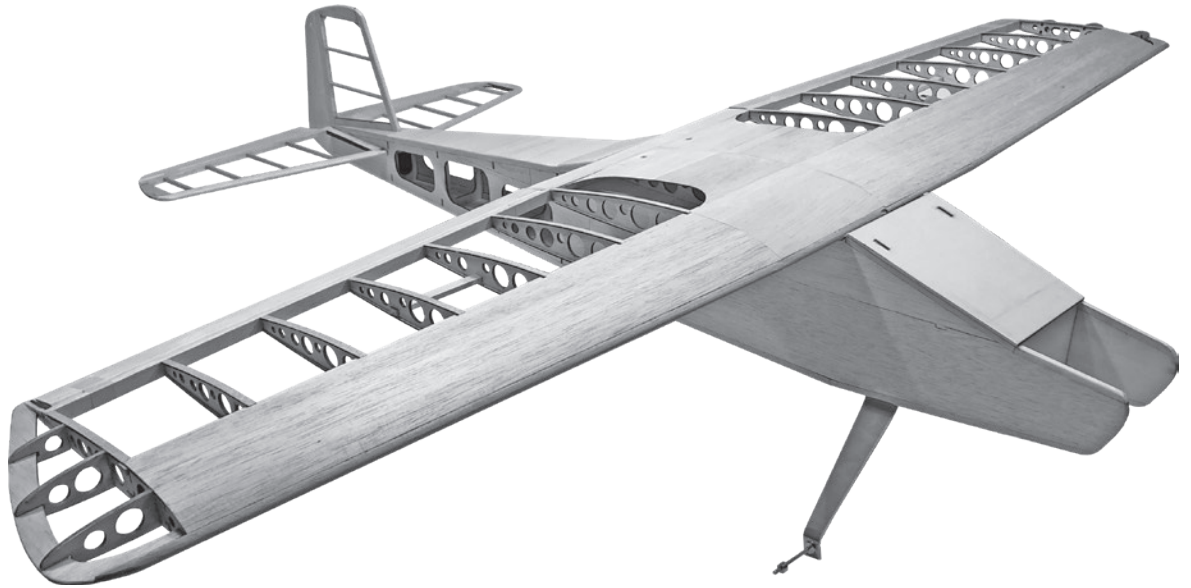


Javelin CONSTRUCTION MANUAL



Specifications: Wingspan: 60 in. • Wing Area: 710 sq in.
Airframe Length: 49 in. • Weight: 4.5 - 6 lbs. (ready to fly)

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 6" x 24" ply sheet
- 1 - LP2 - Laser Cut 1/8" x 6" x 24" ply sheet
- 1 - LP3 - Laser Cut 1/8" x 6" x 24" ply sheet
- 1 - LP4 - Laser Cut 1/8" x 6" x 24" ply sheet
- 1 - LP5 - Laser Cut 1/8" x 6" x 24" ply sheet
- 1 - LP6 - Laser Cut 1/8" x 6" x 24" ply sheet
- 2 - BP1 - Laser Cut 1/8" x 4" x 24" balsa sheet
- 2 - BP2 - Laser Cut 1/8" x 4" x 24" balsa sheet
- 2 - BP3 - Laser Cut 1/8" x 4" x 24" balsa sheet
- 2 - BP4 - Laser Cut 1/8" x 4" x 24" balsa sheet
- 2 - BP5 - Laser Cut 1/8" x 4" x 24" balsa sheet
- 2 - BP6 - Laser Cut 1/8" x 4" x 24" balsa sheet
- 1 - BP7 - Laser Cut 1/8" x 4" x 24" balsa sheet
- 2 - BP8 - Laser Cut 1/16" x 4" x 24" balsa sheet
- 2 - BP9 - Laser Cut 1/16" x 4" x 24" balsa sheet
- 1 - BP10 - Laser Cut 1/16" x 4" x 24" balsa sheet

- 3 - 1/8" x 4" x 24" balsa sheet (uncut)
- 6 - 1/16" x 4" x 24" balsa sheet (uncut)

- 4 - 3/16" x 3/16" x 36" balsa strips
- 5 - 1/4" x 1/4" x 36" balsa strips
- 3 - 1/8" x 1/4" x 36" balsa strips
- 4 - 1/4" x 1/2" x 36" balsa strips
- 2 - 5/16" x 5/16" x 36" balsa strips

- 4 - 3/16" x 3/8" x 36" basswood strips

Hardware parts included in this kit:

- 1 - Pre-bent landing set (left & right)
- C/A type hinges for control surfaces
- 4 - control horns
- 2 - wheel collars 5/32" I.D.
- 2 - 5/32" axle shafts

- 2 - 5/16"-24 lock nuts
- 2 - 1/4 x 20 x 2" wing bolts
- 5 - 2-56 x 1/2" machine screws
- 4 - 2-56 x 3/4" machine screws
- 14 - 2-56 x 3/4" self tapping screws
- 10 - 4-40 x 1/2" socket head cap screws
- 2 - 4-40 x 1" socket head cap screws
- 6 - 4-40 lock nuts
- 6 - 4-40 t-nuts (blind nuts)
- 6 - #4 washers
- 4 - 1/4" x 1/8" neodymium magnets
- 1 - Pre-bent elevator joiner (1/8" music wire)

Other items included in this kit:

- 2 - Rolled plans (1 fuselage and 1 wing)
- 1 - Construction manual
- 1 - OSMW sticker sheet

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. Resist the urge to overpower the Javelin and remember that it is not against the law to practice proper throttle management.

Here is a list of additional parts needed to complete and fly this kit, all of which must be purchased separately. Again, we would recommend supporting your local hobby shop.

- Powerplant:
 - Glow (.25-.51 engine, fuel tank, fuel tubing)
 - Electric (equivalent brushless motor, ESC, & batteries)
- Propeller
- Engine/Motor mount and mounting hardware
- Receiver - (4 channel minimum)
- 5 standard sized servos (4 if electric)
- "Y" servo harness and aileron servo wire extensions.

- Pushrods (two 5" for ailerons, two 24" for elevator & rudder, one 12" for throttle if glow/gas powered)
- Clevises for the pushrods (8 if electric, 10 if glow).
- 2 - 3.5" diameter wheels
- 1 - tailwheel assembly
- Covering
- Optional - 2-1/2" spinner

Additional Required Building Tools and Adhesives

- Drill & assorted drill bits
- Hobby knife and new, sharp blades
- Sandpaper: coarse (80 or 100 grit) & medium (150-200 grit)
- Pencil or pen
- Ruler
- String (two 18" lengths)
- T-Pins
- Waxed paper
- Building board
- Adhesives of your choice. We recommend thin and medium CA (cyanoacrylate) viscosities, and 15 or 30 minute epoxy
- Epoxy brushes and mixing sticks
- Threadlocking compound

Before Starting Assembly

Closely inspect the supplied laser cut parts for damage. If you find any damaged or missing parts, contact us immediately.

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 new, sharp 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.

For each step, we highly recommend that you dry fit the parts in each step first. Lightly sand as needed to ensure a good fit. Once you're satisfied with the fit, then and only then, glue the parts in position.

IT IS VERY IMPORTANT THAT YOU ASSEMBLE THIS JAVELIN 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.

Closely inspect the supplied laser cut parts for damage. If you find any damaged or missing parts, contact us immediately.

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>.

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/java/

Let's begin construction by working on the Javelin's wing. The wing is built with top surface resting on your building board (up-side-down). Also the left and right halves are built at the same time, so you'll need to perform each step on one side of the wing first (say the port side), then perform that same step on the other side (the starboard side).

However, take care as the layout of the ribs will be mirror image from one side of the wing to the other.

Step 1 - Alignment triangles

Pre-cut into BP6 is a triangle that can be used to vertically align any of the parts in the construction of your Javelin. BP6 also includes a foot piece that can be used with the triangle to hold it vertically, hands-free.

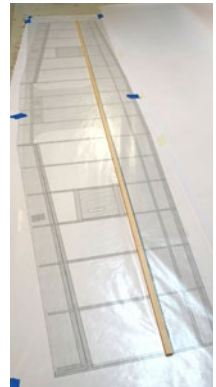


We recommend using this triangle throughout the wing construction, and in the alignment of the vertical fin.

Step 2 - Prepare your work area

You'll need a flat building surface that is a minimum of 60" long as the wing is built as a single piece, not two separate, then joined assemblies.

Position the wing plan over the surface and tape into position. Tear off a length of waxed paper long enough to cover the plan and tape that into position, over the plan.



Step 3 - Wing Assembly (upper spar)

Locate two of the 3/16" x 3/8" x 36" basswood strips. These will form the upper spar. Position them over the plan, measure the length and cut. We prefer to tack-glue these pieces to the waxed paper, holding them in place using a few small drops of medium CA, instead of t-pins. Be sure they are aligned properly and are straight over their entire length. The alignment of this spar is critical as the rest of the wing panel is based off these two pieces.

Step 4 - Wing Assembly (R1)

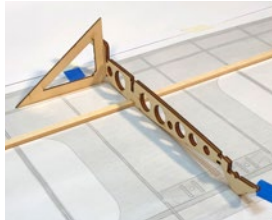
Locate both R1s from LP1. These are glued together to make a thicker piece. We recommend using epoxy for this step and be careful not to let any of the adhesive get into the slots around the perimeter of the rib, as this will cause problems when fitting the



spars, sub-spars and other pieces in the following steps. Hold this assembly flat by weighing it down on a flat surface as it cures. Once cured, wick thin CA generously into the lower wing tab to help strengthen the wood.

