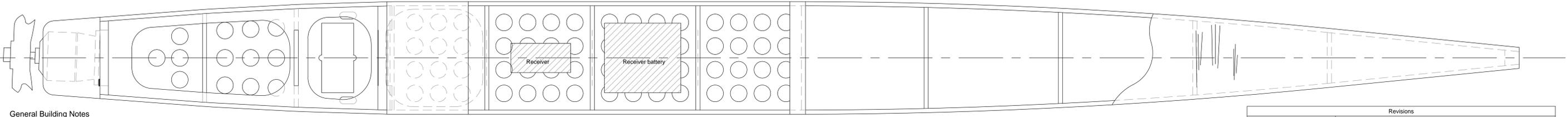


Fuselage plan view



General Building Notes

Where grain is not specified, the builder can assume the grain runs lengthwise (eg, rib grain runs fore-aft; spars run tip to tip)

Check parts before assembly, for close fitment. Parts with cracks or material defects are to be discarded.

Adjust/sand parts to reduce jointing gap. Large gaps are not acceptable - gaps filled with glue, or large glue fills add considerable weight, for no strength gain.

Aliphatic resin wood glue is to be used throughout. Allow at least 3 hours drying time between building stages, assuming room temperature conditions.

Avoid use of cyanoacrylate glues, as they change the physical properties of the wood, making it brittle.

Epoxy resin wood glue to be used in high-stress joints, or those involving metal or plastic. Front former F1 and undercarriage are key areas.

All assemblies are to be built on a large, flat building board. Joints are assumed to be parallel, unless stated otherwise on the drawing.

Equipment installation

The Rules state that "Contestants must ensure that servos and linkages are capable of handling the anticipated air load". 9 gram metal gear servos have been selected. It is important that the builder adheres to this specification. The servos specified have a stall torque of 2.2kg, which is more than enough considering the size and flying speed of the model. In flight testing of the prototype indicated that plastic gear servos were not sufficient to withstand hard landings, let alone crashes, and therefore should not be used.

The servo mountings have been designed to exceed the required strength, and the builder should adhere to the design.

Commercially available plastic pushrods are to be used (the "snake" variety). Horns, clevises and solder extenders are to be used, as shown on the wing plan.

All leads are to be routed away from moving objects, and must be contained fully within the airframe. Servo leads and antennae / aerials should be kept clear from current carrying wires (e.g the flight battery). New wire connections are to be crimped and soldered, followed by a "pull test". "Ify joints are to be re-peeled".

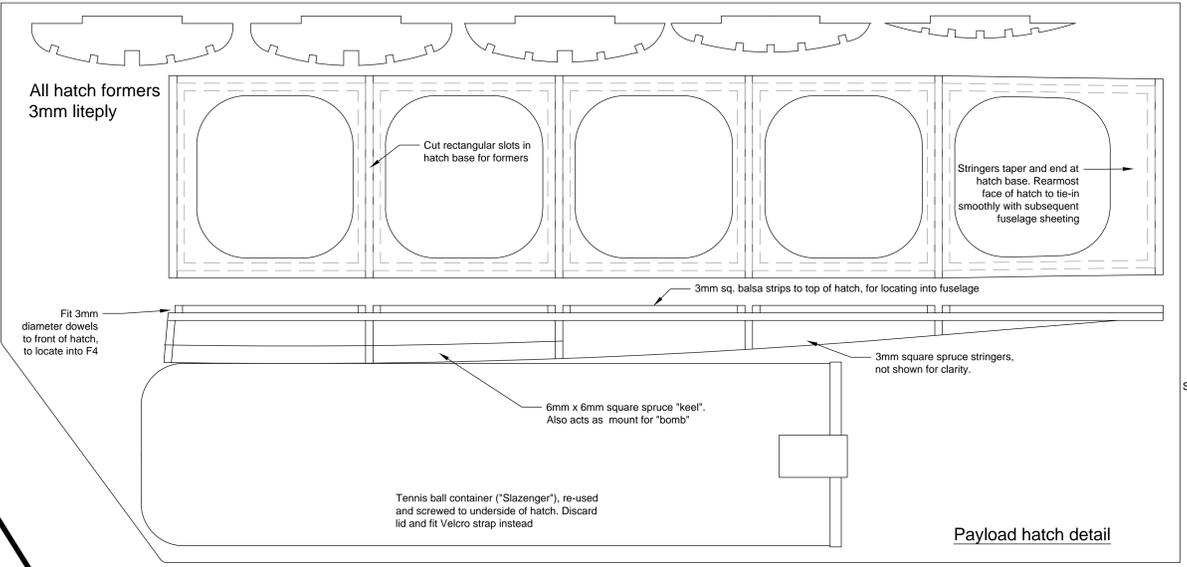
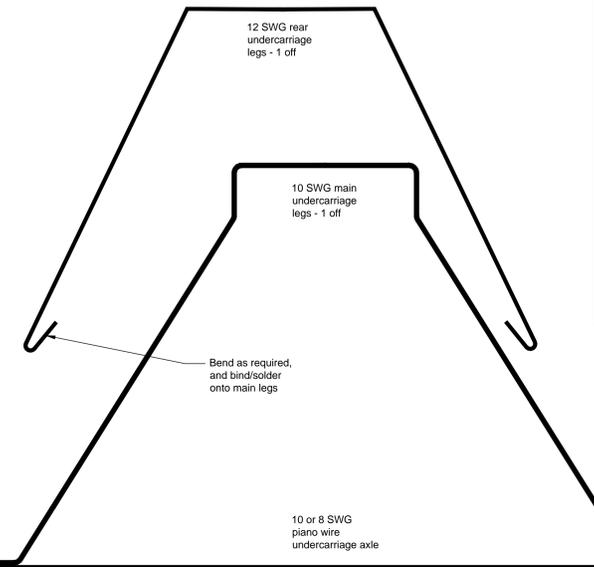
The builder is to confirm that all equipment is capable of carrying the proposed current, and is to allow a sensible margin of error.

