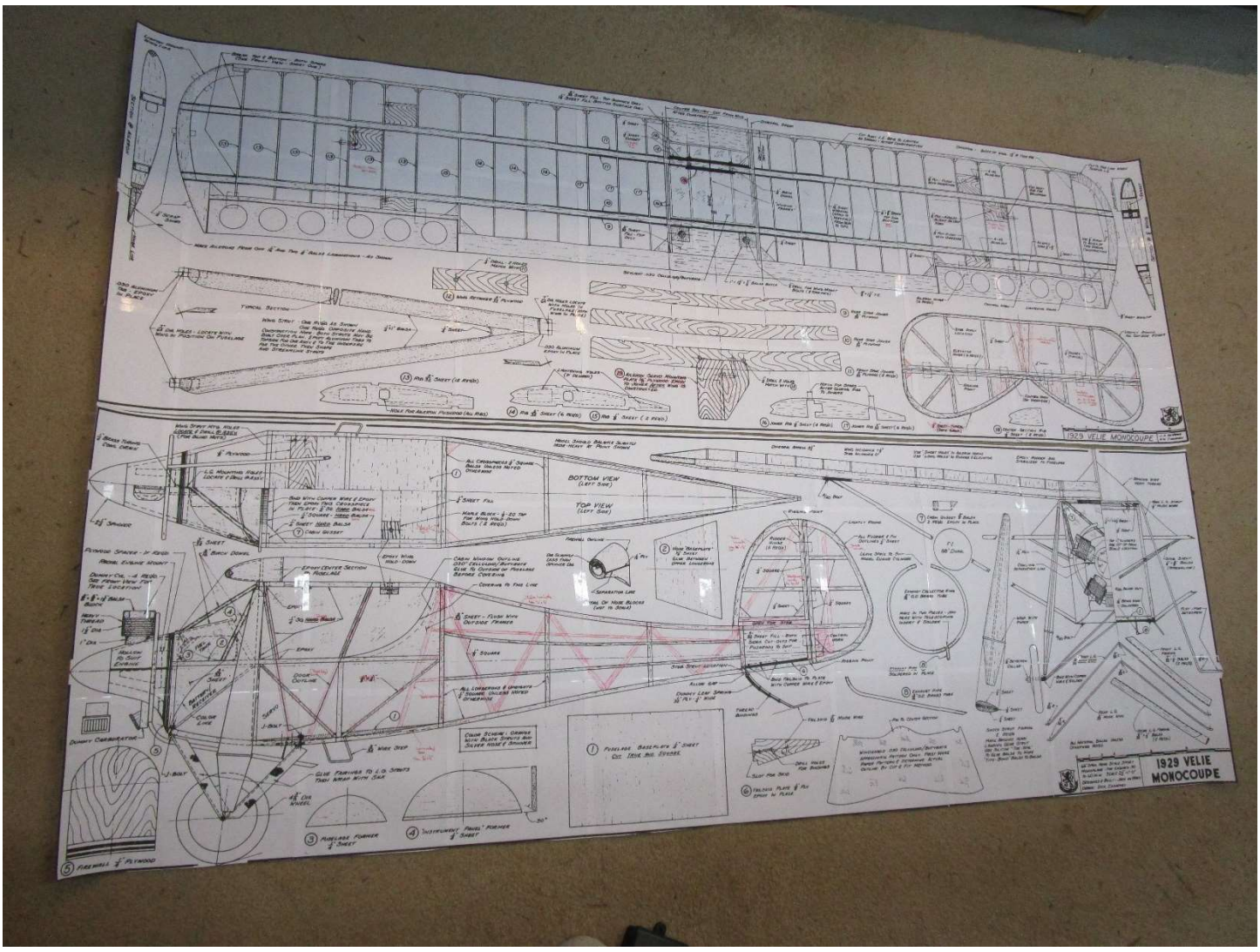
NIEMAN AVIATION ENGINEERING & RC MODEL WORXS INC.
CLEMMONS, NORTH CAROLINA

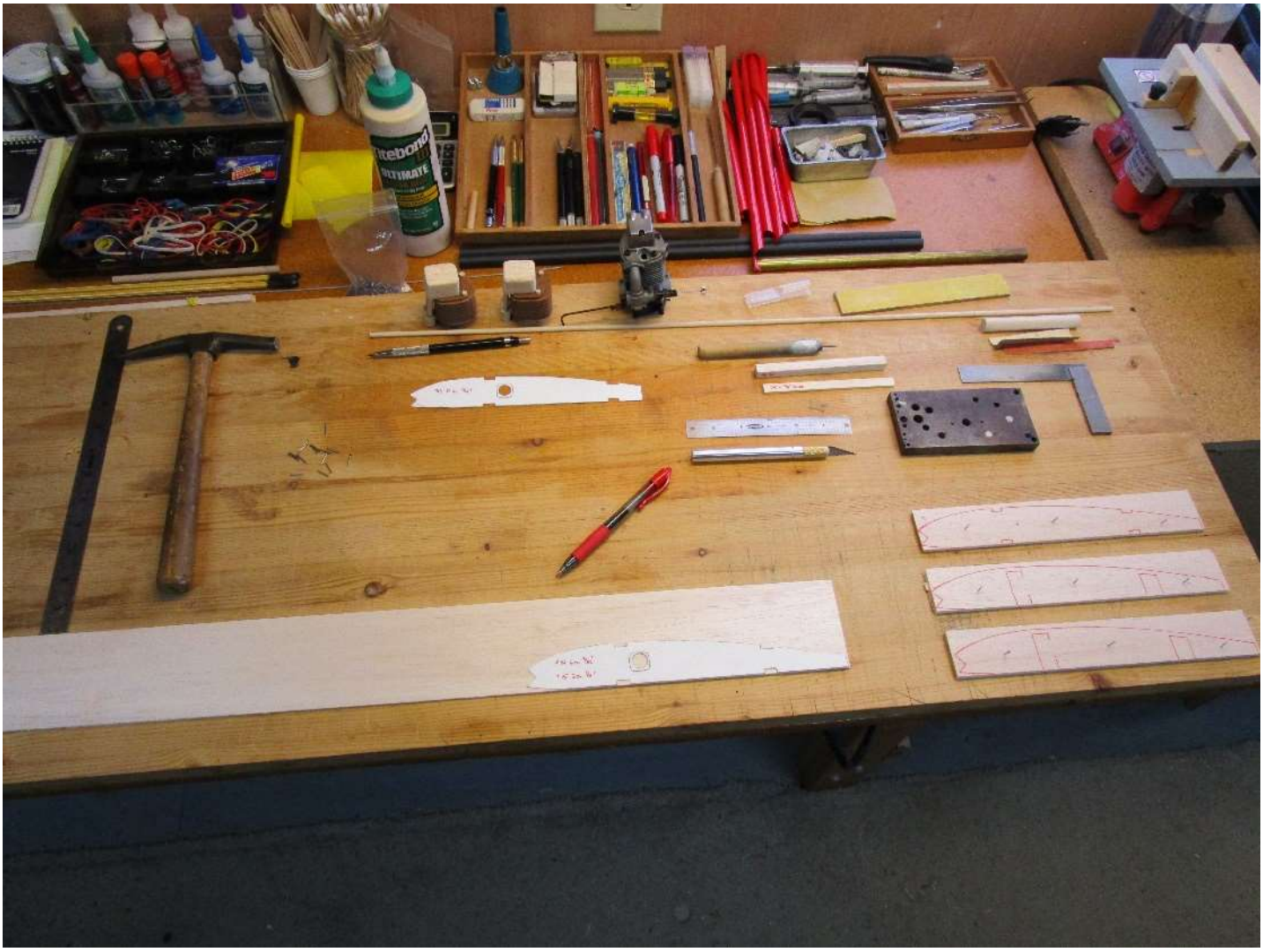
1929 Velie Monocoupe Build Description

The Velie Monocoupe Model 70 was one of the first planes ever built for private fliers. A total of 350 Velie Monocoupes were built from 1927-1929. The Velie Monocoupe was a wooden framed, doped fabric-covered monoplane, seating two people side-by-side in an enclosed cabin (hence the name). Conceived by pilot/businessman Don A. Luscombe, who developed a mock-up in 1926, and developed into a flying airplane by farmer-turned-plane-designer Clayton Folkerts—first produced by Central States Aircraft Corp in Davenport, Iowa—the little plane was a revolution in personal aviation: small, relatively inexpensive, quick, and efficient (70-80 mph on just 55 horsepower), and with an enclosed cockpit (protected from the weather) for two people. In an era of big, costly, lumbering, open-cockpit biplanes, the Monocoupe was like a flying sports car coupe. Powered by the little 55 hp Velie five-cylinder air-cooled radial engine and a wingspan of 32', the model 70 Monocoupe was a very successful airplane. The company sold so many units in 1928 that they were able to claim that 80 percent of the civilian airplanes sold in the U.S. in that year were Monocoupes.

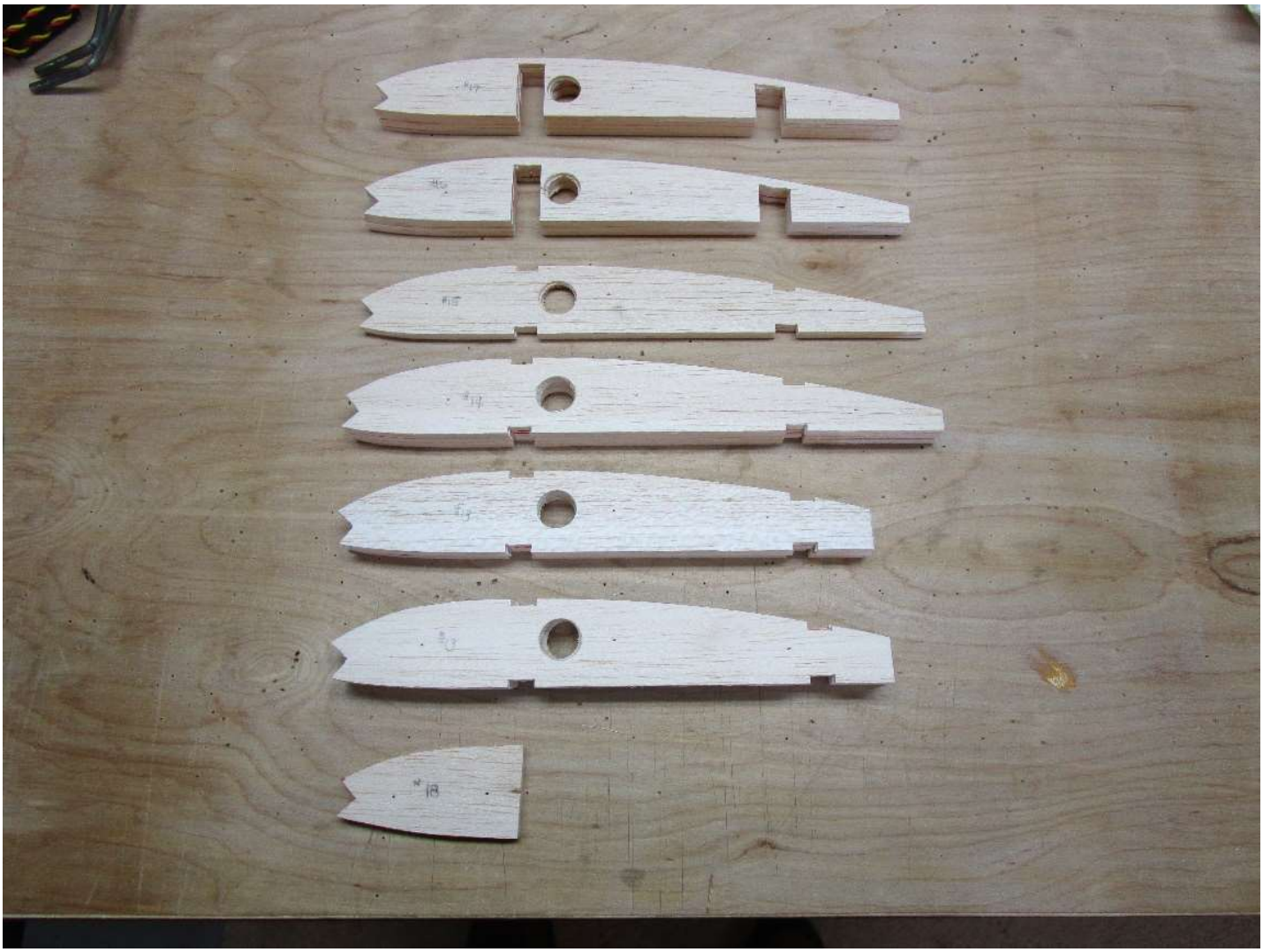


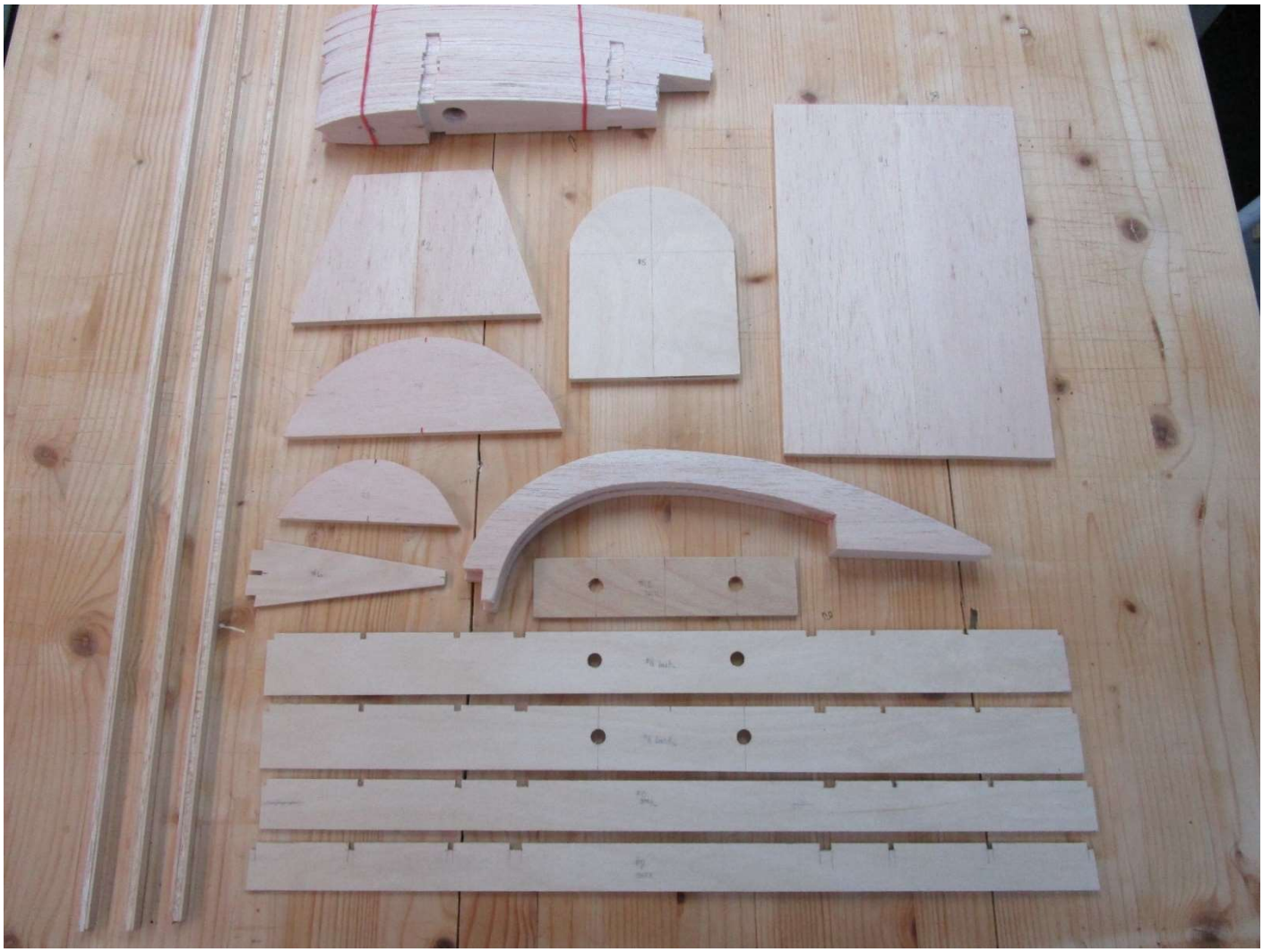
The free 1929 Velie Monocoupe plan and article were downloaded from AeroFred.com. The Velie in this build was designed by Jack de Vries, Colonel U.S.A.F., and the article is from a January 1973 Radio Control Modeler (RCM) magazine. This 40-size version has a wingspan of 66", an overall fuselage length of 45", and is designed for a .30 - .60 cu. in. engine. I will be installing a Thunder Tiger .54 4-stroke my father used many years ago.

The first step in any of my scratch 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 74" x 48" plan shown above. I was not able to get the plan printed out at FedEx because their large format printer could not handle the 48" width. Using 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 that I don't have in my building wood stocks is ordered from Balsa USA. Some of the changes I made to the plan can be seen above in red. These will be discussed in more detail throughout the build sequence.



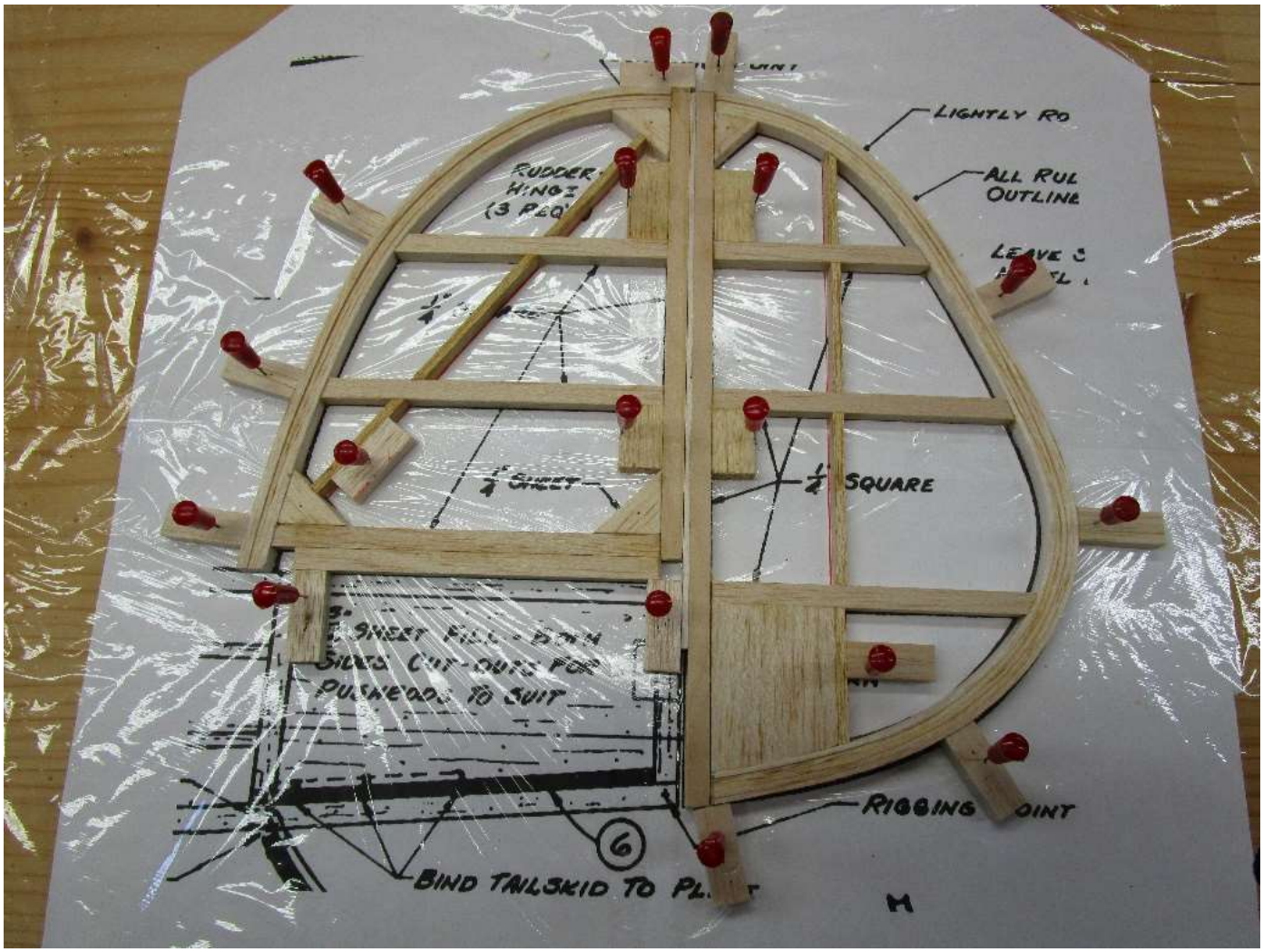
With the wing being longer than my magnetic build board, this build will be accomplished using the old wood build board pin-in-place method. The Velie is a good stick build for anyone with some basic woodworking skills, but I would not say it should be considered for your first scratch build project. I started my build with cutting out templates #13 thru #18 in the plan for all the wing ribs. Trace a given rib pattern on a 3/32" x 3" balsa sheet, and then put multiple pieces of balsa together using small brads at each end of the rib pile to cut out multiple ribs at the same time. I use a table band saw to cut out the rough rib shape, and then a table disk sander to sand down to the final shape, just removing the traced lines. Do the same for the several ribs that call for 1/8" balsa sheet. All notches in the ribs are cut out with the table band saw, checking the width and depth using a scrap piece of spar and leading edge. When finished you should have a total of 32 ribs as shown in the picture below.



