

# **Building Instructions** ***Eraser, PC9, Mustang*** ***and Spitfire***

EPP Trainer & Combat Slope Soarers

***By Canterbury Sailplanes***



**Congratulations on your purchase.**

EPP is a fantastic material for Model Aeroplanes; it's incredibly resilient and will take almost all the punishment you can give it - perfect for learning to fly, or just having fun on the slope

Assembly is quite straightforward and shouldn't be too difficult for the first time builder. If you have any problems please contact Canterbury Sailplanes or the shop you bought the kit from.

We hope you really enjoy building this model.

We guarantee you'll enjoy flying it!

**Canterbury Sailplanes**

[www.flycs.com](http://www.flycs.com)

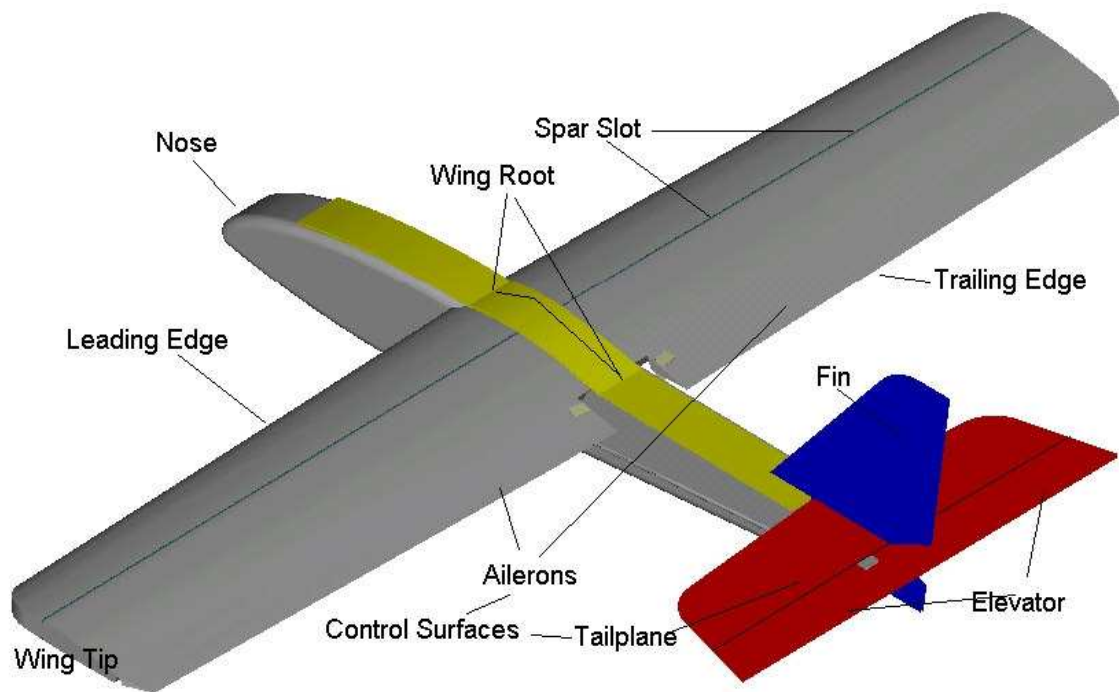
## **GENERAL NOTES**

- These instructions detail the assembly and covering building of the Eraser, Spitfire, Mustang and PC9. 90% of the steps are common to all types, where a different step is required for one or more models this is highlighted with a shaded box.
- A 3D Plan of the *ERASER* is available on the Internet at: <http://www.flycs.com> the file is about 600kb and self extracts. You can then rotate, view and zoom in on any part of the model. It is REALLY worth looking closely at this if you get stuck understanding any part of the assembly instructions. Please note the position of the aileron servo has recently been changed and may not yet be changed on the 3D model.
- On the back of these instructions is a plan, the Spitfire is shown but the locations are relevant to all the models, note that the Eraser wing is mounted on top of the fuselage, the other models have the wing on the bottom of the fuselage.
- This box contains nearly everything you need to build your model; only a 2-channel radio control set, 210ml can of spray adhesive (Ados F2 or Spray 77), a modeling knife and some basic tools are required to get your model ready to fly.
  - Shipping regulations prohibit sending 3M Spray 77 Contact adhesive. This is a great glue for adhering the tape to EPP and is worth getting. Ados F2 does a similar job. Locate adhesive spray from your local hobby or hardware shop. A 210ml size can should be adequate.
  - Gorilla Glue adhesive is included in the kit, this is a great all purpose adhesive. Using it is a little different from most glues as it foams while curing. Note the following point;
    - Read the instructions on the packet.
    - Spray or wipe the surfaces to be glued with a damp cloth
    - Use a minimal amount as the glue foams and expands when curing, Wipe off any excess with a damp cloth.
    - It help get a better finish by taping over the spars, this will leave a smooth finish to the glue.
    - When gluing the tail, fin and wings in place the expanding glue may push the sides apart – clamp or tape the parts together so the glue wont push them apart
    - Any excess can be sanded or cut off.
    - It works well with tape to tape joins – such as gluing the wings on.
- The kit includes Coloured Polypropylene tape and Strapping tape (fiberglass reinforced) make sure you use the correct tape as specified in the instructions. There are 50 meters of Coloured tape and only 24 meters of Strapping tape. Try not to waste any Strapping tape, as there is just enough to complete the model as described in these instructions.
- You might like to decorate your model using different coloured tape, iron on covering film (available from a model shop) or self-adhesive vinyl (available from your local sign writer). Where the Assembly instructions specify coloured tape these other products can be used instead. If you use other coloured tape products, they must be of similar spec, i.e. polypropylene or vinyl, but not PVC. Iron on film also looks great; use low heat, no need to use clear or coloured tape, just apply the iron on film after the strapping tape, use Ados F2 with iron on films as this will help the bond. These instructions refer to “coloured tape” in order to differentiate it from the “strapping tape”. You can test covering film and heat settings on a scrap piece of EPP.

