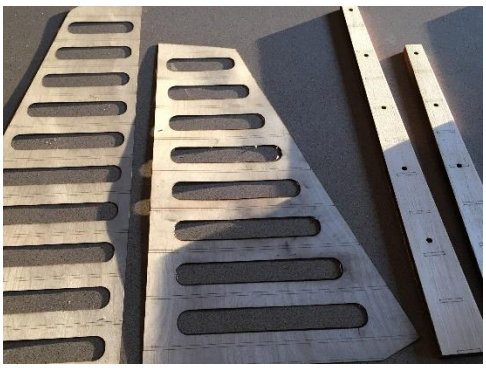
Smellyak Assembly instructions.

Fin and Rudder

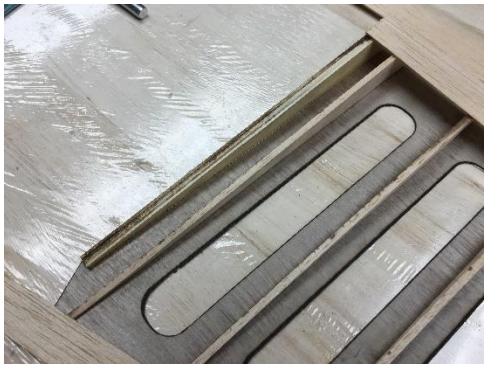
1. Locate all components for building the fin and rudder



Make a small sanding block by using the same spar stock and adding some 80grit paper. This will ensure the optimum spar fit

The fin is built in 2 halves, then joined. This ensures a straight component.

Rudder is also built directly on the center spine. This is a 1/64” ply. Glue the ribs to the laser etched marks on the plywood. The lower ¼” liteply rib is for the control horn mount.



Completed Fin and Rudder. Note; sheeting. Fin is completely sheeted.

Elevators and tail plane.

First laminate the 4 x ¼” Liteply center ribs.

Next step assemble the ribs on the lower ¼’ x 3/8” spar. Work along the span by gluing sheer webs to the ribs. You don’t need build on the plan if you don’t want to, the sheer webs will determine the correct span of the tail plane.

Insert the alignment dowel bulkheads

Glue top spar. Make sure tail plane is on a flat building board and is straight while gluing.

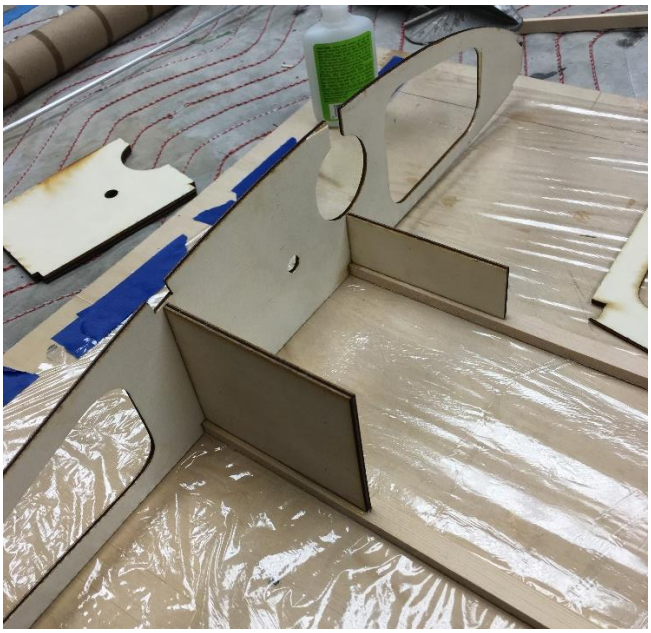
Sheet entire tail plane before adding trailing edge stock. Trailing edges are laser cut with hinge holes cut. Make sure you align correctly with the corresponding elevator components.

Elevators are built directly on the lower sheeting. Locate ribs and cross bracing components and glue directly to the etched lines on the sheeting. Next apply top sheeting, then leading edge which is laser cut with the hinge holes. Make sure the Leading edge aligns correctly with the corresponding component on the tail plane. (Note below picture was taken from a aileron however the build is the same.)

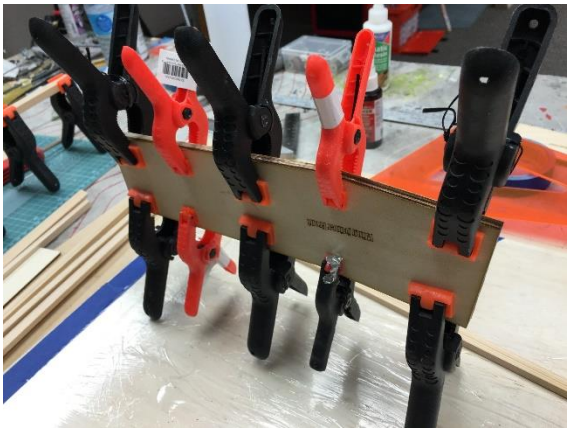
Next drill a ¼” stab mounting hole . Use the plan to position this hole in the correct location.

