SE5 (modified) foam board model design by **Alistair Potter** ©2016

NOTE: design is for 5mm foam board. For other foam boards adjust slots,tabs etc. when cutting. Layout is for A1 sheet size. All dimensions in mm.

If you use these plans, please consider donating a payment to the author.

Payments through PAYPAL to; alipotter@blueyonder.co.uk

Wingspan - 940mm / 37 inches
Length (excluding prop) - 740mm / 29 inches
AUW - 1120grams / 39.5 0zs with 2200mah LiPo
(Imperial sizes are approximate.)

An 11 inch prop is close to scale, though choice of prop will depend on your motor's rotation speed (Kv). The aeroplane shown is flying with an Emax CF2215 1200kv 270W motor with a 9 x 3.8 prop. This setup gives flying time of about 12-14 minutes with my 3S 1500mah battery.

The foam board used in my build is one of the heavier types. On the plus side, a little more weight keeps the plane steadier in the wind, and even at this weight the plane can still fly quite slowly. Built in lighter material, like Dollar Tree foam board, the plane should weigh much less. This will reduce flying speed for an even more scale appearance in the air.

Because of the nose length, this model should not need nose ballast weight. A little additional weight can also be saved by using a modified (shorter) Flite Test power pod - using a shorter pod will also allow a more finished nose, as the pod can be removed by 'un-plugging' it from the front panel.

Dihedral is very pronounced, but is correct for the plane's original specifications. I will note that during my test build I 'lost' some of the dihedral because my initial spar design was too flexible at the turns. To prevent this I have since modified the design. There are actually historical notes about some squadrons reducing the dihedral for greater manouverability - so the version shown in the photograph is still within 'spec' for the plane.

There are a few modifications from my original model design. The first is a reduction in the height of the forward turtle deck. This detail was always a feature of the plane, though is often omitted from model designs. The plane's machine guns projected from the slightly elevated portion in front of the cockpit. Next, I tapered the underside of the fuselage towards the nose. Together, these give the plane a more aggressive and purposeful look. A hidden advantage is less prop noise from pushing air onto the blunt nose. Strangely, this more tapered fuselage is correct for the **earliest** models, which used a smaller engine. Later models had a much bigger radiator block and engine housing.

I've also simplified the method for attaching the cabane structure to the box fuselage deck. Look out for a 'how to' article on the Flite Test website and on my own website mentioned below.

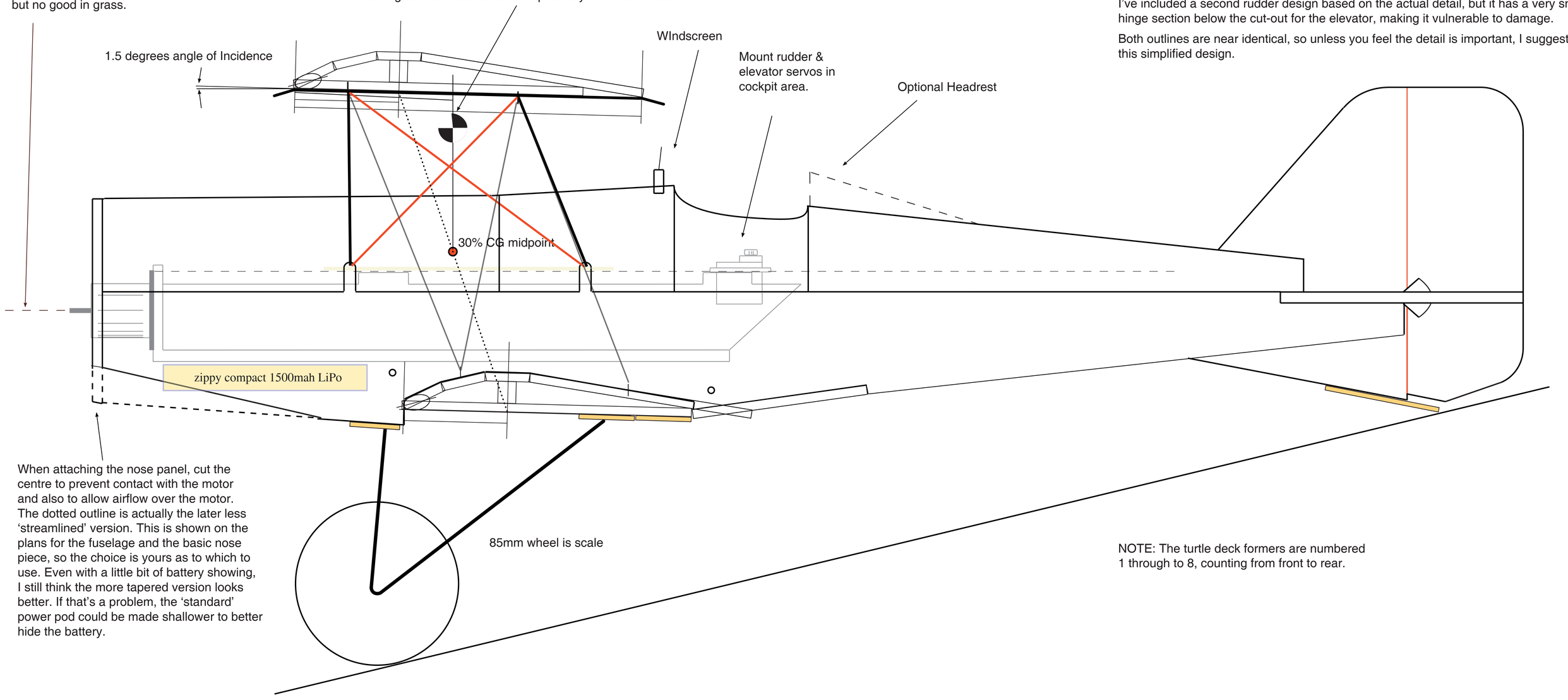
A scale wheel is 85mm. If you want the period wheel look, fill-in any spokes using foam board - see my technique on the Flite Test website: "Olde-Style Wheels for Olde-Style planes".

