SE5 foam board model design by **Alistair Potter** ©2015

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 me flight times of about 13-14 minutes with my 3S 2200mah 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 flying 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 improve flight times and reduce flight speed for an even more scale appearance in the air.

Ailerons are on one wing only, which works well. 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.

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 is plenty of battery space beneath the power pod, but if you wanted an even better look to the plane you might fill-in the space beneath the nose with a hinged or removeable panel. For fatter batteries you'd need to modify the power pod by reducing its depth. It would also be possible to create a removeable turtle deck nose section and mount the battery above the power pod. To further enhance the appearance you might also consider a filler 'wedge' glued to the underside of the lower wing to get rid of the gap under the wing.

A scale wheel is 85mm. My wheel's spokes are filled-in using foam board - see my technique on the Flite Test website: "Olde-Style Wheels for Olde-Style planes".

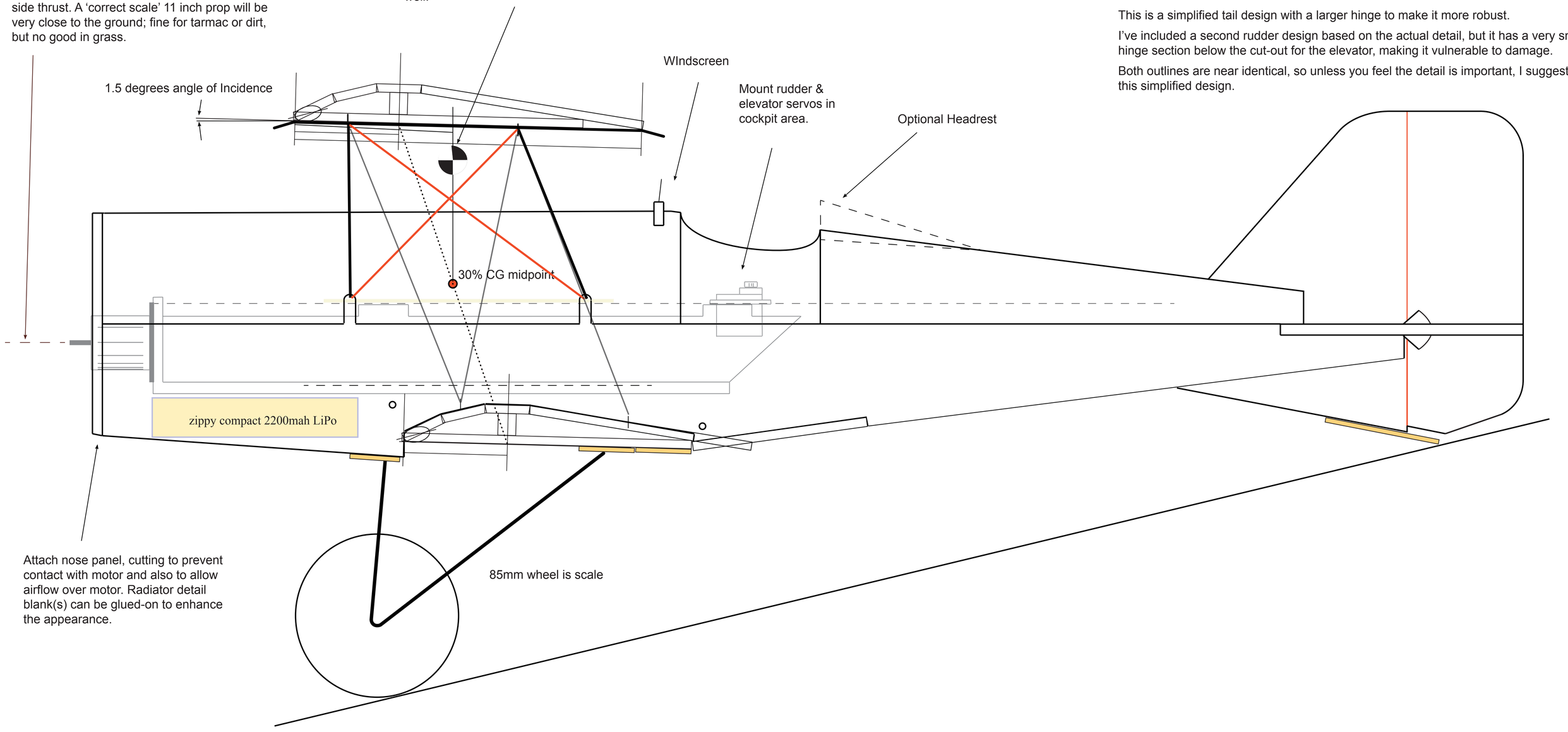
I've provided a flat panel and some detail components to help finish the nose but you may wish to add more detail. In the photograph you'll see I've carved a radiator from polystyrene block, which is then coated it with dilute PVA glue to strengthen it and allow painting or varnishing without it 'melting'.

