

Produced by Cloud Models, Deopham Road, Morley, Wymondham, Norfolk, NR18 9AA
E-mail sales@cloudmodels.com web site cloudmodels.com

Introducing The Cloud Models DH 88 Comet



*By
Tricks*

Thank you for purchasing the Cloud Models DH88 Comet we hope you are going to enjoy building and flying it.

The Comet has been designed to be sport scale so as to make it straightforward to build and fun to fly.

The Comet requires two 400 motors nicad and three-channel radio using 3 servos and a speed controller, plus glues covering paint etc.

The history of the DH88 Comet racers, started with an announcement by Sir MacPherson Robertson that to celebrate the Melbourne centenary there would be an air race between London and Melbourne, with prize money of £15 000 and a cup.

In January 1934 the de Havilland Company realised that there was no prospect of a British aircraft winning the race. Furthermore even if orders were placed, the aircraft was unlikely to be able to recover costs. However the decision was made that if enough orders were placed they would go ahead with building the aircraft even at a loss. With only ten months to the start of the race orders were received for three aircraft. Later another two were built.

No19 G-ACSR was the first Comet to fly. Painted British Racing Green and flown in the race by Cathcart Jones and Ken Waller. This aircraft came third after engine problems; however, it was then flown straight back to establish a Melbourne to London record. This aircraft was then used for Christmas mail before being sold to the French Government. It was then Re registered as F-ANPY and was used for mail flights and by the French military. It is believed that along with a another comet F-ANPZ, it was destroyed in a hanger fire at Istres in 1940.

No34 G-ACSS Painted Red and named Grosvenor House, was flown in the race by T.Campbell Black and C.W.A.Scott. This aircraft won the event. It was then acquired by the British Military for evaluation, and was painted silver and Re registered K5084. After flying at a number of displays the aircraft was damaged during testing and sold for scrap. Fortunately it was brought by F.E.Tasker who had it rebuilt, and the original registration was returned, it was renamed Orphan and carried the racing number G16. The aircraft was entered in a number of races and after being renamed "The Burberry" and flown to the Cape and back, to break another record. It was renamed once more this time to the "Australian Anniversary", and in 1938 made several successful record attempts. This was the end of its record breaking as the aircraft was taken to Gravesend where it was cannibalised. In 1943 it was re-discovered and returned to de Havilland who stored it until 1951, when it was returned to its original colours and suspended from the roof of the exhibition hall during the Festival of Britain. It then displayed in de Havillands showroom at Leavesdon until 1965, when it was donated to the Shuttleworth Trust at Old Warden. On May 17th 1987 Grosvenor House in its original colours once again took to the air.

No 63 G-ACSP Painted Black and named Black Magic, was flown in the race by Jim and Amy Mollison, but had to retire after engine problems. This aircraft was sold to the Portuguese government in 1935. It was Re registered CS-AAJ and named Salazar with the intention to use it for mail flights, which do not appear to have been attempted. The aircraft was overhauled by de Havilland in 1937 and returned to Portugal it is now being restored in the UK.

F-ANPZ built in 1935 to join F-ANPY in France its history being similar.

G-ADEF built in 1935 for Cyril Nicholson and was named Boomerang, it was flown in a number of record attempts some successful, and was entered in the Kings Cup air race. In September 1935 whilst attempting to beat the Cape record the crew bailed out after problems and the aircraft was lost.

IMPORTANT PLEASE READ

It is strongly recommended that you carry adequate insurance and only fly in areas designated for model flying keeping well away from people and property. Models are Capable of serious injury or even death and should not be abused.

The BMFA is a good source for information and insurance www.bmfa.org

The kits are model aircraft **NOT** toys and **NOT** suitable for children.

The builder/flyer is responsible for the safe building and flying of the model.

The model should be checked thoroughly for damage and wear particularly linkages

Prior to every flight and radio equipment should be charged and reliable. If in doubt

DO NOT FLY fix the problem.

C M Manufacturing (Cloud Models) do not accept any responsibility whilst models are being operated.

If in doubt about building or flying please contact your local model flying club and seek

Skilled help particularly if you have not flown this type of model get an experienced

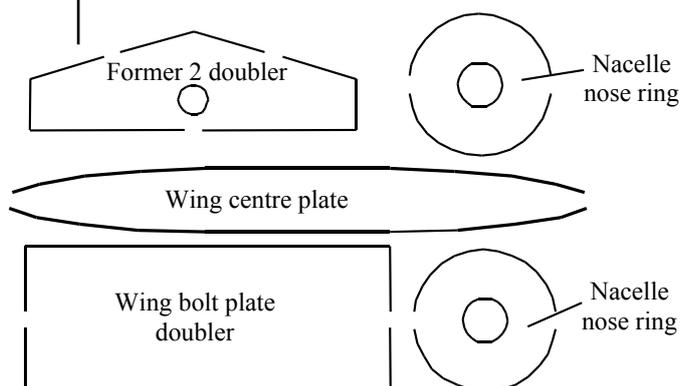
Pilot to test fly and trim your model.