Step 5 - Wing Assembly (R1)

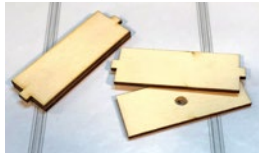
Once the R1 assembly has cured, it is time to glue it in position. Make sure that the piece is fully inserted into the spar so it rests on the board. Also make sure the piece is vertical, and once aligned properly, glue it to the spar. Also, tack the rear tab to the board with a drop or two of medium CA.



Step 6 - Wing Assembly (H1/H2 assemblies)

Locate both H1s and both H2s from LP1 and LP2.

One H1 is glued to one H2 to form a thicker piece. Make sure they are properly aligned and clamp them together until the glue cures. Do this for both sets to make two identical H1/H2 assemblies.



Step 7 - Wing Assembly (R3)

Locate both R3 ribs from BP1 and the H1/H2 assemblies from the previous step.

Pre-cut into the aft of the R1 and R3 ribs are rectangular holes. The tabs from the H1/H2 assemblies fit into these holes to help align them. Note that when installed properly, you will not be able to see the pre-cut hole in H1 as it will be facing the building surface. Glue the H1/H2 assembly to R1. Then glue R3 in position, making sure the H1/H2 tab is inserted into R3 and R3 is at a perfect 90° to the plans.



Now do the same thing for the other side of the wing.

Step 8 - Wing Assembly (H3/H4 assemblies)

Next you'll need two H3s from LP1 and LP2, and four H4s from LP1.

Glue two H4s to one H3 as shown. Make sure the angle of the H4 pieces are the same, they are fully inserted into the holes in H3 and they are perpendicular (90°) to H3. Make two H3/H4 assemblies.



Step 9 - Wing Assembly (H3/H4 assemblies)

Each H3/H4 assembly is now glued into place as shown here. Make sure the assemblies are fully seated into the slots cut into the ribs, and the edges of the assemblies are flush with the rib edges.



Step 10 - Wing Assembly (D1 assembly)

Locate both D1s from LP1 and LP2. These are glued together to make a thicker piece. We recommend using epoxy for this step and be careful not to let any of the adhesive get into the slots as this will cause problems when fitting in the following step. Weigh the assembly down on a flat surface while the glue cures.

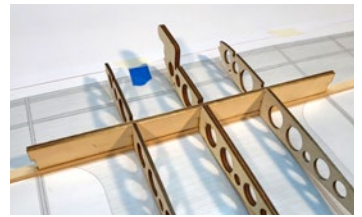


Step 11 - Wing Assembly (attach D1 assembly)

Once the glue has cured on the D1 assembly, its time to glue it in place.

Test fit it first, making sure that all of the slots are free from glue and the D1 is touching the spar along its entire length.

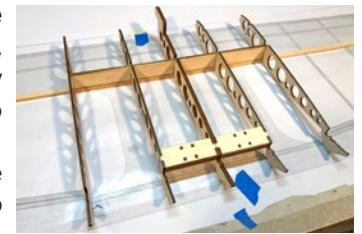
When satisfied, remove the D1 assembly, mix up a bit of epoxy and glue the D1 assembly as shown. Weigh the assembly down while the glue cures.



Step 12 - Wing Assembly (R4s)

Locate two R4s from BP1. These are glued in place as shown, making sure they are properly aligned with the plans, and also vertical to the building surface.

Also make sure to tack down the rear tabs to the waxed paper to hold it in position.



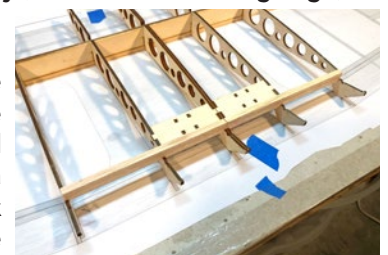
Step 13 - Wing Assembly (center section trailing edge)

Locate two of the 1/4" x 1/2" x 36" balsa strips.

Starting from the center of the wing, measure to the edge of the R4 rib you attached in the previous step. Cut a length from one of the 1/4" x 1/2" x 36" strips and set the remainder aside. Then do the same for the other 1/4" x 1/2" x 36" strip.

DO NOT CUT BOTH LENGTHS FROM THE SAME PIECE OF WOOD AS THIS WILL CAUSE PROBLEMS LATER IN THE BUILD.

These trimmed 1/4" x 1/2" strips will snugly slide into the slots pre-cut into the aft of the R1, R3 and R4 ribs. Glue these in position, making sure they are completely seated in these slots, as shown here.



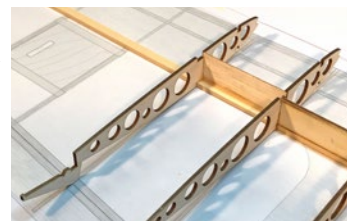
Step 14 - Wing Assembly (R5 and SW1)

If you've never built one of our kits before, what you're about to experience is our **WEB-LOCK** construction technique. This gives you the best chance of properly aligning each rib with a minimum amount of fuss, while also giving you properly sized shear webs that lock everything into place.

Locate two R5s from BP2, and both SW1s from BP10.

Note that all of the SW pieces have a small circle engraved into them. These circles help in orientation of the SW pieces, so make sure each SW is positioned so the circle is closest to the root (center) of the wing, and towards the plans (top of the wing).

Test fit SW1 in place, making sure its tabs completely slide into the pre-cut slots in R4, also making sure to note SW1's orientation. When satisfied with the fit, remove the piece, then glue it in position, making sure it is glued to R4 and the spar.



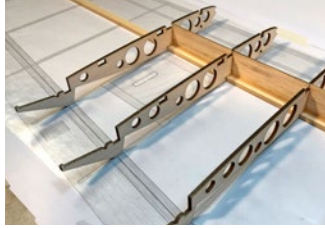
Now, glue R5 in place. When it is properly aligned, the SW1 tabs will be fully seated and R5 will be at a 90° angle to the building surface. Also tack the rear tab to the waxed paper.

□ Step 15 - Wing Assembly (R6 and R7)

Locate two R6s and two R7s from BP2 as well as both SW2s and SW3s from BP10.

Starting with SW2, test fit then glue in position, followed by R6, then SW3 and finally R7.

Also tack the rear tabs on R6 and R7 to the waxed paper.



You are remembering to build both sides of the wing at the same time, aren't you?

□ Step 16 - Wing Assembly (aileron servo rails)

Locate the leftover 3/16" x 3/8" basswood strips you cut when creating the upper spar in step 3. Measure and cut two lengths to span the width between the R6 and R7 ribs, leaving an extra 1/8" or so on each side.

Slide these pieces into the pre-cut slots in the ribs, forming the servo rails. Glue these in position.

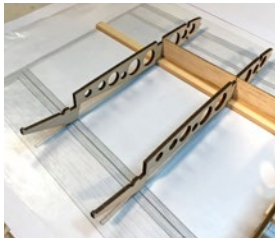


□ Step 17 - Wing Assembly (R8 & R9)

Locate two R8s and two R9s from BP1 as well as both SW4s and SW5s from BP10.

Starting with SW4, test fit then glue in position, followed by R8, then SW5 and finally R9.

Also tack the rear tabs on R8 and R9 to the waxed paper.



□ Step 18 - Wing Assembly (R10/wingtip)

Locate both R10s, TP3s and TP5s from BP1. Also locate both TP1s, both TP2s and both TP4s from BP2.

Glue one TP1 to TP2 as shown. Make two TP1/TP2 assemblies.

Build two R10 assemblies by gluing TP3, TP4, and TP5 into their respective notches in R10. Make sure each of these pieces are glued in at a 90° angle to the R10, and pay attention to the orientation of these pieces as it is possible to insert them the wrong way. The small etched circles are to be oriented to the top of the wing (the edge with the tab on it).

When making the other R10 assembly, remember that it needs to be a mirror image of the first one (a port and a starboard wingtip). They are not interchangeable.

To finish the R10/wingtips, slide the TP1/TP2 assembly into the slots in the TP3-5 pieces. When the TP1/TP2 is properly positioned, its front tab will be completely inserted into the pre-cut slot in R10,



and it will be in contact with the rear of R10, as shown. Glue in position.

□ Step 19 - Wing Assembly (R10/wingtips)

Locate both SW6s from BP10. Test fit, then glue these in position.

Now locate the wingtips you created in the previous step. These are glued in position. Pay careful attention to which tip is going where, as to not mix them up.

Also remember to tack to down the rear tab to the waxed paper.



□ Step 20 - Wing Assembly (trailing edge)

Locate both leftover 1/4" x 1/2" balsa sticks you trimmed earlier. Measure and cut these to fit in the rear groove pre-cut into the ribs. Make sure these pieces are fully inserted, and when properly in position, glue in place.

Now locate two 1/8" x 1/4" x 36" balsa strips. Measure and cut these to glue to the top surface of both trailing edge pieces you just installed. As these trailing edges are set further into the wing, they need to be a touch higher and the added 1/8" of thickness does the trick.

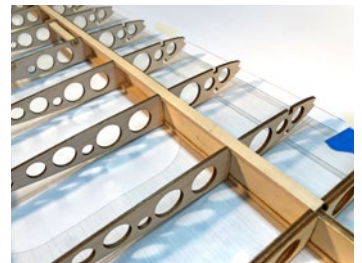
DO NOT ADD THIS FOR THE CENTER SECTION INSTALLED EARLIER IN THE BUILD.