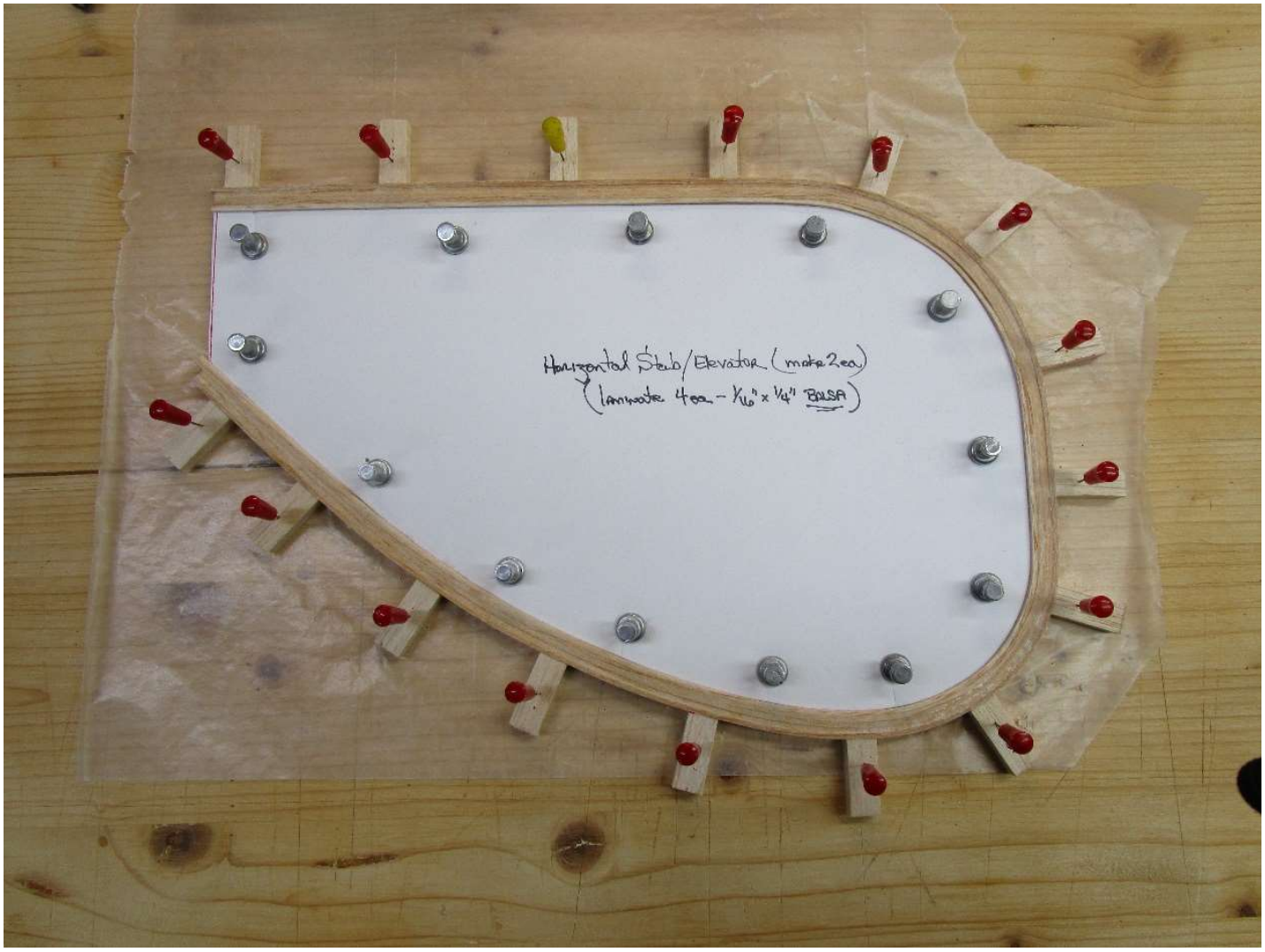


The picture above shows several of the pieces cut from templates taken from the plan. The four birch plywood wing spar joiners at the bottom of the picture have been modified from those on the plan. The full-size aircraft does not have any wing dihedral, so the four spar joiners I made have the plan dihedral removed. The other pieces are per the plan. Other modifications I made to the plan will be discussed as they come up in the build sequence. While doing some web research for my build I came across a build log on RCGroups.com (https://www.rcgroups.com/forums/showthread.php?2977702-RCM-s-1929-Velie-Monocoupe) for the same plans. Reading thru that post I learned some new (for me) build methods which I adopted in my build.

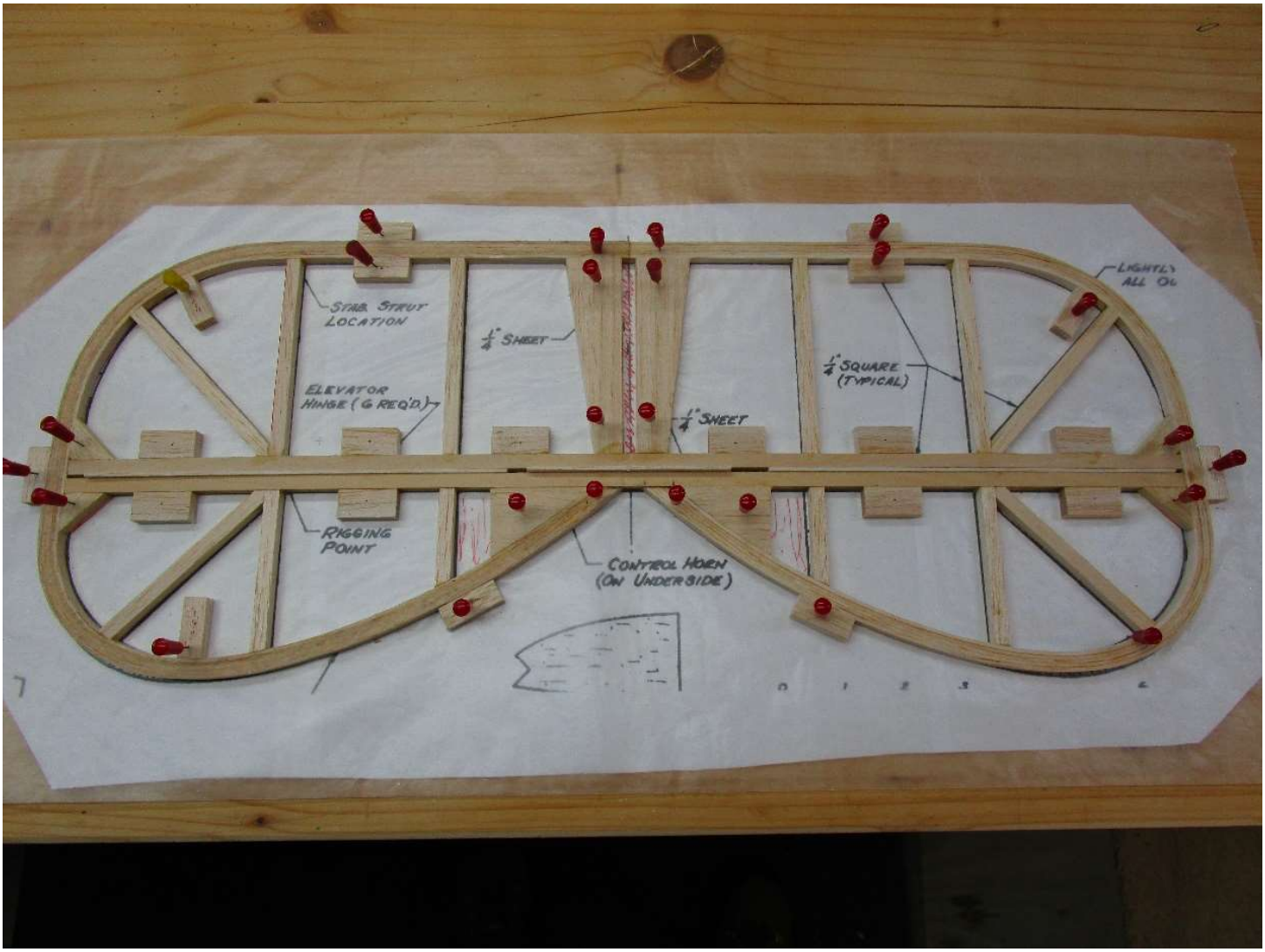
Pictured above is one of those new build methods. For the tail feathers, the plan calls out cutting all the outline pieces from 1/4" sheet balsa, as I've done for many of my scratch builds in the past. Using 3/16" foam core board from Wal Mart, forms are made using templates from the plan traced onto the foam core, cutting that with a table bandsaw, and then carefully sanding to the final shape. Above is the resulting vertical stab/rudder form. I used five (not six as written on the form) strips of 1/16" x 1/4" balsa, soaked in warm water for several minutes, and glue them together using Titebond III Ultimate wood glue, wrapping each strip around the form, and holding them in place as shown. Let this dry overnight and you end up with a very strong laminated balsa outline that holds the shape of the form. A slick and simple build method that will be used for other items in this build, and all my future builds.



The vertical stab/rudder are built right over the plans covered with clear wrap. The vertical stab trailing-edge spar and rudder leading-edge spar are laminated using a 1/8" x 1/4" balsa strip sandwiched between two strips of 1/16" x 1/4" basswood. This greatly increases the strength of the tail and allows for easy pin hinge installation thru the balsa center strip. Other modifications from the plan are the addition of a tab on the bottom of the vertical stab that will fit down inside the center section of the horizontal stab, and a larger balsa plate in the bottom of the rudder to make control horn installation easier. Added small hinge blocks as required.

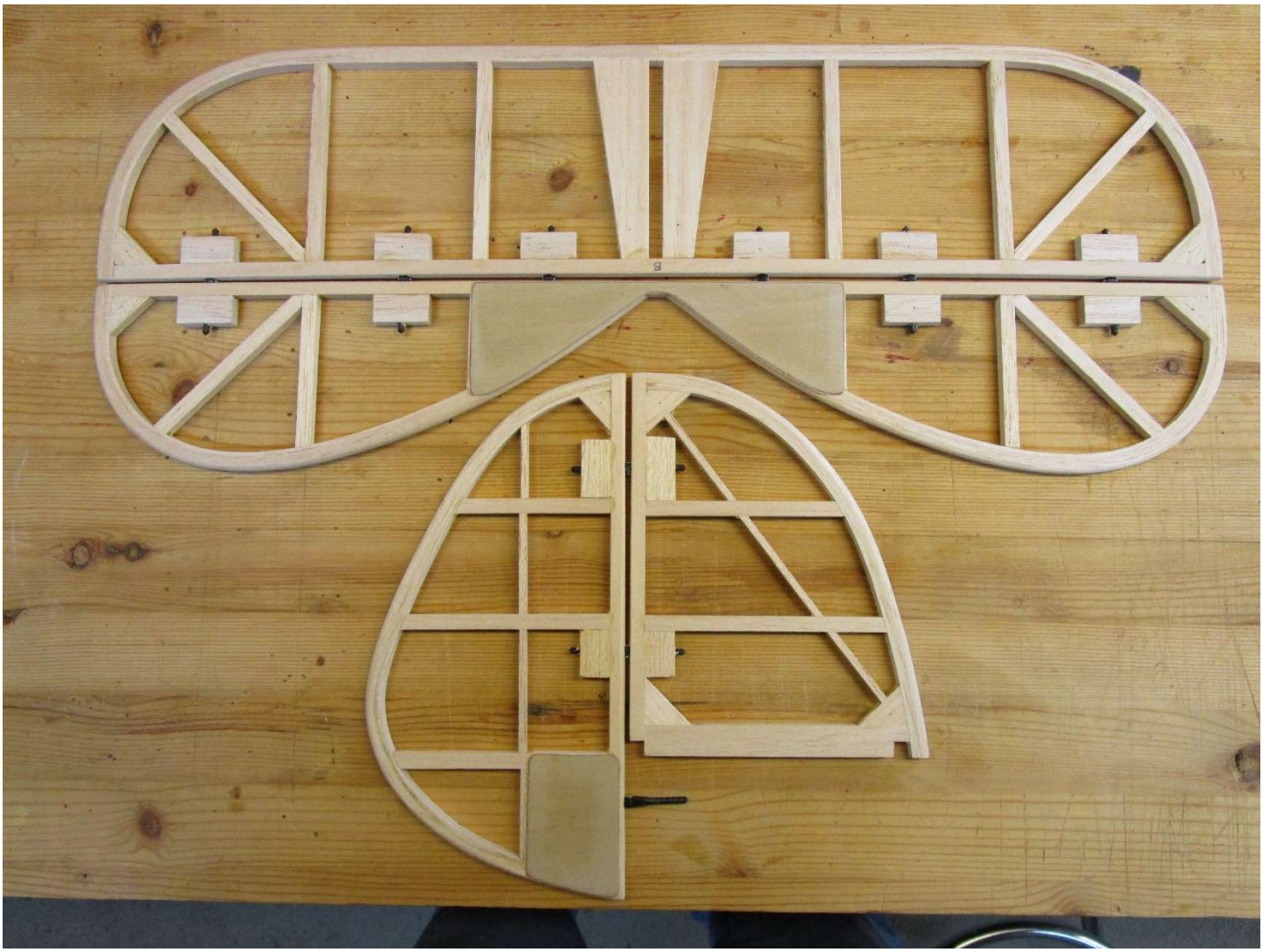


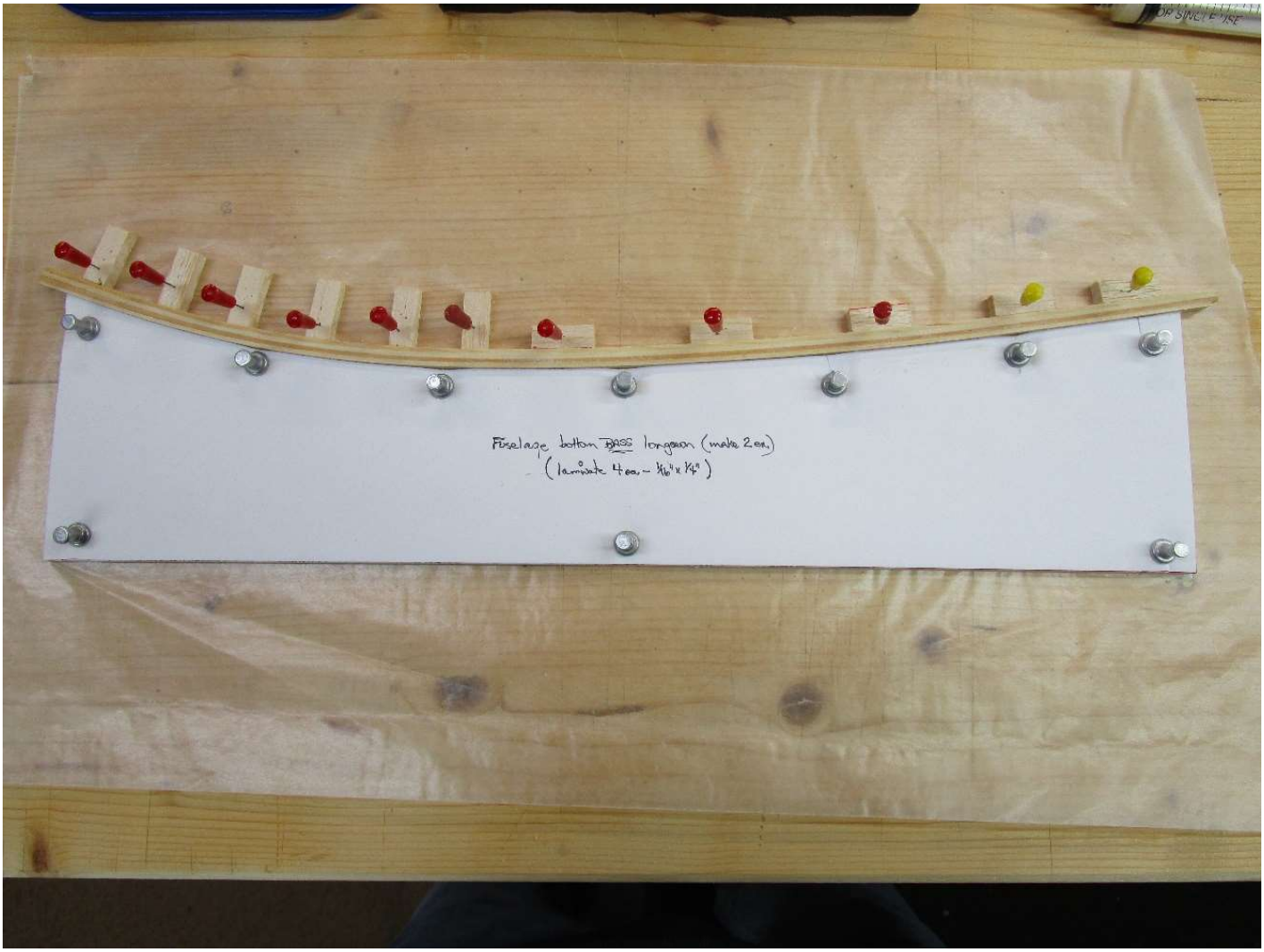
Same method is used for the horizontal stab/elevator outline. Above is the form with five (yes, it says four on the form, oh well) 1/16" x 1/4" balsa strips laminated around the outside. Two of these are required for the horizontal stab/elevator build.