I've provided a little panel to help finish the nose, but you may wish to add more detail. In the photograph you'll see I carved a radiator from polystyrene block. It's coated with dilute PVA glue to strengthen it and to allow painting or varnishing without it 'melting'. You can see all these detail elements and build tips in the in the build article that appears on my website; alipotter.co.uk/RCplanes.htm

Ailerons are on one wing only so the roll rate is graceful rather than snappy, but the plane will roll, and fly inverted at higher revs. For very slow speed turns you'll need to use the rudder and keep the wings flatter or it'll lose height quite quickly. At higher speeds it flies bank-and-yank, though a little rudder always helps. The plane requires very little rudder and elevator input to achieve control. I used the throw gauge from the "FT Cruiser" plans, but later reduced the rudder and elevator throws by about a third of their motion. Aileron throws were fine.

Propshaft height with a standard Flite Test power pod is correct for a 'low propshaft' version of the SE5a. Include a few degrees of down and side thrust. A 'correct scale' 11 inch prop will be very close to the ground; fine for tarmac or dirt, but no good in grass.

The 'calculated' 30% CG is 82mm from the top wing leading edge. However, I find a CG of 78mm works well. I needed to add 40 grams of self-adhesive car wheel balancing weights at the nose, but lighter foam board builders probably won't need this.



This is a simplified tail design with a larger hinge to make it more robust.

I've included a second rudder design based on the actual detail, but it has a very small hinge section below the cut-out for the elevator, making it vulnerable to damage.

Both outlines are near identical, so unless you feel the detail is important, I suggest using this simplified design.

NOTE: The turtle deck formers are numbered 1 through to 8, counting from front to rear.

