembly then please contact us at support@evolution-models.com where we will be happy to discuss your problem and send you a photo or two to illustrate our solution.

Wing

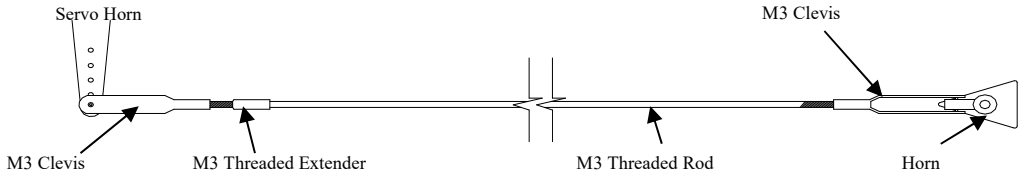
Take the fully covered wing and ailerons, glue the hinges into the aileron using epoxy. Slot the hinges into the corresponding slots on the wing and epoxy in position. Move the aileron full travel (min 45°) to ensure that there is no resistance and repeat the gluing process. Repeat this for the second aileron.

Install the servos in to the wing and feed the wires through the tubes. Pull the wires out at the centre section and cut a hole in each wing bug enough for the plug to fit through into the fuselage. Drill pilot holes and securely screw the servos into place using the fixings supplied with the servo. Centre the servo and attach a single arm horn.

Lay a ruler on the wing lined up with the outermost hole on the servo horn running parallel with the ribs and mark the position on the aileron LE. Place the supplied control horn centrally on this mark. Mark the positions of the holes and drill three 1.5mm (1/16") pilot holes. Place the horn over the holes and insert 3 bolts through to the supplied backing pieces. Screw on the bolts and tighten the assembly to the aileron,

making sure the horn remains at 90° aileron leading edge. Once satisfied that the horn is secured run some Cyano onto the thread to ensure the nut cannot be loosened.

Cut the threaded rod to the correct length before soldering on the threaded extender as shown below. When correctly fitted the clevises should be threaded onto the rod so that it can be threaded in or out an equal amount. Lock the clevises in place using the supplied M3 nuts, ensure this cannot become loose, use a thread lock if needed.

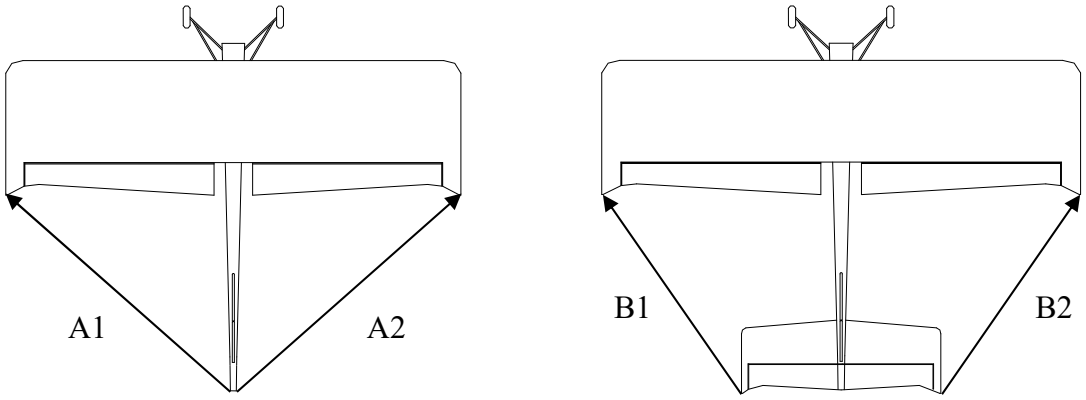


Repeat this for the second aileron.

The wing support plate (Part 17) should be covered but not glued to the wing. The bolts are inserted through the plate into the wing and into the captive nuts the support plate remains independent to spread the load into the wing.

Fuselage

Take the fully covered parts for the Fuselage and insert the 8mm (5/16”) dowels provided. Glue in place with white wood glue or Cyano. Fit the wing to the Fuselage and hold in place with an elastic band so that it is firmly seated, but able to move for adjustment. With a tape measure check that the Fuselage is square to the wing as per the diagram. Ensure A1 = A2.

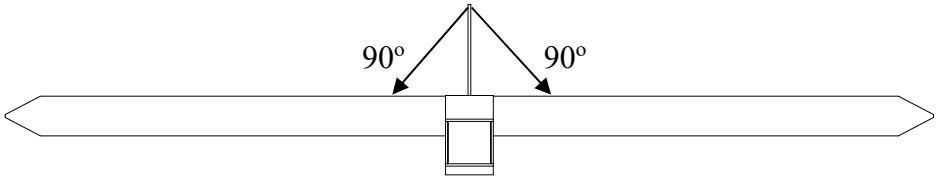


Insert the Tail Plane into its slot and check the measurement B1 = B2. Once satisfied that the Tail Plane is square, mark with a pencil both top and bottom along the edge of the Fuselage. Remove the Tail Plane from its slot and carefully cut 1.5mm (1/16”) on the inside of the line to remove the covering film from both the top and bottom.