The BEC circuit in the speed controller is to be disabled (by removing the red wire of the receiver plug) and the receiver is to be powered by its own battery, via an isolation switch. Mount this switch directly underneath the wing, to avoid accidentally turning off the radio.

The speed controller, flight battery and motor need adequate cooling. At no point should the motor be run for long periods without it's prop. Do not use foam to retain these items.

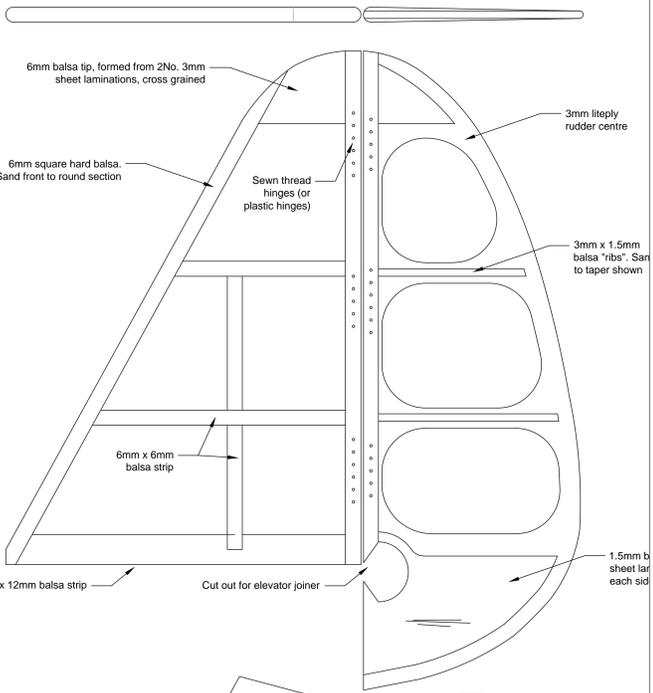
The lipo battery should be retained securely using a Velcro strap, and should be mounted to allow quick removal after a crash / hard landing. If the lipo battery puffs up or gives out excessive heat, remove from model immediately.

All extension leads are to be fitted with a second method of retention, with clips. Long leads, or those carrying large currents, are to be fitted with ferrite rings.



Revisions	
Version	Changes Made
Prototype	Full length ailerons removed and replaced with tip ailerons. Flaperon mix disabled. Tail seat added. Downthrust increased. Wing inclination reduced.
Prototype 2 - Not finished (only reached initial building stage)	Changes from prototype, plus Fuselage Widened; Extra former added (for payload containers); Servos relocated; fuselage sides lightened; battery hatch introduced; tail surfaces increased
Final	Some fuselage lightening holes removed (structure was too weak). F4 Set at an angle (for more payload space); rear sheeting added; undercarriage wire size increased; Hatch added, with external payload container; wing dihedral increased; cowling added to motor and speed controller; battery hatch refined; tailwheel added

Refer to tail building instructions



Fuselage building instructions

Place the first fuselage side flat on a building board and glue formers F4-F8, RX1-RX4 and BB5 in place. Glue second fuselage side on top, and use pins and weights to secure whilst the glue dries. Use set squares to ensure all formers are parallel.