Wing Assembly

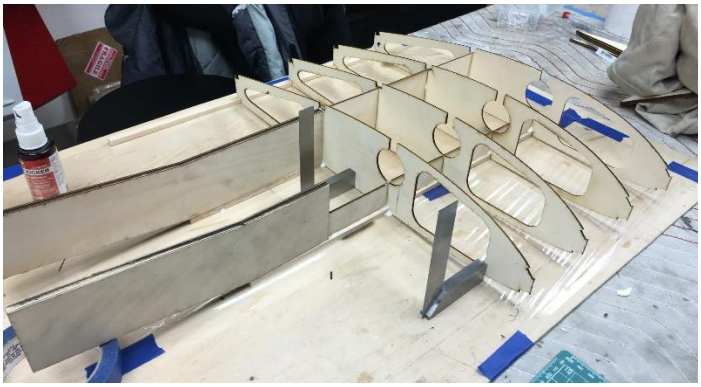
As with the tail plane there is no need to build over the plan if you so choose. The laser cut components are very accurate. First assemble each center section. Align the ribs on the lower spars 3/8” x 1/4” spruce. Then work your way along the spar. Trim of overhanging spar material now as it will be more difficult when sheeting is applied. Spar material is cut to approximate length however some trimming will be necessary.



Next locating the outer joining spars and laminate. Each spar is made up of 3 laminations of 1/8” birch ply.



Glue to the lower spars and slide ribs over them in the appropriate location. The rear spar sheer webs will determine the correct location of these ribs. The top spar notch is notched to be removed after the outer ribs that attach to the joining spars are glued into place.

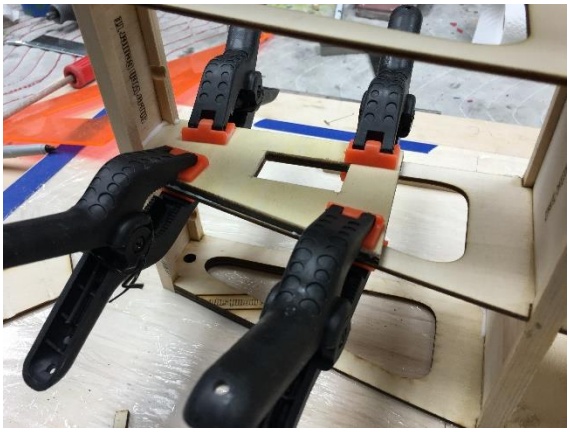


Next laminate top spar, ¼ x 3/8” + ¼” x 3/8 Balsa.

Glue all top spars. TE, Center and LE, top spar into place. . Make sure center section is flat on the building board while the glue is drying.

Important note: It's much easier to install wing bolt attachment plate and blind nut now before sheeting is applied.

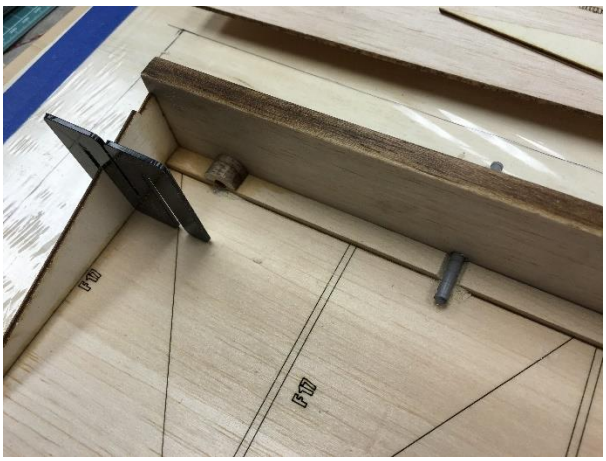
Glue Flap servo mount in place.



Additional note. Test fit flap servo at this stage. Servo cutout is laser cut for a standard giant scale servo however servos can slightly vary in size. It's easier to adjust servo pocket now than after the sheeting is applied.

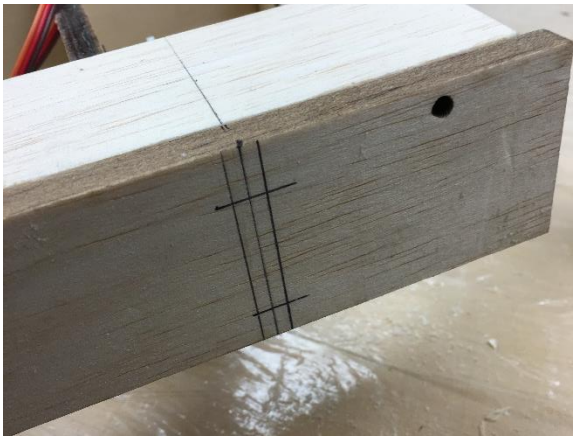
Glue rear rotation dowel support plate in.

Note" you will need to file clearance notches in the lower TE spar for the hinge clearance. This is done on the flap and wing center section. Note hinge support blocks. These are used throughout the build for Ailerons, Elevators and flaps. Some may need to be trimmed to fit between the spars. The below picture is from the flap assembly.



Once glue is dry you can sheet the center section. Sheeting is laser cut and marked. Layout all components with the identification etching faces in.

Note slight bevel for hinge center, this will help for additional flap travel if you need it.



