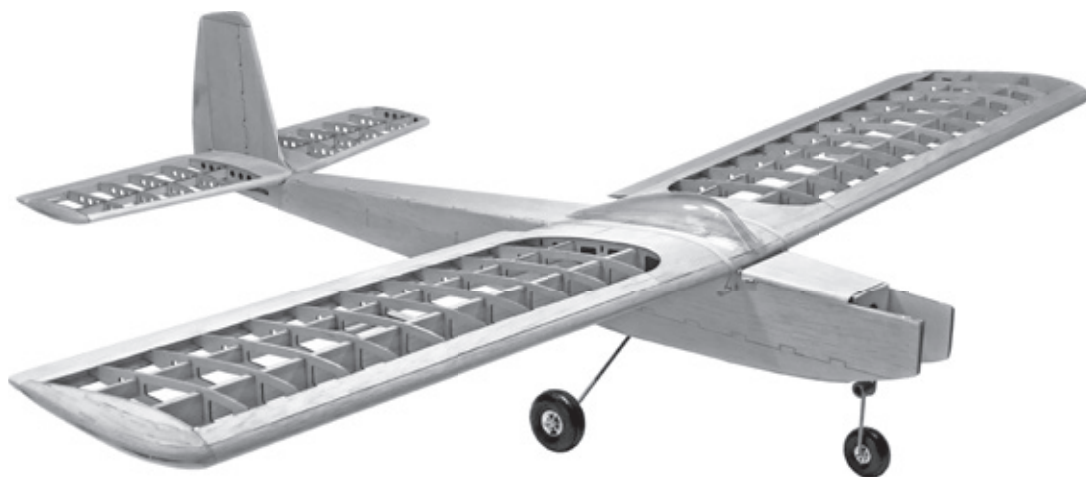


FIFTY SIX

CONSTRUCTION MANUAL



Specifications:

Wingspan: 56 in.
Wing Area: 560 sq in.
Airframe Length: 41.5 in.
Weight: 3.5 - 4.5 lb.

Using the Manual

Be sure to read each step thoroughly before you start the step. Test-fit the parts together to make sure they fit properly. If necessary trim to fit.

Beside each step you will notice a check box (or two). These are so you can keep track of your progress while building your kit. For steps that have two boxes, as in the construction of the left and right wing halves, these steps must be performed two times.

- Your **Old School Model Works** aircraft should not be considered a toy, but rather a sophisticated, working model that functions very much like a full-size airplane. Because of its performance capabilities, this model, if not assembled and operated correctly, could possibly cause injury to yourself or spectators, and damage to property.
- You must assemble this model according to the instructions. Do not alter or modify this model, as doing so may result in an unsafe or un-flyable model. In a few cases the instructions may differ slightly from the photos. In those instances the written instructions should be considered as correct.
- You must take time to build straight, true and strong.
- You must use a R/C radio system that is in first-class condition, a correctly sized power system and components (electronics, batteries, wheels, etc.) throughout the building process.
- You must correctly install all R/C and other components so that the model operates correctly on the ground and in the air. (Installation shown in the manual is a suggestion. You may have to adjust the mounting steps to accommodate the size of your radio equipment.)
- You must check the operation of the model before every flight to insure that all equipment is operating and that the model has remained structurally sound. Be sure to check clevises or other connectors often and replace them if they show any signs of wear or fatigue.



- If you are not an experienced pilot or have not flown this type of model before, we recommend that you get the assistance of an experienced pilot in your R/C club for your first flights. If you're not a member of a club, your local hobby shop has information about clubs in your area whose membership includes experienced pilots.
- While this kit has been flight tested to exceed normal use, if this model will be used for extremely high stress flying, such as racing, or if a power system larger than one in the recommended range is used, the modeler is responsible for taking steps to reinforce the high stress points and/or substituting hardware more suitable for the increased stress.

Remember: Take your time and follow the instructions to end up with a well-built model that is straight and true.



www.oldschoolmodels.com

WARNING

**READ THROUGH THIS MANUAL
BEFORE STARTING CONSTRUCTION.
IT CONTAINS IMPORTANT WARNINGS
AND INSTRUCTIONS CONCERNING
THE CONSTRUCTION AND USE OF THIS
MODEL.**

***A Radio-Controlled aircraft is not a toy!
If misused, it can cause serious bodily harm
and damage to property. Fly only in open
areas, preferably at AMA (Academy of Model
Aeronautics) approved flying sites, following all
instructions included with your radio, powerplant,
electronics and batteries.***

- Inspect your model before every flight to ensure it is airworthy.
- Be aware of any other radio frequency user who may present an interference problem.
- Always be courteous and respectful of other users in your selected flight area.
- Choose an area clear of obstacles and large enough to safely accommodate your flying activity.
- Make sure this area is clear of friends and spectators prior to launching your aircraft.
- Be aware of other activities in the vicinity of your flight path that could cause potential conflict.
- Carefully plan your flight path prior to launch.
- Abide by any and all established AMA National Model Aircraft Safety Codes.

IMPORTANT!!! Two of the most important things you can do to preserve the radio controlled aircraft hobby are to avoid flying near full-scale aircraft and avoid flying near or over groups of people.



WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

INCLUDED ITEMS

Wood parts included in this kit:

- 1 - LP1 - laser cut 1/8" x 5 x 24 sheet
- 1 - LP2 - laser cut 1/8" x 5 x 24 sheet
- 1 - LP3 - laser cut 1/8" x 2 x 24 sheet
- 1 - LP4 - laser cut 1/8" x 5 x 24 sheet
- 1 - LP5 - laser cut 1/8" x 5 x 24 sheet
- 1 - LP6 - laser cut 1/16" x 3 x 3 sheet
- 2 - BP1 - laser cut 1/8" x 4 x 24 balsa
- 1 - BP2 - laser cut 1/8" x 1 x 24 balsa
- 2 - BP3 - laser cut 3/32" x 4 x 24 balsa
- 2 - BP4 - laser cut 3/32" x 4 x 24 balsa
- 1 - BP5 - laser cut 3/32" x 4 x 24 balsa
- 2 - BP6 - laser cut 3/32" x 4 x 24 balsa
- 2 - BP7 - laser cut 3/32" x 4 x 24 balsa
- 1 - BP8 - laser cut 3/32" x 4 x 24 balsa
- 2 - BP9 - laser cut 1/4" x 4 x 12 balsa
- 2 - BP10 - laser cut 1/4" x 4 x 12 balsa
- 1 - BP11 - laser cut 1/4" x 4 x 12 balsa
- 1 - BP12 - laser cut 1/4" x 4 x 12 balsa
- 2 - BP14 - laser cut 1/16" x 4 x 24 balsa
- 2 - BP15 - laser cut 1/16" x 4 x 24 balsa
- 1 - BP16 - laser cut 1/16" x 4 x 24 balsa
- 1 - 3/32" x 4 x 12 balsa sheet
- 1 - 1/16" x 4 x 12 balsa sheet
- 2 - 1/2" x 1/2" x 36" balsa strips
- 2 - 1/4" x 1/2" x 36" balsa strips
- 2 - 1/4" x 1/4" x 36" balsa strips
- 2 - 3/16" x 3/16" x 36" balsa strips
- 4 - 1/8" x 1/8" x 36" basswood strips
- 4 - 1/4" x 1/4" x 36" basswood strips
- 2 - 5/16" x 1-1/4" x 36" tapered balsa strips
- 3 - 1/4" x 36" wooden dowels

Hardware parts included in this kit:

- 8 - magnets
- 2 - pre-bent main gear wires
- 1 - nose gear assembly
- C/A type hinges for control surfaces
- 4 - control horns
- 2 - wheel collars 5/32" I.D.
- 2 - plastic gear straps
- 8 - 2-56 x 1/2" machine screws
- 12 - 2-56 x 3/4" self tapping screws
- 10 #64 rubber bands

Other items included in this kit:

- 2 - Rolled plans (fuselage and wing)
- 1 - Construction Manual
- 1 - Formed Canopy

ITEMS NEEDED

Hardware needed (not included in the kit)

For some of these items there is more than one option which will require a bit of decision making ahead of time. There isn't a right or a wrong choice, so choose the items that work best for you.

We strongly recommended supporting your local hobby shop.

- Powerplant: .19-.35 sized 2-stroke glow engine (or similar electric system)
- Propeller
- Engine/Motor mount and mounting hardware
- 4-6 ounce Fuel Tank and fuel tubing (if glow)
- Receiver - (4 channel minimum)
- 4 servos (electric) or 5 servos (if glow) - we recommend standard servos all around, although you can use a smaller servo on the throttle, if using glow power).
- "Y" servo harness (for ailerons)
- Pushrods (two 5" for ailerons, two 26" for elevator & rudder, one 14" for nose gear steering, one 10" for throttle if glow.)

- Clevises for the pushrods.
- Wheels: one 2-1/4" for nose, two 2-1/2" for mains.
Sure there are a lot of wheels out there, but let's face facts. It's DuBro Chromies for the win here - it's just the right look.
- Covering (2 rolls typically)

Additional Required Building Tools and Adhesives

- Drill & assorted drill bits
- Hobby knife and #10 blades
- Sandpaper: coarse (80 or 100 grit) & medium (150-200 grit)
- Pencil or pen
- Ruler
- T-Pins
- Waxed paper
- Building board
- 2-part epoxy (6 or 15 minute)
- Epoxy brushes and mixing sticks
- Wood adhesives of your choice. We use medium viscosity CA (cyanoacrylate), but aliphatic resin and/or carpenter's glues (used correctly) will work just as well and give longer working time.
- Thin CA for attaching the included hinges

Although an easy to build kit, our Fifty Six kit is not for the novice builder. We are assuming the builder is used to constructing balsa kits and has the techniques and skills necessary to do so.

Closely inspect the supplied laser cut parts for damage. If you find any damaged or missing parts, contact us within 60 days of purchase.

When removing the laser cut parts from their sheets, you'll notice the parts are held in place by several small "tabs". These tabs are uncut pieces of wood and can sometimes make it difficult to remove a part. Rather than breaking and/or splintering the wood by forcing out the part, we recommend removing any laser cut parts from their sheets by using a hobby knife with a #10 blade. A quick cut of the tab will allow the piece to be removed with no damage. Sand any tab remainders flush with the part so there will be no problem aligning them later.

It's best to not remove parts from their sheets until they are needed. Refer to Appendix A of this manual as a reference to what all the laser cut parts look like and are called.

You'll notice a check box next to each step. Check these off as you go along so you don't miss a step. Note that some steps (in building the wing) have two boxes - this means that the step will be done twice - once for each wing half.