- It's also worthwhile investing in a Lost Model Alarm, if you land/crash in trees, bushes or long grass, your model may be hard or even impossible to find. With a lost model alarm you can locate your model much easier. The alarm will sound for up to 2 days. Ask your model shop or check out our website.
- When applying the ADOS F2 to the model; apply by spraying onto the model and leave it a minute or two, wait until the glue is tacky, before laying the tape onto the glued surface. Once it's on however, it's difficult to remove - so take care.
- It's easy to make an authentic colour scheme for your model using coloured tape, coloured vinyl (available from your local sign writer) and paint. Paint is best used for small details as it doesn't stick to the tape very well. Many builders have replaced the EPP nose with a spinner from a powered model plane (available from model shops) to further improve the looks of the model. There are many resources available to find an interesting colour scheme on the Internet, books and magazines.
- Mistakes to avoid;
  - The bottom of the wing is flatter than the top – make sure you mount the wing with the flatter side underneath. They don't fly so good with the wing upside down!
  - The Leading Edge is the rounded edge; it is the bit that should be closest to the front of the model when flying. The sharper edge of the wing (with the ailerons attached) is towards the back of the model. They don't fly at all with the wing back to front.

## **BEFORE YOU BEGIN ASSEMBLY**

- 1) Check that all the parts as per the parts list (see back page) are packed in the box. Note that the parts list includes pictures of some items to help you identify them. This will help later when reading the assembly instructions.
- 2) Other tools that you will need include:
  1. Small power or hand drill
  2. 1.5 - 1/16<sup>th</sup> drill bit
  3. 2.5 – 7/64<sup>th</sup> drill bit
  4. Small ruler or tape measure
  5. Sharp knife, scalpel or modeling knife
  6. Scissors (if you'd rather use them) to cut tape
  7. Sandpaper (40 grit is fine)
  8. Marker (a ballpoint pen will do)
  9. Small phillips head screwdriver (for the servo's)
  10. Small flat head screwdriver (for the control horn screws)
  11. Needle / point nose pliers
  12. Soldering iron (not 'needed' but can be helpful)
- 3) It's probably also a good idea while you're getting these items ready; to make sure you have enough batteries for both your radio control transmitter and receiver. If you have rechargeable batteries, ensure they're charged and ready prior to fitting the servos into the *MODEL*.



- It's quite reasonable for a complete beginner to assemble the MODEL in 3 nights; the estimated time a "complete beginner" would take for each stage has been suggested at each section heading.

## **ASSEMBLY INSTRUCTIONS**

### **WINGS (part 1)** (estimated time = 1 hour)

- 1) Fold open the EPP that surrounds the wing cores. Remove the wing cores.
- 2) **Eraser only;** Use a knife to shape the outermost 30mm - 1 1/4" of the wing leading edge around to the spar slots on the tips. Shape it into a curve similar to the rounded corners of the tailplane and fin. Sand the cut area to a smooth round section. See the large Eraser diagram above.

### **2/ Mustang, Spitfire and PC9 only; Shape the Wing and Aileron Tips**

Note: The upper surface of the aileron is the side with the longest side. The thinnest 'sharp' edge is the trailing edge. (See sketch page 10) Take your ailerons and mark the left and right ailerons

- Select the tip shape for your model from the sheet provided at the back of these instructions.
- Cut the paper around the outline.
- Temporarily tape the ailerons to the wing cores aligned at the tip.
- Lay the paper outline on the tip of one wing and aileron - with the leading edge of your wing and that shown on the drawing correctly aligned. Draw around the outline on one tip then flip the piece of paper and draw on the other tip.
- Use a knife to shape the wing tips, and then sand the wingtips to a rounded shape.
- Remove the ailerons; shape the tips of the ailerons with a sharp knife.

- 3) Join the fibreglass rods to make a top and bottom spar; Insert a fibreglass rod half way in to the alloy joiner tube and glue. Repeat the process to complete 2 spars. Use pliers or a crimp tool to put one crimp in each end of the joiner tubes, about 10mm - 3/4" in from each end. This will ensure they do not move.
- 4) **Mustang, Spitfire and PC9;** It is worthwhile adding a small amount of dihedral (this means the wing tips are raised up a little - about 20mm - 7/8th under *each* tip) it improves the looks of the model and slightly improves stability.
  - Bend the alloy joiner tubes slightly so that the spar tips will be about 20mm - 7/8th up at each end. This is easiest done in a vice, although pliers will also work. Ensure both joiners have the same degree of bend!
- 5) Lay one spar on top of the wing, mark the location of the joiner tube in the centre of the wing and cut away a **minimal** amount of foam to allow it and the spar to sit in the slot in the wing. Repeat for the underside. Test fit the completed spars to ensure a neat fit into the spars slots.
- 6) Lay the left and right wing cores side by side on a table or other flat surface covered with plastic food wrap about the length of the wing and place the two wing roots together, check they line up OK. Glue together with *Ados F2* (you could use the Gorilla glue but you would need to leave it overnight, the *Ados F2* is quicker). Weight down with a couple of phone books or a small pile of magazines - this will keep the wings flat.
- 7) After about 5 minutes, temporarily tape the wing halves together with a 300mm - 12" length of coloured tape applied top and bottom - avoid taping over the spar slots.
- 8) Install the spars;
  - Squeeze Gorilla glue adhesive into the top and bottom spar slots and spread out thinly
  - Push the spars into place, so they don't protrude above the wing surface.
  - Check the wing is straight and has no twists.
  - Wipe off excess adhesive. Lay the wing flat on your table, weight down and leave to set (prop one end up if you have dihedral). If you need to put weight on the top spar, cover with tape or clear kitchen film.
  - Allow 24 hrs for the glue to set.
  - You can now begin work on the fuselage (steps 8-11).