Again, the horizontal stab/elevator is built right over the plan, covered with wax paper this time. The horizontal stab trailing-edge spar and elevator leading-edge spar are laminated using a 1/8" x 1/4" balsa strip sandwiched between two strips of 1/16" x 1/4" basswood. A 1/4" space is left in the center of the horizontal stab center plate for the tab that I added to the bottom of the vertical stab. Added small hinge blocks as required, and some gussets at each end of the spars. Once dry the outline will be cut between the spars.

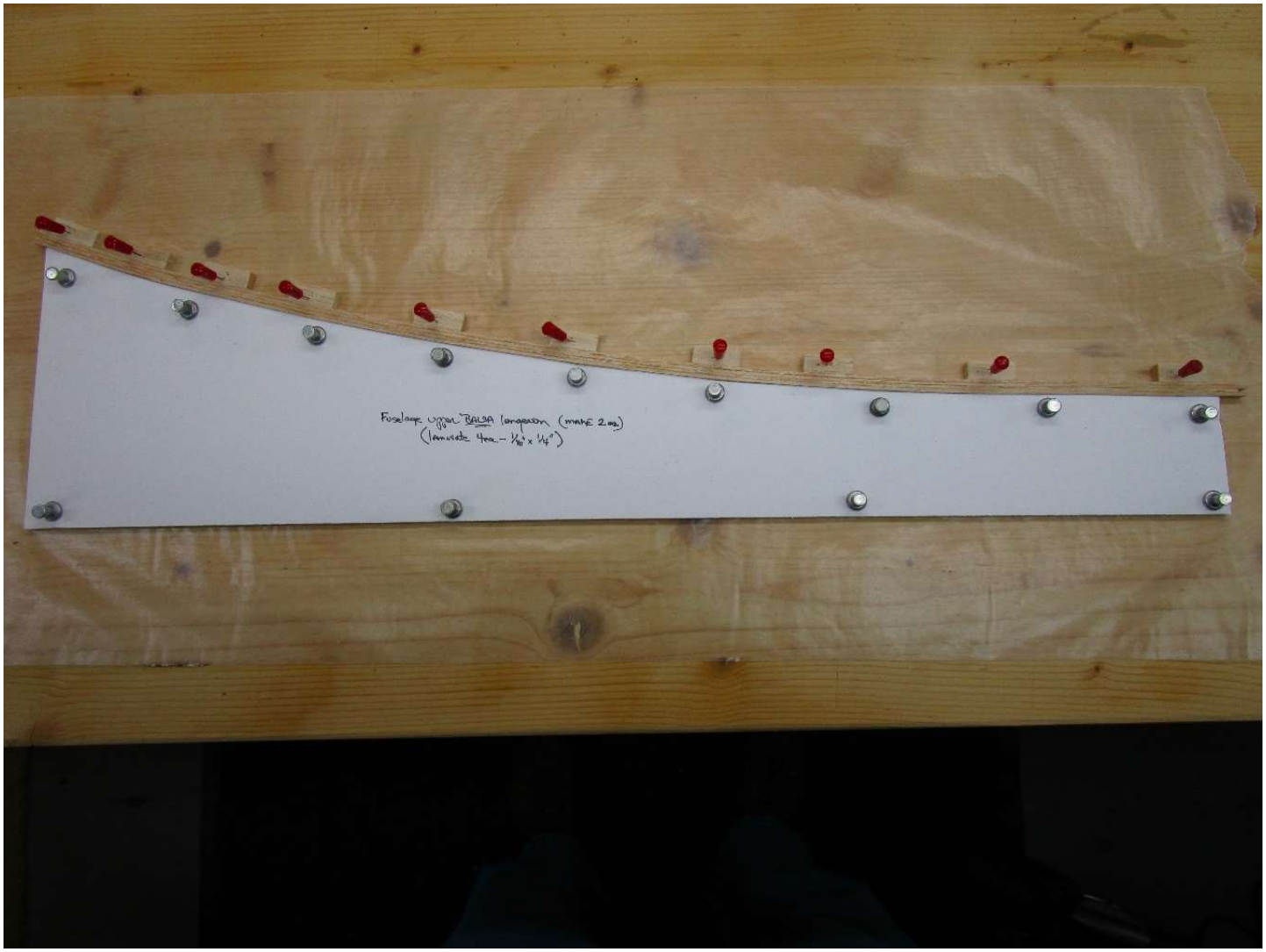
The picture below shows the completed tail feathers after sanding and test installation of hinge pins. A mod I make to all my scratch builds is to place some 0.025" ply on the bottom of the elevator to cover the joints between the center hardwood dowel rod (or leading-edge spar in this case) and the balsa corner bracing on each side of the center gap. I also add a piece of 0.025" ply to the area at the lower portion of the rudder where the control horn will mount. These modifications add a very small amount of weight, but greatly increase the overall strength of the tail feathers and provide solid surfaces for the control horns. The outline laminated pieces have been sanded to a rounded shape. The leading edges of the elevator and rudder are rounded to allow each to pivot at least 45 degrees in both directions. Again, I used Robart pin hinges, drilling the required holes in 1/8" center balsa strips 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 spar). NOTE - While not shown in this picture, after trying to mate the two surfaces together a portion of the vertical stab bottom tab and its trailing edge had to be removed to make room for the elevator leading edge, which was not shown on the plans.

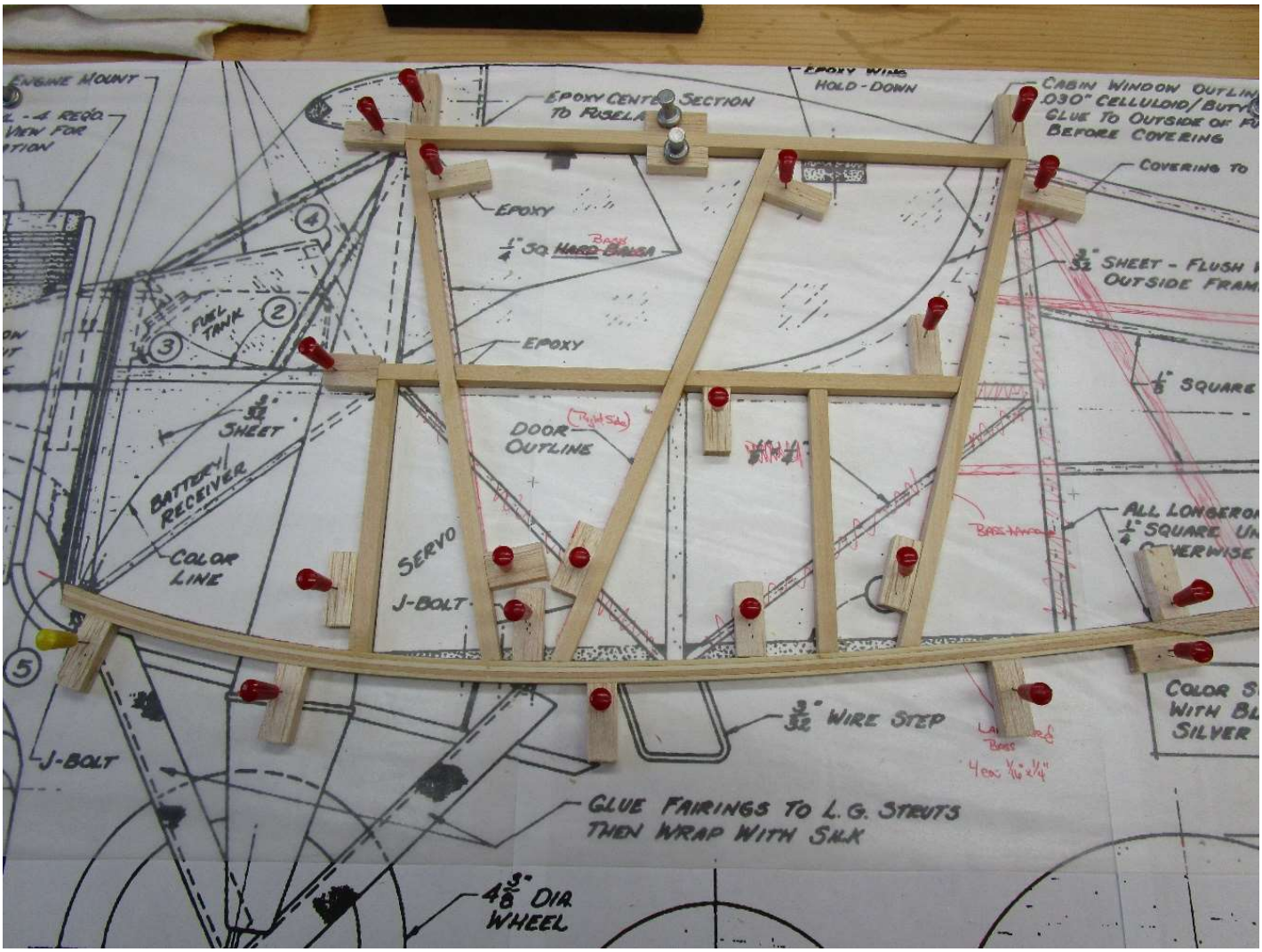




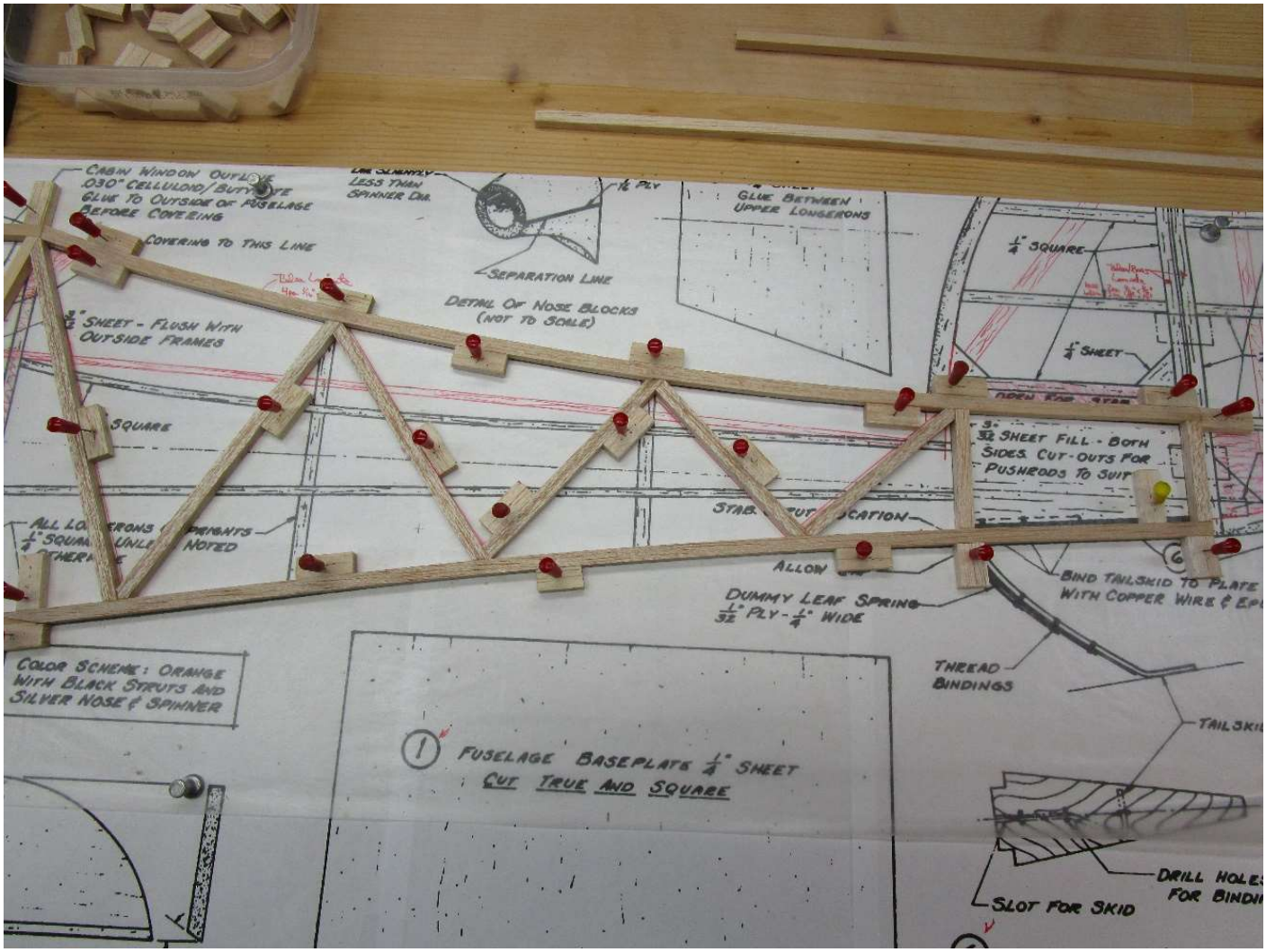
Pictured above, using the same lamination method, a forward fuselage bottom longeron is built up using 4 each 1/16” x 1/4” basswood strips. Two of these are required for the fuselage.

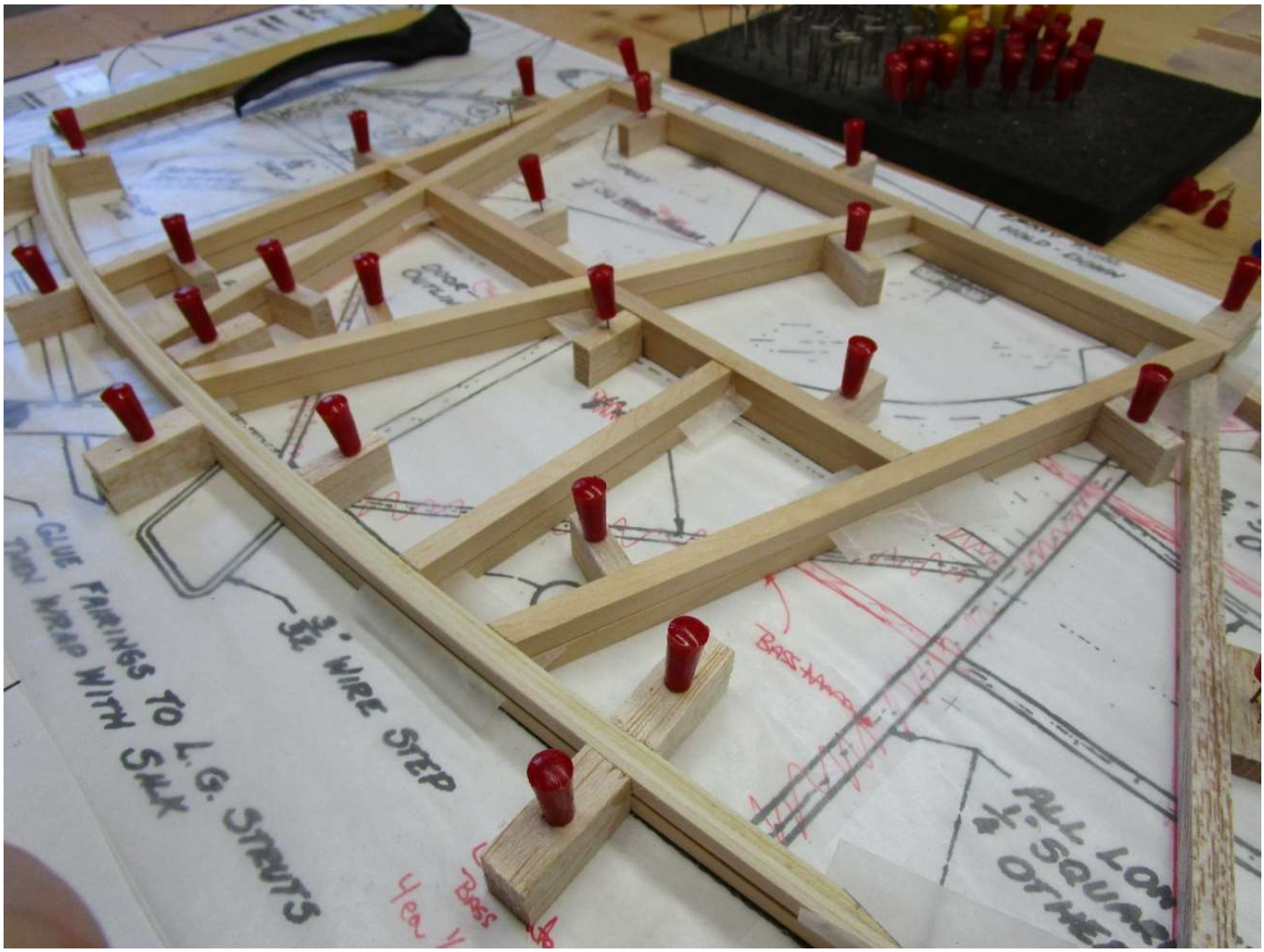
Below is an aft fuselage upper longeron buildup using 4 each 1/16” x 1/4” balsa strips. Again, two of these are required for the fuselage.





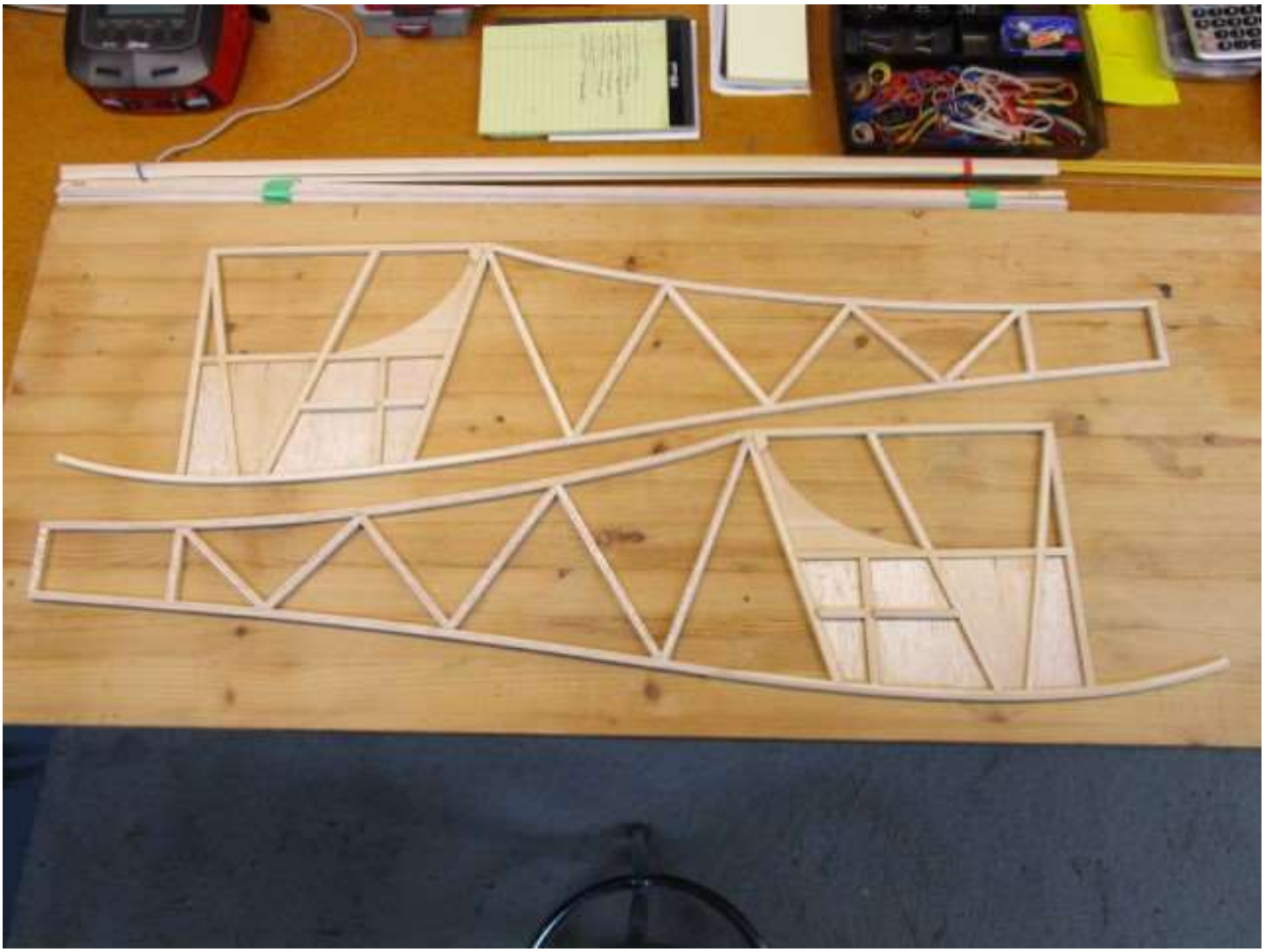
For increased strength, the forward fuselage cabin is built using 1/4" square basswood versus the hard balsa called out on the plan. Note the laminated basswood longeron along the bottom. Modifications were made to better match the fuselage outline to the actual full-size aircraft. Pictured below is the 1/4" square balsa aft fuselage build with the laminated balsa longeron along the top.