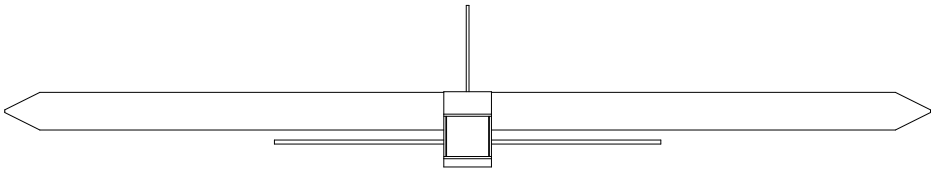
Take the Fin and insert into the slot. With a pencil mark along the Fuselage as with the Tail Plane, remove the Fin and remove the covering from 1.5mm (1/16”) below the line.

!!! **Warning**. Only cut through the film while undertaking the tasks above, **do not** cut into the balsa as this will weaken the Fin and may cause it to fail in flight!!!

Re-insert the Fin and make sure that the cut-out in the base of the Fin lines up with the Tail Plane slot. Insert the Tail Plane to confirm. One satisfied with the fit, glue the Fin into position using epoxy on the base where it joins to the Tail skid and Cyano or white wood glue at the junction with the top deck. Ensure that the Fin is vertical, with the wing seated; also check that the Fin is at 90° by viewing it from the front.



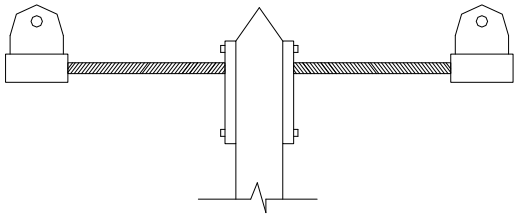
Glue the Tail Plane into position, apply the glue inside the slot, top and bottom, and with help carefully open t he slot while inserting the Tail Plane and release the Fuselage to clamp back down. Only apply slight pressure so as not to break the rear of the Fuselage. When inserting the Tail Plane be careful not to get glue onto the covering. Make sure the Tail Plane is parallel to the wing by viewing from the front as before.



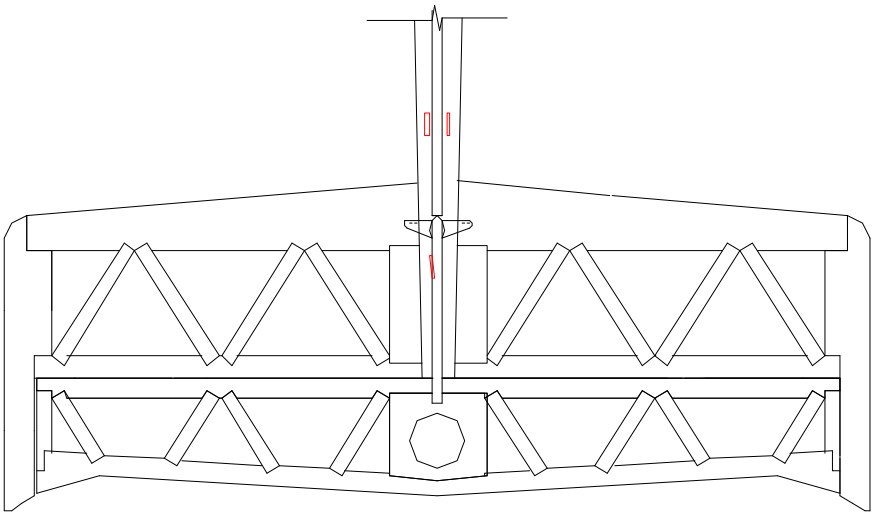
Take the fully covered Fuselage with Fin and Tail Plane fitted and glue the hinges 50% into the Rudder and Elevator. Glue using a thin Cyano and ensure that it penetrates into the slots both top and bottom. Slot the hinges into the corresponding slots on the Fin and Tail Plane. Move the control surfaces full travel (min 45°) to ensure that there is no resistance and repeat the gluing process.

Fit the Elevator servo (rear servo), Rudder servo (front servo) and Throttle servo (glow version) using the screws supplied with the servos, if you haven't already, fit the 6 x 6mm (¼" x ¼") spruce to the front servo. Pilot drill the holes first to prevent the ply and spruce splitting.