## **THE FUSELAGE**

(Estimated time = 1 hour)

### **Mustang, Spitfire and PC9 only;**

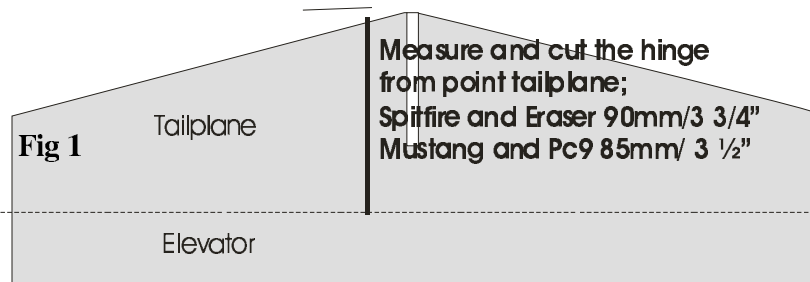
- 9) Glue the Canopy to the top of the fuselage with *Ados F2*.
- 10) Shape the fuselage; you can simply round the corners of the fuselage off using either a very sharp knife or 40grit sandpaper. Round the fuselage corners to the radius of a 5c piece. For a really good scale appearance, carve and sand the fuselage to the shape shown on the plan. Do not shape the fuselage where the wing will be mounted.

Eraser only;

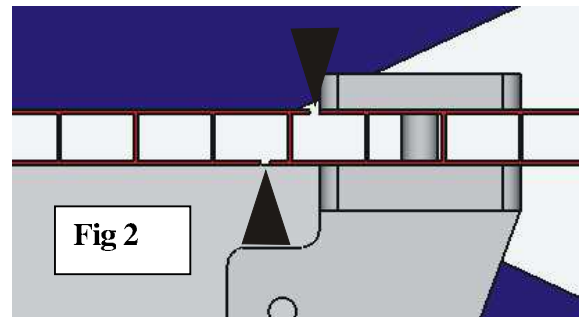
11) Shape the fuselage underside, and around the nose as far as the cut out for the wing strap; Use either a very sharp knife or 40grit sandpaper. Round the fuselage corners to the radius of a 5c piece. Radius the nose a little, but don't make the nose a point; it needs most of the width it has to absorb your landings! Do not round the corners of the top of the fuselage back from the notch where the front of the wing strap fits.

12) We are now going to create an elevator hinge by slitting through the Corflute skin on each side of the tailplane.

- Measure and mark the location of the hinge from point at the front of the tailplane See figure 1

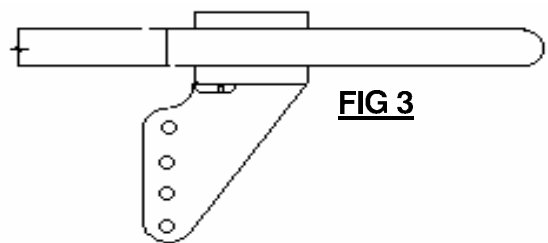


- Use your knife to cut thru just one layer of Corflute, parallel to the flutes of the Corflute. Cut one side first, then turn the tailplane over, check where you cut the first side, and move one flute towards the front of the tail and make another cut. See fig 2



13) Slot the fin and tailplane together. The fin has a slit at the rear allowing the tailplane to slide into it. Temporarily install them in place in the slot at the rear of the fuselage. The hinge line should be m 1/8<sup>th</sup> back from the rear edge of the EPP Fuselage

14) Place the control horn in position on the elevator, on the left side as viewed from the rear with the holes for the clevis aligned vertically below the hinge line and about 20mm - 3/4<sup>th</sup> away from the edge of the fin. Mark the location, remove the tailplane and drill the two 1.5mm - 1/16<sup>th</sup> holes required for mounting the control horn. Thread the screws provided through the holes and screw into the backing plate, which are placed on the elevator's upper surface, screw until firm, but do not over tighten / compress the corflute. Cut off the excess screws on the top side. See fig 3.



15) Cut a small rebate for the control horn on the left side of the fuselage as viewed from the rear.

16) Permanently glue the fin and tailplane to the fuselage. Make sure the fin is at right angles to the tailplane and the tailplane is parallel to the top of the fuselage as viewed from the side - this will ensure the wing and tailplane are at the same angle to the fuselage. Note that some of the fin protrudes below the fuselage.

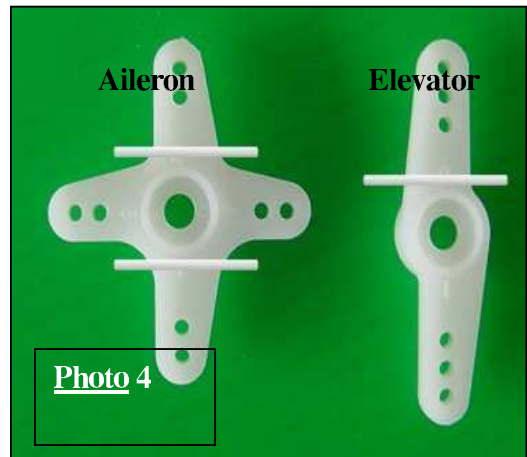
17) Let the glue set overnight.

## **INSTALL THE ELECTRONICS**

(Estimated time = 3.5 hours)

18) Plug your radio control set together (including the servos and receiver). The elevator servo plugs into channel 2 and the aileron servo into channel 1. Then turn it on. Centre the trims on the transmitter, this will ensure both servos are in the neutral position.

- Fit a servo arm about 15mm - 5/8<sup>th</sup> long to the elevator servo (the one which operates when the radio control lever is moved up and down), set at right angles to the servo (See photo 4). If you have arms with more extensions than required, cut off the extras with a pair of side cutters. Enlarge the holes in both the outer holes of the aileron servo arms and the outer hole in the Elevator arm with a 2.5mm – 7/64<sup>th</sup> drill.



- Fit a straight 2-sided horn about 25mm - 1" long to the aileron servo also set at right angles to the servo.

