



Building instructions for the

# FRAKAR

Manufactured by

**FOAMWORKS**

[www.foamworks.co.nz](http://www.foamworks.co.nz)

### Recommended Setup

**Motor:** AXI 2208/34

**Speed Controller:** Phoenix 10

**Battery:** Tanic 3S1P 830mAh

**Prop:** GWS 10 x 4.7"

**Servos:** 3 x PICO or NARO

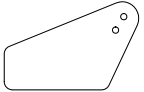
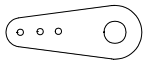

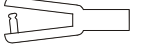
**Receiver:** Micro receiver

All available from:

[www.foamworks.co.nz](http://www.foamworks.co.nz)

### Parts List

Part	Qty
EPP Fuselage	3 Pieces
EPP Wings	2
EPP Ailerons	2
EPP Elevators	2
EPP Rudder	1
1.5mm Carbon Spar (800mm long)	2
9mm Carbon Fuselage Tube	1
Carbon Pushrods	
- Elevator (360mm long)	1
- Rudder (360mm long)	1
- Ailerons (120mm long)	2
5mm Carbon Elevator Spar (250mm long)	1
Undercarriage Legs inc. Wheels	2

Hardware Pack Contents	Qty	
Control Horns	3	
Tailplane Horn	1	
Tailplane Bearers	4	
Plastic Clevis	8	
Sig Easy Hinge	1	
Plastic pushrod support	1	
Ply Motor Mount	1	
Motor Mount Rods	4	

### What you'll need to build this kit

- Drill with 1.5 and 5.5mm bits
- Thin and Medium CA and accelerator
- SHARP knife

### Pre-Construction Notes

- Read through these instructions entirely before commencing construction.
- If you want to paint your kit parts do it now before assembly.
- We suggest using thin and medium CA adhesives for most of the construction. Epoxy can also be used.

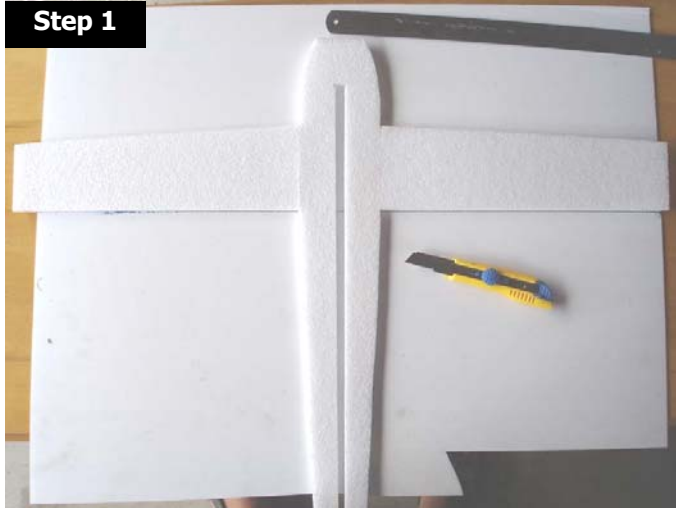
### **Step 1**

Lay the fuselage side piece on a level workbench and dry fit the wings. The Aileron hinge line should run straight through from one side to the other. A reference line drawn on your bench is a good way to check this. Wick CA into the join and allow to dry or spray with accelerator.

### **Step 2**

Drill two 5.5mm holes in the Carbon Fuselage rod for the undercarriage legs. Small pilot holes have been pre-drilled to ensure the correct position and angle of the holes. We suggest using a drill press for this step.

