

BE BE

NORMAN

BY

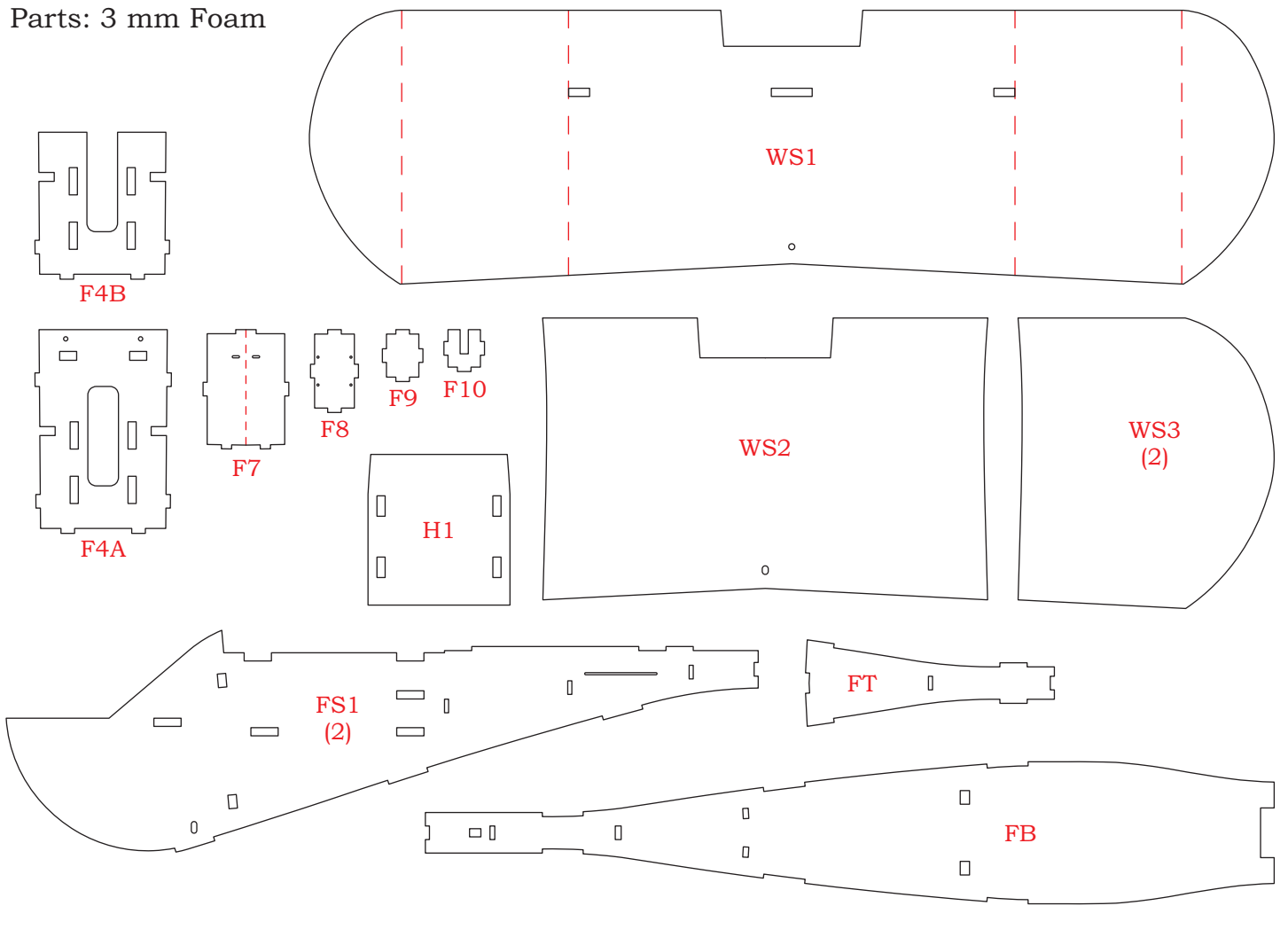
Laine's Planes

Suggested Gear:

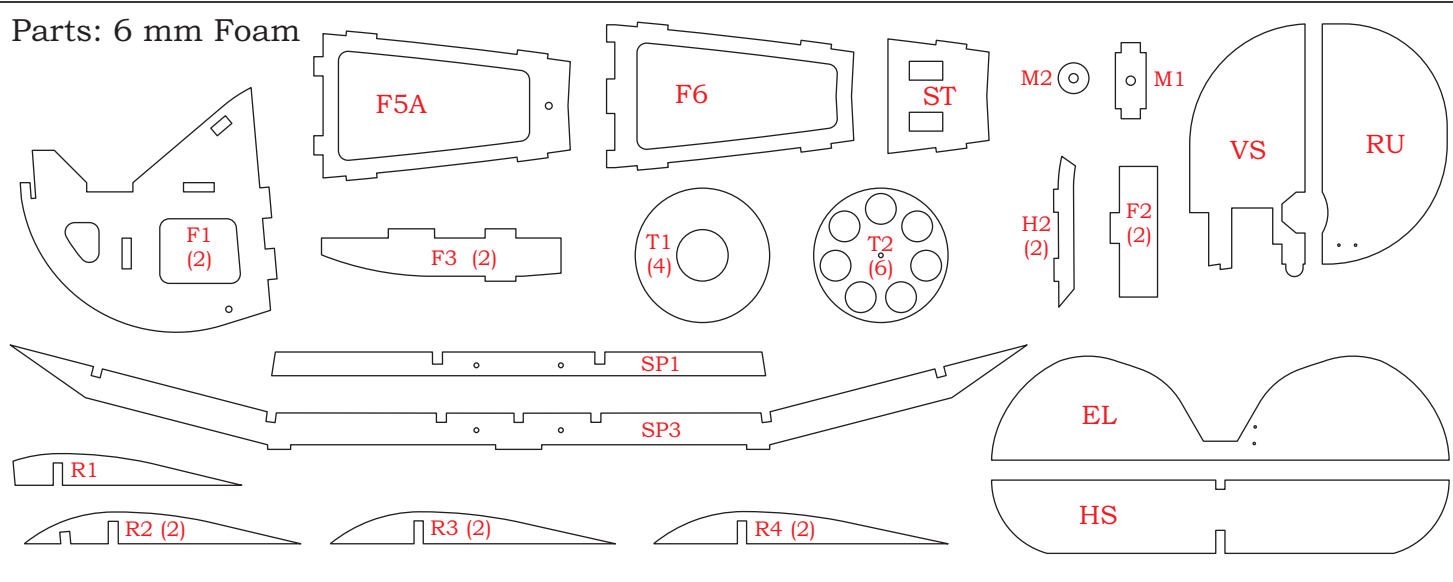
20 gram 1400 Kv motor
8 x 4 propeller or similar
6 amp ESC
500 mAh 2S lipo
5 gram Servos (2)