In the following steps the elevator servo, receiver and battery will be fitted into pre-cut recesses in the fuselage that should be just the right size and depth for standard components. If you need to enlarge or make extra cut outs, do so with a sharp knife to cut the outline down to the correct depth, then remove foam with point nose pliers. Work slowly and carefully – you don't need an oversize hole!

### **Mount the elevator Servo**

Note:

- The servo arm must be closest to the rear of the model (see Fig 5) i.e. the 'body' of the servo will be forward of the horn.
- The servo should go deep enough into the hole so that the top of the elevator servo arm will be 5mm - 1/4" below the surface of the left side of the fuselage.
- The hole is cut suitable for a standard Hitec servo, most standard size servos will fit. It may be necessary to cut the hole bigger or smaller to make your servo a good tight fit. If you need to make the hole smaller cut some foam from the EPP surrounding the wings to use as packing.

19) Cut the mounting lugs off the sides of the servo with side cutters or a very fine saw - be careful not to cut the servo lead! (Don't worry, new servo cases are cheap!)

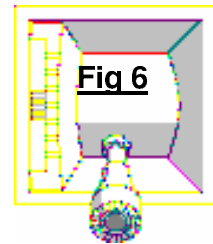
20) Thread the servo lead through the bottom of the hole and out to the other side of the fuselage. Fit the servo in place BUT DON'T glue yet.



21) Cut away a small amount of EPP on the upper side of the servo so the elevator horn can rotate. (See Fig 5)

22) The elevator pushrod runs from the servo arm to the elevator control horn on the tailplane.

- Thread a clevis onto each end of the wire.
- Attach the elevator clevis to the outer hole on the elevator servo arm - about 12mm - 1/2": from the centre of the arm.
- Clip the other clevis into the middle elevator control horn.
- Check the elevator trim is neutral on the transmitter (as in fig 6) Plug the servo into the receiver and plug the battery into the receiver. With the servo centred the elevator should be flat in line with the tailplane with no upward or downward deflection. If the elevator is up then the pushrod is too long, shorten by threading one clevis onto the wire further, if the opposite is true then adjust the clevis accordingly.
- This should achieve about 12-15mm (1/2" to 5/8<sup>th</sup>) of up and down movement of the elevator, measured at the middle of the trailing edge when the servo operates. If it doesn't move that much, you need to move the clevis to a hole closer to the elevator. To achieve less movement, move the clevis to a hole further out on the elevator horn.
- Cut a slot in the fuselage for the full length of the pushrod assembly about 4mm - 1/8" deep and 4mm - 1/8" wide; check the pushrod moves freely inside the outer plastic tube without catching. (The tip of a soldering iron is good for this job)
- Test the elevator servo to check free movement, When the elevator stick on the transmitter is moved towards the base of the transmitter case (see Fig 6), the elevator should move up and vice versa. If not, switch the reverse switch on the transmitter to correct.
- Refit the screw into the servo arm.



23) Secure the elevator servo in position with a small smear of adhesive

24) Install a square battery pack in its recess near the nose. Note the receiver and battery pack are not glued in place, just a tight fit. Tip: put a band of insulation tape around the battery case, and join the ends of the tape together to make a tab with which to pull the battery pack out.

25) Make a 4mm – 1/8<sup>th</sup> deep knife slit from the battery and servos to the receiver recess, and then carefully push the battery and servo wires into the slit with a screwdriver.

26) Lightly spray the sides & bottom of the Eraser fuselage, and top of Spitfire, Mustang and PC9 Fuselage with Ados F2 Adhesive and apply a length of strapping tape full length down each side, the bottom and top. Where required, wrap the excess tape around the sides and bottom/top of the fuselage. You will find the compound curves difficult to tape without creasing the tape, take your time and carefully split the tape length ways so it will go around the curves. Add an extra length of tape to each side of the fuselage from the middle to the front end.

27) Now cover the fuselage with the coloured tape provided. The tape is easiest applied in bands around the fuselage, work from the rear to front. Don't apply tape where the wing will be attached later.

28) Cut slots to permit access to the receiver, battery lead and elevator servo arm. If you are using dry cell batteries, cut away the tape and secure the battery holder in position with insulation tape – it is much easier to remove and reattach. If you have rechargeable



batteries it is possible to leave only the charging socket or the plug between battery and switch outside the tape to enable easy charging. If using a switch cut a small hole to fit it into.

29) Install the receiver in its recess with the leads facing outwards. Cover with a single piece of coloured tape, cut a slot in the tape to permit access to the battery plug if you are not going to fit a switch.

30) Tape the receiver aerial to the side of the fuselage, tape any extra back down the other side of the fuselage. As the receiver is central the aerial begins in the middle of the model and should be long enough to go from the receiver, around the tail and back up the other side. Around the rear is also best for damage control.

31) You can either use a switch set into the fuselage or just plug the battery straight into the receiver. **Note** that if you are installing a switch, make sure ON is forward and OFF is backwards, that way when throwing your glider you will not accidentally turn it off.

## **THE WING - PART 2**

(estimated time = 3 hrs)

32) Now we are going to reinforce and cover the wing with tape. It is possible to build in curves and twists during this phase; **TAKE CARE NOT TO APPLY THE TAPE UNDER TENSION**. Lay the wing on a flat tabletop. Try not to get any wrinkles and creases in the tape. If large wrinkles do occur, remove the tape and start again. Any small wrinkles can possibly be removed later with a clothes iron on a cool setting. See the taping plan at the back of these instructions for guidance.

