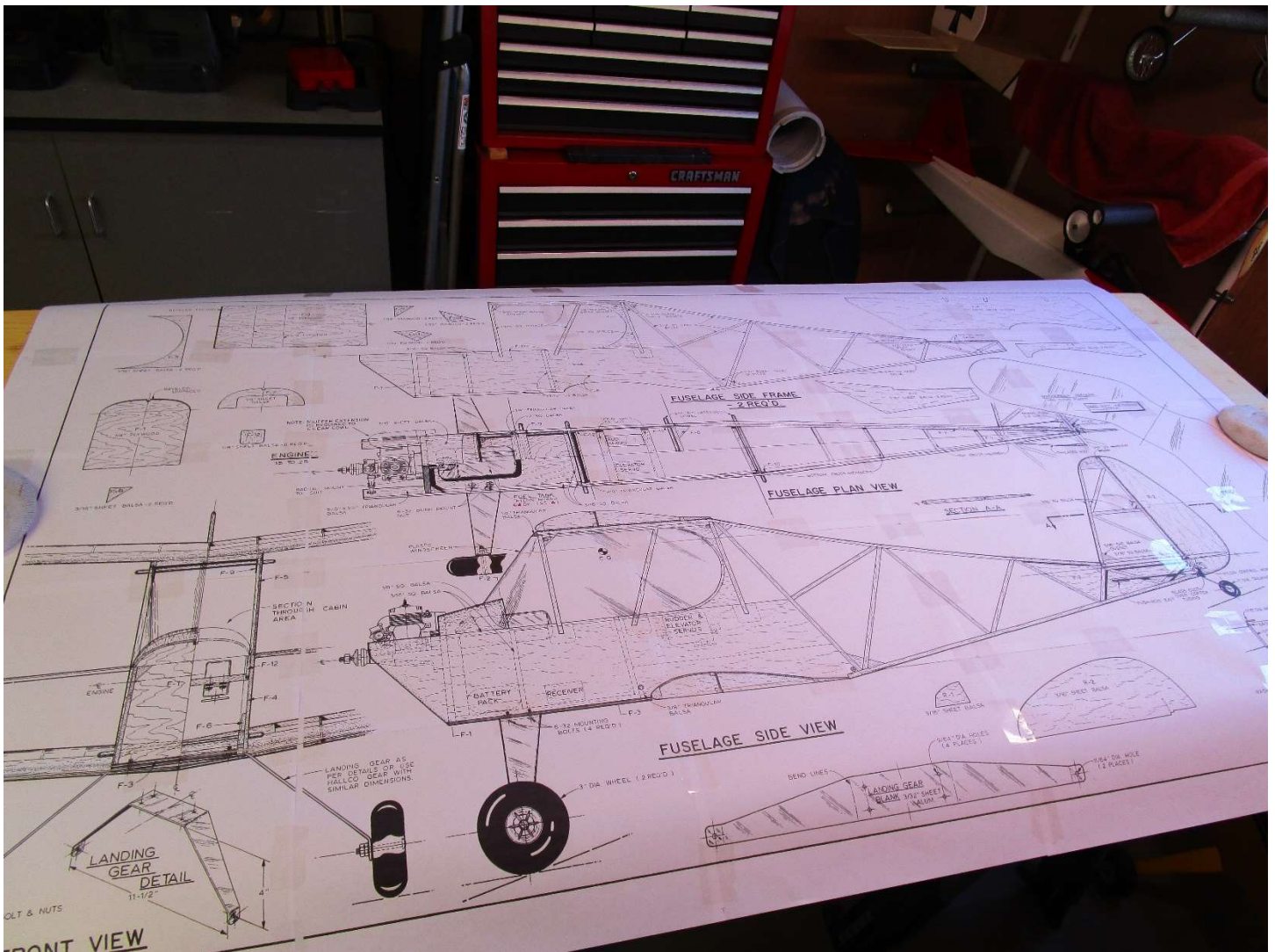




S.T.O.L. Pigeon Build Description



The free STOL Pigeon plan and article were downloaded from AeroFred.com. This is a GREAT site to obtain plans for scratch builds.