Revised: April 5, 2015

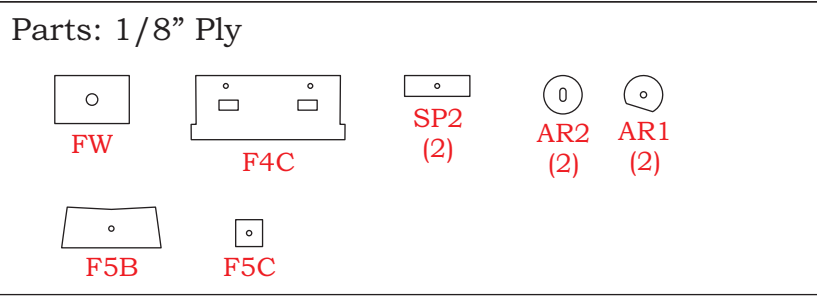
Parts: 3 mm Foam



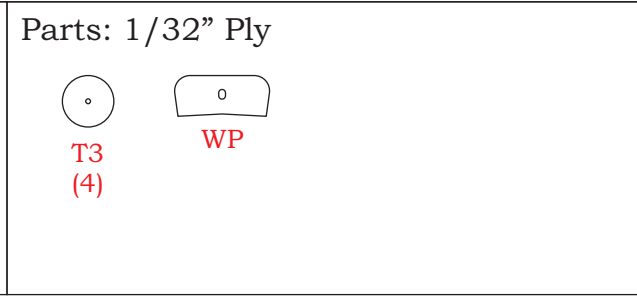
Parts: 6 mm Foam



Parts: 1/8" Ply



Parts: 1/32" Ply



Time spent waiting for glue to dry can be minimized by creating sub-assemblies.

Below is a suggested list of suggested sub-assemblies in a suggested build order:

Page 3: Forward Spar - Parts S1 & S2

Page 5: Fuselage Former F4 - Parts F4A, F4B & F4C

Page 5: Hatch Magnet - Part M1 & Magnet

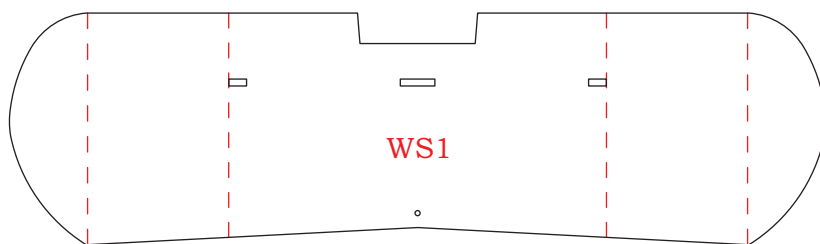
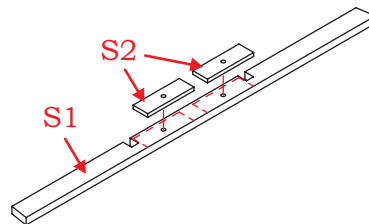
Page 5: Hatch Magnet - Part M2 & Magnet

Page 5: Nose Former Sub-Assembly - Parts F1, F2, F3 & AR1

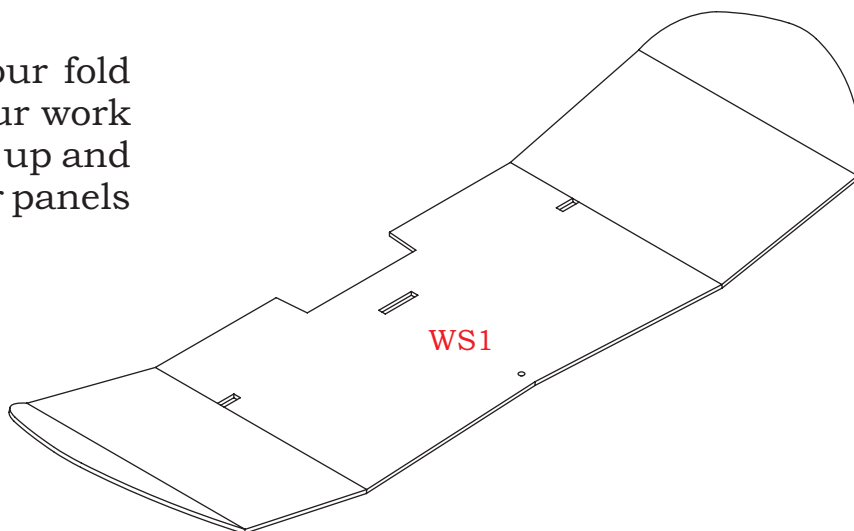
Page 5: Former F5 - Parts F5A, F5B & F5C