- Remove the tape you put on before gluing the spars in.
- Lightly spray the wing top, plus just around the front and back to the underside by about 30mm – 1 ¼" with Ados F2 Adhesive. Allow to cure for a few minutes.
- Apply a layer of strapping tape from one end of the wing to the other along the spar line. (#1 on the plan)
- Apply strapping tape along one half of the wing leading edge, with a strip from one tip to about 50mm - 2" across the join line in the centre of the wing. Place the tape so about half of it can be wrapped around the leading edge to the bottom side. Now repeat for the opposite leading edge and the trailing edge. (#3)
- Apply the next piece of strapping tape just forward of the trailing edge piece, overlapping by 5-10mm ¼ - ½", this one goes from tip to tip (#4)
- The next piece goes on just forward of the #1 piece overlapping by just 5-10mm ¼ - ½". This piece will overlap the leading edge strip slightly; you can either trim it off or lay it over the leading edge piece. (5)
- Repeat for the other side of the wing.

### Coloured Tape (or Iron on film)

- Draw a line 25mm - 1" either side of the wing join line, parallel to the join line, to indicate where NOT to apply coloured tape in the next step. Repeat for the underside. (This makes it easier to bond the wing to the fuselage as the coloured tape does not bond well)
- Respray the wing top with Ados F2; apply lengths of coloured tape the full length of the top of the wing. Start at the trailing edge and work forward, half overlapping the previous layer of tape. Continue until you have reached the leading edge.
- Apply coloured tape to the bottom of the wing using the same technique described for the top.

### Mount the aileron servo

Eraser only: The aileron servo is installed in the bottom surface of the wing, with the arm closest to the trailing edge of the wing. (See photo 7)

### Mustang, Spitfire and PC9 only;

This servo is installed in the top surface of the wing, with the arm closest to the trailing edge of the wing. (See photo 7)

33) Take your aileron servo and remove the arm. Carefully set aside with screw for now.

- Eraser only; Turn the wing over so you can work on the **bottom** surface.
- **Mustang, Spitfire and PC9 only;** Make sure you are working on the top surface of the wing

- Place the servo in position on the wing join line. If you are using a standard Hitec or Futaba servo, the rearward edge of the servo should be 36mm-1 1/2" from the trailing edge of the wing, any other servos set the servo so the horn is 45mm-1 3/4" from the trailing edge. Mark the outline of the servo. See photo 7.
- Cut a rectangular hole down to, but not through, the strapping tape on the other side of the wing. Make it a snug fit for the servo. Glue the servo in place with Gorilla glue.

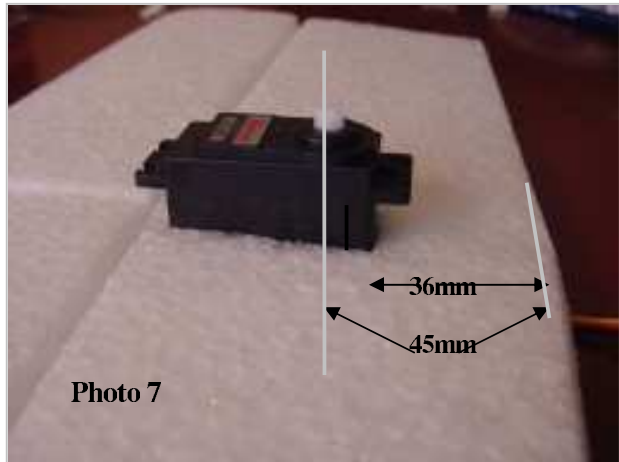


Photo 7

### Ailerons

Note: The upper surface of the aileron is the side with the longest side. The thinnest 'sharp' edge is the trailing edge. Take your ailerons and figure out which will be the left and right ends. Photo 7b The ailerons are slightly too long, it will be necessary to cut a little off the end of each.

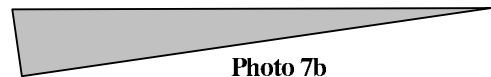


Photo 7b

34) Locate the pre-bent aileron rods. Screw the nylon horns onto the threaded ends of the aileron rods, all the way down until the wire is flush with the top of the horn.

35) Drill a 2.5mm – 7/64<sup>th</sup> hole into the forward edge of each aileron, 40mm - 1 3/4" from the root of the aileron; make the hole 2m - 1" deep. Take care that the hole is parallel to the bottom surface of the aileron. See Photo 8a

36) Use your knife to make a slot in the leading edge from the hole to the end of the aileron for the wire to push into. See photo 8a

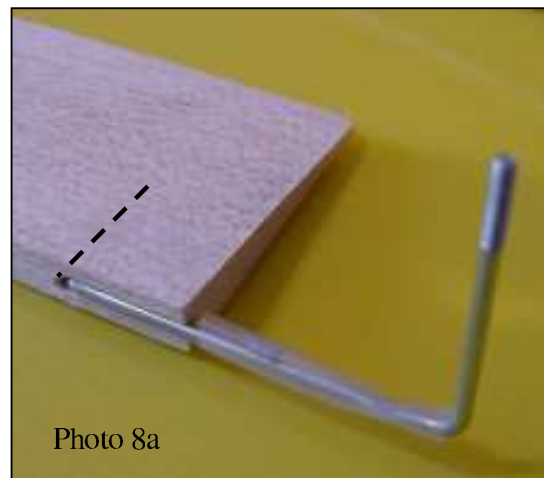


Photo 8a

Glue the wire into the balsa ailerons. On the Mustang, Spitfire, and PC9 the wire and nylon horn will point up as in Figure 8. As the Eraser wing is top mounted its wire will point down.

- 37) Position the wing in place on the fuselage. Take one aileron and hold it in place on the rear of the wing, with the end with the wire on about 1m away from the fuselage. Mark the ailerons at the outer end of the wings.

Eraser only; at one end of each aileron (the 'tips'), cut off a 30-degree angled section. See photo 8B and take a look at the completed ailerons in fig 12 to see the finished result required. Make sure you cut a left and right aileron!!

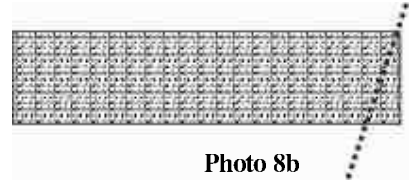


Photo 8b

Mustang, Spitfire and PC9, refer to the wing tip template to shape the aileron ends. Make sure to do a left and right pair!!