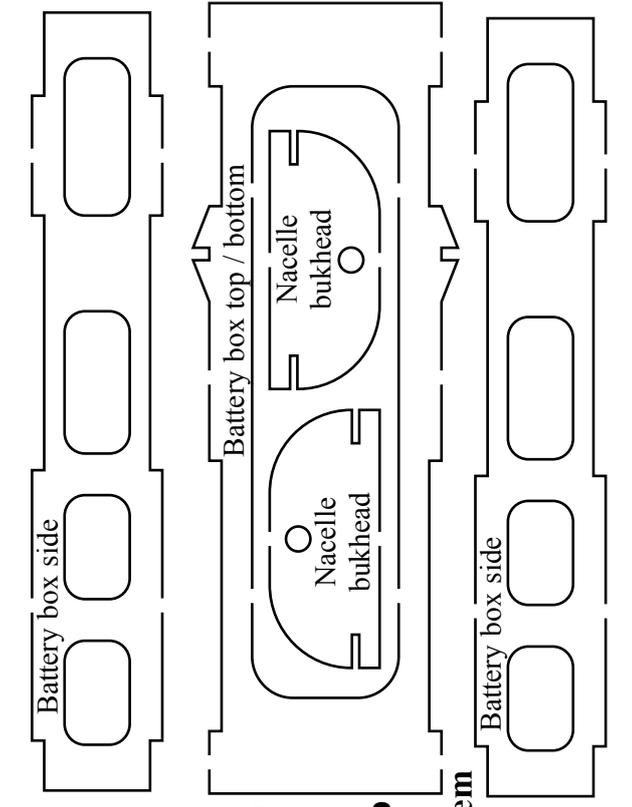
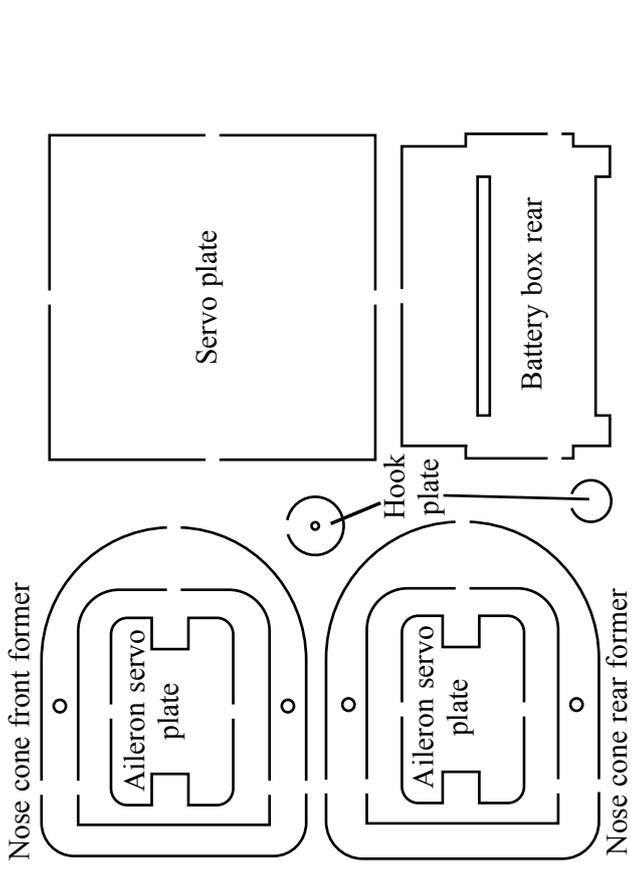
If we can be of assistance please contact us at sales@cloudmodels.com

Below is a general description of the parts in the kit all sizes are nominal.

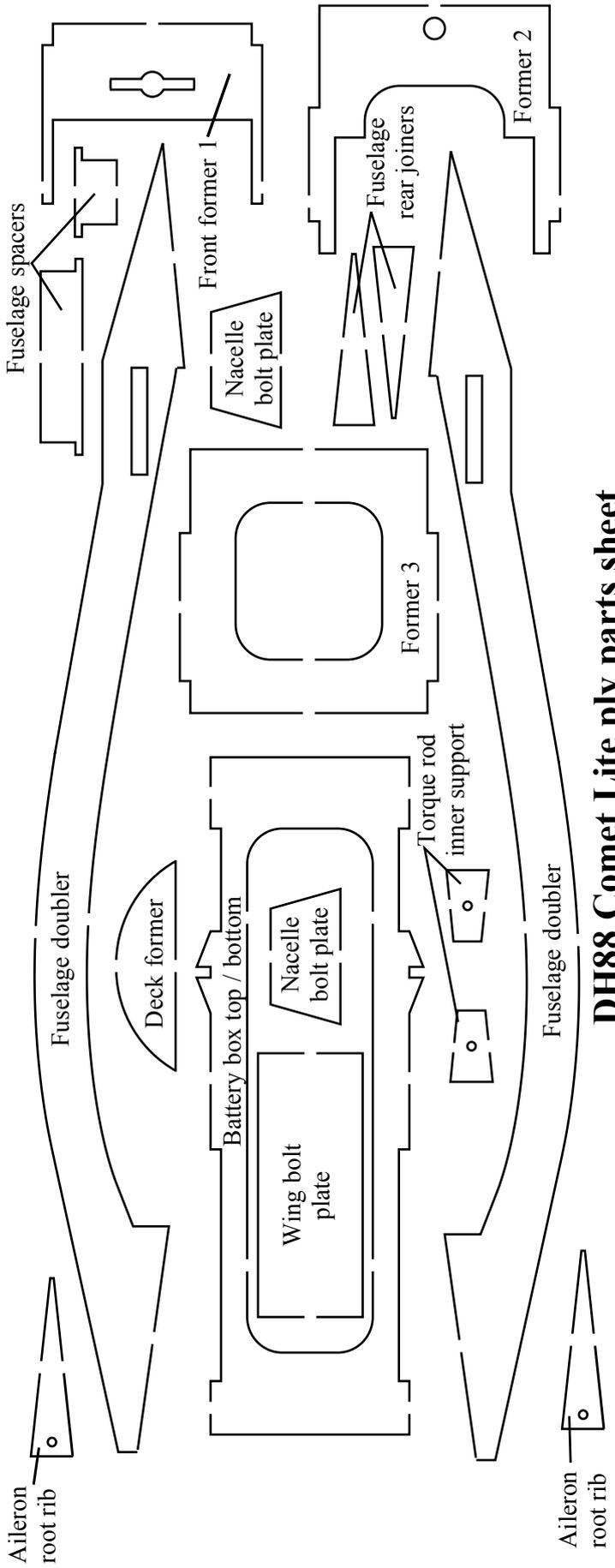
| Description | Qty | Details | Description | Qty | Details |
|------------------------|-----|-------------------------|------------------------|------|--------------|
| Lite Ply CNC Sheet | 2 | | Fuselage Top Moulding | 1 | Plastic |
| Birch Ply CNC Sheet | 1 | | Nose Cone | 1 | Plastic |
| Fuselage Sides | 2 | Shaped | Canopy | 1 | Plastic |
| Fuselage Strip Top | 2 | 3mm X 10mm X 720mm | Nacelle Left | 2 | Plastic |
| Fuselage Strip Bottom | 2 | 3mm X 10mm X 450mm | Nacelle Right | 2 | Plastic |
| Bottom Front & Fillets | 1 | 6mm Stock Sheet Balsa | Nacelle Top | 2 | Plastic |
| Bottom Rear & Ail Face | 1 | 1.5mm Stock Sheet Balsa | Wing Panels | Pair | Foam Veneer |
| Tailplane | 1 | Shaped | Elevator Joiner | 1 | Wire |
| Elevator Main | 2 | Shaped | Wing Bolt | 1 | 6mm |
| Elevator Tips | 2 | Shaped | Wing Captive Nut | 1 | 6mm |
| Fin Main | 1 | Shaped | Nacelle Bolt | 2 | 4 Ba |
| Fin Front | 1 | Shaped | Nacelle Captive Nut | 2 | 4 Ba |
| Rudder Main | 1 | Shaped | Elevator Horn | 1 | |
| Leading Edge | 2 | 6mm X 11mm X 585mm | Horn Screws | 2 | No2 X 12mm |
| Tips | 2 | Shaped | Threaded Rod | 1 | 200mm |
| Wing Trailing Edge | 2 | 3mm X 12mm X 280mm | Threaded Rod | 2 | 100mm |
| Aileron Leading Edge | 2 | 6mm X 12mm X 280mm | Quick Link | 3 | |
| Servo Block | 4 | 9mm X 9mm X 15mm | Swing in Keeper | 3 | |
| Wing Bolt Hard Points | 3 | 12mm Dia X 12mm | Hinges | 1 | 150mm |
| Nacelle Dowel | 2 | 6mm Dia X 20mm | Torque Rod | 1 | |
| Wing Dowel | 1 | 6mm Dia X 50mm | Nose Screw Hook | 1 | |
| Pushrod Wood | 1 | 6mm X 6mm X 450mm | Wing Bandage | 1 | 75mm X 500mm |
| Fin Fillet | 2 | 4mm X 55mm X 55mm | Plastic Tube Nose Cone | 1 | |
| Instructions | 1 | | | | |