There could be a step or two which leaves you a bit puzzled. If this happens, step back and study the photo(s) for that step - both in this manual and online.

All photos shown in this manual are of different Fifty Six prototypes. Several pieces may have changed slightly with improvements we've made so parts may look a little different in some steps.

Online Supplementary Photos

We realize that the smaller black-and-white photos in this manual might not show some of the steps as clearly as you



might want. So we've anticipated this and made these photos available on our website. You can either scan the QR code or type this address into your browser:

www.oldschoolmodels.com/mpics/fiftysix/

IT IS VERY IMPORTANT THAT YOU ASSEMBLE THE FIFTY SIX KIT IN THE ORDER DESCRIBED. SKIPPING FORWARD IN THE STEPS COULD LEAVE YOU WITHOUT THE PROPER LENGTHS OF WOOD TO FINISH THE KIT. WE'VE INCLUDED ENOUGH WOOD TO EASILY COMPLETE THIS KIT, BUT YOU MUST TAKE CARE TO PROPERLY MEASURE AND NOT WASTE WOOD WHEN CUTTING.

Let's begin construction by working on the port (left) wing of your Fifty Six. Note that in these wing assembly photos, there is an extra rib shown - that was eliminated in the final prototype and production kits.

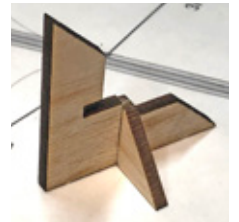
☐ Prepare your work area

You'll need a flat building surface that is a minimum of 36" long. Position the port wing plan over the surface and tape into position. Tear off a length of waxed paper long enough to cover the port wing plan and tape that into position, over the plan.



☐ Alignment triangles

Pre-cut into LP2 is a 90° triangle. This can be used to vertically align any of the parts in the construction of your Fifty Six. LP2 also includes a foot piece that can be used with the triangle to hold it vertically (hands-free).



☐ ☐ Step 1 - Wing Assembly (front spar)

These next few steps will create the front spar. It is recommended that you use a long, straight edge during these steps to ensure that the finished spar is straight and true.

Locate one of the 1/4" square x 36" lengths of basswood, and one SP2 from BP1. Glue the longer edge of SP2 to the basswood as shown here, with them lined up at one end. Make sure that SP2 is pressed up against the basswood along its entire length, and is also held flat against your building board as shown in this photo.



☐ ☐ Step 2 - Wing Assembly (front spar)

Locate one SP1 from BP1. This is glued in place to SP2 and the basswood by lining up the modified scarf joint pre-cut into the pieces. Again, make sure this is aligned straight with the straight edge, and flat along the entire length where it contacts the basswood strip.



□ □ Step 3 - Wing Assembly (front spar)

Locate another SP2 from BP1 and this is now glued on top of the SP1 you just installed. This will allow the lower and upper scarf joints to overlap, rather than be aligned. Again, make sure that this SP2 is glued to the SP1 (and the overlapping portion of SP2) below it, as well as where it contacts the basswood strip. Make sure this joint is straight as shown here.



□ □ Step 4 - Wing Assembly (front spar)

Now locate another SP1 and glue in place, aligning the laser-cut scarf joints and making sure it is properly positioned as the glue cures.



□ □ Step 5 - Wing Assembly (front spar)

To complete this spar, locate another of the 1/4" square basswood strips. Glue this to the edge of the spar assembly, to the edges of the SP1 and SP2 pieces as shown here. Make sure it's flat and straight along its entire length.

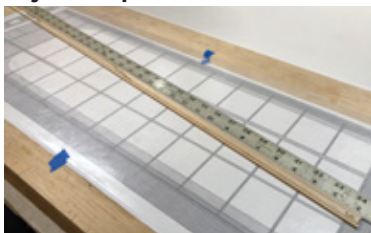


□ □ Step 6 - Wing Assembly (front spar)

Once the glue has cured in the spar assembly, remove it from the building board and lightly sand it's surfaces to make sure they are flat and smooth, removing any glue bumps that may have formed during the assembly and curing. Don't go overboard - just make sure that you have a piece that is flat on all sides so it will slide smoothly into the ribs during the upcoming steps.

□ □ Step 7 - Wing Assembly (rear spar)

Now locate two of the 1/8" square basswood strips, one SP3 and one SP4 from BP1. Using these pieces you'll make the rear spar, using the same techniques as you did for the front spar. Start by gluing the long edge of SP3 to the basswood strip, making sure it's straight along its length. Then glue SP4 in place, lining up the scarf joint. Follow it all up with the other length of basswood glued to the exposed edges of SP3 and SP4. Lightly sand it flat in preparation for the upcoming steps.



□ □ Step 8 - Wing Assembly (wing ribs)

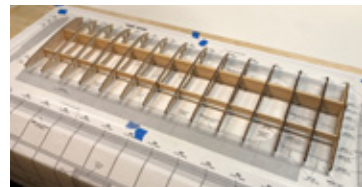
Now locate one complete set of wing ribs. Stack them up in order by referring to the plans. Starting at the root: R1, R2, R2, R3, R4, R4, R5, R5, R4, R4, R4, R4, and R6. Make sure you align them correctly with the under-side tabs all in the same direction. Double,



triple, and quadruple check that you have them in the correct order, then when satisfied, push the front spar into the larger rectangular hole in each rib. The rear spar is pushed through the smaller rectangular hole towards the rear of the ribs.

□ □ Step 9 - Wing Assembly (wing ribs)

Now place this "assembly" onto the wing plan on your building board and start to carefully space the ribs apart so they align with the plans. Take your time and use a light touch so you don't break off any of the underside tabs, or crack any of the ribs. They don't need to be perfectly aligned yet, but get them close. Double check that all the ribs are in the right order one more time as in the next step everything is locked in place, making this the last time you'll be able to easily fix any mix-ups. *It's worth one more look now - trust me.*



□ □ Step 10 - Wing Assembly (wing ribs)

Starting at the tip rib (R6), it's time to start gluing things in place. I like to put a small drop of medium CA on the bottom of the underside tabs of this rib to help lock it in place to the waxed paper (or you can use pins if that's your thing). Also make sure



to use the enclosed triangle that you should have at hand from the first steps of this build. This ensures that this rib is perfectly aligned at 90° to the building surface.

Also make sure that the front and rear spar protrude a little from R6 - maybe an 1/8" or so.

When satisfied, glue the two spars to R6.

□ □ Step 11 - Wing Assembly (wing ribs)

Now, slowly and methodically work your way towards the root rib, one rib at a time. Make sure each rib is precisely aligned - the spars are aligned, and that you firmly glue each rib to both spars. As you go along, you also might want to place a drop of glue on the underside tabs on every third or fourth rib to keep everything aligned with the plans. Continue with this until you have glued the innermost R4 in place. Stop there and move on to the next step.

□ □ Step 12 - Wing Assembly (SPACER)

Locate SPACERs from LP1 and LP4. These are just as the name implies - simply spacers and should NOT be glued into the airframe at any point.

Notice that the pre-cut rectangular spars holes in R3, both R2's and R1 are wider than the spars that are in them. This is to allow for the dihedral braces that will be attached later on. But you need to make sure the spacing is correct when gluing the spars in place, hence the use of the SPACERs.

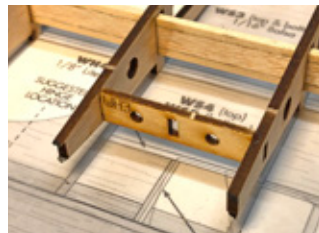
Use one SPACER piece as a substitute for the front dihedral brace first, by sliding it into the holes on the R1, R2 and R3 ribs. This should push the spar towards the rear of the pre-cut slots. Then do the same with the other SPACER for the rear spar holes - again pushing the spar towards the rear of the cutouts in each rib.

☐ ☐ Step 13 - Wing Assembly (R3)

With the SPACERS in place, carefully align rib R3 and the outermost R2 rib, then tack them in place to the spars (best to tack glue on the back side of the spars). Make sure that the SPACERS are not glued to spars or any of the ribs as they will be VERY hard to remove.

☐ ☐ Step 14 - Wing Assembly (WH3)

Locate one of the WH3s from LP1. Its outer tabs fit into the pre-cut slots on the back of the R2 ribs as shown here. Glue it to the outer R2 rib first, then properly align the inner R2 rib. Once aligned, glue that R2 rib in place by tacking it in place to the back of the spars, and then glue the WH3 to it as well.



☐ ☐ Step 15 - Wing Assembly (WH1, WH2, WH4)

Locate WH1, WH2, and WH4 from LP1. Note that WH1, WH2 and WH4 have a small circle engraved on one side. This designates the side that should face R1 because it has a small angle pre-cut into it. Glue each WH1, WH2 and WH4 to R2 making sure their tabs are completely inserted into the holes on the innermost R2 rib.



☐ ☐ Step 16 - Wing Assembly (R1)

Locate DH-JIG from LP1. This is used to help align R1 in this step. WH1, WH2, and WH3 already have this angle cut into them, but you can also use this DH-JIG to further aid the R1 alignment. Slide each of the tabs from those WH pieces into the pre-cut holes of R1, making sure they are completely inserted. When properly aligned you should be able to double-check it with the DH-JIG. After everything is aligned, tack glue R1 to the back of the spars, then also glue R1 to WH1, WH2 and WH3.

☐ ☐ Step 17 - Wing Assembly (SPACER)

With the ribs all in place, carefully remove the SPACER pieces and then glue ribs R3, R2 and R1 to the spars. Make sure you do NOT have any extra glue fouling the holes where the dihedral braces will slide into.

☐ ☐ Step 18 - Wing Assembly (R1A)

Locate two of the R1A pieces from LP1. These are glued into the center rectangular cutout in WH4 and WH3 as shown here, pointing towards the trailing edge of the wing. Make sure they are firmly seated as the glue cures.



☐ ☐ Step 19 - Wing Assembly (trailing edge)

Locate one 1/4" square length of balsa strip. This will be the trailing edge of the wing. Measure and trim it to length, leaving about an extra 1/4" or so. Then carefully slide it on to the back of each of the ribs and it should be held in



place between the two "fingers/fangs/points" on the back of each rib. Working from one side to the other, glue the trailing edge to each of the ribs, making sure that the alignment of each rib is still spot on.