lower wing spar

upper wing spar

wing spacers

top wing - L

interplane strut mount points

6

4

lower wing - L

interplane strut mount points

1

8 8

7

2

wing centering plate

B-type fold

5

3

4 off - top wing centring pads

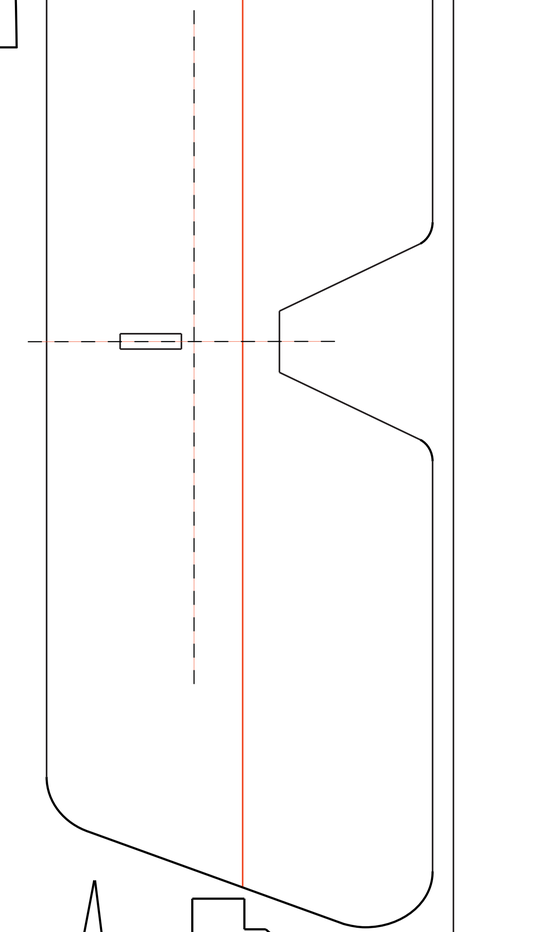
interplane strut mount points

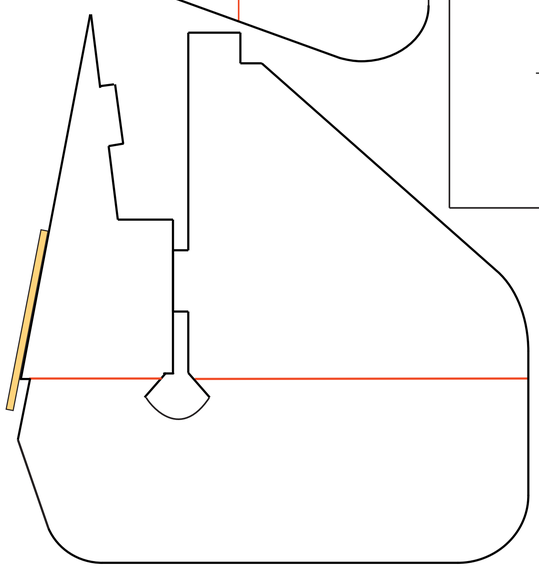
lower wing - R - at centre on this side

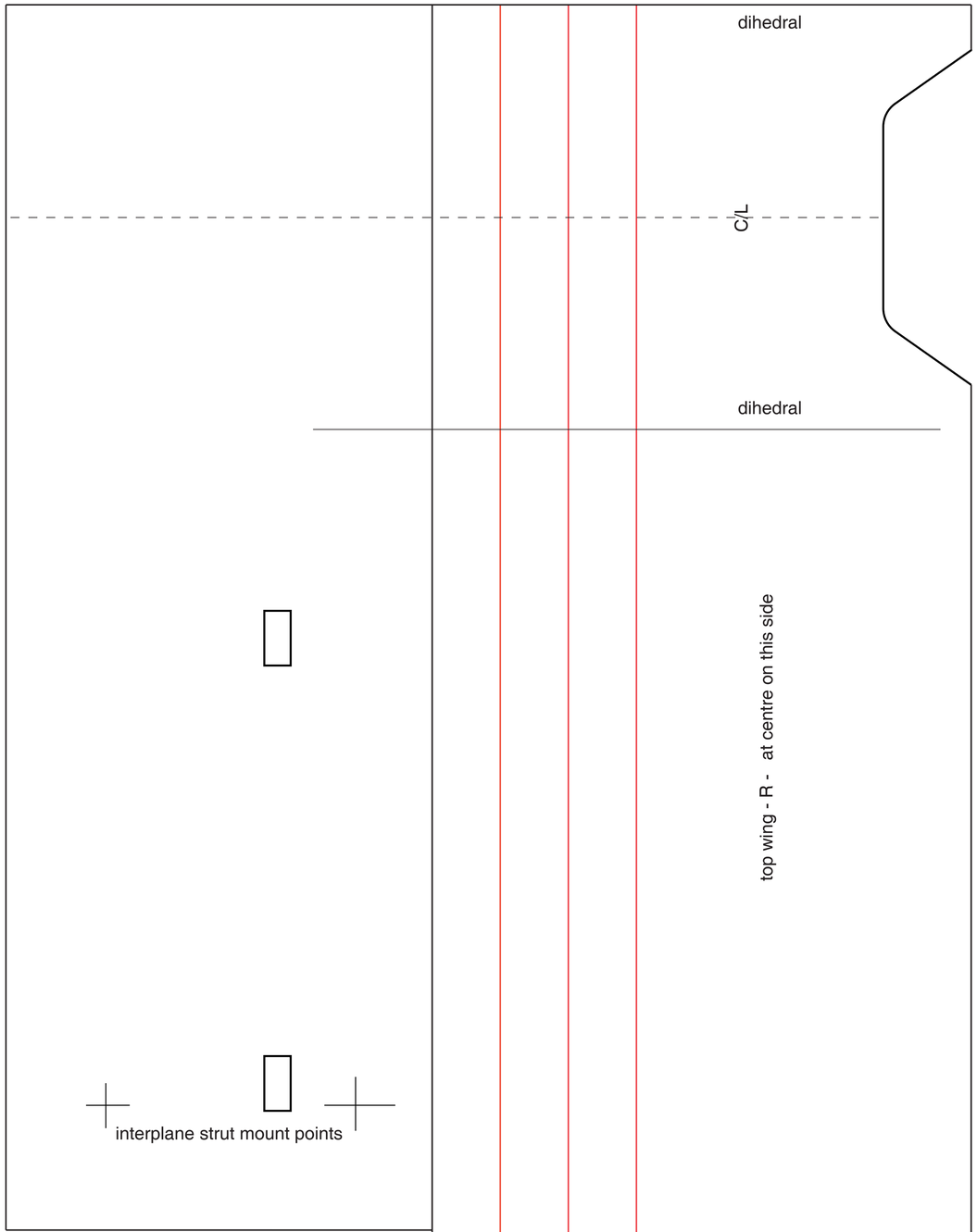
dihedral

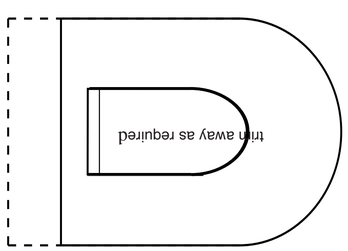
C/L

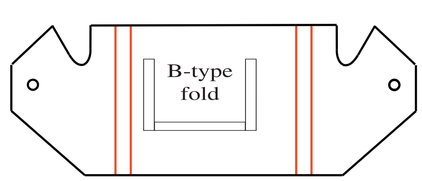
dihedral











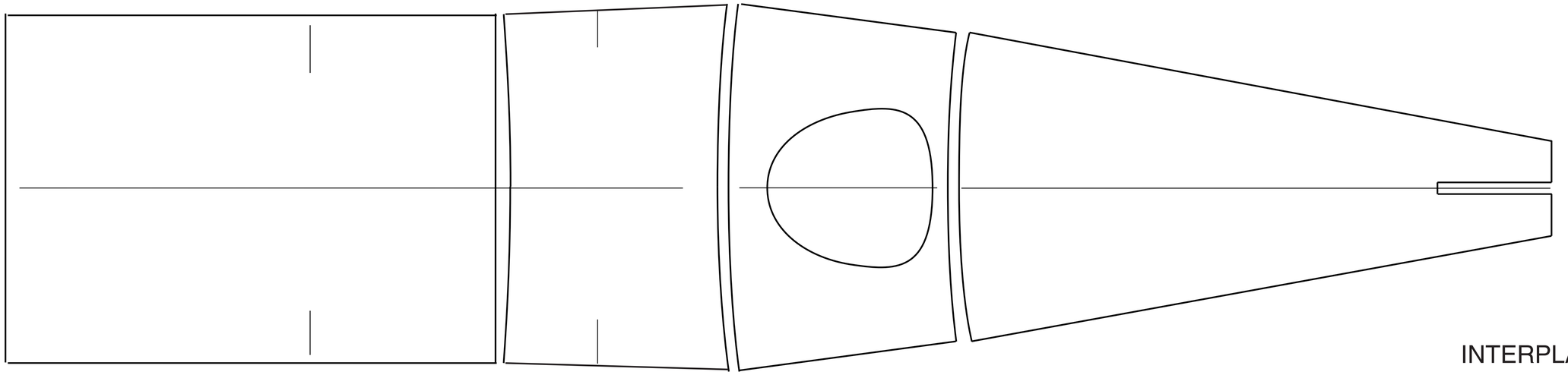
spar centre

spar centre

upper wing spar extension

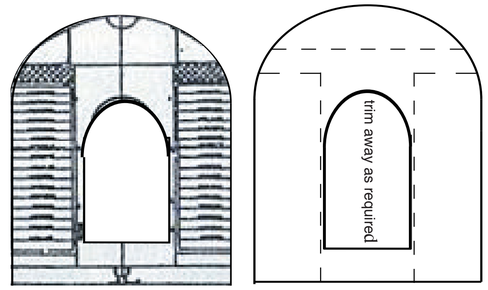
lower wing spar extension

TURTLEDECKS



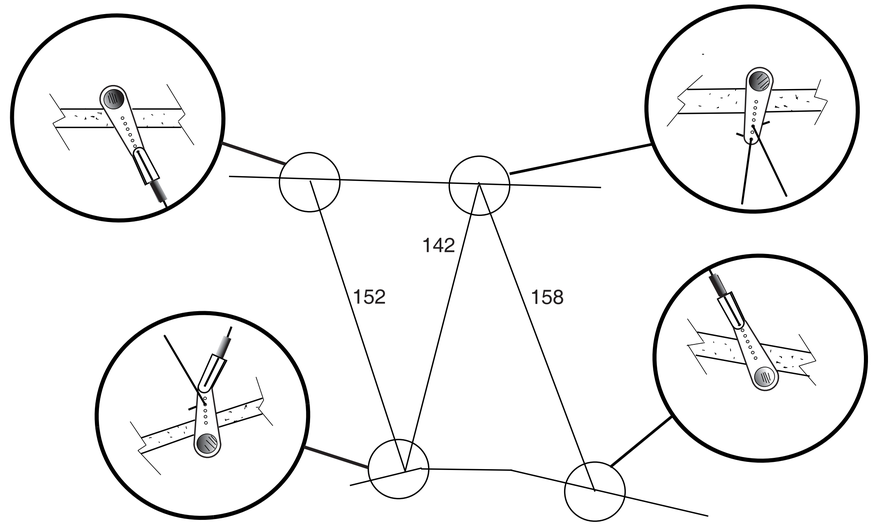
cut around cabane wires

NOSE PANEL



INTERPLANE STRUTS