□ Step 21 - Wing Assembly (lower spar)

Locate two more of the 3/16" x 3/8" x 36" basswood strips. These will form the lower spar. Position over the plan, measure to length and cut.

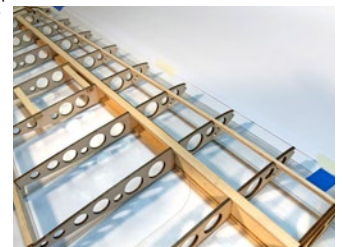
When gluing these two pieces in place, make sure you work from the center of the wing, out - one strip at a time. Also make sure to get plenty of glue for a good bond to DH1, as well as all of the ribs. These strips will need to bend slightly around R4, so make sure to keep pressure (or weight) on them until the glue has cured.



□ Step 22 - Wing Assembly (lower sub-spar)

Locate two 3/16" square balsa strips. These are measured and cut to form the lower sub-spars near the leading edge of the wing.

When gluing these two pieces in place, make sure you again work from the center of the wing out, one strip at a time. Be sure to get plenty of glue for a good bond to all of the ribs. These pieces will need to bend slightly around R4.



□ Step 23 - Wing Assembly (leading edge)

Locate two 5/16" square balsa strips that will be used for the wing's leading edge. Measure and cut them taking note that these will

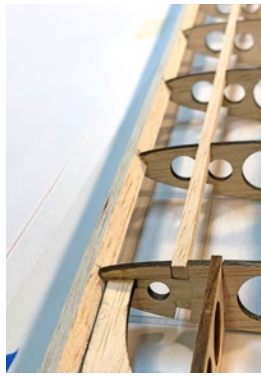
need to bend around R4.

There are two ways to do this. One is to simply cut the leading edge strip into two pieces, meeting at R4. If you choose to do this, pay attention to bevel the ends of the cuts so the two leading edge pieces butt up against each other properly, without a gap.

The other way is to make a series of 3-4 small cuts into back edge of the 5/16" strip, where it will bend around R4. Make these cuts about 2/3" of the way through the strip. This will relieve enough wood to allow it to form the bend and remain as a single piece.

Neither way is necessarily better. Use what best works for you.

Be sure to get plenty of glue for a good bond to all of the ribs and the tips.



□ Step 24 - Wing Assembly (R2)

Locate both R2s from BP2. Note the same circle designator to tell you the orientation - circle towards the top of the wing (building surface).

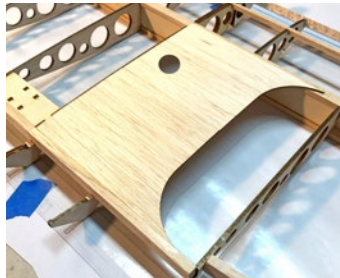
Glue them in place as shown, on each side of the R1 assembly. The front notch will fit around the leading edge and make sure that the back edge is flush with the lower sub-spar.



□ Step 25 - Wing Assembly (lower center sheeting)

Locate two ST2 and two ST3 from BP8. Glue ST2 in place against the trailing edge, then ST3, making sure there is a good bond to the ribs, spar and trailing edge.

The design of the wing will also make this sheeting flush with trailing edge.



□ Step 26 - Wing Assembly (rear center section)

Now we will assemble the rear of the wing's center section.

Locate one of the 1/16" x 4" uncut balsa sheets. Measure and cut two 4" x 6-3/8" pieces. Now, from these smaller pieces, measure and cut four 1-1/4" x 6-3/8" wide strips.

Two strips are laid into the tab extensions as shown here. Glue them to each other and to the trailing edge of the wing. **DO NOT GLUE THE SHEETS TO THE TABS**, or you'll need to do a LOT of extra sanding later.



□ Step 27 - Wing Assembly (rear center section)

Next, locate both R1As from LP1 and eight A4s from BP2. Both R1As are glued in the center, as a continuation of the R1 ribs.

Glue one A4 to each end of



the sheeting, in-line with the R4 ribs to form the caps of this rear section. Then glue two more A4s half way between the R1A and A4s.

The remaining four A4s are then glued midway between the installed pieces so they will equally support the wing sheeting.

□ Step 28 - Wing Assembly (rear center section)

Locate the other two 1-1/4" strips you previously cut as these are used to finish this rear section.

Lightly sand a bevel on what will be the rear edge of both pieces. This bevel should take off just about half of the sheet's thickness, running the entire length of the piece and about a 1/4" wide. This bevel will give a much nicer fit.

When finished sanding, glue these two sheets in position as shown, again making sure they are glued to the R1As, the A4s and the trailing edge. When properly aligned, this sheeting will be just shy of flush when compared to the trailing edge.

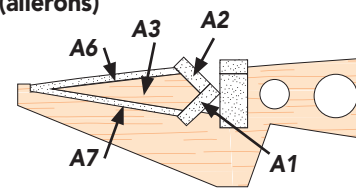


□ Step 29 - Wing Assembly (ailerons)

One of the more unique features of the Javelin is the built-up ailerons. So, let's get started.

Take a moment to look at the diagram to the right. We've called out where each of the aileron pieces will go during the next steps.

Notice the tab extensions. They all have a unique cutout where A1 lays at a 45° angle. Locate both A1s and lay them into the slot as shown here, centered side to side along the space for the aileron (do not glue).



□ Step 30 - Wing Assembly (ailerons)

Locate both A7s from BP9.

These lay on the tab extensions as shown, but first sand a small bevel along the edge where this piece will butt up against A1.

When finished, lay the A7s on the tab extensions as shown, up against A1.

Tack glue A7 to A1 in several spots, ensuring the two pieces are lined up, then finish gluing the two pieces together.



□ Step 31 - Wing Assembly (ailerons)

Locate all of the A3s from BP1 and BP2. These fit as shown, in line with each of the ribs. Glue these in place, making sure they are flat against both the A1 and A7 pieces.

We find that these are easier to hold and position if you lightly "stab" them with a sharp hobby knife, apply the glue then move into place.



□ Step 32 - Wing Assembly (ailerons)

To build up the area where the aileron control horns will be mounted, glue a single A3 in place, directly in line with where the plans show the cutout in the servo hatch for the servo arm. Then glue four additional A3's to this first one - two to one side, then two on the other - as shown here. **It is important to saturate these pieces by wicking in proper amount of thin C/A to harden these pieces.**



□ Step 33 - Wing Assembly (ailerons)

Locate both A2s from BP3. These will be glued to A1 and to the short side of all the A3s, as shown here. **DO NOT GLUE THIS TO THE WING.**



□ Step 34 - Wing Assembly (ailerons)

Now locate both A6s from BP9. Using the same technique as you did on the rear center sheeting, sand a small bevel on the rear of this sheeting, where it will touch A7.



When satisfied, glue A6 in position, making sure it is glued to the rear or A7, all of the A3s and to A2.

When finished, you should have two ailerons that can be removed from the wing by simply lifting them off the tab extensions. Pretty neat, eh?

□ Step 35 - Wing Assembly (lower leading edge sheeting.)

Using 1/16" x 4" balsa sheets, measure, cut and glue the lower leading edge sheeting into place. We recommend doing this in sections - two small center section pieces (from R1-R4), and two tapered outer pieces (from R4-R10).



It's best to glue the forward edge of the sheeting to the leading edge first. When the glue has cured, apply glue to the ribs, then gently wrap the sheeting around the curvature of the wing ribs.

□ Step 36 - Wing Assembly (cap strips)

Pre-cut in BP9 and BP10 are 1/4" strips. These are used as the cap strips, centered on R4-R9, and flush with the outer edge of R10. Measure, cut and glue these into place. They should extend from the back of the leading edge sheeting and butt-up against the trailing edge.



□ Step 37 - Wing Assembly (trim strip)

You should have a couple spare lengths of 5/16" square balsa, trimmed from the leading edge.

Use these pieces to make a strip that will be glued to the rear basswood mount for the aileron hatches. It should run the width between the cap strips and be flush with the outer surface of the cap strips - as shown here.



This is not a structural piece. Instead it is a trim piece that aids in covering later on, as you'll have to cut out the covering in this area to install the servo and hatch.

□ Step 38 - Wing Assembly (top center sheeting)

Now it's time to carefully remove the wing from the building surface as work now shifts to the top of the wing.



With the wing flipped over, install both upper sub-spars using 3/16" square balsa strips. Then locate both ST1 and two ST2 from BP8.

Glue these in place as shown, using the same technique used when attaching the bottom center sheeting.

□ Step 39 - Wing Assembly (top leading edge sheeting.)

Using 1/16" x 4" balsa sheets, measure, cut and glue the top leading edge sheeting into place.



Use the same technique as applying the lower sheeting, doing this in sections and gluing it to the leading edge first, then wrapping it around the wing's curve afterwards. You will also need cut a thin strip of 1/16th to fill the gap in the center section between the leading edge sheeting and the ST2s. Measure and cut from scrap 1/16th sheeting.

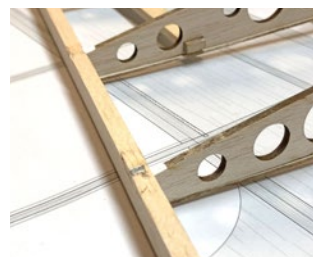
□ Step 40 - Wing Assembly (A5)

Locate four A5 from BP2. These are glued in place on the insides of both ends of the aileron pockets.