Birch ply sheet. Identify the parts before removing them from the sheet with a sharp knife sand parts lightly to de burr them.





Identify the parts before removing them from the sheet with a sharp knife, sand parts lightly to deburr them



DH88 Comet Lite ply parts sheet

Before You Start

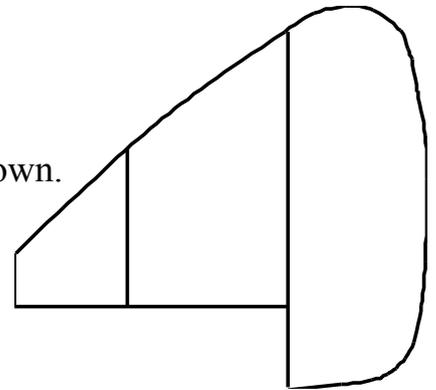
Before you start read the instructions and familiarise yourself with the parts. The Comet is not intended as a beginner's model but anyone with low wing experience should find no problem flying it. It will be noticed that there is washout built into the wing and that the ailerons have been reduced in span from scale to help prevent tip stalling, we suggest they are not changed. No rudder has been fitted although this would be quiet easy if you wish, it was not felt necessary on the prototypes. You may wish to add a hand hold for launching either a small inset in the wing with a grip for your fingers or an external hold could easily be added, a short catapult could also be used with a hook on the second bulkhead. If you wish to incorporate any of these items plan now how and when to make modifications.

The prototypes used Graupner speed 400 6volt motors with 7 cell 2000 nicad the propellers are Robbe 6 X 3 1/2" Folders and a 20amp speed controller was used.

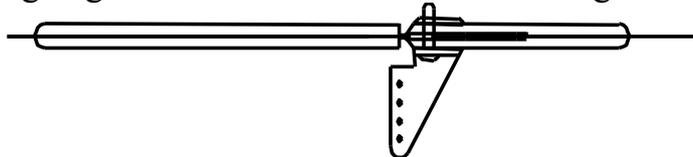
The Comet can be built fairly quickly using cyno and epoxy glues. Do Not Use cyno, cellulose or petroleum based glues on foam parts.