Use a combination of single swing-in keeper and modified z-bend here.



These wires maintain the wing spacing, but will also share load between the wings. Fitting three wires gives triangulation, which stabilises the wing geometry. Just fitting the two outer ‘interplane struts’ creates a ‘folding box’, which will allow the wings to shift, spreading and pinching under different loadings. Including a third wire is in-keeping with ‘real life’ as the real design would have a pair of crossed rigging wires to stiffen the skewed frame.

You might choose to disguise the ‘third’ strut by ‘bulking-up’ the outer wires by folding PVC tape over them to create the impression of timber struts, and you might also add the fourth ‘crossing’ rigging element by using thin string, fishing gut or thick thread. Another piano-wire element could be fitted, but the angling and positioning of the swing-in keepers would make it a fiddly job, and is really not needed.

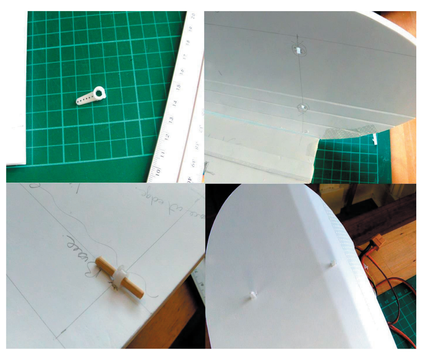
Use fine piano wire, around 1 - 1.3 mm, for the struts. Use spare servo arms with a short length of BBQ skewer through the mounting hole as embedded attachment points.

On the bottom wing tilt both attachment points towards the centre of the wing.

On the top wing tilt only the front attachment point towards the centre of the wing.

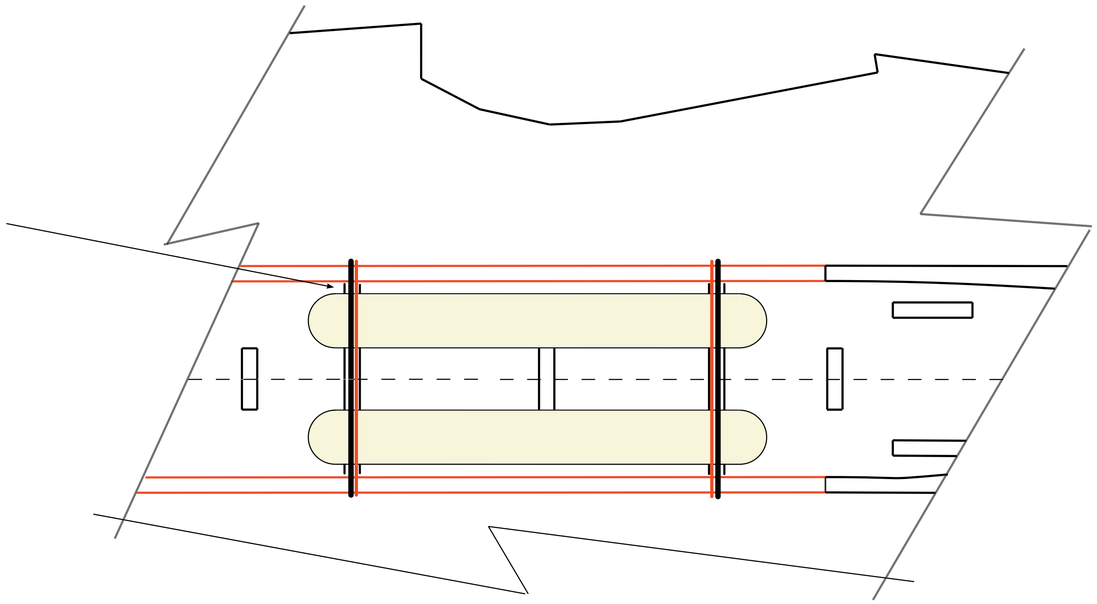
Sizes shown are very approximate and will depend on the fittings in the wings. Just the same as fitting control rods, you have to make them up to size. Make them in pairs left and right, starting with the two centre pieces to establish the overall geometry.