Page 8: Tires = Parts T1, T2 & T3

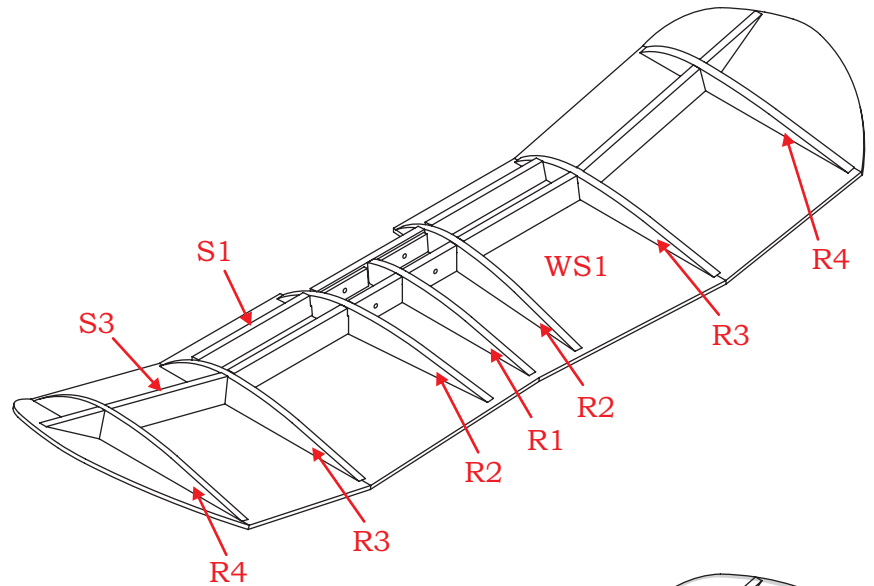
Glue spar reinforcements S2 to spar S1 using the holes in the parts for alignment.



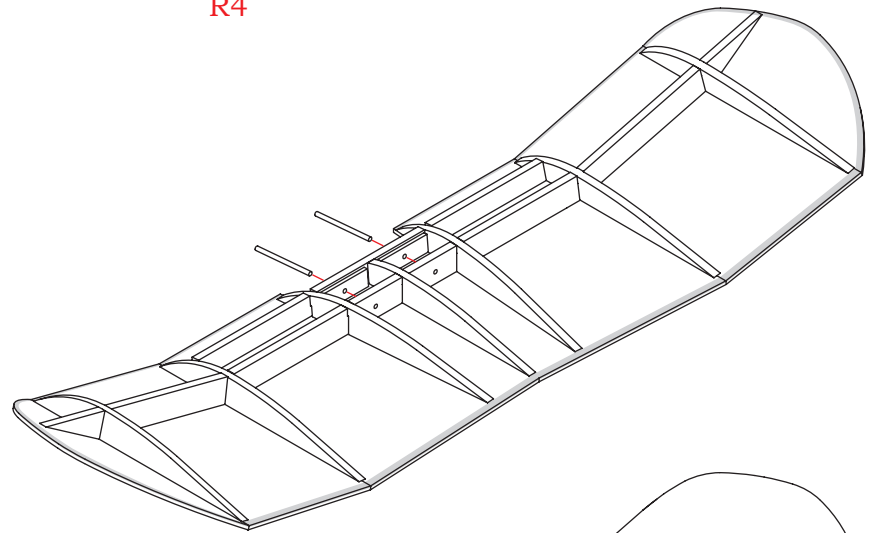
The lower wing skin WS1 has four fold relief cuts. Place the skin on your work surface with the relief cuts facing up and gently bend the wing tip and outer panels up to match the angles in spar S3.



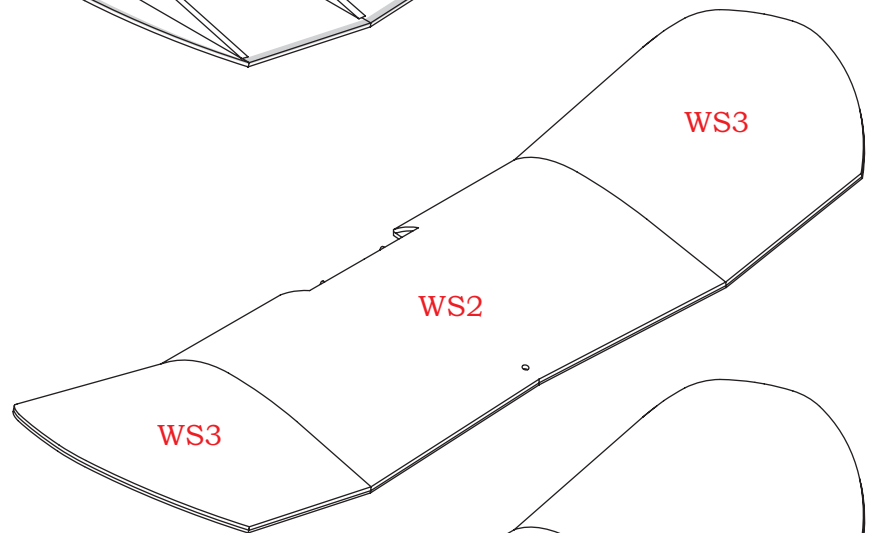
Glue the spars S1 & S3 and the ribs R1, R2, R3 & R4 to the lower wing skin WS1 as shown in this drawing.



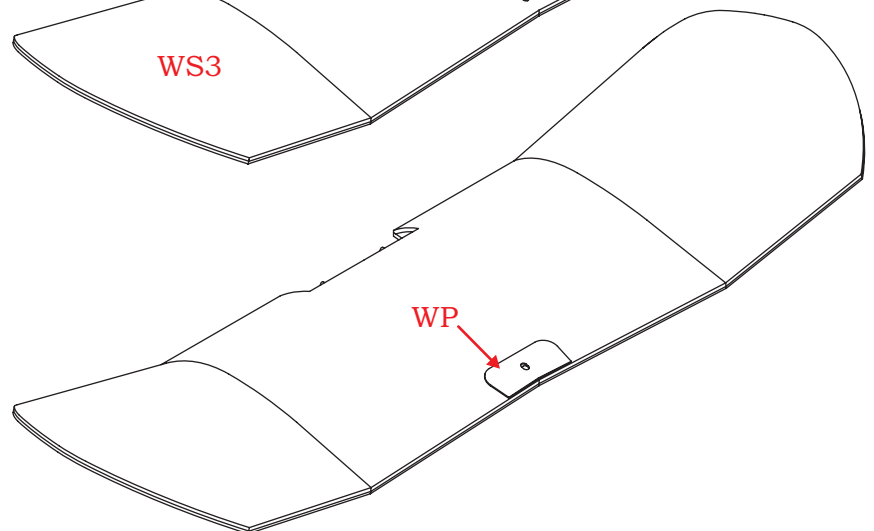
Glue wing hold down dowels into the holes in spars S1 & S2. The dowels should protrude from the face of spar S1 by about 1/4".