The construction is very straightforward. Simplified wings give all of you scratch builders a well-deserved break. The ribs are spaced as far apart as practical, and the wings are identical in all respects. The rib spacing allows a mere 38 ribs to be used for both wings. That number is very close to most 2-meter gliders, but remember, you get all the nostalgia of two wings for the building time of one...

This is a great plane for the first-time scratch builder to build and fly. I modified the plans to use "bolt-on" wings (template found on BalsaWorkbench.com), increased the rudder by 30%, extended both wings to 48" and removed the dihedral, and used an OS .35 2-cycle for power.

I used five channels in this airplane but that is not to say fewer could not be used. This biplane has been flown on three channels and it even does well on two channels. The reason for the five channels in my aircraft is that I tend to get frustrated with a slow aircraft if I can't do aerobatics and have lots of functions to play with.

First step in most of my builds is to print out a copy of the full-size plan on my Canon printer using the "poster" settings, and then putting all the pages together for an overall 77" x 42.5" plan on two sheets. You can also get the plan printed out at FedEx for around \$25 a copy.

Having the full-size plan, I then go thru and determine all the materials I'll need to make the build. Any balsa sticks and sheets, basswood, or plywood I'll need is ordered from Balsa USA.

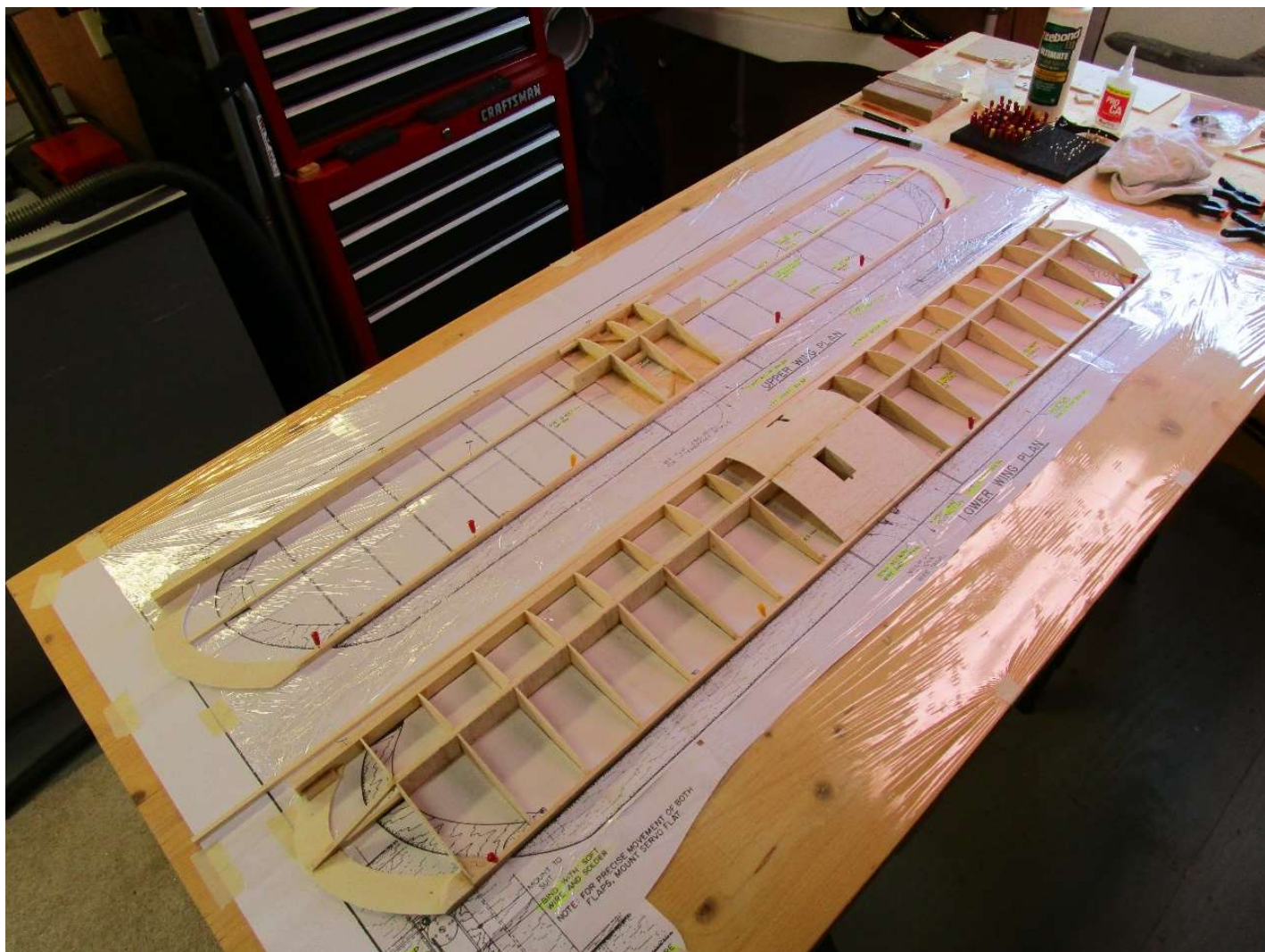


Fuselage sides are built directly over the plans. Wherever the plans call out using "hard" balsa, I've use basswood for added strength. Please note in the picture above that the upper fuselage plan view has several "Red" markups of the changes required for the "bolt-on" wings. The "Stick" construction used in this plan results in a very light model but is also strong in the areas needed. Also shown in red is the 30% increase of the rudder. I did this because of the short fuselage, and I increased the wingspan to 48".