The plane requires very little rudder and elevator input to achieve control - I initially set all the throws using the throw gauge from the FT Cruiser plans. I later reduced the throws on the rudder and elevator by about a third of their motion as they were a bit aggressive for scale-type flying.

Later models of this plane had a different nose profile. A slight slope down from the cockpit, for about the first third, which partially enclosed a machine gun, followed by a shallower slope to the nose. This reduced the height of the nose and gave the turtle deck a slightly squarer section as it approached the nose. This could be achieved by reprofiling the forward turtle deck formers, and making the nose covering up from two pieces instead of one..

Propshaft height with a standard Flite Test power pod is correct for a 'low propshaft' version of the SE5a. Include about 3 degrees 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.



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.

interplane strut mount points

interplane strut mount points

lower wing - L

top wing - L

wing spacers

lower wing spar

upper wing spar

wing centering plate

B-type fold

4 off - top wing centring pads

interplane strut mount points

lower wing - R - flat centre on this side

dihedral

C/L

dihedral

dihedral

C/L

top wing - R - flat centre on this side

interplane strut mount points

trim away as required

B-type fold

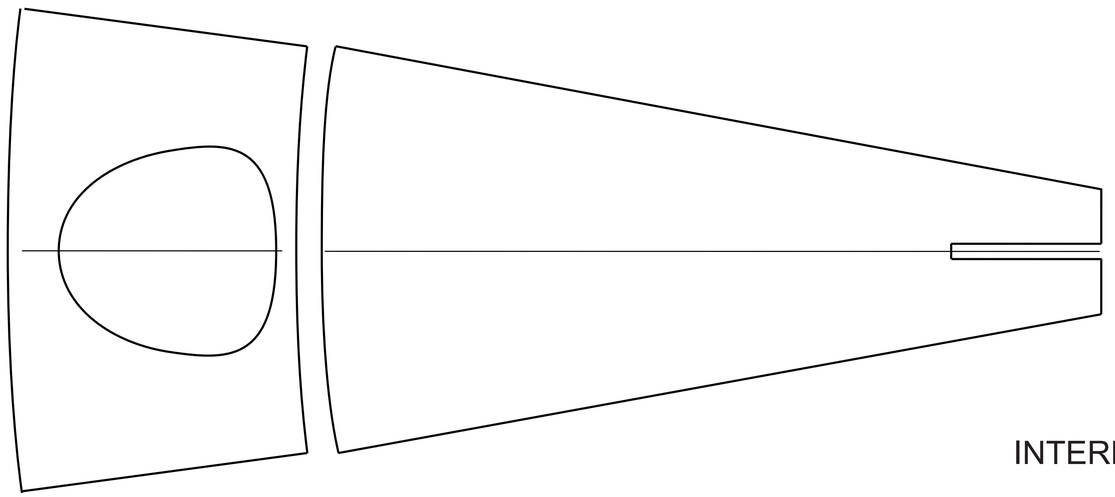
spar centre

spar centre

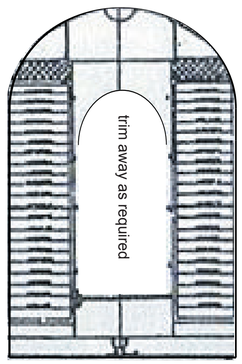
upper wing spar extension

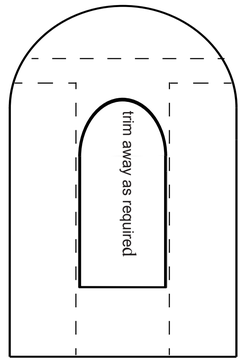
lower wing spar extension

TURTLEDECKS



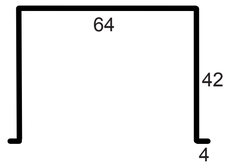
NOSE PANEL





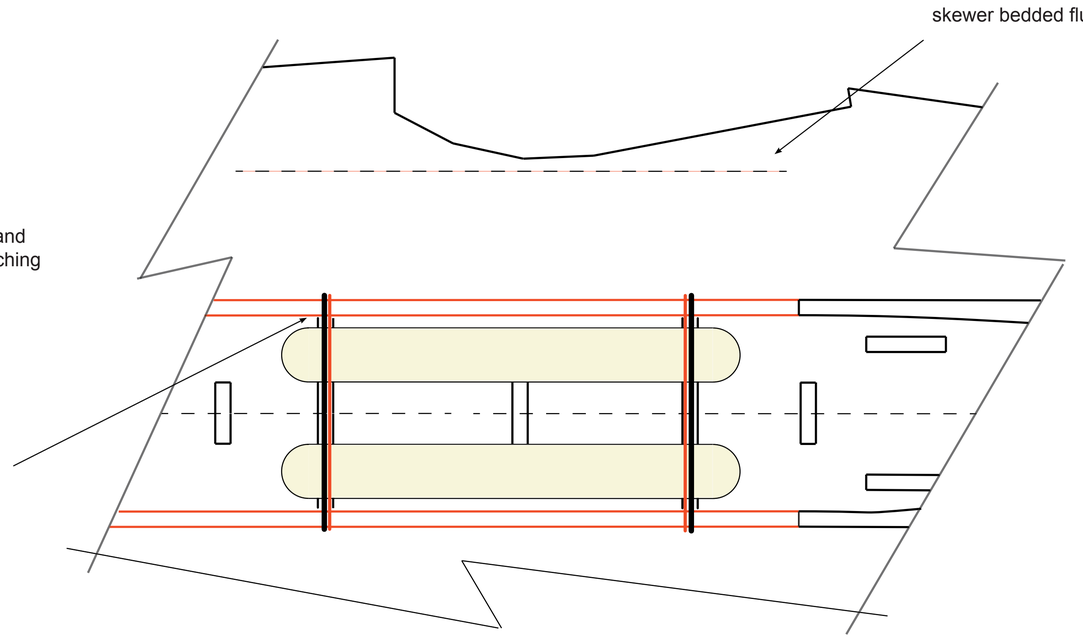
cut around cabane wires

CABANE MOUNTS



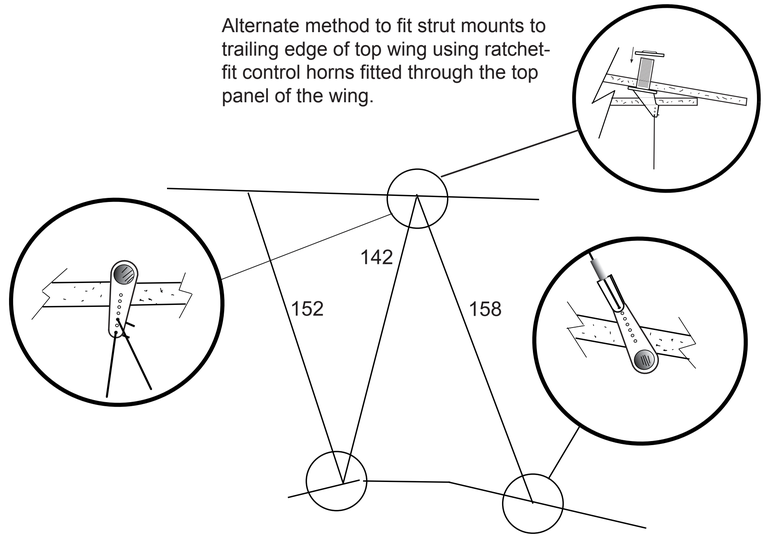
cabane mount x2
(sizes given for guidance, but fit to fuselage width and skewer position - bring top bar close-to but not touching the underside of the tongue depressors.)