☐ ☐ Step 20 - Wing Assembly (leading edge)

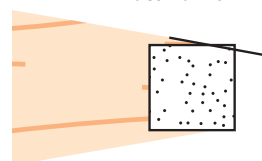
Locate one length of 1/2" square balsa strip. This is the leading edge of the wing. Measure and trim it to length, again, leaving about a 1/4" extra. Working from one end to the other, glue the leading edge in place to each of the ribs, making sure it is firmly seated into the pre-cut, angled slot of each rib.



☐ ☐ Step 21 - Wing Assembly (trailing edge sanding)

You'll now need to very lightly sand the trailing edge. Refer to this diagram to show what I'm on about. The trailing edge needs just a little sanded off the rear edge so it will continue the airfoil shape. Do this for the top and bottom surface of the trailing edge.

Sand this lip to match airfoil



☐ ☐ Step 22 - Wing Assembly (CS2, CS5)

Locate one CS2 from BP15 and one CS5 from LP6. CS5 fits into the pre-cut notch of CS2 as shown here. Before gluing it place, lightly sand the edges of CS5 where it will contact CS2, so you'll have a good fit. When happy with the fit, carefully apply glue to the two contacting edges of CS5 and attach it to CS2. Apply a bit of downward pressure along the seams to make sure the joint is flat along the edges as the glue cures.



☐ ☐ Step 23 - Wing Assembly (CS1, CS2, CS3)

Locate one CS1 and one CS3 from BP15. After trimming, these will all be glued together to form the top sheeting of the wing's center section. Place the CS2 assembly in place on the rear section of the wing, then place the CS1 on the front edge, simulating how it will wrap around the leading edge rib curve (temporarily tape in place if that helps). CS3 has purposely been cut a little long, so you'll need to trim it to get a perfect fit filling the gap between CS1 and CS2.

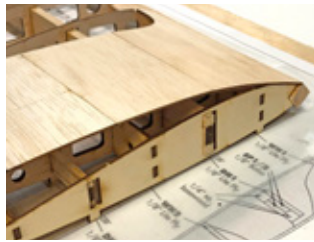


When satisfied with how it all looks, remove the pieces and it's time to glue them together into a single sheet.

When edge gluing the sheeting pieces together, first make sure the edges are flat (give a quick, swipe or two with a sanding block). Then tape the two pieces together with a piece of masking tape. As you lift the sheeting from the board you'll see that the tape will act as a hinge allowing you to put a small amount of adhesive into the joint. When the adhesive is applied, place the sheeting back down on the waxed paper, so that it's flat and apply pressure to the joint while it cures to make sure it's flat along its entire length.

When cured, you'll now have a single, longer piece of sheeting.

It's easier to join the shorter lengths of sheeting together on a flat surface. Then when the glue has cured, glue the sheeting in place on the wing. Start at the leading edge and gluing a little at a time. Press the sheeting firmly against the ribs and wait for the glue to cure before gluing the next section of sheeting - slowly working your way back to the trailing edge, being careful not to put a bend (warp) in the wing.



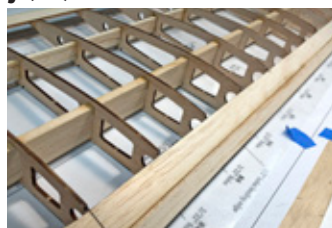
☐ ☐ **Step 24 - Wing Assembly (TE)**

Locate one TE from BP14. This is the trailing edge sheeting. Glue this in place into the "groove" pre-cut into rear of each of rib as shown here. Be sure it is glued to each of the ribs, to the top of the trailing edge and to the center sheeting you just applied.



☐ ☐ **Step 25 - Wing Assembly (LE)**

Locate one LE from BP14. This is the leading edge sheeting. Glue this in place into the "groove" pre-cut into the front of each rib as shown here. Be sure it is glued to each of the ribs and to the leading edge, and the center sheeting.



As the sheeting we get can vary in density, you might have to apply a bit of Windex® glass cleaner to loosen up the grain and allow it to bend without cracking. Soak the outer side of the wood to expand the fibers. Now hold it to curvature needed, then use a hair dryer or covering heat-gun to help "set" the balsa's bend as it dries. Once dry, then you can glue it in position.

☐ ☐ **Step 26 - Wing Assembly (remove under-side tabs)**

Once the glue has cured it's time to carefully remove the wing assembly from the board. Once removed, flip it over and it's time to remove all the underside tabs that helped hold the ribs in place. There's one in the front and one in the back of each rib. On ribs R2-R6, these are balsa and easily cut away with a hobby knife. R1 ribs are lite ply and might need a bit more persuasion to remove. When trimming these tabs, make sure you cut them away just enough so that the airfoil shape of each rib is not interrupted. On the trailing edge, this will mean that each tab will be cut away so the trailing edge sits 1/16" proud of each rib.

☐ ☐ **Step 27 - Wing Assembly (CS1, CS4)**

Locate two CS1s from BP15 and one CS4 from BP16. These are used to create the center sheeting for the underside of the wing.

Use the same techniques that you used when forming the upper sheeting a few steps back. You'll need to trim CS4 to fit between the gap of the CS1's.



Also note that CS4 has a pre-cut hole in it. This is to allow the aileron servo wire to exit. This hole should be positioned so it's closer to the root rib (R1). When this assembly is completed, glue it in place using the same techniques as applying the top sheeting.

☐ ☐ **Step 28 - Wing Assembly (LE & TE)**

Locate one LE and one TE from BP14. These are the lower leading edge and trailing edge sheeting and should be applied in the same way as you applied the top side sheets.

☐ ☐ **Step 29 - Wing Assembly (root, tip sanding)**

Take a few minutes to carefully sand away any extra wood that extends past the root (R1) and tip (R6) ribs. Cut and/or sand as necessary until any extra spar or sheeting material is perfectly flush with those ribs.

☐ ☐ **Step 30 - Wing Assembly (TP1)**

Locate one TP1 from LP1. This is glued in place to R6 as shown here. It should be at 90° to R6 (perpendicular) and all the TP1 tabs should fit completely into the pre-cut slots in R6.



☐ ☐ **Step 31 - Wing Assembly (T2, T3, T4)**

Locate T2 and T4 from BP9P as well as T3 from BP10P.

Make sure you're using BP9P for the port wingtip - NOT BP9S.

Note the etched lines on T2 and T3. These are alignment guides for the piece that fits on top of them.

With the wing sitting up-right, glue T2 on top of TP1 and up against R6. Then glue T3 on top of T2, aligning T3 with the edges guides and up-against R6. T4 is then glued on top of T3, again aligning it with the guides and making sure it's up against R6.



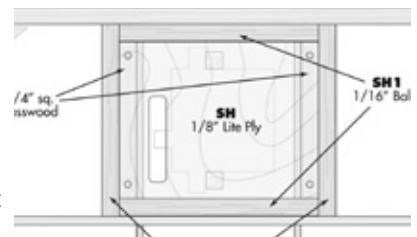
☐ ☐ **Step 32 - Wing Assembly (T5, T6)**

Locate T5 and T6 from BP9P. These are glued to the underside of TP1, T5 first, then T6 using T5's etched lines as a guide.



☐ ☐ **Step 33 - Wing Assembly (aileron box)**

First we'll create the mounting rails for the aileron hatch by using leftover 1/4" square basswood you trimmed when creating the forward spars. Measure and cut two lengths that will span the distance between the forward and rearward spars. With the wing half laid on its top, glue these two strips to the R5 ribs as shown on the plans. These strips should be flush with the lower-most pre-cut edges of the R5 ribs.



☐ ☐ **Step 34 - Wing Assembly (aileron box - SH1)**

Next locate two SH1s from BP15. These are glued to R5's small

ledges just behind the front spar and ahead of the rear spar. Glue these, centered across the two R5 ribs as shown on the plans.

☐ ☐ **Step 35 - Wing Assembly (aileron box - SH)**

Locate one SH from LP5. This should now fit in the area between the SH1's you just installed. If not, lightly sand as necessary to obtain a good fit. Note that there are 4 holes precut into the corners. With a 1/16" bit, use SH as a guide to drill the 4 holes that will be used to attach SH to the wing using 4 of the supplied 2-56 self-tapping screws. Temporarily attach the hatch in place using these screws.

☐ ☐ **Step 36 - Wing Assembly (aileron box)**

Now locate some of the scrap 1/4" square balsa stock trimmed away from the trailing edge pieces. Cut two lengths that will run between the front and rear spars. Glue these in position as shown on the plans - flush with the top surface of SH1, and against the 1/4" square basswood mounts. Do NOT glue them to the SH hatch as that needs to be removable.

Set the port wing half aside and begin work on the starboard wing half. Tape the starboard wing plan and fresh wax paper on your board. Then follow steps 1 through 36 to complete the starboard wing half. Once finished, then move on to step 37.

Note that when building the port half that many of the parts will need to be glued to the opposite side (the WH1, WH2, and the wing stip pieces for instance). Always refer to the plans to make sure you're gluing the parts together in the correct way.

☐ **Step 37 - Wing Assembly (D1, D2)**

Locate D1 from LP1 and D2 from LP2. These are the dihedral braces. Test fit these by sliding them into both of the wing halves, as shown. They should smoothly push into the gap in the R1, R2 and R3 ribs until each brace is half way inserted. Also make sure that you insert them both in the same orientation - so they both point "up" when the wing is held up-right.



Carefully sand as necessary so they both slide in as they should, and allow the root (R1) ribs on both halves to fit flat against each other, along their entire length.

Once satisfied with the fit, take the wing halves apart and remove D1 and D2.

Now it's time to mix up some epoxy and use it to coat the areas where the D1 and D2 pieces will contact the spars and ribs. Also coat the entire face of one of the R1 ribs.

When coated, slide all these pieces back together to form the completed wing assembly. Hold these together with some tape and/or clamps until the epoxy has cured completely.

While waiting for the glue to cure, wipe away any excess with a paper-towel soaked in a bit of denatured alcohol.

☐ **Step 38 - Wing Assembly (ailerons)**

Locate the two lengths of 5/16" x 1-1/4" tapered balsa sticks. These are used as the ailerons. Refer to the plan for the correct length, then cut one aileron from each piece. Also note the slight angle on the aileron tips and cut/sand that in as well.

Note - if you prefer to make your Fifty Six a 3-channel system (without ailerons), you can glue these strips to the trailing edge of each wing to continue on the airfoil shape of the wing. We've not done this with any of the prototypes as we prefer ailerons, but there could be a couple of you out there that are aileron-phobic, so here's your chance to go really "old-school".

This completes the assembly of the wing. Now it's time for the tail surfaces, starting with the vertical fin.

☐ **Step 39 - Vertical Fin Assembly (VF1, VF2, VF4)**

Locate VF1 and VF4 from BP12, and VF2 from BP11.