□ Step 41 - Wing Assembly (tab removal)

Now it's time to trim off the tabs from the trailing edge. Most tabs will pop off quite easily, but you'll need to cut the R1 tabs as they are two pieces of plywood bonded together (a Japanese saw works great for removing R1's tabs).



The tabs on the center section should be cut flush with the sheeting. The tabs on R10 should be flush with the A5 you just installed.

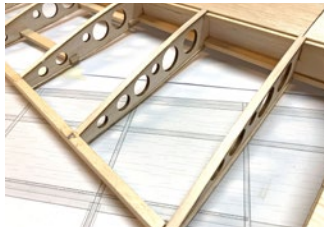
But the tabs on R4-R9 will also need to be trimmed 1/16" below the trailing edge. This will allow the cap strips to be flush when installed.

□ Step 42 - Wing Assembly (cap strips)

Using more of the pre-cut 1/4" strips in BP9 and BP10, it is time to add cap strips to the top of the wing.

As before, these are centered on R4-R9, and flush with the outer edge of R10.

Measure, cut and glue these into place. They should extend from the back of the leading edge sheeting and butt-up against the trailing edge.



**This completes assembly of the Javelin wing.
Now it's time to start construction of the fuselage.**

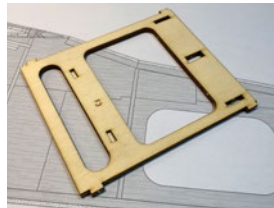
□ Prepare your work area

Now tape the fuselage plan and a fresh piece of waxed paper on your building board.

□ Step 43 - Fuselage Assembly (F3/F4)

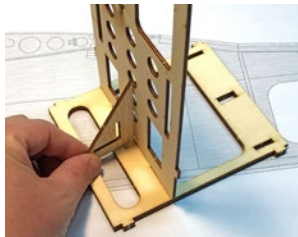
Locate F3 and F4 from LP6. These are glued together as shown here. Note that there is a height difference between them. When properly aligned, the large internal holes and the three rectangular holes at the top will all align.

When gluing, make sure they are flat and perfectly aligned. Also clear any glue from any of the pre-cut holes.



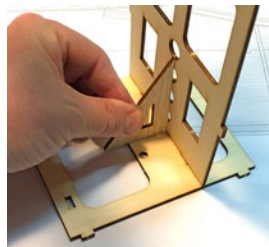
□ Step 44 - Fuselage Assembly (T2)

Locate T2 from LP5. Note that T2 has an arrow etched into it - this should point towards F4 when installed. Position the F3/F4 assembly so that F4 is facing up. Now glue T2 to F4 as shown, making sure it is at a 90° angle.



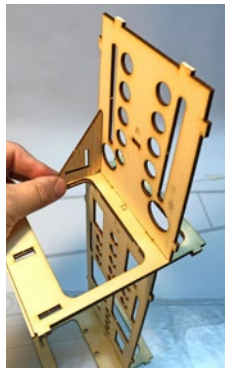
□ Step 45 - Fuselage Assembly (F5)

Locate F5 from LP5. The opposite end of T2 is glued to F5, again at a 90° angle. Note the positioning of F5 in relation to F3/F4, so you don't glue it on up-side-down.



□ Step 46 - Fuselage Assembly (T1)

Locate T1 from LP5. T1 is now glued to F3 and it's proper orientation will be with the two larger pre-cut circles closest to F3. Glue T1 to F3 as shown, making sure it is at a 90° angle.



□ Step 47 - Fuselage Assembly (FS0)

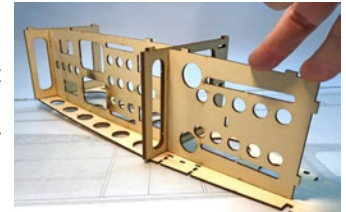
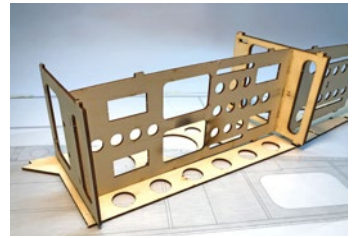
Locate FS0 from LP3 or LP4.

This will be glued to the assembly you have just made but this will require a touch of patience.

First, we recommend dry fitting this first so you can see that all of the tabs fit in to all of the slots.

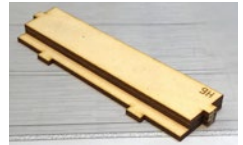
Also note that FS0 will wrap around these pieces as it forms the curve of the forward fuselage. When you think you have it figured out, glue the back edge first - gluing F5 to the side and to a little bit of T2, where it touches T1.

Once the glue has cured, then tackle the front section. You'll probably need to hold/clamp it in place. Note that in this second picture, the rear of this assembly is off of the building surface.



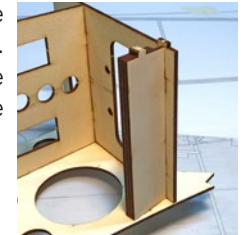
□ Step 48 - Fuselage Assembly (wing hold assembly)

Locate H5 and two H6 from LP2. These are glued together as shown here, making sure the outer tabs and the common edge are all aligned.



□ Step 49 - Fuselage Assembly (wing hold assembly)

The H5/H6 assembly is now glued in place between the top of F5 and the rear of FS0. Don't over-do it, but also don't skimp on the glue here. This piece is the one where the wing bolts to the fuselage.



□ Step 50 - Fuselage Assembly (WB1/WB2)

Locate WB1 from LP2 and WB2 from LP1. These two pieces are glued together as shown. Note the taper on the shorter sides and be sure to properly align the parts.

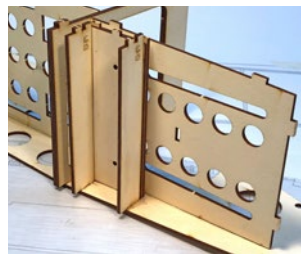


□ Step 51 - Fuselage Assembly (WH9/WH10)

Locate WH9 from LP3 and WH10 from LP4.

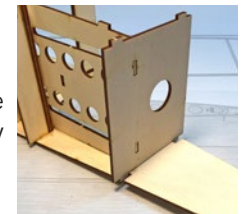
These two pieces, along with the WB1/WB2 assembly are glued into place as shown here, underneath T1, fitting into the slots of FS0.

It's best to dry fit these parts first and take care that they are in the correct order / orientation so they will follow the curvature of the fuselage. Once you understand how they go together, glue them all in position.



□ Step 52 - Fuselage Assembly (F2)

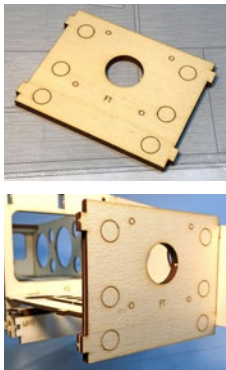
Locate F2 from LP1. This is glued in place as shown, making sure the notches are fully seated in FS0, as well as T1.



□ Step 53 - Fuselage Assembly (F1)

Locate F1 from LP1. Note that one side has several markings etched on it. This side we refer to as the "electric" side. The smaller holes line up with our motor mount box (shown later) and the six larger holes are recommended spots where you could drill holes to allow air to cool the batteries/ESC. If you are going electric, glue this piece in place with the etching facing outward. If you are going glow, disregard all of this by flipping the piece over and gluing the etched side to F2.

Regardless of the way you go, we recommend epoxy for this step.



□ Step 54 - Fuselage Assembly (F0)

Locate FS0 from LP3 or LP4 as this will be used as the other side of the fuselage front section.

As before, we recommend dry fitting this first so you can see that all of the tabs fit in to all of the slots.

When you think you have it figured out, glue the back edge first - gluing F5 to the side and just a little bit of T2, where it touches T1.

Once the glue has cured, then tackle the front section. You'll probably need to hold/clamp it in place while the glue cures.

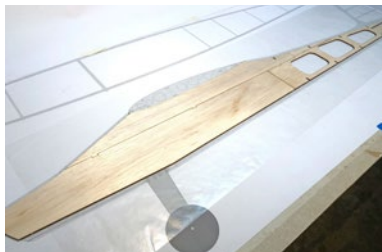


□ Step 55 - Fuselage Assembly (balsa sides)

Locate FS1 from BP4, FS2 and FS4 from BP5 and FS3 from BP6. These four pieces are assembled to create a finished fuselage side.

Glue FS1 to FS2 first, then add FS3 and finally FS4. Make sure these pieces are absolutely flat where they

join so you end up with a smooth side. When finished, repeat this step to make the other balsa fuselage side.



□ Step 56 - Fuselage Assembly (balsa sides)

These next two steps are more critical than most in the construction of our Javelin. That's because there are no slots or tabs to aid in alignment. It's all up to you so get it right the first time as it's very hard to fix any problems once the glue cures.

Take one of the balsa sides from the previous step and you will now glue it to one of the sides of the plywood assembly. Be careful to line it up exactly and make sure it stays in place as the glue cures.



□ Step 57 - Fuselage Assembly (balsa sides)

Just as in the last step, take the other balsa side and glue it to the other side of the plywood assembly. Be careful to line it up exactly and make sure it stays in place as the glue cures.

When finished you will have a fuselage assembly as shown here.