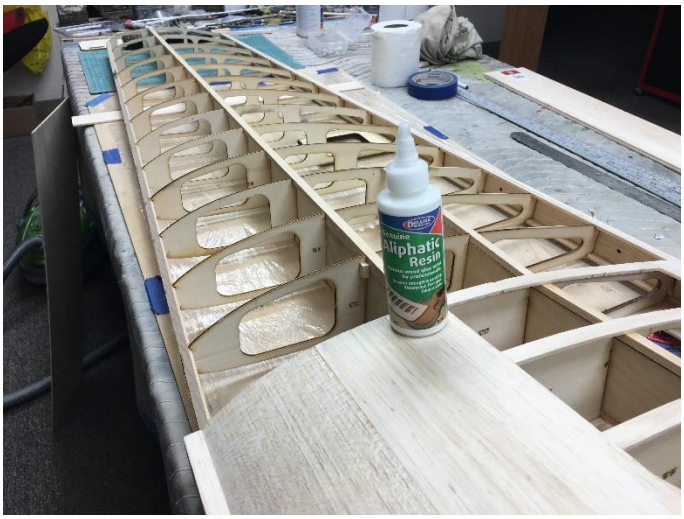
Note: Trailing edge stock is laser cut with corresponding hinge holes for the flap. Ensure the correct alignment. Additionally, the Center section trailing edge has the horn slot laser cut for you.

Completed center section. Note LE is not yet sanded as its easier to blend both inner and outer panels at one time.

Next outer panels. These are built in a similar way. Elevate the center section at the root so the spars are parallel to the building bench. Assure that the outer spars (1/4 x 3/8” spruce) are at right angles to the outer root rib.

Assemble the ribs on the lower main and lower sub spar. Note the lower sub spar and main spar have a 1/8” shim to ensure they are at the correct height so it lines up correctly with the center for gluing.

Attach each rib to spar using the sheer webs to determin the rib spacing. Note the front trailing edge stock ins glued into place and sanded to follow the contour of the ribs. The wing sheeting will be over the top TE stock.

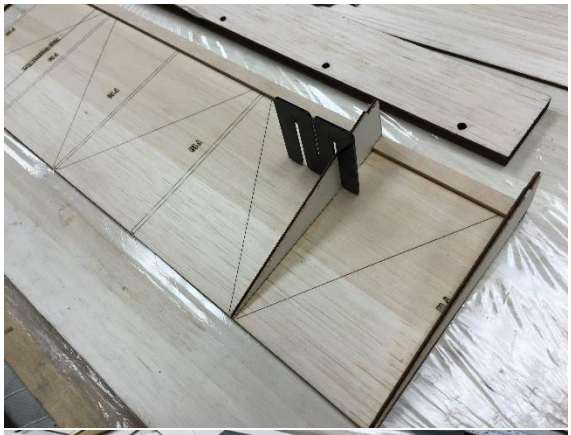


Leading edge sheeting is best applied from the leading edge back, this ensures the best accuracy of the airfoil. Top sheeting is applied first.

Once top sheeting and cap strips are glued, flip over and sheet the bottom. Before sheeting the bottom however glue aileron servo mount support.

Servo hatch is also the servo mount.

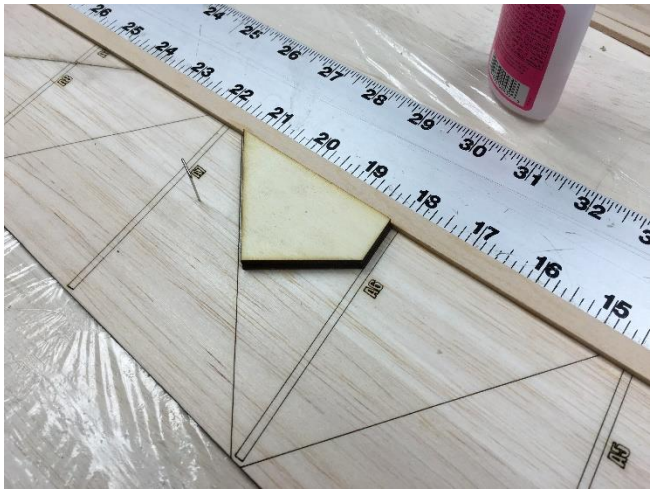
Next step is to build the Flaps and ailerons. Both these components are built in the same way as the elevator by assembling on the actual sheeting.



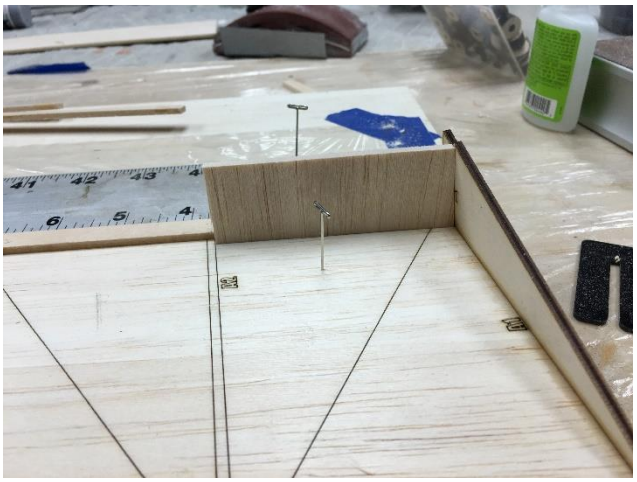
Note: As with the center section the flap hinges will need to have a clearance slot filed into the lower spar.