Sand the upper edges of the spars to match the rib profiles. Sand a slight bevel in the perimeter of the wing skin to match the rib profiles and to increase the surface area for attaching the upper wing skins.

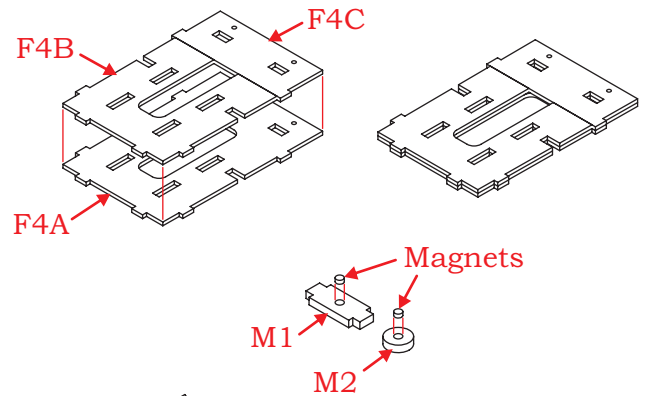


Gently roll-form the upper wing skins WS2 & WS3 to match the curve of the wing. Glue the upper skins to the top of the wing. Low tack tape may be used to hold the edges until the glue dries. Excess upper skin may be trimmed away after the glue dries.



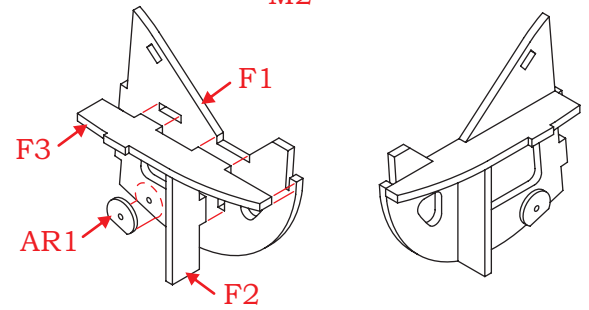
Glue wing mount reinforcement plate to the upper wing surface using the hole for alignment.

Assemble fuselage former F4 from parts F4A, F4B & F4C.

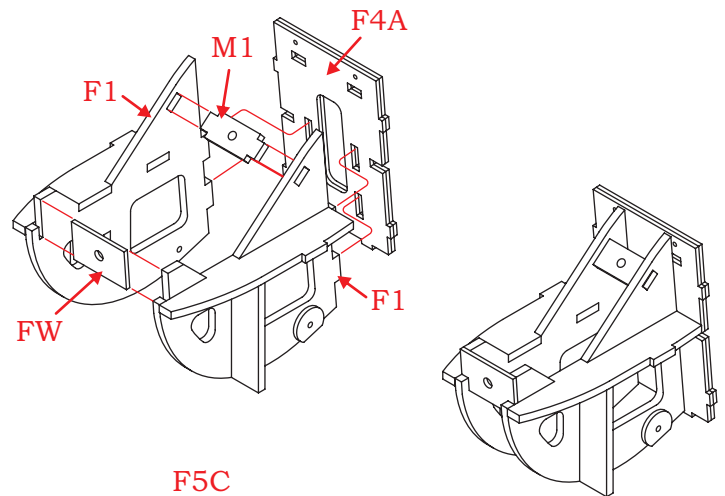


Glue 1/4" diameter x 1/8" thick magnets into parts M1 & M2. The magnets should be flush with one surface of M1 & M2 and should be oriented to pull towards each other.

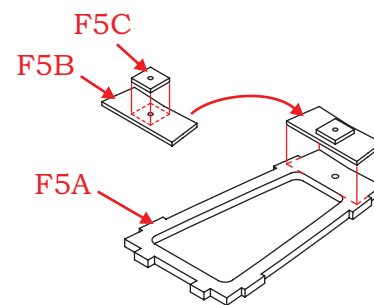
Glue together the nose former sub-assemblies from parts F1, F2, F3 & AR1. Be sure to create a left and a right assembly.



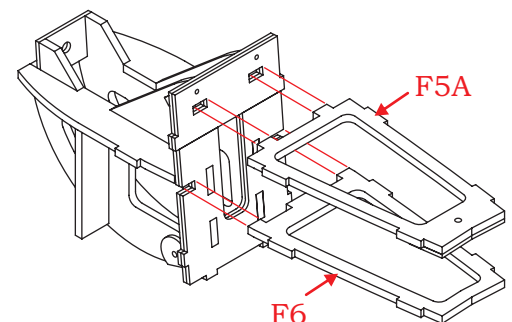
Glue the nose former sub-assemblies to parts M1, FW and the fuselage former F4 assembly. The magnet in part F1 should be flush with the exposed face. The ply portion of F4 (F4C) should face the rear of the assembly.