□ Step 58 - Fuselage Assembly (side alignment)

Using a couple of t-pins, pin the rear of the balsa sides together as shown. Don't glue them - just pin them together so they remain perfectly aligned for the next few steps.



□ Step 59 - Fuselage Assembly (F6)

Locate both halves of F6 from BP7. Glue them together to form a completed piece. Then cut two small strips of scrap 1/8" balsa to form the vertical doublers. No specific dimensions are needed, just as long as they are similar to what's shown here. Glue these in place to strengthen F6 along its sides.



□ Step 60 - Fuselage Assembly (P6)

Now carefully fit the completed F6 into place. Glue it securely to both sides of the fuse, making sure that it is firmly seated in the notches of the fuselage sides.



□ Step 61 - Fuselage Assembly (F7 & F8)

Locate F7 and F8 from BP7. Similarly to what you just did for F6, cut some scrap 1/8" sheet to form a top and bottom support for both of these pieces. This time the supports will run across the pieces.

Glue them in position.



□ Step 62 - Fuselage Assembly (F7, F8 & F9)

Along with F7 and F8 from the previous step, locate F9 from BP5. Starting with F7, carefully place it in position, making sure it is securely glued to both sides of the fuse and firmly seated in the notches of the fuselage sides. Then attach F8, and finally F9.



□ Step 63 - Fuselage Assembly (tailwheel support)

Locate TW1 from LP2 and both TW2s from LP1 and LP5. These three pieces are glued together as shown here to form the thick support needed for some tailwheel mounts. Note that these pieces should be flush on the short end, with the TW2s, centered side to side on TW1.



□ Step 64 - Fuselage Assembly (tailwheel support)

The tailwheel support assembly is now glued in place, on the underside of the fuse, at the rear.

It is positioned so the TW2s are inside the fuse and TW1 is resting on the sides, as shown here. Glue this in place, while also gluing the balsa sides together.



□ Step 65 - Fuselage Assembly (1/4" square)

Now you will begin "framing" the perimeter of the fuselage sides, starting with the longest lengths first. Place the fuselage so it is up-side-down on your building surface.

Measure and cut two lengths of 1/4" square balsa to form the rear framing.

These pieces should run from the tailwheel assembly up to F3. When gluing these in place, make sure the strips are fully inserted into the notches of F4-F9 and follow the curvature of the fuse sides.

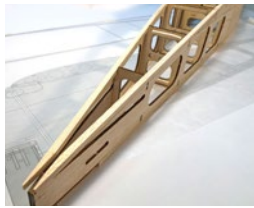


□ Step 66 - Fuselage Assembly (1/4" square)

Flip the fuselage over to cut the next longest pieces, the top of the rear fuse. These pieces should run from the rear of the fuse up to F6.

When gluing these in place, make sure the strips are fully inserted into the notches of F6-F9 and again follow the curvature of the sides.

Also you'll need to cut a relief in both pieces where they meet at the rear of the fuselage. Cut just enough away so you can properly glue on the framing. They will be properly trimmed for the vertical fin clearance later on.



□ Step 67 - Fuselage Assembly (1/4" square)

Flip the fuselage up-side-down for the next pieces, the front of the fuse. These pieces should butt against the 1/4 sq. sticks already installed (at F3) up to the front of the fuselage sides (leaving an extra 1/8" or so for final sanding).

When gluing these in place, make sure the strips are fully inserted into the notches of F1-F3.



□ Step 68 - Fuselage Assembly (1/4" square)

Flip the fuselage upright again for the last of the framing at the front of the fuse and just behind the wing saddle.

Again, when gluing these in place, make sure the strips are fully inserted into the notches of the formers.



□ Step 69 - Fuselage Assembly (P1 & P2)

Locate P1 and P2 from LP2. These are glued in place on the underside of the fuselage as shown here. Make sure they do not overlap into the landing gear mounting box.



□ Step 70 - Fuselage Assembly (bottom sheeting)

Now locate the un-cut sheets of 1/8" x 4" balsa. You will use these to form the sheeting for the bottom of the fuselage. The sheeting is cut so it is cross-grained (running from side to side for strength).

Starting at the rear of P2, measure, cut, and glue strips to form the bottom of the fuselage. Make sure that the sheeting is not only glued to the 1/4" framing, but also to each other as you work your way back 4" at a time. Stop when you reach the end of the framing at tailwheel support.



□ Step 71 - Fuselage Assembly (top sheeting)

Now, flip the fuselage over and sheet the top of the fuselage in the same way, starting at the rear of the wing cutout, backwards - to just forward of F10, as shown here.



□ Step 72 - Fuselage Assembly (hatch)

Locate H1 from LP6, two H2s and two H3s from LP5. Also locate two of the 1/4" magnets from the hardware bag.

First, push the magnets into the holes of both H2s, make sure they are fully seated. A gentle tap should be all that's needed to hold them securely in position.

Now lay H1 flat on your work surface. Glue both H2's in place, on the narrow end of H1. Make sure both are at 90° angles to H1.

Next glue both H3s in place, again at 90° angles and making sure the flat end of each H3 is pushed completely into the slots of H1. Lastly, cut two strips of scrap 1/8" ply to run from side to side as shown in the photo. These will add support and stiffness to H1.



□ Step 73 - Fuselage Assembly (hatch)

Locate the remaining two magnets from the hardware bag. These two magnets are pushed into the pre-cut holes in the fuselage sides, just aft of the firewall.

When pushing these in place, remember that magnets attract in one way only. Putting them in the wrong way will leave you with a hatch that will never close.



This completes major assembly of the Javelin fuselage. Now it's time to start construction of the tail surfaces.

□ Prepare your work area

Now tape the horizontal stabilizer plan and a fresh piece of waxed paper on your building board.

□ Step 74 - Stab Assembly (S1, S2 & S3)

Locate both S1s, both S2s, and four S3s from BP3.

These are glued as shown to form one S1, one S2, as well as two S3 pieces.



□ Step 75 - Stab Assembly (framing)

Cut a length of 1/4" x 1/2" balsa to form the trailing edge of the stab. Also cut the two smaller strips that form the leading edge.

Pin the trailing edge down first, then glue the S1, S2 and S3 assemblies in place.



Next glue on the leading edge pieces.

Finally, from 1/8" x 1/4" balsa stick, cut, fit and glue in the internal bracing.

□ Step 76 - Stab Assembly (gussets)

Locate SG1s, SG2s, SG3s and SG4s from BP6. Refer to the plans as to which goes where, then glue them in position.

Make sure everything is securely glued, then remove from the waxed paper.



□ Prepare your work area

Now tape the vertical fin plan and a fresh piece of waxed paper on your building board.

□ Step 77 - Fin Assembly (RD2 & RD3)

Locate two RD2s and RD3s from BP3.

These are glued as shown to form one RD2 and one RD3.



□ Step 78 - Fin Assembly (framing)

Cut a length of 1/4" x 1/2" balsa to form the trailing edge of the fin, and another for leading edge.

Pin the trailing edge down first, then glue the RD2 and RD3 assemblies in place.

Next glue on the leading edge.

Finally, from 1/8" x 1/4" balsa stick, cut, fit and glue in the internal bracing.



□ Step 79 - Fin Assembly (gussets)

Locate RG1, RG2, RG3 and RG4 from BP1. Refer to the plans as to which goes where, then glue them in position.

Before you remove the finished fin, make a mark on the leading edge where RD1 will be attached.

Make sure everything is securely glued, then remove from the waxed paper.



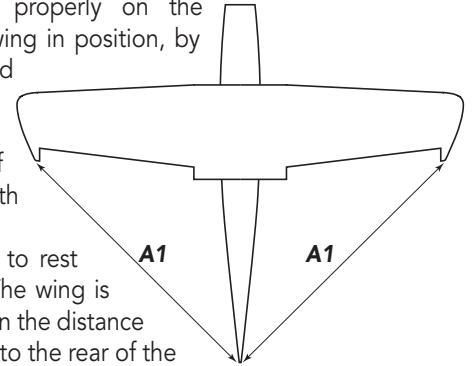
□ Step 80 - Fuselage Assembly (elevator & rudder)

Locate both RUDs from BP7 and four E1 from BP3. These are glued together as shown here, making two elevator halves and one rudder. Make sure all is properly aligned before the glue cures.



□ Step 81 - Fuselage Assembly (wing alignment)

To align the wing properly on the fuselage, place the wing in position, by pushing the forward wing retainer into the slot the center of R3/R4 (lightly sand if necessary for a smooth fit).



Then allow the wing to rest in the wing saddle. The wing is perfectly aligned when the distance from the left wing tip to the rear of the fuselage is the same the distance when measured from the right wing tip.

□ Step 82 - Fuselage Assembly (drill wing bolt holes)

With the wing aligned, drill two 3/16" holes for the wing bolts, using the pre-cut holes in H1 as a guide. Carefully drill down through the wing into the H5/H6 assembly in the fuselage.

Use caution to make sure the wing does not move until both holes are drilled.

When drilling, take your time and make sure the drill is held so the bit is perpendicular with the wing's sheeting. This will make it so the wing bolt goes in at an angle, but the screw's head will be flat on the wing surface. Remove the drill, remove the wing and clean up around the new holes you drilled.

Run a 1/4x20 tap through the H5/H6 pieces so that the wing bolts will thread into this block. A few drops of thin CA will help strengthen and secure the threads you've cut.