Due to the acute angle of the angle bracing you will need to remove some material to allow for the spar clearance.

Important note. Make sure the aileron Horn mount plate is on the lower side of the aileron.



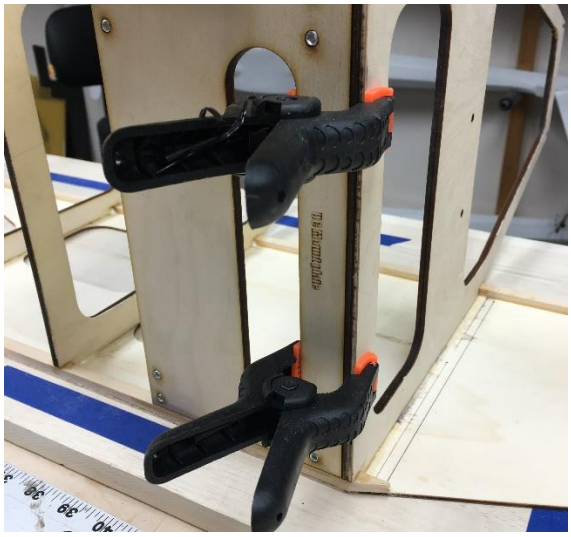
Root rib for the aileron needs to have an approximate 3deg angle. There is a There is a liteply sheer web specifically for this location. This allows for clear movement up and down with the dihedral break.



Fuselage Assembly

The fuse is built primarily on its side in the early stages. First Attach the 4 x 3/8 x ¼" spruce main stringers to the front the front fuselage sides. Make a left and right fuse. The identification etchings face in, this will ensure you don't make two of the same side. Glue F2 – F5 in place.

Next glue the Undercarriage support plate to the front of F2. Note it's easier to install the blind nuts for the UC attachment at this time. On the prototype the UC was attached to brackets that used 2 x 8/32 screws. On the production kits the UC attachment bracket only uses a bracket that only needs 1 x 8/32' screw, therefor only install the blind nuts closest to the fuse side.



Next glue the right fuse side to the bulkheads FF2-F5. Note the fuse sides are market left and right.

Note the position of F2 on the fuse side. It is inline where the fuse rakes forward. Also of note; The right side is slightly shorter to allow for the right thrust on the F1 Bulkhead/firewall.

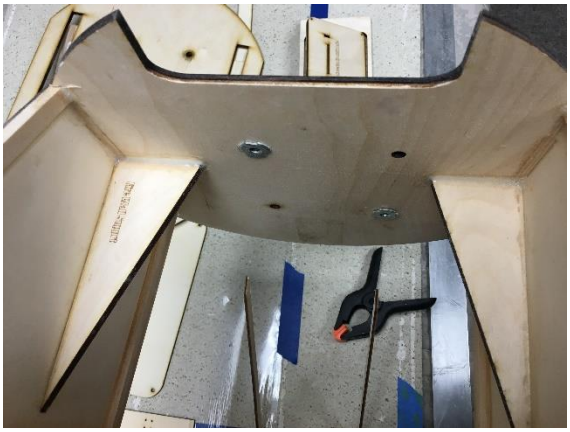
Next attach the fire wall support braces. These help align the Firewall to the correct angle. Note forward fuse side is outlined with 3/8 x ¼" spruce.

The support brace is positioned approximately in the middle of the front of the fuse side.

There will be an overhang when f1 is glued in place. This is intentional and will allow a glue fillet to be used for greater attachment strength.

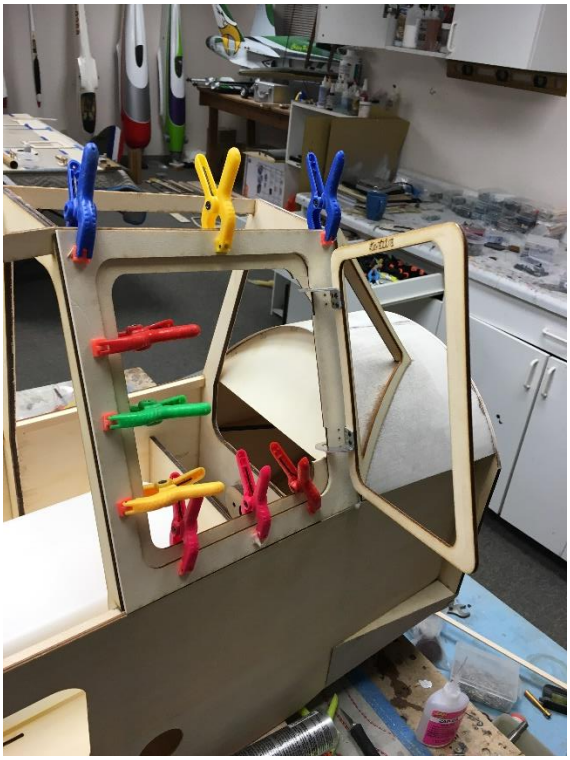
Next glue F1 in place ensuring it is touching the firewall support braces and correctly aligned with the fuse side. Since this picture was taken the F1 design is a larger radius allowing the fuse sides to pass through for greater strength.