Do not make them a tight fit. This will distort the wings, flattening the dihedral on the top wing and increasing the dihedral on the bottom wing

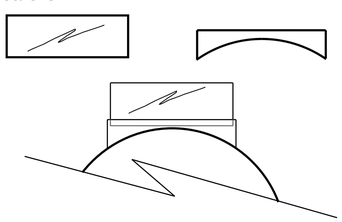


For ease of assembly/dissasembly, use a modified z-bend at one end and a right-angle bend and a small swing-in keeper at the other end. See the build article for more detail.

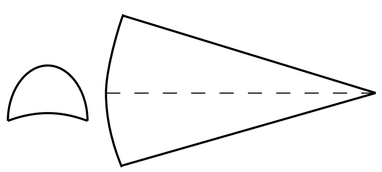
Before gluing down the tongue depressors make sure there is a big enough gap here for the cable ties to pass around the skewer sitting under the box fuselage deck.



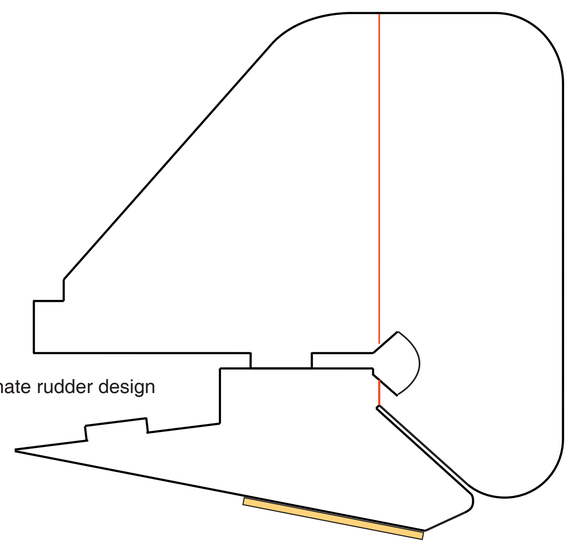
WIndscreen - 14 x 40 clear plastic set edge-on in slit along the top of the shaped foam board mount. Use foam safe CA



Optional Headrest - use ‘cereal packet’ card and butt-join with CA - or carve from block foam. However, headrests were often removed to improve visibility.