Building The Tail Surfaces

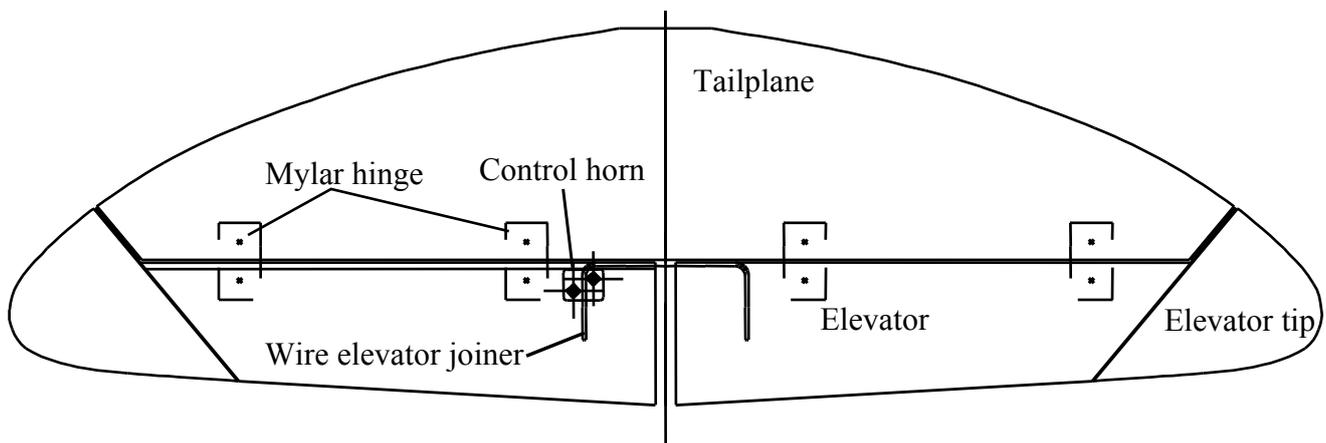
Construct the fin by butt joining the three pieces together as shown. If you wish to add a rudder then now is the time but it has not been felt necessary on the prototypes. When dry sand flat and radius the leading and trailing edges.



Bevel the leading edge of the elevators as shown then glue in place the elevator tips

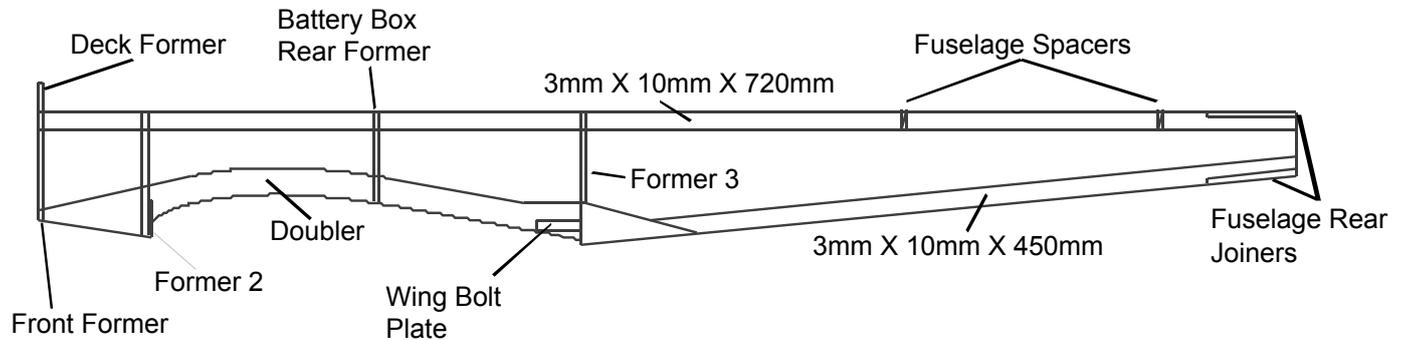


When dry offer the two elevators up to the tailplane trim the elevators to allow the fin to pass between them with clearance. Offer up the wire elevator joiner and mark the position on each elevator drill the centre line of the elevator and slot out to accept the joiner (DO NOT GLUE IN PLACE) Sand the tailplane leading edge and the elevator tips and trailing edge.

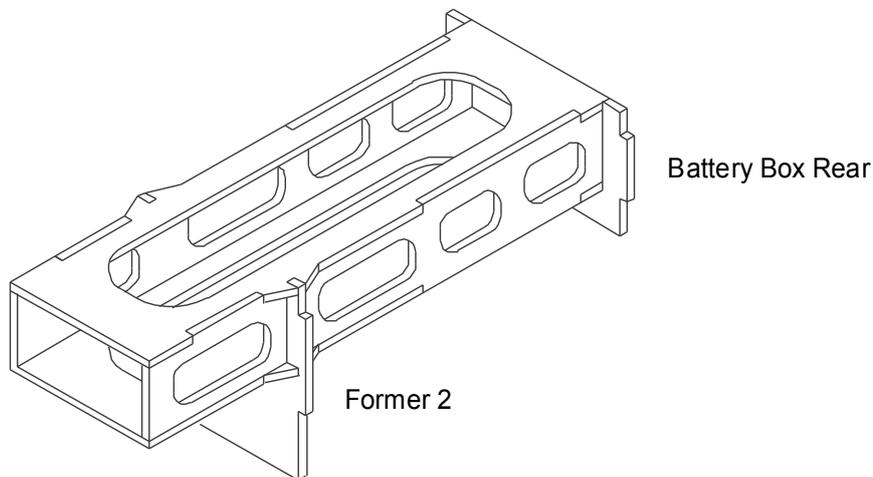


Building The Fuselage

Take the two fuselage sides and glue in place the wing seating doubler, flush with the front and bottom of the side (**MAKE ONE LEFT AND ONE RIGHT**). Along the top of the fuselage sides glue 3mm X 10mm X 720mm balsa strip and along the bottom rear of the sides 3mm X 10mm X 450mm. Glue the doubler onto former 2 and the doubler onto the wing bolt plate.