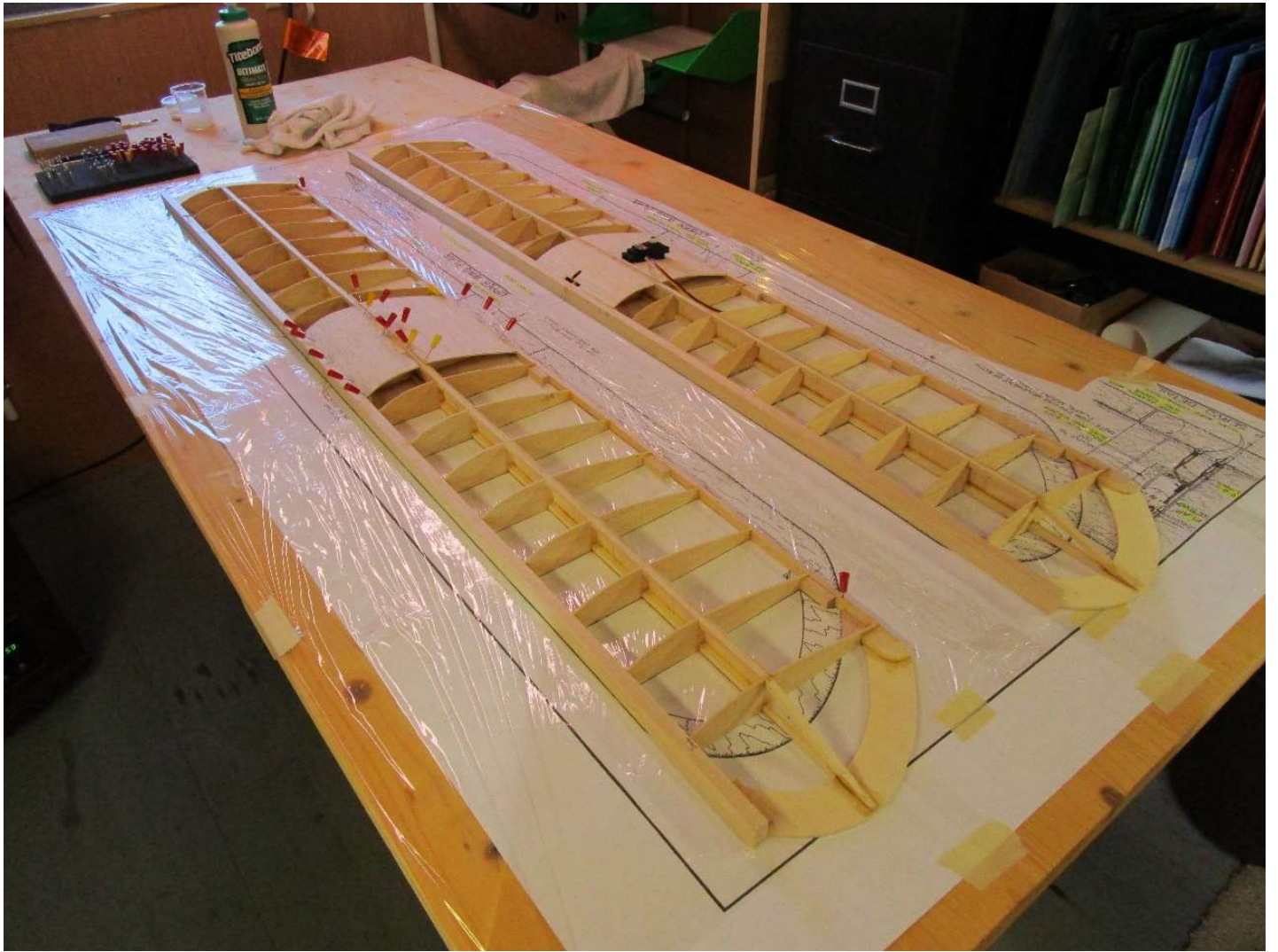


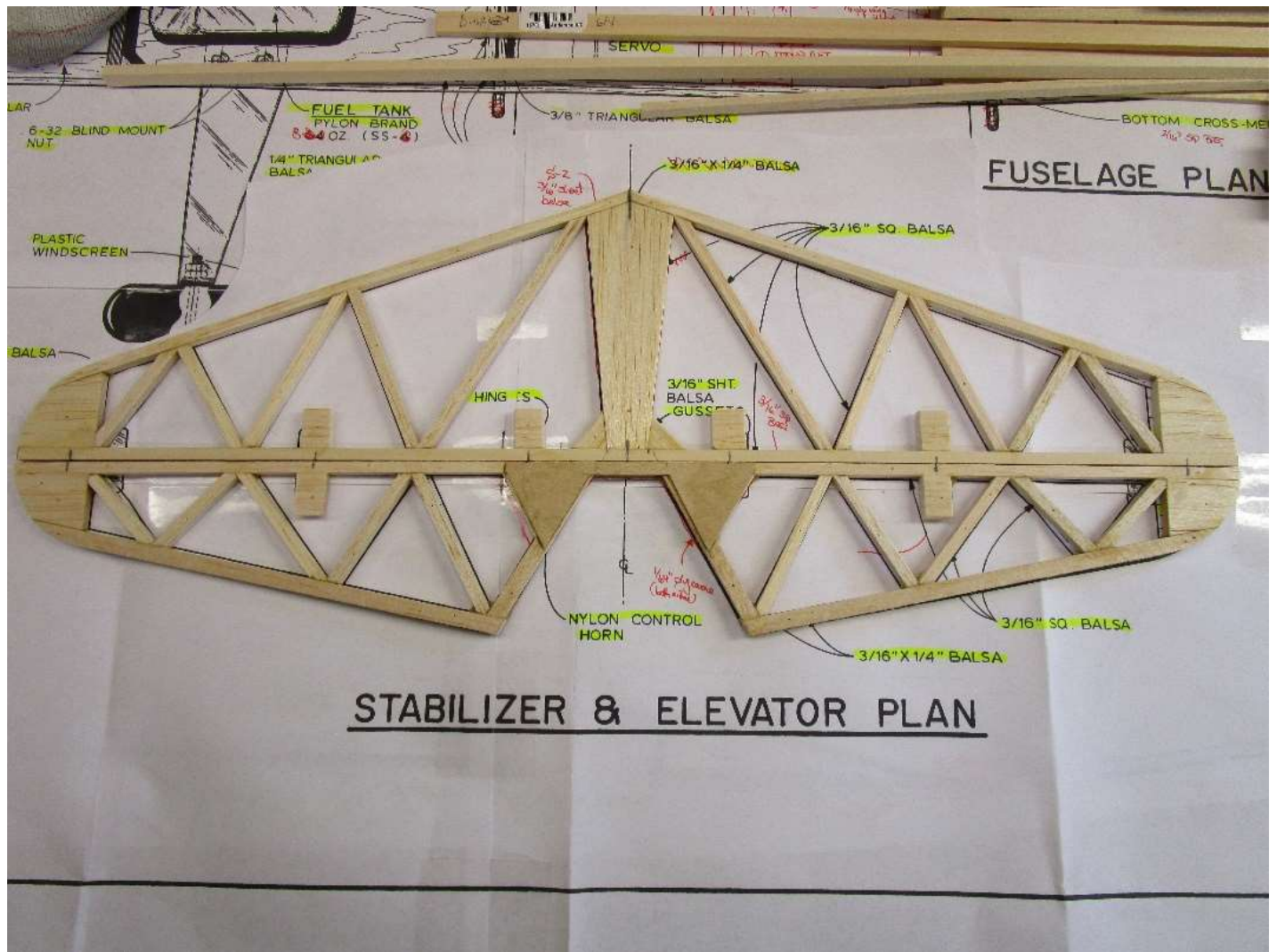
Once you have the two sides are finished, they can be joined together using the various cross members and plywood firewall former. This is done directly over the plan to keep everything aligned and square. Note the several plywood gussets I've placed over the fuselage stick joints for additional strength. You can also see the servo tray side rails that were added to the inside fuselage sides. Because I'm using the OS .35 to power this model, the servos will need to be placed further aft than shown on the plans to obtain the correct CG location.