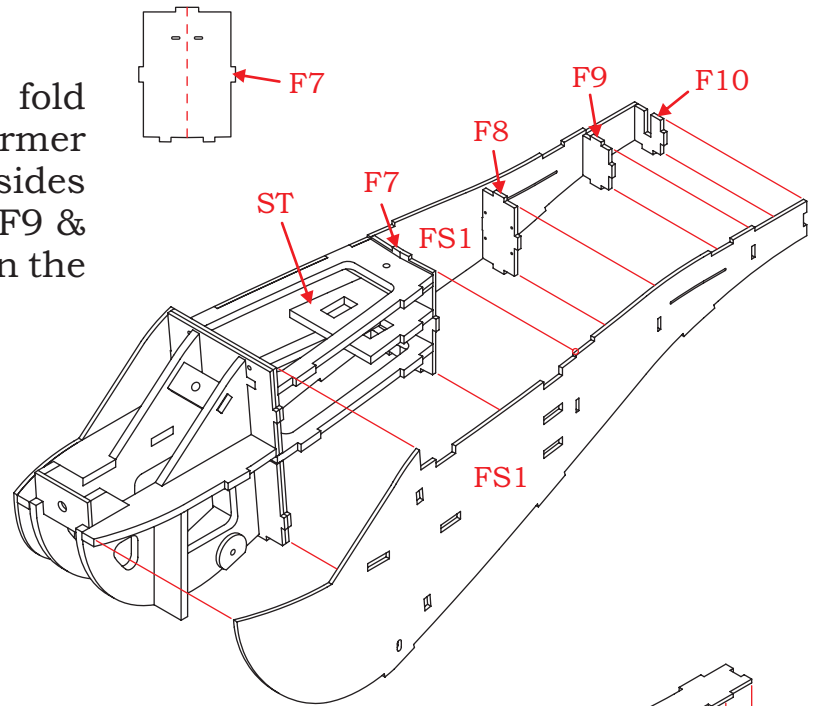
Glue F5C to the bottom of F5B using the hole for alignment. After the glue has dried, tap the hole for 6-32 threads then harden the threads with thin CA. When finished, glue the F5C-F5B assembly to the bottom of F5A.



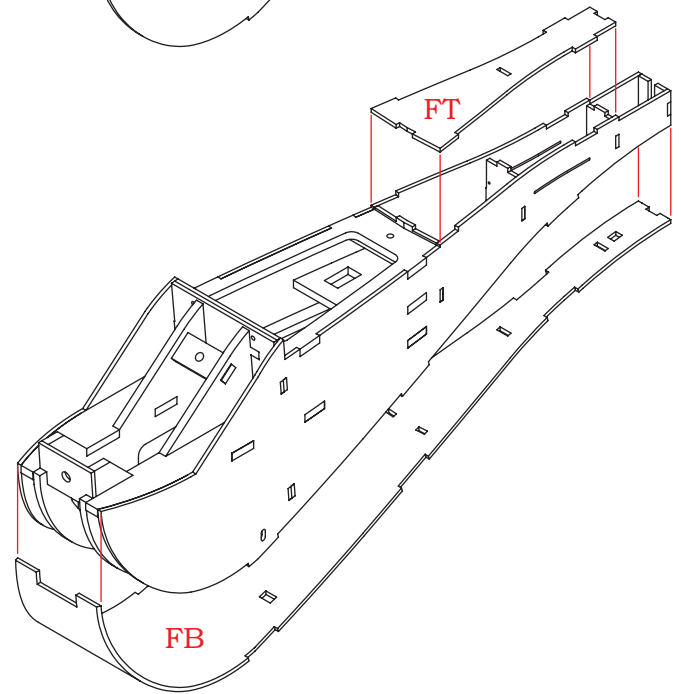
Glue the F5A assembly and part F6 to the rear of the nose former assembly. Use the slots in the fuselage side FS1 to set the correct angle for parts F5A & F6.



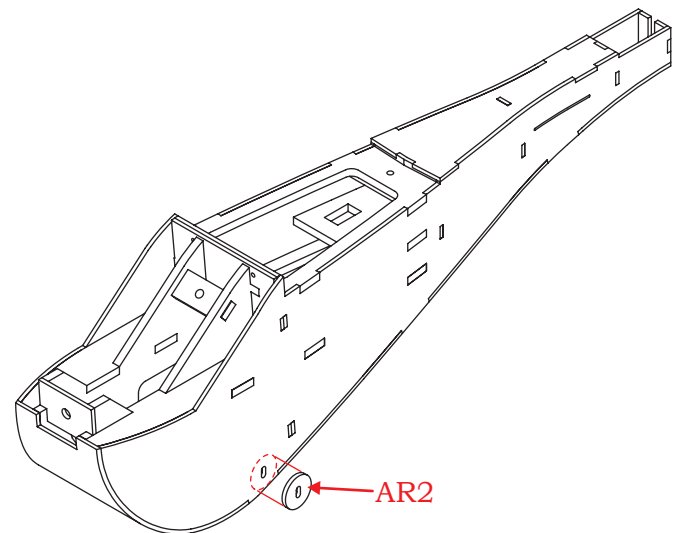
Bend former F7 slightly along the fold relief cut. Glue the nose former assembly to one of the fuselage sides (part FS1). Glue parts ST, F7, F8, F9 & F10 to the fuselage side, then glue on the remaining fuselage side.

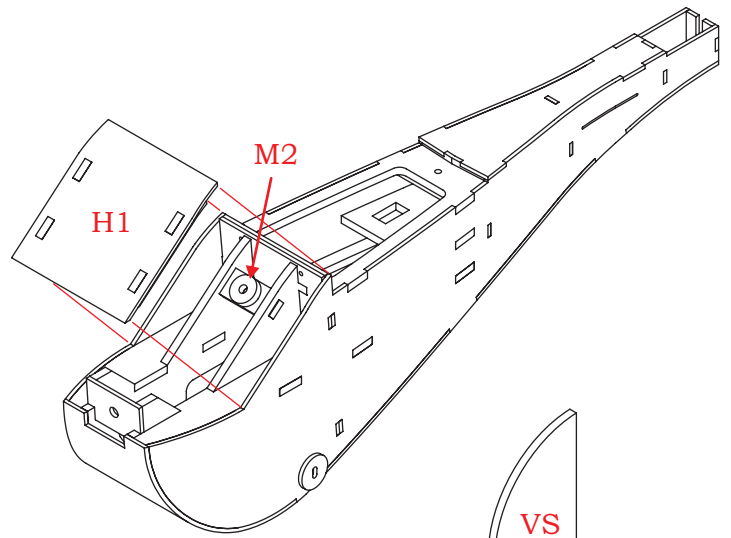
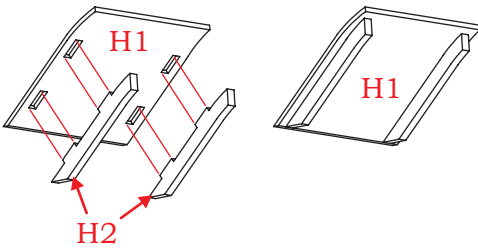