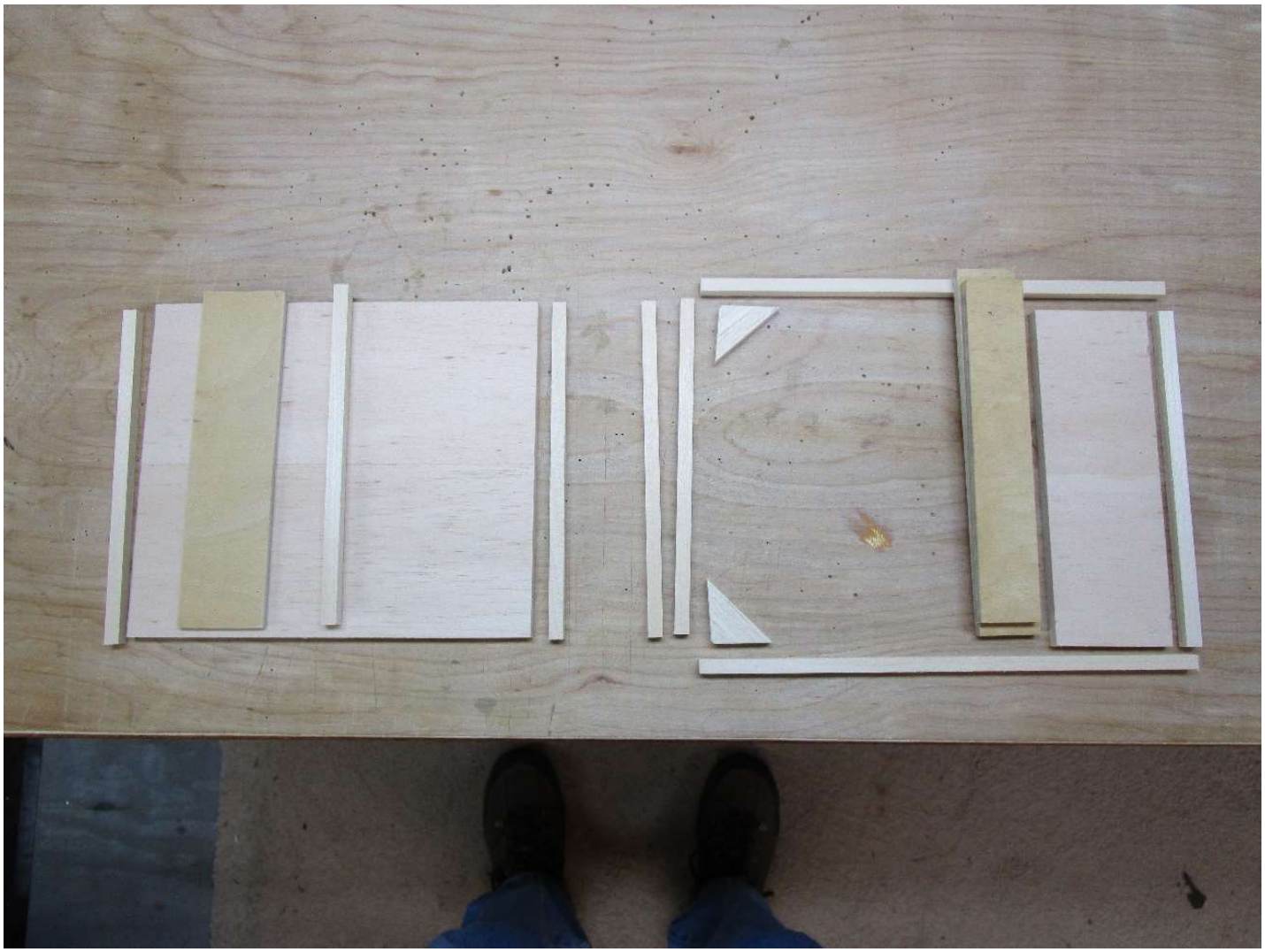

CABIN WINDOW OUTLINE .030" CELLULOID/BUTYRATE GLUE TO OUTSIDE OF FUSELAGE BEFORE COVERING
COVERING TO THIS LINE
SEPARATION LINE
DETAIL OF NOSE BLOCKS (NOT TO SCALE)
GLUE BETWEEN UPPER LONGERONS
1/4 SQUARE
1/4 SHEET
3/32 SHEET FILL - BOTH SIDES. CUT-OUTS FOR PUSHRODS TO SUIT
DUMMY LEAF SPRING 1/32 PLY - 1/4 WIDE
BIND TAILSKID TO PLATE WITH COPPER WIRE & EP
THREAD BINDINGS
COLOR SCHEME: ORANGE WITH BLACK STRUTS AND SILVER NOSE & SPINNER
1 FUSELAGE BASEPLATE 1/4 SHEET CUT TRUE AND SQUARE
SLOT FOR SKID



Once the first fuselage side has dried, the second side is built directly on top of the first as shown in the picture above for the basswood forward cabin sections. Remember to place small wax paper pieces between the two sides at each of the glue joints.

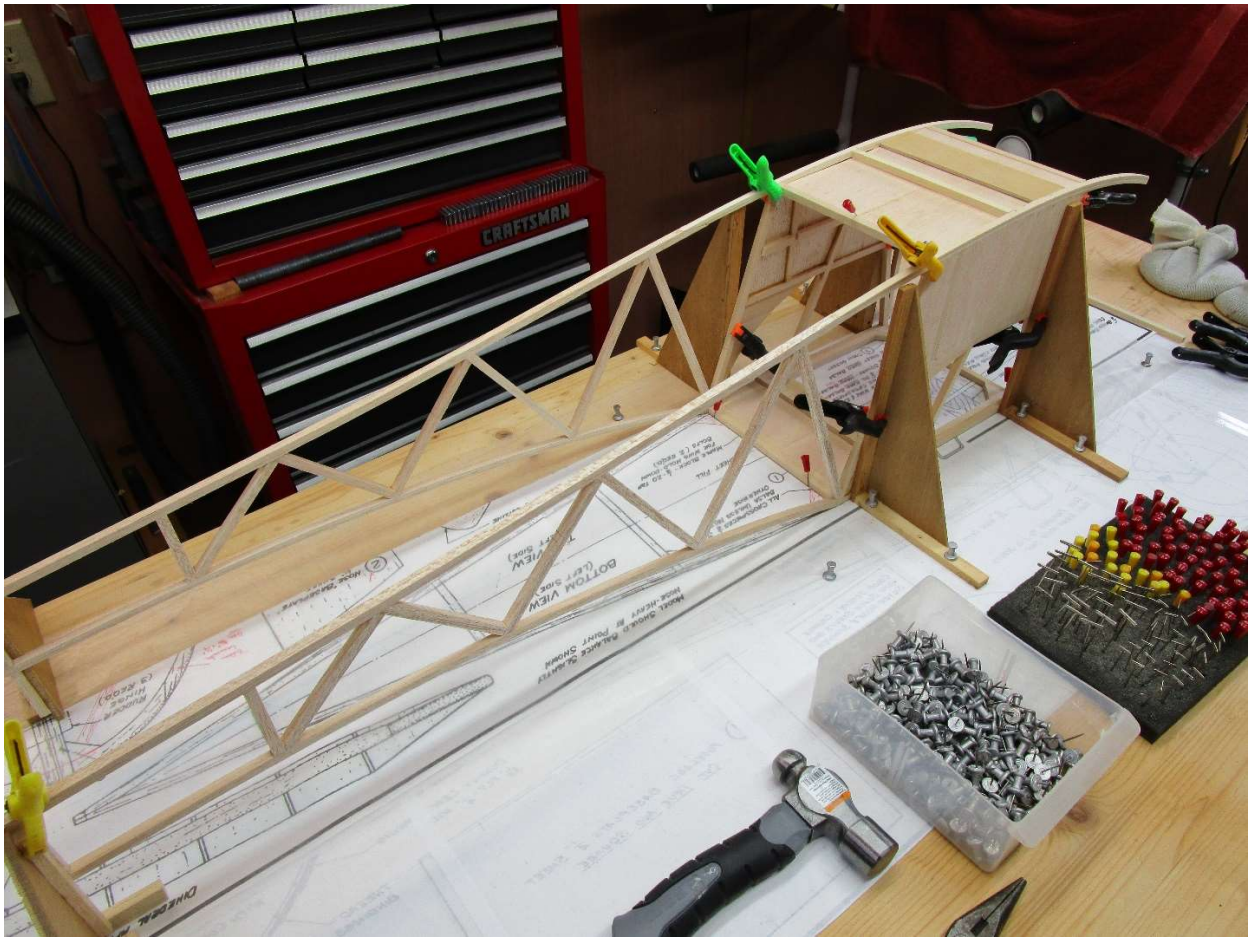
Below are the two sides. Balsa sheeting was used to fill the openings in the lower fuselage cabin, and 3/32" basswood sheeting was used for the curved filler in the rear window opening. Also shown are side supports for the servo tray installation.





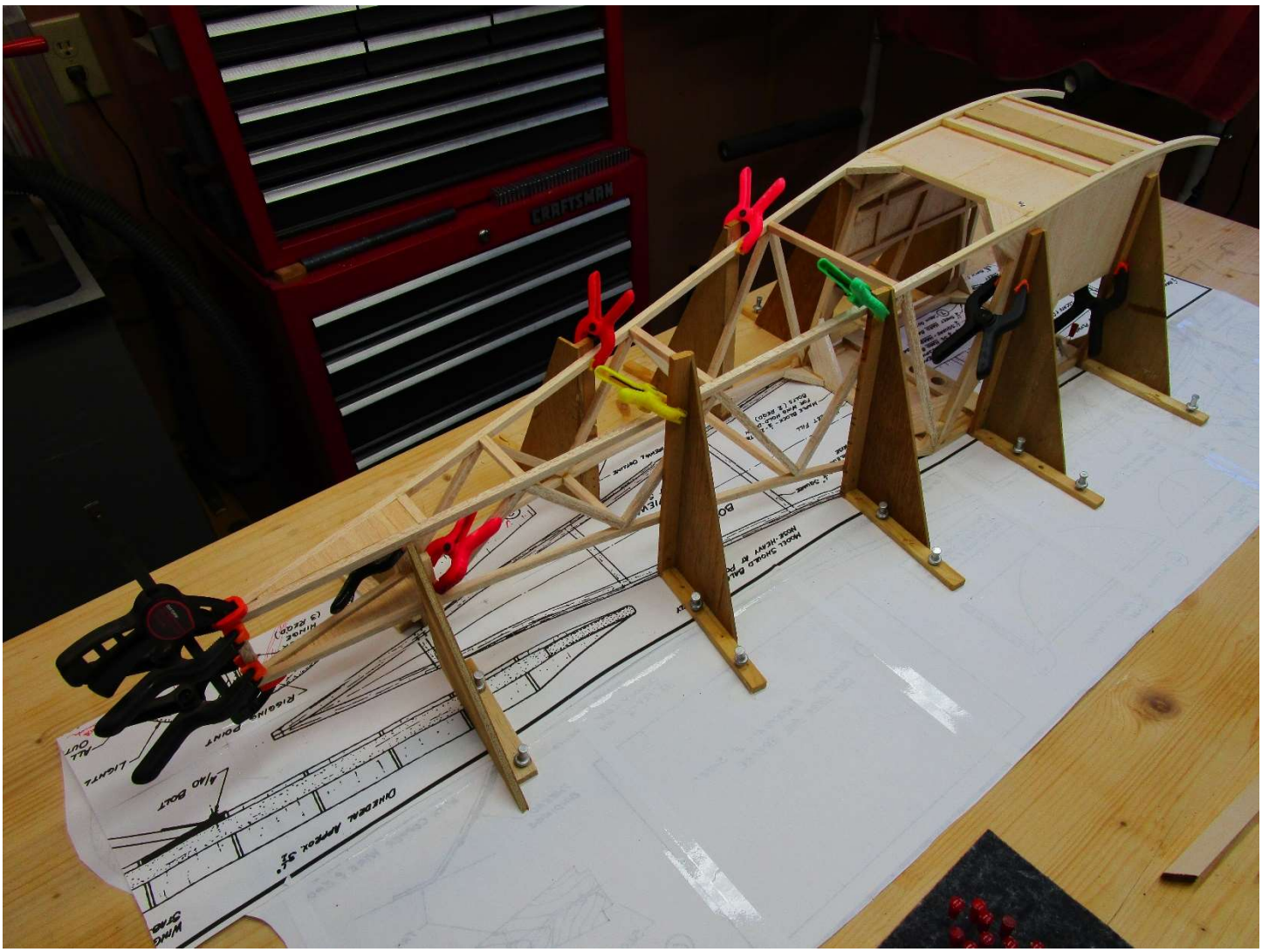
After sanding each of the fuselage sides flat on both sides, it's time to join the two fuselage sides. Above are the various pieces that will be used to join the fuselage cabin sections. All 1/4" square pieces are basswood, the wing mounting plate on the right is two pieces of 1/4" 11-ply (yes, this is not easy to find, and 5-ply will work fine), the fuselage bottom support on the left is 1/8" 5-ply, and the two larger fillers and corner bracing are all 1/4" balsa sheeting. Glue the two wing mounting plates together and then drill three 1/2" lightening holes along its length near the center (see next pictures). Transfer the measurements from the plan for the four each 4-40 nut plates that are installed in the outer edges of the 1/8" bottom support plate, drill the required holes, and install the nut plates before gluing this support to the large 1/4" balsa sheet.

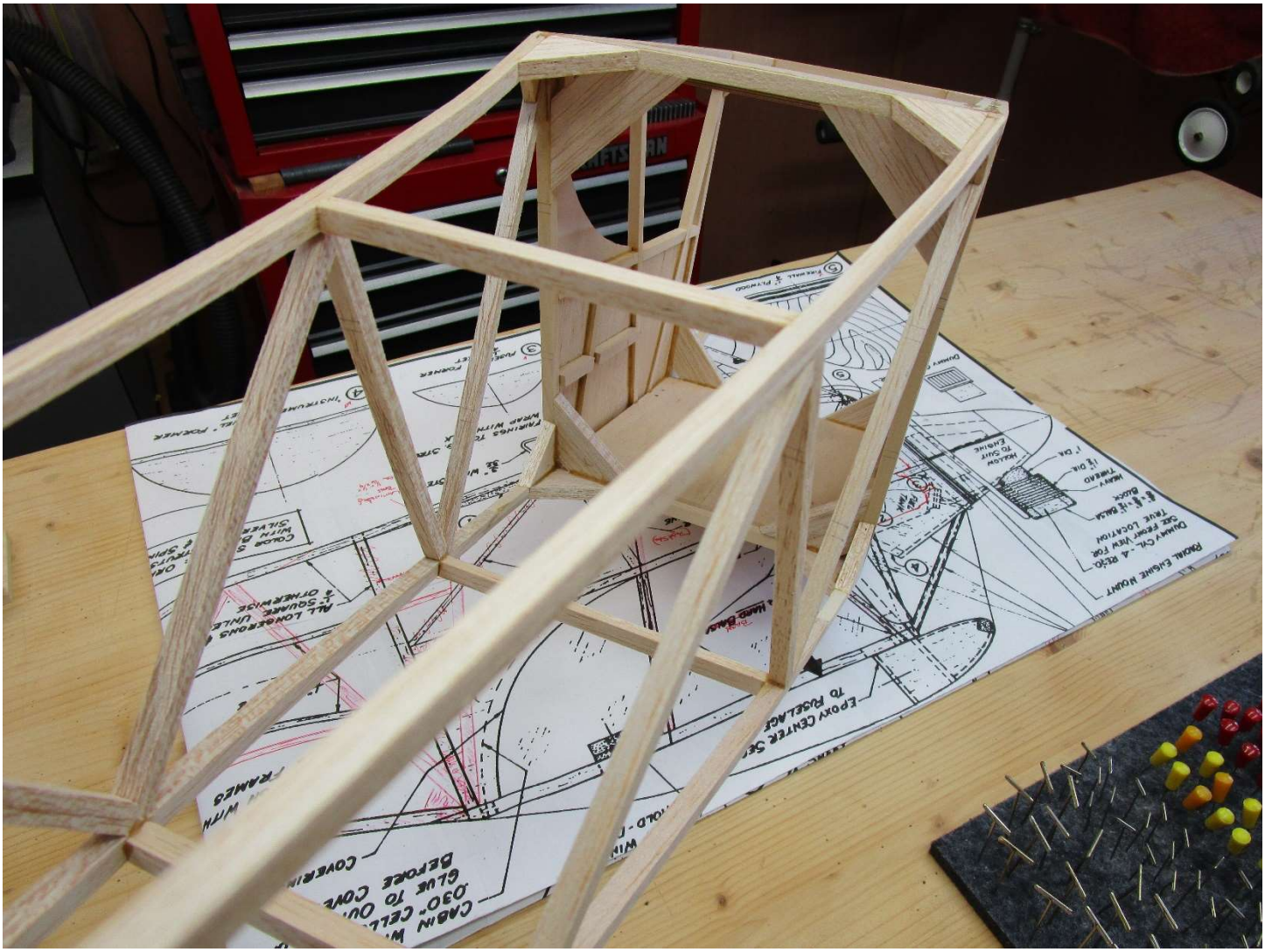
The next two pictures show the dry fit of the various fuselage cabin section cross pieces. The two sides are turned upside down then placed directly over the plan fuselage top/bottom view and supported using wooden triangles to hold them in place. Once you confirm both sides are square to each other and everything fits together as needed, all these pieces get installed using two-part 30-minute epoxy.