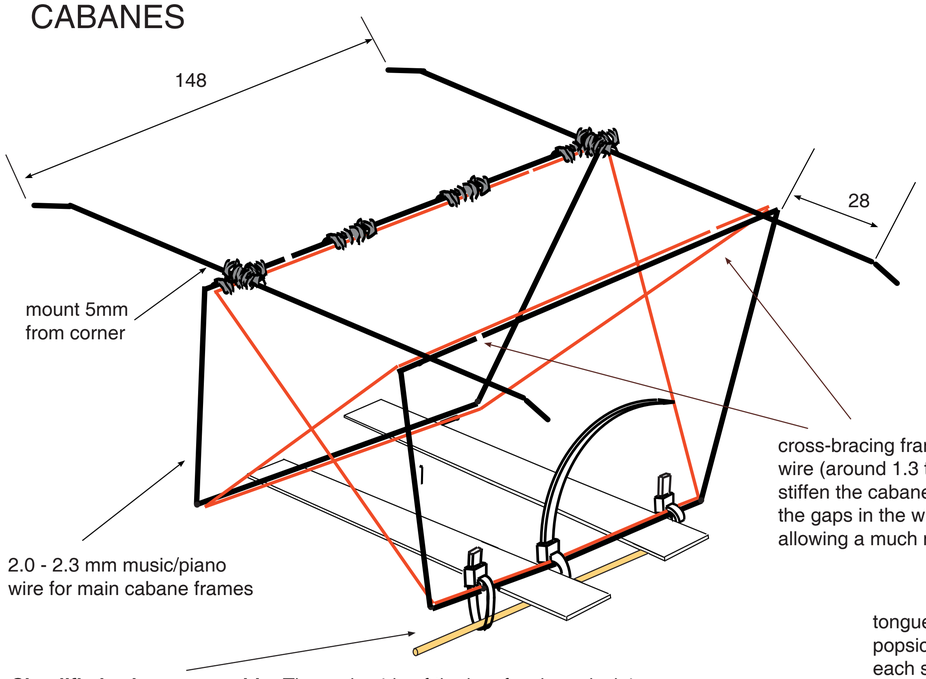


spar assembly

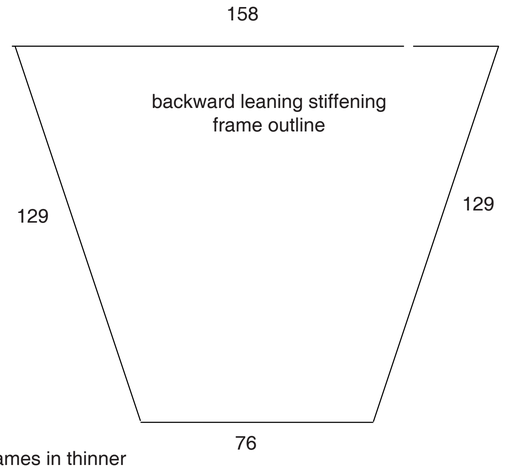


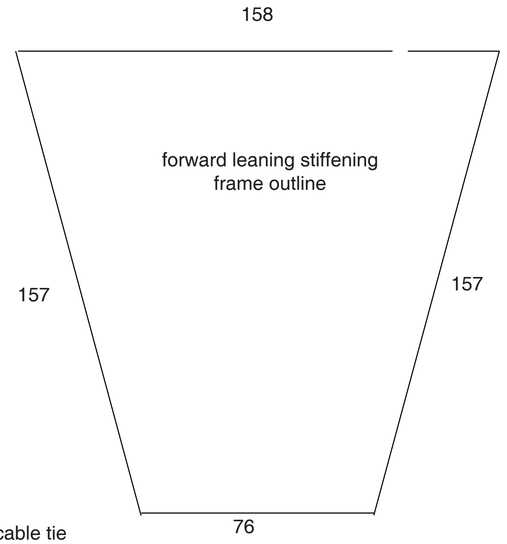
alternate rudder design

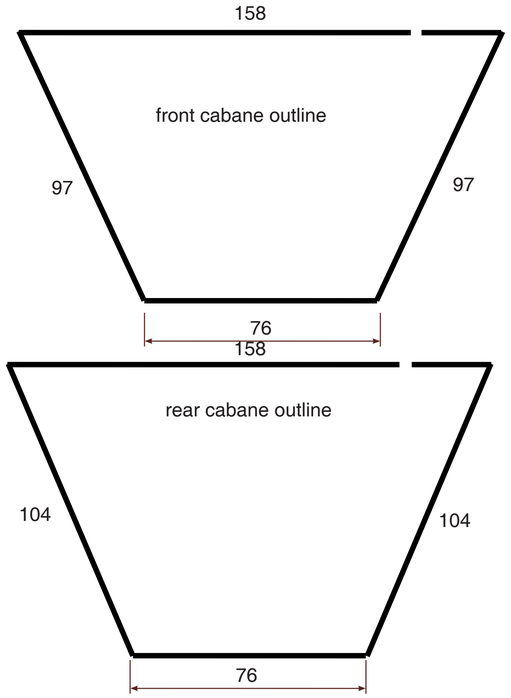
CABANES

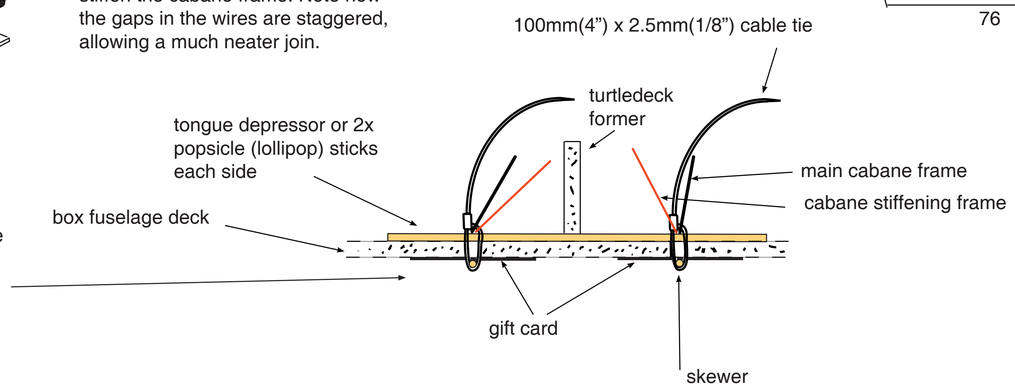


cross-bracing frames in thinner wire (around 1.3 to 1.5mm) to stiffen the cabane frame. Note how the gaps in the wires are staggered, allowing a much neater join.