But, if you prefer, you can also use 1/4x20 t-nuts (not included).

□ Step 83 - Fuselage Assembly (enlarge bolt holes in wing)

Enlarge the bolt holes in the wing from 3/16" to 17/64", allowing the wing bolt to pass through easily.



□ Step 84 - Sanding (airframe)

Now is the time to get quite familiar with the sanding tools of your choice. Take the time to preform 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 and the trailing edges are blended into the cap strips, continuing the curvature of the wing.

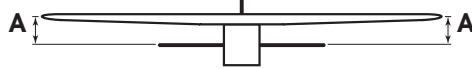
Smooth out the edges of the fuselage. Because of the 1/4" framing installed around the fuselage's perimeter, you can be a little more aggressive in rounding the corners.

Round the leading edge of the stab as well as the trailing edges of the elevator and rudder. When rounding the leading edge of the vertical fin, only round down to the mark you made earlier, where RD1 will attach.

Sand bevels into the leading edge of both elevator halves and the rudder.

Step 85 - Fuselage Assembly (stab alignment)

Although we've done everything possible to

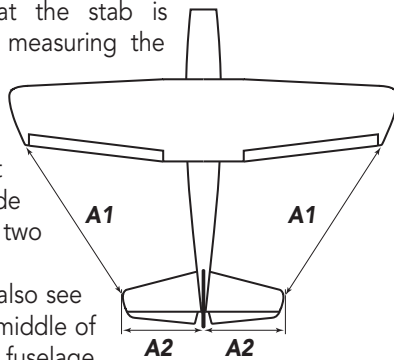


engineer the Javelin so it will build straight and true, take a few minutes to guarantee things are straight before gluing on the tail surfaces.

First bolt on the wing. Now, to align the stab, slide it in place. Look at the fuselage straight on, from the nose (or tail) and make sure that the stab is level with the wings. If not, remove the stab and gently sand the stab supports a little at a time. Check the stab and re-sand the supports as needed.

Step 86 - Fuselage Assembly (stab alignment)

Once leveled, ensure that the stab is aligned with the wing by measuring the distance from the left wing tip to the left tip of the stab. Compare this to the distance between the right wing and right stab tip. Slide the stab a bit until these two measurements are equal.



When aligned, you should also see that the pre-cut slot in the middle of the stab is centered in the fuselage.

Make a couple of marks where the stab touches the fuselage so you can place it back in the same position.

Remove the stab, apply glue on the stab supports then attach the stab in place.

Step 87 - Fuselage Assembly (stab/fin installation)

The vertical fin's tab will slide through the fuselage and down into the slot pre-cut into the stab. Sand the fin if necessary to get a firm, slop-free fit. Also ensure that the fin is perfectly vertical (90° in relation to the stab).



Mark and trim the 1/4" framing so it will allow the rudder to clear.

Once properly in position, it's time to glue the stab and fin in position. Take a bit of time to make sure all glue joints are sufficient, but don't use too much glue as it will make the Javelin unnecessarily tail-heavy.

Step 88 - Fuselage Assembly (P3)

Locate both P3s from BP5. These are glued on the top of the fuse, to the left and right of the vertical fin, completing the sheeting.



Once glued in place, sand these pieces to blend into the fuselage.

Step 89 - Fuselage Assembly (RD1)

Locate both RD1s from BP3. Glue these together, then glue the assembly in place as shown here.



Make sure it is straight when attaching. Then sand to blend into the vertical fin.

Step 90 - Fuselage Assembly (elevator joiner)

Locate the pre-bent elevator joiner from the hardware bag. Make sure that this piece is perfectly flat as it can twist a bit with temperature changes.



Temporarily tape the elevator halves in position on the stab.

Now place the elevator joiner on top of the elevator halves and mark where holes will need to be drilled (approximately 1" in from the inside edge).

Remove each elevator half and carefully drill a hole at these marked locations with a 1/8" drill bit. The hole should be roughly 3/4" deep and straight into the wood. Take care to not drill in at an angle or you risk the chance of the bit cutting through the surface of the piece.

When finished drilling, use a hobby knife to cut a channel just wide and deep enough for the joiner's wire to seat properly.

After you've completed this for both halves, use a bit of medium CA glue to permanently glue the joiner into both halves - making sure the completed leading edge of the elevator is perfectly straight and flat.

This completes major assembly of the Javelin airframe. Now it's time to start construction of the main gear box.

Step 91 - Main gear (axle hole)

Locate the main gear halves from the hardware bag. Each of these need a 5/16" hole drilled into the bottom bend, as shown here. This will allow the axle shaft to be inserted in the next step.



Step 92 - Main gear (attach axle)

Locate the axle shafts and their matching locknuts. These are now attached to the landing gear halves as shown. Make sure the lock nuts are tightened firmly.



Step 93 - Main Gear Assembly (WB5/WB6)

Locate both WB5 and WB6 from LP1 and LP2. These are glued together to make two WB5/WB6 assemblies.



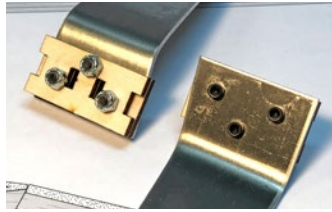
When gluing them together make sure the holes are aligned between the two pieces and that the outer edges are also aligned.

Step 94 - Main Gear Assembly (WB5/WB6)

Locate six 4-40 bolts and six lock nuts from the hardware bag as

well as both pre-bent landing gears.

You will now bolt one WB5/WB6 assembly to each landing gear. When properly installed, the notches in WB5 will be visible, as shown here. Take care to make sure these fasteners are tightened, but not overly tightened so they don't start crushing the plywood.



Step 95 - Main Gear Assembly (WB7)

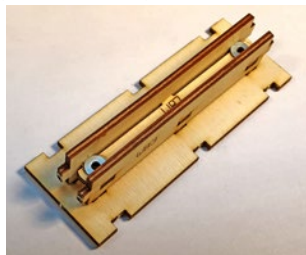
Locate WB7 from LP1 and two #4 washers from the hardware bag. Use a drop of CA to lightly glue one washer to each end of WB7, surrounding the pre-cut mounting holes as shown.



Step 96 - Main Gear Assembly (WB3 & WB8)

Locate both WB3s from LP2 and WB8 from LP1. These pieces, along with the WB7 assembly from the previous step are now assembled as shown here.

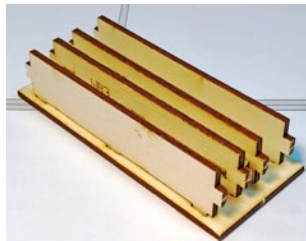
First push the tabs of WB7 into the notches of each WB3. WB7 should be oriented so the side with the washers faces the non-tabbed side of each WB3.



When assembled, then push this assembly into the slots cut into the middle of WB8. Make sure these are all fully seated, perpendicular to each other and firmly glued in place.

Step 97 - Main Gear Assembly (WB4)

Locate the both WB4s from LP2. These are glued in position on the outer rows of pre-cut slots in WH8. *Note that this photo shows WH8 which is wider than your piece. This was a prototype part that was actually cut too wide. The narrower part you have is the correct one.*



Step 98 - Main Gear Assembly (WB4)

Now the three main assemblies are glued together.

Glue one WB5/WB6 assembly to each side of the landing gear box, making sure all of the tabs are firmly seated. It might be wise to use a clamp to hold these assemblies in place.



Also note the orientation of the landing gear and both should extend the same way.

Make sure these pieces are firmly glued together. We also recommend wicking in a bit of thin CA to harden up all of the plywood.

Step 99 - Main Gear Assembly (WB11)

Locate both WB11s from LP3 and LP4.

These are positioned as shown here, and the etched in arrow (not shown in the picture) should point towards the outside of the box.

You'll also notice when looking into the hole, you should be able to see through the other holes in WB7 and WB8.



Step 100 - Main Gear Assembly.

Locate two WB12s and two WB13s from LP3 and LP4.

WB12 is glued to both sides of the aluminum landing gear, allowing the heads of the 4-40 bolts to slide into WB12's pre-cut holes.

WB13 is glued on to WB12 to expand the width of the landing gear box to the correct size.



Step 101 - Main Gear Assembly

Now the finished main gear box can be installed into the bottom of the fuselage. Note you'll have to sand off a bit off the leading edge of both WB13s so the box will slide into the fuselage (accounting for the taper of the fuse sides). You want this to be a very snug fit, but not so much that it bulges the fuselage sides.



Locate both 4-40 x 1-1/2" bolts and two 4-40 t-nuts from the hardware bag.

Insert the assembled landing gear box into the fuselage, paying attention to the angle of the main gear as the rear edge should sweep slightly forward.

Slide both 4-40 bolts into the mounting holes of the box and the screws will extend into the cabin area of the fuselage. Now thread both t-nuts on the bolts as shown here. Tighten the bolts to fully seat the t-nuts in place. You can secure the t-nuts with a few drops of glue, but make sure not to get glue on the threads.



This completes major assembly of the Javelin. You should now have an airframe that looks pretty much like this:



Step 102 - Fuselage Assembly (front sheeting)

We're going to show you this step now, but it's probably best that you don't do it until you've figured out everything happening around the firewall and mounting your choice of power.

It is strongly recommended that



you also sheet the area on the top of the fuselage, between the front sides, as shown here. This not only adds to the looks of the Javelin, but gives much needed support to the sides so they can handle vibration and airflow much better. If using glow lower, you will need to make cutouts for the needle valve and muffler screws.