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



INTERPLANE STRUTS

Alternate method to fit strut mounts to trailing edge of top wing using ratchet-fit control horns fitted through the top panel of the wing.



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.

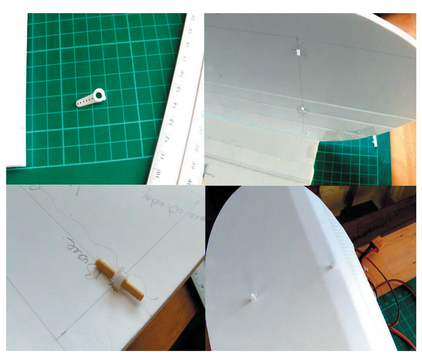
Use fine piano wire, around 1 - 1.3 mm, for the struts. Use spare servo arms with a short length of BBQ skewer through the mounting hole as embedded attachment points.

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.

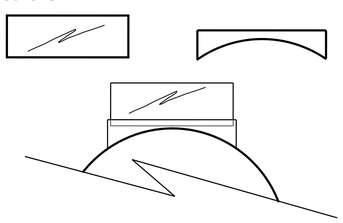
Sizes shown are very approximate and will depend on the fittings in the wings. Just the same as fitting control rods, you have to make them up to size. Make them in pairs left and right, starting with the two centre pieces to establish the overall geometry.

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

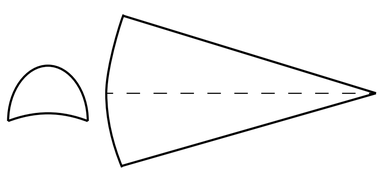


For ease of assembly/dissasembly, use a modified z-bend at one end and a right-angle bend and a small swing-in keeper at the other end.

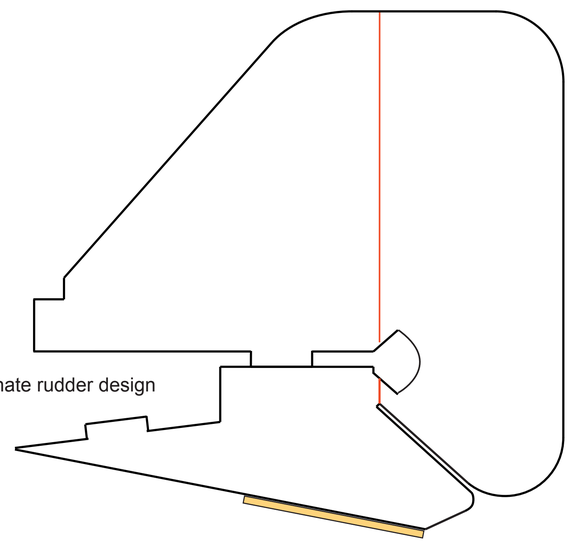
WIndscreen - 14 x 40 clear plastic set edge-on in slit along the top of the shaped foam board mount. Use foam safe CA