Once dry, remove from board and bring together the 2 rear sections of the side. Glue a strip of 10mm balsa in between, and hold with clamps. Look down the length of the fuselage, and check both fuselage sides have bent by the same amount, and that they meet in the centerline of the fuselage. Using the plan view will help to get the fuselage joined exactly.

Add the remaining rear formers (F9 onwards), and check alignment again.

Glue the front formers in place, checking the fuselage on the plan view. Use epoxy on F1.

Sheet the top section of fuselage rear with 1.5mm balsa, with the grain cross-wise.

Fit control snake outers and check for smooth movement with the inner snakes. Tight radii must be avoided.

Sheet the lower rear section of the fuselage, leaving the section between

F9 and F8 clear (this is the rearmost payload compartment)

Glue the tailseat and rear undercarriage support in place. Also glue the 6mm sq spruce strip which supports the rear legs of the main undercarriage.

For the payload hatch, glue the formers onto the base, and allow to dry. Attach the stringers and 6mm spruce keel.

Make the battery access hatch from soft balsa sheet, and fit 3mm square balsa strip to act as guide.

Glue magnets to hatch and fuselage with epoxy resin, and fit cocktail stick retaining pins to front of hatch.

Bend the undercarriage from piano wire, and solder together. Bind the rear section to the fuselage and glue. The main legs are glued in place, sandwiched between a rectangle of 3mm birch ply. Hold with clamps.