***Note: If you do not intend installing the undercarriage then skip this step.***

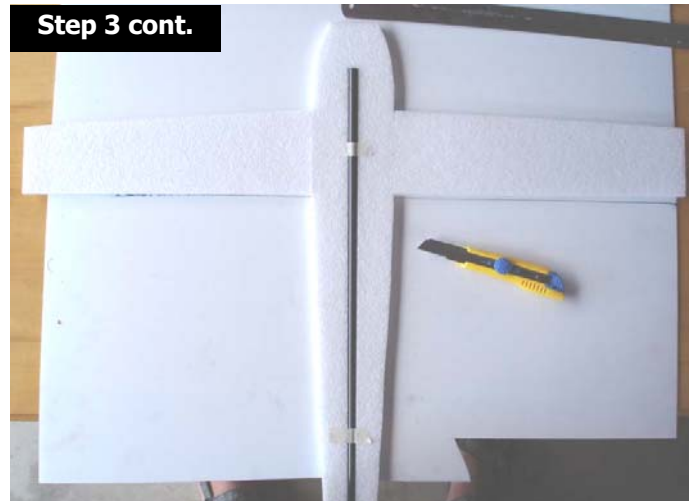
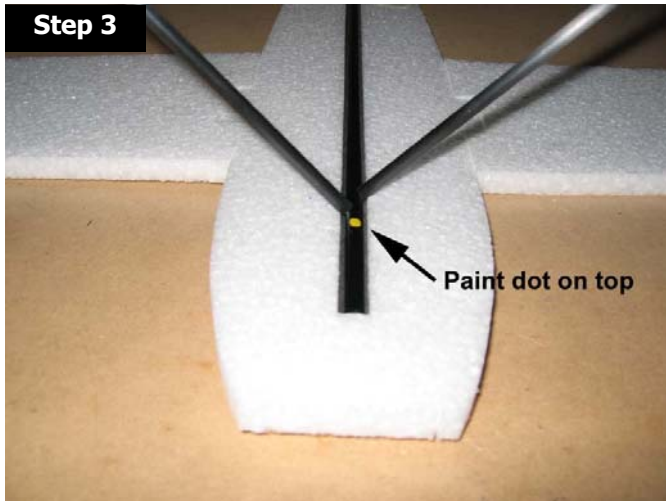


### **Step 3**

Next fit the 9mm Carbon tube into the cutout in the fuselage. The holes you just drilled for the gear should be at the front and the small paint dot marks the top. Loosely insert the gear legs to check the alignment before gluing the Carbon tube into the fuselage. Medium CA or 5min epoxy work well here.

***Don't glue the rear 50mm at this stage. This will get done in Step 7.***

Use masking tape to hold the cutout closed against the tube while the glue dries.



### **Step 4**

Using a straight edge or ruler cut a slot approx 2mm deep across both wings for the top spar.

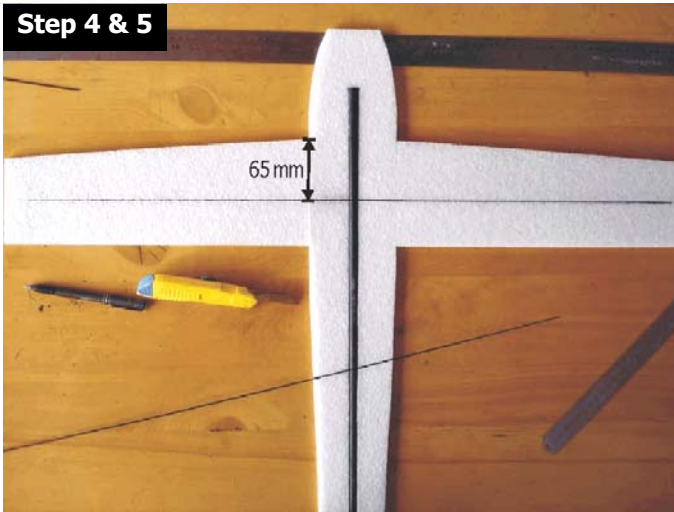
The slot should be 65mm back from the leading edge of the wing where the wing meets the fuse (see pic).

The slot should be 800mm long and finish about an 20-30mm inside of each wing tip. Press the spar into the slot and glue in place with CA. Note that the spar runs over the carbon tube in the fuselage and then down into the foam so there will be a slight bow in the spar. This 'pre-bending' makes the wing stiffer.