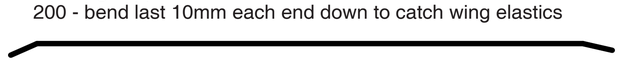




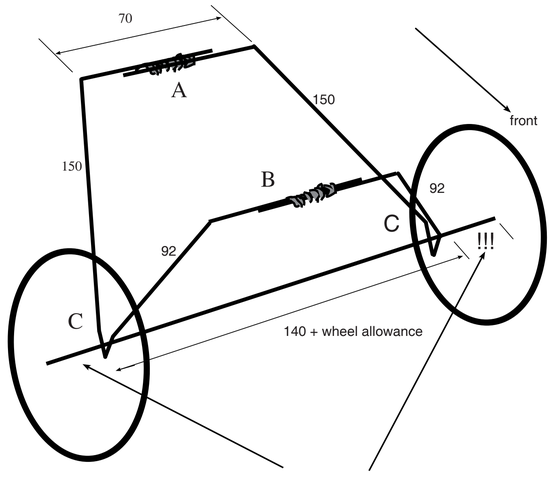


Simplified cabane assembly; The underside of the box fuselage deck is reinforced with a fitted panel of ‘gift card’ material. The top is reinforced with tongue depressors or popsicle sticks. Holes are cut in the gift card to allow cable ties (zip ties) to pass around a skewer that is pushed through the fuselage sides just beneath the cabane frame. The cabane frame is then pinched-down and held firm by the cable ties. The skewer ends are cut off flush with the fuselage sides, and will be hidden by the turtle deck covering.

top wing support rails x2
200 - bend last 10mm each end down to catch wing elastics

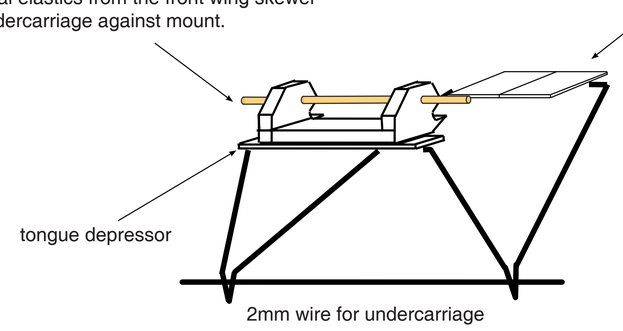


UNDERCARRIAGE



The U/C Mount rests on the fuselage sides and also locates in the wing leading edge - held in place by wing elastic skewer.
Individual elastics from the front wing skewer hold undercarriage against mount.

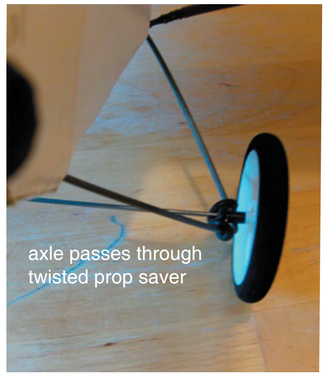
Simply loop the wing elastic around the undercarriage wire. Protect underside of wing with popsicle stick to spread load.

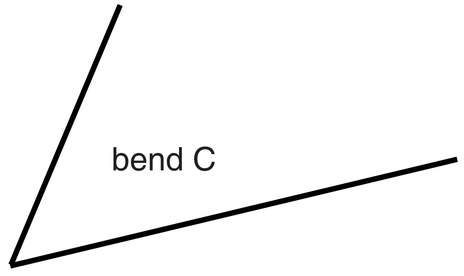


Depending on width of wheel used, allow extra at each end of axle for wheel width and collet/glue blob to attach wheel. 85mm wheel is scale.

Kink the last 15mm of the undercarriage wire at the sharp bottom corner to make it vertical and stop the ‘pointy bit’ catching in any wheel spokes.

The frame can be assembled from two ‘sides’ as shown, or if you have a long-enough wire, from a single piece with only one join. You’ll need about 700mm in length for this.





undercarriage
bending guides