Glue VF1 to VF2, making sure it is properly aligned and that all the tabs in VF1 are completely seated in VF2's tabs. Then, glue VF4 to the top of the VF1/VF2 assembly, making sure it is properly oriented.



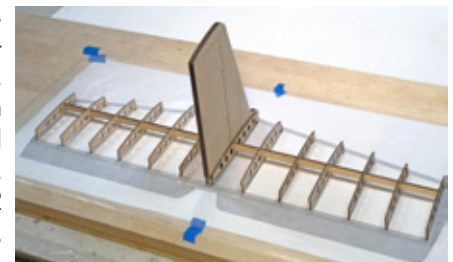
☐ **Step 40 - Stab Assembly (S1 ribs)**

Locate both S1 ribs from BP16. These are glued to the bottom of the vertical fin assembly from the previous step, one on each side. Using the pre-cut holes as a guide, glue one S1 to the vertical fin piece, then flip it over and glue the other S1 to the other side. Make sure these are properly aligned, and straight with each other. Refer to the drawing of this section shown on the side view of the fuselage plans.

Remove the wing plans from your building surface, then cutout and attach the plans for the horizontal stab and elevator. Cover it with wax paper and tape everything into place.

☐ **Step 41 - Stab Assembly (SP5, S2-S7 ribs)**

Locate SP5 from BP2, and both sets of S2-S7 ribs from BP16. Slide the vertical fin assembly on to SP5, all the way to the middle. Then, slide one S2 on each side of SP5, noting the orientation



(all underside tabs pointing the same way, and the leading edges also oriented correctly. Continue on with both S3s, S4s, S5s, S6s, and finally S7s. Place this "assembly down on to the plans and begin to carefully slide the stab ribs into their proper position.

☐ **Step 42 - Stab Assembly (stab ribs)**

Using the 90° alignment triangle, it's time to start gluing the stab ribs to SP5. Start with the vertical fin, with it perfectly centered, 90° to the building surface and straight. Then work your way through one side of



the stab, then the other. Take the time to make sure everything is aligned properly BEFORE you glue it in place, as it's just about impossible to fix if things are out of order and glued in place. When finished, you should have something that looks just about like this photo.

☐ Step 43 - Stab Assembly (trailing edge)

Locate one length of the 1/4" x 1/2" balsa strip. Measure and cut this to length to form the trailing edge of the stab. Leave an extra 1/4" or so, then glue this in place, using the pre-cut "step" on the rear of each rib to help hold it correctly in place. Make sure you glue this piece to each of the stab's ribs.



☐ Step 44 - Stab Assembly (leading edges)

Locate the other length of 1/4" x 1/2" balsa strip to use as the leading edge of the stab. This will need to be cut to length, and the root edges beveled slightly to join correctly at the stab's center. Again, using the "step" cut into the front of each rib, place these pieces in position and glue them to each of the ribs, and to each other.



☐ Step 45 - Stab Assembly (center sheeting, top)

Using the un-cut sheet of 1/16th balsa, it's time to measure, cut and form the center sheeting strips that will be attached to each side of the vertical fin. These sheets run from the top of the S1 ribs (up against the vertical fin), to cover the tops of the S2 ribs.



Using the same techniques that you used when forming the wing's center sheeting, measure and cut 3 total pieces to make each sheet. Take your time when measuring and cutting - especially against the tapered edge of the leading edge. What you want is a piece that fit snugly against the leading and trailing edges as shown here.

Once you have made a pair of these, glue these in place on each side over the S1 and S2 ribs, up against the vertical fin as we've shown here.

☐ Step 46 - Stab Assembly (VF3)

Remove the stab assembly from your building board and flip it over. Remove all the underside tabs by trimming them away, just as you did on the wing. Make sure to continue each of the rib's aerodynamic shape.



Once that is finished, locate VF3 from BP11. This is glued in place into the notch on the underside of the vertical fin. As shown here.

☐ Step 47 - Stab Assembly (center sheeting, bottom)

Using the same techniques as you used on the top sheeting, measure, cut and form the two strips of 1/16th sheeting used on the bottom side. When you are satisfied with their fit, glue them in position as shown.



☐ Step 48 - Stab Assembly (ST)

Sand the both ends of the stab assembly so there's no extra trailing edge, leading edge or stab material protruding past the S7 ribs.

Now locate 6 STs from BP10P and BP10S. Make 2 tip assemblies by gluing 3 of them on top of each other, aligned with each other.

Then lightly sand the long edge so it's flat, then glue one assembly to each tip of the stab, making sure you've properly aligned and centered it on the S7 ribs.



☐ Step 49 - Elevator Assembly

Locate the two extra pieces of 5/16" x 1-1/4" tapered edge stock, as well as one of the 6" lengths of 1/4" dowel. Cut the dowel to length, as shown on the plans. Now measure and cut one elevator half from each tapered edge balsa piece. Mark and cut the notches into the leading edge of these elevator halves as shown on the plans. Then glue each elevator half to the dowel, making sure the entire piece is perfectly straight and flat.

This completes the assembly of the tail surfaces. Now it's time to assemble the fuselage. You won't need to tape down the fuselage plan to the board - simply use it as a reference. However, you may need to put down some fresh waxed paper as you'll need it for a few of the steps.

☐ Step 50 - Fuse Assembly (F3, F3A)

Locate F3 and F3A from LP2. Glue F3A to F3 as shown here, making sure it is properly aligned.



☐ Step 51 - Fuse Assembly (F4 and TR2)

Locate TR2 from LP2 and F4 from LP4. Glue F4 into TR2 as shown here. Make sure F4 is completely inserted into TR2 and is held 90° to the surface of TR2.



☐ Step 52 - Fuse Assembly (F5)

Locate F5 from LP2. This is glued to the back of TR2 as shown here, and pay close attention to it's orientation so you don't attach it up-side-down.



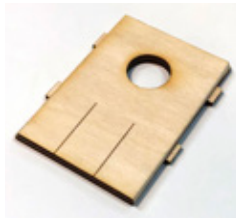
☐ Step 53 - Fuse Assembly (F3/F3A assembly)

Now attach the F3/F3A assembly you created a few steps back, to the front of TR2. Note that the F3 side should be attached to TR2, not the F3A side. Again, make sure it's oriented correctly and is 90° to TR2.



□ Step 54 - Fuse Assembly (F1/F2)

Locate F1 from LP2 and F2 from LP4. These are glued together as shown to form the firewall. Make sure F1 is aligned with F2 and that the etched nose-gear alignment lines are visible. We recommend epoxy for this step.



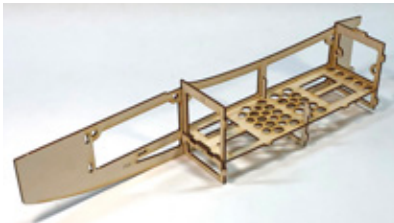
□ Step 55 - Fuse Assembly (TR1)

Locate TR1 from LP2. Note that TR1 has a small circle engraved on the top surface - this designates the starboard side of the fuselage. Both tabs on the front of TR1 should be inserted into the pre-cut holes in F2 as shown here. Also note that this piece is NOT glued perpendicular to TR1. Instead, use the DH-JIG guide you used during the wing construction to give the needed downthrust angle that will become apparent in the next few steps.



□ Step 56 - Fuse Assembly (FSS)

Locate FSS from LP5. This is the starboard side of the fuselage and should be attached to the plywood TR2 assembly you've just created over the last few steps. Take the time to dry-fit this first, to get an idea of how all the tabs fit into FSS's pre-cut holes. When you're ready, glue FSS in place. Make sure that all of the tabs are fully seated into each of the holes, and that FSS follows the gentle curvature cut into TR2.



□ Step 57 - Fuse Assembly (FSP)

Locate FSP from LP4. This is the port side of the fuselage and should be attached to the port side of the plywood box. Again, take the time to dry-fit this first, to get an idea of how all the tabs fit into FSP's pre-cut holes. When you're ready, glue FSP in place. Make sure that all of the tabs are fully seated into each of the holes, and that FSP follows the gentle curvature cut into TR2.



□ Step 58 - Fuse Assembly (TR1)

Now the TR1 assembly is glued in place, between the fuselage sides and into F3A. To do this carefully bend the fuselage sides apart a bit, allowing the assembly to slide into place. When properly aligned, all of the tabs should pop into the pre-cut holes on both FSP and FSS.

When satisfied with this dry-fit, remove the tray, apply glue, and put in back in position. Make sure it's held in place and that the fuselage sides continue their gentle curvature.

□ Step 59 - Fuse Assembly (SS)

Locate both SS from LP3. These are the inner supports for the wing saddle. One is glued in place on the inside of FSP and FSS as shown here. Make sure their edges area aligned with the fuselage sides and they are properly oriented.



□ Step 60 - Fuse Assembly (nose gear block)

This might seem like a strange time to do this, but it's actually the perfect time. Inside the hardware bag is a smaller bag which has all the components needed to make the nose gear assembly. In this group of parts is the nylon nose block, the 4 mounting screws, and the 4 t-nuts.

Using the etched lines on F1, you can easily locate this nose-block so it's straight, as the lines should appear inside each of the 4 block's four mounting holes. Using a 3/32" bit, drill these four mounting positions into F1.

Then use the 4 screws and t-nuts to fasten this in position. You might want to use a bit a thread lock and cut away the extra length from interfering with the tank and/or battery installation later on.



□ Step 61 - Fuse Assembly (SS1, SS2, SS3)

Locate both SS2s and SS3s from BP6, as well as both SS1s from BP7. Glue one SS1 to one SS2, making sure that all the tabs on SS2 are completely seated into the notches cut into SS1. Also make sure that the pieces are flat along this entire joint. Then glue SS3 to the end of this assembly using the same technique. Make 2 assemblies.



□ Step 62 - Fuse Assembly (fuse side prep)

Take the plywood fuselage box and test fit one of the balsa fuselage sides to the port side. Align it so the dowel holes and edges match. Now, using a pencil, trace an outline of the end of the fuselage box on the inside face of the balsa side.

Remove that side, then do the same for the starboard side, again tracing the end on the inside face of the balsa sheeting.



□ Step 63 - Fuse Assembly (fuse side prep)

Locate two 3/16" square balsa strips. These are used to create interior ledges on the top and bottom of the fuselage sides. The strips will be positioned along the bottom of the cutouts on the fuselage sides (refer to the photo). Measure and



cut the bottom strip first. It will start just at the outline you made, rearwards and stop right at the start of TW1 (refer to the plans for these locations). The top strip starts at the drawn outline, and stops at where STS starts. Cut these for both sides, the glue them in place - again making sure they are aligned with the bottom of the cutouts - not the fuselage edges themselves. Also make sure you have a left and right side - NOT two lefts or two rights. Again, refer to the photo.