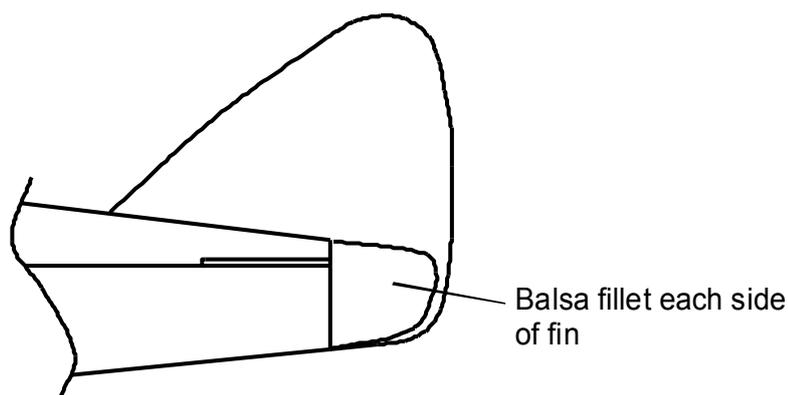
Construct the battery box assembly. The easiest way is to dry fit the top, bottom and sides together, with the battery box rear and former 2, which with the ply doubler facing the rear, slides into the slots in the top and bottom of the battery box. Check the assembly is square and the joints tight and then run thin cyano around all the joints.



Now offer the assembly up to the fuselage sides, former 2 is flush with the leading edge of the wing seating and the formers fit inside the doublers and stringers. With the fuselage upside down on a flat surface the top of the fuselage and the battery box should be flat, Glue the box in place. When dry pull the front of the fuselage in onto the front former, which is flush with the front of the fuselage sides and glue. Pull the rear of the fuselage together with the wing bolt plate (doubler upwards) fitting into the slots in the side doublers, former 3 against the bolt plate and square to the top of the fuselage. The two fuselage rear joiners fit flush with the top and bottom of the fuselage and flush with the rear, check the fuselage is straight glue the assembly together.

Sand the top and bottom of the fuselage flush. Glue the deck former in place on top of the front former. From the plastic top deck remove the front and rear angled portions, trim the moulding 3mm from the bottom. Offer the moulding up to the fuselage trim it to fit over the deck former and onto the sides of the fuselage. Mark the centre line on the tailplane and mark the chord of the tailplane onto the top of the fuselage the rear of the tailplane is level with the rear of the sides. Slide the two fuselage spacers between the rear sides with the tab sitting above the side the rear one locates in front of the tailplane, slide the forward one back until the sides have the same curve and width as the deck then glue them in place. Now glue the tailplane in position check it is level with the wing seating and on the centre line of the fuselage. When dry trim the top deck to fit over the tailplane. When satisfied glue the fin in place above the centre line of the tailplane and check it is square to the tailplane. Slot out the top of the rear deck to fit over the fin. Use modelling pins pushed in along the outside edge of the fuselage sides to help position the top deck and use masking tape to pull the deck down onto the sides. Glue the deck in place.

Offer up the 4mm fin fillets and rough them to shape before gluing them in place.



Cut a hole through the fin and fillet for the elevator joiner. Offer up the elevators and trim the inside face to clear the fillets.

BUILD THE WING

After you have drilled for the wing location dowel use 6mm balsa to sheet the front bottom of the fuselage. Cut out the servo tray for your elevator servo and receiver and fit and glue the plate in position behind the battery box. Make up the elevator push rod with the 6mm square balsa and the long threaded rod cut to take quick link and swing in keeper. Slot the rear of the fuselage to line up with the control horn. Sheet the rear bottom of the fuselage with 1.5mm balsa.

Lay the wing in place and drill through the wing bolt hard point into the wing bolt plate and fit the 6mm captive nut in place. Sand the rear bottom to shape.

Building the wings

Please note that scale ailerons would extend to the tip block, to reduce the possibility of tip stalling we recommend that the aileron dimensions on the drawing be used.

Using the drawing mark on the underside of the wing the hole positions for the motor and servo leads, also the nacelle bolt hard points and the holes for the torque rod outlet. Also mark the positions for the ailerons. Drill or cut with a sharp knife 12mm holes for the motor and aileron lead outlets in the **bottom surface of the wing only** and about half the thickness of the wing. Now using a piece of thin walled brass tube about 12mm diameter with one end sharpened, cut a hole through the wing to the servo lead hole, use a twisting motion. Remove the scrap foam every 5cm or so, be careful not to let the tube wander into the veneer top or bottom surfaces. The same method may be used for the motor wires. Drill or cut a 12mm hole for the nacelle hard point dowels glue these in place and when dry drill the centre for the M4 nacelle retaining bolt.

Cut the ailerons from the wing panels with sharp knife or razor saw. Mark the ailerons left and right. Remove enough from the ailerons to make sure when the end facings to the ailerons and wings are put on there is sufficient clearance. Cut out the box for the torque rod and inner support. Drill a hole from the aileron cut out to the torque rod box drill with the bit in your hand and work it slowly through the foam keeping the hole central to the wing the hole can be over size about 6mm is fine. Slide the tube and inner support onto the torque rod then bend the torque rod about 100mm from the bend at right angles to the first bend (**one left one right**) then trim the end off to 20mm. Work the torque rod assembly through the hole and into position. Glue the assembly in place gluing the tube to its supports and trimming the tube when dry. **DO NOT GET GLUE ON THE TORQUE ROD.**