Glue the fuselage top (part FT) to the fuselage assembly then glue the fuselage bottom (part FB) to the fuselage assembly



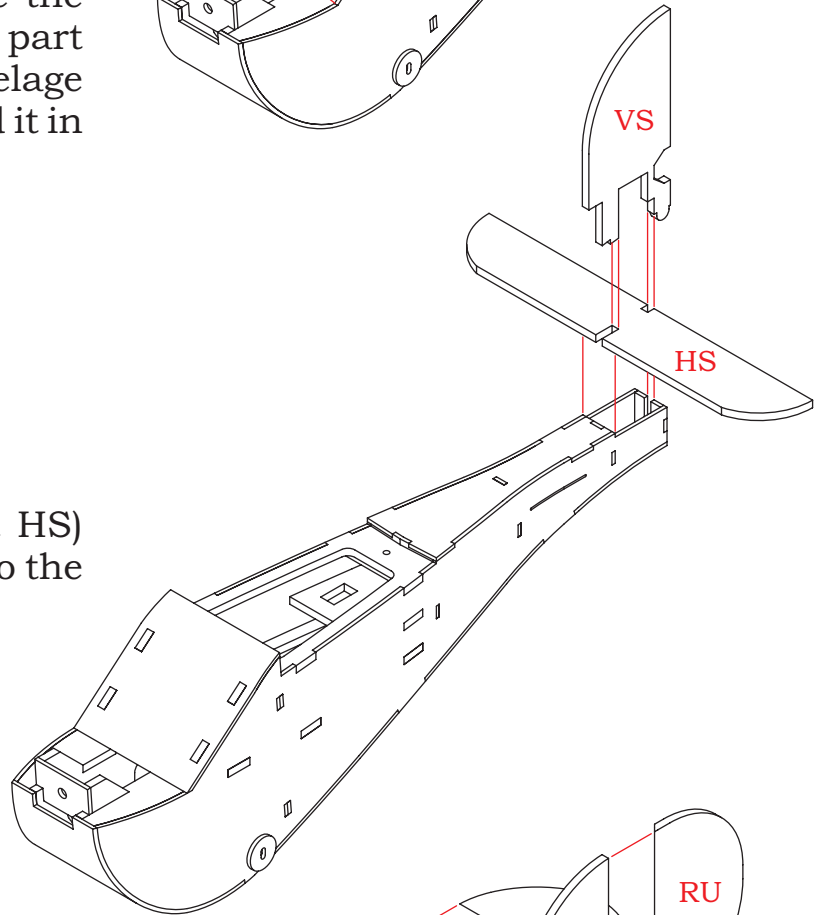
Glue the axle reinforcements (parts AR2) to the fuselage assembly using the slots for alignment.



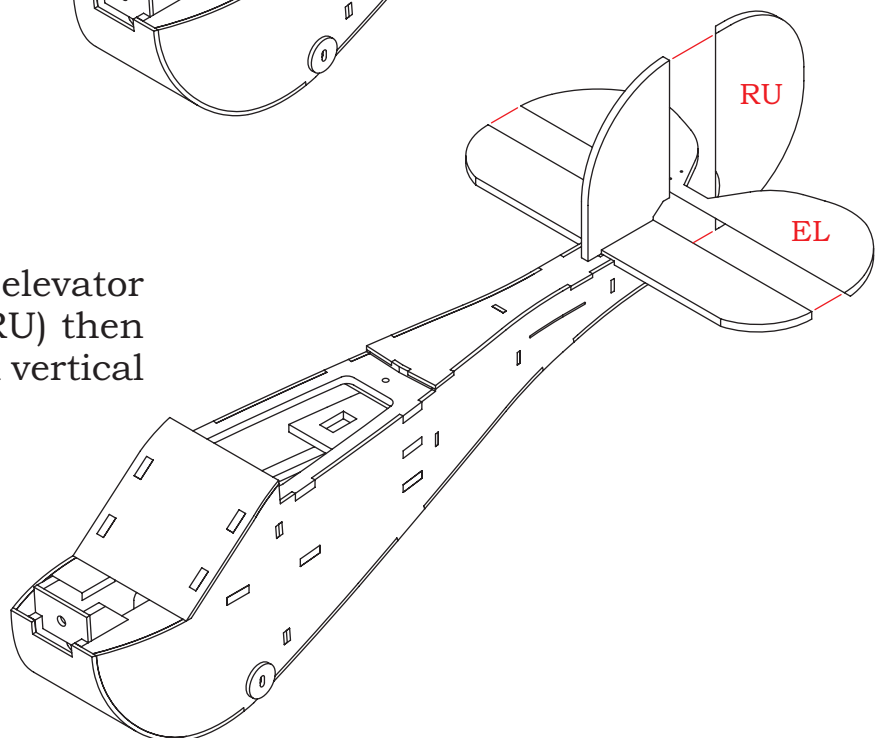


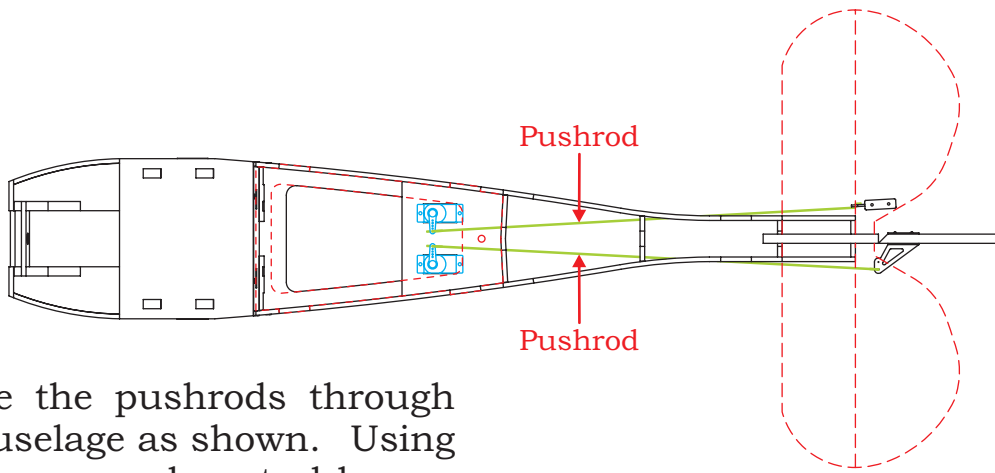
Bevel the lower edge of the hatch (part H1) then gently roll form the upper 1" to match curve of the fuselage. Glue the hatch spars (parts H2) to H1. Place part M2 on top of part M1 in the fuselage assembly. The magnets should hold it in place. Glue H1 to M2.