☐ **Step 64 - Fuse Assembly (STS)**

Locate both STS from BP10. These stab supports are glued in place on the inside of the fuselage sides to "beef-up" those areas. Pay attention to the orientation and make sure that the curved edges of the STS pieces are matched up to the cutouts in the fuselage sides.



☐ **Step 65 - Fuse Assembly (BS, F6, F7, F8)**

Locate BS from BP8, F6 from BP7, and F7, F8 from BP5. Glue the three formers into the BS sheet, making sure they are completely inserted into BS and are each 90° in relation to BS. Note that the tabs will extend slightly from the bottom side of BS and that is intentional. Once you have these three formers in place, sand away the bit of the tabs to give you a smooth bottom surface that should not need any filler later on.



☐ **Step 66 - Fuse Assembly (starboard fuse sheeting)**

Locate the starboard side sheeting you prepped a few steps back. This is now glued to the BS and formers as shown here. Make sure that the notches in the formers are fully inserted into the side sheeting, and all of tabs in BS are fully inserted into the notches along the bottom edge of the side sheeting. There's a bit of a gentle curve in this sheeting, so make sure that the side sheeting follows that curve as you work. Also the tabs will extend past the sheeting a little, so they can be smoothly sanded flush later on.



☐ **Step 67 - Fuse Assembly (port side sheeting)**

Locate the port side sheeting and attach it using the same techniques you used in the previous step.



☐ **Step 68 - Fuse Assembly (attach plywood box)**

Now it's time to test fit the plywood box to the back of the fuselage. On the bottom of F5 is a notch. This notch is the key to lining up

these two pieces, as it should be inserted into the cutout at the front of BS. Dry fit this first, and once the tab is in place, you can then "rotate" the plywood box as needed so it lines up with the front of the fuselage sides. Once you're satisfied how these pieces go together, then remove the plywood box and it's time to glue it in place. If you're using CA for this step, use slower curing viscosities as you might need a bit more working time to properly align the pieces. This is one step where you might want to use a different glue - aliphatic resin and/or carpenter's could give you a LOT more working time. Epoxy could be used, but it will add a bit of weight with the amount of surface area to cover on the side of the fuselage box.



☐ **Step 69 - Fuse Assembly (pushrods)**

Before installing the top sheeting, now might be a good time to think about installing the elevator and rudder pushrods. We typically use Dubro's Laser flexible pushrods and you'll see the outer red tubing installed in this photo. We've pre-cut pushrod guides into each of the formers, as well as pre-cut pushrod exits on the rear of the fuselage sides. If you use Dubro's, or a similar type of pushrod system, don't forget to glue these tubes in place so they won't move.



☐ **Step 70 - Fuse Assembly (TS)**

Locate TS from BP5. This is the top sheeting and should be dry-fitted first. There's a notch cut into the front edge that fits around the top tab in F6. Then the TS's side tabs should be inserted into each of the notches along the fuselage sides. When satisfied how it all goes together, remove it, apply glue, and attach it in place.



☐ **Step 71 - Fuse Assembly (sand the tail surfaces)**

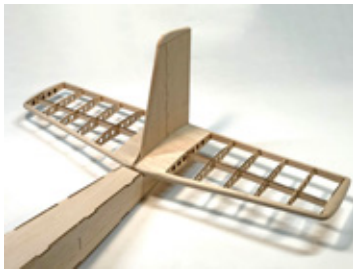
It's time to attach the tail surfaces, but before you do, take the time to sand the leading edges of the stab and vertical fin as they'll be much easier to do now, than after installation. Make sure that the leading edges are nicely rounded, and you might want to test fit them to the rear of the stab a few times as you sand, to get an idea of where you might need a bit more shaping. However, do NOT sand off the front notch that extends from the front of the vertical fin. This is used to align this assembly to the fuselage.

☐ **Step 72 - Fuse Assembly (attach the tail surfaces)**

Once sanded, it's time to trial fit the tail surfaces to the fuselage. With the fuselage sitting upright and flat on your building board, you can then slip the tail surface assembly in place, making sure that the front notch is inserted into the cutout in F8, and the VF3 portion of the vertical fin is nestled in between the fuselage sides. Now, if you take a measurement

from the flat of the building board to tips of the trailing edges, they should be the same distance (giving you a nice, horizontal stab). If adjustment is needed, lightly sand the taller fuselage side to lower the higher side.

Once satisfied with the positioning, glue this in place. Again, use the proper amount of glue, but NOT too much as a little extra weight there makes a huge difference when balancing the model later on. Slower curing CA, aliphatic resin and/or carpenter's is a better choice here.



□ Step 73 - Fuse Assembly (TW1)

Locate TW1 from LP1. This is a tailskid which is glued in place on the bottom of the fuselage, into the cutouts on the bottom of the fuselage sides. You may need to slightly pinch the sides together to have things align correctly.



□ Step 74 - Fuse Assembly (LG2, LG3)

Locate LG2 from LP1 and three LG3s from LP1, LP2, LP4. Make a LP3 stack by gluing the three LP3s on top of each other. Make sure they are perfectly aligned and are properly aligned to each other so the pre-cut holes line up perfectly. Then glue LG2 in place on top of this assembly. Note that LG2 has an arrow engraved in it to designate the edge that should face the nose of the fuselage.



□ Step 75 - Fuse Assembly (LG2, LG3)

The LG2, LG3 assembly is now attached inside the bottom of the fuselage. First, dry fit it and you'll probably need to lightly sand the sides. Refer to this photo for the proper orientation. LG2 should be flush with the fuselage sides, up-against the rear of F4 and the extra length of LG2 will extend under the BS sheeting supporting it. Once you've figured this out, glue this in position, using a bit of epoxy for strength.



□ Step 76 - Fuse Assembly (LG1)

Locate LG1 from LP3. This is glued to the surface of LG2. Note the engraved arrow in LG1, that should face the nose, as shown in this photo. Glue it place, making sure it is aligned side to side, and the holes all line up.



□ Step 77 - Fuse Assembly (lower, front sheeting)

Locate the uncut sheet of 3/32" balsa. This is used to form the lower fuselage sheeting. This is done a piece at a time, starting at the front of the LG1 and extending to the bottom of F1.

Hold the sheeting against the



fuselage, making sure the grain is cross-ways. Mark, cut and glue a portion of the sheeting in position. Repeating this technique, work your way forward until you almost reach F1. The final piece will need trimmed for length and width.

□ Step 78 - Fuse Assembly (hatch sanding)

Locate H1 from BP10P. This is the hatch and you'll notice that it tapers to follow the curvature of the fuselage sides. Also, the leading edge has the right-thrust angle cut into it. We've purposely made it slightly oversized so it can be sanded smooth with the fuselage sides and top, however, the only sanding to worry about right now is the front edge. It will need to be sanded a bit for length, and a bit to add an angle matching the downthrust of the firewall. Do this a little at a time so that the hatch will easily fit into the area between the firewall and F3. It shouldn't be loose, but also not a tight fit as you'll need to account for covering you'll be adding later.

□ Step 79 - Fuse Assembly (hatch notch cutouts)

Use a hobby knife to cut a notch on each side of the fuselage just in front of F3. These notches are already pre-cut into the inner plywood box, but need to be cut into the fuselage sides. We don't to this in our laser-cutting to give a bit more support to that small piece of balsa that makes up the front of the wing saddle area.



□ Step 80 - Fuse Assembly (H2, H3)

Locate H2 and H3 from LP5. Lay H3 across the notch you just cutout in the fuselage, making sure it's centered and correctly oriented to the slightly shorter side faces the firewall. Put a couple drops of glue on the top surface of it, then carefully position the H1 in place on the fuselage to glue the two pieces together. Make sure H1 is centered side-to-side on the fuselage. When glued in place, remove H1, then it's time to attach H2. Note that H2 has a small circle engraved to designate the starboard side, and the front edge of this piece. It should now be glued to the underside of H1, as shown in this photo. Centered side to side.



□ Step 81 - Fuse Assembly (magnets)

Inside the tank/battery area, you'll see 4 pre-cut holes in the plywood side-frames - two on the port side, two on the starboard. Place a drop of glue inside one of the holes, then push in a magnet - making sure it is completely flush the plywood side frame, but take care that you don't damage the outer balsa skin. Do the same for the other 3 pre-cut holes in this area.

Don't worry about positive/negative poles and attraction - that's in the next step.

□ Step 82 - Fuse Assembly (H4)

Locate the 4 H4s from LP4. Push one magnet into each H4's pre-cut hole. Make sure the magnets completely pushed in - flush on both sides.

□ Step 83 - Hatch Assembly (H3)

This step requires attention and visualization to make sure you glue the H4's in place so the matching magnets attract - not repel each other.

Snap each of the H4's in place to the magnets you just installed in the fuselage frame sides. Make sure that the flat side of each H4 is facing upward. Now, take your H1 assembly and hold it over this area so the wider end faces the rear of the fuse.

Make sure you're also holding the hatch so the balsa side is up, the plywood frame is down.

Now, one at a time, you can remove each H4, and press it in place into the corresponding pre-cut notch on the sides of H2 and H3.

They need to stick straight up (or down, depending on how you're holding the hatch), 90° to the hatch surface.

Each should be a nice, press fit that will hold them in place fairly well so you can dry fit the hatch before permanently gluing the H4s in place.

Once each of the H4s are pressed in place, dry fit and make sure each of the corners are attracting, not repelling each other.

When you're good with everything, remove the hatch, then carefully glue each H4 in place, by noting it's orientation, removing it, applying glue, then pushing it back in to place - firmly seated and at the correct angle.

□ Step 84 - Sanding

Now is the time to get quite familiar with the sanding tools of your choice. Take the time to perform a good sanding, rounding the wing's leading edge and blending it into the wingtips. Go over the entire wing, making sure the sheeting is smooth, continuing the curvature of the wing. Pound out the extra time on those wing tips to make sure they are smooth, perfect works of art and match each other exactly.

Push the hatch in place then smooth out the edges of the fuselage. Because of the 3/32" sheeting and the 3/16" balsa supports installed inside the fuselage's rear perimeter, you can put in a little effort to round the edges of the fuselage if you'd like.