- 38) Spray the underside (including the small forward facing edge) of the ailerons with Ados F2 Adhesive.

- Cover the undersides of the ailerons with a layer of coloured tape laid lengthways. Work carefully and do not stretch the tape to ensure you don't build in any twists. Stick tape on from the 'leading' edge back and allow the extra tape to just 'trail' off the trailing edge. The tape does not wrap around the trailing edge very well, so let the tape join together at the trailing edge, then cut later.

- 39) Turn the ailerons over and do almost the same (read the points below) to the upper surface, after spraying with Ados F2 Adhesive;

- Cover the upper surface of the ailerons with a layer of coloured tape laid lengthways. Again work carefully and do not stretch the tape as you apply it. This time however overlap the tape a little (about 15mm - 5/8<sup>th</sup>) over the 'leading' edge, allowing the extra tape to also just 'trail' off the trailing edge. This tape will meet the tape from the underside and will join together at the trailing edge.
- Cut the tape at the trailing edge off using a ruler to get a straight line about 2mm - 1/16<sup>th</sup> beyond the edge of the balsa.

- 40) Position the ailerons with about a 1mm - 1/16<sup>th</sup> gap between the wing and ailerons, and about 3mm - 1/8<sup>th</sup> between the ailerons and fuselage.

- Temporarily hold in position with 2 short pieces of tape on the underside of the wing.
- Apply coloured tape the length of the hinge line on the top surface only.

- 41) Tape the tube over the aileron wires to the rear of the wing with strapping tape.

- 42) Make the Aileron pushrods

- Slide both of the wire aileron pushrods through the outer holes in the aileron servo arm.
- Thread a clevis onto the end of the pushrod. (see photo 9)
- Centre the servo using your RC gear, check that the trim lever (on the transmitter just below the aileron stick) is in the middle and re-install the servo arm making sure it's at a right angle to the centreline of the wing.

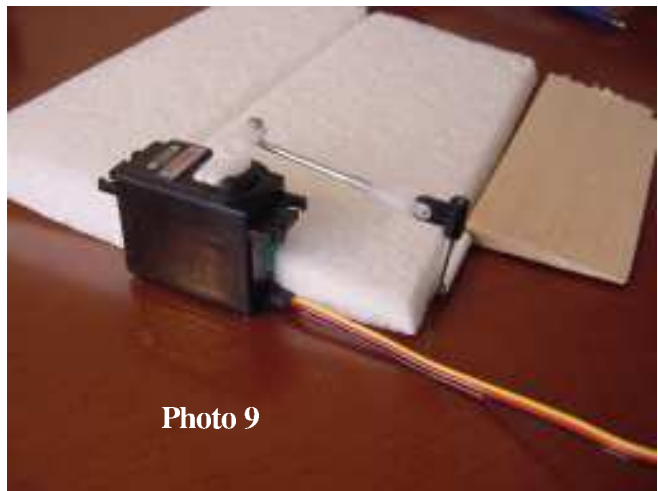
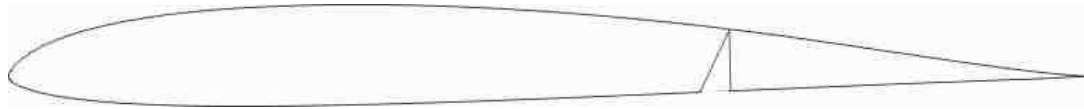


Photo 9

- Clip the clevises into the aileron connectors. See photo 9
- Check also that both ailerons are lined up with each other, and in line with the wing. adjust the length of the linkage if required. See photo 9b.

Photo 9b



- When the transmitter aileron stick is moved left, the left aileron goes up and the right aileron goes down. If not, switch the reverse switch on the transmitter to correct.

43) Now before you glue the wing on,

- Check all linkage attachments are secure.
- Test the radio control to check the system for free movement and for proper aileron movement up and down (about 12 to 15mm -1/2" to 5/8" each way);
- The aileron servo is securely mounted in the wing,
- Put the screw back in the servo arm.
- The clevises are properly clipped into the aileron connectors

44) Make a slot for the aileron servo lead in the fuselage from where the servo will end up in the fuselage to the receiver cavity. Make sure the servo lead can't get in the way of the servo linkage.

45) Test fit the wing to the fuselage. It will most likely be necessary to remove a little more foam from the fuselage either side of the where the aileron servo will be situated to allow the servo arm to move freely, carefully trim away a little foam at a time until there is just enough clearance. The rear of the fuselage cavity may also need a little more space for the aileron pushrod wires to move freely back and forth.

46) There are 2 ways to attach the wing,

- Either; glue the wing in place with plenty of Gorilla glue adhesive. Make sure the wing is square across the fuselage and level with the tailplane, and then put aside to set. Be careful not to glue the servo wire into the wing or fuselage, if this is a risk, cover it in tape first.
- OR; attach it with double sided sticky tape; this produces a very good bond less likely to be knocked off in one of your harder landings.

47) When the glue is dry, spray a mist coat of Ados F2 adhesive along the entire (top – Eraser, bottom - Mustang, Spitfire and PC9) of the fuselage. Mask off the wing and tailplane so that the adhesive only goes on the centre sections of the fuselage. Lay a piece of strapping tape along the fuselage with a 50mm (2") overlap at the front/back of the wing.

48) Test fit the Corflute wing strap to the top/bottom of the wing and fuselage.