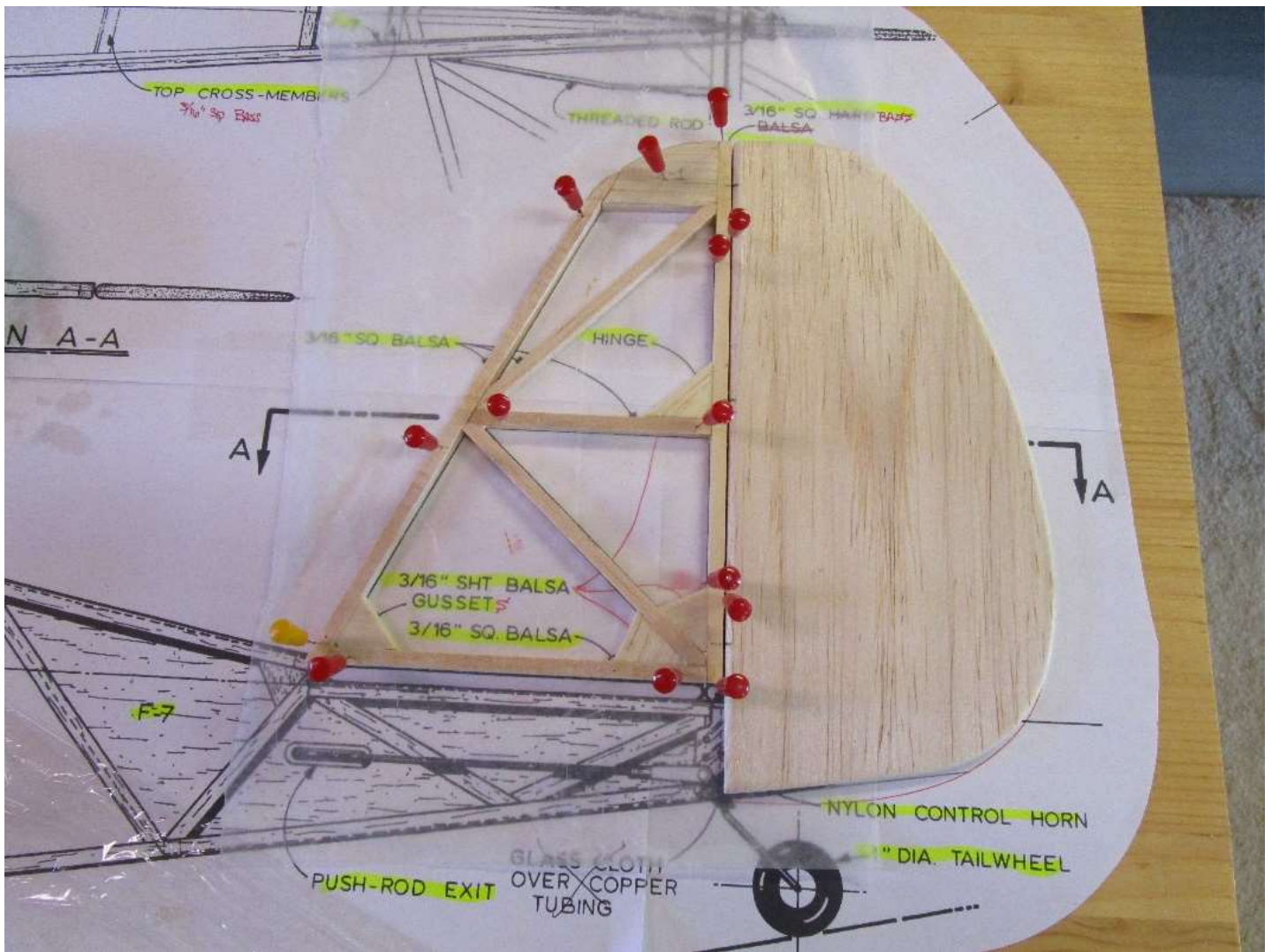
Since the airfoil is flat bottom, the wings can be built directly on the plans without having to use a wing jig. As I'm cutting out each set of ribs, I test fit and adjust each to fit over the lower spar and between the leading and trailing edges. This wing design has vertical grain shear webs between the spars, which results in a strong, but very light wing structure. While many builders use CA for assembly, being an old man that moves slow, I prefer to use a premium wood glue for most of the assembly, and two-part epoxy for the high stress areas (like landing gear blocks, firewall install, horizontal tail to fuselage join, etc.).