CRAFTSMAN

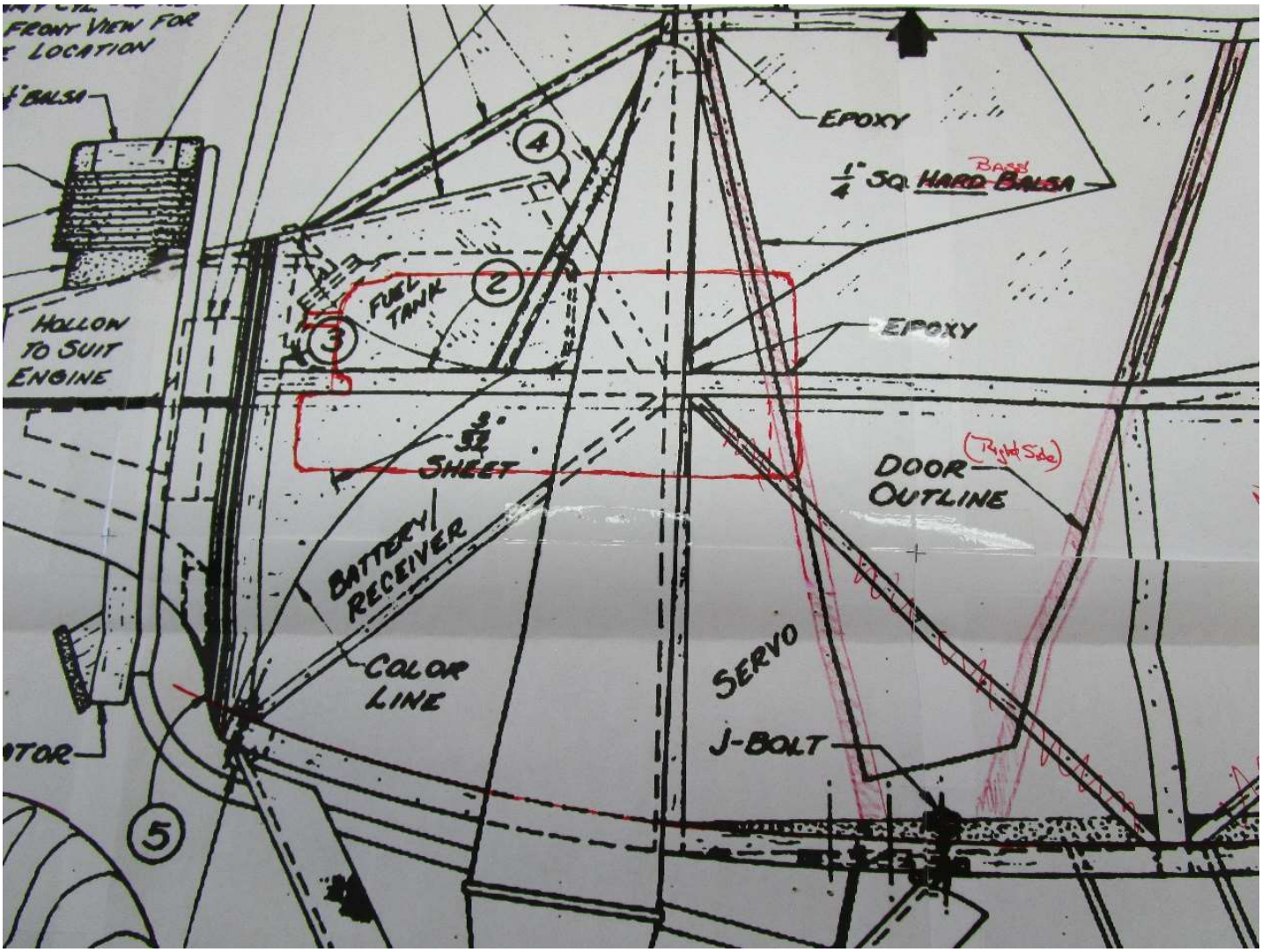

ALL CROSSPIECES ¼" SQUARE BALSA UNLESS NOTED OTHERWISE
¼" SHEET FILL
MAPLE BLOCK - ¼-20 TAP FOR WING HOLD-DOWN BOLTS (2 REQD)

Next comes the aft fuselage join. To allow the two sides to be pulled together at the tail correctly, small notches need to be cut in the top and bottom longerons just aft of the last cabin 1/4" square basswood pieces. These cuts should go approx. halfway thru the longerons. Sand the inside of the two fuselage sides at the tail join so they fit together as shown on the overhead plan view. Also cut two 3/16" balsa fillers that will fit between the two sides on the top and bottom just forward of the tail join. The picture below shows the two sides with these fillers installed along with all the other required 1/4" square "hard" balsa cross members.

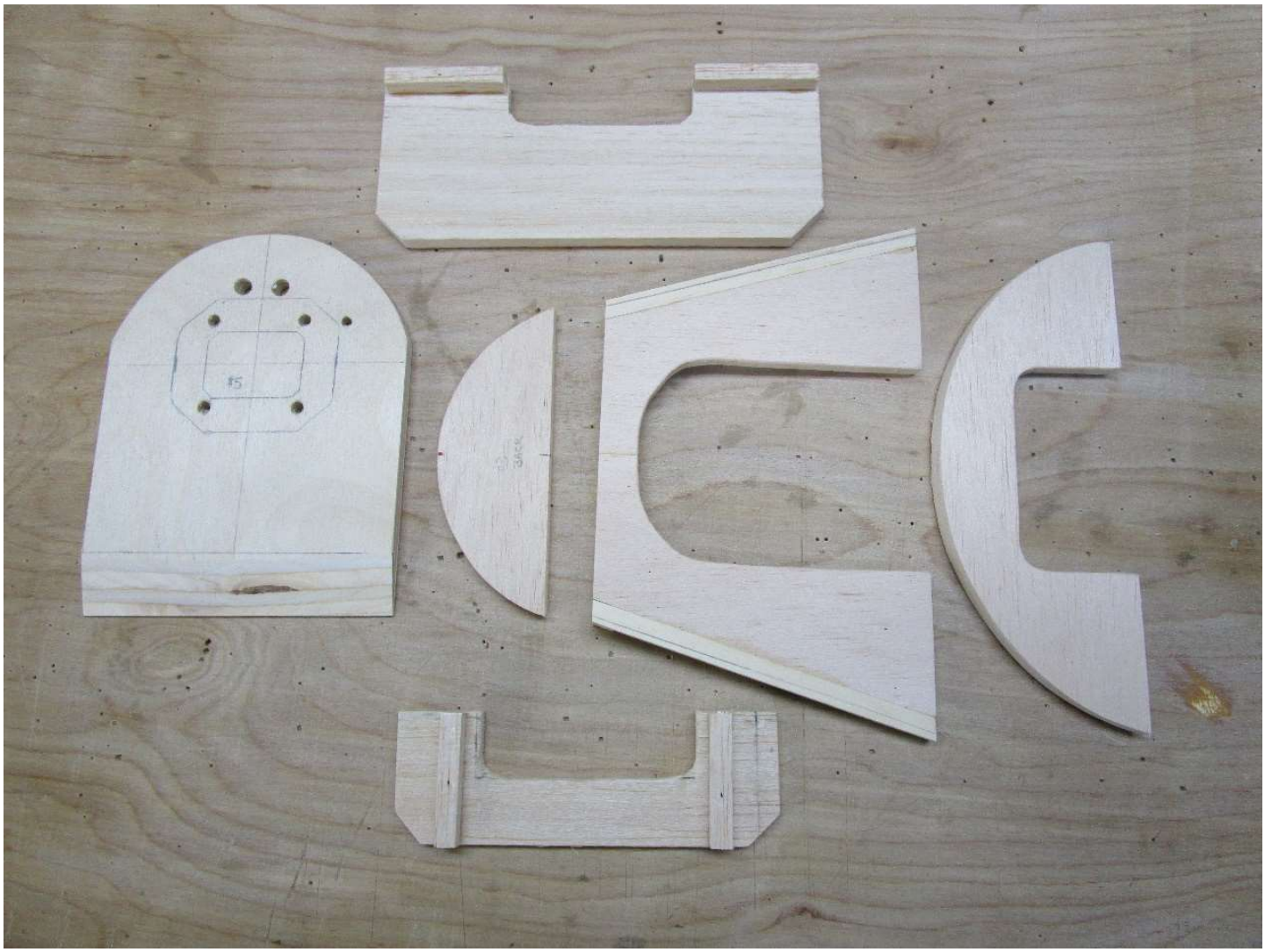




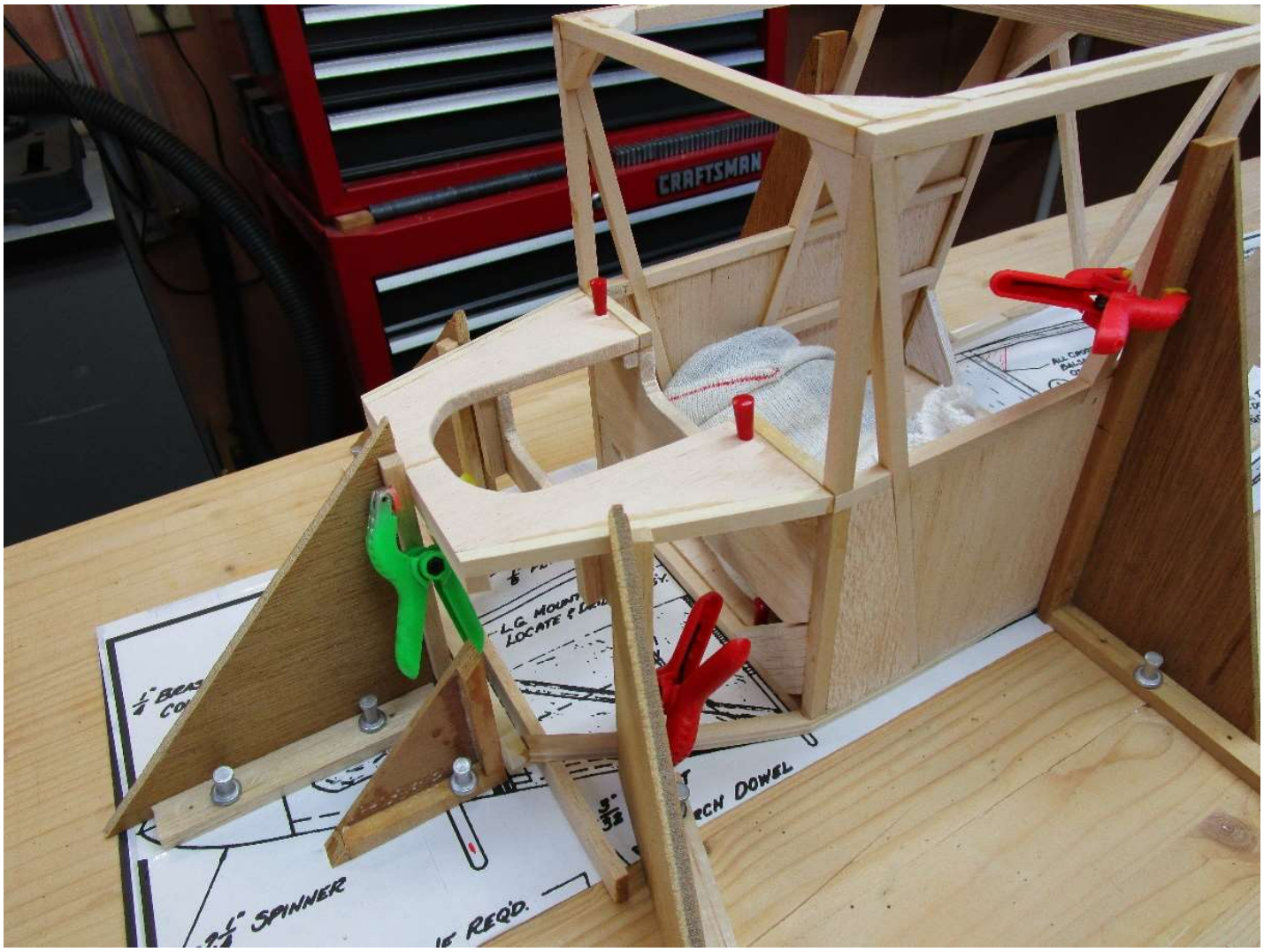
After the fuselage join has been allowed to dry overnight, it can be removed from the build board. The picture above shows some other additions I made to the fuselage structure. Not having any full sheet fuselage formers in this build, I felt there was little structure to counter any twisting of the fuselage, therefore I added diagonal bracing inside the cabin section to stiffen everything. Also, having put notches in the four longerons, I added balsa corner fill pieces at each longeron connection to the cabin to ensure those joints would remain solid.

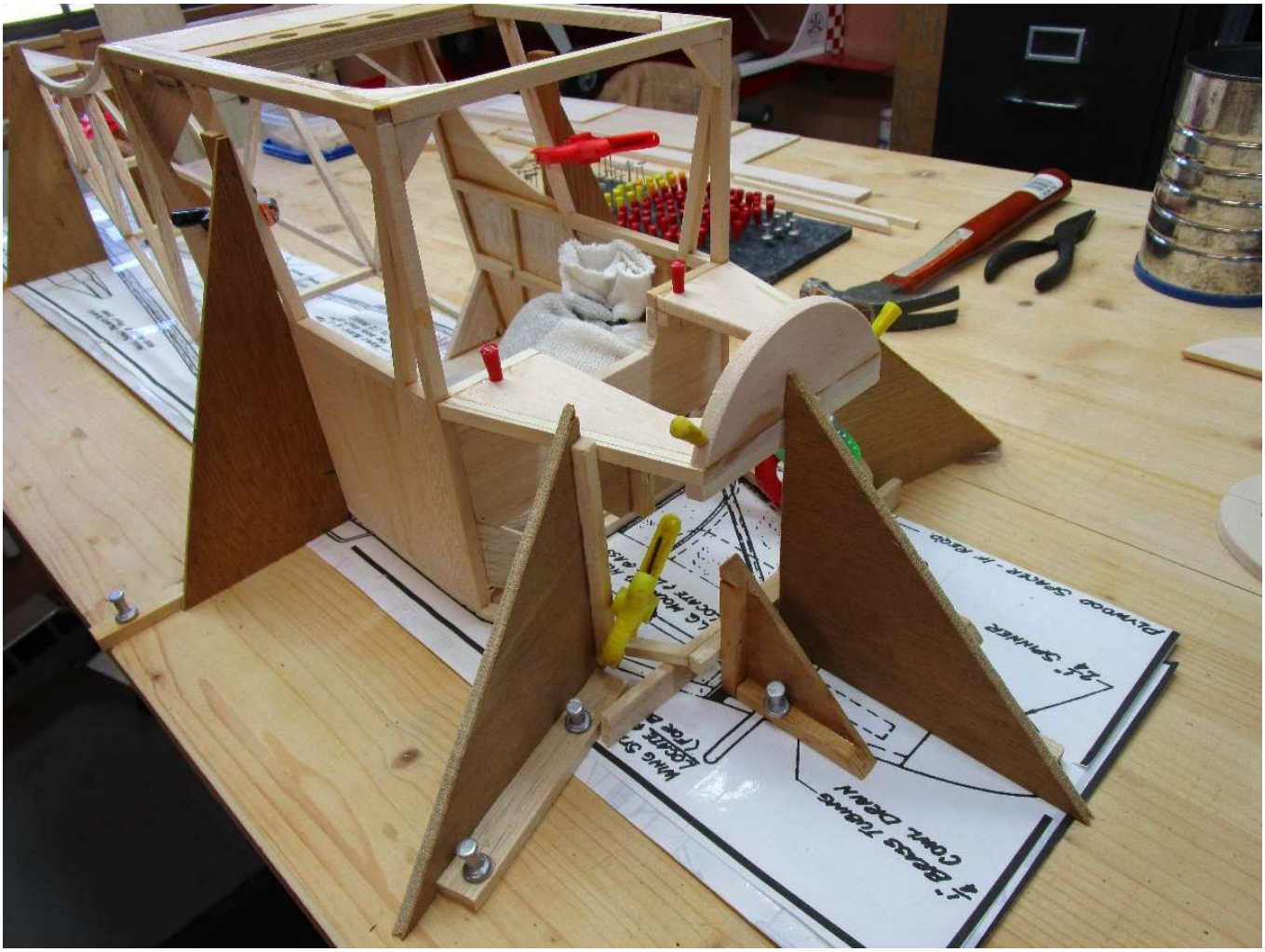


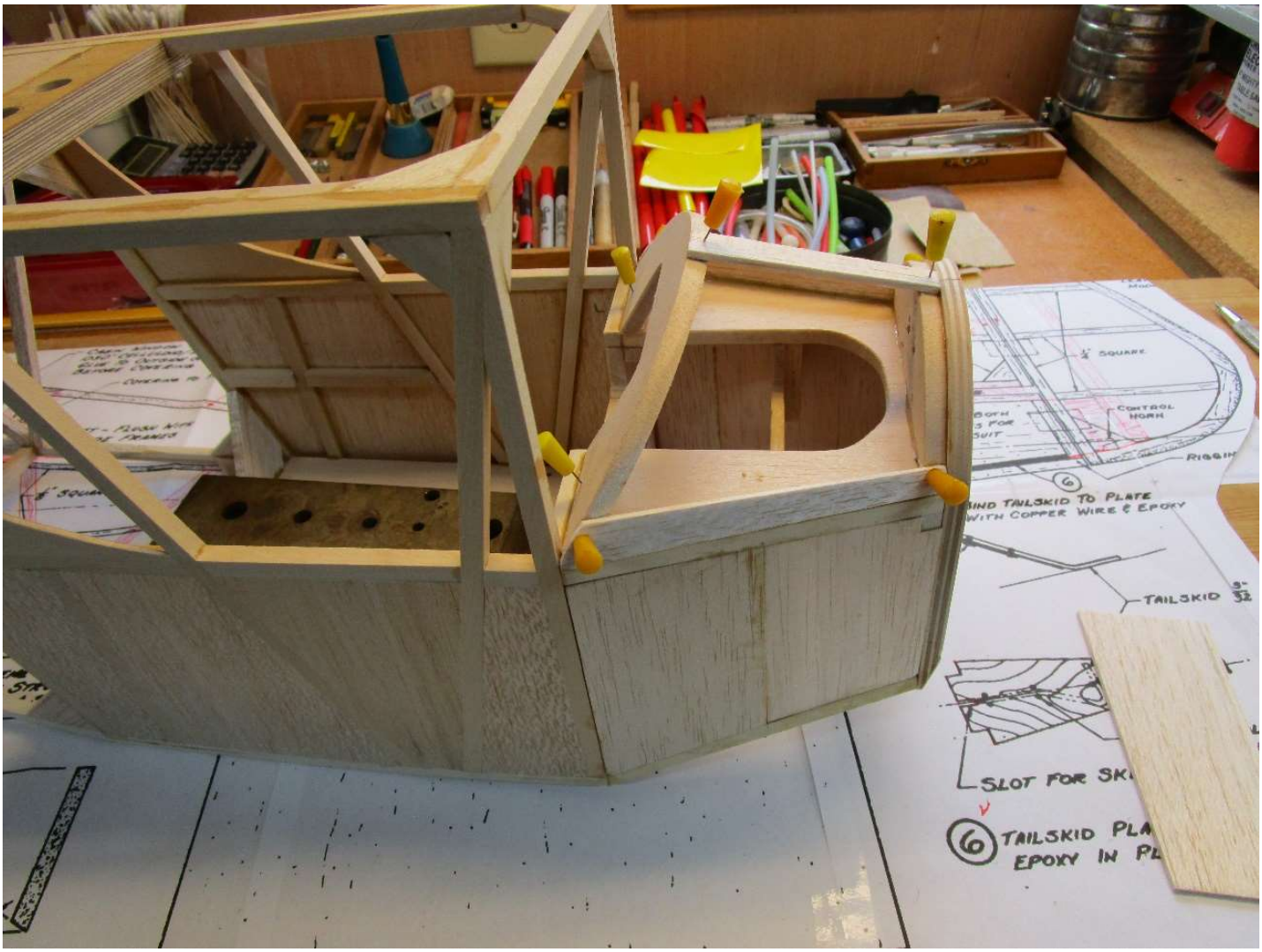
The plans call for a 4 once fuel tank, which is fine if using a .30 as they did in the build article, but I'm going to install a .54 4-cycle which drives the installation of an 8 once fuel tank as shown in the picture above. This requires some modifications to both the nose "baseplate" 1/4" balsa sheet (#2) to lower the fuel tank and the "instrument panel" 1/4" balsa former (#4) to allow the tank to pass thru. It also requires the addition of some fuel tank support structure below the nose baseplate. Below is a picture of the resulting parts required for this fuel tank install, along with the 1/4" 5-ply firewall with all the required holes drilled.