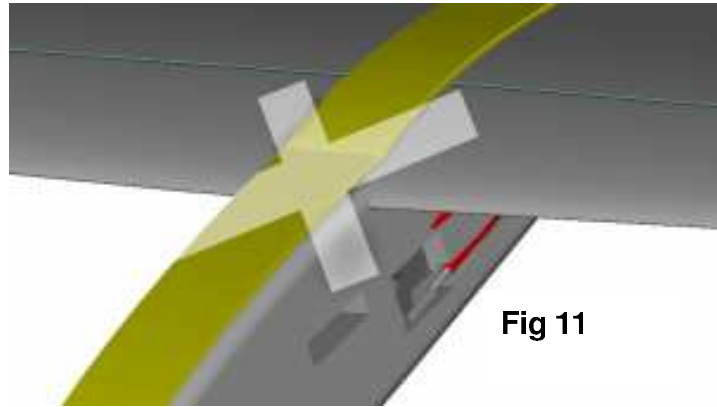
Eraser only;

- Cut a shallow V at the rear end so it is a nice fit against the leading edge of the tailplane
- Then trim the front so it fits neatly into the notch in the forward end of the fuselage.
- Remove from the model and apply strapping tape to the top and bottom of the wing strap (lengthways, parallel to flutes) from the front end to the start of the slot for the fin. This will help prevent it breaking during one of your heavier landings!

49) Apply glue to the full length of the wing strap, fit in place then secure with tape across the wing and around the fuselage just in front of, and behind the wing. Check again the wing is centred on the fuselage and is square to the tailplane, then put the model aside overnight to allow the glue to cure.

50) We can now add a bit more strength to the wing attachment. Place a number of small (5cm) strips of strapping tape (coloured tape is ok if you have no strapping left) across the join between the under wing and the fuselage, in such a manner as to place the fibers running across the join between the wing and fuselage

51) You can also add two pieces of strapping tape in an X, one crossing from the left wing over the wing strap and down to the right side of the front fuselage and vice versa to the other side of the model (see Fig 11). This could be done with coloured tape if you are out of strapping tape.

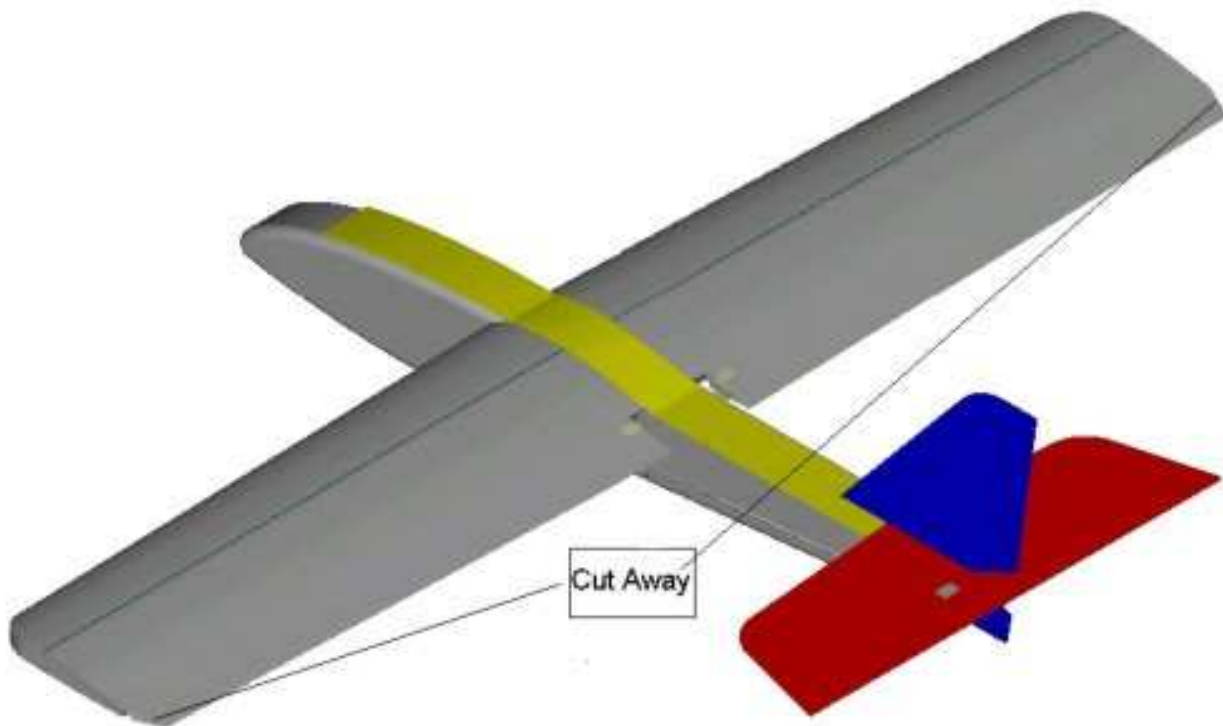


**Fig 11**

52) Apply tape under the tail, and on top between tail and fin, also over the wing strap out to about 80mm - 3" each side of the strap, plus over the strap and down the fuselage side.

53) The Mustang, Spitfire and PC9 kits include a sheet of decorations for the models. Cut these out and apply with Ados F2, then cover with clear sticky tape to make them water proof. The full-size Mustang and Spitfire had oil coolers and rocker covers, the positions are shown on the plan. Make these from the left over EPP around the wings.

**Fig 12**



**CONGRATULATIONS – Your Model is now assembled – LET’S GO FLYING!!!**

## A few notes on flying for beginners

### Balancing your model.

Before flying your model you need to balance it from nose to tail and wing tip to wing tip. On the underside of the wing, on both sides of the fuselage, measure and mark the centre of gravity for the Eraser, Mustang, Spitfire and PC-9, put marks 58mm back from the leading edge of the wing.

Tape small amounts of weight (small pieces of lead are ideal) to the nose or tail so you can balance the model with your finger tips on the marks and a slight nose down attitude for the model. When you've got the right balance, cut a small hole (just big enough for the balance weight) at the point where you taped the weight to the model and put the weight into it. Cover the hole with a piece of coloured tape. You may still need to adjust the balance point slightly when you start flying your model, but this will be a good starting point.