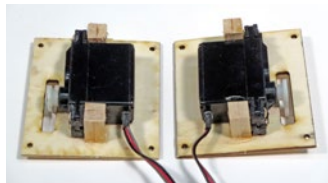
Now it's time to think about radio and engine installation.

These next steps of covering, hinging, radio and power installation are not in any particular order. Some modelers like to cover everything first, then outfit the rest. Others like to hinge and pre-install the components, working out the installation before covering. Use the method that works best for you.

We prefer to pre-install many of the components to make sure there are no surprises in the way things fit or might have to be modified for after market items. We find it much easier to fix these problems now, before covering, as there's nothing worse than ruining a good covering job by having to hack a hole or provide clearance for something.

Aileron servo hatches (from LP2)

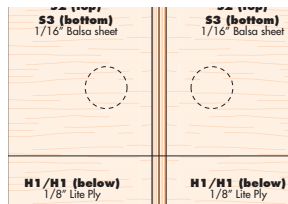
From leftover 3/16" x 3/8" x 36" basswood strip, cut eight 3/4" pieces. Make a mounting post by laminating two pieces, gluing the 3/8" sides together to make a 3/8 x 3/8" square post. Make 3 additional posts from the remaining pieces, sanding the ends flat. Position your aileron servo on the inside of 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 3/16" x 3/8" basswood mounting strips installed earlier. 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.

Aileron wire holes for servo wires

On the plans you'll see callouts where the two holes are pre-cut in the bottom sheeting (S3). These holes allow the aileron servo wires to pass through the wing and into the fuselage.



This is optional, but could make the aileron servo installation a bit easier, once the wings are covered. Cut two 18" lengths of string, one for the port side, and one for starboard. Starting with the port wing panel, push the thread through this hole, then through the circular holes in R3, R4, R5 and R6. The string will now extend from the servo bay, out through the bottom of the wing. Tape both ends of the string so they won't easily pull out. Do the same for the starboard side.



Pushrods (rudder & elevator)

In F5, F6, F7 and F8 we've made provisions to help you run

flexible pushrods back through the fuselage. You'll see a pair of pre-cut holes where you can snake the outside of the flexible tubing system of your choice, then continue out through the exit holes pre-cut in the sides of the fuselage.



The support for F6 is a separate piece - F6A which is in BP7.

If you choose to use this type of pushrod, make sure you glue this outer sleeve to each of these center supports. If you choose a different system, these supports can be cut away as needed for clearance.



Make sure that when installing the control horns, they are placed in-line with the pushrods, and that the line of holes where the clevises attach are positioned over the hinge line.

For the average pilot, we recommend that clevises are attached to the outermost hole on each control horn.

Servo mounting (rudder & elevator)

The rudder and elevator servo should be mounted in the two rectangular holes pre-cut in the back of T2.



Locate four T5s from LP3, LP4 and LP6. These are glued in place as shown to double-up and strengthen T2, where the mounting screws will be threaded in.

Servo mounting (throttle - glow engines)

If you are powering your Javelin with a glow engine, then you'll also need to mount a throttle servo. There are two positions to mount the servo - one on each side of the front of T2. For most installations, the throttle servo will mount on the starboard side. Regardless of the side you choose, glue on a couple more of the T5 pieces to double-up T2 for the servo screws.

Radio installation

Finish the installation of your radio gear by adding the receiver, flight pack battery and the switch. We mounted the receiver to TF2 using a bit of self-adhesive hook-and-loop (not included).

If you're using a flight pack battery, there is no set place to install it. It's location should be dictated more by the C.G. than anything else.

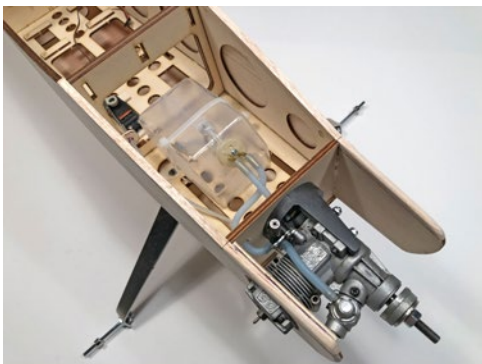
Also any switches (whether radio or arming for the electric power system) can be mounted in the tank/battery compartment. The magnetic hatch is quickly released to get to them.

Power system

Installing your power system of choice is up next. We'll show photos for regarding electric and glow installations. Note that these are suggestions only as your power system might vary from what's shown here.

Glow power

Your engine mounts so the crankshaft is positioned over the center of the circular cutout on the firewall. It can be mounted upright, side or even inverted. We chose side



mounting it as shown here on one of our Javelin prototypes. This particular engine required a muffler extension to space the muffler away from interfering with the bottom of the fuselage. Holes will also need be drilled for the throttle pushrod to pass through into the fuselage.

Electric power

When mounting an electric motor, we have provided a motor spacer box that can be used. Note that it is not universal but has worked with the motors we've tried.

This box consists of parts M1 from LP5 and two MP3s, two MP4s and MP5 from LP6.

MP5 is the base as shown in this photo, then the MP3s and MP4s make up the sides, and M1 the top.

Before gluing these pieces together, drill M1 to accept your motor's mounting bracket, then attach t-nuts (not included) on the back side of M1.

When that's worked out, you can then glue it all together, mount your motor and then mount it to the firewall.

To mount to the firewall, drill four etched mounting locations on F1, then attach it to the firewall using the included 4-40x1/2 bolts, #4 washers and 4-40 t-nuts.

Cooling holes will need be drilled through the firewall as well and you'll find recommended locations for those etched into F1 as well.

One last thing regarding electric power. We've included parts T3 and T4 in LP6. These can be used to create a slightly higher shelf

to mount you batteries. The idea is to raise up the tray level with T2, so larger and longer batteries can be used. Also it allows the batteries to be shifted aft if needed, for C.G. purposes.

Tailwheel mounting

Mount your choice of tailwheel to the bottom of the fuselage. It should mount to the bottom of the plywood TW1 assembly, already installed.

We chose to use a simple wire tailwheel that mounts into the rudder. If going this route, make sure it's in place before hinging and mounting the rudder to the fuselage.



Covering

Now it is time to cover the Javelin. Remove the powerplant, main gear, tailwheel, 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 on the previous page.

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.

Make sure that you attach the elevator first, then the rudder. Also note that the tailwheel assembly should be in place before the rudder is attached.

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.

This completes the assembly of the Javelin. 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) location for the Javelin is measured back 4.1" from the leading edge of the wing, as measured at the wing's center section, 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

C.G. BALANCE POINT



achieved. Stick-on weights are available at your local hobby store and work well for this purpose.

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 the closest or exact control throws listed.

Aileron 7/8" up/down (35% expo)

Elevator 5/8" up/down (25% expo)

Rudder 1" left/right (20% expo)

We've also had fun with Flaperons. If your radio allows it, try programming those in for yourself, on a 2 or 3 position switch. We've used as much as 35% down for full flaps, then half that if using a 3-position switch. This can aid in really slowing the Javelin down to a crawl for landing and make the takeoffs a bit shorter too.

(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.

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. 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.



For more information on all of our other products, as well as the latest news from Old School Model Works:

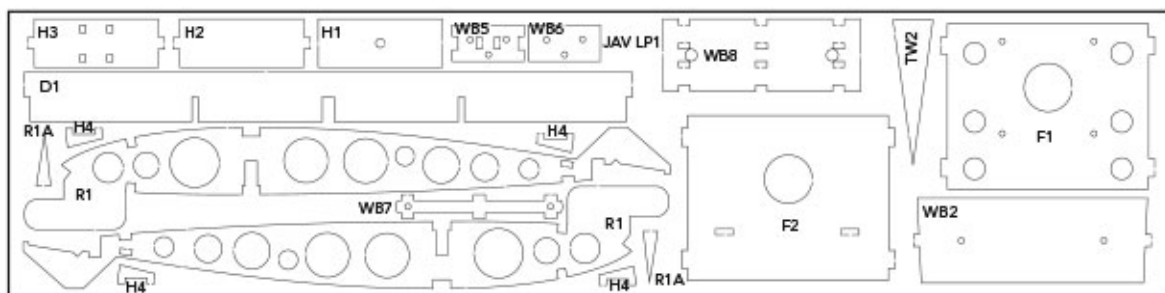
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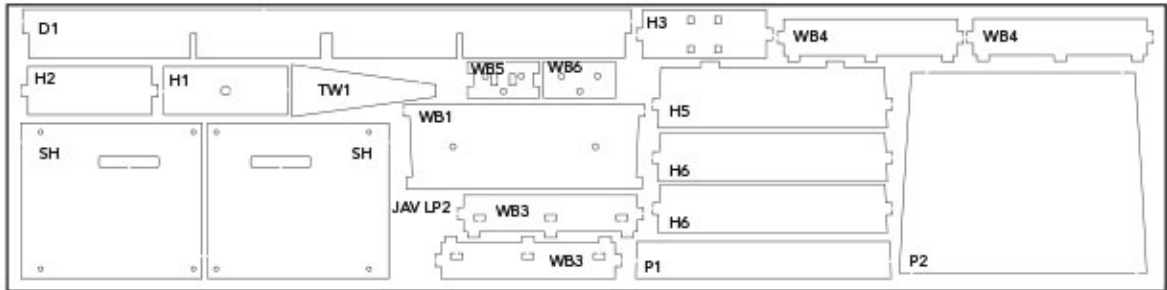
Twitter: www.twitter.com/oldschoolmodels