Note: blind nuts are installed at this time. You firewall is prepared for a DA150/170cc engine.



Next install tank floor, rear UC support bulkhead, anti-rotation support plates, wing bolt support plate, lower RC hatch, canopy support stringers, and tank floor bulkhead.

Next assemble tow hook attachment plate. This is easier done now before it is installed. Test fit servo and linkage.



Next assemble and glue front cockpit doors into place. Note on the prototype small magnets were used to hold doors closed. These are not included in the kit.

Next finish sheeting front fuselage area. All liteply sheeting is marked.

Front deck and lower fairings are sheeted with 1/64” ply.

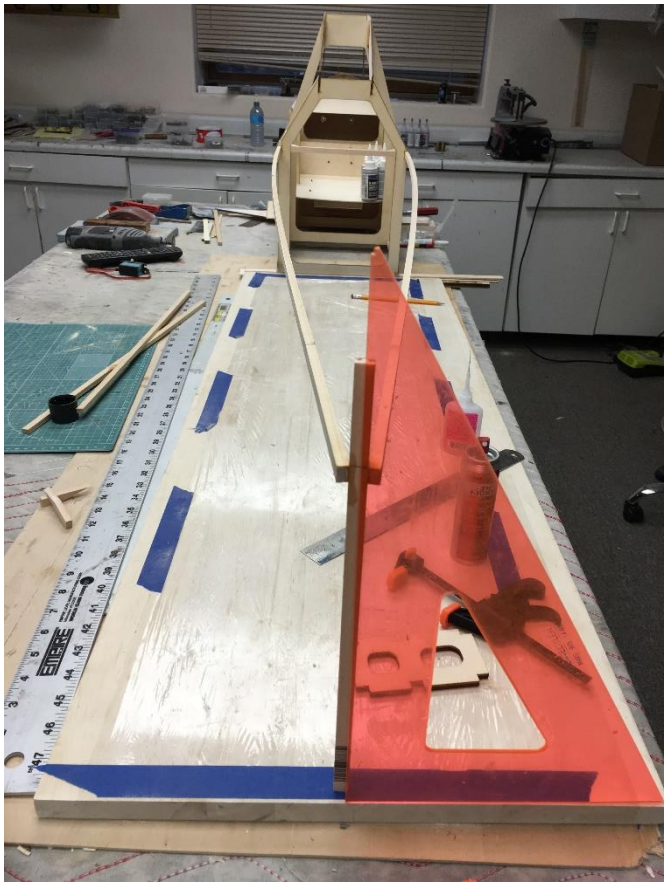
Before moving onto the rear of the fuselage install rear rotation supports and rear wing support bulkhead.

Now to build the Rear of the fuselage. This is done with the fuse positioned upright on the bench. Use a right angle devise to ensure the rear of the fuse at 90deg to the bench.

Use a piece of spruce material to correctly align the main stringers off the bench. Once the correct height is achieved you can position additional pieces of spruce or balsa scrap to ensure the top stringers don’t sag during assembly.

Next pinch the stringers together at the intersection of the spruce alignment piece.

It is important the top main stringers are running parallel to the bench.

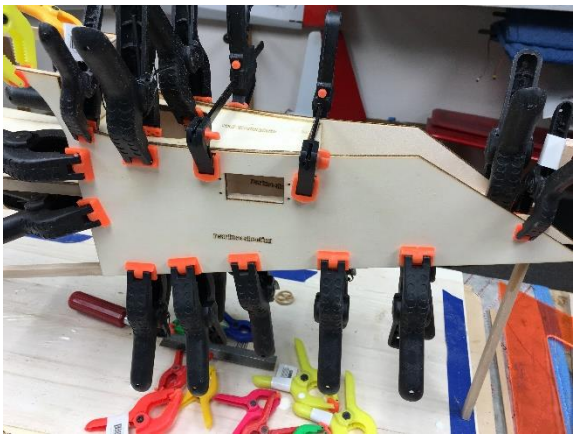


Next, using a razor saw cut through the stringer at the intersection of F5 however do not cut all the way through. Crack the spruce at this point to ensure an accurate angle with no bowing is achieved.

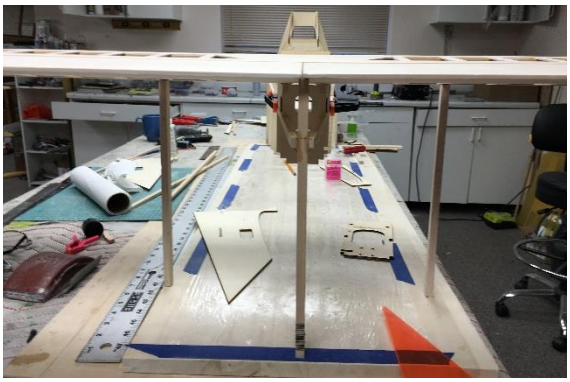
Next glue the elevator support mounts to the top of the main stringers flush to the outside. Position F8/stabilizer support bulkhead in position on the stringers using the servo support mount pieces to align the bulkhead in the correct vertical path.

Using the stabilizer as an alignment device glue the rear F9 bulkhead in place.

Next install outer rear fuse sides.