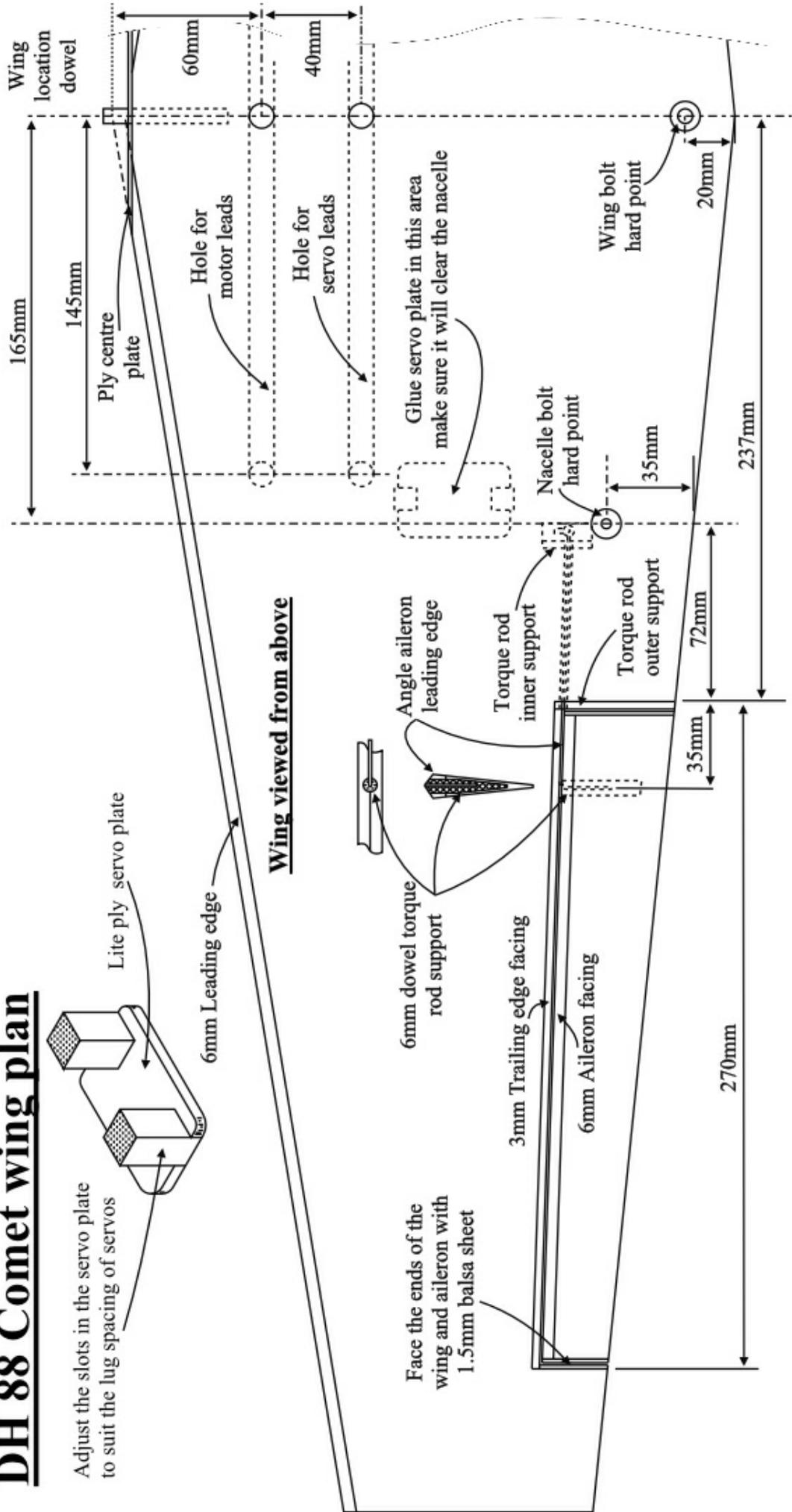
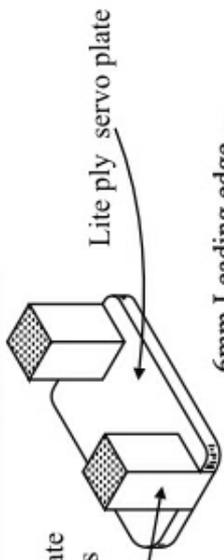
Glue in place the 6mm leading edges the 3mm trailing edges and a piece of scrap 1.5mm balsa to face the end of the aileron cut out, also glue the wing tips in place. When dry sand the wing to shape **DO NOT SAND THE VENEER.**

Lay the wing panels top upwards on a flat surface with the trailing edge overhanging the edge (To clear the torque rods) pack both tips up by 25mm measured at the end of the veneer. Butt the panels together and sand to achieve a good joint epoxy the panels together. When dry offer the wing up to the fuselage trim the leading edge and trailing edge to achieve a good fit allow an extra 1.5mm at the leading edge for the ply centre brace. Glue the brace in position. Mark the position of the wing bolt hard point and drill or cut a 12mm hole glue the dowel in place when dry drill the hard point for the M6 wing bolt. Sand the centre of the wing flush, **DO NOT SAND THE VENEER.** Using the wing bandage supplied reinforce the wing joint. Start at the leading edge keep the ply plate exposed, use a slow drying thin epoxy. When dry mark on the top surface of the wing the position of the lead holes and drill out. Offer the wing up to the fuselage adjust the wing seating if necessary to get a good fit. Drill through the second former with the wing in place with a 6mm drill and glue the wing location dowel into the wing.

Glue the 6mm leading edges to the ailerons and face the ends with scrap 1.5mm balsa. When dry sand the surfaces flush. Offer the ailerons up to the wing and mark the position of the torque rods, drill into the ailerons with a 6mm drill being careful not to break the surface, taper the ends of the torque rod dowel and glue into the aileron push the dowel in as far as it will go without it distorting the veneer. When dry sand the dowel flush then drill to accept the torque rod also slot the aileron leading edge for the wire to sit flush with the surface. Angle the leading edge of the aileron as per drawing.