### **Step 5**

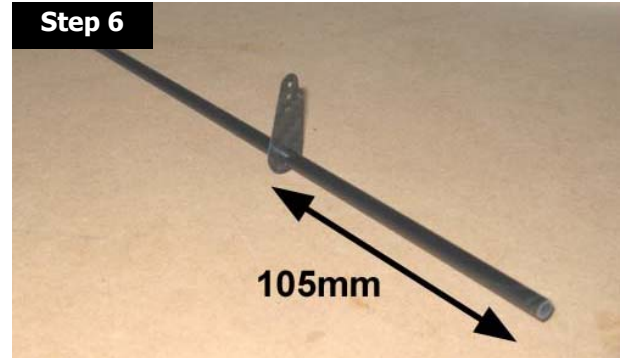
Flip over the whole assembly and insert the bottom spar following the same method as the top spar.

### **Step 4 & 5**



### **Step 6**

Slide the Elevator control horn onto the 5mm carbon elevator spar and secure with a drop of CA 105mm from one end as shown.



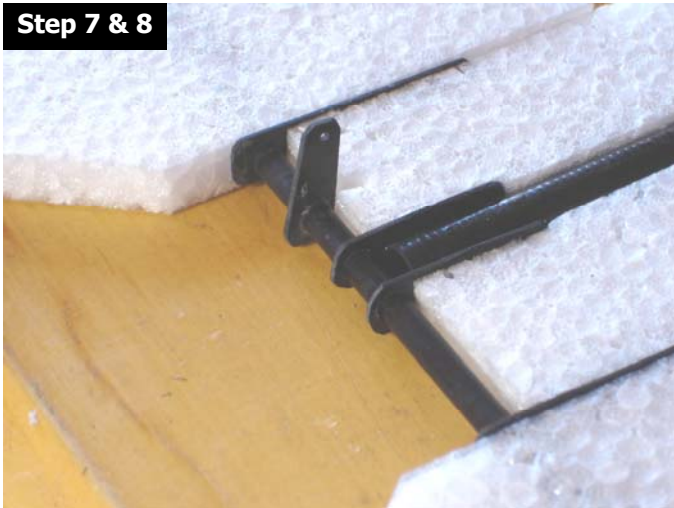
### **Step 7**

Test fit the elevator spar assembly in place along with the four Tailplane bearers. Once you are happy with the alignment and have ensured that the elevator spar is perpendicular to the fuselage tube glue all four bearers in place. ***Be careful not to get any glue into the hinge or the elevator will not move.***

### **Step 8**

Carefully slide each elevator half onto the elevator spar. Check their alignment – they should sit flat on the table with the control horn pointing directly upwards. With a pin, make some holes in the elevator around the spar and 'wick' thin CA into these to secure the elevator halves in place. Check that the whole elevator assembly can move freely.

### **Step 7 & 8**



### **Step 7 & 8**



### **Step 9**

Cut a 45 degree bevel along the hinge line of each aileron. The ailerons will be top hinged with tape so make sure you cut the bevel off the correct edge.

### **Step 10**

Flip your Frakar over and hang the tail off the edge of the bench so the wings and fuse sit flat on the workbench. Position the ailerons and attach with a strip of filament tape. Apply about 3 or 4 small pieces of tape to the underside to help secure the ailerons. ***This tape will need to be replaced from time to time.***



**Step 11**

Glue the fuselage top in place and secure with pins. Make sure it is at 90 degrees to the wings and fuselage sides. Once dry glue the bottom of the fuselage in place.

**Step 12**

Cut a bevel along the hinge line of the rudder. This needs to be 2 x 45 degree bevels to form a 'V' shape.

**Step 13**

Cut the Sig easy hinge into 3 strips. Mount the rudder by cutting slots in the fuselage and rudder hinge line and inserting the easy hinge pieces. Wick some thin CA into the slots to secure the hinges.



**Step 14**

Cut slots in each wing and the rudder and install the control horns as shown.

**Step 15**

Mount the three servos as shown. Make the cutouts a tight fit and secure the servos with small pieces of tape on either side.