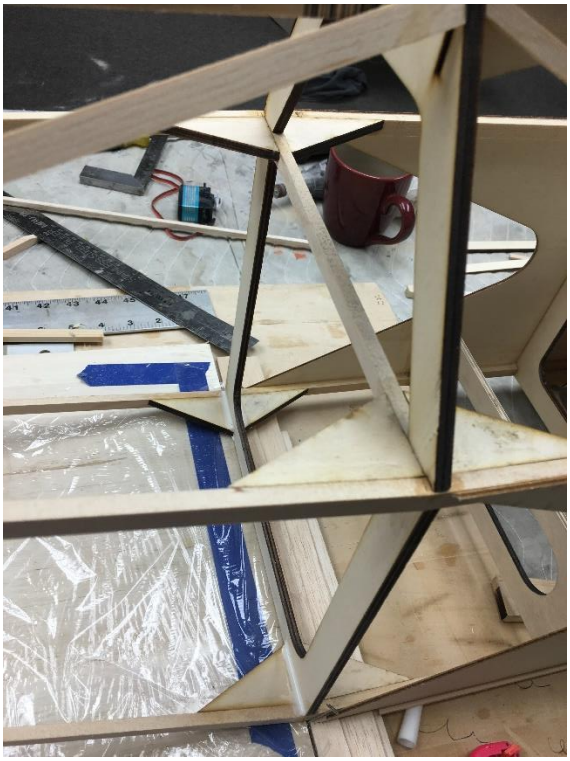
The stabilizer is at 90deg to the fuselage side.



Next position the additional bulkheads F6 and F7 along the stringers. Ensure the bulkheads are at 90 degrees to the fuse center like and at 90 degrees to the building bench.

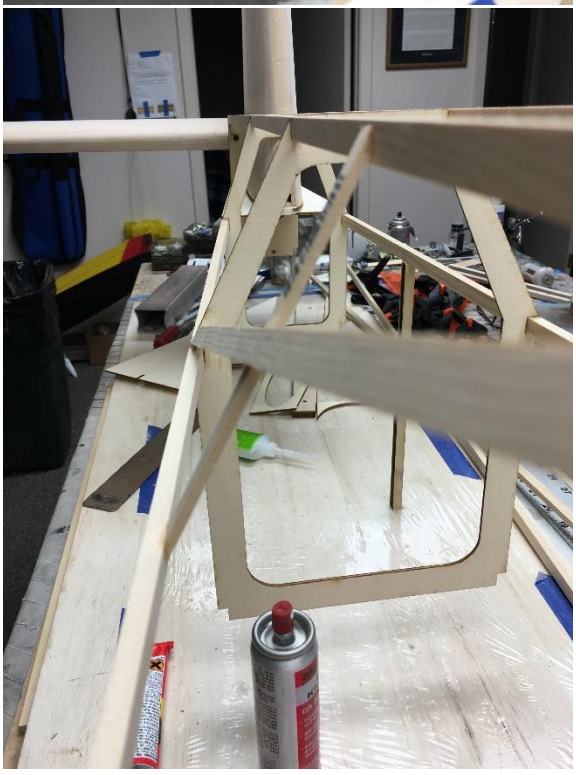
Next install stringer gussets and lower fuse rear stringers which is 3/8” x ¼”.

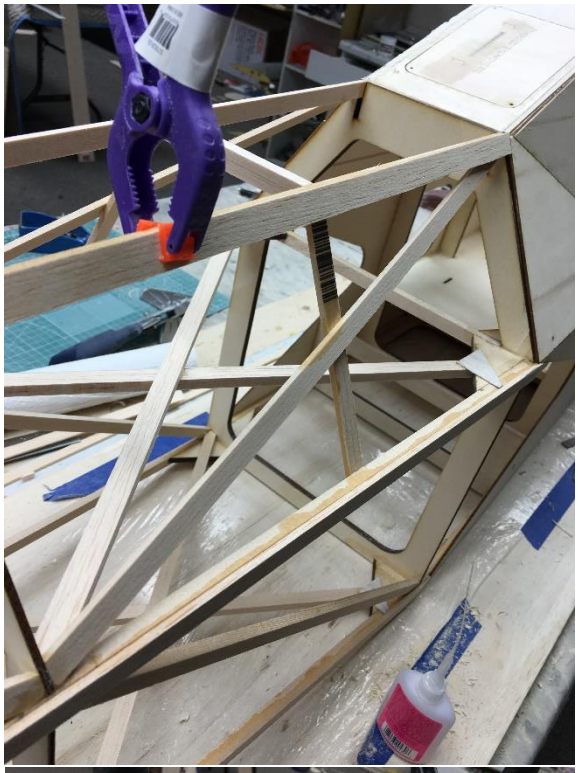
Stringer gussets support the joint at F5.