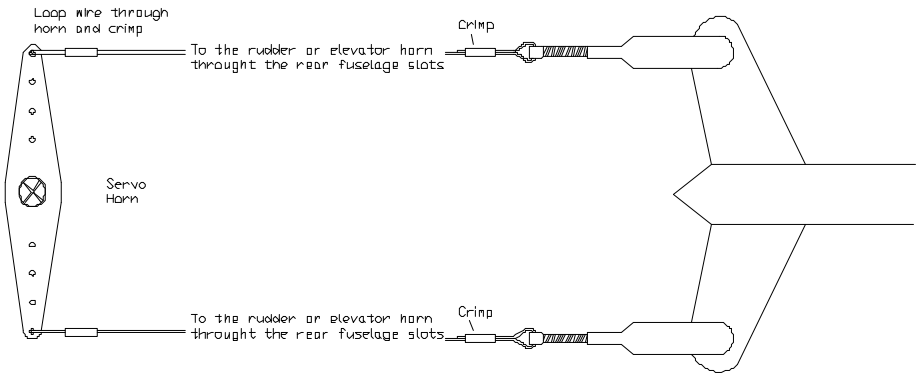
Using two horns from the hardware pack on both the Elevator and Rudder, install them as described earlier for the ailerons, except using a horn either side of the control surface and use the M2 nuts and bolts to fix in place. The Elevator horn is placed at the centre of the Elevator and the Rudder horns are placed at the bottom of the Rudder parallel with the bottom rail. Ensure that they are tight and sealed with Cyano as before. For those wishing to get larger Rudder movements move the horn back from the hinge point by approximately 12.5mm (½").



With a Bradawl make holes for the closed loop system to exit the Fuselage as shown below. Start by making a hole at 90° to the surface, then increase the angle while twisting the Bradawl to about 5°. Make the holes in the positions as shown on the diagram. We have found it neater to insert tubes into the holes, and have used old pen inners (Biro) or excess Bowden outer glued in place with Cyano. Ensure Cyano does not enter the tube or it will glue the cable fast. The hole for the upper Elevator closed loop cable will be placed centrally on the rear deck, but needs to be inserted at an angle so that the cable can be run past the Fin post.



Make up the closed loop systems to the Elevator and Rudder as shown below. Use an M3 nut to lock the clevis onto the closed loop extender. Make sure that the horn is suitable to take the loads imposed by the surfaces.



Ensure the crimps hold the wire tightly, place a drop of Cyano to make sure the wires cannot move.

PETROL VERSION

Installation of the petrol motor is left to the individual, unfortunately because there are many variations of petrol motors on the market we cannot advise how yours should be fitted or operated. If you would like any help in choosing a set-up or support installing a specific set-up please contact us we will be only too happy to help if we can. What ever set-up you choose ensure you follow the manufacturers instructions when fitting and operating it and only use fittings that are appropriate.

ELECTRIC VERSION

Motor Mount

Mount the motor using the recommended motor mount ensuring that it is securely attached to the firewall, do not use screws, only use lock nuts, bolts and washers suitable for this application.



Electronic Speed Controller (ESC)

On the prototypes we mounted the ESC under the Fuselage between the undercarriage mounts, this provided constant cooling which is essential to prevent the ESC from cutting out. Carefully drill holes through the bottom of the Fuselage for the wires to pass into the radio bay. Stick the ESC to the bottom of the Fuselage using double sided tape or hook and loop strips.

Motor Battery

We would recommend using a Lithium Polymer (Li-Po) battery for this model, use extreme caution when using Li-Po batteries and **always** read the manufacturers or suppliers instructions when handling and charging this type of battery. The battery sits at the front of the Fuselage and can be moved forward or back to alter the centre of gravity (Explained later). Once the centre of gravity is achieved ensure that the battery is unable to move during flight or foul the servos.

Receiver and Battery Position

The battery and receiver are to be located between the servo tray and tank or flight battery. For the Electric version mount as close to the servos as possible to allow maximum space in the battery compartment. Ensure that both components are isolated from airframe vibration and that they are not able to move when

the model is in flight. In a model this size we would recommend using a separate UBEC or receiver battery for safety

Control Throws

We only recommend setting the model up with sport flying throws unless you are an experienced flyer. Increasing the control rates will make the model extremely responsive!