Round the trailing edges of the ailerons, elevator, and rudder (BP12). Sand bevels into the leading edge of both elevator halves, the rudder, and the ailerons. And speaking of the ailerons, round off the back outer corners with a nice radius.

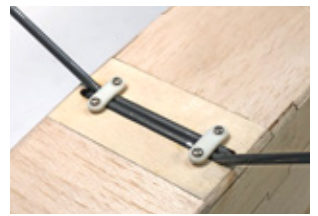
The idea is to spend some time caressing this airframe you've created, smoothing the rough edges until it's something so smooth that it will flow through the air with ease.

□ Step 85 - Fuse Assembly (attach main gear)

Locate both pre-bent main gear wires, two landing gear straps and

four 2-56 self-tapping screws. Using a 5/32 bit, run those down through the holes in LG1, LG2 and LG3 to clear out any excess glue, then push the main gear wires into place.

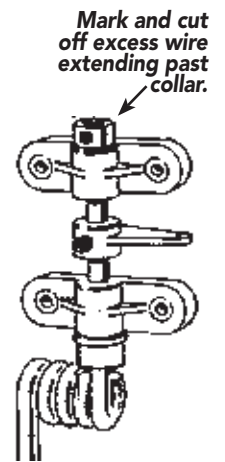
To hold them in place, install the landing gear straps as shown in the photo. Use a 1/16" drill to make the mounting holes for the screws, and then attach the straps in position.



□ Step 86 - Fuse Assembly (nose main gear)

Everything you need to assemble the nose gear is in one package. Push the nose gear wire partially up through the block. Slip the steering arm in place, then push the nose gear wire all the way through the block and the arm.

With the nose gear positioned so the coil is towards the rear of the plane, position the steering arm at a 25-30° angle, then tighten the set-screw in the steering arm just tight enough so it should make a mark on the nose gear wire. Also, mark where the wire should be trimmed off, above the top collar.



Loosen the screw and remove the wire. Grind a small flat on the nose gear where the screw made a mark, and trim the excess top wire, then re-attach. Use a touch of thread-locking compound on the screw to make sure it doesn't vibrate loose later on down the road (or more to the point - down the runway).

□ Step 87 - Electric firewall (E1)

If (and only if) you are powering your Fifty Six with an electric power system, you'll need to also install the electric firewall pieces which position the motor a bit further out than a glow engine needs to be. Locate both E1s from LP2 and LP5.

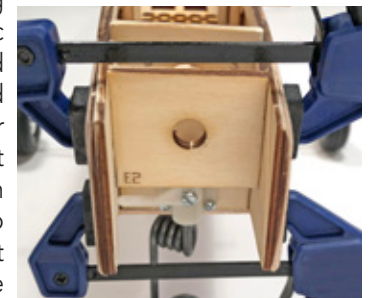
Note that the E1 pieces are a bit more trapezoidal than rectangle. Position these on each side of the front fuselage cheeks as shown in the photo. The angled edge should be up against the firewall, and the top edge flush with the top of the fuselage sheeting. Glue these in place.



□ Step 88 - Electric firewall (E2)

If (and only if) you are powering your Fifty Six with an electric power system, you'll now need to locate both E2s from LP2 and LP4. These are glued together to form a thicker firewall, then it is glued into position as shown in the photo. You may want to slightly bevel the left and right edges to have a better fit to the curvature of the fuselage sides.

We recommend epoxy for this step.



☐ Step 89 - Electric cooling scoop

If (and only if) you are powering your Fifty Six with an electric power system, we advise adding an air-flow scoop to the bottom of the fuselage, just behind the firewall. Refer the photo for how we did it. Simply mark and cut the bottom sheeting on the three sides. Gently lift the front edge and then fit two small triangles to support the sides. You can cut the triangles from scrap 3/32" balsa sheet.



☐ Step 90 - Electric air exits

If (and only if) you are powering your Fifty Six with an electric power system, you'll also need to cut a few holes in the bottom of the fuselage for the cooling air to exit. We recommend this be done on the underside of the fuse, in the area between F6 and F8. Refer the photo as how we setup our prototypes.



☐ Step 92 - Tank / Battery compartment fuel proofing

If you're using a glow engine to power your Lark, it is strongly recommended that you fuel proof the inside of the battery compartment. As you know, fuel has a nasty way of penetrating wood, causing it to disintegrate over time. Spray (or brush) this on, also remembering to protect the underside of the hatch and the engine compartment (firewall and inside of the fuselage cheeks).

This completes assembly of the Fifty Six airframe. These next few steps can be done in most any order - up until it's time to cover.

☐ Wing hold-down dowels.

Locate the two remaining lengths of 1/4" dowels. These are used to create the attachment points for the wing's rubber bands. Cut these to length so that roughly 1" will protrude from each side of the fuselage's outer sheeting. Round both ends of each dowel either by hand, or do it like I do - chuck it up in a drill spin it like a little lathe. Use sandpaper to quickly round off one end, then the other. Then push these in place into the pre-cut holes in the fuselage sides. Don't glue these in place just yet as they'll get in the way when covering. But test fit them now, so you can see how they fit, and how the wing looks like when it's rubber banded in place.

Power system

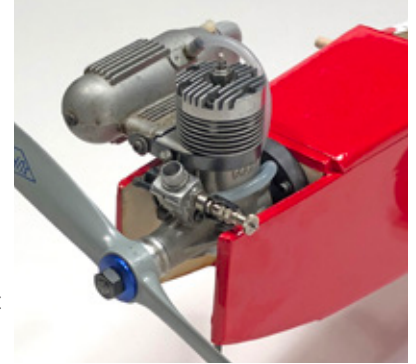
Installing your power system of choice is up next. Here's a couple photos showing sample electric and glow installations. Note that these are suggestions only as your power system might vary from what's shown here.



Glow power

Mounting the engine is a fairly simple thing. It should mount upright and use the thrust lines on the fuselage plans as a general guide. With the nose gear block in place, things are a little tight, so plan this out before drilling any holes. What you see in our prototype is an O.S. .30 mounted on a Dave Brown Products engine mount (now available from Ohio Superstar as of the time this manual was written). Other mounts will work just as well - use what's best for you.

A 4 ounce tank works well and gives a nice flight time, although you might be able to squeeze some 6 ounce tanks in. Again, plan this out before committing to anything permanent.



Electric power

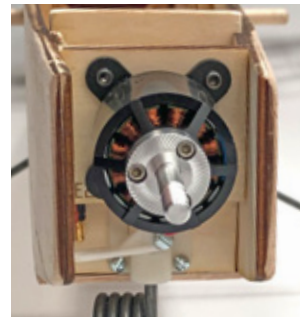
There's a lot of choices out there for electric power, but we've reached out to Innov8tive Designs for their recommendations on power. You'll see those on our website for both their Cobra and BadAss brands. What's pictured here is their Cobra setup one of our prototypes.

Also, we're big believers in having an arming switch/plug when using electric powerplants of this size. There's plenty of options out there and it's something to think about. Remember, in case of an accident, your fingers probably don't grow back!

☐ Control horns, servo & pushrod installation

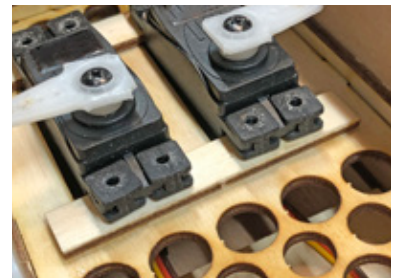
Although you can install the servos and control hardware after covering your Fifty Six, we find it easier to temporarily mount everything in place before covering. This way you have unblocked access inside the fuselage and wings to get the servos, extensions, and pushrods in place.

Shown in the following photo is an example of servo installation in one of the Fifty Six prototypes. Glue TR3 strips (from LP3 and LP5) where the servos are mounted to thicken the mounting surface for the servo's screws. If using standard size servos for the elevator and rudder, you may need to stack the TR3's two-high so the servos will clear the LG assembly underneath the tray.



Take a bit of time to plan things out, including how you'll run the throttle and nose gear steering pushrods.

When mounting the servos to each of the SH's you'll need to cut eight 3/4" lengths of the 1/4" square basswood scrap. Make four thicker mounting posts by laminating two pieces together then sand the ends





flat.

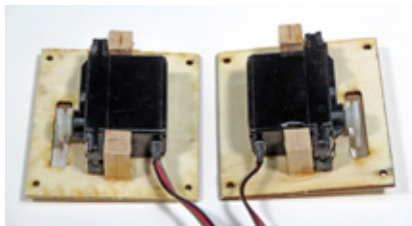
Position your aileron servo on the inside of the aileron hatch so the servo arm output shaft is centered in the opening.

On the inside of each aileron hatch, glue one post on each side of the servo as shown in the photo.

Note that the left hatch is a mirror image of the right hatch.

Now fit the servo hatches into position on the bottom of the wing.

Using the pre-cut holes as a guide, drill four 1/16" mounting holes into the basswood mounting posts you just installed. Harden the wood with a bit of thin CA and you can use the supplied 2-56 x



3/4" self tapping screws to secure the hatches in place.

Finish the layout of your radio gear by adding the receiver, flight pack battery and the switch. We mounted the receiver to the tray by using a bit of self-adhesive hook-and-loop (not included). The radio's switch should be mounted to the opposite side of the muffler (to help keep the goop out of it). Or, for an even cleaner installation, it could be installed inside the tank/battery compartment - hidden under the hatch - VERY NICE!

Covering

Now it is time to cover the Fifty Six. Remove the powerplant, main gear, nosewheel assembly, pushrods, and any other components that would get in the way of applying the covering.

Double check that all surfaces are smooth and ready to cover. Sand as necessary, then cover the entire airframe with the covering/finish of your choice.

Note that if you're powering with an electric motor, you'll need to make a hole for the cooling air to escape the bottom of the fuselage, near the rear.

When the covering is complete, re-attach all the components you removed earlier in this step.

Logos, numbers, etc.

If you want to use graphics similar to the ones we used, Old School Model Works has teamed up with Callie Graphics as a supplier for pre-cut vinyl. They are a very well known provider of custom graphics for R/C models.

We have supplied them with the artwork needed to cut the correct size logos. You can order straight from them, choosing the colors that work for you.

Contact Callie Graphics at this link: <https://callie-graphics.com> or scan

the QR code.



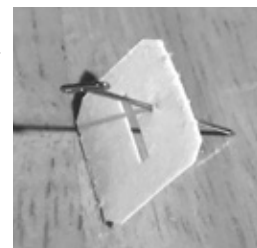
Note that Callie Graphics is not affiliated with Old School Model Works, nor does Old School Model Works generate any income from this partnership.