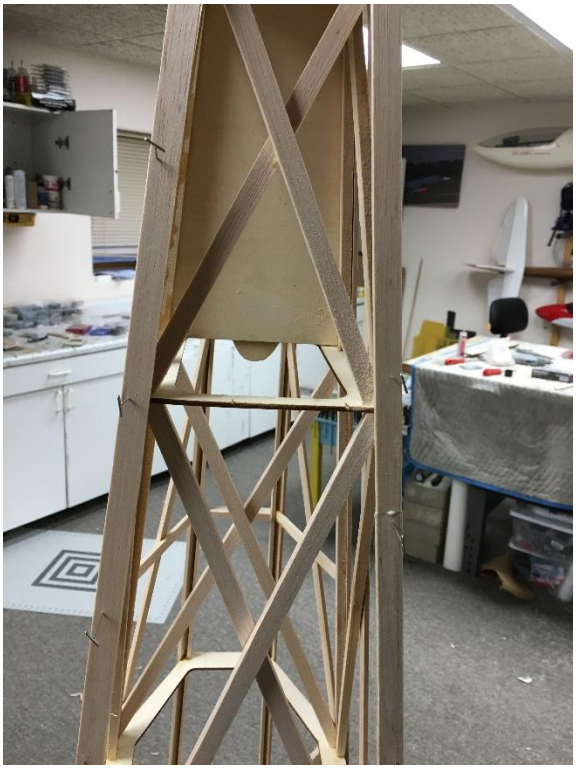


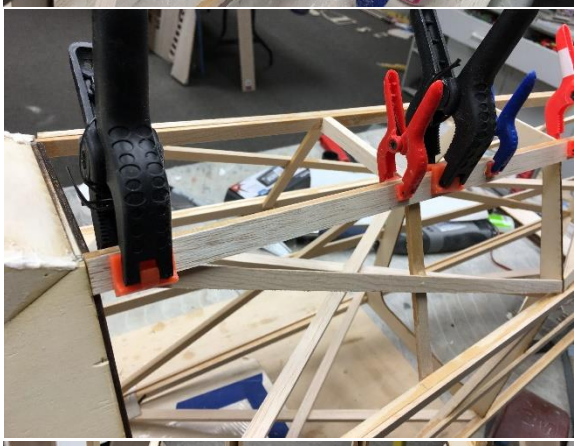
Next step is to glue in place the supporting rear stringers. These are primarily ¼” x ¼” hard Balsa, with the exception of the upper fuse support braces which are 3/8” x 1/8” spruce.

(Next few photos are general pictures to show various joints and positioning of stringers.)