Glue the horizontal stabilizer (part HS) and the vertical stabilizer (part VS) to the fuselage assembly.

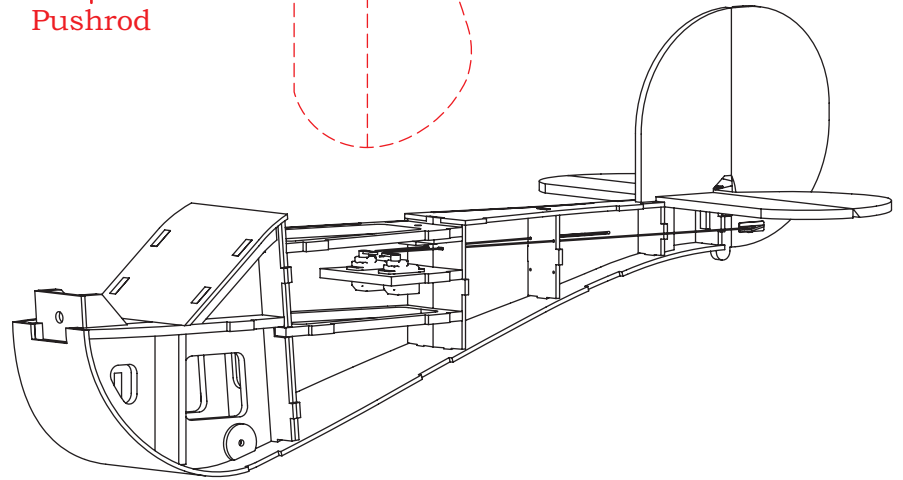


Bevel the leading edges of the elevator (part EL) and the rudder (part RU) then hinge them to the horizontal and vertical stabilizers.

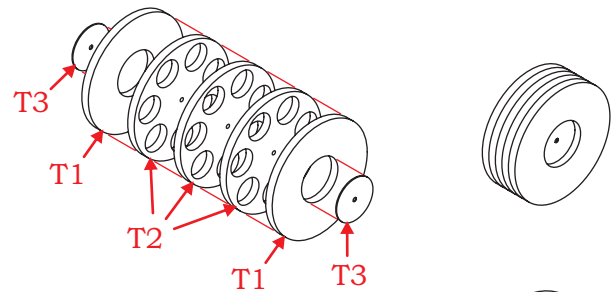




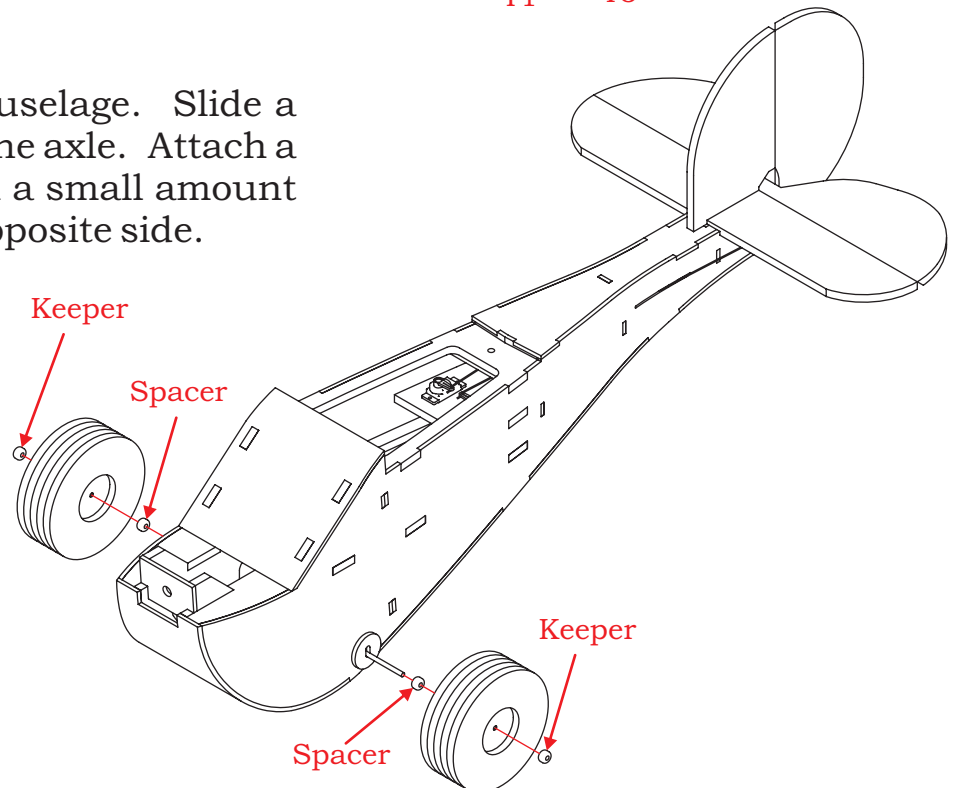
Route the pushrods through the fuselage as shown. Using the servos and control horns, determine the correct pushrod length and the locations for the pushrod Z-bends. Glue the servos into the servo tray (part ST), then attach the control horns to the elevator and the rudder.