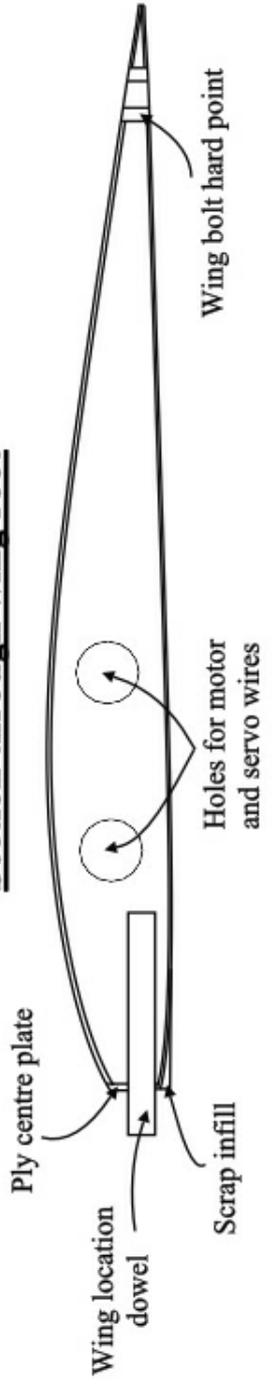
DH 88 Comet wing plan

Adjust the slots in the servo plate to suit the lug spacing of servos



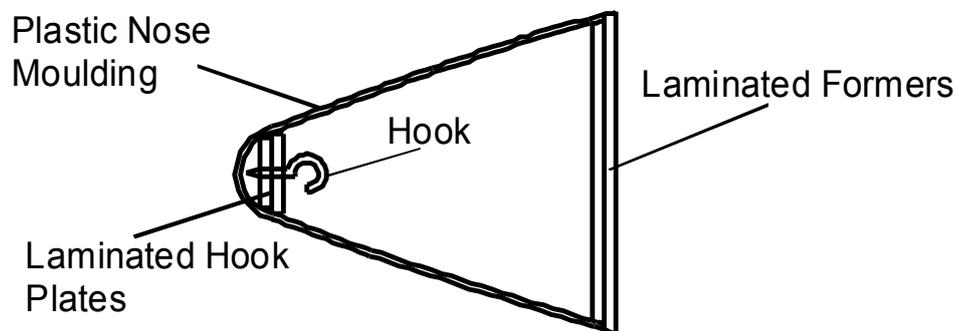
Wing viewed from above

Section through wing root



Building the nose cone

Glue the two round hook plate discs together then screw in the hook and glue the assembly into the nose cone. Sand flush the rear face of the nose cone moulding offer up the smaller nose cone former and lightly sand to fit inside remove as little as possible for a tight fit then glue the second former to the first lining up the holes.



Dry fit the nose cone to the former and carefully sand the outer former to the nose cone contour try not to sand the moulding. Remove the moulding and line up the former with the front of the fuselage. Drill through the two holes into the front former to accept the plastic tube. Trim of two pieces of plastic tube to 10mm and glue them into the holes in the nose cone former assembly. Glue the nose cone to the former. To locate the nose loop a rubber band over a length of tube hook the other end onto the hook in the nose then fit the tube through the bulkhead and twist it to locate.

Mark around the nose cone then remove it and sand the fuselage to shape the bottom is slightly curved down to about 3mm at the wing leading edge. Glue scrap balsa onto the wing centre to blend the wing into the fuselage.

Building The Nacelles

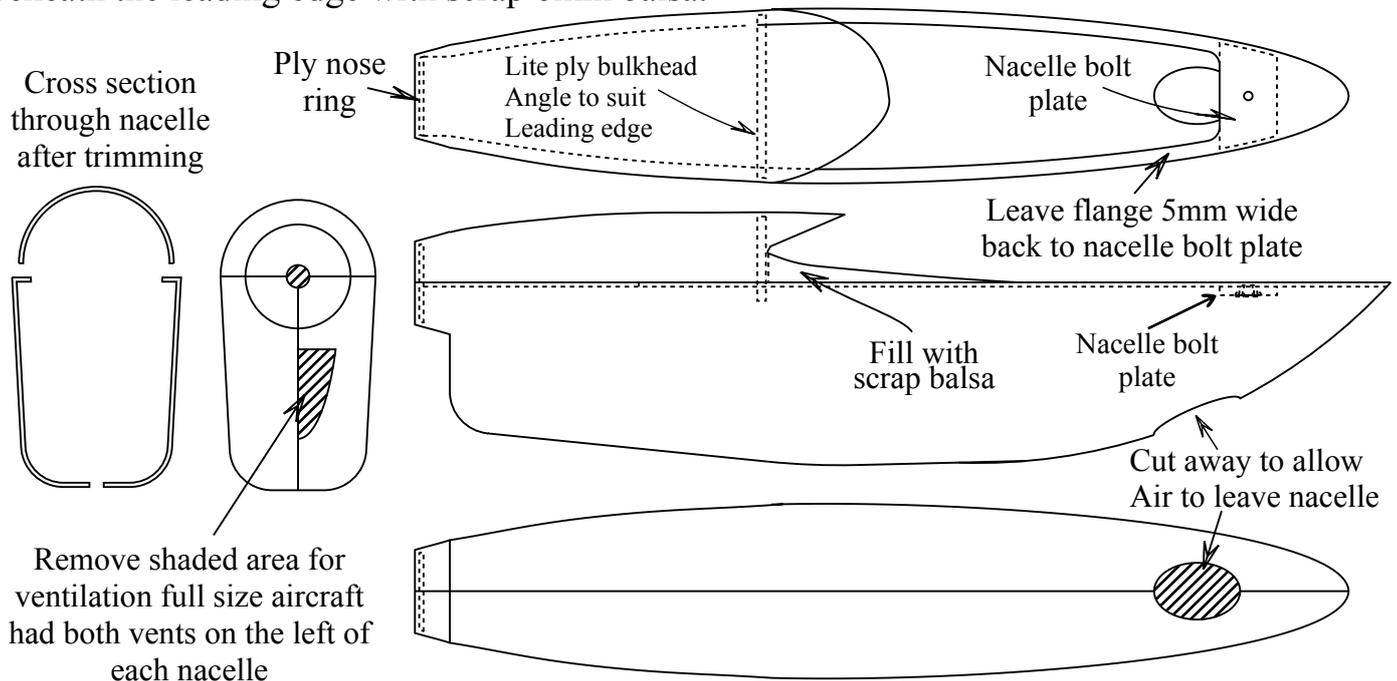
Take a pair of bottom nacelle mouldings and trim their top faces back to about 5mm as shown (keep the scrap), also remove the areas shown to assist motor cooling. Clean up the two inner faces to achieve a neat but joint, use the front ply ring and lite ply former as a guide to width and to keep the front circular. When satisfied cut a number of strips of scrap plastic 5mm wide, glue these strips along the joining inside face of one side of the nacelle so as to form a tab, also glue in position the front ply ring. When dry glue in position the other nacelle side; hold in place with masking tape until dry. Fit and glue in place the nacelle bolt nut plate between the two sides the centre being 35mm from the rear of the nacelle.