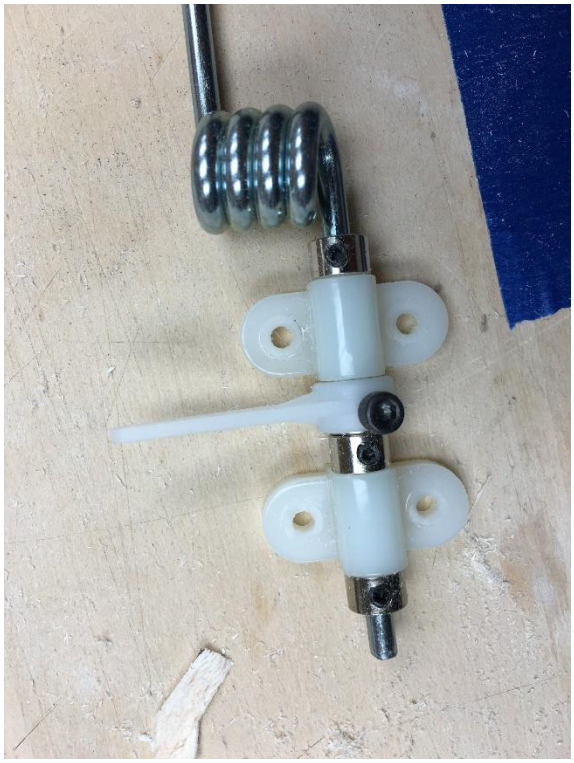


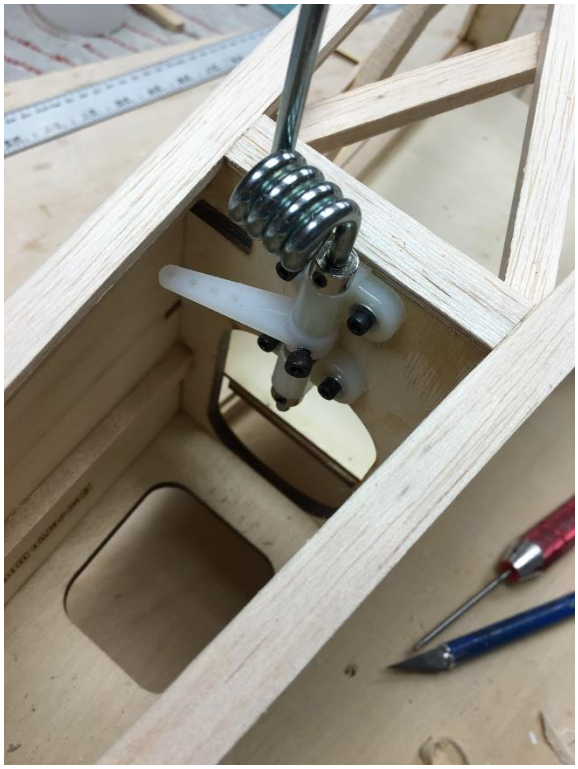




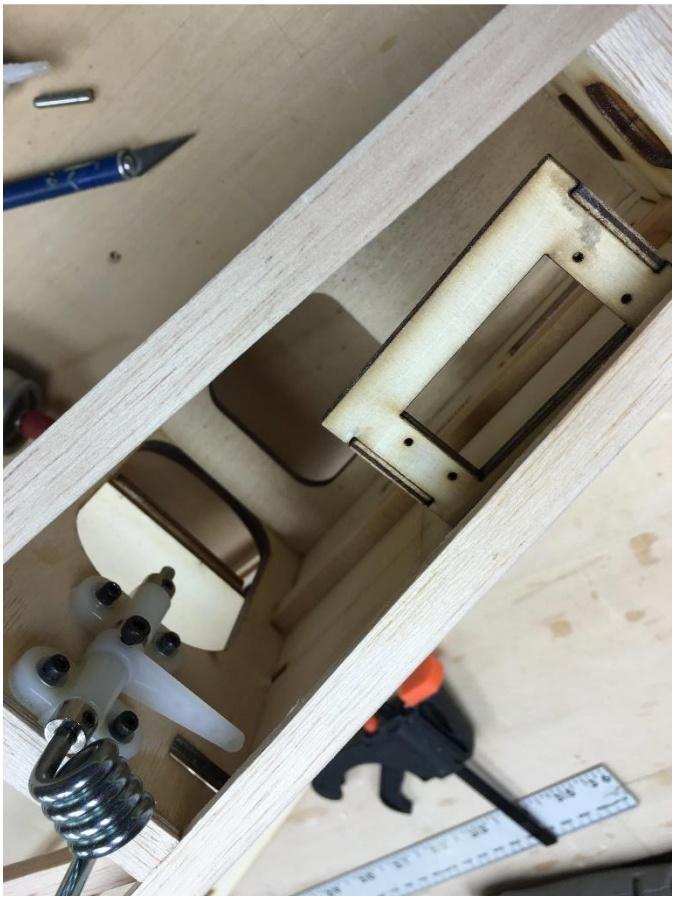
Next install rudder servo mount. Servo installation is through the tow hook servo hatch.

Next rough assemble tail wheel components and trial fit to the bulkhead





Install tailwheel servo mount.

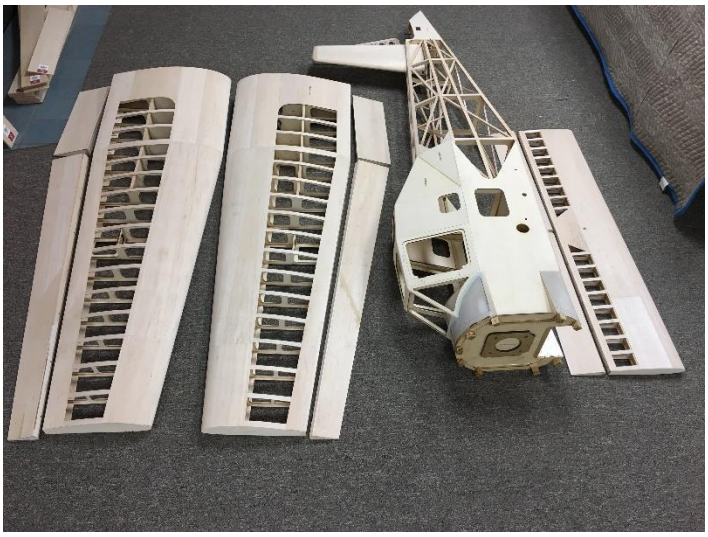


Next install rear stabalizer mount plate and F9 bukhead. Note the stab mount plate is sandwiched between F8 and F9 and the fuse sides.

Install rear fuse top sheeting

Position tail plane and measure from each tip back to the center ensuring it is at 90 degrees to the center line. Once in place drill through mounting plate utilizing the pre-drilled hole in the stab as a drill jig. Once drilled install the blind nut. Stab bolt (Not included is a countersunk, ¼- 20 @ 2.5” long)

Final note. The Perspex windows for the front cockpit are laser cut allowing for plastic covering so they will fit exactly within the window pain. If you choose to paint your model pay careful attention to window cut out areas so the Perspex windows will still fit correctly.



Final comments and setup.

Additional items required:

1 x Robart Door mount: Part # ROB350

1 x Dubro 5/32" Steerable Nose Wheel Assembly.

1 Pkt of Robart Hinges Combo Pack: Part # ROB312.

7" Dubro or Sulivan wheels.

2½" Tailwheel.

Dubro 100 oz fuel tank.

Radio Equipment.

Minimum 9Ch receiver Prototype used: SPMAR9130T

Extensions. Aileron 24" x 2

Elev 48" x 2

Rud 12' x 1

Tailwheel 48" x 1

Receiver to wings 4 x 12"

Tow release servo 1 x 18"

Throttle servo 1 x 24".

Servos

Aileron: 2 x 200plus ounce.

Flaps: 2 x 400oz

Tow Release: 1 x 300oz plus.

Throt: Standard full size.

Control throw:

Aileron 13deg up 11 deg down.

Elev: 12 deg up and down. Note prototype flew with 1/16" of down trim.

Flap: take off 12 deg; Landing 42deg.

Rudder: 20-25 deg.

Balance:

C of G. 7 – 7.5" back from the leading edge