Now lets build the fuselage nose. Again, the two lower laminated basswood longerons need to be notched just forward of the cabin section to allow them to be pulled inward and match the nose "baseplate" angle. Place the fuselage on top of the plan overhead view and using wooden triangles align everything to match the plans. The next two pictures show this assembly to include the new fuel tank supports. Everything here is assembled using a two-part 30-minute epoxy.

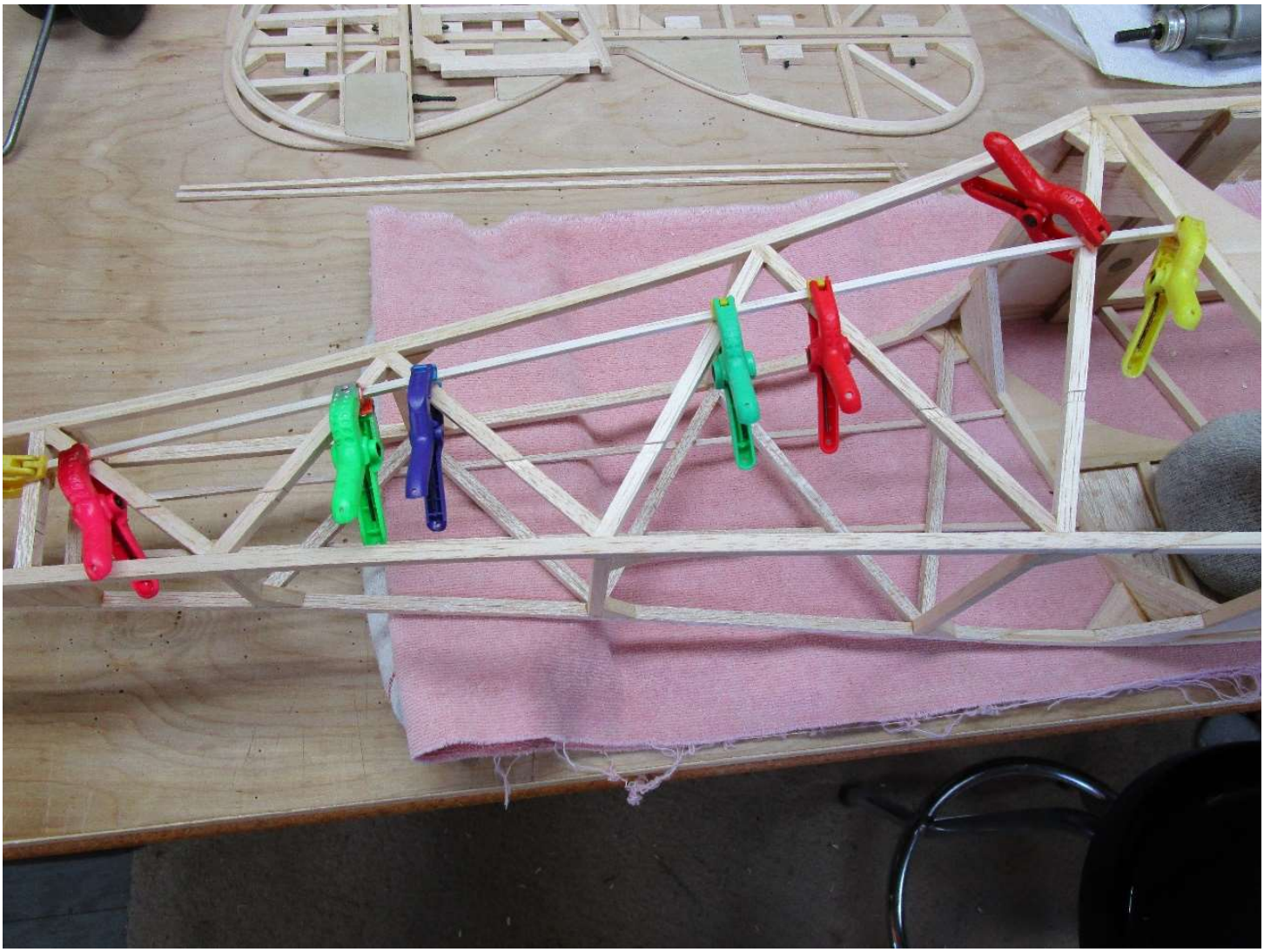


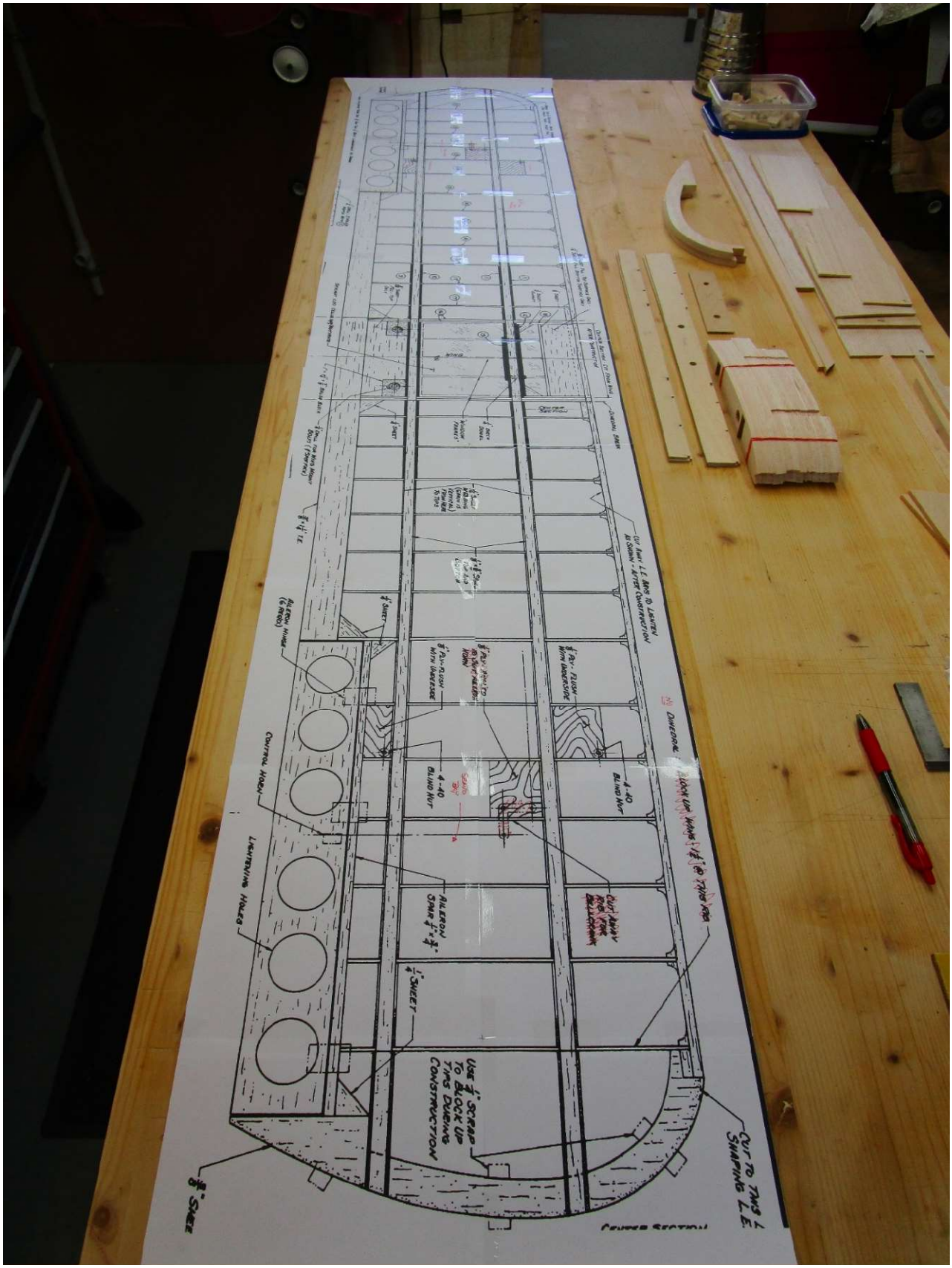




The picture above shows the nose section with the firewall epoxied in place, instrument panel former with some of the nose top sheeting in place, and 3/32" balsa nose side panel filler sheets glued in place.

Pictured below is the placement of the aft fuselage 1/8" square balsa side stringers. If you look closely, you can see that I've cut very shallow channels in each of the fuselage vertical side members to increase the matting surfaces for the stringers.

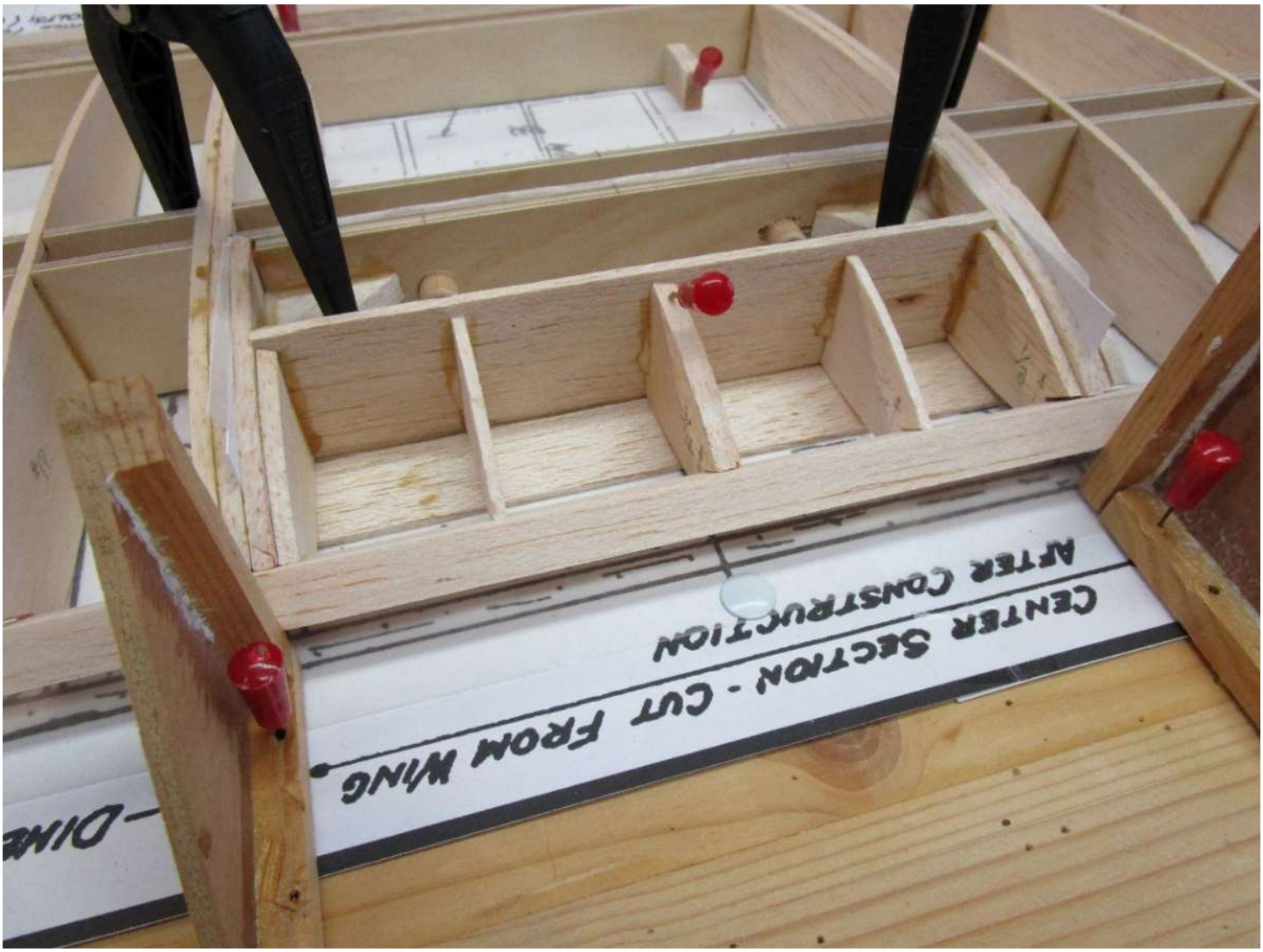




Since the airfoil is semi-symmetrical with a flat bottom, the wing can be built directly over the plans without having to use a wing jig. With the wing being longer than my magnetic build board, this build will have to be accomplished using the standard wood table board with pins and magnets to hold everything in place. As I'm fitting each wing rib, I test fit and adjust each to fit over the two lower 1/8" x 3/8" basswood spars, 3/32"

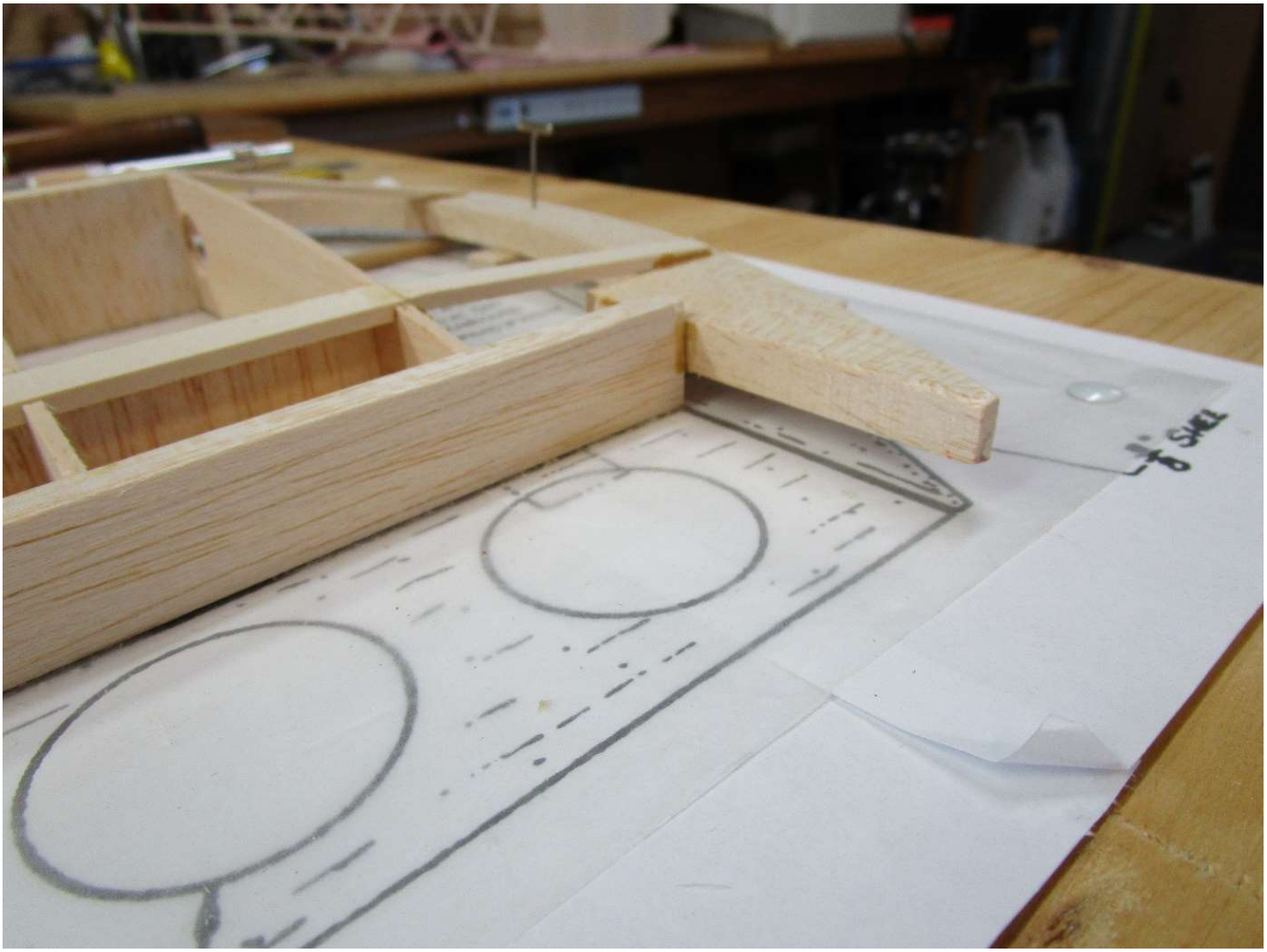
ply spar joiners, and against the balsa trailing-edge pieces, holding each rib in place with the small rectangle magnets placed on each side of the rib. As with the fuselage, I use Titebond III wood glue to joint everything in the wing. Once all ribs are glued in place, the leading-edge pieces and two upper basswood spars can be installed. This is followed with the wing tips, several corner gussets as called out on the plan, wing bolt mounting blocks, and 5/16" birch dowels in front spar.