The nacelle centre line is 165mm from the root of the wing, the rear of the nacelle is level with the trailing edge of the wing, the top of the nacelle lower mouldings sit flat onto the bottom of the rear section of the wing necessitating an infill below the leading edge.

Drill the front of the nacelle to accept your motor and cut away any of the flange along the top of the nacelle to allow clearance. Make sure you cut away any areas required for ventilation of the motor.

Note it is important that the thrust line of the motor is correct, the motor shaft should be parallel to the centre line of the fuselage and to the top face of the nacelle side mouldings.

Offer up the nacelle to the wing and drill through the nacelle hard point and through the nacelle bolt plate, locate the captive nut. Bolt the nacelle in position. Slide the lite ply bulkhead in place, check the alignment of the nacelle and glue the bulkhead to the nacelle (DO NOT GLUE TO THE WING). When dry drill through the bulkhead for the locating dowel, glue the dowel into the wing leaving about 10mm protruding from the leading edge. Now offer up the top portion of the nacelle and trim the rear part away to fit over the top of the wing, it is best to remove a little at a time to achieve a neat fit, also clean up the lower face to achieve a good fit to the rest of the nacelle, when satisfied glue to the bottom part of the nacelle. When dry fill any imperfections and sand with fine wet and dry. Fill in the gap beneath the leading edge with scrap 6mm balsa.



Finishing

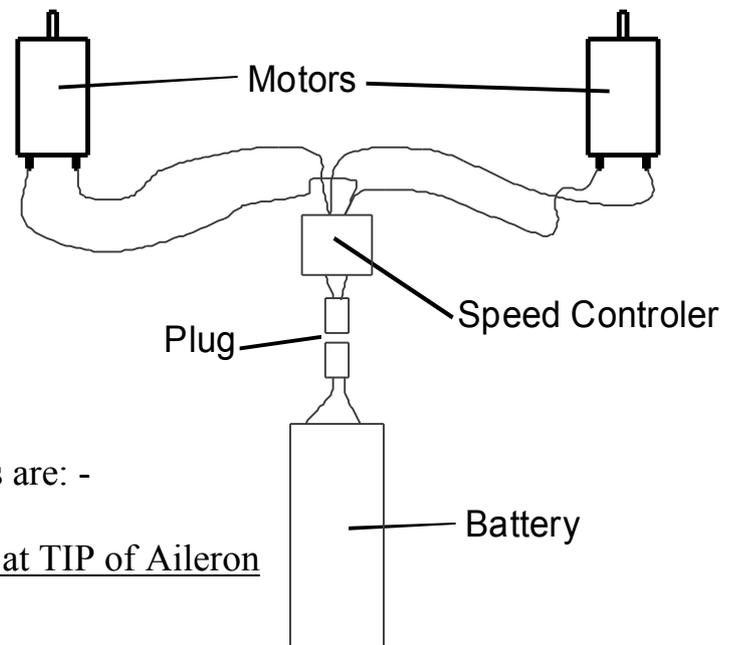
To fit canopy trim out the ends then lay over the top moulding mark the canopy position then trim to fit. Fit out the cockpit if you wish.

As this is not a first time model you will probably have your own preferences when it comes to finishing. The original model was finished in red solarfilm and red solarlac was used on the plastic parts (DO NOT FILM PLASTIC PARTS they distort with heat) the lettering being white stick on transfers and strips of red film can be used for the canopy frame.

The aileron servos fit under the engine nacelles, make up the two servo plates using the parts provided you may have to adjust these slightly to suit your servos. Glue the plates in position on the wing remove any solarfilm etc to make sure you have a good joint. Bend up the pushrods from the two 100mm threaded rods.

Securely fit all the control surface hinges
And fit the elevator horn

Fit your motors and wire up the
Prototype used the layout left always
Disconnect the battery when not in use.
Make sure your speed controller is
Of a suitable rating for the motors
And that the motors are adequately vented.



Finally fit your radio the control movements are: -

Aileron 6mm up and 4mm Down Measured at TIP of Aileron

Elevator 6mm up and 6mm Down

Check your centre of gravity the model should balance 90mm back from former 2. If necessary ballast the model to suit. The prototype weighed in at 49 ozs.

Flying

Check control movements are correct and their sense is correct. Check the centre of gravity. Make sure your motors are run and checked for direction and the battery is charged. If possible choose a day with a light breeze for the test flight. It is preferable to have an assistant for the first flight. Switch on the radio start the motors launch the model slightly nose down into wind and allow it to climb out gently. Keep the speed up this is not a model to be hung on its propellers treat it with respect until you have some height and can explore its capabilities. When you have some height try a few turns throttle back and explore the glide and the stall. On early flights keep to a reasonable speed and make your approach to landing straight in until you are confident. We have found the Comet to be quiet aerobatic and very pleasing to the eye, we hope you have as much enjoyment out of the Comet as we have.

Grosvenor House is painted entirely red with white markings except for the number 34 on the fin which is black on a white background. The spinners are silver grey. The canopy frame is red.