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

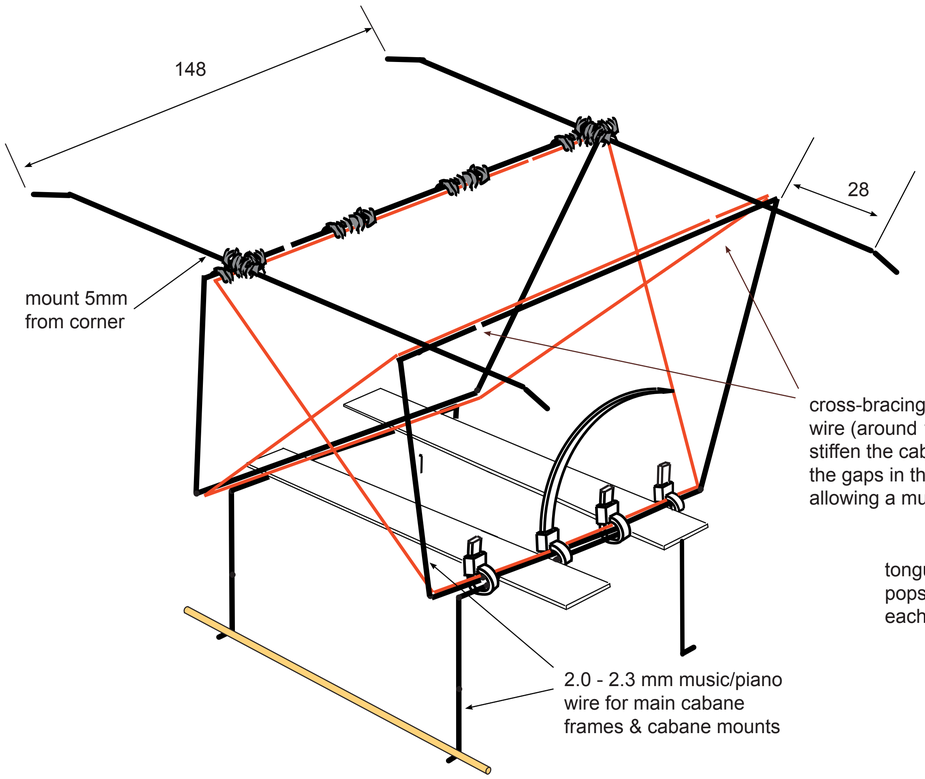


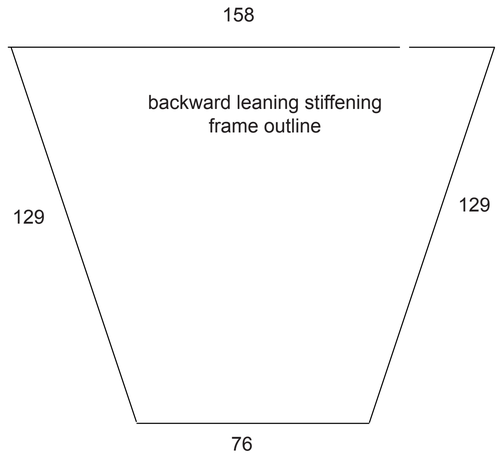
spar assembly

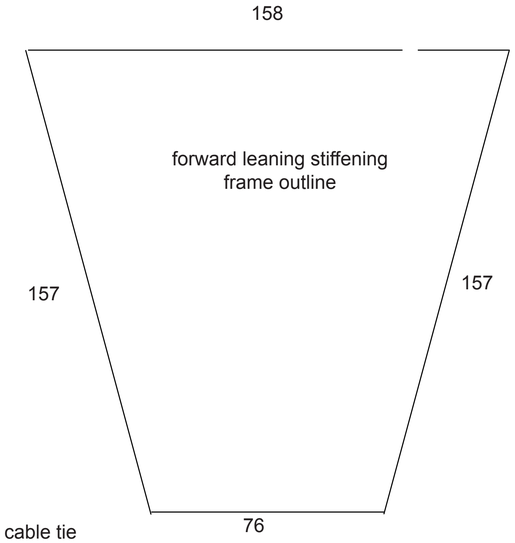


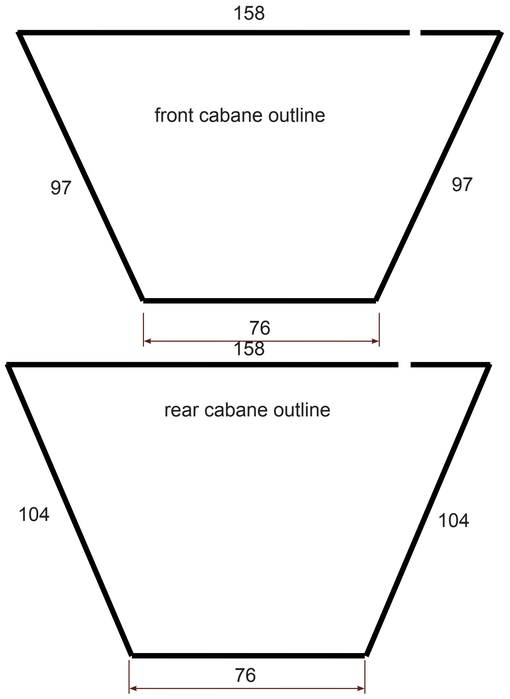
alternate rudder design

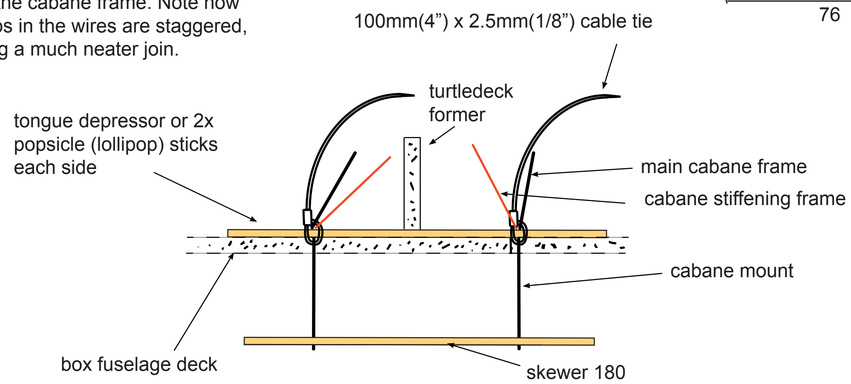
CABANES





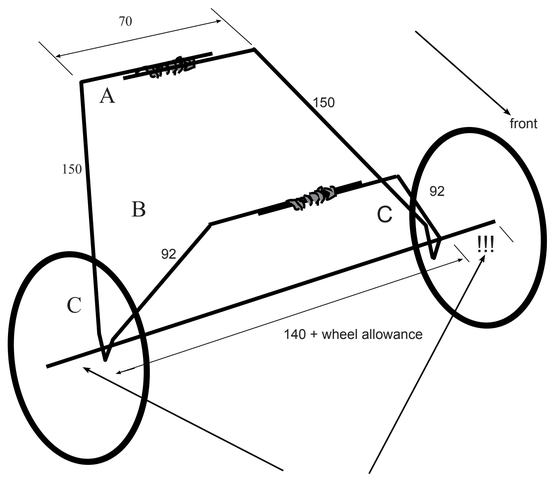






top wing support rails x2
200 - bend last 10mm each end down to catch wing elastics

UNDERCARRIAGE

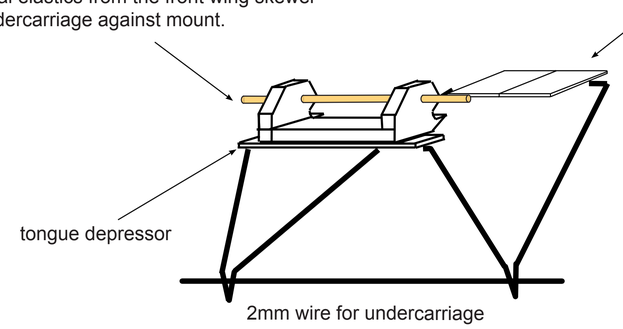


Depending on width of wheel used, allow extra at each end of axle for wheel width and collet/glue blob to attach wheel. 85mm wheel is scale.

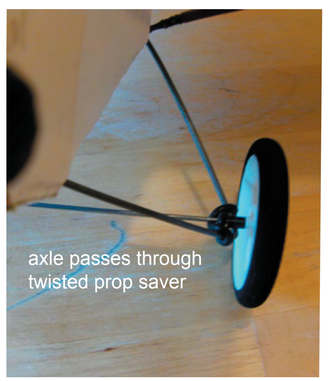
Kink the last 15mm of the undercarriage wire at the sharp bottom corner to make it vertical and stop the ‘pointy bit’ catching in any wheel spokes.

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.

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.



undercarriage bending guides