Attach the Control Surfaces

Now is the time to attach all the control surfaces to the airframe, by gluing the hinges in position with thin C/A. We've noted suggested hinge locations for each of the control surfaces on the plans.

When using the CA hinges, first push a pin through on side, at the center of the hinge as shown here. This will keep the hinge centered as it's pushed into the surfaces. When you've got all the hinges for a surface in place, then remove the pins and glue the hinges.

Make sure that you attach the elevator first, then the rudder.



Attach wheels

Use the included 5/32" i.d. wheel collars to hold each wheel (not included) on the axles. For a maintenance free installation, file a small flat on the axle where the set screw of the wheel collar touches. Also use a touch of thread-locking compound to keep the screw from loosening over time.

Optional canopy

Included is a canopy and though it's certainly up to you if you choose to use it, the canopy is just a defining part of the Fifty Six's outline, so why not use it?

The following steps will describe how to properly prepare and attach it.

- Trim along it's flat edge. You'll want to trim away the excess plastic and leave a smooth lip, roughly 3/16" wide around the it's perimeter.
- Place it on the wing and see if will over the wing's curvature, starting at the leading edge. Not all canopies are exactly identical, so a bit of trial and error is needed to get a good fit.
- If you're going to add a pilot figure (not included), now is the time to test-fit, then glue it in place.
- Give the canopy a quick wash in warm, soapy water.
- If you're going to tint or paint the canopy, do this on the inside now and allow it to dry.
- Use a bit of canopy glue to attach the canopy. So it doesn't move while the glue cures, hold it in place with a bit of low-tack masking tape.

This completes the assembly of the Fifty Six. Now you'll need to adjust the control throws and check for balance.

Recommended C.G. setting:

An important part of preparing the aircraft for flight is properly balancing the model. This is especially important because of the various motor/battery combinations that can be used.

CAUTION! DO NOT SKIP THIS STEP!

The recommended Center of Gravity (CG) range for the Fifty Six is

3-3/4" - 3-7/8" from the leading edge of the wing, and you'll see this marked on the fuselage plan with this symbol.

If necessary, move the battery, receiver, and/or add weight to either the nose or the tail until the correct balance is achieved. Stick-on weights are available at your local hobby store and work well for this purpose.

We recommend balancing it at the forward point for the first flights, then moving it backward if you'd like it to be a little more maneuverable.

Recommended Control Throws:

The amount of control throw should be adjusted as closely as possible using mechanical means, rather than making large changes electronically at the radio.

By moving the position of the clevis at the control horn toward the outermost hole, you will decrease the amount of control throw of the control surface. Moving it toward the control surface will increase the amount of throw. Moving the pushrod wire at the servo arm will have the opposite effect: Moving it closer to center will decrease throw, and away from center will increase throw. Work with a combination of the two to achieve something relatively close to these throws that are good for everyday sport flying. If competing in pattern, you'll probably want to dial these down a bit to give a smoother appearance to your maneuvers.

C.G. BALANCE POINT



Aileron 1/2" up/down (25% expo)

Elevator 3/8" up/down (20% expo)

Rudder 1" left/right (15% expo)

(Expert tip: Once the control throws have been set, cut a few pieces of medium silicone fuel tubing (or heat shrink tubing) to go around each of the clevises. This will keep them from opening during flight.)

Preflight:

Charge both the transmitter and receiver pack for your airplane. Use the recommended charger supplied with your particular radio system, following the instructions provided with the radio. In most cases, the radio should be charged the night before going out flying.

Check the radio installation and make sure all the control surfaces are moving correctly (i.e. the correct direction and with the recommended throws). Test run the engine and make sure it transitions smoothly from idle to full throttle and back. Also ensure the engine is tuned according to the manufacturer's instructions, and it will run consistently and constantly at full throttle when adjusted.

Check all the control horns, servo horns and clevises to make sure they are secure and in good condition. Replace any items that would be considered questionable. Failure of any of these components in flight would mean the loss of your aircraft.

Range check your radio before flying

Before each flying session, range check your radio. This is accomplished by turning on your transmitter with the antenna collapsed. Turn on the radio in your airplane, but do not attach the arming switch.

With your airplane on the ground, you should be able to walk 30 paces away from your airplane and still have complete control of all functions.

If not, don't attempt to fly! Have your radio equipment checked out by the manufacturer.

Flying:

I normally don't write about flying our kits, but I want to make a note here, as the Fifty Six is an old-fashioned trainer.

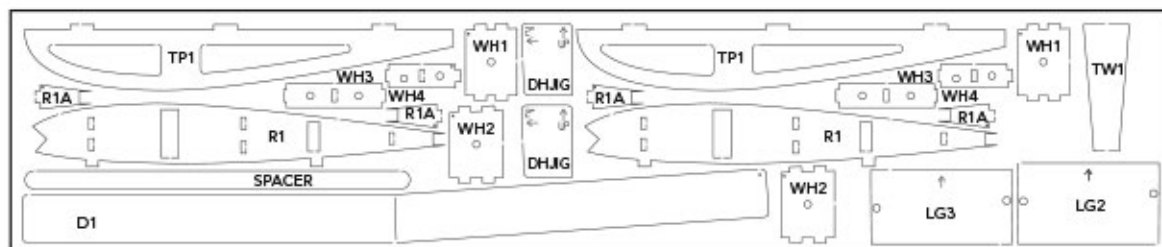
By that, I mean that this design is designed to climb under higher throttle settings, and descend with lower throttle settings. The semi-symmetrical airfoil, and the incidences built into the fuselage give it the ability to climb quite easily.

If you're wanting to do high-speed passes along the runway, this might not be the right model for you. It can be done by holding in a bunch of down elevator, or by adding more down thrust behind the motor mount.

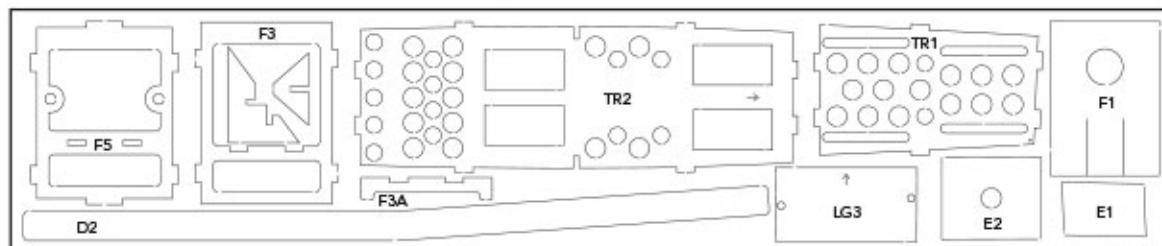
However, that's really not the point of this design. It's meant to be easy to fly as a trainer, and a little bit of a barnstormer for the sport pilot. It's a lot of fun to cruise around the sky, or even shoot touch-n-goes.