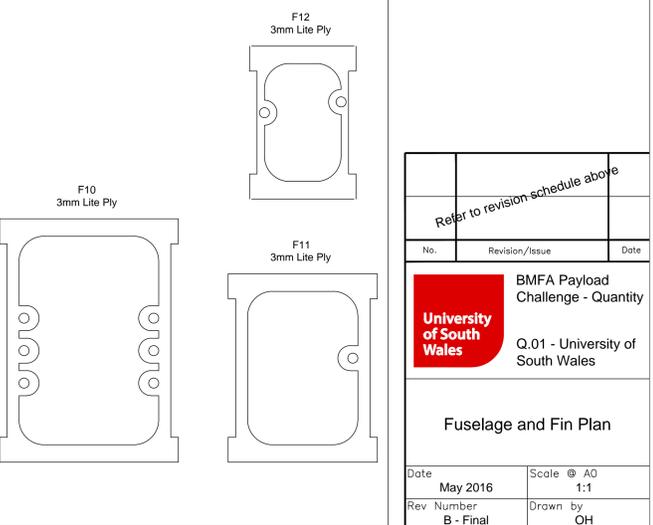
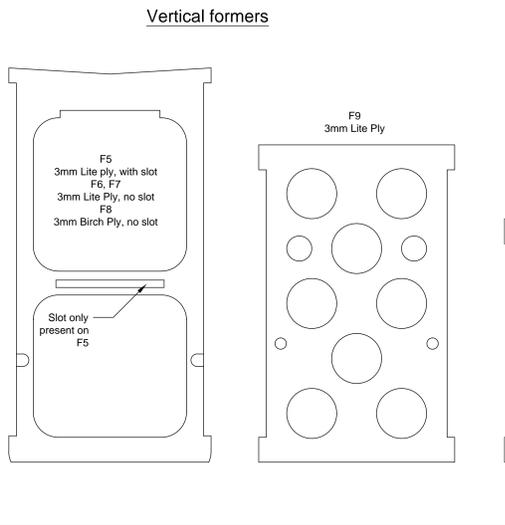
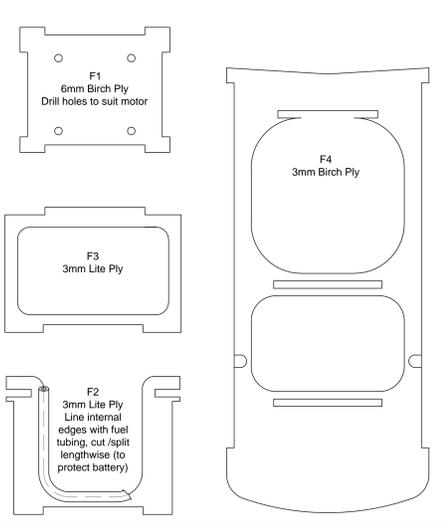
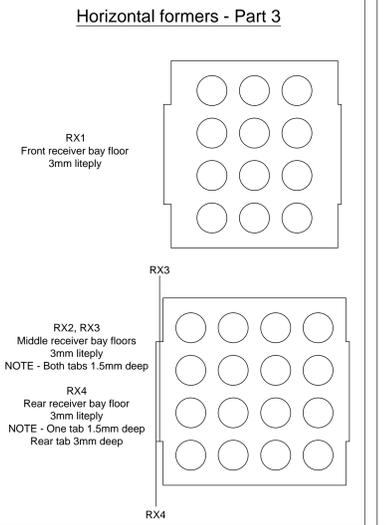
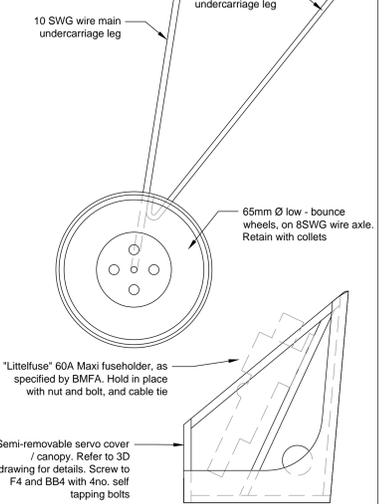
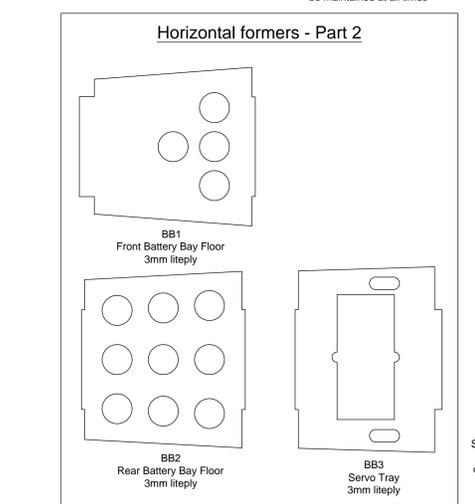
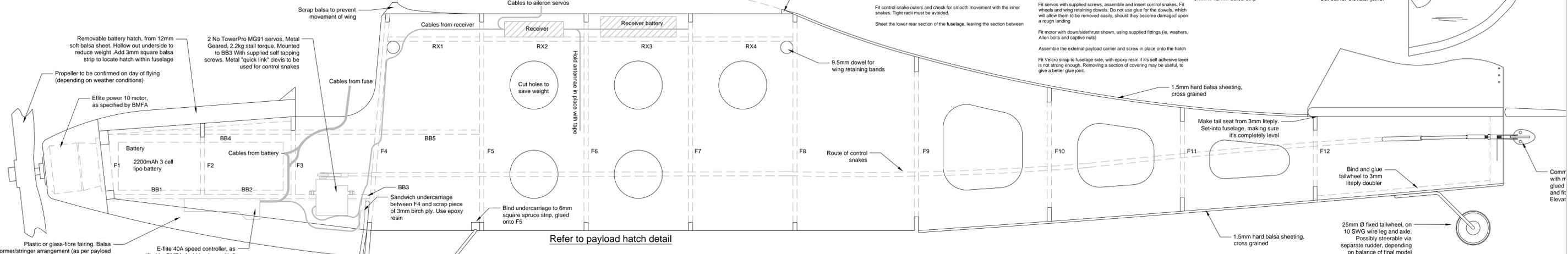
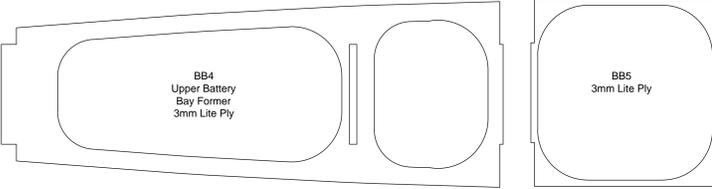
Apply dope to the whole fuselage (3 coats, thinned 50/50 with cellulose thinner) and cover with heat-shrinking plastic film covering, as per the manufacturers instructions.

Fit servos with supplied screws, assemble and insert control snakes. Fit wheels and wing retaining dowels. Do not use glue for the dowels, which will allow them to be removed easily, should they become damaged upon a rough landing.

Fit motor with downthrust shown, using supplied fittings (ie, washers, Allen bolts and captive nuts).

Assemble the external payload carrier and screw in place onto the hatch.

Fit Velcro strap to fuselage side, with epoxy resin if it's self adhesive layer is not strong enough. Removing a section of covering may be useful, to give a better glue joint.



Refer to revision schedule above		
No.	Revision/Issue	Date
BMFA Payload Challenge - Quantity Q.01 - University of South Wales		
Fuselage and Fin Plan		
Date	Scale	© A0
May 2016	1:1	
Rev Number	Drawn by	
B - Final	OH	