**Step 16**

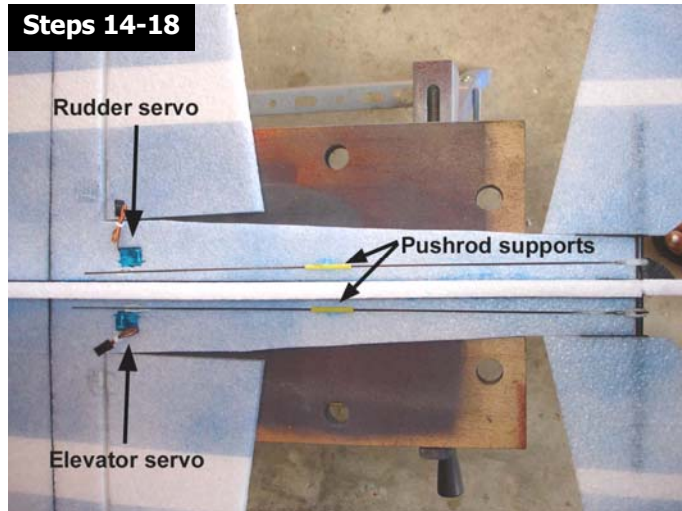
Glue a plastic clevis onto one end of each of the long pushrods (elevator and rudder) Attach the pushrods to the control horns. Cut a small (15mm long) length of the plastic pushrod support and slide onto each pushrod. Glue these to the fuselage about half way along the pushrods. ***Don't get any glue inside the supports or the pushrods will not move.***

**Step 17**

Trim the elevator and rudder pushrods as necessary and attach the other clevises. Connect to servos.

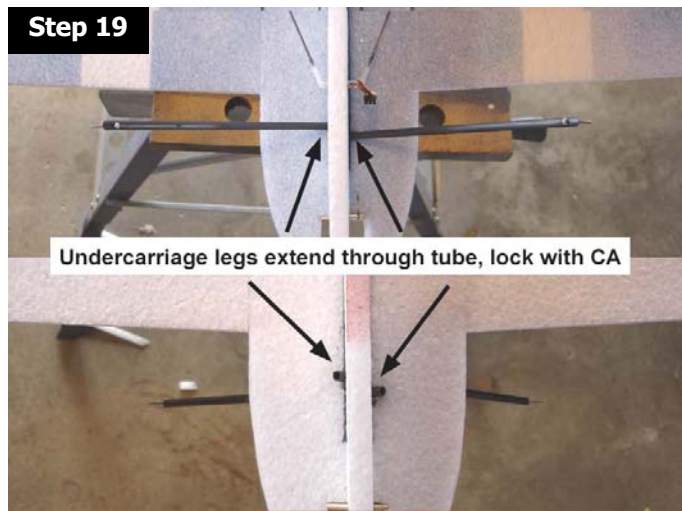
### **Step 18**

Install the aileron pushrods trimming to length as necessary. Note these do not require any plastic supports.



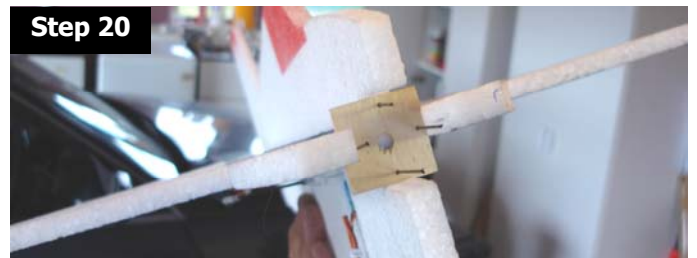
### **Step 19**

Insert the undercarriage legs into the holes you drilled earlier. You may need to remove some foam to make them fit. Check the height and alignment of the wheels and then lock the legs in place with a drop of CA.



### **Step 20**

Cut away enough foam from the nose area to mount your motor. Drill four 1.5mm holes in the motor mounting plate and push the four carbon rods through and into the foam. Glue in place. Attach your motor to the motor mount



### **Step 21**

We suggest mounting your receiver, speed controller and battery with Velcro. This is especially good for the battery as you can make easy adjustments to the centre of gravity.

### **Step 22**

That's it! Setup your radio, charge your batteries and you're ready to start hovering!