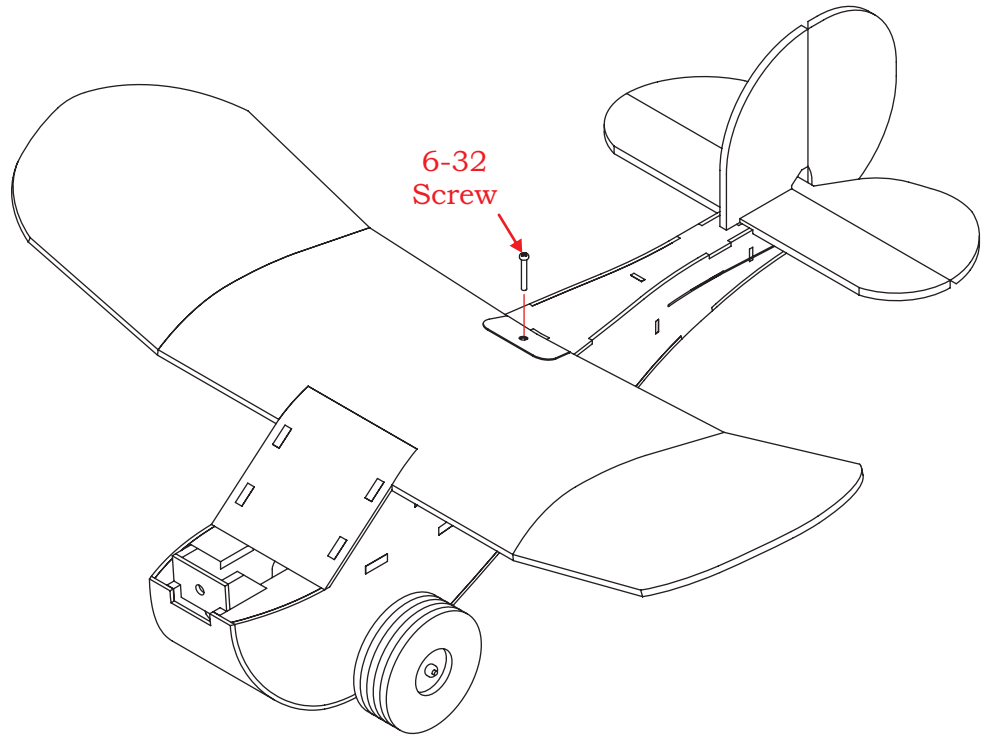
Assemble a pair of tires using parts T1, T2 & T3 as shown in the drawing.



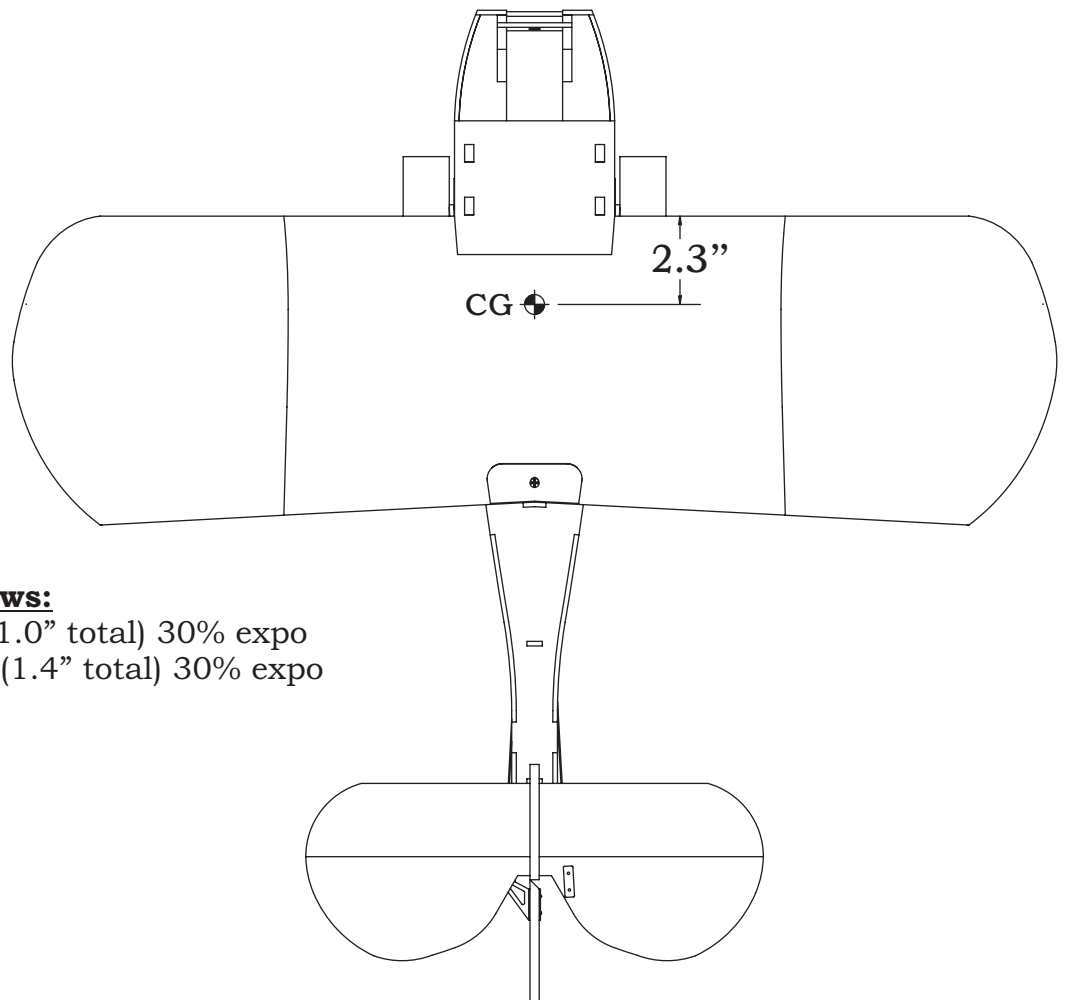
Slide the axle through the fuselage. Slide a spacer bead and a tire onto the axle. Attach a keeper bead to the axle with a small amount of hot glue. Repeat for the opposite side.



Attach the wing with the 6-32 machine screw.



Suggested starting CG
2.3" back from the Wing
Leading Edge.



Suggested starting throws:
Rudder 0.5" left & right (1.0" total) 30% expo
Elevator 0.7" up & down (1.4" total) 30% expo