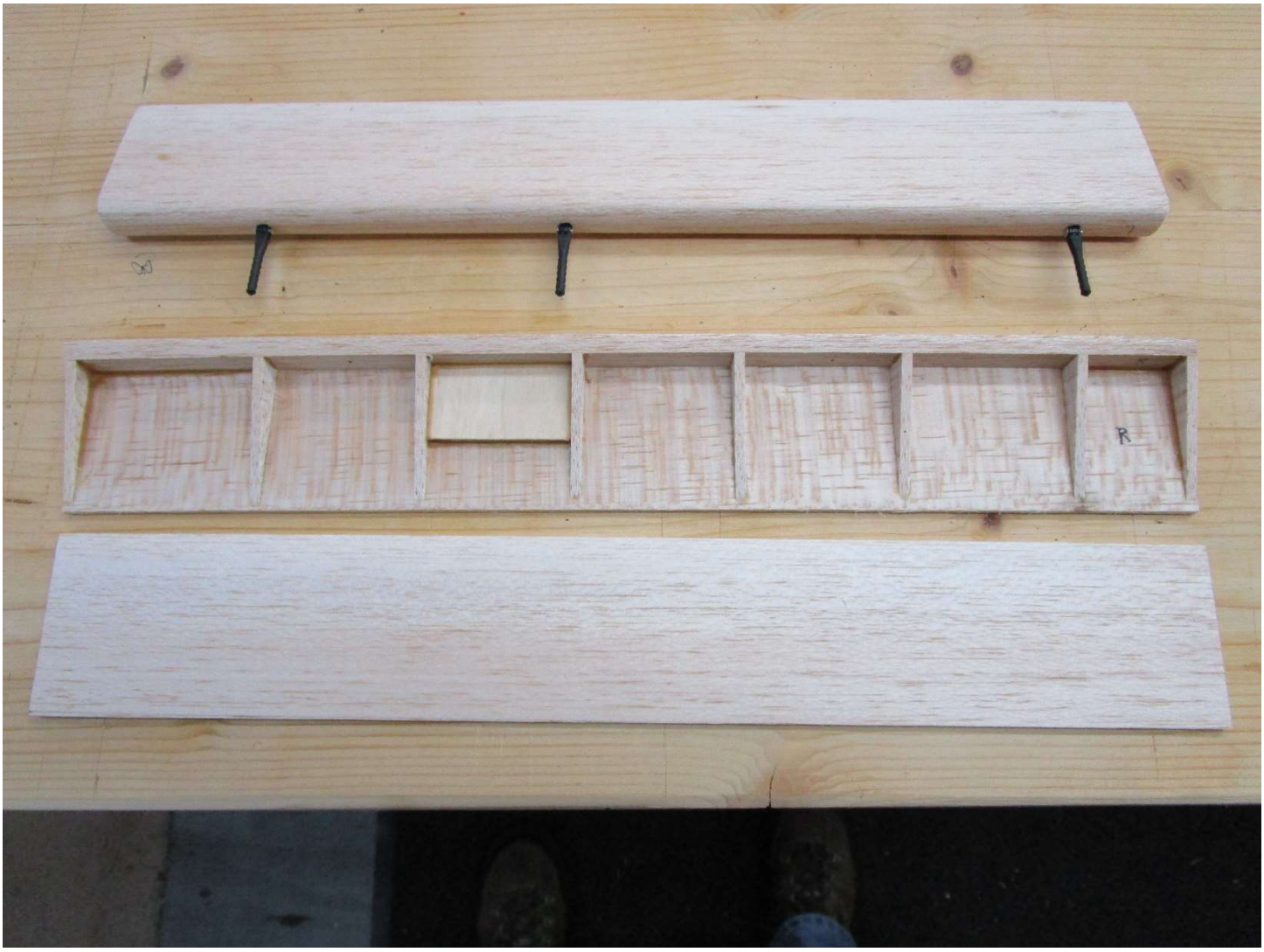
The picture below shows details for the wing center section that will be epoxied to the top of the fuselage. I modified this by adding five false ribs to the front that will strengthen the structure and help support the balsa sheeting that covers the lower and upper surfaces of this center section. Note the thick paper shims between this section and the wing ribs on each side. This spacing is important.



Below you see the entire wing with all ribs, trailing edge pieces, plywood wing joiners, top basswood spars, 1/16" vertical grain balsa sheer webbing between each rib, the leading edge, and wing tips installed. As per the plan, plywood plates with blind nuts for the wing struts are also epoxied in place. I added the aileron servo plate basswood supports between the spars on each side of the wing just outside of the strut support plates.

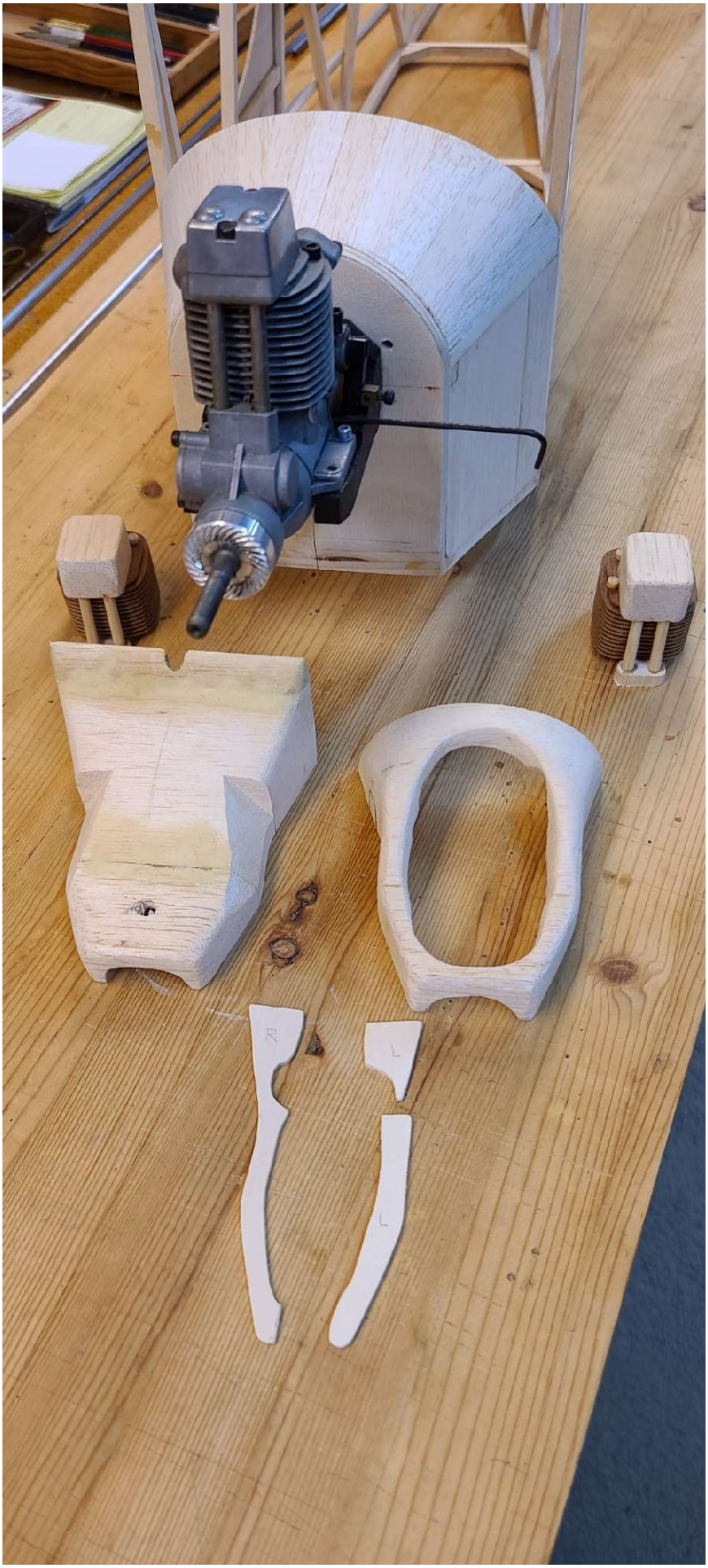
Next step is to build the two ailerons. While the plan calls for using three sheets of balsa glued together, I'm going to build up the ailerons using two balsa sheets with small, tapered ribs between them, and a solid balsa leading edge. While taking measurements for the ailerons I discovered an issue with the plans. As pictured below, the ailerons will lie flat on the building board, yet the 3/8" balsa wingtip is attached to the wing with 1/4" shims placed below the tips. This results in a mismatch between the plan wingtip bottom edge and the aileron. I'll have to address this with a modification of the wingtip once I remove the wing from the building board.





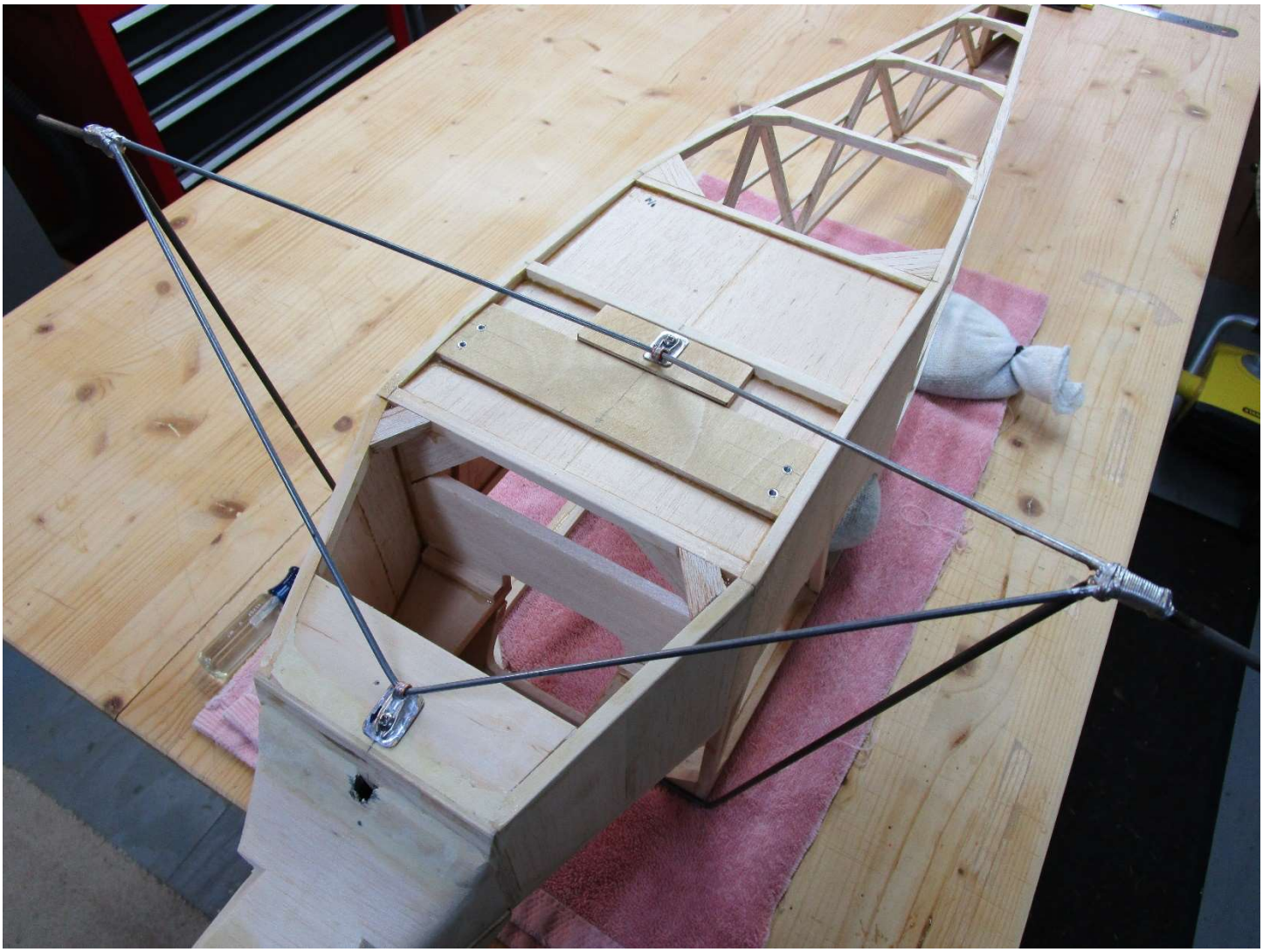
The pictured above shows how the airlerons are built up. The right airleron in the lower part of the picture shows how I placed false rib ends between the two balsa sheets to match the taper of the main wing ribs. The small ply piece is where the control horn will mount on the bottom of the airleron. The left airleron shows the test fit of the hinge pins and the rounding of the airleron leading edge. After placing the airlerons into the main wing, I was able to fix the mismatch at the wingtip by gluing a piece of 1/4" x 1/2" balsa along the bottom of the wingtip and then shape the wingtip to match the end of the airleron. Simple enough I guess.

Above is the wing about ready for covering. The wingtips are rounded and shaped to match the airlerons. The wing leading edge is rounded and all ribs sanded to match the front and rear spars, leading edge, and training edge. Still have to drill the two wing rear 1/4" mounting bolt holes, but that will need the fuselage completed first. So lets go do that now.

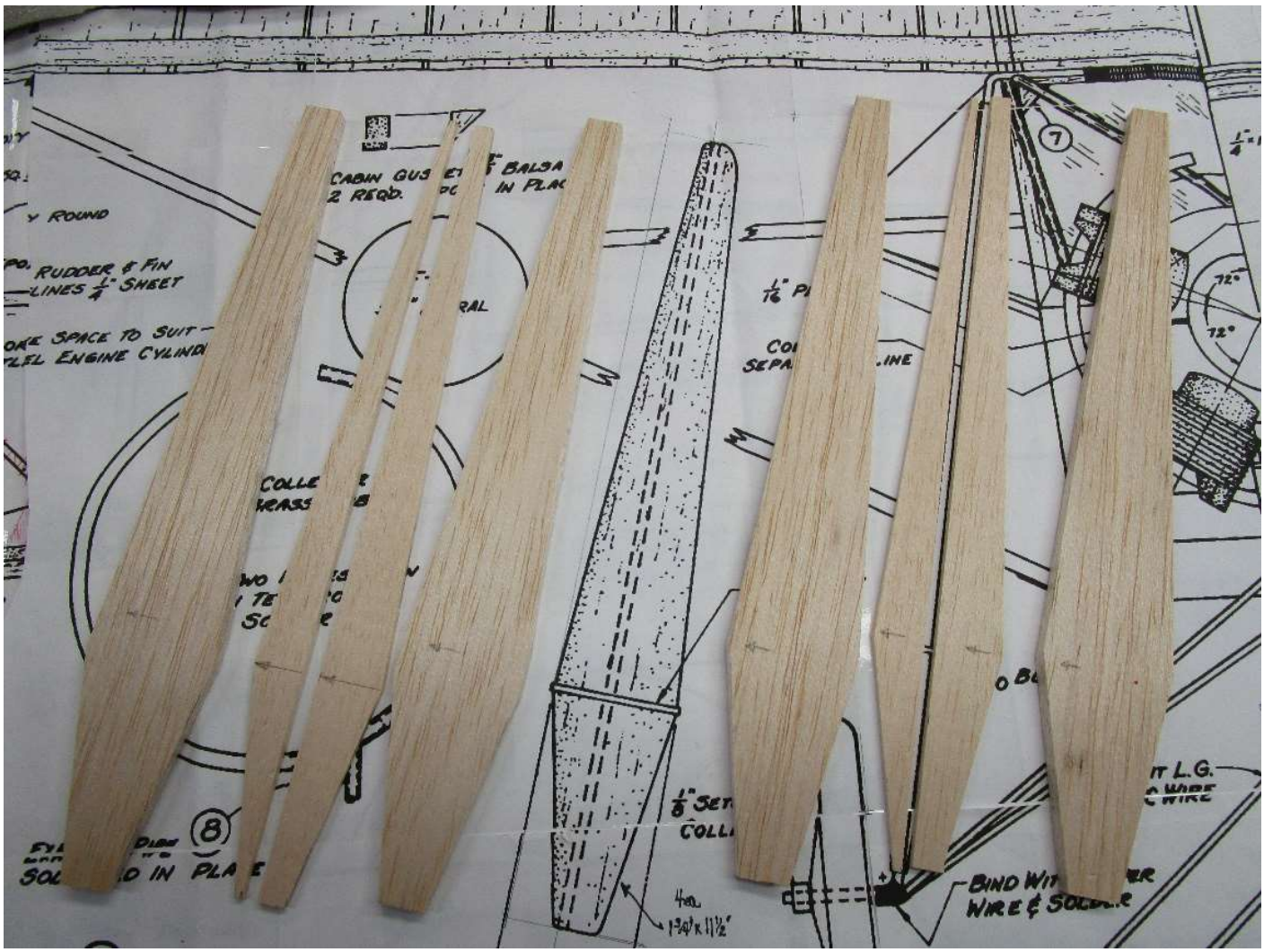


Here you can see the .54 4-cycle sitting on the engine mount which is bolted to the 1/4" ply firewall. The original Velie used a five-cylinder radial engine, but given the large size of the .54 cylinder head I was not going to be able to fit five cylinders around the nose section of this model. So, I elected to use two dummy cylinders placed 120 degrees off each side of the real center cylinder head. The dummy heads were made using 1/32" mahogany sheets separated with balsa sheets to try and best match the real cylinder. A valve rocker arm cover and push rods were then fitted to try and match the real engine. The dummy engine cylinders will be painted before final assembly to match the real head. The two dummy cylinders will be epoxied to the lower nose cover assembly, which is shown on the left side of the picture and is turned upside down. This was made using balsa block which is then sanded to match the contour of the firewall and hollowed out to fit around the engine mount and front of engine. The lower nose section will be epoxied to the front of the plywood firewall. To finish out the nose section, I cut out and shaped a balsa block to match the contour of the lower cover assembly and the rounder upper firewall, and to fit around the upper cylinder head, throttle linkage, and choke rod. This upper cover will be held in place with small hatch magnets. The thin plywood pieces will be glued to the bottom of the upper nose cover section to add some strength.

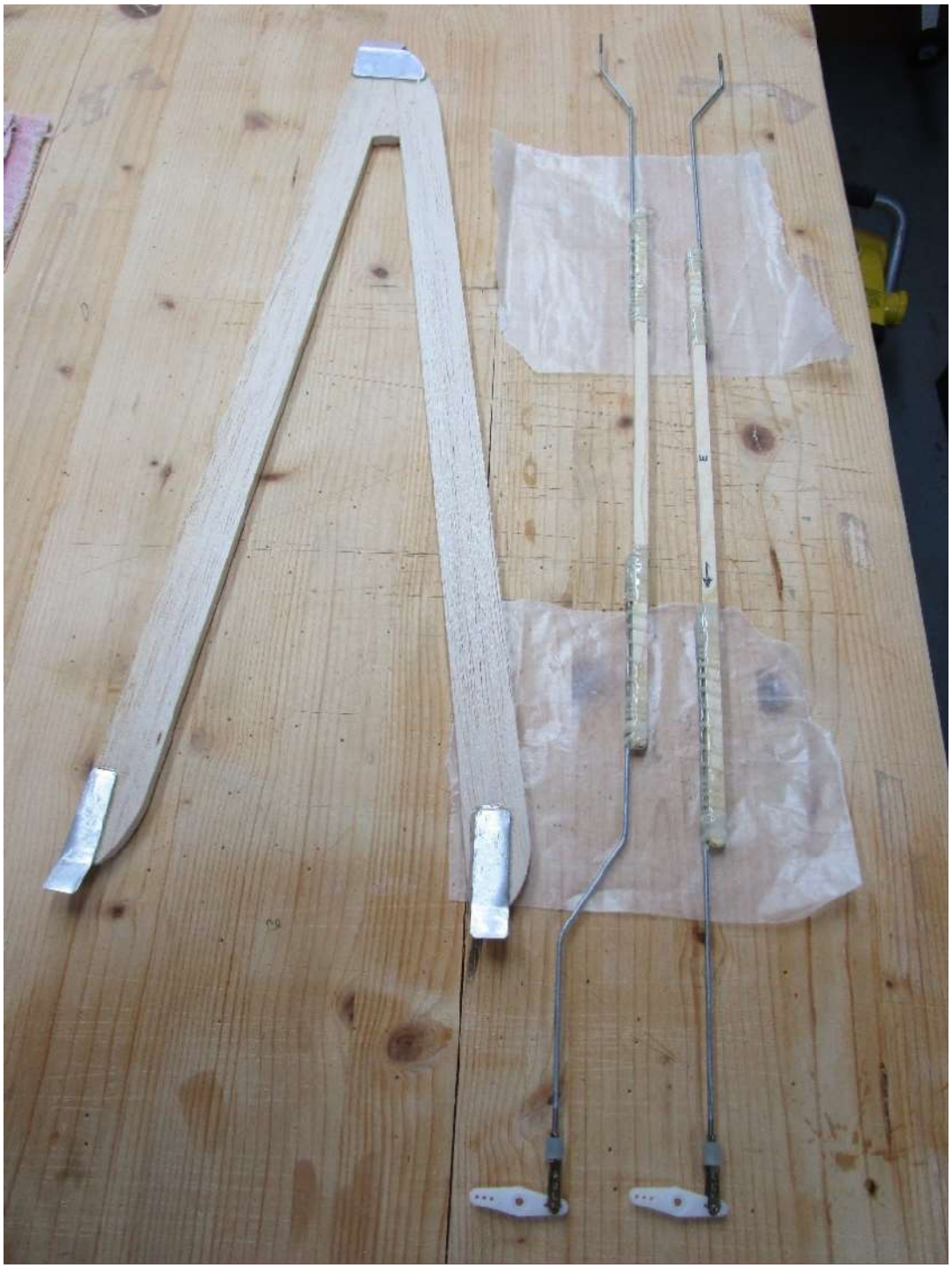
Now for the landing gear. First step is to bend the main landing gear (MLG) strut per the plan using 1/8" music wire, and then the front and rear landing gear supports using 3/32" music wire. As shown on the plan, the MLG strut is attached to the fuselage along the top front of the cabin using wire, and the two gear support wires are attached to the bottom of the fuselage using "J" bolts. I could not find any "J" bolts small enough to use, so I built two small mounting plates using brass sheet and some 18-gauge copper wire. I wrapped the copper wire around the 3/32" music wire a couple times and then soldered the resulting coil with ears to the brass sheet. These can then be mounted to the fuselage using small wood screws. You will want to put some ply down where these meet the fuselage. I temporarily lashed the MLG strut wire to the top of the fuselage and temporarily wrapped copper wire around the joints between the three gear pieces so the correct position of the fuselage mounting plates could be determined. Once this is accomplished I pre-drilled and installed the two mounting plates to the ply sheets. Next, I wrapped one side of the gear with 24-gauge copper wire to hold all three gear wires in place and then soldered these together. Do the same for the other side. Shown in the picture below is the resulting landing gear assembly minus all the balsa fairings.