FUSELAGE PLAN

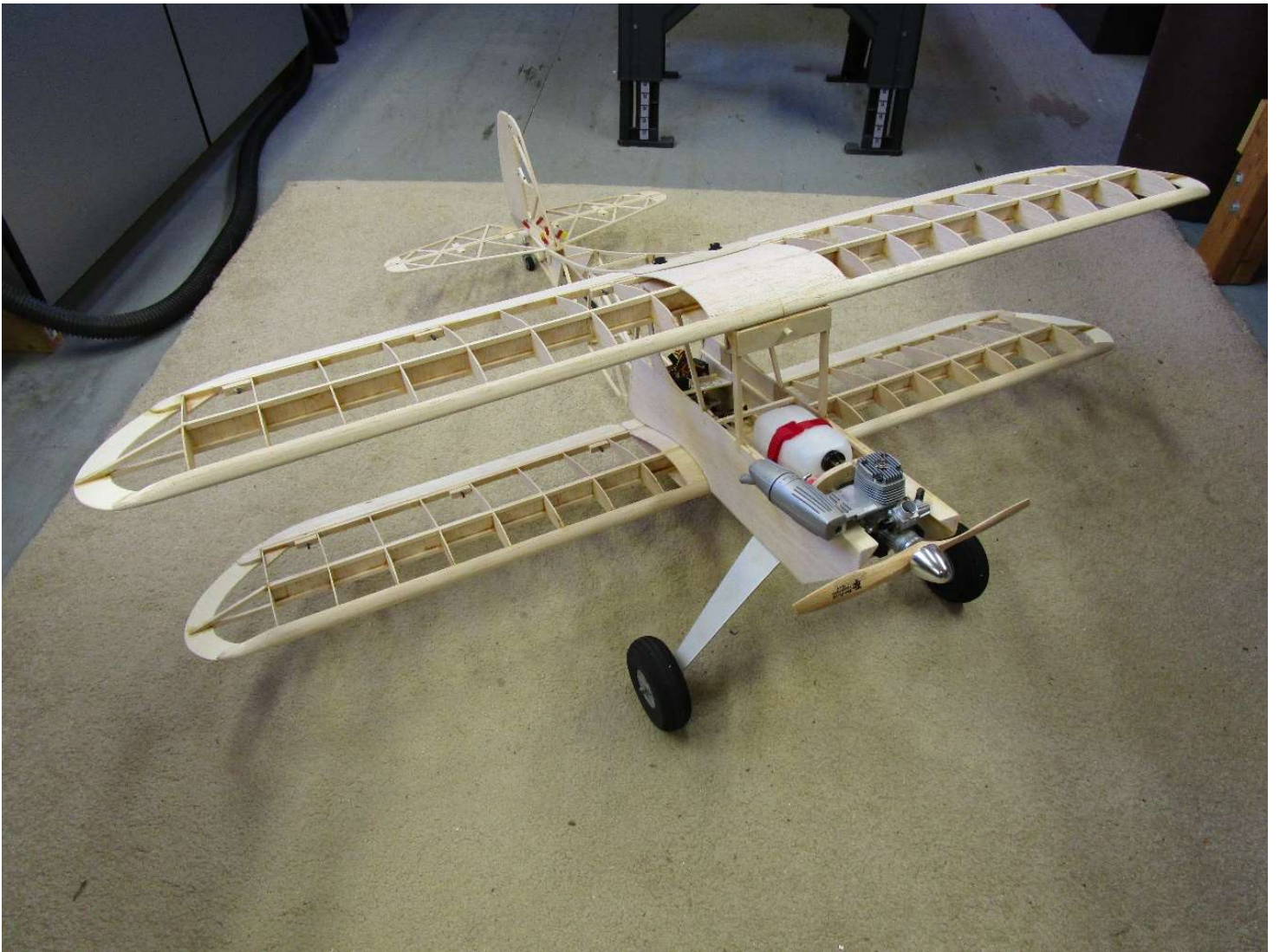
STABILIZER & ELEVATOR PLAN

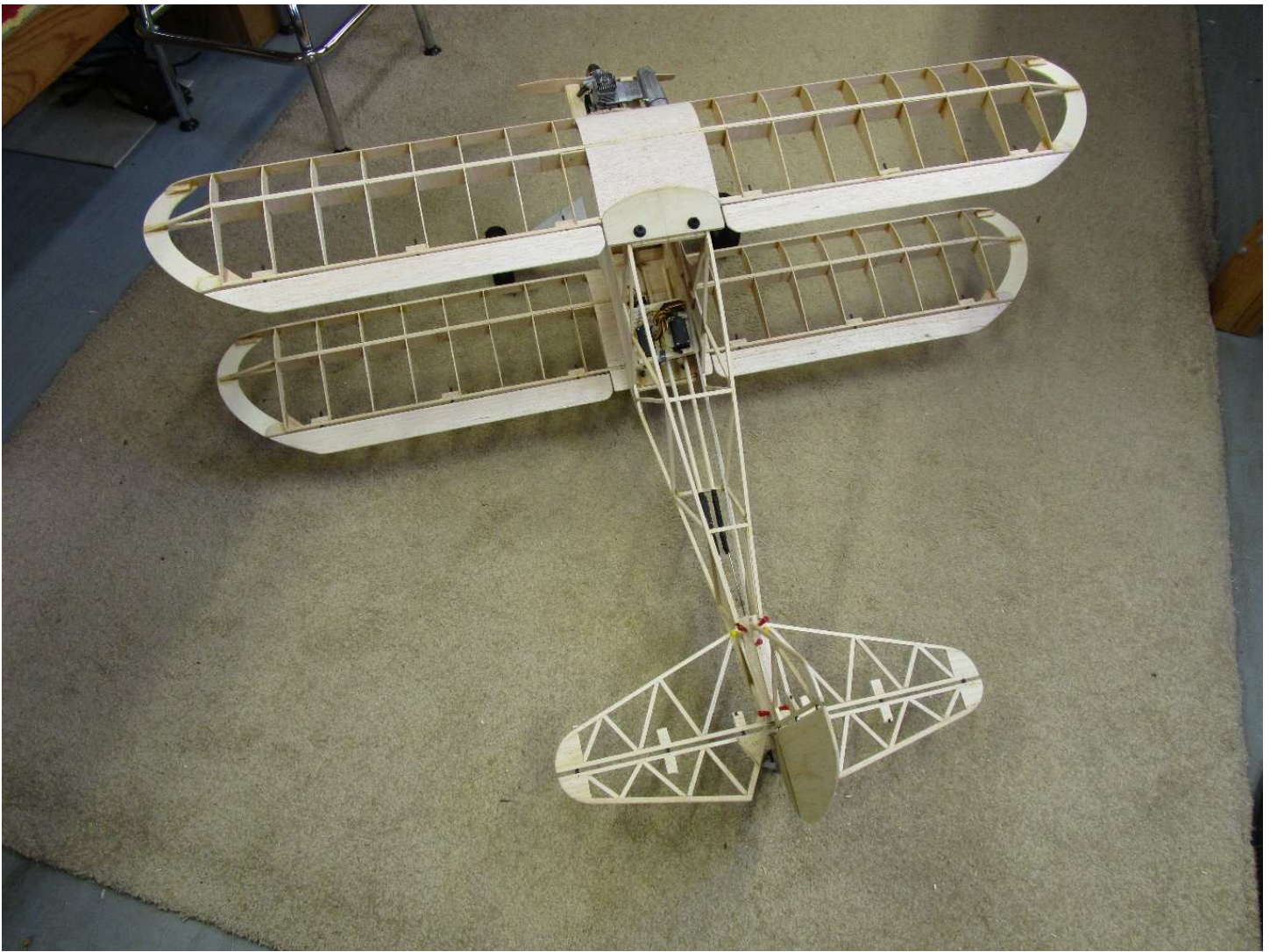


The two pictures above show the build-up of the various tail feathers. Each are built directly over the plans covered with some wax paper. Modifications I made were to use basswood for the vertical stab trailing edge, horizontal stab trailing edge, and the elevator leading edge. Another mod I make to all my scratch builds is to place some 1/64" ply on the bottom of the elevator to cover the joints between the center hardwood dowel rod, the leading-edge pieces, and the balsa corner bracing on each side of the center gap. I also add a piece of 1/64" ply to the area at the lower portion of the rudder where the control horn will mount (not shown in these pictures). All these modifications will add a very small amount of weight but will greatly increase the overall strength of the tail feathers and provide solid surfaces for the control horns. The leading edges of the elevator and rudder must be rounded to allow each to pivot at least 45 degrees in both directions. I will use Robart pin hinges, drilling the required holes in basswood pieces using the little Robart fixture. These get epoxied into the tail feathers after all covering is