For test flying and sports flying, set the control throws up as shown below:

Ailerons - 65mm Up and Down measured at the tip
Elevator – 50mm Up and Down measured at the tip
Rudder – 150mm Left and Right measured at the top

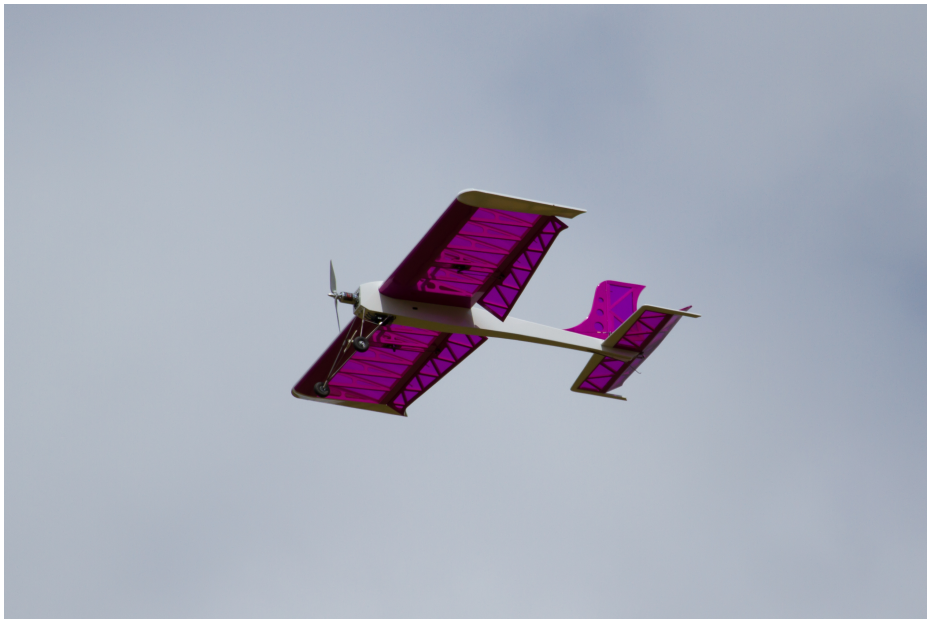
These throws will provide control responses suitable for test flying. Once confident in the models performance increase the rates.

When you are content with the control setup, use some heat shrink tubing or excess fuel tube over the clevis to ensure that it cannot open.

Flap Mix

If your transmitter has the ability to mix in flaps, we have used this function to make the model loop and pitch much tighter. Flap is when the ailerons move in the same direction (up or down) together.

To set this mix up increase the Elevator movement until the model begins to screw out of loops with full movement, once this begins to happen back off the movement slightly. Repeat this with the flaps, with full up elevator and full flap the model should be able to perform a tight loop without screwing out. We highly recommend this mix as it makes the model more stable in loops and at slower speeds.



The flaps should be set as below:

Elevator up – Flaps (Ailerons) Down
Elevator Down – Flaps (Ailerons) Up

Centre of Gravity (CoG)

Once you have completed the model, and all components, including receiver and batter have been installed check the balance of the model with the fuel tank empty. With a helper place a Finger under the wing to see where the CoG sits. The Fusion has a huge CoG range, but we recommend starting about 50mm (2”) behind the spar. When you and your helper lift the model it should balance on this point, if it does not then add weight to the Tail or nose to correct. If at all possible change the position of the lipo, radio battery and receiver rather than adding weight. For the experienced pilot this balance point is the starting point, gradually push the CoG rearward to make the model more responsive, but less stable.

Stickers

Carefully cut out the Stickers to suit your style, spray a little soapy water on to the film in the position you wish to place the sticker. Peal the backing off and carefully position over the model. Beginning at one end place the sticker onto the surface and smooth out any air bubbles as you proceed.

First Flight and subsequent flights

We would only advise that you fly your model from a BMFA (or countries model flying association) recognised model flying site; do not fly from a park or public area. This model is designed for the experienced modeller in mind. Before every flight check the model for damage, check all controls surfaces, hinges and linkages etc are secure, if in doubt **do not fly**. After each flight check the model for any landing damage of flight stresses, never fly a model if you believe that it has been damaged or find any signs of fatigue. Always clean down petrol models at the end of each flying session.

Contact

If there are any issues with you kit please contact us at the address below, please allow 24hrs for us to get back to you. Also contact us for any advice or help during your build, we are only too happy to help.

support@evolution-models.com

Safety & disclaimer

This is a big model and should be operated in an area suitable for its size and recognised by the BMFA (or countries model flying association). The operator should seek guidance from the BMFA (or countries model flying association) and be clear of the guidelines for operating model aircraft.

This Radio Controlled model is not a toy. It can cause serious injury to the operator, public and property if misused or abused. Ensure that you read all the instructions supplied with this kit and instructions provided with the engine and radio control system or any other components purchased separately carefully. Also make sure that any parts bought separately are suitable for their application.

Evolution Models do not have any control over the final assembly of the model or material used for final assembly. No liability shall be assumed for damage resulting from the use of this product. By the act of using the final assembled product the user accepts all resulting liability.

We guarantee the kit will be free from defects both in material and workmanship at the date of purchase; this does not cover any parts damaged by use, misuse or modification. Evolution Models' liability will not exceed the original cost of the purchased kit.

This disclaimer does not limit or reduce Evolution Models' liability for death or personal injury caused by Evolution Models' negligence.