Each of the gear wires are covered with a fairing as shown on the plan. In the picture below are the various pieces cut to form the shock strut fairings that go around the MLG strut wire. I used 1/4" balsa sheet cut 1.75" x 11.5", and 1/8" balsa sheets for the center spacer that goes around the 1/8" MLG wire. These are then sanded to form an aerodynamic shape. The front and rear landing gear fairings are cut from 3/32" x 1/2" balsa sheet, and also sanded to a tapered shape. All the gear fairings will be covered with black Ultracoat once that are mounted to the gear wires using epoxy. The resulting shock strut fairing is shown in the second picture below.

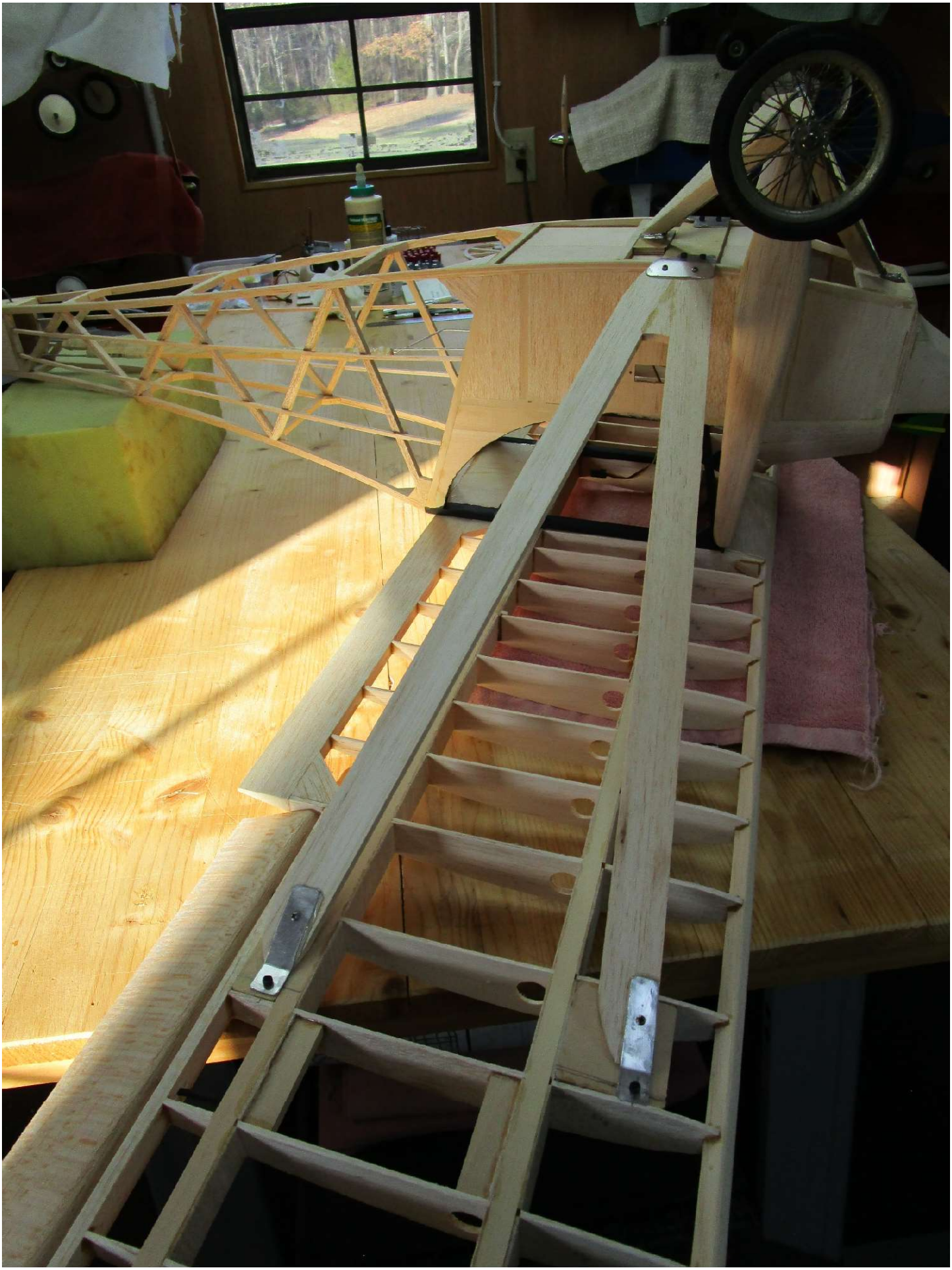


The tail gear is just a simple tail skid made from 3/32" music wire. This is mounted to the bottom of the fuselage tail using a ply plate assembly as shown on the plan and in the picture below. This skid will be finished out later with a dummy leaf spring made from 1/32" thick ply sheet cut 1/4" wide and layered along the front of the tail skid wire.



Shown in the picture to the left are the control rods for the rudder and elevator. These were made using 1/4" square hardwood, 2-56 wire control rods threaded on one end, lacing cord that my father used to stich the fabric covering on real aircraft wings he restored, and the hardware needed at each end of the control rods. The lacing cord is epoxied once wrapped around the control rods.

The other item in this picture is one of the wing struts. The two struts are actual flight load bearing structures to help hold the wing to the fuselage, so use good hard balsa strips. These were cut and assembled per the plan drawings, but I found a small problem when I did the final fit check of all the main assemblies. As I indicated earlier in the wing build, the original aircraft did not have any dihedral in the wing as was required by the plan, and I built the wing flat on the building board without the dihedral. Building the struts per the plan resulted in struts that were approx. 1/2" too long, so I had to modify them at the fuselage end. While doing that, I found the epoxy bond between the aluminum fittings and balsa struts were not as strong as I expected, so I put small screws thru the fittings and the strut strips. The picture below shows these modifications and how they attach to the fuselage and wing. Before covering, each strut will be shaped per the plan.

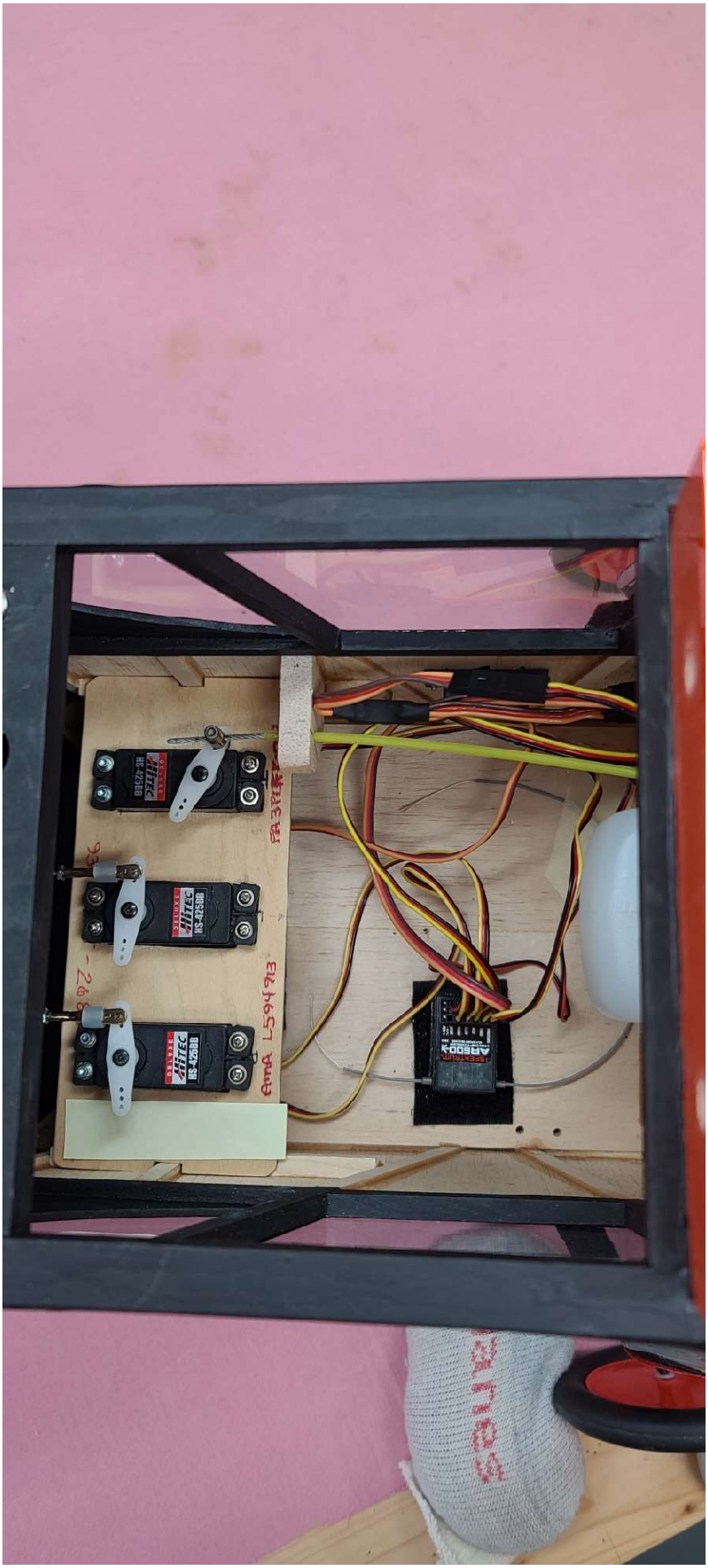


Final step before starting the Ultracoat covering is to do a complete fit check of all major assemblies and an initial CG check. To do this I install all servos with control rods, the fuel tank, the engine with muffler, prop and prop nut, temporally install the MLG with wheels, pin the tail assemblies in place on the fuselage, and mount the wing to the fuselage along with the wing struts. I then check where I'll have to install the 6v receiver battery pack to obtain a correct CG per the plan. The picture below shows this step. The two dummy cylinder heads were not used here, but they are very light and will not change the CG any more than the covering that will go on the fuselage and tail surfaces.

Now on to the covering. I'm assuming if you're looking to accomplish this scratch build, you have already done some covering before, so I'm not going to bore you with all the ins and outs on how to apply Ultracoat. If you need that info, it can be found on our club web page on the "Tips" page. The picture below shows what I use to do covering. The "pink" (no comments please) cotton sheet over my worktable helps to hold pieces in place and reduces marking up the covering. Tools I use are a good covering iron with a cotton head cover, a smaller trim sealing iron, good sharp scissors, #11 knife, ruler, and a sand or lead shot filled sock to hold parts while you're trying to apply the covering along edges and curves. Here you see the horizontal stab in work, and the MLG assembly behind it has black Ultracoat already completed. I initially use 275 degrees for my iron to attach the covering, bottom surface of each part first, followed by sides (as on the fuselage), and then finish with the upper surface. Once all covering has been installed on a given part, I raise the iron temp up to 325 degrees and go back over all the seams and edges first, and then work the entire surface to get the covering to shrink up to a nice drum like surface. Doing this final step before having covering on all sides can lead to warping a structure.

As I had indicated earlier, I first cover the bottom of a given structure. To the left is the wing with all the covering installed on the bottom surface. Before starting the upper surface, I mount both aileron servos and run the servo leads (with required extensions) down thru all the ribs to the center section. Note the cable tie around the servo lead joint to ensure it will not come apart. Now you can complete the wing covering on the upper surface.

Above you can see the covering being put on the two wing struts. Each are first sanded to the aerodynamic shape shown on the plan and wiped down with a tack cloth to remove all sanding dust. After all covering is in place, I paint the metal connector plates with black enamel paint. To the left of the wing struts are the two smaller struts that run from the bottom of the fuselage tail up to the front of the horizontal stabilizer. These will be painted black. Further back on the table is the upper engine cowling which was painted flat black on the inside and then covered with aluminum Ultracoat on the outside, as was the lower cowling. The two dummy cylinder head assemblies have their initial coat of flat black, which will be followed with a light spraying of aluminum to match the real cylinder head. The rocker arm covers, and valve push rod tubes will be painted silver.



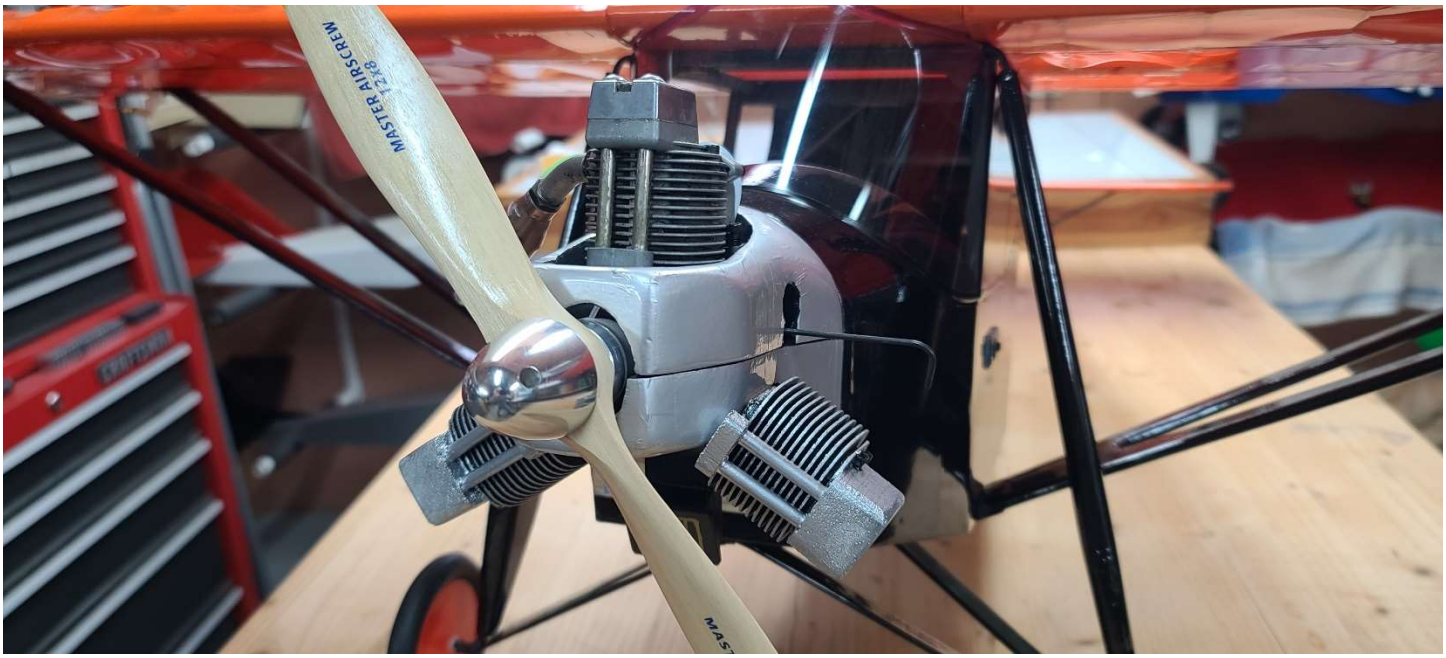
Shown here is the inside of the fuselage cabin. Lots of working room in here. The servo tray assembly had to be installed as far aft in the cabin as possible to help obtain the proper CG, as was the 6-volt receiver battery pack, which is on the floor of the cabin under the servos. The on/off switch with charger port is mounted thru the left wall of the cabin but hidden in this picture by the aileron "Y" cable coiled up on top of it. A 2.4 MHz receiver is attached to the cabin floor using Velcro tape. Not visible is a receiver battery voltage meter that I mounted to the top of the fuel tank so it could be easily seen thru the windshield. Note, I also use the servo tray to document my AMA and FAA registration numbers on the aircraft, as required by both organizations.

All window panels were cut from plastic sheets using the plans as a guide and installed on the fuselage and wing center section using 1/4" trim tape.

Once you have all the major sub-assemblies covered with Ultracoat, installation of the tail surfaces onto the fuselage comes next. The picture below shows this in progress. I used my magnetic building board and a couple fixtures to ensure the horizontal stabilizer is mounted parallel to the wing. Using two magnetic fixtures that have thumb screws installed, I was able to adjust their positions such that the stab ends are maintained at the same height above the board while the 30-minute epoxy cures on the stab/fuselage surfaces. These fixtures where then used to hold the vertical stabilizer at 90 degrees to the horizontal stab while its epoxy joint cured.

Following these steps, the elevator and rudder were installed using Robart pin hinges and epoxy. The control rods were connected to the tail surface control horns and respective servos, and the clevises adjusted to obtain the correct zero input positions. For the wing, each aileron was installed using Robart pin hinges and epoxy. Control horns were installed and short 2-56 control rods with clevises were run between the servo arms and control horns. Lastly, the throttle servo arm is connected to the engine throttle lever using braided wire guided thru a plastic housing. This can be seen at the servo end in the prior page picture. With all the mechanical connections made, power up your transmitter and receiver to check the control surfaces throws and correct deflection directions. Also remember to check the throttle throw direction.

The picture below shows the two dummy engine cylinders installed on the lower engine cowling. These were installed using 30-minute epoxy, with wooden pins to strengthen the joint between the cowling and cylinder head. Also, partially visible behind the prop is the fake engine oil cooler hanging down into the airstream.



Below are two pictures of the final product. Before first flight all control throws and directions will be double checked, as will the CG location. Receiver battery will be cycled to ensure a good full charge, an engine run ground check and range check with the transmitter will also be accomplished. Now to wait until the weather warms up later this spring for first flight. Hope you enjoyed this build article.