finished, and the tail surfaces are epoxied to the fuselage (horizontal stab first, followed by the vertical stab, then the elevator, and finally the rudder which fits over the elevator center dowel).



The picture above shows the various completed pieces laid out across my workshop benches. Now it's time to see how everything fits together. Install the engine along with the muffler, prop, and spinner. Install the fuel tank and receiver battery along with any required padding, and the throttle guide tubing. Slide the elevator and rudder control rods into guide tubes. Install the landing gear and tires on the fuselage. Temporarily install hinge pins in the ailerons and flaps, elevator, and rudder, and then mate to the respective members. As seen in the two pictures below, attach the wings to the fuselage, and then temporarily pin the tail feathers to the fuselage. Now to see where the servo tray assembly needs to be placed in the fuselage to obtain the correct longitudinal CG. You also need to check the lateral balance and place any required weight in the wingtip that is light. Disassemble everything, finish sand all surfaces with 220 grit sandpaper, wipe surfaces down with a tack cloth, and lightly coat all areas that will contact your covering with Coverite Balsarite from SIG. I paint the inside of the engine compartment with flat black oil-based enamel paint to protect the balsa from any glow fuel. Apply whatever covering you like to use.





Once all covering is completed, epoxy the horizontal stabilizer to the fuselage making sure it is level, then install the vertical stab to the top of the horizontal stab using epoxy. I use a plastic triangle taped to the two stabs to ensure they remain perpendicular to each other while the epoxy cures. With that finished the elevator is matted to the horizontal stab using epoxy and 6 pin hinges, followed with mounting the rudder to the horizontal stab. With all the tail feathers in place the control horns are mounted to the elevator and rudder and the control rods measured and installed.

The last two pictures below show the finished STOL Pigeon. Double check all the control throws, and throttle throw for correct directions, and verify the CG is per the plans. Don't forget to complete a range test of your receiver.

“A fun plane to fly and holds true to its name "STOL" (Short Take Off & Landing). The flaps are extremely effective, take-off roll is reduced to 25 feet on grass and the landing on a calm evening is a very short 5 feet from touch down to roll out.”