Remember, a nose heavy model is more docile to fly, moving the centre of gravity rearwards makes the model more twitchy and sensitive to control movements – models with a rearward centre of gravity don't usually penetrate into the wind that well either.

Now check the wing tip to wing tip balance, support the model under the nose and tail with the wings level. If the model keeps rolling to one side, that wing is heavier than the opposite wing. Add small weights (nails are good for this) to the *lighter* wing tip until the model stays level. Once you've got the model balanced, permanently attach the balance weight either as you did for the fuselage or if you used nails, just push them into the end of the wing.

If your model isn't balanced from wing tip to wing tip it will always turn towards the heavy wing, which can make flying and performing aerobatics difficult.

**If you haven't flown before it is well worth getting some help.** Ask at the local model shop or go to a local flying slope, most fliers will be very happy to help.

If you are a first time flier, before going to a slope, go to the local park and practice throwing and gliding the plane flat and level into the wind. This will get you used to the controls so that corrections become quick and automatic because on the slope you don't get time to think about which stick to push in which direction. Before each flying session, check the basic functions, i.e. up is up, down is down (stick forward) and right is right and left is left. Check the radio range by following your radio manufacturers' instructions.

These initial flights will also be a good opportunity to trim your model for straight and level flight. Choose a day when the wind isn't blowing a gale, a good 10 -15knot breeze is ideal for first flights. When you get more experienced, flying in stronger winds can be a lot of fun, but you may need to add ballast weight (under/at the centre of gravity) to get the model to penetrate into the wind.

Once on the slope and you've mastered level flight try some turns. As you turn you'll need to add a small amount of up elevator to keep the model level. Be very gentle on the controls, the model will not fly well if you use excessive control movements on the sticks. It's best to **always turn into the wind** as down wind turns can take up a lot of airspace; it can also be tricky to judge the correct airspeed.

Good soaring slopes are a little hard to find, however this makes an interesting challenge for this captivating sport. A good slope is characterised by the wind blowing straight up a slope that is steeper than 45 degrees. Tall sand dunes over about 6 Meters and hills higher than about 30 Meters should provide sufficient lift. You will often see birds soaring in these areas.

**It is best to talk with local flyers** or see where others are flying to find the best sites for each wind direction and strength. You can also then get first-hand tips on flying and trimming.

Choose a place to fly that offers a landing site. With EPP models this is less important - just dodge rocks if you can. Long grass, tussock or bushes are fine. **Watch out for spectators!**

Thermals will also assist flying. Thermals are generated by the sun heating the land, warming air which then rises. This makes a sunny slope work better than a sheltered one. Before flying, ensure that your transmitter batteries are charged. Follow your radio manufacturer's instructions for safe radio operation. ***Always make sure that no one is on your frequency before turning your radio transmitter on.*** Do this by asking any other flyers if they are on your particular radio channel (refer radio manufacturer instructions to determine the channel you are on). If in doubt – turn your receiver (model) on first (leave the transmitter turned off), if the elevator and ailerons are static the frequency should be clear, if they move often and erratically there is activity on your frequency. Best idea is don't fly until you're sure the frequency is clear.

When you choose a slope, have a good look around and imagine where you will fly, pinpoint areas such as trees and cliffs where you don't want to fly and decide where you will land and perform a final range check (refer radio manufacturer instructions).

Always throw off straight and level into the wind and quite hard. Be ready to stop a steep initial climb by pushing the elevator stick forward. Also be ready for a sudden turn to one side. Concentrate on keeping the model in front of you and heading away from the slope. If the model heads down and out from the slope, try pulling up a little. *If the model continues to sink, land it before you loose it!*

If the model climbs nicely but starts to go back over your head, apply some down elevator to get speed up and hold a little down until you can fly it some meters in front of you. Once you are comfortable, try some zigzag turns, always turning into the wind. Remember to add up elevator when turning. Don't try fancy moves yet, just concentrating on getting your hours up. Practice, practice, practice. Note the bad areas are below the horizon and down wind of you. This will put you out of the lift and into turbulence.

It can be quite cold on the slope so be prepared to dress warmly so you can enjoy the day.

**WARNING:** Model Aircraft, even those made from EPP foam, can be extremely dangerous if you hit someone, be careful, think about where you are going to fly and the safety of yourself and those around you.

### **SUMMARY OF SLOPE ETIQUETTE**

You will always be welcomed at an established slope flying location by experienced flyers. The majority of flyers will almost always be prepared to stop what they are doing to help out and offer advice if you ask for it, so don't be shy. Some informal rules have developed over time that allow everyone to enjoy the slope. Some of these are listed below:-

Always check no other flyers are on the same frequency as you before turning anything on. *You can only establish this by asking around.*






Avoid flying or landing where other flyers are standing. Pay particular attention if there are any spectators nearby, foam models still hurt.

Do not engage in combat with a composite or balsa model at any time. These are very expensive models and do not bounce like your new EPP model!

Challenge other EPP flyers before beginning combat so they know what's going on and can decline if they wish.

Avoid at all times any hang gliders or Para gliders. If you intend to share the same slope make sure you talk to these people before launching. You must give way at all times. *A foam model has the potential to damage parts of a hang glider or para glider resulting in serious injury or death.*

## Parts LIST

EPP Wings	Left & right	
Balsa Ailerons	2	
EPP Fuselage	1	
Canopy	1	Mustang, Spitfire and PC9 only
Corflute tailplane	1	
Corflute Fin	1	
Corflute wing Strap	1	
Spars	4	
Elevator pushrod wire 535mm long and plastic tube.	1	
Short steel rod with knob (aileron pushrods)	2	
Gorilla glue Adhesive	1	
Strapping Tape	1	
Black Plastic Aileron connector	2	
Coloured tape roll 50 metres	1	
Wing Spar joiner tubes	2	
Control Horn & Base Plate	1 set	
Control Horn screws	2	
Plastic Clevis	4	
Aileron Control wire (pre bent)	2	
Instruction Manual	1	
Graphics Sheet	1	

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