LP1
1/8" Lite Ply



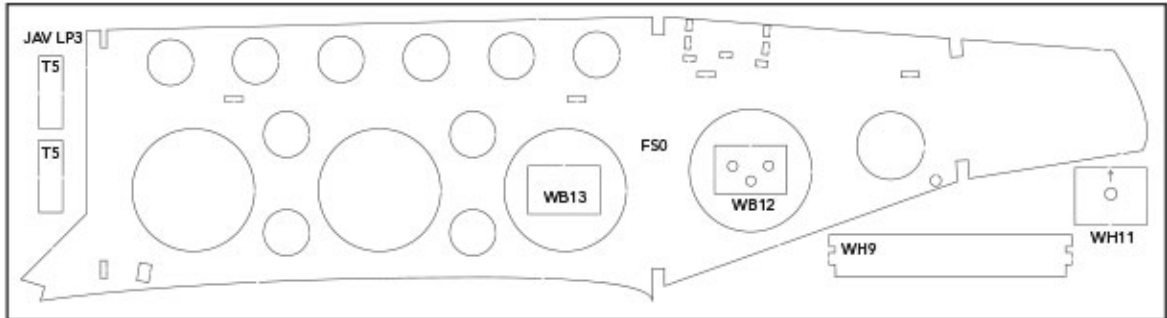
LP2

1/8" Lite Ply



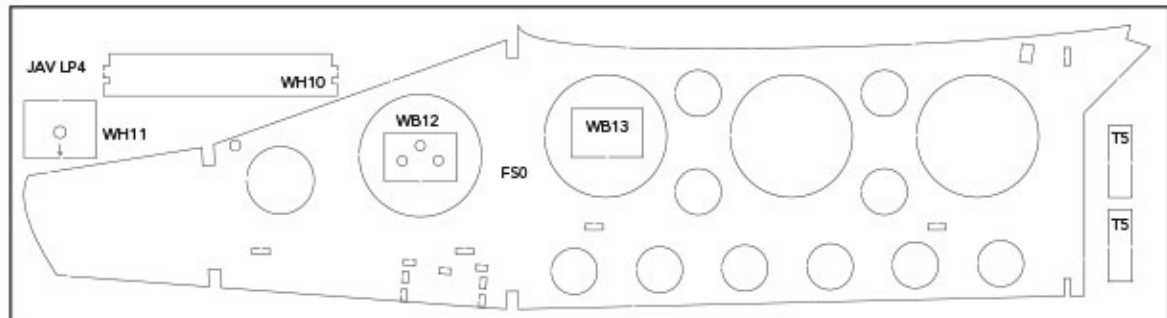
LP3

1/8" Lite Ply



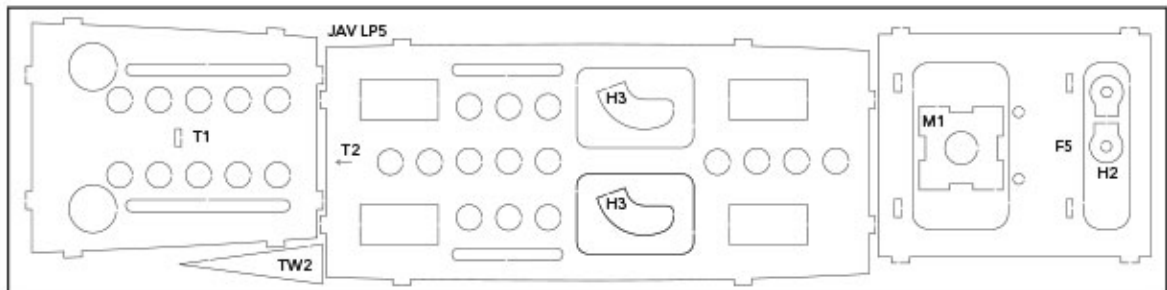
LP4

1/8" Lite Ply



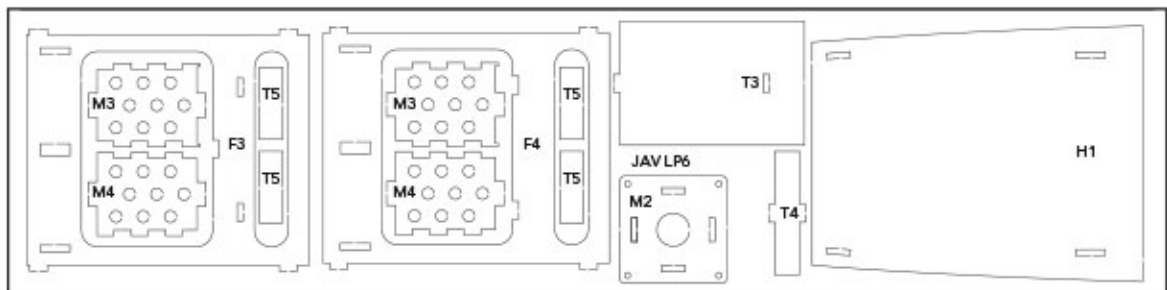
LP5

1/8" Lite Ply



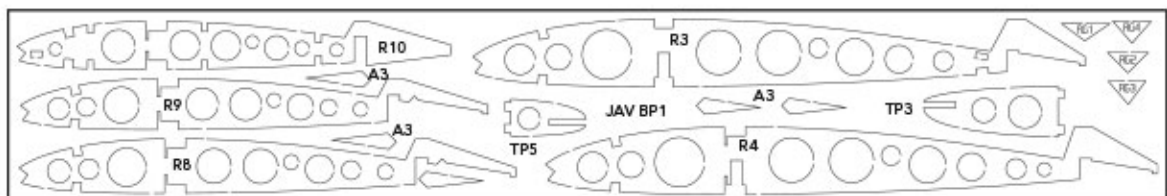
LP6

1/8" Lite Ply

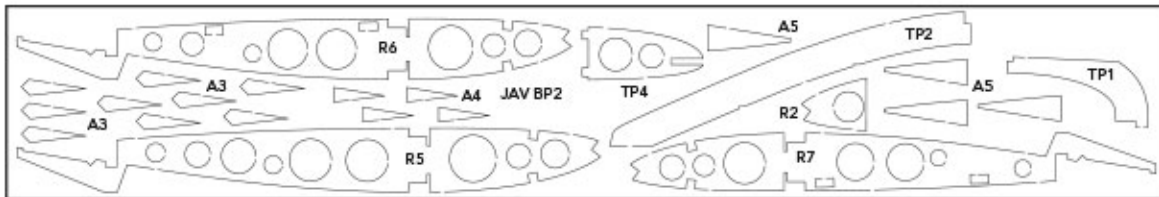


BP1

1/8" Balsa



BP2
1/8" Balsa



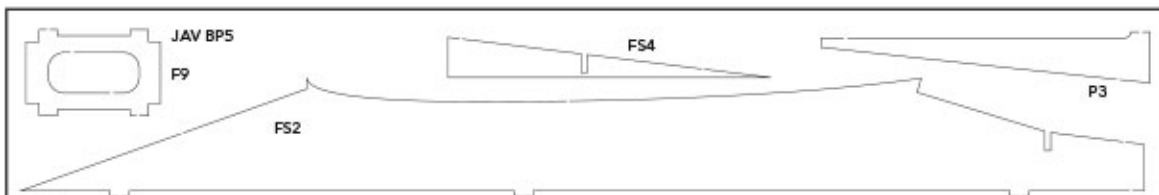
BP3
1/8" Balsa



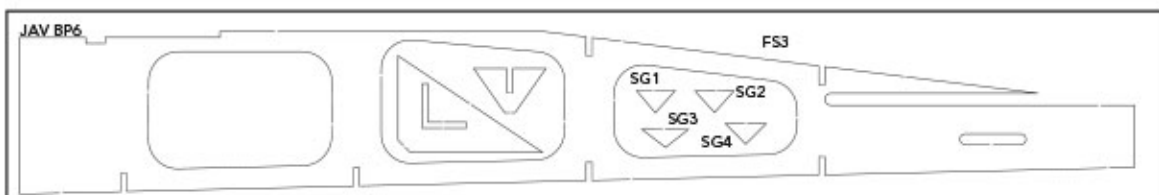
BP4
1/8" Balsa



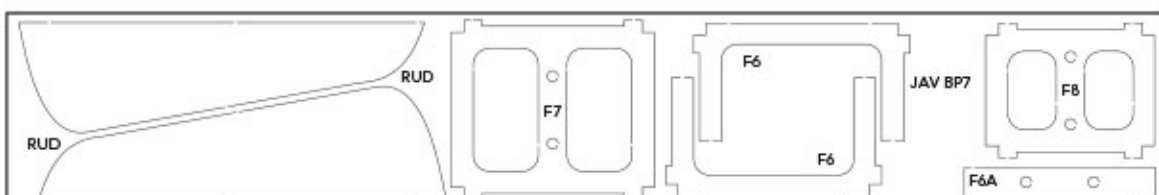
BP5
1/8" Balsa



BP6
1/8" Balsa



BP7
1/8" Balsa



BP8
1/16" Balsa



BP9
1/16" Balsa



BP10
1/16" Balsa