LP1

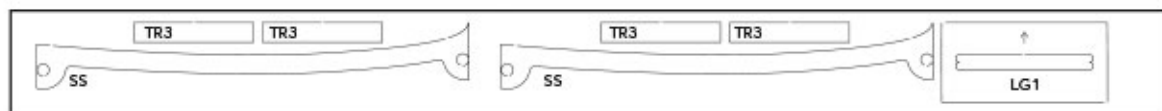
1/8" Lite Ply

**LP2**

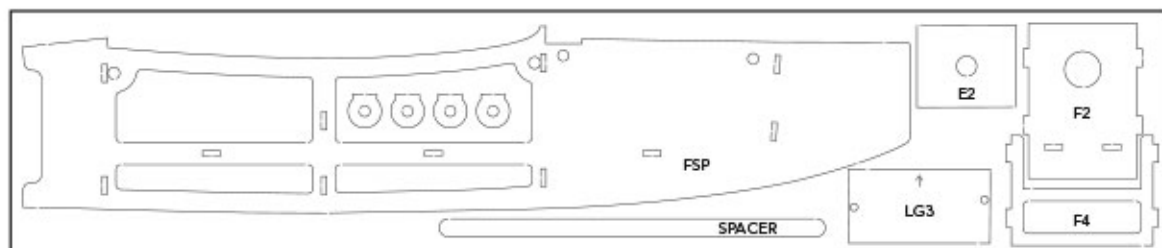
1/8" Lite Ply

**LP3**

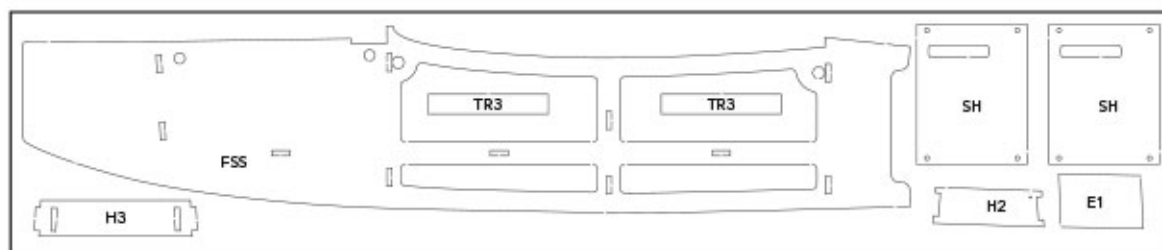
1/8" Lite Ply

**LP4**

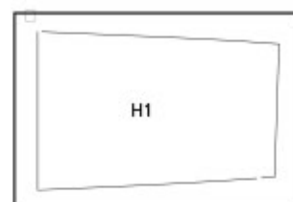
1/8" Lite Ply

**LP5**

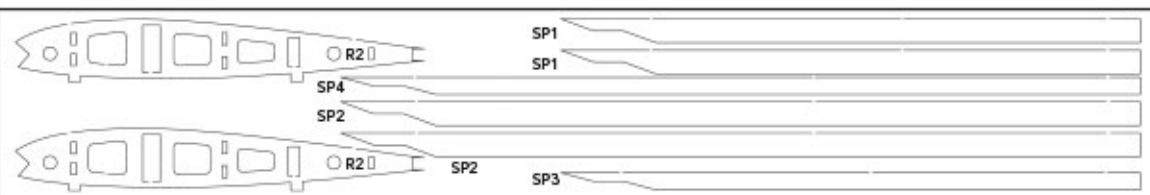
1/8" Lite Ply

**LP6**

1/16" Ply

**BP13**
1/4" Balsa**BP1**

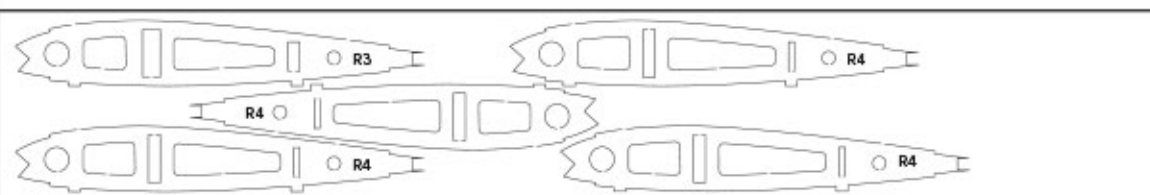
1/8" Balsa

**BP2**

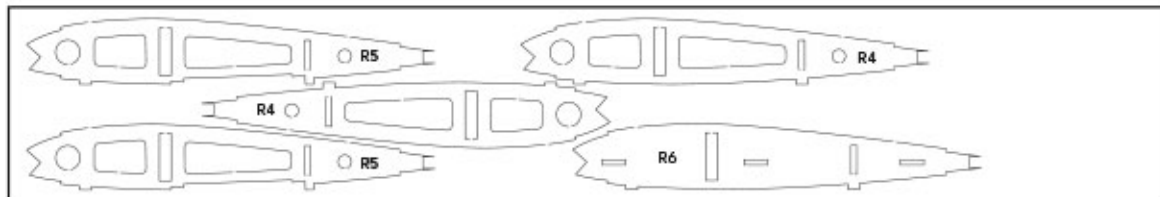
1/8" Balsa

**BP3**

3/32" Balsa



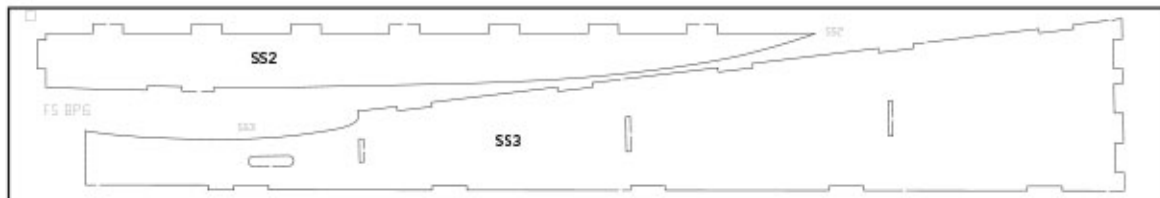
BP4
3/32" Balsa



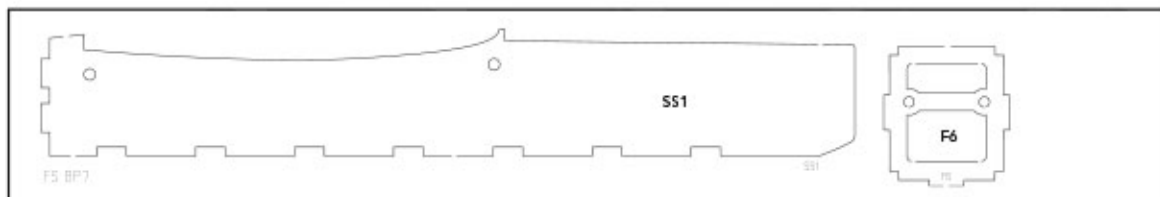
BP5
3/32" Balsa



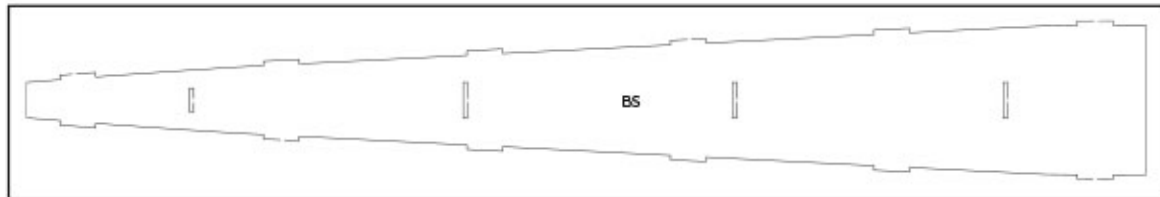
BP6
3/32" Balsa



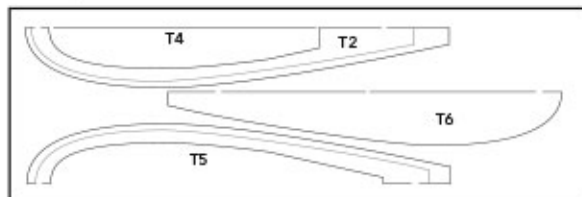
BP7
3/32" Balsa



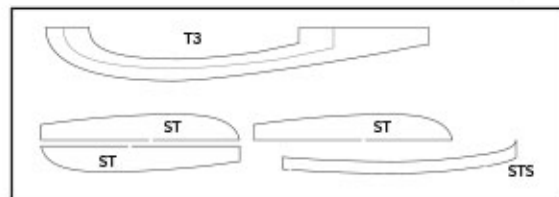
BP8
3/32" Balsa



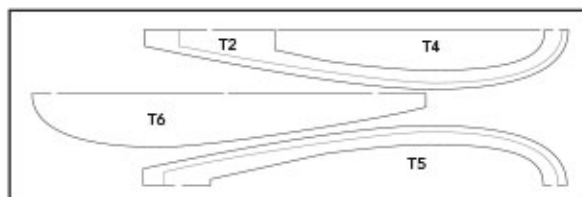
BP9P
1/4" Balsa



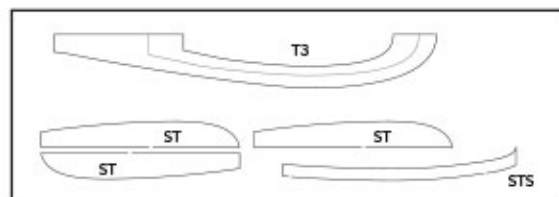
BP10P
1/4" Balsa



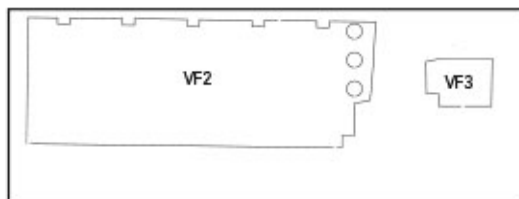
BP9S
1/4" Balsa



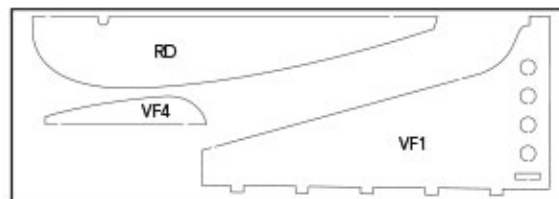
BP10S
1/4" Balsa



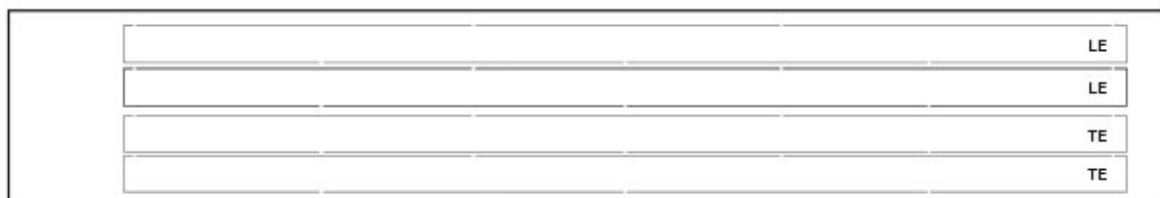
BP11
1/4" Balsa



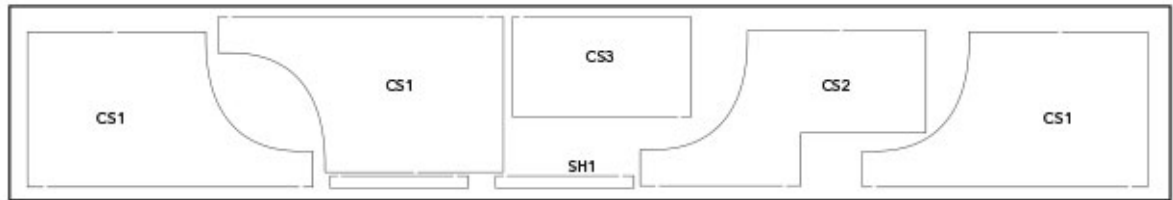
BP12
1/4" Balsa



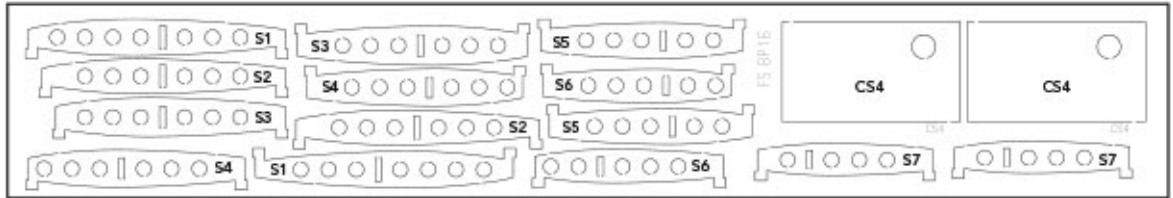
BP14
1/16" Balsa



BP15
1/16" Balsa



BP16
1/16" Balsa



Warranty Information

Old School Model Works guarantees this kit to be free from defects in both material and workmanship at the date of purchase. This warranty does not cover any parts damage by use or modification. In no case shall **Old School Model Works'** liability exceed the original cost of the purchased kit. If you find any damaged or missing parts, contact us within 60 days from purchase to receive replacement(s).

Further, **Old School Model Works** reserves the right to change or modify this warranty without notice.

In that **Old School Model Works** has no control over the final assembly or material used for the final assembly, no liability shall be assumed nor accepted for any damage of the final user-assembled product. By the act of using the product, the user accepts all resulting liability.

Limit of Liability

In the use of this product, our only obligation shall be to replace such quantity of the product proven to be defective. The user shall determine the suitability of the product for his or her intended use and shall assume all risk and liability in connection therewith.

If the buyer is not prepared to accept the liability associated with the use of this product, the buyer is advised to return this kit immediately in new and un-opened condition.

As of this printing, you are required to register with the FAA if you own this product. For up-to-date information on how to register with the FAA, visit <https://registermyuas.faa.gov> . For additional assistance on regulations and guidance of UAS usage, visit <http://www.knowbeforeyoufly.org> .

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